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CONTENTS

1 Overview

The Redfish standard comprises a set of specifications maintained by the Redfish Forum, a working group within the DMTF. The standard defines a protocol that uses RESTful interfaces to provide access to data and operations associated with the management of systems and networks. One of the strengths of the Redfish protocol is that it works with a wide range of servers: from stand-alone servers to rack-mount and bladed environments to large-scale data centers and cloud environments.

The Redfish standard addresses several key issues for infrastructures that require scalability. Large infrastructures often consist of many simple servers of different makes and types. This hyper-scale usage model requires a new approach to systems management. The Redfish protocol addresses these needs by providing a standard protocol based on out-of-band systems management.

With these goals in mind, the Redfish protocol was designed as an open-industry standard to meet scalability requirements in multi-vendor deployments. It easily integrates with commonly used tools, using RESTful interfaces to perform operations and using JSON for data payloads.

1.1 Who should read this document?

This document is for Redfish service developers or application software developers that interface with a Redfish service. This document includes the informative and normative descriptions copied from the description and long description annotations in the *Redfish Schema Bundle* (DSP8010), and adds supplemental normative text to further explain the usage of particular properties or resources.

If mistakes or discrepencies arise in this document, the *Redfish Schema Bundle* (DSP8010) is the primary normative document.

1.2 How can I provide feedback?

Feedback on all Redfish specifications and documents is encouraged. Feedback can be directed to the DMTF and the Redfish Forum by the following means:

- **Redfish User Forum:** http://www.redfishforum.com User forum monitored by DMTF Redfish Forum personnel to answer questions about any Redfish-related topics.
- **DMTF Feedback Portal:** https://www.dmtf.org/standards/feedback Formal submission portal for enhancements or proposals to the DMTF and Redfish Forum.

1.3 Where can I find more information?

The following web sites provide more information about the Redfish standard:

- **Redfish Developer Hub**

  Resources for developers who use Redfish to build applications. Contains an interactive schema explorer, hosted schema, and other links.

- **Redfish Specification Forum**

  DMTF Redfish-monitored user forum. Answers questions about Redfish-related topics.

- **DMTF GitHub repositories**

  Open source tools and libraries for working with Redfish.

- **Redfish standards**

  Schemas, specifications, mockups, white papers, FAQ, educational material, and more.

- **DMTF Redfish Forum**

  Working group that maintains the Redfish standard. Site lists member companies, future work and schedules, charter, and information about joining.

1.4 Related documents

The following documents are part of the Redfish development effort. They can be accessed or downloaded from the DMTF Redfish Standards web site: http://www.dmtf.org/standards/redfish

- DSP0218 - Platform Level Data Model (PLDM) for Redfish Device Enablement Specification - Binary-encoded JSON (BEJ) and dictionary-based mapping of Redfish schemas and properties into PLDM messages.
- DSP0266 - Redfish Specification - Main Redfish Specification.
- DSP0268 - Redfish Data Model Specification - Normative descriptions and additional text for every schema defined in DSP8010 and example payloads for every resource.
- DSP0270 - Redfish Host Interface Specification - "In-band" or "OS-based" Redfish host interface.
- DSP0272 - Redfish Interoperability Profiles Specification - Structure and JSON document that is used to define and publish an interoperability profile that checks an implementation's conformance to a defined minimum set of functionality.
- DSP2043 - Redfish Mockups Bundle - Set of mockups that can be used as sample output from `GETs` from a Redfish service. Informative in nature, it was used to develop the schema. A person can set up an NGINX or similar server and configure it to output JSON format and then use this directory for demonstration purposes.
- DSP2044 - Redfish White Paper - Non-normative document helping those new to Redfish understand how to interact with the Redfish service and understand common functions and tasks.
- DSP2046 - Redfish Resource and Schema Guide - Informative documentation regarding common Redfish

resource properties and a listing of properties that can be found in each of the Redfish resources.

- DSP2053 - Redfish Property Guide - Informative documentation providing an index to individual property definitions across all Redfish schema.
- DSP2065 - Redfish Message Registry Guide - Informative documentation providing details regarding the messages defined in Redfish standard message registries.
- DSP8010 - Redfish Schema - Redfish schema definitions. These files are normative in nature and are normatively referenced by the *Redfish Specification*. The three schema formats are CSDL (OData Common Schema Definition Language format, which is in XML), JSON Schema, and OpenAPI schema. These schema definitions should be functionally equivalent, thus specifying the schema in two different languages.
- DSP8011 - Redfish Standard Registries - Redfish registry definitions. This bundle of Redfish registries includes message registries used for Redfish-defined messages including events and privilege maps.
- DSP8013 - Redfish Interoperability Profiles Bundle - Bundle of published Redfish interoperability profile documents and supporting schema and sample documents used for creating profiles.

2 Using this guide

Every Redfish response consists of a JSON payload containing properties that are strictly defined by a schema for that resource. The schema that defines a resource can be determined from the value of the `@odata.type` property returned in every Redfish response. This guide details the definitions for every Redfish standard schema.

Each schema section contains:

- The name, current version, and description of the schema.
- The release history of the schema. Lists each minor schema version and the DSP8010 release bundle that included it.
- List of the possible URIs where schema-defined resources can appear in a Redfish service following specification version v1.6 or later. See URI listings.
- Table that defines each property. Shows additional details for those properties when needed.
- List of available actions defined for the schema.
- Example JSON payload for a resource using the schema.

The property-level details include:

Column	Purpose
Property name	The case-sensitive name of the JSON property as it appears in the JSON payload. Lists the schema version in parentheses when properties were added to or deprecated in the schema after the initial v1.0.0 release.
Type	The JSON data types for the property, which can include boolean, number, string, or object. The `string (enum)` tag identifies enumerated strings. Number types that use units specify the units.
Attributes	Designates whether: • The property is read-only or read-write, if supported by the implementation. • The service might return a `null` value if the property value is temporarily unavailable.
Description	The description of the property, as copied directly from the schema's definition of the property.

2.1 URI listings

The *Redfish Specification v1.6.0* added mandatory support for the *OpenAPI Specification v3.0*. As part of this support, the URIs for every Redfish resource are defined to appear at known, fixed locations. Resource collections also appear at fixed locations, with the members of each collection appearing at URIs constructed by using a fixed path structure, with appropriate path segments equal to the value of `Id` properties of members along the path.

Support for v1.6.0 and OpenAPI can be determined by comparing the value of the `RedfishVersion` property in the service root (`/redfish/v1/`). Services that report a `1.6.0` or higher value, such as `1.6.1` or `1.7.0`, adhere to the URI definitions.

The URI listings do not apply to Redfish services that support specification versions earlier than v1.6.0. For those services, clients must use the hypermedia features of the API to discover hyperlinks from the service root to each resource. While services typically match the URIs listed in this document for many of their resources, this match is not guaranteed and results in errors.

3 Common properties

3.1 Properties that all Redfish schemas define

The following properties are defined for inclusion in every Redfish schema, and therefore may be encountered in any response payload. They are documented here in this guide to avoid repetition in the Reference guide property tables.

> **Note:** Several of these properties are payload annotations but appear here because they are required for all Redfish resources.

3.1.1 Properties

Property	Type	Attributes	Notes
@odata.context	string (URI)	*read-only*	The value of this property shall be the context URL that describes the resource according to OData-Protocol and shall be of the form defined in the Redfish specification.
@odata.etag	string	*read-only*	The value of this property shall be a string that is defined by the ETag HTTP header definition in RFC7232.
@odata.id	string (URI)	*read-only required*	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
@odata.type	string	*read-only required*	The value of this property shall be a URI fragment that specifies the type of the resource and it shall be of the form defined in the Redfish specification.
Description	string	*read-write*	This property shall contain the description of this resource. The value shall conform with the 'Description' clause of the Redfish Specification.
Id	string	*read-write*	This property shall contain the identifier for this resource. The value shall conform with the 'Id' clause of the Redfish Specification.
Name	string	*read-write required*	This property shall contain the name of this resource or array member. The value shall conform with the 'Name' clause of the Redfish Specification.
Oem {}	object		The manufacturer- or provider-specific extension moniker that divides the `Oem` object into sections.

3.2 Frequently used properties

In addition, the following properties are frequently defined in Redfish schemas. Their definition and usage is the same throughout the Redfish data model.

3.2.1 Properties

Property	Type	Attributes	Notes
Actions {}	object		The Redfish actions available for this Resource.
Links {}	object		The links associated with the Resource, as defined by that Resource's schema definition. All associated reference properties defined for a Resource are nested under the Links property. Find all directly referenced, or subordinate, Resource properties from the root of the Resource.
RelatedItem [{	array		An array of links. Each link points to a Resource or part of a Resource as defined by that Resource's schema. This representation is not intended to be a strong linking methodology like other references. Instead, it shows a relationship between elements or subelements in disparate parts of the service. For example, fans might be in one area of the system and processors in another. The relationship between the two might not be obvious. This property can show that one is related to the other. In this example, it might indicate that a specific fan cools a specific processor.
@odata.id	string (URI)	*read-only*	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

3.3 Payload annotations

Payload annotations are a mechanism in which a service provides additional information about a given property or object. Redfish limits usage of these annotations to OData core terms, Redfish extensions, or Redfish messages.

3.3.1 Property-level annotations

A payload annotation for a single property takes the form of an additional property named `Property@Schema.Term`, where `Property` is the JSON property being annotated, `Schema` is the schema file where the definition for the annotation is found, and `Term` is the name of the annotation.

3.3.2 Properties

Property	Type	Attributes	Notes
@Message.ExtendedInfo {}	object		The additional information for a set of message structures for a property. These messages can be useful when a property is `null` due to an error condition and the service wants to convey why the property is `null`.

Property	Type	Attributes	Notes
@odata.count	integer	*read-only*	The value of this property shall be an integer representing the number of items in a collection.
@Redfish.AllowableValues [ ]	array (string)	*read-only*	The string values that a service accepts for a property or action parameter.

In the following example, the property `ResetType` is annotated with the `Redfish` schema-defined `AllowableValues` term. `Redfish` is an alias for `RedfishExtensions`. This term indicates to the client that the service supports the values `On` and `ForceOff` for `ResetType`.

```
{
    "ResetType@Redfish.AllowableValues": [
        "On",
        "ForceOff"
    ]
}
```

3.3.3 Resource-level or object-level annotations

A payload annotation for an entire Resource or a JSON object takes the `@Schema.Term` form, where `Schema` is the schema file where the definition is found and `Term` is the name of the annotation. These payload annotations are used to provide further information about the object itself.

3.3.4 Properties

Property	Type	Attributes	Notes
@Redfish.ActionInfo	string (URI)	*read-only*	The URI to an ActionInfo Resource, which describes the parameters that this Action instance supports.
@Redfish.CollectionCapabilities {}	object		This type shall describe any capabilities of a resource collection in terms of how a client can create resources within the resource collection. For property details, see CollectionCapabilities.
@Redfish.MaintenanceWindow {}	object		This type shall indicate that a resource has a maintenance window assignment for applying settings or operations. Other resources can link to this object to convey a common control surface for the configuration of the maintenance window. For property details, see MaintenanceWindow.

Property	Type	Attributes	Notes
@Redfish.OperationApplyTime	string (enum)	*read-write*	The client's requested apply time to complete a create, delete, or action operation. *For the possible property values, see @Redfish.OperationApplyTime in Property details.*
@Redfish.OperationApplyTimeSupport {}	object		This type shall indicate that a client can request a specific apply time of a create, delete, or action operation of a resource. For property details, see OperationApplyTimeSupport.
@Redfish.Settings {}	object		This type shall describe any settings of a resource. For property details, see Settings.
@Redfish.SettingsApplyTime {}	object		This type shall be specified by client to indicate the preferred time to apply the configuration settings. For property details, see PreferredApplyTime.

3.3.5 Property details

3.3.5.1 @Redfish.OperationApplyTime:

The client's requested apply time to complete a create, delete, or action operation.

string	Description
AtMaintenanceWindowStart	This value shall indicate the requested create, delete, or action operation is applied during the maintenance window that the MaintenanceWindowStartTime and MaintenanceWindowDurationInSeconds properties specify. A service can complete resets during this maintenance window.
Immediate	This value shall indicate the requested create, delete, or action operation is applied immediately. This value may result in an immediate host reset, manager reset, or other side effects.
InMaintenanceWindowOnReset	This value shall indicate the requested create, delete, or action operation is applied during the maintenance window that the MaintenanceWindowStartTime and MaintenanceWindowDurationInSeconds properties specify, and if a reset occurs within the maintenance window.
OnReset	This value shall indicate the requested create, delete, or action operation is applied when the system or service is reset.
OnStartUpdateRequest	This value shall indicate the requested create, delete, or action operation is applied when the StartUpdate action of the update service is invoked.

This example annotates the object with the `Redfish` schema-defined action info term. `Redfish` is an alias for `RedfishExtensions`. This term indicates that the client can find more information about the `#ComputerSystem.Reset` action at the `/redfish/v1/Systems/1/ResetActionInfo` URI:

```
{
    "#ComputerSystem.Reset": {
        "target": "/redfish/v1/Systems/1/Actions/ComputerSystem.Reset",
        "@Redfish.ActionInfo": "/redfish/v1/Systems/1/ResetActionInfo"
    }
}
```

4 Common objects

Redfish schemas frequently define the following JSON objects. Like the individual common properties listed above, these objects share a common definition that is shown here to avoid repetition in the Reference guide property tables.

4.1 Actions

The `Actions` object contains the available for a resource.

4.1.1 Properties

Property	Type	Attributes	Notes
#{action name} {	object		A single Redfish action.
@Redfish.ActionInfo	string	*read-only*	The URI for an ActionInfo Resource that describes this action.
target	string	*read-only*	The target URI for the POST operation to invoke the action.
}			

4.2 Capacity

4.2.1 Description

This is the schema definition for the Capacity of a device. It represents the properties for capacity for any data store.

- This composition may be used to represent storage capacity. The sum of the values in Data, Metadata, and Snapshot shall be equal to the total capacity for the data store.

4.2.2 Properties

Property	Type	Attributes	Notes
Data {	object		The capacity information relating to the user data. • The value shall be capacity information relating to provisioned user data.

Property	Type	Attributes	Notes
AllocatedBytes	integer (bytes)	*read-write (null)*	The number of bytes currently allocated by the storage system in this data store for this data type. • The value shall be the number of bytes currently allocated by the storage system in this data store for this data type.
ConsumedBytes	integer (bytes)	*read-only (null)*	The number of bytes consumed in this data store for this data type. • The value shall be the number of logical bytes currently consumed in this data store for this data type.
GuaranteedBytes	integer (bytes)	*read-write (null)*	The number of bytes the storage system guarantees can be allocated in this data store for this data type. • The value shall be the number of bytes the storage system guarantees can be allocated in this data store for this data type.
ProvisionedBytes	integer (bytes)	*read-write (null)*	The maximum number of bytes that can be allocated in this data store for this data type. • The value shall be the maximum number of bytes that can be allocated in this data store for this data type.
}			
IsThinProvisioned	boolean	*read-only (null)*	Marks that the capacity is not necessarily fully allocated. • If the value is false, the capacity shall be fully allocated. The default value shall be false.
Metadata {	object		The capacity information relating to metadata. • The value shall be capacity information relating to provisioned system (non-user accessible) data.
AllocatedBytes	integer (bytes)	*read-write (null)*	The number of bytes currently allocated by the storage system in this data store for this data type. • The value shall be the number of bytes currently allocated by the storage system in this data store for this data type.
ConsumedBytes	integer (bytes)	*read-only (null)*	The number of bytes consumed in this data store for this data type. • The value shall be the number of logical bytes currently consumed in this data store for this data type.

Property	Type	Attributes	Notes
GuaranteedBytes	integer (bytes)	*read-write (null)*	The number of bytes the storage system guarantees can be allocated in this data store for this data type. • The value shall be the number of bytes the storage system guarantees can be allocated in this data store for this data type.
ProvisionedBytes	integer (bytes)	*read-write (null)*	The maximum number of bytes that can be allocated in this data store for this data type. • The value shall be the maximum number of bytes that can be allocated in this data store for this data type.
}			
Snapshot {	object		The capacity information relating to snapshot or backup data. • The value shall be capacity information relating to provisioned snapshot or backup data.
AllocatedBytes	integer (bytes)	*read-write (null)*	The number of bytes currently allocated by the storage system in this data store for this data type. • The value shall be the number of bytes currently allocated by the storage system in this data store for this data type.
ConsumedBytes	integer (bytes)	*read-only (null)*	The number of bytes consumed in this data store for this data type. • The value shall be the number of logical bytes currently consumed in this data store for this data type.
GuaranteedBytes	integer (bytes)	*read-write (null)*	The number of bytes the storage system guarantees can be allocated in this data store for this data type. • The value shall be the number of bytes the storage system guarantees can be allocated in this data store for this data type.
ProvisionedBytes	integer (bytes)	*read-write (null)*	The maximum number of bytes that can be allocated in this data store for this data type. • The value shall be the maximum number of bytes that can be allocated in this data store for this data type.
}			

4.3 Condition

4.3.1 Description

A condition that requires attention.

- This type shall contain the description and details of a condition that exists within this resource or a related resource that requires attention.

4.3.2 Properties

Property	Type	Attributes	Notes
LogEntry {	object		The link to the log entry created for this condition. • This property shall contain a link to a resource of type LogEntry that represents the log entry created for this condition. See the *LogEntry* schema for details on this property.
@odata.id	string	*read-only*	Link to a LogEntry resource. See the Links section and the *LogEntry* schema for details.
}			
Message	string	*read-only*	The human-readable message for this condition. • This property shall contain a human-readable message describing this condition.
MessageArgs [ ]	array (string)	*read-only*	An array of message arguments that are substituted for the arguments in the message when looked up in the message registry. • This property shall contain an array of message arguments that are substituted for the arguments in the message when looked up in the message registry. It has the same semantics as the MessageArgs property in the Redfish MessageRegistry schema.
MessageId	string	*read-only* *required*	The identifier for the message. • This property shall contain a MessageId, as defined in the 'MessageId format' clause of the Redfish Specification.
OriginOfCondition {	object		A link to the resource or object that originated the condition. • This property shall contain a link to the resource or object that originated the condition. This property shall not be present if the condition was caused by this resource.

Property	Type	Attributes	Notes
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
Resolution *(v1.14+)*	string	*read-only*	Suggestions on how to resolve the condition. • This property shall contain the resolution of the condition. Services should replace the resolution defined in the message registry with a more specific resolution.
Severity	string (enum)	*read-only*	The severity of the condition. • This property shall contain the severity of the condition. Services can replace the value defined in the message registry with a value more applicable to the implementation. *For the possible property values, see Severity in Property details.*
Timestamp	string (date-time)	*read-only*	The time the condition occurred. • This property shall indicate the time the condition occurred.

4.3.3 Property details

4.3.3.1 Severity:

The severity of the condition.

- This property shall contain the severity of the condition. Services can replace the value defined in the message registry with a value more applicable to the implementation.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

4.4 Identifier

4.4.1 Description

Any additional identifiers for a resource.

- This type shall contain any additional identifiers for a resource.

4.4.2 Properties

Property	Type	Attributes	Notes
DurableName *(v1.1+)*	string	*read-only* *(null)*	The world-wide, persistent name of the resource. • This property shall contain the world-wide unique identifier for the resource. The string shall be in the Identifier.DurableNameFormat property value format.
DurableNameFormat *(v1.1+)*	string (enum)	*read-only* *(null)*	The format of the durable name property. • This property shall represent the format of the DurableName property. *For the possible property values, see DurableNameFormat in Property details.*

4.4.3 Property details

4.4.3.1 DurableNameFormat:

The format of the durable name property.

- This property shall represent the format of the DurableName property.

string	Description
EUI	The IEEE-defined 64-bit Extended Unique Identifier (EUI). • This durable name shall contain the hexadecimal representation of the IEEE-defined 64-bit Extended Unique Identifier (EUI), as defined in the IEEE's Guidelines for 64-bit Global Identifier (EUI-64) Specification. The DurableName property shall follow the regular expression pattern '^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})$', where the most significant octet is first.

string	Description
FC_WWN	The Fibre Channel (FC) World Wide Name (WWN). • This durable name shall contain a hexadecimal representation of the World-Wide Name (WWN) format, as defined in the T11 Fibre Channel Physical and Signaling Interface Specification. The DurableName property shall follow the regular expression pattern '^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})$', where the most significant octet is first.
iQN	The iSCSI Qualified Name (iQN). • This durable name shall be in the iSCSI Qualified Name (iQN) format, as defined in RFC3720 and RFC3721.
MACAddress *(v1.14+)*	The media access control address (MAC address). • This durable name shall be a media access control address (MAC address), which is a unique identifier assigned to a network interface controller (NIC) for use as a network address. This value should not be used if a more specific type of identifier is available. The DurableName property shall follow the regular expression pattern '^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$', where the most significant octet is first.
NAA	The Name Address Authority (NAA) format. • This durable name shall contain a hexadecimal representation of the Name Address Authority structure, as defined in the T11 Fibre Channel - Framing and Signaling - 3 (FC-FS-3) specification. The DurableName property shall follow the regular expression pattern '^(([0-9A-Fa-f]{2}){8}){1,2}$', where the most significant octet is first.
NGUID *(v1.10+)*	The Namespace Globally Unique Identifier (NGUID). • This durable name shall be in the Namespace Globally Unique Identifier (NGUID), as defined in the NVN Express Specification. The DurableName property shall follow the regular expression pattern '^([0-9A-Fa-f]{2}){16}$', where the most significant octet is first.
NQN *(v1.6+)*	The NVMe Qualified Name (NQN). • This durable name shall be in the NVMe Qualified Name (NQN) format, as defined in the NVN Express over Fabric Specification.
NSID *(v1.6+, deprecated v1.12)*	The NVM Namespace Identifier (NSID). • This durable name shall be in the NVM Namespace Identifier (NSID) format, as defined in the NVN Express Specification. *Deprecated in v1.12 and later. This value has been deprecated due to its non-uniqueness and `NGUID` should be used.*

string	Description
UUID	The Universally Unique Identifier (UUID). • This durable name shall contain the hexadecimal representation of the UUID, as defined by RFC4122. The DurableName property shall follow the regular expression pattern '([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})'.

4.5 IOStatistics

4.5.1 Description

The properties of this type represent IO statistics.

- The properties of this type shall be used to represent the IO statistics of the requested object.

4.5.2 Properties

Property	Type	Attributes	Notes
NonIORequests	integer ({tot})	*read-write (null)*	Count of non IO requests. • The value shall represent the total count from the time of last reset or wrap of non IO requests.
NonIORequestTime	string	*read-write (null)*	The time that the resource is busy processing write requests. • The value shall be an ISO 8601 conformant duration describing the time that the resource is busy processing non IO requests from the time of last reset or wrap.
ReadHitIORequests	integer ({tot})	*read-write (null)*	Count of read IO requests satisfied from memory. • The value shall represent the total count from the time of last reset or wrap of read IO requests satisfied from memory.
ReadIOKiBytes	integer (KiBy)	*read-write (null)*	Number of kibibytes read. • The value shall represent the total number of kibibytes read from the time of last reset or wrap.
ReadIORequests	integer ({tot})	*read-write (null)*	Count of read IO requests. • The value shall represent the total count from the time of last reset or wrap of read IO requests satisfied from either media or memory (i.e. from a storage device or from a cache).

Property	Type	Attributes	Notes
ReadIORequestTime	string	*read-write (null)*	The time that the resource is busy processing read requests. • The value shall be an ISO 8601 conformant duration describing the time that the resource is busy processing read requests from the time of last reset or wrap.
WriteHitIORequests	integer ({tot})	*read-write (null)*	Count of write IO requests coalesced into memory. • The value shall represent the total count from the time of last reset or wrap of write IO requests coalesced into memory.
WriteIOKiBytes	integer (KiBy)	*read-write (null)*	Number of kibibytes written. • The value shall represent the total number of kibibytes written from the time of last reset or wrap.
WriteIORequests	integer ({tot})	*read-write (null)*	Count of write IO requests. • The value shall represent the total count from the time of last reset or wrap of write IO requests.
WriteIORequestTime	string	*read-write (null)*	The time that the resource is busy processing write requests. • The value shall be an ISO 8601 conformant duration describing the time that the resource is busy processing write requests from the time of last reset or wrap.

4.6 IPv4Address

4.6.1 Description

This type describes an IPv4 address.

- This type shall describe an IPv4 address assigned to an interface.

4.6.2 Properties

Property	Type	Attributes	Notes
Address	string	*read-write (null)*	The IPv4 address. • This property shall contain an IPv4 address assigned to this interface. If DHCPv4 is enabled on the interface, this property becomes read-only. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`

Property	Type	Attributes	Notes
AddressOrigin	string (enum)	*read-only (null)*	This indicates how the address was determined. • This property shall contain the IP address origin for this network interface. *For the possible property values, see AddressOrigin in Property details.*
Gateway	string	*read-write (null)*	The IPv4 gateway for this address. • This property shall contain the IPv4 default gateway address for this interface. If DHCPv4 is enabled on the interface and is configured to set the IPv4 default gateway address, this property becomes read-only. If multiple IPv4 addresses are present on the same interface only a single default gateway is allowed. Any additional IPv4 addresses shall not have a default gateway specified. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
Oem {}	object		See the OEM object definition in the Using this guide clause.
SubnetMask	string	*read-write (null)*	The IPv4 subnet mask. • This property shall contain the IPv4 subnet mask for this address. If DHCPv4 is enabled on the interface, this property becomes read-only. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`

4.6.3 Property details

4.6.3.1 AddressOrigin:

This indicates how the address was determined.

- This property shall contain the IP address origin for this network interface.

string	Description
BOOTP	A BOOTP service-provided address.
DHCP	A DHCPv4 service-provided address.
IPv4LinkLocal	The address is valid for only this network segment, or link.
Static	A user-configured static address.

4.7 IPv6Address

4.7.1 Description

This type describes an IPv6 address.

- This type shall describe an IPv6 address assigned to an interface.

4.7.2 Properties

Property	Type	Attributes	Notes
Address	string	*read-write (null)*	The IPv6 address. • This property lists an IPv6 address that is currently assigned on this interface.
AddressOrigin	string (enum)	*read-only (null)*	This indicates how the address was determined. • This property shall contain the IPv6 address origin for this interface. *For the possible property values, see AddressOrigin in Property details.*
AddressState	string (enum)	*read-only (null)*	The current RFC4862-defined state of this address. • This property shall contain the current RFC4862-defined state of this address. Preferred and Deprecated states follow the definitions in RFC4862, section 5.5.4. The Tentative state indicates that the address is undergoing Duplicate Address Detection (DAD), as defined in RFC4862, section 5.4. The Failed state indicates a static address that did not pass DAD. A static address in the Failed state is not in use on the network stack, and corrective action is required to remedy this condition. *For the possible property values, see AddressState in Property details.*
Oem {}	object		See the OEM object definition in the Using this guide clause.
PrefixLength	integer	*read-only (null)*	The IPv6 address prefix Length. • This property shall contain the IPv6 address prefix length for this interface.

4.7.3 Property details

4.7.3.1 AddressOrigin:

This indicates how the address was determined.

- This property shall contain the IPv6 address origin for this interface.

string	Description
DHCPv6	A DHCPv6 service-provided address.
LinkLocal	The address is valid for only this network segment, or link.
SLAAC	A stateless autoconfiguration (SLAAC) service-provided address.
Static	A static user-configured address.

4.7.3.2 AddressState:

The current RFC4862-defined state of this address.

- This property shall contain the current RFC4862-defined state of this address. Preferred and Deprecated states follow the definitions in RFC4862, section 5.5.4. The Tentative state indicates that the address is undergoing Duplicate Address Detection (DAD), as defined in RFC4862, section 5.4. The Failed state indicates a static address that did not pass DAD. A static address in the Failed state is not in use on the network stack, and corrective action is required to remedy this condition.

string	Description
Deprecated	This address is currently within its valid lifetime but is now outside its RFC4862-defined preferred lifetime.
Failed	This address has failed Duplicate Address Detection (DAD) testing, as defined in RFC4862, section 5.4, and is not currently in use.
Preferred	This address is currently within both its RFC4862-defined valid and preferred lifetimes.
Tentative	This address is currently undergoing Duplicate Address Detection (DAD) testing, as defined in RFC4862, section 5.4.

4.8 IPv6GatewayStaticAddress

4.8.1 Description

This type represents a single IPv6 static address to be assigned on a network interface.

- This type shall represent a single IPv6 static address to be assigned on a network interface.

4.8.2 Properties

Property	Type	Attributes	Notes
Address *(v1.1+)*	string	*read-write required (null)*	A valid IPv6 address. • This property provides access to a static IPv6 address that is currently assigned on a network interface.
Oem *(v1.1+)* {}	object		See the OEM object definition in the Using this guide clause.
PrefixLength *(v1.1+)*	integer	*read-write (null)*	The IPv6 network prefix length, in bits, for this address. • Provides the IPv6 network prefix length, in bits, for this address.

4.9 IPv6StaticAddress

4.9.1 Description

This type represents a single IPv6 static address to be assigned on a network interface.

- This type shall represent a single IPv6 static address to be assigned on a network interface.

4.9.2 Properties

Property	Type	Attributes	Notes
Address	string	*read-write required (null)*	A valid IPv6 address. • This property provides access to a static IPv6 address that is currently assigned on a network interface.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PrefixLength	integer	*read-write required (null)*	The prefix length, in bits, of this IPv6 address. • This property shall contain the IPv6 network prefix length, in bits, for this address.

4.10 Location

4.10.1 Description

The location of a resource.

- This type shall describe the location of a resource.

4.10.2 Properties

Property	Type	Attributes	Notes
AltitudeMeters *(v1.6+)*	number (meters)	*read-write (null)*	The altitude of the resource in meters. • This property shall contain the altitude of the resource, in meters units, defined as the elevation above sea level.
Contacts *(v1.7+)* [{	array		An array of contact information. • This property shall contain an array of contact information for an individual or organization responsible for this resource.
ContactName *(v1.7+)*	string	*read-write (null)*	Name of this contact. • This property shall contain the name of a person or organization to contact for information about this resource.
EmailAddress *(v1.7+)*	string	*read-write (null)*	Email address for this contact. • This property shall contain the email address for a person or organization to contact for information about this resource.
PhoneNumber *(v1.7+)*	string	*read-write (null)*	Phone number for this contact. • This property shall contain the phone number for a person or organization to contact for information about this resource.
}]			
Info *(v1.1+, deprecated v1.5*	string	*read-only (null)*	The location of the resource. • This property shall represent the location of the resource. *Deprecated in v1.5 and later. This property has been deprecated in favor of the PostalAddress, Placement, and PartLocation properties.*

Property	Type	Attributes	Notes
InfoFormat *(v1.1+, deprecated v1.5*	string	*read-only (null)*	The format of the Info property. • This property shall represent the Info property format. *Deprecated in v1.5 and later. This property has been deprecated in favor of the PostalAddress, Placement, and PartLocation properties.*
Latitude *(v1.6+)*	number (deg)	*read-write (null)*	The latitude of the resource. • This property shall contain the latitude of the resource specified in degrees using a decimal format and not minutes or seconds.
Longitude *(v1.6+)*	number (deg)	*read-write (null)*	The longitude of the resource in degrees. • This property shall contain the longitude of the resource specified in degrees using a decimal format and not minutes or seconds.
Oem *(v1.1+)* {	object		See the OEM object definition in the Using this guide clause.
(pattern) {}	object		Property names follow regular expression pattern "^[A-Za-z0-9_]+$"
}			
PartLocation *(v1.5+)* {	object		The part location for a resource within an enclosure. • This property shall contain the part location for a resource within an enclosure. This representation shall indicate the location of a part within a location specified by the Placement property.
LocationOrdinalValue *(v1.5+)*	integer	*read-only (null)*	The number that represents the location of the part. For example, if LocationType is `Slot` and this unit is in slot 2, the LocationOrdinalValue is `2`. • This property shall contain the number that represents the location of the part based on the LocationType. LocationOrdinalValue shall be measured based on the Orientation value starting with `0`.
LocationType *(v1.5+)*	string (enum)	*read-only (null)*	The type of location of the part. • This property shall contain the type of location of the part. *For the possible property values, see LocationType in Property details.*
Orientation *(v1.5+)*	string (enum)	*read-only (null)*	The orientation for the ordering of the slot enumeration used by the LocationOrdinalValue property. • This property shall contain the orientation for the ordering used by the LocationOrdinalValue property. *For the possible property values, see Orientation in Property details.*

Property	Type	Attributes	Notes
Reference *(v1.5+)*	string (enum)	*read-only (null)*	The reference point for the part location. Provides guidance about the general location of the part. • This property shall contain the general location within the unit of the part. *For the possible property values, see Reference in Property details.*
ServiceLabel *(v1.5+)*	string	*read-only (null)*	The label of the part location, such as a silk-screened name or a printed label. • This property shall contain the label assigned for service at the part location.
}			
Placement *(v1.3+)* {	object		A place within the addressed location. • This property shall contain a place within the addressed location.
AdditionalInfo *(v1.7+)*	string	*read-write (null)*	Area designation or other additional info. • This property shall contain additional information, such as Tile, Column (Post), Wall, or other designation that describes a location that cannot be conveyed with other properties defined for the Placement object.
Rack *(v1.3+)*	string	*read-write (null)*	The name of a rack location within a row. • This property shall contain the name of the rack within a row.
RackOffset *(v1.3+)*	integer	*read-write (null)*	The vertical location of the item, in terms of RackOffsetUnits. • The vertical location of the item in the rack. Rack offset units shall be measured from bottom to top, starting with 0.
RackOffsetUnits *(v1.3+)*	string (enum)	*read-write (null)*	The type of rack units in use. • This property shall contain a RackUnit enumeration literal that indicates the type of rack units in use. *For the possible property values, see RackOffsetUnits in Property details.*
Row *(v1.3+)*	string	*read-write (null)*	The name of the row. • This property shall contain the name of the row.
}			
PostalAddress *(v1.3+)* {	object		The postal address of the addressed resource. • This property shall contain a postal address of the resource.

Property	Type	Attributes	Notes
AdditionalCode *(v1.3+)*	string	*read-write (null)*	The additional code. • The value shall conform to the RFC5139-defined requirements of the ADDCODE field.
AdditionalInfo *(v1.7+)*	string	*read-write (null)*	The room designation or other additional information. • The value shall conform to the requirements of the LOC field as defined in RFC5139. Provides additional information.
Building *(v1.3+)*	string	*read-write (null)*	The name of the building. • The value shall conform to the RFC5139-defined requirements of the BLD field. Names the building.
City *(v1.3+)*	string	*read-write (null)*	City, township, or shi (JP). • The value shall conform to the RFC5139-defined requirements of the A3 field. Names a city, township, or shi (JP).
Community *(v1.3+)*	string	*read-write (null)*	The postal community name. • The value shall conform to the RFC5139-defined requirements of the PCN field. A postal community name.
Country *(v1.3+)*	string	*read-write (null)*	The country. • The value shall conform to the RFC5139-defined requirements of the Country field.
District *(v1.3+)*	string	*read-write (null)*	A county, parish, gun (JP), or district (IN). • The value shall conform to the RFC5139-defined requirements of the A2 field. Names a county, parish, gun (JP), or district (IN).
Division *(v1.3+)*	string	*read-write (null)*	City division, borough, city district, ward, or chou (JP). • The value shall conform to the RFC5139-defined requirements of the A4 field. Names a city division, borough, city district, ward, or chou (JP).
Floor *(v1.3+)*	string	*read-write (null)*	The floor. • The value shall conform to the RFC5139-defined requirements of the FLR field. Provides a floor designation.

Property	Type	Attributes	Notes
GPSCoords *(v1.3+, deprecated v1.6*	string	*read-write (null)*	The GPS coordinates of the part. • The value shall conform to the RFC5139-defined requirements of the ADDCODE field. Shall contain the GPS coordinates of the location. If furnished, expressed in the '[-][nn]n.nnnnnn, [-][nn]n.nnnnn' format. For example, two comma-separated positive or negative numbers with six decimal places of precision. *Deprecated in v1.6 and later. This property has been deprecated in favor of the Longitude and Latitude properties.*
HouseNumber *(v1.3+)*	integer	*read-write (null)*	The numeric portion of house number. • The value shall conform to the RFC5139-defined requirements of the HNO field. The numeric portion of the house number.
HouseNumberSuffix *(v1.3+)*	string	*read-write (null)*	The house number suffix. • The value shall conform to the RFC5139-defined requirements of the HNS field. Provides a suffix to a house number, (F, B, or 1/2).
Landmark *(v1.3+)*	string	*read-write (null)*	The landmark. • The value shall conform to the RFC5139-defined requirements of the LMK field. Identifies a landmark or vanity address.
LeadingStreetDirection *(v1.3+)*	string	*read-write (null)*	A leading street direction. • The value shall conform to the requirements of the PRD field as defined in RFC5139. Names a leading street direction, (N, W, or SE).
Location *(v1.3+, deprecated v1.7*	string	*read-write (null)*	The room designation or other additional information. • The value shall conform to the RFC5139-defined requirements of the LOC field. Provides additional information. *Deprecated in v1.7 and later. This property has been deprecated in favor of the AdditionalInfo property.*
Name *(v1.3+)*	string	*read-write (null)*	The name. • The value shall conform to the RFC5139-defined requirements of the NAM field. Names the occupant.
Neighborhood *(v1.3+)*	string	*read-write (null)*	Neighborhood or block. • The value shall conform to the RFC5139-defined requirements of the A5 field. Names a neighborhood or block.

Property	Type	Attributes	Notes
PlaceType *(v1.3+)*	string	*read-write (null)*	The description of the type of place that is addressed. • The value shall conform to the RFC5139-defined requirements of the PLC field. Examples include office and residence.
POBox *(v1.3+)*	string	*read-write (null)*	The post office box (PO box). • The value shall conform to the RFC5139-defined requirements of the POBOX field. A post office box (PO box).
PostalCode *(v1.3+)*	string	*read-write (null)*	The postal code or zip code. • The value shall conform to the RFC5139-defined requirements of the PC field. A postal code (or zip code).
Road *(v1.3+)*	string	*read-write (null)*	The primary road or street. • The value shall conform to the RFC5139-defined requirements of the RD field. Designates a primary road or street.
RoadBranch *(v1.3+)*	string	*read-write (null)*	The road branch. • The value shall conform to the RFC5139-defined requirements of the RDBR field. Shall contain a post office box (PO box) road branch.
RoadPostModifier *(v1.3+)*	string	*read-write (null)*	The road post-modifier. • The value shall conform to the RFC5139-defined requirements of the POM field. For example, Extended.
RoadPreModifier *(v1.3+)*	string	*read-write (null)*	The road pre-modifier. • The value shall conform to the RFC5139-defined requirements of the PRM field. For example, Old or New.
RoadSection *(v1.3+)*	string	*read-write (null)*	The road section. • The value shall conform to the RFC5139-defined requirements of the RDSEC field. A road section.
RoadSubBranch *(v1.3+)*	string	*read-write (null)*	The road sub branch. • The value shall conform to the RFC5139-defined requirements of the RDSUBBR field.
Room *(v1.3+)*	string	*read-write (null)*	The name or number of the room. • The value shall conform to the RFC5139-defined requirements of the ROOM field. A name or number of a room to locate the resource within the unit.

Property	Type	Attributes	Notes
Seat *(v1.3+)*	string	*read-write (null)*	The seat, such as the desk, cubicle, or workstation. • The value shall conform to the RFC5139-defined requirements of the SEAT field. A name or number of a seat, such as the desk, cubicle, or workstation.
Street *(v1.3+)*	string	*read-write (null)*	Street name. • The value shall conform to the RFC5139-defined requirements of the A6 field. Names a street.
StreetSuffix *(v1.3+)*	string	*read-write (null)*	Avenue, Platz, Street, Circle. • The value shall conform to the RFC5139-defined requirements of the STS field. Names a street suffix.
Territory *(v1.3+)*	string	*read-write (null)*	A top-level subdivision within a country. • The value shall conform to the RFC5139-defined requirements of the A1 field when it names a territory, state, region, province, or prefecture within a country.
TrailingStreetSuffix *(v1.3+)*	string	*read-write (null)*	A trailing street suffix. • The value shall conform to the RFC5139-defined requirements of the POD field. Names a trailing street suffix.
Unit *(v1.3+)*	string	*read-write (null)*	The name or number of the apartment unit or suite. • The value shall conform to the RFC5139-defined requirements of the UNIT field. The name or number of a unit, such as the apartment or suite, to locate the resource.
}			

4.10.3 Property details

4.10.3.1 LocationType:

The type of location of the part.

- This property shall contain the type of location of the part.

string	Description
Backplane *(v1.12+)*	A backplane. • This value shall indicate the part is a backplane in an enclosure.
Bay	A bay. • This value shall indicate the part is located in a bay.
Connector	A connector or port. • This value shall indicate the part is located in a connector or port.
Embedded *(v1.13+)*	Embedded within a part. • This value shall indicate the part is embedded or otherwise permanently incorporated into a larger part or device. This value shall not be used for parts that can be removed by a user or are considered field-replaceable.
Slot	A slot. • This value shall indicate the part is located in a slot.
Socket	A socket. • This value shall indicate the part is located in a socket.

4.10.3.2 Orientation:

The orientation for the ordering of the slot enumeration used by the LocationOrdinalValue property.

- This property shall contain the orientation for the ordering used by the LocationOrdinalValue property.

string	Description
BackToFront	The ordering for the LocationOrdinalValue is back to front. • This value shall indicate the ordering for LocationOrdinalValue is back to front.
BottomToTop	The ordering for LocationOrdinalValue is bottom to top. • This value shall indicate the ordering for LocationOrdinalValue is bottom to top.
FrontToBack	The ordering for LocationOrdinalValue is front to back. • This value shall indicate the ordering for LocationOrdinalValue is front to back.

string	Description
LeftToRight	The ordering for the LocationOrdinalValue is left to right. • This value shall indicate the ordering for LocationOrdinalValue is left to right.
RightToLeft	The ordering for the LocationOrdinalValue is right to left. • This value shall indicate the ordering for LocationOrdinalValue is right to left.
TopToBottom	The ordering for the LocationOrdinalValue is top to bottom. • This value shall indicate the ordering for LocationOrdinalValue is top to bottom.

4.10.3.3 RackOffsetUnits:

The type of rack units in use.

- This property shall contain a RackUnit enumeration literal that indicates the type of rack units in use.

string	Description
EIA_310	A rack unit that is equal to 1.75 in (44.45 mm). • Rack units shall conform to the EIA-310 standard.
OpenU	A rack unit that is equal to 48 mm (1.89 in). • Rack units shall be specified in terms of the Open Compute Open Rack Specification.

4.10.3.4 Reference:

The reference point for the part location. Provides guidance about the general location of the part.

- This property shall contain the general location within the unit of the part.

string	Description
Bottom	The part is in the bottom of the unit. • This value shall indicate the part is in the bottom of the unit.
Front	The part is in the front of the unit. • This value shall indicate the part is in the front of the unit.

string	Description
Left	The part is on the left side of of the unit. • This value shall indicate the part is on the left side of of the unit.
Middle	The part is in the middle of the unit. • This value shall indicate the part is in the middle of the unit.
Rear	The part is in the rear of the unit. • This value shall indicate the part is in the rear of the unit.
Right	The part is on the right side of the unit. • This value shall indicate the part is on the right side of the unit.
Top	The part is in the top of the unit. • This value shall indicate the part is in the top of the unit.

4.11 Message

4.11.1 Description

The message that the Redfish service returns.

- This type shall contain a message that the Redfish service returns, as described in the Redfish Specification.

4.11.2 Properties

Property	Type	Attributes	Notes
Message	string	*read-only*	The human-readable message. • This property shall contain a human-readable message.
MessageArgs [ ]	array (string)	*read-only*	An array of message arguments that are substituted for the arguments in the message when looked up in the message registry. • This property shall contain an array of message arguments that are substituted for the arguments in the message when looked up in the message registry. It has the same semantics as the MessageArgs property in the Redfish MessageRegistry schema.

Property	Type	Attributes	Notes
MessageId	string	*read-only* *required*	The identifier for the message. • This property shall contain a MessageId, as defined in the 'MessageId format' clause of the Redfish Specification.
MessageSeverity *(v1.1+)*	string (enum)	*read-only*	The severity of the message. • This property shall contain the severity of the message. Services can replace the value defined in the message registry with a value more applicable to the implementation. *For the possible property values, see MessageSeverity in Property details.*
Oem {}	object		See the OEM object definition in the Using this guide clause.
RelatedProperties [ ]	array (string)	*read-only*	A set of properties described by the message. • This property shall contain an array of RFC6901-defined JSON pointers indicating the properties described by the message, if appropriate for the message.
Resolution	string	*read-only*	Used to provide suggestions on how to resolve the situation that caused the message. • This property shall contain the resolution of the message. Services can replace the resolution defined in the message registry with a more specific resolution in message payloads.
Severity *(deprecated v1.1)*	string	*read-only*	The severity of the message. • This property shall contain the severity of the message, as defined in the 'Status' clause of the Redfish Specification. Services can replace the value defined in the message registry with a value more applicable to the implementation. *Deprecated in v1.1 and later. This property has been deprecated in favor of MessageSeverity, which ties the values to the enumerations defined for the Health property within Status.*

4.11.3 Property details

4.11.3.1 MessageSeverity:

The severity of the message.

- This property shall contain the severity of the message. Services can replace the value defined in the message registry with a value more applicable to the implementation.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

4.12 Redundancy

4.12.1 Description

The common redundancy definition and structure used in other Redfish schemas.

- This object represents the redundancy element property.

4.12.2 Properties

Property	Type	Attributes	Notes
@odata.id	string (URI)	*read-only required*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions *(v1.2+)* {}	object		The available actions for this resource. • This property shall contain the available actions for this resource.
MaxNumSupported	integer	*read-only (null)*	The maximum number of members allowable for this particular redundancy group. • This property shall contain the maximum number of members allowed in the redundancy group.
MemberId	string	*read-only required*	The unique identifier for the member within an array. • This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
MinNumNeeded	integer	*read-only required (null)*	The minimum number of members needed for this group to be redundant. • This property shall contain the minimum number of members allowed in the redundancy group for the current redundancy mode to still be fault tolerant.

Property	Type	Attributes	Notes
Mode	string (enum)	*read-write required (null)*	The redundancy mode of the group. • This property shall contain the information about the redundancy mode of this subsystem. *For the possible property values, see Mode in Property details.*
Name	string	*read-only required*	The name of the resource or array member. • This object represents the name of this resource or array member. The resource values shall comply with the Redfish Specification-described requirements. This string value shall be of the 'Name' reserved word format.
Oem {}	object		See the OEM object definition in the Using this guide clause.
RedundancyEnabled *(v1.1+)*	boolean	*read-write (null)*	An indication of whether redundancy is enabled. • This property shall indicate whether the redundancy is enabled.
RedundancySet [{	array	*required*	The links to components of this redundancy set. • This property shall contain the links to components that are part of this redundancy set.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Status {}	object	*required*	The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

4.12.3 Property details

4.12.3.1 Mode:

The redundancy mode of the group.

- This property shall contain the information about the redundancy mode of this subsystem.

string	Description
Failover	Failure of one unit automatically causes a standby or offline unit in the redundancy set to take over its functions.
N+m	Multiple units are available and active such that normal operation will continue if one or more units fail.
NotRedundant *(v1.3+)*	The subsystem is not configured in a redundancy mode, either due to configuration or the functionality has been disabled by the user.
Sharing	Multiple units contribute or share such that operation will continue, but at a reduced capacity, if one or more units fail.
Sparing	One or more spare units are available to take over the function of a failed unit, but takeover is not automatic.

4.13 RedundantGroup

4.13.1 Description

The redundancy information for the devices in a redundancy group.

- This type shall contain redundancy information for the set of devices in this redundancy group.

4.13.2 Properties

Property	Type	Attributes	Notes
MaxSupportedInGroup *(v1.4+)*	integer	*read-only (null)*	The maximum number of devices supported in this redundancy group. • This property shall contain the maximum number of devices allowed in the redundancy group.
MinNeededInGroup *(v1.4+)*	integer	*read-only required (null)*	The minimum number of devices needed for this group to be redundant. • This property shall contain the minimum number of functional devices needed in the redundancy group for the current redundancy mode to be fault tolerant.
RedundancyGroup *(v1.4+)* [{	array	*required*	The links to the devices included in this redundancy group. • This property shall contain the links to the resources that represent the devices that are part of this redundancy group.

Property	Type	Attributes	Notes
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
RedundancyType *(v1.4+)*	string (enum)	*read-write required (null)*	The redundancy mode of the group. • This property shall contain the information about the redundancy mode of this redundancy group. *For the possible property values, see RedundancyType in Property details.*
Status *(v1.4+)* {}	object	*required*	The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

4.13.3 Property details

4.13.3.1 RedundancyType:

The redundancy mode of the group.

- This property shall contain the information about the redundancy mode of this redundancy group.

string	Description
Failover	Failure of one unit automatically causes a standby or offline unit in the redundancy set to take over its functions. • This value shall indicate that a failure of one unit automatically causes a standby or offline unit in the redundancy set to take over its functions.
NotRedundant	The subsystem is not configured in a redundancy mode, either due to configuration or the functionality has been disabled by the user.
NPlusM	Multiple units are available and active such that normal operation will continue if one or more units fail. • This value shall indicate that the capacity or services provided by the set of N+M devices can withstand failure of up to M units, with all units in the group normally providing capacity or service.
Sharing	Multiple units contribute or share such that operation will continue, but at a reduced capacity, if one or more units fail.

string	Description
Sparing	One or more spare units are available to take over the function of a failed unit, but takeover is not automatic.

4.14 ReplicaInfo

4.14.1 Description

Defines the characteristics of a replica of a source.

- The value shall define the characteristics of a replica of a source.

4.14.2 Properties

Property	Type	Attributes	Notes
ConsistencyEnabled	boolean	*read-only (null)*	True if consistency is enabled. • If true, consistency shall be enabled across the source and its associated target replica(s). The default value for this property is false.
ConsistencyState	string (enum)	*read-only (null)*	The current state of consistency. • The ConsistencyState enumeration literal shall indicate the current state of consistency. *For the possible property values, see ConsistencyState in Property details.*
ConsistencyStatus	string (enum)	*read-only (null)*	The current status of consistency. • The ConsistencyStatus enumeration literal shall specify the current status of consistency. Consistency may have been disabled or is experiencing an error condition. *For the possible property values, see ConsistencyStatus in Property details.*
ConsistencyType	string (enum)	*read-only (null)*	Indicates the consistency type used by the source and its associated target group. • The ConsistencyType enumeration literal shall indicate the consistency type used by the source and its associated target group. *For the possible property values, see ConsistencyType in Property details.*

Property	Type	Attributes	Notes
DataProtectionLineOfService *(v1.1+)* {	object		A pointer to the DataProtection line of service element that describes this replica. • The value shall be a pointer to the data protection line of service that describes this replica.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
FailedCopyStopsHostIO	boolean	*read-only* *(null)*	If true, the storage array tells host to stop sending data to source element if copying to a remote element fails. • If true, the storage array shall stop receiving data to the source element if copying to a remote element fails. The default value for this property is false.
PercentSynced	integer (%)	*read-only* *(null)*	Specifies the percent of the work completed to reach synchronization. • Specifies the percent of the work completed to reach synchronization. Shall not be instantiated if implementation is not capable of providing this information. If related to a group, then PercentSynced shall be an average of the PercentSynced across all members of the group.
Replica {	object		Deprecated - Use Source Replica. The resource that is the source of this replica. • Deprecated - Use Source Replica. The value shall reference the resource that is the source of this replica.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
ReplicaFaultDomain *(v1.3+)*	string (enum)	*read-only* *(null)*	ReplicaFaultDomain describes the fault domain (local or remote) of the replica relationship. • The ReplicaFaultDomain enumeration literal shall describe the fault domain (local or remote) of the replica relationship. *For the possible property values, see ReplicaFaultDomain in Property details.*

Property	Type	Attributes	Notes
ReplicaPriority	string (enum)	*read-only (null)*	The priority of background copy engine I/O to be managed relative to host I/O operations during a sequential background copy operation. • The enumeration literal shall specify the priority of background copy engine I/O to be managed relative to host I/O operations during a sequential background copy operation. *For the possible property values, see ReplicaPriority in Property details.*
ReplicaProgressStatus	string (enum)	*read-only (null)*	The status of the session with respect to Replication activity. • The ReplicaProgressStatus enumeration literal shall specify the status of the session with respect to Replication activity. *For the possible property values, see ReplicaProgressStatus in Property details.*
ReplicaReadOnlyAccess	string (enum)	*read-only (null)*	This property specifies whether the source, the target, or both elements are read only to the host. • The enumeration literal shall specify whether the source, the target, or both elements are read only to the host. *For the possible property values, see ReplicaReadOnlyAccess in Property details.*
ReplicaRecoveryMode	string (enum)	*read-only (null)*	Describes whether the copy operation continues after a broken link is restored. • The enumeration literal shall specify whether the copy operation continues after a broken link is restored. *For the possible property values, see ReplicaRecoveryMode in Property details.*
ReplicaRole	string (enum)	*read-only (null)*	The source or target role of this replica. • The ReplicaRole enumeration literal shall represent the source or target role of this replica as known to the containing resource. *For the possible property values, see ReplicaRole in Property details.*
ReplicaSkewBytes	integer (bytes)	*read-only (null)*	Applies to Adaptive mode and it describes maximum number of bytes the SyncedElement (target) can be out of sync. • Applies to Adaptive mode and it describes maximum number of bytes the SyncedElement (target) can be out of sync. If the number of out-of-sync bytes exceeds the skew value, ReplicaUpdateMode shall be switched to synchronous.

Property	Type	Attributes	Notes
ReplicaState	string (enum)	*read-only (null)*	ReplicaState describes the state of the relationship with respect to Replication activity. • The ReplicaState enumeration literal shall specify the state of the relationship with respect to Replication activity. *For the possible property values, see ReplicaState in Property details.*
ReplicaType	string (enum)	*read-only (null)*	ReplicaType describes the intended outcome of the replication. • The ReplicaType enumeration literal shall describe the intended outcome of the replication. *For the possible property values, see ReplicaType in Property details.*
ReplicaUpdateMode	string (enum)	*read-only (null)*	Describes whether the target elements will be updated synchronously or asynchronously. • The enumeration literal shall specify whether the target elements will be updated synchronously or asynchronously. *For the possible property values, see ReplicaUpdateMode in Property details.*
RequestedReplicaState	string (enum)	*read-only (null)*	The last requested or desired state for the relationship. • The last requested or desired state for the relationship. The actual state of the relationship shall be represented by ReplicaState. When RequestedState reaches the requested state, this property shall be null. *For the possible property values, see RequestedReplicaState in Property details.*
SourceReplica *(v1.2+)* {	object		The resource that is the source of this replica. • The value shall reference the resource that is the source of this replica.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
SyncMaintained	boolean	*read-only (null)*	Synchronization is maintained. • If true, Synchronization shall be maintained. The default value for this property is false.

Property	Type	Attributes	Notes
UndiscoveredElement	string (enum)	*read-only (null)*	This property specifies whether the source, the target, or both elements involved in a copy operation are undiscovered. • The enumeration literal shall specify whether the source, the target, or both elements involved in a copy operation are undiscovered. An element is considered undiscovered if its object model is not known to the service performing the copy operation. *For the possible property values, see UndiscoveredElement in Property details.*
WhenActivated	string (%)	*read-only (null)*	Specifies when point-in-time copy was taken or when the replication relationship is activated, reactivated, resumed or re-established. • The value shall be an ISO 8601 conformant time of day that specifies when the point-in-time copy was taken or when the replication relationship is activated, reactivated, resumed or re-established. This property shall be null if the implementation is not capable of providing this information.
WhenDeactivated	string (%)	*read-only (null)*	Specifies when the replication relationship is deactivated. • The value shall be an ISO 8601 conformant time of day that specifies when the replication relationship is deactivated. Do not instantiate this property if implementation is not capable of providing this information.
WhenEstablished	string (%)	*read-only (null)*	Specifies when the replication relationship is established. • The value shall be an ISO 8601 conformant time of day that specifies when the replication relationship is established. Do not instantiate this property if implementation is not capable of providing this information.
WhenSuspended	string (%)	*read-only (null)*	Specifies when the replication relationship is suspended. • The value shall be an ISO 8601 conformant time of day that specifies when the replication relationship is suspended. Do not instantiate this property if implementation is not capable of providing this information.
WhenSynced	string	*read-only (null)*	The point in time that the Elements were synchronized. • The value shall be an ISO 8601 conformant time of day that specifies when the elements were synchronized.
WhenSynchronized	string (%)	*read-only (null)*	Specifies when the replication relationship is synchronized. • The value shall be an ISO 8601 conformant time of day that specifies when the replication relationship is synchronized. Do not instantiate this property if implementation is not capable of providing this information.

4.14.3 Property details

4.14.3.1 ConsistencyState:

The current state of consistency.

- The ConsistencyState enumeration literal shall indicate the current state of consistency.

string	Description
Consistent	Consistent. • This enumeration literal shall indicate that the source and target shall be consistent.
Inconsistent	Not consistent. • This enumeration literal shall indicate that the source and target are not required to be consistent.

4.14.3.2 ConsistencyStatus:

The current status of consistency.

- The ConsistencyStatus enumeration literal shall specify the current status of consistency. Consistency may have been disabled or is experiencing an error condition.

string	Description
Consistent	Consistent. • This enumeration literal shall indicate that the source and target are consistent.
Disabled	Consistency disabled. • This enumeration literal shall indicate that the source and target have consistency disabled.
InError	Consistency error. • This enumeration literal shall indicate that the source and target are not consistent.
InProgress	Becoming consistent. • This enumeration literal shall indicate that the source and target are becoming consistent.

4.14.3.3 ConsistencyType:

Indicates the consistency type used by the source and its associated target group.

- The ConsistencyType enumeration literal shall indicate the consistency type used by the source and its associated target group.

string	Description
SequentiallyConsistent	Sequentially consistent. • This enumeration literal shall indicate that the source and target shall be sequentially consistent.

4.14.3.4 ReplicaFaultDomain:

ReplicaFaultDomain describes the fault domain (local or remote) of the replica relationship.

- The ReplicaFaultDomain enumeration literal shall describe the fault domain (local or remote) of the replica relationship.

string	Description
Local	Local indicates that the source and target replicas are contained within a single fault domain. • This enumeration literal shall indicate that the source and target replicas are contained within a single fault domain.
Remote	Remote indicates that the source and target replicas are in separate fault domains. • This enumeration literal shall indicate that the source and target replicas are in separate fault domains.

4.14.3.5 ReplicaPriority:

The priority of background copy engine I/O to be managed relative to host I/O operations during a sequential background copy operation.

- The enumeration literal shall specify the priority of background copy engine I/O to be managed relative to host I/O operations during a sequential background copy operation.

string	Description
High	Copy engine I/O has higher priority than host I/O. • Copy engine I/O shall have a higher priority than host I/O.
Low	Copy engine I/O lower priority than host I/O. • Copy engine I/O shall have a lower priority than host I/O.
Same	Copy engine I/O has the same priority as host I/O. • Copy engine I/O shall have the same priority as host I/O.
Urgent	Copy operation to be performed as soon as possible, regardless of the host I/O requests. • Regardless of the host I/O requests, the Copy operation shall be performed as soon as possible.

4.14.3.6 ReplicaProgressStatus:

The status of the session with respect to Replication activity.

- The ReplicaProgressStatus enumeration literal shall specify the status of the session with respect to Replication activity.

string	Description
Aborting	Abort in progress. • This enumeration literal shall indicate that replication has an abort in progress.
Completed	The request is completed. Data flow is idle. • This enumeration literal shall indicate that the request is completed. Data flow is idle.
Detaching	Detach in progress. • This enumeration literal shall indicate that replication has a detach in progress.
Dormant	Indicates that the data flow is inactive, suspended or quiesced. • This enumeration literal shall indicate that the data flow is inactive, suspended or quiesced.
FailingBack	Undoing the result of failover. • This enumeration literal shall indicate that replication is undoing the result of failover.

string	Description
FailingOver	In the process of switching source and target. • This enumeration literal shall indicate that replication is in the process of switching source and target.
Fracturing	Fracture in progress. • This enumeration literal shall indicate that replication has a fracture in progress.
Initializing	In the process of establishing source/replica relationship and the data flow has not started. • This enumeration literal shall indicate that replication is in the process of establishing source/replica relationship and the data flow has not started.
Mixed	Applies to groups with element pairs with different statuses. Generally, the individual statuses need to be examined. • This enumeration literal shall indicate that replication status is mixed across element pairs in a replication group. Generally, the individual statuses need to be examined.
Pending	The flow of data has stopped momentarily due to limited bandwidth or a busy system. • This enumeration literal shall indicate that the flow of data has stopped momentarily due to limited bandwidth or a busy system.
Preparing	Preparation in progress. • This enumeration literal shall indicate that replication has preparation in progress.
RequiresActivate	The requested operation has completed, however, the synchronization relationship needs to be activated before further copy operations can be issued. • This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be activated before further copy operations can be issued.
RequiresDetach	The requested operation has completed, however, the synchronization relationship needs to be detached before further copy operations can be issued. • This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be detached before further copy operations can be issued.
RequiresFracture	The requested operation has completed, however, the synchronization relationship needs to be fractured before further copy operations can be issued. • This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be fractured before further copy operations can be issued.

string	Description
RequiresResume	The requested operation has completed, however, the synchronization relationship needs to be resumed before further copy operations can be issued. • This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be resumed before further copy operations can be issued.
RequiresResync	The requested operation has completed, however, the synchronization relationship needs to be resynced before further copy operations can be issued. • This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be resynced before further copy operations can be issued.
RequiresSplit	The requested operation has completed, however, the synchronization relationship needs to be split before further copy operations can be issued. • This enumeration literal shall indicate that the requested operation has completed, however, the synchronization relationship needs to be split before further copy operations can be issued.
Restoring	Restore in progress. • This enumeration literal shall indicate that replication has a restore in progress.
Resyncing	Resync in progress. • This enumeration literal shall indicate that replication has resynchronization in progress.
Splitting	Split in progress. • This enumeration literal shall indicate that replication has a split in progress.
Suspending	The copy operation is in the process of being suspended. • This enumeration literal shall indicate that replication has a copy operation in the process of being suspended.
Synchronizing	Sync in progress. • This enumeration literal shall indicate that replication has synchronization in progress.
Terminating	The relationship is in the process of terminating. • This enumeration literal shall indicate that the replication relationship is in the process of terminating.

4.14.3.7 ReplicaReadOnlyAccess:

This property specifies whether the source, the target, or both elements are read only to the host.

- The enumeration literal shall specify whether the source, the target, or both elements are read only to the host.

string	Description
Both	Both the source and the target elements are read only to the host. • Both the source and the target elements shall be read only to the host.
ReplicaElement	The replica element. • The replica element shall be read-only to the host.
SourceElement	The source element. • The source element shall be read-only to the host.

4.14.3.8 ReplicaRecoveryMode:

Describes whether the copy operation continues after a broken link is restored.

- The enumeration literal shall specify whether the copy operation continues after a broken link is restored.

string	Description
Automatic	Copy operation resumes automatically. • The copy operation shall resume automatically.
Manual	ReplicaState is set to Suspended after the link is restored. It is required to issue the Resume operation to continue. • The ReplicaState shall be set to Suspended after the link is restored. It is required to issue the Resume operation to continue.

4.14.3.9 ReplicaRole:

The source or target role of this replica.

- The ReplicaRole enumeration literal shall represent the source or target role of this replica as known to the containing resource.

string	Description
Source	The source element. • This enumeration literal shall indicate a source element.

string	Description
Target	The target element. • This enumeration literal shall indicate target element.

4.14.3.10 ReplicaState:

ReplicaState describes the state of the relationship with respect to Replication activity.

- The ReplicaState enumeration literal shall specify the state of the relationship with respect to Replication activity.

string	Description
Aborted	The copy operation is aborted with the Abort operation. Use the Resync Replica operation to restart the copy operation. • This enumeration literal shall indicate that the copy operation is aborted with the Abort operation. The Resync Replica operation can be used to restart the copy operation.
Broken	The relationship is non-functional due to errors in the source, the target, the path between the two or space constraints. • This enumeration literal shall indicate that the relationship is non-functional due to errors in the source, the target, the path between the two or space constraints.
Failedover	Reads and writes are sent to the target element. Source element is not reachable. • This enumeration literal shall indicate that the reads and writes are sent to the target element. The source element may not be reachable.
Fractured	Target is split from the source. • This enumeration literal shall indicate that the Target is split from the source. The target may not be consistent.
Inactive	Data flow has stopped, writes to source element will not be sent to target element. • This enumeration literal shall indicate that data flow has stopped, writes to source element shall not be sent to target element.
Initialized	The link to enable replication is established and source/replica elements are associated, but the data flow has not started. • This enumeration literal shall indicate that the link to enable replication is established and source/replica elements are associated, but the data flow has not started.

string	Description
Invalid	The array is unable to determine the state of the replication relationship, for example, after the connection is restored; however, either source or target elements have an unknown status. • This enumeration literal shall indicate that the storage server is unable to determine the state of the replication relationship, for example, after the connection is restored; however, either source or target elements have an unknown status.
Mixed	Applies to the ReplicaState of GroupSynchronized. It indicates the StorageSynchronized relationships of the elements in the groups have different ReplicaState values. • This enumeration literal shall indicate the ReplicaState of GroupSynchronized. The value indicates the StorageSynchronized relationships of the elements in the group have different ReplicaState values.
Partitioned	State of replication relationship can not be determined, for example, due to a connection problem. • This enumeration literal shall indicate that the state of replication relationship can not be determined, for example, due to a connection problem.
Prepared	Initialization is completed, however, the data flow has not started. • This enumeration literal shall indicate that initialization is completed, however, the data flow has not started.
Restored	It indicates the source element was restored from the target element. • This enumeration literal shall indicate that the source element was restored from the target element.
Skewed	The target has been modified and is no longer synchronized with the source element or the point-in-time view. • This enumeration literal shall indicate that the target has been modified and is no longer synchronized with the source element or the point-in-time view.
Split	The target element was gracefully (or systematically) split from its source element -- consistency is guaranteed. • This enumeration literal shall indicate that the target element was gracefully (or systematically) split from its source element -- consistency shall be guaranteed.
Suspended	Data flow between the source and target elements has stopped. Writes to source element are held until the relationship is Resumed. • This enumeration literal shall indicate that the data flow between the source and target elements has stopped. Writes to source element shall be held until the relationship is Resumed.
Synchronized	For the Mirror, Snapshot, or Clone replication, the target represents a copy of the source. • This enumeration literal shall indicate that for Mirror, Snapshot, or Clone replication, the target represents a copy of the source.

string	Description
Unsynchronized	Not all the source element data has been copied to the target element. • This enumeration literal shall indicate that not all the source element data has been copied to the target element.

4.14.3.11 ReplicaType:

ReplicaType describes the intended outcome of the replication.

- The ReplicaType enumeration literal shall describe the intended outcome of the replication.

string	Description
Clone	Create a point in time, full copy the source. • This enumeration literal shall indicate that replication shall create a point in time, full copy the source.
Mirror	Create and maintain a copy of the source. • This enumeration literal shall indicate that replication shall create and maintain a copy of the source.
Snapshot	Create a point in time, virtual copy of the source. • This enumeration literal shall indicate that replication shall create a point in time, virtual copy of the source.
TokenizedClone	Create a token based clone. • This enumeration literal shall indicate that replication shall create a token based clone.

4.14.3.12 ReplicaUpdateMode:

Describes whether the target elements will be updated synchronously or asynchronously.

- The enumeration literal shall specify whether the target elements will be updated synchronously or asynchronously.

string	Description
Active	Active-Active (i.e. bidirectional) synchronous updates. • This enumeration literal shall indicate Active-Active (i.e. bidirectional) synchronous updates.

string	Description
Adaptive	Allows implementation to switch between synchronous and asynchronous modes. • This enumeration literal shall indicate that an implementation may switch between synchronous and asynchronous modes.
Asynchronous	Asynchronous updates. • This enumeration literal shall indicate Asynchronous updates.
Synchronous	Synchronous updates. • This enumeration literal shall indicate Synchronous updates.

4.14.3.13 RequestedReplicaState:

The last requested or desired state for the relationship.

- The last requested or desired state for the relationship. The actual state of the relationship shall be represented by ReplicaState. When RequestedState reaches the requested state, this property shall be null.

string	Description
Aborted	The copy operation is aborted with the Abort operation. Use the Resync Replica operation to restart the copy operation. • This enumeration literal shall indicate that the copy operation is aborted with the Abort operation. The Resync Replica operation can be used to restart the copy operation.
Broken	The relationship is non-functional due to errors in the source, the target, the path between the two or space constraints. • This enumeration literal shall indicate that the relationship is non-functional due to errors in the source, the target, the path between the two or space constraints.
Failedover	Reads and writes are sent to the target element. Source element is not reachable. • This enumeration literal shall indicate that the reads and writes are sent to the target element. The source element may not be reachable.
Fractured	Target is split from the source. • This enumeration literal shall indicate that the Target is split from the source. The target may not be consistent.

string	Description
Inactive	Data flow has stopped, writes to source element will not be sent to target element. • This enumeration literal shall indicate that data flow has stopped, writes to source element shall not be sent to target element.
Initialized	The link to enable replication is established and source/replica elements are associated, but the data flow has not started. • This enumeration literal shall indicate that the link to enable replication is established and source/replica elements are associated, but the data flow has not started.
Invalid	The array is unable to determine the state of the replication relationship, for example, after the connection is restored; however, either source or target elements have an unknown status. • This enumeration literal shall indicate that the storage server is unable to determine the state of the replication relationship, for example, after the connection is restored; however, either source or target elements have an unknown status.
Mixed	Applies to the ReplicaState of GroupSynchronized. It indicates the StorageSynchronized relationships of the elements in the groups have different ReplicaState values. • This enumeration literal shall indicate the ReplicaState of GroupSynchronized. The value indicates the StorageSynchronized relationships of the elements in the group have different ReplicaState values.
Partitioned	State of replication relationship can not be determined, for example, due to a connection problem. • This enumeration literal shall indicate that the state of replication relationship can not be determined, for example, due to a connection problem.
Prepared	Initialization is completed, however, the data flow has not started. • This enumeration literal shall indicate that initialization is completed, however, the data flow has not started.
Restored	It indicates the source element was restored from the target element. • This enumeration literal shall indicate that the source element was restored from the target element.
Skewed	The target has been modified and is no longer synchronized with the source element or the point-in-time view. • This enumeration literal shall indicate that the target has been modified and is no longer synchronized with the source element or the point-in-time view.
Split	The target element was gracefully (or systematically) split from its source element -- consistency is guaranteed. • This enumeration literal shall indicate that the target element was gracefully (or systematically) split from its source element -- consistency shall be guaranteed.

string	Description
Suspended	Data flow between the source and target elements has stopped. Writes to source element are held until the relationship is Resumed. • This enumeration literal shall indicate that the data flow between the source and target elements has stopped. Writes to source element shall be held until the relationship is Resumed.
Synchronized	For the Mirror, Snapshot, or Clone replication, the target represents a copy of the source. • This enumeration literal shall indicate that for Mirror, Snapshot, or Clone replication, the target represents a copy of the source.
Unsynchronized	Not all the source element data has been copied to the target element. • This enumeration literal shall indicate that not all the source element data has been copied to the target element.

4.14.3.14 UndiscoveredElement:

This property specifies whether the source, the target, or both elements involved in a copy operation are undiscovered.

- The enumeration literal shall specify whether the source, the target, or both elements involved in a copy operation are undiscovered. An element is considered undiscovered if its object model is not known to the service performing the copy operation.

string	Description
ReplicaElement	The replica element is undiscovered. • This enumeration literal shall indicate that the replica element is undiscovered.
SourceElement	The source element is undiscovered. • This enumeration literal shall indicate that the source element is undiscovered.

4.15 Schedule

4.15.1 Description

Schedule a series of occurrences.

- The properties of this type shall schedule a series of occurrences.

4.15.2 Properties

Property	Type	Attributes	Notes
EnabledDaysOfMonth [ ]	array (integer, null)	*read-write*	Days of the month when scheduled occurrences are enabled. `0` indicates that every day of the month is enabled. • This property shall contain the days of the month when scheduled occurrences are enabled, for enabled days of week and months of year. If the array contains a single value of `0`, or if the property is not present, all days of the month shall be enabled.
EnabledDaysOfWeek [ ]	array (string (enum))	*read-write (null)*	Days of the week. • Days of the week when scheduled occurrences are enabled, for enabled days of the month and months of the year. If not present, all days of the week are enabled. ◦ Days of the week when scheduled occurrences are enabled. If not present, all days of the week shall be enabled. *For the possible property values, see EnabledDaysOfWeek in Property details.*
EnabledIntervals *(v1.1+)* [ ]	array (string, null)	*read-write*	Intervals when scheduled occurrences are enabled. • Each value shall be an ISO 8601 conformant interval specifying when occurrences are enabled.
EnabledMonthsOfYear [ ]	array (string (enum))	*read-write (null)*	Months of the year. • The months of the year when scheduled occurrences are enabled. If not present, all months of the year are enabled. ◦ This property shall contain the months of the year when scheduled occurrences are enabled, for enabled days of week and days of month. If not present, all months of the year shall be enabled. *For the possible property values, see EnabledMonthsOfYear in Property details.*
InitialStartTime	string (date-time)	*read-write (null)*	The date and time when the initial occurrence is scheduled to occur. • This property shall contain the date and time when the initial occurrence is scheduled to occur.
Lifetime	string	*read-write (null)*	The time after provisioning when the schedule as a whole expires. • This property shall contain a Redfish Duration that describes the time after provisioning when the schedule expires. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
MaxOccurrences	integer	*read-write (null)*	The maximum number of scheduled occurrences. • This property shall contain the maximum number of scheduled occurrences.

Property	Type	Attributes	Notes
Name	string	*read-write (null)*	The schedule name. • The name of the schedule, which is constructed as OrgID:ScheduleName. Examples include ACME:Daily, ACME:Weekly, and ACME:FirstTuesday.
RecurrenceInterval	string	*read-write (null)*	The duration between consecutive occurrences. • This property shall contain the duration between consecutive occurrences. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`

4.15.3 Property details

4.15.3.1 EnabledDaysOfWeek:

Days of the week.

- Days of the week when scheduled occurrences are enabled, for enabled days of the month and months of the year. If not present, all days of the week are enabled.
  - Days of the week when scheduled occurrences are enabled. If not present, all days of the week shall be enabled.

string	Description
Every	Every day of the week. • This value indicates that every day of the week has been selected. When used in array properties, such as for enabling a function on certain days, it shall be the only member in the array.
Friday	Friday.
Monday	Monday.
Saturday	Saturday.
Sunday	Sunday.
Thursday	Thursday.
Tuesday	Tuesday.
Wednesday	Wednesday.

4.15.3.2 EnabledMonthsOfYear:

Months of the year.

- The months of the year when scheduled occurrences are enabled. If not present, all months of the year are enabled.
  - This property shall contain the months of the year when scheduled occurrences are enabled, for enabled days of week and days of month. If not present, all months of the year shall be enabled.

string	Description
April	April.
August	August.
December	December.
Every	Every month of the year. • This value indicates that every month of the year has been selected. When used in array properties, such as for enabling a function for certain months, it shall be the only member in the array.
February	February.
January	January.
July	July.
June	June.
March	March.
May	May.
November	November.
October	October.
September	September.

4.16 Status

4.16.1 Description

The status and health of a resource and its children.

- This type shall contain any status or health properties of a resource.

4.16.2 Properties

Property	Type	Attributes	Notes
Conditions *(v1.11+)* [{	array		Conditions in this resource that require attention. • This property shall represent the active conditions requiring attention in this or a related resource that affects the Health or HealthRollup of this resource. The service may roll up multiple conditions originating from a resource, using the `ConditionInRelatedResource` message from Base Message Registry.
LogEntry {	object		The link to the log entry created for this condition. • This property shall contain a link to a resource of type LogEntry that represents the log entry created for this condition. See the *LogEntry* schema for details on this property.
@odata.id	string	*read-only*	Link to a LogEntry resource. See the Links section and the *LogEntry* schema for details.
}			
Message	string	*read-only*	The human-readable message for this condition. • This property shall contain a human-readable message describing this condition.
MessageArgs [ ]	array (string)	*read-only*	An array of message arguments that are substituted for the arguments in the message when looked up in the message registry. • This property shall contain an array of message arguments that are substituted for the arguments in the message when looked up in the message registry. It has the same semantics as the MessageArgs property in the Redfish MessageRegistry schema.
MessageId	string	*read-only* *required*	The identifier for the message. • This property shall contain a MessageId, as defined in the 'MessageId format' clause of the Redfish Specification.
OriginOfCondition {	object		A link to the resource or object that originated the condition. • This property shall contain a link to the resource or object that originated the condition. This property shall not be present if the condition was caused by this resource.

Property	Type	Attributes	Notes
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
Resolution *(v1.14+)*	string	*read-only*	Suggestions on how to resolve the condition. • This property shall contain the resolution of the condition. Services should replace the resolution defined in the message registry with a more specific resolution.
Severity	string (enum)	*read-only*	The severity of the condition. • This property shall contain the severity of the condition. Services can replace the value defined in the message registry with a value more applicable to the implementation. *For the possible property values, see Severity in Property details.*
Timestamp	string (date-time)	*read-only*	The time the condition occurred. • This property shall indicate the time the condition occurred.
}]			
Health	string (enum)	*read-only* *(null)*	The health state of this resource in the absence of its dependent resources. • This property shall represent the health state of the resource without considering its dependent resources. The values shall conform to those defined in the Redfish Specification. *For the possible property values, see Health in Property details.*
HealthRollup	string (enum)	*read-only* *(null)*	The overall health state from the view of this resource. • This property shall represent the health state of the resource and its dependent resources. The values shall conform to those defined in the Redfish Specification. *For the possible property values, see HealthRollup in Property details.*
Oem {	object		See the OEM object definition in the Using this guide clause.
(pattern) {}	object		Property names follow regular expression pattern "^[A-Za-z0-9_]+$"
}			

Property	Type	Attributes	Notes
State	string (enum)	*read-only (null)*	The known state of the resource, such as, enabled. • This property shall indicate whether and why this component is available. Enabled indicates the resource is available. Disabled indicates the resource has been intentionally made unavailable but it can be enabled. Offline indicates the resource is unavailable intentionally and requires action to make it available. InTest indicates that the component is undergoing testing. Starting indicates that the resource is becoming available. Absent indicates the resource is physically unavailable. *For the possible property values, see State in Property details.*

4.16.3 Property details

4.16.3.1 Health:

The health state of this resource in the absence of its dependent resources.

- This property shall represent the health state of the resource without considering its dependent resources. The values shall conform to those defined in the Redfish Specification.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

4.16.3.2 HealthRollup:

The overall health state from the view of this resource.

- This property shall represent the health state of the resource and its dependent resources. The values shall conform to those defined in the Redfish Specification.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

4.16.3.3 Severity:

The severity of the condition.

- This property shall contain the severity of the condition. Services can replace the value defined in the message registry with a value more applicable to the implementation.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

4.16.3.4 State:

The known state of the resource, such as, enabled.

- This property shall indicate whether and why this component is available. Enabled indicates the resource is available. Disabled indicates the resource has been intentionally made unavailable but it can be enabled. Offline indicates the resource is unavailable intentionally and requires action to make it available. InTest indicates that the component is undergoing testing. Starting indicates that the resource is becoming available. Absent indicates the resource is physically unavailable.

string	Description
Absent	This function or resource is either not present or detected.
Deferring *(v1.2+)*	The element does not process any commands but queues new requests.
Disabled	This function or resource is disabled.
Enabled	This function or resource is enabled.
InTest	This function or resource is undergoing testing, or is in the process of capturing information for debugging.
Qualified *(v1.9+)*	The element quality is within the acceptable range of operation.
Quiesced *(v1.2+)*	The element is enabled but only processes a restricted set of commands.
StandbyOffline	This function or resource is enabled but awaits an external action to activate it.
StandbySpare	This function or resource is part of a redundancy set and awaits a failover or other external action to activate it.

string	Description
Starting	This function or resource is starting.
UnavailableOffline *(v1.1+)*	This function or resource is present but cannot be used.
Updating *(v1.2+)*	The element is updating and might be unavailable or degraded.

5 Resource collections

A resource collection is a core concept in Redfish. A resource collection is a group of like resources where the number of instances in the group can shrink or grow depending on the scope of the Redfish service or the configuration of the devices being managed. Every resource collection contains the same set of supported properties, and all contain `Collection` in the name of their schema. Every resource linked in the `Members` array within a resource collection will have the same resource type with the same major version, but can vary in minor or errata schema versions.

The properties of a resource collection are:

5.0.1 Properties

Property	Type	Attributes	Notes
@odata.context	string (URI)	*read-only*	The value of this property shall be the context URL that describes the resource according to OData-Protocol and shall be of the form defined in the Redfish specification.
@odata.id	string (URI)	*read-only* *required*	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
@odata.type	string	*read-only* *required*	The value of this property shall be a URI fragment that specifies the type of the resource and it shall be of the form defined in the Redfish specification.
Description	string	*read-only* *(null)*	This property shall contain the description of this resource. The value shall conform with the 'Description' clause of the Redfish Specification.
Members [{	array	*required*	The members of this collection.
@odata.id	string (URI)	*read-only*	The link to a Resource instance, which is a member of this collection.
}]			
Members@odata.count	integer	*read-only*	The value of this property shall be an integer representing the number of items in a collection.
Members@odata.navigationLink	string (URI)	*read-write*	
Name	string	*read-only* *required*	This property shall contain the name of this resource or array member. The value shall conform with the 'Name' clause of the Redfish Specification.
Oem {}	object		This string property shall be in the `Oem` reserved word format.

As shown in the following example, a Redfish service may provide management functionality for several `ComputerSystem` resources, and therefore a `ComputerSystemCollection` resource is provided. This example shows a service with four `ComputerSystem` instances inside the `Members` array.


```
{
    "@odata.type": "#ComputerSystemCollection.ComputerSystemCollection",
    "Name": "Computer System Collection",
    "Members@odata.count": 4,
    "Members": [
        {
            "@odata.id": "/redfish/v1/Systems/529QB9450R6"
        },
        {
            "@odata.id": "/redfish/v1/Systems/529QB9451R6"
        },
        {
            "@odata.id": "/redfish/v1/Systems/529QB9452R6"
        },
        {
            "@odata.id": "/redfish/v1/Systems/529QB9453R6"
        }
    ],
    "@odata.id": "/redfish/v1/Systems"
}
```


5.1 Collection capabilities annotation (#CollectionCapabilities)

This annotation is used to inform the client how to form the request body for a create (POST) operation to a given collection based on a specified use case, which will result in a new member being added to the given collection.

5.1.1 Properties

Property	Type	Attributes	Notes
Capabilities [{	array		This property shall contain an array of objects that describe the capabilities of this resource collection.
CapabilitiesObject {	object	*required*	This property shall contain a link to a resource that matches the type for a resource collection and shall contain annotations that describe the properties allowed in the POST request.
@odata.id	string (URI)	*read-only*	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			

Property	Type	Attributes	Notes
Links {	object	*required*	This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		This property shall contain the OEM extensions. All values for properties contained in this object shall conform to the Redfish Specification-described requirements. For property details, see Oem.
RelatedItem [{	array		This property shall contain an array of links to resources that are related to this capability.
@odata.id	string (URI)	*read-only*	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
RelatedItem@odata.count	integer	*read-only*	The value of this property shall be an integer representing the number of items in a collection.
TargetCollection {	object	*required*	This property shall contain a link to a resource collection that this structure describes. A client can use this structure to understand how to form the POST request for the collection.
@odata.id	string (URI)	*read-only*	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
}			
UseCase	string (enum)	*read-only* *required*	This property shall contain an enumerated value that describes the use case for this capability instance. *For the possible property values, see UseCase in Property details.*
}]			
MaxMembers *(v1.2+)*	integer	*read-only*	This property shall contain the maximum number of members allowed in this resource collection.

5.1.2 Property details

5.1.2.1 UseCase:

This property shall contain an enumerated value that describes the use case for this capability instance.

string	Description
ComputerSystemComposition	This capability describes a client creating a new computer system resource from a set of disaggregated hardware.
ComputerSystemConstrainedComposition *(v1.1+)*	This capability describes a client creating a new computer system resource from a set of constraints.
ResourceBlockComposition *(v1.3+)*	This capability describes a client creating a new resource block from a set of other resource blocks.
ResourceBlockConstrainedComposition *(v1.3+)*	This capability describes a client creating a new resource block from a set of constraints.
VolumeCreation	This capability describes a client creating a new volume resource as part of an existing storage subsystem.

5.1.3 Example collection capabilities annotation

```
{
    "@Redfish.CollectionCapabilities": {
        "@odata.type": "#CollectionCapabilities.v1_1_0.CollectionCapabilities",
        "Capabilities": [
            {
                "CapabilitiesObject": {
                    "@odata.id": "/redfish/v1/Systems/Capabilities"
                },
                "UseCase": "ComputerSystemComposition",
                "Links": {
                    "TargetCollection": {
                        "@odata.id": "/redfish/v1/Systems"
                    }
                }
            },
            {
                "CapabilitiesObject": {
                    "@odata.id": "/redfish/v1/Systems/ConstrainedCompositionCapabilities"
                },
                "UseCase": "ComputerSystemConstrainedComposition",
                "Links": {
                    "TargetCollection": {
                        "@odata.id": "/redfish/v1/Systems"
                    }
                }
            }
        ]
    },
    ...
}
```

5.2 Resource collection URIs in Redfish v1.6 and later

The following table lists all Redfish-defined resource collections and the URIs where they can appear.

> **Note:** The URIs listed are valid for Redfish services that conform to the *Redfish Specification v1.6.0* or higher. Services built on earlier specification versions might use different URIs, which must be discovered by following the hyperlinks from the service root (`/redfish/v1/`).

Collection Type	URIs
AccelerationFunctionCollection	/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/AccelerationFunctions /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/AccelerationFunctions /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/AccelerationFunctions /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/AccelerationFunctions /redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/AccelerationFunctions
AddressPoolCollection	/redfish/v1/Fabrics/*{FabricId}*/AddressPools
AggregateCollection	/redfish/v1/AggregationService/Aggregates
AggregationSourceCollection	/redfish/v1/AggregationService/AggregationSources
AllowDenyCollection	/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/NetworkDeviceFunctions/*{NetworkDeviceFunctionId}*/AllowDeny /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions{NetworkDeviceFunctionId}/AllowDeny /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions{NetworkDeviceFunctionId}/AllowDeny /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions{NetworkDeviceFunctionId}/AllowDeny /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions{NetworkDeviceFunctionId}/AllowDeny /redfish/v1/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions{NetworkDeviceFunctionId}/AllowDeny
BatteryCollection	/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/Batteries
BootOptionCollection	/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/BootOptions /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/BootOptions /redfish/v1/Systems/*{ComputerSystemId}*/BootOptions
CableCollection	/redfish/v1/Cables

Collection Type	URIs
CertificateCollection	/redfish/v1/AccountService/Accounts/{*ManagerAccountId*}/Certificates /redfish/v1/AccountService/ActiveDirectory/Certificates /redfish/v1/AccountService/ExternalAccountProviders/{*ExternalAccountProviderId*}/Certificates /redfish/v1/AccountService/LDAP/Certificates /redfish/v1/Chassis/{*ChassisId*}/Certificates /redfish/v1/Chassis/{*ChassisId*}/Drives/{*DriveId*}/Certificates /redfish/v1/Chassis/{*ChassisId*}/Memory/{*MemoryId*}/Certificates /redfish/v1/Chassis/{*ChassisId*}/NetworkAdapters/{*NetworkAdapterId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Drives/{*DriveId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Memory/{*MemoryId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Processors/{*ProcessorId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Storage/{*StorageId*}/Controllers/{*StorageControllerId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Storage/{*StorageId*}/Drives/{*DriveId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Storage/{*StorageId*}/StorageControllers/{*StorageControllerId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/Boot/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/KeyManagement/KMIPCertificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/Memory/{*MemoryId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/Processors/{*ProcessorId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/SecureBoot/SecureBootDatabases/{*DatabaseId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/Storage/{*StorageId*}/Controllers/{*StorageControllerId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/Storage/{*StorageId*}/Drives/{*DriveId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/Storage/{*StorageId*}/StorageControllers/{*StorageControllerId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/VirtualMedia/{*VirtualMediaId*}/Certificates /redfish/v1/CompositionService/ResourceBlocks/{*ResourceBlockId*}/Systems/{*ComputerSystemId*}/VirtualMedia/{*VirtualMediaId*}/ClientCertificates /redfish/v1/EventService/Subscriptions/{*EventDestinationId*}/Certificates /redfish/v1/EventService/Subscriptions/{*EventDestinationId*}/ClientCertificates /redfish/v1/Fabrics/{*FabricId*}/Switches/{*SwitchId*}/Certificates /redfish/v1/Managers/{*ManagerId*}/Certificates /redfish/v1/Managers/{*ManagerId*}/NetworkProtocol/HTTPS/Certificates /redfish/v1/Managers/{*ManagerId*}/RemoteAccountService/Accounts/{*ManagerAccountId*}/Certificates /redfish/v1/Managers/{*ManagerId*}/RemoteAccountService/ActiveDirectory/Certificates /redfish/v1/Managers/{*ManagerId*}/RemoteAccountService/ExternalAccountProviders/{*ExternalAccountProviderId*}/Certificates

Collection Type	URIs
	/redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/LDAP/Certificates /redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/SPDM/RevokedCertificates /redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/SPDM/TrustedCertificates /redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/TLS/Client/RevokedCertificates /redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/TLS/Client/TrustedCertificates /redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/TLS/Server/RevokedCertificates /redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/TLS/Server/TrustedCertificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Boot/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/KeyManagement/KMIPCertificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*/Certificates /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*/ClientCertificates /redfish/v1/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Certificates /redfish/v1/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Certificates /redfish/v1/Systems/*{ComputerSystemId}*/Boot/Certificates /redfish/v1/Systems/*{ComputerSystemId}*/Certificates /redfish/v1/Systems/*{ComputerSystemId}*/KeyManagement/KMIPCertificates /redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/Certificates /redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Certificates /redfish/v1/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Certificates /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Certificates /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Certificates /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Certificates /redfish/v1/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*/Certificates

Collection Type	URIs
	/redfish/v1/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*/ClientCertificates /redfish/v1/UpdateService/ClientCertificates /redfish/v1/UpdateService/RemoteServerCertificates
ChassisCollection	/redfish/v1/Chassis
CircuitCollection	/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Branches /redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Mains /redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Branches /redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Mains /redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Subfeeds /redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Branches /redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Mains /redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Branches /redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Mains /redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Branches /redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Feeders /redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Mains /redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Subfeeds /redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Branches /redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Feeders /redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Mains
ComponentIntegrityCollection	/redfish/v1/ComponentIntegrity
CompositionReservationCollection	/redfish/v1/CompositionService/CompositionReservations
ComputerSystemCollection	/redfish/v1/Systems
ConnectionCollection	/redfish/v1/Fabrics/*{FabricId}*/Connections
ConnectionMethodCollection	/redfish/v1/AggregationService/ConnectionMethods
ControlCollection	/redfish/v1/Chassis/*{ChassisId}*/Controls /redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Controls /redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Controls /redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Controls /redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Controls /redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Controls

Collection Type	URIs
DriveCollection	/redfish/v1/Chassis/*{ChassisId}*/Drives /redfish/v1/Storage/*{StorageId}*/FileSystems/*{FileSystemId}*/CapacitySources/*{CapacitySourceId}*/ProvidingDrives /redfish/v1/Storage/*{StorageId}*/StoragePools/*{StoragePoolId}*/CapacitySources/*{CapacitySourceId}*/ProvidingDrives /redfish/v1/Storage/*{StorageId}*/Volumes/*{VolumeId}*/CapacitySources/*{CapacitySourceId}*/ProvidingDrives /redfish/v1/StorageServices/*{StorageServiceId}*/Drives /redfish/v1/StorageServices/*{StorageServiceId}*/FileSystems/*{FileSystemId}*/CapacitySources/*{CapacitySourceId}*/ProvidingDrives /redfish/v1/StorageServices/*{StorageServiceId}*/StoragePools/*{StoragePoolId}*/CapacitySources/*{CapacitySourceId}*/ProvidingDrives /redfish/v1/StorageServices/*{StorageServiceId}*/Volumes/*{VolumeId}*/CapacitySources/*{CapacitySourceId}*/ProvidingDrives /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/FileSystems/*{FileSystemId}*/CapacitySources/*{CapacitySourceId}*/ProvidingDrives /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StoragePools/*{StoragePoolId}*/CapacitySources/*{CapacitySourceId}*/ProvidingDrives /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Volumes/*{VolumeId}*/CapacitySources/*{CapacitySourceId}*/ProvidingDrives
EndpointCollection	/redfish/v1/Fabrics/*{FabricId}*/Endpoints /redfish/v1/Storage/*{StorageId}*/Endpoints /redfish/v1/StorageServices/*{StorageServiceId}*/Endpoints
EndpointGroupCollection	/redfish/v1/Fabrics/*{FabricId}*/EndpointGroups /redfish/v1/Storage/*{StorageId}*/EndpointGroups /redfish/v1/StorageServices/*{StorageServiceId}*/EndpointGroups /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/EndpointGroups
EthernetInterfaceCollection	/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdaptersId}*/NetworkDeviceFunctions/*{NetworkDeviceFunctionId}*/EthernetInterfaces /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/EthernetInterfaces /redfish/v1/Managers/*{ManagerId}*/EthernetInterfaces /redfish/v1/Managers/*{ManagerId}*/HostInterfaces/*{HostInterfaceId}*/HostEthernetInterfaces /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/EthernetInterfaces /redfish/v1/Systems/*{ComputerSystemId}*/EthernetInterfaces
EventDestinationCollection	/redfish/v1/EventService/Subscriptions
ExternalAccountProviderCollection	/redfish/v1/AccountService/ExternalAccountProviders /redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/ExternalAccountProviders
FabricAdapterCollection	/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters /redfish/v1/CompositionService/Resourceblocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters /redfish/v1/Resourceblocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters /redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters

Collection Type	URIs
FabricCollection	/redfish/v1/Fabrics
FacilityCollection	/redfish/v1/Facilities
FanCollection	/redfish/v1/Chassis/*{ChassisId}*/ThermalSubsystem/Fans
GraphicsControllerCollection	/redfish/v1/Systems/*{ComputerSystemId}*/GraphicsControllers
HostInterfaceCollection	/redfish/v1/Managers/*{ManagerId}*/HostInterfaces
JobCollection	/redfish/v1/JobService/Jobs /redfish/v1/JobService/Jobs/*{JobId}*/Steps
JsonSchemaFileCollection	/redfish/v1/JsonSchemas
KeyCollection	/redfish/v1/AccountService/Accounts/*{ManagerAccountId}*/Keys /redfish/v1/KeyService/NVMeoFSecrets /redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/Accounts/*{ManagerAccountId}*/Keys
KeyPolicyCollection	/redfish/v1/KeyService/NVMeoFKeyPolicies
LicenseCollection	/redfish/v1/LicenseService/Licenses
LogEntryCollection	/redfish/v1/Chassis/*{ChassisId}*/LogServices/*{LogServiceId}*/Entries /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/LogServices/*{LogServiceId}*/Entries /redfish/v1/JobService/Log/Entries /redfish/v1/Managers/*{ManagerId}*/LogServices/*{LogServiceId}*/Entries /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/LogServices/*{LogServiceId}*/Entries /redfish/v1/Systems/*{ComputerSystemId}*/LogServices/*{LogServiceId}*/Entries /redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/DeviceLog/Entries /redfish/v1/TelemetryService/LogService/Entries
LogServiceCollection	/redfish/v1/Chassis/*{ChassisId}*/LogServices /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/LogServices /redfish/v1/Managers/*{ManagerId}*/LogServices /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/LogServices /redfish/v1/Systems/*{ComputerSystemId}*/LogServices
ManagerAccountCollection	/redfish/v1/AccountService/Accounts /redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/Accounts
ManagerCollection	/redfish/v1/Managers
MediaControllerCollection	/redfish/v1/Chassis/*{ChassisId}*/MediaControllers

Collection Type	URIs
MemoryChunksCollection	/redfish/v1/Chassis/*{ChassisId}*/MemoryDomains/*{MemoryDomainId}*/MemoryChunks /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/MemoryDomains/*{MemoryDomainId}*/MemoryChunks /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/MemoryDomains/*{MemoryDomainId}*/MemoryChunks /redfish/v1/Systems/*{ComputerSystemId}*/MemoryDomains/*{MemoryDomainId}*/MemoryChunks
MemoryCollection	/redfish/v1/Chassis/*{ChassisId}*/Memory /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory /redfish/v1/Systems/*{ComputerSystemId}*/Memory
MemoryDomainCollection	/redfish/v1/Chassis/*{ChassisId}*/MemoryDomains /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/MemoryDomains /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/MemoryDomains /redfish/v1/Systems/*{ComputerSystemId}*/MemoryDomains
MessageRegistryCollection	
MessageRegistryFileCollection	/redfish/v1/Registries
MetricDefinitionCollection	/redfish/v1/TelemetryService/MetricDefinitions
MetricReportCollection	/redfish/v1/TelemetryService/MetricReports
MetricReportDefinitionCollection	/redfish/v1/TelemetryService/MetricReportDefinitions
NetworkAdapterCollection	/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters
NetworkDeviceFunctionCollection	/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/NetworkDeviceFunctions /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions /redfish/v1/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions
NetworkInterfaceCollection	/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces /redfish/v1/Systems/*{ComputerSystemId}*/NetworkInterfaces

Collection Type	URIs
NetworkPortCollection	/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/NetworkPorts /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkPorts /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkPorts /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkPorts /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkPorts /redfish/v1/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkPorts
OperatingConfigCollection	/redfish/v1/Systems/*{ComputerSystemId}*/OperatingConfigs /redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/OperatingConfigs
OutletCollection	/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Outlets /redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Outlets /redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Outlets /redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Outlets
OutletGroupCollection	/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/OutletGroups /redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/OutletGroups /redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/OutletGroups /redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/OutletGroups
PCIeDeviceCollection	/redfish/v1/Chassis/*{ChassisId}*/PCIeDevices /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/PCIeDevices /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/PCIeDevices /redfish/v1/Systems/*{ComputerSystemId}*/PCIeDevices
PCIeFunctionCollection	/redfish/v1/Chassis/*{ChassisId}*/PCIeDevices/*{PCIeDeviceId}*/PCIeFunctions /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*/PCIeFunctions /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*/PCIeFunctions /redfish/v1/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*/PCIeFunctions

Collection Type	URIs
PortCollection	/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports /redfish/v1/Chassis/*{ChassisId}*/MediaControllers/*{MediaControllerId}*/Ports /redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports /redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports /redfish/v1/Managers/*{ManagerId}*/DedicatedNetworkPorts /redfish/v1/Managers/*{ManagerId}*/SharedNetworkPorts /redfish/v1/Managers/*{ManagerId}*/USBPorts /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*/Ports /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Ports /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/Ports /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports /redfish/v1/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports

Collection Type	URIs
	/redfish/v1/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports /redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports /redfish/v1/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports /redfish/v1/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/Ports /redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports /redfish/v1/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports
PowerDistributionCollection	/redfish/v1/PowerEquipment/ElectricalBuses /redfish/v1/PowerEquipment/FloorPDUs /redfish/v1/PowerEquipment/PowerShelves /redfish/v1/PowerEquipment/RackPDUs /redfish/v1/PowerEquipment/Switchgear /redfish/v1/PowerEquipment/TransferSwitches
PowerDomainCollection	/redfish/v1/Facilities/*{FacilityId}*/PowerDomains
PowerSupplyCollection	/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/PowerSupplies /redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/PowerSupplies
ProcessorCollection	/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors /redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*/SubProcessors /redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors /redfish/v1/Systems/*{ComputerSystemId}*/Processors /redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors /redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors

Collection Type	URIs
RegisteredClientCollection	/redfish/v1/RegisteredClients
ResourceBlockCollection	/redfish/v1/CompositionService/ActivePool /redfish/v1/CompositionService/FreePool /redfish/v1/CompositionService/ResourceBlocks /redfish/v1/ResourceBlocks
RoleCollection	/redfish/v1/AccountService/Roles /redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/Roles
RouteEntryCollection	/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/MSDT /redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT /redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT /redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/SSDT /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/MSDT /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/SSDT /redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/LPRT /redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/MPRT /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/MSDT /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/SSDT /redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/MSDT /redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT /redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT /redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/SSDT

Collection Type	URIs
RouteSetEntryCollection	/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/MSDT/*{MSDTId}*/RouteSet /redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*/RouteSet /redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*/RouteSet /redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/SSDT/*{SSDTId}*/RouteSet /redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*/RouteSet /redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*/RouteSet /redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/MSDT/*{MSDTId}*/RouteSet /redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*/RouteSet /redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*/RouteSet /redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/SSDT/*{SSDTId}*/RouteSet
SecureBootDatabaseCollection	/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases /redfish/v1/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases
SensorCollection	/redfish/v1/Chassis/*{ChassisId}*/Sensors /redfish/v1/Facilities/*{FacilityId}*/Sensors /redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Sensors /redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Sensors /redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Sensors /redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Sensors /redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Sensors
SerialInterfaceCollection	/redfish/v1/Managers/*{ManagerId}*/SerialInterfaces
SessionCollection	/redfish/v1/SessionService/Sessions
SignatureCollection	/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Signatures /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Signatures /redfish/v1/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Signatures
SimpleStorageCollection	/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SimpleStorage /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SimpleStorage /redfish/v1/Systems/*{ComputerSystemId}*/SimpleStorage
SoftwareInventoryCollection	/redfish/v1/UpdateService/FirmwareInventory /redfish/v1/UpdateService/SoftwareInventory

Collection Type	URIs
StorageCollection	/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage /redfish/v1/Storage /redfish/v1/Systems/*{ComputerSystemId}*/Storage
StorageControllerCollection	/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers /redfish/v1/Storage/*{StorageId}*/Controllers /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers
SwitchCollection	/redfish/v1/Fabrics/*{FabricId}*/Switches
TaskCollection	/redfish/v1/TaskService/Tasks /redfish/v1/TaskService/Tasks/*{TaskId}*/SubTasks
TriggersCollection	/redfish/v1/TelemetryService/Triggers
TrustedComponentCollection	/redfish/v1/Chassis/*{ChassisId}*/TrustedComponents
USBControllerCollection	/redfish/v1/Systems/*{ComputerSystemId}*/USBControllers
VCATEntryCollection	/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/VCAT /redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/REQ-VCAT /redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/RSP-VCAT /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/VCAT /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/REQ-VCAT /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/RSP-VCAT /redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/VCAT /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/VCAT /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/REQ-VCAT /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/RSP-VCAT /redfish/v1/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/VCAT /redfish/v1/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/REQ-VCAT /redfish/v1/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/RSP-VCAT

Collection Type	URIs
VirtualMediaCollection	/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/VirtualMedia /redfish/v1/Managers/*{ManagerId}*/VirtualMedia /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/VirtualMedia /redfish/v1/Systems/*{ComputerSystemId}*/VirtualMedia
VLanNetworkInterfaceCollection	/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/NetworkDeviceFunctions/*{NetworkDeviceFunctionId}*/Ethernet/VLANs /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs /redfish/v1/Managers/*{ManagerId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs /redfish/v1/Systems/*{ComputerSystemId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs
VolumeCollection	/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Volumes /redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Volumes /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Volumes /redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Volumes /redfish/v1/Storage/*{StorageId}*/ConsistencyGroups/*{ConsistencyGroupId}*/Volumes /redfish/v1/Storage/*{StorageId}*/FileSystems/*{FileSystemId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes /redfish/v1/Storage/*{StorageId}*/StoragePools/*{StoragePoolId}*/AllocatedVolumes /redfish/v1/Storage/*{StorageId}*/StoragePools/*{StoragePoolId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes /redfish/v1/Storage/*{StorageId}*/Volumes /redfish/v1/StorageServices/*{StorageServiceId}*/ConsistencyGroups/*{ConsistencyGroupId}*/Volumes /redfish/v1/StorageServices/*{StorageServiceId}*/FileSystems/*{FileSystemId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes /redfish/v1/StorageServices/*{StorageServiceId}*/StoragePools/*{StoragePoolId}*/AllocatedVolumes /redfish/v1/StorageServices/*{StorageServiceId}*/StoragePools/*{StoragePoolId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes /redfish/v1/StorageServices/*{StorageServiceId}*/Volumes /redfish/v1/StorageServices/*{StorageServiceId}*/Volumes/*{VolumeId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/ConsistencyGroups/*{ConsistencyGroupId}*/Volumes /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/FileSystems/*{FileSystemId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StoragePools/*{StoragePoolId}*/AllocatedVolumes /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StoragePools/*{StoragePoolId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes /redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Volumes

Collection Type	URIs
ZoneCollection	/redfish/v1/CompositionService/ResourceZones /redfish/v1/Fabrics/*{FabricId}*/Zones

6 Reference guide

To produce this guide, the DMTF's Redfish Documentation Generator merges the DMTF Redfish Schema Bundle (DSP8010) contents with supplemental text.

6.1 AccelerationFunction 1.0.3

Version	*v1.0*
Release	2018.3

6.1.1 Description

The AccelerationFunction schema describes an acceleration function that a processor implements. This can include functions such as audio processing, compression, encryption, packet inspection, packet switching, scheduling, or video processing.

- This Resource shall represent the acceleration function that a processor implements in a Redfish implementation. This can include functions such as audio processing, compression, encryption, packet inspection, packet switching, scheduling, or video processing.

6.1.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/AccelerationFunctions/*{AccelerationFunctionId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/AccelerationFunctions/*{AccelerationFunctionId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/AccelerationFunctions/*{AccelerationFunctionId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/AccelerationFunctions/*{AccelerationFunctionId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/AccelerationFunctions/*{AccelerationFunctionId}*

6.1.3 Properties

Property	Type	Attributes	Notes
AccelerationFunctionType	string (enum)	*read-only* *(null)*	The acceleration function type. • This property shall contain the string that identifies the acceleration function type. *For the possible property values, see AccelerationFunctionType in Property details.*
FpgaReconfigurationSlots [ ]	array (string)	*read-only*	An array of the reconfiguration slot identifiers of the FPGA that this acceleration function occupies. • This property shall contain an array of the FPGA reconfiguration slot identifiers that this acceleration function occupies.
Links {	object		The links to other Resources that are related to this Resource. • This property shall contain links to Resources that are related to but are not contained by, or subordinate to, this Resource.
Endpoints [{	array		An array of links to the endpoints that connect to this acceleration function. • This property shall contain an array of links to Resources of the Endpoint type that are associated with this acceleration function.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeFunctions [{	array		An array of links to the PCIeFunctions associated with this acceleration function. • This property shall contain an array of links of the PCIeFunction type that represent the PCIe functions associated with this acceleration function.
@odata.id	string	*read-only*	Link to a PCIeFunction resource. See the Links section and the *PCIeFunction* schema for details.
}]			
}			
Manufacturer	string	*read-only*	The acceleration function code manufacturer. • This property shall contain a string that identifies the manufacturer of the acceleration function.

Property	Type	Attributes	Notes
PowerWatts	integer (Watts)	*read-only*	The acceleration function power consumption, in watts. • This property shall contain the total acceleration function power consumption, in watts.
Status {}	object		The status and health of the Resource and its subordinate or dependent Resources. • This property shall contain any status or health properties of the Resource. For property details, see Status.
UUID	string	*read-only (null)*	The UUID for this acceleration function. • This property shall contain a UUID for the acceleration function. RFC4122 describes methods that can create the value. The value should be considered to be opaque. Client software should only treat the overall value as a UUID and should not interpret any sub-fields within the UUID. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`
Version	string	*read-only*	The acceleration function version. • This property shall describe the acceleration function version.

6.1.4 Property details

6.1.4.1 AccelerationFunctionType:

The acceleration function type.

- This property shall contain the string that identifies the acceleration function type.

string	Description
AudioProcessing	An audio processing function.
Compression	A compression function.
Encryption	An encryption function.
OEM	An OEM-defined acceleration function.
PacketInspection	A packet inspection function.
PacketSwitch	A packet switch function.

string	Description
Scheduler	A scheduler function.
VideoProcessing	A video processing function.

6.1.5 Example response

```
{
    "@odata.type": "#AccelerationFunction.v1_0_3.AccelerationFunction",
    "Id": "Compression",
    "Name": "Compression Accelerator",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "FpgaReconfigurationSlots": [
        "AFU0"
    ],
    "AccelerationFunctionType": "Compression",
    "Manufacturer": "Intel (R) Corporation",
    "Version": "Green Compression Type 1 v.1.00.86",
    "PowerWatts": 15,
    "Links": {
        "Endpoints": [],
        "PCIeFunctions": []
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/Processors/FPGA1/AccelerationFunctions/Compression"
}
```

6.2 AccountService 1.11.1

Version	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	...
Release	2022.1	2021.2	2021.1	2020.4	2019.4	2019.2	2019.1	2018.3	2018.1	2017.1	2016.3	...

6.2.1 Description

The AccountService schema defines an account service. The properties are common to, and enable management of, all user accounts. The properties include the password requirements and control features, such as account lockout. Properties and actions in this service specify general behavior that should be followed for typical accounts, however

implementations may override these behaviors for special accounts or situations to avoid denial of service or other deadlock situations.

- This resource shall represent an account service for a Redfish implementation. The properties are common to, and enable management of, all user accounts. The properties include the password requirements and control features, such as account lockout. Properties and actions in this service specify general behavior that should be followed for typical accounts, however implementations may override these behaviors for special accounts or situations to avoid denial of service or other deadlock situations.

6.2.2 URIs

/redfish/v1/AccountService
/redfish/v1/Managers/*{ManagerId}*/RemoteAccountService

6.2.3 Properties

Property	Type	Attributes	Notes
AccountLockoutCounterResetAfter	integer (seconds)	*read-write*	The period of time, in seconds, between the last failed login attempt and the reset of the lockout threshold counter. This value must be less than or equal to the AccountLockoutDuration value. A reset sets the counter to `0`. • This property shall contain the period of time, in seconds, from the last failed login attempt when the AccountLockoutThreshold counter, which counts the number of failed login attempts, is reset to `0`. Then, AccountLockoutThreshold failures are required before the account is locked. This value shall be less than or equal to the AccountLockoutDuration value. The threshold counter also resets to `0` after each successful login. If the AccountLockoutCounterResetEnabled value is `false`, this property shall be ignored.
AccountLockoutCounterResetEnabled *(v1.5+)*	boolean	*read-write*	An indication of whether the threshold counter is reset after AccountLockoutCounterResetAfter expires. If `true`, it is reset. If `false`, only a successful login resets the threshold counter and if the user reaches the AccountLockoutThreshold limit, the account will be locked out indefinitely and only an administrator-issued reset clears the threshold counter. If this property is absent, the default is `true`. • This property shall indicate whether the threshold counter is reset after the AccountLockoutCounterResetAfter expires. If `true`, it is reset. If `false`, only a successful login resets the threshold counter and if the user reaches the AccountLockoutThreshold limit, the account shall be locked out indefinitely and only an administrator-issued reset clears the threshold counter. If this property is absent, the default is `true`.

Property	Type	Attributes	Notes
AccountLockoutDuration	integer (seconds)	*read-write (null)*	The period of time, in seconds, that an account is locked after the number of failed login attempts reaches the account lockout threshold, within the period between the last failed login attempt and the reset of the lockout threshold counter. If this value is `0`, no lockout will occur. If the AccountLockoutCounterResetEnabled value is `false`, this property is ignored. • This property shall contain the period of time, in seconds, that an account is locked after the number of failed login attempts reaches the AccountLockoutThreshold value, within the AccountLockoutCounterResetAfter window of time. The value shall be greater than or equal to the AccountLockoutCounterResetAfter value. If this value is `0`, no lockout shall occur. If AccountLockoutCounterResetEnabled value is `false`, this property shall be ignored.
AccountLockoutThreshold	integer	*read-write (null)*	The number of allowed failed login attempts before a user account is locked for a specified duration. If `0`, the account is never locked. • This property shall contain the threshold of failed login attempts before a user account is locked. If `0`, the account shall never be locked.
Accounts {	object		The collection of manager accounts. • This property shall contain a link to a resource collection of type ManagerAccountCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *ManagerAccount*. See the ManagerAccount schema for details.
}			
ActiveDirectory *(v1.3+)* {}	object		The first Active Directory external account provider that this account service supports. • This property shall contain the first Active Directory external account provider that this account service supports. If the account service supports one or more Active Directory services as an external account provider, this entity shall be populated by default. This entity shall not be present in the additional external account providers resource collection. For more information about this property, see ExternalAccountProvider in Property Details.

Property	Type	Attributes	Notes
AdditionalExternalAccountProviders *(v1.3+)* {	object		The additional external account providers that this account service uses. • This property shall contain a link to a resource collection of type ExternalAccountProviderCollection that represents the additional external account providers that this account service uses. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *ExternalAccountProvider*. See the ExternalAccountProvider schema for details.
}			
AuthFailureLoggingThreshold	integer	*read-write*	The number of authorization failures per account that are allowed before the failed attempt is logged to the manager log. • This property shall contain the threshold for when an authorization failure is logged. Logging shall occur after every `n` occurrences of an authorization failure on the same account, where `n` represents the value of this property. If the value is `0`, logging of authorization failures shall be disabled.
LDAP *(v1.3+)* {}	object		The first LDAP external account provider that this account service supports. • This property shall contain the first LDAP external account provider that this account service supports. If the account service supports one or more LDAP services as an external account provider, this entity shall be populated by default. This entity shall not be present in the additional external account providers resource collection. For more information about this property, see ExternalAccountProvider in Property Details.
LocalAccountAuth *(v1.3+)*	string (enum)	*read-write*	An indication of how the service uses the accounts collection within this account service as part of authentication. The enumerated values describe the details for each mode. • This property shall govern how the service uses the manager accounts resource collection within this account service as part of authentication. The enumerated values describe the details for each mode. *For the possible property values, see LocalAccountAuth in Property details.*
MaxPasswordLength	integer	*read-write*	The maximum password length for this account service. • This property shall contain the maximum password length that the implementation allows for this account service. This property does not apply to accounts from external account providers.

Property	Type	Attributes	Notes
MinPasswordLength	integer	*read-write*	The minimum password length for this account service. • This property shall contain the minimum password length that the implementation allows for this account service. This property does not apply to accounts from external account providers.
OAuth2 *(v1.10+)* {}	object	*(null)*	The first OAuth 2.0 external account provider that this account service supports. • This property shall contain the first OAuth 2.0 external account provider that this account service supports. If the account service supports one or more OAuth 2.0 services as an external account provider, this entity shall be populated by default. This entity shall not be present in the additional external account providers resource collection. For more information about this property, see ExternalAccountProvider in Property Details.
PasswordExpirationDays *(v1.9+)*	integer	*read-write* *(null)*	The number of days before account passwords in this account service will expire. • This property shall contain the number of days before account passwords in this account service will expire. The value shall be applied during account creation and password modification unless the PasswordExpiration property is provided. The value `null` shall indicate that account passwords never expire. This property does not apply to accounts from external account providers.
PrivilegeMap *(v1.1+)* {	object		The link to the mapping of the privileges required to complete a requested operation on a URI associated with this service. • This property shall contain a link to a resource of type PrivilegeMapping that contains the privileges that are required for a user context to complete a requested operation on a URI associated with this service. See the *PrivilegeRegistry* schema for details on this property.
@odata.id	string	*read-only*	Link to a PrivilegeRegistry resource. See the Links section and the *PrivilegeRegistry* schema for details.
}			
RestrictedOemPrivileges *(v1.8+)* [ ]	array (string)	*read-only*	The set of restricted OEM privileges. • This property shall contain an array of OEM privileges that are restricted by the service.

Property	Type	Attributes	Notes
RestrictedPrivileges *(v1.8+)* [ ]	array (string (enum))	*read-only*	• The set of restricted Redfish privileges. ◦ This property shall contain an array of Redfish privileges that are restricted by the service. *For the possible property values, see RestrictedPrivileges in Property details.*
Roles {	object		The collection of Redfish roles. • This property shall contain a link to a resource collection of type RoleCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Role*. See the Role schema for details.
}			
ServiceEnabled	boolean	*read-write (null)*	An indication of whether the account service is enabled. If `true`, it is enabled. If `false`, it is disabled and users cannot be created, deleted, or modified, and new sessions cannot be started. However, established sessions might still continue to run. Any service, such as the session service, that attempts to access the disabled account service fails. However, this does not affect HTTP Basic Authentication connections. • This property shall indicate whether the account service is enabled. If `true`, it is enabled. If `false`, it is disabled and users cannot be created, deleted, or modified, and new sessions cannot be started. However, established sessions may still continue to run. Any service, such as the session service, that attempts to access the disabled account service fails. However, this does not affect HTTP Basic Authentication connections.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedAccountTypes *(v1.8+)* [ ]	array (string (enum))	*read-only*	• The account types supported by the service. ◦ This property shall contain an array of the account types supported by the service. *For the possible property values, see SupportedAccountTypes in Property details.*

Property	Type	Attributes	Notes
SupportedOEMAccountTypes *(v1.8+)* [ ]	array (string)	*read-only*	The OEM account types supported by the service. • This property shall contain an array of the OEM account types supported by the service.
TACACSplus *(v1.8+)* {}	object	*(null)*	The first TACACS+ external account provider that this account service supports. • This property shall contain the first TACACS+ external account provider that this account service supports. If the account service supports one or more TACACS+ services as an external account provider, this entity shall be populated by default. This entity shall not be present in the additional external account providers resource collection. For more information about this property, see ExternalAccountProvider in Property Details.

6.2.4 Property details

6.2.4.1 AccountProviderType:

The type of external account provider to which this service connects.

- This property shall contain the type of external account provider to which this service connects.

string	Description
ActiveDirectoryService	An external Active Directory service. • The external account provider shall be a Microsoft Active Directory Technical Specification-conformant service. The ServiceAddresses format shall contain a set of fully qualified domain names (FQDN) or NetBIOS names that links to the set of domain servers for the Active Directory service.
LDAPService	A generic external LDAP service. • The external account provider shall be an RFC4511-conformant service. The ServiceAddresses format shall contain a set of fully qualified domain names (FQDN) that links to the set of LDAP servers for the service.
OAuth2 *(v1.10+)*	An external OAuth 2.0 service. • The external account provider shall be an RFC6749-conformant service. The ServiceAddresses format shall contain a set of URIs that correspond to the RFC8414-defined metadata for the OAuth 2.0 service.

string	Description
OEM	An OEM-specific external authentication or directory service.
RedfishService	An external Redfish service. • The external account provider shall be a DMTF Redfish Specification-conformant service. The ServiceAddresses format shall contain a set of URIs that correspond to a Redfish account service.
TACACSplus *(v1.8+)*	An external TACACS+ service. • The external account provider shall be an RFC8907-conformant service. The ServiceAddresses format shall contain a set of host:port that correspond to a TACACS+ service and where the format for host and port are defined in RFC3986.

6.2.4.2 Authentication:

The information required to authenticate to the external service.

AuthenticationType *(v1.3+)*	string (enum)	*read-write (null)*	The type of authentication used to connect to the external account provider. • This property shall contain the type of authentication used to connect to the external account provider. *For the possible property values, see AuthenticationType in Property details.*
EncryptionKey *(v1.8+)*	string	*read-write (null)*	Specifies the encryption key. • This property shall contain the value of a symmetric encryption key for account services that support some form of encryption, obfuscation, or authentication such as TACACS+. The value shall be `null` in responses. The property shall accept a hexadecimal string whose length depends on the external account service, such as TACACS+. A TACACS+ service shall use this property to specify the secret key as defined in RFC8907. Pattern: `^[0-9a-fA-F]+$`
EncryptionKeySet *(v1.8+)*	boolean	*read-only (null)*	Indicates if the EncryptionKey property is set. • This property shall contain `true` if a valid value was provided for the EncryptionKey property. Otherwise, the property shall contain `false`. For a TACACS+ service, the value `false` shall indicate data obfuscation, as defined in section 4.5 of RFC8907, is disabled.
KerberosKeytab *(v1.3+)*	string	*read-write (null)*	The Base64-encoded version of the Kerberos keytab for this service. A PATCH or PUT operation writes the keytab. This property is `null` in responses. • This property shall contain a Base64-encoded version of the Kerberos keytab for this service. A PATCH or PUT operation writes the keytab. The value shall be `null` in responses.
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.

Password *(v1.3+)*	string	*read-write (null)*	The password for this service. A PATCH or PUT request writes the password. This property is `null` in responses. • This property shall contain the password for this service. A PATCH or PUT operation writes the password. The value shall be `null` in responses.
Token *(v1.3+)*	string	*read-write (null)*	The token for this service. A PATCH or PUT operation writes the token. This property is `null` in responses. • This property shall contain the token for this service. A PATCH or PUT operation writes the token. The value shall be `null` in responses.
Username *(v1.3+)*	string	*read-write*	The user name for the service. • This property shall contain the user name for this service.

6.2.4.3 AuthenticationType:

The type of authentication used to connect to the external account provider.

- This property shall contain the type of authentication used to connect to the external account provider.

string	Description
KerberosKeytab	A Kerberos keytab.
OEM	An OEM-specific authentication mechanism.
Token	An opaque authentication token.
UsernameAndPassword	A user name and password combination.

6.2.4.4 ExternalAccountProvider:

The external account provider services that can provide accounts for this manager to use for authentication.

AccountProviderType *(v1.3+, deprecated v1.5*	string (enum)	*read-only (null)*	The type of external account provider to which this service connects. • This property shall contain the type of external account provider to which this service connects. *For the possible property values, see AccountProviderType in Property details. Deprecated in v1.5 and later. This property is deprecated because the account provider type is known when used in the LDAP and ActiveDirectory objects.*

Authentication *(v1.3+)* {}	object		The authentication information for the external account provider. • This property shall contain the authentication information for the external account provider. For more information about this property, see Authentication in Property Details.
Certificates *(v1.4+)* {	object		The link to a collection of certificates that the external account provider uses. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates the external account provider uses. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
LDAPService *(v1.3+)* {}	object		The additional mapping information needed to parse a generic LDAP service. • This property shall contain any additional mapping information needed to parse a generic LDAP service. This property should only be present inside the LDAP property. For more information about this property, see LDAPService in Property Details.
OAuth2Service *(v1.10+)* {}	object	*(null)*	The additional information needed to parse an OAuth 2.0 service. • This property shall contain additional information needed to parse an OAuth 2.0 service. This property should only be present inside an OAuth2 property. For more information about this property, see OAuth2Service in Property Details.
PasswordSet *(v1.7+)*	boolean	*read-only*	Indicates if the Password property is set. • This property shall contain `true` if a valid value was provided for the Password property. Otherwise, the property shall contain `false`.
Priority *(v1.8+)*	integer	*read-write (null)*	The authentication priority for the external account provider. • This property shall contain the assigned priority for the specified external account provider. The value `0` value shall indicate the highest priority. Increasing values shall represent decreasing priority. If an external provider does not have a priority assignment or two or more external providers have the same priority, the behavior shall be determined by the Redfish service. The priority is used to determine the order of authentication and authorization for each external account provider.
RemoteRoleMapping *(v1.3+)* [{	array		The mapping rules to convert the external account providers account information to the local Redfish role. • This property shall contain a set of the mapping rules that are used to convert the external account providers account information to the local Redfish role.

LocalRole *(v1.3+)*	string	*read-write (null)*	The name of the local Redfish role to which to map the remote user or group. • This property shall contain the RoleId property value within a role resource on this Redfish service to which to map the remote user or group.
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
RemoteGroup *(v1.3+)*	string	*read-write (null)*	The name of the remote group, or the remote role in the case of a Redfish service, that maps to the local Redfish role to which this entity links. • This property shall contain the name of the remote group, or the remote role in the case of a Redfish service, that maps to the local Redfish role to which this entity links.
RemoteUser *(v1.3+)*	string	*read-write (null)*	The name of the remote user that maps to the local Redfish role to which this entity links. • This property shall contain the name of the remote user that maps to the local Redfish role to which this entity links.
}]			
ServiceAddresses *(v1.3+)* [ ]	array (string, null)	*read-write*	The addresses of the user account providers to which this external account provider links. The format of this field depends on the type of external account provider. • This property shall contain the addresses of the account providers to which this external account provider links. The format of this field depends on the type of external account provider. Each item in the array shall contain a single address. Services can define their own behavior for managing multiple addresses.
ServiceEnabled *(v1.3+)*	boolean	*read-write (null)*	An indication of whether this service is enabled. • This property shall indicate whether this service is enabled.
TACACSplusService *(v1.8+)* {}	object	*(null)*	The additional information needed to parse a TACACS+ services. • This property shall contain additional information needed to parse a TACACS+ services. This property should only be present inside a TACACSplus property. For more information about this property, see TACACSplusService in Property Details.

6.2.4.5 LDAPService:

The settings required to parse a generic LDAP service.

Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
SearchSettings *(v1.3+)* {	object		The required settings to search an external LDAP service. • This property shall contain the required settings to search an external LDAP service.

BaseDistinguishedNames *(v1.3+)* [ ]	array (string, null)	*read-write*	The base distinguished names to use to search an external LDAP service. • This property shall contain an array of base distinguished names to use to search an external LDAP service.
GroupNameAttribute *(v1.3+)*	string	*read-write (null)*	The attribute name that contains the LDAP group name entry. • This property shall contain the attribute name that contains the LDAP group name.
GroupsAttribute *(v1.3+)*	string	*read-write (null)*	The attribute name that contains the groups for a user on the LDAP user entry. • This property shall contain the attribute name that contains the groups for an LDAP user entry.
SSHKeyAttribute *(v1.11+)*	string	*read-write (null)*	The attribute name that contains the LDAP user's SSH public key entry. • This property shall contain the attribute name that contains the LDAP user's SSH public key.
UsernameAttribute *(v1.3+)*	string	*read-write (null)*	The attribute name that contains the LDAP user name entry. • This property shall contain the attribute name that contains the LDAP user name.
}			

6.2.4.6 LocalAccountAuth:

An indication of how the service uses the accounts collection within this account service as part of authentication. The enumerated values describe the details for each mode.

- This property shall govern how the service uses the manager accounts resource collection within this account service as part of authentication. The enumerated values describe the details for each mode.

string	Description
Disabled	The service never authenticates users based on the account service-defined accounts collection. • The service shall never authenticate users based on the account service-defined manager accounts resource collection.
Enabled	The service authenticates users based on the account service-defined accounts collection. • The service shall authenticate users based on the account service-defined manager accounts resource collection.

string	Description
Fallback	The service authenticates users based on the account service-defined accounts collection only if any external account providers are currently unreachable. • The service shall authenticate users based on the account service-defined manager accounts resource collection only if any external account providers are currently unreachable.
LocalFirst *(v1.6+)*	The service first authenticates users based on the account service-defined accounts collection. If authentication fails, the service authenticates by using external account providers. • The service shall first authenticate users based on the account service-defined manager accounts resource collection. If authentication fails, the service shall authenticate by using external account providers.

6.2.4.7 Mode:

The mode of operation for token validation.

- This property shall contain the mode of operation for token validation.

string	Description
Discovery	OAuth 2.0 service information for token validation is downloaded by the service. • This value shall indicate the service performs token validation from information found at the URIs specified by the ServiceAddresses property. Services shall implement a caching method of this information so it's not necessary to retrieve metadata and key information for every request containing a token.
Offline	OAuth 2.0 service information for token validation is configured by a client. Clients should configure the Issuer and OAuthServiceSigningKeys properties for this mode. • This value shall indicate the service performs token validation from properties configured by a client. Clients should configure the Issuer and OAuthServiceSigningKeys properties for this mode.

6.2.4.8 OAuth2Service:

Various settings to parse an OAuth 2.0 service.

Audience *(v1.10+)* [ ]	array (string)	*read-only*	The allowable audience strings of the Redfish service. • This property shall contain an array of allowable RFC7519-defined audience strings of the Redfish service. The values shall uniquely identify the Redfish service. For example, a MAC address or UUID for the manager can uniquely identify the service.

Issuer *(v1.10+)*	string	*read-write (null)*	The issuer string of the OAuth 2.0 service. Clients should configure this property if Mode contains `Offline`. • This property shall contain the RFC8414-defined issuer string of the OAuth 2.0 service. If the Mode property contains the value `Discovery`, this property shall contain the value of the `issuer` string from the OAuth 2.0 service's metadata and this property shall be read-only. Clients should configure this property if Mode contains `Offline`.
Mode *(v1.10+)*	string (enum)	*read-write*	The mode of operation for token validation. • This property shall contain the mode of operation for token validation. *For the possible property values, see Mode in Property details.*
OAuthServiceSigningKeys *(v1.10+)*	string	*read-write (null)*	The Base64-encoded signing keys of the issuer of the OAuth 2.0 service. Clients should configure this property if Mode contains `Offline`. • This property shall contain a Base64-encoded string of the RFC7517-defined signing keys of the issuer of the OAuth 2.0 service. If the Mode property contains the value `Discovery`, this property shall contain the keys found at the URI specified by the `jwks_uri` string from the OAuth 2.0 service's metadata and this property shall be read-only. Clients should configure this property if Mode contains `Offline`.

6.2.4.9 PasswordExchangeProtocols:

- Indicates the allowed TACACS+ password exchange protocols.
  - This property shall indicate all the allowed TACACS+ password exchange protocol described under section 5.4.2 of RFC8907.

string	Description
ASCII	The ASCII Login method. • This value shall indicate the ASCII Login flow as described under section 5.4.2 of RFC8907.
CHAP	The CHAP Login method. • This value shall indicate the CHAP Login flow as described under section 5.4.2 of RFC8907.
MSCHAPv1	The MS-CHAP v1 Login method. • This value shall indicate the MS-CHAP v1 Login flow as described under section 5.4.2 of RFC8907.
MSCHAPv2	The MS-CHAP v2 Login method. • This value shall indicate the MS-CHAP v2 Login flow as described under section 5.4.2 of RFC8907.

string	Description
PAP	The PAP Login method. • This value shall indicate the PAP Login flow as described under section 5.4.2 of RFC8907.

6.2.4.10 RestrictedPrivileges:

- The set of restricted Redfish privileges.
  - This property shall contain an array of Redfish privileges that are restricted by the service.

string	Description
AdministrateStorage	Administrator for storage subsystems and storage systems found in the storage collection and storage system collection respectively.
AdministrateSystems	Adminsitrator for systems found in the systems collection. Able to manage boot configuration, keys, and certificates for systems.
ConfigureComponents	Can configure components that this service manages.
ConfigureCompositionInfrastructure	Can view and configure composition service resources. • This value shall be used to indicate the user can view and configure composition service resources without matching the Client property in the ResourceBlock or CompositionReservation resources.
ConfigureManager	Can configure managers.
ConfigureSelf	Can change the password for the current user account and log out of their own sessions.
ConfigureUsers	Can configure users and their accounts.
Login	Can log in to the service and read Resources.
NoAuth	Authentication is not required. • This value shall be used to indicate an operation does not require authentication. This privilege shall not be used in Redfish Roles.
OperateStorageBackup	Operator for storage backup functionality for storage subsystems and storage systems found in the storage collection and storage system collection respectively.
OperateSystems	Operator for systems found in the systems colletion. Able to perform resets and configure interfaces.

6.2.4.11 SupportedAccountTypes:

- The account types supported by the service.

- This property shall contain an array of the account types supported by the service.

string	Description
HostConsole	Allow access to the host's console, which could be connected through Telnet, SSH, or other protocol. • This value shall indicate the account is allowed to access the host console.
IPMI	Allow access to the Intelligent Platform Management Interface service. • This value shall indicate the account is allowed to access the Intelligent Platform Management Interface service.
KVMIP	Allow access to a Keyboard-Video-Mouse over IP session. • This value shall indicate the account is allowed to access the Keyboard-Video-Mouse over IP session service.
ManagerConsole	Allow access to the manager's console, which could be connected through Telnet, SSH, SM CLP, or other protocol. • This value shall indicate the account is allowed to access the manager console.
OEM	OEM account type. See the OEMAccountTypes property. • This value shall indicate the account is allowed to access the services listed in the OEMAccountTypes property.
Redfish	Allow access to the Redfish service. • This value shall indicate the account is allowed to access Redfish services. If the version of the ManagerAccount resource is lower than the schema version when another enumeration value in this list was added, the implementation may include that functionality as part of the `Redfish` value.
SNMP	Allow access to SNMP services. • This value shall indicate the account is allowed to access SNMP services.
VirtualMedia	Allow access to control virtual media. • This value shall indicate the account is allowed to control virtual media.
WebUI	Allow access to a web user interface session, such as a graphical interface or another web-based protocol. • This value shall indicate the account is allowed to access the web interface.

6.2.4.12 TACACSplusService:

Various settings to parse a TACACS+ service.

PasswordExchangeProtocols *(v1.8+)* [ ]	array (string (enum))	*read-write (null)*	• Indicates the allowed TACACS+ password exchange protocols. ◦ This property shall indicate all the allowed TACACS+ password exchange protocol described under section 5.4.2 of RFC8907. *For the possible property values, see PasswordExchangeProtocols in Property details.*
PrivilegeLevelArgument *(v1.8+)*	string	*read-write (null)*	Indicates the name of the TACACS+ argument name in an authorization request. • This property shall specify the name of the argument in a TACACS+ Authorization REPLY packet body, as defined in RFC8907, that contains the user's privilege level.

6.2.5 Example response

```
{
    "@odata.type": "#AccountService.v1_11_1.AccountService",
    "Id": "AccountService",
    "Name": "Account Service",
    "Description": "Local Manager Account Service",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "ServiceEnabled": true,
    "AuthFailureLoggingThreshold": 3,
    "MinPasswordLength": 8,
    "AccountLockoutThreshold": 5,
    "AccountLockoutDuration": 30,
    "AccountLockoutCounterResetAfter": 30,
    "AccountLockoutCounterResetEnabled": true,
    "Accounts": {
        "@odata.id": "/redfish/v1/AccountService/Accounts"
    },
    "Roles": {
        "@odata.id": "/redfish/v1/AccountService/Roles"
    },
    "LocalAccountAuth": "Enabled",
    "LDAP": {
        "AccountProviderType": "LDAPService",
        "ServiceEnabled": false,
        "ServiceAddresses": [
            "ldaps://ldap.example.org:636"
        ],
        "Authentication": {
            "AuthenticationType": "UsernameAndPassword",
            "Username": "cn=Manager,dc=example,dc=org",
            "Password": null
        },
        "LDAPService": {
```

```
            "SearchSettings": {
                "BaseDistinguishedNames": [
                    "dc=example,dc=org"
                ],
                "UsernameAttribute": "uid",
                "GroupsAttribute": "memberof"
            }
        },
        "RemoteRoleMapping": [
            {
                "RemoteUser": "cn=Manager,dc=example,dc=org",
                "LocalRole": "Administrator"
            },
            {
                "RemoteGroup": "cn=Admins,ou=Groups,dc=example,dc=org",
                "LocalRole": "Administrator"
            },
            {
                "RemoteGroup": "cn=PowerUsers,ou=Groups,dc=example,dc=org",
                "LocalRole": "Operator"
            },
            {
                "RemoteGroup": "(cn=*)",
                "LocalRole": "ReadOnly"
            }
        ]
    },
    "ActiveDirectory": {
        "AccountProviderType": "ActiveDirectoryService",
        "ServiceEnabled": true,
        "ServiceAddresses": [
            "ad1.example.org",
            "ad2.example.org",
            null,
            null
        ],
        "Authentication": {
            "AuthenticationType": "KerberosKeytab",
            "KerberosKeytab": null
        },
        "RemoteRoleMapping": [
            {
                "RemoteGroup": "Administrators",
                "LocalRole": "Administrator"
            },
            {
                "RemoteUser": "DOMAIN\\Bob",
                "LocalRole": "Operator"
            },
            {
```

```
                "RemoteGroup": "PowerUsers",
                "LocalRole": "Operator"
            },
            {
                "RemoteGroup": "Everybody",
                "LocalRole": "ReadOnly"
            }
        ]
    },
    "AdditionalExternalAccountProviders": {
        "@odata.id": "/redfish/v1/AccountService/ExternalAccountProviders"
    },
    "@odata.id": "/redfish/v1/AccountService"
}
```


6.3 ActionInfo 1.3.0

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2021.2	2018.2	2016.2

6.3.1 Description

The ActionInfo schema defines the supported parameters and other information for a Redfish action. Supported parameters can differ among vendors and even among resource instances. This data can ensure that action requests from applications contain supported parameters.

- This resource shall represent the supported parameters and other information for a Redfish action on a target within a Redfish implementation. Supported parameters can differ among vendors and even among resource instances. This data can ensure that action requests from applications contain supported parameters.

6.3.2 Properties

Property	Type	Attributes	Notes
Parameters [{	array		The list of parameters included in the specified Redfish action. • This property shall list the parameters included in the specified Redfish action for this resource.

Property	Type	Attributes	Notes
AllowableNumbers *(v1.3+)* [ ]	array (string, null)	*read-only*	The allowable numeric values or duration values, inclusive ranges of values, and incremental step values for this parameter as applied to this action target. • This property shall indicate the allowable numeric values, inclusive ranges of values, and incremental step values values for this parameter as applied to this action target, as defined in the 'Allowable values for numbers and durations' clause of the Redfish Specification. For arrays, this property shall represent the allowable values for each array member. This property shall only be present for numeric parameters or string parameters that specify a duration.
AllowablePattern *(v1.3+)*	string	*read-only* *(null)*	The allowable pattern for this parameter as applied to this action target. • This property shall contain a regular expression that describes the allowable values for this parameter as applied to this action target. For arrays, this property shall represent the allowable values for each array member. This property shall only be present for string parameters.
AllowableValues [ ]	array (string, null)	*read-only*	The allowable values for this parameter as applied to this action target. • This property shall indicate the allowable values for this parameter as applied to this action target. For arrays, this property shall represent the allowable values for each array member.
ArraySizeMaximum *(v1.2+)*	integer	*read-only* *(null)*	The maximum number of array elements allowed for this parameter. • This property shall contain the maximum number of array elements that this service supports for this parameter. This property shall not be present for non-array parameters.
ArraySizeMinimum *(v1.2+)*	integer	*read-only* *(null)*	The minimum number of array elements required for this parameter. • This property shall contain the minimum number of array elements required by this service for this parameter. This property shall not be present for non-array parameters.
DataType	string (enum)	*read-only* *(null)*	The JSON property type for this parameter. • This property shall contain the JSON property type for this parameter. *For the possible property values, see DataType in Property details.*
MaximumValue *(v1.1+)*	number	*read-only* *(null)*	The maximum supported value for this parameter. • This integer or number property shall contain the maximum value that this service supports. For arrays, this property shall represent the maximum value for each array member. This property shall not be present for non-integer or number parameters.

Property	Type	Attributes	Notes
MinimumValue *(v1.1+)*	number	*read-only* *(null)*	The minimum supported value for this parameter. • This integer or number property shall contain the minimum value that this service supports. For arrays, this property shall represent the minimum value for each array member. This property shall not be present for non-integer or number parameters.
Name	string	*read-only* *required*	The name of the parameter for this action. • This property shall contain the name of the parameter included in a Redfish action.
ObjectDataType	string	*read-only* *(null)*	The data type of an object-based parameter. • This property shall describe the entity type definition in `@odata.type` format for the parameter. This property shall be required for parameters with a data type of `Object` or `ObjectArray`, and shall not be present for parameters with other data types.
Required	boolean	*read-only*	An indication of whether the parameter is required to complete this action. • This property shall indicate whether the parameter is required to complete this action.
}]			

6.3.3 Property details

6.3.3.1 DataType:

The JSON property type for this parameter.

- This property shall contain the JSON property type for this parameter.

string	Description
Boolean	A boolean.
Number	A number.
NumberArray	An array of numbers.
Object	An embedded JSON object.
ObjectArray	An array of JSON objects.

string	Description
String	A string.
StringArray	An array of strings.

6.3.4 Example response

```
{
    "@odata.type": "#ActionInfo.v1_3_0.ActionInfo",
    "Id": "ResetActionInfo",
    "Name": "Reset Action Info",
    "Parameters": [
        {
            "Name": "ResetType",
            "Required": true,
            "DataType": "String",
            "AllowableValues": [
                "On",
                "ForceOff",
                "GracefulShutdown",
                "GracefulRestart",
                "ForceRestart",
                "Nmi",
                "ForceOn",
                "PushPowerButton"
            ]
        }
    ],
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/ResetActionInfo"
}
```

6.4 AddressPool 1.2.1

Version	*v1.2*	*v1.1*	*v1.0*
Release	2021.2	2020.3	2019.4

6.4.1 Description

The schema definition of an address pool and its configuration.

- This resource shall represent an address pool in a Redfish implementation.

6.4.2 URIs

/redfish/v1/Fabrics/*{FabricId}*/AddressPools/*{AddressPoolId}*

6.4.3 Properties

Property	Type	Attributes	Notes
Ethernet *(v1.1+)* {	object		The Ethernet related properties for this address pool. • This property shall contain the Ethernet related properties to this address pool.
BFDSingleHopOnly *(v1.1+)* {	object	*(null)*	Bidirectional Forwarding Detection (BFD) related properties for this Ethernet fabric. • This property shall contain the Bidirectional Forwarding Detection (BFD) related properties for this Ethernet fabric.
DemandModeEnabled *(v1.1+)*	boolean	*read-write (null)*	Bidirectional Forwarding Detection (BFD) Demand Mode status. • This property shall indicate if Bidirectional Forwarding Detection (BFD) Demand Mode is enabled. In Demand mode, no periodic BFD Control packets will flow in either direction.
DesiredMinTxIntervalMilliseconds *(v1.1+)*	integer	*read-write (null)*	Desired Bidirectional Forwarding Detection (BFD) minimal transmit interval. • This property shall contain the minimum interval, in milliseconds, that the local system would like to use when transmitting Bidirectional Forwarding Detection (BFD) Control packets, less any jitter applied.
KeyChain *(v1.1+)*	string	*read-write (null)*	Bidirectional Forwarding Detection (BFD) Key Chain name. • This property shall contain the name of the Bidirectional Forwarding Detection (BFD) Key Chain.

Property	Type	Attributes	Notes
LocalMultiplier *(v1.1+)*	integer	*read-write (null)*	Bidirectional Forwarding Detection (BFD) multiplier value. • This property shall contain the Bidirectional Forwarding Detection (BFD) multiplier value. A BFD multiplier consists of the number of consecutive BFD packets that shall be missed from a BFD peer before declaring that peer unavailable, and informing the higher-layer protocols of the failure.
MeticulousModeEnabled *(v1.1+)*	boolean	*read-write (null)*	Meticulous MD5 authentication of the Bidirectional Forwarding Detection (BFD) session. • This property shall indicate whether the keyed MD5 sequence number is updated with every packet. If `true` , the keyed MD5 sequence number is updated with every packet, if `false` it is updated periodically.
RequiredMinRxIntervalMilliseconds *(v1.1+)*	integer	*read-write (null)*	Bidirectional Forwarding Detection (BFD) receive value. • This property shall contain the Bidirectional Forwarding Detection (BFD) receive value. The BFD receive value determines how frequently (in milliseconds) BFD packets will be expected to be received from BFD peers.
SourcePort *(v1.1+)*	integer	*read-write (null)*	Bidirectional Forwarding Detection (BFD) source port. • This property shall contain the Bidirectional Forwarding Detection (BFD) source port.
}			
BGPEvpn *(v1.1+)* {	object	*(null)*	BGP Ethernet Virtual Private Network (EVPN) related properties for this Ethernet fabric. • This property shall contain the BGP Ethernet Virtual Private Network (EVPN) related properties for this Ethernet fabric.
AnycastGatewayIPAddress *(v1.1+)*	string	*read-write (null)*	The anycast gateway IPv4 address. • This property shall contain the anycast gateway IPv4 address for a host subnet. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
AnycastGatewayMACAddress *(v1.1+)*	string	*read-write (null)*	The anycast gateway MAC address. • This property shall contain the anycast gateway MAC address for a host subnet. Pattern: `^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$`

Property	Type	Attributes	Notes
ARPProxyEnabled *(v1.1+)*	boolean	*read-write (null)*	Address Resolution Protocol (ARP) proxy status. • This property shall indicate whether proxy Address Resolution Protocol (ARP) is enabled.
ARPSupressionEnabled *(v1.1+)*	boolean	*read-write (null)*	Address Resolution Protocol (ARP) suppression status. • This property shall indicate whether Address Resolution Protocol (ARP) suppression is enabled.
ESINumberRange *(v1.1+)* {	object	*(null)*	The Ethernet Segment Identifier (ESI) number range for the fabric. • This property shall contain Ethernet Segment Identifier (ESI) number ranges for allocation in supporting functions such as multihoming.
Lower *(v1.1+)*	integer	*read-write*	Lower Ethernet Segment Identifier (ESI) number. • This property shall contain the lower Ethernet Segment Identifier (ESI) number to be used as part of a range of ESI numbers.
Upper *(v1.1+)*	integer	*read-write*	Upper Ethernet Segment Identifier (ESI) number. • This property shall contain the upper Ethernet Segment Identifier (ESI) number to be used as part of a range of ESI numbers.
}			
EVINumberRange *(v1.1+)* {	object	*(null)*	The Ethernet Virtual Private Network (EVPN) Instance number (EVI) number range for the fabric. • This property shall contain the Ethernet Virtual Private Network (EVPN) Instance number (EVI) range for EVPN based fabrics.
Lower *(v1.1+)*	integer	*read-write*	Lower Ethernet Virtual Private Network (EVPN) Instance (EVI) number. • This property shall contain the lower Ethernet Virtual Private Network (EVPN) Instance (EVI) number to be used as part of a range of EVI numbers.

Property	Type	Attributes	Notes
Upper *(v1.1+)*	integer	*read-write*	Upper Ethernet Virtual Private Network (EVPN) Instance (EVI) number. • This property shall contain the upper Ethernet Virtual Private Network (EVPN) Instance (EVI) number to be used as part of a range of EVI numbers.
}			
GatewayIPAddress *(v1.1+)*	string	*read-write (null)*	The gateway IPv4 address. • This property shall contain the Gateway IPv4 address for a host subnet. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
GatewayIPAddressRange *(v1.2+)* {	object	*(null)*	The IPv4 address range for gateways. • This property shall contain the IPv4 address range for gateway nodes on this subnet.
Lower *(v1.2+)*	string	*read-write (null)*	The lower IPv4 address. • This property shall contain the lower IP address to be used as part of a range of addresses for gateway nodes in Ethernet Virtual Private Network (EVPN) based fabrics. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
Upper *(v1.2+)*	string	*read-write (null)*	The upper IPv4 address. • This property shall contain the upper IP address to be used as part of a range of addresses for gateway nodes in Ethernet Virtual Private Network (EVPN) based fabrics. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
}			
NDPProxyEnabled *(v1.1+)*	boolean	*read-write (null)*	Network Discovery Protocol (NDP) proxy status. • This property shall indicate whether Network Discovery Protocol (NDP) proxy is enabled.
NDPSupressionEnabled *(v1.1+)*	boolean	*read-write (null)*	Network Discovery Protocol (NDP) suppression status. • This property shall indicate whether Network Discovery Protocol (NDP) suppression is enabled.

Property	Type	Attributes	Notes
RouteDistinguisherAdministratorSubfield *(v1.2+)*	string	*read-write (null)*	The Route Distinguisher (RD) Administrator subfield. • This property shall contain the RFC4364-defined Route Distinguisher (RD) Administrator subfield.
RouteDistinguisherRange *(v1.1+)* {	object	*(null)*	The Route Distinguisher (RD) number range for the fabric. • This property shall contain the Route Distinguisher (RD) Instance number range for Ethernet Virtual Private Network (EVPN) based fabrics.
Lower *(v1.1+)*	integer	*read-write*	Lower Route Distinguisher (RD) number. • This property shall contain the lower Route Distinguisher (RD) number to be used as part of a range of Route Distinguisher values.
Upper *(v1.1+)*	integer	*read-write*	Upper Route Distinguisher (RD) number. • This property shall contain the upper Route Distinguisher (RD) number to be used as part of a range of Route Distinguisher values.
}			
RouteTargetAdministratorSubfield *(v1.2+)*	string	*read-write (null)*	The Route Target (RT) Administrator Subfield. • This property shall contain the RFC4364-defined Route Target (RT) Administrator subfield.
RouteTargetRange *(v1.1+)* {	object	*(null)*	The Route Target (RT) number range for the fabric. • This property shall contain the Route Target (RT) Instance number range for Ethernet Virtual Private Network (EVPN) based fabrics.
Lower *(v1.1+)*	integer	*read-write (null)*	Lower Route Target (RT) number. • This property shall contain the lower Route Target (RT) number to be used as part of a range of Route Target values.
Upper *(v1.1+)*	integer	*read-write (null)*	Upper Route Target (RT) number. • This property shall contain the upper Route Target (RT) number to be used as part of a range of Route Target values.
}			

Property	Type	Attributes	Notes
UnderlayMulticastEnabled *(v1.1+)*	boolean	*read-write (null)*	Underlay multicast status. • This property shall indicate whether multicast is enabled on the Ethernet fabric underlay.
UnknownUnicastSuppressionEnabled *(v1.1+)*	boolean	*read-write (null)*	Suppression of unknown unicast packets. • This property shall indicate whether unknown unicast packets should be suppressed.
VLANIdentifierAddressRange *(v1.1+)* {	object	*(null)*	Virtual LAN (VLAN) tag related address range applicable to this Ethernet fabric or for end host subnets. • This property shall contain Virtual LAN (VLAN) tag related address range applicable to this Ethernet fabric or for endpoint host subnets. VLAN tags can be used for the purpose of identifying packets belonging to different networks.
Lower *(v1.1+)*	integer	*read-write (null)*	Virtual LAN (VLAN) tag lower value. • This property shall contain the Virtual LAN (VLAN) tag lower value.
Upper *(v1.1+)*	integer	*read-write (null)*	Virtual LAN (VLAN) tag upper value. • This property shall contain the Virtual LAN (VLAN) tag upper value.
}			
}			
EBGP *(v1.1+)* {	object	*(null)*	External BGP (eBGP) related properties for this Ethernet fabric. • This property shall contain the External BGP (eBGP) related properties for this Ethernet fabric.
AllowDuplicateASEnabled *(v1.1+)*	boolean	*read-write (null)*	Allow duplicate Autonomous System (AS) path. • This property shall indicate whether duplicate Autonomous System (AS) numbers are allowed. If `true`, routes with the same AS number as the receiving router should be allowed. If `false`,routes should be dropped if the router receives its own AS number in a Border Gateway Protocol (BGP) update.

Property	Type	Attributes	Notes
AllowOverrideASEnabled *(v1.1+)*	boolean	*read-write (null)*	Option to override an Autonomous System (AS) number with the AS number of the sending peer . • This property shall indicate whether Autonomous System (AS) numbers should be overridden. If `true`, AS number should be overridden with the AS number of the sending peer. If `false`, AS number override is disabled.
AlwaysCompareMEDEnabled *(v1.1+)*	boolean	*read-write (null)*	Compare Multi Exit Discriminator (MED) status. • This property shall indicate whether neighbor Multi Exit Discriminator (MED) attributes should be compared.
ASNumberRange *(v1.1+)* {	object	*(null)*	Autonomous System (AS) number range. • This property shall contain the range of Autonomous System (AS) numbers assigned to each Border Gateway Protocol (BGP) peer within the fabric.
Lower *(v1.1+)*	integer	*read-write*	Lower Autonomous System (AS) number. • This property shall contain the lower Autonomous System (AS) number to be used as part of a range of ASN values.
Upper *(v1.1+)*	integer	*read-write*	Upper Autonomous System (AS) number. • This property shall contain the upper Autonomous System (AS) number to be used as part of a range of ASN values.
}			
BGPLocalPreference *(v1.1+)*	integer	*read-write (null)*	Local preference value. • This property shall contain the local preference value. Highest local preference value is preferred for Border Gateway Protocol (BGP) best path selection.
BGPNeighbor *(v1.1+)* {	object	*(null)*	Border Gateway Protocol (BGP) neighbor related properties. • This property shall contain all Border Gateway Protocol (BGP) neighbor related properties.

Property	Type	Attributes	Notes
Address *(v1.1+)*	string	*read-write (null)*	Border Gateway Protocol (BGP) neighbor address. • This property shall contain the IPv4 address assigned to a Border Gateway Protocol (BGP) neighbor. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
AllowOwnASEnabled *(v1.1+)*	boolean	*read-write (null)*	Allow own Autonomous System (AS) status. • This property shall indicate whether the Autonomous System (AS) of the receiving router is permitted in a Border Gateway Protocol (BGP) update. If `true`, routes should be received and processed even if the router detects its own ASN in the AS-Path. If `false`, they should be dropped.
CIDR *(v1.2+)*	integer	*read-write*	The Classless Inter-Domain Routing (CIDR) value used for neighbor communication. This is the number of ones before the first zero in the subnet mask. • The value of this property shall contain the RFC4271-defined Classless Inter-Domain Routing (CIDR) value.
ConnectRetrySeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) retry timer in seconds. • This property shall contain the Border Gateway Protocol (BGP) Retry Timer. The BGP Retry Timer allows the administrator to set the amount of time in seconds between retries to establish a connection to configured peers which have gone down.
Enabled *(v1.2+)*	boolean	*read-write*	An indication of whether BGP neighbor communication is enabled. • The value of this property shall indicate whether BGP neighbor communication is enabled.
HoldTimeSeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) hold timer in seconds. • This property shall contain the Border Gateway Protocol (BGP) Hold Timer agreed upon between peers.
KeepaliveIntervalSeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) Keepalive timer in seconds. • This property shall contain the Keepalive timer in seconds. It is used in conjunction with the Border Gateway Protocol (BGP) hold timer.

Property	Type	Attributes	Notes
LocalAS *(v1.1+)*	integer	*read-write (null)*	Local Autonomous System (AS) number. • This property shall contain the Autonomous System (AS) number of the local Border Gateway Protocol (BGP) peer.
LogStateChangesEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) neighbor log state change status. • This property shall indicate whether Border Gateway Protocol (BGP) neighbor state changes are logged.
MaxPrefix *(v1.1+)* {	object	*(null)*	Border Gateway Protocol (BGP) max prefix properties. • These properties are applicable to configuring Border Gateway Protocol (BGP) max prefix related properties.
MaxPrefixNumber *(v1.1+)*	integer	*read-write (null)*	Maximum prefix number. • This property shall contain the maximum number of prefixes allowed from the neighbor.
RestartTimerSeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) restart timer in seconds. • This property determines how long peer routers will wait to delete stale routes before a Border Gateway Protocol (BGP) open message is received. This timer should be less than the BGP HoldTimeSeconds property.
ShutdownThresholdPercentage *(v1.1+)*	number (%)	*read-write (null)*	Shutdown threshold status. • This property shall contain the percentage of the maximum prefix received value at which the router starts to generate a warning message.
ThresholdWarningOnlyEnabled *(v1.1+)*	boolean	*read-write (null)*	Threshold warning only status. • This property shall indicate what action to take if the Border Gateway Protocol (BGP) route threshold is reached. If `true`, when the Maximum-Prefix limit is exceeded, a log message is generated. If `false`, when the Maximum-Prefix limit is exceeded, the peer session is terminated.
}			

Property	Type	Attributes	Notes
MinimumAdvertisementIntervalSeconds *(v1.1+)*	integer	*read-write (null)*	Minimum Border Gateway Protocol (BGP) advertisement interval in seconds. • This property shall contain the minimum time between Border Gateway Protocol (BGP) route advertisements in seconds.
PassiveModeEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) passive mode status. • This property shall indicate whether Border Gateway Protocol (BGP) passive mode is enabled.
PathMTUDiscoveryEnabled *(v1.1+)*	boolean	*read-write (null)*	Path MTU discovery status. • This property shall indicate whether MTU discovery is permitted.
PeerAS *(v1.1+)*	integer	*read-write (null)*	Peer Autonomous System (AS) number. • This property shall contain the Autonomous System (AS) number of the external Border Gateway Protocol (BGP) peer.
ReplacePeerASEnabled *(v1.1+)*	boolean	*read-write (null)*	Replace Border Gateway Protocol (BGP) peer Autonomous System (AS) status. • This property shall indicate whether peer Autonomous System (AS) numbers should be replaced. If `true`, private ASNs are removed and replaced with the peer AS. If `false`, they remain unchanged.
TCPMaxSegmentSizeBytes *(v1.1+)*	integer	*read-write (null)*	TCP max segment size in Bytes. • This property shall contain the TCP max segment size in Bytes signifying the number of bytes that shall be transported in a single packet.
TreatAsWithdrawEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) treat as withdraw status. • This property shall indicate Border Gateway Protocol (BGP) withdraw status. If `true`, the UPDATE message containing the path attribute shall be treated as though all contained routes had been withdrawn. If `false`, they should remain.
}			

Property	Type	Attributes	Notes
BGPRoute *(v1.1+)* {	object	*(null)*	Border Gateway Protocol (BGP) route related properties. • This property shall contain Border Gateway Protocol (BGP) route related properties.
AdvertiseInactiveRoutesEnabled *(v1.1+)*	boolean	*read-write* *(null)*	Advertise inactive route status. • This property shall indicate whether inactive routes should be advertised. If `true`, advertise the best Border Gateway Protocol (BGP) route that is inactive because of Interior Gateway Protocol (IGP) preference. If `false`, do not use as part of BGP best path selection.
DistanceExternal *(v1.1+)*	integer	*read-write* *(null)*	Route distance for external routes. • This property shall modify the administrative distance for routes learned via External BGP (eBGP).
DistanceInternal *(v1.1+)*	integer	*read-write* *(null)*	Route distance for internal routes. • This property shall modify the administrative distance for routes learned via Internal BGP (iBGP).
DistanceLocal *(v1.1+)*	integer	*read-write* *(null)*	Route distance for local routes. • This property shall modify the administrative distance for routes configured on a local router.
ExternalCompareRouterIdEnabled *(v1.1+)*	boolean	*read-write* *(null)*	Compare router id status. • This property shall indicate whether external router ids should be compared. If `true`, prefer the route that comes from the Border Gateway Protocol (BGP) router with the lowest router ID. If `false`, do not use as part of BGP best path selection.
FlapDampingEnabled *(v1.1+)*	boolean	*read-write* *(null)*	Route flap dampening status. • This property shall indicate whether route flap dampening should be enabled.
SendDefaultRouteEnabled *(v1.1+)*	boolean	*read-write* *(null)*	Send default route status. • This property shall indicate whether the default route should be advertised. If `true`, the default route is advertised to all Border Gateway Protocol (BGP) neighbors unless specifically denied. If `false`, the default route is not advertised.

Property	Type	Attributes	Notes
}			
BGPWeight *(v1.1+)*	integer	*read-write (null)*	BGP weight attribute. • This property shall contain the Border Gateway Protocol (BGP) weight attribute value for external peers. A higher BGP weight value is preferred for BGP best path selection.
GracefulRestart *(v1.1+)* {	object	*(null)*	Graceful restart related properties. • This property shall contain all graceful restart related properties.
GracefulRestartEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) graceful restart status. • This property shall indicate whether to enable Border Gateway Protocol (BGP) graceful restart features.
HelperModeEnabled *(v1.1+)*	boolean	*read-write (null)*	Graceful restart helper mode status. • This property shall indicate what to do with stale routes. If `true`, the router continues to be forward packets to stale routes, if `false`, it does not forward packets to stale routes.
StaleRoutesTimeSeconds *(v1.1+)*	integer	*read-write (null)*	Stale route timer in seconds. • This property shall contain the time in seconds to hold stale routes for a restarting peer.
TimeSeconds *(v1.1+)*	integer	*read-write (null)*	Graceful restart timer in seconds. • This property shall contain the time in seconds to wait for a graceful restart capable neighbor to re-establish Border Gateway Protocol (BGP) peering.
}			
MED *(v1.1+)*	integer	*read-write (null)*	BGP Multi Exit Discriminator (MED) value. • This property shall contain the Border Gateway Protocol (BGP) Multi Exit Discriminator (MED) value. A lower MED value is preferred for BGP best path selection.
MultihopEnabled *(v1.1+)*	boolean	*read-write (null)*	External BGP (eBGP) multihop status. • This property shall indicate whether External BGP (eBGP) multihop is enabled.

Property	Type	Attributes	Notes
MultihopTTL *(v1.1+)*	integer	*read-write (null)*	External BGP (eBGP) multihop Time to Live (TTL) value. • This property shall contain the External BGP (eBGP) multihop Time to Live (TTL) value.
MultiplePaths *(v1.1+)* {	object	*(null)*	Multiple path related properties. • This property shall contain all multiple path related properties.
MaximumPaths *(v1.1+)*	integer	*read-write (null)*	Maximum paths number. • This property shall contain the maximum number of paths for multi path operation.
UseMultiplePathsEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) multiple paths status. • This property shall indicate whether multiple paths should be advertised. If `true`, Border Gateway Protocol (BGP) advertises multiple paths for the same prefix for path diversity. If `false`, it advertises based on best path selection.
}			
SendCommunityEnabled *(v1.1+)*	boolean	*read-write (null)*	This property shall indicate whether community attributes are sent. • This property shall indicate whether community attributes are sent to BGP neighbors.
}			
IPv4 *(v1.1+)* {	object	*(null)*	IPv4 and Virtual LAN (VLAN) related addressing for this Ethernet fabric. • This property shall contain IPv4 and Virtual LAN (VLAN) addressing related properties for this Ethernet fabric.
AnycastGatewayIPAddress *(v1.1+)*	string	*read-write (null)*	The anycast gateway IPv4 address. • This property shall contain the anycast gateway IPv4 address for a host subnet. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`

Property	Type	Attributes	Notes
AnycastGatewayMACAddress *(v1.1+)*	string	*read-write (null)*	The anycast gateway MAC address. • This property shall contain the anycast gateway MAC address for a host subnet. Pattern: `^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$`
DHCP *(v1.1+)* {	object	*(null)*	The Dynamic Host Configuration Protocol (DHCP) related addressing for this Ethernet fabric. • This property shall contain the primary and secondary Dynamic Host Configuration Protocol (DHCP) server addressing for this Ethernet fabric.
DHCPInterfaceMTUBytes *(v1.1+)*	integer	*read-write (null)*	Dynamic Host Configuration Protocol (DHCP) interface Maximum Transmission Unit (MTU). • This property shall contain the Maximum Transmission Unit (MTU) to use on this interface in bytes.
DHCPRelayEnabled *(v1.1+)*	boolean	*read-write (null)*	Dynamic Host Configuration Protocol (DHCP) relay status. • This property shall indicate whether Dynamic Host Configuration Protocol (DHCP) Relay is enabled.
DHCPServer *(v1.1+)* [ ]	array (string, null)	*read-write*	The Dynamic Host Configuration Protocol (DHCP) IPv4 addresses for this Ethernet fabric. • This property shall contain an array of addresses assigned to the Dynamic Host Configuration Protocol (DHCP) server for this Ethernet fabric.
}			
DistributeIntoUnderlayEnabled *(v1.1+)*	boolean	*read-write (null)*	Indicates if host subnets should be distributed into the fabric underlay. • This property shall indicate whether host subnets are distributed into the fabric underlay.
DNSDomainName *(v1.1+)*	string	*read-write (null)*	The Domain Name Service (DNS) domain name for this Ethernet fabric. • This property shall contain the Domain Name Service (DNS) domain name for this Ethernet fabric.

Property	Type	Attributes	Notes
DNSServer *(v1.1+)* [ ]	array (string, null)	*read-write*	The Domain Name Service (DNS) servers for this Ethernet fabric. • This property shall contain an array of the Domain Name Service (DNS) servers for this Ethernet fabric. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
EBGPAddressRange *(v1.1+)* {}	object	*(null)*	External BGP (eBGP) related addressing for this Ethernet fabric. • This property shall contain the range of IPv4 addresses assigned to External BGP (eBGP) neighbors belonging to different ASes (Autonomous Systems). For more information about this property, see IPv4AddressRange in Property Details.
FabricLinkAddressRange *(v1.1+)* {}	object	*(null)*	Link related IPv4 addressing for this Ethernet fabric typically applied to connections between spine and leaf Ethernet switches. • This property shall contain link related IPv4 addressing for this Ethernet fabric typically applied to connections between spine and leaf Ethernet switches. For more information about this property, see IPv4AddressRange in Property Details.
GatewayIPAddress *(v1.1+)*	string	*read-write (null)*	The gateway IPv4 address. • This property shall contain the gateway IPv4 address for a host subnet. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
HostAddressRange *(v1.1+)* {}	object	*(null)*	IPv4 related host subnet addressing for physical device endpoints that connect to this Ethernet fabric. • This property shall contain the IP subnet range for host addressing for physical device endpoints that connect to this Ethernet fabric. An endpoint shall be allocated an IP address from this host address range. The Ethernet fabric should provide IP unicast or multicast connectivity for host device endpoints belonging to this host address range. For more information about this property, see IPv4AddressRange in Property Details.

Property	Type	Attributes	Notes
IBGPAddressRange *(v1.1+)* {}	object	*(null)*	Internal BGP (iBGP) related addressing for this Ethernet fabric. • This property shall contain the range of IPv4 addresses assigned to Internal BGP (iBGP) neighbors belonging to the same AS (Autonomous System). For more information about this property, see IPv4AddressRange in Property Details.
LoopbackAddressRange *(v1.1+)* {}	object	*(null)*	Loopback related IPv4 addressing for this Ethernet fabric. • This property shall contain the range of loopback related IPv4 addresses assigned to this Ethernet fabric's Ethernet switches. A loopback interface provides a stable interface to which a IP address is then assigned. This address can be configured as the source address when the networking device needs to send data for control plane protocols such as BGP and OSPF. For more information about this property, see IPv4AddressRange in Property Details.
ManagementAddressRange *(v1.1+)* {}	object	*(null)*	Management related addressing for this Ethernet fabric. • This property shall contain the range of management IPv4 addresses assigned to manage this Ethernet fabric's Ethernet switches. For more information about this property, see IPv4AddressRange in Property Details.
NativeVLAN *(v1.1+)*	integer	*read-write (null)*	The native Virtual LAN (VLAN) tag value. • This property shall contain native Virtual LAN (VLAN) tag value for untagged traffic.
NTPOffsetHoursMinutes *(v1.1+)*	integer	*read-write (null)*	The Network Time Protocol (NTP) offset configuration. • This property shall contain the Network Time Protocol (NTP) offset. The NTP offset property is used to calculate the time from UTC (Universal Time Coordinated) time in hours and minutes.
NTPServer *(v1.1+)* [ ]	array (string, null)	*read-write*	The Network Time Protocol (NTP) servers for this Ethernet fabric. • This property shall contain an array of the Network Time Protocol (NTP) servers for this Ethernet fabric.

Property	Type	Attributes	Notes
NTPTimezone *(v1.1+)*	string	*read-write (null)*	The Network Time Protocol (NTP) timezone for this Ethernet fabric. • This property shall contain the Network Time Protocol (NTP) timezone name assigned to this Ethernet fabric.
SystemMACRange *(v1.2+)* {	object	*(null)*	The MAC address range for systems in this subnet. • This property shall contain the Media Access Control (MAC) address range for systems in Ethernet Virtual Private Network (EVPN) based fabrics.
Lower *(v1.2+)*	string	*read-write (null)*	The lower system MAC address. • This property shall contain the lower system Media Access Control (MAC) address to be used as part of a range of system MAC addresses. Pattern: `^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$`
Upper *(v1.2+)*	string	*read-write (null)*	The upper system MAC address. • This property shall contain the upper system Media Access Control (MAC) address to be used as part of a range of system MAC addresses. Pattern: `^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$`
}			
VLANIdentifierAddressRange *(v1.1+)* {	object	*(null)*	Virtual LAN (VLAN) tag related addressing for this Ethernet fabric or for end host networks. • This property shall contain Virtual LAN (VLAN) tags for the entire fabric as well as to end hosts.
Lower *(v1.1+)*	integer	*read-write (null)*	Virtual LAN (VLAN) tag lower value. • This property shall contain the Virtual LAN (VLAN) tag lower value.
Upper *(v1.1+)*	integer	*read-write (null)*	Virtual LAN (VLAN) tag upper value. • This property shall contain the Virtual LAN (VLAN) tag upper value.
}			
}			

Property	Type	Attributes	Notes
MultiProtocolEBGP *(v1.1+)* {	object	*(null)*	Multi Protocol eBGP (MP eBGP) related properties for this Ethernet fabric. • This property shall contain the Multi Protocol eBGP (MP eBGP) related properties for this Ethernet fabric.
AllowDuplicateASEnabled *(v1.1+)*	boolean	*read-write (null)*	Allow duplicate Autonomous System (AS) path. • This property shall indicate whether duplicate Autonomous System (AS) numbers are allowed. If `true`, routes with the same AS number as the receiving router should be allowed. If `false`,routes should be dropped if the router receives its own AS number in a Border Gateway Protocol (BGP) update.
AllowOverrideASEnabled *(v1.1+)*	boolean	*read-write (null)*	Option to override an Autonomous System (AS) number with the AS number of the sending peer . • This property shall indicate whether Autonomous System (AS) numbers should be overridden. If `true`, AS number should be overridden with the AS number of the sending peer. If `false`, AS number override is disabled.
AlwaysCompareMEDEnabled *(v1.1+)*	boolean	*read-write (null)*	Compare Multi Exit Discriminator (MED) status. • This property shall indicate whether neighbor Multi Exit Discriminator (MED) attributes should be compared.
ASNumberRange *(v1.1+)* {	object	*(null)*	Autonomous System (AS) number range. • This property shall contain the range of Autonomous System (AS) numbers assigned to each Border Gateway Protocol (BGP) peer within the fabric.
Lower *(v1.1+)*	integer	*read-write*	Lower Autonomous System (AS) number. • This property shall contain the lower Autonomous System (AS) number to be used as part of a range of ASN values.
Upper *(v1.1+)*	integer	*read-write*	Upper Autonomous System (AS) number. • This property shall contain the upper Autonomous System (AS) number to be used as part of a range of ASN values.
}			

Property	Type	Attributes	Notes
BGPLocalPreference *(v1.1+)*	integer	*read-write (null)*	Local preference value. • This property shall contain the local preference value. Highest local preference value is preferred for Border Gateway Protocol (BGP) best path selection.
BGPNeighbor *(v1.1+)* {	object	*(null)*	Border Gateway Protocol (BGP) neighbor related properties. • This property shall contain all Border Gateway Protocol (BGP) neighbor related properties.
Address *(v1.1+)*	string	*read-write (null)*	Border Gateway Protocol (BGP) neighbor address. • This property shall contain the IPv4 address assigned to a Border Gateway Protocol (BGP) neighbor. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
AllowOwnASEnabled *(v1.1+)*	boolean	*read-write (null)*	Allow own Autonomous System (AS) status. • This property shall indicate whether the Autonomous System (AS) of the receiving router is permitted in a Border Gateway Protocol (BGP) update. If `true`, routes should be received and processed even if the router detects its own ASN in the AS-Path. If `false`, they should be dropped.
CIDR *(v1.2+)*	integer	*read-write*	The Classless Inter-Domain Routing (CIDR) value used for neighbor communication. This is the number of ones before the first zero in the subnet mask. • The value of this property shall contain the RFC4271-defined Classless Inter-Domain Routing (CIDR) value.
ConnectRetrySeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) retry timer in seconds. • This property shall contain the Border Gateway Protocol (BGP) Retry Timer. The BGP Retry Timer allows the administrator to set the amount of time in seconds between retries to establish a connection to configured peers which have gone down.
Enabled *(v1.2+)*	boolean	*read-write*	An indication of whether BGP neighbor communication is enabled. • The value of this property shall indicate whether BGP neighbor communication is enabled.

Property	Type	Attributes	Notes
HoldTimeSeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) hold timer in seconds. • This property shall contain the Border Gateway Protocol (BGP) Hold Timer agreed upon between peers.
KeepaliveIntervalSeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) Keepalive timer in seconds. • This property shall contain the Keepalive timer in seconds. It is used in conjunction with the Border Gateway Protocol (BGP) hold timer.
LocalAS *(v1.1+)*	integer	*read-write (null)*	Local Autonomous System (AS) number. • This property shall contain the Autonomous System (AS) number of the local Border Gateway Protocol (BGP) peer.
LogStateChangesEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) neighbor log state change status. • This property shall indicate whether Border Gateway Protocol (BGP) neighbor state changes are logged.
MaxPrefix *(v1.1+)* {	object	*(null)*	Border Gateway Protocol (BGP) max prefix properties. • These properties are applicable to configuring Border Gateway Protocol (BGP) max prefix related properties.
MaxPrefixNumber *(v1.1+)*	integer	*read-write (null)*	Maximum prefix number. • This property shall contain the maximum number of prefixes allowed from the neighbor.
RestartTimerSeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) restart timer in seconds. • This property determines how long peer routers will wait to delete stale routes before a Border Gateway Protocol (BGP) open message is received. This timer should be less than the BGP HoldTimeSeconds property.
ShutdownThresholdPercentage *(v1.1+)*	number (%)	*read-write (null)*	Shutdown threshold status. • This property shall contain the percentage of the maximum prefix received value at which the router starts to generate a warning message.

Property	Type	Attributes	Notes
ThresholdWarningOnlyEnabled *(v1.1+)*	boolean	*read-write (null)*	Threshold warning only status. • This property shall indicate what action to take if the Border Gateway Protocol (BGP) route threshold is reached. If `true`, when the Maximum-Prefix limit is exceeded, a log message is generated. If `false`, when the Maximum-Prefix limit is exceeded, the peer session is terminated.
}			
MinimumAdvertisementIntervalSeconds *(v1.1+)*	integer	*read-write (null)*	Minimum Border Gateway Protocol (BGP) advertisement interval in seconds. • This property shall contain the minimum time between Border Gateway Protocol (BGP) route advertisements in seconds.
PassiveModeEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) passive mode status. • This property shall indicate whether Border Gateway Protocol (BGP) passive mode is enabled.
PathMTUDiscoveryEnabled *(v1.1+)*	boolean	*read-write (null)*	Path MTU discovery status. • This property shall indicate whether MTU discovery is permitted.
PeerAS *(v1.1+)*	integer	*read-write (null)*	Peer Autonomous System (AS) number. • This property shall contain the Autonomous System (AS) number of the external Border Gateway Protocol (BGP) peer.
ReplacePeerASEnabled *(v1.1+)*	boolean	*read-write (null)*	Replace Border Gateway Protocol (BGP) peer Autonomous System (AS) status. • This property shall indicate whether peer Autonomous System (AS) numbers should be replaced. If `true`, private ASNs are removed and replaced with the peer AS. If `false`, they remain unchanged.
TCPMaxSegmentSizeBytes *(v1.1+)*	integer	*read-write (null)*	TCP max segment size in Bytes. • This property shall contain the TCP max segment size in Bytes signifying the number of bytes that shall be transported in a single packet.

Property	Type	Attributes	Notes
TreatAsWithdrawEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) treat as withdraw status. • This property shall indicate Border Gateway Protocol (BGP) withdraw status. If `true`, the UPDATE message containing the path attribute shall be treated as though all contained routes had been withdrawn. If `false`, they should remain.
}			
BGPRoute *(v1.1+)* {	object	*(null)*	Border Gateway Protocol (BGP) route related properties. • This property shall contain Border Gateway Protocol (BGP) route related properties.
AdvertiseInactiveRoutesEnabled *(v1.1+)*	boolean	*read-write (null)*	Advertise inactive route status. • This property shall indicate whether inactive routes should be advertised. If `true`, advertise the best Border Gateway Protocol (BGP) route that is inactive because of Interior Gateway Protocol (IGP) preference. If `false`, do not use as part of BGP best path selection.
DistanceExternal *(v1.1+)*	integer	*read-write (null)*	Route distance for external routes. • This property shall modify the administrative distance for routes learned via External BGP (eBGP).
DistanceInternal *(v1.1+)*	integer	*read-write (null)*	Route distance for internal routes. • This property shall modify the administrative distance for routes learned via Internal BGP (iBGP).
DistanceLocal *(v1.1+)*	integer	*read-write (null)*	Route distance for local routes. • This property shall modify the administrative distance for routes configured on a local router.
ExternalCompareRouterIdEnabled *(v1.1+)*	boolean	*read-write (null)*	Compare router id status. • This property shall indicate whether external router ids should be compared. If `true`, prefer the route that comes from the Border Gateway Protocol (BGP) router with the lowest router ID. If `false`, do not use as part of BGP best path selection.

Property	Type	Attributes	Notes
FlapDampingEnabled *(v1.1+)*	boolean	*read-write (null)*	Route flap dampening status. • This property shall indicate whether route flap dampening should be enabled.
SendDefaultRouteEnabled *(v1.1+)*	boolean	*read-write (null)*	Send default route status. • This property shall indicate whether the default route should be advertised. If `true`, the default route is advertised to all Border Gateway Protocol (BGP) neighbors unless specifically denied. If `false`, the default route is not advertised.
}			
BGPWeight *(v1.1+)*	integer	*read-write (null)*	BGP weight attribute. • This property shall contain the Border Gateway Protocol (BGP) weight attribute value for external peers. A higher BGP weight value is preferred for BGP best path selection.
GracefulRestart *(v1.1+)* {	object	*(null)*	Graceful restart related properties. • This property shall contain all graceful restart related properties.
GracefulRestartEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) graceful restart status. • This property shall indicate whether to enable Border Gateway Protocol (BGP) graceful restart features.
HelperModeEnabled *(v1.1+)*	boolean	*read-write (null)*	Graceful restart helper mode status. • This property shall indicate what to do with stale routes. If `true`, the router continues to be forward packets to stale routes, if `false`, it does not forward packets to stale routes.
StaleRoutesTimeSeconds *(v1.1+)*	integer	*read-write (null)*	Stale route timer in seconds. • This property shall contain the time in seconds to hold stale routes for a restarting peer.
TimeSeconds *(v1.1+)*	integer	*read-write (null)*	Graceful restart timer in seconds. • This property shall contain the time in seconds to wait for a graceful restart capable neighbor to re-establish Border Gateway Protocol (BGP) peering.

Property	Type	Attributes	Notes
}			
MED *(v1.1+)*	integer	*read-write (null)*	BGP Multi Exit Discriminator (MED) value. • This property shall contain the Border Gateway Protocol (BGP) Multi Exit Discriminator (MED) value. A lower MED value is preferred for BGP best path selection.
MultihopEnabled *(v1.1+)*	boolean	*read-write (null)*	External BGP (eBGP) multihop status. • This property shall indicate whether External BGP (eBGP) multihop is enabled.
MultihopTTL *(v1.1+)*	integer	*read-write (null)*	External BGP (eBGP) multihop Time to Live (TTL) value. • This property shall contain the External BGP (eBGP) multihop Time to Live (TTL) value.
MultiplePaths *(v1.1+)* {	object	*(null)*	Multiple path related properties. • This property shall contain all multiple path related properties.
MaximumPaths *(v1.1+)*	integer	*read-write (null)*	Maximum paths number. • This property shall contain the maximum number of paths for multi path operation.
UseMultiplePathsEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) multiple paths status. • This property shall indicate whether multiple paths should be advertised. If `true`, Border Gateway Protocol (BGP) advertises multiple paths for the same prefix for path diversity. If `false`, it advertises based on best path selection.
}			
SendCommunityEnabled *(v1.1+)*	boolean	*read-write (null)*	This property shall indicate whether community attributes are sent. • This property shall indicate whether community attributes are sent to BGP neighbors.
}			

Property	Type	Attributes	Notes
MultiProtocolIBGP *(v1.1+)* {	object	*(null)*	Multi Protocol iBGP (MP iBGP) related properties for this Ethernet fabric. • This property shall contain the Multi Protocol iBGP (MP iBGP) related properties for this Ethernet fabric.
ASNumberRange *(v1.1+)* {	object	*(null)*	Autonomous System (AS) number range. • This property shall contain the range of Autonomous System (AS) numbers assigned to each Border Gateway Protocol (BGP) peer within the fabric.
Lower *(v1.1+)*	integer	*read-write*	Lower Autonomous System (AS) number. • This property shall contain the lower Autonomous System (AS) number to be used as part of a range of ASN values.
Upper *(v1.1+)*	integer	*read-write*	Upper Autonomous System (AS) number. • This property shall contain the upper Autonomous System (AS) number to be used as part of a range of ASN values.
}			
BGPNeighbor *(v1.1+)* {	object	*(null)*	Border Gateway Protocol (BGP) neighbor related properties. • This property shall contain all Border Gateway Protocol (BGP) neighbor related properties.
Address *(v1.1+)*	string	*read-write (null)*	Border Gateway Protocol (BGP) neighbor address. • This property shall contain the IPv4 address assigned to a Border Gateway Protocol (BGP) neighbor. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
AllowOwnASEnabled *(v1.1+)*	boolean	*read-write (null)*	Allow own Autonomous System (AS) status. • This property shall indicate whether the Autonomous System (AS) of the receiving router is permitted in a Border Gateway Protocol (BGP) update. If `true`, routes should be received and processed even if the router detects its own ASN in the AS-Path. If `false`, they should be dropped.

Property	Type	Attributes	Notes
CIDR *(v1.2+)*	integer	*read-write*	The Classless Inter-Domain Routing (CIDR) value used for neighbor communication. This is the number of ones before the first zero in the subnet mask. • The value of this property shall contain the RFC4271-defined Classless Inter-Domain Routing (CIDR) value.
ConnectRetrySeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) retry timer in seconds. • This property shall contain the Border Gateway Protocol (BGP) Retry Timer. The BGP Retry Timer allows the administrator to set the amount of time in seconds between retries to establish a connection to configured peers which have gone down.
Enabled *(v1.2+)*	boolean	*read-write*	An indication of whether BGP neighbor communication is enabled. • The value of this property shall indicate whether BGP neighbor communication is enabled.
HoldTimeSeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) hold timer in seconds. • This property shall contain the Border Gateway Protocol (BGP) Hold Timer agreed upon between peers.
KeepaliveIntervalSeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) Keepalive timer in seconds. • This property shall contain the Keepalive timer in seconds. It is used in conjunction with the Border Gateway Protocol (BGP) hold timer.
LocalAS *(v1.1+)*	integer	*read-write (null)*	Local Autonomous System (AS) number. • This property shall contain the Autonomous System (AS) number of the local Border Gateway Protocol (BGP) peer.
LogStateChangesEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) neighbor log state change status. • This property shall indicate whether Border Gateway Protocol (BGP) neighbor state changes are logged.
MaxPrefix *(v1.1+)* {	object	*(null)*	Border Gateway Protocol (BGP) max prefix properties. • These properties are applicable to configuring Border Gateway Protocol (BGP) max prefix related properties.

Property	Type	Attributes	Notes
MaxPrefixNumber *(v1.1+)*	integer	*read-write (null)*	Maximum prefix number. • This property shall contain the maximum number of prefixes allowed from the neighbor.
RestartTimerSeconds *(v1.1+)*	integer	*read-write (null)*	Border Gateway Protocol (BGP) restart timer in seconds. • This property determines how long peer routers will wait to delete stale routes before a Border Gateway Protocol (BGP) open message is received. This timer should be less than the BGP HoldTimeSeconds property.
ShutdownThresholdPercentage *(v1.1+)*	number (%)	*read-write (null)*	Shutdown threshold status. • This property shall contain the percentage of the maximum prefix received value at which the router starts to generate a warning message.
ThresholdWarningOnlyEnabled *(v1.1+)*	boolean	*read-write (null)*	Threshold warning only status. • This property shall indicate what action to take if the Border Gateway Protocol (BGP) route threshold is reached. If `true`, when the Maximum-Prefix limit is exceeded, a log message is generated. If `false`, when the Maximum-Prefix limit is exceeded, the peer session is terminated.
}			
MinimumAdvertisementIntervalSeconds *(v1.1+)*	integer	*read-write (null)*	Minimum Border Gateway Protocol (BGP) advertisement interval in seconds. • This property shall contain the minimum time between Border Gateway Protocol (BGP) route advertisements in seconds.
PassiveModeEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) passive mode status. • This property shall indicate whether Border Gateway Protocol (BGP) passive mode is enabled.
PathMTUDiscoveryEnabled *(v1.1+)*	boolean	*read-write (null)*	Path MTU discovery status. • This property shall indicate whether MTU discovery is permitted.

Property	Type	Attributes	Notes
PeerAS *(v1.1+)*	integer	*read-write (null)*	Peer Autonomous System (AS) number. • This property shall contain the Autonomous System (AS) number of the external Border Gateway Protocol (BGP) peer.
ReplacePeerASEnabled *(v1.1+)*	boolean	*read-write (null)*	Replace Border Gateway Protocol (BGP) peer Autonomous System (AS) status. • This property shall indicate whether peer Autonomous System (AS) numbers should be replaced. If `true`, private ASNs are removed and replaced with the peer AS. If `false`, they remain unchanged.
TCPMaxSegmentSizeBytes *(v1.1+)*	integer	*read-write (null)*	TCP max segment size in Bytes. • This property shall contain the TCP max segment size in Bytes signifying the number of bytes that shall be transported in a single packet.
TreatAsWithdrawEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) treat as withdraw status. • This property shall indicate Border Gateway Protocol (BGP) withdraw status. If `true`, the UPDATE message containing the path attribute shall be treated as though all contained routes had been withdrawn. If `false`, they should remain.
}			
BGPRoute *(v1.1+)* {	object	*(null)*	Border Gateway Protocol (BGP) route related properties. • This property shall contain Border Gateway Protocol (BGP) route related properties.
AdvertiseInactiveRoutesEnabled *(v1.1+)*	boolean	*read-write (null)*	Advertise inactive route status. • This property shall indicate whether inactive routes should be advertised. If `true`, advertise the best Border Gateway Protocol (BGP) route that is inactive because of Interior Gateway Protocol (IGP) preference. If `false`, do not use as part of BGP best path selection.
DistanceExternal *(v1.1+)*	integer	*read-write (null)*	Route distance for external routes. • This property shall modify the administrative distance for routes learned via External BGP (eBGP).

Property	Type	Attributes	Notes
DistanceInternal *(v1.1+)*	integer	*read-write (null)*	Route distance for internal routes. • This property shall modify the administrative distance for routes learned via Internal BGP (iBGP).
DistanceLocal *(v1.1+)*	integer	*read-write (null)*	Route distance for local routes. • This property shall modify the administrative distance for routes configured on a local router.
ExternalCompareRouterIdEnabled *(v1.1+)*	boolean	*read-write (null)*	Compare router id status. • This property shall indicate whether external router ids should be compared. If `true`, prefer the route that comes from the Border Gateway Protocol (BGP) router with the lowest router ID. If `false`, do not use as part of BGP best path selection.
FlapDampingEnabled *(v1.1+)*	boolean	*read-write (null)*	Route flap dampening status. • This property shall indicate whether route flap dampening should be enabled.
SendDefaultRouteEnabled *(v1.1+)*	boolean	*read-write (null)*	Send default route status. • This property shall indicate whether the default route should be advertised. If `true`, the default route is advertised to all Border Gateway Protocol (BGP) neighbors unless specifically denied. If `false`, the default route is not advertised.
}			
GracefulRestart *(v1.1+)* {	object	*(null)*	Graceful restart related properties. • This property shall contain all graceful restart related properties.
GracefulRestartEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) graceful restart status. • This property shall indicate whether to enable Border Gateway Protocol (BGP) graceful restart features.
HelperModeEnabled *(v1.1+)*	boolean	*read-write (null)*	Graceful restart helper mode status. • This property shall indicate what to do with stale routes. If `true`, the router continues to be forward packets to stale routes, if `false`, it does not forward packets to stale routes.

Property	Type	Attributes	Notes
StaleRoutesTimeSeconds *(v1.1+)*	integer	*read-write (null)*	Stale route timer in seconds. • This property shall contain the time in seconds to hold stale routes for a restarting peer.
TimeSeconds *(v1.1+)*	integer	*read-write (null)*	Graceful restart timer in seconds. • This property shall contain the time in seconds to wait for a graceful restart capable neighbor to re-establish Border Gateway Protocol (BGP) peering.
}			
MultiplePaths *(v1.1+)* {	object	*(null)*	Multiple path related properties. • This property shall contain all multiple path related properties.
MaximumPaths *(v1.1+)*	integer	*read-write (null)*	Maximum paths number. • This property shall contain the maximum number of paths for multi path operation.
UseMultiplePathsEnabled *(v1.1+)*	boolean	*read-write (null)*	Border Gateway Protocol (BGP) multiple paths status. • This property shall indicate whether multiple paths should be advertised. If `true`, Border Gateway Protocol (BGP) advertises multiple paths for the same prefix for path diversity. If `false`, it advertises based on best path selection.
}			
SendCommunityEnabled *(v1.1+)*	boolean	*read-write (null)*	This property shall indicate whether community attributes are sent. • This property shall indicate whether community attributes are sent to BGP neighbors.
}			
}			
GenZ {	object		The Gen-Z related properties for this address pool. • This property shall contain the Gen-Z related properties to this address pool.

Property	Type	Attributes	Notes
AccessKey	string	*read-write (null)*	The Access Key required for this address pool. • This property shall contain the Gen-Z Core Specification-defined Access Key required for this address pool. Pattern: `^0[xX]([a-fA-F]|[0-9]){2}$`
MaxCID	integer	*read-write (null)*	The maximum value for the Component Identifier (CID). • This property shall contain the maximum value for the Gen-Z Core Specification-defined Component Identifier (CID).
MaxSID	integer	*read-write (null)*	The maximum value for the Subnet Identifier (SID). • This property shall contain the maximum value for the Gen-Z Core Specification-defined Subnet Identifier (SID).
MinCID	integer	*read-write (null)*	The minimum value for the Component Identifier (CID). • This property shall contain the minimum value for the Gen-Z Core Specification-defined Component Identifier (CID).
MinSID	integer	*read-write (null)*	The minimum value for the Subnet Identifier (SID). • This property shall contain the minimum value for the Gen-Z Core Specification-defined Subnet Identifier (SID).
}			
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints [{	array		An array of links to the endpoints that this address pool contains. • This property shall contain an array of links to resources of type Endpoint that this address pool contains.
@odata.id	string	*read-write*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			

Property	Type	Attributes	Notes
Oem {}	object		See the OEM object definition in the Using this guide clause.
Zones [{	array		An array of links to the zones that this address pool contains. • This property shall contain an array of links to resources of type Zone that this address pool contains.
@odata.id	string	*read-write*	Link to a Zone resource. See the Links section and the *Zone* schema for details.
}]			
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.4.4 Property details

6.4.4.1 IPv4AddressRange:

IPv4 related address range for an Ethernet fabric.

Lower *(v1.1+)*	string	*read-write (null)*	Lower IPv4 network address. • This property shall contain the lower IPv4 network address to be used as part of a subnet. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
Upper *(v1.1+)*	string	*read-write (null)*	Upper IPv4 network address. • This property shall contain the upper IPv4 network address to be used as part of a host subnet. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`

6.4.5 Example response

```
{
    "@odata.type": "#AddressPool.v1_2_1.AddressPool",
    "Id": "AP1",
    "Name": "Address Pool 1",
```

```
    "Description": "Address Pool 1",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "GenZ": {
        "MinCID": 1,
        "MaxCID": 4096,
        "MinSID": 100,
        "MaxSID": 8192,
        "AccessKey": "0x1A"
    },
    "Links": {
        "Endpoints": [
            {
                "@odata.id": "/redfish/v1/Fabrics/GenZ/Endpoints/1"
            }
        ]
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/GenZ/AddressPools/AP1"
}
```


6.5 Aggregate 1.0.1

Version	*v1.0*
Release	2020.2

6.5.1 Description

The Aggregate schema describes a grouping method for an aggregation service. Aggregates are formal groups of resources that are more persistent than ad hoc groupings.

- This resource shall represent an aggregation service grouping method for a Redfish implementation.

6.5.2 URIs

/redfish/v1/AggregationService/Aggregates/*{AggregateId}*

6.5.3 Properties

Property	Type	Attributes	Notes
Elements [{	array	*required*	The elements of this aggregate. • This property shall contain an array of links to the elements of this aggregate.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
ElementsCount	integer	*read-only* *(null)*	The number of entries in the Elements array. • This property shall contain the number of entries in the Elements array.

6.5.4 Actions

6.5.4.1 AddElements

Description

This action is used to add one or more resources to the aggregate.

- This action shall add one or more resources to the aggregate, resulting in that the resources are included in the Elements array of the aggregate.

Action URI: {Base URI of target resource}/Actions/Aggregate.AddElements

Action parameters

Parameter Name	Type	Attributes	Notes
Elements [{	array	*required*	An array of resource links to add to the Elements array. • This parameter shall contain an array of links to the specified resources to add to the aggregate's Elements array.

Parameter Name	Type	Attributes	Notes
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Request Example

```
{
    "Elements": [
        {
            "@odata.id": "/redfish/v1/Systems/cluster-node7"
        },
        {
            "@odata.id": "node8.intranet.contoso.com/redfish/v1/Systems/1"
        }
    ]
}
```

6.5.4.2 RemoveElements

Description

This action is used to remove one or more resources from the aggregate.

- This action shall remove one or more resources from the aggregate, resulting in that the resources are removed from the Elements array of the aggregate.

Action URI: {Base URI of target resource}/Actions/Aggregate.RemoveElements

Action parameters

Parameter Name	Type	Attributes	Notes
Elements [{	array	*required*	An array of resource links to remove from the Elements array. • This parameter shall contain an array of links to the specified resources to remove from the aggregate's Elements array.

Parameter Name	Type	Attributes	Notes
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Request Example

```
{
    "Elements": [
        {
            "@odata.id": "node8.intranet.contoso.com/redfish/v1/Systems/1"
        }
    ]
}
```

6.5.4.3 Reset

Description

This action is used to reset a collection of resources. For example, this could be an aggregate or a list of computer systems.

- This action shall perform a reset of a collection of resources.

Action URI: {Base URI of target resource}/Actions/Aggregate.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
BatchSize	integer	*optional*	The number of elements in each batch being reset. • This parameter shall contain the number of elements in each batch simultaneously being issued a reset.
DelayBetweenBatchesInSeconds	integer (seconds)	*optional*	The delay of the batches of elements being reset in seconds. • This parameter shall contain the delay of the batches of elements being reset in seconds.

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ForceRestart",
    "BatchSize": 5,
    "DelayBetweenBatchesInSeconds": 30
}
```

6.5.4.4 SetDefaultBootOrder

Description

This action is used to restore the boot order to the default state for the computer systems that are members of this aggregate.

- This action shall restore the boot order to the default state for the computer systems that are members of this aggregate.

Action URI: {Base URI of target resource}/Actions/Aggregate.SetDefaultBootOrder

Action parameters

This action takes no parameters.

6.5.5 Property details

6.5.5.1 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.

string	Description
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.5.6 Example response


```
{
    "@odata.type": "#Aggregate.v1_0_1.Aggregate",
    "Id": "Aggregate1",
    "Name": "Aggregate One",
    "ElementsCount": 2,
    "Elements": [
        {
            "@odata.id": "/redfish/v1/Systems/cluster-node3"
        },
        {
            "@odata.id": "/redfish/v1/Systems/cluster-node4"
        }
    ],
    "Actions": {
        "#Aggregate.Reset": {
            "target": "/redfish/v1/AggregationService/Aggregates/Aggregate1/Actions/Aggregate.Reset",
            "@Redfish.ActionInfo": "/redfish/v1/AggregationService/Aggregates/Aggregate1/ResetActionInfo"
        },
        "#Aggregate.SetDefaultBootOrder": {
            "target": "/redfish/v1/AggregationService/Aggregates/Aggregate1/Actions/Aggregate.SetDefaultBootOrder",
            "@Redfish.ActionInfo": "/redfish/v1/AggregationService/Aggregates/Aggregate1/SetDefaultBootOrderActionInfo"
```

```
        },
        "#Aggregate.AddElements": {
            "target": "/redfish/v1/AggregationService/Aggregates/Aggregate1/Actions/Aggregate.AddElements",
            "@Redfish.ActionInfo": "/redfish/v1/AggregationService/Aggregates/Aggregate1/AddElementsActionInfo"
        },
        "#Aggregate.RemoveElements": {
            "target": "/redfish/v1/AggregationService/Aggregates/Aggregate1/Actions/Aggregate.RemoveElements",
            "@Redfish.ActionInfo": "/redfish/v1/AggregationService/Aggregates/Aggregate1/RemoveElementsActionInfo"
        }
    },
    "@odata.id": "/redfish/v1/AggregationService/Aggregates/Aggregate1"
}
```


6.6 AggregationService 1.0.1

Version	*v1.0*
Release	2020.2

6.6.1 Description

The AggregationService schema contains properties for managing aggregation operations, either on ad hoc combinations of resources or on defined sets of resources called aggregates. Access points define the properties needed to access the entity being aggregated and connection methods describe the protocol or other semantics of the connection.

- This resource shall represent an aggregation service for a Redfish implementation.

6.6.2 URIs

/redfish/v1/AggregationService

6.6.3 Properties

Property	Type	Attributes	Notes
Aggregates {	object		The link to the collection of aggregates associated with this service. • This property shall contain a link to a resource collection of type AggregateCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Aggregate*. See the Aggregate schema for details.
}			
AggregationSources {	object		The link to the collection of aggregation sources associated with this service. • This property shall contain a link to a resource collection of type AggregationSourceCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *AggregationSource*. See the AggregationSource schema for details.
}			
ConnectionMethods {	object		The link to the collection of connection methods associated with this service. • This property shall contain a link to a resource collection of type ConnectionMethodCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *ConnectionMethod*. See the ConnectionMethod schema for details.
}			
ServiceEnabled	boolean	*read-write (null)*	An indication of whether the aggregation service is enabled. • This property shall indicate whether the aggregation service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.6.4 Actions

6.6.4.1 Reset

Description

This action is used to reset a set of resources. For example this could be a list of computer systems.

- This action shall perform a reset of a set of resources.

Action URI: {Base URI of target resource}/Actions/AggregationService.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
BatchSize	integer	*optional*	The number of elements in each batch being reset. • This parameter shall contain the number of elements in each batch simultaneously being issued a reset.
DelayBetweenBatchesInSeconds	integer (seconds)	*optional*	The delay of the batches of elements being reset in seconds. • This parameter shall contain the delay of the batches of elements being reset in seconds.
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. *For the possible property values, see ResetType in Property details.*
TargetURIs [{	array	*required*	An array of links to the resources being reset. • This parameter shall contain an array of links to the resources being reset.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Request Example

```
{
    "ResetType": "ForceRestart",
    "BatchSize": 1,
    "DelayBetweenBatchesInSeconds": 30,
    "TargetURIs": [
        {
            "@odata.id": "/redfish/v1/Systems/cluster-node3"
        },
        {
            "@odata.id": "/redfish/v1/Systems/cluster-node4"
        },
        {
            "@odata.id": "node7.intranet.contoso.com/redfish/v1/Systems/1"
        }
    ]
}
```

6.6.4.2 SetDefaultBootOrder

Description

This action is used to restore the boot order to the default state for the specified computer systems.

- This action shall restore the boot order to the default state for the specified computer systems.

Action URI: {Base URI of target resource}/Actions/AggregationService.SetDefaultBootOrder

Action parameters

Parameter Name	Type	Attributes	Notes
Systems [{	array	*required*	The computer systems to restore. • This parameter shall contain an array of links to resources of type ComputerSystem.
@odata.id	string	*read-only*	Link to a ComputerSystem resource. See the Links section and the *ComputerSystem* schema for details.
}]			

Request Example

```
{
    "Systems": [
```

```
        {
            "@odata.id": "/redfish/v1/Systems/cluster-node3"
        },
        {
            "@odata.id": "/redfish/v1/Systems/cluster-node4"
        },
        {
            "@odata.id": "node7.intranet.contoso.com/redfish/v1/Systems/1"
        }
    ]
}
```


6.6.5 Property details

6.6.5.1 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.

string	Description
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.

string	Description
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.6.6 Example response

```
{
    "@odata.type": "#AggregationService.v1_0_1.AggregationService",
    "Id": "AggregationService",
    "Description": "Aggregation Service",
    "Name": "Aggregation Service",
    "ServiceEnabled": true,
    "Status": {
        "Health": "OK",
        "HealthRollup": "OK",
        "State": "Enabled"
    },
    "Aggregates": {
        "@odata.id": "/redfish/v1/AggregationService/Aggregates"
    },
    "AggregationSources": {
        "@odata.id": "/redfish/v1/AggregationService/AggregationSources"
    },
    "ConnectionMethods": {
        "@odata.id": "/redfish/v1/AggregationService/ConnectionMethods"
    },
    "Actions": {
        "#AggregationService.Reset": {
            "target": "/redfish/v1/AggregationService/Actions/AggregationService.Reset",
            "@Redfish.ActionInfo": "/redfish/v1/AggregationService/ResetActionInfo"
        },
        "#AggregationService.SetDefaultBootOrder": {
            "target": "/redfish/v1/AggregationService/Actions/AggregationService.SetDefaultBootOrder",
            "@Redfish.ActionInfo": "/redfish/v1/AggregationService/SetDefaultBootOrderActionInfo"
        }
    },
    "@odata.id": "/redfish/v1/AggregationService/"
}
```

6.7 AggregationSource 1.2.0

Version	*v1.2*	*v1.1*	*v1.0*
Release	2021.3	2020.4	2020.2

6.7.1 Description

The AggregationSource schema is used to represent the source of information for a subset of the resources provided by a Redfish service. It can be thought of as a provider of information. As such, most such interfaces have requirements to support the gathering of information like address and account used to access the information.

- This resource shall represent an aggregation source for a Redfish implementation.

6.7.2 URIs

/redfish/v1/AggregationService/AggregationSources/*{AggregationSourceId}*

6.7.3 Properties

Property	Type	Attributes	Notes
AggregationType *(v1.2+)*	string (enum)	*read-write*	The type of aggregation used towards the aggregation source. • This property shall contain the type of aggregation used for the connection method towards the aggregation source. If this property is not present, the value shall be assumed to be `Complete`. *For the possible property values, see AggregationType in Property details.*
HostName	string (URI)	*read-write (null)*	The URI of the system to be accessed. • This property shall contain the URI of the system to be aggregated. This property shall not be required when the aggregation source is configured to only receive notifications from the aggregated system and the AggregationType property contains the value `NotificationsOnly`.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
ConnectionMethod {	object	*(null)*	An array of links to the connection methods used to contact this aggregation source. • This property shall contain an array of links to resources of type ConnectionMethod that are used to connect to the aggregation source. See the *ConnectionMethod* schema for details on this property.
@odata.id	string	*read-only*	Link to a ConnectionMethod resource. See the Links section and the *ConnectionMethod* schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
ResourcesAccessed [{	array		An array links to the resources added to the service through this aggregation source. It is recommended that this be the minimal number of properties needed to find the resources that would be lost when the aggregation source is deleted. • This property shall contain an array of links to the resources added to the service through the aggregation source. It is recommended that this be the minimal number of properties needed to find the resources that would be lost when the aggregation source is deleted. For example, this could be the pointers to the members of the root level collections or the manager of a BMC.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
Password	string	*read-write (null)*	The password for accessing the aggregation source. The value is `null` in responses. • This property shall contain a password for accessing the aggregation source. The value shall be `null` in responses.
SNMP *(v1.1+)* {	object	*(null)*	SNMP settings of the aggregation source. • This property shall contain the SNMP settings of the aggregation source.

Property	Type	Attributes	Notes
AuthenticationKey *(v1.1+)*	string	*read-write (null)*	The secret authentication key for SNMPv3. • This property shall contain the key for SNMPv3 authentication. The value shall be `null` in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with `Passphrase:`, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with `Hex:`, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. The passphrase can contain any printable characters except for the double quotation mark. Pattern: `(^[ !#-~]+$)\|(^Passphrase:[ ^[ !#-~]+$)|(^Hex:[0-9A-Fa-f]{24,96})|(^\*+$)`
AuthenticationKeySet *(v1.1+)*	boolean	*read-only*	Indicates if the AuthenticationKey property is set. • This property shall contain `true` if a valid value was provided for the AuthenticationKey property. Otherwise, the property shall contain `false`.
AuthenticationProtocol *(v1.1+)*	string (enum)	*read-write (null)*	The authentication protocol for SNMPv3. • This property shall contain the SNMPv3 authentication protocol. *For the possible property values, see AuthenticationProtocol in Property details.*
EncryptionKey *(v1.1+)*	string	*read-write (null)*	The secret authentication key for SNMPv3. • This property shall contain the key for SNMPv3 encryption. The value shall be `null` in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with `Passphrase:`, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with `Hex:`, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. The passphrase can contain any printable characters except for the double quotation mark. Pattern: `(^[A-Za-z0-9]+$)\|(^\*+$)`
EncryptionKeySet *(v1.1+)*	boolean	*read-only*	Indicates if the EncryptionKey property is set. • This property shall contain `true` if a valid value was provided for the EncryptionKey property. Otherwise, the property shall contain `false`.
EncryptionProtocol *(v1.1+)*	string (enum)	*read-write (null)*	The encryption protocol for SNMPv3. • This property shall contain the SNMPv3 encryption protocol. *For the possible property values, see EncryptionProtocol in Property details.*

Property	Type	Attributes	Notes
TrapCommunity *(v1.2+)*	string	*read-write (null)*	The SNMP trap community string. • This property shall contain the SNMP trap community string. The value shall be `null` in responses. Services may provide a common trap community if not specified by the client when creating the aggregation source.
}			
UserName	string	*read-write (null)*	The user name for accessing the aggregation source. • This property shall contain the user name for accessing the aggregation source.

6.7.4 Property details

6.7.4.1 AggregationType:

The type of aggregation used towards the aggregation source.

- This property shall contain the type of aggregation used for the connection method towards the aggregation source. If this property is not present, the value shall be assumed to be `Complete`.

string	Description
Full	Full aggregation according to connection method. • This value shall indicate that the aggregator is performing full aggregation according to the connection method without any limitation such as only receiving notifications.
NotificationsOnly	Only notifications are aggregated. • This value shall indicate that the aggregator is only aggregating notifications or events from the aggregation source according to the connection method used. This value shall not be used with connection methods that do not include notifications.

6.7.4.2 AuthenticationProtocol:

The authentication protocol for SNMPv3.

- This property shall contain the SNMPv3 authentication protocol.

string	Description
CommunityString	Trap community string authentication. • This value shall indicate authentication using SNMP community strings and the value of TrapCommunity.
HMAC128_SHA224	HMAC-128-SHA-224 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC128SHA224AuthProtocol.
HMAC192_SHA256	HMAC-192-SHA-256 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC192SHA256AuthProtocol.
HMAC256_SHA384	HMAC-256-SHA-384 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC256SHA384AuthProtocol.
HMAC384_SHA512	HMAC-384-SHA-512 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC384SHA512AuthProtocol.
HMAC_MD5	HMAC-MD5-96 authentication. • This value shall indicate authentication conforms to the RFC3414-defined HMAC-MD5-96 authentication protocol.
HMAC_SHA96	HMAC-SHA-96 authentication. • This value shall indicate authentication conforms to the RFC3414-defined HMAC-SHA-96 authentication protocol.
None	No authentication. • This value shall indicate authentication is not required.

6.7.4.3 EncryptionProtocol:

The encryption protocol for SNMPv3.

- This property shall contain the SNMPv3 encryption protocol.

string	Description
CBC_DES	CBC-DES encryption. • This value shall indicate encryption conforms to the RFC3414-defined CBC-DES encryption protocol.
CFB128_AES128	CFB128-AES-128 encryption. • This value shall indicate encryption conforms to the RFC3414-defined CFB128-AES-128 encryption protocol.
None	No encryption. • This value shall indicate there is no encryption.

6.7.5 Example response

```
{
    "@odata.type": "#AggregationSource.v1_2_0.AggregationSource",
    "Id": "AggregationSource1",
    "Name": "AggregationSource One",
    "HostName": "https://Someserver.Contoso.com/redfish/v1",
    "UserName": "root",
    "Password": null,
    "Links": {
        "ConnectionMethod": {
            "@odata.id": "/redfish/v1/AggregationService/ConnectionMethods/ConnectionMethod1"
        },
        "ResourcesAccessed": [
            {
                "@odata.id": "/redfish/v1/Managers/1"
            }
        ]
    },
    "Actions": {},
    "@odata.id": "/redfish/v1/AggregationService/AggregationSources/AggregationSource1"
}
```

6.8 AllowDeny 1.0.0

Version	*v1.0*
Release	2021.2

6.8.1 Description

The AllowDeny schema represents a set of allow or deny configurations.

- This resource shall represent an AllowDeny resource in a Redfish implementation.

6.8.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/NetworkDeviceFunctions/*{NetworkDeviceFunctionId}*/AllowDeny/*{AllowDenyId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions{NetworkDeviceFunctionId}/AllowDeny/*{AllowDenyId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions{NetworkDeviceFunctionId}/AllowDeny/*{AllowDenyId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions{NetworkDeviceFunctionId}/AllowDeny/*{AllowDenyId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions{NetworkDeviceFunctionId}/AllowDeny/*{AllowDenyId}*
/redfish/v1/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*/NetworkDeviceFunctions{NetworkDeviceFunctionId}/AllowDeny/*{AllowDenyId}*

6.8.3 Properties

Property	Type	Attributes	Notes
AllowType	string (enum)	*read-write (null)*	Indicates the type of permission. • This property shall indicate the type of permission. *For the possible property values, see AllowType in Property details.*
DestinationPortLower	integer	*read-write (null)*	The TCP, UDP, or other destination port to which this rule begins to application, inclusive. • This property shall contain the TCP, UDP, or other destination port to which this rule begins application, inclusive.
DestinationPortUpper	integer	*read-write (null)*	The TCP, UDP, or other destination port to which this rule ends application, inclusive. • This property shall contain the TCP, UDP, or other destination port to which this rule ends application, inclusive.

Property	Type	Attributes	Notes
Direction	string (enum)	*read-write (null)*	Indicates the direction of the data to which this permission applies. • This value shall indicate the direction of the data to which this permission applies for this network device function. *For the possible property values, see Direction in Property details.*
IANAProtocolNumber	integer	*read-write (null)*	The IANA protocol number to which this permission applies. For TCP, this is `6`. For UDP, this is `17`. • This property shall contain the IANA protocol number to which this permission applies.
IPAddressLower	string	*read-write (null)*	The lower IP address to which this permission applies. • This property shall contain the lower IP address to which this permission applies.
IPAddressType	string (enum)	*read-write (null)*	The type of IP address populated in the IPAddressLower and IPAddressUpper properties. • This property shall contain the type of IP address populated in the IPAddressLower and IPAddressUpper properties. Services shall not permit mixing IPv6 and IPv4 addresses on the same resource. *For the possible property values, see IPAddressType in Property details.*
IPAddressUpper	string	*read-write (null)*	The upper IP address to which this permission applies. • This property shall contain the upper IP address to which this permission applies.
SourcePortLower	integer	*read-write (null)*	The TCP, UDP, or other source port to which this rule begins application, inclusive. • This property shall contain the TCP, UDP, or other source port to which this rule begins application, inclusive.
SourcePortUpper	integer	*read-write (null)*	The TCP, UDP or other source port to which this rule ends application, inclusive. • This property shall contain the TCP, UDP, or other source port to which this rule ends application, inclusive.
StatefulSession	boolean	*read-write (null)*	Indicates if this is a permission that only applies to stateful connection. • This property shall indicate if this permission only applies to stateful connection, which are those using SYN, ACK, and FIN.

6.8.4 Property details

6.8.4.1 AllowType:

Indicates the type of permission.

- This property shall indicate the type of permission.

string	Description
Allow	Indicates that traffic that matches the criteria in this resource shall be permitted.
Deny	Indicates that traffic that matches the criteria in this resource shall not be permitted.

6.8.4.2 Direction:

Indicates the direction of the data to which this permission applies.

- This value shall indicate the direction of the data to which this permission applies for this network device function.

string	Description
Egress	Indicates that this limit is enforced on packets and bytes transmitted by the network device function.
Ingress	Indicates that this limit is enforced on packets and bytes received by the network device function.

6.8.4.3 IPAddressType:

The type of IP address populated in the IPAddressLower and IPAddressUpper properties.

- This property shall contain the type of IP address populated in the IPAddressLower and IPAddressUpper properties. Services shall not permit mixing IPv6 and IPv4 addresses on the same resource.

string	Description
IPv4	IPv4 addressing is used for all IP-fields in this object.
IPv6	IPv6 addressing is used for all IP-fields in this object.

6.8.5 Example response


```
{
    "@odata.type": "#AllowDeny.v1_0_0.AllowDeny",
    "Id": "AllowDeny Rule 1",
    "Name": "Allow Rule 1",
    "Direction": "Ingress",
    "AllowType": "Allow",
    "StatefulSession": true,
    "IPAddressType": "IPv4",
    "IPAddressLower": "192.168.1.1",
    "IPAddressUpper": "192.168.1.100",
    "IANAProtocolNumber": 6,
    "SourcePortLower": 5,
    "SourcePortUpper": 65535,
    "DestinationPortLower": 5,
    "DestinationPortUpper": 65535,
    "@odata.id": "/redfish/v1/Chassis/Card1/NetworkAdapters/Slot1/NetworkDeviceFunctions/SC2KP1F0/AllowDeny/Rule1"
}
```


6.9 Assembly 1.4.0

Version	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2020.3	2018.2	2018.1	2017.3

6.9.1 Description

The Assembly schema defines an assembly. Assembly information contains details about a device, such as part number, serial number, manufacturer, and production date. It also provides access to the original data for the assembly.

- This Resource shall represent an assembly for a Redfish implementation. Assembly information contains details about a device, such as part number, serial number, manufacturer, and production date. It also provides access to the original data for the assembly.

6.9.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/Assembly
/redfish/v1/Chassis/*{ChassisId}*/Drives/*{DriveId}*/Assembly
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Assembly

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*/Assembly
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/Assembly
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/Assembly
/redfish/v1/Chassis/*{ChassisId}*/PCIeDevices/*{PCIeDeviceId}*/Assembly
/redfish/v1/Chassis/*{ChassisId}*/Power/PowerSupplies/*{PowerSupplyId}*/Assembly
/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/Batteries/*{BatteryId}*/Assembly
/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/PowerSupplies/*{PowerSupplyId}*/Assembly
/redfish/v1/Chassis/*{ChassisId}*/Thermal/Fans/*{FanId}*/Assembly
/redfish/v1/Chassis/*{ChassisId}*/ThermalSubsystem/Fans/*{FanId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Assembly
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Assembly
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/PowerSupplies/*{PowerSupplyId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/Assembly

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Assembly
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Assembly
/redfish/v1/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Assembly
/redfish/v1/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Assembly
/redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/Assembly
/redfish/v1/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*/Assembly
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Assembly
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/Assembly
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/Assembly
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Assembly
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Assembly
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Assembly

6.9.3 Properties

Property	Type	Attributes	Notes
Assemblies [{	array		The assembly records. • These properties shall define assembly records for a Redfish implementation.
@odata.id	string (URI)	*read-only required*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions {}	object		The available actions for this Resource. • This property shall contain the available actions for this Resource.

Property	Type	Attributes	Notes
BinaryDataURI	string (URI)	*read-only* *(null)*	The URI at which to access an image of the assembly information. • This property shall contain the URI at which to access an image of the assembly information, using the Redfish protocol and authentication methods. The Service provides this URI for the download of the OEM-specific binary image of the assembly data. An HTTP GET from this URI shall return a response payload of MIME time `application/octet-stream`. If the service supports it, an HTTP PUT to this URI shall replace the binary image of the assembly.
Description	string	*read-only* *(null)*	The description of the assembly. • This property shall contain the description of the assembly.
EngineeringChangeLevel	string	*read-only* *(null)*	The engineering change level of the assembly. • This property shall contain the engineering change level or revision of the assembly.
Location *(v1.3+)* {}	object		The location of the assembly. • This property shall contain location information of the associated assembly. For property details, see Location.
LocationIndicatorActive *(v1.3+)*	boolean	*read-write* *(null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource.
MemberId	string	*read-only* *required*	The unique identifier for the member within an array. • This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
Model	string	*read-only* *(null)*	The model number of the assembly. • This property shall contain the name by which the manufacturer generally refers to the assembly.
Name	string	*read-only* *(null)*	The name of the assembly. • This property shall contain the name of the assembly.
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PartNumber	string	*read-only (null)*	The part number of the assembly. • This property shall contain the part number of the assembly.
PhysicalContext *(v1.2+)*	string (enum)	*read-only*	The area or device to which the assembly data applies. • This property shall contain a description of the physical context for the assembly data. *For the possible property values, see PhysicalContext in Property details.*
Producer	string	*read-only (null)*	The producer or manufacturer of the assembly. • This property shall contain the name of the company that produced or manufactured the assembly. This value shall be equal to the 'Manufacturer' field value in a PLDM FRU structure, if applicable, for the assembly.
ProductionDate	string (date-time)	*read-only (null)*	The production date of the assembly. • This property shall contain the date of production or manufacture for the assembly. The time of day portion of the property shall be `00:00:00Z`, if the time of day is unknown.
Replaceable *(v1.4+)*	boolean	*read-only (null)*	An indication of whether the component associated this assembly can be independently replaced as allowed by the vendor's replacement policy. • This property shall indicate whether the component associated this assembly can be independently replaced as allowed by the vendor's replacement policy. A value of `false` indicates the component needs to be replaced by policy, as part of another component. If the `LocationType` property of this assembly contains `Embedded`, this property shall contain `false`.
SerialNumber *(v1.2+)*	string	*read-only (null)*	The serial number of the assembly. • This property shall contain a manufacturer-allocated number that identifies the assembly.
SKU	string	*read-only (null)*	The SKU of the assembly. • This property shall contain the SKU of the assembly.
SparePartNumber	string	*read-only (null)*	The spare part number of the assembly. • This property shall contain the spare part number of the assembly.

Property	Type	Attributes	Notes
Status *(v1.1+)* {}	object		The status and health of the Resource and its subordinate or dependent Resources. • This property shall contain any status or health properties of the Resource. For property details, see Status.
Vendor	string	*read-only (null)*	The vendor of the assembly. • This property shall contain the name of the company that provides the final product that includes this assembly. This value shall be equal to the 'Vendor' field value in a PLDM FRU structure, if applicable, for the assembly.
Version	string	*read-only (null)*	The hardware version of the assembly. • This property shall contain the hardware version of the assembly as determined by the vendor or supplier.
}]			

6.9.4 Property details

6.9.4.1 PhysicalContext:

The area or device to which the assembly data applies.

- This property shall contain a description of the physical context for the assembly data.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.

string	Description
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.

string	Description
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.9.5 Example response

```
{
    "@odata.type": "#Assembly.v1_4_0.Assembly",
    "Id": "Assembly",
    "Name": "System-related Assembly data",
    "Assemblies": [
        {
            "@odata.id": "/redfish/v1/Chassis/1/Assembly#/Assemblies/0",
            "MemberId": "0",
            "Name": "System Board",
            "Description": "PCA System Board",
            "Model": "345TTT",
            "PartNumber": "923943",
            "SparePartNumber": "55-434",
            "SKU": "55ZZATR",
            "SerialNumber": "345394834",
            "Vendor": "Contoso",
```

```
            "ProductionDate": "2017-04-01T14:55:33+03:00",
            "Producer": "Contoso Supply Co.",
            "Version": "1.44B",
            "EngineeringChangeLevel": "9",
            "BinaryDataURI": "/dumpster/434",
            "Oem": {
                "Contoso": {
                    "Region": "C",
                    "Packaging": "Retail"
                }
            }
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1/Assembly#/Assemblies/1",
            "MemberId": "1",
            "Name": "Fan Controller",
            "Description": "PCA Fan Controller",
            "Model": "F58AS",
            "PartNumber": "3434-149",
            "Vendor": "Contoso",
            "Version": "2.4.481",
            "BinaryDataURI": "/dumpster/422",
            "Status": {
                "State": "Enabled",
                "Health": "Warning"
            }
        }
    ],
    "@odata.id": "/redfish/v1/Chassis/1/Assembly"
}
```


6.10 AttributeRegistry 1.3.6

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2018.3	2018.1	2017.1	2016.1

6.10.1 Description

The AttributeRegistry schema contains a set of key-value pairs that represent the structure of an attribute registry. It includes mechanisms for building user interfaces, or menus, allowing consistent navigation of the contents. The attribute registry is specific to an implementation or product. The attributes and property names are not standardized.

- This resource shall represent an attribute registry for a Redfish implementation.

6.10.2 Properties

Property	Type	Attributes	Notes
Language	string	*read-only required*	The RFC5646-conformant language code for the attribute registry. • This property shall contain an RFC5646-conformant language code.
OwningEntity	string	*read-only required*	The organization or company that publishes this attribute registry. • This property shall represent the publisher of this attribute registry.
RegistryEntries {	object		The list of all attributes and their metadata for this component. • This property shall list attributes for this component, along with their possible values, dependencies, and other metadata.
Attributes [{	array		An array of attributes and their possible values in the attribute registry. • This property shall contain an array containing the attributes and their possible values and other metadata in the attribute registry.
AttributeName	string	*read-only required*	The unique name for the attribute. • This property shall contain the name of this attribute that is unique in this attribute registry. Pattern: `^[A-Za-z][A-Za-z0-9_]+$`
CurrentValue	string, boolean, number	*read-only (null)*	The placeholder of the current value for the attribute. • This property shall contain the placeholder of the current value for the attribute, to aid in evaluating dependencies. The evaluation results of the Dependencies array may affect the current attribute value.
DefaultValue	string, boolean, number	*read-only (null)*	The default value for the attribute. • This property shall contain the default value for the attribute.
DisplayName	string	*read-only (null)*	The user-readable display string for the attribute in the defined language. • This property shall contain the user-readable display string for the attribute in the defined language.
DisplayOrder	integer	*read-only (null)*	The ascending order, as a number, in which this attribute appears relative to other attributes. • This property shall contain the ascending order, as a number, in which this attribute appears relative to other attributes.

Property	Type	Attributes	Notes
GrayOut	boolean	*read-only (null)*	An indication of whether this attribute is grayed out. A grayed-out attribute is not active and is grayed out in user interfaces but the attribute value can be modified. • This property shall indicate whether this attribute is grayed out. A grayed-out attribute is not active and is grayed out in user interfaces but the attribute value can be modified. The evaluation results of the Dependencies array may affect the grayed-out state of an attribute.
HelpText	string	*read-only (null)*	The help text for the attribute. • This property shall contain the help text for the attribute.
Hidden	boolean	*read-only (null)*	An indication of whether this attribute is hidden in user interfaces. • This property shall indicate whether this attribute is hidden in user interfaces. The evaluation results of the Dependencies array may affect the hidden state of an attribute.
Immutable	boolean	*read-only (null)*	An indication of whether this attribute is immutable. Immutable attributes shall not be modified and typically reflect a hardware state. • This property shall indicate whether this attribute is immutable. Immutable attributes shall not be modified and typically reflect a hardware state.
IsSystemUniqueProperty	boolean	*read-only (null)*	An indication of whether this attribute is unique for this system and should not be replicated. • This property shall indicate whether this attribute is unique.
LowerBound	integer	*read-only (null)*	The lower limit for an integer attribute. • This property shall contain a number indicating the lower limit for an integer attribute.
MaxLength	integer	*read-only (null)*	The maximum character length of a string attribute. • This numeric property shall contain the maximum character length of an attribute of the String type.
MenuPath	string	*read-only (null)*	The path that describes the menu hierarchy of this attribute. • This property shall contain the menu hierarchy of this attribute, in the form of a path to the menu names. It shall start with `./` to indicate the root menu, followed by the menu names with `/` characters to delineate the menu traversal. Pattern: `^\.\/([^/]+(\/[^/]+)*)?$`

Property	Type	Attributes	Notes
MinLength	integer	*read-only (null)*	The minimum character length of the string attribute. • This property shall contain a number indicating the minimum character length of an attribute of the String type.
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
ReadOnly	boolean	*read-only (null)*	An indication of whether this attribute is read-only. A read-only attribute cannot be modified, and should be grayed out in user interfaces. • This property shall indicate whether this attribute is read-only. A read-only attribute cannot be modified, and should be grayed out in user interfaces. The evaluation results of the Dependencies array may affect the read-only state of an attribute.
ResetRequired *(v1.2+)*	boolean	*read-only (null)*	An indication of whether a system or device reset is required for this attribute value change to take effect. • This property shall indicate whether a system or device reset is required for this attribute value change to take effect.
ScalarIncrement	integer	*read-only (null)*	The amount to increment or decrement an integer attribute each time a user requests a value change. The `0` value indicates a free-form numeric user-input attribute. • This property shall contain a number indicating the amount to increment or decrement an integer attribute each time a user requests a value change. The `0` value indicates a free-form numeric user-input attribute.
Type	string (enum)	*read-only*	The attribute type. • This property shall contain an enumeration that describes the attribute type. *For the possible property values, see Type in Property details.*
UefiDevicePath *(v1.2+)*	string	*read-only (null)*	The UEFI device path that qualifies this attribute. • This property shall contain the UEFI Specification-defined UEFI device path that qualifies and locates this device for this attribute.
UefiKeywordName *(v1.2+)*	string	*read-only*	The UEFI keyword string for this attribute. • This property shall contain the UEFI Specification-defined keyword for this attribute.

Property	Type	Attributes	Notes
UefiNamespaceId *(v1.2+)*	string	*read-only*	The UEFI namespace ID for the attribute. • This property shall contain the UEFI Specification-defined namespace ID for this attribute.
UpperBound	integer	*read-only (null)*	The upper limit for an integer attribute. • This property shall contain a number indicating the upper limit for an integer attribute.
Value [{	array		An array of the possible values for enumerated attribute values. • This property shall contain an array containing the possible values of an attribute of the Enumeration type.
ValueDisplayName	string	*read-only (null)*	A user-readable display string of the value for the attribute in the defined language. • This property shall contain a string representing the user-readable display string of the value for the attribute in the defined language.
ValueName	string	*read-only required*	The unique value name for the attribute. • This property shall contain a string representing the value name for the attribute. ValueName is a unique string within the list of possible values in the Value array for an attribute.
}]			
ValueExpression	string	*read-only (null)*	A valid regular expression, according to the Perl regular expression dialect, that validates the attribute value. Applies to only string and integer attributes. • This property shall contain a valid regular expression, according to the Perl regular expression dialect, that validates the attribute value. Applies to only string and integer attributes.
WarningText	string	*read-only (null)*	The warning text for the attribute. • This property shall contain the warning text for the attribute.
WriteOnly	boolean	*read-only (null)*	An indication of whether this attribute is write-only. A write-only attribute reverts to its initial value after settings are applied. • This property shall indicate whether this attribute is write-only. A write-only attribute reverts to its initial value after settings are applied.
}]			

Property	Type	Attributes	Notes
Dependencies [{	array		An array of dependencies of attributes on this component. • This property shall contain an array containing a list of dependencies of attributes on this component.
Dependency {	object		The dependency expression for one or more attributes in this attribute registry. • This property shall contain the dependency expression for one or more attributes in this attribute registry.
MapFrom [{	array		An array of the map-from conditions for a mapping dependency. • This property shall contain an array containing the map-from conditions for a dependency of the Map type.
MapFromAttribute	string	*read-only*	The attribute to use to evaluate this dependency expression. • This property shall contain the AttributeName for the attribute to use to evaluate this dependency expression term. Pattern: `^[A-Za-z][A-Za-z0-9_]+$`
MapFromCondition	string (enum)	*read-only*	The condition to use to evaluate this dependency expression. • This property shall contain the condition to use to evaluate this dependency expression. For example, `EQU` or `NEQ`. *For the possible property values, see MapFromCondition in Property details.*
MapFromProperty	string (enum)	*read-only*	The metadata property for the attribute that the MapFromAttribute property specifies to use to evaluate this dependency expression. • This property shall contain the metadata property for the attribute that the MapFromAttribute property specifies to use to evaluate this dependency expression. For example, this value could be the MapFromAttribute CurrentValue, or ReadOnly state. *For the possible property values, see MapFromProperty in Property details.*
MapFromValue	string, boolean, number	*read-only (null)*	The value to use to evaluate this dependency expression. • The value that the property in MapFromProperty in the attribute in MapFromAttribute to use to evaluate this dependency expression.

Property	Type	Attributes	Notes
MapTerms	string (enum)	*read-only*	The logical term that combines two or more map-from conditions in this dependency expression. For example, `AND` for logical AND, or `OR` for logical OR. • This property shall contain the logical term that combines two or more MapFrom conditions in this dependency expression. For example, `AND` for logical AND, or `OR` for logical OR. If multiple logical terms are present in a dependency expression, they should be evaluated in array order, meaning they are evaluated left-to-right when displayed as a logic expression. *For the possible property values, see MapTerms in Property details.*
`}]`			
MapToAttribute	string	*read-only*	The AttributeName of the attribute that is affected by this dependency expression. • This property shall contain the AttributeName of the attribute that is affected by this dependency expression. Pattern: `^[A-Za-z][A-Za-z0-9_]+$`
MapToProperty	string (enum)	*read-only*	The metadata property for the attribute that contains the map-from condition that evaluates this dependency expression. • This property shall contain the metadata property for the attribute that the MapFromAttribute property specifies that evaluates this dependency expression. For example, this value could be the MapFromAttribute CurrentValue or ReadOnly state. *For the possible property values, see MapToProperty in Property details.*
MapToValue	string, boolean, number	*read-only* *(null)*	The value that the map-to property changes to if the dependency expression evaluates to `true`. • The value that the property in MapToProperty in the attribute specified in MapToAttribute changes to if the dependency expression evaluates to `true`.
`}`			
DependencyFor	string	*read-only*	The AttributeName of the attribute whose change triggers the evaluation of this dependency expression. • This property shall contain the AttributeName of the attribute whose change triggers the evaluation of this dependency expression. Pattern: `^[A-Za-z][A-Za-z0-9_]+$`

Property	Type	Attributes	Notes
Type	string (enum)	*read-only*	The type of the dependency structure. • This property shall contain an enumeration that describes the type for the attribute dependency. *For the possible property values, see Type in Property details.*
}]			
Menus [{	array		An array for the attributes menus and their hierarchy in the attribute registry. • This property shall contain an array containing the attributes menus and their hierarchy in the attribute registry.
DisplayName	string	*read-only (null)*	The user-readable display string of this menu in the defined language. • This property shall contain the user-readable display string of the menu in the defined language.
DisplayOrder	integer	*read-only (null)*	The ascending order, as a number, in which this menu appears relative to other menus. • This property shall contain the ascending order, as a number, in which this menu appears relative to other menus.
GrayOut	boolean	*read-only (null)*	An indication of whether this menu is grayed out. A grayed-only menu is not accessible in user interfaces. • This property shall indicate whether this menu is grayed out. A grayed-only menu is not accessible in user interfaces.
Hidden *(v1.3+)*	boolean	*read-only (null)*	An indication of whether this menu is hidden in user interfaces. • This property shall indicate whether this menu is hidden in user interfaces. The evaluation results of the Dependencies array may affect the hidden state of a menu.
MenuName	string	*read-only*	The unique name string of this menu. • This property shall contain the name of this menu that is unique in this attribute registry. Pattern: `^[^/]+$`

Property	Type	Attributes	Notes
MenuPath	string	*read-only (null)*	The path to the menu names that describes this menu hierarchy relative to other menus. • This property shall contain the menu hierarchy of this menu, in the form of a path to the menu names. It shall start with `./` to indicate the root menu, followed by the menu names with `/` characters to delineate the menu traversal. Pattern: `^\.\/([^/]+(\/[^/]+)*)?$`
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
ReadOnly	boolean	*read-only (null)*	An indication of whether this menu is read-only. A read-only menu, its properties, and sub-menus are not accessible in user interfaces. • This property shall indicate whether this menu is read-only. A read-only menu is not accessible in user interfaces, and all properties contained in that menu and its sub-menus are read-only.
}]			
}			
RegistryVersion	string	*read-only required*	The attribute registry version. • This property shall contain the version of this attribute registry. Pattern: `^\d+\.\d+\.\d+$`
SupportedSystems [{	array		An array of systems that this attribute registry supports. • This property shall contain an array containing a list of systems that this attribute registry supports.
FirmwareVersion *(v1.1+)*	string	*read-only (null)*	Firmware version. • The version of the component firmware image to which this attribute registry applies.
ProductName	string	*read-only (null)*	The product name of the computer system to which this attribute registry applies. • This property shall contain the product name of the computer system to which this attribute registry applies.
SystemId	string	*read-only (null)*	The ID of the systems to which this attribute registry applies. • This property shall contain the system ID that identifies the systems to which this attribute registry applies. This can be identified by one or more properties in the computer system resource, such as Model, SubModel, or SKU. Pattern: `^[A-Za-z0-9]+$`

Property	Type	Attributes	Notes
`}]`			

6.10.3 Property details

6.10.3.1 MapFromCondition:

The condition to use to evaluate this dependency expression.

- This property shall contain the condition to use to evaluate this dependency expression. For example, `EQU` or `NEQ`.

string	Description
EQU	The logical operation for 'Equal'.
GEQ	The logical operation for 'Greater than or Equal'.
GTR	The logical operation for 'Greater than'.
LEQ	The logical operation for 'Less than or Equal'.
LSS	The logical operation for 'Less than'.
NEQ	The logical operation for 'Not Equal'.

6.10.3.2 MapFromProperty:

The metadata property for the attribute that the MapFromAttribute property specifies to use to evaluate this dependency expression.

- This property shall contain the metadata property for the attribute that the MapFromAttribute property specifies to use to evaluate this dependency expression. For example, this value could be the MapFromAttribute CurrentValue, or ReadOnly state.

string	Description
CurrentValue	The dependency on an attribute's CurrentValue.
DefaultValue	The dependency on an attribute's DefaultValue.
GrayOut	The dependency on an attribute's GrayOut state.

string	Description
Hidden	The dependency on an attribute's Hidden state.
LowerBound	The dependency on an attribute's LowerBound.
MaxLength	The dependency on an attribute's MaxLength.
MinLength	The dependency on an attribute's MinLength.
ReadOnly	The dependency on an attribute's ReadOnly state.
ScalarIncrement	The dependency on an attribute's ScalarIncrement.
UpperBound	The dependency on an attribute's UpperBound.
WriteOnly	The dependency on an attribute's WriteOnly state.

6.10.3.3 MapTerms:

The logical term that combines two or more map-from conditions in this dependency expression. For example, `AND` for logical AND, or `OR` for logical OR.

- This property shall contain the logical term that combines two or more MapFrom conditions in this dependency expression. For example, `AND` for logical AND, or `OR` for logical OR. If multiple logical terms are present in a dependency expression, they should be evaluated in array order, meaning they are evaluated left-to-right when displayed as a logic expression.

string	Description
AND	The operation used for logical 'AND' of dependency terms.
OR	The operation used for logical 'OR' of dependency terms.

6.10.3.4 MapToProperty:

The metadata property for the attribute that contains the map-from condition that evaluates this dependency expression.

- This property shall contain the metadata property for the attribute that the MapFromAttribute property specifies that evaluates this dependency expression. For example, this value could be the MapFromAttribute CurrentValue or ReadOnly state.

string	Description
CurrentValue	The dependency that affects an attribute's CurrentValue.
DefaultValue	The dependency that affects an attribute's DefaultValue.
DisplayName	The dependency that affects an attribute's DisplayName.
DisplayOrder	The dependency that affects an attribute's DisplayName.
GrayOut	The dependency that affects an attribute's GrayOut state.
HelpText	The dependency that affects an attribute's HelpText.
Hidden	The dependency that affects an attribute's Hidden state.
Immutable	The dependency that affects an attribute's Immutable state.
LowerBound	The dependency that affects an attribute's LowerBound.
MaxLength	The dependency that affects an attribute's MaxLength.
MinLength	The dependency that affects an attribute's MinLength.
ReadOnly	The dependency that affects an attribute's ReadOnly state.
ScalarIncrement	The dependency that affects an attribute's ScalarIncrement.
UpperBound	The dependency that affects an attribute's UpperBound.
ValueExpression	The dependency that affects an attribute's ValueExpression.
WarningText	The dependency that affects an attribute's WarningText.
WriteOnly	The dependency that affects an attribute's WriteOnly state.

6.10.3.5 Type:

6.10.3.5.1 In RegistryEntries: Attributes:

The attribute type.

- This property shall contain an enumeration that describes the attribute type.

string	Description
Boolean	A flag with a `true` or `false` value.
Enumeration	A list of the known possible enumerated values.

string	Description
Integer	An integer value.
Password	Password values that do not appear as plain text. The value shall be null in responses.
String	Free-form text in their values.

6.10.3.5.2 In RegistryEntries: Dependencies:

The type of the dependency structure.

- This property shall contain an enumeration that describes the type for the attribute dependency.

string	Description
Map	A simple mapping dependency. If the condition evaluates to `true`, the attribute or state changes to the mapped value.

6.10.4 Example response


```
{
    "@odata.type": "#AttributeRegistry.v1_3_6.AttributeRegistry",
    "Description": "This registry defines a representation of BIOS Attribute instances",
    "Id": "BiosAttributeRegistryG9000.v1_0_0",
    "Language": "en",
    "Name": "G9000 BIOS Attribute Registry",
    "OwningEntity": "Contoso",
    "RegistryVersion": "1.0.0",
    "SupportedSystems": [
        {
            "ProductName": "Contoso Server GLH9000",
            "SystemId": "G9000",
            "FirmwareVersion": "v1.00 (06/02/2014)"
        }
    ],
    "RegistryEntries": {
        "Attributes": [
            {
                "CurrentValue": null,
                "DisplayName": "Embedded NIC 1 Boot",
                "DisplayOrder": 5,
                "HelpText": "Select this option to enable network boot (PXE, iSCSI, or FCoE) for the selected NIC. You may nee
                "MenuPath": "./SystemOptions/NetworkBootOptions",
                "AttributeName": "NicBoot1",
```

```
            "ReadOnly": false,
            "Hidden": false,
            "Type": "Enumeration",
            "Value": [
                {
                    "ValueDisplayName": "Network Boot",
                    "ValueName": "NetworkBoot"
                },
                {
                    "ValueDisplayName": "Disabled",
                    "ValueName": "Disabled"
                }
            ],
            "WarningText": "Important: When enabling network boot support for an embedded NIC, the NIC boot option does no
        },
        {
            "CurrentValue": null,
            "DisplayName": "Embedded SATA Configuration",
            "DisplayOrder": 74,
            "HelpText": "Important: Select this option to configure the embedded chipset SATA controller.",
            "MenuPath": "./SystemOptions/SataOptions",
            "AttributeName": "EmbeddedSata",
            "ReadOnly": false,
            "Hidden": false,
            "Type": "Enumeration",
            "Value": [
                {
                    "ValueDisplayName": "Enable SATA AHCI Support",
                    "ValueName": "Ahci"
                },
                {
                    "ValueDisplayName": "Enable Software RAID Support",
                    "ValueName": "Raid"
                }
            ],
            "WarningText": "Important: Software RAID is not supported when the Boot Mode is configured in Legacy BIOS Mode
        }
    ],
    "Dependencies": [
        {
            "Dependency": {
                "MapFrom": [
                    {
                        "MapFromAttribute": "BootMode",
                        "MapFromCondition": "EQU",
                        "MapFromProperty": "CurrentValue",
                        "MapFromValue": "LegacyBios"
                    }
                ],
                "MapToAttribute": "EmbeddedSata",
```

```
                    "MapToProperty": "ReadOnly",
                    "MapToValue": true
                },
                "DependencyFor": "EmbeddedSata",
                "Type": "Map"
            }
        ],
        "Menus": [
            {
                "DisplayName": "BIOS Configuration",
                "DisplayOrder": 1,
                "MenuPath": "./",
                "MenuName": "BiosMainMenu",
                "Hidden": false,
                "ReadOnly": false
            },
            {
                "DisplayName": "System Options",
                "DisplayOrder": 2,
                "MenuPath": "./SystemOptions",
                "MenuName": "SystemOptions",
                "Hidden": false,
                "ReadOnly": false
            }
        ]
    }
}
```


6.11 Battery 1.2.0

Version	*v1.2*	*v1.1*
Release	2022.2	2021.2

6.11.1 Description

The Battery schema describes a battery unit, such as those used to provide systems with power during a power loss event.

- This resource shall represent a battery for a Redfish implementation.

6.11.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/Batteries/*{BatteryId}*

6.11.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this battery. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
CapacityActualAmpHours	number (A.h)	*read-only* *(null)*	The actual maximum capacity of this battery in amp-hours. • This property shall contain the actual maximum capacity of this battery in amp-hours.
CapacityActualWattHours	number (W.h)	*read-only* *(null)*	The actual maximum capacity of this battery in watt-hours. • This property shall contain the actual maximum capacity of this battery in watt-hours.
CapacityRatedAmpHours	number (A.h)	*read-only* *(null)*	The rated maximum capacity of this battery in amp-hours. • This property shall contain the rated maximum capacity of this battery in amp-hours.
CapacityRatedWattHours	number (W.h)	*read-only* *(null)*	The rated maximum capacity of this battery in watt-hours. • This property shall contain the rated maximum capacity of this battery in watt-hours.
ChargeState	string (enum)	*read-only* *(null)*	The charge state of this battery. • This property shall contain the charge state of this battery. *For the possible property values, see ChargeState in Property details.*
FirmwareVersion	string	*read-only* *(null)*	The firmware version for this battery. • This property shall contain the firmware version as defined by the manufacturer for this battery.

Property	Type	Attributes	Notes
HotPluggable	boolean	*read-only* *(null)*	An indication of whether this device can be inserted or removed while the equipment is in operation. • This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Devices indicated as hot-pluggable shall allow the device to become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot-pluggable.
Links *(v1.1+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Memory *(v1.1+)* [{	array		An array of links to the memory devices to which this battery provides power during a power loss event. • This property shall contain an array of links to resources of type Memory that represent the memory devices to which this battery provides power during a power loss event, such as battery-backed NVDIMMs. This property shall not be present if the battery powers the containing chassis as a whole rather than individual components in a chassis.
@odata.id	string	*read-only*	Link to a Memory resource. See the Links section and the *Memory* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
StorageControllers *(v1.1+)* [{	array		An array of links to the storage controllers to which this battery provides power during a power loss event. • This property shall contain an array of links to resources of type StorageController that represent the storage controllers to which this battery provides power during a power loss event, such as battery-backed RAID controllers. This property shall not be present if the battery powers the containing chassis as a whole rather than individual components in a chassis.
@odata.id	string	*read-only*	Link to a StorageController resource. See the Links section and the *StorageController* schema for details.
}]			
}			

Property	Type	Attributes	Notes
Location {}	object		The location of the battery. • This property shall contain location information of this battery. For property details, see Location.
LocationIndicatorActive	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	*read-only (null)*	The manufacturer of this battery. • This property shall contain the name of the organization responsible for producing the battery. This organization may be the entity from whom the battery is purchased, but this is not necessarily true.
MaxChargeRateAmps	number (A)	*read-only (null)*	The maximum charge rate of this battery in amps. • This property shall contain the maximum charge rate of this battery in amps.
MaxChargeVoltage	number (Volts)	*read-only (null)*	The maximum charge voltage of this battery. • This property shall contain the maximum charge voltage of this battery.
MaxDischargeRateAmps	number (A)	*read-only (null)*	The maximum discharge rate of this battery in amps. • This property shall contain the maximum discharge rate of this battery in amps.
Metrics {	object		The link to the battery metrics resource associated with this battery. • This property shall contain a link to a resource of type BatteryMetrics. See the *BatteryMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a BatteryMetrics resource. See the Links section and the *BatteryMetrics* schema for details.
}			
Model	string	*read-only (null)*	The model number for this battery. • This property shall contain the model information as defined by the manufacturer for this battery.
PartNumber	string	*read-only (null)*	The part number for this battery. • This property shall contain the part number as defined by the manufacturer for this battery.

Property	Type	Attributes	Notes
ProductionDate	string (date-time)	*read-only (null)*	The production or manufacturing date of this battery. • This property shall contain the date of production or manufacture for this battery.
Replaceable *(v1.2+)*	boolean	*read-only (null)*	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. • This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of `false` indicates the component needs to be replaced by policy, as part of another component. If the `LocationType` property of this component contains `Embedded`, this property shall contain `false`.
SerialNumber	string	*read-only (null)*	The serial number for this battery. • This property shall contain the serial number as defined by the manufacturer for this battery.
SparePartNumber	string	*read-only (null)*	The spare part number for this battery. • This property shall contain the spare or replacement part number as defined by the manufacturer for this battery.
StateOfHealthPercent {	object (excerpt)		The state of health (percent) of this battery. • This property shall contain the state of health, in percent units, of this battery. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Percent`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
Version	string	*read-only (null)*	The hardware version of this battery. • This property shall contain the hardware version of this battery as determined by the vendor or supplier.

6.11.4 Actions

6.11.4.1 Calibrate

Description

This action performs a self-calibration, or learn cycle, of the battery.

- This action shall perform a self-calibration, or learn cycle, of the battery.

Action URI: {Base URI of target resource}/Actions/Battery.Calibrate

Action parameters

This action takes no parameters.

6.11.4.2 Reset

Description

This action resets the battery.

- This action shall reset the battery.

Action URI: {Base URI of target resource}/Actions/Battery.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a `GracefulRestart`. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "PowerCycle"
}
```

6.11.4.3 SelfTest

Description

This action performs a self-test of the battery.

- This action shall perform a self-test of the battery.

Action URI: {Base URI of target resource}/Actions/Battery.SelfTest

Action parameters

This action takes no parameters.

6.11.5 Property details

6.11.5.1 ChargeState:

The charge state of this battery.

- This property shall contain the charge state of this battery.

string	Description
Charging	The battery is charging. • This value shall indicate the battery is charging and energy is entering the battery.
Discharging	The battery is discharging. • This value shall indicate the battery is discharging and energy is leaving the battery.
Idle	The battery is idle. • This value shall indicate the battery is idle and energy is not entering or leaving the battery. Small amounts of energy may enter or leave the battery while in this state if the battery is regulating itself.

6.11.5.2 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a `GracefulRestart`.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.

string	Description
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.11.6 Example response

```
{
    "@odata.type": "#Battery.v1_2_0.Battery",
    "Id": "Module1",
    "Name": "Battery 1",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Actions": {
        "#Battery.SelfTest": {
```

```
            "target": "/redfish/v1/Chassis/1U/PowerSubsystem/Batteries/Module1/Actions/Battery.SelfTest"
        },
        "#Battery.Calibrate": {
            "target": "/redfish/v1/Chassis/1U/PowerSubsystem/Batteries/Module1/Actions/Battery.Calibrate"
        }
    },
    "Location": {
        "PartLocation": {
            "ServiceLabel": "Battery 1",
            "LocationType": "Bay",
            "LocationOrdinalValue": 0
        }
    },
    "Model": "RKS-440DC",
    "Manufacturer": "Contoso Power",
    "FirmwareVersion": "1.00",
    "Version": "A05",
    "ProductionDate": "2019-10-01T06:00:00Z",
    "SerialNumber": "3488247",
    "PartNumber": "23456-133",
    "SparePartNumber": "93284-133",
    "LocationIndicatorActive": false,
    "HotPluggable": true,
    "CapacityRatedWattHours": 20,
    "CapacityActualWattHours": 19.41,
    "MaxDischargeRateAmps": 10,
    "StateOfHealthPercent": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1StateOfHealth",
        "Reading": 91
    },
    "ChargeState": "Idle",
    "Metrics": {
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/Batteries/Module1/Metrics"
    },
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/Batteries/Module1"
}
```


6.12 BatteryMetrics 1.0.1

Version	*v1.0*
Release	2021.2

6.12.1 Description

The BatteryMetrics schema contains definitions for the metrics of a battery unit.

- This resource shall be used to represent the metrics of a battery unit for a Redfish implementation.

6.12.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/Batteries/*{BatteryId}*/Metrics

6.12.3 Properties

Property	Type	Attributes	Notes
CellVoltages [{	array (excerpt)		The cell voltages (V) for this battery. • This property shall contain the cell voltages, in volt units, for this battery. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
}]			
ChargePercent {}	object		The amount of charge available (percent) in this battery. • This property shall contain the amount of charge available, in percent units, in this battery. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Percent`. For more information about this property, see SensorExcerpt in Property Details.

Property	Type	Attributes	Notes
DischargeCycles	number	*read-only* *(null)*	The number of discharges this battery sustained. • This property shall contain the number of discharges this battery sustained.
InputCurrentAmps {	object (excerpt)		The input current (A) for this battery. • This property shall contain the input current, in ampere units, for this battery. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
CrestFactor *(v1.1+)*	number	*read-only* *(null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only* *(null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only* *(null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
}			
InputVoltage {	object (excerpt)		The input voltage (V) for this battery. • This property shall contain the input voltage, in volt units, for this battery. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
CrestFactor *(v1.1+)*	number	*read-only* *(null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
}			
OutputCurrentAmps [{	array (excerpt)		The output currents (A) for this battery. • This property shall contain the output currents, in ampere units, for this battery. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. The sensors shall appear in the same array order as the OutputVoltages property. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
}]			

Property	Type	Attributes	Notes
OutputVoltages [{	array (excerpt)		The output voltages (V) for this battery. • This property shall contain the output voltages, in volt units, for this battery. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. The sensors shall appear in the same array order as the OutputCurrentAmps property. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
}]			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
StoredChargeAmpHours {}	object		The charge (Ah) stored in this battery. • This property shall contain the stored charge, in ampere-hours units, for this battery. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `ChargeAh`. For more information about this property, see SensorExcerpt in Property Details.

Property	Type	Attributes	Notes
StoredEnergyWattHours {}	object		The energy (Wh) stored in this battery. • This property shall contain the stored energy, in watt-hour units, for this battery. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergyWh`. For more information about this property, see SensorExcerpt in Property Details.
TemperatureCelsius {}	object		The temperature (C) for this battery. • This property shall contain the temperature, in degrees Celsius units, for this battery. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Temperature`. For more information about this property, see SensorExcerpt in Property Details.

6.12.4 Property details

6.12.4.1 SensorExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.

6.12.5 Example response

```
{
    "@odata.type": "#BatteryMetrics.v1_0_1.BatteryMetrics",
    "Id": "Metrics",
    "Name": "Metrics for Battery 1",
    "DischargeCycles": 8.67,
    "InputVoltage": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1InputVoltage",
        "Reading": 12.22
```

```
    },
    "InputCurrentAmps": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1InputCurrent",
        "Reading": 0
    },
    "OutputVoltages": [
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1OutputVoltage",
            "Reading": 12.22
        }
    ],
    "OutputCurrentAmps": [
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1OutputCurrent",
            "Reading": 0
        }
    ],
    "StoredEnergyWattHours": {
        "Reading": 19.41
    },
    "TemperatureCelsius": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/Battery1Temp",
        "Reading": 33
    },
    "ChargePercent": {
        "Reading": 100
    },
    "CellVoltages": [
        {
            "Reading": 3.44
        },
        {
            "Reading": 3.45
        },
        {
            "Reading": 3.43
        },
        {
            "Reading": 3.43
        },
        {
            "Reading": 3.45
        },
        {
            "Reading": 3.44
        },
        {
            "Reading": 3.43
        },
        {
```

```
            "Reading": 3.44
        }
    ],
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/Batteries/Module1/Metrics"
}
```


6.13 Bios 1.2.0

Version	*v1.2*	*v1.1*	*v1.0*
Release	2021.1	2019.2	2016.1

6.13.1 Description

The Bios schema contains properties related to the BIOS attribute registry. The attribute registry describes the system-specific BIOS attributes and actions for changing to BIOS settings. Changes to the BIOS typically require a system reset before they take effect. It is likely that a client finds the `@Redfish.Settings` term in this resource, and if it is found, the client makes requests to change BIOS settings by modifying the resource identified by the `@Redfish.Settings` term.

- This resource shall represent BIOS attributes for a Redfish implementation.

6.13.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Bios
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Bios
/redfish/v1/Systems/*{ComputerSystemId}*/Bios

6.13.3 Properties

Property	Type	Attributes	Notes
AttributeRegistry	string	*read-only (null)*	The resource ID of the attribute registry that has the system-specific information about a BIOS resource. • The link to the attribute registry that lists the metadata describing the BIOS attribute settings in this resource.

Property	Type	Attributes	Notes
Attributes {	object		The list of BIOS attributes specific to the manufacturer or provider. • This property shall contain the list of BIOS attributes specific to the manufacturer or provider. BIOS attribute settings appear as additional properties in this object, and can be looked up in the attribute registry by their AttributeName.
(pattern)	string, boolean, number	*read-write (null)*	Property names follow regular expression pattern "^[A-Za-z][A-Za-z0-9_]+$"
}			
Links *(v1.1+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ActiveSoftwareImage *(v1.1+)* {	object		The link to the software inventory that represents the active BIOS firmware image. • This property shall contain a link a resource of type SoftwareInventory that represents the active BIOS firmware image. See the *SoftwareInventory* schema for details on this property.
@odata.id	string	*read-write*	Link to a SoftwareInventory resource. See the Links section and the *SoftwareInventory* schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
SoftwareImages *(v1.1+)* [{	array		The images that are associated with this BIOS. • This property shall contain an array of links to resources of type SoftwareInventory that represent the firmware images that apply to this BIOS.
@odata.id	string	*read-only*	Link to a SoftwareInventory resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
}			

Property	Type	Attributes	Notes
ResetBiosToDefaultsPending *(v1.2+)*	boolean	*read-only* *(null)*	An indication of whether there is a pending request to reset the BIOS attributes to default values. • This property shall indicate whether there is a pending request to reset the BIOS attributes to default values. A successful completion of the ResetBios action shall set this property to `true`. Applying the default attribute values to this resource shall set this property to `false`. Services may reject modification requests to the settings resource if this property contains `true`.

6.13.4 Actions

6.13.4.1 ChangePassword

Description

This action changes a BIOS password.

- This action shall change the selected BIOS password.

Action URI: {Base URI of target resource}/Actions/Bios.ChangePassword

Action parameters

Parameter Name	Type	Attributes	Notes
NewPassword	string	*required*	The new BIOS password. • This parameter shall contain the new BIOS password.
OldPassword	string	*required*	The existing BIOS password. • This parameter shall contain the existing BIOS password to change.
PasswordName	string	*required*	The name of the BIOS password to change. • This parameter shall contain the name of the BIOS password to change. For instance, AdminPassword or UserPassword.

Request Example

```
{
```

```
    "OldPassword": "secret123",
    "NewPassword": "B3tterS3cur1tY!",
    "PasswordName": "Admin"
}
```

6.13.4.2 ResetBios

Description

This action resets the BIOS attributes to default.

- This action shall reset the BIOS attributes to their default values. To apply the default values, a system reset may be required. This action can impact other resources. This action may clear pending values in the settings resource.

Action URI: {Base URI of target resource}/Actions/Bios.ResetBios

Action parameters

This action takes no parameters.

6.13.5 Example response

```
{
    "@odata.type": "#Bios.v1_2_0.Bios",
    "Id": "BIOS",
    "Name": "BIOS Configuration Current Settings",
    "AttributeRegistry": "BiosAttributeRegistryP89.v1_0_0",
    "Attributes": {
        "AdminPhone": "",
        "BootMode": "Uefi",
        "EmbeddedSata": "Raid",
        "NicBoot1": "NetworkBoot",
        "NicBoot2": "Disabled",
        "PowerProfile": "MaxPerf",
        "ProcCoreDisable": 0,
        "ProcHyperthreading": "Enabled",
        "ProcTurboMode": "Enabled",
        "UsbControl": "UsbEnabled"
    },
    "@Redfish.Settings": {
        "@odata.type": "#Settings.v1_3_5.Settings",
        "ETag": "9234ac83b9700123cc32",
        "Messages": [
```

```
            {
                "MessageId": "Base.1.0.SettingsFailed",
                "RelatedProperties": [
                    "#/Attributes/ProcTurboMode"
                ]
            }
        ],
        "SettingsObject": {
            "@odata.id": "/redfish/v1/Systems/437XR1138R2/Bios/Settings"
        },
        "Time": "2016-03-07T14:44.30-05:00"
    },
    "Actions": {
        "#Bios.ResetBios": {
            "target": "/redfish/v1/Systems/437XR1138R2/Bios/Actions/Bios.ResetBios"
        },
        "#Bios.ChangePassword": {
            "target": "/redfish/v1/Systems/437XR1138R2/Bios/Actions/Bios.ChangePassword"
        }
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Bios"
}
```


6.14 BootOption 1.0.4

Version	*v1.0*
Release	2017.3

6.14.1 Description

The BootOption schema reports information about a single boot option in a system. It represents the properties of a bootable device available in the system.

- This resource shall represent a single boot option within a system.

6.14.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/BootOptions/*{BootOptionId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/BootOptions/*{BootOptionId}*
/redfish/v1/Systems/*{ComputerSystemId}*/BootOptions/*{BootOptionId}*

6.14.3 Properties

Property	Type	Attributes	Notes
Alias	string (enum)	*read-only* *(null)*	The alias of this boot source. • This property shall contain the string alias of this boot source that describes the type of boot. *For the possible property values, see Alias in Property details.*
BootOptionEnabled	boolean	*read-write* *(null)*	An indication of whether the boot option is enabled. If `true`, it is enabled. If `false`, the boot option that the boot order array on the computer system contains is skipped. In the UEFI context, this property shall influence the load option active flag for the boot option. • This property shall indicate whether the boot option is enabled. If `true`, it is enabled. If `false`, the boot option that the boot order array on the computer system contains shall be skipped. In the UEFI context, this property shall influence the load option active flag for the boot option.
BootOptionReference	string	*read-only* *required* *(null)*	The unique boot option. • This property shall correspond to the boot option or device. For UEFI systems, this string shall match the UEFI boot option variable name, such as `Boot####`. The BootOrder array of a computer system resource contains this value.
DisplayName	string	*read-only* *(null)*	The user-readable display name of the boot option that appears in the boot order list in the user interface. • This property shall contain a user-readable boot option name, as it should appear in the boot order list in the user interface.
RelatedItem [{	array		An array of links to resources or objects associated with this boot option. • This property shall contain an array of links to resources or objects that are associated with this boot option.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
UefiDevicePath	string	*read-only* *(null)*	The UEFI device path to access this UEFI boot option. • This property shall contain the UEFI Specification-defined UEFI device path that identifies and locates the device for this boot option.

6.14.4 Property details

6.14.4.1 Alias:

The alias of this boot source.

- This property shall contain the string alias of this boot source that describes the type of boot.

string	Description
BiosSetup	Boot to the BIOS setup utility.
Cd	Boot from the CD or DVD.
Diags	Boot to the manufacturer's diagnostics program.
Floppy	Boot from the floppy disk drive.
Hdd	Boot from a hard drive.
None	Boot from the normal boot device.
Pxe	Boot from the Pre-Boot EXecution (PXE) environment.
Recovery	Boot to a system-designated recovery process or image.
RemoteDrive	Boot from a remote drive, such as an iSCSI target.
SDCard	Boot from an SD card.
UefiBootNext	Boot to the UEFI device that the BootNext property specifies.
UefiHttp	Boot from a UEFI HTTP network location.
UefiShell	Boot to the UEFI Shell.
UefiTarget	Boot to the UEFI device specified in the UefiTargetBootSourceOverride property.
Usb	Boot from a system BIOS-specified USB device.
Utilities	Boot to the manufacturer's utilities program or programs.

6.14.5 Example response


```
{
    "@odata.type": "#BootOption.v1_0_4.BootOption",
    "Id": "1",
```

```
    "Name": "Boot Option",
    "Description": "UEFI Boot Option",
    "BootOptionReference": "Boot0000",
    "DisplayName": "Windows Boot Manager",
    "UefiDevicePath": "PciRoot(0x0)/Pci(0x1,0x0)/Pci(0x0,0x0)/Scsi(0x0,0x0)/HD(2,GPT,B02BF459-8975-4222-A1C4-17915C29E5E5,0x96
    "Alias": "Hdd",
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Systems/1/SimpleStorage/1"
        }
    ],
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/BootOptions/1"
}
```


6.15 Cable 1.2.0

Version	*v1.2*	*v1.1*	*v1.0*
Release	2021.4	2021.3	2021.2

6.15.1 Description

The Cable schema contains properties that describe a cable connecting endpoints of a chassis, port, or any other cable-compatible endpoint.

- This resource contains a simple cable for a Redfish implementation.

6.15.2 URIs

/redfish/v1/Cables/*{CableId}*

6.15.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this cable. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
AssetTag	string	*read-write (null)*	The user-assigned asset tag for this cable. • This property shall track the cable for inventory purposes.
CableClass	string (enum)	*read-write (null)*	The identifier for the downstream resource. • The property shall contain the cable class for this cable. *For the possible property values, see CableClass in Property details.*
CableStatus	string (enum)	*read-write*	The user-reported status of this resource. • This property shall contain the user-reported status of this resource. *For the possible property values, see CableStatus in Property details.*
CableType	string	*read-write (null)*	The type of this cable. • This property shall contain a user-defined type for this cable.
DownstreamConnectorTypes [ ]	array (string (enum))	*read-write*	• The connector types this cable supports. ◦ The property shall contain an array of connector types this cable supports. *For the possible property values, see DownstreamConnectorTypes in Property details.*
DownstreamName	string	*read-write (null)*	The identifier for the downstream resource. • This property shall contain any identifier for a downstream resource.
LengthMeters	number	*read-write (null)*	The length of the cable in meters. • This property shall contain the length of the cable in meters.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
DownstreamChassis [{	array		An array of links to the downstream chassis connected to this cable. • This property shall contain an array of links to resources of type Chassis that represent the physical downstream containers connected to this cable.

Property	Type	Attributes	Notes
@odata.id	string	*read-write*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			
DownstreamPorts [{	array		An array of links to the downstream ports connected to this cable. • This property shall contain an array of links to resources of type Port that represent the physical downstream connections connected to this cable.
@odata.id	string	*read-write*	Link to a Port resource. See the Links section and the *Port* schema for details.
}]			
DownstreamResources [{	array		An array of links to the downstream resources connected to this cable. • This property shall contain an array of links to resources that represent the physical downstream connections connected to this cable. Even if the resource is already referenced in another property within Links, such as DownstreamPorts or DownstreamChassis, it shall also be referenced in this property.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
UpstreamChassis [{	array		An array of links to the upstream chassis connected to this cable. • This property shall contain an array of links to resources of type Chassis that represent the physical upstream containers connected to this cable.
@odata.id	string	*read-write*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			
UpstreamPorts [{	array		An array of links to the upstream ports connected to this cable. • This property shall contain an array of links to resources of type Port that represent the physical upstream connections connected to this cable.
@odata.id	string	*read-write*	Link to a Port resource. See the Links section and the *Port* schema for details.
}]			

Property	Type	Attributes	Notes
UpstreamResources [{	array		An array of links to the upstream resources connected to this cable. • This property shall contain an array of links to resources that represent the physical upstream connections connected to this cable. Even if the resource is already referenced in another property within Links, such as UpstreamPorts or UpstreamChassis, it shall also be referenced in this property.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
Location {}	object		The location of the assembly. • This property shall contain location information of the associated assembly. For property details, see Location.
Manufacturer	string	*read-write (null)*	The manufacturer of this cable. • This property shall contain the name of the organization responsible for producing the cable. This organization might be the entity from whom the cable is purchased, but this is not necessarily true.
Model	string	*read-write (null)*	The model number of the cable. • This property shall contain the name by which the manufacturer generally refers to the cable.
PartNumber	string	*read-write (null)*	The part number for this cable. • This property shall contain the part number assigned by the organization that is responsible for producing or manufacturing the cable.
SerialNumber	string	*read-write (null)*	The serial number for this cable. • This property shall contain the manufacturer-allocated number that identifies the cable.
SKU	string	*read-write (null)*	The SKU for this cable. • This property shall contain the stock-keeping unit (SKU) number for this cable.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
UpstreamConnectorTypes [ ]	array (string (enum))	*read-write*	• The connector types this cable supports. ◦ The property shall contain an array of connector types this cable supports. *For the possible property values, see UpstreamConnectorTypes in Property details.*
UpstreamName	string	*read-write (null)*	The identifier for the downstream resource. • This property shall contain any identifier for an upstream resource.
UserDescription	string	*read-write (null)*	The description of this cable. • This property shall contain a user-defined description for this cable.
UserLabel *(v1.1+)*	string	*read-write*	A user-assigned label. • This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
Vendor	string	*read-write (null)*	The manufacturer of this cable. • This property shall contain the name of the company that provides the final product that includes this cable.

6.15.4 Property details

6.15.4.1 CableClass:

The identifier for the downstream resource.

- The property shall contain the cable class for this cable.

string	Description
Fabric	This cable is used for connecting to a fabric.
Fan	This cable is used for connecting to a fan system.

string	Description
General	This cable is used for providing general connectivity.
Network	This cable is used for connecting to a networking system.
PCIe	This cable is used for connecting to a PCIe endpoint.
Power	This cable is used for connecting to a power system.
Serial	This cable is used for connecting to a serial endpoint.
Storage	This cable is used for connecting to a storage system.
USB	This cable is used for connecting to a USB endpoint.
Video	This cable is used for connecting to a video system.

6.15.4.2 CableStatus:

The user-reported status of this resource.

- This property shall contain the user-reported status of this resource.

string	Description
Degraded	The cable is degraded. • This value shall indicate the cable is degraded. The State property in Status shall contain the value `Enabled` and The Health property in Status shall contain the value `Warning`.
Disabled	The cable is disabled. • This value shall indicate the cable is disabled. The State property in Status shall contain the value `Disabled`.
Failed	The cable has failed. • This value shall indicate the cable has failed. The State property in Status shall contain the value `Enabled` and The Health property in Status shall contain the value `Critical`.
Normal	The cable is operating normally. • This value shall indicate the cable is operating normally. The State property in Status shall contain the value `Enabled` and The Health property in Status shall contain the value `OK`.

string	Description
SetByService	The cable status is set by the service. • This value shall indicate the status for the cable is not defined by the user. If implemented, the service shall determine the value of the State and Health properties in Status.
Testing	The cable is under test. • This value shall indicate the cable is under test. The State property in Status shall contain the value `InTest`.

6.15.4.3 DownstreamConnectorTypes:

- The connector types this cable supports.
  - The property shall contain an array of connector types this cable supports.

string	Description
ACPower	This cable connects to a AC power connector.
CDFP	This cable connects to a CDFP connector.
DB9	This cable connects to a DB9 connector.
DCPower	This cable connects to a DC power connector.
DisplayPort	This cable connects to a DisplayPort power connector.
HDMI	This cable connects to an HDMI connector.
ICI	This cable connects to an ICI connector.
IPASS	This cable connects to an IPASS connector.
OSFP	This cable connects to a OSFP connector.
PCIe	This cable connects to a PCIe connector.
Proprietary	This cable connects to a proprietary connector.
QSFP	This cable connects to a QSFP connector.
RJ45	This cable connects to an RJ45 connector.
SATA	This cable connects to a SATA connector.
SCSI	This cable connects to a SCSI connector.
SFP	This cable connects to a SFP connector.

string	Description
SFPPlus	This cable connects to a SFPPlus connector.
SlimSAS	This cable connects to a SlimSAS connector.
USBA	This cable connects to a USB-A connector.
USBC	This cable connects to a USB-C connector.

6.15.4.4 UpstreamConnectorTypes:

- The connector types this cable supports.
  - The property shall contain an array of connector types this cable supports.

string	Description
ACPower	This cable connects to a AC power connector.
CDFP	This cable connects to a CDFP connector.
DB9	This cable connects to a DB9 connector.
DCPower	This cable connects to a DC power connector.
DisplayPort	This cable connects to a DisplayPort power connector.
HDMI	This cable connects to an HDMI connector.
ICI	This cable connects to an ICI connector.
IPASS	This cable connects to an IPASS connector.
OSFP	This cable connects to a OSFP connector.
PCIe	This cable connects to a PCIe connector.
Proprietary	This cable connects to a proprietary connector.
QSFP	This cable connects to a QSFP connector.
RJ45	This cable connects to an RJ45 connector.
SATA	This cable connects to a SATA connector.
SCSI	This cable connects to a SCSI connector.
SFP	This cable connects to a SFP connector.
SFPPlus	This cable connects to a SFPPlus connector.

string	Description
SlimSAS	This cable connects to a SlimSAS connector.
USBA	This cable connects to a USB-A connector.
USBC	This cable connects to a USB-C connector.

6.15.5 Example response


```
{
    "@odata.type": "#Cable.v1_2_0.Cable",
    "Id": "hdmi_dp",
    "Name": "HDMI to DP Cable",
    "UserDescription": "HDMI to DisplayPort Cable",
    "UpstreamName": "HDMI0",
    "DownstreamName": "Video Out",
    "CableType": "HDMI",
    "LengthMeters": 0.1,
    "CableClass": "Video",
    "UpstreamConnectorTypes": [
        "HDMI"
    ],
    "DownstreamConnectorTypes": [
        "DisplayPort"
    ],
    "Links": {
        "UpstreamChassis": [
            {
                "@odata.id": "/redfish/v1/Chassis/bmc"
            }
        ]
    },
    "PartNumber": "934AMS02X",
    "Manufacturer": "Cable Co.",
    "SerialNumber": "2345791",
    "Vendor": "Cablestore",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "CableStatus": "Normal",
    "@odata.id": "/redfish/v1/Cables/hdmi_dp"
}
```

6.16 Certificate 1.6.0

Version	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2021.3	2021.2	2021.1	2020.1	2019.1	2018.3

6.16.1 Description

The Certificate schema describes a certificate that proves the identify of a component, account, or service.

- This resource shall represent a certificate for a Redfish implementation.

6.16.2 URIs

/redfish/v1/AccountService/Accounts/*{ManagerAccountId}*/Certificates/*{CertificateId}*
/redfish/v1/AccountService/ActiveDirectory/Certificates/*{CertificateId}*
/redfish/v1/AccountService/ExternalAccountProviders/*{ExternalAccountProviderId}*/Certificates/*{CertificateId}*
/redfish/v1/AccountService/LDAP/Certificates/*{CertificateId}*
/redfish/v1/Chassis/*{ChassisId}*/Certificates/*{CertificateId}*
/redfish/v1/Chassis/*{ChassisId}*/Drives/*{DriveId}*/Certificates/*{CertificateId}*
/redfish/v1/Chassis/*{ChassisId}*/Memory/*{MemoryId}*/Certificates/*{CertificateId}*
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Boot/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/KeyManagement/KMIPCertificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/Certificates/*{CertificateId}*

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*/Certificates/*{CertificateId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*/ClientCertificates/*{CertificateId}*
/redfish/v1/EventService/Subscriptions/*{EventDestinationId}*/Certificates/*{CertificateId}*
/redfish/v1/EventService/Subscriptions/*{EventDestinationId}*/ClientCertificates/*{CertificateId}*
/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Certificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/Certificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/NetworkProtocol/HTTPS/Certificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/Accounts/*{ManagerAccountId}*/Certificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/ActiveDirectory/Certificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/ExternalAccountProviders/*{ExternalAccountProviderId}*/Certificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/LDAP/Certificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/SPDM/RevokedCertificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/SPDM/TrustedCertificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/TLS/Client/RevokedCertificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/TLS/Client/TrustedCertificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/TLS/Server/RevokedCertificates/*{CertificateId}*
/redfish/v1/Managers/*{ManagerId}*/SecurityPolicy/TLS/Server/TrustedCertificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Boot/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/KeyManagement/KMIPCertificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/Certificates/*{CertificateId}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*/Certificates/*{CertificateId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*/ClientCertificates/*{CertificateId}*
/redfish/v1/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Boot/Certificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Certificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/KeyManagement/KMIPCertificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/Certificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Certificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Certificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Certificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Certificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*/Certificates/*{CertificateId}*
/redfish/v1/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*/ClientCertificates/*{CertificateId}*
/redfish/v1/UpdateService/ClientCertificates/*{CertificateId}*
/redfish/v1/UpdateService/RemoteServerCertificates/*{CertificateId}*

6.16.3 Properties

Property	Type	Attributes	Notes
CertificateString	string	*read-only required on create (null)*	The string for the certificate. • This property shall contain the certificate, and the format shall follow the requirements specified by the CertificateType property value. If the certificate contains any private keys, they shall be removed from the string in responses. If the service does not know the private key for the certificate and is needed to use the certificate, the client shall provide the private key as part of the string in the POST request. *For more information about this property, see Property details.*
CertificateType	string (enum)	*read-only required on create (null)*	The format of the certificate. • This property shall contain the format type for the certificate. *For the possible property values, see CertificateType in Property details.*
CertificateUsageTypes *(v1.4+)* [ ]	array (string (enum))	*read-only (null)*	• The types or purposes for this certificate. ◦ The value of this property shall contain an array describing the types or purposes for this certificate. *For the possible property values, see CertificateUsageTypes in Property details.*
Fingerprint *(v1.3+)*	string	*read-only*	The fingerprint of the certificate. • The value of this property shall be a string containing the ASCII representation of the fingerprint of the certificate. The hash algorithm used to generate this fingerprint shall be specified by the FingerprintHashAlgorithm property. Pattern: `^([0-9A-Fa-f]{2}:){0,}([0-9A-Fa-f]{2})$`
FingerprintHashAlgorithm *(v1.3+)*	string	*read-only*	The hash algorithm for the fingerprint of the certificate. • The value of this property shall be a string containing the hash algorithm used for generating the Fingerprint property. The value shall be one of the strings in the 'Algorithm Name' field of the 'TPM_ALG_ID Constants' table within the 'Trusted Computing Group Algorithm Registry'.
Issuer {	object		The issuer of the certificate. • This property shall contain an object containing information about the issuer of the certificate.

Property	Type	Attributes	Notes
AdditionalCommonNames *(v1.6+)* [ ]	array (string, null)	*read-only*	Additional common names of the entity. • The value of this property shall contain an array of additional common names for the entity, as defined by the RFC5280 'commonName' attribute, in array order as they appear in the certificate. This property shall not be present if only one common name is found. The first common name shall not appear in this property.
AdditionalOrganizationalUnits *(v1.6+)* [ ]	array (string, null)	*read-only*	Additional organizational units of the entity. • The value of this property shall contain an array of additional organizational units for the entity, as defined by the RFC5280 'organizationalUnitName' attribute, in array order as they appear in the certificate. This property shall not be present if only one organizational unit is found. The first organizational unit shall not appear in this property.
City	string	*read-only*	The city or locality of the organization of the entity. • This property shall contain the city or locality of the organization of the entity, as defined by the RFC5280 'localityName' attribute.
CommonName	string	*read-only*	The common name of the entity. • This property shall contain the common name of the entity, as defined by the RFC5280 'commonName' attribute.
Country	string	*read-only*	The country of the organization of the entity. • This property shall contain the two-letter ISO code for the country of the organization of the entity, as defined by the RFC5280 'countryName' attribute.
DisplayString *(v1.6+)*	string	*read-only (null)*	A human-readable string for this identifier. • The value of this property shall contain a display string that represents the entire identifier. The string should be formatted using industry conventions, such as the single-line human-readable string described by RFC2253 and preserving the field order as shown in the certificate.
DomainComponents *(v1.6+)* [ ]	array (string, null)	*read-only*	The domain components of the entity. • The value of this property shall contain an array of domain component fields for the entity, as defined by the RFC4519 'domainComponent' attribute, in array order as they appear in the certificate.

Property	Type	Attributes	Notes
Email	string	*read-only* *(null)*	The email address of the contact within the organization of the entity. • This property shall contain the email address of the contact within the organization of the entity, as defined by the RFC2985 'emailAddress' attribute.
Organization	string	*read-only*	The name of the organization of the entity. • This property shall contain the name of the organization of the entity, as defined by the RFC5280 'organizationName' attribute.
OrganizationalUnit	string	*read-only*	The name of the unit or division of the organization of the entity. • This property shall contain the name of the unit or division of the organization of the entity, as defined by the RFC5280 'organizationalUnitName' attribute.
State	string	*read-only*	The state, province, or region of the organization of the entity. • This property shall contain the state, province, or region of the organization of the entity, as defined by the RFC5280 'stateOrProvinceName' attribute.
}			
KeyUsage [ ]	array (string (enum))	*read-only* *(null)*	The usages of a key contained within a certificate. • The key usage extension, which defines the purpose of the public keys in this certificate. ◦ This property shall contain the key usage extension, which defines the purpose of the public keys in this certificate. *For the possible property values, see KeyUsage in Property details.*
Links *(v1.4+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Issuer *(v1.4+)* {	object	*(null)*	A link to the certificate of the CA that issued this certificate. • This property shall contain a link to a resources of type Certificate that represents the certificate of the CA that issued this certificate.
@odata.id	string	*read-write*	Link to another Certificate resource.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
Subjects *(v1.4+)* [{	array		An array of links to certificates that were issued by the CA that is represented by this certificate. • This property shall contain an array of links to resources of type Certificate that were issued by the CA that is represented by this certificate.
@odata.id	string	*read-write*	Link to another Certificate resource.
}]			
}			
SerialNumber *(v1.3+)*	string	*read-only*	The serial number of the certificate. • The value of this property shall be a string containing the ASCII representation of the serial number of the certificate, as defined by the RFC5280 'serialNumber' field. Pattern: `^([0-9A-Fa-f]{2}:){0,}([0-9A-Fa-f]{2})$`
SignatureAlgorithm *(v1.3+)*	string	*read-only*	The algorithm used for creating the signature of the certificate. • The value of this property shall be a string containing the algorithm used for generating the signature of the certificate, as defined by the RFC5280 'signatureAlgorithm' field. The value shall be a string representing the ASN.1 OID of the signature algorithm as defined in, but not limited to, RFC3279, RFC4055, or RFC4491.
SPDM *(v1.5+)* {	object	*(null)*	SPDM-related information for the certificate. • The value of this property shall contain SPDM-related information for the certificate. This property shall only be present for SPDM certificates.
SlotId *(v1.5+)*	integer	*read-only* *(null)*	Slot identifier of the certificate. • The value of this property shall contain an integer between 0 and 7, inclusive, that represents the slot identifier for an SPDM-provided certificate.
}			
Subject {	object		The subject of the certificate. • This property shall contain an object containing information about the subject of the certificate.

Property	Type	Attributes	Notes
AdditionalCommonNames *(v1.6+)* [ ]	array (string, null)	*read-only*	Additional common names of the entity. • The value of this property shall contain an array of additional common names for the entity, as defined by the RFC5280 'commonName' attribute, in array order as they appear in the certificate. This property shall not be present if only one common name is found. The first common name shall not appear in this property.
AdditionalOrganizationalUnits *(v1.6+)* [ ]	array (string, null)	*read-only*	Additional organizational units of the entity. • The value of this property shall contain an array of additional organizational units for the entity, as defined by the RFC5280 'organizationalUnitName' attribute, in array order as they appear in the certificate. This property shall not be present if only one organizational unit is found. The first organizational unit shall not appear in this property.
City	string	*read-only*	The city or locality of the organization of the entity. • This property shall contain the city or locality of the organization of the entity, as defined by the RFC5280 'localityName' attribute.
CommonName	string	*read-only*	The common name of the entity. • This property shall contain the common name of the entity, as defined by the RFC5280 'commonName' attribute.
Country	string	*read-only*	The country of the organization of the entity. • This property shall contain the two-letter ISO code for the country of the organization of the entity, as defined by the RFC5280 'countryName' attribute.
DisplayString *(v1.6+)*	string	*read-only (null)*	A human-readable string for this identifier. • The value of this property shall contain a display string that represents the entire identifier. The string should be formatted using industry conventions, such as the single-line human-readable string described by RFC2253 and preserving the field order as shown in the certificate.
DomainComponents *(v1.6+)* [ ]	array (string, null)	*read-only*	The domain components of the entity. • The value of this property shall contain an array of domain component fields for the entity, as defined by the RFC4519 'domainComponent' attribute, in array order as they appear in the certificate.

Property	Type	Attributes	Notes
Email	string	*read-only (null)*	The email address of the contact within the organization of the entity. • This property shall contain the email address of the contact within the organization of the entity, as defined by the RFC2985 'emailAddress' attribute.
Organization	string	*read-only*	The name of the organization of the entity. • This property shall contain the name of the organization of the entity, as defined by the RFC5280 'organizationName' attribute.
OrganizationalUnit	string	*read-only*	The name of the unit or division of the organization of the entity. • This property shall contain the name of the unit or division of the organization of the entity, as defined by the RFC5280 'organizationalUnitName' attribute.
State	string	*read-only*	The state, province, or region of the organization of the entity. • This property shall contain the state, province, or region of the organization of the entity, as defined by the RFC5280 'stateOrProvinceName' attribute.
}			
UefiSignatureOwner *(v1.2+)*	string	*read-only (null)*	The UEFI signature owner for this certificate. • The value of this property shall contain the GUID of the UEFI signature owner for this certificate as defined by the UEFI Specification. This property shall only be present for certificates managed by UEFI. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`
ValidNotAfter	string (date-time)	*read-only*	The date when the certificate is no longer valid. • This property shall contain the date when the certificate validity period ends.
ValidNotBefore	string (date-time)	*read-only*	The date when the certificate becomes valid. • This property shall contain the date when the certificate validity period begins.

6.16.4 Actions

6.16.4.1 Rekey *(v1.1+)*

Description

This action generates a new key-pair for a certificate and produces a certificate signing request.

- This action shall use the certificate data to generate a new key-pair for a certificate. The response shall contain a signing request that a certificate authority (CA) will sign. The service should retain the private key that generated this request for installation of the certificate. The private key should not be part of the response. The private key should not be part of the response.

Action URI: {Base URI of target resource}/Actions/Certificate.Rekey

Action parameters

Parameter Name	Type	Attributes	Notes
ChallengePassword	string	*optional*	The challenge password to apply to the certificate for revocation requests. • This property shall contain the challenge password to apply to the certificate for revocation requests as defined by the RFC2985 'challengePassword' attribute.
KeyBitLength	integer	*optional*	The length of the key, in bits, if needed based on the KeyPairAlgorithm parameter value. • This parameter shall contain the length of the key, in bits, if needed based on the KeyPairAlgorithm parameter value.
KeyCurveId	string	*optional*	The curve ID to use with the key, if needed based on the KeyPairAlgorithm parameter value. • This parameter shall contain the curve ID to use with the key, if needed based on the KeyPairAlgorithm parameter value. The allowable values for this parameter shall be the strings in the 'Name' field of the 'TPM_ECC_CURVE Constants' table within the 'Trusted Computing Group Algorithm Registry'.
KeyPairAlgorithm	string	*optional*	The type of key-pair for use with signing algorithms. • This parameter shall contain the type of key-pair for use with signing algorithms. The allowable values for this parameter shall be the strings in the 'Algorithm Name' field of the 'TPM_ALG_ID Constants' table within the 'Trusted Computing Group Algorithm Registry'.

Response Payload

{			
Certificate *(v1.1+)* {	object	*required*	The link to the certificate being rekeyed. • This property shall contain a link to a resource of type Certificate that is replaced after the certificate authority (CA) signs the certificate.

@odata.id	string	*read-only*	Link to another Certificate resource.
}			
CSRString *(v1.1+)*	string	*read-only required*	The string for the certificate signing request. • This property shall contain the certificate signing request as a PEM-encoded string, containing structures specified by RFC2986. The private key should not be part of the string.
}			

Request Example

```
{
    "KeyPairAlgorithm": "TPM_ALG_RSA",
    "KeyBitLength": 4096
}
```

Response Example

```
{
    "CSRString": "-----BEGIN CERTIFICATE REQUEST-----...-----END CERTIFICATE REQUEST-----",
    "Certificate": {
        "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates/1"
    }
}
```

6.16.4.2 Renew *(v1.1+)*

Description

This action generates a certificate signing request by using the existing information and key-pair of the certificate.

- This action shall generate a certificate signing request using the existing information and key-pair of the certificate. The response shall contain a signing request that a certificate authority (CA) will sign. The service should retain the private key that this request generates for when the certificate is installed. The private key should not be part of the response.

Action URI: {Base URI of target resource}/Actions/Certificate.Renew

Action parameters

Parameter Name	Type	Attributes	Notes
ChallengePassword	string	*optional*	The challenge password to apply to the certificate for revocation requests. • This property shall contain the challenge password to apply to the certificate for revocation requests as defined by the RFC2985 'challengePassword' attribute.

Response Payload

{			
Certificate *(v1.1+)* {	object	*required*	The link to the certificate being renewed. • This property shall contain a link to a resource of type Certificate that is replaced after the certificate authority (CA) signs the certificate.
@odata.id	string	*read-only*	Link to another Certificate resource.
}			
CSRString *(v1.1+)*	string	*read-only required*	The string for the certificate signing request. • This property shall contain the certificate signing request as a PEM-encoded string, containing structures specified by RFC2986. The private key should not be part of the string.
}			

Request Example

```
{
    "ChallengePassword": "p4ssw0rd"
}
```

Response Example

```
{
    "CSRString": "-----BEGIN CERTIFICATE REQUEST-----...-----END CERTIFICATE REQUEST-----",
    "Certificate": {
        "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates/1"
    }
}
```

6.16.5 Property details

6.16.5.1 CertificateString:

The string for the certificate.

- This property shall contain the certificate, and the format shall follow the requirements specified by the CertificateType property value. If the certificate contains any private keys, they shall be removed from the string in responses. If the service does not know the private key for the certificate and is needed to use the certificate, the client shall provide the private key as part of the string in the POST request.

When a certificate of type `PEMchain` or `PKCS7` is installed, the service may create multiple resources to represent each of the certificates found in the string. If the service divides the request into multiple resources, the service:

- Shall provide the response with the resource that represents the first certificate in the string.
- Shall apply the appropriate value for `CertificateType` for each of the new resources.
- Should populate the `Issuer` property within the `Links` property.
- May populate the `Subjects` property within the `Links` property.

To satisfy JSON encoding requirements, newlines in the string shall be replaced with `\n`. Standard JSON libraries typically manage this conversion automatically.

6.16.5.2 CertificateType:

The format of the certificate.

- This property shall contain the format type for the certificate.

6.16.5.2.1 PEMchain

When the value of `CertificateType` is `PEMchain`, the format represents a series of certificates. The format shall be a concatenation, in order, of the following:

- The private key of the leaf certificate.
  - The private key may be omitted.
- The leaf certificate for the end entity.
  - The leaf certificate may be omitted.
  - If the leaf certificate is omitted, the private key shall be omitted.
- A set of certificate authorithy (CA) certificates in order of issuance.

The private key shall be encoded as described in section 10 of RFC7468.

The leaf certificate and CA certificates shall be certificates as defined by RFC5280 and shall be encoded as described in section 5 of RFC7468.

Each certificate in the set of CA certificates shall be the issuer of the preceding certificate. For example, the first CA certificate is the issuer of the leaf certificate, the second CA certificate is the issuer of the first CA certificate, and so on. The last CA certificate typically represents the root CA and is self-signed. The set of certificates should contain all certificates leading to the root CA.

The following example for a `PEMchain` certificate contains three certificates: the leaf certificate for "*.dmtf.org", the CA certificate "Go Daddy Secure Certificate Authorithy - G2", and the root CA certificate "Go Daddy Root Certificate Authority - G2".

```
-----BEGIN CERTIFICATE-----
MIIGpzCCBY+gAwIBAgIJAO3nRphCG8xGMA0GCSqGSIb3DQEBCwUAMIG0MQswCQYD
VQQGEwJVUzEQMA4GA1UECBMHQXJpem9uYTETMBEGA1UEBxMKU2NvdHRzZGFsZTEa
MBgGA1UEChMRR29EYWRkeS5jb20sIEluYy4xLTArBgNVBAsTJGh0dHA6Ly9jZXJ0
cy5nb2RhZGR5LmNvbS9yZXBvc2l0b3J5LzEzMDEGA1UEAxMqR28gRGFkZHkgU2Vj
dXJlIENlcnRpZmljYXRlIEF1dGhvcml0eSAtIEcyMB4XDTE5MDYxNTE1MDIyNFoX
DTIxMDgxNDE5MDQ0M1owODEhMB8GA1UECxMYRG9tYWluIENvbnRyb2wgVmFsaWRh
dGVkMRMwEQYDVQQDDAoqLmRtdGYub3JnMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8A
MIIBCgKCAQEAvEVrgkWuoz0kAEMqa3mna38MlN41vztntdE3Glm1IB5cHL1igJm0
PKnlvF0ShxBCOXKRMn8Z3HsbfQ4IQRD20meT6LWnMHCHE5+DKhDdzvz6SSlwmOF+
arAqDdBRXRkyvVVvpw2YLGTWc572t2WqhgKOrC7eaT9D/kxJmhVIt4NwNGj4Awl6
5fqNxxqWLDEJw9HYgxXMyv78gZaV66wZmE0MiypSKI0VtlZs8gryHdDG8iWbP0At
n098jcrkOkI5ewDq/jBHXdFfTgJtSkBIR4wpgmM+tL8pgEplyntWM/0xPBphJf6k
LjcoulHeW8r5Fv6II85fnNR7gW5pxnFz1wIDAQABo4IDNTCCAzEwDAYDVR0TAQH/
BAIwADAdBgNVHSUEFjAUBggrBgEFBQcDAQYIKwYBBQUHAwIwDgYDVR0PAQH/BAQD
AgWgMDgGA1UdHwQxMC8wLaAroCmGJ2h0dHA6Ly9jcmwuZ29kYWRkeS5jb20vZ2Rp
ZzJzMS0xMTc1LmNybDBdBgNVHSAEVjBUMEgGC2CGSAGG/W0BBxcBMDkwNwYIKwYB
BQUHAgEWK2h0dHA6Ly9jZXJ0aWZpY2F0ZXMuZ29kYWRkeS5jb20vcmVwb3NpdG9y
eS8wCAYGZ4EMAQIBMHYGCCsGAQUFBwEBBGowaDAkBggrBgEFBQcwAYYYaHR0cDov
L29jc3AuZ29kYWRkeS5jb20vMEAGCCsGAQUFBzAChjRodHRwOi8vY2VydGlmaWNh
dGVzLmdvZGFkZHkuY29tL3JlcG9zaXRvcnkvZ2RpZzIuY3J0MB8GA1UdIwQYMBaA
FEDCvSeOzDSDMKIz1/tss/C0LIDOMB8GA1UdEQQYMBaCCiouZG10Zi5vcmeCCGRt
dGYub3JnMB0GA1UdDgQWBBQZ2f2Fj14M4O81b6l5o+91idrySDCCAX4GCisGAQQB
1nkCBAIEggFuBIIBagFoAHYApLkJkLQYWBSHuxOizGdwCjw1mAT5G9+443fNDsgN
3BAAAAFrW6lKdgAABAMARzBFAiAJcqOn6x917jSYgE1Dot7wcN//5XMbi6ZVO4Ke
D5tEdAIhAK8iYDLb6rHEscWcPOu7XHUj3l/oqtez4KBh4wvCsn3GAHYA7ku9t3XO
YLrhQmkfq+GeZqMPfl+wctiDAMR7iXqo/csAAAFrW6lQOQAABAMARzBFAiEAqohS
sSlGBdXgemmfXuthuox/T8kKNwqmsTwtMNG2J9MCIBQBQTwmO/C7W4g+U/J0B4vU
LKWPGOYrnoOwHLdWpXOqAHYARJRlLrDuzq/EQAfYqP4owNrmgr7YyzG1P9MzlrW2
gagAAAFrW6lSdwAABAMARzBFAiEA44PR+UD/fXG57Edi/WdAiutVuO3xsN2dJKA2
yGl6TVMCIEP4D0A4C/3avvjo+Tc7IAPm98yF4gQhpxyevFFVGw+YMA0GCSqGSIb3
DQEBCwUAA4IBAQCx/1p1gal19B0+jg+0SdtFtSC81pF1Fkp/QQ2/9cvo6eklC3Hl
kvAIzu4+MzB77o+y47WJICX90Flk/xVWXKp3Nq6XoQQgJc9hbzdLHErZqE0t+3bB
4/ZNBpxeE2aOl/8QhKiA0ibYuAJn8acH5dVfk7Yy7Uv1LqyGw/YyRdPtukA4s7NA
8YLhFK5LfMKm/9HAi4Q7XJ6blnFKppemhqSqdarJ48u6qlLUcm64EmhZjwjUaE6f
1ML5qtGn57EZla3sfB7xjZ0KbfYY3IOA1XLP/bVKewjopQve2FR/rZ4KW9wrR0GS
0EyYN7gphrtSoWwCJDk8zRDfzOf1TOevaNLx
```

```
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIE0DCCA7igAwIBAgIBBzANBgkqhkiG9w0BAQsFADCBgzELMAkGA1UEBhMCVVMx
EDAOBgNVBAgTB0FyaXpvbmExEzARBgNVBAcTClNjb3R0c2RhbGUxGjAYBgNVBAoT
EUdvRGFkZHkuY29tLCBJbmMuMTEwLwYDVQQDEyhHbyBEYWRkeSBSb290IENlcnRp
ZmljYXRlIEF1dGhvcml0eSAtIEcyMB4XDTExMDUwMzA3MDAwMFoXDTMxMDUwMzA3
MDAwMFowgbQxCzAJBgNVBAYTAlVTMRAwDgYDVQQIEwdBcml6b25hMRMwEQYDVQQH
EwpTY290dHNkYWxlMRowGAYDVQQKExFHb0RhZGR5LmNvbSwgSW5jLjEtMCsGA1UE
CxMkaHR0cDovL2NlcnRzLmdvZGFkZHkuY29tL3JlcG9zaXRvcnkvMTMwMQYDVQQD
EypHbyBEYWRkeSBTZWN1cmUgQ2VydGlmaWNhdGUgQXV0aG9yaXR5IC0gRzIwggEi
MA0GCSqGSIb3DQEBAQUAA4IBDwAwggEKAoIBAQC54MsQ1K92vdSTYuswZLiBCGzD
BNliF44v/z5lz4/OYuY8UhzaFkVLVat4a2ODYpDOD2lsmcgaFItMzEUz6ojcnqOv
K/6AYZ15V8TPLvQ/MDxdR/yaFrzDN5ZBUY4RS1T4KL7QjL7wMDge87Am+GZHY23e
cSZHjzhHU9FGHbTj3ADqRay9vHHZqm8A29vNMDp5T19MR/gd71vCxJ1gO7GyQ5HY
pDNO6rPWJ0+tJYqlxvTV0KaudAVkV4i1RFXULSo6Pvi4vekyCgKUZMQWOlDxSq7n
eTOvDCAHf+jfBDnCaQJsY1L6d8EbyHSHyLmTGFBUNUtpTrw700kuH9zB0lL7AgMB
AAGjggEaMIIBFjAPBgNVHRMBAf8EBTADAQH/MA4GA1UdDwEB/wQEAwIBBjAdBgNV
HQ4EFgQUQMK9J47MNIMwojPX+2yz8LQsgM4wHwYDVR0jBBgwFoAUOpqFBxBnKLbv
9r0FQW4gwZTaD94wNAYIKwYBBQUHAQEEKDAmMCQGCCsGAQUFBzABhhhodHRwOi8v
b2NzcC5nb2RhZGR5LmNvbS8wNQYDVR0fBC4wLDAqoCigJoYkaHR0cDovL2NybC5n
b2RhZGR5LmNvbS9nZHJvb3QtZzIuY3JsMEYGA1UdIAQ/MD0wOwYEVR0gADAzMDEG
CCsGAQUFBwIBFiVodHRwczovL2NlcnRzLmdvZGFkZHkuY29tL3JlcG9zaXRvcnkv
MA0GCSqGSIb3DQEBCwUAA4IBAQAIfmyTEMg4uJapkEv/oV9PBO9sPpyIBslQj6Zz
91cxG7685C/b+LrTW+C05+Z5Yg4MotdqY3MxtfWoSKQ7CC2iXZDXtHwlTxFWMMS2
RJ17LJ3lXubvDGGqv+QqG+6EnriDfcFDzkSnE3ANkR/0yBOtg2DZ2HKocyQetawi
DsoXiWJYRBuriSUBAA/NxBti21G00w9RKpv0vHP8ds42pM3Z2Czqrpv1KrKQ0U11
GIo/ikGQI31bS/6kA1ibRrLDYGCD+H1QQc7CoZDDu+8Cl9IVVO5EFdkKrqeKM+2x
LXY2JtwE65/3YR8V3Idv7kaWKK2hJn0KCacuBKONvPi8BDAB
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIDxTCCAq2gAwIBAgIBADANBgkqhkiG9w0BAQsFADCBgzELMAkGA1UEBhMCVVMx
EDAOBgNVBAgTB0FyaXpvbmExEzARBgNVBAcTClNjb3R0c2RhbGUxGjAYBgNVBAoT
EUdvRGFkZHkuY29tLCBJbmMuMTEwLwYDVQQDEyhHbyBEYWRkeSBSb290IENlcnRp
ZmljYXRlIEF1dGhvcml0eSAtIEcyMB4XDTA5MDkwMTAwMDAwMFoXDTM3MTIzMTIz
NTk1OVowgYMxCzAJBgNVBAYTAlVTMRAwDgYDVQQIEwdBcml6b25hMRMwEQYDVQQH
EwpTY290dHNkYWxlMRowGAYDVQQKExFHb0RhZGR5LmNvbSwgSW5jLjExMC8GA1UE
AxMoR28gRGFkZHkgUm9vdCBDZXJ0aWZpY2F0ZSBBdXRob3JpdHkgLSBHMjCCASIw
DQYJKoZIhvcNAQEBBQADggEPADCCAQoCggEBAL9xYgjx+lk09xvJGKP3gElY6SKD
E6bFIEMBO4Tx5oVJnyfq9oQbTqC023CYxzIBsQU+B07u9PpPL1kwIuerGVZr4oAH
/PMWdYA5UXvl+TW2dE6pjYIT5LY/qQOD+qK+ihVqf94Lw7YZFAXK6sOoBJQ7Rnwy
DfMAZiLIjWltNowRGLfTshxgtDj6AozO091GB94KPutdfMh8+7ArU6SSYmlRJQVh
GkSBjCypQ5Yj36w6gZoOKcUcqeldHraenjAKOc7xiID7S13MMuyFYkMlNAJWJwGR
tDtwKj9useiciAF9n9T521NtYJ2/LOdYq7hfRvzOxBsDPAnrSTFcaUaz4EcCAwEA
AaNCMEAwDwYDVR0TAQH/BAUwAwEB/zAOBgNVHQ8BAf8EBAMCAQYwHQYDVR0OBBYE
FDqahQcQZyi27/a9BUFuIMGU2g/eMA0GCSqGSIb3DQEBCwUAA4IBAQCZ21151fmX
WWcDYfF+OwYxdS2hII5PZYe096acvNjpL9DbWu7PdIxztDhC2gV7+AJ1uP2lsdeu
9tfeE8tTEH6KRtGX+rcuKxGrkLAngPnon1rpN5+r5N9ss4UXnT3ZJE95kTXWXwTr
gIOrmgIttRD02JDHBHNA7XIloKmf7J6raBKZV8aPEjoJpL1E/QYVN8Gb5DKj7Tjo
2GTzLH4U/ALqn83/B2gX2yKQOC16jdFU8WnjXzPKej17CuPKf1855eJ1usV2GDPO
LPAvTK33sefOT6jEm0pUBsV/fdUID+Ic/n4XuKxe9tQWskMJDE32p2u0mYRlynqI
4uJEvlz36hz1
```

```
-----END CERTIFICATE-----
```

6.16.5.2.2 PEM

When the value of `CertificateType` is `PEM`, the format represents a single certificate and an optional private key. The format shall be an order independent concatenation of the following:

- The private key of the leaf certificate.
  - The private key may be omitted.
- The leaf certificate for the end entity.

The private key shall be encoded as described in section 10 of RFC7468.

The leaf certificate shall be a certificate as defined by RFC5280 and shall be encoded as described in section 5 of RFC7468.

6.16.5.2.3 PKCS7

When the value of `CertificateType` is `PKCS7`, the format represents a PKCS7 bundle and an optional private key. The format shall be an order independent concatenation of the following:

- The private key of the PKCS7 bundle.
  - The private key may be omitted.
- The PKCS7 bundle containing one or more certificates.

The private key shall be encoded as described in section 10 of RFC7468.

The PKCS7 bundle shall contain one or more certificates as defined by RFC5280 and shall be encoded as described in section 8 of RFC7468.

string	Description
PEM	A Privacy Enhanced Mail (PEM)-encoded single certificate. • This value shall indicate the format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined structures, representing a single certificate.
PEMchain *(v1.4+)*	A Privacy Enhanced Mail (PEM)-encoded certificate chain. • This value shall indicate the format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined structures, representing a certificate chain.

string	Description
PKCS7	A Privacy Enhanced Mail (PEM)-encoded PKCS7 certificate. • The format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined and RFC2315-defined structures. The service can discard additional certificates or other data in the structure.

6.16.5.3 CertificateUsageTypes:

- The types or purposes for this certificate.
  - The value of this property shall contain an array describing the types or purposes for this certificate.

string	Description
BIOS	This certificate is a BIOS certificate like those associated with UEFI.
Device	This certificate is a device type certificate like those associated with SPDM and other standards.
Platform	This certificate is a platform type certificate like those associated with SPDM and other standards.
SSH	This certificate is used for SSH.
User	This certificate is a user certificate like those associated with a manager account.
Web	This certificate is a web or HTTPS certificate like those used for event destinations.

6.16.5.4 KeyUsage:

The usages of a key contained within a certificate.

- The key usage extension, which defines the purpose of the public keys in this certificate.
  - This property shall contain the key usage extension, which defines the purpose of the public keys in this certificate.

string	Description
ClientAuthentication	TLS WWW client authentication.
CodeSigning	Signs downloadable executable code.
CRLSigning	Verifies signatures on certificate revocation lists (CRLs).
DataEncipherment	Directly enciphers raw user data without an intermediate symmetric cipher.

string	Description
DecipherOnly	Deciphers data while performing a key agreement.
DigitalSignature	Verifies digital signatures, other than signatures on certificates and CRLs.
EmailProtection	Email protection.
EncipherOnly	Enciphers data while performing a key agreement.
KeyAgreement	Key agreement.
KeyCertSign	Verifies signatures on public key certificates.
KeyEncipherment	Enciphers private or secret keys.
NonRepudiation	Verifies digital signatures, other than signatures on certificates and CRLs, and provides a non-repudiation service that protects against the signing entity falsely denying some action.
OCSPSigning	Signs OCSP responses.
ServerAuthentication	TLS WWW server authentication.
Timestamping	Binds the hash of an object to a time.

6.16.6 Example response


```
{
    "@odata.type": "#Certificate.v1_6_0.Certificate",
    "Id": "1",
    "Name": "HTTPS Certificate",
    "CertificateString": "-----BEGIN CERTIFICATE-----\nMIIFsTCC [*truncated*] GXG5zljlu\n-----END CERTIFICATE-----",
    "CertificateType": "PEM",
    "Issuer": {
        "Country": "US",
        "State": "Oregon",
        "City": "Portland",
        "Organization": "Contoso",
        "OrganizationalUnit": "ABC",
        "CommonName": "manager.contoso.org"
    },
    "Subject": {
        "Country": "US",
        "State": "Oregon",
        "City": "Portland",
        "Organization": "Contoso",
        "OrganizationalUnit": "ABC",
        "CommonName": "manager.contoso.org"
    },
```

```
    "ValidNotBefore": "2018-09-07T13:22:05Z",
    "ValidNotAfter": "2019-09-07T13:22:05Z",
    "KeyUsage": [
        "KeyEncipherment",
        "ServerAuthentication"
    ],
    "SerialNumber": "5d:7a:d8:df:f6:fc:c1:b3:ca:fe:fb:cc:38:f3:01:64:51:ea:05:cb",
    "Fingerprint": "A6:E9:D2:5C:DC:52:DA:4B:3B:14:97:F3:A4:53:D9:99:A1:0B:56:41",
    "FingerprintHashAlgorithm": "TPM_ALG_SHA1",
    "SignatureAlgorithm": "sha256WithRSAEncryption",
    "Oem": {},
    "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates/1"
}
```


6.17 CertificateLocations 1.0.2

Version	*v1.0*
Release	2018.3

6.17.1 Description

The CertificateLocations schema describes a Resource that an administrator can use in order to locate all certificates installed on a given service.

- This Resource shall represent the Certificate Location Properties for a Redfish implementation.

6.17.2 URIs

/redfish/v1/CertificateService/CertificateLocations

6.17.3 Properties

Property	Type	Attributes	Notes
Links {	object		The links to other Resources that are related to this Resource. • This property shall contain links to Resources that are related to but are not contained by or subordinate to this Resource.

Property	Type	Attributes	Notes
Certificates [{	array		An array of links to the certificates installed on this service. • This property shall contain an array of links to Certificate Resources that are installed on this service.
@odata.id	string	*read-only*	Link to a Certificate resource. See the Links section and the *Certificate* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			

6.17.4 Example response

```
{
    "@odata.type": "#CertificateLocations.v1_0_2.CertificateLocations",
    "Id": "CertificateLocations",
    "Name": "Certificate Locations",
    "Links": {
        "Certificates": [
            {
                "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates/1"
            }
        ]
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/CertificateService/CertificateLocations"
}
```

6.18 CertificateService 1.0.4

Version	*v1.0*
Release	2018.3

6.18.1 Description

The CertificateService schema describes a certificate service that represents the actions available to manage certificates and links to the certificates.

- This resource shall represent the certificate service properties for a Redfish implementation.

6.18.2 URIs

/redfish/v1/CertificateService

6.18.3 Properties

Property	Type	Attributes	Notes
CertificateLocations {	object		The information about the location of certificates. • This property shall contain a link to a resource of type CertificateLocations. See the *CertificateLocations* schema for details on this property.
@odata.id	string	*read-only*	Link to a CertificateLocations resource. See the Links section and the *CertificateLocations* schema for details.
}			

6.18.4 Actions

6.18.4.1 GenerateCSR

Description

This action makes a certificate signing request.

- This action shall make a certificate signing request. The response shall contain a signing request that a certificate authority (CA) will sign. The service should retain the private key that was generated during this request for installation of the certificate. The private key should not be part of the response.

Action URI: {Base URI of target resource}/Actions/CertificateService.GenerateCSR

Action parameters

Parameter Name	Type	Attributes	Notes
AlternativeNames [ ]	array (string)	*optional*	The additional host names of the component to secure. • This parameter shall contain an array of additional host names of the component to secure, as defined by the RFC5280 'subjectAltName' attribute.

Parameter Name	Type	Attributes	Notes
{ **CertificateCollection**	object	*required*	The link to the certificate collection where the certificate is installed after the certificate authority (CA) signs the certificate. • This parameter shall contain a link to a resource collection of type CertificateCollection where the certificate is installed after the certificate authority (CA) signs the certificate. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
ChallengePassword	string	*optional*	The challenge password to apply to the certificate for revocation requests. • This property shall contain the challenge password to apply to the certificate for revocation requests as defined by the RFC2985 'challengePassword' attribute.
City	string	*required*	The city or locality of the organization making the request. • This parameter shall contain the city or locality of the organization making the request, as defined by the RFC5280 'localityName' attribute.
CommonName	string	*required*	The fully qualified domain name of the component to secure. • This parameter shall contain the fully qualified domain name of the component to secure, as defined by the RFC5280 'commonName' attribute.
ContactPerson	string	*optional*	The name of the user making the request. • This property shall contain the name of the user making the request, as defined by the RFC5280 'name' attribute.
Country	string	*required*	The two-letter country code of the organization making the request. • This parameter shall contain the two-letter ISO code for the country of the organization making the request, as defined by the RFC5280 'countryName' attribute.
Email	string	*optional*	The email address of the contact within the organization making the request. • This parameter shall contain the email address of the contact within the organization making the request, as defined by the RFC2985 'emailAddress' attribute.
GivenName	string	*optional*	The given name of the user making the request. • This parameter shall contain the given name of the user making the request, as defined by the RFC5280 'givenName' attribute.

Parameter Name	Type	Attributes	Notes
Initials	string	*optional*	The initials of the user making the request. • This parameter shall contain the initials of the user making the request, as defined by the RFC5280 'initials' attribute.
KeyBitLength	integer	*optional*	The length of the key, in bits, if needed based on the KeyPairAlgorithm parameter value. • This parameter shall contain the length of the key, in bits, if needed based on the KeyPairAlgorithm parameter value.
KeyCurveId	string	*optional*	The curve ID to use with the key, if needed based on the KeyPairAlgorithm parameter value. • This parameter shall contain the curve ID to use with the key, if needed based on the KeyPairAlgorithm parameter value. The allowable values for this parameter shall be the strings in the 'Name' field of the 'TPM_ECC_CURVE Constants' table within the 'Trusted Computing Group Algorithm Registry'.
KeyPairAlgorithm	string	*optional*	The type of key-pair for use with signing algorithms. • This parameter shall contain the type of key-pair for use with signing algorithms. The allowable values for this parameter shall be the strings in the 'Algorithm Name' field of the 'TPM_ALG_ID Constants' table within the 'Trusted Computing Group Algorithm Registry'.
KeyUsage [ ]	array (string (enum))	*read-write*	The usages of a key contained within a certificate. • The usage of the key contained in the certificate. ◦ This parameter shall contain the usage of the key contained in the certificate. If the client does not provide this value, the service can determine the appropriate key usage settings in the certificate signing request. *For the possible property values, see KeyUsage in Property details.*
Organization	string	*required*	The name of the organization making the request. • This parameter shall contain the name of the organization making the request, as defined by the RFC5280 'organizationName' attribute.
OrganizationalUnit	string	*required*	The name of the unit or division of the organization making the request. • This parameter shall contain the name of the unit or division of the organization making the request, as defined by the RFC5280 'organizationalUnitName' attribute.

Parameter Name	Type	Attributes	Notes
State	string	*required*	The state, province, or region of the organization making the request. • This parameter shall contain the state, province, or region of the organization making the request, as defined by the RFC5280 'stateOrProvinceName' attribute.
Surname	string	*optional*	The surname of the user making the request. • This parameter shall contain the surname of the user making the request, as defined by the RFC5280 'surname' attribute.
UnstructuredName	string	*optional*	The unstructured name of the subject. • This property shall contain the unstructured name of the subject, as defined by the RFC2985 'unstructuredName' attribute.

Response Payload

{			
CertificateCollection {	object	*required*	The link to the certificate collection where the certificate is installed. • This property shall contain a link to a resource collection of type CertificateCollection where the certificate is installed after the certificate authority (CA) has signed the certificate. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
CSRString	string	*read-only required*	The string for the certificate signing request. • This property shall contain the Privacy Enhanced Mail (PEM)-encoded string, which contains RFC2986-specified structures, of the certificate signing request. The private key should not be part of the string.
}			

Request Example

```
{
    "Country": "US",
    "State": "Oregon",
```

```
    "City": "Portland",
    "Organization": "Contoso",
    "OrganizationalUnit": "ABC",
    "CommonName": "manager.contoso.org",
    "AlternativeNames": [
        "manager.contoso.com",
        "manager.contoso.us"
    ],
    "Email": "admin@contoso.org",
    "KeyPairAlgorithm": "TPM_ALG_RSA",
    "KeyBitLength": 4096,
    "KeyUsage": [
        "KeyEncipherment",
        "ServerAuthentication"
    ],
    "CertificateCollection": {
        "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates"
    }
}
```

Response Example

```
{
    "CSRString": "-----BEGIN CERTIFICATE REQUEST-----...-----END CERTIFICATE REQUEST-----",
    "CertificateCollection": {
        "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates"
    }
}
```

6.18.4.2 ReplaceCertificate

Description

This action replaces a certificate.

- This action shall replace a certificate. The `Location` header in the response shall contain the URI of the new certificate resource.

Action URI: {Base URI of target resource}/Actions/CertificateService.ReplaceCertificate

Action parameters

Parameter Name	Type	Attributes	Notes
CertificateString	string	*required*	The string for the certificate. • This parameter shall contain the string of the certificate, and the format shall follow the requirements specified by the CertificateType property value. If the certificate contains any private keys, they shall be removed from the string in responses. If the service does not know the private key for the certificate and it is needed to use the certificate, the client shall provide the private key as part of the string in the POST request.
CertificateType	string (enum)	*required*	The format of the certificate. • This parameter shall contain the format type for the certificate. *For the possible property values, see CertificateType in Property details.*
CertificateUri {	object	*required*	The link to the certificate that is being replaced. • This parameter shall contain a link to a resource of type Certificate that is being replaced. See the *Certificate* schema for details on this property.
@odata.id	string	*read-only*	Link to a Certificate resource. See the Links section and the *Certificate* schema for details.
}			

Request Example

```
{
    "CertificateUri": {
        "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol/HTTPS/Certificates/1"
    },
    "CertificateString": "-----BEGIN CERTIFICATE-----\n...\n-----END CERTIFICATE-----",
    "CertificateType": "PEM"
}
```

6.18.5 Property details

6.18.5.1 CertificateType:

The format of the certificate.

- This parameter shall contain the format type for the certificate.

string	Description
PEM	A Privacy Enhanced Mail (PEM)-encoded single certificate. • This value shall indicate the format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined structures, representing a single certificate.
PEMchain	A Privacy Enhanced Mail (PEM)-encoded certificate chain. • This value shall indicate the format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined structures, representing a certificate chain.
PKCS7	A Privacy Enhanced Mail (PEM)-encoded PKCS7 certificate. • The format of the certificate shall contain a Privacy Enhanced Mail (PEM)-encoded string, containing RFC5280-defined and RFC2315-defined structures. The service can discard additional certificates or other data in the structure.

6.18.5.2 KeyUsage:

The usages of a key contained within a certificate.

- The usage of the key contained in the certificate.
  - This parameter shall contain the usage of the key contained in the certificate. If the client does not provide this value, the service can determine the appropriate key usage settings in the certificate signing request.

string	Description
ClientAuthentication	TLS WWW client authentication.
CodeSigning	Signs downloadable executable code.
CRLSigning	Verifies signatures on certificate revocation lists (CRLs).
DataEncipherment	Directly enciphers raw user data without an intermediate symmetric cipher.
DecipherOnly	Deciphers data while performing a key agreement.
DigitalSignature	Verifies digital signatures, other than signatures on certificates and CRLs.
EmailProtection	Email protection.
EncipherOnly	Enciphers data while performing a key agreement.
KeyAgreement	Key agreement.
KeyCertSign	Verifies signatures on public key certificates.
KeyEncipherment	Enciphers private or secret keys.

string	Description
NonRepudiation	Verifies digital signatures, other than signatures on certificates and CRLs, and provides a non-repudiation service that protects against the signing entity falsely denying some action.
OCSPSigning	Signs OCSP responses.
ServerAuthentication	TLS WWW server authentication.
Timestamping	Binds the hash of an object to a time.

6.18.6 Example response

```
{
    "@odata.type": "#CertificateService.v1_0_4.CertificateService",
    "Id": "CertificateService",
    "Name": "Certificate Service",
    "Actions": {
        "#CertificateService.GenerateCSR": {
            "target": "/redfish/v1/CertificateService/Actions/CertificateService.GenerateCSR",
            "@Redfish.ActionInfo": "/redfish/v1/CertificateService/GenerateCSRActionInfo"
        },
        "#CertificateService.ReplaceCertificate": {
            "target": "/redfish/v1/CertificateService/Actions/CertificateService.ReplaceCertificate",
            "@Redfish.ActionInfo": "/redfish/v1/CertificateService/ReplaceCertificateActionInfo"
        }
    },
    "CertificateLocations": {
        "@odata.id": "/redfish/v1/CertificateService/CertificateLocations"
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/CertificateService"
}
```

6.19 Chassis 1.21.0

Version	*v1.21*	*v1.20*	*v1.19*	*v1.18*	*v1.17*	*v1.16*	*v1.15*	*v1.14*	*v1.13*	*v1.12*	*v1.11*	...
Release	2022.2	2022.1	2021.4	2021.3	2021.2	2021.1	2020.4	2020.3	2020.2	2020.1	2019.4	...

6.19.1 Description

The Chassis schema represents the physical components of a system. This resource represents the sheet-metal confined spaces and logical zones such as racks, enclosures, chassis and all other containers. Subsystems, such as

sensors, that operate outside of a system's data plane are linked either directly or indirectly through this resource. A subsystem that operates outside of a system's data plane are not accessible to software that runs on the system.

- This resource shall represent a chassis or other physical enclosure for a Redfish implementation.

6.19.2 URIs

/redfish/v1/Chassis/*{ChassisId}*

6.19.3 Properties

Property	Type	Attributes	Notes
Assembly *(v1.6+)* {	object		The link to the assembly associated with this chassis. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
AssetTag	string	*read-write (null)*	The user-assigned asset tag of this chassis. • This property shall contain an identifying string that tracks the chassis for inventory purposes.
Certificates *(v1.15+)* {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
ChassisType	string (enum)	*read-only required*	The type of physical form factor of the chassis. • This property shall indicate the physical form factor for the type of chassis. *For the possible property values, see ChassisType in Property details.*

Property	Type	Attributes	Notes
Controls *(v1.17+)* {	object		The link to the collection of controls located in this chassis. • This property shall contain a link to a resource collection of type ControlCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Control*. See the Control schema for details.
}			
DepthMm *(v1.4+)*	number (mm)	*read-only* *(null)*	The depth of the chassis. • This property shall represent the depth (length) of the chassis, in millimeters, as specified by the manufacturer.
Drives *(v1.14+)* {	object		The link to the collection of drives within this chassis. • This property shall contain a link to a resource collection of type DriveCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Drive*. See the Drive schema for details.
}			
ElectricalSourceManagerURIs *(v1.18+)* [ ]	array (URI) (string, null)	*read-write*	The URIs of the management interfaces for the upstream electrical source connections for this chassis. • This property shall contain an array of URIs to the management applications or devices that provide monitoring or control of the upstream electrical sources that provide power to this chassis.
ElectricalSourceNames *(v1.18+)* [ ]	array (string, null)	*read-write*	The names of the upstream electrical sources, such as circuits or outlets, connected to this chassis. • This property shall contain an arrays of strings that identify the upstream electrical sources, such as the names of circuits or outlets, that provide power to this chassis.
EnvironmentalClass *(v1.9+)*	string (enum)	*read-write* *(null)*	The ASHRAE Environmental Class for this chassis. • This property shall contain the ASHRAE Environmental Class for this chassis, as defined by ASHRAE Thermal Guidelines for Data Processing Environments. These classes define respective environmental limits that include temperature, relative humidity, dew point, and maximum allowable elevation. *For the possible property values, see EnvironmentalClass in Property details.*

Property	Type	Attributes	Notes
EnvironmentMetrics *(v1.15+)* {	object		The link to the environment metrics for this chassis. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the environment metrics for this chassis. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			
FabricAdapters *(v1.20+)* {	object		The link to the collection of fabric adapters located in this chassis. • This property shall contain a link to a resource collection of type FabricAdapterCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *FabricAdapter*. See the FabricAdapter schema for details.
}			
HeightMm *(v1.4+)*	number (mm)	*read-only (null)*	The height of the chassis. • This property shall represent the height of the chassis, in millimeters, as specified by the manufacturer.
HotPluggable *(v1.21+)*	boolean	*read-only (null)*	An indication of whether this component can be inserted or removed while the equipment is in operation. • This property shall indicate whether the component can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Components indicated as hot-pluggable shall allow the component to become operable without altering the operational state of the underlying equipment. Components that cannot be inserted or removed from equipment in operation, or components that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot-pluggable.
IndicatorLED *(deprecated v1.14)*	string (enum)	*read-write (null)*	The state of the indicator LED, which identifies the chassis. • This property shall contain the indicator light state for the indicator light associated with this system. *For the possible property values, see IndicatorLED in Property details. Deprecated in v1.14 and later. This property has been deprecated in favor of the LocationIndicatorActive property.*

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Cables *(v1.17+)* [{	array		An array of links to the cables connected to this chassis. • This property shall contain an array of links to resources of type Cable that represent the cables connected to this chassis.
@odata.id	string	*read-only*	Link to a Cable resource. See the Links section and the *Cable* schema for details.
}]			
ComputerSystems [{	array		An array of links to the computer systems that this chassis directly and wholly contains. • This property shall contain an array of links to resources of type ComputerSystem with which this physical container is associated. If a chassis also links to a computer system to which this resource also links, this chassis shall not link to that computer system.
@odata.id	string	*read-only*	Link to a ComputerSystem resource. See the Links section and the *ComputerSystem* schema for details.
}]			
ContainedBy {	object		The link to the chassis that contains this chassis. • This property shall contain a link to a resource of type Chassis that represents the chassis that contains this chassis.
@odata.id	string	*read-write*	Link to another Chassis resource.
}			
Contains [{	array		An array of links to any other chassis that this chassis has in it. • This property shall contain an array of links to resources of type Chassis that represent the chassis instances that this chassis contains.
@odata.id	string	*read-write*	Link to another Chassis resource.
}]			

Property	Type	Attributes	Notes
CooledBy *(deprecated v1.20)* [{	array		An array of links to resources or objects that cool this chassis. Normally, the link is for either a chassis or a specific set of fans. • This property shall contain an array of links to resources or objects that cool this chassis. *Deprecated in v1.20 and later. This property has been deprecated in favor of the Fans link property, and details provided in the ThermalSubsystem resource.*
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Drives *(v1.2+)* [{	array		An array of links to the drives located in this chassis. • This property shall contain an array of links to resources of type Drive that are in this chassis.
@odata.id	string	*read-only*	Link to a Drive resource. See the Links section and the *Drive* schema for details.
}]			
Facility *(v1.11+)* {	object		The link to the facility that contains this chassis. • This property shall contain a link to the resource of type Facility and shall represent the smallest facility that contains this chassis. This property shall not appear in resources that include a ContainedBy property within the Links property. See the *Facility* schema for details on this property.
@odata.id	string	*read-write*	Link to a Facility resource. See the Links section and the *Facility* schema for details.
}			
Fans *(v1.20+)* [{	array		An array of links to the fans that cool this chassis. • This property shall contain an array of links to resources of type Fan that represent the fans that provide cooling to this chassis. This property shall not be present if the ThermalManagedByParent property contains `true` or if the fans are contained in the ThermalSubsystem resource for this chassis.
@odata.id	string	*read-only*	Link to a Fan resource. See the Links section and the *Fan* schema for details.
}]			

Property	Type	Attributes	Notes
ManagedBy [{	array		An array of links to the managers responsible for managing this chassis. • This property shall contain an array of links to resources of type Manager that manage this chassis.
@odata.id	string	*read-only*	Link to a Manager resource. See the Links section and the *Manager* schema for details.
}]			
ManagersInChassis *(v1.2+)* [{	array		An array of links to the managers located in this chassis. • This property shall contain an array of links to resources of type Manager that are in this chassis.
@odata.id	string	*read-only*	Link to a Manager resource. See the Links section and the *Manager* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeDevices *(v1.4+, deprecated v1.10* [{	array		An array of links to the PCIe devices located in this chassis. • This property shall contain an array of links to resources of type PCIeDevice. *Deprecated in v1.10 and later. This property has been deprecated in favor of the PCIeDevices resource collection in the root of this resource.*
@odata.id	string	*read-only*	Link to a PCIeDevice resource. See the Links section and the *PCIeDevice* schema for details.
}]			
PowerDistribution *(v1.20+)* {	object	*(null)*	A link to power distribution functionality contained in this chassis. • This property shall contain a link to a resource of type PowerDistribution that represents the power distribution functionality contained within this chassis. See the *PowerDistribution* schema for details on this property.
@odata.id	string	*read-only*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}			

Property	Type	Attributes	Notes
PoweredBy *(deprecated v1.20)* [{	array		An array of links to resources or objects that power this chassis. Normally, the link is for either a chassis or a specific set of power supplies. • This property shall contain an array of links to resources or objects that power this chassis. *Deprecated in v1.20 and later. This property has been deprecated in favor of the PowerOutlets and PowerSupplies link properties, and details provided in the PowerSubsystem resource.*
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
PowerOutlets *(v1.18+)* [{	array		An array of links to the outlets that provide power to this chassis. • This property shall contain an array of links to resources of type Outlet that represent the outlets that provide power to this chassis. This property shall not be present if the PoweredByParent property contains `true`.
@odata.id	string	*read-write*	Link to a Outlet resource. See the Links section and the *Outlet* schema for details.
}]			
PowerSupplies *(v1.20+)* [{	array		An array of links to the power supplies that provide power to this chassis. • This property shall contain an array of links to resources of type PowerSupply that represent the power supplies that provide power to this chassis. This property shall not be present if the PoweredByParent property contains `true` or the power supplies are contained in the PowerSubsystem resource for this chassis.
@odata.id	string	*read-only*	Link to a PowerSupply resource. See the Links section and the *PowerSupply* schema for details.
}]			
Processors *(v1.9+)* [{	array		An array of links to the processors located in this chassis. • This property shall contain an array of links to resources of type Processor type that this chassis contains.
@odata.id	string	*read-only*	Link to a Processor resource. See the Links section and the *Processor* schema for details.
}]			

Property	Type	Attributes	Notes
ResourceBlocks *(v1.5+)* [{	array		An array of links to the resource blocks located in this chassis. • This property shall contain an array of links of to resources of type ResourceBlock that this chassis contains.
@odata.id	string	*read-only*	Link to a ResourceBlock resource. See the Links section and the *ResourceBlock* schema for details.
}]			
Storage *(v1.2+)* [{	array		An array of links to the storage subsystems connected to or inside this chassis. • This property shall contain an array of links to resources of type Storage that are connected to or contained in this chassis.
@odata.id	string	*read-only*	Link to a Storage resource. See the Links section and the *Storage* schema for details.
}]			
Switches *(v1.7+)* [{	array		An array of links to the switches located in this chassis. • This property shall contain an array of links to resources of type Switch that this chassis contains.
@odata.id	string	*read-only*	Link to a Switch resource. See the Links section and the *Switch* schema for details.
}]			
}			
Location *(v1.2+)* {}	object		The location of the chassis. • This property shall contain location information of the associated chassis. For property details, see Location.
LocationIndicatorActive *(v1.14+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
LogServices {	object		The link to the logs for this chassis. • This property shall contain a link to a resource collection of type LogServiceCollection. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to Collection of *LogService*. See the LogService schema for details.
}			
Manufacturer	string	*read-only* *(null)*	The manufacturer of this chassis. • This property shall contain the name of the organization responsible for producing the chassis. This organization may be the entity from whom the chassis is purchased, but this is not necessarily true.
MaxPowerWatts *(v1.12+)*	number (Watts)	*read-only* *(null)*	The upper bound of the total power consumed by the chassis. • This property shall contain the upper bound of the total power consumed by the chassis.
Measurements *(v1.15+, deprecated v1.19* [{	array		An array of DSP0274-defined measurement blocks. • This property shall contain an array of DSP0274-defined measurement blocks. *Deprecated in v1.19 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
@odata.id	string	*read-only*	Link to a MeasurementBlock resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
MediaControllers *(v1.11+, deprecated v1.20* {	object		The link to the collection of media controllers located in this chassis. • This property shall contain a link to a resource collection of type MediaControllerCollection. Contains a link to a resource. *Deprecated in v1.20 and later. This property has been deprecated in favor of FabricAdapters.*
@odata.id	string	*read-only*	Link to Collection of *MediaController*. See the MediaController schema for details.
}			
Memory *(v1.11+)* {	object		The link to the collection of memory located in this chassis. • This property shall contain a link to a resource collection of type MemoryCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Memory*. See the Memory schema for details.
}			

Property	Type	Attributes	Notes
MemoryDomains *(v1.11+)* {	object		The link to the collection of memory domains located in this chassis. • This property shall contain a link to a resource collection of type MemoryDomainCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *MemoryDomain*. See the MemoryDomain schema for details.
}			
MinPowerWatts *(v1.12+)*	number (Watts)	*read-only* *(null)*	The lower bound of the total power consumed by the chassis. • This property shall contain the lower bound of the total power consumed by the chassis.
Model	string	*read-only* *(null)*	The model number of the chassis. • This property shall contain the name by which the manufacturer generally refers to the chassis.
NetworkAdapters *(v1.4+)* {	object		The link to the collection of network adapters associated with this chassis. • This property shall contain a link to a resource collection of type NetworkAdapterCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *NetworkAdapter*. See the NetworkAdapter schema for details.
}			
PartNumber	string	*read-only* *(null)*	The part number of the chassis. • This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the chassis.
PCIeDevices *(v1.10+)* {	object		The link to the collection of PCIe devices located in this chassis. • This property shall contain a link to a resource collection of type PCIeDeviceCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PCIeDevice*. See the PCIeDevice schema for details.
}			

Property	Type	Attributes	Notes
PCIeSlots *(v1.8+)* {	object		The link to the PCIe slot properties for this chassis. • This property shall contain a link to the resource of type PCIeSlots that represents the PCIe slot information for this chassis. See the *PCIeSlots* schema for details on this property.
@odata.id	string	*read-only*	Link to a PCIeSlots resource. See the Links section and the *PCIeSlots* schema for details.
}			
PhysicalSecurity *(v1.1+)* {	object		The state of the physical security sensor. • This property shall contain the sensor state of the physical security.
IntrusionSensor *(v1.1+)*	string (enum)	*read-write (null)*	This indicates the known state of the physical security sensor, such as if it is hardware intrusion detected. • This property shall represent the state of this physical security sensor. Hardware intrusion indicates the internal hardware is detected as being accessed in an insecure state. Tampering detected indicates the physical tampering of the monitored entity is detected. *For the possible property values, see IntrusionSensor in Property details.*
IntrusionSensorNumber *(v1.1+)*	integer	*read-only (null)*	A numerical identifier to represent the physical security sensor. • This property shall contain a numerical identifier for this physical security sensor that is unique within this resource.
IntrusionSensorReArm *(v1.1+)*	string (enum)	*read-only (null)*	The method that restores this physical security sensor to the normal state. • This property shall represent the method that restores this physical security sensor to the normal state. Manual indicates manual re-arm is needed. Automatic indicates the state is restored automatically because no abnormal physical security conditions are detected. *For the possible property values, see IntrusionSensorReArm in Property details.*
}			
Power *(deprecated v1.15)* {	object		The link to the power properties, or power supplies, power policies, and sensors, for this chassis. • This property shall contain a link to a resource of type Power that represents the power characteristics of this chassis. See the *Power* schema for details on this property. *Deprecated in v1.15 and later. This link has been deprecated in favor of the PowerSubsystem link property.*

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to a Power resource. See the Links section and the *Power* schema for details.
}			
PoweredByParent *(v1.20+)*	boolean	*read-only* *(null)*	Indicates that the chassis receives power from the containing chassis. • This property shall indicate whether the chassis receives power from the chassis that contains it. The value `true` shall indicate that the containing chassis provides power. The value `false` shall indicate the chassis receives power from its own power subsystem, another chassis instance's power supplies, or outlets.
PowerState *(v1.0.1+)*	string (enum)	*read-only* *(null)*	The current power state of the chassis. • This property shall contain the power state of the chassis. *For the possible property values, see PowerState in Property details.*
PowerSubsystem *(v1.15+)* {	object		The link to the power subsystem properties for this chassis. • This property shall contain a link to a resource of type PowerSubsystem that represents the power subsystem information for this chassis. See the *PowerSubsystem* schema for details on this property.
@odata.id	string	*read-only*	Link to a PowerSubsystem resource. See the Links section and the *PowerSubsystem* schema for details.
}			
Replaceable *(v1.21+)*	boolean	*read-only* *(null)*	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. • This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of `false` indicates the component needs to be replaced by policy, as part of another component. If the `LocationType` property of this component contains `Embedded`, this property shall contain `false`.
Sensors *(v1.9+)* {	object		The link to the collection of sensors located in the equipment and sub-components. • This property shall contain a link to a resource collection of type SensorCollection that contains the sensors located in the chassis and sub-components. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Sensor*. See the Sensor schema for details.
}			

Property	Type	Attributes	Notes
SerialNumber	string	*read-only (null)*	The serial number of the chassis. • This property shall contain a manufacturer-allocated number that identifies the chassis.
SKU	string	*read-only (null)*	The SKU of the chassis. • This property shall contain the stock-keeping unit number for this chassis.
SparePartNumber *(v1.16+)*	string	*read-only (null)*	The spare part number of the chassis. • This property shall contain the spare part number of the chassis.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
Thermal *(deprecated v1.15)* {	object		The link to the thermal properties, such as fans, cooling, and sensors, for this chassis. • This property shall contain a link to a resource of type Thermal that represents the thermal characteristics of this chassis. See the *Thermal* schema for details on this property. *Deprecated in v1.15 and later. This link has been deprecated in favor of the ThermalSubsystem link property.*
@odata.id	string	*read-only*	Link to a Thermal resource. See the Links section and the *Thermal* schema for details.
}			
ThermalDirection *(v1.20+)*	string (enum)	*read-only (null)*	Indicates the thermal management path through the chassis. • This property shall indicate the general direction of the thermal management path through the chassis. *For the possible property values, see ThermalDirection in Property details.*
ThermalManagedByParent *(v1.20+)*	boolean	*read-only (null)*	Indicates that the chassis is thermally managed by the parent chassis. • This property shall indicate whether the chassis relies on the containing chassis to provide thermal management. The value `true` shall indicate that the chassis relies on the containing chassis to provide thermal management. The value `false` shall indicate the chassis provides thermal management, and may provide details in a ThermalSubsystem resource, or by populating the Fans property in Links.

Property	Type	Attributes	Notes
ThermalSubsystem *(v1.15+)* {	object		The link to the thermal subsystem properties for this chassis. • This property shall contain a link to a resource of type ThermalSubsystem that represents the thermal subsystem information for this chassis. See the *ThermalSubsystem* schema for details on this property.
@odata.id	string	*read-only*	Link to a ThermalSubsystem resource. See the Links section and the *ThermalSubsystem* schema for details.
}			
TrustedComponents *(v1.21+)* {	object		The link to the trusted components in this chassis. • This property shall contain a link to a resource collection of type TrustedComponentCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *TrustedComponent*. See the TrustedComponent schema for details.
}			
UUID *(v1.7+)*	string	*read-only* *(null)*	The UUID for this chassis. • This property shall contain the universal unique identifier number for this chassis. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`
Version *(v1.21+)*	string	*read-only* *(null)*	The hardware version of this chassis. • This property shall contain the hardware version of this chassis as determined by the vendor or supplier.
WeightKg *(v1.4+)*	number (kg)	*read-only* *(null)*	The weight of the chassis. • This property shall represent the published mass, commonly referred to as weight, of the chassis, in kilograms.
WidthMm *(v1.4+)*	number (mm)	*read-only* *(null)*	The width of the chassis. • This property shall represent the width of the chassis, in millimeters, as specified by the manufacturer.

6.19.4 Actions

6.19.4.1 Reset

Description

This action resets the chassis but does not reset systems or other contained resources, although side effects can occur that affect those resources.

- This action shall reset the chassis but shall not reset systems or other contained resources, although side effects can occur that affect those resources.

Action URI: {Base URI of target resource}/Actions/Chassis.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and complete an implementation-specific default reset. Services should include the @Redfish.AllowableValues annotation for this parameter to ensure compatibility with clients, even when ActionInfo has been implemented. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ForceRestart"
}
```

6.19.5 Property details

6.19.5.1 ChassisType:

The type of physical form factor of the chassis.

- This property shall indicate the physical form factor for the type of chassis.

string	Description
Blade	An enclosed or semi-enclosed, typically vertically-oriented, system chassis that must be plugged into a multi-system chassis to function normally.
Card	A loose device or circuit board intended to be installed in a system or other enclosure.
Cartridge	A small self-contained system intended to be plugged into a multi-system chassis.
Component	A small chassis, card, or device that contains devices for a particular subsystem or function.
Drawer	An enclosed or semi-enclosed, typically horizontally-oriented, system chassis that can be slid into a multi-system chassis.
Enclosure	A generic term for a chassis that does not fit any other description.
Expansion	A chassis that expands the capabilities or capacity of another chassis.
IPBasedDrive *(v1.3+)*	A chassis in a drive form factor with IP-based network connections.
Module	A small, typically removable, chassis or card that contains devices for a particular subsystem or function.
Other	A chassis that does not fit any of these definitions.
Pod	A collection of equipment racks in a large, likely transportable, container.
Rack	An equipment rack, typically a 19-inch wide freestanding unit.
RackGroup *(v1.4+)*	A group of racks that form a single entity or share infrastructure.
RackMount	A single-system chassis designed specifically for mounting in an equipment rack.
Row	A collection of equipment racks.
Shelf	An enclosed or semi-enclosed, typically horizontally-oriented, system chassis that must be plugged into a multi-system chassis to function normally.
Sidecar	A chassis that mates mechanically with another chassis to expand its capabilities or capacity.
Sled	An enclosed or semi-enclosed, system chassis that must be plugged into a multi-system chassis to function normally similar to a blade type chassis.
StandAlone	A single, free-standing system, commonly called a tower or desktop chassis.
StorageEnclosure *(v1.6+)*	A chassis that encloses storage.
Zone	A logical division or portion of a physical chassis that contains multiple devices or systems that cannot be physically separated.

6.19.5.2 EnvironmentalClass:

The ASHRAE Environmental Class for this chassis.

- This property shall contain the ASHRAE Environmental Class for this chassis, as defined by ASHRAE Thermal Guidelines for Data Processing Environments. These classes define respective environmental limits that include temperature, relative humidity, dew point, and maximum allowable elevation.

string	Description
A1	ASHRAE Environmental Class 'A1'.
A2	ASHRAE Environmental Class 'A2'.
A3	ASHRAE Environmental Class 'A3'.
A4	ASHRAE Environmental Class 'A4'.

6.19.5.3 IndicatorLED:

The state of the indicator LED, which identifies the chassis.

- This property shall contain the indicator light state for the indicator light associated with this system.

string	Description
Blinking	The indicator LED is blinking. • This value shall represent the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Lit	The indicator LED is lit. • This value shall represent the indicator LED is in a solid on state. If the service does not support this value, it shall return the HTTP 400 (Bad Request) status code to reject PATCH or PUT requests that contain this value.
Off	The indicator LED is off. • This value shall represent the indicator LED is in a solid off state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Unknown *(deprecated v1.2)*	The state of the indicator LED cannot be determined. • This value shall represent the indicator LED is in an unknown state. The service shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code. *Deprecated in v1.2 and later. This value has been deprecated in favor of returning null if the state is unknown.*

6.19.5.4 IntrusionSensor:

This indicates the known state of the physical security sensor, such as if it is hardware intrusion detected.

- This property shall represent the state of this physical security sensor. Hardware intrusion indicates the internal hardware is detected as being accessed in an insecure state. Tampering detected indicates the physical tampering of the monitored entity is detected.

string	Description
HardwareIntrusion	A door, lock, or other mechanism protecting the internal system hardware from being accessed is detected to be in an insecure state.
Normal	No abnormal physical security condition is detected at this time.
TamperingDetected	Physical tampering of the monitored entity is detected.

6.19.5.5 IntrusionSensorReArm:

The method that restores this physical security sensor to the normal state.

- This property shall represent the method that restores this physical security sensor to the normal state. Manual indicates manual re-arm is needed. Automatic indicates the state is restored automatically because no abnormal physical security conditions are detected.

string	Description
Automatic	Because no abnormal physical security condition is detected, this sensor is automatically restored to the normal state.
Manual	A manual re-arm of this sensor restores it to the normal state.

6.19.5.6 PowerState:

The current power state of the chassis.

- This property shall contain the power state of the chassis.

string	Description
Off	The components within the chassis have no power, except some components might continue to have AUX power, such as the management controller.

string	Description
On	The components within the chassis have power.
PoweringOff	A temporary state between on and off. The components within the chassis can take time to process the power off action.
PoweringOn	A temporary state between off and on. The components within the chassis can take time to process the power on action.

6.19.5.7 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and complete an implementation-specific default reset. Services should include the @Redfish.AllowableValues annotation for this parameter to ensure compatibility with clients, even when ActionInfo has been implemented.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.

string	Description
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.19.5.8 ThermalDirection:

Indicates the thermal management path through the chassis.

- This property shall indicate the general direction of the thermal management path through the chassis.

string	Description
BackToFront	A chassis with the air intake in the back and exhaust out the front. • This value shall indicate a chassis with the air intake generally from the back of the chassis and the air exhaust out the front of the chassis.
FrontToBack	A chassis with the air intake in the front and exhaust out the back. • This value shall indicate a chassis with the air intake generally from the front of the chassis and the air exhaust out the back of the chassis.
Sealed	A sealed chassis with no air pathway. • This value shall indicate a sealed chassis with no air pathway through the chassis.
TopExhaust	A chassis with air exhaust on the top. • This value shall indicate a chassis with the air exhaust out the top of the chassis.

6.19.6 Example response

```
{
    "@odata.type": "#Chassis.v1_21_0.Chassis",
    "Id": "1U",
    "Name": "Computer System Chassis",
    "ChassisType": "RackMount",
    "AssetTag": "Chicago-45Z-2381",
    "Manufacturer": "Contoso",
    "Model": "3500RX",
    "SKU": "8675309",
    "SerialNumber": "437XR1138R2",
    "PartNumber": "224071-J23",
    "PowerState": "On",
    "LocationIndicatorActive": true,
    "Location": {
        "Placement": {
            "Row": "North",
            "Rack": "WEB43",
            "RackOffsetUnits": "EIA_310",
```

```
            "RackOffset": 12
        }
    },
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "HeightMm": 44.45,
    "WidthMm": 431.8,
    "DepthMm": 711,
    "WeightKg": 15.31,
    "EnvironmentalClass": "A3",
    "Sensors": {
        "@odata.id": "/redfish/v1/Chassis/1U/Sensors"
    },
    "PowerSubsystem": {
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem"
    },
    "ThermalSubsystem": {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem"
    },
    "EnvironmentMetrics": {
        "@odata.id": "/redfish/v1/Chassis/1U/EnvironmentMetrics"
    },
    "Links": {
        "ComputerSystems": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2"
            }
        ],
        "ManagedBy": [
            {
                "@odata.id": "/redfish/v1/Managers/BMC"
            }
        ],
        "ManagersInChassis": [
            {
                "@odata.id": "/redfish/v1/Managers/BMC"
            }
        ],
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1U"
}
```

6.20 Circuit 1.7.0

Version	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2022.1	2021.4	2021.3	2021.2	2020.4	2020.3	2019.4

6.20.1 Description

This is the schema definition for an electrical circuit.

- This resource shall be used to represent an electrical circuit for a Redfish implementation.

6.20.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Mains/*{CircuitId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Mains/*{CircuitId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Subfeeds/*{CircuitId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Mains/*{CircuitId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Mains/*{CircuitId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Feeders/*{CircuitId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Mains/*{CircuitId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Subfeeds/*{CircuitId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Feeders/*{CircuitId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Mains/*{CircuitId}*

6.20.3 Properties

Property	Type	Attributes	Notes
BreakerState	string (enum)	*read-only (null)*	The state of the over current protection device. • This property shall contain the state of the over current protection device. *For the possible property values, see BreakerState in Property details.*

Property	Type	Attributes	Notes
CircuitType	string (enum)	*read-only* *(null)*	The type of circuit. • This property shall contain the type of circuit. *For the possible property values, see CircuitType in Property details.*
ConfigurationLocked *(v1.5+)*	boolean	*read-write*	Indicates whether the configuration is locked. • This property shall indicate whether modification requests to this resource are not permitted. If `true`, services shall reject modification requests to other properties in this resource.
CriticalCircuit	boolean	*read-write* *(null)*	Designates if this is a critical circuit. • This property shall indicate whether the circuit is designated as a critical circuit, and therefore is excluded from autonomous logic that could affect the state of the circuit. The value shall be `true` if the circuit is deemed critical, and `false` if the circuit is not critical.
CurrentAmps {}	object		The current (A) for this single phase circuit. • This property shall contain the current, in ampere units, for this single phase circuit. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This property shall not appear in resource instances representing poly-phase circuits. For more information about this property, see SensorCurrentExcerpt in Property Details.
ElectricalConsumerNames *(v1.4+)* [ ]	array (string, null)	*read-write*	An array of names of downstream devices that are powered by this circuit. • This property shall contain an array of user-assigned identifying strings that describe downstream devices that are powered by this circuit.
ElectricalContext	string (enum)	*read-only* *(null)*	The combination of current-carrying conductors. • This property shall contain the combination of current-carrying conductors that distribute power. *For the possible property values, see ElectricalContext in Property details.*
ElectricalSourceManagerURI *(v1.4+)*	string (URI)	*read-write*	The URI of the management interface for the upstream electrical source connection for this circuit. • This property shall contain a URI to the management application or device that provides monitoring or control of the upstream electrical source that provide power to this circuit. If a value has not been assigned by a user, the value of this property shall be an empty string.

Property	Type	Attributes	Notes
ElectricalSourceName *(v1.4+)*	string	*read-write*	The name of the upstream electrical source, such as a circuit or outlet, connected to this circuit. • This property shall contain a string that identifies the upstream electrical source, such as the name of a circuit or outlet, that provides power to this circuit. If a value has not been assigned by a user, the value of this property shall be an empty string.
EnergykWh {}	object		The energy (kWh) for this circuit. • This property shall contain the total energy, in kilowatt-hour units, for this circuit, that represents the `Total` ElectricalContext sensor when multiple energy sensors exist for this circuit. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. For more information about this property, see SensorEnergykWhExcerpt in Property Details.
FrequencyHz {}	object		The frequency (Hz) for this circuit. • This property shall contain the frequency, in hertz units, for this circuit. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Frequency`. For more information about this property, see SensorExcerpt in Property Details.
IndicatorLED *(deprecated v1.1)*	string (enum)	*read-write (null)*	The state of the indicator LED, which identifies the circuit. • This property shall contain the indicator light state for the indicator light associated with this circuit. *For the possible property values, see IndicatorLED in Property details. Deprecated in v1.1 and later. This property has been deprecated in favor of the LocationIndicatorActive property.*
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
BranchCircuit {	object	*(null)*	A reference to the branch circuit related to this circuit. • This property shall contain a link to a resource of type Circuit that represents the branch circuit associated with this circuit.
@odata.id	string	*read-only*	Link to another Circuit resource.
}			

Property	Type	Attributes	Notes
DistributionCircuits *(v1.4+)* [{	array		An array of links to the circuits powered by this circuit. • This property shall contain an array of links to resources of type Circuit that represent the circuits powered by this circuit.
@odata.id	string	*read-write*	Link to another Circuit resource.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Outlets [{	array		An array of references to the outlets contained by this circuit. • This property shall contain an array of links to resources of type Outlet that represent the outlets associated with this circuit.
@odata.id	string	*read-only*	Link to a Outlet resource. See the Links section and the *Outlet* schema for details.
}]			
PowerOutlet *(v1.4+)* {	object	*(null)*	A link to the power outlet that provides power to this circuit. • This property shall contain a link to a resource of type Outlet that represents the outlet that provides power to this circuit. See the *Outlet* schema for details on this property.
@odata.id	string	*read-write*	Link to a Outlet resource. See the Links section and the *Outlet* schema for details.
}			
SourceCircuit *(v1.4+)* {	object	*(null)*	A link to the circuit that provides power to this circuit. • This property shall contain a link to a resource of type Circuit that represents the circuit that provides power to this circuit. This property should be used when the power source is not represented by an Outlet resource, such as a feeder circuit.
@odata.id	string	*read-write*	Link to another Circuit resource.
}			
}			

Property	Type	Attributes	Notes
LocationIndicatorActive *(v1.1+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
NominalVoltage	string (enum)	*read-only (null)*	The nominal voltage for this circuit. • This property shall contain the nominal voltage for this circuit, in Volts. *For the possible property values, see NominalVoltage in Property details.*
PhaseWiringType	string (enum)	*read-only (null)*	The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires). • This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires). *For the possible property values, see PhaseWiringType in Property details.*
PlugType	string (enum)	*read-only (null)*	The type of plug according to NEMA, IEC, or regional standards. • This property shall contain the type of physical plug used for this circuit, as defined by IEC, NEMA, or regional standard. *For the possible property values, see PlugType in Property details.*
PolyPhaseCurrentAmps {	object	*(null)*	The current readings for this circuit. • This property shall contain the current sensors for this circuit. For single phase circuits this property shall contain a duplicate copy of the current sensor referenced in the CurrentAmps property, if present. For poly-phase circuits this property should contain multiple current sensor readings used to fully describe the circuit.
Line1 {}	object		Line 1 current (A). • This property shall contain the line current, in ampere units, for L1. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This property shall not be present if the equipment does not include an L1 measurement. For more information about this property, see SensorCurrentExcerpt in Property Details.

Property	Type	Attributes	Notes
Line2 {}	object		Line 2 current (A). • This property shall contain the line current, in ampere units, for L2. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This property shall not be present if the equipment does not include an L2 measurement. For more information about this property, see SensorCurrentExcerpt in Property Details.
Line3 {}	object		Line 3 current (A). • This property shall contain the line current, in ampere units, for L3. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This property shall not be present if the equipment does not include an L3 measurement. For more information about this property, see SensorCurrentExcerpt in Property Details.
Neutral {}	object		Neutral line current (A). • This property shall contain the line current, in ampere units, for the Neutral line. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This property shall not be present if the equipment does not include a Neutral line measurement. For more information about this property, see SensorCurrentExcerpt in Property Details.
}			
PolyPhaseEnergykWh {	object	*(null)*	The energy readings for this circuit. • This property shall contain the energy sensors for this circuit. For single phase circuits this property shall contain a duplicate copy of the energy sensor referenced in the EnergykWh property, if present. For poly-phase circuits this property should contain multiple energy sensor readings used to fully describe the circuit.
Line1ToLine2 {}	object		The Line 1 to Line 2 energy (kWh) for this circuit. • This property shall contain the energy, in kilowatt-hour units, between L1 and L2. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This property shall not be present if the equipment does not include an L1-L2 measurement. For more information about this property, see SensorEnergykWhExcerpt in Property Details.

Property	Type	Attributes	Notes
Line1ToNeutral {}	object		The Line 1 to Neutral energy (kWh) for this circuit. • This property shall contain the energy, in kilowatt-hour units, between L1 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This property shall not be present if the equipment does not include an L1-Neutral measurement. For more information about this property, see SensorEnergykWhExcerpt in Property Details.
Line2ToLine3 {}	object		The Line 2 to Line 3 energy (kWh) for this circuit. • This property shall contain the energy, in kilowatt-hour units, between L2 and L3. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This property shall not be present if the equipment does not include an L2-L3 measurement. For more information about this property, see SensorEnergykWhExcerpt in Property Details.
Line2ToNeutral {}	object		The Line 2 to Neutral energy (kWh) for this circuit. • This property shall contain the energy, in kilowatt-hour units, between L2 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This property shall not be present if the equipment does not include an L2-Neutral measurement. For more information about this property, see SensorEnergykWhExcerpt in Property Details.
Line3ToLine1 {}	object		The Line 3 to Line 1 energy (kWh) for this circuit. • This property shall contain the energy, in kilowatt-hour units, between L3 and L1. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This property shall not be present if the equipment does not include an L3-L1 measurement. For more information about this property, see SensorEnergykWhExcerpt in Property Details.
Line3ToNeutral {}	object		The Line 3 to Neutral energy (kWh) for this circuit. • This property shall contain the energy, in kilowatt-hour units, between L3 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This property shall not be present if the equipment does not include an L3-Neutral measurement. For more information about this property, see SensorEnergykWhExcerpt in Property Details.

Property	Type	Attributes	Notes
}			
PolyPhasePowerWatts {	object	*(null)*	The power readings for this circuit. • This property shall contain the power sensors for this circuit. For single phase circuits this property shall contain a duplicate copy of the power sensor referenced in the PowerWatts property, if present. For poly-phase circuits this property should contain multiple power sensor readings used to fully describe the circuit.
Line1ToLine2 {}	object		The Line 1 to Line 2 power (W) for this circuit. • This property shall contain the power, in watt units, between L1 and L2. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This property shall not be present if the equipment does not include an L1-L2 measurement. For more information about this property, see SensorPowerExcerpt in Property Details.
Line1ToNeutral {}	object		The Line 1 to Neutral power (W) for this circuit. • This property shall contain the power, in watt units, between L1 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This property shall not be present if the equipment does not include an L1-Neutral measurement. For more information about this property, see SensorPowerExcerpt in Property Details.
Line2ToLine3 {}	object		The Line 2 to Line 3 power (W) for this circuit. • This property shall contain the power, in watt units, between L2 and L3. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This property shall not be present if the equipment does not include an L2-L3 measurement. For more information about this property, see SensorPowerExcerpt in Property Details.
Line2ToNeutral {}	object		The Line 2 to Neutral power (W) for this circuit. • This property shall contain the power, in watt units, between L2 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This property shall not be present if the equipment does not include an L2-Neutral measurement. For more information about this property, see SensorPowerExcerpt in Property Details.

Property	Type	Attributes	Notes
Line3ToLine1 {}	object		The Line 3 to Line 1 power (W) for this circuit. • This property shall contain the power, in watt units, between L3 and L1. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This property shall not be present if the equipment does not include an L3-L1 measurement. For more information about this property, see SensorPowerExcerpt in Property Details.
Line3ToNeutral {}	object		The Line 3 to Neutral power (W) for this circuit. • This property shall contain the power, in watt units, between L3 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This property shall not be present if the equipment does not include an L3-Neutral measurement. For more information about this property, see SensorPowerExcerpt in Property Details.
}			
PolyPhaseVoltage {	object	*(null)*	The voltage readings for this circuit. • This property shall contain the voltage sensors for this circuit. For single phase circuits this property shall contain a duplicate copy of the voltage sensor referenced in the Voltage property, if present. For poly-phase circuits this property should contain multiple voltage sensor readings used to fully describe the circuit.
Line1ToLine2 {}	object		The Line 1 to Line 2 voltage (V) for this circuit. • This property shall contain the line-to-line voltage, in volt units, between L1 and L2. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L1-L2 measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.
Line1ToNeutral {}	object		The Line 1 to Neutral voltage (V) for this circuit. • This property shall contain the line-to-line voltage, in volt units, between L1 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L1-Neutral measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.

Property	Type	Attributes	Notes
Line2ToLine3 {}	object		The Line 2 to Line 3 voltage (V) for this circuit. • This property shall contain the line-to-line voltage, in volt units, between L2 and L3. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L2-L3 measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.
Line2ToNeutral {}	object		The Line 2 to Neutral voltage (V) for this circuit. • This property shall contain the line-to-line voltage, in volt units, between L2 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L2-Neutral measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.
Line3ToLine1 {}	object		The Line 3 to Line 1 voltage (V) for this circuit. • This property shall contain the line-to-line voltage, in volt units, between L3 and L1. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L3-L1 measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.
Line3ToNeutral {}	object		The Line 3 to Neutral voltage (V) for this circuit. • This property shall contain the line-to-line voltage, in volt units, between L3 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L3-Neutral measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.
}			
PowerControlLocked *(v1.5+)*	boolean	*read-write*	Indicates whether power control requests are locked. • This property shall indicate whether requests to the PowerControl action are locked. If `true`, services shall reject requests to the PowerControl action.

Property	Type	Attributes	Notes
PowerCycleDelaySeconds	number	*read-write (null)*	The number of seconds to delay power on after a PowerControl action to cycle power. Zero seconds indicates no delay. • This property shall contain the number of seconds to delay power on after a PowerControl action to cycle power. The value `0` shall indicate no delay to power on.
PowerEnabled	boolean	*read-only (null)*	Indicates if the circuit can be powered. • This property shall indicate the power enable state of the circuit. The value `true` shall indicate that the circuit can be powered on, and `false` shall indicate that the circuit cannot be powered.
PowerLoadPercent *(v1.3+)* {}	object		The power load (percent) for this circuit. • This property shall contain the power load, in percent units, for this circuit, that represents the `Total` ElectricalContext for this circuit. For more information about this property, see SensorExcerpt in Property Details.
PowerOffDelaySeconds	number	*read-write (null)*	The number of seconds to delay power off after a PowerControl action. Zero seconds indicates no delay to power off. • This property shall contain the number of seconds to delay power off after a PowerControl action. The value `0` shall indicate no delay to power off.
PowerOnDelaySeconds	number	*read-write (null)*	The number of seconds to delay power up after a power cycle or a PowerControl action. Zero seconds indicates no delay to power up. • This property shall contain the number of seconds to delay power up after a power cycle or a PowerControl action. The value `0` shall indicate no delay to power up.
PowerRestoreDelaySeconds	number	*read-write (null)*	The number of seconds to delay power on after power has been restored. Zero seconds indicates no delay. • This property shall contain the number of seconds to delay power on after a power fault. The value `0` shall indicate no delay to power on.
PowerRestorePolicy	string (enum)	*read-write*	The desired power state of the circuit when power is restored after a power loss. • This property shall contain the desired PowerState of the circuit when power is applied. The value `LastState` shall return the circuit to the PowerState it was in when power was lost. *For the possible property values, see PowerRestorePolicy in Property details.*

Property	Type	Attributes	Notes
PowerState	string (enum)	*read-only* *(null)*	The power state of the circuit. • This property shall contain the power state of the circuit. *For the possible property values, see PowerState in Property details.*
PowerStateInTransition *(v1.5+)*	boolean	*read-only*	Indicates whether the power state is undergoing a delayed transition. • This property shall indicate whether the PowerState property will undergo a transition between on and off states due to a configured delay. The transition may be due to the configuration of the power on, off, or restore delay properties. If `true`, the PowerState property will transition at the conclusion of a configured delay.
PowerWatts {}	object		The power (W) for this circuit. • This property shall contain the total power, in watt units, for this circuit, that represents the `Total` ElectricalContext sensor when multiple power sensors exist for this circuit. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. For more information about this property, see SensorPowerExcerpt in Property Details.
RatedCurrentAmps	number (A)	*read-only* *(null)*	The rated maximum current allowed for this circuit. • This property shall contain the rated maximum current for this circuit, in ampere units, after any required de-rating, due to safety agency or other regulatory requirements, has been applied.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
UnbalancedCurrentPercent *(v1.5+)* {}	object		The current imbalance (percent) between phases. • This property shall contain the current imbalance, in percent units, between phases in a poly-phase circuit. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Percent`. For more information about this property, see SensorExcerpt in Property Details.

Property	Type	Attributes	Notes
UnbalancedVoltagePercent *(v1.5+)* {}	object		The voltage imbalance (percent) between phases. • This property shall contain the voltage imbalance, in percent units, between phases in a poly-phase circuit. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Percent`. For more information about this property, see SensorExcerpt in Property Details.
UserLabel *(v1.4+)*	string	*read-write*	A user-assigned label. • This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
Voltage {}	object		The voltage (V) for this single phase circuit. • This property shall contain the voltage, in volt units, for this single phase circuit. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not appear in resource instances representing poly-phase circuits. For more information about this property, see SensorVoltageExcerpt in Property Details.
VoltageType	string (enum)	*read-only* *(null)*	The type of voltage applied to the circuit. • This property shall contain the type of voltage applied to the circuit. *For the possible property values, see VoltageType in Property details.*

6.20.4 Actions

6.20.4.1 BreakerControl

Description

This action attempts to reset the circuit breaker.

- This action shall control the state of the circuit breaker or over-current protection device.

Action URI: {Base URI of target resource}/Actions/Circuit.BreakerControl

Action parameters

Parameter Name	Type	Attributes	Notes
PowerState	string (enum)	*optional*	The desired power state of the circuit if the breaker is reset successfully. • This parameter shall contain the desired power state of the circuit. *For the possible property values, see PowerState in Property details.*

Request Example

```
{
    "PowerState": "On"
}
```

6.20.4.2 PowerControl

Description

This action turns the circuit on or off.

- This action shall control the power state of the circuit.

Action URI: {Base URI of target resource}/Actions/Circuit.PowerControl

Action parameters

Parameter Name	Type	Attributes	Notes
PowerState	string (enum)	*optional*	The desired power state of the circuit. • This parameter shall contain the desired power state of the circuit. *For the possible property values, see PowerState in Property details.*

Request Example

```
{
    "PowerState": "Off"
}
```

6.20.4.3 ResetMetrics

Description

This action resets metrics related to this circuit.

- This action shall reset any time intervals or counted values for this circuit.

Action URI: {Base URI of target resource}/Actions/Circuit.ResetMetrics

Action parameters

This action takes no parameters.

6.20.5 Property details

6.20.5.1 BreakerState:

The state of the over current protection device.

- This property shall contain the state of the over current protection device.

string	Description
Normal	The breaker is powered on.
Off	The breaker is off.
Tripped	The breaker has been tripped.

6.20.5.2 CircuitType:

The type of circuit.

- This property shall contain the type of circuit.

string	Description
Branch	A branch (output) circuit.
Bus *(v1.3+)*	An electrical bus circuit.
Feeder	A feeder (output) circuit.

string	Description
Mains	A mains input or utility circuit.
Subfeed	A subfeed (output) circuit.

6.20.5.3 ElectricalContext:

The combination of current-carrying conductors.

- This property shall contain the combination of current-carrying conductors that distribute power.

string	Description
Line1	The circuits that share the L1 current-carrying conductor. • This value shall represent a circuit that shares the L1 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToLine2	The circuit formed by L1 and L2 current-carrying conductors. • This value shall represent a circuit formed by L1 and L2 current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToNeutral	The circuit formed by L1 and neutral current-carrying conductors. • This value shall represent a circuit formed by L1 and neutral current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToNeutralAndL1L2	The circuit formed by L1, L2, and neutral current-carrying conductors. • This value shall represent circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase/ 4-Wire or Three-phase / 5-Wire.
Line2	The circuits that share the L2 current-carrying conductor. • This value shall represent a circuit that shares the L2 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 4-Wire or 5-Wire.
Line2ToLine3	The circuit formed by L2 and L3 current-carrying conductors. • This value shall represent a circuit formed by L2 and L3 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.

string	Description
Line2ToNeutral	The circuit formed by L2 and neutral current-carrying conductors. • This value shall represent a circuit formed by L2 and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL1L2	The circuit formed by L1, L2, and Neutral current-carrying conductors. • This value shall represent a circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase/ 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL2L3	The circuits formed by L2, L3, and neutral current-carrying conductors. • This value shall represent a circuit formed by L2, L3, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
Line3	The circuits that share the L3 current-carrying conductor. • This value shall represent a circuit that shares the L3 current-carrying conductor, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line3ToLine1	The circuit formed by L3 and L1 current-carrying conductors. • This value shall represent a circuit formed by L3 and L1 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line3ToNeutral	The circuit formed by L3 and neutral current-carrying conductors. • This value shall represent a circuit formed by L3 and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
Line3ToNeutralAndL3L1	The circuit formed by L3, L1, and neutral current-carrying conductors. • This value shall represent a circuit formed by L3, L1, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
LineToLine	The circuit formed by two current-carrying conductors. • This value shall represent a circuit formed by two current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
LineToNeutral	The circuit formed by a line and neutral current-carrying conductor. • This value shall represent a circuit formed by a line and neutral current-carrying conductor, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 4-Wire or 5-Wire.

string	Description
Neutral	The grounded current-carrying return circuit of current-carrying conductors. • This value shall represent the grounded current-carrying return circuit of current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 5-Wire.
Total	The circuit formed by all current-carrying conductors. • This value shall represent the circuits formed by all current-carrying conductors for any phase wiring type.

6.20.5.4 IndicatorLED:

The state of the indicator LED, which identifies the circuit.

- This property shall contain the indicator light state for the indicator light associated with this circuit.

string	Description
Blinking	The indicator LED is blinking. • This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Lit	The indicator LED is lit. • This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Off	The indicator LED is off. • This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.

6.20.5.5 NominalVoltage:

The nominal voltage for this circuit.

- This property shall contain the nominal voltage for this circuit, in Volts.

string	Description
AC100To127V *(v1.6+)*	AC 100-127V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-127VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To240V	AC 100-240V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To277V	AC 100-277V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC120V	AC 120V nominal. • This value shall indicate the device supports a nominal voltage of 120VAC. Specific values are generally used to describe support on device outputs or outlets.
AC200To240V	AC 200-240V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC200To277V	AC 200-277V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC208V	AC 208V nominal. • This value shall indicate the device supports a nominal voltage of 208VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC230V	AC 230V nominal. • This value shall indicate the device supports a nominal voltage of 230AC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC240AndDC380V	AC 200-240V and DC 380V. • This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC240V	AC 240V nominal. • This value shall indicate the device supports a nominal voltage of 240VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.

string	Description
AC277AndDC380V	AC 200-277V and DC 380V. • This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC277V	AC 277V nominal. • This value shall indicate the device supports a nominal voltage of 277VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
AC400V	AC 400V or 415V nominal. • This value shall indicate the device supports a nominal voltage of 400VAC or 415VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
AC480V	AC 480V nominal. • This value shall indicate the device supports a nominal voltage of 480VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
DC12V *(v1.7+)*	DC 12V nominal. • This value shall indicate the device supports a nominal voltage of 12VDC.
DC16V *(v1.7+)*	DC 16V nominal. • This value shall indicate the device supports a nominal voltage of 16VDC.
DC1_8V *(v1.7+)*	DC 1.8V nominal. • This value shall indicate the device supports a nominal voltage of 1.8VDC.
DC240V	DC 240V nominal. • This value shall indicate the device supports a nominal voltage of 240VDC.
DC380V	High Voltage DC (380V). • This value shall indicate the device supports a nominal voltage of 380VDC.
DC3_3V *(v1.7+)*	DC 3.3V nominal. • This value shall indicate the device supports a nominal voltage of 3.3VDC.
DC48V *(v1.2+)*	DC 48V nominal. • This value shall indicate the device supports a nominal voltage of 48VDC.

string	Description
DC5V *(v1.7+)*	DC 5V nominal. • This value shall indicate the device supports a nominal voltage of 5VDC.
DC9V *(v1.7+)*	DC 9V nominal. • This value shall indicate the device supports a nominal voltage of 9VDC.
DCNeg48V	-48V DC. • This value shall indicate the device supports a nominal voltage of -48VDC.

6.20.5.6 PhaseWiringType:

The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires).

- This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires).

string	Description
OneOrTwoPhase3Wire	Single or Two-Phase / 3-Wire (Line1, Line2 or Neutral, Protective Earth). • This value shall represent a Single or Two-Phase / 3-Wire (Line1, Line2 or Neutral, Protective Earth) wiring. This value shall be used when both phase configurations are supported. This is most common where detachable cordsets are used.
OnePhase3Wire	Single-phase / 3-Wire (Line1, Neutral, Protective Earth). • This value shall represent a Single-phase / 3-Wire (Line1, Neutral, Protective Earth) wiring.
ThreePhase4Wire	Three-phase / 4-Wire (Line1, Line2, Line3, Protective Earth). • This value shall represent a Three-phase / 4-Wire (Line1, Line2, Line3, Protective Earth) wiring.
ThreePhase5Wire	Three-phase / 5-Wire (Line1, Line2, Line3, Neutral, Protective Earth). • This value shall represent a Three-phase / 5-Wire (Line1, Line2, Line3, Neutral, Protective Earth) wiring.
TwoPhase3Wire	Two-phase / 3-Wire (Line1, Line2, Protective Earth). • This value shall represent a Two-phase / 3-Wire (Line1, Line2, Protective Earth) wiring.

string	Description
TwoPhase4Wire	Two-phase / 4-Wire (Line1, Line2, Neutral, Protective Earth). • This value shall represent a Two-phase / 4-Wire (Line1, Line2, Neutral, Protective Earth) wiring.

6.20.5.7 PlugType:

The type of plug according to NEMA, IEC, or regional standards.

- This property shall contain the type of physical plug used for this circuit, as defined by IEC, NEMA, or regional standard.

string	Description
California_CS8265	California Standard CS8265 (Single-phase 250V; 50A; 2P3W). • This value shall represent a plug that matches the 'California Standard' CS8265 style plug (Three-phase 250V; 50A; 3P4W).
California_CS8365	California Standard CS8365 (Three-phase 250V; 50A; 3P4W). • This value shall represent a plug that matches the 'California Standard' CS8365 style plug (Three-phase 250V; 50A; 3P4W).
Field_208V_3P4W_60A	Field-wired; Three-phase 200-250V; 60A; 3P4W. • This value shall represent field-wired input is three-phase 200-250V; 60A; 3P4W. It is appropriate for use on a 60A branch circuit.
Field_400V_3P5W_32A	Field-wired; Three-phase 200-240/346-415V; 32A; 3P5W. • This value shall represent field-wired input is three-phase 200-240/346-415V; 32A; 3P5W. It is appropriate for use on a 30, 32A, or 40A branch circuit.
IEC_60309_316P6	IEC 60309 316P6 (Single-phase 200-250V; 16A; 1P3W; Blue, 6-hour). • This value shall represent a plug that matches the IEC 60309 316P6 plug (Single-phase 200-250V; 16A; 1P3W; Blue, 6-hour).
IEC_60309_332P6	IEC 60309 332P6 (Single-phase 200-250V; 32A; 1P3W; Blue, 6-hour). • This value shall represent a plug that matches the IEC 60309 332P6 plug (Single-phase 200-250V; 32A; 1P3W; Blue, 6-hour).

string	Description
IEC_60309_363P6	IEC 60309 363P6 (Single-phase 200-250V; 63A; 1P3W; Blue, 6-hour). • This value shall represent a plug that matches the IEC 60309 363P6 plug (Single-phase 200-250V; 63A; 1P3W; Blue, 6-hour).
IEC_60309_460P9	IEC 60309 460P9 (Three-phase 200-250V; 60A; 3P4W; Blue; 9-hour). • This value shall represent a plug that matches the IEC 60309 460P9 plug (Three-phase 200-250V; 60A; 3P4W; Blue; 9-hour).
IEC_60309_516P6	IEC 60309 516P6 (Three-phase 200-240/346-415V; 16A; 3P5W; Red; 6-hour). • This value shall represent a plug that matches the IEC 60309 516P6 plug (Three-phase 200-240/346-415V; 16A; 3P5W; Red; 6-hour).
IEC_60309_532P6	IEC 60309 532P6 (Three-phase 200-240/346-415V; 32A; 3P5W; Red; 6-hour). • This value shall represent a plug that matches the IEC 60309 plug 532P6 (Three-phase 200-240/346-415V; 32A; 3P5W; Red; 6-hour).
IEC_60309_560P9	IEC 60309 560P9 (Three-phase 120-144/208-250V; 60A; 3P5W; Blue; 9-hour). • This value shall represent a plug that matches the IEC 60309 plug 560P9 (Three-phase 120-144/208-250V; 60A; 3P5W; Blue; 9-hour).
IEC_60309_563P6	IEC 60309 563P6 (Three-phase 200-240/346-415V; 63A; 3P5W; Red; 6-hour). • This value shall represent a plug that matches the IEC 60309 563P6 plug (Three-phase 200-240/346-415V; 63A; 3P5W; Red; 6-hour).
IEC_60320_C14	IEC C14 (Single-phase 250V; 10A; 1P3W). • This value shall represent a plug that matches the IEC 60320 specified C14 input (Single-phase 250V; 10A; 1P3W).
IEC_60320_C20	IEC C20 (Single-phase 250V; 16A; 1P3W). • This value shall represent a plug that matches the IEC 60320 specified C20 input (Single-phase 250V; 16A; 1P3W).
NEMA_5_15P	NEMA 5-15P (Single-phase 125V; 15A; 1P3W). • This value shall represent a plug that matches the NEMA specified 5-15 straight (non-locking) plug (Single-phase 125V; 15A; 1P3W).
NEMA_5_20P	NEMA 5-20P (Single-phase 125V; 20A; 1P3W). • This value shall represent a plug that matches the NEMA specified 5-20 straight (non-locking) plug that exhibits a T-slot (Single-phase 125V; 20A; 1P3W).

string	Description
NEMA_6_15P	NEMA 6-15P (Single-phase 250V; 15A; 2P3W). • This value shall represent a plug that matches the NEMA specified 6-15 straight (non-locking) plug (Single-phase 250V; 15A; 2P3W).
NEMA_6_20P	NEMA 6-20P (Single-phase 250V; 20A; 2P3W). • This value shall represent a plug that matches the NEMA specified 6-20 straight (non-locking) plug (Single-phase 250V; 20A; 2P3W).
NEMA_L14_20P	NEMA L14-20P (Split-phase 125/250V; 20A; 2P4W). • This value shall represent a plug that matches the NEMA specified locking L14-20 plug (Split-phase 125/250V; 20A; 2P4W).
NEMA_L14_30P	NEMA L14-30P (Split-phase 125/250V; 30A; 2P4W). • This value shall represent a plug that matches the NEMA specified locking L14-30 plug (Split-phase 125/250V; 30A; 2P4W).
NEMA_L15_20P	NEMA L15-20P (Three-phase 250V; 20A; 3P4W). • This value shall represent a plug that matches the NEMA specified locking L15-20 plug (Three-phase 250V; 20A; 3P4W).
NEMA_L15_30P	NEMA L15-30P (Three-phase 250V; 30A; 3P4W). • This value shall represent a plug that matches the NEMA specified locking L15-30 plug (Three-phase 250V; 30A; 3P4W).
NEMA_L21_20P	NEMA L21-20P (Three-phase 120/208V; 20A; 3P5W). • This value shall represent a plug that matches the NEMA specified locking L21-20 plug (Three-phase 120/208V; 20A; 3P5W).
NEMA_L21_30P	NEMA L21-30P (Three-phase 120/208V; 30A; 3P5W). • This value shall represent a plug that matches the NEMA specified locking L21-30 plug (Three-phase 120/208V; 30A; 3P5W).
NEMA_L22_20P	NEMA L22-20P (Three-phase 277/480V; 20A; 3P5W). • This value shall represent a plug that matches the NEMA specified locking L22-20 plug (Three-phase 277/480V; 20A; 3P5W).
NEMA_L22_30P	NEMA L22-30P (Three-phase 277/480V; 30A; 3P5W). • This value shall represent a plug that matches the NEMA specified locking L22-30 plug (Three-phase 277/480V; 30A; 3P5W).

string	Description
NEMA_L5_15P	NEMA L5-15P (Single-phase 125V; 15A; 1P3W). • This value shall represent a plug that matches the NEMA specified locking L5-15 plug (Single-phase 125V; 15A; 1P3W).
NEMA_L5_20P	NEMA L5-20P (Single-phase 125V; 20A; 1P3W). • This value shall represent a plug that matches the NEMA specified locking L5-20 plug (Single-phase 125V; 20A; 1P3W).
NEMA_L5_30P	NEMA L5-30P (Single-phase 125V; 30A; 1P3W). • This value shall represent a plug that matches the NEMA specified locking L5-30 plug (Single-phase 125V; 30A; 1P3W).
NEMA_L6_15P	NEMA L6-15P (Single-phase 250V; 15A; 2P3W). • This value shall represent a plug that matches the NEMA specified locking L6-15 plug (Single-phase 250V; 15A; 2P3W).
NEMA_L6_20P	NEMA L6-20P (Single-phase 250V; 20A; 2P3W). • This value shall represent a plug that matches the NEMA specified locking L6-20 plug (Single-phase 250V; 20A; 2P3W).
NEMA_L6_30P	NEMA L6-30P (Single-phase 250V; 30A; 2P3W). • This value shall represent a plug that matches the NEMA specified locking L6-30 plug (Single-phase 250V; 30A; 2P3W).

6.20.5.8 PowerRestorePolicy:

The desired power state of the circuit when power is restored after a power loss.

- This property shall contain the desired PowerState of the circuit when power is applied. The value `LastState` shall return the circuit to the PowerState it was in when power was lost.

string	Description
AlwaysOff	Always remain powered off when external power is applied.
AlwaysOn	Always power on when external power is applied.
LastState	Return to the last power state (on or off) when external power is applied.

6.20.5.9 PowerState:

6.20.5.9.1 In top level:

The power state of the circuit.

- This property shall contain the power state of the circuit.

string	Description
Off	The state is powered off.
On	The state is powered on.
Paused	The state is paused.
PoweringOff	A temporary state between on and off.
PoweringOn	A temporary state between off and on.

6.20.5.9.2 In Actions: BreakerControl, Actions: PowerControl:

The desired power state of the circuit if the breaker is reset successfully.

- This parameter shall contain the desired power state of the circuit.

string	Description
Off	Power off.
On	Power on.
PowerCycle *(v1.5+)*	Power cycle. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.

6.20.5.10 SensorCurrentExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.

6.20.5.11 SensorEnergykWhExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

ApparentkVAh *(v1.5+)*	number (kV.A.h)	*read-only (null)*	Apparent energy (kVAh). • This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading *(v1.1+)*	number	*read-only (null)*	The total accumulation value for this sensor. • This property shall contain the total accumulation of the Reading property over the sensor's life time. This value shall not be reset by the ResetMetrics action.
ReactivekVARh *(v1.5+)*	number (kV.A.h)	*read-only (null)*	Reactive energy (kVARh). • This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.

SensorResetTime	string (date-time)	*read-only (null)*	The date and time when the time-based properties were last reset. • This property shall contain the date and time when the ResetMetrics action was last performed or the service last reset the time-based property values.

6.20.5.12 SensorExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.

6.20.5.13 SensorPowerExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

ApparentVA	number (V.A)	*read-only (null)*	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees *(v1.5+)*	number	*read-only (null)*	The phase angle (degrees) between the current and voltage waveforms. • This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a ReadingType containing `Power`, and shall not appear in sensors with other ReadingType values.

PowerFactor	number	*read-only (null)*	The power factor for this sensor. • This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. PowerFactor is expressed in unit-less 1/100ths. This property can appear in sensors containing a ReadingType value of `Power`, and shall not appear in sensors of other ReadingType values.
ReactiveVAR	number (V.A)	*read-only (null)*	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. • This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.

6.20.5.14 SensorVoltageExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.

6.20.5.15 VoltageType:

The type of voltage applied to the circuit.

- This property shall contain the type of voltage applied to the circuit.

string	Description
AC	Alternating Current (AC) circuit.
DC	Direct Current (DC) circuit.

6.20.6 Example response


```
{
    "@odata.type": "#Circuit.v1_7_0.Circuit",
    "Id": "A",
    "Name": "Branch Circuit A",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "CircuitType": "Branch",
    "PhaseWiringType": "TwoPhase3Wire",
    "NominalVoltage": "AC200To240V",
    "RatedCurrentAmps": 16,
    "BreakerState": "Normal",
    "PolyPhaseVoltage": {
        "Line1ToNeutral": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/VoltageAL1N",
            "Reading": 118.2
        },
        "Line1ToLine2": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/VoltageAL1L2",
            "Reading": 203.5
        }
    },
    "CurrentAmps": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/CurrentA",
        "Reading": 5.19
    },
    "PolyPhaseCurrentAmps": {
        "Line1": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/CurrentA",
            "Reading": 5.19
        }
    },
    "PowerWatts": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PowerA",
        "Reading": 937.4,
        "ApparentVA": 937.4,
        "ReactiveVAR": 0,
        "PowerFactor": 1
    },
```

```
    "PolyPhasePowerWatts": {
        "Line1ToNeutral": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PowerA1",
            "Reading": 937.4,
            "PeakReading": 1000.5,
            "ApparentVA": 937.4,
            "ReactiveVAR": 0,
            "PowerFactor": 1
        }
    },
    "FrequencyHz": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/FrequencyA",
        "Reading": 60
    },
    "EnergykWh": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/EnergyA",
        "Reading": 325675
    },
    "Links": {
        "Outlets": [
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1"
            },
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A2"
            },
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A3"
            }
        ]
    },
    "Actions": {
        "#Circuit.BreakerControl": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A/Circuit.BreakerControl"
        },
        "#Outlet.ResetMetrics": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A/Circuit.ResetMetrics"
        }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A"
}
```


6.21 ComponentIntegrity 1.2.0

Version	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2022.1	2021.4

6.21.1 Description

The ComponentIntegrity resource provides critical and pertinent security information about a specific device, system, software element, or other managed entity.

- This resource shall represent critical and pertinent security information about a specific device, system, software element, or other managed entity.

6.21.2 URIs

/redfish/v1/ComponentIntegrity/*{ComponentIntegrityId}*

6.21.3 Properties

Property	Type	Attributes	Notes
ComponentIntegrityEnabled	boolean	*read-write*	An indication of whether security protocols are enabled for the component. • This property shall indicate whether security protocols are enabled for the component. If ComponentIntegrityType contains `SPDM`, a value of `false` shall prohibit the SPDM Requester from using SPDM to communicate with the component identified by the TargetComponentURI property. If ComponentIntegrityType contains `TPM`, a value of `false` shall disable the TPM component identified by the TargetComponentURI property entirely. If `false`, services shall not provide the TPM and SPDM properties in response payloads for this resource. If `false`, services shall reject action requests to this resource. If `true`, services shall allow security protocols with the component identified by the TargetComponentURI property.
ComponentIntegrityType	string (enum)	*read-only required*	The type of security technology for the component. • This value of this property shall contain the underlying security technology providing integrity information for the component. *For the possible property values, see ComponentIntegrityType in Property details.*

Property	Type	Attributes	Notes
ComponentIntegrityTypeVersion	string	*read-only required*	The version of the security technology. • This value of this property shall contain the version of the security technology indicated by the ComponentIntegrityType property. If ComponentIntegrityType contains `SPDM`, this property shall contain the negotiated or selected SPDM protocol and shall follow the regular expression pattern '^\d+.\d+.\d+$'. If ComponentIntegrityType contains `TPM`, this property shall contain the version of the TPM.
LastUpdated	string (date-time)	*read-only (null)*	The date and time when information for the component was last updated. • This property shall contain the date and time when information for the component was last updated.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ComponentsProtected [{	array		An array of links to resources that the target component protects. • This property shall contain an array of links to resources that the component identified by the TargetComponentURI property provides integrity protection. This property shall not contain the value of the TargetComponentURI property.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
SPDM {	object		Integrity information about the SPDM Responder as reported by an SPDM Requester. • This property shall contain integrity information about the SPDM Responder identified by the TargetComponentURI property as reported by an SPDM Requester. This property shall be present if ComponentIntegrityType contains `SPDM` and `ComponentIntegrityEnabled` contains `true`. For other cases, this property shall be absent.

Property	Type	Attributes	Notes
ComponentCommunication {	object	*(null)*	Information about communication between the SPDM Requester and SPDM Responder. • This property shall contain information about communication between the SPDM Requester and SPDM Responder.
Sessions [{	array		The active sessions or communication channels between two components. • This property shall contain an array of the active sessions or communication channels between two components The active sessions or communication channels do not reflect how future sessions or communication channels are established.
SessionId	integer	*read-only* *(null)*	The identifier for an active session or communication channel between two components. • This property shall contain the unique identifier for the active session or communication channel between two components.
SessionType	string (enum)	*read-only* *(null)*	The type of session or communication channel between two components. • This property shall contain the type of session or communication channel between two components. *For the possible property values, see SessionType in Property details.*
}]			
}			
IdentityAuthentication {	object	*(null)*	Identity authentication information about the SPDM Requester and SPDM Responder. • This property shall contain identity authentication information about the SPDM Requester and SPDM Responder.
RequesterAuthentication {	object	*(null)*	Authentication information of the identity of the SPDM Requester. • This property shall contain authentication information of the identity of the SPDM Requester.

Property	Type	Attributes	Notes
ProvidedCertificate {	object		A link to the certificate that represents the identify of the SPDM Requester provided in mutual authentication. • This property shall contain a link to a resource of type Certificate that represents the identify of the SPDM Requester provided in mutual authentication. See the *Certificate* schema for details on this property.
@odata.id	string	*read-only*	Link to a Certificate resource. See the Links section and the *Certificate* schema for details.
}			
}			
ResponderAuthentication {	object	*(null)*	Authentication information of the identity of the SPDM Responder. • This property shall contain authentication information of the identity of the SPDM Responder.
ComponentCertificate {	object		A link to the certificate that represents the identify of the component. • This property shall contain a link to a resource of type Certificate that represents the identify of the component referenced by the TargetComponentURI property. See the *Certificate* schema for details on this property.
@odata.id	string	*read-only*	Link to a Certificate resource. See the Links section and the *Certificate* schema for details.
}			
VerificationStatus	string (enum)	*read-only* *(null)*	The status of the verification of the identity of the component. • This property shall contain the status of the verification of the identity of the component referenced by the TargetComponentURI property.. *For the possible property values, see VerificationStatus in Property details.*
}			
}			
MeasurementSet {	object	*(null)*	Measurement information about the SPDM Responder. • This property shall contain measurement information for the SPDM Responder.

Property	Type	Attributes	Notes
Measurements [{	array		Measurements from an SPDM Responder. • This property shall contain measurements from an SPDM Responder.
LastUpdated	string (date-time)	*read-only (null)*	The date and time when information for the measurement was last updated. • This property shall contain the date and time when information for the measurement was last updated.
Measurement	string	*read-only (null)*	The measurement data. • This property shall contain the Base64-encoded measurement using the hash algorithm indicated by the MeasurementHashAlgorithm property. This property shall not contain a raw bit stream as a measurement. If the SPDM Responder provides a raw bit stream, the SPDM Requester may apply a hash algorithm to the raw bit stream in order to report the measurement. Pattern: `^[A-Za-z0-9+/]+={0,2}$`
MeasurementHashAlgorithm	string	*read-only (null)*	The hash algorithm used to compute the measurement. • This property shall contain the hash algorithm used to compute the measurement. The allowable values for this property shall be the hash algorithm names found in the 'BaseHashAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274. If the algorithm is an extended algorithm, this property shall contain the value `OEM`. This property shall not be present if MeasurementSpecification does not contain `DMTF`.
MeasurementIndex	integer	*read-only (null)*	The index of the measurement. • This property shall contain the index of the measurement.
MeasurementType	string (enum)	*read-only (null)*	The type or characteristics of the data that this measurement represents. • This property shall contain the type or characteristics of the data that this measurement represents. This property shall not be present if MeasurementSpecification does not contain `DMTF`. *For the possible property values, see MeasurementType in Property details.*
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PartofSummaryHash	boolean	*read-only (null)*	Indicates whether this measurement is part of the measurement summary. • This property shall indicate if this measurement is part of the measurement summary in the MeasurementSummary property. If this property is not present, it shall be assumed to be `false`.
SecurityVersionNumber *(v1.1+)*	string	*read-only (null)*	The security version number the measurement represents. • This property shall contain an 8-byte hex-encoded string of the security version number the measurement represents. This property shall only be present if MeasurementType contains the value `MutableFirmwareSecurityVersionNumber`. Pattern: `^[A-Za-z0-9]{16}$`
}]			
MeasurementSpecification	string (enum)	*read-only (null)*	The measurement specification negotiated between the SPDM Requester and SPDM Responder. • This property shall contain the measurement specification negotiated between the SPDM Requester and SPDM Responder. *For the possible property values, see MeasurementSpecification in Property details.*
MeasurementSummary	string	*read-only (null)*	The measurement summary data. • This property shall contain the Base64-encoded measurement summary using the hash algorithm indicated by the MeasurementSummaryHashAlgorithm property. Pattern: `^[A-Za-z0-9+/]+={0,2}$`
MeasurementSummaryHashAlgorithm	string	*read-only (null)*	The hash algorithm used to compute the measurement summary. • This property shall contain the hash algorithm used to compute the measurement summary. The allowable values for this property shall be the hash algorithm names found in the 'BaseHashAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274. If the algorithm is an extended algorithm, this property shall contain the value `OEM`.
MeasurementSummaryType	string (enum)	*read-only (null)*	The type of measurement summary. • This property shall contain the type of measurement summary. *For the possible property values, see MeasurementSummaryType in Property details.*

Property	Type	Attributes	Notes
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Requester {	object	*required*	The link to the the component that is reporting the integrity information of the target component. • This property shall contain a link to the resource representing the SPDM Responder that is reporting the integrity of the SPDM Responder identified by the TargetComponentURI property.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
TargetComponentURI	string	*read-only* *required*	The link to the the component whose integrity that this resource reports. • This value of this property shall contain a link to the resource whose integrity information is reported in this resource. If ComponentIntegrityType contains `SPDM`, this property shall contain a URI to the resource that represents the SPDM Responder. If ComponentIntegrityType contains `TPM`, this property shall contain a URI with RFC6901-defined JSON fragment notation to a member of the TrustedModules array in a ComputerSystem resource that represents the TPM or a resource of type TrustedComponent that represents the TPM.

Property	Type	Attributes	Notes
TPM {	object		Integrity information about the Trusted Platform Module (TPM). • This property shall contain integrity information about the Trusted Platform Module (TPM) identified by the TargetComponentURI property, This property shall be present if ComponentIntegrityType contains `TPM` and `ComponentIntegrityEnabled` contains `true`. For other cases, this property shall be absent.
ComponentCommunication {	object	*(null)*	Information about communication with the TPM. • This property shall contain information about communication with the TPM.
Sessions [{	array		The active sessions or communication channels between two components. • This property shall contain an array of the active sessions or communication channels between two components The active sessions or communication channels do not reflect how future sessions or communication channels are established.
SessionId	integer	*read-only* *(null)*	The identifier for an active session or communication channel between two components. • This property shall contain the unique identifier for the active session or communication channel between two components.
SessionType	string (enum)	*read-only* *(null)*	The type of session or communication channel between two components. • This property shall contain the type of session or communication channel between two components. *For the possible property values, see SessionType in Property details.*
}]			
}			
IdentityAuthentication {	object	*(null)*	Identity authentication information about the TPM. • This property shall contain identity authentication information about the TPM.

Property	Type	Attributes	Notes
ComponentCertificate {	object		A link to the certificate that represents the identify of the component. • This property shall contain a link to a resource of type Certificate that represents the identify of the component referenced by the TargetComponentURI property. See the *Certificate* schema for details on this property.
@odata.id	string	*read-only*	Link to a Certificate resource. See the Links section and the *Certificate* schema for details.
}			
VerificationStatus	string (enum)	*read-only* *(null)*	The status of the verification of the identity of the component. • This property shall contain the status of the verification of the identity of the component referenced by the TargetComponentURI property.. *For the possible property values, see VerificationStatus in Property details.*
}			
MeasurementSet {	object	*(null)*	Measurement information from the TPM. • This property shall contain measurement information from the TPM.
Measurements [{	array		Measurements from a TPM. • This property shall contain measurements from a TPM.
LastUpdated	string (date-time)	*read-only* *(null)*	The date and time when information for the measurement was last updated. • This property shall contain the date and time when information for the measurement was last updated.
Measurement	string	*read-only* *(null)*	The measurement data. • This property shall contain the Base64-encoded PCR digest using the hashing algorithm indicated by MeasurementHashAlgorithm property. Pattern: `^[A-Za-z0-9+/]+={0,2}$`

Property	Type	Attributes	Notes
MeasurementHashAlgorithm	string	*read-only (null)*	The hash algorithm used to compute the measurement. • This property shall contain the hash algorithm used to compute the measurement. The allowable values for this property shall be the strings in the 'Algorithm Name' field of the 'TPM_ALG_ID Constants' table within the 'Trusted Computing Group Algorithm Registry'.
PCR	integer	*read-only (null)*	The Platform Configuration Register (PCR) bank of the measurement. • This property shall contain the Platform Configuration Register (PCR) bank of the measurement.
}]			
}			
NonceSizeBytesMaximum *(v1.2+)*	integer	*read-only (null)*	The maximum number of bytes that can be specified in the Nonce parameter of the TPMGetSignedMeasurements action. • This property shall contain the maximum number of bytes that can be specified in the Nonce parameter of the TPMGetSignedMeasurements action.
}			

6.21.4 Actions

6.21.4.1 SPDMGetSignedMeasurements

Description

This action generates an SPDM cryptographic signed statement over the given nonce and measurements of the SPDM Responder.

- This action shall generate a cryptographic signed statement over the given nonce and measurements corresponding to the SPDM Responder. This action shall not be present if the ComponentIntegrityType property does not contain the value `SPDM`. The SPDM Requester shall issue one or more SPDM 'GET_MEASUREMENTS' requests for each of the requested measurement indices to the SPDM Responder. When the SPDM 'GET_MEASUREMENTS' requests are made for version 1.2, the parameter 'RawBitStreamRequested' shall contain `0`. The SPDM Requester shall provide the nonce for the action to the SPDM Responder in the last SPDM 'GET_MEASUREMENTS' request. The SPDM Requester shall request a signature in the last SPDM 'GET_MEASUREMENTS' request.

Action URI: {Base URI of target resource}/Actions/ComponentIntegrity.SPDMGetSignedMeasurements

Action parameters

Parameter Name	Type	Attributes	Notes
MeasurementIndices [ ]	array (integer)	*optional*	An array of indices that identify the measurement blocks to sign. • This parameter shall contain an array of indices that identify the measurement blocks to sign. This array shall contain one or more unique values between `0` to `254`, inclusive, or contain a single value of `255`. If not provided by the client, the value shall be assumed to be an array containing a single value of `255`.
Nonce	string	*optional*	A 32-byte hex-encoded string that is signed with the measurements. The value should be unique. • This parameter shall contain a 32-byte hex-encoded string that is signed with the measurements. If not provided by the client, the SPDM Requester shall generate the nonce. The value should be unique and generated using a random or a pseudo-random generator. The SPDM Requester shall send this value to the SPDM Responder in the SPDM 'GET_MEASUREMENTS' request. Pattern: `^[0-9a-fA-F]{64}$`
SlotId	integer	*optional*	The slot identifier for the certificate containing the private key to generate the signature over the measurements. • This parameter shall contain the SPDM slot identifier for the certificate containing the private key to generate the signature over the measurements. If not provided by the client, the value shall be assumed to be `0`. The SPDM Requester shall send this value to the SPDM Responder in the SPDM 'GET_MEASUREMENTS' request.

Response Payload

{			
Certificate {	object		A link to the certificate corresponding to the SPDM slot identifier that can be used to validate the signature. • This property shall contain a link to a resource of type Certificate that represents the certificate corresponding to the SPDM slot identifier that can be used to validate the signature. This property shall not be present if the SlotId parameter contains the value `15`. See the *Certificate* schema for details on this property.

@odata.id	string	*read-only*	Link to a Certificate resource. See the Links section and the *Certificate* schema for details.
}			
HashingAlgorithm	string	*read-only required*	The hashing algorithm used for generating the cryptographic signed statement. • This property shall contain the hashing algorithm negotiated between the SPDM Requester and the SPDM Responder. The allowable values for this property shall be the hash algorithm names found in the 'BaseHashAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274. If the algorithm is an extended algorithm, this property shall contain the value `OEM`.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PublicKey	string	*read-only*	A Privacy Enhanced Mail (PEM)-encoded public key that can be used to validate the signature. • This property shall contain a Privacy Enhanced Mail (PEM)-encoded public key, as defined in section 13 of RFC7468, that can be used to validate the signature. This property shall only be present when the SPDM Requester was pre-provisioned with the SPDM Responder's public key and the SlotId parameter contains the value `15`.
SignedMeasurements	string	*read-only required*	Base64 encoded cryptographic signed statement generated by the signer. • This property shall contain the cryptographic signed statement over the given nonce and measurement blocks corresponding to the requested measurement indices. If the SPDM version is 1.2, this value shall be a concatenation of SPDM 'VCA' and 'GET_MEASUREMENTS' requests and responses exchanged between the SPDM Requester and the SPDM Responder. If SPDM version is 1.0 or 1.1, this value shall be a concatenation of SPDM 'GET_MEASUREMENTS' requests and responses exchanged between the SPDM Requester and the SPDM Responder. The last 'MEASUREMENTS' response shall contain a signature generated over the 'L2' string by the SPDM Responder.
SigningAlgorithm	string	*read-only required*	The asymmetric signing algorithm used for generating the cryptographic signed statement. • This property shall contain the asymmetric signing algorithm negotiated between the SPDM Requester and the SPDM Responder. The allowable values for this property shall be the asymmetric key signature algorithm names found in the 'BaseAsymAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274. If the algorithm is an extended algorithm, this property shall contain the value `OEM`.
Version	string	*read-only required*	The SPDM version used by the SPDM Responder to generate the cryptographic signed statement. • This property shall contain the SPDM version negotiated between the SPDM Requester and the SPDM Responder to generate the cryptographic signed statement. For example, `1.0`, `1.1`, or `1.2`.
}			

Request Example

```
{
    "Nonce": "4f2359ee609824d33d35c2968b6c56b702a692ab0d8a441f25c7d81fbe833a78",
    "SlotId": 0,
    "MeasurementIndices": [
        0,
        1,
        2
    ]
}
```

Response Example

```
{
    "@odata.type": "#ComponentIntegrity.v1_0_0.SPDMGetSignedMeasurementsResponse",
    "Version": "1.1",
    "HashingAlgorithm": "SHA256",
    "SigningAlgorithm": "TPM_ALG_RSAPSS_3072",
    "SignedMeasurements": "EeAQx8PJWv9CbeGdmlPaARrrMw... TRUNCATED (TYPICALLY KB or MB)",
    "Certificate": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Certificates/SScert"
    }
}
```

6.21.4.2 TPMGetSignedMeasurements *(v1.2+)*

Description

This action generates a TPM cryptographic signed statement over the given nonce and PCRs of the TPM for TPM 2.0 devices.

- This action shall generate a cryptographic signed statement over the given nonce and PCRs of the TPM for TPM 2.0 devices. This action shall not be present if the ComponentIntegrityType property does not contain the value `TPM`.

Action URI: {Base URI of target resource}/Actions/ComponentIntegrity.TPMGetSignedMeasurements

Action parameters

Parameter Name	Type	Attributes	Notes
Certificate {	object	*required*	The URI for the certificate that represents the TPM attestation key. • This parameter shall contain the reference to the certificate installed on the TPM that represents the TPM's attestation key for the 'signHandle' parameter of the 'TPM2_Quote' command defined in the Trusted Platform Module Library Specification. See the *Certificate* schema for details on this property.
@odata.id	string	*read-only*	Link to a Certificate resource. See the Links section and the *Certificate* schema for details.
}			
Nonce	string	*optional*	A set of bytes as a hex-encoded string that is signed with the measurements. The value should be unique. • This parameter shall contain a set of bytes as a hex-encoded string that is signed with the measurements. Services shall reject the action request if the number of bytes provided is larger than the value specified by the NonceSizeBytesMaximum property in the TPM property. If not provided by the client, the service shall generate the nonce. The value should be unique and generated using a random or a pseudo-random generator. The service shall send this value to the TPM in the 'qualifyingData' parameter of the 'TPM2_Quote' command defined in the Trusted Platform Module Library Specification. Pattern: `^[0-9a-fA-F]$`
PCRSelection	string	*required*	An object that identify the PCRs to sign. • This parameter shall contain the Base64-encoded representation of the 'TPML_PCR_SELECTION' object, as defined by the Trusted Platform Module Library Specification, that identifies the PCRs to sign. The service shall send this value to the TPM in the 'PCRselect' parameter of the 'TPM2_Quote' command defined in the Trusted Platform Module Library Specification.
Scheme	string	*required*	The signing scheme to use for the TPM attestation key. • This parameter shall contain the Base64-encoded representation of the 'TPMT_SIG_SCHEME' object, as defined in the Trusted Platform Module Library Specification, that identifies the signing scheme to use for the TPM attestation key. The service shall send this value to the TPM in the 'inScheme' parameter of the 'TPM2_Quote' command defined in the Trusted Platform Module Library Specification.

Response Payload

{			

Oem *(v1.2+)* {}	object		See the OEM object definition in the Using this guide clause.
SignedMeasurements *(v1.2+)*	string	*read-only required*	The Base64-encoded cryptographic signed statement generated by the signer. • This property shall contain a Base64-encoded cryptographic signed statement generated by the signer. This value shall be the concatenation of the 'quoted' and 'signature' response values of the 'TPM2_Quote' command defined in the Trusted Platform Module Library Specification.
}			

6.21.5 Property details

6.21.5.1 ComponentIntegrityType:

The type of security technology for the component.

- This value of this property shall contain the underlying security technology providing integrity information for the component.

string	Description
OEM	OEM-specific. • This value shall indicate the integrity information is OEM-specific and the OEM section may include additional information.
SPDM	Security Protocol and Data Model (SPDM) protocol. • This value shall indicate the integrity information is obtained through the Security Protocol and Data Model (SPDM) protocol as defined in DMTF DSP0274.
TPM	Trusted Platform Module (TPM). • This value shall indicate the integrity information is related to a Trusted Platform Module (TPM) as defined by the Trusted Computing Group (TCG).

6.21.5.2 MeasurementSpecification:

The measurement specification negotiated between the SPDM Requester and SPDM Responder.

- This property shall contain the measurement specification negotiated between the SPDM Requester and SPDM Responder.

string	Description
DMTF	DMTF. • This value shall indicate the measurement specification is defined by DMTF in DSP0274.

6.21.5.3 MeasurementSummaryType:

The type of measurement summary.

- This property shall contain the type of measurement summary.

string	Description
All	The measurement summary covers all measurements in SPDM.
TCB	The measurement summary covers the TCB.

6.21.5.4 MeasurementType:

The type or characteristics of the data that this measurement represents.

- This property shall contain the type or characteristics of the data that this measurement represents. This property shall not be present if MeasurementSpecification does not contain `DMTF`.

string	Description
FirmwareConfiguration	Firmware configuration, such as configurable firmware policy.
HardwareConfiguration	Hardware configuration, such as straps.
ImmutableROM	Immutable ROM.
MeasurementManifest	Measurement Manifest.
MutableFirmware	Mutable firmware or any mutable code.
MutableFirmwareSecurityVersionNumber	Mutable firmware security version number.
MutableFirmwareVersion	Mutable firmware version.

6.21.5.5 SessionType:

The type of session or communication channel between two components.

- This property shall contain the type of session or communication channel between two components.

string	Description
AuthenticatedOnly	An established session where only authentication is protecting the communication.
EncryptedAuthenticated	An established session where both encryption and authentication are protecting the communication.
Plain	A plain text session without any protection.

6.21.5.6 VerificationStatus:

The status of the verification of the identity of the component.

- This property shall contain the status of the verification of the identity of the component referenced by the TargetComponentURI property..

string	Description
Failed	Unsuccessful verification.
Success	Successful verification.

6.21.6 Example response

```
{
    "@odata.type": "#ComponentIntegrity.v1_2_0.ComponentIntegrity",
    "Id": "TPM-0",
    "Description": "TPM physically attached to a GPU.",
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "ComponentIntegrityType": "TPM",
    "ComponentIntegrityTypeVersion": "1.2.0",
    "ComponentIntegrityEnabled": true,
    "LastUpdated": "2021-11-02T14:09:54-07:00",
    "TargetComponentURI": "/redvish/v1/Systems/437XR1138R2#/TrustedModules/0",
    "Links": {
        "ComponentsProtected": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2/GraphicsControllers/GPU1"
            }
        ]
    },
```

```
    "TPM": {
        "MeasurementSet": {
            "Measurements": [
                {
                    "PCR": 1,
                    "Measurement": "h6spEuxbyOtGhP35UoGhTcVX3iRaZQGDw4Yk5oQcabw=",
                    "LastUpdated": "2021-10-31T20:14:27-07:00",
                    "MeasurementHashAlgorithm": "TPM_ALG_SHA256"
                },
                {
                    "PCR": 3,
                    "Measurement": "GnbzS4ToNQb+Y7SxXw4AvRDTf4SzO5eeAlAlDca28AA=",
                    "LastUpdated": "2021-10-31T20:14:27-07:00",
                    "MeasurementHashAlgorithm": "TPM_ALG_SHA256"
                },
                {
                    "PCR": 1,
                    "Measurement": "pLJa5Dyh8CDYFZ1WNOrsiSG1eyCPBlre42CD7CTywg7VkcC4afw4ZG3gQxi2XEFCt5jxz6tN1/cbx/DNx2/tOg==",
                    "LastUpdated": "2021-10-31T20:14:27-07:00",
                    "MeasurementHashAlgorithm": "TPM_ALG_SHA512"
                },
                {
                    "PCR": 3,
                    "Measurement": "GBgEucATV8omirTmYqY+vvbbisHR1jBKfVAEK1XSifBHnnIYXopsc0NExURDSSyPjO21NrPqnwiq5LhI1p6rzQ==",
                    "LastUpdated": "2021-10-31T20:14:27-07:00",
                    "MeasurementHashAlgorithm": "TPM_ALG_SHA512"
                }
            ]
        },
        "IdentityAuthentication": {
            "VerificationStatus": "Success",
            "ComponentCertificate": {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2/Certificates/TPMcert"
            }
        },
        "ComponentCommunication": {
            "Sessions": [
                {
                    "SessionId": 4556,
                    "SessionType": "Plain"
                }
            ]
        }
    },
    "@odata.id": "/redfish/v1/ComponentIntegrity/TPM-0"
}
```

6.22 CompositionReservation 1.0.0

Version	*v1.0*
Release	2021.1

6.22.1 Description

The CompositionReservation schema contains reservation information related to the Compose action defined in the CompositionService resource when the of RequestType parameter contains the value `PreviewReserve`.

- This resource represents the composition reservation of the composition service for a Redfish implementation.

6.22.2 URIs

/redfish/v1/CompositionService/CompositionReservations/*{CompositionReservationId}*

6.22.3 Properties

Property	Type	Attributes	Notes
Client	string	*read-only*	The client that owns the reservation. • This property shall contain the client that owns the reservation. The service shall determine this value based on the client that invoked the Compose action that resulted in the creation of this reservation.
Manifest {	object		The manifest document processed by the service that resulted in this reservation. • This property shall contain the manifest document processed by the service that resulted in this reservation. This property shall be required if the RequestFormat parameter in the Compose action request contained the value `Manifest`.
Description	string	*read-write (null)*	The description of this manifest. • This property shall contain the description of this manifest.

Property	Type	Attributes	Notes
Expand	string (enum)	*read-write (null)*	The expansion control for references in manifest responses, similar to the `$expand=.` query parameter. • This property shall contain the expansion control for references in manifest responses. *For the possible property values, see Expand in Property details.*
Stanzas [{	array		An array of stanzas that describe the requests specified by this manifest. • This property shall contain an array of stanzas that describe the requests specified by this manifest.
OEMStanzaType	string	*read-write (null)*	The OEM-defined type of stanza. • This property shall contain the OEM-defined type of stanza. This property shall be present if StanzaType is `OEM`.
Request {}	object	*(null)*	The request details for the stanza. • This property shall contain the request details for the stanza and the contents vary based depending on the value of the StanzaType property.
Response {}	object	*(null)*	The response details for the stanza. • This property shall contain the response details for the stanza and the contents vary based depending on the value of the StanzaType property.
StanzaId	string	*read-write (null)*	The identifier of the stanza. This is a unique identifier specified by the client and is not used by the service. • This property shall contain the identifier of the stanza.
StanzaType	string (enum)	*read-write (null)*	The type of stanza. • This property shall contain the type of stanza. *For the possible property values, see StanzaType in Property details.*
}]			
Timestamp	string (date-time)	*read-write (null)*	The date and time when the manifest was created. • This property shall contain the date and time when the manifest was created.
}			
ReservationTime	string (date-time)	*read-only*	The date time the service created the reservation. • This property shall indicate the date and time when the reservation was created by the service.

Property	Type	Attributes	Notes
ReservedResourceBlocks [{	array		The array of links to the reserved resource blocks. • This property shall contain an array of links to resources of type ResourceBlock that represent the reserved resource blocks for this reservation. Upon deletion of the reservation or when the reservation is applied, the Reserved property in the referenced resource blocks shall change to `false`.
@odata.id	string	*read-only*	Link to a ResourceBlock resource. See the Links section and the *ResourceBlock* schema for details.
}]			

6.22.4 Property details

6.22.4.1 Expand:

The expansion control for references in manifest responses, similar to the `$expand=.` query parameter.

- This property shall contain the expansion control for references in manifest responses.

string	Description
All	Expand all subordinate references. • This value shall indicate that all subordinate references in the manifest response will be expanded.
None	Do not expand any references. • This value shall indicate that references in the manifest response will not be expanded.
Relevant	Expand relevant subordinate references. Relevant references are those that are tied to a constrained composition request, such as a request for a quantity of processors. • This value shall indicate that relevant subordinate references in the manifest response will be expanded.

6.22.4.2 StanzaType:

The type of stanza.

- This property shall contain the type of stanza.

string	Description
ComposeResource	A stanza that describes the desired end state for a composed resource block. The resources consumed by the composed resource block are moved to the active pool. • This value shall indicate a stanza that describes a composed resource block. The resource blocks assigned to the composed resource block shall be moved to the active pool. The Request property of the stanza shall contain a resource of type ResourceBlock that represents the composition request. The Response property of the stanza shall contain a resource of type ResourceBlock that represents the composed resource block or a Redfish Specification-defined error response.
ComposeSystem	A stanza that describes the desired end state for computer system composition operation. The resources consumed by the composed computer system are moved to the active pool. • This value shall indicate a stanza that describes the specific, constrained, or mixed resources required to compose a computer system. The resource blocks assigned to the computer system shall be moved to the active pool. The Request property of the stanza shall contain a resource of type ComputerSystem that represents the composition request. The Response property of the stanza shall contain a resource of type ComputerSystem that represents the composed system or a Redfish Specification-defined error response.
DecomposeResource	A stanza that references a composed resource block to decompose and return resources to the free pool. • This value shall indicate a stanza that references a composed resource block to decompose and return the resource blocks to the free pool that are no longer contributing to composed resources. The Request property of the stanza shall be a reference object as defined by the 'Reference properties' clause of the Redfish Specification containing a reference to the resource of type ResourceBlock to decompose. The Response property of the stanza shall contain a resource of type ResourceBlock that represents the decomposed resource block or a Redfish Specification-defined error response.
DecomposeSystem	A stanza that references a computer system to decompose and return resources to the free pool. • This value shall indicate a stanza that references a computer system to decompose and return the resource blocks to the free pool that are no longer contributing to composed resources. The Request property of the stanza shall be a Redfish Specification-defined reference object containing a reference to the resource of type ComputerSystem to decompose. The Response property of the stanza shall contain a resource of type ComputerSystem that represents the decomposed system or a Redfish Specification-defined error response.
OEM	A stanza that describes an OEM-specific request. • This value shall indicate a stanza that describes an OEM-specific request. The OEMStanzaType property shall contain the specific OEM stanza type.

string	Description
RegisterResourceBlock *(v1.1+)*	A stanza that references a resource, such as a computer system, in order to create a resource block that references the resource and add it to the free pool. • This value shall indicate a stanza that references a resource to create a resource block that references the resource and add it to the free pool. The Request property of the stanza shall contain a resource of type ResourceBlock that represents the registration request. The Response property of the stanza shall contain a resource of type ResourceBlock that represents the composed system or a Redfish Specification-defined error response.

6.23 CompositionService 1.2.0

Version	*v1.2*	*v1.1*	*v1.0*
Release	2021.1	2018.2	2017.1

6.23.1 Description

The CompositionService schema describes a composition service and its properties and links to the resources available for composition.

- This resource shall represent the composition service and its properties for a Redfish implementation.

6.23.2 URIs

/redfish/v1/CompositionService

6.23.3 Properties

Property	Type	Attributes	Notes
ActivePool *(v1.2+)* {	object		The link to the collection of resource blocks within the active pool. Resource blocks in the active pool are contributing to at least one composed resource as a result of a composition request. • This property shall contain a link to a resource collection of type ResourceBlockCollection. The members of this collection shall represent the resource blocks in the active pool. Services shall filter members of this collection based on the requesting client. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to Collection of *ResourceBlock*. See the ResourceBlock schema for details.
}			
AllowOverprovisioning *(v1.1+)*	boolean	*read-write (null)*	An indication of whether this service is allowed to overprovision a composition relative to the composition request. • This property shall indicate whether this service is allowed to overprovision a composition relative to the composition request.
AllowZoneAffinity *(v1.1+)*	boolean	*read-only (null)*	An indication of whether a client can request that a specific resource zone fulfill a composition request. • This property shall indicate whether a client can request that a specific resource zone fulfill a composition request.
CompositionReservations *(v1.2+)* {	object		The link to the collection of reservations with the composition reservation collection. • This property shall contain a link to a resource collection of type CompositionReservationCollection. The members of this collection shall contain links to reserved resource blocks and the related document that caused the reservations. Services shall filter members of this collection based on the requesting client. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *CompositionReservation*. See the CompositionReservation schema for details.
}			
FreePool *(v1.2+)* {	object		The link to the collection of resource blocks within the free pool. Resource blocks in the free pool are not contributing to any composed resources. • This property shall contain a link to a resource collection of type ResourceBlockCollection. The members of this collection shall represent the resource blocks in the free pool. Services shall filter members of this collection based on the requesting client. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *ResourceBlock*. See the ResourceBlock schema for details.
}			

Property	Type	Attributes	Notes
ReservationDuration *(v1.2+)*	string	*read-write (null)*	The length of time a composition reservation is held before the service deletes the reservation marks any related resource blocks as no longer reserved. • This property shall contain the length of time a composition reservation is held before the service deletes the reservation marks any related resource blocks as no longer reserved. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
ResourceBlocks {	object		The resource blocks available on the service. • This property shall contain a link to a resource collection of type ResourceBlockCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *ResourceBlock*. See the ResourceBlock schema for details.
}			
ResourceZones {	object		The resource zones available on the service. • This property shall contain a link to a resource collection of type ZoneCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Zone*. See the Zone schema for details.
}			
ServiceEnabled	boolean	*read-write (null)*	An indication of whether this service is enabled. • This property shall indicate whether this service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.23.4 Actions

6.23.4.1 Compose *(v1.2+)*

Description

This action performs a set of operations specified by a manifest.

- This action shall perform a set of operations specified by a manifest. Services shall not apply any part of the

manifest unless all operations specified by the manifest are successful.

Action URI: {Base URI of target resource}/Actions/CompositionService.Compose

Action parameters

Parameter Name	Type	Attributes	Notes
Manifest {	object	*optional*	The manifest containing the compose operation request. • This parameter shall contain the manifest containing the compose operation request. This parameter shall be required if RequestFormat contains the value `Manifest`.
Description	string	*read-write (null)*	The description of this manifest. • This property shall contain the description of this manifest.
Expand	string (enum)	*read-write (null)*	The expansion control for references in manifest responses, similar to the `$expand=.` query parameter. • This property shall contain the expansion control for references in manifest responses. *For the possible property values, see Expand in Property details.*
Stanzas [{	array		An array of stanzas that describe the requests specified by this manifest. • This property shall contain an array of stanzas that describe the requests specified by this manifest.
OEMStanzaType	string	*read-write (null)*	The OEM-defined type of stanza. • This property shall contain the OEM-defined type of stanza. This property shall be present if StanzaType is `OEM`.
Request {}	object	*(null)*	The request details for the stanza. • This property shall contain the request details for the stanza and the contents vary based depending on the value of the StanzaType property.
Response {}	object	*(null)*	The response details for the stanza. • This property shall contain the response details for the stanza and the contents vary based depending on the value of the StanzaType property.
StanzaId	string	*read-write (null)*	The identifier of the stanza. This is a unique identifier specified by the client and is not used by the service. • This property shall contain the identifier of the stanza.

Parameter Name	Type	Attributes	Notes
StanzaType	string (enum)	*read-write (null)*	The type of stanza. • This property shall contain the type of stanza. *For the possible property values, see StanzaType in Property details.*
}]			
Timestamp	string (date-time)	*read-write (null)*	The date and time when the manifest was created. • This property shall contain the date and time when the manifest was created.
}			
RequestFormat	string (enum)	*required*	The format of the request. • This parameter shall contain the format of the request. *For the possible property values, see RequestFormat in Property details.*
RequestType	string (enum)	*required*	The type of request. • This parameter shall contain the type of request. *For the possible property values, see RequestType in Property details.*
ReservationId	string	*optional*	The identifier of the composition reservation if applying a reservation. The value for this parameter is obtained from the response of a Compose action where the RequestType parameter contains the value `PreviewReserve`. • This parameter shall contain the value of the Id property of the CompositionReservation resource for applying a reservation.

Response Payload

{			
Manifest *(v1.2+)* {	object		The manifest containing the compose operation response. • This property shall contain the manifest containing the compose operation response. This property shall be required if RequestFormat contains the value `Manifest`.
Description	string	*read-write (null)*	The description of this manifest. • This property shall contain the description of this manifest.

Expand	string (enum)	*read-write (null)*	The expansion control for references in manifest responses, similar to the `$expand=.` query parameter. • This property shall contain the expansion control for references in manifest responses. *For the possible property values, see Expand in Property details.*
Stanzas [{	array		An array of stanzas that describe the requests specified by this manifest. • This property shall contain an array of stanzas that describe the requests specified by this manifest.
OEMStanzaType	string	*read-write (null)*	The OEM-defined type of stanza. • This property shall contain the OEM-defined type of stanza. This property shall be present if StanzaType is `OEM`.
Request {}	object	*(null)*	The request details for the stanza. • This property shall contain the request details for the stanza and the contents vary based depending on the value of the StanzaType property.
Response {}	object	*(null)*	The response details for the stanza. • This property shall contain the response details for the stanza and the contents vary based depending on the value of the StanzaType property.
StanzaId	string	*read-write (null)*	The identifier of the stanza. This is a unique identifier specified by the client and is not used by the service. • This property shall contain the identifier of the stanza.
StanzaType	string (enum)	*read-write (null)*	The type of stanza. • This property shall contain the type of stanza. *For the possible property values, see StanzaType in Property details.*
}]			
Timestamp	string (date-time)	*read-write (null)*	The date and time when the manifest was created. • This property shall contain the date and time when the manifest was created.
}			
RequestFormat *(v1.2+)*	string (enum)	*read-only required*	The format of the request. • This property shall contain the format of the request. *For the possible property values, see RequestFormat in Property details.*

RequestType *(v1.2+)*	string (enum)	*read-only required*	The type of request. • This property shall contain the type of request. *For the possible property values, see RequestType in Property details.*
ReservationId *(v1.2+)*	string	*read-only*	The identifier of the composition reservation that was created. • This property shall contain the value of the Id property of the CompositionReservation resource that was created. This property shall be required if RequestType contains the value `PreviewReserve`.
}			

Request Example

```
{
    "RequestFormat": "Manifest",
    "RequestType": "Apply",
    "Manifest": {
        "Description": "Specific composition example",
        "Timestamp": "2019-08-22T10:35:16+06:00",
        "Expand": "None",
        "Stanzas": [
            {
                "StanzaType": "ComposeSystem",
                "StanzaId": "Compute1",
                "Request": {
                    "Links": {
                        "ResourceBlocks": [
                            {
                                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/BladeServer-1"
                            },
                            {
                                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NVMe-TargetsAppliance-1"
                            },
                            {
                                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NetworkCard1"
                            }
                        ]
                    }
                }
            }
        ]
    }
}
```

Response Example

```
{
    "RequestFormat": "Manifest",
    "RequestType": "Apply",
    "Manifest": {
        "Description": "Specific composition example",
        "Timestamp": "2019-08-22T10:35:16+06:00",
        "Expand": "None",
        "Stanzas": [
            {
                "StanzaType": "ComposeSystem",
                "StanzaId": "Compute1",
                "Request": {
                    "Links": {
                        "ResourceBlocks": [
                            {
                                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/BladeServer-1"
                            },
                            {
                                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NVMe-TargetsAppliance-1"
                            },
                            {
                                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NetworkCard1"
                            }
                        ]
                    }
                },
                "Response": {
                    "@odata.id": "/redfish/v1/Systems/ComposedCompute1",
                    "@odata.type": "#ComputerSystem.v1_14_0.ComputerSystem",
                    "Id": "ComposedCompute1",
                    "Name": "Computer system composed from Compute1",
                    "Processors": {
                        "@odata.id": "/redfish/v1/Systems/ComposedCompute1/Processors"
                    },
                    "Memory": {
                        "@odata.id": "/redfish/v1/Systems/ComposedCompute1/Memory"
                    },
                    "NetworkInterfaces": {
                        "@odata.id": "/redfish/v1/Systems/ComposedCompute1/NetworkInterfaces"
                    },
                    "Storage": {
                        "@odata.id": "/redfish/v1/Systems/ComposedCompute1/Storage"
                    },
                    "Links": {
                        "ResourceBlocks": [
                            {
                                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/BladeServer-1"
                            },
                            {
                                "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NVMe-TargetsAppliance-1"
```

```
                        },
                        {
                            "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/NetworkCard1"
                        }
                    ]
                }
            }
        }
    ]
  }
}
```

6.23.5 Property details

6.23.5.1 Expand:

The expansion control for references in manifest responses, similar to the `$expand=.` query parameter.

- This property shall contain the expansion control for references in manifest responses.

string	Description
All	Expand all subordinate references. • This value shall indicate that all subordinate references in the manifest response will be expanded.
None	Do not expand any references. • This value shall indicate that references in the manifest response will not be expanded.
Relevant	Expand relevant subordinate references. Relevant references are those that are tied to a constrained composition request, such as a request for a quantity of processors. • This value shall indicate that relevant subordinate references in the manifest response will be expanded.

6.23.5.2 RequestFormat:

The format of the request.

- This parameter shall contain the format of the request.

string	Description
Manifest	The request body contains a manifest. • This value shall indicate that the request contains a manifest as defined by the Redfish Manifest schema.

6.23.5.3 RequestType:

The type of request.

- This parameter shall contain the type of request.

string	Description
Apply	Perform the requested operations specified by the manifest and modify resources as needed. • This value shall indicate that the request is to apply the requested operations specified by the manifest and modify resources as needed.
Preview	Preview the outcome of the operations specified by the manifest. • This value shall indicate that the request is to preview the outcome of the operations specified by the manifest to show what the service will do based on the contents of the request, and not affect any resources within the service.
PreviewReserve	Preview the outcome of the operations specified by the manifest and reserve resources. • This value shall indicate that the request is to preview the outcome of the operations specified by the manifest to show what the service will do based on the contents of the request. Resources that would have been affected by this request shall be marked as reserved, but otherwise shall not be affected.

6.23.5.4 StanzaType:

The type of stanza.

- This property shall contain the type of stanza.

string	Description
ComposeResource	A stanza that describes the desired end state for a composed resource block. The resources consumed by the composed resource block are moved to the active pool. • This value shall indicate a stanza that describes a composed resource block. The resource blocks assigned to the composed resource block shall be moved to the active pool. The Request property of the stanza shall contain a resource of type ResourceBlock that represents the composition request. The Response property of the stanza shall contain a resource of type ResourceBlock that represents the composed resource block or a Redfish Specification-defined error response.
ComposeSystem	A stanza that describes the desired end state for computer system composition operation. The resources consumed by the composed computer system are moved to the active pool. • This value shall indicate a stanza that describes the specific, constrained, or mixed resources required to compose a computer system. The resource blocks assigned to the computer system shall be moved to the active pool. The Request property of the stanza shall contain a resource of type ComputerSystem that represents the composition request. The Response property of the stanza shall contain a resource of type ComputerSystem that represents the composed system or a Redfish Specification-defined error response.
DecomposeResource	A stanza that references a composed resource block to decompose and return resources to the free pool. • This value shall indicate a stanza that references a composed resource block to decompose and return the resource blocks to the free pool that are no longer contributing to composed resources. The Request property of the stanza shall be a reference object as defined by the 'Reference properties' clause of the Redfish Specification containing a reference to the resource of type ResourceBlock to decompose. The Response property of the stanza shall contain a resource of type ResourceBlock that represents the decomposed resource block or a Redfish Specification-defined error response.
DecomposeSystem	A stanza that references a computer system to decompose and return resources to the free pool. • This value shall indicate a stanza that references a computer system to decompose and return the resource blocks to the free pool that are no longer contributing to composed resources. The Request property of the stanza shall be a Redfish Specification-defined reference object containing a reference to the resource of type ComputerSystem to decompose. The Response property of the stanza shall contain a resource of type ComputerSystem that represents the decomposed system or a Redfish Specification-defined error response.
OEM	A stanza that describes an OEM-specific request. • This value shall indicate a stanza that describes an OEM-specific request. The OEMStanzaType property shall contain the specific OEM stanza type.

string	Description
RegisterResourceBlock *(v1.1+)*	A stanza that references a resource, such as a computer system, in order to create a resource block that references the resource and add it to the free pool. • This value shall indicate a stanza that references a resource to create a resource block that references the resource and add it to the free pool. The Request property of the stanza shall contain a resource of type ResourceBlock that represents the registration request. The Response property of the stanza shall contain a resource of type ResourceBlock that represents the composed system or a Redfish Specification-defined error response.

6.23.6 Example response

```
{
    "@odata.type": "#CompositionService.v1_2_0.CompositionService",
    "Id": "CompositionService",
    "Name": "Composition Service",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "ServiceEnabled": true,
    "AllowOverprovisioning": true,
    "AllowZoneAffinity": true,
    "ResourceBlocks": {
        "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks"
    },
    "ResourceZones": {
        "@odata.id": "/redfish/v1/CompositionService/ResourceZones"
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/CompositionService"
}
```

6.24 ComputerSystem 1.19.0

Version	*v1.19*	*v1.18*	*v1.17*	*v1.16*	*v1.15*	*v1.14*	*v1.13*	*v1.12*	*v1.11*	*v1.10*	*v1.9*	...
Release	2022.2	2022.1	2021.4	2021.2	2021.1	2020.4	2020.3	2020.2	2020.1	2019.4	2019.3	...

6.24.1 Description

The ComputerSystem schema represents a computer or system instance and the software-visible resources, or

items within the data plane, such as memory, CPU, and other devices that it can access. Details of those resources or subsystems are also linked through this resource.

- This resource shall represent a computing system in the Redfish Specification.

6.24.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*
/redfish/v1/Systems/*{ComputerSystemId}*

6.24.3 Properties

Property	Type	Attributes	Notes
AssetTag	string	*read-write (null)*	The user-definable tag that can track this computer system for inventory or other client purposes. • This property shall contain the system asset tag value.
Bios *(v1.1+)* {	object		The link to the BIOS settings associated with this system. • This property shall contain a link to a resource of type Bios that lists the BIOS settings for this system. See the *Bios* schema for details on this property.
@odata.id	string	*read-only*	Link to a Bios resource. See the Links section and the *Bios* schema for details.
}			
BiosVersion	string	*read-only (null)*	The version of the system BIOS or primary system firmware. • This property shall contain the version string of the currently installed and running BIOS for x86 systems. For other systems, the property may contain a version string that represents the primary system firmware.
Boot {	object		The boot settings for this system. • This property shall contain the boot settings for this system.

Property	Type	Attributes	Notes
AliasBootOrder *(v1.6+)* [ ]	array (string (enum))	*read-write (null)*	• Ordered array of boot source aliases representing the persistent boot order associated with this computer system. ◦ This property shall contain an ordered array of boot source aliases of the BootSource type that represents the persistent boot order of this computer system. This array shall not contain duplicate values. Virtual devices for an alias should take precedence over a physical device. Systems may attempt to boot from multiple devices that share an alias. *For the possible property values, see AliasBootOrder in Property details.*
AutomaticRetryAttempts *(v1.11+)*	integer	*read-write (null)*	The number of attempts the system will automatically retry booting. • This property shall contain the number of attempts the system will automatically retry booting in the event the system enters an error state on boot.
AutomaticRetryConfig *(v1.11+)*	string (enum)	*read-write (null)*	The configuration of how the system retries booting automatically. • This property shall contain the configuration of how the system retry booting automatically. *For the possible property values, see AutomaticRetryConfig in Property details.*
BootNext *(v1.5+)*	string	*read-write (null)*	The BootOptionReference of the Boot Option to perform a one-time boot from when BootSourceOverrideTarget is `UefiBootNext`. • This property shall contain the BootOptionReference of the UEFI boot option for one time boot, as defined by the UEFI Specification. The valid values for this property are specified in the values of the BootOrder array. BootSourceOverrideEnabled set to `Continuous` is not supported for BootSourceOverrideTarget set to `UefiBootNext` because this setting is defined in UEFI as a one-time boot setting.
BootOptions *(v1.5+)* {	object		The link to the collection of the UEFI boot options associated with this computer system. • This property shall contain a link to a resource collection of type BootOptionCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *BootOption*. See the BootOption schema for details.
}			

Property	Type	Attributes	Notes
BootOrder *(v1.5+)* [ ]	array (string, null)	*read-write*	An array of BootOptionReference strings that represent the persistent boot order for with this computer system. Changes to the boot order typically require a system reset before they take effect. It is likely that a client finds the `@Redfish.Settings` term in this resource, and if it is found, the client makes requests to change boot order settings by modifying the resource identified by the `@Redfish.Settings` term. • This property shall contain an array of BootOptionReference strings that represent the persistent boot order for this computer system. For UEFI systems, this is the UEFI Specification-defined UEFI BootOrder.
BootOrderPropertySelection *(v1.6+)*	string (enum)	*read-write (null)*	The name of the boot order property that the system uses for the persistent boot order. • This property shall indicate which boot order property the system uses for the persistent boot order. *For the possible property values, see BootOrderPropertySelection in Property details.*
BootSourceOverrideEnabled	string (enum)	*read-write (null)*	The state of the boot source override feature. • This property shall contain `Once` for a one-time boot override, and `Continuous` for a remain-active-until-cancelled override. If set to `Once`, the value is reset to `Disabled` after the BootSourceOverrideTarget actions have completed successfully. Changes to this property do not alter the BIOS persistent boot order configuration. *For the possible property values, see BootSourceOverrideEnabled in Property details.*
BootSourceOverrideMode *(v1.1+)*	string (enum)	*read-write (null)*	The BIOS boot mode to use when the system boots from the BootSourceOverrideTarget boot source. • This property shall contain the BIOS boot mode to use when the system boots from the BootSourceOverrideTarget boot source. *For the possible property values, see BootSourceOverrideMode in Property details.*

Property	Type	Attributes	Notes
BootSourceOverrideTarget	string (enum)	*read-write (null)*	The current boot source to use at the next boot instead of the normal boot device, if BootSourceOverrideEnabled is `true`. • This property shall contain the source to boot the system from, overriding the normal boot order. The @Redfish.AllowableValues annotation specifies the valid values for this property. `UefiTarget` indicates to boot from the UEFI device path found in UefiTargetBootSourceOverride. `UefiBootNext` indicates to boot from the UEFI BootOptionReference found in BootNext. Virtual devices for a target should take precedence over a physical device. Systems may attempt to boot from multiple devices that share a target identifier. Changes to this property do not alter the BIOS persistent boot order configuration. *For the possible property values, see BootSourceOverrideTarget in Property details.*
Certificates *(v1.7+)* {	object		The link to a collection of certificates used for booting through HTTPS by this computer system. • This property shall contain a link to a resource collection of type CertificateCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
HttpBootUri *(v1.9+)*	string (URI)	*read-write (null)*	The URI to boot from when BootSourceOverrideTarget is set to `UefiHttp`. • This property shall contain the URI to perform an HTTP or HTTPS boot when BootSourceOverrideTarget is set to `UefiHttp`.
RemainingAutomaticRetryAttempts *(v1.11+)*	integer	*read-only (null)*	The number of remaining automatic retry boots. • This property shall contain the number of attempts remaining the system will retry booting in the event the system enters an error state on boot. If `0`, the system has no remaining automatic boot retry attempts and shall not automatically retry booting if the system enters an error state. This property shall be reset to the value of AutomaticRetryAttempts upon a successful boot attempt.
StopBootOnFault *(v1.15+)*	string (enum)	*read-write (null)*	If the boot should stop on a fault. • This property shall contain the setting if the boot should stop on a fault. *For the possible property values, see StopBootOnFault in Property details.*

Property	Type	Attributes	Notes
TrustedModuleRequiredToBoot *(v1.14+)*	string (enum)	*read-write (null)*	The Trusted Module boot requirement. • This property shall contain the Trusted Module boot requirement. *For the possible property values, see TrustedModuleRequiredToBoot in Property details.*
UefiTargetBootSourceOverride	string	*read-write (null)*	The UEFI device path of the device from which to boot when BootSourceOverrideTarget is `UefiTarget`. • This property shall contain the UEFI device path of the override boot target. Changes to this property do not alter the BIOS persistent boot order configuration.
}			
BootProgress *(v1.13+)* {	object	*(null)*	This object describes the last boot progress state. • This object shall contain the last boot progress state and time.
LastBootTimeSeconds *(v1.18+)*	number	*read-only (null)*	The number of seconds the system spent booting to the operating system during the last boot. • This property shall contain the number of seconds that elapsed between system reset or power on and LastState transitioning to `OSRunning`. If LastState contains `OSRunning`, this property shall contain the most recent boot time. For other values of LastState, this property shall contain the boot time for the previous boot.
LastState *(v1.13+)*	string (enum)	*read-only (null)*	The last boot progress state. • This property shall contain the last boot progress state. *For the possible property values, see LastState in Property details.*
LastStateTime *(v1.13+)*	string (date-time)	*read-only (null)*	The date and time when the last boot state was updated. • This property shall contain the date and time when the last boot state was updated.
Oem *(v1.13+)* {}	object		See the OEM object definition in the Using this guide clause.
OemLastState *(v1.13+)*	string	*read-only (null)*	The OEM-specific last state, if the LastState type is `OEM`. • This property shall represent the OEM-specific LastState of the BootProgress. This property shall only be present if LastState is `OEM`.
}			

Property	Type	Attributes	Notes
Certificates *(v1.14+)* {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
Composition *(v1.18+)* {	object	*(null)*	Information about the composition capabilities and state of the computer system. • This property shall contain information about the composition capabilities and state of the computer system.
UseCases *(v1.18+)* [ ]	array (string (enum))	*read-only* *(null)*	• The composition use cases in which this computer system can participate. ◦ This property shall contain the composition use cases in which this computer system can participate. *For the possible property values, see UseCases in Property details.*
}			
EthernetInterfaces {	object		The link to the collection of Ethernet interfaces associated with this system. • This property shall contain a link to a resource collection of type EthernetInterfaceCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *EthernetInterface*. See the EthernetInterface schema for details.
}			
FabricAdapters *(v1.10+)* {	object		The link to the collection of fabric adapters associated with this system. • This property shall contain a link to a resource collection of type FabricAdapterCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *FabricAdapter*. See the FabricAdapter schema for details.
}			

Property	Type	Attributes	Notes
GraphicalConsole *(v1.13+)* {	object		The information about the graphical console (KVM-IP) service of this system. • This property shall contain the information about the graphical console (KVM-IP) service of this system.
ConnectTypesSupported *(v1.13+)* [ ]	array (string (enum))	*read-only*	• This property enumerates the graphical console connection types that the implementation allows. ◦ This property shall contain an array of the enumerations. KVMIP shall be included if a vendor-define KVM-IP protocol is supported. *For the possible property values, see ConnectTypesSupported in Property details.*
MaxConcurrentSessions *(v1.13+)*	integer	*read-only*	The maximum number of service sessions, regardless of protocol, that this system can support. • This property shall contain the maximum number of concurrent service sessions that this implementation supports.
Port *(v1.13+)*	integer	*read-write (null)*	The protocol port. • This property shall contain the port assigned to the service.
ServiceEnabled *(v1.13+)*	boolean	*read-write*	An indication of whether the service is enabled for this system. • This property shall indicate whether the protocol for the service is enabled.
}			
GraphicsControllers *(v1.15+)* {	object		The link to a collection of graphics controllers that can output video for this system. • This property shall contain a link to a resource collection of type GraphicsControllerCollection that contains graphics controllers that can output video for this system. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *GraphicsController*. See the GraphicsController schema for details.
}			
HostedServices *(v1.2+)* {	object		The services that this computer system supports. • This property shall describe services that this computer system supports.

Property	Type	Attributes	Notes
Oem *(v1.2+)* {}	object		See the OEM object definition in the Using this guide clause.
StorageServices *(v1.2+)* {	object		The link to a collection of storage services that this computer system supports. • This property shall contain a link to a resource collection of type HostedStorageServices.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
}			
HostingRoles *(v1.2+)* [ ]	array (string (enum))	*read-only*	The enumerations of HostingRoles specify different features that the hosting ComputerSystem supports. • The hosting roles that this computer system supports. ◦ This property shall contain the hosting roles that this computer system supports. *For the possible property values, see HostingRoles in Property details.*
HostName	string	*read-write (null)*	The DNS host name, without any domain information. • This property shall contain the host name for this system, as reported by the operating system or hypervisor. A service running in the host operating system typically reports this value to the manager.
HostWatchdogTimer *(v1.5+)* {	object		The host watchdog timer functionality for this system. • This object shall contain properties that describe the host watchdog timer functionality for this ComputerSystem.
FunctionEnabled *(v1.5+)*	boolean	*read-write required (null)*	An indication of whether a user has enabled the host watchdog timer functionality. This property indicates only that a user has enabled the timer. To activate the timer, installation of additional host-based software is necessary; an update to this property does not initiate the timer. • This property shall indicate whether a user has enabled the host watchdog timer functionality. This property indicates only that a user has enabled the timer. To activate the timer, installation of additional host-based software is necessary; an update to this property does not initiate the timer.

Property	Type	Attributes	Notes
Oem *(v1.5+)* {}	object		See the OEM object definition in the Using this guide clause.
Status *(v1.5+)* {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
TimeoutAction *(v1.5+)*	string (enum)	*read-write required (null)*	The action to perform when the watchdog timer reaches its timeout value. • This property shall contain the action to perform when the watchdog timer reaches its timeout value. *For the possible property values, see TimeoutAction in Property details.*
WarningAction *(v1.5+)*	string (enum)	*read-write (null)*	The action to perform when the watchdog timer is close to reaching its timeout value. This action typically occurs from three to ten seconds before to the timeout value, but the exact timing is dependent on the implementation. • This property shall contain the action to perform before the watchdog timer expires. This action typically occurs from three to ten seconds before to the timeout value, but the exact timing is dependent on the implementation. *For the possible property values, see WarningAction in Property details.*
}			
IdlePowerSaver *(v1.16+)* {	object	*(null)*	The idle power saver settings of the computer system. • This property shall contain the idle power saver settings of the computer system.
Enabled *(v1.16+)*	boolean	*read-write*	An indication of whether idle power saver is enabled. • The value of this property shall indicate if idle power saver is enabled.
EnterDwellTimeSeconds *(v1.16+)*	integer (seconds)	*read-write (null)*	The duration in seconds the computer system is below the EnterUtilizationPercent value before the idle power save is activated. • This property shall contain the duration in seconds the computer system is below the EnterUtilizationPercent value before the idle power save is activated.

Property	Type	Attributes	Notes
EnterUtilizationPercent *(v1.16+)*	number (%)	*read-write (null)*	The percentage of utilization that the computer system shall be lower than to enter idle power save. • This property shall contain the percentage of utilization that the computer system shall be lower than to enter idle power save.
ExitDwellTimeSeconds *(v1.16+)*	integer (seconds)	*read-write (null)*	The duration in seconds the computer system is above the ExitUtilizationPercent value before the idle power save is stopped. • This property shall contain the duration in seconds the computer system is above the ExitUtilizationPercent value before the idle power save is stopped.
ExitUtilizationPercent *(v1.16+)*	number (%)	*read-write (null)*	The percentage of utilization that the computer system shall be higher than to exit idle power save. • This property shall contain the percentage of utilization that the computer system shall be higher than to exit idle power save.
}			
IndicatorLED *(deprecated v1.13)*	string (enum)	*read-write (null)*	The state of the indicator LED, which identifies the system. • This property shall contain the state of the indicator light, which identifies this system. *For the possible property values, see IndicatorLED in Property details. Deprecated in v1.13 and later. This property has been deprecated in favor of the LocationIndicatorActive property.*
KeyManagement *(v1.16+)* {	object	*(null)*	The key management settings of the computer system. • This property shall contain the key management settings of the computer system.
KMIPCertificates *(v1.16+)* {	object		The link to a collection of server certificates for the servers referenced by the KMIPServers property. • This property shall contain a link to a resource collection of type CertificateCollection that represents the server certificates for the servers referenced by the KMIPServers property. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
KMIPServers *(v1.16+)* [{	array		The KMIP servers to which this computer system is subscribed. • This property shall contain the KMIP servers to which this computer system is subscribed for key management.

Property	Type	Attributes	Notes
Address *(v1.16+)*	string	*read-write (null)*	The KMIP server address. • This property shall contain the KMIP server address.
Password *(v1.16+)*	string	*read-write (null)*	The password to access the KMIP server. The value is `null` in responses. • This property shall contain the password to access the KMIP server. The value shall be `null` in responses.
Port *(v1.16+)*	integer	*read-write (null)*	The KMIP server port. • This property shall contain the KMIP server port.
Username *(v1.16+)*	string	*read-write (null)*	The username to access the KMIP server. • This property shall contain the username to access the KMIP server.
}]			
}			
LastResetTime *(v1.12+)*	string (date-time)	*read-only*	The date and time when the system was last reset or rebooted. • This property shall contain the date and time when the system last came out of a reset or was rebooted.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis [{	array		An array of links to the chassis that contains this system. • This property shall contain an array of links to resources of type Chassis that represent the physical containers associated with this resource.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			
ConsumingComputerSystems *(v1.5+)* [{	array		An array of links to ComputerSystems that are realized, in whole or in part, from this ComputerSystem. • The value shall be an array of links to ComputerSystems that are realized, in whole or in part, from this ComputerSystem.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to another ComputerSystem resource.
}]			
CooledBy [{	array		An array of links to resources or objects that that cool this computer system. Normally, the link is for either a chassis or a specific set of fans. • This property shall contain an array of links to resources or objects that cool this computer system.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Endpoints *(v1.2+)* [{	array		An array of links to the endpoints that connect to this system. • This property shall contain an array of links to resources of type Endpoint with which this system is associated.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
ManagedBy [{	array		An array of links to the managers responsible for this system. • This property shall contain an array of link to resources of type Manager that represent the resources with management responsibility for this resource.
@odata.id	string	*read-only*	Link to a Manager resource. See the Links section and the *Manager* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
OffloadedNetworkDeviceFunctions *(v1.17+)* [{	array		The network device functions to which this system performs offload computation, such as with a SmartNIC. • This property shall contain an array of links to resources of type NetworkDeviceFunction that represent the network device functions to which this system performs offload computation, such as with a SmartNIC. This property shall not be present if the SystemType property does not contain `DPU`.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}]			
PoweredBy [{	array		An array of links to resources or objects that power this computer system. Normally, the link is for either a chassis or a specific set of power supplies. • This property shall contain an array of links to resources or objects that power this computer system.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
ResourceBlocks *(v1.4+)* [{	array		An array of links to the resource blocks that are used in this computer system. • This property shall contain an array of links to resources of type ResourceBlock that show the resource blocks that are used in this computer system.
@odata.id	string	*read-write*	Link to a ResourceBlock resource. See the Links section and the *ResourceBlock* schema for details.
}]			
SupplyingComputerSystems *(v1.5+)* [{	array		An array of links to ComputerSystems that contribute, in whole or in part, to the implementation of this ComputerSystem. • The value shall be an array of links to ComputerSystems that contribute, in whole or in part, to the implementation of this ComputerSystem.
@odata.id	string	*read-only*	Link to another ComputerSystem resource.
}]			
TrustedComponents *(v1.19+)* [{	array		An array of links to the trusted components for this system. • This property shall contain an array of link to resources of type TrustedComponent.
@odata.id	string	*read-only*	Link to a TrustedComponent resource. See the Links section and the *TrustedComponent* schema for details.

Property	Type	Attributes	Notes
}]			
}			
LocationIndicatorActive *(v1.13+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
LogServices {	object		The link to the collection of log services associated with this system. • This property shall contain a link to a resource collection of type LogServiceCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *LogService*. See the LogService schema for details.
}			
Manufacturer	string	*read-only (null)*	The manufacturer or OEM of this system. • This property shall contain a value that represents the manufacturer of the system.
ManufacturingMode *(v1.18+)*	boolean	*read-only (null)*	An indication of whether the system is in manufacturing mode. Manufacturing mode is a special boot mode, not normally available to end users, that modifies features and settings for use while the system is being manufactured and tested. • This property shall indicate whether the system is in manufacturing mode. If the system supports SMBIOS, the value shall match the 'Manufacturing mode is enabled' setting from the 'BIOS Characteristics' entry.
Measurements *(v1.14+, deprecated v1.17* [{	array		An array of DSP0274-defined measurement blocks. • This property shall contain an array of DSP0274-defined measurement blocks. *Deprecated in v1.17 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
@odata.id	string	*read-only*	Link to a MeasurementBlock resource. See the Links section and the *SoftwareInventory* schema for details.
}]			

Property	Type	Attributes	Notes
Memory *(v1.1+)* {	object		The link to the collection of memory associated with this system. • This property shall contain a link to a resource collection of type MemoryCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Memory*. See the Memory schema for details.
}			
MemoryDomains *(v1.2+)* {	object		The link to the collection of memory domains associated with this system. • This property shall contain a link to a resource collection of type MemoryDomainCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *MemoryDomain*. See the MemoryDomain schema for details.
}			
MemorySummary {	object		The central memory of the system in general detail. • This property shall describe the central memory for this resource.
MemoryMirroring *(v1.1+)*	string (enum)	*read-only* *(null)*	The ability and type of memory mirroring that this computer system supports. • This property shall contain the ability and type of memory mirroring that this computer system supports. *For the possible property values, see MemoryMirroring in Property details.*
Metrics *(v1.8+)* {	object		The link to the metrics associated with all memory in this system. • This property shall contain a link to the metrics associated with all memory in this system. See the *MemoryMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a MemoryMetrics resource. See the Links section and the *MemoryMetrics* schema for details.
}			

Property	Type	Attributes	Notes
Status *(deprecated v1.16)* {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status. *Deprecated in v1.16 and later. This property has been deprecated in favor of the Conditions property within Status in the root of this resource.*
TotalSystemMemoryGiB	number (GiBy)	*read-only (null)*	The total configured operating system-accessible memory (RAM), measured in GiB. • This property shall contain the amount of configured system general purpose volatile (RAM) memory as measured in gibibytes.
TotalSystemPersistentMemoryGiB *(v1.4+)*	number (GiBy)	*read-only (null)*	The total configured, system-accessible persistent memory, measured in GiB. • This property shall contain the total amount of configured persistent memory available to the system as measured in gibibytes.
}			
Model	string	*read-only (null)*	The product name for this system, without the manufacturer name. • This property shall describe how the manufacturer refers to this system. Typically, this value is the product name for this system without the manufacturer name.
NetworkInterfaces *(v1.3+)* {	object		The link to the collection of Network Interfaces associated with this system. • This property shall contain a link to a resource collection of type NetworkInterfaceCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *NetworkInterface*. See the NetworkInterface schema for details.
}			
PartNumber	string	*read-only (null)*	The part number for this system. • This property shall contain the manufacturer-defined part number for the system.

Property	Type	Attributes	Notes
PCIeDevices *(v1.2+)* [{	array		The link to a collection of PCIe devices that this computer system uses. • This property shall contain an array of links of the PCIeDevice type.
@odata.id	string	*read-only*	Link to a PCIeDevice resource. See the Links section and the *PCIeDevice* schema for details.
}]			
PCIeFunctions *(v1.2+)* [{	array		The link to a collection of PCIe functions that this computer system uses. • This property shall contain an array of links of the PCIeFunction type.
@odata.id	string	*read-only*	Link to a PCIeFunction resource. See the Links section and the *PCIeFunction* schema for details.
}]			
PowerCycleDelaySeconds *(v1.13+)*	number	*read-write (null)*	The number of seconds to delay power on after a `Reset` action requesting `PowerCycle`. Zero seconds indicates no delay. • This property shall contain the number of seconds to delay power on after a `Reset` action requesting `PowerCycle`. The value `0` shall indicate no delay to power on.
PowerMode *(v1.15+)*	string (enum)	*read-write (null)*	The power mode setting of the computer system. • This property shall contain the computer system power mode setting. *For the possible property values, see PowerMode in Property details.*
PowerOffDelaySeconds *(v1.13+)*	number	*read-write (null)*	The number of seconds to delay power off during a reset. Zero seconds indicates no delay to power off. • This property shall contain the number of seconds to delay power off during a reset. The value `0` shall indicate no delay to power off.
PowerOnDelaySeconds *(v1.13+)*	number	*read-write (null)*	The number of seconds to delay power on after a power cycle or during a reset. Zero seconds indicates no delay to power up. • This property shall contain the number of seconds to delay power on after a power cycle or during a reset. The value `0` shall indicate no delay to power on.

Property	Type	Attributes	Notes
PowerRestorePolicy *(v1.6+)*	string (enum)	*read-write*	The desired power state of the system when power is restored after a power loss. • This property shall indicate the desired PowerState of the system when power is applied to the system. The `LastState` value shall return the system to the PowerState it was in when power was lost. *For the possible property values, see PowerRestorePolicy in Property details.*
PowerState	string (enum)	*read-only (null)*	The current power state of the system. • This property shall contain the power state of the system. *For the possible property values, see PowerState in Property details.*
Processors {	object		The link to the collection of processors associated with this system. • This property shall contain a link to a resource collection of type ProcessorCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Processor*. See the Processor schema for details.
}			
ProcessorSummary {	object		The central processors of the system in general detail. • This property shall describe the central processors for this resource. Processors described by this property shall be limited to the processors that execute system code, and shall not include processors used for offload functionality.
CoreCount *(v1.14+)*	integer	*read-only (null)*	The number of processor cores in the system. • This property shall contain the total number of central processor cores in in the system.
Count	integer	*read-only (null)*	The number of physical processors in the system. • This property shall contain the total number of physical central processors in the system.
LogicalProcessorCount *(v1.5+)*	integer	*read-only (null)*	The number of logical processors in the system. • This property shall contain the total number of logical central processors in the system.

Property	Type	Attributes	Notes
Metrics *(v1.7+)* {	object		The link to the metrics associated with all processors in this system. • This property shall contain a link to the metrics associated with all processors in this system. See the *ProcessorMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a ProcessorMetrics resource. See the Links section and the *ProcessorMetrics* schema for details.
}			
Model	string	*read-only (null)*	The processor model for the primary or majority of processors in this system. • This property shall contain the processor model for the central processors in the system, per the description in the Processor Information - Processor Family section of the SMBIOS Specification DSP0134 2.8 or later.
Status *(deprecated v1.16)* {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status. *Deprecated in v1.16 and later. This property has been deprecated in favor of the Conditions property within Status in the root of this resource.*
ThreadingEnabled *(v1.15+)*	boolean	*read-write*	An indication of whether threading is enabled on all processors in this system. • The value of this property shall indicate that all Processor resources in this system where the ProcessorType property contains `CPU` have multiple threading support enabled.
}			
Redundancy *(v1.5+)* [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. • The link to a collection of redundancy entities. Each entity specifies a kind and level of redundancy and a collection, or redundancy set, of other computer systems that provide the specified redundancy to this computer system. ◦ This property shall contain a set of redundancy entities. Each entity specifies a kind and level of redundancy and a collection, or redundancy set, of other computer systems that provide the specified redundancy to this computer system. For property details, see Redundancy.

Property	Type	Attributes	Notes
SecureBoot *(v1.1+)* {	object		The link to the UEFI Secure Boot associated with this system. • This property shall contain a link to a resource of type SecureBoot. See the *SecureBoot* schema for details on this property.
@odata.id	string	*read-only*	Link to a SecureBoot resource. See the Links section and the *SecureBoot* schema for details.
}			
SerialConsole *(v1.13+)* {	object		The serial console services that this system provides. • This property shall contain information about the serial console services of this system.
IPMI *(v1.13+)* {}	object		The connection details for an IPMI Serial-over-LAN service. • This property shall contain connection details for a serial console service that uses the IPMI Serial-over-LAN (SOL) protocol. For more information about this property, see SerialConsoleProtocol in Property Details.
MaxConcurrentSessions *(v1.13+)*	integer	*read-only*	The maximum number of service sessions, regardless of protocol, that this system can support. • This property shall contain the maximum number of concurrent service sessions that this implementation supports.
SSH *(v1.13+)* {}	object		The connection details for an SSH serial console service. • This property shall contain connection details for a serial console service that uses the Secure Shell (SSH) protocol. For more information about this property, see SerialConsoleProtocol in Property Details.
Telnet *(v1.13+)* {}	object		The connection details for a Telnet serial console service. • This property shall contain connection details for a serial console service that uses the Telnet protocol. For more information about this property, see SerialConsoleProtocol in Property Details.
}			
SerialNumber	string	*read-only* *(null)*	The serial number for this system. • This property shall contain the serial number for the system.

Property	Type	Attributes	Notes
SimpleStorage {	object		The link to the collection of storage devices associated with this system. • This property shall contain a link to a resource collection of type SimpleStorageCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *SimpleStorage*. See the SimpleStorage schema for details.
}			
SKU	string	*read-only (null)*	The manufacturer SKU for this system. • This property shall contain the SKU for the system.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
Storage *(v1.1+)* {	object		The link to the collection of storage devices associated with this system. • This property shall contain a link to a resource collection of type StorageCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Storage*. See the Storage schema for details.
}			
SubModel *(v1.5+)*	string	*read-only (null)*	The sub-model for this system. • This property shall contain the information about the sub-model (or configuration) of the system. This shall not include the model/product name or the manufacturer name.
SystemType	string (enum)	*read-only*	The type of computer system that this resource represents. • An enumeration that indicates the kind of system that this resource represents. *For the possible property values, see SystemType in Property details.*

Property	Type	Attributes	Notes
TrustedModules *(v1.1+, deprecated v1.19* [{	array		An array of trusted modules in the system. • This object shall contain an array of objects with properties that describe the trusted modules for this resource. *Deprecated in v1.19 and later. This property has been deprecated in favor of the TrustedComponents property in Links.*
FirmwareVersion *(v1.1+)*	string	*read-only (null)*	The firmware version of this Trusted Module. • This property shall contain the firmware version as defined by the manufacturer for the Trusted Module.
FirmwareVersion2 *(v1.3+)*	string	*read-only (null)*	The second firmware version of this Trusted Module, if applicable. • This property shall contain the 2nd firmware version, if applicable, as defined by the manufacturer for the Trusted Module.
InterfaceType *(v1.1+)*	string (enum)	*read-only (null)*	The interface type of the Trusted Module. • This property shall contain the interface type of the installed Trusted Module. *For the possible property values, see InterfaceType in Property details.*
InterfaceTypeSelection *(v1.3+)*	string (enum)	*read-only (null)*	The interface type selection supported by this Trusted Module. • This property shall contain the interface type Selection method (for example to switch between TPM1_2 and TPM2_0) that is supported by this TrustedModule. *For the possible property values, see InterfaceTypeSelection in Property details.*
Oem *(v1.1+)* {}	object		See the OEM object definition in the Using this guide clause.
Status *(v1.1+)* {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
}]			
USBControllers *(v1.15+)* {	object		The link to a collection of USB controllers for this system. • This property shall contain a link to a resource collection of type USBControllerCollection that contains USB controllers for this system. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to Collection of *USBController*. See the USBController schema for details.
}			
UUID	string	*read-only* *(null)*	The UUID for this system. • This property shall contain the universal unique identifier number for this system. RFC4122 describes methods to create this value. The value should be considered to be opaque. Client software should only treat the overall value as a UUID and should not interpret any sub-fields within the UUID. If the system supports SMBIOS, the property value should follow the SMBIOS 2.6 and later recommendation for converting the SMBIOS 16-byte UUID structure into the Redfish canonical `xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx` string format, so that the property value matches the byte order presented by current OS APIs, such as WMI and dmidecode. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})` *For more information about this property, see Property details.*
VirtualMedia *(v1.13+)* {	object		The link to the virtual media services for this system. • This property shall contain a link to a resource collection of type VirtualMediaCollection that this system uses. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *VirtualMedia*. See the VirtualMedia schema for details.
}			
VirtualMediaConfig *(v1.13+)* {	object		The information about the virtual media service of this system. • This property shall contain the information about the virtual media service of this system.
Port *(v1.13+)*	integer	*read-write* *(null)*	The protocol port. • This property shall contain the port assigned to the service.
ServiceEnabled *(v1.13+)*	boolean	*read-write*	An indication of whether the service is enabled for this system. • This property shall indicate whether the protocol for the service is enabled.
}			

6.24.4 Actions

6.24.4.1 AddResourceBlock *(v1.6+)*

Description

This action adds a resource block to a system.

- This action shall add a resource block to a system.

Action URI: {Base URI of target resource}/Actions/ComputerSystem.AddResourceBlock

Action parameters

Parameter Name	Type	Attributes	Notes
ComputerSystemETag	string	*optional*	The current ETag of the system. • This parameter shall contain the current ETag of the system. If the client-provided ETag does not match the current ETag of the system, the service shall return the HTTP 428 (Precondition Required) status code to reject the request.
ResourceBlock {	object	*required*	The resource block to add to the system. • This parameter shall contain a link to the specified resource block to add to the system. See the *ResourceBlock* schema for details on this property.
@odata.id	string	*read-only*	Link to a ResourceBlock resource. See the Links section and the *ResourceBlock* schema for details.
}			
ResourceBlockETag	string	*optional*	The current ETag of the resource block to add to the system. • This parameter shall contain the current ETag of the resource block to add to the system. If the client-provided ETag does not match the current ETag of the resource block that the ResourceBlock parameter specifies, the service shall return the HTTP 428 (Precondition Required) status code to reject the request.

Request Example

```
{
```

```
    "ResourceBlock": {
        "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/Offload-GPU1"
    },
    "ResourceBlockETag": "W/\"19472363938\"",
    "ComputerSystemETag": "W/\"99374369273\""
}
```

6.24.4.2 RemoveResourceBlock *(v1.6+)*

Description

This action removes a resource block from a system.

- This action shall remove a resource block from a system.

Action URI: {Base URI of target resource}/Actions/ComputerSystem.RemoveResourceBlock

Action parameters

Parameter Name	Type	Attributes	Notes
ComputerSystemETag	string	*optional*	The current ETag of the system. • This parameter shall contain the current ETag of the system. If the client-provided ETag does not match the current ETag of the system, the service shall return the HTTP 428 (Precondition Required) status code to reject the request.
ResourceBlock {	object	*required*	The resource block to remove from the system. • This parameter shall contain a link to the specified resource block to remove from the system. See the *ResourceBlock* schema for details on this property.
@odata.id	string	*read-only*	Link to a ResourceBlock resource. See the Links section and the *ResourceBlock* schema for details.
}			
ResourceBlockETag	string	*optional*	The current ETag of the resource block to remove from the system. • This parameter shall contain the current ETag of the resource block to remove from the system. If the client-provided ETag does not match the current ETag of the resource block that the ResourceBlock parameter specifies, the service shall return the HTTP 428 (Precondition Required) status code to reject the request.

Request Example

```
{
    "ResourceBlock": {
        "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/Offload-GPU1"
    },
    "ResourceBlockETag": "W/\"19472363938\"",
    "ComputerSystemETag": "W/\"99374369273\""
}
```

6.24.4.3 Reset

Description

This action resets the system.

- This action shall reset the system represented by the resource. For systems that implement ACPI Power Button functionality, the PushPowerButton value shall perform or emulate an ACPI Power Button Push, and the ForceOff value shall perform an ACPI Power Button Override, commonly known as a four-second hold of the power button.

Action URI: {Base URI of target resource}/Actions/ComputerSystem.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. Services should include the @Redfish.AllowableValues annotation for this parameter to ensure compatibility with clients, even when ActionInfo has been implemented. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ForceRestart"
}
```

6.24.4.4 SetDefaultBootOrder *(v1.5+)*

Description

This action sets the BootOrder to the default settings.

- This action shall set the BootOrder array to the default settings.

Action URI: {Base URI of target resource}/Actions/ComputerSystem.SetDefaultBootOrder

Action parameters

This action takes no parameters.

6.24.5 Property details

6.24.5.1 AliasBootOrder:

- Ordered array of boot source aliases representing the persistent boot order associated with this computer system.
  - This property shall contain an ordered array of boot source aliases of the BootSource type that represents the persistent boot order of this computer system. This array shall not contain duplicate values. Virtual devices for an alias should take precedence over a physical device. Systems may attempt to boot from multiple devices that share an alias.

string	Description
BiosSetup	Boot to the BIOS setup utility.
Cd	Boot from the CD or DVD.
Diags	Boot to the manufacturer's diagnostics program.
Floppy	Boot from the floppy disk drive.
Hdd	Boot from a hard drive.
None	Boot from the normal boot device.
Pxe	Boot from the Pre-Boot EXecution (PXE) environment.
Recovery	Boot to a system-designated recovery process or image.
RemoteDrive	Boot from a remote drive, such as an iSCSI target.
SDCard	Boot from an SD card.

string	Description
UefiBootNext	Boot to the UEFI device that the BootNext property specifies.
UefiHttp	Boot from a UEFI HTTP network location.
UefiShell	Boot to the UEFI Shell.
UefiTarget	Boot to the UEFI device specified in the UefiTargetBootSourceOverride property.
Usb	Boot from a system BIOS-specified USB device.
Utilities	Boot to the manufacturer's utilities program or programs.

6.24.5.2 AutomaticRetryConfig:

The configuration of how the system retries booting automatically.

- This property shall contain the configuration of how the system retry booting automatically.

string	Description
Disabled	Disable automatic retrying of booting. • This value shall indicate that automatic retrying of booting is disabled.
RetryAlways	Always automatically retry booting. • This value shall indicate that the system will always automatically retry booting.
RetryAttempts	Automatic retrying of booting is based on a specified retry count. • This value shall indicate that the number of retries of booting is based on the AutomaticRetryAttempts property, and the RemainingAutomaticRetryAttempts property indicates the number of remaining attempts.

6.24.5.3 BootOrderPropertySelection:

The name of the boot order property that the system uses for the persistent boot order.

- This property shall indicate which boot order property the system uses for the persistent boot order.

string	Description
AliasBootOrder	The system uses the AliasBootOrder property to specify the persistent boot order.

string	Description
BootOrder	The system uses the BootOrder property to specify the persistent boot order.

6.24.5.4 BootSourceOverrideEnabled:

The state of the boot source override feature.

- This property shall contain `Once` for a one-time boot override, and `Continuous` for a remain-active-until-cancelled override. If set to `Once`, the value is reset to `Disabled` after the BootSourceOverrideTarget actions have completed successfully. Changes to this property do not alter the BIOS persistent boot order configuration.

string	Description
Continuous	The system boots to the target specified in the BootSourceOverrideTarget property until this property is `Disabled`.
Disabled	The system boots normally.
Once	On its next boot cycle, the system boots one time to the boot source override target. Then, the BootSourceOverrideEnabled value is reset to `Disabled`.

6.24.5.5 BootSourceOverrideMode:

The BIOS boot mode to use when the system boots from the BootSourceOverrideTarget boot source.

- This property shall contain the BIOS boot mode to use when the system boots from the BootSourceOverrideTarget boot source.

string	Description
Legacy	The system boots in non-UEFI boot mode to the boot source override target.
UEFI	The system boots in UEFI boot mode to the boot source override target.

6.24.5.6 BootSourceOverrideTarget:

The current boot source to use at the next boot instead of the normal boot device, if BootSourceOverrideEnabled is `true`.

- This property shall contain the source to boot the system from, overriding the normal boot order. The @Redfish.AllowableValues annotation specifies the valid values for this property. `UefiTarget` indicates to boot from the UEFI device path found in UefiTargetBootSourceOverride. `UefiBootNext` indicates to boot from the

UEFI BootOptionReference found in BootNext. Virtual devices for a target should take precedence over a physical device. Systems may attempt to boot from multiple devices that share a target identifier. Changes to this property do not alter the BIOS persistent boot order configuration.

string	Description
BiosSetup	Boot to the BIOS setup utility.
Cd	Boot from the CD or DVD.
Diags	Boot to the manufacturer's diagnostics program.
Floppy	Boot from the floppy disk drive.
Hdd	Boot from a hard drive.
None	Boot from the normal boot device.
Pxe	Boot from the Pre-Boot EXecution (PXE) environment.
Recovery *(v1.19+)*	Boot to a system-designated recovery process or image.
RemoteDrive *(v1.2+)*	Boot from a remote drive, such as an iSCSI target.
SDCard *(v1.1+)*	Boot from an SD card.
UefiBootNext *(v1.5+)*	Boot to the UEFI device that the BootNext property specifies.
UefiHttp *(v1.1+)*	Boot from a UEFI HTTP network location.
UefiShell	Boot to the UEFI Shell.
UefiTarget	Boot to the UEFI device specified in the UefiTargetBootSourceOverride property.
Usb	Boot from a system BIOS-specified USB device.
Utilities	Boot to the manufacturer's utilities program or programs.

6.24.5.7 ConnectTypesSupported:

- This property enumerates the graphical console connection types that the implementation allows.
  - This property shall contain an array of the enumerations. KVMIP shall be included if a vendor-define KVM-IP protocol is supported.

string	Description
KVMIP	The controller supports a graphical console connection through a KVM-IP (redirection of Keyboard, Video, Mouse over IP) protocol.

string	Description
OEM	The controller supports a graphical console connection through an OEM-specific protocol.

6.24.5.8 HostingRoles:

The enumerations of HostingRoles specify different features that the hosting ComputerSystem supports.

- The hosting roles that this computer system supports.
  - This property shall contain the hosting roles that this computer system supports.

string	Description
Appliance	The system hosts functionality that supports the system acting as an appliance.
ApplicationServer	The system hosts functionality that supports general purpose applications.
BareMetalServer	The system hosts functionality that supports the system acting as a bare metal server.
ContainerServer	The system hosts functionality that supports the system acting as a container server.
StorageServer	The system hosts functionality that supports the system acting as a storage server.
Switch	The system hosts functionality that supports the system acting as a switch.
VirtualMachineServer	The system hosts functionality that supports the system acting as a virtual machine server.

6.24.5.9 IndicatorLED:

The state of the indicator LED, which identifies the system.

- This property shall contain the state of the indicator light, which identifies this system.

string	Description
Blinking	The indicator LED is blinking. • This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.

string	Description
Lit	The indicator LED is lit. • This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Off	The indicator LED is off. • This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Unknown *(deprecated v1.1)*	The state of the indicator LED cannot be determined. • This value shall represent that the indicator LED is in an unknown state. The service shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code. *Deprecated in v1.1 and later. This value has been deprecated in favor of returning null if the state is unknown.*

6.24.5.10 InterfaceType:

The interface type of the Trusted Module.

- This property shall contain the interface type of the installed Trusted Module.

string	Description
TCM1_0	Trusted Cryptography Module (TCM) 1.0.
TPM1_2	Trusted Platform Module (TPM) 1.2.
TPM2_0	Trusted Platform Module (TPM) 2.0.

6.24.5.11 InterfaceTypeSelection:

The interface type selection supported by this Trusted Module.

- This property shall contain the interface type Selection method (for example to switch between TPM1_2 and TPM2_0) that is supported by this TrustedModule.

string	Description
BiosSetting	The TrustedModule supports switching InterfaceType through platform software, such as a BIOS configuration attribute.
FirmwareUpdate	The TrustedModule supports switching InterfaceType through a firmware update.
None	The TrustedModule does not support switching the InterfaceType.
OemMethod	The TrustedModule supports switching InterfaceType through an OEM proprietary mechanism.

6.24.5.12 LastState:

The last boot progress state.

- This property shall contain the last boot progress state.

string	Description
BusInitializationStarted	The system has started initializing the buses. • This value shall indicate that the system has started to initialize the buses.
MemoryInitializationStarted	The system has started initializing the memory. • This value shall indicate that the system has started to initialize memory.
None	The system is not booting. • This value shall indicate that the system is not booting or running, such as the system is powered off.
OEM	A boot progress state in an OEM-defined format. • This value shall indicate an OEM-defined boot progress state.
OSBootStarted	The operating system has started booting. • This value shall indicate that the operating system has started to boot.
OSRunning	The operating system is running. • This value shall indicate that the operating system is running and shall indicate the final boot progress state.
PCIResourceConfigStarted	The system has started initializing the PCI resources. • This value shall indicate that the system has started to initialize PCI resources.

string	Description
PrimaryProcessorInitializationStarted	The system has started initializing the primary processor. • This value shall indicate that the system has started to initialize the primary processor.
SecondaryProcessorInitializationStarted	The system has started initializing the remaining processors. • This value shall indicate that the system has started to initialize the secondary processors.
SetupEntered *(v1.15+)*	The system has entered the setup utility. • This value shall indicate that the system has entered the setup utility.
SystemHardwareInitializationComplete	The system has completed initializing all hardware. • This value shall indicate that the system has completed initializing all hardware.

6.24.5.13 MemoryMirroring:

The ability and type of memory mirroring that this computer system supports.

- This property shall contain the ability and type of memory mirroring that this computer system supports.

string	Description
DIMM	The system supports DIMM mirroring at the DIMM level. Individual DIMMs can be mirrored.
Hybrid	The system supports a hybrid mirroring at the system and DIMM levels. Individual DIMMs can be mirrored.
None	The system does not support DIMM mirroring.
System	The system supports DIMM mirroring at the system level. Individual DIMMs are not paired for mirroring in this mode.

6.24.5.14 PowerMode:

The power mode setting of the computer system.

- This property shall contain the computer system power mode setting.

string	Description
BalancedPerformance	The system performs at the highest speeds while utilization is high and performs at reduced speeds when the utilization is low. • This value shall indicate the system performs at the highest speeds possible when the utilization is high and performs at reduced speeds when the utilization is low to save power. This mode is a compromise between `MaximumPerformance` and `PowerSaving`.
MaximumPerformance	The system performs at the highest speeds possible. • This value shall indicate the system performs at the highest speeds possible. This mode should be used when performance is the top priority.
OEM	The system power mode is OEM-defined. • This value shall indicate the system performs at an OEM-defined power mode.
OSControlled	The system power mode is controlled by the operating system. • This value shall indicate the system performs at a operating system controlled power mode.
PowerSaving	The system performs at reduced speeds to save power. • This value shall indicate the system performs at reduced speeds to save power. This mode should be used when power saving is the top priority.
Static	The system power mode is static. • This value shall indicate the system performs at a static base speed.

6.24.5.15 PowerRestorePolicy:

The desired power state of the system when power is restored after a power loss.

- This property shall indicate the desired PowerState of the system when power is applied to the system. The `LastState` value shall return the system to the PowerState it was in when power was lost.

string	Description
AlwaysOff	The system always remains powered off when power is applied.
AlwaysOn	The system always powers on when power is applied.
LastState	The system returns to its last on or off power state when power is applied.

6.24.5.16 PowerState:

The current power state of the system.

- This property shall contain the power state of the system.

string	Description
Off	The system is powered off, although some components might continue to have AUX power such as management controller.
On	The system is powered on.
PoweringOff	A temporary state between on and off. The power off action can take time while the OS is in the shutdown process.
PoweringOn	A temporary state between off and on. This temporary state can be very short.

6.24.5.17 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. Services should include the @Redfish.AllowableValues annotation for this parameter to ensure compatibility with clients, even when ActionInfo has been implemented.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.

string	Description
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.

string	Description
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.24.5.18 SerialConsoleProtocol:

The information about a serial console service that this system provides.

ConsoleEntryCommand *(v1.13+)*	string	*read-only (null)*	The command string passed to the service to select or enter the system's serial console. • This property shall contain a command string that can be provided by a client to select or enter the system's serial console, when the console is shared among several systems or a manager CLI.
HotKeySequenceDisplay *(v1.13+)*	string	*read-only (null)*	The hotkey sequence available for the user to exit the serial console session. • This property shall contain a string that can be provided to a user to describe the hotkey sequence used to exit the serial console session, or, if shared with a manager CLI, to return to the CLI.
Port *(v1.13+)*	integer	*read-write (null)*	The protocol port. • This property shall contain the port assigned to the protocol.
ServiceEnabled *(v1.13+)*	boolean	*read-write*	An indication of whether the service is enabled for this system. • This property shall indicate whether the protocol for the service is enabled.
SharedWithManagerCLI *(v1.13+)*	boolean	*read-only*	Indicates whether the serial console service is shared with access to the manager's command-line interface (CLI). • This property shall indicate whether the serial console service is shared with access to the manager's command-line interface (CLI).

6.24.5.19 StopBootOnFault:

If the boot should stop on a fault.

- This property shall contain the setting if the boot should stop on a fault.

string	Description
AnyFault	The system should stop the boot on any fault. • This value shall indicate the system will stop the boot if a fault occurs. This includes, but is not limited to, faults that affect performance, fault tolerance, or capacity.
Never	The system performs any normal recovery actions during boot if a fault occurs. • This value shall indicate the system will continue to attempt to boot if a fault occurs.

6.24.5.20 SystemType:

The type of computer system that this resource represents.

- An enumeration that indicates the kind of system that this resource represents.

string	Description
Composed *(v1.4+)*	A computer system constructed by binding resource blocks together. • A SystemType of Composed typically represents a single system constructed from disaggregated resources through the Redfish composition service.
DPU *(v1.16+)*	A computer system that performs the functions of a data processing unit, such as a SmartNIC. • A SystemType of DPU typically represents a single system that performs offload computation as a data processing unit, such as a SmartNIC.
OS	An operating system instance. • A SystemType of OS typically represents an OS or hypervisor view of the system.
Physical	A computer system. • A SystemType of Physical typically represents the hardware aspects of a system, such as a management controller.
PhysicallyPartitioned	A hardware-based partition of a computer system. • A SystemType of PhysicallyPartitioned typically represents a single system constructed from one or more physical systems through a firmware or hardware-based service.
Virtual	A virtual machine instance running on this system. • A SystemType of Virtual typically represents a system that is actually a virtual machine instance.

string	Description
VirtuallyPartitioned	A virtual or software-based partition of a computer system. • A SystemType of VirtuallyPartitioned typically represents a single system constructed from one or more virtual systems through a software-based service.

6.24.5.21 TimeoutAction:

The action to perform when the watchdog timer reaches its timeout value.

- This property shall contain the action to perform when the watchdog timer reaches its timeout value.

string	Description
None	No action taken.
OEM	Perform an OEM-defined action.
PowerCycle	Power cycle the system.
PowerDown	Power down the system.
ResetSystem	Reset the system.

6.24.5.22 TrustedModuleRequiredToBoot:

The Trusted Module boot requirement.

- This property shall contain the Trusted Module boot requirement.

string	Description
Disabled	No Trusted Module requirement to boot. • This value shall indicate a Trusted Module is not required to boot.
Required	A functional Trusted Module is required to boot. • This value shall indicate a functioning Trusted Module is required to boot.

6.24.5.23 UseCases:

- The composition use cases in which this computer system can participate.

- This property shall contain the composition use cases in which this computer system can participate.

string	Description
ExpandableSystem	This computer system supports expandable system composition and is associated with a resource block. • This value shall indicate the computer system supports expandable system composition and is associated with a resource block.
ResourceBlockCapable	This computer system supports being registered as a resource block in order for it to participate in composition requests. • This value shall indicate the computer system supports being registered as a resource block in order for it to participate in composition requests.

6.24.5.24 UUID:

The UUID for this system.

- This property shall contain the universal unique identifier number for this system. RFC4122 describes methods to create this value. The value should be considered to be opaque. Client software should only treat the overall value as a UUID and should not interpret any sub-fields within the UUID. If the system supports SMBIOS, the property value should follow the SMBIOS 2.6 and later recommendation for converting the SMBIOS 16-byte UUID structure into the Redfish canonical `xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx` string format, so that the property value matches the byte order presented by current OS APIs, such as WMI and dmidecode.

Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`

The UUID property contains the value of the Universally Unique IDentifier (UUID) of a system, also known in some systems as GUIDs (Globally Unique IDentifier). A UUID is 128 bits long (16 bytes).

Redfish clients should consider the value of the property to be opaque and should not interpret any sub-fields within the UUID.

The UUID property is a string data type. The RFC4122-specified 36-character string format is `xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx`, where each `x` represents a hexadecimal value from `0` to `f`.

If the computer system supports SMBIOS, the UUID string should be formed from the raw binary 16-byte SMBIOS UUID structure. This allows out-of-band clients to correlate the UUID that in-band agents are reading from SMBIOS. The UUID is represented out-of-band through the Redfish API.

6.24.5.24.1 Case sensitivity

Regarding the case of the hex values, RFC4122 specifies that the hex values should be lowercase characters. Most

modern scripting languages typically also represent hex values in lowercase characters following the RFC. However, dmidecode, WMI and some Redfish implementations currently use uppercase characters for UUID on output.

Comparisons between UUID values should always be case-insensitive.

For new Redfish implementations, the recommendation is to follow RFC4122 guidelines: output using lower-case hex values when converting from the SMBIOS raw binary data.

Redfish implementations and operating system APIs are permitted to output in uppercase. For that reason, Redfish clients MUST compare UUIDs using a case-insensitive comparison (as recommended by RFC4122).

6.24.5.24.2 Conversion of UUID format

The SMBIOS 2.6 and later specification specifies the proper algorithm for converting the raw binary SMBIOS 16-byte structure into the canonical string format of `xxxxxx-xxxx-xxxx-xxxx-xxxxxx`). Redfish services should follow the SMBIOS 2.6 and later specification for implementing this conversion.

WMI and Linux dmidecode also follow the SMBIOS guidelines.

Specifically, RFC4122 defines that the canonical string value should follow network byte ordering. The SMBIOS represents the UUID as these fields:

```
{
 DWORD    time_low,
 WORD     time_mid,
 WORD     time_hi_and_version,
 BYTE     clock_seq_hi_and_reserved,
 BYTE     clock_seq_low,
 BYTE[6]  node
}
```

Little-endian systems (including x86 systems) require a little-endian to network-byte-order conversion for the first three fields in order to convert the SMBIOS binary UUID to network byte order.

As specified in the SMBIOS 2.6 and later specifications, if the canonical UUID string is:

```
00112233-4455-6677-8899-aabbccddeeff
```

The corresponding raw representation in the SMBIOS UUID structure is:

```
raw_smbios_uuid = {
  0x33,
```

```
  0x22,
  0x11,
  0x00,
  0x55,
  0x44,
  0x77,
  0x66,
  0x88,
  0x99,
  0xAA,
  0xBB,
  0xCC,
  0xDD,
  0xEE,
  0xFF
}
```

Notice in the above SMBIOS representation that each of the first three words boundaries are in little-endian order. For example, the hex digits '00112233' are represented by the first raw SMBIOS 4-byte DWORD '0x33, 0x22, 0x11, 0x00'. The following sample code (written in C) could be used to convert the raw SMBIOS UUID struct in a little-endian system to the 35-character canonical string:

```
/* routine to convert raw little-endian smbios structure to canonical string */
sprintf(
  redfishUUID,
  "%02x%02x%02x%02x-%02x%02x-%02x%02x-%02x%02x-%02x%02x%02x%02x%02x%02x",
  raw_smbios_uuid[3], raw_smbios_uuid[2],
  raw_smbios_uuid[1], raw_smbios_uuid[0],
  raw_smbios_uuid[5],raw_smbios_uuid[4],
  raw_smbios_uuid[7], raw_smbios_uuid[6],
  raw_smbios_uuid[8], raw_smbios_uuid[9],
  raw_smbios_uuid[10], raw_smbios_uuid[11],
  raw_smbios_uuid[12], raw_smbios_uuid[13],
  raw_smbios_uuid[14], raw_smbios_uuid[15]
);
```

The previous sample code creates the same canonical-formated string as WMI and dmidecode for little-endian X86 systems.

If the computer architecture is not little-endian, then the conversion and canonical representation should be the same as the operating system's APIs, such as WMI and dmidecode.

> **Note:** As specified in RFC4122, the fields in the string should be zero-filled hexadecimal values, as shown in the previous conversion code, so that the overall string length and format is `xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxx`.

6.24.5.25 WarningAction:

The action to perform when the watchdog timer is close to reaching its timeout value. This action typically occurs from three to ten seconds before to the timeout value, but the exact timing is dependent on the implementation.

- This property shall contain the action to perform before the watchdog timer expires. This action typically occurs from three to ten seconds before to the timeout value, but the exact timing is dependent on the implementation.

string	Description
DiagnosticInterrupt	Raise a (typically non-maskable) Diagnostic Interrupt.
MessagingInterrupt	Raise a legacy IPMI messaging interrupt.
None	No action taken.
OEM	Perform an OEM-defined action.
SCI	Raise an interrupt using the ACPI System Control Interrupt (SCI).
SMI	Raise a Systems Management Interrupt (SMI).

6.24.6 Example response


```
{
    "@odata.type": "#ComputerSystem.v1_19_0.ComputerSystem",
    "Id": "437XR1138R2",
    "Name": "WebFrontEnd483",
    "SystemType": "Physical",
    "AssetTag": "Chicago-45Z-2381",
    "Manufacturer": "Contoso",
    "Model": "3500RX",
    "SKU": "8675309",
    "SerialNumber": "437XR1138R2",
    "PartNumber": "224071-J23",
    "Description": "Web Front End node",
    "UUID": "38947555-7742-3448-3784-823347823834",
    "HostName": "web483",
    "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
    },
    "HostingRoles": [
        "ApplicationServer"
    ],
```

```
    "LocationIndicatorActive": false,
    "PowerState": "On",
    "Boot": {
        "BootSourceOverrideEnabled": "Once",
        "BootSourceOverrideTarget": "Pxe",
        "BootSourceOverrideTarget@Redfish.AllowableValues": [
            "None",
            "Pxe",
            "Cd",
            "Usb",
            "Hdd",
            "BiosSetup",
            "Utilities",
            "Diags",
            "SDCard",
            "UefiTarget"
        ],
        "BootSourceOverrideMode": "UEFI",
        "UefiTargetBootSourceOverride": "/0x31/0x33/0x01/0x01"
    },
    "TrustedModules": [
        {
            "FirmwareVersion": "1.13b",
            "InterfaceType": "TPM1_2",
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            }
        }
    ],
    "Oem": {
        "Contoso": {
            "@odata.type": "#Contoso.ComputerSystem",
            "ProductionLocation": {
                "FacilityName": "PacWest Production Facility",
                "Country": "USA"
            }
        },
        "Chipwise": {
            "@odata.type": "#Chipwise.ComputerSystem",
            "Style": "Executive"
        }
    },
    "BiosVersion": "P79 v1.33 (02/28/2015)",
    "ProcessorSummary": {
        "Count": 2,
        "Model": "Multi-Core Intel(R) Xeon(R) processor 7xxx Series"
    },
    "MemorySummary": {
        "TotalSystemMemoryGiB": 96,
```

```
        "TotalSystemPersistentMemoryGiB": 0,
        "MemoryMirroring": "None"
    },
    "Bios": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/BIOS"
    },
    "Processors": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors"
    },
    "Memory": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory"
    },
    "EthernetInterfaces": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/EthernetInterfaces"
    },
    "SimpleStorage": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/SimpleStorage"
    },
    "LogServices": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/LogServices"
    },
    "Links": {
        "Chassis": [
            {
                "@odata.id": "/redfish/v1/Chassis/1U"
            }
        ],
        "ManagedBy": [
            {
                "@odata.id": "/redfish/v1/Managers/BMC"
            }
        ]
    },
    "Actions": {
        "#ComputerSystem.Reset": {
            "target": "/redfish/v1/Systems/437XR1138R2/Actions/ComputerSystem.Reset",
            "ResetType@Redfish.AllowableValues": [
                "On",
                "ForceOff",
                "GracefulShutdown",
                "GracefulRestart",
                "ForceRestart",
                "Nmi",
                "ForceOn",
                "PushPowerButton"
            ]
        },
        "Oem": {
            "#Contoso.Reset": {
                "target": "/redfish/v1/Systems/437XR1138R2/Oem/Contoso/Actions/Contoso.Reset"
```

```
            }
        }
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2"
}
```

6.25 Connection 1.1.0

Version	*v1.1*	*v1.0*
Release	2021.1	2020.3

6.25.1 Description

The Connection schema describes the access permissions endpoints, or groups of endpoints, have with other resources in the service.

- This resource shall represent a connection information in the Redfish Specification.

6.25.2 URIs

/redfish/v1/Fabrics/*{FabricId}*/Connections/*{ConnectionId}*

6.25.3 Properties

Property	Type	Attributes	Notes
ConnectionKeys *(v1.1+)* {	object		The permission keys required to access the specified resources for this connection. • This property shall contain the permissions keys required to access the specified resources for this connection. Some fabrics require permission checks on transactions from authorized initiators.
GenZ *(v1.1+)* {	object	*(null)*	The Gen-Z-specific permission key information for this connection. • This property shall contain the Gen-Z-specific permission key information for this connection.

Property	Type	Attributes	Notes
AccessKey *(v1.1+)*	string	*read-write*	The Access Key for this connection. • This property shall contain the Gen-Z Core Specification-defined Access Key for this connection. Pattern: `^0[xX]([a-fA-F]|[0-9]){2}$`
RKeyDomainCheckingEnabled *(v1.1+)*	boolean	*read-write*	Indicates whether Region Key domain checking is enabled for this connection. • This property shall indicate whether Region Key domain checking is enabled for this connection.
RKeyReadOnlyKey *(v1.1+)*	string	*read-write*	The read-only Region Key for this connection. • This property shall contain the Gen-Z Core Specification-defined read-only Region Key for this connection. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){4}$`
RKeyReadWriteKey *(v1.1+)*	string	*read-write*	The read-write Region Key for this connection. • This property shall contain the Gen-Z Core Specification-defined read-write Region Key for this connection. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){4}$`
}			
}			
ConnectionType	string (enum)	*read-only (null)*	The type of resources this connection specifies. • This property shall contain the type of resources this connection specifies. *For the possible property values, see ConnectionType in Property details.*
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
InitiatorEndpointGroups [{	array		An array of links to the initiator endpoint groups that are associated with this connection. • This property shall contain an array of links to resources of type EndpointGroup that are the initiator endpoint groups associated with this connection. If the referenced endpoint groups contain the GroupType property, the GroupType property shall contain the value `Initiator` or `Client`. This property shall not be present if InitiatorEndpoints is present.

Property	Type	Attributes	Notes
@odata.id	string	*read-write*	Link to a EndpointGroup resource. See the Links section and the *EndpointGroup* schema for details.
}]			
InitiatorEndpoints [{	array		An array of links to the initiator endpoints that are associated with this connection. • This property shall contain an array of links to resources of type Endpoint that are the initiator endpoints associated with this connection. If the referenced endpoints contain the EntityRole property, the EntityRole property shall contain the value `Initiator` or `Both`. This property shall not be present if InitiatorEndpointGroups is present.
@odata.id	string	*read-write*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
TargetEndpointGroups [{	array		An array of links to the target endpoint groups that are associated with this connection. • This property shall contain an array of links to resources of type EndpointGroup that are the target endpoint groups associated with this connection. If the referenced endpoint groups contain the GroupType property, the GroupType property shall contain the value `Target` or `Server`. This property shall not be present if TargetEndpoints is present.
@odata.id	string	*read-write*	Link to a EndpointGroup resource. See the Links section and the *EndpointGroup* schema for details.
}]			
TargetEndpoints [{	array		An array of links to the target endpoints that are associated with this connection. • This property shall contain an array of links to resources of type Endpoint that are the target endpoints associated with this connection. If the referenced endpoints contain the EntityRole property, the EntityRole property shall contain the value `Target` or `Both`. This property shall not be present if TargetEndpointGroups is present.
@odata.id	string	*read-write*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.

Property	Type	Attributes	Notes
}]			
}			
MemoryChunkInfo *(v1.1+)* [{	array		The set of memory chunks and access capabilities specified for this connection. • This property shall contain the set of memory chunks and access capabilities specified for this connection.
AccessCapabilities *(v1.1+)* [ ]	array (string (enum))	*read-write (null)*	• Supported IO access capabilities. ◦ Each entry shall specify a current memory access capability. *For the possible property values, see AccessCapabilities in Property details.*
AccessState *(v1.1+)*	string (enum)	*read-write (null)*	The access state for this connection. • The value of this property shall contain the access state for the associated resource in this connection. *For the possible property values, see AccessState in Property details.*
MemoryChunk *(v1.1+)* {	object	*(null)*	The specified memory chunk. • This property shall contain a link to a resource of type MemoryChunk. The endpoints referenced by the InitiatorEndpoints or InitiatorEndpointGroups properties shall be given access to this memory chunk as described by this object. If TargetEndpoints or TargetEndpointGroups is present, the referenced initiator endpoints shall be required to access the referenced memory chunk through one of the referenced target endpoints. See the *MemoryChunks* schema for details on this property.
@odata.id	string	*read-write*	Link to a MemoryChunks resource. See the Links section and the *MemoryChunks* schema for details.
}			
}]			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
VolumeInfo [{	array		The set of volumes and access capabilities specified for this connection. • This property shall contain the set of volumes and access capabilities specified for this connection.
AccessCapabilities [ ]	array (string (enum))	*read-write (null)*	• Supported IO access capabilities. ◦ Each entry shall specify a current storage access capability. *For the possible property values, see AccessCapabilities in Property details.*
AccessState	string (enum)	*read-write (null)*	The access state for this connection. • The value of this property shall contain the access state for the associated resource in this connection. *For the possible property values, see AccessState in Property details.*
Volume {	object		The specified volume. • This property shall contain a link to a resource of type Volume. The endpoints referenced by the InitiatorEndpoints or InitiatorEndpointGroups properties shall be given access to this volume as described by this object. If TargetEndpoints or TargetEndpointGroups is present, the referenced initiator endpoints shall be required to access the referenced volume through one of the referenced target endpoints.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
}]			

6.25.4 Property details

6.25.4.1 AccessCapabilities:

- Supported IO access capabilities.
  - Each entry shall specify a current memory access capability.

string	Description
Read	Endpoints are allowed to perform reads from the specified resource.
Write	Endpoints are allowed to perform writes to the specified resource.

6.25.4.2 AccessState:

The access state for this connection.

- The value of this property shall contain the access state for the associated resource in this connection.

string	Description
NonOptimized	The resource is in an active and non-optimized state. • This value shall indicate the resource is in an active and non-optimized state.
Optimized	The resource is in an active and optimized state. • This value shall indicate the resource is in an active and optimized state.
Standby	The resource is in a standby state. • This value shall indicate the resource is in a standby state.
Transitioning	The resource is transitioning to a new state. • This value shall indicate the resource is transitioning to a new state.
Unavailable	The resource is in an unavailable state. • This value shall indicate the resource is in an unavailable state.

6.25.4.3 ConnectionType:

The type of resources this connection specifies.

- This property shall contain the type of resources this connection specifies.

string	Description
Memory	A connection to memory related resources.
Storage	A connection to storage related resources, such as volumes.

6.25.5 Example response

```
{
    "@odata.type": "#Connection.v1_1_0.Connection",
    "Id": "1",
    "Name": "Connection info for host 1",
    "ConnectionType": "Storage",
    "VolumeInfo": [
        {
            "AccessCapabilities": [
                "Read",
                "Write"
            ],
            "Volume": {
                "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/1"
            }
        },
        {
            "AccessCapabilities": [
                "Read",
                "Write"
            ],
            "Volume": {
                "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/3"
            }
        }
    ],
    "Links": {
        "InitiatorEndpoints": [
            {
                "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Endpoints/Initiator1"
            }
        ]
    },
    "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Connections/1"
}
```

6.26 ConnectionMethod 1.0.0

Version	*v1.0*
Release	2020.2

6.26.1 Description

The ConnectionMethod schema describes the protocol, provider, or other method used to communicate to a given access point for a Redfish aggregation service.

- This resource shall represent a connection method for a Redfish implementation.

6.26.2 URIs

/redfish/v1/AggregationService/ConnectionMethods/*{ConnectionMethodId}*

6.26.3 Properties

Property	Type	Attributes	Notes
ConnectionMethodType	string (enum)	*read-only (null)*	The type of connection method. • This property shall contain an identifier of the connection method. *For the possible property values, see ConnectionMethodType in Property details.*
ConnectionMethodVariant	string	*read-only (null)*	The variant of connection method. • This property shall contain an additional identifier of the connection method. This property shall be present if ConnectionMethodType is `OEM`.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AggregationSources [{	array		An array of links to the access points using this connection method. • This property shall contain an array of links to resources of type AggregationSource that are using this connection method.
@odata.id	string	*read-only*	Link to a AggregationSource resource. See the Links section and the *AggregationSource* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			

6.26.4 Property details

6.26.4.1 ConnectionMethodType:

The type of connection method.

- This property shall contain an identifier of the connection method.

string	Description
IPMI15	IPMI 1.5 connection method. • This value shall indicate the connection method is IPMI 1.5.
IPMI20	IPMI 2.0 connection method. • This value shall indicate the connection method is IPMI 2.0.
NETCONF	NETCONF connection method. • This value shall indicate the connection method is NETCONF.
OEM	OEM connection method. • This value shall indicate the connection method is OEM. The ConnectionMethodVariant property shall contain further identification information.
Redfish	Redfish connection method. • This value shall indicate the connection method is Redfish.
SNMP	SNMP connection method. • This value shall indicate the connection method is SNMP.

6.26.5 Example response

```
{
    "@odata.type": "#ConnectionMethod.v1_0_0.ConnectionMethod",
    "Id": "ConnectionMethod1",
    "Name": "ConnectionMethod One",
    "ConnectionMethodType": "Redfish",
    "ConnectionMethodVariant": "Contoso",
    "Links": {
        "AggregationSources": [
```

```
            {
                "@odata.id": "/redfish/v1/AggregationService/AggregationSources/AggregationSource1"
            }
        ]
    },
    "Actions": {},
    "@odata.id": "/redfish/v1/AggregationService/ConnectionMethods/ConnectionMethod1"
}
```


6.27 Control 1.2.0

Version	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2021.4	2021.2

6.27.1 Description

The Control schema describes a control point and its properties.

- This resource shall represent a control point for a Redfish implementation.

6.27.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/Controls/*{ControlId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Controls/*{ControlId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Controls/*{ControlId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Controls/*{ControlId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Controls/*{ControlId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Controls/*{ControlId}*

6.27.3 Properties

Property	Type	Attributes	Notes
Accuracy	number (%)	*read-only (null)*	The estimated percent error of measured versus actual values. • This property shall contain the percent error of the measured versus actual values of the SetPoint property.

Property	Type	Attributes	Notes
AllowableMax	number	*read-only* *(null)*	The maximum possible setting for this control. • This property shall indicate the maximum possible value of the SetPoint or SettingMax properties for this control. Services shall not accept values for SetPoint or SettingMax above this value.
AllowableMin	number	*read-only* *(null)*	The minimum possible setting for this control. • This property shall indicate the minimum possible value of the SetPoint or SettingMin properties for this control. Services shall not accept values for SetPoint or SettingMin below this value.
AllowableNumericValues [ ]	array (number, null)	*read-only*	The supported values for the set point. • This property shall contain the supported values for this control. The units shall follow the value of SetPointUnits. This property should only be present when the set point or range has a limited set of supported values that cannot be accurately described using the Increment property.
AssociatedSensors [{	array		An array of links to the sensors associated with this control. • This property shall contain an array of links to resources of type Sensor that represent the sensors related to this control.
@odata.id	string	*read-only*	Link to a Sensor resource. See the Links section and the *Sensor* schema for details.
}]			
ControlDelaySeconds	number	*read-write* *(null)*	The time delay in seconds before the control will activate once the value has deviated from the set point. • This property shall contain the time in seconds that will elapse after the control value deviates above or below the value of SetPoint before the control will activate.
ControlLoop {	object	*(null)*	The control loop details. • This property shall contain the details for the control loop described by this resource.
CoefficientUpdateTime	string (date-time)	*read-only* *(null)*	The date and time that the control loop coefficients were changed. • This property shall contain the date and time that any of the coefficients for the control loop were last changed.

Property	Type	Attributes	Notes
Differential	number	*read-write (null)*	The differential coefficient. • This property shall contain the coefficient for the differential factor in a control loop.
Integral	number	*read-write (null)*	The integral coefficient. • This property shall contain the coefficient for the integral factor in a control loop.
Proportional	number	*read-write (null)*	The proportional coefficient. • This property shall contain the coefficient for the proportional factor in a control loop.
}			
ControlMode	string (enum)	*read-write (null)*	The current operating mode of the control. • This property shall contain the operating mode of the control. *For the possible property values, see ControlMode in Property details.*
ControlType	string (enum)	*read-only (null)*	The type of control. • This property shall contain the type of the control. *For the possible property values, see ControlType in Property details.*
DeadBand	number	*read-write (null)*	The maximum deviation from the set point allowed before the control will activate. • This property shall contain the maximum deviation value allowed above or below the value of SetPoint before the control will activate.
Implementation	string (enum)	*read-only (null)*	The implementation of the control. • This property shall contain the implementation of the control. *For the possible property values, see Implementation in Property details.*
Increment	number	*read-only (null)*	The smallest increment supported for the set point. • This property shall contain the smallest change allowed to the value of the SetPoint, SettingMin, or SettingMax properties. The units shall follow the value of SetPointUnits.
Location {}	object		The location information for this control. • This property shall indicate the location information for this control. For property details, see Location.

Property	Type	Attributes	Notes
PhysicalContext	string (enum)	*read-only (null)*	The area or device to which this control applies. • This property shall contain a description of the affected component or region within the equipment to which this control applies. *For the possible property values, see PhysicalContext in Property details.*
PhysicalSubContext	string (enum)	*read-only (null)*	The usage or location within a device to which this control applies. • This property shall contain a description of the usage or sub-region within the equipment to which this control applies. This property generally differentiates multiple controls within the same PhysicalContext instance. *For the possible property values, see PhysicalSubContext in Property details.*
RelatedItem [{	array		An array of links to resources that this control services. • This property shall contain an array of links to resources that this control services.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Sensor {	object (excerpt)		The sensor reading associated with this control. • This property shall contain the Sensor excerpt directly associated with this control. The value of the DataSourceUri property shall reference a resource of type Sensor. This property shall not be present if multiple sensors are associated with a single control. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}			
SetPoint	number	*read-write (null)*	The desired set point of the control. • This property shall contain the desired set point control value. The units shall follow the value of SetPointUnits.

Property	Type	Attributes	Notes
SetPointType	string (enum)	*read-only (null)*	The set point type used to operate the control. • This property shall contain the type of set point definitions used to describe this control. *For the possible property values, see SetPointType in Property details.*
SetPointUnits	string	*read-only (null)*	The units of the set point. • This property shall contain the units of the control's set point.
SetPointUpdateTime	string (date-time)	*read-only (null)*	The date and time that the set point was changed. • This property shall contain the date and time that the value of SetPoint was last changed.
SettingMax	number	*read-write (null)*	The maximum set point in the allowed range. • This property shall contain the maximum desired set point within the acceptable range. The service shall reject values greater than the value of AllowableMax. The units shall follow the value of SetPointUnits.
SettingMin	number	*read-write (null)*	The minimum set point in the allowed range. • This property shall contain the minimum desired set point within the acceptable range. The service shall reject values less than the value of AllowableMin. The units shall follow the value of SetPointUnits.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.27.4 Actions

6.27.4.1 ResetToDefaults *(v1.2+)*

Description

The action resets the values of writable properties to factory defaults.

- This action shall reset the values of writable properties in this resource to their default values as specified by the manufacturer.

Action URI: {Base URI of target resource}/Actions/Control.ResetToDefaults

Action parameters

This action takes no parameters.

6.27.5 Property details

6.27.5.1 ControlMode:

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

6.27.5.2 ControlType:

The type of control.

- This property shall contain the type of the control.

string	Description
Frequency	Frequency (Hz) control. • This value shall indicate a control used to limit the operating frequency, in hertz units, of a device, either to a single set point or within a range, and the SetPointUnits property shall contain `Hz`.
FrequencyMHz *(v1.1+)*	Frequency (MHz) control. • This value shall indicate a control used to limit the operating frequency, in megahertz units, of a device, either to a single set point or within a range, and the SetPointUnits property shall contain `MHz`.
Power	Power (W) control or power limit. • This value shall indicate a control used to regulate or limit maximum power consumption, in watt units, either to a single set point or within a range, and the SetPointUnits property shall contain `W`.

string	Description
Pressure *(v1.1+)*	Pressure (kPa) control. • This value shall indicate a control used to adjust pressure in a system, in kilopascal units, and the SetPointUnits property shall contain `kPa`.
Temperature	Temperature (C) control or thermostat. • This value shall indicate a control used to regulate temperature, in units of degrees Celsius, either to a single set point or within a range, and the SetPointUnits property shall contain `Cel`.

6.27.5.3 Implementation:

The implementation of the control.

- This property shall contain the implementation of the control.

string	Description
Direct	The set point directly affects the control value.
Monitored	A physical control that cannot be adjusted through this interface.
Programmable	The set point can be adjusted through this interface.

6.27.5.4 PhysicalContext:

The area or device to which this control applies.

- This property shall contain a description of the affected component or region within the equipment to which this control applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.

string	Description
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.

string	Description
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.27.5.5 PhysicalSubContext:

The usage or location within a device to which this control applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this control applies. This property generally differentiates multiple controls within the same PhysicalContext instance.

string	Description
Input	The input.
Output	The output.

6.27.5.6 SetPointType:

The set point type used to operate the control.

- This property shall contain the type of set point definitions used to describe this control.

string	Description
Range	Control uses a range of values. • This value shall indicate the control utilizes a set point range for its operation. The SettingMin and SettingMax properties shall be present for this control type. The SetPoint property shall not be present for this control type.
Single	Control uses a single set point. • This value shall indicate the control utilizes a single set point for its operation. The SetPoint property shall be present for this control type. The SettingMin and SettingMax properties shall not be present for this control type.

6.27.6 Example response

```
{
    "@odata.type": "#Control.v1_2_0.Control",
    "Id": "PowerLimit",
    "Name": "System Power Limit",
    "PhysicalContext": "Chassis",
    "ControlType": "Power",
    "ControlMode": "Automatic",
    "SetPoint": 500,
    "SetPointUnits": "W",
    "AllowableMax": 1000,
    "AllowableMin": 150,
    "Sensor": {
        "Reading": 374,
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/TotalPower"
    },
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "@odata.id": "/redfish/v1/Chassis/1U/Controls/PowerLimit"
}
```

6.28 Drive 1.15.0

Version	*v1.15*	*v1.14*	*v1.13*	*v1.12*	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	...
Release	2022.1	2021.4	2021.2	2020.4	2020.3	2020.2	2019.4	2019.3	2019.2	2019.1	2018.2	...

6.28.1 Description

The Drive schema represents a single physical drive for a system, including links to associated volumes.

- This resource shall represent a drive or other physical storage medium for a Redfish implementation.

6.28.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/Drives/*{DriveId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*

6.28.3 Properties

Property	Type	Attributes	Notes
Assembly *(v1.3+)* {	object		The link to the assembly associated with this drive. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
AssetTag	string	*read-write (null)*	The user-assigned asset tag for this drive. • This property shall track the drive for inventory purposes.

Property	Type	Attributes	Notes
BlockSizeBytes	integer (bytes)	*read-only (null)*	The size, in bytes, of the smallest addressable unit, or block. • This property shall contain size of the smallest addressable unit of the associated drive.
CapableSpeedGbs	number (Gbit/s)	*read-only (null)*	The speed, in gigabit per second (Gbit/s), at which this drive can communicate to a storage controller in ideal conditions. • This property shall contain fastest capable bus speed, in gigabit per second (Gbit/s), of the associated drive.
CapacityBytes	integer (bytes)	*read-only (null)*	The size, in bytes, of this drive. • This property shall contain the raw size, in bytes, of the associated drive.
Certificates *(v1.12+)* {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
EncryptionAbility	string (enum)	*read-only (null)*	The encryption ability of this drive. • This property shall contain the encryption ability for the associated drive. *For the possible property values, see EncryptionAbility in Property details.*
EncryptionStatus	string (enum)	*read-only (null)*	The status of the encryption of this drive. • This property shall contain the encryption status for the associated drive. *For the possible property values, see EncryptionStatus in Property details.*
EnvironmentMetrics *(v1.12+)* {	object		The link to the environment metrics for this drive. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the environment metrics for this drive. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			

Property	Type	Attributes	Notes
FailurePredicted	boolean	*read-only* *(null)*	An indication of whether this drive currently predicts a failure in the near future. • This property shall indicate whether this drive currently predicts a manufacturer-defined failure.
HotspareReplacementMode *(v1.5+)*	string (enum)	*read-write* *(null)*	The replacement mode for the hot spare drive. • This property shall indicate whether a commissioned hot spare continues to serve as a hot spare after the failed drive is replaced. *For the possible property values, see HotspareReplacementMode in Property details.*
HotspareType	string (enum)	*read-write* *(null)*	The type of hot spare that this drive serves as. • This property shall contain the hot spare type for the associated drive. If the drive currently serves as a hot spare, its Status.State field shall be 'StandbySpare' and 'Enabled' when it is part of a volume. *For the possible property values, see HotspareType in Property details.*
Identifiers [{ }]	array (object)		Any additional identifiers for a resource. • The durable names for the drive. ◦ This property shall contain a list of all known durable names for the associated drive. For property details, see Identifier.
IndicatorLED *(deprecated v1.11)*	string (enum)	*read-write* *(null)*	The state of the indicator LED, that identifies the drive. • This property shall contain the state for the indicator light associated with this drive. *For the possible property values, see IndicatorLED in Property details. Deprecated in v1.11 and later. This property has been deprecated in favor of the LocationIndicatorActive property.*
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis *(v1.2+)* {	object		The link to the chassis that contains this drive. • This property shall contain a link to a resource of type Chassis that represents the physical container associated with this drive. See the *Chassis* schema for details on this property.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.

Property	Type	Attributes	Notes
}			
Endpoints *(v1.1+)* [{	array		An array of links to the endpoints that connect to this drive. • This property shall contain an array of links to resources of type Endpoint with which this drive is associated.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
NetworkDeviceFunctions *(v1.14+)* [{	array		An array of links to the network device functions that provide network connectivity for this drive. • This property shall contain the array of links to resources of type NetworkDeviceFunction. This property should only be present for drives with network connectivity, such as Ethernet attached drives.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeFunctions *(v1.6+)* [{	array		An array of links to the PCIe functions that the drive produces. • This property shall link to a resource of type PCIeFunction that represents the PCIe functions associated with this resource.
@odata.id	string	*read-only*	Link to a PCIeFunction resource. See the Links section and the *PCIeFunction* schema for details.
}]			
Storage *(v1.13+)* {	object		A link to the storage subsystem to which this drive belongs. • This property shall contain a link to a resource of type Storage that represents the storage subsystem to which this drive belongs. See the *Storage* schema for details on this property.
@odata.id	string	*read-only*	Link to a Storage resource. See the Links section and the *Storage* schema for details.
}			

Property	Type	Attributes	Notes
StoragePools *(v1.8+)* [{	array		An array of links to the storage pools to which this drive belongs. • This property shall contain an array of links of type StoragePool to which this drive belongs.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Volumes [{	array		An array of links to the volumes that this drive either wholly or only partially contains. • This property shall contain an array of links to resources of type Volume with which this drive is associated. This property shall include all volume resources of which this drive is a member and all volumes for which this drive acts as a spare if the hot spare type is `Dedicated`.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
Location *(deprecated v1.4)* [{ }]	array (object)		The location of a resource. • The location of the drive. ◦ This property shall contain location information of the associated drive. For property details, see Location. *Deprecated in v1.4 and later. This property has been deprecated in favor of the singular property PhysicalLocation found in Drive.v1_4_0.*
LocationIndicatorActive *(v1.11+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
Manufacturer	string	*read-only (null)*	The manufacturer of this drive. • This property shall contain the name of the organization responsible for producing the drive. This organization may be the entity from whom the drive is purchased, but this is not necessarily true.

Property	Type	Attributes	Notes
Measurements *(v1.12+, deprecated v1.14* [{	array		An array of DSP0274-defined measurement blocks. • This property shall contain an array of DSP0274-defined measurement blocks. *Deprecated in v1.14 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
@odata.id	string	*read-only*	Link to a MeasurementBlock resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
MediaType	string (enum)	*read-only (null)*	The type of media contained in this drive. • This property shall contain the type of media contained in the associated drive. *For the possible property values, see MediaType in Property details.*
Model	string	*read-only (null)*	The model number for the drive. • This property shall contain the name by which the manufacturer generally refers to the drive.
Multipath *(v1.9+)*	boolean	*read-only (null)*	An indication of whether the drive is accessible from multiple paths. • This property shall indicate whether the drive is accessible by an initiator from multiple paths allowing for failover capabilities upon a path failure.
NegotiatedSpeedGbs	number (Gbit/s)	*read-only (null)*	The speed, in gigabit per second (Gbit/s), at which this drive currently communicates to the storage controller. • This property shall contain current bus speed, in gigabit per second (Gbit/s), of the associated drive.
Operations *(v1.1+)* [{	array		The operations currently running on the Drive. • This property shall contain a list of all operations currently running on the Drive.
AssociatedTask *(v1.1+)* {	object		The link to the task associated with the operation, if any. • This property shall contain a link to a resource of type Task that represents the task associated with the operation. See the *Task* schema for details on this property.
@odata.id	string	*read-only*	Link to a Task resource. See the Links section and the *Task* schema for details.
}			

Property	Type	Attributes	Notes
OperationName *(v1.1+)*	string	*read-only (null)*	The name of the operation. • This property shall contain a string of the name of the operation.
PercentageComplete *(v1.1+)*	integer (%)	*read-only (null)*	The percentage of the operation that has been completed. • This property shall contain an integer of the percentage of the operation that has been completed.
}]			
PartNumber	string	*read-only (null)*	The part number for this drive. • This property shall contain the part number assigned by the organization that is responsible for producing or manufacturing the drive.
PhysicalLocation *(v1.4+)* {}	object		The location of the drive. • This property shall contain location information of the associated drive. For property details, see Location.
PredictedMediaLifeLeftPercent	number (%)	*read-only (null)*	The percentage of reads and writes that are predicted to be available for the media. • This property shall contain an indicator of the percentage of life remaining in the drive's media.
Protocol	string (enum)	*read-only (null)*	The protocol that this drive currently uses to communicate to the storage controller. • This property shall contain the protocol that the associated drive currently uses to communicate to the storage controller for this system. *For the possible property values, see Protocol in Property details.*
ReadyToRemove *(v1.10+)*	boolean	*read-write (null)*	An indication of whether the drive is prepared by the system for removal. • This property shall indicate whether the system is prepared for the removal of this drive.
Revision	string	*read-only (null)*	The revision of this drive. This is typically the firmware or hardware version of the drive. • This property shall contain the manufacturer-defined revision for the associated drive.
RotationSpeedRPM	number ({rev}/min)	*read-only (null)*	The rotation speed of this drive, in revolutions per minute (RPM). • This property shall contain the rotation speed, in revolutions per minute (RPM), of the associated drive.

Property	Type	Attributes	Notes
SerialNumber	string	*read-only (null)*	The serial number for this drive. • This property shall contain the manufacturer-allocated number that identifies the drive.
SKU	string	*read-only (null)*	The SKU for this drive. • This property shall contain the stock-keeping unit (SKU) number for this drive.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
StatusIndicator	string (enum)	*read-write (null)*	The state of the status indicator, which communicates status information about this drive. • This property shall contain the status indicator state for the status indicator associated with this drive. The Redfish.AllowableValues annotation specifies the valid values for this property. *For the possible property values, see StatusIndicator in Property details.*
WriteCacheEnabled *(v1.7+)*	boolean	*read-write (null)*	An indication of whether the drive write cache is enabled. • This property shall indicate whether the drive write cache is enabled.

6.28.4 Actions

6.28.4.1 Reset *(v1.7+)*

Description

This action resets this drive.

- This action shall reset this drive.

Action URI: {Base URI of target resource}/Actions/Drive.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation specific default reset. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "On"
}
```

6.28.4.2 SecureErase

Description

This action securely erases the contents of the drive.

- This action shall securely erase the drive.

Action URI: {Base URI of target resource}/Actions/Drive.SecureErase

Action parameters

Parameter Name	Type	Attributes	Notes
OverwritePasses *(v1.15+)*	integer	*optional*	The number of times to overwrite the drive if performing an overwrite type of sanitization. • This parameter shall contain the number of times to overwrite the drive if the SanitizationType parameter contains the value `Overwrite`. This parameter shall be ignored if the SanitizationType parameter does not contain the value `Overwrite`. If the client does not provide this parameter, the service shall perform an implementation specific number of passes.
SanitizationType *(v1.15+)*	string (enum)	*optional*	The type of data sanitization to perform. • This parameter shall contain the type of data sanitization to perform for the secure erase request. The service can accept a request without the parameter and perform an implementation specific default secure erase. *For the possible property values, see SanitizationType in Property details.*

6.28.5 Property details

6.28.5.1 EncryptionAbility:

The encryption ability of this drive.

- This property shall contain the encryption ability for the associated drive.

string	Description
None	The drive is not capable of self-encryption.
Other	The drive is capable of self-encryption through some other means.
SelfEncryptingDrive	The drive is capable of self-encryption per the Trusted Computing Group's Self Encrypting Drive Standard.

6.28.5.2 EncryptionStatus:

The status of the encryption of this drive.

- This property shall contain the encryption status for the associated drive.

string	Description
Foreign	The drive is currently encrypted, the data is not accessible to the user, and the system requires user intervention to expose the data.
Locked	The drive is currently encrypted and the data is not accessible to the user. However, the system can unlock the drive automatically.
Unecrypted *(deprecated v1.1)*	The drive is not currently encrypted. *Deprecated in v1.1 and later. This value has been deprecated in favor of Unencrypted.*
Unencrypted *(v1.1+)*	The drive is not currently encrypted.
Unlocked	The drive is currently encrypted but the data is accessible to the user in unencrypted form.

6.28.5.3 HotspareReplacementMode:

The replacement mode for the hot spare drive.

- This property shall indicate whether a commissioned hot spare continues to serve as a hot spare after the failed drive is replaced.

string	Description
NonRevertible	The hot spare drive that is commissioned due to a drive failure remains as a data drive and does not revert to a hot spare if the failed drive is replaced.
Revertible	The hot spare drive that is commissioned due to a drive failure reverts to a hot spare after the failed drive is replaced and rebuilt.

6.28.5.4 HotspareType:

The type of hot spare that this drive serves as.

- This property shall contain the hot spare type for the associated drive. If the drive currently serves as a hot spare, its Status.State field shall be 'StandbySpare' and 'Enabled' when it is part of a volume.

string	Description
Chassis	The drive is serving as a hot spare for all other drives in this storage domain that are contained in the same chassis.
Dedicated	The drive is serving as a hot spare for a user-defined set of drives or volumes. Clients cannot specify this value when modifying the HotspareType property. This value is reported as a result of configuring the spare drives within a volume.
Global	The drive is serving as a hot spare for all other drives in this storage domain.
None	The drive is not a hot spare.

6.28.5.5 IndicatorLED:

The state of the indicator LED, that identifies the drive.

- This property shall contain the state for the indicator light associated with this drive.

string	Description
Blinking	The indicator LED is blinking. • This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.

string	Description
Lit	The indicator LED is lit. • This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Off	The indicator LED is off. • This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.

6.28.5.6 MediaType:

The type of media contained in this drive.

- This property shall contain the type of media contained in the associated drive.

string	Description
HDD	The drive media type is traditional magnetic platters.
SMR	The drive media type is shingled magnetic recording.
SSD	The drive media type is solid state or flash memory.

6.28.5.7 Protocol:

The protocol that this drive currently uses to communicate to the storage controller.

- This property shall contain the protocol that the associated drive currently uses to communicate to the storage controller for this system.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.

string	Description
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.

string	Description
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.

string	Description
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.

string	Description
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.28.5.8 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.

string	Description
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.

string	Description
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.28.5.9 SanitizationType:

The type of data sanitization to perform.

- This parameter shall contain the type of data sanitization to perform for the secure erase request. The service can accept a request without the parameter and perform an implementation specific default secure erase.

string	Description
BlockErase	Delete all logical block addresses, including those that are not currently mapping to active addresses, but leaving the data on the drive. • This value shall indicate sanitization is performed by deleting all logical block addresses, including those that are not currently mapping to active addresses, but leaving the data on the drive.
CryptographicErase	Erase the target data's encryption key leaving only the ciphertext on the drive. For more information, see NIST800-88 and ISO/IEC 27040. • This value shall indicate sanitization is performed by erasing the target data's encryption key leaving only the ciphertext on the drive. For more information, see NIST800-88 and ISO/IEC 27040.
Overwrite	Overwrite data by writing an implementation specific pattern onto all sectors of the drive. • This value shall indicate sanitization is performed by overwriting data by writing an implementation specific pattern onto all sectors of the drive.

6.28.5.10 StatusIndicator:

The state of the status indicator, which communicates status information about this drive.

- This property shall contain the status indicator state for the status indicator associated with this drive. The Redfish.AllowableValues annotation specifies the valid values for this property.

string	Description
Fail	The drive has failed.
Hotspare	The drive has been marked to automatically rebuild and replace a failed drive.
InACriticalArray	The array to which this drive belongs has been degraded.
InAFailedArray	The array to which this drive belongs has failed.
OK	The drive is OK.
PredictiveFailureAnalysis	The drive still works but is predicted to fail soon.
Rebuild	The drive is being rebuilt.

6.28.6 Example response


```
{
    "@odata.type": "#Drive.v1_15_0.Drive",
    "Id": "3D58ECBC375FD9F2",
    "Name": "Drive Sample",
    "LocationIndicatorActive": true,
    "Model": "C123",
    "Revision": "100A",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "CapacityBytes": 899527000000,
    "FailurePredicted": false,
    "Protocol": "SAS",
    "MediaType": "HDD",
    "Manufacturer": "Contoso",
    "SerialNumber": "1234568",
    "PartNumber": "C123-1111",
    "Identifiers": [
        {
            "DurableNameFormat": "NAA",
            "DurableName": "32ADF365C6C1B7BD"
        }
    ],
    "HotspareType": "None",
    "EncryptionAbility": "SelfEncryptingDrive",
    "EncryptionStatus": "Unlocked",
    "RotationSpeedRPM": 15000,
    "BlockSizeBytes": 512,
    "CapableSpeedGbs": 12,
    "NegotiatedSpeedGbs": 12,
```

```
    "Links": {
        "Volumes": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Volumes/2"
            },
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Volumes/3"
            }
        ]
    },
    "Actions": {
        "#Drive.SecureErase": {
            "target": "/redfish/v1/Systems/437XR1138R2/Storage/1/Drives/3D58ECBC375FD9F2/Actions/Drive.SecureErase"
        }
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Drives/3D58ECBC375FD9F2"
}
```

6.29 Endpoint 1.7.0

Version	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2021.1	2020.3	2019.4	2018.3	2018.2	2017.3	2016.2

6.29.1 Description

The Endpoint schema contains the properties of an endpoint resource that represents the properties of an entity that sends or receives protocol-defined messages over a transport.

- This resource contains a fabric endpoint for a Redfish implementation.

6.29.2 URIs

/redfish/v1/Fabrics/*{FabricId}*/Endpoints/*{EndpointId}*
/redfish/v1/Storage/*{StorageId}*/Endpoints/*{EndpointId}*
/redfish/v1/StorageServices/*{StorageServiceId}*/Endpoints/*{EndpointId}*

6.29.3 Properties

Property	Type	Attributes	Notes
ConnectedEntities [{	array		All the entities connected to this endpoint. • This property shall contain all entities to which this endpoint allows access.
EntityLink {	object		The link to the associated entity. • This property shall contain a link to an entity of the type specified by the description of the EntityType property value.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
EntityPciId {	object		The PCI ID of the connected entity. • This property shall contain the PCI ID of the connected PCIe entity.
ClassCode *(v1.2+)*	string	*read-only (null)*	The Class Code, Subclass, and Programming Interface code of this PCIe function. • This property shall contain the PCI Class Code, Subclass, and Programming Interface of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){3}$`
DeviceId	string	*read-only (null)*	The Device ID of this PCIe function. • This property shall contain the PCI Device ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
FunctionNumber *(v1.2+)*	integer	*read-only (null)*	The PCI ID of the connected entity. • This property shall contain the PCI Function Number of the connected PCIe entity.
SubsystemId	string	*read-only (null)*	The Subsystem ID of this PCIe function. • This property shall contain the PCI Subsystem ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`

Property	Type	Attributes	Notes
SubsystemVendorId	string	*read-only (null)*	The Subsystem Vendor ID of this PCIe function. • This property shall contain the PCI Subsystem Vendor ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
VendorId	string	*read-only (null)*	The Vendor ID of this PCIe function. • This property shall contain the PCI Vendor ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
}			
EntityRole	string (enum)	*read-only (null)*	The role of the connected entity. • This property shall indicate if the specified entity is an initiator, target, or both. *For the possible property values, see EntityRole in Property details.*
EntityType	string (enum)	*read-only (null)*	The type of the connected entity. • This property shall indicate if type of connected entity. *For the possible property values, see EntityType in Property details.*
GenZ *(v1.4+)* {	object	*(null)*	The Gen-Z related properties for the entity. • This property shall contain the Gen-Z related properties for the entity.
AccessKey *(v1.4+, deprecated v1.6*	string	*read-write (null)*	The Access Key for the entity. • This property shall contain the Gen-Z Core Specification-defined 6 bit Access Key for the entity. Pattern: `^0[xX]([a-fA-F]|[0-9]){2}$` *Deprecated in v1.6 and later. This property has been deprecated in favor of the ConnectionKeys property in the Connection resource.*
GCID *(v1.4+)* {	object	*(null)*	The Global Component ID (GCID) for the entity. • This property shall contain the Gen-Z Core Specification-defined Global Component ID for the entity.
CID *(v1.4+)*	string	*read-write (null)*	The component identifier portion of the GCID for the entity. • This property shall contain the 12 bit component identifier portion of the GCID of the entity. Pattern: `^0[xX]([a-fA-F]|[0-9]){3}$`

Property	Type	Attributes	Notes
SID *(v1.4+)*	string	*read-write (null)*	The subnet identifier portion of the GCID for the entity. • This property shall contain the 16 bit subnet identifier portion of the GCID of the entity. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
}			
RegionKey *(v1.4+, deprecated v1.6*	string	*read-write (null)*	The Region Key for the entity. • This property shall contain the Gen-Z Core Specification-defined 32 bit Region Key for the entity. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){4}$` *Deprecated in v1.6 and later. This property has been deprecated in favor of the ConnectionKeys property in the Connection resource.*
}			
Identifiers [{ }]	array (object)		Any additional identifiers for a resource. • Identifiers for the remote entity. ◦ Identifiers for the remote entity shall be unique in the context of other resources that can reached over the connected network. For property details, see Identifier.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PciClassCode *(deprecated v1.2)*	string	*read-only (null)*	The Class Code, Subclass, and Programming Interface code of this PCIe function. • This property shall contain the PCI Class Code, Subclass, and Programming Interface of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){3}$` *Deprecated in v1.2 and later. This property has been deprecated in favor of the ClassCode property inside the EntityPciId object.*
PciFunctionNumber *(deprecated v1.2)*	integer	*read-only (null)*	The PCI ID of the connected entity. • This property shall contain the PCI Function Number of the connected PCIe entity. *Deprecated in v1.2 and later. This property has been deprecated in favor of the FunctionNumber property inside the EntityPciId object.*
}]			
EndpointProtocol	string (enum)	*read-only (null)*	The protocol supported by this endpoint. • This property shall contain the protocol this endpoint uses to communicate with other endpoints on this fabric. *For the possible property values, see EndpointProtocol in Property details.*

Property	Type	Attributes	Notes
HostReservationMemoryBytes	integer (bytes)	*read-only (null)*	The amount of memory in bytes that the host should allocate to connect to this endpoint. • This property shall contain the amount of memory in bytes that the host should allocate to connect to this endpoint.
Identifiers [{ }]	array (object)		Any additional identifiers for a resource. • Identifiers for this endpoint. ◦ Identifiers for this endpoint shall be unique in the context of other endpoints that can reached over the connected network. For property details, see Identifier.
IPTransportDetails *(v1.1+)* [{	array		An array of details for each IP transport supported by this endpoint. The array structure can model multiple IP addresses for this endpoint. • This array shall contain the details for each IP transport supported by this endpoint.
IPv4Address *(v1.1+)* {}	object		The IPv4 addresses assigned to the endpoint. • This property shall contain the IPv4Address. For property details, see IPv4Address.
IPv6Address *(v1.1+)* {}	object		The IPv6 addresses assigned to the endpoint. • This property shall contain the IPv6Address. For property details, see IPv6Address.
Port *(v1.1+)*	number	*read-only*	The UDP or TCP port number used by the endpoint. • This property shall contain an specify UDP or TCP port number used for communication with the endpoint.
TransportProtocol *(v1.1+)*	string (enum)	*read-only*	The protocol used by the connection entity. • This property shall contain the protocol used by the connection entity. *For the possible property values, see TransportProtocol in Property details.*
}]			
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
AddressPools *(v1.4+)* [{	array		An array of links to the address pools associated with this endpoint. • This property shall contain an array of links to resources of type AddressPool with which this endpoint is associated.
@odata.id	string	*read-write*	Link to a AddressPool resource. See the Links section and the *AddressPool* schema for details.
}]			
ConnectedPorts *(v1.4+)* [{	array		An array of links to the switch ports or remote device ports at the other end of the link. • This property shall contain an array of links to resources of type Port that represent the switch ports or remote device ports to which this endpoint is connected.
@odata.id	string	*read-only*	Link to a Port resource. See the Links section and the *Port* schema for details.
}]			
Connections *(v1.5+)* [{	array		The connections to which this endpoint belongs. • This property shall contain an array of links to resources of type Connection that represent the connections to which this endpoint belongs.
@odata.id	string	*read-only*	Link to a Connection resource. See the Links section and the *Connection* schema for details.
}]			
LocalPorts *(v1.7+)* [{	array		An array of links to the device ports that this endpoint represents. • This property shall contain an array of links to resources of type Port that represent the device ports that this endpoint represents.
@odata.id	string	*read-only*	Link to a Port resource. See the Links section and the *Port* schema for details.
}]			
MutuallyExclusiveEndpoints [{	array		An array of links to the endpoints that cannot be used in zones if this endpoint is in a zone. • This property shall contain an array of links to resources of type Endpoint that cannot be used in a zone if this endpoint is in a zone.
@odata.id	string	*read-only*	Link to another Endpoint resource.

Property	Type	Attributes	Notes
}]			
NetworkDeviceFunction *(v1.1+)* [{	array		When NetworkDeviceFunction resources are present, this array contains links to the network device functions that connect to this endpoint. • This property shall contain an array of links to resources of type NetworkDeviceFunction with which this endpoint is associated.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Ports *(deprecated v1.7)* [{	array		An array of links to the physical ports associated with this endpoint. • This property shall contain an array of links to resources of type Port that are utilized by this endpoint. *Deprecated in v1.7 and later. This property has been deprecated in favor of the ConnectedPorts and LocalPorts properties to clarify the semantics of each port referenced.*
@odata.id	string	*read-only*	Link to a Port resource. See the Links section and the *Port* schema for details.
}]			
Zones *(v1.6+)* [{	array		The zones to which this endpoint belongs. • This property shall contain an array of links to resources of type Zone that represent the zones to which this endpoint belongs.
@odata.id	string	*read-only*	Link to a Zone resource. See the Links section and the *Zone* schema for details.
}]			
}			
PciId {	object		The PCI ID of the endpoint. • This property shall contain the PCI ID of the endpoint.
ClassCode *(v1.2+)*	string	*read-only* *(null)*	The Class Code, Subclass, and Programming Interface code of this PCIe function. • This property shall contain the PCI Class Code, Subclass, and Programming Interface of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){3}$`

Property	Type	Attributes	Notes
DeviceId	string	*read-only (null)*	The Device ID of this PCIe function. • This property shall contain the PCI Device ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
FunctionNumber *(v1.2+)*	integer	*read-only (null)*	The PCI ID of the connected entity. • This property shall contain the PCI Function Number of the connected PCIe entity.
SubsystemId	string	*read-only (null)*	The Subsystem ID of this PCIe function. • This property shall contain the PCI Subsystem ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
SubsystemVendorId	string	*read-only (null)*	The Subsystem Vendor ID of this PCIe function. • This property shall contain the PCI Subsystem Vendor ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
VendorId	string	*read-only (null)*	The Vendor ID of this PCIe function. • This property shall contain the PCI Vendor ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
}			
Redundancy [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. • Redundancy information for the lower-level endpoints supporting this endpoint. ◦ The values of the properties in this array shall show how this endpoint is grouped with other endpoints for form redundancy sets. For property details, see Redundancy.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.29.4 Property details

6.29.4.1 EndpointProtocol:

The protocol supported by this endpoint.

- This property shall contain the protocol this endpoint uses to communicate with other endpoints on this fabric.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.

string	Description
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.

string	Description
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.29.4.2 EntityRole:

The role of the connected entity.

- This property shall indicate if the specified entity is an initiator, target, or both.

string	Description
Both	The entity can both send and receive commands, messages, and other requests to or from other entities on the fabric.

string	Description
Initiator	The entity sends commands, messages, or other types of requests to other entities on the fabric, but cannot receive commands from other entities.
Target	The entity receives commands, messages, or other types of requests from other entities on the fabric, but cannot send commands to other entities.

6.29.4.3 EntityType:

The type of the connected entity.

- This property shall indicate if type of connected entity.

string	Description
AccelerationFunction *(v1.3+)*	The entity is an acceleration function realized through a device, such as an FPGA. • This value shall indicate the entity this endpoint represents is an acceleration function. The EntityLink property, if present, should be of type AccelerationFunction.
Bridge	The entity is a PCI(e) bridge. • This value shall indicate the entity this endpoint represents is a PCI(e) bridge.
DisplayController	The entity is a display controller. • This value shall indicate the entity this endpoint represents is a display controller.
Drive	The entity is a drive. • This value shall indicate the entity this endpoint represents is a drive. The EntityLink property, if present, should be of type Drive.
FabricBridge *(v1.4+)*	The entity is a fabric bridge. • This value shall indicate the entity this endpoint represents is a fabric bridge. The EntityLink property, if present, should be of type FabricAdapter.
Manager *(v1.5+)*	The entity is a manager. • This value shall indicate the entity this endpoint represents is a manager. The EntityLink property, if present, should be of type Manager.
MediaController *(v1.4+)*	The entity is a media controller. • This value shall indicate the entity this endpoint represents is a media controller. The EntityLink property, if present, should be of type MediaController.

string	Description
MemoryChunk *(v1.4+)*	The entity is a memory chunk. • This value shall indicate the entity this endpoint represents is a memory chunk. The EntityLink property, if present, should be of type MemoryChunk.
NetworkController	The entity is a network controller. • This value shall indicate the entity this endpoint represents is a network controller. The EntityLink property, if present, should be of type NetworkDeviceFunction or EthernetInterface.
Processor	The entity is a processor. • This value shall indicate the entity this endpoint represents is a processor. The EntityLink property, if present, should be of type Processor.
RootComplex	The entity is a PCI(e) root complex. • This value shall indicate the entity this endpoint represents is a PCI(e) root complex. The EntityLink property, if present, should be of type ComputerSystem.
StorageExpander	The entity is a storage expander. • This value shall indicate the entity this endpoint represents is a storage expander. The EntityLink property, if present, should be of type Chassis.
StorageInitiator	The entity is a storage initiator. • This value shall indicate the entity this endpoint represents is a storage initiator. The EntityLink property, if present, should be of type StorageController.
StorageSubsystem *(v1.6+)*	The entity is a storage subsystem. • This value shall indicate the entity this endpoint represents is a storage subsystem. The EntityLink property, if present, should be of type Storage.
Switch *(v1.4+)*	The entity is a switch, not an expander. Use `Expander` for expanders. • This value shall indicate the entity this endpoint represents is a switch and not an expander. The EntityLink property, if present, should be of type Switch.
Volume *(v1.1+)*	The entity is a volume. • This value shall indicate the entity this endpoint represents is a volume. The EntityLink property, if present, should be of type Volume.

6.29.4.4 TransportProtocol:

The protocol used by the connection entity.

- This property shall contain the protocol used by the connection entity.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.

string	Description
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.

string	Description
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.

string	Description
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.29.5 Example response

```
{
    "@odata.type": "#Endpoint.v1_7_0.Endpoint",
    "Id": "Drive1",
    "Name": "SAS Drive",
    "Description": "The SAS Drive in Enclosure 2 Bay 0",
    "EndpointProtocol": "SAS",
    "ConnectedEntities": [
        {
            "EntityType": "Drive",
            "EntityRole": "Target",
            "Identifiers": [
                {
                    "DurableNameFormat": "NAA",
                    "DurableName": "32ADF365C6C1B7C3"
```

```
                }
            ],
            "Oem": {}
        }
    ],
    "Links": {
        "MutuallyExclusiveEndpoints": [
            {
                "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Enclosure2"
            }
        ],
        "ConnectedPorts": [
            {
                "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1/Ports/8"
            },
            {
                "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch2/Ports/8"
            }
        ],
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Drive1"
}
```


6.30 EndpointGroup 1.3.2

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.3	WIP v1.1.0	WIP v1.0.5	TP v1.0.3

6.30.1 Description

The EndpointGroup schema describes group of endpoints that are managed as a unit.

- This resource shall represent a group of endpoints that are managed as a unit for a Redfish implementation.

6.30.2 URIs

/redfish/v1/Fabrics/*{FabricId}*/EndpointGroups/*{EndpointGroupId}*
/redfish/v1/Storage/*{StorageId}*/EndpointGroups/*{EndpointGroupId}*
/redfish/v1/StorageServices/*{StorageServiceId}*/EndpointGroups/*{EndpointGroupId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/EndpointGroups/*{EndpointGroupId}*

6.30.3 Properties

Property	Type	Attributes	Notes
AccessState *(deprecated v1.3)*	string (enum)	*read-write (null)*	The access state for this group. • The value of this property shall contain the access state for all associated resources in this endpoint group. *For the possible property values, see AccessState in Property details. Deprecated in v1.3 and later. This property has been deprecated in favor of the AccessState property in the connection resource.*
Endpoints *(deprecated v1.3)* [{	array		The endpoints in this endpoint group. • This property shall contain an array of links to resources of type Endpoint that represent the endpoints that are in this endpoint group. *Deprecated in v1.3 and later. This property has been deprecated in favor of the Endpoints property within Links.*
@odata.id	string	*read-write*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
GroupType	string (enum)	*read-write (null)*	The endpoint group type. • The value of this property shall contain the endpoint group type. If this endpoint group represents a SCSI target group, the value of this property shall contain `Server` or `Target`. *For the possible property values, see GroupType in Property details.*
Identifier {}	object		The durable name for the endpoint group. • This property shall contain the durable name for the endpoint group. For property details, see Identifier.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Connections *(v1.3+)* [{	array		The connections to which this endpoint group belongs. • This property shall contain an array of links to resources of type Connection that represent the connections to which this endpoint group belongs.
@odata.id	string	*read-only*	Link to a Connection resource. See the Links section and the *Connection* schema for details.

Property	Type	Attributes	Notes
}]			
Endpoints *(v1.3+)* [{	array		The endpoints in this endpoint group. • This property shall contain an array of links to resources of type Endpoint that represent the endpoints that are in this endpoint group.
@odata.id	string	*read-write*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Preferred *(deprecated v1.2)*	boolean	*read-write (null)*	An indication if access to the resources through the endpoint group is preferred. • The value of this property shall indicate if access to the resources through the endpoint group is preferred over access through other endpoints. The default value for this property is `false`. *Deprecated in v1.2 and later. This property has been deprecated in favor of the AccessState property in the connection resource.*
TargetEndpointGroupIdentifier	integer	*read-write (null)*	The SCSI-defined identifier for this group. • The value of this property shall contain a SCSI-defined identifier for this group that corresponds to the TARGET PORT GROUP field in the REPORT TARGET PORT GROUPS response and the TARGET PORT GROUP field in an INQUIRY VPD page 85 response, type 5h identifier. See the INCITS SAM-5 specification. This property may not be present if the endpoint group does not represent a SCSI target group.

6.30.4 Property details

6.30.4.1 AccessState:

The access state for this group.

- The value of this property shall contain the access state for all associated resources in this endpoint group.

string	Description
NonOptimized	The endpoints are in an active and non-optimized state. • This value shall indicate each endpoint is in an active and non-optimized state.
Optimized	The endpoints are in an active and optimized state. • This value shall indicate each endpoint is in an active and optimized state.
Standby	The endpoints are in a standby state. • This value shall indicate each endpoint is in a standby state.
Transitioning	The endpoints are transitioning to a new state. • This value shall indicate each endpoint is transitioning to a new state.
Unavailable	The endpoints are in an unavailable state. • This value shall indicate each endpoint is in an unavailable state.

6.30.4.2 GroupType:

The endpoint group type.

- The value of this property shall contain the endpoint group type. If this endpoint group represents a SCSI target group, the value of this property shall contain `Server` or `Target`.

string	Description
Client *(deprecated v1.3)*	The group contains the client (initiator) endpoints. • This value shall indicate that the endpoint group contains client (initiator) endpoints. If the associated endpoints contain the EntityRole property, the EntityRole property shall contain the value `Initiator` or `Both`. *Deprecated in v1.3 and later. This value has been deprecated in favor of `Initiator`.*
Initiator *(v1.3+)*	The group contains the initiator endpoints. • This value shall indicate that the endpoint group contains initiator endpoints. If the associated endpoints contain the EntityRole property, the EntityRole property shall contain the value `Initiator` or `Both`.

string	Description
Server *(deprecated v1.3)*	The group contains the server (target) endpoints. • This value shall indicate that the endpoint group contains server (target) endpoints. If the associated endpoints contain the EntityRole property, the EntityRole property shall contain the value `Target` or `Both`. *Deprecated in v1.3 and later. This value has been deprecated in favor of `Target`.*
Target *(v1.3+)*	The group contains the target endpoints. • This value shall indicate that the endpoint group contains target endpoints. If the associated endpoints contain the EntityRole property, the EntityRole property shall contain the value `Target` or `Both`.

6.30.5 Example response

```
{
    "@odata.type": "#EndpointGroup.v1_3_2.EndpointGroup",
    "Id": "1",
    "Name": "Endpoint group for all initiators",
    "GroupType": "Initiator",
    "Links": {
        "Endpoints": [
            {
                "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Endpoints/Initiator1"
            },
            {
                "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Endpoints/Initiator2"
            }
        ],
        "Connections": [
            {
                "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Connections/3"
            }
        ]
    },
    "@odata.id": "/redfish/v1/Fabrics/NVMeoF/EndpointGroups/1"
}
```

6.31 EnvironmentMetrics 1.3.0

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2021.4	2021.2	2020.4

6.31.1 Description

The EnvironmentMetrics schema represents the environmental metrics of a device.

- This resource shall represent the environmental metrics for a Redfish implementation.

6.31.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/Drives/*{DriveId}*/EnvironmentMetrics
/redfish/v1/Chassis/*{ChassisId}*/EnvironmentMetrics
/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Chassis/*{ChassisId}*/MediaControllers/*{MediaControllerId}*/EnvironmentMetrics
/redfish/v1/Chassis/*{ChassisId}*/MediaControllers/*{MediaControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Chassis/*{ChassisId}*/Memory/*{MemoryId}*/EnvironmentMetrics
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/EnvironmentMetrics
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Chassis/*{ChassisId}*/PCIeDevices/*{PCIeDeviceId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*/
EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{ControllerId}*/
EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/
{StorageControllerId}/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/
EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/
{StorageControllerId}/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/
{FabricAdapterId}/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/
GraphicsControllers/*{ControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/
{MemoryId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/PCIeDevices/
{PCIeDeviceId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/
{ProcessorId}/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/
{ProcessorId}/Ports/*{PortId}*/EnvironmentMetrics

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{ControllerId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/EnvironmentMetrics
/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Facilities/*{FacilityId}*/AmbientMetrics
/redfish/v1/Facilities/*{FacilityId}*/EnvironmentMetrics
/redfish/v1/Managers/*{ManagerId}*/DedicatedNetworkPorts/*{PortId}*/EnvironmentMetrics
/redfish/v1/Managers/*{ManagerId}*/USBPorts/*{PortId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{ControllerId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{ControllerId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/EnvironmentMetrics

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Storage/*{StorageId}*/Controllers/*{ControllerId}*/EnvironmentMetrics
/redfish/v1/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{ControllerId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/EnvironmentMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports/*{PortId}*/EnvironmentMetrics

6.31.3 Properties

Property	Type	Attributes	Notes
AbsoluteHumidity *(v1.2+)* {}	object		Absolute humidity (g/cu m). • This property shall contain the absolute (volumetric) humidity sensor reading, in grams/cubic meter units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `AbsoluteHumidity`. For more information about this property, see SensorExcerpt in Property Details.
DewPointCelsius *(v1.1+)* {}	object		The dew point temperature (C). • This property shall contain the dew point, in degrees Celsius, based on the temperature and humidity values for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Temperature`. For more information about this property, see SensorExcerpt in Property Details.

Property	Type	Attributes	Notes
EnergyJoules *(v1.2+)* {}	object		Energy consumption (J). • This property shall contain the total energy, in joules, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergyJoules`. This property is used for reporting device-level energy consumption measurements, while EnergykWh is used for large-scale consumption measurements. For more information about this property, see SensorExcerpt in Property Details.
EnergykWh {	object (excerpt)		Energy consumption (kWh). • This property shall contain the total energy, in kilowatt-hours, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentkVAh *(v1.5+)*	number (kV.A.h)	*read-only* *(null)*	Apparent energy (kVAh). • This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading *(v1.1+)*	number	*read-only* *(null)*	The total accumulation value for this sensor. • This property shall contain the total accumulation of the Reading property over the sensor's life time. This value shall not be reset by the ResetMetrics action.
ReactivekVARh *(v1.5+)*	number (kV.A.h)	*read-only* *(null)*	Reactive energy (kVARh). • This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
Reading	number	*read-only* *(null)*	The sensor value. • This property shall contain the sensor value.

Property	Type	Attributes	Notes
SensorResetTime	string (date-time)	*read-only (null)*	The date and time when the time-based properties were last reset. • This property shall contain the date and time when the ResetMetrics action was last performed or the service last reset the time-based property values.
}			
FanSpeedsPercent [{	array (excerpt)		Fan speeds (percent). • This property shall contain the fan speeds, in percent units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Percent`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
DeviceName *(v1.2+)*	string	*read-only (null)*	The name of the device. • This property shall contain the name of the device associated with this sensor. If the device is represented by a resource, the value shall contain the value of the Name property of the associated resource.
PhysicalContext	string (enum)	*read-only (null)*	The area or device to which this sensor measurement applies. • This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies. *For the possible property values, see PhysicalContext in Property details.*
PhysicalSubContext	string (enum)	*read-only (null)*	The usage or location within a device to which this sensor measurement applies. • This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same PhysicalContext instance. *For the possible property values, see PhysicalSubContext in Property details.*
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
SpeedRPM *(v1.2+)*	number ({rev}/min)	*read-only (null)*	The rotational speed. • This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
}]			

Property	Type	Attributes	Notes
HumidityPercent {}	object		Humidity (percent). • This property shall contain the humidity, in percent units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Humidity`. For more information about this property, see SensorExcerpt in Property Details.
PowerLimitWatts *(v1.1+)* {	object (excerpt)		Power limit (W). • This property shall contain the power limit control, in watt units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Control with the ControlType property containing the value of `Power`. This object is an excerpt of the *Control* resource located at the URI shown in DataSourceUri.
AllowableMax	number	*read-only* *(null)*	The maximum possible setting for this control. • This property shall indicate the maximum possible value of the SetPoint or SettingMax properties for this control. Services shall not accept values for SetPoint or SettingMax above this value.
AllowableMin	number	*read-only* *(null)*	The minimum possible setting for this control. • This property shall indicate the minimum possible value of the SetPoint or SettingMin properties for this control. Services shall not accept values for SetPoint or SettingMin below this value.
ControlMode	string (enum)	*read-write* *(null)*	The current operating mode of the control. • This property shall contain the operating mode of the control. *For the possible property values, see ControlMode in Property details.*
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this control. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy. If no source resource is implemented, meaning the excerpt represents the only available data, this property shall not be present.
Reading	number	*read-only* *(null)*	The reading of the sensor associated with this control. • This property shall contain the value of the Reading property of the Sensor resource directly associated with this control. This property shall not be present if multiple sensors are associated with a single control.

Property	Type	Attributes	Notes
ReadingUnits	string	*read-only* *(null)*	The units of the sensor reading associated with this control. • This property shall contain the units of the sensor's reading and thresholds. This property shall not be present if multiple sensors are associated with a single control.
SetPoint	number	*read-write* *(null)*	The desired set point of the control. • This property shall contain the desired set point control value. The units shall follow the value of SetPointUnits.
}			
PowerLoadPercent *(v1.1+)* {}	object		The power load (percent) for this device. • This property shall contain the power load, in percent units, for this device, that represents the `Total` ElectricalContext for this device. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Percent`. For more information about this property, see SensorExcerpt in Property Details.
PowerWatts {	object (excerpt)		Power consumption (W). • This property shall contain the total power, in watt units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentVA	number (V.A)	*read-only* *(null)*	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees *(v1.5+)*	number	*read-only* *(null)*	The phase angle (degrees) between the current and voltage waveforms. • This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a ReadingType containing `Power`, and shall not appear in sensors with other ReadingType values.

Property	Type	Attributes	Notes
PowerFactor	number	*read-only (null)*	The power factor for this sensor. • This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. PowerFactor is expressed in unit-less 1/100ths. This property can appear in sensors containing a ReadingType value of `Power`, and shall not appear in sensors of other ReadingType values.
ReactiveVAR	number (V.A)	*read-only (null)*	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. • This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}			
TemperatureCelsius {}	object		Temperature (Celsius). • This property shall contain the temperature, in degrees Celsius units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Temperature`. For more information about this property, see SensorExcerpt in Property Details.

6.31.4 Actions

6.31.4.1 ResetMetrics

Description

This action resets the summary metrics related to this equipment.

- This action shall reset any time intervals or counted values for this equipment.

Action URI: {Base URI of target resource}/Actions/EnvironmentMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.31.4.2 ResetToDefaults *(v1.3+)*

Description

The action resets the values of writable properties to factory defaults.

- This action shall reset the values of writable properties in this resource to their default values as specified by the manufacturer.

Action URI: {Base URI of target resource}/Actions/EnvironmentMetrics.ResetToDefaults

Action parameters

This action takes no parameters.

6.31.5 Property details

6.31.5.1 ControlMode:

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

6.31.5.2 PhysicalContext:

The area or device to which this sensor measurement applies.

- This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.

string	Description
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.31.5.3 PhysicalSubContext:

The usage or location within a device to which this sensor measurement applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same PhysicalContext instance.

string	Description
Input	The input.
Output	The output.

6.31.5.4 SensorExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.

6.31.6 Example response

```
{
    "@odata.type": "#EnvironmentMetrics.v1_3_0.EnvironmentMetrics",
    "Name": "Processor Environment Metrics",
    "TemperatureCelsius": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPU1Temp",
        "Reading": 44
    },
    "PowerWatts": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPU1Power",
        "Reading": 12.87
    },
    "FanSpeedsPercent": [
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPUFan1",
            "DeviceName": "CPU #1 Fan Speed",
            "Reading": 80
        }
    ],
```

```
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/1/EnvironmentMetrics"
}
```


6.32 EthernetInterface 1.9.0

Version	*v1.9*	*v1.8*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2021.2	2020.1	2019.1	2017.3	2017.1	2016.3	2016.2	1.0

6.32.1 Description

The EthernetInterface schema represents a single, logical Ethernet interface or network interface controller (NIC).

- This resource contains NIC resources as part of the Redfish Specification.

6.32.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdaptersId}*/NetworkDeviceFunctions/*{NetworkDeviceFunctionId}*/EthernetInterfaces/*{EthernetInterfaceId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/EthernetInterfaces/*{EthernetInterfaceId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/EthernetInterfaces/*{EthernetInterfaceId}*
/redfish/v1/Managers/*{ManagerId}*/EthernetInterfaces/*{EthernetInterfaceId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/EthernetInterfaces/*{EthernetInterfaceId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/EthernetInterfaces/*{EthernetInterfaceId}*
/redfish/v1/Systems/*{ComputerSystemId}*/EthernetInterfaces/*{EthernetInterfaceId}*

6.32.3 Properties

Property	Type	Attributes	Notes
AutoNeg	boolean	*read-write (null)*	An indication of whether the speed and duplex are automatically negotiated and configured on this interface. • This property shall indicate whether the speed and duplex are automatically negotiated and configured on this interface.

Property	Type	Attributes	Notes
DHCPv4 *(v1.4+)* {	object		DHCPv4 configuration for this interface. • This property shall contain the configuration of DHCP v4.
DHCPEnabled *(v1.4+)*	boolean	*read-write (null)*	An indication of whether DHCP v4 is enabled on this Ethernet interface. • This property shall indicate whether DHCP v4 is enabled for this Ethernet interface.
FallbackAddress *(v1.5+)*	string (enum)	*read-write (null)*	DHCPv4 fallback address method for this interface. • This property shall contain the fallback address method of DHCPv4. *For the possible property values, see FallbackAddress in Property details.*
UseDNSServers *(v1.4+)*	boolean	*read-write (null)*	An indication of whether this interface uses DHCP v4-supplied DNS servers. • This property shall indicate whether the interface uses DHCP v4-supplied DNS servers.
UseDomainName *(v1.4+)*	boolean	*read-write (null)*	An indication of whether this interface uses a DHCP v4-supplied domain name. • This property shall indicate whether the interface uses a DHCP v4-supplied domain name.
UseGateway *(v1.4+)*	boolean	*read-write (null)*	An indication of whether this interface uses a DHCP v4-supplied gateway. • This property shall indicate whether the interface uses a DHCP v4-supplied gateway.
UseNTPServers *(v1.4+)*	boolean	*read-write (null)*	An indication of whether the interface uses DHCP v4-supplied NTP servers. • This property shall indicate whether the interface uses DHCP v4-supplied NTP servers.
UseStaticRoutes *(v1.4+)*	boolean	*read-write (null)*	An indication of whether the interface uses DHCP v4-supplied static routes. • This property shall indicate whether the interface uses a DHCP v4-supplied static routes.
}			
DHCPv6 *(v1.4+)* {	object		DHCPv6 configuration for this interface. • This property shall contain the configuration of DHCP v6.

Property	Type	Attributes	Notes
OperatingMode *(v1.4+)*	string (enum)	*read-write (null)*	Determines the DHCPv6 operating mode for this interface. • This property shall control the operating mode of DHCPv6 on this interface. *For the possible property values, see OperatingMode in Property details.*
UseDNSServers *(v1.4+)*	boolean	*read-write (null)*	An indication of whether the interface uses DHCP v6-supplied DNS servers. • This property shall indicate whether the interface uses DHCP v6-supplied DNS servers.
UseDomainName *(v1.4+)*	boolean	*read-write (null)*	An indication of whether this interface uses a DHCP v6-supplied domain name. • This property shall indicate whether the interface uses a DHCP v6-supplied domain name.
UseNTPServers *(v1.4+)*	boolean	*read-write (null)*	An indication of whether the interface uses DHCP v6-supplied NTP servers. • This property shall indicate whether the interface uses DHCP v6-supplied NTP servers.
UseRapidCommit *(v1.4+)*	boolean	*read-write (null)*	An indication of whether the interface uses DHCP v6 rapid commit mode for stateful mode address assignments. Do not enable this option in networks where more than one DHCP v6 server is configured to provide address assignments. • This property shall indicate whether the interface uses DHCP v6 rapid commit mode for stateful mode address assignments.
}			
EthernetInterfaceType *(v1.6+)*	string (enum)	*read-only (null)*	The type of interface. • This property shall contain the type of interface. *For the possible property values, see EthernetInterfaceType in Property details.*
FQDN	string	*read-write (null)*	The complete, fully qualified domain name that DNS obtains for this interface. • This property shall contain the fully qualified domain name that DNS obtains for this interface.
FullDuplex	boolean	*read-write (null)*	An indication of whether full-duplex mode is enabled on the Ethernet connection for this interface. • This property shall indicate whether full-duplex mode is enabled on the Ethernet connection for this interface.

Property	Type	Attributes	Notes
HostName	string	*read-write (null)*	The DNS host name, without any domain information. • This property shall contain DNS host name for this interface.
InterfaceEnabled	boolean	*read-write (null)*	An indication of whether this interface is enabled. • This property shall indicate whether this interface is enabled.
IPv4Addresses [{ }]	array (object)		This type describes an IPv4 address. • The IPv4 addresses currently in use by this interface. ◦ This property shall contain an array of objects that represent the IPv4 connection characteristics currently in use by this interface for any value of AddressOrigin. It is recommended that this property be regarded as read-only with configuration of static addresses performed by updating the values within IPv4StaticAddresses. Services may reject updates to this array for this reason. For property details, see IPv4Address.
IPv4StaticAddresses *(v1.4+)* [{ }]	array (object)	*(null)*	This type describes an IPv4 address. • The IPv4 static addresses assigned to this interface. See IPv4Addresses for the addresses in use by this interface. ◦ This property shall contain an array of objects that represent all IPv4 static addresses assigned to, but not necessarily in use by, this interface. The IPv4Addresses property shall also list the addresses that this interface uses . For property details, see IPv4Address.
IPv6Addresses [{ }]	array (object)		This type describes an IPv6 address. • The IPv6 addresses currently in use by this interface. ◦ This property shall contain an array of objects that represent the IPv6 connection characteristics for this interface for any value of AddressOrigin. For property details, see IPv6Address.
IPv6AddressPolicyTable [{	array		An array that represents the RFC6724-defined address selection policy table. • This property shall contain an array of objects that represent the RFC6724-defined address selection policy table.
Label	integer	*read-write (null)*	The IPv6 label, as defined in RFC6724, section 2.1. • This property shall contain the IPv6 label value for this table entry, as defined in RFC6724, section 2.1.

Property	Type	Attributes	Notes
Precedence	integer	*read-write (null)*	The IPv6 precedence, as defined in RFC6724, section 2.1. • This property shall contain the IPv6 precedence value for this table entry, as defined in RFC6724, section 2.1.
Prefix	string	*read-write (null)*	The IPv6 address prefix, as defined in RFC6724, section 2.1. • This property shall contain the IPv6 address prefix for this table entry, as defined in RFC6724, section 2.1.
}]			
IPv6DefaultGateway	string	*read-only (null)*	The IPv6 default gateway address in use on this interface. • This property shall contain the current IPv6 default gateway address in use on this interface.
IPv6StaticAddresses [{ }]	array (object)	*(null)*	This type represents a single IPv6 static address to be assigned on a network interface. • The IPv6 static addresses assigned to this interface. See IPv6Addresses for the addresses in use by this interface. ◦ This property shall contain an array of objects that represent the IPv6 static connection characteristics for this interface. For property details, see IPv6StaticAddress.
IPv6StaticDefaultGateways *(v1.4+)* [{ }]	array (object)	*(null)*	This type represents a single IPv6 static address to be assigned on a network interface. • The IPv6 static default gateways for this interface. ◦ The values in this array shall represent the IPv6 static default gateway addresses for this interface. For property details, see IPv6GatewayStaticAddress v1.1.3).
Links *(v1.1+)* {	object	*required on create*	The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis *(v1.3+)* {	object		The link to the chassis that contains this Ethernet interface. • This property shall contain a link to a resource of type Chassis that represent the physical container associated with this Ethernet interface. See the *Chassis* schema for details on this property.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}			

Property	Type	Attributes	Notes
Endpoints *(v1.1+)* [{	array		An array of links to the endpoints that connect to this Ethernet interface. • This property shall contain an array of links to resources of type Endpoint with which this Ethernet interface is associated.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
HostInterface *(v1.2+)* {	object		The link to a Host Interface that is associated with this Ethernet interface. • This property shall contain a link to a resource of type HostInterface that represents the interface that a host uses to communicate with a manager. See the *HostInterface* schema for details on this property.
@odata.id	string	*read-only*	Link to a HostInterface resource. See the Links section and the *HostInterface* schema for details.
}			
NetworkDeviceFunction *(v1.6+, deprecated v1.7* {	object	*(null)*	The link to the parent network device function and is only used when representing one of the VLANs on that network device function, such as is done in Unix. • This property shall contain a link to a resource of type NetworkDeviceFunction and only be populated with the EthernetInterfaceType property is `Virtual`. See the *NetworkDeviceFunction* schema for details on this property. *Deprecated in v1.7 and later. This property has been deprecated in favor of NetworkDeviceFunctions as each EthernetInterface could represent more than one NetworkDeviceFunction.*
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}			
NetworkDeviceFunctions *(v1.7+)* [{	array		The link to the network device functions that comprise this Ethernet interface. • This property shall contain an array of links to resources of type NetworkDeviceFunction.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
Ports *(v1.9+)* [{	array		The links to the ports providing this Ethernet interface. • This property shall contain an array of links to resources of type Port that represent the ports providing this Ethernet interface. This property shall not be present if the Ethernet interface is not directly associated to a physical port.
@odata.id	string	*read-only*	Link to a Port resource. See the Links section and the *Port* schema for details.
}]			
RelatedInterfaces *(v1.9+)* [{	array	*required on create*	The links to the Ethernet interfaces that comprise this Ethernet interface. • This property shall contain an array of links to resources of type EthernetInterface. If TeamMode contains `None`, this property shall contain one member that represents the parent interface for the VLAN. For other values of TeamMode, this property shall contain the members of the team.
@odata.id	string	*read-write*	Link to another EthernetInterface resource.
}]			
}			
LinkStatus *(v1.1+)*	string (enum)	*read-only (null)*	The link status of this interface, or port. • This property shall contain the link status of this interface, or port. *For the possible property values, see LinkStatus in Property details.*
MACAddress	string	*read-write (null)*	The currently configured MAC address of the interface, or logical port. • This property shall contain the effective current MAC address of this interface. If an assignable MAC address is not supported, this value is a read-only alias of the PermanentMACAddress. Pattern: `^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$`
MaxIPv6StaticAddresses	integer	*read-only (null)*	The maximum number of static IPv6 addresses that can be configured on this interface. • This property shall indicate the number of array items supported by IPv6StaticAddresses, or the maximum number of static IPv6 addresses that can be configured on this interface.
MTUSize	integer	*read-write (null)*	The currently configured maximum transmission unit (MTU), in bytes, on this interface. • This property shall contain the size, in bytes, of largest protocol data unit (PDU) that can be passed in an Ethernet (MAC) frame on this interface.

Property	Type	Attributes	Notes
NameServers [ ]	array (string)	*read-only*	The DNS servers in use on this interface. • This property shall contain the DNS servers in use on this interface.
PermanentMACAddress	string	*read-only* *(null)*	The permanent MAC address assigned to this interface, or port. • This property shall contain the permanent MAC address of this interface, or port. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: `^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$`
SpeedMbps	integer (Mbit/s)	*read-write* *(null)*	The current speed, in Mbit/s, of this interface. • This property shall contain the link speed of the interface, in Mbit/s. This property shall be writable only when the AutoNeg property is `false`.
StatelessAddressAutoConfig *(v1.4+)* {	object		Stateless address autoconfiguration (SLAAC) parameters for this interface. • This object shall contain the IPv4 and IPv6 stateless address automatic configuration (SLAAC) properties for this interface.
IPv4AutoConfigEnabled *(v1.4+)*	boolean	*read-write* *(null)*	An indication of whether IPv4 stateless address autoconfiguration (SLAAC) is enabled for this interface. • This property shall indicate whether IPv4 stateless address autoconfiguration (SLAAC) is enabled for this interface.
IPv6AutoConfigEnabled *(v1.4+)*	boolean	*read-write* *(null)*	An indication of whether IPv6 stateless address autoconfiguration (SLAAC) is enabled for this interface. • This property shall indicate whether IPv6 stateless address autoconfiguration (SLAAC) is enabled for this interface.
}			
StaticNameServers *(v1.4+)* [ ]	array (string, null)	*read-write*	The statically-defined set of DNS server IPv4 and IPv6 addresses. • This property shall contain the statically-defined set of DNS server IP addresses to use when DHCP provisioning is not enabled for name server configuration. As an implementation option, they can be used in addition to DHCP-provided addresses, or in cases where the DHCP server provides no DNS assignments.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
TeamMode *(v1.9+)*	string (enum)	*read-write (null)*	The team mode for this interface. • This property shall contain the team mode for this interface. If this property is not present, the value shall be assumed to be `None`. *For the possible property values, see TeamMode in Property details.*
UefiDevicePath	string	*read-only (null)*	The UEFI device path for this interface. • This property shall contain the UEFI device path to the device that implements this interface, or port.
VLAN {	object		If this network interface supports more than one VLAN, this property is absent. VLAN collections appear in the Links property of this resource. • This property shall contain the VLAN for this interface. If this interface supports more than one VLAN, the VLAN property shall be absent and, instead, the VLAN collection link shall be present.
Tagged *(v1.3+)*	boolean	*read-write (null)*	An indication of whether this VLAN is tagged or untagged for this interface. • This property shall indicate whether this VLAN is tagged or untagged for this interface.
VLANEnable	boolean	*read-write required on create (null)*	An indication of whether this VLAN is enabled for this VLAN network interface. • This property shall indicate whether this VLAN is enabled for this VLAN network interface.
VLANId	integer	*read-write required on create (null)*	The ID for this VLAN. • This property shall contain the ID for this VLAN.
VLANPriority *(v1.2+)*	integer	*read-write (null)*	The priority for this VLAN. • This property shall contain the priority for this VLAN.
}			
VLANs *(deprecated v1.7)* {	object		The link to a collection of VLANs, which applies only if the interface supports more than one VLAN. If this property applies, the VLANEnabled and VLANId properties do not apply. • This property shall contain a link to a resource collection of type VLanNetworkInterfaceCollection, which applies only if the interface supports more than one VLAN. If this property is present, the VLANEnabled and VLANId properties shall not be present. Contains a link to a resource. *Deprecated in v1.7 and later. This property has been deprecated in favor of newer methods indicating multiple VLANs.*

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to Collection of *VLanNetworkInterface*. See the VLanNetworkInterface schema for details.
}			

6.32.4 Property details

6.32.4.1 EthernetInterfaceType:

The type of interface.

- This property shall contain the type of interface.

string	Description
Physical	A physical Ethernet interface. • This value shall indicate a physical traditional network interface.
Virtual	A virtual Ethernet interface. • This value shall indicate a network device function has multiple VLANs and is representing one of them as a virtual Ethernet interface. The NetworkDeviceFunction property within Links shall contain the locator for the parent network device function.

6.32.4.2 FallbackAddress:

DHCPv4 fallback address method for this interface.

- This property shall contain the fallback address method of DHCPv4.

string	Description
AutoConfig	Fall back to an autoconfigured address. • DHCP shall fall back to an address generated by the implementation.
None	Continue attempting DHCP without a fallback address. • DHCP shall continue trying to obtain an address without falling back to a fixed address.

string	Description
Static	Fall back to a static address specified by IPv4StaticAddresses. • DHCP shall fall back to a static address specified by IPv4StaticAddresses.

6.32.4.3 LinkStatus:

The link status of this interface, or port.

- This property shall contain the link status of this interface, or port.

string	Description
LinkDown	No link is detected on this interface, but the interface is connected.
LinkUp	The link is available for communication on this interface.
NoLink	No link or connection is detected on this interface.

6.32.4.4 OperatingMode:

Determines the DHCPv6 operating mode for this interface.

- This property shall control the operating mode of DHCPv6 on this interface.

string	Description
Disabled	DHCPv6 is disabled. • DHCPv6 shall be disabled for this interface.
Enabled *(v1.8+)*	DHCPv6 is enabled. • DHCPv6 shall be enabled for this interface.
Stateful *(deprecated v1.8)*	DHCPv6 stateful mode. • DHCPv6 shall operate in stateful mode on this interface. DHCPv6 stateful mode configures addresses, and when it is enabled, stateless mode is also implicitly enabled. Services may replace this value with `Enabled`. *Deprecated in v1.8 and later. This property has been deprecated in favor of `EnabLed`. The control between 'stateful' and 'stateless' is managed by the DHCP server and not the client.*

string	Description
Stateless *(deprecated v1.8)*	DHCPv6 stateless mode. • DHCPv6 shall operate in stateless mode on this interface. DHCPv6 stateless mode allows configuring the interface using DHCP options but does not configure addresses. It is always enabled by default whenever DHCPv6 Stateful mode is also enabled. Services may replace this value with `Enabled`. *Deprecated in v1.8 and later. This property has been deprecated in favor of `Enabled`. The control between 'stateful' and 'stateless' is managed by the DHCP server and not the client.*

6.32.4.5 TeamMode:

The team mode for this interface.

- This property shall contain the team mode for this interface. If this property is not present, the value shall be assumed to be `None`.

string	Description
ActiveBackup	One interface in the team is active and the others are kept in standby until a failure occurs.
AdaptiveLoadBalancing	Packets are transmitted and received based upon the current load of each interface in the team.
AdaptiveTransmitLoadBalancing	Packets are transmitted based upon the current load of each interface in the team.
Broadcast	Packets are transmitted on all interfaces in the team.
IEEE802_3ad	The interfaces in the team create an IEEE802.3ad link aggregation group.
None	No teaming.
RoundRobin	Packets are transmitted in sequential order from the teamed interfaces.
XOR	Transmitting is determined based upon a hash policy.

6.32.5 Example response

```
{
    "@odata.type": "#EthernetInterface.v1_9_0.EthernetInterface",
    "Id": "1",
    "Name": "Ethernet Interface",
    "Description": "Manager NIC 1",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
```

```
    },
    "LinkStatus": "LinkUp",
    "PermanentMACAddress": "12:44:6A:3B:04:11",
    "MACAddress": "12:44:6A:3B:04:11",
    "SpeedMbps": 1000,
    "AutoNeg": true,
    "FullDuplex": true,
    "MTUSize": 1500,
    "HostName": "web483",
    "FQDN": "web483.contoso.com",
    "NameServers": [
        "names.contoso.com"
    ],
    "IPv4Addresses": [
        {
            "Address": "192.168.0.10",
            "SubnetMask": "255.255.252.0",
            "AddressOrigin": "DHCP",
            "Gateway": "192.168.0.1"
        }
    ],
    "DHCPv4": {
        "DHCPEnabled": true,
        "UseDNSServers": true,
        "UseGateway": true,
        "UseNTPServers": false,
        "UseStaticRoutes": true,
        "UseDomainName": true
    },
    "DHCPv6": {
        "OperatingMode": "Enabled",
        "UseDNSServers": true,
        "UseDomainName": false,
        "UseNTPServers": false,
        "UseRapidCommit": false
    },
    "StatelessAddressAutoConfig": {
        "IPv4AutoConfigEnabled": false,
        "IPv6AutoConfigEnabled": true
    },
    "IPv4StaticAddresses": [
        {
            "Address": "192.168.88.130",
            "SubnetMask": "255.255.0.0",
            "Gateway": "192.168.0.1"
        }
    ],
    "IPv6AddressPolicyTable": [
        {
            "Prefix": "::1/128",
```

```
            "Precedence": 50,
            "Label": 0
        }
    ],
    "MaxIPv6StaticAddresses": 1,
    "IPv6StaticAddresses": [
        {
            "Address": "fc00:1234::a:b:c:d",
            "PrefixLength": 64
        }
    ],
    "IPv6StaticDefaultGateways": [
        {
            "Address": "fe80::fe15:b4ff:fe97:90cd",
            "PrefixLength": 64
        }
    ],
    "IPv6DefaultGateway": "fe80::214:c1ff:fe4c:5c4d",
    "IPv6Addresses": [
        {
            "Address": "fe80::1ec1:deff:fe6f:1e24",
            "PrefixLength": 64,
            "AddressOrigin": "SLAAC",
            "AddressState": "Preferred",
            "Oem": {}
        },
        {
            "Address": "fc00:1234::a:b:c:d",
            "PrefixLength": 64,
            "AddressOrigin": "Static",
            "AddressState": "Preferred",
            "Oem": {}
        },
        {
            "Address": "2001:1:3:5::100",
            "PrefixLength": 64,
            "AddressOrigin": "DHCPv6",
            "AddressState": "Preferred",
            "Oem": {}
        },
        {
            "Address": "2002:2:5::1ec1:deff:fe6f:1e24",
            "PrefixLength": 64,
            "AddressOrigin": "SLAAC",
            "AddressState": "Preferred",
            "Oem": {}
        }
    ],
    "StaticNameServers": [
        "192.168.150.1",
```

```
            "fc00:1234:200:2500"
        ],
        "VLAN": {
            "VLANEnable": true,
            "VLANId": 101
        },
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/EthernetInterfaces/12446A3B0411"
    }
```


6.33 Event 1.7.1

Version	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2021.2	2020.3	2020.2	2019.1	2018.2	2017.1	2016.1	1.0

6.33.1 Description

The Event schema describes the JSON payload received by an event destination, which has subscribed to event notification, when events occur. This resource contains data about events, including descriptions, severity, and a message identifier to a message registry that can be accessed for further information.

- This resource contains an event for a Redfish implementation.

6.33.2 Properties

Property	Type	Attributes	Notes
Context *(v1.1+)*	string	*read-only*	A context can be supplied at subscription time. This property is the context value supplied by the subscriber. • This property shall contain a client supplied context for the event destination to which this event is being sent.
Events [{	array	*required*	Each event in this array has a set of properties that describe the event. Because this is an array, more than one event can be sent simultaneously. • This property shall contain an array of objects that represent the occurrence of one or more events.
Actions *(v1.2+)* {}	object		The available actions for this resource. • This property shall contain the available actions for this resource.

Property	Type	Attributes	Notes
Context *(deprecated v1.1)*	string	*read-only*	A context can be supplied at subscription time. This property is the context value supplied by the subscriber. • This property shall contain a client supplied context for the event destination to which this event is being sent. *Deprecated in v1.1 and later. Events are triggered independently from subscriptions to those events. This property has been deprecated in favor of the Context property found at the root level of the object.*
EventGroupId *(v1.3+)*	integer	*read-only*	The identifier that correlates events with the same root cause. If `0`, no other event is related to this event. • This property shall indicate that events are related and shall have the same value when multiple event messages are produced by the same root cause. Implementations shall use separate values for events with a separate root cause. This property value shall not imply an ordering of events. The `0` value shall indicate that this event is not grouped with any other event.
EventId	string	*read-only*	The unique instance identifier of an event. • This property shall contain a service-defined unique identifier for the event.
EventTimestamp	string (date-time)	*read-only*	The time the event occurred. • This property shall indicate the time the event occurred where the value shall be consistent with the Redfish service time that is also used for the values of the Modified property.
EventType *(deprecated v1.3)*	string (enum)	*read-only* *required*	The type of event. • This property shall indicate the type of event. *For the possible property values, see EventType in Property details. Deprecated in v1.3 and later. This property has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the RegistryPrefix and ResourceType properties and not on the EventType property.*
LogEntry *(v1.7+)* {	object		The link to a log entry if an entry was created for this event. • This property shall contain a link to a resource of type LogEntry that represents the log entry created for this event. See the *LogEntry* schema for details on this property.
@odata.id	string	*read-only*	Link to a LogEntry resource. See the Links section and the *LogEntry* schema for details.
}			

Property	Type	Attributes	Notes
MemberId	string	*read-only* *required*	The unique identifier for the member within an array. • This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
Message	string	*read-only*	The human-readable event message. • This property shall contain a human-readable event message.
MessageArgs [ ]	array (string)	*read-only*	An array of message arguments that are substituted for the arguments in the message when looked up in the message registry. • This property shall contain an array of message arguments that are substituted for the arguments in the message when looked up in the message registry. It has the same semantics as the MessageArgs property in the Redfish MessageRegistry schema.
MessageId	string	*read-only* *required*	The identifier for the message. • This property shall contain a MessageId, as defined in the 'MessageId format' clause of the Redfish Specification. Pattern: `^[A-Za-z0-9]+\.\d+\.\d+\.[A-Za-z0-9.]+$`
MessageSeverity *(v1.5+)*	string (enum)	*read-only*	The severity of the message in this event. • This property shall contain the severity of the message in this event. Services can replace the value defined in the message registry with a value more applicable to the implementation. *For the possible property values, see MessageSeverity in Property details.*
Oem {}	object		See the OEM object definition in the Using this guide clause.
OriginOfCondition {	object		A link to the resource or object that originated the condition that caused the event to be generated. • This property shall contain a link to the resource or object that originated the condition that caused the event to be generated. If the event subscription has the IncludeOriginOfCondition property set to `true`, it shall include the entire resource or object referenced by the link. For events that represent the creation or deletion of a resource, this property should reference the created or deleted resource and not the collection that contains the resource.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

Property	Type	Attributes	Notes
}			
Severity *(deprecated v1.5)*	string	*read-only*	The severity of the event. • This property shall contain the severity of the event, as defined in the 'Status' clause of the Redfish Specification. Services can replace the value defined in the message registry with a value more applicable to the implementation. *Deprecated in v1.5 and later. This property has been deprecated in favor of MessageSeverity, which ties the values to the enumerations defined for the Health property within Status.*
SpecificEventExistsInGroup *(v1.6+)*	boolean	*read-only*	Indicates this event is equivalent to a more specific event in this Event Group. • This property shall indicate that the event is equivalent to another event, with a more specific definition, within the same EventGroupId. For example, the `DriveFailed` message from the Storage Device Message Registry is more specific than the `ResourceStatusChangedCritical` message from the Resource Event Message Registry, when both occur with the same EventGroupId. This property shall contain `true` if a more specific event is available, and shall contain `false` if no equivalent event exists in the same EventGroupId. If this property is absent, the value shall be assumed to be `false`.
}]			

6.33.3 Property details

6.33.3.1 EventType:

The type of event.

- This property shall indicate the type of event.

string	Description
Alert	A condition requires attention.
MetricReport *(v1.3+)*	The telemetry service is sending a metric report. • Events of type `MetricReport` shall be sent to a client in accordance with the MetricReport schema definition.

string	Description
Other *(v1.4+)*	Because EventType is deprecated as of Redfish Specification v1.6, the event is based on a registry or resource but not an EventType. • Events of type `Other` shall be sent to a client in accordance with subscriptions to RegistryPrefixes or ResourceTypes.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
ResourceUpdated	A resource has been updated.
StatusChange	The status of a resource has changed.

6.33.3.2 MessageSeverity:

The severity of the message in this event.

- This property shall contain the severity of the message in this event. Services can replace the value defined in the message registry with a value more applicable to the implementation.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.33.4 Example response

```
{
    "@odata.type": "#Event.v1_7_0.Event",
    "Id": "1",
    "Name": "Event Array",
    "Context": "ContosoWebClient",
    "Events": [
        {
            "EventType": "Other",
            "EventId": "4593",
            "Severity": "Warning",
            "Message": "A cable has been removed from network adapter '1' port '1'.",
            "MessageId": "NetworkDevice.1.0.CableRemoved",
```

```
            "MessageArgs": [
                "1",
                "1"
            ],
            "OriginOfCondition": {
                "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces/1"
            },
            "LogEntry": {
                "@odata.id": "/redfish/v1/Managers/BMC/LogServices/EventLog/Entries/532"
            }
        }
    ]
}
```

6.34 EventDestination 1.12.0

Version	*v1.12*	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	...
Release	2022.1	2021.2	2020.4	2020.3	2020.1	2019.3	2019.2	2019.1	2018.2	2018.1	2017.1	...

6.34.1 Description

The EventDestination schema defines the target of an event subscription, including the event types and context to provide to the target in the event payload.

- This resource shall represent the target of an event subscription, including the event types and context to provide to the target in the event payload.

6.34.2 URIs

/redfish/v1/EventService/Subscriptions/*{EventDestinationId}*

6.34.3 Properties

Property	Type	Attributes	Notes
Certificates *(v1.9+)* {	object		The link to a collection of server certificates for the server referenced by the Destination property. • This property shall contain a link to a resource collection of type CertificateCollection that represent the server certificates for the server referenced by the Destination property. If VerifyCertificate is `true`, services shall compare the certificates in this collection with the certificate obtained during handshaking with the event destination in order to verify the identify of the event destination prior to sending an event. If the server cannot be verified, the service shall not send the event. If VerifyCertificate is `false`, the service shall not perform certificate verification. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
ClientCertificates *(v1.11+)* {	object		The link to a collection of client identity certificates provided to the server referenced by the Destination property. • This property shall contain a link to a resource collection of type CertificateCollection that represents the client identity certificates that are provided to the server referenced by the Destination property as part of TLS handshaking. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
Context	string	*read-write required (null)*	A client-supplied string that is stored with the event destination subscription. • This property shall contain a client-supplied context that remains with the connection through the connection's lifetime.
DeliveryRetryPolicy *(v1.6+)*	string (enum)	*read-write (null)*	The subscription delivery retry policy for events, where the subscription type is RedfishEvent. • This property shall indicate the subscription delivery retry policy for events where the subscription type is RedfishEvent. *For the possible property values, see DeliveryRetryPolicy in Property details.*

Property	Type	Attributes	Notes
Destination	string (URI)	*read-only required on create*	The URI of the destination event receiver. • This property shall contain a URI to the destination where the events are sent. If Protocol is `SMTP`, the URI shall follow the RFC6068-described format. SNMP URIs shall be consistent with RFC4088. Specifically, for SNMPv3, if a username is specified in the SNMP URI, the SNMPv3 authentication and encryption configuration associated with that user shall be utilized in the SNMPv3 traps. Syslog URIs shall be consistent with RFC3986 and contain the scheme `syslog://`. Server-sent event destinations shall be in the form `redfish-sse://ip:port` where `ip` and `port` are the IP address and the port of the client with the open SSE connection. For other URIs, such as HTTP or HTTPS, they shall be consistent with RFC3986.
EventFormatType *(v1.4+)*	string (enum)	*read-only (null)*	The content types of the message that are sent to the EventDestination. • This property shall indicate the content types of the message that this service sends to the EventDestination. If this property is not present, the EventFormatType shall be assumed to be Event. *For the possible property values, see EventFormatType in Property details.*
EventTypes *(deprecated v1.5)* [ ]	array (string (enum))	*read-only*	• The types of events that are sent to the destination. ◦ This property shall contain an array that contains the types of events that shall be sent to the destination. To specify that a client is subscribing for metric reports, the EventTypes property should include 'MetricReport'. If the subscription does not include this property, the service shall use a single element with a default of `Other`. *For the possible property values, see EventTypes in Property details. Deprecated in v1.5 and later. This property has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the RegistryPrefix and ResourceType properties and not on the EventType property. Use EventFormatType to create subscriptions for metric reports. If the subscription does not include this property, the service shall use a single element with a default of `Other`.*
ExcludeMessageIds *(v1.12+)* [ ]	array (string, null)	*read-only*	The list of MessageIds that are not sent to this event destination. • This property shall contain an array of exculded MessageIds that are not allowed values for the MessageId property within an event sent to the subscriber. The MessageId shall be in the `MessageRegistry.MessageId` format. If included, the MessageId major and minor version details should be ignored. Events with a MessageId that is contained in this array shall not be sent to the subscriber. If this property is an empty array or is absent, no exclusive filtering based upon the MessageId of an event is performed.

Property	Type	Attributes	Notes
ExcludeRegistryPrefixes *(v1.12+)* [ ]	array (string, null)	*read-only*	The list of prefixes for the message registries that contain the MessageIds that are not sent to this event destination. • This property shall contain an array of prefixes of excluded message registries that contain the MessageIds that are not allowed values for the MessageId property within an event sent to the subscriber. Events with a MessageId that is from a message registry contained in this array shall not be sent to the subscriber. If this property is an empty array or is absent, no exclusive filtering based upon message registry of the MessageId of an event is performed.
HeartbeatIntervalMinutes *(v1.11+)*	integer	*read-only* *(null)*	Interval for sending heartbeat events to the destination in minutes. • This property shall indicate the interval for sending periodic heartbeat events to the subscriber. The value shall be the interval, in minutes, between each periodic event. This property shall not be present if the SendHeartbeat property is not present.
HttpHeaders [{	array		An array of settings for HTTP headers, such as authorization information. This array is null or an empty array in responses. An empty array is the preferred return value on read operations. • This property shall contain an object consisting of the names and values of of HTTP header to be included with every event POST to the event destination. This object shall be null or an empty array in responses. An empty array is the preferred return value in responses.
(pattern)	string	*read-write*	Property names follow regular expression pattern "^[^:\\s]+$"
}]			
IncludeOriginOfCondition *(v1.8+)*	boolean	*read-only* *(null)*	An indication of whether the events subscribed to will also include the entire resource or object referenced the OriginOfCondition property in the event payload. • This property shall indicate whether the event payload sent to the subscription destination will expand the OriginOfCondition property to include the resource or object referenced by the OriginOfCondition property.
MessageIds *(v1.1+)* [ ]	array (string, null)	*read-only*	The list of MessageIds that are sent to this event destination. • This property shall contain an array of MessageIds that are the allowable values for the MessageId property within an event sent to the subscriber. The MessageId should be in the `MessageRegistry.MessageId` format. If included, the MessageId major and minor version details should be ignored. Events with a MessageId that is not contained in this array and is not from a message registry contained in RegistryPrefixes shall not be sent to the subscriber. If this property is an empty array or is absent, no inclusive filtering based upon the MessageId of an event is performed.

Property	Type	Attributes	Notes
MetricReportDefinitions *(v1.6+)* [{	array		A list of metric report definitions for which the service only sends related metric reports. If this property is absent or the array is empty, metric reports that originate from any metric report definition are sent to the subscriber. • This property shall specify an array of metric report definitions that are the only allowable generators of metric reports for this subscription. Metric reports originating from metric report definitions not contained in this array shall not be sent to the subscriber. If this property is absent or the array is empty, the service shall send metric reports originating from any metric report definition to the subscriber.
@odata.id	string	*read-only*	Link to a MetricReportDefinition resource. See the Links section and the *MetricReportDefinition* schema for details.
}]			
OEMProtocol *(v1.9+)*	string	*read-only*	The OEM-defined protocol type of the event connection. • This property shall contain the protocol type that the event uses to send the event to the destination. This property shall be present if Protocol is `OEM`.
OEMSubscriptionType *(v1.9+)*	string	*read-only*	The OEM-defined subscription type for events. • This property shall indicate the OEM-defined type of subscription for events. This property shall be present if SubscriptionType is `OEM`.
OriginResources *(v1.1+)* [{	array		The array of resources for which the service sends only related events. • This property shall specify an array of resources, resource collections, or referenceable members that are the only allowable values for the OriginOfCondition property within an event that the service sends to the subscriber. Events with an OriginOfCondition that is not contained in this array, and is not subordinate to members of this array if SubordinateResources contains the value `true`, shall not be sent to the subscriber. If this property is an empty array or is absent, no filtering based upon the URI of the OriginOfCondition of an event is performed.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Property	Type	Attributes	Notes
Protocol	string (enum)	*read-only required on create*	The protocol type of the event connection. • This property shall contain the protocol type that the event uses to send the event to the destination. A `Redfish` value shall indicate that the event type shall adhere to the type defined in the Redfish Specification. *For the possible property values, see Protocol in Property details.*
RegistryPrefixes *(v1.4+)* [ ]	array (string, null)	*read-only*	The list of prefixes for the message registries that contain the MessageIds that are sent to this event destination. • This property shall contain an array the prefixes of message registries that contain the MessageIds that are the allowable values for the MessageId property within an event sent to the subscriber. Events with a MessageId that is not from a message registry contained in this array and is not contained by MessageIds shall not be sent to the subscriber. If this property is an empty array or is absent, no inclusive filtering based upon message registry of the MessageId of an event is performed.
ResourceTypes *(v1.4+)* [ ]	array (string, null)	*read-only*	The list of resource type values (schema names) that correspond to the OriginOfCondition. The version and full namespace should not be specified. • This property shall specify an array of resource type values that contain the allowable resource types for the resource referenced by the OriginOfCondition property. Events with the resource type of the resource referenced by the OriginOfCondition property that is not contained in this array shall not be sent to the subscriber. If this property is an empty array or is absent, no filtering based upon the resource type of the OriginOfCondition of an event is performed. This property shall contain only the general namespace for the type and not the versioned value. For example, it shall not contain `Task.v1_2_0.Task` and instead shall contain `Task`. To specify that a client is subscribing to metric reports, the EventTypes property should include `MetricReport`.
SendHeartbeat *(v1.11+)*	boolean	*read-only (null)*	Send a heartbeat event periodically to the destination. • This property shall indicate that the service shall periodically send the `RedfishServiceFunctional` message defined in the Heartbeat Event Message Registry to the subscriber. If this property is not present, no periodic event shall be sent. This property shall not apply to event destinations if the SubscriptionType property contains the value `SSE`.
SNMP *(v1.7+)* {	object		Settings for an SNMP event destination. • This property shall contain the settings for an SNMP event destination.

Property	Type	Attributes	Notes
AuthenticationKey *(v1.7+)*	string	*read-write (null)*	The secret authentication key for SNMPv3. • This property shall contain the key for SNMPv3 authentication. The value shall be `null` in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with `Passphrase:`, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with `Hex:`, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. The passphrase can contain any printable characters except for the double quotation mark. Pattern: `(^[ !#-~]+$)\|(^Passphrase:[ ^[ !#-~]+$)|(^Hex:[0-9A-Fa-f]{24,96})|(^\*+$)`
AuthenticationKeySet *(v1.10+)*	boolean	*read-only*	Indicates if the AuthenticationKey property is set. • This property shall contain `true` if a valid value was provided for the AuthenticationKey property. Otherwise, the property shall contain `false`.
AuthenticationProtocol *(v1.7+)*	string (enum)	*read-write (null)*	The authentication protocol for SNMPv3. • This property shall contain the SNMPv3 authentication protocol. *For the possible property values, see AuthenticationProtocol in Property details.*
EncryptionKey *(v1.7+)*	string	*read-write (null)*	The secret authentication key for SNMPv3. • This property shall contain the key for SNMPv3 encryption. The value shall be `null` in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with `Passphrase:`, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with `Hex:`, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. The passphrase can contain any printable characters except for the double quotation mark. Pattern: `(^[A-Za-z0-9]+$)\|(^\*+$)`
EncryptionKeySet *(v1.10+)*	boolean	*read-only*	Indicates if the EncryptionKey property is set. • This property shall contain `true` if a valid value was provided for the EncryptionKey property. Otherwise, the property shall contain `false`.
EncryptionProtocol *(v1.7+)*	string (enum)	*read-write (null)*	The encryption protocol for SNMPv3. • This property shall contain the SNMPv3 encryption protocol. *For the possible property values, see EncryptionProtocol in Property details.*

Property	Type	Attributes	Notes
TrapCommunity *(v1.7+)*	string	*read-write (null)*	The SNMP trap community string. • This property shall contain the SNMP trap community string. The value shall be `null` in responses.
}			
Status *(v1.6+)* {}	object		This property shall contain the status of the subscription. For property details, see Status.
SubordinateResources *(v1.4+)*	boolean	*read-only (null)*	An indication of whether the subscription is for events in the OriginResources array and its subordinate resources. If `true` and the OriginResources array is specified, the subscription is for events in the OriginResources array and its subordinate resources. Note that resources associated through the Links section are not considered subordinate. If `false` and the OriginResources array is specified, the subscription shall be for events in the OriginResources array only. If the OriginResources array is not present, this property shall have no relevance. • This property shall indicate whether the subscription is for events in the OriginResources array and its subordinate resources. If `true` and the OriginResources array is specified, the subscription is for events in the OriginResources array and its subordinate resources. Note that resources associated through the Links section are not considered subordinate. If `false` and the OriginResources array is specified, the subscription shall be for events in the OriginResources array only. If the OriginResources array is not present, this property shall have no relevance.
SubscriptionType *(v1.3+)*	string (enum)	*read-only required (null)*	The subscription type for events. • This property shall indicate the type of subscription for events. If this property is not present, the SubscriptionType shall be assumed to be RedfishEvent. *For the possible property values, see SubscriptionType in Property details.*
SyslogFilters *(v1.9+)* [{	array		A list of filters applied to syslog messages before sending to a remote syslog server. An empty list indicates all syslog messages are sent. • This property shall describe all desired syslog messages to send to a remote syslog server. If this property contains an empty array or is absent, all messages shall be sent.
LogFacilities *(v1.9+)* [ ]	array (string (enum))	*read-write (null)*	The syslog facility code is an enumeration of program types. • The types of programs that can log messages. ◦ This property shall contain the types of programs that can log messages. If this property contains an empty array or is absent, all facilities shall be indicated. *For the possible property values, see LogFacilities in Property details.*

Property	Type	Attributes	Notes
LowestSeverity *(v1.9+)*	string (enum)	*read-write (null)*	The lowest severity level message that will be forwarded. • This property shall contain the lowest syslog severity level that will be forwarded. The service shall forward all messages equal to or greater than the value in this property. The value `All` shall indicate all severities. *For the possible property values, see LowestSeverity in Property details.*
}]			
VerifyCertificate *(v1.9+)*	boolean	*read-write (null)*	An indication of whether the service will verify the certificate of the server referenced by the Destination property prior to sending the event. • This property shall indicate whether whether the service will verify the certificate of the server referenced by the Destination property prior to sending the event. If this property is not supported by the service or specified by the client in the create request, it shall be assumed to be `false`.

6.34.4 Actions

6.34.4.1 ResumeSubscription

Description

This action resumes a suspended event subscription.

- This action shall resume a suspended event subscription, which affects the subscription status. The service may deliver buffered events when the subscription is resumed.

Action URI: {Base URI of target resource}/Actions/EventDestination.ResumeSubscription

Action parameters

Parameter Name	Type	Attributes	Notes
DeliverBufferedEventDuration *(v1.12+)*	string	*optional*	The maximum age of buffered events that should be delivered when resuming the subscription. • This parameter shall indicate the event age of any buffered or otherwise undelivered events that shall be delivered to this event destination when the subscription is resumed. The service shall deliver any available, previously undelivered event that was created within the duration specified. A value that equates to zero time, such as `PT0S`, shall indicate that no previously undelivered events shall be sent. If undelivered events within the duration may been discarded due to a lack of buffer space, the service should send the EventBufferExceeded message from the Base Message Registry. If the client does not provide this parameter, the service shall apply an implementation specific duration. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`

Request Example

```
{
    "DeliverBufferedEventDuration": "PT8H"
}
```

6.34.4.2 SuspendSubscription *(v1.12+)*

Description

This action suspends an event subscription.

- This action shall suspend an event subscription. No events shall be sent to the event destination until invocation of the ResumeSubscription action. The value of the State property within Status shall contain `Disabled` for a suspended subscription. The service may buffer events while the subscription is suspended.

Action URI: {Base URI of target resource}/Actions/EventDestination.SuspendSubscription

Action parameters

This action takes no parameters.

6.34.5 Property details

6.34.5.1 AuthenticationProtocol:

The authentication protocol for SNMPv3.

- This property shall contain the SNMPv3 authentication protocol.

string	Description
CommunityString	Trap community string authentication. • This value shall indicate authentication using SNMP community strings and the value of TrapCommunity.
HMAC128_SHA224 *(v1.10+)*	HMAC-128-SHA-224 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC128SHA224AuthProtocol.
HMAC192_SHA256 *(v1.10+)*	HMAC-192-SHA-256 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC192SHA256AuthProtocol.
HMAC256_SHA384 *(v1.10+)*	HMAC-256-SHA-384 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC256SHA384AuthProtocol.
HMAC384_SHA512 *(v1.10+)*	HMAC-384-SHA-512 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC384SHA512AuthProtocol.
HMAC_MD5	HMAC-MD5-96 authentication. • This value shall indicate authentication conforms to the RFC3414-defined HMAC-MD5-96 authentication protocol.
HMAC_SHA96	HMAC-SHA-96 authentication. • This value shall indicate authentication conforms to the RFC3414-defined HMAC-SHA-96 authentication protocol.
None	No authentication. • This value shall indicate authentication is not required.

6.34.5.2 DeliveryRetryPolicy:

The subscription delivery retry policy for events, where the subscription type is RedfishEvent.

- This property shall indicate the subscription delivery retry policy for events where the subscription type is RedfishEvent.

string	Description
RetryForever	The subscription is not suspended or terminated, and attempts at delivery of future events shall continue regardless of the number of retries. • This value shall indicate the subscription is not suspended or terminated, and attempts at delivery of future events shall continue regardless of the number of retries. The interval between retries remains constant and is specified by the DeliveryRetryIntervalSeconds property in the event service.
RetryForeverWithBackoff *(v1.10+)*	The subscription is not suspended or terminated, and attempts at delivery of future events shall continue regardless of the number of retries, but issued over time according to a service-defined backoff algorithm. • This value shall indicate the subscription is not suspended or terminated, and attempts at delivery of future events shall continue regardless of the number of retries. Retry attempts are issued over time according to a service-defined backoff algorithm. The backoff algorithm may insert an increasing amount of delay between retry attempts and may reach a maximum.
SuspendRetries	The subscription is suspended after the maximum number of retries is reached. • This value shall indicate the subscription is suspended after the maximum number of retries is reached, specified by the DeliveryRetryAttempts property in the event service. The value of the State property within Status shall contain `Disabled` for a suspended subscription.
TerminateAfterRetries	The subscription is terminated after the maximum number of retries is reached. • This value shall indicate the subscription is terminated after the maximum number of retries is reached, specified by the DeliveryRetryAttempts property in the event service.

6.34.5.3 EncryptionProtocol:

The encryption protocol for SNMPv3.

- This property shall contain the SNMPv3 encryption protocol.

string	Description
CBC_DES	CBC-DES encryption. • This value shall indicate encryption conforms to the RFC3414-defined CBC-DES encryption protocol.
CFB128_AES128	CFB128-AES-128 encryption. • This value shall indicate encryption conforms to the RFC3414-defined CFB128-AES-128 encryption protocol.
None	No encryption. • This value shall indicate there is no encryption.

6.34.5.4 EventFormatType:

The content types of the message that are sent to the EventDestination.

- This property shall indicate the content types of the message that this service sends to the EventDestination. If this property is not present, the EventFormatType shall be assumed to be Event.

string	Description
Event	The subscription destination receives an event payload. • The subscription destination shall receive an event payload as defined by the value of the Protocol property.
MetricReport	The subscription destination receives a metric report. • The subscription destination shall receive a metric report payload as defined by the value of the Protocol property.

6.34.5.5 EventTypes:

- The types of events that are sent to the destination.
  - This property shall contain an array that contains the types of events that shall be sent to the destination. To specify that a client is subscribing for metric reports, the EventTypes property should include 'MetricReport'. If the subscription does not include this property, the service shall use a single element with a default of `Other`.

string	Description
Alert	A condition requires attention.
MetricReport	The telemetry service is sending a metric report. • Events of type `MetricReport` shall be sent to a client in accordance with the MetricReport schema definition.
Other	Because EventType is deprecated as of Redfish Specification v1.6, the event is based on a registry or resource but not an EventType. • Events of type `Other` shall be sent to a client in accordance with subscriptions to RegistryPrefixes or ResourceTypes.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
ResourceUpdated	A resource has been updated.
StatusChange	The status of a resource has changed.

6.34.5.6 LogFacilities:

The syslog facility code is an enumeration of program types.

- The types of programs that can log messages.
  - This property shall contain the types of programs that can log messages. If this property contains an empty array or is absent, all facilities shall be indicated.

string	Description
Auth	Security/authentication messages.
Authpriv	Security/authentication messages.
Console	Log alert.
Cron	Clock daemon.
Daemon	System daemons.
FTP	FTP daemon.
Kern	Kernel messages.
Local0	Locally used facility 0.

string	Description
Local1	Locally used facility 1.
Local2	Locally used facility 2.
Local3	Locally used facility 3.
Local4	Locally used facility 4.
Local5	Locally used facility 5.
Local6	Locally used facility 6.
Local7	Locally used facility 7.
LPR	Line printer subsystem.
Mail	Mail system.
News	Network news subsystem.
NTP	NTP subsystem.
Security	Log audit.
SolarisCron	Scheduling daemon.
Syslog	Messages generated internally by syslogd.
User	User-level messages.
UUCP	UUCP subsystem.

6.34.5.7 LowestSeverity:

The lowest severity level message that will be forwarded.

- This property shall contain the lowest syslog severity level that will be forwarded. The service shall forward all messages equal to or greater than the value in this property. The value `All` shall indicate all severities.

string	Description
Alert	A condition that should be corrected immediately, such as a corrupted system database.
All	A message of any severity.
Critical	Hard device errors.
Debug	Messages that contain information normally of use only when debugging a program.

string	Description
Emergency	A panic condition.
Error	An Error.
Informational	Informational only.
Notice	Conditions that are not error conditions, but that may require special handling.
Warning	A Warning.

6.34.5.8 Protocol:

The protocol type of the event connection.

- This property shall contain the protocol type that the event uses to send the event to the destination. A `Redfish` value shall indicate that the event type shall adhere to the type defined in the Redfish Specification.

string	Description
OEM *(v1.9+)*	The destination follows an OEM protocol for event notifications. • This value shall indicate an OEM specific protocol. The OEMProtocol property shall contain the specific OEM event destination protocol.
Redfish	The destination follows the Redfish Specification for event notifications. • This value shall indicate the destination follows the Redfish Specification for event notifications. Destinations requesting EventFormatType of `Event` shall receive a Redfish resource of type Event. Destinations requesting EventFormatType of `MetricReport` shall receive a Redfish resource of type MetricReport.
SMTP *(v1.7+)*	The destination follows the SMTP specification for event notifications. • This value shall indicate the destination follows the RFC5321-defined SMTP specification.
SNMPv1 *(v1.7+)*	The destination follows the SNMPv1 protocol for event notifications. • This value shall indicate the destination follows the RFC1157-defined SNMPv1 protocol.
SNMPv2c *(v1.7+)*	The destination follows the SNMPv2c protocol for event notifications. • This value shall indicate the destination follows the SNMPv2c protocol as defined by RFC1441 and RFC1452.

string	Description
SNMPv3 *(v1.7+)*	The destination follows the SNMPv3 protocol for event notifications. • This value shall indicate the destination follows the SNMPv3 protocol as defined by RFC3411 and RFC3418.
SyslogRELP *(v1.9+)*	The destination follows syslog RELP for event notifications. • This value shall indicate the destination follows the Reliable Event Logging Protocol (RELP) transport for syslog as defined by www.rsyslog.com.
SyslogTCP *(v1.9+)*	The destination follows syslog TCP-based for event notifications. • This value shall indicate the destination follows the TCP-based transport for syslog as defined in RFC6587.
SyslogTLS *(v1.9+)*	The destination follows syslog TLS-based for event notifications. • This value shall indicate the destination follows the TLS-based transport for syslog as defined in RFC5424.
SyslogUDP *(v1.9+)*	The destination follows syslog UDP-based for event notifications. • This value shall indicate the destination follows the UDP-based transport for syslog as defined in RFC5424.

6.34.5.9 SubscriptionType:

The subscription type for events.

- This property shall indicate the type of subscription for events. If this property is not present, the SubscriptionType shall be assumed to be RedfishEvent.

string	Description
OEM *(v1.9+)*	The subscription is an OEM subscription. • This value shall indicate an OEM subscription type. The OEMSubscriptionType property shall contain the specific OEM subscription type.
RedfishEvent	The subscription follows the Redfish Specification for event notifications. To send an event notification, a service sends an HTTP POST to the subscriber's destination URI.
SNMPInform *(v1.7+)*	The subscription follows versions 2 and 3 of SNMP Inform for event notifications. • This value shall indicate the subscription follows versions 2 and 3 of SNMP Inform for event notifications. Protocol shall specify the appropriate version of SNMP.

string	Description
SNMPTrap *(v1.7+)*	The subscription follows the various versions of SNMP Traps for event notifications. • This value shall indicate the subscription follows the various versions of SNMP Traps for event notifications. Protocol shall specify the appropriate version of SNMP.
SSE	The subscription follows the HTML5 server-sent event definition for event notifications.
Syslog *(v1.9+)*	The subscription sends Syslog messages for event notifications. • This value shall indicate the subscription forwards syslog messages to the event destination. Protocol shall specify the appropriate syslog protocol.

6.34.6 Example response

```
{
    "@odata.type": "#EventDestination.v1_12_0.EventDestination",
    "Id": "1",
    "Name": "WebUser3 subscribes to all Redfish events",
    "Destination": "http://www.dnsname.com/Destination1",
    "SubscriptionType": "RedfishEvent",
    "DeliveryRetryPolicy": "TerminateAfterRetries",
    "RegistryPrefixes": [],
    "MessageIds": [],
    "OriginResources": [],
    "ResourceTypes": [],
    "Status": {
        "State": "Enabled"
    },
    "Actions": {
        "#EventDestination.ResumeSubscription": {
            "target": "/redfish/v1/EventService/Subscriptions/1/Actions/EventDestination.ResumeSubscription"
        }
    },
    "Context": "WebUser3",
    "Protocol": "Redfish",
    "@odata.id": "/redfish/v1/EventService/Subscriptions/1"
}
```

6.35 EventService 1.8.0

Version	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2020.2	2020.1	2019.3	2019.2	2019.1	2018.2	2018.1	1.0

6.35.1 Description

The EventService schema contains properties for managing event subscriptions and generates the events sent to subscribers. The resource has links to the actual collection of subscriptions, which are called event destinations.

- This resource shall represent an event service for a Redfish implementation.

6.35.2 URIs

/redfish/v1/EventService

6.35.3 Properties

Property	Type	Attributes	Notes
DeliveryRetryAttempts	integer	*read-write*	The number of times that the POST of an event is retried before the subscription terminates. This retry occurs at the service level, which means that the HTTP POST to the event destination fails with an HTTP `4XX` or `5XX` status code or an HTTP timeout occurs this many times before the event destination subscription terminates. • This property shall contain the number of times that the POST of an event is retried before the subscription terminates. This retry occurs at the service level, which means that the HTTP POST to the event destination fails with an HTTP `4XX` or `5XX` status code or an HTTP timeout occurs this many times before the event destination subscription terminates.
DeliveryRetryIntervalSeconds	integer (seconds)	*read-write*	The interval, in seconds, between retry attempts for sending any event. • This property shall contain the interval, in seconds, between the retry attempts for any event sent to the subscription destination.
EventFormatTypes *(v1.2+)* [ ]	array (string (enum))	*read-only (null)*	• The content types of the message that this service can send to the event destination. ◦ This property shall contain the content types of the message that this service can send to the event destination. If this property is not present, the EventFormatType shall be assumed to be `Event`. *For the possible property values, see EventFormatTypes in Property details.*

Property	Type	Attributes	Notes
EventTypesForSubscription *(deprecated v1.3)* [ ]	array (string (enum))	*read-only*	• The types of events to which a client can subscribe. ◦ This property shall contain the types of events to which a client can subscribe. The semantics associated with the enumeration values are defined in the Redfish Specification. *For the possible property values, see EventTypesForSubscription in Property details. Deprecated in v1.3 and later. This property has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the RegistryPrefix and ResourceType properties and not on the EventType property.*
ExcludeMessageId *(v1.8+)*	boolean	*read-only*	An indication of whether the service supports filtering by the ExcludeMessageIds property. • This property shall indicate whether this service supports filtering by the ExcludeMessageIds property.
ExcludeRegistryPrefix *(v1.8+)*	boolean	*read-only*	An indication of whether the service supports filtering by the ExcludeRegistryPrefixes property. • This property shall indicate whether this service supports filtering by the ExcludeRegistryPrefixes property.
IncludeOriginOfConditionSupported *(v1.6+)*	boolean	*read-only* *(null)*	An indication of whether the service supports including the resource payload of the origin of condition in the event payload. • This property shall indicate whether the service supports including the resource payload of the origin of condition in the event payload. If `true`, event subscriptions are allowed to specify the IncludeOriginOfCondition property.
RegistryPrefixes *(v1.2+)* [ ]	array (string, null)	*read-only*	The list of the prefixes of the message registries that can be used for the RegistryPrefixes or ExcludeRegistryPrefixes properties on a subscription. If this property is absent or contains an empty array, the service does not support RegistryPrefix-based subscriptions. • This property shall contain the array of the prefixes of the message registries that shall be allowed or excluded for an event subscription.
ResourceTypes *(v1.2+)* [ ]	array (string, null)	*read-only*	The list of @odata.type values, or schema names, that can be specified in the ResourceTypes array in a subscription. If this property is absent or contains an empty array, the service does not support resource type-based subscriptions. • This property shall specify an array of the valid @odata.type values that can be used for an event subscription.

Property	Type	Attributes	Notes
ServerSentEventUri *(v1.1+)*	string (URI)	*read-only*	The link to a URI for receiving Server-Sent Event representations for the events that this service generates. • This property shall contain a URI that specifies an HTML5 Server-Sent Event-conformant endpoint.
ServiceEnabled	boolean	*read-write (null)*	An indication of whether this service is enabled. If `false`, events are no longer published, new SSE connections cannot be established, and existing SSE connections are terminated. • This property shall indicate whether this service is enabled. If `false`, events are no longer published, new SSE connections cannot be established, and existing SSE connections are terminated.
SMTP *(v1.5+)* {	object		Settings for SMTP event delivery. • This property shall contain settings for SMTP event delivery.
Authentication *(v1.5+)*	string (enum)	*read-write (null)*	The authentication method for the SMTP server. • This property shall contain the authentication method for the SMTP server. *For the possible property values, see Authentication in Property details.*
ConnectionProtocol *(v1.5+)*	string (enum)	*read-write (null)*	The connection type to the outgoing SMTP server. • This property shall contain the connection type to the outgoing SMTP server. *For the possible property values, see ConnectionProtocol in Property details.*
FromAddress *(v1.5+)*	string	*read-write (null)*	The 'from' email address of the outgoing email. • This property shall contain the email address to use for the 'from' field in an outgoing email.
Password *(v1.5+)*	string	*read-write (null)*	The password for authentication with the SMTP server. The value is `null` in responses. • This property shall contain the password for authentication with the SMTP server. The value shall be `null` in responses.
Port *(v1.5+)*	integer	*read-write (null)*	The destination SMTP port. • This property shall contain the destination port for the SMTP server.

Property	Type	Attributes	Notes
ServerAddress *(v1.5+)*	string	*read-write (null)*	The address of the SMTP server. • This property shall contain the address of the SMTP server for outgoing email.
ServiceEnabled *(v1.5+)*	boolean	*read-write (null)*	An indication if SMTP for event delivery is enabled. • This property shall indicate if SMTP for event delivery is enabled.
Username *(v1.5+)*	string	*read-write (null)*	The username for authentication with the SMTP server. • This property shall contain the username for authentication with the SMTP server.
}			
SSEFilterPropertiesSupported *(v1.2+)* {	object		The set of properties that are supported in the `$filter` query parameter for the ServerSentEventUri. • This property shall contain the properties that are supported in the `$filter` query parameter for the URI indicated by the ServerSentEventUri property, as described by the Redfish Specification.
EventFormatType *(v1.2+)*	boolean	*read-only*	An indication of whether the service supports filtering by the EventFormatType property. • This property shall indicate whether this service supports filtering by the EventFormatType property.
EventType *(v1.2+, deprecated v1.3*	boolean	*read-only*	An indication of whether the service supports filtering by the EventTypes property. • This property shall indicate whether this service supports filtering by the EventTypes property. *Deprecated in v1.3 and later. This property has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the RegistryPrefix and ResourceType properties and not on the EventType property.*
MessageId *(v1.2+)*	boolean	*read-only*	An indication of whether the service supports filtering by the MessageIds property. • This property shall indicate whether this service supports filtering by the MessageIds property.

Property	Type	Attributes	Notes
MetricReportDefinition *(v1.2+)*	boolean	*read-only*	An indication of whether the service supports filtering by the MetricReportDefinitions property. • This property shall indicate whether this service supports filtering by the MetricReportDefinitions property.
OriginResource *(v1.2+)*	boolean	*read-only*	An indication of whether the service supports filtering by the OriginResources property. • This property shall indicate whether this service supports filtering by the OriginResources property.
RegistryPrefix *(v1.2+)*	boolean	*read-only*	An indication of whether the service supports filtering by the RegistryPrefixes property. • This property shall indicate whether this service supports filtering by the RegistryPrefixes property.
ResourceType *(v1.2+)*	boolean	*read-only*	An indication of whether the service supports filtering by the ResourceTypes property. • This property shall indicate whether this service supports filtering by the ResourceTypes property.
SubordinateResources *(v1.4+)*	boolean	*read-only*	An indication of whether the service supports filtering by the SubordinateResources property. • This property shall indicate whether this service supports filtering by the SubordinateResources property.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SubordinateResourcesSupported *(v1.2+)*	boolean	*read-only* *(null)*	An indication of whether the service supports the SubordinateResources property on both event subscriptions and generated events. • This property shall indicate whether the service supports the SubordinateResources property on both event subscriptions and generated events.

Property	Type	Attributes	Notes
Subscriptions {	object		The link to a collection of event destinations. • This property shall contain the link to a resource collection of type EventDestinationCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *EventDestination*. See the EventDestination schema for details.
}			

6.35.4 Actions

6.35.4.1 SubmitTestEvent

Description

This action generates a test event.

- This action shall add a test event to the event service with the event data specified in the action parameters. Then, this message should be sent to any appropriate event destinations.

Action URI: {Base URI of target resource}/Actions/EventService.SubmitTestEvent

Action parameters

Parameter Name	Type	Attributes	Notes
EventGroupId *(v1.3+)*	integer	*optional*	The group identifier for the event. • The parameter shall contain the group identifier for the event. It has the same semantics as the EventGroupId property in the Event schema for Redfish.
EventId	string	*optional*	The ID for the event to add. • This parameter shall have the same semantics as the EventId property in the Event schema for Redfish. A service can ignore this value and replace it with its own.
EventTimestamp	string (date-time)	*optional*	The date and time for the event to add. • This parameter shall contain the date and time for the event to add and have the same semantics as the EventTimestamp property in the Event schema for Redfish.

Parameter Name	Type	Attributes	Notes
EventType *(deprecated v1.3)*	string (enum)	*optional*	The type for the event to add. • This parameter shall contain the property name for which the following allowable values apply. *For the possible property values, see EventType in Property details. Deprecated in v1.3 and later. This parameter has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the RegistryPrefix and ResourceType properties and not on the EventType property.*
Message	string	*optional*	The human-readable message for the event to add. • This parameter shall have the same semantics as the Message property in the Event schema for Redfish.
MessageArgs [ ]	array (string)	*optional*	An array of message arguments for the event to add. • This parameter shall have the same semantics as the MessageArgs property in the Event schema for Redfish.
MessageId	string	*required*	The MessageId for the event to add. • This parameter shall contain the MessageId for the event to add and have the same semantics as the MessageId property in the Event schema for Redfish.
OriginOfCondition	string (URI)	*optional*	The URL in the OriginOfCondition property of the event to add. It is not a reference object. • This parameter shall be a string that represents the URL contained by the OriginOfCondition property in the Event schema for Redfish.
Severity	string	*optional*	The severity for the event to add. • This parameter shall contain the severity for the event to add and have the same semantics as the Severity property in the Event schema for Redfish.

Request Example

```
{
    "EventId": "5",
    "EventTimestamp": "2016-01-10T18:02:00Z",
    "Severity": "Critical",
    "Message": "Fan 2 crossed Lower Fatal Threshold; fans are no longer redundant",
    "MessageId": "Event.1.0.FanWayTooSlow",
    "MessageArgs": [
        "2"
    ],
    "OriginOfCondition": "/redfish/v1/Chassis/MultiBladeEncl/Thermal"
```

```
}
```

6.35.5 Property details

6.35.5.1 Authentication:

The authentication method for the SMTP server.

- This property shall contain the authentication method for the SMTP server.

string	Description
AutoDetect	Auto-detect. • This value shall indicate authentication is auto-detected.
CRAM_MD5	CRAM-MD5 authentication. • This value shall indicate authentication conforms to the RFC4954-defined AUTH CRAM-MD5 mechanism.
Login *(deprecated v1.7)*	LOGIN authentication. • This value shall indicate authentication conforms to the RFC4954-defined AUTH LOGIN mechanism. *Deprecated in v1.7 and later. This value has been deprecated in favor of `Plain`, which supersedes the LOGIN authentication method for SASL.*
None	No authentication. • This value shall indicate authentication is not required.
Plain	PLAIN authentication. • This value shall indicate authentication conforms to the RFC4954-defined AUTH PLAIN mechanism.

6.35.5.2 ConnectionProtocol:

The connection type to the outgoing SMTP server.

- This property shall contain the connection type to the outgoing SMTP server.

string	Description
AutoDetect	Auto-detect. • This value shall indicate the connection is auto-detected.
None	Clear text. • This value shall indicate the connection is in clear text.
StartTLS	StartTLS. • This value shall indicate the connection conforms to the RFC3207-defined StartTLS extension.
TLS_SSL	TLS/SSL. • This value shall indicate the connection is TLS/SSL.

6.35.5.3 EventFormatTypes:

- The content types of the message that this service can send to the event destination.
  - This property shall contain the content types of the message that this service can send to the event destination. If this property is not present, the EventFormatType shall be assumed to be `Event`.

string	Description
Event	The subscription destination receives an event payload. • The subscription destination shall receive an event payload as defined by the value of the Protocol property.
MetricReport	The subscription destination receives a metric report. • The subscription destination shall receive a metric report payload as defined by the value of the Protocol property.

6.35.5.4 EventType:

The type for the event to add.

- This parameter shall contain the property name for which the following allowable values apply.

string	Description
Alert	A condition requires attention.

string	Description
MetricReport	The telemetry service is sending a metric report. • Events of type `MetricReport` shall be sent to a client in accordance with the MetricReport schema definition.
Other	Because EventType is deprecated as of Redfish Specification v1.6, the event is based on a registry or resource but not an EventType. • Events of type `Other` shall be sent to a client in accordance with subscriptions to RegistryPrefixes or ResourceTypes.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
ResourceUpdated	A resource has been updated.
StatusChange	The status of a resource has changed.

6.35.5.5 EventTypesForSubscription:

- The types of events to which a client can subscribe.
  - This property shall contain the types of events to which a client can subscribe. The semantics associated with the enumeration values are defined in the Redfish Specification.

string	Description
Alert	A condition requires attention.
MetricReport	The telemetry service is sending a metric report. • Events of type `MetricReport` shall be sent to a client in accordance with the MetricReport schema definition.
Other	Because EventType is deprecated as of Redfish Specification v1.6, the event is based on a registry or resource but not an EventType. • Events of type `Other` shall be sent to a client in accordance with subscriptions to RegistryPrefixes or ResourceTypes.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
ResourceUpdated	A resource has been updated.
StatusChange	The status of a resource has changed.

6.35.6 Example response


```
{
    "@odata.type": "#EventService.v1_8_0.EventService",
    "Id": "EventService",
    "Name": "Event Service",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "ServiceEnabled": true,
    "DeliveryRetryAttempts": 3,
    "DeliveryRetryIntervalSeconds": 60,
    "EventTypesForSubscription": [
        "StatusChange",
        "ResourceUpdated",
        "ResourceAdded",
        "ResourceRemoved",
        "Alert",
        "Other"
    ],
    "ServerSentEventUri": "/redfish/v1/EventService/SSE",
    "SSEFilterPropertiesSupported": {
        "EventType": true,
        "MetricReportDefinition": false,
        "RegistryPrefix": true,
        "ResourceType": true,
        "EventFormatType": false,
        "MessageId": true,
        "OriginResource": true,
        "SubordinateResources": true
    },
    "Subscriptions": {
        "@odata.id": "/redfish/v1/EventService/Subscriptions"
    },
    "Actions": {
        "#EventService.SubmitTestEvent": {
            "target": "/redfish/v1/EventService/Actions/EventService.SubmitTestEvent",
            "@Redfish.ActionInfo": "/redfish/v1/EventService/SubmitTestEventActionInfo"
        },
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/EventService"
}
```

6.36 ExternalAccountProvider 1.4.1

Version	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2021.2	2020.4	2018.3	2018.1

6.36.1 Description

The ExternalAccountProvider schema represents a remote service that provides accounts for this manager to use for authentication.

- This resource shall represent a remote authentication service in the Redfish Specification.

6.36.2 URIs

/redfish/v1/AccountService/ExternalAccountProviders/*{ExternalAccountProviderId}*
/redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/ExternalAccountProviders/*{ExternalAccountProviderId}*

6.36.3 Properties

Property	Type	Attributes	Notes
AccountProviderType	string (enum)	*read-only required on create (null)*	The type of external account provider to which this service connects. • This property shall contain the type of external account provider to which this service connects. *For the possible property values, see AccountProviderType in Property details.*
Authentication {	object		The authentication information for the external account provider. • This property shall contain the authentication information for the external account provider.
AuthenticationType	string (enum)	*read-write (null)*	The type of authentication used to connect to the external account provider. • This property shall contain the type of authentication used to connect to the external account provider. *For the possible property values, see AuthenticationType in Property details.*

Property	Type	Attributes	Notes
EncryptionKey *(v1.2+)*	string	*read-write (null)*	Specifies the encryption key. • This property shall contain the value of a symmetric encryption key for account services that support some form of encryption, obfuscation, or authentication such as TACACS+. The value shall be `null` in responses. The property shall accept a hexadecimal string whose length depends on the external account service, such as TACACS+. A TACACS+ service shall use this property to specify the secret key as defined in RFC8907. Pattern: `^[0-9a-fA-F]+$`
EncryptionKeySet *(v1.2+)*	boolean	*read-only (null)*	Indicates if the EncryptionKey property is set. • This property shall contain `true` if a valid value was provided for the EncryptionKey property. Otherwise, the property shall contain `false`. For a TACACS+ service, the value `false` shall indicate data obfuscation, as defined in section 4.5 of RFC8907, is disabled.
KerberosKeytab	string	*read-write (null)*	The Base64-encoded version of the Kerberos keytab for this service. A PATCH or PUT operation writes the keytab. This property is `null` in responses. • This property shall contain a Base64-encoded version of the Kerberos keytab for this service. A PATCH or PUT operation writes the keytab. The value shall be `null` in responses.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Password	string	*read-write (null)*	The password for this service. A PATCH or PUT request writes the password. This property is `null` in responses. • This property shall contain the password for this service. A PATCH or PUT operation writes the password. The value shall be `null` in responses.
Token	string	*read-write (null)*	The token for this service. A PATCH or PUT operation writes the token. This property is `null` in responses. • This property shall contain the token for this service. A PATCH or PUT operation writes the token. The value shall be `null` in responses.
Username	string	*read-write*	The user name for the service. • This property shall contain the user name for this service.
}			

Property	Type	Attributes	Notes
Certificates *(v1.1+)* {	object		The link to a collection of certificates that the external account provider uses. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates the external account provider uses. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
LDAPService {	object		The additional mapping information needed to parse a generic LDAP service. • This property shall contain any additional mapping information needed to parse a generic LDAP service. This property should only be present if AccountProviderType is `LDAPService`.
Oem {}	object		See the OEM object definition in the Using this guide clause.
SearchSettings {	object		The required settings to search an external LDAP service. • This property shall contain the required settings to search an external LDAP service.
BaseDistinguishedNames [ ]	array (string, null)	*read-write*	The base distinguished names to use to search an external LDAP service. • This property shall contain an array of base distinguished names to use to search an external LDAP service.
GroupNameAttribute	string	*read-write (null)*	The attribute name that contains the LDAP group name entry. • This property shall contain the attribute name that contains the LDAP group name.
GroupsAttribute	string	*read-write (null)*	The attribute name that contains the groups for a user on the LDAP user entry. • This property shall contain the attribute name that contains the groups for an LDAP user entry.
SSHKeyAttribute *(v1.4+)*	string	*read-write (null)*	The attribute name that contains the LDAP user's SSH public key entry. • This property shall contain the attribute name that contains the LDAP user's SSH public key.

Property	Type	Attributes	Notes
UsernameAttribute	string	*read-write (null)*	The attribute name that contains the LDAP user name entry. • This property shall contain the attribute name that contains the LDAP user name.
}			
}			
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
OAuth2Service *(v1.3+)* {	object	*(null)*	The additional information needed to parse an OAuth 2.0 service. • This property shall contain additional information needed to parse an OAuth 2.0 service. This property should only be present inside an OAuth2 property.
Audience *(v1.3+)* [ ]	array (string)	*read-only*	The allowable audience strings of the Redfish service. • This property shall contain an array of allowable RFC7519-defined audience strings of the Redfish service. The values shall uniquely identify the Redfish service. For example, a MAC address or UUID for the manager can uniquely identify the service.
Issuer *(v1.3+)*	string	*read-write (null)*	The issuer string of the OAuth 2.0 service. Clients should configure this property if Mode contains `Offline`. • This property shall contain the RFC8414-defined issuer string of the OAuth 2.0 service. If the Mode property contains the value `Discovery`, this property shall contain the value of the `issuer` string from the OAuth 2.0 service's metadata and this property shall be read-only. Clients should configure this property if Mode contains `Offline`.
Mode *(v1.3+)*	string (enum)	*read-write*	The mode of operation for token validation. • This property shall contain the mode of operation for token validation. *For the possible property values, see Mode in Property details.*

Property	Type	Attributes	Notes
OAuthServiceSigningKeys *(v1.3+)*	string	*read-write (null)*	The Base64-encoded signing keys of the issuer of the OAuth 2.0 service. Clients should configure this property if Mode contains `Offline`. • This property shall contain a Base64-encoded string of the RFC7517-defined signing keys of the issuer of the OAuth 2.0 service. If the Mode property contains the value `Discovery`, this property shall contain the keys found at the URI specified by the `jwks_uri` string from the OAuth 2.0 service's metadata and this property shall be read-only. Clients should configure this property if Mode contains `Offline`.
}			
Priority *(v1.2+)*	integer	*read-write (null)*	The authentication priority for the external account provider. • This property shall contain the assigned priority for the specified external account provider. The value `0` value shall indicate the highest priority. Increasing values shall represent decreasing priority. If an external provider does not have a priority assignment or two or more external providers have the same priority, the behavior shall be determined by the Redfish service. The priority is used to determine the order of authentication and authorization for each external account provider.
RemoteRoleMapping [{	array		The mapping rules to convert the external account providers account information to the local Redfish role. • This property shall contain a set of the mapping rules that are used to convert the external account providers account information to the local Redfish role.
LocalRole	string	*read-write (null)*	The name of the local Redfish role to which to map the remote user or group. • This property shall contain the RoleId property value within a role resource on this Redfish service to which to map the remote user or group.
Oem {}	object		See the OEM object definition in the Using this guide clause.
RemoteGroup	string	*read-write (null)*	The name of the remote group, or the remote role in the case of a Redfish service, that maps to the local Redfish role to which this entity links. • This property shall contain the name of the remote group, or the remote role in the case of a Redfish service, that maps to the local Redfish role to which this entity links.

Property	Type	Attributes	Notes
RemoteUser	string	*read-write (null)*	The name of the remote user that maps to the local Redfish role to which this entity links. • This property shall contain the name of the remote user that maps to the local Redfish role to which this entity links.
}]			
ServiceAddresses [ ]	array (string, null)	*read-write*	The addresses of the user account providers to which this external account provider links. The format of this field depends on the type of external account provider. • This property shall contain the addresses of the account providers to which this external account provider links. The format of this field depends on the type of external account provider. Each item in the array shall contain a single address. Services can define their own behavior for managing multiple addresses.
ServiceEnabled	boolean	*read-write (null)*	An indication of whether this service is enabled. • This property shall indicate whether this service is enabled.
TACACSplusService *(v1.2+)* {	object	*(null)*	The additional information needed to parse a TACACS+ services. • This property shall contain additional information needed to parse a TACACS+ services. This property should only be present inside a TACACSplus property.
PasswordExchangeProtocols *(v1.2+)* [ ]	array (string (enum))	*read-write (null)*	• Indicates the allowed TACACS+ password exchange protocols. ◦ This property shall indicate all the allowed TACACS+ password exchange protocol described under section 5.4.2 of RFC8907. *For the possible property values, see PasswordExchangeProtocols in Property details.*
PrivilegeLevelArgument *(v1.2+)*	string	*read-write (null)*	Indicates the name of the TACACS+ argument name in an authorization request. • This property shall specify the name of the argument in a TACACS+ Authorization REPLY packet body, as defined in RFC8907, that contains the user's privilege level.
}			

6.36.4 Property details

6.36.4.1 AccountProviderType:

The type of external account provider to which this service connects.

- This property shall contain the type of external account provider to which this service connects.

string	Description
ActiveDirectoryService	An external Active Directory service. • The external account provider shall be a Microsoft Active Directory Technical Specification-conformant service. The ServiceAddresses format shall contain a set of fully qualified domain names (FQDN) or NetBIOS names that links to the set of domain servers for the Active Directory service.
LDAPService	A generic external LDAP service. • The external account provider shall be an RFC4511-conformant service. The ServiceAddresses format shall contain a set of fully qualified domain names (FQDN) that links to the set of LDAP servers for the service.
OAuth2 *(v1.3+)*	An external OAuth 2.0 service. • The external account provider shall be an RFC6749-conformant service. The ServiceAddresses format shall contain a set of URIs that correspond to the RFC8414-defined metadata for the OAuth 2.0 service.
OEM	An OEM-specific external authentication or directory service.
RedfishService	An external Redfish service. • The external account provider shall be a DMTF Redfish Specification-conformant service. The ServiceAddresses format shall contain a set of URIs that correspond to a Redfish account service.
TACACSplus *(v1.3+)*	An external TACACS+ service. • The external account provider shall be an RFC8907-conformant service. The ServiceAddresses format shall contain a set of host:port that correspond to a TACACS+ service and where the format for host and port are defined in RFC3986.

6.36.4.2 AuthenticationType:

The type of authentication used to connect to the external account provider.

- This property shall contain the type of authentication used to connect to the external account provider.

string	Description
KerberosKeytab	A Kerberos keytab.
OEM	An OEM-specific authentication mechanism.
Token	An opaque authentication token.
UsernameAndPassword	A user name and password combination.

6.36.4.3 Mode:

The mode of operation for token validation.

- This property shall contain the mode of operation for token validation.

string	Description
Discovery	OAuth 2.0 service information for token validation is downloaded by the service. • This value shall indicate the service performs token validation from information found at the URIs specified by the ServiceAddresses property. Services shall implement a caching method of this information so it's not necessary to retrieve metadata and key information for every request containing a token.
Offline	OAuth 2.0 service information for token validation is configured by a client. Clients should configure the Issuer and OAuthServiceSigningKeys properties for this mode. • This value shall indicate the service performs token validation from properties configured by a client. Clients should configure the Issuer and OAuthServiceSigningKeys properties for this mode.

6.36.4.4 PasswordExchangeProtocols:

- Indicates the allowed TACACS+ password exchange protocols.
  - This property shall indicate all the allowed TACACS+ password exchange protocol described under section 5.4.2 of RFC8907.

string	Description
ASCII	The ASCII Login method. • This value shall indicate the ASCII Login flow as described under section 5.4.2 of RFC8907.

string	Description
CHAP	The CHAP Login method. • This value shall indicate the CHAP Login flow as described under section 5.4.2 of RFC8907.
MSCHAPv1	The MS-CHAP v1 Login method. • This value shall indicate the MS-CHAP v1 Login flow as described under section 5.4.2 of RFC8907.
MSCHAPv2	The MS-CHAP v2 Login method. • This value shall indicate the MS-CHAP v2 Login flow as described under section 5.4.2 of RFC8907.
PAP	The PAP Login method. • This value shall indicate the PAP Login flow as described under section 5.4.2 of RFC8907.

6.36.5 Example response


```
{
    "@odata.type": "#ExternalAccountProvider.v1_4_1.ExternalAccountProvider",
    "Id": "ExternalRedfishService",
    "Name": "Remote Redfish Service",
    "Description": "Remote Redfish Service providing additional Accounts to this Redfish Service",
    "AccountProviderType": "RedfishService",
    "ServiceAddresses": [
        "http://redfish.dmtf.org/redfish/v1/AccountService"
    ],
    "Authentication": {
        "AuthenticationType": "Token",
        "Token": null
    },
    "RemoteRoleMapping": [
        {
            "RemoteGroup": "Admin",
            "LocalRole": "Administrator"
        },
        {
            "RemoteGroup": "Operator",
            "LocalRole": "Operator"
        },
        {
            "RemoteGroup": "ReadOnly",
            "LocalRole": "ReadOnly"
        }
    ],
    "@odata.id": "/redfish/v1/AccountService/ExternalAccountProviders/ExternalRedfishService"
```

```
}
```

6.37 Fabric 1.3.0

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2021.4	2020.3	2019.4	2016.2

6.37.1 Description

The Fabric schema represents a simple fabric consisting of one or more switches, zero or more endpoints, and zero or more zones.

- This resource shall represent a simple switchable fabric for a Redfish implementation.

6.37.2 URIs

/redfish/v1/Fabrics/*{FabricId}*

6.37.3 Properties

Property	Type	Attributes	Notes
AddressPools *(v1.1+)* {	object		The collection of links to the address pools that this fabric contains. • This property shall contain a link to a resource collection of type AddressPoolCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *AddressPool*. See the AddressPool schema for details.
}			
Connections *(v1.2+)* {	object		The collection of links to the connections that this fabric contains. • This property shall contain a link to a resource collection of type ConnectionCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Connection*. See the Connection schema for details.

Property	Type	Attributes	Notes
}			
EndpointGroups *(v1.2+)* {	object		The collection of links to the endpoint groups that this fabric contains. • This property shall contain a link to a resource collection of type EndpointGroupCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *EndpointGroup*. See the EndpointGroup schema for details.
}			
Endpoints {	object		The collection of links to the endpoints that this fabric contains. • This property shall contain a link to a resource collection of type EndpointCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Endpoint*. See the Endpoint schema for details.
}			
FabricType	string (enum)	*read-only* *(null)*	The protocol being sent over this fabric. • This property shall contain the type of fabric being represented by this simple fabric. *For the possible property values, see FabricType in Property details.*
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
MaxZones	integer	*read-only* *(null)*	The maximum number of zones the switch can currently configure. • This property shall contain the maximum number of zones the switch can currently configure. Changes in the logical or physical configuration of the system can change this value.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
Switches {	object		The collection of links to the switches that this fabric contains. • This property shall contain a link to a resource collection of type SwitchCollection. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to Collection of *Switch*. See the Switch schema for details.
}			
UUID *(v1.3+)*	string	*read-write (null)*	The UUID for this fabric. • This property shall contain a universal unique identifier number for the fabric. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`
Zones {	object		The collection of links to the zones that this fabric contains. • This property shall contain a link to a resource collection of type ZoneCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Zone*. See the Zone schema for details.
}			

6.37.4 Property details

6.37.4.1 FabricType:

The protocol being sent over this fabric.

- This property shall contain the type of fabric being represented by this simple fabric.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.

string	Description
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.

string	Description
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.

string	Description
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.

string	Description
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.37.5 Example response

```
{
    "@odata.type": "#Fabric.v1_3_0.Fabric",
    "Id": "SAS",
    "Name": "SAS Fabric",
    "FabricType": "SAS",
    "Description": "A SAS Fabric with redundant switches connected to two initiators",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Zones": {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Zones"
    },
    "Endpoints": {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints"
    },
    "Switches": {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Switches"
    },
    "Links": {
        "Oem": {}
    },
    "Actions": {
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/SAS"
}
```

6.38 FabricAdapter 1.4.0

Version	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*

Release	2022.2	2022.1	2021.3	2021.2	2019.4

6.38.1 Description

A FabricAdapter represents the physical fabric adapter capable of connecting to an interconnect fabric. Examples include but are not limited to Ethernet, NVMe over Fabrics, Gen-Z, and SAS fabric adapters.

- A FabricAdapter represents the physical Fabric adapter capable of connecting to an interconnect fabric. Examples include but are not limited to Ethernet, NVMe over Fabrics, Gen-Z, and SAS fabric adapters.

6.38.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*
/redfish/v1/CompositionService/Resourceblocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*
/redfish/v1/Resourceblocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*

6.38.3 Properties

Property	Type	Attributes	Notes
ASICManufacturer	string	*read-only (null)*	The manufacturer name for the ASIC of this fabric adapter. • This property shall contain the manufacturer name of the ASIC for the fabric adapter as defined by the manufacturer.
ASICPartNumber	string	*read-only (null)*	The part number for the ASIC on this fabric adapter. • This property shall contain the part number of the ASIC for the fabric adapter as defined by the manufacturer.
ASICRevisionIdentifier	string	*read-only (null)*	The revision identifier for the ASIC on this fabric adapter. • This property shall contain the revision identifier of the ASIC for the fabric adapter as defined by the manufacturer.
FabricType *(v1.3+)*	string (enum)	*read-write*	The configured fabric type of this fabric adapter. • This property shall contain the configured fabric type of this fabric adapter. *For the possible property values, see FabricType in Property details.*

Property	Type	Attributes	Notes
FabricTypeCapabilities *(v1.3+)* [ ]	array (string (enum))	*read-only*	• An array of fabric types supported by this fabric adapter. ◦ This property shall contain an array of fabric types supported by this fabric adapter. *For the possible property values, see FabricTypeCapabilities in Property details.*
FirmwareVersion	string	*read-only* *(null)*	The firmware version of this fabric adapter. • This property shall contain the firmware version for the fabric adapter as defined by the manufacturer.
GenZ {	object		The Gen-Z specific properties for this fabric adapter. • This property shall contain the Gen-Z specific properties for this fabric adapter.
MSDT {	object		The Multi Subnet Destination Table for the component. • This property shall contain a link to a Resource Collection of type RouteEntryCollection, and shall represent the Gen-Z Core Specification-defined MSDT structure. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *RouteEntry*. See the RouteEntry schema for details.
}			
PIDT [ ]	array (string, null)	*read-write*	An array of table entry values for the Packet Injection Delay Table. • This property shall contain an array of table entry values for the Gen-Z Core Specification-defined Packet Injection Delay Table for the component.
RequestorVCAT {	object		The Requestor Virtual Channel Action Table for the component. • This property shall contain a link to a Resource Collection of type VCATEntryCollection, and shall represent the Gen-Z Core Specification-defined REQ-VCAT structure. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *VCATEntry*. See the VCATEntry schema for details.
}			
ResponderVCAT {	object		The Responder Virtual Channel Action Table for the component. • This property shall contain a link to a Resource Collection of type VCATEntryCollection, and shall represent the Gen-Z Core Specification-defined RSP-VCAT structure. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *VCATEntry*. See the VCATEntry schema for details.

Property	Type	Attributes	Notes
}			
RITable [ ]	array (string, null)	*read-write*	An array of table entry values for the Responder Interface Table. • This property shall contain an array of table entry values for the Gen-Z Core Specification-defined Responder Interface Table for the component.
SSDT {	object		The Single Subnet Destination Table for the component. • This property shall contain a link to a Resource Collection of type RouteEntryCollection, and shall represent the Gen-Z Core Specification-defined SSDT structure. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *RouteEntry*. See the RouteEntry schema for details.
}			
}			
Links {	object		The links to other Resources that are related to this Resource. • The Redfish Specification-described Links Property shall contain links to Resources related to but not subordinate to this Resource.
Endpoints [{	array		An array of links to the endpoints that represent the logical fabric connection to this fabric adapter. • This property shall contain an array of links to Resources of type Endpoint that represents the logical fabric connection associated with this fabric adapter.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
MemoryDomains *(v1.3+)* [{	array		An array of links to the memory domains associated with this fabric adapter. • This property shall contain an array of links to resources of type MemoryDomain that represent the memory domains associated with this fabric adapter.
@odata.id	string	*read-write*	Link to a MemoryDomain resource. See the Links section and the *MemoryDomain* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PCIeDevices *(v1.2+)* [{	array		An array of links to the PCIe devices associated with this fabric adapter. • This property shall contain an array of links to resources of type PCIeDevice that represent the PCIe devices associated with this fabric adapter.
@odata.id	string	*read-only*	Link to a PCIeDevice resource. See the Links section and the *PCIeDevice* schema for details.
}]			
}			
Location *(v1.1+)* {}	object		The location of the fabric adapter. • This property shall contain location information for the fabric adapter. For property details, see Location.
LocationIndicatorActive *(v1.4+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	*read-only (null)*	The manufacturer or OEM of this fabric adapter. • This property shall contain a value that represents the manufacturer of the fabric adapter.
Model	string	*read-only (null)*	The model string for this fabric adapter. • This property shall contain the information about how the manufacturer refers to this fabric adapter.
PartNumber	string	*read-only (null)*	The part number for this fabric adapter. • This property shall contain the part number for the fabric adapter as defined by the manufacturer.
PCIeInterface {	object		The PCIe interface details for this fabric adapter. • This property shall contain details on the PCIe interface that connects this PCIe-based fabric adapter to its host.
LanesInUse *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes in use by this device. • This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the MaxLanes property value.

Property	Type	Attributes	Notes
MaxLanes *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes supported by this device. • This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The highest version of the PCIe specification supported by this device. • This property shall contain the maximum PCIe specification that this device supports. *For the possible property values, see MaxPCIeType in Property details.*
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
PCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The version of the PCIe specification in use by this device. • This property shall contain the negotiated PCIe interface version in use by this device. *For the possible property values, see PCIeType in Property details.*
}			
Ports {	object		The link to the collection of ports that exist on the fabric adapter. • This property shall contain a link to a Resource Collection of type PortCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			
SerialNumber	string	*read-only (null)*	The serial number for this fabric adapter. • This property shall contain the serial number for the fabric adapter.
SKU	string	*read-only (null)*	The manufacturer SKU for this fabric adapter. • This property shall contain the SKU for the fabric adapter.
SparePartNumber	string	*read-only (null)*	The spare part number for this fabric adapter. • This property shall contain the spare part number for the fabric adapter as defined by the manufacturer.
Status {}	object		The status and health of the Resource and its subordinate or dependent Resources. • This property shall contain any status or health properties of the Resource. For property details, see Status.

Property	Type	Attributes	Notes
UUID	string	*read-only (null)*	The UUID for this fabric adapter. • This property shall contain a universal unique identifier number for the fabric adapter. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`

6.38.4 Property details

6.38.4.1 FabricType:

The configured fabric type of this fabric adapter.

- This property shall contain the configured fabric type of this fabric adapter.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.

string	Description
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.

string	Description
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.

string	Description
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.38.4.2 FabricTypeCapabilities:

- An array of fabric types supported by this fabric adapter.

- This property shall contain an array of fabric types supported by this fabric adapter.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.

string	Description
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.

string	Description
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.

string	Description
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.38.4.3 MaxPCIeType:

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.38.4.4 PCIeType:

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.38.5 Example response

```
{
    "@odata.type": "#FabricAdapter.v1_4_0.FabricAdapter",
    "Id": "Bridge",
    "Name": "Gen-Z Bridge",
    "Manufacturer": "Contoso",
    "Model": "Gen-Z Bridge Model X",
    "PartNumber": "975999-001",
    "SparePartNumber": "152111-A01",
    "SKU": "Contoso 2-port Gen-Z Bridge",
    "SerialNumber": "2M220100SL",
    "ASICRevisionIdentifier": "A0",
    "ASICPartNumber": "53312",
    "ASICManufacturer": "Contoso",
    "FirmwareVersion": "7.4.10",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Ports": {
        "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/Ports"
    },
    "PCIeInterface": {
        "MaxPCIeType": "Gen4",
        "MaxLanes": 64,
        "PCIeType": "Gen4",
        "LanesInUse": 64
```

```
    },
    "UUID": "45724775-ed3b-2214-1313-9865200c1cc1",
    "Links": {
        "Endpoints": [
            {
                "@odata.id": "/redfish/v1/Fabrics/GenZ/Endpoints/3"
            }
        ]
    },
    "GenZ": {
        "SSDT": {
            "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/SSDT"
        },
        "MSDT": {
            "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/MSDT"
        },
        "RequestorVCAT": {
            "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/REQ-VCAT"
        },
        "ResponderVCAT": {
            "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/RSP-VCAT"
        },
        "RITable": [
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E",
            "0x12",
            "0x3E"
        ],
        "PIDT": [
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
```

```
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
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            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568",
            "0x12234568"
        ]
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1"
}
```


6.39 Facility 1.3.0

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2021.3	2021.2	2020.4	2019.4

6.39.1 Description

The Facility schema represents the physical location containing equipment, such as a room, building, or campus.

- This resource shall be used to represent a location containing equipment, such as a room, building, or campus, for a Redfish implementation.

6.39.2 URIs

/redfish/v1/Facilities/*{FacilityId}*

6.39.3 Properties

Property	Type	Attributes	Notes
AmbientMetrics *(v1.1+)* {	object		The link to the ambient environment metrics for this facility. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the outdoor environment metrics for this facility. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			
EnvironmentMetrics *(v1.1+)* {	object		The link to the environment metrics for this facility. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the environment metrics for this facility. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			
FacilityType	string (enum)	*read-only* *required*	The type of location this resource represents. • This property shall contain the type of location this resource represents. *For the possible property values, see FacilityType in Property details.*
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ContainedByFacility {	object		The link to the facility that contains this facility. • This property shall contain a link to a resource of type Facility that represents the facility that contains this facility.
@odata.id	string	*read-write*	Link to another Facility resource.
}			

Property	Type	Attributes	Notes
ContainsChassis [{	array		An array of links to outermost chassis contained within this facility. • The value of this property shall be an array of links to resources of type Chassis that represent the outermost chassis that this facility contains. This array shall only contain chassis instances that do not include a ContainedBy property within the Links property. That is, only chassis instances that are not contained by another chassis.
@odata.id	string	*read-write*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			
ContainsFacilities [{	array		An array of links to other facilities contained within this facility. • The value of this property shall be an array of links to resources of type Facility that represent the facilities that this facility contains.
@odata.id	string	*read-write*	Link to another Facility resource.
}]			
ElectricalBuses *(v1.3+)* [{	array		An array of links to the electrical buses in this facility. • The value of this property shall contain an array of links to resources of type PowerDistribution that represent the electrical buses in this facility.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
FloorPDUs [{	array		An array of links to the floor power distribution units in this facility. • The value of this property shall be an array of links to resources of type PowerDistribution that represent the floor power distribution units in this facility.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
ManagedBy [{	array		An array of links to the managers responsible for managing this facility. • The value of this property shall be an array of links to resources of type Manager that represent the managers that manager this facility.
@odata.id	string	*read-only*	Link to a Manager resource. See the Links section and the *Manager* schema for details.

Property	Type	Attributes	Notes
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PowerShelves *(v1.2+)* [{	array		An array of links to the power shelves in this facility. • The value of this property shall be an array of links to resources of type PowerDistribution that represent the power shelves in this facility.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
RackPDUs [{	array		An array of links to the rack-level power distribution units in this facility. • The value of this property shall be an array of links to resources of type PowerDistribution that represent the rack-level power distribution units in this facility.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
Switchgear [{	array		An array of links to the switchgear in this facility. • The value of this property shall be an array of links to resources of type PowerDistribution that represent the switchgear in this facility.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
TransferSwitches [{	array		An array of links to the transfer switches in this facility. • The value of this property shall be an array of links to resources of type PowerDistribution that represent the transfer switches in this facility.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
}			

Property	Type	Attributes	Notes
Location {}	object		The location of the facility. • This property shall contain location information of the associated facility. For property details, see Location.
PowerDomains {	object		Link to the power domains in this facility. • This property shall contain a link to a resource collection of type PowerDomainCollection that contains the power domains associated with this facility. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PowerDomain*. See the PowerDomain schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.39.4 Property details

6.39.4.1 FacilityType:

The type of location this resource represents.

- This property shall contain the type of location this resource represents.

string	Description
Building	A structure with a roof and walls.
Floor	A floor inside of a building.
Room	A room inside of a building or floor.
Site	A small area consisting of several buildings.

6.39.5 Example response

```
{
    "@odata.type": "#Facility.v1_3_0.Facility",
```

```
    "Id": "Room237",
    "Name": "Room #237, 2nd Floor",
    "FacilityType": "Room",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Location": {
        "PostalAddress": {
            "Country": "US",
            "Territory": "OR",
            "City": "Portland",
            "Street": "1001 SW 5th Avenue",
            "HouseNumber": 1100,
            "Name": "DMTF, Inc.",
            "PostalCode": "97204",
            "Floor": "2",
            "Room": "237"
        }
    },
    "PowerDomains": {
        "@odata.id": "/redfish/v1/Facilities/Room237/PowerDomains"
    },
    "Links": {
        "ContainedByFacility": {
            "@odata.id": "/redfish/v1/Facilities/Building"
        },
        "RackPDUs": [
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1"
            }
        ]
    },
    "@odata.id": "/redfish/v1/Facilities/Room237"
}
```


6.40 Fan 1.3.0

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2022.1	2021.1	2020.4

6.40.1 Description

The Fan schema describes a cooling fan unit for a computer system or similar devices contained within a chassis.

- This resource shall represent the management properties for monitoring and management of cooling fans for a Redfish implementation.

6.40.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/ThermalSubsystem/Fans/*{FanId}*

6.40.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this fan. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
HotPluggable	boolean	*read-only* *(null)*	An indication of whether this device can be inserted or removed while the equipment is in operation. • This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Hot-pluggable devices can become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be not hot-pluggable.
Links *(v1.2+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
CoolingChassis *(v1.2+)* [{	array		An array of links to the chassis that are directly cooled by this fan. • This property shall contain an array of links to resources of type Chassis that represent the chassis directly cooled by this fan. This property shall not be present if the fan is only providing cooling to its containing chassis.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
}			
Location {}	object		The location of the fan. • This property shall contain location information of this fan. For property details, see Location.
LocationIndicatorActive	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	*read-only (null)*	The manufacturer of this fan. • This property shall contain the name of the organization responsible for producing the fan. This organization may be the entity from whom the fan is purchased, but this is not necessarily true.
Model	string	*read-only (null)*	The model number for this fan. • This property shall contain the model information as defined by the manufacturer for this fan.
PartNumber	string	*read-only (null)*	The part number for this fan. • This property shall contain the part number as defined by the manufacturer for this fan.
PhysicalContext	string (enum)	*read-only*	The area or device associated with this fan. • This property shall contain a description of the affected device or region within the chassis with which this fan is associated. *For the possible property values, see PhysicalContext in Property details.*
PowerWatts *(v1.1+)* {	object (excerpt)		Power consumption (W). • This property shall contain the total power, in watt units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentVA	number (V.A)	*read-only (null)*	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees *(v1.5+)*	number	*read-only (null)*	The phase angle (degrees) between the current and voltage waveforms. • This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a ReadingType containing `Power`, and shall not appear in sensors with other ReadingType values.
PowerFactor	number	*read-only (null)*	The power factor for this sensor. • This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. PowerFactor is expressed in unit-less 1/100ths. This property can appear in sensors containing a ReadingType value of `Power`, and shall not appear in sensors of other ReadingType values.
ReactiveVAR	number (V.A)	*read-only (null)*	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. • This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}			
Replaceable *(v1.3+)*	boolean	*read-only (null)*	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. • This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of `false` indicates the component needs to be replaced by policy, as part of another component. If the `LocationType` property of this component contains `Embedded`, this property shall contain `false`.
SerialNumber	string	*read-only (null)*	The serial number for this fan. • This property shall contain the serial number as defined by the manufacturer for this fan.

Property	Type	Attributes	Notes
SparePartNumber	string	*read-only* *(null)*	The spare part number for this fan. • This property shall contain the spare or replacement part number as defined by the manufacturer for this fan.
SpeedPercent {	object (excerpt)		The fan speed (percent). • This property shall contain the fan speed, in percent units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Percent`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only* *(null)*	The sensor value. • This property shall contain the sensor value.
SpeedRPM *(v1.2+)*	number ({rev}/min)	*read-only* *(null)*	The rotational speed. • This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.40.4 Property details

6.40.4.1 PhysicalContext:

The area or device associated with this fan.

- This property shall contain a description of the affected device or region within the chassis with which this fan is associated.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.

string	Description
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.40.5 Example response


```
{
    "@odata.type": "#Fan.v1_3_0.Fan",
    "Id": "Bay1",
    "Name": "Fan Bay 1",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "PhysicalContext": "Chassis",
    "Model": "RKS-440DC",
    "Manufacturer": "Contoso Fans",
    "PartNumber": "23456-133",
    "SparePartNumber": "93284-133",
    "LocationIndicatorActive": true,
    "HotPluggable": true,
    "SpeedPercent": {
        "Reading": 45,
        "SpeedRPM": 2200,
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/FanBay1"
    },
    "Location": {
        "PartLocation": {
            "ServiceLabel": "Chassis Fan Bay 1",
            "LocationType": "Bay",
            "LocationOrdinalValue": 0
        }
    },
    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/Bay1"
}
```


6.41 GraphicsController 1.0.0

Version	*v1.0*
Release	2021.1

6.41.1 Description

The GraphicsController schema defines a graphics controller that can be used to drive one or more display devices.

- This resource shall represent a graphics output device in a Redfish implementation.

6.41.2 URIs

/redfish/v1/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*

6.41.3 Properties

Property	Type	Attributes	Notes
AssetTag	string	*read-write (null)*	The user-assigned asset tag for this graphics controller. • This property shall contain the user-assigned asset tag, which is an identifying string that tracks the drive for inventory purposes.
BiosVersion	string	*read-only (null)*	The version of the graphics controller BIOS or primary graphics controller firmware. • This property shall contain the version string of the currently installed and running BIOS or firmware for the graphics controller.
DriverVersion	string	*read-only (null)*	The version of the graphics controller driver loaded in the operating system. • This property shall contain the version string of the currently loaded driver for this graphics controller.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeDevice {	object	*(null)*	A link to the PCIe device that represents this graphics controller. • This property shall contain a link to a resource of type PCIeDevice that represents this graphics controller. See the *PCIeDevice* schema for details on this property.
@odata.id	string	*read-only*	Link to a PCIeDevice resource. See the Links section and the *PCIeDevice* schema for details.
}			
Processors [{	array		An array of links to the processors that are a part of this graphics controller. • This property shall contain an array of links to resources of type Processor that represent the processors that this graphics controller contains.
@odata.id	string	*read-only*	Link to a Processor resource. See the Links section and the *Processor* schema for details.

Property	Type	Attributes	Notes
}]			
}			
Location {}	object		The location of the graphics controller. • This property shall contain location information of the associated graphics controller. For property details, see Location.
Manufacturer	string	*read-only* *(null)*	The manufacturer of this graphics controller. • This property shall contain the name of the organization responsible for producing the graphics controller. This organization may be the entity from which the graphics controller is purchased, but this is not necessarily true.
Model	string	*read-only* *(null)*	The product model number of this graphics controller. • This property shall contain the manufacturer-provided model information of this graphics controller.
PartNumber	string	*read-only* *(null)*	The part number for this graphics controller. • This property shall contain the manufacturer-provided part number for the graphics controller.
Ports {	object		The ports of the graphics controller. • This property shall contain a link to a resource collection of type PortCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			
SerialNumber	string	*read-only* *(null)*	The serial number for this graphics controller. • This property shall contain a manufacturer-allocated number that identifies the graphics controller.
SKU	string	*read-only* *(null)*	The SKU for this graphics controller. • This property shall contain the SKU number for this graphics controller.
SparePartNumber	string	*read-only* *(null)*	The spare part number of the graphics controller. • This property shall contain the spare part number of the graphics controller.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.41.4 Example response

```
{
    "@odata.type": "#GraphicsController.v1_0_0.GraphicsController",
    "Id": "GPU1",
    "Name": "Contoso Graphics Controller 1",
    "AssetTag": "",
    "Manufacturer": "Contoso",
    "Model": "GPU1",
    "SKU": "80937",
    "SerialNumber": "2M220100SL",
    "PartNumber": "G37891",
    "SparePartNumber": "G37890",
    "BiosVersion": "90.02.17.00.7D",
    "DriverVersion": "27.21.14.6079 (Contoso 460.79) DCH / Win 10 64",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Location": {
        "PartLocation": {
            "ServiceLabel": "Slot 1",
            "LocationOrdinalValue": 1,
            "LocationType": "Slot",
            "Orientation": "LeftToRight",
            "Reference": "Rear"
        }
    },
    "Ports": {
        "@odata.id": "/redfish/v1/Systems/1/GraphicsControllers/GPU1/Ports"
    },
    "Links": {
        "Processors": [
            {
                "@odata.id": "/redfish/v1/Systems/1/Processors/GPU"
            }
        ],
        "PCIeDevice": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/GraphicsControllers/GPU1"
```

```
}
```

6.42 HostInterface 1.3.0

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.3	2018.2	2017.1	2016.3

6.42.1 Description

The properties associated with a Host Interface. A Host Interface is a connection between host software and a Redfish Service.

- This Resource shall represent a Host Interface as part of the Redfish Specification.

6.42.2 URIs

/redfish/v1/Managers/*{ManagerId}*/HostInterfaces/*{HostInterfaceId}*

6.42.3 Properties

Property	Type	Attributes	Notes
AuthenticationModes [ ]	array (string (enum))	*read-write*	• The authentication modes available on this interface. ◦ This property shall contain an array consisting of the authentication modes allowed on this interface. *For the possible property values, see AuthenticationModes in Property details.*
AuthNoneRoleId *(v1.2+)*	string	*read-write*	The role when no authentication on this interface is used. • This property shall contain the Id property of the Role Resource that is used when no authentication on this interface is performed. This property shall contain absent if AuthNone is not supported by the service for the AuthenticationModes property.

Property	Type	Attributes	Notes
CredentialBootstrapping *(v1.3+)* {	object		The credential bootstrapping settings for this interface. • This property shall contain settings for the Redfish Host Interface Specification-defined 'credential bootstrapping via IPMI commands' feature for this interface. This property shall be absent if credential bootstrapping is not supported by the service.
EnableAfterReset *(v1.3+)*	boolean	*read-write (null)*	An indication of whether credential bootstrapping is enabled after a reset for this interface. • This property shall indicate whether credential bootstrapping is enabled after a reset for this interface. If `true`, services shall set the Enabled property to `true` after a reset of the host or the service.
Enabled *(v1.3+)*	boolean	*read-write (null)*	An indication of whether credential bootstrapping is enabled for this interface. • This property shall indicate whether credential bootstrapping is enabled for this interface.
RoleId *(v1.3+)*	string	*read-write*	The role used for the bootstrap account created for this interface. • This property shall contain the Id property of the role resource that is used for the bootstrap account created for this interface.
}			
ExternallyAccessible	boolean	*read-only (null)*	An indication of whether external entities can access this interface. External entities are non-host entities. For example, if the host and manager are connected through a switch and the switch also exposes an external port on the system, external clients can also use the interface, and this property value is `true`. • This property shall indicate whether external entities can access this interface. External entities are non-host entities. For example, if the host and manager are connected through a switch and the switch also exposes an external port on the system, external clients can also use the interface, and this property value is `true`.
FirmwareAuthEnabled *(deprecated v1.3)*	boolean	*read-write (null)*	An indication of whether this firmware authentication is enabled for this interface. • This property shall indicate whether firmware authentication is enabled for this interface. *Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.*

Property	Type	Attributes	Notes
FirmwareAuthRoleId *(deprecated v1.3)*	string	*read-write*	The Role used for firmware authentication on this interface. • This property shall contain the Id property of the Role Resource that is configured for firmware authentication on this interface. *Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.*
HostEthernetInterfaces {	object		A link to the collection of network interface controllers or cards (NICs) that a computer system uses to communicate with this Host Interface. • This property shall contain a link to a Resource Collection of type EthernetInterface that computer systems use as the Host Interface to this manager. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *EthernetInterface*. See the EthernetInterface schema for details.
}			
HostInterfaceType	string (enum)	*read-only (null)*	The Host Interface type for this interface. • This property shall contain an enumeration that describes the type of the interface. *For the possible property values, see HostInterfaceType in Property details.*
InterfaceEnabled	boolean	*read-write (null)*	An indication of whether this interface is enabled. • This property shall indicate whether this interface is enabled.
KernelAuthEnabled *(deprecated v1.3)*	boolean	*read-write (null)*	An indication of whether this kernel authentication is enabled for this interface. • This property shall indicate whether kernel authentication is enabled for this interface. *Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.*
KernelAuthRoleId *(deprecated v1.3)*	string	*read-write*	The Role used for kernel authentication on this interface. • This property shall contain the Id property of the Role Resource that is configured for kernel authentication on this interface. *Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.*
Links {	object		The links to other Resources that are related to this Resource. • The Redfish Specification-described Links Property shall contain links to Resources related to but not subordinate to this Resource.

Property	Type	Attributes	Notes
AuthNoneRole *(v1.2+)* {	object		The link to the Redfish Role that contains the privileges on this Host Interface when no authentication is performed. • This property shall contain a link to a Resource of type Role, and should link to the Resource identified by property AuthNoneRoleId. This property shall be absent if AuthNone is not supported by the service for the AuthenticationModes property. See the *Role* schema for details on this property.
@odata.id	string	*read-only*	Link to a Role resource. See the Links section and the *Role* schema for details.
}			
ComputerSystems [{	array		An array of links to the computer systems connected to this Host Interface. • This property shall contain an array of links to Resources of the ComputerSystem type that are connected to this Host Interface.
@odata.id	string	*read-only*	Link to a ComputerSystem resource. See the Links section and the *ComputerSystem* schema for details.
}]			
CredentialBootstrappingRole *(v1.3+)* {	object		The link to the role that contains the privileges for the bootstrap account created for this interface. • This property shall contain a link to a resource of type Role, and should link to the resource identified by the RoleId property within CredentialBootstrapping. This property shall be absent if the Redfish Host Interface Specification-defined 'credential bootstrapping via IPMI commands' feature is not supported by the service. See the *Role* schema for details on this property.
@odata.id	string	*read-only*	Link to a Role resource. See the Links section and the *Role* schema for details.
}			
FirmwareAuthRole *(deprecated v1.3)* {	object		The link to the Redfish Role that has firmware authentication privileges on this Host Interface. • This property shall contain a link to a Resource of type Role, and should link to the Resource identified by property FirmwareAuthRoleId. See the *Role* schema for details on this property. *Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.*
@odata.id	string	*read-only*	Link to a Role resource. See the Links section and the *Role* schema for details.

Property	Type	Attributes	Notes
}			
KernelAuthRole *(deprecated v1.3)* {	object		The link to the Redfish Role defining privileges for this Host Interface when using kernel authentication. • This property shall contain a link to a Resource of type Role, and should link to the Resource identified by property KernelAuthRoleId. See the *Role* schema for details on this property. *Deprecated in v1.3 and later. This property has been deprecated in favor of newer methods of negotiating credentials.*
@odata.id	string	*read-only*	Link to a Role resource. See the Links section and the *Role* schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
ManagerEthernetInterface {	object		A link to a single network interface controllers or cards (NIC) that this manager uses for network communication with this Host Interface. • This property shall contain a link to a Resource of type EthernetInterface that represents the network interface that this manager uses as the Host Interface. See the *EthernetInterface* schema for details on this property.
@odata.id	string	*read-only*	Link to a EthernetInterface resource. See the Links section and the *EthernetInterface* schema for details.
}			
NetworkProtocol {	object		A link to the network services and their settings that the manager controls. In this property, clients find configuration options for the network and network services. • This property shall contain a link to a Resource of type ManagerNetworkProtocol that represents the network services for this manager. See the *ManagerNetworkProtocol* schema for details on this property.
@odata.id	string	*read-only*	Link to a ManagerNetworkProtocol resource. See the Links section and the *ManagerNetworkProtocol* schema for details.
}			

Property	Type	Attributes	Notes
Status {}	object		The status and health of the Resource and its subordinate or dependent Resources. • This property shall contain any status or health properties of the Resource. For property details, see Status.

6.42.4 Property details

6.42.4.1 AuthenticationModes:

- The authentication modes available on this interface.
  - This property shall contain an array consisting of the authentication modes allowed on this interface.

string	Description
AuthNone	Requests without any sort of authentication are allowed.
BasicAuth	Requests using HTTP Basic Authentication are allowed.
OemAuth	Requests using OEM authentication mechanisms are allowed.
RedfishSessionAuth	Requests using Redfish Session Authentication are allowed.

6.42.4.2 HostInterfaceType:

The Host Interface type for this interface.

- This property shall contain an enumeration that describes the type of the interface.

string	Description
NetworkHostInterface	This interface is a Network Host Interface.

6.42.5 Example response

```
{
    "@odata.type": "#HostInterface.v1_3_0.HostInterface",
    "Id": "1",
```

```
    "Name": "Host Interface",
    "Description": "Management Host Interface",
    "HostInterfaceType": "NetworkHostInterface",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "InterfaceEnabled": true,
    "ExternallyAccessible": false,
    "AuthenticationModes": [
        "AuthNone",
        "BasicAuth",
        "RedfishSessionAuth",
        "OemAuth"
    ],
    "CredentialBootstrapping": {
        "EnableAfterReset": true,
        "Enabled": true,
        "RoleId": "User"
    },
    "HostEthernetInterfaces": {
        "@odata.id": "/redfish/v1/Managers/BMC/HostInterfaces/1/HostEthernetInterfaces"
    },
    "ManagerEthernetInterface": {
        "@odata.id": "/redfish/v1/Managers/BMC/EthernetInterfaces/ToHost"
    },
    "NetworkProtocol": {
        "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol"
    },
    "Links": {
        "ComputerSystems": [
            {
                "@odata.id": "/redfish/v1/Systems/ORD144"
            }
        ],
        "CredentialBootstrappingRole": {
            "@odata.id": "/redfish/v1/AccountService/Roles/User"
        }
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Managers/BMC/HostInterfaces/1"
}
```


6.43 Job 1.1.1

Version	*v1.1*	*v1.0*

Release	2022.1	2018.2

6.43.1 Description

The Job schema contains information about a job that a Redfish job service schedules or executes. Clients create jobs to describe a series of operations that occur at periodic intervals.

- This resource shall contain a job in a Redfish implementation.

6.43.2 URIs

/redfish/v1/JobService/Jobs/*{JobId}*
/redfish/v1/JobService/Jobs/*{JobId}*/Steps/*{JobId2}*

6.43.3 Properties

Property	Type	Attributes	Notes
CreatedBy	string	*read-only*	The person or program that created this job entry. • This property shall contain the user name, software program name, or other identifier indicating the creator of this job.
EndTime	string (date-time)	*read-only*	The date and time when the job was completed. • This property shall indicate the date and time when the job was completed. This property shall not appear if the job is running or was not completed. This property shall appear only if the JobState is Completed, Cancelled, or Exception.
EstimatedDuration *(v1.1+)*	string	*read-only* *(null)*	The estimated total time required to complete the job. • This property shall indicate the estimated total time needed to complete the job. The value is not expected to change while the job is in progress, but the service may update the value if it obtains new information that significantly changes the expected duration. Services should be conservative in the reported estimate and clients should treat this value as an estimate. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`

Property	Type	Attributes	Notes
HidePayload	boolean	*read-only*	An indication of whether the contents of the payload should be hidden from view after the job has been created. If `true`, responses do not return the payload. If `false`, responses return the payload. If this property is not present when the job is created, the default is `false`. • This property shall indicate whether the contents of the payload should be hidden from view after the job has been created. If `true`, responses shall not return the Payload property. If `false`, responses shall return the Payload property. If this property is not present when the job is created, the default is `false`.
JobState	string (enum)	*read-write*	The state of the job. • This property shall indicate the state of the job. *For the possible property values, see JobState in Property details.*
JobStatus	string (enum)	*read-only*	The status of the job. • This property shall indicate the health status of the job. This property should contain `Critical` if one or more messages in the Messages array contains the severity `Critical`. This property should contain `Warning` if one or more messages in the Messages array contains the severity `Warning` and no messages contain the severity `Critical`. This property should contain `OK` if all messages in the Messages array contain the severity `OK` or the array is empty. *For the possible property values, see JobStatus in Property details.*
MaxExecutionTime	string	*read-write (null)*	The maximum amount of time the job is allowed to execute. • The value shall be an ISO 8601 conformant duration describing the maximum duration the job is allowed to execute before being stopped by the service.
Messages [{ }]	array (object)		The message that the Redfish service returns. • An array of messages associated with the job. ◦ This property shall contain an array of messages associated with the job. For property details, see Message.
Payload {	object		The HTTP and JSON payload details for this job. • This property shall contain the HTTP and JSON payload information for executing this job. This property shall not be included in the response if the HidePayload property is `true`.
HttpHeaders [ ]	array (string)	*read-only*	An array of HTTP headers in this job. • This property shall contain an array of HTTP headers in this job.
HttpOperation	string	*read-only*	The HTTP operation that executes this job. • This property shall contain the HTTP operation that executes this job.

Property	Type	Attributes	Notes
JsonBody	string	*read-only*	The JSON payload to use in the execution of this job. • This property shall contain JSON-formatted payload for this job.
TargetUri	string (URI)	*read-only*	The link to the target for this job. • This property shall contain link to a target location for an HTTP operation.
}			
PercentComplete	integer (%)	*read-only (null)*	The completion percentage of this job. • This property shall indicate the completion progress of the job, reported in percent of completion. If the job has not been started, the value shall be zero.
Schedule {}	object		The schedule settings for this job. • This object shall contain the scheduling details for this job and the recurrence frequency for future instances of this job. For property details, see Schedule.
StartTime	string (date-time)	*read-only*	The date and time when the job was started or is scheduled to start. • This property shall indicate the date and time when the job was last started or is scheduled to start.
StepOrder [ ]	array (string)	*read-only*	The serialized execution order of the job steps. • This property shall contain an array of IDs for the job steps in the order that they shall be executed. Each step shall be completed prior to the execution of the next step in array order. An incomplete list of steps shall be considered an invalid configuration. If this property is not present or contains an empty array it shall indicate that the step execution order is omitted and may occur in parallel or in series as determined by the service.
Steps {	object		The link to a collection of steps for this job. • This property shall contain the link to a resource collection of type JobCollection. This property shall not be present if this resource represents a step for a job. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Job*. See the Job schema for details.
}			

6.43.4 Property details

6.43.4.1 JobState:

The state of the job.

- This property shall indicate the state of the job.

string	Description
Cancelled	Job was cancelled. • This value shall represent that the operation completed because the job was cancelled by an operator.
Completed	Job was completed. • This value shall represent that the operation completed successfully or with warnings.
Continue	Job is to resume operation. • This value shall represent that the operation has been resumed from a paused condition and should return to a Running state.
Exception	Job has stopped due to an exception condition. • This value shall represent that the operation completed with errors.
Interrupted	Job has been interrupted. • This value shall represent that the operation has been interrupted but is expected to restart and is therefore not complete.
New	A new job. • This value shall represent that this job is newly created but the operation has not yet started.
Pending	Job is pending and has not started. • This value shall represent that the operation is pending some condition and has not yet begun to execute.
Running	Job is running normally. • This value shall represent that the operation is executing.

string	Description
Service	Job is running as a service. • This value shall represent that the operation is now running as a service and expected to continue operation until stopped or killed.
Starting	Job is starting. • This value shall represent that the operation is starting.
Stopping	Job is in the process of stopping. • This value shall represent that the operation is stopping but is not yet complete.
Suspended	Job has been suspended. • This value shall represent that the operation has been suspended but is expected to restart and is therefore not complete.
UserIntervention	Job is waiting for user intervention. • This value shall represent that the operation is waiting for a user to intervene and needs to be manually continued, stopped, or cancelled.

6.43.4.2 JobStatus:

The status of the job.

- This property shall indicate the health status of the job. This property should contain `Critical` if one or more messages in the Messages array contains the severity `Critical`. This property should contain `Warning` if one or more messages in the Messages array contains the severity `Warning` and no messages contain the severity `Critical`. This property should contain `OK` if all messages in the Messages array contain the severity `OK` or the array is empty.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.43.5 Example response


```
{
    "@odata.type": "#Job.v1_1_1.Job",
    "Id": "RebootRack",
    "Name": "Scheduled Nightly Reboot of the rack",
    "JobStatus": "OK",
    "JobState": "Running",
    "StartTime": "2018-04-01T00:01+6:00",
    "PercentComplete": 24,
    "Schedule": {
        "Lifetime": "P4Y",
        "InitialStartTime": "2018-01-01T01:00:00+06:00",
        "RecurrenceInterval": "P1D",
        "EnabledDaysOfWeek": [
            "Monday",
            "Tuesday",
            "Wednesday",
            "Thursday",
            "Friday"
        ]
    },
    "Steps": {
        "@odata.id": "/redfish/v1/JobService/Jobs/RebootRack/Steps"
    },
    "StepOrder": [
        "Red",
        "Orange",
        "Yellow",
        "Green",
        "Blue",
        "Indigo",
        "Violet"
    ],
    "@odata.id": "/redfish/v1/JobService/Jobs/RebootRack"
}
```


6.44 JobService 1.0.4

Version	*v1.0*
Release	2018.2

6.44.1 Description

The JobService schema contains properties for scheduling and execution of operations, represents the properties for the job service itself, and has links to jobs managed by the job service.

- This resource shall represent a job service for a Redfish implementation.

6.44.2 URIs

/redfish/v1/JobService

6.44.3 Properties

Property	Type	Attributes	Notes
DateTime	string (date-time)	*read-only (null)*	The current date and time setting for the job service. • This property shall contain the current date and time setting for the job service.
Jobs {	object		The links to the jobs collection. • This property shall contain a link to a resource collection of type JobCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Job*. See the Job schema for details.
}			
Log {	object		The link to a log service that the job service uses. This service can be a dedicated log service or a pointer a log service under another resource, such as a manager. • This property shall contain a link to a resource of type LogService that this job service uses. See the *LogService* schema for details on this property.
@odata.id	string	*read-only*	Link to a LogService resource. See the Links section and the *LogService* schema for details.
}			
ServiceCapabilities {	object		The supported capabilities of this job service implementation. • This type shall contain properties that describe the capabilities or supported features of this implementation of a job service.

Property	Type	Attributes	Notes
MaxJobs	integer	*read-only (null)*	The maximum number of jobs supported. • This property shall contain the maximum number of jobs supported by the implementation.
MaxSteps	integer	*read-only (null)*	The maximum number of job steps supported. • This property shall contain the maximum number of steps supported by a single job instance.
Scheduling	boolean	*read-only (null)*	An indication of whether scheduling of jobs is supported. • This property shall indicate whether the Schedule property within the job supports scheduling of jobs.
}			
ServiceEnabled	boolean	*read-write (null)*	An indication of whether this service is enabled. • This property shall indicate whether this service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.44.4 Example response

```
{
    "@odata.type": "#JobService.v1_0_4.JobService",
    "Id": "JobService",
    "Name": "Job Service",
    "DateTime": "2018-06-13T04:14+06:00",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "ServiceEnabled": true,
    "ServiceCapabilities": {
        "MaxJobs": 100,
        "MaxSteps": 50,
        "Scheduling": true
    },
    "Jobs": {
        "@odata.id": "/redfish/v1/JobService/Jobs"
    },
```

```
    "Log": {
        "@odata.id": "/redfish/v1/JobService/Log"
    },
    "Actions": {
        "Oem": {
            "#Contoso.EasyButton": {
                "target": "/redfish/v1/JobService/Contoso.EasyButton",
                "@Redfish.ActionInfo": "/redfish/v1/JobService/EasyButtonActionInfo"
            }
        }
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/JobService"
}
```


6.45 JsonSchemaFile 1.1.4

Version	*v1.1*	*v1.0*
Release	2017.1	1.0

6.45.1 Description

The JsonSchemaFile schema contains the properties that describe the locations, as URIs, of a Redfish Schema definition that a Redfish Service implements or references.

- This Resource shall represent the schema file locator Resource for a Redfish implementation.

6.45.2 URIs

/redfish/v1/JsonSchemas/*{JsonSchemaFileId}*

6.45.3 Properties

Property	Type	Attributes	Notes
Languages [ ]	array (string)	*read-only* *required*	The RFC5646-conformant language codes for the available schemas. • This property contains a set of RFC5646-conformant language codes.

Property	Type	Attributes	Notes
Location [{	array	*required*	Location information for this schema file. • This property shall contain the location information for this schema file.
ArchiveFile	string	*read-only*	The name of the file in the archive, if the schema is hosted on the service in an archive file. • This property shall contain the file name of the individual schema file within the archive file that the ArchiveUri property specifies. The file name shall conform to the Redfish Specification-described format.
ArchiveUri	string (URI)	*read-only*	The link to an archive file, if the schema is hosted on the service in an archive file. • This property shall contain a URI colocated with the Redfish Service that specifies the location of the schema file, which can be retrieved using the Redfish protocol and authentication methods. This property shall be used for only archive files, in zip or other formats. The ArchiveFile value shall be the individual schema file name within the archive file.
Language	string	*read-only*	The language code for the schema file. • This property shall contain an RFC5646-conformant language code or the `default` string.
PublicationUri	string (URI)	*read-only*	The link to publicly available (canonical) URI for schema. • This property shall contain a URI not colocated with the Redfish Service that specifies the canonical location of the schema file. This property shall be used for only individual schema files.
Uri	string (URI)	*read-only*	The link to locally available URI for schema. • This property shall contain a URI colocated with the Redfish Service that specifies the location of the schema file, which can be retrieved using the Redfish protocol and authentication methods. This property shall be used for only individual schema files. The file name portion of the URI shall conform to the format specified in the Redfish Specification.
}]			
Schema	string	*read-only* *required*	The @odata.type name this schema describes. • This property shall contain the @odata.type property value for that schema and shall conform to the Redfish Specification-specified syntax for the Type property.

6.45.4 Example response


```
{
    "@odata.type": "#JsonSchemaFile.v1_1_4.JsonSchemaFile",
    "Id": "Chassis.v1_11_0",
    "Name": "Chassis Schema File",
    "Description": "Chassis Schema File Location",
    "Languages": [
        "en"
    ],
    "Schema": "#Chassis.v1_11_0.Chassis",
    "Oem": {},
    "Location": [
        {
            "Language": "en",
            "ArchiveUri": "/Schemas.gz",
            "PublicationUri": "http://redfish.dmtf.org/schemas/v1/Chassis.v1_11_0.json",
            "ArchiveFile": "Chassis.v1_11_0.json"
        },
        {
            "Language": "zh",
            "ArchiveUri": "/Schemas.zh.gz",
            "PublicationUri": "http://schemas.contoso.com/Chassis.v1_11_0.zh.json",
            "ArchiveFile": "Chassis.v1_11_0.zh.json"
        },
        {
            "Language": "xy",
            "Uri": "/redfish/v1/JsonSchemas/Chassis.v1_11_0.xy.json",
            "PublicationUri": "http://schemas.contoso.com/Chassis.v1_11_0.xy.json"
        }
    ],
    "@odata.id": "/redfish/v1/JsonSchemas/Chassis.v1_11_0"
}
```


6.46 Key 1.1.0

Version	*v1.1*	*v1.0*
Release	2022.1	2021.2

6.46.1 Description

The Key schema describes sensitive data for accessing devices or services.

- This resource shall represent a key for a Redfish implementation.

6.46.2 URIs

/redfish/v1/AccountService/Accounts/*{ManagerAccountId}*/Keys/*{KeyId}*
/redfish/v1/KeyService/NVMeoFSecrets/*{KeyId}*
/redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/Accounts/*{ManagerAccountId}*/Keys/*{KeyId}*

6.46.3 Properties

Property	Type	Attributes	Notes
KeyString	string	*read-only required on create (null)*	The string for the key. • This property shall contain the key, and the format shall follow the requirements specified by the KeyType property value.
KeyType	string (enum)	*read-only required on create (null)*	The format of the key. • This property shall contain the format type for the key. *For the possible property values, see KeyType in Property details.*
NVMeoF {	object	*(null)*	NVMe-oF specific properties. • This property shall contain NVMe-oF specific properties for this key. This property shall be present if KeyType contains the value `NVMeoF`.
HostKeyId	string	*read-write (null)*	The identifier of the host key paired with this target key. • This property shall contain the value of the Id property of the Key resource representing the host key paired with this target key. An empty string shall indicate the key is not paired. This property shall be absent for host keys.
NQN	string	*read-only required on create (null)*	The NVMe Qualified Name (NQN) of the host or target subsystem associated with this key. • This property shall contain the NVMe Qualified Name (NQN) of the host or target subsystem associated with this key. The value of this property shall follow the NQN format defined by the NVMe Base Specification.
OEMSecurityProtocolType	string	*read-only (null)*	The OEM security protocol that this key uses. • This property shall contain the OEM-defined security protocol that this key uses. The value shall be derived from the contents of the KeyString property. This property shall be present if SecurityProtocolType contains the value `OEM`.

Property	Type	Attributes	Notes
SecureHashAllowList [ ]	array (string (enum))	*read-only (null)*	The NVMe secure hash algorithms that a key is allowed to use. • The secure hash algorithms allowed with the usage of this key. ◦ This property shall contain the secure hash algorithms allowed with the usage of this key. An empty list or the absence of this property shall indicate any secure hash algorithms are allowed with this key. *For the possible property values, see SecureHashAllowList in Property details.*
SecurityProtocolType	string (enum)	*read-only (null)*	The security protocol that this key uses. • This property shall contain the security protocol that this key uses. The value shall be derived from the contents of the KeyString property. *For the possible property values, see SecurityProtocolType in Property details.*
}			
UserDescription *(v1.1+)*	string	*read-write (null)*	A user-defined string to describe this key. • This property shall contain a user-provided string that describes the key.

6.46.4 Property details

6.46.4.1 KeyType:

The format of the key.

- This property shall contain the format type for the key.

string	Description
NVMeoF	An NVMe-oF key. • This value shall indicate the format of the key is defined by one of the NVMe specifications.
SSH *(v1.1+)*	An SSH public key. • This value shall indicate the format of the key is defined by one of the SSH public key formats as defined in, but not limited to, RFC4253, RFC4716, or RFC8709.

6.46.4.2 SecureHashAllowList:

The NVMe secure hash algorithms that a key is allowed to use.

- The secure hash algorithms allowed with the usage of this key.
  - This property shall contain the secure hash algorithms allowed with the usage of this key. An empty list or the absence of this property shall indicate any secure hash algorithms are allowed with this key.

string	Description
SHA256	SHA-256. • This value shall indicate the SHA-256 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.
SHA384	SHA-384. • This value shall indicate the SHA-384 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.
SHA512	SHA-512. • This value shall indicate the SHA-512 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.

6.46.4.3 SecurityProtocolType:

The security protocol that this key uses.

- This property shall contain the security protocol that this key uses. The value shall be derived from the contents of the KeyString property.

string	Description
DHHC	Diffie-Hellman Hashed Message Authentication Code Challenge Handshake Authentication Protocol (DH-HMAC-CHAP). • This value shall indicate the Diffie-Hellman Hashed Message Authentication Code Challenge Handshake Authentication Protocol (DH-HMAC-CHAP) as defined by the NVMe Base Specification.
OEM	OEM. • This value shall indicate an OEM-defined security protocol. The OEMSecurityProtocolType property shall contain the specific OEM protocol.
TLS_PSK	Transport Layer Security Pre-Shared Key (TLS PSK). • This value shall indicate Transport Layer Security Pre-Shared Key (TLS PSK) as defined by the NVMe TCP Transport Specification.

6.46.5 Example response


```
{
    "@odata.type": "#Key.v1_1_0.Key",
    "Id": "0",
    "Name": "NVMeoF key 0, target subsystem",
    "KeyType": "NVMeoF",
    "KeyString": "DHHC-1:00:ia6zGodOr4SEG0Zzaw398rpY0wqipUWj4jWjUh4HWUz6aQ2n:",
    "NVMeoF": {
        "NQN": "nqn.corp.com:nvme:target-subsystem-0001",
        "SecurityProtocolType": "DHHC",
        "HostKeyId": "1",
        "SecureHashAllowList": [
            "SHA384",
            "SHA512"
        ]
    },
    "@odata.id": "/redfish/v1/KeyService/NVMeoFSecrets/0"
}
```


6.47 KeyPolicy 1.0.0

Version	*v1.0*
Release	2021.2

6.47.1 Description

The KeyPolicy schema describes settings for how keys are allowed to be used for accessing devices or services.

- This resource shall represent a key policy for a Redfish implementation.

6.47.2 URIs

/redfish/v1/KeyService/NVMeoFKeyPolicies/*{KeyPolicyId}*

6.47.3 Properties

Property	Type	Attributes	Notes
IsDefault	boolean	*read-write (null)*	Indicates if this is the default key policy. • This property shall indicate if this key policy is the policy applied when no other policies are specified.
KeyPolicyType	string (enum)	*read-only required on create (null)*	The type of key policy. • This property shall contain the type of key policy. *For the possible property values, see KeyPolicyType in Property details.*
NVMeoF {	object	*(null)*	NVMe-oF specific properties. • This property shall contain NVMe-oF specific properties for this key policy. This property shall be present if KeyPolicyType contains the value `NVMeoF`.
CipherSuiteAllowList [ ]	array (string (enum))	*read-write (null)*	The NVMe cipher suites that a key is allowed to use. • The cipher suites that this key policy allows. ◦ This property shall contain the cipher suites that this key policy allows. The absence of the property shall indicate any cipher suite is allowed. An empty list shall indicate no cipher suites are allowed. *For the possible property values, see CipherSuiteAllowList in Property details.*
DHGroupAllowList [ ]	array (string (enum))	*read-write (null)*	The NVMe Diffie-Hellman (DH) groups that a key is allowed to use. • The Diffie-Hellman (DH) groups that this key policy allows. ◦ This property shall contain the Diffie-Hellman (DH) groups that this key policy allows. The absence of the property shall indicate any DH group is allowed. An empty list shall indicate no DH groups are allowed. *For the possible property values, see DHGroupAllowList in Property details.*
OEMSecurityProtocolAllowList [ ]	array (string, null)	*read-write*	The OEM security protocols that this key policy allows. • This property shall contain the OEM-defined security protocols that this key policy allows. NVMe-oF channels are restricted to OEM-defined security protocols in this list. An empty list shall indicate no security protocols are allowed. This property shall be present if SecurityProtocolAllowList contains `OEM`.

Property	Type	Attributes	Notes
SecureHashAllowList [ ]	array (string (enum))	*read-write (null)*	The NVMe secure hash algorithms that a key is allowed to use. • The secure hash algorithms that this key policy allows. ◦ This property shall contain the secure hash algorithms that this key policy allows. The absence of the property shall indicate any secure hash algorithm is allowed. An empty list shall indicate no secure hash algorithms are allowed. *For the possible property values, see SecureHashAllowList in Property details.*
SecurityProtocolAllowList [ ]	array (string (enum))	*read-write (null)*	The NVMe security protocols that a key is allowed to use. • The security protocols that this key policy allows. ◦ This property shall contain the security protocols that this key policy allows. NVMe-oF channels are restricted to security protocols in this list. The absence of the property shall indicate any security protocol is allowed. An empty list shall indicate no security protocols are allowed. *For the possible property values, see SecurityProtocolAllowList in Property details.*
SecurityTransportAllowList [ ]	array (string (enum))	*read-write (null)*	The NVMe security transports that a key is allowed to use. • The security transports that this key policy allows. ◦ This property shall contain the security transports that this key policy allows. The absence of the property shall indicate any security transport is allowed. An empty list shall indicate no security transports are allowed. *For the possible property values, see SecurityTransportAllowList in Property details.*
}			

6.47.4 Property details

6.47.4.1 CipherSuiteAllowList:

The NVMe cipher suites that a key is allowed to use.

- The cipher suites that this key policy allows.
  - This property shall contain the cipher suites that this key policy allows. The absence of the property shall indicate any cipher suite is allowed. An empty list shall indicate no cipher suites are allowed.

string	Description
TLS_AES_128_GCM_SHA256	TLS_AES_128_GCM_SHA256. • This value shall indicate TLS_AES_128_GCM_SHA256 as defined by the 'Mandatory and Recommended Cipher Suites' clause in the NVMe TCP Transport Specification.
TLS_AES_256_GCM_SHA384	TLS_AES_256_GCM_SHA384. • This value shall indicate TLS_AES_256_GCM_SHA384 as defined by the 'Mandatory and Recommended Cipher Suites' clause in the NVMe TCP Transport Specification.

6.47.4.2 DHGroupAllowList:

The NVMe Diffie-Hellman (DH) groups that a key is allowed to use.

- The Diffie-Hellman (DH) groups that this key policy allows.
  - This property shall contain the Diffie-Hellman (DH) groups that this key policy allows. The absence of the property shall indicate any DH group is allowed. An empty list shall indicate no DH groups are allowed.

string	Description
FFDHE2048	2048-bit Diffie-Hellman (DH) group. • This value shall indicate the 2048-bit Diffie-Hellman (DH) group as defined by the 'DH-HMAC-CHAP Diffie-Hellman group identifiers' figure in the NVMe Base Specification.
FFDHE3072	3072-bit Diffie-Hellman (DH) group. • This value shall indicate the 3072-bit Diffie-Hellman (DH) group as defined by the 'DH-HMAC-CHAP Diffie-Hellman group identifiers' figure in the NVMe Base Specification.
FFDHE4096	4096-bit Diffie-Hellman (DH) group. • This value shall indicate the 4096-bit Diffie-Hellman (DH) group as defined by the 'DH-HMAC-CHAP Diffie-Hellman group identifiers' figure in the NVMe Base Specification.
FFDHE6144	6144-bit Diffie-Hellman (DH) group. • This value shall indicate the 2048-bit Diffie-Hellman (DH) group as defined by the 'DH-HMAC-CHAP Diffie-Hellman group identifiers' figure in the NVMe Base Specification.
FFDHE8192	8192-bit Diffie-Hellman (DH) group. • This value shall indicate the 8192-bit Diffie-Hellman (DH) group as defined by the 'DH-HMAC-CHAP Diffie-Hellman group identifiers' figure in the NVMe Base Specification.

6.47.4.3 KeyPolicyType:

The type of key policy.

- This property shall contain the type of key policy.

string	Description
NVMeoF	An NVMe-oF key policy. • This value shall indicate the key policy is for an NVMe-oF key.

6.47.4.4 SecureHashAllowList:

The NVMe secure hash algorithms that a key is allowed to use.

- The secure hash algorithms that this key policy allows.
  - This property shall contain the secure hash algorithms that this key policy allows. The absence of the property shall indicate any secure hash algorithm is allowed. An empty list shall indicate no secure hash algorithms are allowed.

string	Description
SHA256	SHA-256. • This value shall indicate the SHA-256 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.
SHA384	SHA-384. • This value shall indicate the SHA-384 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.
SHA512	SHA-512. • This value shall indicate the SHA-512 hash function as defined by the 'DH-HMAC-CHAP hash function identifiers' figure in the NVMe Base Specification.

6.47.4.5 SecurityProtocolAllowList:

The NVMe security protocols that a key is allowed to use.

- The security protocols that this key policy allows.
  - This property shall contain the security protocols that this key policy allows. NVMe-oF channels are

restricted to security protocols in this list. The absence of the property shall indicate any security protocol is allowed. An empty list shall indicate no security protocols are allowed.

string	Description
DHHC	Diffie-Hellman Hashed Message Authentication Code Challenge Handshake Authentication Protocol (DH-HMAC-CHAP). • This value shall indicate the Diffie-Hellman Hashed Message Authentication Code Challenge Handshake Authentication Protocol (DH-HMAC-CHAP) as defined by the NVMe Base Specification.
OEM	OEM. • This value shall indicate an OEM-defined security protocol. The OEMSecurityProtocolAllowList property shall contain the specific OEM protocol.
TLS_PSK	Transport Layer Security Pre-Shared Key (TLS PSK). • This value shall indicate Transport Layer Security Pre-Shared Key (TLS PSK) as defined by the NVMe TCP Transport Specification.

6.47.4.6 SecurityTransportAllowList:

The NVMe security transports that a key is allowed to use.

- The security transports that this key policy allows.
  - This property shall contain the security transports that this key policy allows. The absence of the property shall indicate any security transport is allowed. An empty list shall indicate no security transports are allowed.

string	Description
TLSv2	Transport Layer Security (TLS) v2. • This value shall indicate Transport Layer Security (TLS) v2 as defined by the 'Transport Specific Address Subtype Definition for NVMe/TCP Transport' figure in the NVMe TCP Transport Specification.
TLSv3	Transport Layer Security (TLS) v3. • This value shall indicate Transport Layer Security (TLS) v3 as defined by the 'Transport Specific Address Subtype Definition for NVMe/TCP Transport' figure in the NVMe TCP Transport Specification.

6.47.5 Example response


```
{
    "@odata.type": "#KeyPolicy.v1_0_0.KeyPolicy",
    "Id": "0",
    "Name": "Default NVMeoF Key Policy",
    "IsDefault": true,
    "KeyPolicyType": "NVMeoF",
    "NVMeoF": {
        "SecurityTransportAllowList": [
            "TLSv2",
            "TLSv3"
        ],
        "CipherSuiteAllowList": [
            "TLS_AES_128_GCM_SHA256",
            "TLS_AES_256_GCM_SHA384"
        ],
        "SecurityProtocolAllowList": [
            "DHHC",
            "TLS_PSK"
        ],
        "DHGroupAllowList": [
            "FFDHE2048",
            "FFDHE3072",
            "FFDHE4096",
            "FFDHE6144",
            "FFDHE8192"
        ],
        "SecureHashAllowList": [
            "SHA384",
            "SHA512"
        ]
    },
    "@odata.id": "/redfish/v1/KeyService/NVMeoFKeyPolicies/0"
}
```


6.48 KeyService 1.0.0

Version	*v1.0*
Release	2021.2

6.48.1 Description

The KeyService schema describes a key service that represents the actions available to manage keys.

- This resource shall represent the key service properties for a Redfish implementation.

6.48.2 URIs

/redfish/v1/KeyService

6.48.3 Properties

Property	Type	Attributes	Notes
NVMeoFKeyPolicies {	object		The NVMe-oF key policies maintained by this service. • This property shall contain a link to a resource collection of type KeyPolicyCollection that contains the NVMe-oF key policies maintained by this service. The KeyPolicyType property for all members of this collection shall contain the value `NVMeoF`. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *KeyPolicy*. See the KeyPolicy schema for details.
}			
NVMeoFSecrets {	object		The NVMe-oF keys maintained by this service. • This property shall contain a link to a resource collection of type KeyCollection that contains the NVMe-oF keys maintained by this service. The KeyType property for all members of this collection shall contain the value `NVMeoF`. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Key*. See the Key schema for details.
}			

6.48.4 Example response

```
{
    "@odata.type": "#KeyService.v1_0_0.KeyService",
    "Id": "KeyService",
    "Name": "Key Service",
    "Actions": {},
```

```
    "NVMeoFSecrets": {
        "@odata.id": "/redfish/v1/KeyService/NVMeoFSecrets"
    },
    "NVMeoFKeyPolicies": {
        "@odata.id": "/redfish/v1/KeyService/NVMeoFKeyPolicies"
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/KeyService"
}
```


6.49 License 1.0.0

Version	*v1.0*
Release	2021.3

6.49.1 Description

The License schema describes a license for a feature.

- This resource shall represent a license for a Redfish implementation.

6.49.2 URIs

/redfish/v1/LicenseService/Licenses/*{LicenseId}*

6.49.3 Properties

Property	Type	Attributes	Notes
AuthorizationScope	string (enum)	*read-only (null)*	The authorization scope of the license. • This property shall contain the authorization scope of the license. *For the possible property values, see AuthorizationScope in Property details.*
Contact {	object		The contact of the license. • This property shall contain an object containing information about the contact of the license.

Property	Type	Attributes	Notes
ContactName	string	*read-only (null)*	Name of this contact. • This property shall contain the name of a person or organization to contact for information about this license.
EmailAddress	string	*read-only (null)*	Email address for this contact. • This property shall contain the email address for a person or organization to contact for information about this license.
PhoneNumber	string	*read-only (null)*	Phone number for this contact. • This property shall contain the phone number for a person or organization to contact for information about this license.
}			
DownloadURI	string (URI)	*read-only*	The URI at which to download the license file. • This property shall contain the URI at which to download the license file, using the Redfish protocol and authentication methods. The service provides this URI for the download of the OEM-specific binary file of license data. An HTTP GET from this URI shall return a response payload of MIME time `application/octet-stream`.
EntitlementId	string	*read-only (null)*	The entitlement identifier for this license. • This property shall contain the entitlement identifier for this license, used to display a license key, partial license key, or other value used to identify or differentiate license instances.
ExpirationDate	string (date-time)	*read-only (null)*	The date and time when the license expires. • This property shall contain the date and time when the license expires.
GracePeriodDays	integer	*read-only (null)*	The grace days of this license. • The value of this property shall contain the number of days that the license is still usable after the date and time specified by the ExpirationDate property.
InstallDate	string (date-time)	*read-only (null)*	The date and time when the license was installed. • This property shall contain the date and time when the license was installed.
LicenseInfoURI	string (URI)	*read-only (null)*	The URI at which more information about this license can be obtained. • This property shall contain the URI at which to provide more information about the license. The information provided at the URI is intended to be general product-related and not tied to specific user, customer, or license instance.

Property	Type	Attributes	Notes
LicenseOrigin	string (enum)	*read-only (null)*	This indicates the origin of the license. • This property shall contain the origin for the license. *For the possible property values, see LicenseOrigin in Property details.*
LicenseString	string	*read-only required on create (null)*	The Base64-encoded string of the license. • This property shall contain the Base64-encoded string of the license. This property shall not appear in response payloads.
LicenseType	string (enum)	*read-only (null)*	The type of the license. • This property shall contain the type for the license. *For the possible property values, see LicenseType in Property details.*
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AuthorizedDevices [{	array		An array of links to devices authorized by the license. • This property shall contain an array of links to devices that are authorized by the license. Clients can provide this property when installing a license to apply the license to specific devices. If not provided when installing a license, the service may determine the devices to which the license applies. This property shall not be present if the AuthorizationScope property contains the value `Service`.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Manufacturer	string	*read-only (null)*	The manufacturer or producer of this license. • This property shall represent the name of the manufacturer or producer of this license.
MaxAuthorizedDevices	integer	*read-only (null)*	The maximum number of devices authorized by the license. • This property shall contain the maximum number of devices that are authorized by the license. This property shall only be present if the AuthorizationScope property contains the value `Capacity`.

Property	Type	Attributes	Notes
PartNumber	string	*read-only (null)*	The part number for this license. • This property shall contain the manufacturer-provided part number for the license.
RemainingDuration	string	*read-only (null)*	The remaining usage duration before the license expires. • This property shall contain the remaining usage duration before the license expires. This property shall only be present for licenses that are based on usage time. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
RemainingUseCount	integer	*read-only (null)*	The remaining usage count before the license expires. • This property shall contain the remaining usage count before the license expires. This property shall only be present for licenses that are based on usage count.
Removable	boolean	*read-only (null)*	An indication of whether the license is removable. • This property shall indicate whether a user can remove the license with an HTTP DELETE operation.
SerialNumber	string	*read-only (null)*	The serial number for this license. • This property shall contain a manufacturer-allocated number that identifies the license.
SKU	string	*read-only (null)*	The SKU for this license. • This property shall contain the SKU number for this license.
Status {}	object		The status of the license. • This property shall contain the status of license. For property details, see Status.

6.49.4 Property details

6.49.4.1 AuthorizationScope:

The authorization scope of the license.

- This property shall contain the authorization scope of the license.

string	Description
Capacity	The license authorizes functionality to a number of devices, but not restricted to specific device instances. • This value shall indicate the license authorizes functionality for one or more device instances limited to a maximum number of devices specified by the value of the MaxAuthorizedDevices property.
Device	The license authorizes functionality for specific device instances. • This value shall indicate the license authorizes functionality for one or more specific device instances, listed as values of the AuthorizedDevices property.
Service	The license authorizes functionality to this Redfish service. • This value shall indicate the license authorizes product-level or service-level functionality for the Redfish service. This may include hardware or software features not tied to a specific device or subsystem. License resources using this value shall not include the AuthorizedDevices nor the MaxAuthorizedDevices properties.

6.49.4.2 LicenseOrigin:

This indicates the origin of the license.

- This property shall contain the origin for the license.

string	Description
BuiltIn	A license was provided with the product.
Installed	A license installed by user.

6.49.4.3 LicenseType:

The type of the license.

- This property shall contain the type for the license.

string	Description
Production	A license for use in production environments. • This value shall indicate a license purchased or obtained for use in production environments.

string	Description
Prototype	A prototype version of license. • This value shall indicate a license that is designed for the development or internal use.
Trial	A trial license. • This value shall indicate a trial version of a license.

6.49.5 Example response


```
{
    "@odata.type": "#License.v1_0_0.License",
    "Id": "KVM",
    "Name": "Blade KVM-IP License 3-Pack",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "EntitlementId": "LIC20180820LDLM5C",
    "LicenseType": "Production",
    "Removable": false,
    "LicenseOrigin": "BuiltIn",
    "AuthorizationScope": "Device",
    "GracePeriodDays": 60,
    "Manufacturer": "Contoso",
    "InstallDate": "2020-08-20T20:13:44Z",
    "ExpirationDate": "2022-08-20T20:13:43Z",
    "Links": {
        "AuthorizedDevices": [
            {
                "@odata.id": "/redfish/v1/Managers/Blade1"
            },
            {
                "@odata.id": "/redfish/v1/Managers/Blade4"
            },
            {
                "@odata.id": "/redfish/v1/Managers/Blade5"
            }
        ]
    },
    "Contact": {
        "ContactName": "Bob Johnson",
        "EmailAddress": "bjohnson@contoso.com"
    },
    "DownloadURI": "/dumpster/license111",
    "LicenseInfoURI": "http://shop.contoso.com/licenses/blade-kvm",
```

```
    "Actions": {},
    "Oem": {},
    "@odata.id": "/redfish/v1/LicenseService/Licenses/KVM"
}
```


6.50 LicenseService 1.0.0

Version	*v1.0*
Release	2021.3

6.50.1 Description

The LicenseService schema describes the license service and the properties for the service itself with a link to the collection of licenses. The license service also provides methods for installing licenses in a Redfish service.

- This resource shall represent an license service and the properties that affect the service itself for a Redfish implementation.

6.50.2 URIs

/redfish/v1/LicenseService

6.50.3 Properties

Property	Type	Attributes	Notes
LicenseExpirationWarningDays	integer	*read-write (null)*	The number of days prior to a license expiration that a warning message is sent. A value of zero indicates no warning message is sent. • This property shall contain the number of days prior to a license expiration that the service shall send the `DaysBeforeExpiration` message from the License Message Registry at least once. A value of zero shall indicate that no warning messages are sent prior to license expiration.

Property	Type	Attributes	Notes
Licenses {	object	*(null)*	The link to the collection of licenses. • This property shall contain a link to a resource collection of type LicenseCollection. When installing a license with a POST operation to this collection, the service may update an existing License resource instead of creating a new resource. In these cases, the service shall respond with the HTTP `200 OK` status code or HTTP `204 No Content` status code and the `Location` header in the response shall contain the URI of the updated License resource. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *License*. See the License schema for details.
}			
ServiceEnabled	boolean	*read-write* *(null)*	An indication of whether this service is enabled. • This property shall indicate whether this service is enabled.

6.50.4 Actions

6.50.4.1 Install

Description

This action installs one or more licenses from a remote file.

- This action shall install one or more licenses from a remote file. The service may update an existing License resource. The `Location` header in the response shall contain the URI of the new or updated License resource.

Action URI: {Base URI of target resource}/Actions/LicenseService.Install

Action parameters

Parameter Name	Type	Attributes	Notes
LicenseFileURI	string	*required*	The URI of the license file to install. • This parameter shall contain an RFC3986-defined URI that links to a file that the license service retrieves to install license in that file. This URI should contain a scheme that describes the transfer protocol. If the TransferProtocol parameter is absent or not supported, and a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to get the file.

Parameter Name	Type	Attributes	Notes
Password	string	*optional*	The password to access the URI specified by the LicenseFileURI parameter. • This parameter shall represent the password to access the URI specified by the LicenseFileURI parameter.
TransferProtocol	string (enum)	*optional*	The network protocol that the license service uses to retrieve the license file located at the URI provided in LicenseFileURI. This parameter is ignored if the URI provided in LicenseFileURI contains a scheme. • This parameter shall contain the network protocol that the license service shall use to retrieve the license file located at the LicenseFileURI. Services should ignore this parameter if the URI provided in LicenseFileURI contains a scheme. If this parameter is not provided or supported, and a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to retrieve the file. *For the possible property values, see TransferProtocol in Property details.*
Username	string	*optional*	The user name to access the URI specified by the LicenseFileURI parameter. • This parameter shall represent the user name to access the URI specified by the LicenseFileURI parameter.

Request Example

```
{
    "LicenseFileURI": "ftp://licensing.contoso.org/bmc_kvmip_8RS247MKRQ8027.bin",
    "Username": "operations",
    "Password": "Pa55w0rd"
}
```

6.50.5 Property details

6.50.5.1 TransferProtocol:

The network protocol that the license service uses to retrieve the license file located at the URI provided in LicenseFileURI. This parameter is ignored if the URI provided in LicenseFileURI contains a scheme.

- This parameter shall contain the network protocol that the license service shall use to retrieve the license file located at the LicenseFileURI. Services should ignore this parameter if the URI provided in LicenseFileURI contains a scheme. If this parameter is not provided or supported, and a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to retrieve the file.

string	Description
CIFS	Common Internet File System (CIFS).
FTP	File Transfer Protocol (FTP).
HTTP	Hypertext Transfer Protocol (HTTP).
HTTPS	Hypertext Transfer Protocol Secure (HTTPS).
NFS	Network File System (NFS).
OEM	A manufacturer-defined protocol.
SCP	Secure Copy Protocol (SCP).
SFTP	Secure File Transfer Protocol (SFTP).
TFTP	Trivial File Transfer Protocol (TFTP).

6.50.6 Example response

```
{
    "@odata.type": "#LicenseService.v1_0_0.LicenseService",
    "Name": "License Service",
    "ServiceEnabled": true,
    "LicenseExpirationWarningDays": 14,
    "Actions": {
        "#LicenseService.Install": {
            "target": "/redfish/v1/LicenseService/Actions/LicenseService.Install",
            "@Redfish.ActionInfo": "/redfish/v1/LicenseService/InstallActionInfo"
        }
    },
    "Licenses": {
        "@odata.id": "/redfish/v1/LicenseService/Licenses"
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/LicenseService"
}
```

6.51 LogEntry 1.13.0

Version	*v1.13*	*v1.12*	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	...
Release	2022.2	2022.1	2021.4	2021.3	2021.1	2020.4	2020.3	2020.1	2019.3	2018.2	2017.3	...

6.51.1 Description

The LogEntry schema defines the record format for a log. It is designed for Redfish event logs, OEM-specific log formats, and the IPMI System Event Log (SEL). The EntryType field indicates the type of log and the resource includes several additional properties dependent on the EntryType.

- This resource shall represent the log format for log services in a Redfish implementation.

6.51.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/LogServices/*{LogServiceId}*/Entries/*{LogEntryId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/LogServices/*{LogServiceId}*/Entries/*{LogEntryId}*
/redfish/v1/JobService/Log/Entries/*{LogEntryId}*
/redfish/v1/Managers/*{ManagerId}*/LogServices/*{LogServiceId}*/Entries/*{LogEntryId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/LogServices/*{LogServiceId}*/Entries/*{LogEntryId}*
/redfish/v1/Systems/*{ComputerSystemId}*/LogServices/*{LogServiceId}*/Entries/*{LogEntryId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/DeviceLog/Entries/*{LogEntryId}*
/redfish/v1/TelemetryService/LogService/Entries/*{LogEntryId}*

6.51.3 Properties

Property	Type	Attributes	Notes
AdditionalDataSizeBytes *(v1.7+)*	integer (bytes)	*read-only (null)*	The size of the additional data for the log entry. • This property shall contain the size of the additional data referenced by the AdditionalDataURI property for the log entry.
AdditionalDataURI *(v1.7+)*	string (URI)	*read-only (null)*	The URI at which to access the additional data for the log entry, such as diagnostic data, image captures, or other files. • This property shall contain the URI at which to access the additional data for the log entry, using the Redfish protocol and authentication methods.
Created	string (date-time)	*read-only*	The date and time when the log entry was created. • This property shall contain the date and time when the log entry was created.

Property	Type	Attributes	Notes
DiagnosticDataType *(v1.7+)*	string (enum)	*read-only (null)*	The type of diagnostic data available at the AdditionalDataURI location. • This property shall contain the type of diagnostic data contained at the URI referenced by AdditionalDataURI. *For the possible property values, see DiagnosticDataType in Property details.*
EntryCode	string (enum)	*read-only (null)*	The entry code for the log entry if the entry type is `SEL`. • This property shall contain the entry code for the log entry if the EntryType is `SEL`. Tables 42-1 and 42-2 of the IPMI Specification v2.0 revision 1.1 describe these enumerations. *For the possible property values, see EntryCode in Property details.*
EntryType	string (enum)	*read-only required*	The type of log entry. • This property shall represent the type of log entry. If the resource represents an IPMI SEL entry, the value shall contain `SEL`. If the resource represents a Redfish event log entry, the value shall contain `Event`. If the resource represents an OEM log entry format, the value shall contain `Oem`. *For the possible property values, see EntryType in Property details.*
EventGroupId *(v1.4+)*	integer	*read-only (null)*	An identifier that correlates events with the same cause. • This property shall indicate that events are related and shall have the same value in the case where multiple event messages are produced by the same root cause. Implementations shall use separate values for events with separate root cause. There shall not be ordering of events implied by this property's value.
EventId *(v1.1+)*	string	*read-only*	The unique instance identifier for an event. • If present, this LogEntry records an Event and the value shall indicate a unique identifier for the event, the format of which is implementation dependent.
EventTimestamp *(v1.1+)*	string (date-time)	*read-only*	The date and time when the event occurred. • If present, this LogEntry records an event and the value shall contain the date and time when the event occurred.
EventType *(v1.1+, deprecated v1.4*	string (enum)	*read-only*	The type of event recorded in this log. • If present, this LogEntry records an event and the value shall indicate the type of event. *For the possible property values, see EventType in Property details. Deprecated in v1.4 and later. This property has been deprecated. Starting with Redfish Specification v1.6 (Event v1.3), subscriptions are based on the RegistryPrefix and ResourceType properties and not on the EventType property.*

Property	Type	Attributes	Notes
GeneratorId *(v1.5+)*	string	*read-only* *(null)*	An identifier of the device that has generated the IPMI SEL Event Record. • If EntryType is `SEL`, this property shall contain the 'Generator ID' field of the IPMI SEL Event Record. If EntryType is not `SEL`, this property should not be present. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
OriginOfCondition {	object		The link to the resource that caused the log entry. • This property shall contain a link to the resource that caused the log entry. For log entries that represent the creation or deletion of a resource, this property should reference the created or deleted resource and not the collection that contains the resource.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
RelatedItem *(v1.12+)* [{	array		An array of links to resources associated with this log entry. • This property shall contain an array of links to resources that are related to this log entry. It shall not contain links to LogEntry resources. RelatedLogEntries is used to reference related log entries. This property shall not contain the value of the OriginOfCondition property.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
RelatedLogEntries *(v1.12+)* [{	array		An array of links to other log entries that are related to this log entry. • This property shall contain an array of links to resources of type LogEntry in this or other log services that are related to this log entry.
@odata.id	string	*read-only*	Link to another LogEntry resource.
}]			

Property	Type	Attributes	Notes
}			
Message	string	*read-only* *(null)*	The message of the log entry. This property decodes from the entry type. If the entry type is `Event`, this property contains a message. If the entry type is `SEL`, this property contains an SEL-specific message. Otherwise, this property contains an OEM-specific log entry. In most cases, this property contains the actual log entry. • This property shall contain the message of the log entry. This property decodes from the entry type. If the entry type is `Event`, this property contains a message. If the entry type is `SEL`, this property contains an SEL-specific message, following the format specified in Table 32-1, SEL Event Records, in the IPMI Specification v2.0 revision 1.1. Otherwise, this property contains an OEM-specific log entry. In most cases, this property contains the actual log entry.
MessageArgs [ ]	array (string)	*read-only*	The arguments for the message. • This property shall contain message arguments to substitute into the included or looked-up message.
MessageId	string	*read-only*	The MessageId, event data, or OEM-specific information. This property decodes from the entry type. If the entry type is `Event`, this property contains a Redfish Specification-defined MessageId. If the entry type is `SEL`, this property contains the Event Data. Otherwise, this property contains OEM-specific information. • This property shall contain the MessageId, event data, or OEM-specific information. This property decodes from the entry type. If the entry type is `Event`, this property contains a Redfish Specification-defined MessageId property of the event. If the entry type is `SEL`, the format should follow the pattern '^0[xX](([a-fA-F]
Modified *(v1.6+)*	string (date-time)	*read-only*	The date and time when the log entry was last modified. • This property shall contain the date and time when the log entry was last modified. This property shall not appear if the log entry has not been modified since it was created.
OEMDiagnosticDataType *(v1.7+)*	string	*read-only* *(null)*	The OEM-defined type of diagnostic data at the AdditionalDataURI location. • This property shall contain the OEM-defined type of diagnostic data contained at the URI referenced by AdditionalDataURI. This property shall be present if DiagnosticDataType is `OEM`.

Property	Type	Attributes	Notes
OemLogEntryCode *(v1.3+)*	string	*read-only* *(null)*	The OEM-specific entry code, if the LogEntryCode type is `OEM`. • This property shall represent the OEM-specific Log Entry Code type of the Entry. This property shall only be present if EntryType is `SEL` and LogEntryCode is `OEM`.
OemRecordFormat	string	*read-only* *(null)*	The OEM-specific format of the entry. If the entry type is `Oem`, this property contains more information about the record format from the OEM. • This property shall represent the OEM-specific format of the entry. This property shall be required if the EntryType value is `Oem`.
OemSensorType *(v1.3+)*	string	*read-only* *(null)*	The OEM-specific sensor type if the sensor type is `OEM`. • This property shall represent the OEM-specific sensor type of the entry. This property shall only be used if EntryType is `SEL` and SensorType is `OEM`.
Originator *(v1.11+)*	string	*read-only*	The source of the log entry. • This property shall contain the source of the log entry.
OriginatorType *(v1.11+)*	string (enum)	*read-only*	The type of originator data. • This property shall contain the type of originator data. *For the possible property values, see OriginatorType in Property details.*
Resolution *(v1.9+)*	string	*read-only*	Used to provide suggestions on how to resolve the situation that caused the log entry. • This property shall contain the resolution of the log entry. Services should replace the resolution defined in the message registry with a more specific resolution in a log entry.
Resolved *(v1.8+)*	boolean	*read-write* *(null)*	Indicates if the cause of the log entry has been resolved or repaired. • This property shall contain an indication if the cause of the log entry has been resolved or repaired. The value `true` shall indicate if the cause of the log entry has been resolved or repaired. This property shall contain the value `false` if the log entry is still active. The value `false` shall be the initial state.
SensorNumber	integer	*read-only* *(null)*	The IPMI-defined sensor number. • This property shall contain the IPMI sensor number if the value of the EntryType property is `SEL`. This property should not appear in the resource for other values of EntryType.

Property	Type	Attributes	Notes
SensorType	string (enum)	*read-only (null)*	The sensor type to which the log entry pertains if the entry type is `SEL`. • This property shall contain the sensor type to which the log entry pertains if the entry type is `SEL`. Table 42-3, Sensor Type Codes, in the IPMI Specification v2.0 revision 1.1 describes these enumerations. *For the possible property values, see SensorType in Property details.*
ServiceProviderNotified *(v1.9+)*	boolean	*read-only (null)*	Indicates if the log entry has been sent to the service provider. • This property shall contain an indication if the log entry has been sent to the service provider.
Severity	string (enum)	*read-only (null)*	The severity of the log entry. • This property shall contain the severity of the condition that created the log entry, as defined in the Status section of the Redfish Specification. *For the possible property values, see Severity in Property details.*
SpecificEventExistsInGroup *(v1.13+)*	boolean	*read-only*	Indicates this log entry is equivalent to a more specific log entry within the same EventGroupId. • This property shall indicate that this log entry is equivalent to another log entry, with a more specific definition, within the same EventGroupId. For example, the `DriveFailed` message from the Storage Device Message Registry is more specific than the `ResourceStatusChangedCritical` message from the Resource Event Message Registry, when both occur with the same EventGroupId. This property shall contain `true` if a more specific event is available, and shall contain `false` if no equivalent event exists in the same EventGroupId. If this property is absent, the value shall be assumed to be `false`.

6.51.4 Property details

6.51.4.1 DiagnosticDataType:

The type of diagnostic data available at the AdditionalDataURI location.

- This property shall contain the type of diagnostic data contained at the URI referenced by AdditionalDataURI.

string	Description
CPER *(v1.10+)*	UEFI Common Platform Error Record. • This value shall indicate the data provided at the URI specified by the AdditionalDataURI property is a complete UEFI Specification-defined Common Platform Error Record. The CPER data shall contain a Record Header and at least one Section as defined by the UEFI Specification.
CPERSection *(v1.10+)*	A Section of a UEFI Common Platform Error Record. • This value shall indicate the data provided at the URI specified by the AdditionalDataURI property is a single Section of a UEFI Specification-defined Common Platform Error Record. The CPER data shall contain one Section as defined by the UEFI Specification, with no Record Header.
Manager	Manager diagnostic data.
OEM	OEM diagnostic data.
OS	Operating system (OS) diagnostic data.
PreOS	Pre-OS diagnostic data.

6.51.4.2 EntryCode:

The entry code for the log entry if the entry type is `SEL`.

- This property shall contain the entry code for the log entry if the EntryType is `SEL`. Tables 42-1 and 42-2 of the IPMI Specification v2.0 revision 1.1 describe these enumerations.

string	Description
Assert	The condition has been asserted.
D0 Power State	The ACPI-defined D0 power state.
D1 Power State	The ACPI-defined D1 power state.
D2 Power State	The ACPI-defined D2 power state.
D3 Power State	The ACPI-defined D3 power state.
Deassert	The condition has been deasserted.
Device Disabled	A device has been disabled.
Device Enabled	A device has been enabled.
Device Inserted / Device Present	A device has been inserted or is present.

string	Description
Device Removed / Device Absent	A device has been removed or is absent.
Fully Redundant	Indicates that full redundancy has been regained.
Informational	An informational event.
Install Error	An install error has been detected.
Limit Exceeded	A limit has been exceeded.
Limit Not Exceeded	A limit has not been exceeded.
Lower Critical - going high	The reading crossed the Lower Critical threshold while going high.
Lower Critical - going low	The reading crossed the Lower Critical threshold while going low.
Lower Non-critical - going high	The reading crossed the Lower Non-critical threshold while going high.
Lower Non-critical - going low	The reading crossed the Lower Non-critical threshold while going low.
Lower Non-recoverable - going high	The reading crossed the Lower Non-recoverable threshold while going high.
Lower Non-recoverable - going low	The reading crossed the Lower Non-recoverable threshold while going low.
Monitor	A monitor event.
Non-redundant:Insufficient Resources	Unit is non-redundant and has insufficient resources to maintain normal operation.
Non-redundant:Sufficient Resources from Insufficient Resources	Unit has regained minimum resources needed for normal operation.
Non-redundant:Sufficient Resources from Redundant	Redundancy has been lost but unit is functioning with minimum resources needed for normal operation.
OEM *(v1.3+)*	An OEM-defined event.
Performance Lags	Performance does not meet expectations.
Performance Met	Performance meets expectations.
Predictive Failure asserted	A Predictive Failure has been detected.
Predictive Failure deasserted	A Predictive Failure is no longer present.
Redundancy Degraded	Redundancy still exists, but at less than full level.

string	Description
Redundancy Degraded from Fully Redundant	Unit has lost some redundant resource(s) but is still in a redundant state.
Redundancy Degraded from Non-redundant	Unit has regained some resource(s) and is redundant but not fully redundant.
Redundancy Lost	Entered any non-redundant state, including Non-redundant: Insufficient Resources.
State Asserted	The state has been asserted.
State Deasserted	The state has been deasserted.
Transition to Active	The state transitioned to active.
Transition to Busy	The state transitioned to busy.
Transition to Critical from less severe	A state has changed to Critical from less severe.
Transition to Critical from Non-recoverable	A state has changed to Critical from Non-recoverable.
Transition to Degraded	A state has transitioned to Degraded.
Transition to Idle	The state transitioned to idle.
Transition to In Test	A state has transitioned to In Test.
Transition to Non-Critical from more severe	A state has changed to Non-Critical from more severe.
Transition to Non-Critical from OK	A state has changed to Non-Critical from OK.
Transition to Non-recoverable	A state has changed to Non-recoverable.
Transition to Non-recoverable from less severe	A state has changed to Non-recoverable from less severe.
Transition to Off Duty	A state has transitioned to Off Duty.
Transition to Off Line	A state has transitioned to Off Line.
Transition to OK	A state has changed to OK.
Transition to On Line	A state has transitioned to On Line.
Transition to Power Off	A state has transitioned to Power Off.
Transition to Power Save	A state has transitioned to Power Save.
Transition to Running	A state has transitioned to Running.

string	Description
Upper Critical - going high	The reading crossed the Upper Critical threshold while going high.
Upper Critical - going low	The reading crossed the Upper Critical threshold while going low.
Upper Non-critical - going high	The reading crossed the Upper Non-critical threshold while going high.
Upper Non-critical - going low	The reading crossed the Upper Non-critical threshold while going low.
Upper Non-recoverable - going high	The reading crossed the Upper Non-recoverable threshold while going high.
Upper Non-recoverable - going low	The reading crossed the Upper Non-recoverable threshold while going low.

6.51.4.3 EntryType:

The type of log entry.

- This property shall represent the type of log entry. If the resource represents an IPMI SEL entry, the value shall contain `SEL`. If the resource represents a Redfish event log entry, the value shall contain `Event`. If the resource represents an OEM log entry format, the value shall contain `Oem`.

string	Description
Event	A Redfish-defined message.
Oem	An entry in an OEM-defined format.
SEL	A legacy IPMI System Event Log (SEL) entry.

6.51.4.4 EventType:

The type of event recorded in this log.

- If present, this LogEntry records an event and the value shall indicate the type of event.

string	Description
Alert	A condition requires attention.

string	Description
MetricReport	The telemetry service is sending a metric report. • Events of type `MetricReport` shall be sent to a client in accordance with the MetricReport schema definition.
Other	Because EventType is deprecated as of Redfish Specification v1.6, the event is based on a registry or resource but not an EventType. • Events of type `Other` shall be sent to a client in accordance with subscriptions to RegistryPrefixes or ResourceTypes.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
ResourceUpdated	A resource has been updated.
StatusChange	The status of a resource has changed.

6.51.4.5 OriginatorType:

The type of originator data.

- This property shall contain the type of originator data.

string	Description
Client	A client of the service created this log entry.
Internal	A process running on the service created this log entry.
SupportingService	A process not running on the service but running on a supporting service, such as RDE implementations, UEFI, or host processes, created this log entry.

6.51.4.6 SensorType:

The sensor type to which the log entry pertains if the entry type is `SEL`.

- This property shall contain the sensor type to which the log entry pertains if the entry type is `SEL`. Table 42-3, Sensor Type Codes, in the IPMI Specification v2.0 revision 1.1 describes these enumerations.

string	Description
Add-in Card	A sensor for an add-in card.
BaseOSBoot/InstallationStatus	A sensor for a base OS boot or installation status event.
Battery	A sensor for a battery.
Boot Error	A sensor for a boot error event.
Button/Switch	A sensor for a button or switch.
Cable/Interconnect	A sensor for a cable or interconnect device type.
Chassis	A sensor for a chassis.
ChipSet	A sensor for a chipset.
CoolingDevice	A sensor for a cooling device.
Critical Interrupt	A sensor for a critical interrupt event.
Current	A current sensor.
Drive Slot/Bay	A sensor for a drive slot or bay.
Entity Presence	A sensor for an entity presence event.
Event Logging Disabled	A sensor for the event log.
Fan	A fan sensor.
FRUState	A sensor for a FRU state event.
LAN	A sensor for a LAN device.
Management Subsystem Health	A sensor for a management subsystem health event.
Memory	A sensor for a memory device.
Microcontroller/Coprocessor	A sensor for a microcontroller or coprocessor.
Module/Board	A sensor for a module or board.
Monitor ASIC/IC	A sensor for a monitor ASIC or IC.
OEM *(v1.3+)*	An OEM-defined sensor.
OS Stop/Shutdown	A sensor for an OS stop or shutdown event
Other FRU	A sensor for another type of FRU.
Other Units-based Sensor	A sensor for a miscellaneous analog sensor.

string	Description
Physical Chassis Security	A physical security sensor.
Platform Alert	A sensor for a platform alert event.
Platform Security Violation Attempt	A platform security sensor.
POST Memory Resize	A sensor for a POST memory resize event.
Power Supply / Converter	A sensor for a power supply or DC-to-DC converter.
PowerUnit	A sensor for a power unit.
Processor	A sensor for a processor.
Session Audit	A sensor for a session audit event.
Slot/Connector	A sensor for a slot or connector.
System ACPI PowerState	A sensor for an ACPI power state event.
System Event	A sensor for a system event.
System Firmware Progress	A sensor for a system firmware progress event.
SystemBoot/Restart	A sensor for a system boot or restart event.
Temperature	A temperature sensor.
Terminator	A sensor for a terminator.
Version Change	A sensor for a version change event.
Voltage	A voltage sensor.
Watchdog	A sensor for a watchdog event.

6.51.4.7 Severity:

The severity of the log entry.

- This property shall contain the severity of the condition that created the log entry, as defined in the Status section of the Redfish Specification.

string	Description
Critical	A critical condition that requires immediate attention.

string	Description
OK	Informational or operating normally.
Warning	A condition that requires attention.

6.51.5 Example response

```
{
    "@odata.type": "#LogEntry.v1_13_0.LogEntry",
    "Id": "1",
    "Name": "Log Entry 1",
    "EntryType": "Event",
    "Severity": "Critical",
    "Created": "2012-03-07T14:44:00Z",
    "Resolved": false,
    "Message": "Temperature threshold exceeded",
    "MessageId": "Contoso.1.0.TempAssert",
    "MessageArgs": [
        "42"
    ],
    "Links": {
        "OriginOfCondition": {
            "@odata.id": "/redfish/v1/Chassis/1U/Thermal"
        },
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/LogServices/Log1/Entries/1"
}
```

6.52 LogService 1.3.1

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2021.2	2020.3	2017.3	1.0

6.52.1 Description

The LogService schema contains properties for monitoring and configuring a log service. When the Id property contains `DeviceLog`, the log contains device-resident log entries that follow the physical device when moved from system-to-system, and not a replication or subset of a system event log.

- This resource shall represent a log service for a Redfish implementation. When the Id property contains `DeviceLog`, the log shall contain log entries that migrate with the device.

6.52.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/LogServices/*{LogServiceId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/LogServices/*{LogServiceId}*
/redfish/v1/JobService/Log
/redfish/v1/Managers/*{ManagerId}*/LogServices/*{LogServiceId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/LogServices/*{LogServiceId}*
/redfish/v1/Systems/*{ComputerSystemId}*/LogServices/*{LogServiceId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/DeviceLog
/redfish/v1/TelemetryService/LogService

6.52.3 Properties

Property	Type	Attributes	Notes
AutoDSTEnabled *(v1.3+)*	boolean	*read-write*	An indication of whether the log service is configured for automatic Daylight Saving Time (DST) adjustment. • This property shall indicate whether the log service is configured for automatic Daylight Saving Time (DST) adjustment. DST adjustment shall not modify the timestamp of existing log entries.
DateTime	string (date-time)	*read-write (null)*	The current date and time with UTC offset of the log service. • This property shall contain the current date and time with UTC offset of the log service.
DateTimeLocalOffset	string	*read-write (null)*	The time offset from UTC that the DateTime property is in `+HH:MM` format. • This property shall contain the offset from UTC time that the DateTime property contains. If both DateTime and DateTimeLocalOffset are provided in modification requests, services shall apply DateTimeLocalOffset after DateTime is applied. Pattern: `^([-+][0-1][0-9]:[0-5][0-9])$`
Entries {	object		The link to the log entry collection. • This property shall contain a link to a resource collection of type LogEntryCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *LogEntry*. See the LogEntry schema for details.

Property	Type	Attributes	Notes
}			
LogEntryType *(v1.1+)*	string (enum)	*read-only (null)*	The format of the log entries. • This property shall contain the value for the EntryType property of all LogEntry resources contained in the LogEntryCollection resource for this log service. If the service cannot determine or guarantee a single EntryType value for all LogEntry resources, this property shall contain the value `Multiple`. *For the possible property values, see LogEntryType in Property details.*
MaxNumberOfRecords	integer	*read-only*	The maximum number of log entries that this service can have. • This property shall contain the maximum number of LogEntry resources in the LogEntryCollection resource for this service.
OverWritePolicy	string (enum)	*read-only*	The overwrite policy for this service that takes place when the log is full. • This property shall indicate the policy of the log service when the MaxNumberOfRecords has been reached. *For the possible property values, see OverWritePolicy in Property details.*
ServiceEnabled	boolean	*read-write (null)*	An indication of whether this service is enabled. • This property shall indicate whether this service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SyslogFilters *(v1.2+)* [{	array		A list of syslog message filters to be logged locally. • This property shall describe all desired syslog messages to be logged locally. If this property contains an empty array, all messages shall be logged.
LogFacilities *(v1.2+)* [ ]	array (string (enum))	*read-write (null)*	The syslog facility code is an enumeration of program types. • The types of programs that can log messages. ◦ This property shall contain the types of programs that can log messages. If this property contains an empty array or is absent, all facilities shall be indicated. *For the possible property values, see LogFacilities in Property details.*
LowestSeverity *(v1.2+)*	string (enum)	*read-write (null)*	The lowest severity level message that will be logged. • This property shall contain the lowest syslog severity level that will be logged. The service shall log all messages equal to or greater than the value in this property. The value `All` shall indicate all severities. *For the possible property values, see LowestSeverity in Property details.*

Property	Type	Attributes	Notes
}]			

6.52.4 Actions

6.52.4.1 ClearLog

Description

The action to clear the log for this log service.

- This action shall delete all entries found in the LogEntryCollection resource for this log service.

Action URI: {Base URI of target resource}/Actions/LogService.ClearLog

Action parameters

Parameter Name	Type	Attributes	Notes
LogEntriesETag *(v1.3+)*	string	*optional*	The ETag of the log entry collection within this log service. If the provided ETag does not match the current ETag of the log entry collection, the request is rejected. • This parameter shall contain the ETag of the LogEntryCollection resource for this log service. If the client-provided ETag does not match the current ETag of the LogEntryCollection resource for this log service, the service shall return the HTTP 428 (Precondition Required) status code to reject the request.

Request Example

```
{
    "LogEntriesEtag": "W/\"2A90423A\""
}
```

6.52.4.2 CollectDiagnosticData *(v1.2+)*

Description

The action to collect the diagnostic data for the given type. When the diagnostic data is collected, a new log entry will be created and the additional data referenced by the new log entry will contain the diagnostic data.

- This action shall collect the diagnostic data for the given type. The `Location` header in the response shall

contain a URI to a resource of type LogEntry that contains the diagnostic data. The AdditionalDataURI property in the referenced LogEntry resource shall contain the URI to download the diagnostic data.

Action URI: {Base URI of target resource}/Actions/LogService.CollectDiagnosticData

Action parameters

Parameter Name	Type	Attributes	Notes
DiagnosticDataType	string (enum)	*required*	The type of diagnostic data to collect. • This parameter shall contain the type of diagnostic data to collect. *For the possible property values, see DiagnosticDataType in Property details.*
OEMDiagnosticDataType	string	*optional*	The OEM-defined type of diagnostic data to collect. • This parameter shall contain the OEM-defined type of diagnostic data to collect. This parameter shall be required if DiagnosticDataType is `OEM`.

Request Example

```
{
    "DiagnosticDataType": "Manager"
}
```

6.52.5 Property details

6.52.5.1 DiagnosticDataType:

The type of diagnostic data to collect.

- This parameter shall contain the type of diagnostic data to collect.

string	Description
Manager	Manager diagnostic data.
OEM	OEM diagnostic data.
OS	Operating system (OS) diagnostic data.
PreOS	Pre-OS diagnostic data.

6.52.5.2 LogEntryType:

The format of the log entries.

- This property shall contain the value for the EntryType property of all LogEntry resources contained in the LogEntryCollection resource for this log service. If the service cannot determine or guarantee a single EntryType value for all LogEntry resources, this property shall contain the value `Multiple`.

string	Description
Event	The log contains Redfish-defined messages.
Multiple	The log contains multiple log entry types and, therefore, the log service cannot guarantee a single entry type.
OEM	The log contains entries in an OEM-defined format.
SEL	The log contains legacy IPMI System Event Log (SEL) entries.

6.52.5.3 LogFacilities:

The syslog facility code is an enumeration of program types.

- The types of programs that can log messages.
  - This property shall contain the types of programs that can log messages. If this property contains an empty array or is absent, all facilities shall be indicated.

string	Description
Auth	Security/authentication messages.
Authpriv	Security/authentication messages.
Console	Log alert.
Cron	Clock daemon.
Daemon	System daemons.
FTP	FTP daemon.
Kern	Kernel messages.
Local0	Locally used facility 0.
Local1	Locally used facility 1.

string	Description
Local2	Locally used facility 2.
Local3	Locally used facility 3.
Local4	Locally used facility 4.
Local5	Locally used facility 5.
Local6	Locally used facility 6.
Local7	Locally used facility 7.
LPR	Line printer subsystem.
Mail	Mail system.
News	Network news subsystem.
NTP	NTP subsystem.
Security	Log audit.
SolarisCron	Scheduling daemon.
Syslog	Messages generated internally by syslogd.
User	User-level messages.
UUCP	UUCP subsystem.

6.52.5.4 LowestSeverity:

The lowest severity level message that will be logged.

- This property shall contain the lowest syslog severity level that will be logged. The service shall log all messages equal to or greater than the value in this property. The value `All` shall indicate all severities.

string	Description
Alert	A condition that should be corrected immediately, such as a corrupted system database.
All	A message of any severity.
Critical	Hard device errors.
Debug	Messages that contain information normally of use only when debugging a program.
Emergency	A panic condition.

string	Description
Error	An Error.
Informational	Informational only.
Notice	Conditions that are not error conditions, but that may require special handling.
Warning	A Warning.

6.52.5.5 OverWritePolicy:

The overwrite policy for this service that takes place when the log is full.

- This property shall indicate the policy of the log service when the MaxNumberOfRecords has been reached.

string	Description
NeverOverWrites	When full, new entries to the log are discarded.
Unknown	The overwrite policy is not known or is undefined.
WrapsWhenFull	When full, new entries to the log overwrite earlier entries.

6.52.6 Example response

```
{
    "@odata.type": "#LogService.v1_3_1.LogService",
    "Id": "Log1",
    "Name": "System Log Service",
    "Description": "This log contains entries related to the operation of the host Computer System.",
    "MaxNumberOfRecords": 1000,
    "OverWritePolicy": "WrapsWhenFull",
    "DateTime": "2015-03-13T04:14:33+06:00",
    "DateTimeLocalOffset": "+06:00",
    "ServiceEnabled": true,
    "LogEntryType": "Event",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Oem": {},
    "Actions": {
        "#LogService.ClearLog": {
            "target": "/redfish/v1/Managers/1/LogServices/Log1/Actions/LogService.ClearLog"
        },
```

```
        "Oem": {}
    },
    "Entries": {
        "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries"
    },
    "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1"
}
```

6.53 Manager 1.16.0

Version	*v1.16*	*v1.15*	*v1.14*	*v1.13*	*v1.12*	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	...
Release	2022.2	2022.1	2021.4	2021.2	2021.1	2020.4	2020.3	2020.2	2020.1	2019.4	2019.2	...

6.53.1 Description

In Redfish, a manager is a systems management entity that can implement or provide access to a Redfish service. Examples of managers are BMCs, enclosure managers, management controllers, and other subsystems that are assigned manageability functions. An implementation can have multiple managers, which might be directly accessible through a Redfish-defined interface.

- This resource shall represent a management subsystem for a Redfish implementation.

6.53.2 URIs

/redfish/v1/Managers/*{ManagerId}*

6.53.3 Properties

Property	Type	Attributes	Notes
AdditionalFirmwareVersions *(v1.15+)* {	object		The additional firmware versions of the manager. • This property shall contain the additional firmware versions of the manager.
Bootloader *(v1.7+)*	string	*read-only (null)*	The bootloader version contained in this software, such as U-Boot or UEFI. • This property shall contain the bootloader version contained in this software.

Property	Type	Attributes	Notes
Kernel *(v1.7+)*	string	*read-only* *(null)*	The kernel version contained in this software. • This property shall contain the kernel version contained in this software. For strict POSIX software, the value shall contain the output of `uname -srm`. For Microsoft Windows, the value shall contain the output of `ver`.
Microcode *(v1.7+)*	string	*read-only* *(null)*	The microcode version contained in this software, such as processor microcode. • This property shall contain the microcode version contained in this software.
Oem *(v1.7+)* {}	object		See the OEM object definition in the Using this guide clause.
OSDistribution *(v1.8+)*	string	*read-only* *(null)*	The operating system name of this software. • This property shall contain the operating system name of this software.
}			
AutoDSTEnabled *(v1.4+)*	boolean	*read-write*	An indication of whether the manager is configured for automatic Daylight Saving Time (DST) adjustment. • This property shall indicate whether the manager is configured for automatic Daylight Saving Time (DST) adjustment.
Certificates *(v1.13+)* {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
CommandShell {	object		The command shell service that this manager provides. • This property shall contain information about the command shell service of this manager.

Property	Type	Attributes	Notes
ConnectTypesSupported [ ]	array (string (enum))	*read-only*	• This property enumerates the command shell connection types that the implementation allows. ◦ This property shall contain an array of the enumerations. SSH shall be included if the Secure Shell (SSH) protocol is supported. Telnet shall be included if the Telnet protocol is supported. IPMI shall be included if the IPMI Serial Over LAN (SOL) protocol is supported. *For the possible property values, see ConnectTypesSupported in Property details.*
MaxConcurrentSessions	integer	*read-only*	The maximum number of service sessions, regardless of protocol, that this manager can support. • This property shall contain the maximum number of concurrent service sessions that this implementation supports.
ServiceEnabled	boolean	*read-write*	An indication of whether the service is enabled for this manager. • This property shall indicate whether the protocol for the service is enabled.
}			
DateTime	string (date-time)	*read-write (null)*	The current date and time with UTC offset of the manager. • This property shall contain the current date and time with UTC offset of the manager.
DateTimeLocalOffset	string	*read-write (null)*	The time offset from UTC that the DateTime property is in `+HH:MM` format. • This property shall contain the offset from UTC time that the DateTime property contains. If both DateTime and DateTimeLocalOffset are provided in modification requests, services shall apply DateTimeLocalOffset after DateTime is applied. Pattern: `^([-+][0-1][0-9]:[0-5][0-9])$`
DedicatedNetworkPorts *(v1.16+)* {	object		The dedicated network ports of the manager. • This property shall contain a link to a resource collection of type PortCollection that represent the dedicated network ports of the manager. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			

Property	Type	Attributes	Notes
EthernetInterfaces {	object		The link to a collection of NICs that this manager uses for network communication. • This property shall contain a link to a resource collection of type EthernetInterfaceCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *EthernetInterface*. See the EthernetInterface schema for details.
}			
FirmwareVersion	string	*read-only* *(null)*	The firmware version of this manager. • This property shall contain the firmware version as defined by the manufacturer for the associated manager.
GraphicalConsole {	object		The information about the graphical console service of this manager. • This property shall contain the information about the graphical console (KVM-IP) service of this manager. This property should be used to describe a service for the manager's console or operating system, not a service provided on behalf of a host operating system. Implementations representing host OS consoles, known generally as a KVM-IP feature, should use the GraphicalConsole property in ComputerSystem.
ConnectTypesSupported [ ]	array (string (enum))	*read-only*	• This property enumerates the graphical console connection types that the implementation allows. ◦ This property shall contain an array of the enumerations. RDP shall be included if the Remote Desktop (RDP) protocol is supported. KVMIP shall be included if a vendor-define KVM-IP protocol is supported. *For the possible property values, see ConnectTypesSupported in Property details.*
MaxConcurrentSessions	integer	*read-only*	The maximum number of service sessions, regardless of protocol, that this manager can support. • This property shall contain the maximum number of concurrent service sessions that this implementation supports.
ServiceEnabled	boolean	*read-write*	An indication of whether the service is enabled for this manager. • This property shall indicate whether the protocol for the service is enabled.
}			

Property	Type	Attributes	Notes
HostInterfaces *(v1.3+)* {	object		The link to a collection of host interfaces that this manager uses for local host communication. Clients can find host interface configuration options and settings in this navigation property. • This property shall contain a link to a resource collection of type HostInterfaceCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *HostInterface*. See the HostInterface schema for details.
}			
LastResetTime *(v1.9+)*	string (date-time)	*read-only*	The date and time when the manager was last reset or rebooted. • This property shall contain the date and time when the manager last came out of a reset or was rebooted.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ActiveSoftwareImage *(v1.6+)* {	object		The link to the software inventory resource that represents the active firmware image for this manager. • This property shall contain a link to a resource of type SoftwareInventory that represents the active firmware image for this manager. See the *SoftwareInventory* schema for details on this property.
@odata.id	string	*read-write*	Link to a SoftwareInventory resource. See the Links section and the *SoftwareInventory* schema for details.
}			
ManagedBy *(v1.9+)* [{	array		The array of links to the managers responsible for managing this manager. • This property shall contain an array of links to resources of type Manager that represent the managers for this manager.
@odata.id	string	*read-only*	Link to another Manager resource.
}]			
ManagerForChassis [{	array		An array of links to the chassis this manager controls. • This property shall contain an array of links to chassis over which this manager instance has control.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.

Property	Type	Attributes	Notes
}]			
ManagerForManagers *(v1.9+)* [{	array		An array of links to the managers that are managed by this manager. • This property shall contain an array of links to resources of type Manager that represent the managers being managed by this manager.
@odata.id	string	*read-only*	Link to another Manager resource.
}]			
ManagerForServers [{	array		An array of links to the systems that this manager controls. • This property shall contain an array of links to computer systems over which this manager instance has control.
@odata.id	string	*read-only*	Link to a ComputerSystem resource. See the Links section and the *ComputerSystem* schema for details.
}]			
ManagerForSwitches *(v1.4+)* [{	array		An array of links to the switches that this manager controls. • This property shall contain an array of links to switches that this manager instance controls.
@odata.id	string	*read-only*	Link to a Switch resource. See the Links section and the *Switch* schema for details.
}]			
ManagerInChassis *(v1.1+)* {	object		The link to the chassis where this manager is located. • This property shall contain a link to the chassis where this manager is located. See the *Chassis* schema for details on this property.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
SoftwareImages *(v1.6+)* [{	array		The images that are associated with this manager. • This property shall contain an array of links to resource of type SoftwareInventory that represent the firmware images that apply to this manager.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to a SoftwareInventory resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
}			
Location *(v1.11+)* {}	object		The location of the manager. • This property shall contain location information of the associated manager. For property details, see Location.
LocationIndicatorActive *(v1.11+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
LogServices {	object		The link to a collection of logs that the manager uses. • This property shall contain a link to a resource collection of type LogServiceCollection that this manager uses. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *LogService*. See the LogService schema for details.
}			
ManagerDiagnosticData *(v1.14+)* {	object	*(null)*	The diagnostic data for this manager. • This property shall contain a link to a resource of type ManagerDiagnosticData that represents the diagnostic data for this manager. See the *ManagerDiagnosticData* schema for details on this property.
@odata.id	string	*read-only*	Link to a ManagerDiagnosticData resource. See the Links section and the *ManagerDiagnosticData* schema for details.
}			
ManagerType	string (enum)	*read-only*	The type of manager that this resource represents. • This property shall describe the function of this manager. The `ManagementController` value shall be used if none of the other enumerations apply. *For the possible property values, see ManagerType in Property details.*

Property	Type	Attributes	Notes
Manufacturer *(v1.7+)*	string	*read-only (null)*	The manufacturer of this manager. • This property shall contain the name of the organization responsible for producing the manager. This organization may be the entity from whom the manager is purchased, but this is not necessarily true.
Measurements *(v1.13+, deprecated v1.14* [{	array		An array of DSP0274-defined measurement blocks. • This property shall contain an array of DSP0274-defined measurement blocks. *Deprecated in v1.14 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
@odata.id	string	*read-only*	Link to a MeasurementBlock resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
Model	string	*read-only (null)*	The model information of this manager, as defined by the manufacturer. • This property shall contain the information about how the manufacturer refers to this manager.
NetworkProtocol {	object		The link to the network services and their settings that the manager controls. • This property shall contain a link to a resource of type ManagerNetworkProtocol, which represents the network services for this manager. See the *ManagerNetworkProtocol* schema for details on this property.
@odata.id	string	*read-only*	Link to a ManagerNetworkProtocol resource. See the Links section and the *ManagerNetworkProtocol* schema for details.
}			
PartNumber *(v1.7+)*	string	*read-only (null)*	The part number of the manager. • This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the manager.
PowerState *(v1.2+)*	string (enum)	*read-only (null)*	The current power state of the manager. • This property shall contain the power state of the manager. *For the possible property values, see PowerState in Property details.*

Property	Type	Attributes	Notes
Redundancy [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. • The redundancy information for the managers of this system. ◦ The properties in this array shall show how this manager is grouped with other managers for form redundancy sets. For property details, see Redundancy.
RemoteAccountService *(v1.5+)* {	object		The link to the account service resource for the remote manager that this resource represents. • This property shall contain a link to the account service resource for the remote manager that this resource represents. This property shall only be present when providing aggregation of a remote manager. See the *AccountService* schema for details on this property.
@odata.id	string	*read-only*	Link to a AccountService resource. See the Links section and the *AccountService* schema for details.
}			
RemoteRedfishServiceUri *(v1.5+)*	string (URI)	*read-only* *(null)*	The URI of the Redfish service root for the remote manager that this resource represents. • This property shall contain the URI of the Redfish service root for the remote manager that this resource represents. This property shall only be present when providing aggregation of Redfish services.
SecurityPolicy *(v1.16+)* {	object	*(null)*	The security policy settings for this manager. • This property shall contain a link to a resource of type SecurityPolicy that contains the security policy settings for this manager. See the *SecurityPolicy* schema for details on this property.
@odata.id	string	*read-only*	Link to a SecurityPolicy resource. See the Links section and the *SecurityPolicy* schema for details.
}			
SerialConsole *(deprecated v1.10)* {	object		The serial console service that this manager provides. • This property shall contain information about the serial console service of this manager. *Deprecated in v1.10 and later. This property has been deprecated in favor of the SerialConsole property in the ComputerSystem resource.*

Property	Type	Attributes	Notes
ConnectTypesSupported [ ]	array (string (enum))	*read-only*	• This property enumerates the serial console connection types that the implementation allows. ◦ This property shall contain an array of the enumerations. SSH shall be included if the Secure Shell (SSH) protocol is supported. Telnet shall be included if the Telnet protocol is supported. IPMI shall be included if the IPMI Serial Over LAN (SOL) protocol is supported. *For the possible property values, see ConnectTypesSupported in Property details.*
MaxConcurrentSessions	integer	*read-only*	The maximum number of service sessions, regardless of protocol, that this manager can support. • This property shall contain the maximum number of concurrent service sessions that this implementation supports.
ServiceEnabled	boolean	*read-write*	An indication of whether the service is enabled for this manager. • This property shall indicate whether the protocol for the service is enabled.
}			
SerialInterfaces {	object		The link to a collection of serial interfaces that this manager uses for serial and console communication. • This property shall contain a link to a resource collection of type SerialInterfaceCollection, which this manager uses. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *SerialInterface*. See the SerialInterface schema for details.
}			
SerialNumber *(v1.7+)*	string	*read-only (null)*	The serial number of the manager. • This property shall contain a manufacturer-allocated number that identifies the manager.
ServiceEntryPointUUID	string	*read-only (null)*	The UUID of the Redfish service that is hosted by this manager. • This property shall contain the UUID of the Redfish service that is hosted by this manager. Each manager providing an entry point to the same Redfish service shall report the same UUID value, even though the name of the property may imply otherwise. This property shall not be present if this manager does not provide a Redfish service entry point. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`

Property	Type	Attributes	Notes
ServiceIdentification *(v1.15+)*	string	*read-write (null)*	A product instance identifier displayed in the Redfish service root. • This property shall contain a vendor or user-provided value that identifies and associates a discovered Redfish service with a particular product instance. This property shall only be present if the manager provides a ServiceRoot resource. The value of this property can be used during deployment processes to match user credentials or other a priori product instance information to the appropriate Redfish service.
SharedNetworkPorts *(v1.16+)* {	object		The shared network ports of the manager. • This property shall contain a link to a resource collection of type PortCollection that represent the shared network ports of the manager. The members of this collection shall reference Port resources subordinate to NetworkAdapter resources. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			
SparePartNumber *(v1.11+)*	string	*read-only (null)*	The spare part number of the manager. • This property shall contain the spare part number of the manager.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
TimeZoneName *(v1.10+)*	string	*read-write*	The time zone of the manager. • This property shall contain the time zone of the manager. The time zone shall be either the 'Name' or the 'Format' for the zone as defined in the IANA Time Zone Database. The value of this property is used for display purposes, especially to enhance the display of time. A Redfish service may not be able to ensure accuracy and consistency between the DateTimeOffset property and this property. Therefore, to specify the correct time zone offset, see the DateTimeOffset property.
USBPorts *(v1.12+)* {	object		The USB ports of the manager. • This property shall contain a link to a resource collection of type PortCollection that represent the USB ports of the manager. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			

Property	Type	Attributes	Notes
UUID	string	*read-only* *(null)*	The UUID for this manager. • This property shall contain the UUID for the manager. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`
VirtualMedia *(deprecated v1.10)* {	object		The link to the Virtual Media services for this particular manager. • This property shall contain a link to a resource collection of type VirtualMediaCollection, which this manager uses. Contains a link to a resource. *Deprecated in v1.10 and later. This property has been deprecated in favor of the VirtualMedia property in the ComputerSystem resource.*
@odata.id	string	*read-only*	Link to Collection of *VirtualMedia*. See the VirtualMedia schema for details.
}			

6.53.4 Actions

6.53.4.1 ForceFailover

Description

The ForceFailover action forces a failover of this manager to the manager used in the parameter.

- This action shall perform a forced failover of the manager's redundancy to the manager supplied as a parameter.

Action URI: {Base URI of target resource}/Actions/Manager.ForceFailover

Action parameters

Parameter Name	Type	Attributes	Notes
NewManager {	object	*required*	The manager to which to fail over. • This parameter shall contain the manager to which to fail over.
@odata.id	string	*read-only*	Link to another Manager resource.
}			

Request Example

```
{
    "NewManager": [
        {
            "@odata.id": "/redfish/v1/Managers/3"
        }
    ]
}
```

6.53.4.2 ModifyRedundancySet

Description

The ModifyRedundancySet operation adds members to or removes members from a redundant group of managers.

- The ModifyRedundancySet operation shall add members to or remove members from a redundant group of managers.

Action URI: {Base URI of target resource}/Actions/Manager.ModifyRedundancySet

Action parameters

Parameter Name	Type	Attributes	Notes
Add [{	array	*optional*	An array of managers to add to the redundancy set. • This parameter shall contain an array of managers to add to the redundancy set.
@odata.id	string	*read-only*	Link to another Manager resource.
}]			
Remove [{	array	*optional*	An array of managers to remove from the redundancy set. • This parameter shall contain an array of managers to remove from the redundancy set.
@odata.id	string	*read-only*	Link to another Manager resource.
}]			

Request Example

```
{
    "Add": [
```

```
        {
            "@odata.id": "/redfish/v1/Managers/4"
        }
    ]
}
```

6.53.4.3 Reset

Description

The reset action resets/reboots the manager.

- This action shall reset the manager.

Action URI: {Base URI of target resource}/Actions/Manager.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation specific default reset. Services should include the @Redfish.AllowableValues annotation for this parameter to ensure compatibility with clients, even when ActionInfo has been implemented. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ForceRestart"
}
```

6.53.4.4 ResetToDefaults *(v1.8+)*

Description

The reset action resets the manager settings to factory defaults. This can cause the manager to reset.

- This action shall reset the manager settings. This action can impact other resources.

Action URI: {Base URI of target resource}/Actions/Manager.ResetToDefaults

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*required*	The type of reset to defaults. • This parameter shall contain the type of reset to defaults. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "PreserveNetworkAndUsers"
}
```

6.53.5 Property details

6.53.5.1 ConnectTypesSupported:

6.53.5.1.1 In CommandShell:

- This property enumerates the command shell connection types that the implementation allows.
  - This property shall contain an array of the enumerations. SSH shall be included if the Secure Shell (SSH) protocol is supported. Telnet shall be included if the Telnet protocol is supported. IPMI shall be included if the IPMI Serial Over LAN (SOL) protocol is supported.

string	Description
IPMI	The controller supports a command shell connection through the IPMI Serial Over LAN (SOL) protocol.
Oem	The controller supports a command shell connection through an OEM-specific protocol.
SSH	The controller supports a command shell connection through the SSH protocol.
Telnet	The controller supports a command shell connection through the Telnet protocol.

6.53.5.1.2 In GraphicalConsole:

- This property enumerates the graphical console connection types that the implementation allows.

- This property shall contain an array of the enumerations. RDP shall be included if the Remote Desktop (RDP) protocol is supported. KVMIP shall be included if a vendor-define KVM-IP protocol is supported.

string	Description
KVMIP	The controller supports a graphical console connection through a KVM-IP (redirection of Keyboard, Video, Mouse over IP) protocol.
Oem	The controller supports a graphical console connection through an OEM-specific protocol.

6.53.5.1.3 In SerialConsole:

- This property enumerates the serial console connection types that the implementation allows.
  - This property shall contain an array of the enumerations. SSH shall be included if the Secure Shell (SSH) protocol is supported. Telnet shall be included if the Telnet protocol is supported. IPMI shall be included if the IPMI Serial Over LAN (SOL) protocol is supported.

string	Description
IPMI	The controller supports a serial console connection through the IPMI Serial Over LAN (SOL) protocol.
Oem	The controller supports a serial console connection through an OEM-specific protocol.
SSH	The controller supports a serial console connection through the SSH protocol.
Telnet	The controller supports a serial console connection through the Telnet protocol.

6.53.5.2 ManagerType:

The type of manager that this resource represents.

- This property shall describe the function of this manager. The `ManagementController` value shall be used if none of the other enumerations apply.

string	Description
AuxiliaryController	A controller that provides management functions for a particular subsystem or group of devices.
BMC	A controller that provides management functions for a single computer system.
EnclosureManager	A controller that provides management functions for a chassis or group of devices or systems.
ManagementController	A controller that primarily monitors or manages the operation of a device or system.
RackManager	A controller that provides management functions for a whole or part of a rack.

string	Description
Service *(v1.4+)*	A software-based service that provides management functions.

6.53.5.3 PowerState:

The current power state of the manager.

- This property shall contain the power state of the manager.

string	Description
Off	The state is powered off.
On	The state is powered on.
Paused	The state is paused.
PoweringOff	A temporary state between on and off.
PoweringOn	A temporary state between off and on.

6.53.5.4 ResetType:

6.53.5.4.1 In Actions: Reset:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation specific default reset. Services should include the @Redfish.AllowableValues annotation for this parameter to ensure compatibility with clients, even when ActionInfo has been implemented.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.

string	Description
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.

string	Description
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.53.5.4.2 In Actions: ResetToDefaults:

The type of reset to defaults.

- This parameter shall contain the type of reset to defaults.

string	Description
PreserveNetwork	Reset all settings except network settings to factory defaults.
PreserveNetworkAndUsers	Reset all settings except network and local user names/passwords to factory defaults.
ResetAll	Reset all settings to factory defaults.

6.53.6 Example response

```
{
    "@odata.type": "#Manager.v1_16_0.Manager",
    "Id": "BMC",
    "Name": "Manager",
    "ManagerType": "BMC",
    "Description": "Contoso BMC",
    "ServiceEntryPointUUID": "92384634-2938-2342-8820-489239905423",
    "UUID": "58893887-8974-2487-2389-841168418919",
    "Model": "Joo Janta 200",
    "FirmwareVersion": "4.4.6521",
    "DateTime": "2015-03-13T04:14:33+06:00",
    "DateTimeLocalOffset": "+06:00",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
```

```
    },
    "PowerState": "On",
    "GraphicalConsole": {
        "ServiceEnabled": true,
        "MaxConcurrentSessions": 2,
        "ConnectTypesSupported": [
            "KVMIP"
        ]
    },
    "CommandShell": {
        "ServiceEnabled": true,
        "MaxConcurrentSessions": 4,
        "ConnectTypesSupported": [
            "Telnet",
            "SSH"
        ]
    },
    "HostInterfaces": {
        "@odata.id": "/redfish/v1/Managers/9/HostInterfaces"
    },
    "NetworkProtocol": {
        "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol"
    },
    "EthernetInterfaces": {
        "@odata.id": "/redfish/v1/Managers/BMC/NICs"
    },
    "SerialInterfaces": {
        "@odata.id": "/redfish/v1/Managers/BMC/SerialInterfaces"
    },
    "LogServices": {
        "@odata.id": "/redfish/v1/Managers/BMC/LogServices"
    },
    "VirtualMedia": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/VirtualMedia"
    },
    "Links": {
        "ManagerForServers": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2"
            }
        ],
        "ManagerForChassis": [
            {
                "@odata.id": "/redfish/v1/Chassis/1U"
            }
        ],
        "ManagerInChassis": {
            "@odata.id": "/redfish/v1/Chassis/1U"
        },
        "Oem": {}
```

```
    },
    "Actions": {
        "#Manager.Reset": {
            "target": "/redfish/v1/Managers/BMC/Actions/Manager.Reset",
            "ResetType@Redfish.AllowableValues": [
                "ForceRestart",
                "GracefulRestart"
            ]
        },
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Managers/BMC"
}
```


6.54 ManagerAccount 1.9.0

Version	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2021.1	2020.4	2020.1	2019.4	2019.3	2019.1	2018.3	2017.1	1.0

6.54.1 Description

The ManagerAccount schema defines the user accounts that are owned by a manager. Changes to a manager account might affect the current Redfish service connection if this manager is responsible for the Redfish service.

- This resource shall represent a user account for the manager in a Redfish implementation. The account shall indicate the allowed access to one of more services in the manager.

6.54.2 URIs

/redfish/v1/AccountService/Accounts/*{ManagerAccountId}*
/redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/Accounts/*{ManagerAccountId}*

6.54.3 Properties

Property	Type	Attributes	Notes
AccountExpiration *(v1.8+)*	string (date-time)	*read-write (null)*	Indicates the date and time when this account expires. If `null`, the account never expires. • This property shall contain the date and time when this account expires. The service shall disable or delete an account that has expired. This property shall not apply to accounts created by the Redfish Host Interface Specification-defined credential bootstrapping. If the value is `null`, or the property is not present, the account never expires.
AccountTypes *(v1.4+)* [ ]	array (string (enum))	*read-write (null)*	• The list of services in the manager that the account is allowed to access. ◦ This property shall contain an array of the various manager services that the account is allowed to access. This shall not include functionality for receiving events or other notifications. If this property is not provided by the client, the default value shall be an array that contains the value `Redfish`. The service may add additional values when this property is set or updated if allowed by the value of the StrictAccountTypes property. *For the possible property values, see AccountTypes in Property details.*
Certificates *(v1.2+)* {	object		The link to a collection of certificates used for this account. • This property shall contain a link to a resource collection of type CertificateCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
Enabled	boolean	*read-write*	An indication of whether an account is enabled. An administrator can disable it without deleting the user information. If `true`, the account is enabled and the user can log in. If `false`, the account is disabled and, in the future, the user cannot log in. • This property shall indicate whether an account is enabled. If `true`, the account is enabled and the user can log in. If `false`, the account is disabled and, in the future, the user cannot log in.
HostBootstrapAccount *(v1.8+)*	boolean	*read-only*	An indication of whether this account is a bootstrap account for the host interface. • This property shall indicate whether this account is a bootstrap account created by the Redfish Host Interface Specification-defined credential bootstrapping.

Property	Type	Attributes	Notes
Keys *(v1.9+)* {	object		The link to the collection of keys that can be used to authenticate this account. For example, an SSH public key could be added to this collection to allow for SSH public key authentication. • This property shall contain a link to a resource collection of type KeyCollection that contains the keys that can be used to authenticate this account. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Key*. See the Key schema for details.
}			
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Role {	object		The link to the Redfish role that defines the privileges for this account. • This property shall contain a link to a resource of type Role, and should link to the resource identified by the RoleId property. See the *Role* schema for details on this property.
@odata.id	string	*read-only*	Link to a Role resource. See the Links section and the *Role* schema for details.
}			
}			
Locked	boolean	*read-write*	An indication of whether the account service automatically locked the account because the lockout threshold was exceeded. To manually unlock the account before the lockout duration period, an administrator can change the property to `false` to clear the lockout condition. • This property shall indicate whether the account service automatically locked the account because the AccountLockoutThreshold was exceeded. To manually unlock the account before the lockout duration period, an administrator shall be able to change the property to `false` to clear the lockout condition.
OEMAccountTypes *(v1.4+)* [ ]	array (string, null)	*read-write*	The OEM account types. • This property shall contain an array of the OEM account types for this account. This property shall be valid when AccountTypes contains `OEM`.

Property	Type	Attributes	Notes
Password	string	*read-write required on create (null)*	The password. Use this property with a PATCH or PUT to write the password for the account. This property is `null` in responses. • This property shall contain the password for this account. The value shall be `null` in responses.
PasswordChangeRequired *(v1.3+)*	boolean	*read-write (null)*	An indication of whether the service requires that the password for this account be changed before further access to the account is allowed. • This property shall indicate whether the service requires that the password for this account be changed before further access to the account is allowed. The implementation may deny access to the service if the password has not been changed. A manager account created with an initial PasswordChangeRequired value of `true` may force a password change before first access of the account. When the Password property for this account is updated, the service shall set this property to `false`.
PasswordExpiration *(v1.6+)*	string (date-time)	*read-write (null)*	Indicates the date and time when this account password expires. If `null`, the account password never expires. • This property shall contain the date and time when this account password expires. If the value is `null`, the account password never expires. If provided during account creation or password modification, this value shall override the value of the PasswordExpirationDays property in the AccountService resource.
RoleId	string	*read-write required on create*	The role for this account. • This property shall contain the RoleId of the role resource configured for this account. The service shall reject POST, PATCH, or PUT operations that provide a RoleId that does not exist by returning the HTTP 400 (Bad Request) status code.
SNMP *(v1.4+)* {	object	*(null)*	The SNMP settings for this account. • This property shall contain the SNMP settings for this account when AccountTypes contains `SNMP`.

Property	Type	Attributes	Notes
AuthenticationKey *(v1.4+)*	string	*read-write (null)*	The secret authentication key for SNMPv3. • This property shall contain the key for SNMPv3 authentication. The value shall be `null` in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with `Passphrase:`, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with `Hex:`, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. The passphrase can contain any printable characters except for the double quotation mark. Pattern: `(^[ !#-~]+$)\|(^Passphrase:[ ^[ !#-~]+$)|(^Hex:[0-9A-Fa-f]{24,96})|(^\*+$)`
AuthenticationKeySet *(v1.5+)*	boolean	*read-only*	Indicates if the AuthenticationKey property is set. • This property shall contain `true` if a valid value was provided for the AuthenticationKey property. Otherwise, the property shall contain `false`.
AuthenticationProtocol *(v1.4+)*	string (enum)	*read-write (null)*	The authentication protocol for SNMPv3. • This property shall contain the SNMPv3 authentication protocol. *For the possible property values, see AuthenticationProtocol in Property details.*
EncryptionKey *(v1.4+)*	string	*read-write (null)*	The secret encryption key used in SNMPv3. • This property shall contain the key for SNMPv3 encryption. The value shall be `null` in responses. This property accepts a passphrase or a hex-encoded key. If the string starts with `Passphrase:`, the remainder of the string shall be the passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. If the string starts with `Hex:`, then the remainder of the string shall be the key encoded in hexadecimal notation. If the string starts with neither, the full string shall be a passphrase and shall be converted to the key as described in the 'Password to Key Algorithm' section of RFC3414. The passphrase can contain any printable characters except for the double quotation mark. Pattern: `(^[ !#-~]+$)\|(^Passphrase:[ ^[ !#-~]+$)|(^Hex:[0-9A-Fa-f]{32})|(^\*+$)`
EncryptionKeySet *(v1.5+)*	boolean	*read-only*	Indicates if the EncryptionKey property is set. • This property shall contain `true` if a valid value was provided for the EncryptionKey property. Otherwise, the property shall contain `false`.
EncryptionProtocol *(v1.4+)*	string (enum)	*read-write (null)*	The encryption protocol for SNMPv3. • This property shall contain the SNMPv3 encryption protocol. *For the possible property values, see EncryptionProtocol in Property details.*

Property	Type	Attributes	Notes
}			
StrictAccountTypes *(v1.7+)*	boolean	*read-write (null)*	Indicates if the service needs to use the account types exactly as specified when the account is created or updated. • This property shall indicate if the service needs to use the value of AccountTypes and OEMAccountTypes values exactly as specified. A `true` value shall indicate the service needs to either accept the value without changes or reject the request. A `false` value shall indicate the service may add additional `AccountTypes` and `OEMAccountTypes` values as needed to support limitations it has in separately controlling access to individual services. If this property is not present, the value shall be assumed to be `false`. An update of the service can cause account types to be added to or removed from the AccountTypes and OEMAccountTypes properties, regardless of the value of this property. After a service update, clients should inspect all accounts where the value of this property is `true` and perform maintenance as needed.
UserName	string	*read-write required on create*	The user name for the account. • This property shall contain the user name for this account.

6.54.4 Property details

6.54.4.1 AccountTypes:

- The list of services in the manager that the account is allowed to access.
  - This property shall contain an array of the various manager services that the account is allowed to access. This shall not include functionality for receiving events or other notifications. If this property is not provided by the client, the default value shall be an array that contains the value `Redfish`. The service may add additional values when this property is set or updated if allowed by the value of the StrictAccountTypes property.

string	Description
HostConsole	Allow access to the host's console, which could be connected through Telnet, SSH, or other protocol. • This value shall indicate the account is allowed to access the host console.
IPMI	Allow access to the Intelligent Platform Management Interface service. • This value shall indicate the account is allowed to access the Intelligent Platform Management Interface service.

string	Description
KVMIP	Allow access to a Keyboard-Video-Mouse over IP session. • This value shall indicate the account is allowed to access the Keyboard-Video-Mouse over IP session service.
ManagerConsole	Allow access to the manager's console, which could be connected through Telnet, SSH, SM CLP, or other protocol. • This value shall indicate the account is allowed to access the manager console.
OEM	OEM account type. See the OEMAccountTypes property. • This value shall indicate the account is allowed to access the services listed in the OEMAccountTypes property.
Redfish	Allow access to the Redfish service. • This value shall indicate the account is allowed to access Redfish services. If the version of the ManagerAccount resource is lower than the schema version when another enumeration value in this list was added, the implementation may include that functionality as part of the `Redfish` value.
SNMP	Allow access to SNMP services. • This value shall indicate the account is allowed to access SNMP services.
VirtualMedia	Allow access to control virtual media. • This value shall indicate the account is allowed to control virtual media.
WebUI	Allow access to a web user interface session, such as a graphical interface or another web-based protocol. • This value shall indicate the account is allowed to access the web interface.

6.54.4.2 AuthenticationProtocol:

The authentication protocol for SNMPv3.

- This property shall contain the SNMPv3 authentication protocol.

string	Description
HMAC128_SHA224 *(v1.7+)*	HMAC-128-SHA-224 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC128SHA224AuthProtocol.

string	Description
HMAC192_SHA256 *(v1.7+)*	HMAC-192-SHA-256 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC192SHA256AuthProtocol.
HMAC256_SHA384 *(v1.7+)*	HMAC-256-SHA-384 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC256SHA384AuthProtocol.
HMAC384_SHA512 *(v1.7+)*	HMAC-384-SHA-512 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC384SHA512AuthProtocol.
HMAC_MD5	HMAC-MD5-96 authentication. • This value shall indicate authentication conforms to the RFC3414-defined HMAC-MD5-96 authentication protocol.
HMAC_SHA96	HMAC-SHA-96 authentication. • This value shall indicate authentication conforms to the RFC3414-defined HMAC-SHA-96 authentication protocol.
None	No authentication. • This value shall indicate authentication is not required.

6.54.4.3 EncryptionProtocol:

The encryption protocol for SNMPv3.

- This property shall contain the SNMPv3 encryption protocol.

string	Description
CBC_DES	CBC-DES encryption. • This value shall indicate encryption conforms to the RFC3414-defined CBC-DES encryption protocol.
CFB128_AES128	CFB128-AES-128 encryption. • This value shall indicate encryption conforms to the RFC3826-defined CFB128-AES-128 encryption protocol.

string	Description
None	No encryption. • This value shall indicate there is no encryption.

6.54.5 Example response

```
{
    "@odata.type": "#ManagerAccount.v1_9_0.ManagerAccount",
    "Id": "1",
    "Name": "User Account",
    "Description": "User Account",
    "Enabled": true,
    "Password": null,
    "UserName": "Administrator",
    "RoleId": "Administrator",
    "Locked": false,
    "Links": {
        "Role": {
            "@odata.id": "/redfish/v1/AccountService/Roles/Administrator"
        }
    },
    "@odata.id": "/redfish/v1/AccountService/Accounts/1"
}
```

6.55 ManagerDiagnosticData 1.1.0

Version	*v1.1*
Release	2021.4

6.55.1 Description

The ManagerDiagnosticData schema defines internal diagnostic data for a manager. It contains information that might be used by vendors to collect debug information about the manager. Clients should not make decisions for raising alerts, creating service events, or other actions based on information in this resource.

- This resource shall represent internal diagnostic data for a manager for a Redfish implementation. Clients should not make decisions for raising alerts, creating service events, or other actions based on information in this resource.

6.55.2 URIs

/redfish/v1/Managers/*{ManagerId}*/ManagerDiagnosticData

6.55.3 Properties

Property	Type	Attributes	Notes
BootTimeStatistics {	object		The boot time statistics of the manager. • This property shall contain the boot time statistics of the manager.
FirmwareTimeSeconds	number	*read-only (null)*	The number of seconds the manager spent in the firmware stage. • This property shall contain the number of seconds the manager spent in the firmware stage.
InitrdTimeSeconds	number	*read-only (null)*	The number of seconds the manager spent in the initrd boot stage. • This property shall contain the number of seconds the manager spent in the initrd boot stage.
KernelTimeSeconds	number	*read-only (null)*	The number of seconds the manager spent in the kernel stage. • This property shall contain the number of seconds the manager spent in the kernel stage.
LoaderTimeSeconds	number	*read-only (null)*	The number of seconds the manager spent in the loader stage. • This property shall contain the number of seconds the manager spent in the loader stage.
UserSpaceTimeSeconds	number	*read-only (null)*	The number of seconds the manager spent in the user space boot stage. • This property shall contain the number of seconds the manager spent in the user space boot stage.
}			
FreeStorageSpaceKiB	integer (KiBy)	*read-only (null)*	The available storage space on this manager in kibibytes (KiB). • This property shall contain the available storage space on this manager in kibibytes (KiB).

Property	Type	Attributes	Notes
I2CBuses [{	array		The statistics of the I2C buses. • This property shall contain the statistics of the I2C buses. Services may subdivide a physical bus into multiple entries in this property based on how the manager tracks bus segments, virtual buses from a controller, and other segmentation capabilities.
BusErrorCount	integer	*read-only (null)*	The number of bus errors on this I2C bus. • This property shall contain the number of bus errors on this I2C bus. Bus errors include, but are not limited to, an SDA rising or falling edge while SCL is high or a stuck bus signal.
I2CBusName	string	*read-only*	The name of the I2C bus. • This property shall contain the name of the I2C bus.
NACKCount	integer	*read-only (null)*	The number of NACKs on this I2C bus. • This property shall contain the number of NACKs on this I2C bus.
TotalTransactionCount	integer	*read-only (null)*	The total number of transactions on this I2C bus. • This property shall contain the total number of transactions on this I2C bus. The count shall include the number of I2C transactions initiated by the manager and the number of I2C transactions where the manager is the target device.
}]			
MemoryECCStatistics {	object		The memory ECC statistics of the manager. • This property shall contain the memory ECC statistics of the manager.
CorrectableECCErrorCount	integer	*read-only (null)*	The number of the correctable errors since reset. • This property shall contain the number of correctable errors since reset.
UncorrectableECCErrorCount	integer	*read-only (null)*	The number of the uncorrectable errors since reset. • This property shall contain the number of uncorrectable errors since reset.
}			
MemoryStatistics {	object		The memory statistics of the manager. • This property shall contain the memory statistics of the manager.

Property	Type	Attributes	Notes
AvailableBytes	integer (bytes)	*read-only (null)*	The amount of memory available in bytes for starting new processes without swapping. • This property shall contain the amount of memory available in bytes for starting new processes without swapping. This includes free memory and reclaimable cache and buffers.
BuffersAndCacheBytes	integer (bytes)	*read-only (null)*	The amount of memory used in bytes by kernel buffers, page caches, and slabs. • This property shall contain the amount of memory used in bytes by kernel buffers, page caches, and slabs.
FreeBytes	integer (bytes)	*read-only (null)*	The amount of free memory in bytes. • This property shall contain the amount of free memory in bytes.
SharedBytes	integer (bytes)	*read-only (null)*	The amount of shared memory in bytes. • This property shall contain the amount of shared memory in bytes. This includes things such as memory consumed by temporary filesystems.
TotalBytes	integer (bytes)	*read-only (null)*	The total amount of memory in bytes. • This property shall contain the total amount of memory in bytes.
UsedBytes	integer (bytes)	*read-only (null)*	The amount of used memory in bytes. • This property shall contain the amount of used memory in bytes. This value is calculated as TotalBytes minus FreeBytes minus BuffersAndCacheBytes.
}			
ProcessorStatistics {	object		The processor statistics of the manager. • This property shall contain the processor statistics of the manager.
KernelPercent	number (%)	*read-only (null)*	The percentage of CPU time spent in kernel mode. • This property shall contain the percentage of CPU time spent in kernel mode.
UserPercent	number (%)	*read-only (null)*	The percentage of CPU time spent in user mode. • This property shall contain the percentage of CPU time spent in user mode.
}			

Property	Type	Attributes	Notes
TopProcesses [{	array		The statistics of the top processes of this manager. • This property shall contain the statistics of the top processes of this manager.
CommandLine	string	*read-only*	The command line of this process. • This property shall contain the command line with parameters of this process.
KernelTimeSeconds	number	*read-only* *(null)*	The number of seconds this process executed in kernel space. • This property shall contain the number of seconds this process executed in kernel space.
ResidentSetSizeBytes	integer (bytes)	*read-only* *(null)*	The resident set size of this process in bytes. • This property shall contain the resident set size of this process in bytes, which is the amount of memory allocated to the process and is in RAM.
RestartAfterFailureCount *(v1.1+)*	integer	*read-only* *(null)*	The number of times this process has restarted unexpectedly. • This property shall contain the number of times this process has restarted unexpectedly, such as due to unintentional failures, restarts, or shutdowns, with the same command line including arguments.
RestartCount *(v1.1+)*	integer	*read-only* *(null)*	The number of times this process has restarted. • This property shall contain the number of times this process has restarted with the same command line including arguments.
UptimeSeconds *(v1.1+)*	number	*read-only* *(null)*	The wall-clock time this process has been running in seconds. • This property shall contain the wall-clock time this process has been running in seconds.
UserTimeSeconds	number	*read-only* *(null)*	The number of seconds this process executed in user space. • This property shall contain the number of seconds this process executed in user space.
}]			

6.55.4 Actions

6.55.4.1 ResetMetrics

Description

Resets time intervals or counted values of the diagnostic data for this manager.

- This action shall reset any time intervals or counted values of the diagnostic data for this manager.

Action URI: {Base URI of target resource}/Actions/ManagerDiagnosticData.ResetMetrics

Action parameters

This action takes no parameters.

6.55.5 Example response


```
{
    "@odata.type": "#ManagerDiagnosticData.v1_1_0.ManagerDiagnosticData",
    "Id": "ManagerDiagnosticData",
    "Name": "Manager Diagnostic Data",
    "I2CBuses": [
        {
            "I2CBusName": "i2c-0",
            "TotalTransactionCount": 10000,
            "BusErrorCount": 12,
            "NACKCount": 34
        },
        {
            "I2CBusName": "i2c-1",
            "TotalTransactionCount": 20000,
            "BusErrorCount": 56,
            "NACKCount": 78
        }
    ],
    "MemoryStatistics": {
        "TotalBytes": 1013052000,
        "UsedBytes": 45084000,
        "FreeBytes": 894820000,
        "SharedBytes": 19864000,
        "BuffersAndCacheBytes": 73148000,
        "AvailableBytes": 928248000
    },
    "ProcessorStatistics": {
        "KernelPercent": 12.34,
```

```
        "UserPercent": 23.45
    },
    "TopProcesses": [
        {
            "CommandLine": "dbus-broker",
            "UserTimeSeconds": 14400,
            "KernelTimeSeconds": 10800,
            "ResidentSetSizeBytes": 2300000
        },
        {
            "CommandLine": "swampd",
            "UserTimeSeconds": 13200,
            "KernelTimeSeconds": 8441,
            "ResidentSetSizeBytes": 8883000
        },
        {
            "CommandLine": "ipmid",
            "UserTimeSeconds": 13100,
            "KernelTimeSeconds": 6650,
            "ResidentSetSizeBytes": 23400000
        },
        {
            "CommandLine": "phosphor-hwmon-readd -i iface1",
            "UserTimeSeconds": 5100,
            "KernelTimeSeconds": 3200,
            "ResidentSetSizeBytes": 564000
        }
    ],
    "BootTimeStatistics": {
        "FirmwareTimeSeconds": 42.3,
        "LoaderTimeSeconds": 12.3,
        "KernelTimeSeconds": 33.1,
        "InitrdTimeSeconds": 3.2,
        "UserSpaceTimeSeconds": 81.1
    },
    "MemoryECCStatistics": {
        "CorrectableECCErrorCount": 1,
        "UncorrectableECCErrorCount": 2
    },
    "@odata.id": "/redfish/v1/Managers/BMC/ManagerDiagnosticData"
}
```


6.56 ManagerNetworkProtocol 1.9.0

Version	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2021.2	2020.4	2020.1	2019.3	2018.3	2018.2	2017.1	2016.3	1.0

6.56.1 Description

The network service settings for the manager.

- This Resource shall represent the network service settings for the manager.

6.56.2 URIs

/redfish/v1/Managers/*{ManagerId}*/NetworkProtocol

6.56.3 Properties

Property	Type	Attributes	Notes
DHCP *(v1.1+)* {}	object		The settings for this manager's DHCPv4 protocol support. • This object shall contain the DHCPv4 protocol settings for the manager. For more information about this property, see Protocol in Property Details.
DHCPv6 *(v1.3+)* {}	object		The settings for this manager's DHCPv6 protocol support. • This object shall contain the DHCPv6 protocol settings for the manager. For more information about this property, see Protocol in Property Details.
FQDN	string	*read-only (null)*	The fully qualified domain name for the manager obtained by DNS including the host name and top-level domain name. • This property shall contain the fully qualified domain name for the manager.
HostName	string	*read-only (null)*	The DNS host name of this manager, without any domain information. • This property shall contain the host name without any domain information.
HTTP {}	object		The settings for this manager's HTTP protocol support. • This object shall contain the HTTP protocol settings for the manager. The default Port property value should be `80` for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.

Property	Type	Attributes	Notes
HTTPS {	object		The settings for this manager's HTTPS protocol support. • This object shall contain the HTTPS/SSL protocol settings for this manager. The default Port property value should be `443` for compatibility with established client implementations.
Certificates *(v1.4+)* {	object		The link to a collection of certificates used for HTTPS by this manager. • This property shall contain a link to a Resource Collection of type CertificateCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
Port	integer	*read-write (null)*	The protocol port. • This property shall contain the port assigned to the protocol.
ProtocolEnabled	boolean	*read-write (null)*	An indication of whether the protocol is enabled. • This property shall indicate whether the protocol is enabled.
}			
IPMI {}	object		The settings for this manager's IPMI-over-LAN protocol support. • This object shall contain the IPMI over LAN protocol settings for the manager. The default Port property value should be `623` for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.
KVMIP {}	object		The settings for this manager's KVM-IP protocol support that apply to all system instances controlled by this manager. • This object shall contain the KVM-IP (Keyboard, Video, Mouse over IP) protocol settings for the manager. If multiple systems are supported by this manager, these properties, if present, apply to all instances of KVMIP controlled by this manager. For more information about this property, see Protocol in Property Details.
NTP *(v1.2+)* {	object		The settings for this manager's NTP protocol support. • This object shall contain the NTP protocol settings for the manager.

Property	Type	Attributes	Notes
NetworkSuppliedServers *(v1.9+)* [ ]	array (string, null)	*read-only*	The NTP servers supplied by other network protocols to this manager. • This property shall contain the NTP servers supplied by other network protocols to this manager. DHCP is an example of a protocol that can supply NTP servers to this manager.
NTPServers *(v1.2+)* [ ]	array (string, null)	*read-write*	Indicates to which user-supplied NTP servers this manager is subscribed. • This property shall contain all the user-supplied NTP servers for which this manager is using to obtain time. NetworkSuppliedServers is used for NTP servers supplied by other network protocols such as DHCP.
Port	integer	*read-write (null)*	The protocol port. • This property shall contain the port assigned to the protocol.
ProtocolEnabled	boolean	*read-write (null)*	An indication of whether the protocol is enabled. • This property shall indicate whether the protocol is enabled.
}			
Proxy *(v1.8+)* {	object	*(null)*	The HTTP/HTTPS proxy information for this manager. • This property shall contain the HTTP/HTTPS proxy configuration for this manager.
Enabled *(v1.8+)*	boolean	*read-write*	Indicates if the manager uses the proxy server. • This property shall indicate if the proxy server is used for communications.
ExcludeAddresses *(v1.8+)* [ ]	array (string, null)	*read-write*	Addresses that do not require the proxy server to access. • This property shall contain a list of hostnames or IP addresses that do not require a connection through the proxy server to access.
Password *(v1.8+)*	string	*read-write (null)*	The password for the proxy. The value is `null` in responses. • This property shall contain the password for this proxy. The value shall be `null` in responses.
PasswordSet *(v1.8+)*	boolean	*read-only*	Indicates if the Password property is set. • This property shall contain `true` if a valid value was provided for the Password property. Otherwise, the property shall contain `false`.

Property	Type	Attributes	Notes
ProxyAutoConfigURI *(v1.8+)*	string (URI)	*read-write (null)*	The URI used to access a proxy auto-configuration (PAC) file. • This property shall contain the URI at which to access a proxy auto-configuration (PAC) file containing one or more JavaScript functions for configuring proxy usage for this manager.
ProxyServerURI *(v1.8+)*	string (URI)	*read-write*	The URI of the proxy server, including the scheme and any non-default port value. • This property shall contain the URI of the proxy server. The value shall contain the scheme for accessing the server, and shall include the port if the value is not the default port for the specified scheme.
Username *(v1.8+)*	string	*read-write*	The username for the proxy. • This property shall contain the username for this proxy.
}			
RDP *(v1.3+)* {}	object		The settings for this manager's Remote Desktop Protocol support. • This object shall contain the Remote Desktop Protocol settings for the manager. For more information about this property, see Protocol in Property Details.
RFB *(v1.3+)* {}	object		The settings for this manager's Remote Frame Buffer protocol support, which can support VNC. • This object shall contain the Remote Frame Buffer protocol settings for the manager. For more information about this property, see Protocol in Property Details.
SNMP {	object		The settings for this manager's SNMP support. • This object shall contain the SNMP protocol settings for this manager. The default Port property value should be `161` for compatibility with established client implementations.
AuthenticationProtocol *(v1.5+)*	string (enum)	*read-write (null)*	The authentication protocol used for SNMP access to this manager. • This property shall contain the SNMP authentication protocol used to access this manager. When the property contains the value `Account`, the SNMP settings in each manager account are used for authentication. *For the possible property values, see AuthenticationProtocol in Property details.*

Property	Type	Attributes	Notes
CommunityAccessMode *(v1.5+)*	string (enum)	*read-write (null)*	The access level of the SNMP community. • This property shall contain the access/privilege level of the SNMP community used to access an SNMP manager. *For the possible property values, see CommunityAccessMode in Property details.*
CommunityStrings *(v1.5+)* [{	array		The SNMP community strings. • This property shall contain an array of the SNMP community strings used to access an SNMP manager.
AccessMode *(v1.5+)*	string (enum)	*read-write (null)*	The access level of the SNMP community. • This property shall contain the access/privilege level of the SNMP community used to access an SNMP manager. *For the possible property values, see AccessMode in Property details.*
CommunityString *(v1.5+)*	string	*read-write (null)*	The SNMP community string. • This property shall contain the SNMP community string used for accessing an SNMP service on this manager. If HideCommunityStrings is `true`, this value shall be `null` in responses.
Name *(v1.5+)*	string	*read-write (null)*	The name of the SNMP community. • This property shall contain a display name describing the SNMP community.
}]			
EnableSNMPv1 *(v1.5+)*	boolean	*read-write (null)*	Indicates if access via SNMPv1 is enabled. • This property shall indicate if access to the SNMP service on this manager using the SNMPv1 protocol is enabled.
EnableSNMPv2c *(v1.5+)*	boolean	*read-write (null)*	Indicates if access via SNMPv2c is enabled. • This property shall indicate if access to the SNMP service on this manager using the SNMPv2c protocol is enabled.
EnableSNMPv3 *(v1.5+)*	boolean	*read-write (null)*	Indicates if access via SNMPv3 is enabled. • This property shall indicate if access to the SNMP service on this manager using the SNMPv3 protocol is enabled.

Property	Type	Attributes	Notes
EncryptionProtocol *(v1.5+)*	string (enum)	*read-write (null)*	The encryption protocol used for SNMPv3 access to this manager. • This property shall contain the SNMPv3 encryption protocol used to access this manager, unless AuthenticationProtocol contains the value `Account`. *For the possible property values, see EncryptionProtocol in Property details.*
EngineId *(v1.5+)* {	object	*(null)*	The engine ID. • This property shall contain the RFC3411-defined engine ID.
ArchitectureId *(v1.6+)*	string	*read-write (null)*	The architecture identifier. • This property shall contain the architecture identifier as described in item 3 of the snmpEngineID syntax of RFC3411. The full RFC3411-defined snmpEngineID is form from the concatenation of the value in the PrivateEnterpriseId property and the value in this property. If the most significant bit in PrivateEnterpriseId is set to zero, this property shall not be present. Pattern: `^([A-Fa-f0-9]{2} ){0,27}[A-Fa-f0-9]{2}$`
EnterpriseSpecificMethod *(v1.5+)*	string	*read-write (null)*	The enterprise specific method. • This property shall contain the enterprise specific method as described in item 2 of the snmpEngineID syntax of RFC3411. The full RFC3411-defined snmpEngineID is form from the concatenation of the value in the PrivateEnterpriseId property and the value in this property. If the most significant bit in PrivateEnterpriseId is set to one, this property shall not be present. Pattern: `^([A-Fa-f0-9]{2} ){7}[A-Fa-f0-9]{2}$`
PrivateEnterpriseId *(v1.5+)*	string	*read-only (null)*	The private enterprise ID. • This property shall contain an RFC3411-defined private enterprise ID. Pattern: `^([A-Fa-f0-9]{2} ){3}[A-Fa-f0-9]{2}$`
}			
HideCommunityStrings *(v1.5+)*	boolean	*read-write (null)*	Indicates if the community strings should be hidden. • This property shall indicate if the community strings should be hidden in responses.
Port	integer	*read-write (null)*	The protocol port. • This property shall contain the port assigned to the protocol.

Property	Type	Attributes	Notes
ProtocolEnabled	boolean	*read-write (null)*	An indication of whether the protocol is enabled. • This property shall indicate whether the protocol is enabled.
}			
SSDP {	object		The settings for this manager's SSDP support. • This object shall contain the SSDP protocol settings for this manager. Simple Service Discovery Protocol (SSDP) is for network discovery of devices supporting the Redfish Service. The default Port property value should be `1900` for compatibility with established client implementations.
NotifyIPv6Scope	string (enum)	*read-write (null)*	The IPv6 scope for multicast NOTIFY messages for SSDP. • This property shall contain the IPv6 scope for multicast NOTIFY messages. The valid enumerations are a subset of the available IPv6 scope types. *For the possible property values, see NotifyIPv6Scope in Property details.*
NotifyMulticastIntervalSeconds	integer (seconds)	*read-write (null)*	The time interval, in seconds, between transmissions of the multicast NOTIFY ALIVE message from this service for SSDP. • This property shall contain the time interval, in seconds, between transmissions of the multicast NOTIFY ALIVE message. A setting of 0 seconds shall disable this functionality. The recommended value is 600 seconds.
NotifyTTL	integer	*read-write (null)*	The time-to-live hop count for SSDP multicast NOTIFY messages. • This property shall contain the time-to-live hop count used for multicast NOTIFY messages. The recommended value is 2.
Port	integer	*read-write (null)*	The protocol port. • This property shall contain the port assigned to the protocol.
ProtocolEnabled	boolean	*read-write (null)*	An indication of whether the protocol is enabled. • This property shall indicate whether the protocol is enabled.
}			

Property	Type	Attributes	Notes
SSH {}	object		The settings for this manager's Secure Shell (SSH) protocol support. • This object shall contain the Secure Shell (SSH) protocol settings for the manager. The default value should be 22 for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.
Status {}	object		The status and health of the Resource and its subordinate or dependent Resources. • This property shall contain any status or health properties of the Resource. For property details, see Status.
Telnet {}	object		The settings for this manager's Telnet protocol support. • This object shall contain the Telnet protocol settings for this manager. The default Port property value should be `23` for compatibility with established client implementations. For more information about this property, see Protocol in Property Details.
VirtualMedia {}	object		The settings for this manager's virtual media support that apply to all system instances controlled by this manager. • This object shall contain the virtual media protocol settings for this manager. The Port property shall contain the TCP port assigned for Virtual Media usage. If multiple systems are supported by this manager, these properties, if present, apply to all instances of virtual media controlled by this manager. For more information about this property, see Protocol in Property Details.

6.56.4 Property details

6.56.4.1 AccessMode:

The access level of the SNMP community.

- This property shall contain the access/privilege level of the SNMP community used to access an SNMP manager.

string	Description
Full	READ-WRITE access mode. • This value shall indicate the RFC1157-defined READ-WRITE access mode.

string	Description
Limited	READ-ONLY access mode. • This value shall indicate the RFC1157-defined READ-ONLY access mode.

6.56.4.2 AuthenticationProtocol:

The authentication protocol used for SNMP access to this manager.

- This property shall contain the SNMP authentication protocol used to access this manager. When the property contains the value `Account`, the SNMP settings in each manager account are used for authentication.

string	Description
Account	Authentication is determined by account settings. • This value shall indicate authentication for SNMPv3 access is determined based on the corresponding account settings.
CommunityString	SNMP community string authentication. • This value shall indicate authentication uses SNMP community strings.
HMAC128_SHA224 *(v1.7+)*	HMAC-128-SHA-224 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC128SHA224AuthProtocol.
HMAC192_SHA256 *(v1.7+)*	HMAC-192-SHA-256 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC192SHA256AuthProtocol.
HMAC256_SHA384 *(v1.7+)*	HMAC-256-SHA-384 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC256SHA384AuthProtocol.
HMAC384_SHA512 *(v1.7+)*	HMAC-384-SHA-512 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC7860-defined usmHMAC384SHA512AuthProtocol.
HMAC_MD5	HMAC-MD5-96 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC3414-defined HMAC-MD5-96 authentication protocol.

string	Description
HMAC_SHA96	HMAC-SHA-96 authentication. • This value shall indicate authentication for SNMPv3 access conforms to the RFC3414-defined HMAC-SHA-96 authentication protocol.

6.56.4.3 CommunityAccessMode:

The access level of the SNMP community.

- This property shall contain the access/privilege level of the SNMP community used to access an SNMP manager.

string	Description
Full	READ-WRITE access mode. • This value shall indicate the RFC1157-defined READ-WRITE access mode.
Limited	READ-ONLY access mode. • This value shall indicate the RFC1157-defined READ-ONLY access mode.

6.56.4.4 EncryptionProtocol:

The encryption protocol used for SNMPv3 access to this manager.

- This property shall contain the SNMPv3 encryption protocol used to access this manager, unless AuthenticationProtocol contains the value `Account`.

string	Description
Account	Encryption is determined by account settings. • This value shall indicate encryption is determined based on the corresponding account settings.
CBC_DES	CBC-DES encryption. • This value shall indicate encryption conforms to the RFC3414-defined CBC-DES encryption protocol.

string	Description
CFB128_AES128	CFB128-AES-128 encryption. • This value shall indicate encryption conforms to the RFC3414-defined CFB128-AES-128 encryption protocol.
None	No encryption. • This value shall indicate there is no encryption.

6.56.4.5 NotifyIPv6Scope:

The IPv6 scope for multicast NOTIFY messages for SSDP.

- This property shall contain the IPv6 scope for multicast NOTIFY messages. The valid enumerations are a subset of the available IPv6 scope types.

string	Description
Link	SSDP NOTIFY messages are sent to addresses in the IPv6 local link scope.
Organization	SSDP NOTIFY messages are sent to addresses in the IPv6 local organization scope.
Site	SSDP NOTIFY messages are sent to addresses in the IPv6 local site scope.

6.56.4.6 Protocol:

The settings for a network protocol associated with a manager.

Port	integer	*read-write (null)*	The protocol port. • This property shall contain the port assigned to the protocol.
ProtocolEnabled	boolean	*read-write (null)*	An indication of whether the protocol is enabled. • This property shall indicate whether the protocol is enabled.

6.56.5 Example response

```
{
    "@odata.type": "#ManagerNetworkProtocol.v1_9_0.ManagerNetworkProtocol",
```

```
    "Id": "NetworkProtocol",
    "Name": "Manager Network Protocol",
    "Description": "Manager Network Service",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "HostName": "web483-bmc",
    "FQDN": "web483-bmc.dmtf.org",
    "HTTP": {
        "ProtocolEnabled": true,
        "Port": 80
    },
    "HTTPS": {
        "ProtocolEnabled": true,
        "Port": 443
    },
    "IPMI": {
        "ProtocolEnabled": true,
        "Port": 623
    },
    "SSH": {
        "ProtocolEnabled": true,
        "Port": 22
    },
    "SNMP": {
        "ProtocolEnabled": true,
        "Port": 161
    },
    "VirtualMedia": {
        "ProtocolEnabled": true,
        "Port": 17988
    },
    "SSDP": {
        "ProtocolEnabled": true,
        "Port": 1900,
        "NotifyMulticastIntervalSeconds": 600,
        "NotifyTTL": 5,
        "NotifyIPv6Scope": "Site"
    },
    "Telnet": {
        "ProtocolEnabled": true,
        "Port": 23
    },
    "KVMIP": {
        "ProtocolEnabled": true,
        "Port": 5288
    },
    "@odata.id": "/redfish/v1/Managers/BMC/NetworkProtocol"
}
```

6.57 MediaController 1.3.0 (deprecated)

Version	*v1.3 Deprecated*	*v1.2 Deprecated*	*v1.1*	*v1.0*
Release	2022.1	2021.1	2020.2	2019.4

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of the FabricAdapter schema.

6.57.1 Description

The MediaController schema contains the definition of the media controller and its configuration.

- This resource contains the media controller in a Redfish implementation.

6.57.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/MediaControllers/*{MediaControllerId}*

6.57.3 Properties

Property	Type	Attributes	Notes
EnvironmentMetrics *(v1.2+)* {	object		The link to the environment metrics for this media controller. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the environment metrics for this media controller. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints [{	array		An array of links to the endpoints that connect to this media controller. • This property shall contain an array of links to resources of type Endpoint with which this media controller is associated.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
MemoryDomains [{	array		An array of links to the memory domains associated with this media controller. • This property shall contain an array of links to resources of type MemoryDomain that represent the memory domains associated with this memory controller.
@odata.id	string	*read-only*	Link to a MemoryDomain resource. See the Links section and the *MemoryDomain* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Manufacturer	string	*read-only* *(null)*	The manufacturer of this media controller. • This property shall contain the manufacturer of the media controller.
MediaControllerType	string (enum)	*read-only* *(null)*	The type of media controller. • This property shall contain the type of media controller. *For the possible property values, see MediaControllerType in Property details.*
Model	string	*read-only* *(null)*	The model of this media controller. • This property shall contain the model of the media controller.
PartNumber	string	*read-only* *(null)*	The part number of this media controller. • This property shall indicate the part number as provided by the manufacturer of this media controller.
Ports {	object		The link to the collection of ports associated with this media controller. • This property shall contain a link to a resource collection of type PortCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			
SerialNumber	string	*read-only* *(null)*	The serial number of this media controller. • This property shall indicate the serial number as provided by the manufacturer of this media controller.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
UUID *(v1.1+)*	string	*read-only (null)*	The UUID for this media controller. • This property shall contain a universal unique identifier number for the media controller. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`

6.57.4 Actions

6.57.4.1 Reset

Description

This action resets this media controller.

- This action shall reset this media controller.

Action URI: {Base URI of target resource}/Actions/MediaController.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ForceRestart"
}
```

6.57.5 Property details

6.57.5.1 MediaControllerType:

The type of media controller.

- This property shall contain the type of media controller.

string	Description
Memory	The media controller is for memory. • This value shall indicate the media controller is for memory.

6.57.5.2 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.

string	Description
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.

string	Description
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.57.6 Example response

```
{
    "@odata.type": "#MediaController.v1_3_0.MediaController",
    "Id": "MediaController1",
    "Name": "Media Controller 1",
    "MediaControllerType": "Memory",
    "Manufacturer": "Contoso",
    "Model": "Contoso MediaController",
    "SerialNumber": "2M220100SL",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "UUID": "41784113-ed6b-2284-1414-916520dc1dd1",
    "Ports": {
        "@odata.id": "/redfish/v1/Chassis/GenZ/MediaControllers/1/Ports"
    },
    "Actions": {
        "#MediaController.Reset": {
            "target": "/redfish/v1/Chassis/GenZ/MediaControllers/1/Actions/MediaController.Reset",
            "ResetType@Redfish.AllowableValues": [
                "ForceRestart"
            ]
        }
    },
    "Links": {
        "Endpoints": [
            {
                "@odata.id": "/redfish/v1/Fabrics/GenZ/Endpoints/1"
            }
        ],
        "MemoryDomains": [
            {
                "@odata.id": "/redfish/v1/Chassis/GenZ/MemoryDomains/1"
            }
        ]
    },
    "Oem": {},
```

```
    "@odata.id": "/redfish/v1/Chassis/GenZ/MediaControllers/1"
}
```

6.58 Memory 1.16.0

Version	*v1.16*	*v1.15*	*v1.14*	*v1.13*	*v1.12*	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	...
Release	2022.2	2022.1	2021.4	2021.2	2021.1	2020.4	2020.3	2019.4	2019.2	2018.3	2018.2	...

6.58.1 Description

The Memory schema represents a memory device, such as a DIMM, and its configuration.

- This resource shall represent a memory device in a Redfish implementation.

6.58.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/Memory/*{MemoryId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*

6.58.3 Properties

Property	Type	Attributes	Notes
AllocationAlignmentMiB *(v1.2+)*	integer (mebibytes)	*read-only (null)*	The boundary that memory regions are allocated on, measured in mebibytes (MiB). • This property shall contain the alignment boundary on which memory regions are allocated, measured in MiB.
AllocationIncrementMiB *(v1.2+)*	integer (mebibytes)	*read-only (null)*	The size of the smallest unit of allocation for a memory region in mebibytes (MiB). • This property shall contain the allocation increment for regions, measured in MiB.

Property	Type	Attributes	Notes
AllowedSpeedsMHz [ ]	array (MHz) (integer)	*read-only*	Speeds supported by this memory device. • This property shall contain the speed supported by this memory device.
Assembly *(v1.4+)* {	object		The link to the assembly resource associated with this memory device. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
BaseModuleType	string (enum)	*read-only* *(null)*	The base module type of the memory device. • This property shall contain the base module type of the memory device. *For the possible property values, see BaseModuleType in Property details.*
BusWidthBits	integer	*read-only* *(null)*	The bus width, in bits. • This property shall contain the bus width, in bits.
CacheSizeMiB *(v1.4+)*	integer (mebibytes)	*read-only* *(null)*	Total size of the cache portion memory in MiB. • This property shall contain the total size of the cache portion memory in MiB.
CapacityMiB	integer (mebibytes)	*read-only* *(null)*	Memory capacity in mebibytes (MiB). • This property shall contain the memory capacity in MiB.
Certificates *(v1.11+)* {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			

Property	Type	Attributes	Notes
ConfigurationLocked *(v1.7+)*	boolean	*read-only (null)*	An indication of whether the configuration of this memory device is locked and cannot be altered. • This property shall indicate whether the configuration of this memory device is locked and cannot be altered.
DataWidthBits	integer	*read-only (null)*	Data width in bits. • This property shall contain the data width in bits.
DeviceID *(deprecated v1.3)*	string	*read-only (null)*	Device ID. • This property shall contain the device ID of the memory device. *Deprecated in v1.3 and later. This property has been deprecated in favor of ModuleProductID.*
DeviceLocator *(deprecated v1.9)*	string	*read-only (null)*	Location of the memory device in the platform. • This property shall contain location of the memory device in the platform, typically marked in the silk screen. *Deprecated in v1.9 and later. This property has been deprecated in favor of the ServiceLabel property within Location.*
Enabled *(v1.12+)*	boolean	*read-write*	An indication of whether this memory is enabled. • The value of this property shall indicate if this memory is enabled.
EnvironmentMetrics *(v1.11+)* {	object		The link to the environment metrics for this memory. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the environment metrics for this memory. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			
ErrorCorrection	string (enum)	*read-only (null)*	Error correction scheme supported for this memory device. • This property shall contain the error correction scheme supported for this memory device. *For the possible property values, see ErrorCorrection in Property details.*

Property	Type	Attributes	Notes
FirmwareApiVersion	string	*read-only (null)*	Version of API supported by the firmware. • This property shall contain the version of API supported by the firmware.
FirmwareRevision	string	*read-only (null)*	Revision of firmware on the memory controller. • This property shall contain the revision of firmware on the memory controller.
FunctionClasses *(deprecated v1.3)* [ ]	array (string)	*read-only*	Function classes by the memory device. • This property shall contain the function classes by the memory device. *Deprecated in v1.3 and later. This property has been deprecated in favor of OperatingMemoryModes at the root of the resource, or MemoryClassification found within RegionSet.*
IsRankSpareEnabled	boolean	*read-only (null)*	An indication of whether rank spare is enabled for this memory device. • This property shall indicate whether rank spare is enabled for this memory device.
IsSpareDeviceEnabled	boolean	*read-only (null)*	An indication of whether a spare device is enabled for this memory device. • This property shall indicate whether the spare device is enabled.
Links *(v1.2+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Batteries *(v1.15+)* [{	array		The batteries that provide power to this memory device during a power loss event. • This property shall contain an array of links to resources of type Battery that represent the batteries that provide power to this memory device during a power loss event, such as with battery-backed NVDIMMs. This property shall not be present if the batteries power the containing chassis as a whole rather than the individual memory device.
@odata.id	string	*read-only*	Link to a Battery resource. See the Links section and the *Battery* schema for details.
}]			

Property	Type	Attributes	Notes
Chassis *(v1.2+)* {	object		The link to the chassis that contains this memory device. • This property shall contain a link to a resource of type Chassis that represents the physical container associated with this memory device. See the *Chassis* schema for details on this property.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Processors *(v1.11+)* [{	array		An array of links to the processors associated with this memory device. • This property shall contain an array of links to resources of type Processor that are associated with this memory device.
@odata.id	string	*read-only*	Link to a Processor resource. See the Links section and the *Processor* schema for details.
}]			
}			
Location *(v1.4+)* {}	object		The location of the memory device. • This property shall contain location information of the associated memory device. For property details, see Location.
LocationIndicatorActive *(v1.10+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
Log *(v1.13+)* {	object		The link to the log service associated with this memory. • This property shall contain a link to a resource of type LogService. See the *LogService* schema for details on this property.
@odata.id	string	*read-only*	Link to a LogService resource. See the Links section and the *LogService* schema for details.

Property	Type	Attributes	Notes
}			
LogicalSizeMiB *(v1.4+)*	integer (mebibytes)	*read-only (null)*	Total size of the logical memory in MiB. • This property shall contain the total size of the logical memory in MiB.
Manufacturer	string	*read-only (null)*	The memory device manufacturer. • This property shall contain the manufacturer of the memory device.
MaxTDPMilliWatts [ ]	array (milliWatts) (integer)	*read-only*	Set of maximum power budgets supported by the memory device in milliwatts. • This property shall contain an array of maximum power budgets supported by the memory device in milliwatts.
Measurements *(v1.11+, deprecated v1.14* [{	array		An array of DSP0274-defined measurement blocks. • This property shall contain an array of DSP0274-defined measurement blocks. *Deprecated in v1.14 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
@odata.id	string	*read-only*	Link to a MeasurementBlock resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
MemoryDeviceType	string (enum)	*read-only (null)*	Type details of the memory device. • This property shall contain the Memory Device Type as defined by SMBIOS. *For the possible property values, see MemoryDeviceType in Property details.*
MemoryLocation {	object		Memory connection information to sockets and memory controllers. • This object shall contain properties that describe the memory connection information to sockets and memory controllers.
Channel	integer	*read-only (null)*	The channel number to which the memory device is connected. • This property shall contain the channel number to which the memory device is connected.

Property	Type	Attributes	Notes
MemoryController	integer	*read-only (null)*	The memory controller number to which the memory device is connected. • This property shall contain the memory controller number to which the memory device is connected.
Slot	integer	*read-only (null)*	The slot number to which the memory device is connected. • This property shall contain the slot number to which the memory device is connected.
Socket	integer	*read-only (null)*	The socket number to which the memory device is connected. • This property shall contain the socket number to which the memory device is connected.
}			
MemoryMedia [ ]	array (string (enum))	*read-only*	• Media of this memory device. ◦ This property shall contain the media types of this memory device. *For the possible property values, see MemoryMedia in Property details.*
MemorySubsystemControllerManufacturerID *(v1.3+)*	string	*read-only (null)*	The manufacturer ID of the memory subsystem controller of this memory device. • This property shall contain the two byte manufacturer ID of the memory subsystem controller of this memory device as defined by JEDEC in JEP-106. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
MemorySubsystemControllerProductID *(v1.3+)*	string	*read-only (null)*	The product ID of the memory subsystem controller of this memory device. • This property shall contain the two byte product ID of the memory subsystem controller of this memory device as defined by the manufacturer. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
MemoryType	string (enum)	*read-only (null)*	The type of memory device. • This property shall contain the type of memory device that this resource represents. *For the possible property values, see MemoryType in Property details.*

Property	Type	Attributes	Notes
Metrics {	object		The link to the metrics associated with this memory device. See the *MemoryMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a MemoryMetrics resource. See the Links section and the *MemoryMetrics* schema for details.
}			
Model *(v1.11+)*	string	*read-only (null)*	The product model number of this device. • This property shall indicate the model information as provided by the manufacturer of this memory.
ModuleManufacturerID *(v1.3+)*	string	*read-only (null)*	The manufacturer ID of this memory device. • This property shall contain the two byte manufacturer ID of this memory device as defined by JEDEC in JEP-106. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
ModuleProductID *(v1.3+)*	string	*read-only (null)*	The product ID of this memory device. • This property shall contain the two byte product ID of this memory device as defined by the manufacturer. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
NonVolatileSizeMiB *(v1.4+)*	integer (mebibytes)	*read-only (null)*	Total size of the non-volatile portion memory in MiB. • This property shall contain the total size of the non-volatile portion memory in MiB.
OperatingMemoryModes [ ]	array (string (enum))	*read-only*	• Memory modes supported by the memory device. ◦ This property shall contain the memory modes supported by the memory device. *For the possible property values, see OperatingMemoryModes in Property details.*

Property	Type	Attributes	Notes
OperatingSpeedMhz	integer (MHz)	*read-only (null)*	Operating speed of the memory device in MHz or MT/s as appropriate. • This property shall contain the operating speed of the memory device in MHz or MT/s (mega-transfers per second) as reported by the memory device. Memory devices that operate at their bus speed shall report the operating speed in MHz (bus speed), while memory devices that transfer data faster than their bus speed, such as DDR memory, shall report the operating speed in MT/s (mega-transfers/second). The reported value shall match the conventionally reported values for the technology used by the memory device.
OperatingSpeedRangeMHz *(v1.13+)* {	object (excerpt)		Range of allowed operating speeds (MHz). • This property shall contain the operating speed control, in megahertz units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Control with the ControlType property containing the value of `FrequencyMHz`. This object is an excerpt of the *Control* resource located at the URI shown in DataSourceUri.
AllowableMax	number	*read-only (null)*	The maximum possible setting for this control. • This property shall indicate the maximum possible value of the SetPoint or SettingMax properties for this control. Services shall not accept values for SetPoint or SettingMax above this value.
AllowableMin	number	*read-only (null)*	The minimum possible setting for this control. • This property shall indicate the minimum possible value of the SetPoint or SettingMin properties for this control. Services shall not accept values for SetPoint or SettingMin below this value.
AllowableNumericValues [ ]	array (number, null)	*read-only*	The supported values for the set point. • This property shall contain the supported values for this control. The units shall follow the value of SetPointUnits. This property should only be present when the set point or range has a limited set of supported values that cannot be accurately described using the Increment property.

Property	Type	Attributes	Notes
ControlMode	string (enum)	*read-write (null)*	The current operating mode of the control. • This property shall contain the operating mode of the control. *For the possible property values, see ControlMode in Property details.*
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this control. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy. If no source resource is implemented, meaning the excerpt represents the only available data, this property shall not be present.
Reading	number	*read-only (null)*	The reading of the sensor associated with this control. • This property shall contain the value of the Reading property of the Sensor resource directly associated with this control. This property shall not be present if multiple sensors are associated with a single control.
ReadingUnits	string	*read-only (null)*	The units of the sensor reading associated with this control. • This property shall contain the units of the sensor's reading and thresholds. This property shall not be present if multiple sensors are associated with a single control.
SettingMax	number	*read-write (null)*	The maximum set point in the allowed range. • This property shall contain the maximum desired set point within the acceptable range. The service shall reject values greater than the value of AllowableMax. The units shall follow the value of SetPointUnits.
SettingMin	number	*read-write (null)*	The minimum set point in the allowed range. • This property shall contain the minimum desired set point within the acceptable range. The service shall reject values less than the value of AllowableMin. The units shall follow the value of SetPointUnits.
}			
PartNumber	string	*read-only (null)*	The product part number of this device. • This property shall indicate the part number as provided by the manufacturer of this memory device.

Property	Type	Attributes	Notes
PersistentRegionNumberLimit *(v1.2+)*	integer	*read-only (null)*	Total number of persistent regions this memory device can support. • This property shall contain the total number of persistent regions this memory device can support.
PersistentRegionSizeLimitMiB	integer (mebibytes)	*read-only (null)*	Total size of persistent regions in mebibytes (MiB). • This property shall contain the total size of persistent regions in MiB.
PersistentRegionSizeMaxMiB *(v1.2+)*	integer (mebibytes)	*read-only (null)*	Maximum size of a single persistent region in mebibytes (MiB). • This property shall contain the maximum size of a single persistent regions in MiB.
PowerManagementPolicy {	object		Power management policy information. • This object shall contain properties that describe the power management policy for this resource.
AveragePowerBudgetMilliWatts	integer (milliWatts)	*read-only (null)*	Average power budget, in milliwatts. • This property shall contain the average power budget, in milliwatts.
MaxTDPMilliWatts	integer (milliWatts)	*read-only (null)*	Maximum TDP in milliwatts. • This property shall contain the maximum TDP in milliwatts.
PeakPowerBudgetMilliWatts	integer (milliWatts)	*read-only (null)*	Peak power budget, in milliwatts. • This property shall contain the peak power budget, in milliwatts.
PolicyEnabled	boolean	*read-only (null)*	An indication of whether the power management policy is enabled. • This property shall indicate whether the power management policy is enabled.
}			
RankCount	integer	*read-only (null)*	Number of ranks available in the memory device. • This property shall contain the number of ranks available in the memory device. The ranks could be used for spare or interleave.

Property	Type	Attributes	Notes
Regions [{	array		Memory regions information within the memory device. • This property shall contain the memory region information within the memory device.
MemoryClassification	string (enum)	*read-only (null)*	The classification of memory that the memory region occupies. • This property shall contain the classification of memory that the memory region occupies. *For the possible property values, see MemoryClassification in Property details.*
OffsetMiB	integer (mebibytes)	*read-only (null)*	Offset within the memory that corresponds to the start of this memory region in mebibytes (MiB). • This property shall contain the offset within the memory that corresponds to the start of this memory region in MiB.
PassphraseEnabled *(v1.5+)*	boolean	*read-only (null)*	An indication of whether the passphrase is enabled for this region. • This property shall indicate whether the passphrase is enabled for this region.
PassphraseState *(deprecated v1.5)*	boolean	*read-only (null)*	An indication of whether the state of the passphrase for this region is enabled. • This property shall indicate whether the state of the passphrase for this region is enabled. *Deprecated in v1.5 and later. This property has been deprecated in favor of PassphraseEnabled found within RegionSet.*
RegionId	string	*read-only (null)*	Unique region ID representing a specific region within the memory device. • This property shall contain the unique region ID representing a specific region within the memory device.
SizeMiB	integer (mebibytes)	*read-only (null)*	Size of this memory region in mebibytes (MiB). • This property shall contain the size of this memory region in MiB.
}]			
SecurityCapabilities {	object		Security capabilities of the memory device. • This property shall contain properties that describe the security capabilities of the memory device.

Property	Type	Attributes	Notes
ConfigurationLockCapable *(v1.7+)*	boolean	*read-only (null)*	An indication of whether this memory device supports the locking, or freezing, of the configuration. • This property shall indicate whether this memory device supports the locking, or freezing, of the configuration.
DataLockCapable *(v1.7+)*	boolean	*read-only (null)*	An indication of whether this memory device supports data locking. • This property shall indicate whether this memory device supports the locking of data access.
MaxPassphraseCount	integer	*read-only (null)*	Maximum number of passphrases supported for this memory device. • This property shall contain the maximum number of passphrases supported for this memory device.
PassphraseCapable	boolean	*read-only (null)*	An indication of whether the memory device is passphrase capable. • This property shall indicate whether the memory device is passphrase capable.
PassphraseLockLimit *(v1.7+)*	integer	*read-only (null)*	The maximum number of incorrect passphrase attempts allowed before memory device is locked. • This property shall contain the maximum number of incorrect passphrase access attempts allowed before access to data is locked. If 0, the number of attempts is infinite.
SecurityStates *(deprecated v1.7)* [ ]	array (string (enum))	*read-only*	• Security states supported by the memory device. ◦ This property shall contain the security states supported by the memory device. *For the possible property values, see SecurityStates in Property details. Deprecated in v1.7 and later. This property has been deprecated in favor of using the individual PassphraseCapable, DataLockCapable and ConfigurationLockCapable properties.*
}			
SecurityState *(v1.7+)*	string (enum)	*read-write (null)*	The current security state of this memory device. • This property shall contain the current security state of this memory device. *For the possible property values, see SecurityState in Property details.*

Property	Type	Attributes	Notes
SerialNumber	string	*read-only (null)*	The product serial number of this device. • This property shall indicate the serial number as provided by the manufacturer of this memory device.
SpareDeviceCount	integer	*read-only (null)*	Number of unused spare devices available in the memory device. • This property shall contain the number of unused spare devices available in the memory device. If memory devices fails, the spare device could be used.
SparePartNumber *(v1.11+)*	string	*read-only (null)*	The spare part number of the memory. • This property shall contain the spare part number of the memory.
Status *(v1.1+)* {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SubsystemDeviceID *(deprecated v1.3)*	string	*read-only (null)*	Subsystem device ID. • This property shall contain the subsystem device ID of the memory device. *Deprecated in v1.3 and later. This property has been deprecated in favor of MemorySubsystemControllerProductID.*
SubsystemVendorID *(deprecated v1.3)*	string	*read-only (null)*	SubSystem vendor ID. • This property shall contain the subsystem vendor ID of the memory device. *Deprecated in v1.3 and later. This property has been deprecated in favor of MemorySubsystemControllerManufacturerID.*
VendorID *(deprecated v1.3)*	string	*read-only (null)*	Vendor ID. • This property shall contain the vendor ID of the memory device. *Deprecated in v1.3 and later. This property has been deprecated in favor of ModuleManufacturerID.*
VolatileRegionNumberLimit *(v1.2+)*	integer	*read-only (null)*	Total number of volatile regions this memory device can support. • This property shall contain the total number of volatile regions this memory device can support.

Property	Type	Attributes	Notes
VolatileRegionSizeLimitMiB	integer (mebibytes)	*read-only (null)*	Total size of volatile regions in mebibytes (MiB). • This property shall contain the total size of volatile regions in MiB.
VolatileRegionSizeMaxMiB *(v1.2+)*	integer (mebibytes)	*read-only (null)*	Maximum size of a single volatile region in mebibytes (MiB). • This property shall contain the maximum size of a single volatile regions in MiB.
VolatileSizeMiB *(v1.4+)*	integer (mebibytes)	*read-only (null)*	Total size of the volatile portion memory in MiB. • This property shall contain the total size of the volatile portion memory in MiB.

6.58.4 Actions

6.58.4.1 DisablePassphrase

Description

Disable passphrase for given regions.

- This action shall disable the need for passphrases on the supplied region provided the supplied passphrase matches that of the region.

Action URI: {Base URI of target resource}/Actions/Memory.DisablePassphrase

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	*required*	Passphrase for doing the operation. • This property shall contain the passphrase used in this action.
RegionId	string	*required*	The memory region ID to which to apply this action. • This property shall contain the memory region ID to which to apply this action.

Request Example

```
{
    "Passphrase": "FluffyBunny",
    "RegionId": 2
}
```

6.58.4.2 OverwriteUnit *(v1.6+)*

Description

This contains the action for securely erasing given regions using the NIST SP800-88 Purge: Overwrite.

- This action shall securely erase the supplied region provided the supplied passphrase matches that of the given region using the NIST SP800-88 Purge: Overwrite. Use the SecureEraseUnit method to perform NIST SP800-88 Purge: Cryptographic Erase.

Action URI: {Base URI of target resource}/Actions/Memory.OverwriteUnit

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	*required*	Passphrase for doing the operation. • This property shall contain the passphrase used in this action.
RegionId	string	*required*	The memory region ID to which to apply this action. • This property shall contain the memory region ID to which to apply this action.

Request Example

```
{
    "Passphrase": "FluffyBunny",
    "RegionId": 2
}
```

6.58.4.3 Reset *(v1.8+)*

Description

This action resets this memory device.

- This action shall reset this memory device.

Action URI: {Base URI of target resource}/Actions/Memory.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation specific default reset. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ForceRestart"
}
```

6.58.4.4 ResetToDefaults *(v1.16+)*

Description

The action resets the values of writable properties to factory defaults.

- This action shall reset the values of writable properties in this resource to their default values as specified by the manufacturer.

Action URI: {Base URI of target resource}/Actions/Memory.ResetToDefaults

Action parameters

This action takes no parameters.

6.58.4.5 SecureEraseUnit

Description

This contains the action for securely erasing given regions using the NIST SP800-88 Purge: Cryptographic Erase.

- This action shall securely erase the supplied region provided the supplied passphrase matches that of the given

region using the NIST SP800-88 Purge: Cryptographic Erase. Use the OverwriteUnit method to perform NIST SP800-88 Purge: Overwrite.

Action URI: {Base URI of target resource}/Actions/Memory.SecureEraseUnit

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	*required*	Passphrase for doing the operation. • This property shall contain the passphrase used in this action.
RegionId	string	*required*	The memory region ID to which to apply this action. • This property shall contain the memory region ID to which to apply this action.

Request Example

```
{
    "Passphrase": "FluffyBunny",
    "RegionId": 2
}
```

6.58.4.6 SetPassphrase

Description

Set passphrase for the given regions.

- This action shall apply the supplied passphrase to the supplied region.

Action URI: {Base URI of target resource}/Actions/Memory.SetPassphrase

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	*required*	Passphrase for doing the operation. • This property shall contain the passphrase used in this action.

Parameter Name	Type	Attributes	Notes
RegionId	string	*required*	The memory region ID to which to apply this action. • This property shall contain the memory region ID to which to apply this action.

Request Example

```
{
    "Passphrase": "FluffyBunny",
    "RegionId": 2
}
```

6.58.4.7 UnlockUnit

Description

This contains the action for unlocking given regions.

- This action shall apply the supplied passphrase to the supplied region for the purpose of unlocking the given regions.

Action URI: {Base URI of target resource}/Actions/Memory.UnlockUnit

Action parameters

Parameter Name	Type	Attributes	Notes
Passphrase	string	*required*	The passphrase required to complete the operation. • This property shall contain the passphrase required to complete this action.
RegionId	string	*required*	The memory region ID to which to apply this action. • This property shall contain the memory region ID to which to apply this action.

Request Example

```
{
    "Passphrase": "FluffyBunny",
```

```
    "RegionId": 2
}
```

6.58.5 Property details

6.58.5.1 BaseModuleType:

The base module type of the memory device.

- This property shall contain the base module type of the memory device.

string	Description
Die *(v1.7+)*	A die within a package.
LRDIMM	Load Reduced.
Mini_RDIMM	Mini_RDIMM.
Mini_UDIMM	Mini_UDIMM.
RDIMM	Registered DIMM.
SO_DIMM	SO_DIMM.
SO_DIMM_16b	SO_DIMM_16b.
SO_DIMM_32b	SO_DIMM_32b.
SO_RDIMM_72b	SO_RDIMM_72b.
SO_UDIMM_72b	SO_UDIMM_72b.
UDIMM	UDIMM.

6.58.5.2 ControlMode:

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.

string	Description
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

6.58.5.3 ErrorCorrection:

Error correction scheme supported for this memory device.

- This property shall contain the error correction scheme supported for this memory device.

string	Description
AddressParity	Address parity errors can be corrected.
MultiBitECC	Multibit data errors can be corrected by ECC.
NoECC	No ECC available.
SingleBitECC	Single bit data errors can be corrected by ECC.

6.58.5.4 MemoryClassification:

The classification of memory that the memory region occupies.

- This property shall contain the classification of memory that the memory region occupies.

string	Description
Block	Block-accessible memory.
ByteAccessiblePersistent	Byte-accessible persistent memory.
Volatile	Volatile memory.

6.58.5.5 MemoryDeviceType:

Type details of the memory device.

- This property shall contain the Memory Device Type as defined by SMBIOS.

string	Description
DDR	DDR.
DDR2	DDR2.
DDR2_SDRAM	DDR2 SDRAM.
DDR2_SDRAM_FB_DIMM	DDR2 SDRAM FB_DIMM.
DDR2_SDRAM_FB_DIMM_PROBE	DDR2 SDRAM FB_DIMM PROBE.
DDR3	DDR3.
DDR3_SDRAM	DDR3 SDRAM.
DDR4	DDR4.
DDR4_SDRAM	DDR4 SDRAM.
DDR4E_SDRAM	DDR4E SDRAM.
DDR5 *(v1.11+)*	Double data rate type five synchronous dynamic random-access memory.
DDR_SDRAM	DDR SDRAM.
DDR_SGRAM	DDR SGRAM.
EDO	EDO.
FastPageMode	Fast Page Mode.
GDDR *(v1.11+)*	Synchronous graphics random-access memory.
GDDR2 *(v1.11+)*	Double data rate type two synchronous graphics random-access memory.
GDDR3 *(v1.11+)*	Double data rate type three synchronous graphics random-access memory.
GDDR4 *(v1.11+)*	Double data rate type four synchronous graphics random-access memory.
GDDR5 *(v1.11+)*	Double data rate type five synchronous graphics random-access memory.
GDDR5X *(v1.11+)*	Double data rate type five X synchronous graphics random-access memory.
GDDR6 *(v1.11+)*	Double data rate type six synchronous graphics random-access memory.
HBM *(v1.7+)*	High Bandwidth Memory.
HBM2 *(v1.7+)*	The second generation of High Bandwidth Memory.
HBM3 *(v1.11+)*	The third generation of High Bandwidth Memory.
Logical *(v1.4+)*	Logical Non-volatile device.

string	Description
LPDDR3_SDRAM	LPDDR3 SDRAM.
LPDDR4_SDRAM	LPDDR4 SDRAM.
OEM *(v1.11+)*	OEM-defined.
PipelinedNibble	Pipelined Nibble.
ROM	ROM.
SDRAM	SDRAM.

6.58.5.6 MemoryMedia:

- Media of this memory device.
  - This property shall contain the media types of this memory device.

string	Description
DRAM	DRAM media.
Intel3DXPoint	Intel 3D XPoint media.
NAND	NAND media.
Proprietary	Proprietary media.

6.58.5.7 MemoryType:

The type of memory device.

- This property shall contain the type of memory device that this resource represents.

string	Description
DRAM	The memory device is comprised of volatile memory. • This value shall represent a volatile DRAM memory device.
IntelOptane *(v1.6+)*	The memory device is an Intel Optane Persistent Memory Module. • This value shall represent an Intel Optane Persistent Memory Module.

string	Description
NVDIMM_F	The memory device is comprised of non-volatile memory. • This value shall represent an NVDIMM_F memory device as defined by JEDEC.
NVDIMM_N	The memory device is comprised of volatile memory backed by non-volatile memory. • This value shall represent an NVDIMM_N memory device as defined by JEDEC.
NVDIMM_P	The memory device is comprised of a combination of non-volatile and volatile memory. • This value shall represent an NVDIMM_P memory device as defined by JEDEC.

6.58.5.8 OperatingMemoryModes:

- Memory modes supported by the memory device.
  - This property shall contain the memory modes supported by the memory device.

string	Description
Block	Block-accessible system memory.
PMEM	Persistent memory, byte-accessible through system address space.
Volatile	Volatile memory.

6.58.5.9 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

string	Description
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.

string	Description
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.58.5.10 SecurityState:

The current security state of this memory device.

- This property shall contain the current security state of this memory device.

string	Description
Disabled	Secure mode is disabled.
Enabled	Secure mode is enabled and access to the data is allowed.
Frozen *(deprecated v1.7)*	Secure state is frozen and cannot be modified until reset. *Deprecated in v1.7 and later. This value has been deprecated in favor of using the ConfigurationLocked to indicate that the configuration has been frozen.*
Locked	Secure mode is enabled and access to the data is locked.
Passphraselimit	Number of attempts to unlock the memory exceeded limit.
Unlocked *(deprecated v1.7)*	Secure mode is enabled and access to the data is unlocked. *Deprecated in v1.7 and later. This value has been deprecated in favor of 'Enabled' to indicate normal security operation.*

6.58.5.11 SecurityStates:

- Security states supported by the memory device.
  - This property shall contain the security states supported by the memory device.

string	Description
Disabled	Secure mode is disabled.
Enabled	Secure mode is enabled and access to the data is allowed.
Frozen	Secure state is frozen and cannot be modified until reset.
Locked	Secure mode is enabled and access to the data is locked.
Passphraselimit	Number of attempts to unlock the memory exceeded limit.
Unlocked	Secure mode is enabled and access to the data is unlocked.

6.58.6 Example response


```
{
    "@odata.type": "#Memory.v1_16_0.Memory",
    "Name": "Regular Memory",
    "Id": "1",
    "RankCount": 1,
    "MaxTDPMilliWatts": [
        12000
    ],
    "CapacityMiB": 8192,
    "DataWidthBits": 64,
    "BusWidthBits": 72,
    "ErrorCorrection": "MultiBitECC",
    "MemoryLocation": {
        "Socket": 1,
        "MemoryController": 1,
        "Channel": 1,
        "Slot": 1
    },
    "MemoryType": "DRAM",
    "MemoryDeviceType": "DDR4",
    "BaseModuleType": "RDIMM",
    "MemoryMedia": [
        "DRAM"
    ],
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Metrics": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1/MemoryMetrics"
    },
    "EnvironmentMetrics": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1/EnvironmentMetrics"
```

```
    },
    "Location": {
        "PartLocation": {
            "ServiceLabel": "Socket 1_A",
            "LocationType": "Socket",
            "LocationOrdinalValue": 0
        }
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1"
}
```

6.59 MemoryChunks 1.4.2

Version	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.3	2019.4	2017.3	2017.1	2016.2

6.59.1 Description

The schema definition of a memory chunk and its configuration.

- This resource shall represent memory chunks and interleave sets in a Redfish implementation.

6.59.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/MemoryDomains/*{MemoryDomainId}*/MemoryChunks/*{MemoryChunksId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/MemoryDomains/*{MemoryDomainId}*/MemoryChunks/*{MemoryChunksId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/MemoryDomains/*{MemoryDomainId}*/MemoryChunks/*{MemoryChunksId}*
/redfish/v1/Systems/*{ComputerSystemId}*/MemoryDomains/*{MemoryDomainId}*/MemoryChunks/*{MemoryChunksId}*

6.59.3 Properties

Property	Type	Attributes	Notes
AddressRangeOffsetMiB *(v1.3+)*	integer (mebibytes)	*read-only* *(null)*	Offset of the memory chunk in the address range in MiB. • The value of this property shall be the offset of the memory chunk in the address range in MiB.

Property	Type	Attributes	Notes
AddressRangeType	string (enum)	*read-only required (null)*	Memory type of this memory chunk. • This property shall contain the type of memory chunk. *For the possible property values, see AddressRangeType in Property details.*
DisplayName *(v1.4+)*	string	*read-write (null)*	A user-configurable string to name the memory chunk. • This property shall contain a user-configurable string to name the memory chunk.
InterleaveSets [{	array		The interleave sets for the memory chunk. • These properties shall represent the interleave sets for the memory chunk. If not specified by the client during a create operation, the memory chunk shall be created across all available memory within the memory domain.
Memory {	object		Describes a memory device of the interleave set. • This property shall contain the memory device to which these settings apply.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
MemoryLevel	integer	*read-only (null)*	Level of the interleave set for multi-level tiered memory. • This property shall contain the level of this interleave set for multi-level tiered memory.
OffsetMiB	integer (mebibytes)	*read-only (null)*	Offset within the DIMM that corresponds to the start of this memory region, measured in mebibytes (MiB). • This property shall contain the offset within the DIMM that corresponds to the start of this memory region, with units in MiB.
RegionId	string	*read-only (null)*	DIMM region identifier. • This property shall contain the DIMM region identifier.
SizeMiB	integer (mebibytes)	*read-only (null)*	Size of this memory region measured in mebibytes (MiB). • This property shall contain the size of this memory region, with units in MiB.
}]			

Property	Type	Attributes	Notes
IsMirrorEnabled	boolean	*read-only (null)*	An indication of whether memory mirroring is enabled for this memory chunk. • This property shall indicate whether memory mirroring is enabled for this memory chunk.
IsSpare	boolean	*read-only (null)*	An indication of whether sparing is enabled for this memory chunk. • This property shall indicate whether sparing is enabled for this memory chunk.
Links *(v1.3+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by or subordinate to this resource.
Endpoints *(v1.3+)* [{	array		An array of links to the endpoints that connect to this memory chunk. • This property shall contain a link to the resources of type Endpoint with which this memory chunk is associated.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
MemoryChunkSizeMiB	integer (mebibytes)	*read-only (null)*	Size of the memory chunk measured in mebibytes (MiB). • This property shall contain the size of the memory chunk in MiB.
Status *(v1.2+)* {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.59.4 Property details

6.59.4.1 AddressRangeType:

Memory type of this memory chunk.

- This property shall contain the type of memory chunk.

string	Description
Block	Block accessible memory.
PMEM	Byte accessible persistent memory.
Volatile	Volatile memory.

6.59.5 Example response


```
{
    "@odata.type": "#MemoryChunks.v1_4_2.MemoryChunks",
    "Name": "Memory Chunk - Whole System",
    "Id": "1",
    "MemoryChunkSizeMiB": 32768,
    "AddressRangeType": "Volatile",
    "IsMirrorEnabled": false,
    "IsSpare": false,
    "InterleaveSets": [
        {
            "Memory": {
                "@odata.id": "/redfish/v1/Systems/2/Memory/1"
            }
        },
        {
            "Memory": {
                "@odata.id": "/redfish/v1/Systems/2/Memory/2"
            }
        },
        {
            "Memory": {
                "@odata.id": "/redfish/v1/Systems/2/Memory/3"
            }
        },
        {
            "Memory": {
                "@odata.id": "/redfish/v1/Systems/2/Memory/4"
            }
        }
    ],
    "@Redfish.Settings": {
        "@odata.type": "#Settings.v1_3_5.Settings",
        "SettingsObject": {
            "@odata.id": "/redfish/v1/Systems/2/MemoryDomains/1/MemoryChunks/1/SD"
        },
        "Time": "2012-03-07T14:44.30-05:00",
        "ETag": "someetag",
        "Messages": [
            {
```

```
                "MessageId": "Base.1.0.Success"
            }
        ]
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/2/MemoryDomains/1/MemoryChunks/1"
}
```


6.60 MemoryDomain 1.4.0

Version	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2019.4	2017.1	2016.3	2016.2

6.60.1 Description

The MemoryDomain schema describes a memory domain and its configuration. Memory domains indicate to the client which memory, or DIMMs, can be grouped together in memory chunks to represent addressable memory.

- This Resource shall represent memory domains in a Redfish implementation.

6.60.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/MemoryDomains/*{MemoryDomainId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/MemoryDomains/*{MemoryDomainId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/MemoryDomains/*{MemoryDomainId}*
/redfish/v1/Systems/*{ComputerSystemId}*/MemoryDomains/*{MemoryDomainId}*

6.60.3 Properties

Property	Type	Attributes	Notes
AllowsBlockProvisioning	boolean	*read-only (null)*	An indication of whether this memory domain supports the provisioning of blocks of memory. • This property shall indicate whether this memory domain supports the creation of blocks of memory.

Property	Type	Attributes	Notes
AllowsMemoryChunkCreation	boolean	*read-only (null)*	An indication of whether this memory domain supports the creation of memory chunks. • This property shall indicate whether this memory domain supports the creation of memory chunks.
AllowsMirroring *(v1.1+)*	boolean	*read-only (null)*	An indication of whether this memory domain supports the creation of memory chunks with mirroring enabled. • This property shall indicate whether this memory domain supports the creation of memory chunks with mirroring enabled.
AllowsSparing *(v1.1+)*	boolean	*read-only (null)*	An indication of whether this memory domain supports the creation of memory chunks with sparing enabled. • This property shall indicate whether this memory domain supports the creation of memory chunks with sparing enabled.
InterleavableMemorySets [{	array		The interleave sets for the memory chunk. • This property shall represent the interleave sets for the memory chunk.
MemorySet [{	array		The set of memory for a particular interleave set. • The values in this array shall be links to Resources of the Memory type.
@odata.id	string	*read-only*	Link to a Memory resource. See the Links section and the *Memory* schema for details.
}]			
}]			
Links *(v1.3+)* {	object		The links to other Resources that are related to this Resource. • The Redfish Specification-described Links Property shall contain links to Resources related to but not subordinate to this Resource.
FabricAdapters *(v1.4+)* [{	array		An array of links to the fabric adapters providing this memory domain. • This property shall contain an array of links to resources of type FabricAdapter with which this memory domain is associated.
@odata.id	string	*read-only*	Link to a FabricAdapter resource. See the Links section and the *FabricAdapter* schema for details.
}]			

Property	Type	Attributes	Notes
MediaControllers *(v1.3+, deprecated v1.4* [{	array		An array of links to the media controllers for this memory domain. • This property shall contain an array of links to Resources of type MediaController that are associated with this memory domain. *Deprecated in v1.4 and later. This property has been deprecated in favor of the FabricAdapters property.*
@odata.id	string	*read-only*	Link to a MediaController resource. See the Links section and the *MediaController* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
MemoryChunks {	object		The link to the collection of memory chunks associated with this memory domain. • This property shall contain a link to a Resource Collection of type MemoryChunkCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *MemoryChunks*. See the MemoryChunks schema for details.
}			

6.60.4 Example response

```
{
    "@odata.type": "#MemoryDomain.v1_4_0.MemoryDomain",
    "Name": "Memory Domain - Whole System Mirroring Only",
    "Id": "1",
    "MemoryChunks": {
        "@odata.id": "/redfish/v1/Systems/4/MemoryDomains/1/MemoryChunks"
    },
    "AllowsMemoryChunkCreation": false,
    "AllowsBlockProvisioning": false,
    "InterleavableMemorySets": [
        {
            "MemorySet": [
                {
                    "@odata.id": "/redfish/v1/Systems/2/Memory/1"
                },
                {
                    "@odata.id": "/redfish/v1/Systems/2/Memory/2"
```

```
                },
                {
                    "@odata.id": "/redfish/v1/Systems/2/Memory/3"
                },
                {
                    "@odata.id": "/redfish/v1/Systems/2/Memory/4"
                }
            ]
        }
    ],
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/2/MemoryDomains/1"
}
```


6.61 MemoryMetrics 1.5.0

Version	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2020.3	2020.1	2019.2	2016.2	2016.1

6.61.1 Description

The usage and health statistics for a memory device or system memory summary.

- The MemoryMetrics schema shall contain the memory metrics for a memory device or system memory summary in a Redfish implementation.

6.61.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*/MemoryMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/MemorySummary/MemoryMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/MemoryMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/MemorySummary/MemoryMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/MemorySummary/MemoryMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*/MemoryMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/MemorySummary/MemoryMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/MemoryMetrics

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/MemorySummary/MemoryMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/MemorySummary/MemoryMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/MemoryMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/MemorySummary/MemoryMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/MemorySummary/MemoryMetrics

6.61.3 Properties

Property	Type	Attributes	Notes
BandwidthPercent *(v1.2+)*	number (%)	*read-only (null)*	The memory bandwidth utilization as a percentage. • This property shall contain memory bandwidth utilization as a percentage. When this resource is subordinate to the MemorySummary object, this property shall be the memory bandwidth utilization over all memory as a percentage.
BlockSizeBytes	integer (bytes)	*read-only (null)*	The block size, in bytes. • This property shall contain the block size, in bytes, of all structure elements. When this resource is subordinate to the MemorySummary object, this property is not applicable.
CurrentPeriod {	object		The memory metrics since the last reset or ClearCurrentPeriod action. • This property shall contain properties that describe the memory metrics for the current period.
BlocksRead	integer	*read-only (null)*	The number of blocks read since reset. • This property shall contain the number of blocks read since reset. When this resource is subordinate to the MemorySummary object, this property shall be the sum of BlocksRead over all memory.
BlocksWritten	integer	*read-only (null)*	The number of blocks written since reset. • This property shall contain the number of blocks written since reset. When this resource is subordinate to the MemorySummary object, this property shall be the sum of BlocksWritten over all memory.

Property	Type	Attributes	Notes
CorrectableECCErrorCount *(v1.4+)*	integer	*read-only (null)*	The number of the correctable errors since reset. • This property shall contain the number of correctable errors since reset. When this resource is subordinate to the MemorySummary object, this property shall be the sum of CorrectableECCErrorCount over all memory.
IndeterminateCorrectableErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of indeterminate correctable errors since reset. • This property shall contain the number of indeterminate correctable errors since reset. Since the error origin is indeterminate, the same error can be duplicated across multiple MemoryMetrics resources. When this resource is subordinate to the MemorySummary object, this property shall be the sum of indeterminate correctable errors across all memory without duplication, which may not be the sum of all IndeterminateCorrectableErrorCount properties over all memory.
IndeterminateUncorrectableErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of indeterminate uncorrectable errors since reset. • This property shall contain the number of indeterminate uncorrectable errors since reset. Since the error origin is indeterminate, the same error can be duplicated across multiple MemoryMetrics resources. When this resource is subordinate to the MemorySummary object, this property shall be the sum of indeterminate uncorrectable errors across all memory without duplication, which may not be the sum of all IndeterminateUncorrectableErrorCount properties over all memory.
UncorrectableECCErrorCount *(v1.4+)*	integer	*read-only (null)*	The number of the uncorrectable errors since reset. • This property shall contain the number of uncorrectable errors since reset. When this resource is subordinate to the MemorySummary object, this property shall be the sum of UncorrectableECCErrorCount over all memory.
}			
HealthData {	object		The health information of the memory. • This property shall contain properties that describe the health data memory metrics for the memory.

Property	Type	Attributes	Notes
AlarmTrips {	object		Alarm trip information about the memory. • This object shall contain properties describe the types of alarms that have been raised by the memory. When this resource is subordinate to the MemorySummary object, this property shall indicate whether an alarm of a given type have been raised by any area of memory.
AddressParityError	boolean	*read-only (null)*	An indication of whether an address parity error was detected that a retry could not correct. • This property shall indicate whether an address parity error was detected that a retry could not correct.
CorrectableECCError	boolean	*read-only (null)*	An indication of whether the correctable error threshold crossing alarm trip was detected. • This property shall indicate whether the correctable error threshold crossing alarm trip was detected.
SpareBlock	boolean	*read-only (null)*	An indication of whether the spare block capacity crossing alarm trip was detected. • This property shall indicate whether the spare block capacity crossing alarm trip was detected.
Temperature	boolean	*read-only (null)*	An indication of whether a temperature threshold alarm trip was detected. • This property shall indicates whether a temperature threshold alarm trip was detected.
UncorrectableECCError	boolean	*read-only (null)*	An indication of whether the uncorrectable error threshold alarm trip was detected. • This property shall indicate whether the uncorrectable error threshold alarm trip was detected.
}			
DataLossDetected	boolean	*read-only (null)*	An indication of whether data loss was detected. • This property shall indicate whether data loss was detected. When this resource is subordinate to the MemorySummary object, this property shall indicate whether any data loss was detected in any area of memory.

Property	Type	Attributes	Notes
LastShutdownSuccess	boolean	*read-only (null)*	An indication of whether the last shutdown succeeded. • This property shall indicate whether the last shutdown succeeded.
PerformanceDegraded	boolean	*read-only (null)*	An indication of whether performance has degraded. • This property shall indicate whether performance has degraded. When this resource is subordinate to the MemorySummary object, this property shall indicate whether degraded performance mode status is detected in any area of memory.
PredictedMediaLifeLeftPercent *(v1.1+)*	number (%)	*read-only (null)*	The percentage of reads and writes that are predicted to still be available for the media. • This property shall contain an indicator of the percentage of life remaining in the media.
RemainingSpareBlockPercentage	number (%)	*read-only (null)*	The remaining spare blocks, as a percentage. • This property shall contain the remaining spare blocks as a percentage. When this resource is subordinate to the MemorySummary object, this property shall be the RemainingSpareBlockPercentage over all memory.
}			
LifeTime {	object		The memory metrics for the lifetime of the memory. • This property shall contain properties that describe the memory metrics for the lifetime of the memory.
BlocksRead	integer	*read-only (null)*	The number of blocks read for the lifetime of the memory. • This property shall contain the number of blocks read for the lifetime of the memory. When this resource is subordinate to the MemorySummary object, this property shall be the sum of BlocksRead over all memory.
BlocksWritten	integer	*read-only (null)*	The number of blocks written for the lifetime of the memory. • This property shall contain the number of blocks written for the lifetime of the memory. When this resource is subordinate to the MemorySummary object, this property shall be the sum of BlocksWritten over all memory.

Property	Type	Attributes	Notes
CorrectableECCErrorCount *(v1.4+)*	integer	*read-only (null)*	The number of the correctable errors for the lifetime of the memory. • This property shall contain the number of the correctable errors for the lifetime of the memory. When this resource is subordinate to the MemorySummary object, this property shall be the sum of CorrectableECCErrorCount over all memory.
IndeterminateCorrectableErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of indeterminate correctable errors for the lifetime of the memory. • This property shall contain the number of indeterminate correctable errors for the lifetime of the memory. Since the error origin is indeterminate, the same error can be duplicated across multiple MemoryMetrics resources. When this resource is subordinate to the MemorySummary object, this property shall be the sum of indeterminate correctable errors across all memory without duplication, which may not bey the sum of all IndeterminateCorrectableErrorCount properties over all memory.
IndeterminateUncorrectableErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of indeterminate uncorrectable errors for the lifetime of the memory. • This property shall contain the number of indeterminate uncorrectable errors for the lifetime of the memory. Since the error origin is indeterminate, the same error can be duplicated across multiple MemoryMetrics resources. When this resource is subordinate to the MemorySummary object, this property shall be the sum of indeterminate uncorrectable errors across all memory without duplication, which may not be the sum of all IndeterminateUncorrectableErrorCount properties over all memory.
UncorrectableECCErrorCount *(v1.4+)*	integer	*read-only (null)*	The number of the uncorrectable errors for the lifetime of the memory. • This property shall contain the number of the uncorrectable errors for the lifetime of the memory. When this resource is subordinate to the MemorySummary object, this property shall be the sum of UncorrectableECCErrorCount over all memory.
}			

Property	Type	Attributes	Notes
OperatingSpeedMHz *(v1.3+)*	integer (MHz)	*read-only (null)*	Operating speed of memory in MHz or MT/s as appropriate. • This property shall contain the operating speed of memory in MHz or MT/s (mega-transfers per second) as reported by the memory device. Memory devices that operate at their bus speed shall report the operating speed in MHz (bus speed), while memory devices that transfer data faster than their bus speed, such as DDR memory, shall report the operating speed in MT/s (mega-transfers/second). The reported value shall match the conventionally reported values for the technology used by the memory device.

6.61.4 Actions

6.61.4.1 ClearCurrentPeriod

Description

This action sets the CurrentPeriod property's values to 0.

- This action shall set the CurrentPeriod property's values to 0.

Action URI: {Base URI of target resource}/Actions/MemoryMetrics.ClearCurrentPeriod

Action parameters

This action takes no parameters.

6.61.5 Example response


```
{
    "@odata.type": "#MemoryMetrics.v1_5_0.MemoryMetrics",
    "Name": "Memory Metrics",
    "Id": "Metrics",
    "BlockSizeBytes": 4096,
    "CurrentPeriod": {
        "BlocksRead": 0,
        "BlocksWritten": 0
    },
    "LifeTime": {
        "BlocksRead": 0,
        "BlocksWritten": 0
    },
```

```
    "HealthData": {
        "RemainingSpareBlockPercentage": 50,
        "LastShutdownSuccess": true,
        "DataLossDetected": false,
        "PerformanceDegraded": false,
        "AlarmTrips": {
            "Temperature": true,
            "SpareBlock": false,
            "UncorrectableECCError": false,
            "CorrectableECCError": false
        }
    },
    "Actions": {
        "#MemoryMetrics.ClearCurrentPeriod": {
            "target": "/redfish/v1/Systems/1/Memory/1/Actions/MemoryMetrics.ClearCurrentPeriod"
        },
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/Memory/1/MemoryMetrics"
}
```


6.62 MessageRegistry 1.5.0

Version	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2021.3	2020.1	2019.1	2018.2	2017.1	1.0

6.62.1 Description

The MessageRegistry schema describes all message registries. It represents the properties for the message registries themselves.

- This resource shall represent a message registry for a Redfish implementation.

6.62.2 Properties

Property	Type	Attributes	Notes
Language	string	*read-only required*	The RFC5646-conformant language code for the message registry. • This property shall contain an RFC5646-conformant language code.

Property	Type	Attributes	Notes
Messages {	object	*required*	The message keys contained in the message registry. • This property shall contain the message keys contained in the message registry. The message keys are the suffix of the MessageId and shall be unique within this message registry.
(pattern) {	object		Property names follow regular expression pattern "[A-Za-z0-9]+"
ArgDescriptions *(v1.3+)* [ ]	array (string, null)	*read-only*	The MessageArg descriptions, in order, used for this message. • This property shall contain an ordered array of text describing each argument used as substitution in the message.
ArgLongDescriptions *(v1.3+)* [ ]	array (string, null)	*read-only*	The MessageArg normative descriptions, in order, used for this message. • This property shall contain an ordered array of normative language for each argument used as substitution in the message.
ClearingLogic *(v1.2+)* {	object		The clearing logic associated with this message. The properties within indicate that what messages are cleared by this message as well as under what conditions. • This type shall contain the available actions for this resource.
ClearsAll *(v1.2+)*	boolean	*read-only (null)*	An indication of whether all prior conditions and messages are cleared, provided the ClearsIf condition is met. • This property shall indicate whether all prior conditions and messages are cleared, provided the ClearsIf condition is met.
ClearsIf *(v1.2+)*	string (enum)	*read-only (null)*	The condition when the event is cleared. • This property shall contain the condition the event is cleared. *For the possible property values, see ClearsIf in Property details.*
ClearsMessage *(v1.2+)* [ ]	array (string, null)	*read-only*	The array of MessageIds that this message clears when the other conditions are met. • This property shall contain an array of MessageIds that this message clears when the other conditions are met. The MessageIds shall not include the message registry name or version and shall contain only the MessageId portion. MessageIds shall not refer to other message registries.
}			

Property	Type	Attributes	Notes
Deprecated *(v1.5+)*	string	*read-only (null)*	The reason the message has been deprecated. • This property shall indicate that a message is deprecated. The value of the string should explain the deprecation, including reference to new message or messages to be used. The message can be supported in new and existing implementations, but usage in new implementations is discouraged. Deprecated messages are likely to be removed in a future major version of the message registry.
Description	string	*read-only required*	A short description of how and when to use this message. • This property shall indicate how and when this message is returned by the Redfish service.
LongDescription *(v1.3+)*	string	*read-only (null)*	The normative language that describes this message's usage. • This property shall contain the normative language that describes this message's usage in a Redfish implementation.
Message	string	*read-only required*	The actual message. • This property shall contain the message to display. If a %integer is included in part of the string, it shall represent a string substitution for any MessageArgs that accompany the message, in order.
MessageSeverity *(v1.4+)*	string (enum)	*read-only required (null)*	The severity of the message. • This property shall contain the severity of the message. Services can replace the severity defined in the message registry with a value more applicable to the implementation in message payloads and event payloads. *For the possible property values, see MessageSeverity in Property details.*
NumberOfArgs	integer	*read-only required*	The number of arguments in the message. • This property shall contain the number of arguments that are substituted for the locations marked with % in the message.
Oem {}	object		See the OEM object definition in the Using this guide clause.
ParamTypes [ ]	array (string (enum))	*read-only*	• The MessageArg types, in order, for the message. ◦ This property shall contain an ordered array of argument data types that match the data types of the MessageArgs. *For the possible property values, see ParamTypes in Property details.*

Property	Type	Attributes	Notes
Resolution	string	*read-only required*	Used to provide suggestions on how to resolve the situation that caused the error. • This property shall contain the resolution of the message. Services can replace the resolution defined in the message registry with a more specific resolution in message payloads.
Severity *(deprecated v1.4)*	string	*read-only required*	The severity of the message. • This property shall contain the severity of the condition resulting in the message, as defined in the 'Status' clause of the Redfish Specification. Services can replace the severity defined in the message registry with a value more applicable to the implementation in message payloads and event payloads. *Deprecated in v1.4 and later. This property has been deprecated in favor of MessageSeverity, which ties the values to the enumerations defined for the Health property within Status.*
VersionAdded *(v1.5+)*	string	*read-only (null)*	The registry version which added this message. • This property shall contain the version of the message registry when the message was added. This property shall not appear for messages created at version `1.0.0` of a message registry. Pattern: `^\d+\.\d+\.\d+$`
VersionDeprecated *(v1.5+)*	string	*read-only (null)*	The registry version when the the message was deprecated. • This property shall contain the version of the registry when the message was deprecated. This property shall not appear if the message has not been deprecated. Pattern: `^\d+\.\d+\.\d+$`
}			
}			
OwningEntity	string	*read-only required*	The organization or company that publishes this message registry. • This property shall represent the publisher of this message registry.
RegistryPrefix	string	*read-only required*	The single-word prefix that is used in forming and decoding MessageIds. • This property shall contain the Redfish Specification-defined prefix used in forming and decoding MessageIds that uniquely identifies all messages that belong to this message registry.

Property	Type	Attributes	Notes
RegistryVersion	string	*read-only required*	The message registry version in the middle portion of a MessageId. • This property shall contain the version of this message registry. Pattern: `^\d+\.\d+\.\d+$`

6.62.3 Property details

6.62.3.1 ClearsIf:

The condition when the event is cleared.

- This property shall contain the condition the event is cleared.

string	Description
SameOriginOfCondition	This enumeration shall describe when the message for an event is cleared by the other messages in the ClearingLogic property, provided the OriginOfCondition for both events are the same.

6.62.3.2 MessageSeverity:

The severity of the message.

- This property shall contain the severity of the message. Services can replace the severity defined in the message registry with a value more applicable to the implementation in message payloads and event payloads.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.62.3.3 ParamTypes:

- The MessageArg types, in order, for the message.
  - This property shall contain an ordered array of argument data types that match the data types of the MessageArgs.

string	Description
number	The argument is a number.
string	The argument is a string.

6.62.4 Example response


```
{
    "@odata.type": "#MessageRegistry.v1_3_1.MessageRegistry",
    "Id": "Basic.1.2.0",
    "Name": "Simple Message Registry",
    "Language": "en",
    "Description": "Collection of Basic messages for numerous use cases",
    "RegistryPrefix": "Basic",
    "RegistryVersion": "1.2.0",
    "OwningEntity": "Contoso",
    "Messages": {
        "Success": {
            "Description": "Indicates that all conditions of a successful operation have been met.",
            "Message": "Successfully Completed Request",
            "Severity": "OK",
            "NumberOfArgs": 0,
            "Resolution": "None"
        },
        "GeneralError": {
            "Description": "Indicates that a general error has occurred.",
            "Message": "A general error has occurred. See ExtendedInfo for more information.",
            "Severity": "Critical",
            "NumberOfArgs": 0,
            "Resolution": "See ExtendedInfo for more information."
        },
        "ResourceAtUriUnauthorized": {
            "Description": "Indicates that the attempt to access the resource/file/image at the URI was unauthorized.",
            "Message": "While accessing the resource at %1, the service received an authorization error %2.",
            "Severity": "Critical",
            "NumberOfArgs": 2,
            "ParamTypes": [
                "string",
                "string"
            ],
            "Resolution": "Ensure that the appropriate access is provided for the service in order for it to access the URI."
        }
    }
}
```

6.63 MessageRegistryFile 1.1.3

Version	*v1.1*	*v1.0*
Release	2017.1	2016.1

6.63.1 Description

The MessageRegistryFile schema describes the Message Registry file locator Resource.

- This Resource shall represent the Message Registry file locator for a Redfish implementation.

6.63.2 URIs

/redfish/v1/Registries/*{MessageRegistryFileId}*

6.63.3 Properties

Property	Type	Attributes	Notes
Languages [ ]	array (string)	*read-only* *required*	The RFC5646-conformant language codes for the available Message Registries. • This property contains a set of RFC5646-conformant language codes.
Location [{	array	*required*	The location information for this Message Registry file. • This property shall contain the location information for this Message Registry file.
ArchiveFile	string	*read-only*	If the service hosts the Message Registry in an archive file, the name of the file within the archive. • This property shall contain the file name of the individual Message Registry file within the archive file specified by the ArchiveUri property. The file name shall conform to the Redfish Specification-specified syntax.
ArchiveUri	string (URI)	*read-only*	If the Message Registry is hosted on the service in an archive file, the link to the archive file. • This property shall contain a URI that is colocated with the Redfish Service that specifies the location of the Message Registry file, which can be retrieved using the Redfish protocol and authentication methods. This property shall be used for only ZIP or other archive files. The ArchiveFile property shall contain the file name of the individual Message Registry file within the archive file.

Property	Type	Attributes	Notes
Language	string	*read-only*	The language code for the Message Registry file. • This property shall contain an RFC5646-conformant language code or `default`.
PublicationUri	string (URI)	*read-only*	The link to publicly available (canonical) URI for the Message Registry. • This property shall contain a URI not colocated with the Redfish Service that specifies the canonical location of the Message Registry file. This property shall be used for only individual Message Registry files.
Uri	string (URI)	*read-only*	The link to locally available URI for the Message Registry. • This property shall contain a URI colocated with the Redfish Service that specifies the location of the Message Registry file, which can be retrieved using the Redfish protocol and authentication methods. This property shall be used for only individual Message Registry files. The file name portion of the URI shall conform to Redfish Specification-specified syntax.
`}]`			
Registry	string	*read-only* *required*	The registry name and its major and minor versions. This registry can be any type of registry, such as a Message Registry, Privilege Registry, or Attribute Registry. • This property shall contain the Message Registry name and it major and minor versions, as defined by the Redfish Specification. This registry can be any type of registry, such as Message Registry, Privilege Registry, or Attribute Registry.

6.63.4 Example response

```
{
    "@odata.type": "#MessageRegistryFile.v1_1_3.MessageRegistryFile",
    "Id": "Base.v1_0_0",
    "Name": "Base Message Registry File",
    "Description": "Base Message Registry File locations",
    "Languages": [
        "en"
    ],
    "Registry": "Base.1.0",
    "Location": [
        {
            "Language": "en",
            "ArchiveUri": "/FileRepo/Registries.gz",
            "PublicationUri": "http://redfish.dmtf.org/registries/Base.v1_0_0.json",
            "ArchiveFile": "Base.v1_0_0.json"
        },
        {
```

```
            "Language": "zh",
            "ArchiveUri": "/FileRepo/Registries.zh.gz",
            "PublicationUri": "http://redfish.dmtf.org/registries/Base.v1_0_0.zh.json",
            "ArchiveFile": "Base.v1_0_0.zh.json"
        }
    ],
    "Oem": {},
    "@odata.id": "/redfish/v1/Registries/Base.v1_0_0"
}
```


6.64 MetricDefinition 1.3.1

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2021.1	2020.3	2018.2

6.64.1 Description

The MetricDefinition schema describes the metadata information for a metric.

- This resource shall contain the metadata information for a metric in a Redfish implementation.

6.64.2 URIs

/redfish/v1/TelemetryService/MetricDefinitions/*{MetricDefinitionId}*

6.64.3 Properties

Property	Type	Attributes	Notes
Accuracy	number	*read-only (null)*	The estimated percent error of measured versus actual values. • This property shall contain the percent error +/- of the measured versus actual values. The property is not meaningful when the MetricType property is `Discrete`.
Calculable	string (enum)	*read-write (null)*	An indication of whether the metric can be used in a calculation. • This property shall specify whether the metric can be used in a calculation. *For the possible property values, see Calculable in Property details.*

Property	Type	Attributes	Notes
CalculationAlgorithm	string (enum)	*read-only (null)*	The calculation that is performed on a source metric to obtain the metric being defined. • This property shall contain the calculation performed to obtain the metric. *For the possible property values, see CalculationAlgorithm in Property details.*
CalculationParameters [{	array		The metric properties that are part of a calculation that this metric definition defines. • This property shall list the metric properties that are part of a calculation that this metric definition defines. This property should be present if ImplementationType contains `Synthesized` or `Calculated`.
ResultMetric	string	*read-only (null)*	The URI with wildcards and property identifiers of the metric property that stores the result of the calculation. If the URI has wildcards, the wildcards are substituted as specified in the Wildcards property. • This property shall contain a URI with wildcards and property identifiers of the metric property that stores the result of the calculation. A set of curly braces shall delimit each wildcard in the URI. The corresponding entry in the Wildcard property shall replace each wildcard. After each wildcard is replaced, it shall identify a resource property to which the metric definition applies. The property identifiers portion of the URI shall follow RFC6901-defined JSON pointer notation rules.
SourceMetric	string	*read-only (null)*	The URI with wildcards and property identifiers of the metric property used as the input into the calculation. If the URI has wildcards, the wildcards are substituted as specified in the Wildcards property. • This property shall contain a URI with wildcards and property identifiers of the metric property used as the input into the calculation. A set of curly braces shall delimit each wildcard in the URI. The corresponding entry in the Wildcard property shall replace each wildcard. After each wildcard is replaced, it shall identify a resource property to which the metric definition applies. The property identifiers portion of the URI shall follow RFC6901-defined JSON pointer notation rules.
}]			
CalculationTimeInterval	string	*read-write (null)*	The time interval over which the metric calculation is performed. • This property shall specify the time interval over the metric calculation is performed. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`

Property	Type	Attributes	Notes
Calibration	number	*read-only* *(null)*	The calibration offset added to the metric reading. • This property shall contain the calibration offset added to the metric reading. The value shall have the units specified in the Units property. The property is not meaningful when the MetricType property is `Discrete`.
DiscreteValues [ ]	array (string, null)	*read-write*	This array property specifies possible values of a discrete metric. • The values of the property shall specify the possible values of the discrete metric. This property shall have values when the MetricType property is `Discrete`.
Implementation	string (enum)	*read-only* *(null)*	The implementation of the metric. • This property shall specify the implementation of the metric. *For the possible property values, see Implementation in Property details.*
IsLinear	boolean	*read-write* *(null)*	An indication of whether the metric values are linear versus non-linear. • This property shall indicate whether the metric values are linear versus non-linear. Linear metrics can use a greater than relation to compared them. An example of linear metrics include performance metrics. Examples of non-linear metrics include error codes.
LogicalContexts *(v1.3+)* [ ]	array (string (enum))	*read-only*	• The logical contexts related to the metric. ◦ This property shall contain the logical contexts related to the metric. This property should be present when the PhysicalContext property does not provide complete information and additional context information is needed. For example, if the metric refers to capacity or performance. *For the possible property values, see LogicalContexts in Property details.*
MaxReadingRange	number	*read-only* *(null)*	Maximum value for metric reading. • The value shall indicate the highest possible value for a related MetricValue. The value shall have the units specified in the property Units. The property is not meaningful when the MetricType property is `Discrete`.
MetricDataType	string (enum)	*read-write* *(null)*	The data type of the metric. • This property shall specify the data-type of the metric. *For the possible property values, see MetricDataType in Property details.*

Property	Type	Attributes	Notes
MetricProperties [ ]	array (URI) (string, null)	*read-write*	The list of URIs with wildcards and property identifiers that this metric definition defines. If a URI has wildcards, the wildcards are substituted as specified in the Wildcards property. • This array property shall list the URIs with wildcards and property identifiers that this metric defines. A set of curly braces shall delimit each wildcard in the URI. The corresponding entry in the Wildcard property shall replace each wildcard. After each wildcard is replaced, it shall identify a resource property to which the metric definition applies. The property identifiers portion of the URI shall follow RFC6901-defined JSON pointer notation rules. This property should not be present if ImplementationType contains `Synthesized` or `Calculated`.
MetricType	string (enum)	*read-write (null)*	The type of metric. • This property shall specify the type of metric. *For the possible property values, see MetricType in Property details.*
MinReadingRange	number	*read-only (null)*	Minimum value for metric reading. • This property shall contain the lowest possible value for the metric reading. The value shall have the units specified in the property Units. The property is not meaningful when the MetricType property is `Discrete`.
OEMCalculationAlgorithm *(v1.1+)*	string	*read-only (null)*	The OEM-defined calculation that is performed on a source metric to obtain the metric being defined. • This property shall contain the OEM-defined calculation performed to obtain the metric. This property shall be present if CalculationAlgorithm is `OEM`.
PhysicalContext	string (enum)	*read-only (null)*	The physical context of the metric. • This property shall contain the physical context of the metric. *For the possible property values, see PhysicalContext in Property details.*
Precision	integer	*read-only (null)*	Number of significant digits in the metric reading. • This property shall specify the number of significant digits in the metric reading. The property is not meaningful when the MetricType property is `Discrete`.
SensingInterval	string	*read-write (null)*	The time interval between when a metric is updated. • This property shall specify the time interval between when a metric is updated. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`

Property	Type	Attributes	Notes
TimestampAccuracy	string	*read-only (null)*	The accuracy of the timestamp. • This property shall specify the expected + or - variability of the timestamp. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
Units	string	*read-write (null)*	The units of measure for this metric. • This property shall specify the units of the metric. This property shall be consistent with the case-sensitive ('C/s' column) Unified Code for Units of Measure. Note: Not all units of measured are covered by UCUM.
Wildcards [{	array		The wildcards and their substitution values for the entries in the MetricProperties array property. • The property shall contain a list of wildcards and their replacement strings, which are applied to the MetricProperties array property. Each wildcard shall have a corresponding entry in this array property.
Name	string	*read-only (null)*	The string used as a wildcard. • This property shall contain the string used as a wildcard.
Values [ ]	array (string, null)	*read-only*	An array of values to substitute for the wildcard. • This property shall contain the list of values to substitute for the wildcard.
}]			

6.64.4 Property details

6.64.4.1 Calculable:

An indication of whether the metric can be used in a calculation.

- This property shall specify whether the metric can be used in a calculation.

string	Description
NonCalculatable	No calculations should be performed on the metric reading.
NonSummable	The sum of the metric reading across multiple instances is not meaningful.
Summable	The sum of the metric reading across multiple instances is meaningful.

6.64.4.2 CalculationAlgorithm:

The calculation that is performed on a source metric to obtain the metric being defined.

- This property shall contain the calculation performed to obtain the metric.

string	Description
Average	The metric is calculated as the average metric reading over a sliding time interval. • The metric shall be calculated as the average metric reading over a sliding time interval. The time interval shall contain the CalculationTimeInterval property value.
Maximum	The metric is calculated as the maximum metric reading over during a time interval. • The metric shall be calculated as the maximum metric reading over a sliding time interval. The time interval shall contain the CalculationTimeInterval property value.
Minimum	The metric is calculated as the minimum metric reading over a sliding time interval. • The metric shall be calculated as the minimum metric reading over a sliding time interval. The time interval shall contain the CalculationTimeInterval property value.
OEM *(v1.1+)*	The metric is calculated as specified by an OEM. • The metric shall be calculated as specified by an OEM. The OEMCalculationAlgorithm property shall contain the specific OEM calculation algorithm.

6.64.4.3 Implementation:

The implementation of the metric.

- This property shall specify the implementation of the metric.

string	Description
Calculated	The metric is implemented by applying a calculation on another metric property. The calculation is specified in the CalculationAlgorithm property.
DigitalMeter	The metric is implemented as digital meter.
PhysicalSensor	The metric is implemented as a physical sensor.
Synthesized	The metric is implemented by applying a calculation on one or more metric properties. The calculation is not provided.

6.64.4.4 LogicalContexts:

- The logical contexts related to the metric.
  - This property shall contain the logical contexts related to the metric. This property should be present when the PhysicalContext property does not provide complete information and additional context information is needed. For example, if the metric refers to capacity or performance.

string	Description
Capacity	Capacity related logical context.
Environment	Environment related logical context.
Network	Network related logical context.
Performance	Performance related logical context.
Security	Security related logical context.
Storage	Storage related logical context.

6.64.4.5 MetricDataType:

The data type of the metric.

- This property shall specify the data-type of the metric.

string	Description
Boolean	The JSON boolean definition.
DateTime	The JSON string definition with the date-time format.
Decimal	The JSON decimal definition.
Enumeration	The JSON string definition with a set of defined enumerations.
Integer	The JSON integer definition.
String	The JSON string definition.

6.64.4.6 MetricType:

The type of metric.

- This property shall specify the type of metric.

string	Description
Countdown	The metric is a countdown metric. The metric reading is a non-negative integer that decreases monotonically. When a counter reaches its minimum, the value resets to preset value and resumes counting down.
Counter	The metric is a counter metric. The metric reading is a non-negative integer that increases monotonically. When a counter reaches its maximum, the value resets to 0 and resumes counting.
Discrete	The metric is a discrete metric. The metric value is discrete. The possible values are listed in the DiscreteValues property. • The metric values shall indicate discrete states.
Gauge	The metric is a gauge metric. The metric value is a real number. When the metric value reaches the gauge's extrema, it stays at that value, until the reading falls within the extrema.
Numeric	The metric is a numeric metric. The metric value is any real number.
String *(v1.2+)*	The metric is a non-discrete string metric. The metric reading is a non-discrete string that displays some non-discrete, non-numeric data.

6.64.4.7 PhysicalContext:

The physical context of the metric.

- This property shall contain the physical context of the metric.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.

string	Description
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.

string	Description
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.64.5 Example response


```
{
    "@odata.type": "#MetricDefinition.v1_3_1.MetricDefinition",
    "Id": "PowerConsumedWatts",
    "Name": "Power Consumed Watts Metric Definition",
    "MetricType": "Numeric",
    "Implementation": "PhysicalSensor",
    "PhysicalContext": "PowerSupply",
    "MetricDataType": "Decimal",
    "Units": "W",
    "Precision": 4,
    "Accuracy": 1,
    "Calibration": 2,
    "MinReadingRange": 0,
    "MaxReadingRange": 50,
    "SensingInterval": "PT1S",
    "TimestampAccuracy": "PT1S",
    "Wildcards": [
        {
```

```
            "Name": "ChassisID",
            "Values": [
                "1"
            ]
        }
    ],
    "MetricProperties": [
        "/redfish/v1/Chassis/{ChassisID}/Power#/PowerControl/0/PowerConsumedWatts"
    ],
    "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/PowerConsumedWatts"
}
```

6.65 MetricReport 1.5.0

Version	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2020.2	2019.4	2019.2	2018.3	2018.2

6.65.1 Description

The MetricReport schema represents a set of collected metrics.

- This resource shall represent a metric report in a Redfish implementation. When a metric report is deleted, the historic metric data used to generate the report shall be deleted as well unless other metric reports are consuming the data.

6.65.2 URIs

/redfish/v1/TelemetryService/MetricReports/*{MetricReportId}*

6.65.3 Properties

Property	Type	Attributes	Notes
Context *(v1.4+)*	string	*read-only*	A context can be supplied at subscription time. This property is the context value supplied by the subscriber. • This property shall contain a client supplied context for the event destination to which this event is being sent. This property shall only be present when sent as a payload in an event.

Property	Type	Attributes	Notes
MetricReportDefinition {	object		The link to the definition of this metric report. • This property shall contain a link to a resource of type MetricReportDefinition. See the *MetricReportDefinition* schema for details on this property.
@odata.id	string	*read-only*	Link to a MetricReportDefinition resource. See the Links section and the *MetricReportDefinition* schema for details.
}			
MetricValues [{	array		An array of metric values for the metered items of this metric report. • The values shall be metric values for this metric report.
MetricDefinition *(deprecated v1.5)* {	object		The link to the metric definition for this metric. • This property shall contain a link to a resource of type MetricDefinition that describes what this metric value captures. See the *MetricDefinition* schema for details on this property. *Deprecated in v1.5 and later. This property has been deprecated in favor of the MetricId property.*
@odata.id	string	*read-only*	Link to a MetricDefinition resource. See the Links section and the *MetricDefinition* schema for details.
}			
MetricId	string	*read-only* *(null)*	The metric definitions identifier that contains additional information for the source metric. • This property shall contain the value of the Id property of the MetricDefinition resource that contains additional information for the source metric.
MetricProperty	string (URI)	*read-only* *(null)*	The URI for the property from which this metric is derived. • This property shall contain a URI following RFC6901-specified JSON pointer notation to the property from which this metric is derived. The value of MetricValue may contain additional calculations performed on the property based upon the configuration of the MetricReportDefinition.
MetricValue	string	*read-only* *(null)*	The metric value, as a string. • This property shall contain the metric value, as a string.
Oem *(v1.2+)* {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
Timestamp	string (date-time)	*read-only (null)*	The date and time when the metric is obtained. A management application can establish a time series of metric data by retrieving the instances of metric value and sorting them according to their timestamp. • The value shall time when the metric value was obtained. Note that this value may be different from the time when this instance is created.
}]			
ReportSequence *(deprecated v1.3)*	string	*read-only*	The current sequence identifier for this metric report. • This property shall contain the current sequence identifier for this metric report. The sequence identifier is a unique identifier assigned by the Service for serializing metric reports as they are produced. *Deprecated in v1.3 and later. This property has been deprecated due to specification changes with regards to Server-Sent Events.*
Timestamp *(v1.1+)*	string (date-time)	*read-only (null)*	The time associated with the metric report in its entirety. The time of the metric report can be relevant when the time of individual metrics are minimally different. • This property shall contain the time when the metric report was generated.

6.65.4 Example response


```
{
    "@odata.type": "#MetricReport.v1_5_0.MetricReport",
    "Id": "AvgPlatformPowerUsage",
    "Name": "Average Platform Power Usage metric report",
    "MetricReportDefinition": {
        "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/AvgPlatformPowerUsage"
    },
    "MetricValues": [
        {
            "MetricId": "AverageConsumedWatts",
            "MetricValue": "100",
            "Timestamp": "2016-11-08T12:25:00-05:00",
            "MetricProperty": "/redfish/v1/Chassis/Tray_1/Power#/0/PowerConsumedWatts"
        },
        {
            "MetricId": "AverageConsumedWatts",
            "MetricValue": "94",
            "Timestamp": "2016-11-08T13:25:00-05:00",
            "MetricProperty": "/redfish/v1/Chassis/Tray_1/Power#/0/PowerConsumedWatts"
        },
        {
            "MetricId": "AverageConsumedWatts",
```

```
            "MetricValue": "100",
            "Timestamp": "2016-11-08T14:25:00-05:00",
            "MetricProperty": "/redfish/v1/Chassis/Tray_1/Power#/0/PowerConsumedWatts"
        }
    ],
    "@odata.id": "/redfish/v1/TelemetryService/MetricReports/AvgPlatformPowerUsage"
}
```


6.66 MetricReportDefinition 1.4.2

Version	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.4	2019.2	2019.1	2018.3	2018.2

6.66.1 Description

The MetricReportDefinition schema describes set of metrics that are collected into a metric report.

- This resource shall specify a set of metrics that shall be collected into a metric report in a Redfish implementation.

6.66.2 URIs

/redfish/v1/TelemetryService/MetricReportDefinitions/*{MetricReportDefinitionId}*

6.66.3 Properties

Property	Type	Attributes	Notes
AppendLimit	integer	*read-only*	The maximum number of entries that can be appended to a metric report. When the metric report reaches its limit, its behavior is dictated by the ReportUpdates property. • This property shall contain a number that indicates the maximum number of entries that can be appended to a metric report. When the metric report reaches its limit, its behavior shall be dictated by the ReportUpdates property. This property shall be required if ReportUpdates contains `AppendWrapsWhenFull` or `AppendStopsWhenFull`.

Property	Type	Attributes	Notes
Links *(v1.2+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Triggers *(v1.2+)* [{	array		The triggers that cause this metric report definition to generate a new metric report upon a trigger occurrence when the TriggerActions property contains `RedfishMetricReport`. • This property shall contain a set of triggers that cause this metric report to generate a new metric report upon a trigger occurrence when the TriggerActions property contains `RedfishMetricReport`.
@odata.id	string	*read-only*	Link to a Triggers resource. See the Links section and the *Triggers* schema for details.
}]			
}			
MetricProperties [ ]	array (URI) (string, null)	*read-write*	The list of URIs with wildcards and property identifiers to include in the metric report. If a URI has wildcards, the wildcards are substituted as specified in the Wildcards property. • This property shall contain a list of URIs with wildcards and property identifiers to include in the metric report. A set of curly braces shall delimit each wildcard in the URI. The corresponding entry in the Wildcard property shall replace each wildcard. After each wildcard is replaced, it shall describe a resource property to include in the metric report. The property identifiers portion of the URI shall follow RFC6901-specified JSON pointer notation rules.
MetricReport {	object		The most recent metric report produced by this metric report definition. • This property shall contain a link to a resource of type MetricReport that represents the most recent metric report produced by this metric report definition. See the *MetricReport* schema for details on this property.
@odata.id	string	*read-only*	Link to a MetricReport resource. See the Links section and the *MetricReport* schema for details.
}			
MetricReportDefinitionEnabled *(v1.2+)*	boolean	*read-write (null)*	An indication of whether the generation of new metric reports is enabled. • This property shall indicate whether the generation of new metric reports is enabled.

Property	Type	Attributes	Notes
MetricReportDefinitionType	string (enum)	*read-write (null)*	Specifies when the metric report is generated. • This property shall specify when the metric report is generated. If the value is `Periodic`, the Schedule property shall be present. *For the possible property values, see MetricReportDefinitionType in Property details.*
MetricReportHeartbeatInterval *(v1.2+)*	string	*read-write (null)*	The interval at which to send the complete metric report because the Redfish client wants refreshed metric data even when the data has not changed. This property value is always greater than the recurrence interval of a metric report, and it only applies when the SuppressRepeatedMetricValue property is `true`. • The property value shall contain a Redfish duration that describes the time interval between generations of the unsuppressed metric report. It shall always be a value greater than the RecurrenceInterval property within Schedule and should only apply when the SuppressRepeatedMetricValue property is `true`. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
Metrics [{	array		The list of metrics to include in the metric report. The metrics may include calculations to apply to metric properties. • The property shall contain a list of metrics to include in the metric report. The metrics may include calculations to apply to metric properties.
CollectionDuration	string	*read-write (null)*	The duration over which the function is computed. • This property shall specify the duration over which the function is computed. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
CollectionFunction	string (enum)	*read-write (null)*	Specifies the function to perform on each of the metric properties listed in the MetricProperties property or the metric properties specified in the MetricDefinition referenced by the MetricId property. If not specified, calculations are not performed on the metric properties. • The property shall specify the function to perform on each of the metric properties listed in the MetricProperties property or the metric properties specified in the MetricDefinition referenced by the MetricId property. If not specified, calculations shall not be performed on the metric properties. *For the possible property values, see CollectionFunction in Property details.*

Property	Type	Attributes	Notes
CollectionTimeScope	string (enum)	*read-write (null)*	The scope of time over which the function is applied. • This property shall specify the scope of time over which the function is applied. *For the possible property values, see CollectionTimeScope in Property details.*
MetricId	string	*read-write (null)*	The metric definition identifier that contains the metric properties to include in the metric report. • This property shall contain the value of the Id property of the MetricDefinition resource that contains the metric properties to include in the metric report. This property should not be present if MetricProperties is present.
MetricProperties [ ]	array (URI) (string, null)	*read-write*	The list of URIs with wildcards and property identifiers to include in the metric report. If a URI has wildcards, the wildcards are substituted as specified in the Wildcards property. • This property shall contain a list of URIs with wildcards and property identifiers to include in the metric report. A set of curly braces shall delimit each wildcard in the URI. The corresponding entry in the Wildcard property shall replace each wildcard. After each wildcard is replaced, it shall describe a resource property to include in the metric report. The property identifiers portion of the URI shall follow RFC6901-specified JSON pointer notation rules. This property should not be present if MetricId is present.
Oem *(v1.4+)* {}	object		See the OEM object definition in the Using this guide clause.
}]			
ReportActions [ ]	array (string (enum))	*read-write*	Actions to perform when a metric report is generated. • The set of actions to perform when a metric report is generated. ◦ This property shall contain the set of actions to perform when the metric report is generated. This property should be ignored if MetricReportDefinitionType contains the value `OnRequest`. *For the possible property values, see ReportActions in Property details.*
ReportTimespan *(v1.3+)*	string	*read-write (null)*	The maximum timespan that a metric report can cover. • This property shall contain maximum timespan that a metric report can cover. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`

Property	Type	Attributes	Notes
ReportUpdates	string (enum)	*read-write*	The behavior for how subsequent metric reports are handled in relationship to an existing metric report created from the metric report definition. Namely, whether to overwrite, append, or create a metric report. • This property shall contain the behavior for how subsequent metric reports are handled in relationship to an existing metric report created from the metric report definition. This property should be ignored if MetricReportDefinitionType contains the value `OnRequest`. *For the possible property values, see ReportUpdates in Property details.*
Schedule {}	object		The schedule for generating the metric report. • This property shall contain the schedule of the metric report. The metric report shall be generated at an interval specified by the RecurrenceInterval property within Schedule. If MaxOccurrences property within Schedule is specified, the metric report shall no longer be generated after the specified number of occurrences. The State property within Status should be set to `Disabled` and the MetricReportDefinitionEnabled property should be set to `false` when the specified number of occurrences is reached. For property details, see Schedule.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SuppressRepeatedMetricValue *(v1.2+)*	boolean	*read-write (null)*	An indication of whether any metrics are suppressed from the generated metric report. If `true`, any metric that equals the same value in the previously generated metric report is suppressed from the current report. Also, duplicate metrics are suppressed. If `false`, no metrics are suppressed from the current report. The current report may contain no metrics if all metrics equal the values in the previously generated metric report. • This property shall indicate whether any metrics are suppressed from the generated metric report. If `true`, any metric that equals the same value in the previously generated metric report is suppressed from the current report. Also, duplicate metrics are suppressed. If `false`, no metrics are suppressed from the current report. The current report may contain no metrics if all metrics equal the values in the previously generated metric report.

Property	Type	Attributes	Notes
Wildcards [{	array		The set of wildcards and their substitution values for the entries in the MetricProperties property. • The property shall contain a set of wildcards and their replacement strings, which are applied to the MetricProperties property. Each wildcard expressed in the MetricProperties property shall have a corresponding entry in this property.
Keys *(deprecated v1.1)* [ ]	array (string, null)	*read-write*	An array of values to substitute for the wildcard. • This property shall contain the list of values to substitute for the wildcard. *Deprecated in v1.1 and later. This property has been deprecated in favor of using the property Values.*
Name	string	*read-write (null)*	The string used as a wildcard. • This property shall contain the string used as a wildcard.
Values *(v1.1+)* [ ]	array (string, null)	*read-write*	An array of values to substitute for the wildcard. • This property shall contain the list of values to substitute for the wildcard.
}]			

6.66.4 Property details

6.66.4.1 CollectionFunction:

Specifies the function to perform on each of the metric properties listed in the MetricProperties property or the metric properties specified in the MetricDefinition referenced by the MetricId property. If not specified, calculations are not performed on the metric properties.

- The property shall specify the function to perform on each of the metric properties listed in the MetricProperties property or the metric properties specified in the MetricDefinition referenced by the MetricId property. If not specified, calculations shall not be performed on the metric properties.

string	Description
Average	The metric is calculated as the average metric reading over a duration. • This value shall indicate the metric is calculated as the average metric reading over a duration. The duration shall be the CollectionDuration property value.

string	Description
Maximum	The metric is calculated as the maximum metric reading over a duration. • This value shall indicate the metric is calculated as the maximum metric reading over a duration. The duration shall be the CollectionDuration property value.
Minimum	The metric is calculated as the minimum metric reading over a duration. • This value shall indicate the metric is calculated as the minimum metric reading over a duration. The duration shall be the CollectionDuration property value.
Summation	The metric is calculated as the sum of the values over a duration. • This value shall indicate the metric is calculated as the sum of the specified metric reading over a duration. The duration shall be the CollectionDuration property value.

6.66.4.2 CollectionTimeScope:

The scope of time over which the function is applied.

- This property shall specify the scope of time over which the function is applied.

string	Description
Interval	The corresponding metric values apply to a time interval. On the corresponding metric value instances, the Timestamp property value in the metric report specifies the end of the time interval and the CollectionDuration property specifies its duration. • This value shall indicate the corresponding metric values apply to a time interval. On the corresponding metric value instances, the Timestamp property value in the metric report shall specify the end of the time interval and the CollectionDuration property shall specify its duration.
Point	The corresponding metric values apply to a point in time. On the corresponding metric value instances, the Timestamp property value in the metric report specifies the point in time. • This value shall indicate the corresponding metric values apply to a point in time. On the corresponding metric value instances, the Timestamp property value in the metric report shall specify the point in time.

string	Description
StartupInterval	The corresponding metric values apply to a time interval that began at the startup of the measured resource. On the corresponding metric value instances, the Timestamp property value in the metric report shall specifies the end of the time interval. The CollectionDuration property value specifies the duration between the startup of resource and timestamp. • This value shall indicate the corresponding metric values apply to a time interval that began at the startup of the measured resource. On the corresponding metric value instances, the Timestamp property value in the metric report shall specify the end of the time interval. The CollectionDuration property value shall specify the duration between the startup of resource and timestamp.

6.66.4.3 MetricReportDefinitionType:

Specifies when the metric report is generated.

- This property shall specify when the metric report is generated. If the value is `Periodic`, the Schedule property shall be present.

string	Description
OnChange	The metric report is generated when any of the metric values change.
OnRequest	The metric report is generated when a HTTP GET is performed on the specified metric report.
Periodic	The metric report is generated at a periodic time interval, specified in the Schedule property.

6.66.4.4 ReportActions:

Actions to perform when a metric report is generated.

- The set of actions to perform when a metric report is generated.
  - This property shall contain the set of actions to perform when the metric report is generated. This property should be ignored if MetricReportDefinitionType contains the value `OnRequest`.

string	Description
LogToMetricReportsCollection	Record the occurrence to the metric report collection. • This value shall indicate the service records the occurrence to the metric report collection found under the telemetry service. The service shall update the metric report based on the setting of the ReportUpdates property.

string	Description
RedfishEvent	Send a Redfish event message containing the metric report. • This value shall indicate the service sends a Redfish event of type MetricReport to subscribers in the event subscription collection of the event service.

6.66.4.5 ReportUpdates:

The behavior for how subsequent metric reports are handled in relationship to an existing metric report created from the metric report definition. Namely, whether to overwrite, append, or create a metric report.

- This property shall contain the behavior for how subsequent metric reports are handled in relationship to an existing metric report created from the metric report definition. This property should be ignored if MetricReportDefinitionType contains the value `OnRequest`.

string	Description
AppendStopsWhenFull	New information is appended to the metric report. The service stops adding entries when the metric report has reached its maximum capacity. • This value shall indicate the service appends new information to the metric report referenced by the MetricReport property. The service shall stop adding entries when the metric report has reached its maximum capacity. The State property within Status should be set to `Disabled` and the MetricReportDefinitionEnabled property should be set to `false` when the append limit is reached.
AppendWrapsWhenFull	New information is appended to the metric report. The metric report entries are overwritten with new entries when the metric report has reached its maximum capacity. • This value shall indicate the service appends new information to the metric report referenced by the MetricReport property. The service shall overwrite entries in the metric report with new entries when the metric report has reached its maximum capacity.
NewReport	A new metric report is created, whose identifier is a service-defined identifier concatenated with the timestamp. • This value shall indicate the service creates a new metric report resource, whose Id property is a service-defined identifier concatenated with the timestamp. The metric report referenced by the MetricReport property shall reference the metric report most recently created by this metric report definition.
Overwrite	Overwrite the metric report. • This value shall indicate the service overwrites the metric report referenced by the MetricReport property.

6.66.5 Example response

```
{
    "@odata.type": "#MetricReportDefinition.v1_4_2.MetricReportDefinition",
    "Id": "PlatformPowerUsage",
    "Name": "Transmit and Log Platform Power Usage",
    "MetricReportDefinitionType": "Periodic",
    "Schedule": {
        "RecurrenceInterval": "PT1H"
    },
    "ReportActions": [
        "RedfishEvent",
        "LogToMetricReportsCollection"
    ],
    "ReportUpdates": "AppendWrapsWhenFull",
    "AppendLimit": 256,
    "MetricReport": {
        "@odata.id": "/redfish/v1/TelemetryService/MetricReports/PlatformPowerUsage"
    },
    "Status": {
        "State": "Enabled"
    },
    "Wildcards": [
        {
            "Name": "PWild",
            "Values": [
                "0"
            ]
        },
        {
            "Name": "TWild",
            "Values": [
                "Tray_1",
                "Tray_2"
            ]
        }
    ],
    "MetricProperties": [
        "/redfish/v1/Chassis/{TWild}/Power#/PowerControl/{PWild}/PowerConsumedWatts"
    ],
    "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/PlatformPowerUsage"
}
```

6.67 NetworkAdapter 1.9.0

Version	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*

Release	2021.4	2021.2	2021.1	2020.4	2020.3	2020.2	2019.2	2018.2	2017.3	2016.3

6.67.1 Description

The NetworkAdapter schema represents a physical network adapter capable of connecting to a computer network. Examples include but are not limited to Ethernet, Fibre Channel, and converged network adapters.

- This resource shall represent a physical network adapter capable of connecting to a computer network in a Redfish implementation.

6.67.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*

6.67.3 Properties

Property	Type	Attributes	Notes
Assembly *(v1.1+)* {	object		The link to the assembly resource associated with this adapter. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
Certificates *(v1.6+)* {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
Controllers [{	array		The set of network controllers ASICs that make up this NetworkAdapter. • This property shall contain the set of network controllers ASICs that make up this network adapter.

Property	Type	Attributes	Notes
ControllerCapabilities {	object		The capabilities of this controller. • This property shall contain the capabilities of this controller.
DataCenterBridging {	object		Data center bridging (DCB) for this controller. • This property shall contain capability, status, and configuration values related to data center bridging (DCB) for this controller.
Capable	boolean	*read-only (null)*	An indication of whether this controller is capable of data center bridging (DCB). • This property shall indicate whether this controller is capable of data center bridging (DCB).
}			
NetworkDeviceFunctionCount	integer	*read-only (null)*	The maximum number of physical functions available on this controller. • This property shall contain the number of physical functions available on this controller.
NetworkPortCount	integer	*read-only (null)*	The number of physical ports on this controller. • This property shall contain the number of physical ports on this controller.
NPAR *(v1.2+)* {	object		NIC Partitioning (NPAR) capabilities for this controller. • This property shall contain capability, status, and configuration values related to NIC partitioning for this controller.
NparCapable *(v1.2+)*	boolean	*read-only (null)*	An indication of whether the controller supports NIC function partitioning. • This property shall indicate whether the controller supports NIC function partitioning.
NparEnabled *(v1.2+)*	boolean	*read-write (null)*	An indication of whether NIC function partitioning is active on this controller. • This property shall indicate whether NIC function partitioning is active on this controller.
}			

Property	Type	Attributes	Notes
NPIV {	object		N_Port ID Virtualization (NPIV) capabilities for this controller. • This property shall contain N_Port ID Virtualization (NPIV) capabilities for this controller.
MaxDeviceLogins	integer	*read-only (null)*	The maximum number of N_Port ID Virtualization (NPIV) logins allowed simultaneously from all ports on this controller. • This property shall contain the maximum number of N_Port ID Virtualization (NPIV) logins allowed simultaneously from all ports on this controller.
MaxPortLogins	integer	*read-only (null)*	The maximum number of N_Port ID Virtualization (NPIV) logins allowed per physical port on this controller. • This property shall contain the maximum number of N_Port ID Virtualization (NPIV) logins allowed per physical port on this controller.
}			
VirtualizationOffload {	object		Virtualization offload for this controller. • This property shall contain capability, status, and configuration values related to virtualization offload for this controller.
SRIOV {	object		Single-root input/output virtualization (SR-IOV) capabilities. • This property shall contain single-root input/output virtualization (SR-IOV) capabilities.
SRIOVVEPACapable	boolean	*read-only (null)*	An indication of whether this controller supports single root input/output virtualization (SR-IOV) in Virtual Ethernet Port Aggregator (VEPA) mode. • This property shall indicate whether this controller supports single root input/output virtualization (SR-IOV) in Virtual Ethernet Port Aggregator (VEPA) mode.
}			
VirtualFunction {	object		The virtual function of the controller. • This property shall describe the capability, status, and configuration values related to the virtual function for this controller.

Property	Type	Attributes	Notes
DeviceMaxCount	integer	*read-only* *(null)*	The maximum number of virtual functions supported by this controller. • This property shall contain the maximum number of virtual functions supported by this controller.
MinAssignmentGroupSize	integer	*read-only* *(null)*	The minimum number of virtual functions that can be allocated or moved between physical functions for this controller. • This property shall contain the minimum number of virtual functions that can be allocated or moved between physical functions for this controller.
NetworkPortMaxCount	integer	*read-only* *(null)*	The maximum number of virtual functions supported per network port for this controller. • This property shall contain the maximum number of virtual functions supported per network port for this controller.
}			
}			
}			
FirmwarePackageVersion	string	*read-only* *(null)*	The version of the user-facing firmware package. • This property shall contain the version number of the user-facing firmware package.
Identifiers *(v1.3+)* [{ }]	array (object)		Any additional identifiers for a resource. • The durable names for the network adapter controller. ◦ This property shall contain a list of all known durable names for the controller associated with the network adapter. For property details, see Identifier.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
NetworkDeviceFunctions [{	array		An array of links to the network device functions associated with this network controller. • This property shall contain an array of links to resources of type NetworkDeviceFunction that represent the network device functions associated with this network controller.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.

Property	Type	Attributes	Notes
}]			
NetworkPorts *(deprecated v1.5)* [{	array		An array of links to the network ports associated with this network controller. • This property shall contain an array of links to resources of type NetworkPort that represent the network ports associated with this network controller. *Deprecated in v1.5 and later. This property has been deprecated in favor of the Ports property.*
@odata.id	string	*read-only*	Link to a NetworkPort resource. See the Links section and the *NetworkPort* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeDevices [{	array		An array of links to the PCIe devices associated with this network controller. • This property shall contain an array of links to resources of type PCIeDevice that represent the PCIe devices associated with this network controller.
@odata.id	string	*read-only*	Link to a PCIeDevice resource. See the Links section and the *PCIeDevice* schema for details.
}]			
Ports *(v1.5+)* [{	array		An array of links to the ports associated with this network controller. • This property shall contain an array of links to resources of type Port that represent the ports associated with this network controller.
@odata.id	string	*read-only*	Link to a Port resource. See the Links section and the *Port* schema for details.
}]			
}			
Location *(v1.1+)* {}	object		The location of the network adapter controller. • This property shall contain location information of the controller associated with the network adapter. For property details, see Location.

Property	Type	Attributes	Notes
PCIeInterface *(v1.2+)* {	object		The PCIe interface details for this controller. • This property shall contain details for the PCIe interface that connects this PCIe-based controller to its host.
LanesInUse *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes in use by this device. • This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the MaxLanes property value.
MaxLanes *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes supported by this device. • This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The highest version of the PCIe specification supported by this device. • This property shall contain the maximum PCIe specification that this device supports. *For the possible property values, see MaxPCIeType in Property details.*
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
PCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The version of the PCIe specification in use by this device. • This property shall contain the negotiated PCIe interface version in use by this device. *For the possible property values, see PCIeType in Property details.*
}			
}]			
EnvironmentMetrics *(v1.7+)* {	object		The link to the environment metrics for this network adapter. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the environment metrics for this network adapter. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			

Property	Type	Attributes	Notes
Identifiers *(v1.4+)* [{ }]	array (object)		Any additional identifiers for a resource. • The durable names for the network adapter. ◦ This property shall contain a list of all known durable names for the network adapter. For property details, see Identifier.
LLDPEnabled *(v1.7+)*	boolean	*read-write*	Enable or disable LLDP globally for an adapter. • This property shall contain the state indicating whether LLDP is globally enabled on a network adapter. If set to `false`, the LLDPEnabled value for the ports associated with this adapter shall be disregarded.
Location *(v1.4+)* {}	object		The location of the network adapter. • This property shall contain location information of the network adapter. For property details, see Location.
Manufacturer	string	*read-only (null)*	The manufacturer or OEM of this network adapter. • This property shall contain a value that represents the manufacturer of the network adapter.
Measurements *(v1.6+, deprecated v1.9* [{	array		An array of DSP0274-defined measurement blocks. • This property shall contain an array of DSP0274-defined measurement blocks. *Deprecated in v1.9 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
@odata.id	string	*read-only*	Link to a MeasurementBlock resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
Metrics *(v1.7+)* {	object	*(null)*	The link to the metrics associated with this adapter. • This property shall contain a link to a resource of type NetworkAdapterMetrics that contains the metrics associated with this adapter. See the *NetworkAdapterMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a NetworkAdapterMetrics resource. See the Links section and the *NetworkAdapterMetrics* schema for details.
}			

Property	Type	Attributes	Notes
Model	string	*read-only (null)*	The model string for this network adapter. • This property shall contain the information about how the manufacturer refers to this network adapter.
NetworkDeviceFunctions {	object		The link to the collection of network device functions associated with this network adapter. • This property shall contain a link to a resource collection of type NetworkDeviceFunctionCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *NetworkDeviceFunction*. See the NetworkDeviceFunction schema for details.
}			
NetworkPorts *(deprecated v1.5)* {	object		The link to the collection of network ports associated with this network adapter. • This property shall contain a link to a resource collection of type NetworkPortCollection. Contains a link to a resource. *Deprecated in v1.5 and later. This property has been deprecated in favor of the Ports property.*
@odata.id	string	*read-only*	Link to Collection of *NetworkPort*. See the NetworkPort schema for details.
}			
PartNumber	string	*read-only (null)*	Part number for this network adapter. • This property shall contain the part number for the network adapter as defined by the manufacturer.
Ports *(v1.5+)* {	object		The link to the collection of ports associated with this network adapter. • This property shall contain a link to a resource collection of type PortCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			

Property	Type	Attributes	Notes
Processors *(v1.8+)* {	object		The link to the collection of offload processors contained in this network adapter. • This property shall contain a link to a resource collection of type ProcessorCollection that represent the offload processors contained in this network adapter. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Processor*. See the Processor schema for details.
}			
SerialNumber	string	*read-only (null)*	The serial number for this network adapter. • This property shall contain the serial number for the network adapter.
SKU	string	*read-only (null)*	The manufacturer SKU for this network adapter. • This property shall contain the SKU for the network adapter.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.67.4 Actions

6.67.4.1 ResetSettingsToDefault

Description

This action is to clear the settings back to factory defaults.

- This action shall reset of all active and pending settings back to factory default settings upon reset of the network adapter.

Action URI: {Base URI of target resource}/Actions/NetworkAdapter.ResetSettingsToDefault

Action parameters

This action takes no parameters.

6.67.5 Property details

6.67.5.1 MaxPCIeType:

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.67.5.2 PCIeType:

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.67.6 Example response


```
{
    "@odata.type": "#NetworkAdapter.v1_9_0.NetworkAdapter",
    "Id": "9fa725a1",
```

```
    "Name": "Network Adapter View",
    "Manufacturer": "Contoso",
    "Model": "599TPS-T",
    "SKU": "Contoso TPS-Net 2-Port Base-T",
    "SerialNumber": "003BFLRT00023234",
    "PartNumber": "975421-B20",
    "Ports": {
        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/Ports"
    },
    "NetworkDeviceFunctions": {
        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkDeviceFunctions"
    },
    "Controllers": [
        {
            "FirmwarePackageVersion": "7.4.10",
            "Links": {
                "PCIeDevices": [
                    {
                        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC"
                    }
                ],
                "Ports": [
                    {
                        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/Ports/1"
                    }
                ],
                "NetworkDeviceFunctions": [
                    {
                        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkDeviceFunctions/111111111100"
                    }
                ]
            },
            "ControllerCapabilities": {
                "NetworkPortCount": 2,
                "NetworkDeviceFunctionCount": 8,
                "DataCenterBridging": {
                    "Capable": true
                },
                "VirtualizationOffload": {
                    "VirtualFunction": {
                        "DeviceMaxCount": 256,
                        "NetworkPortMaxCount": 128,
                        "MinAssignmentGroupSize": 4
                    },
                    "SRIOV": {
                        "SRIOVVEPACapable": true
                    }
                },
                "NPIV": {
                    "MaxDeviceLogins": 4,
```

```
                    "MaxPortLogins": 2
                },
                "NPAR": {
                    "NparCapable": true,
                    "NparEnabled": false
                }
            },
            "PCIeInterface": {
                "PCIeType": "Gen2",
                "MaxPCIeType": "Gen3",
                "LanesInUse": 1,
                "MaxLanes": 4
            },
            "Location": {
                "PartLocation": {
                    "ServiceLabel": "Slot 1",
                    "LocationType": "Slot",
                    "LocationOrdinalValue": 0,
                    "Reference": "Rear",
                    "Orientation": "LeftToRight"
                }
            }
        }
    ],
    "Actions": {
        "#NetworkAdapter.ResetSettingsToDefault": {
            "target": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/Actions/NetworkAdapter.ResetSettingsToDefault"
        },
        "Oem": {}
    },
    "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1"
}
```


6.68 NetworkAdapterMetrics 1.0.0

Version	*v1.0*
Release	2021.1

6.68.1 Description

The NetworkAdapterMetrics schema contains usage and health statistics for a network adapter.

- This resource shall represent the network metrics for a single network adapter in a Redfish implementation.

6.68.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Metrics

6.68.3 Properties

Property	Type	Attributes	Notes
CPUCorePercent	number (%)	*read-only (null)*	The device CPU core utilization as a percentage. • This property shall contain the device CPU core utilization as a percentage.
HostBusRXPercent	number (%)	*read-only (null)*	The host bus, such as PCIe, RX utilization as a percentage. • This property shall contain the host bus, such as PCIe, RX utilization as a percentage, which is calculated by dividing the total bytes received by the theoretical max.
HostBusTXPercent	number (%)	*read-only (null)*	The host bus, such as PCIe, TX utilization as a percentage. • This property shall contain the host bus, such as PCIe, TX utilization as a percentage, which is calculated by dividing the total bytes transmitted by the theoretical max.
NCSIRXBytes	integer (bytes)	*read-only (null)*	The total number of NC-SI bytes received since reset. • This property shall contain the total number of NC-SI bytes received since reset, including both passthrough and non-passthrough traffic.
NCSIRXFrames	integer	*read-only (null)*	The total number of NC-SI frames received since reset. • This property shall contain the total number of NC-SI frames received since reset, including both passthrough and non-passthrough traffic.
NCSITXBytes	integer (bytes)	*read-only (null)*	The total number of NC-SI bytes sent since reset. • This property shall contain the total number of NC-SI bytes sent since reset, including both passthrough and non-passthrough traffic.
NCSITXFrames	integer	*read-only (null)*	The total number of NC-SI frames sent since reset. • This property shall contain the total number of NC-SI frames sent since reset, including both passthrough and non-passthrough traffic.

Property	Type	Attributes	Notes
RXBytes	integer (bytes)	*read-only* *(null)*	The total number of bytes received since reset. • This property shall contain the total number of bytes received since reset, including host and remote management passthrough traffic, and inclusive of all protocol overhead.
RXMulticastFrames	integer	*read-only* *(null)*	The total number of good multicast frames received since reset. • This property shall contain the total number of good multicast frames received since reset.
RXUnicastFrames	integer	*read-only* *(null)*	The total number of good unicast frames received since reset. • This property shall contain the total number of good unicast frames received since reset.
TXBytes	integer (bytes)	*read-only* *(null)*	The total number of bytes transmitted since reset. • This property shall contain the total number of bytes transmitted since reset, including host and remote management passthrough traffic, and inclusive of all protocol overhead.
TXMulticastFrames	integer	*read-only* *(null)*	The total number of good multicast frames transmitted since reset. • This property shall contain the total number of good multicast frames transmitted since reset.
TXUnicastFrames	integer	*read-only* *(null)*	The total number of good unicast frames transmitted since reset. • This property shall contain the total number of good unicast frames transmitted since reset.

6.68.4 Example response


```
{
    "@odata.type": "#NetworkAdapterMetrics.v1_0_0.NetworkAdapterMetrics",
    "Id": "NetworkAdapterMetrics",
    "Name": "Network Adapter Metrics",
    "HostBusRXPercent": 35.53,
    "HostBusTXPercent": 14.17,
    "CPUCorePercent": 8.35,
    "NCSIRXFrames": 0,
    "NCSITXFrames": 0,
    "NCSIRXBytes": 0,
    "NCSITXBytes": 0,
    "RXBytes": 7754199970,
```

```
    "RXMulticastFrames": 1941,
    "RXUnicastFrames": 27193387,
    "TXBytes": 9436506547,
    "TXMulticastFrames": 153,
    "TXUnicastFrames": 18205770,
    "@odata.id": "/redfish/v1/Chassis/1U/NetworkAdapters/Slot1/Metrics"
}
```


6.69 NetworkDeviceFunction 1.9.0

Version	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2021.4	2021.2	2021.1	2020.3	2020.1	2018.2	2017.3	2017.1	2016.3

6.69.1 Description

The NetworkDeviceFunction schema represents a logical interface that a network adapter exposes.

- This resource shall represent a logical interface that a network adapter exposes in a Redfish implementation.

6.69.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/NetworkDeviceFunctions/*{NetworkDeviceFunctionId}*

6.69.3 Properties

Property	Type	Attributes	Notes
AllowDeny *(v1.7+)* {	object		The link to the collection of allow and deny permissions for packets leaving and arriving to this network device function. • This property shall contain a link to a resource collection of type AllowDenyCollection that contains the permissions for packets leaving and arriving to this network device function. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *AllowDeny*. See the AllowDeny schema for details.
}			

Property	Type	Attributes	Notes
AssignablePhysicalNetworkPorts *(v1.5+)* [{	array		An array of physical ports to which this network device function can be assigned. • This property shall contain an array of links to resources of type Port that are the physical ports to which this network device function can be assigned.
@odata.id	string	*read-only*	Link to a Port resource. See the Links section and the *Port* schema for details.
}]			
AssignablePhysicalPorts *(deprecated v1.5)* [{	array		An array of physical ports to which this network device function can be assigned. • This property shall contain an array of links to resources of type NetworkPort that are the physical ports to which this network device function can be assigned. *Deprecated in v1.5 and later. This property has been deprecated in favor of the AssignablePhysicalNetworkPorts property.*
@odata.id	string	*read-only*	Link to a NetworkPort resource. See the Links section and the *NetworkPort* schema for details.
}]			
BootMode	string (enum)	*read-write (null)*	The boot mode configured for this network device function. • This property shall contain the boot mode configured for this network device function. If the value is not `Disabled`, this network device function shall be configured for boot by using the specified technology. *For the possible property values, see BootMode in Property details.*
DeviceEnabled	boolean	*read-write (null)*	An indication of whether the network device function is enabled. • This property shall indicate whether the network device function is enabled. The operating system shall not enumerate or see disabled network device functions.
Ethernet {	object		The Ethernet capabilities, status, and configuration values for this network device function. • This property shall contain Ethernet capabilities, status, and configuration values for this network device function.

Property	Type	Attributes	Notes
EthernetInterfaces *(v1.7+)* {	object	*(null)*	The Ethernet interface collection that represents all the Ethernet Interfaces on this network device function. • This property shall contain a link to a collection of type EthernetInterfaceCollection that represent the Ethernet interfaces present on this network device function. This property shall not be present if this network device function is not referenced by a NetworkInterface resource. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *EthernetInterface*. See the EthernetInterface schema for details.
}			
MACAddress	string	*read-write (null)*	The currently configured MAC address. • This property shall contain the effective current MAC address of this network device function. If an assignable MAC address is not supported, this is a read-only alias of the PermanentMACAddress. Pattern: `^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$`
MTUSize	integer	*read-write (null)*	The maximum transmission unit (MTU) configured for this network device function. • The maximum transmission unit (MTU) configured for this network device function. This value serves as a default for the OS driver when booting. The value only takes effect on boot.
MTUSizeMaximum *(v1.5+)*	integer	*read-only (null)*	The largest maximum transmission unit (MTU) size supported for this network device function. • This property shall contain the largest maximum transmission unit (MTU) size supported for this network device function.
PermanentMACAddress	string	*read-only (null)*	The permanent MAC address assigned to this function. • This property shall contain the permanent MAC Address of this function. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: `^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$`
VLAN *(v1.3+)* {	object		The VLAN information for this interface. If this network interface supports more than one VLAN, this property is not present. • This property shall contain the VLAN for this interface. If this interface supports more than one VLAN, the VLAN property shall not be present and the VLANs property shall be present instead.

Property	Type	Attributes	Notes
Tagged *(v1.3+)*	boolean	*read-write (null)*	An indication of whether this VLAN is tagged or untagged for this interface. • This property shall indicate whether this VLAN is tagged or untagged for this interface.
VLANEnable	boolean	*read-write required on create (null)*	An indication of whether this VLAN is enabled for this VLAN network interface. • This property shall indicate whether this VLAN is enabled for this VLAN network interface.
VLANId	integer	*read-write required on create (null)*	The ID for this VLAN. • This property shall contain the ID for this VLAN.
VLANPriority *(v1.2+)*	integer	*read-write (null)*	The priority for this VLAN. • This property shall contain the priority for this VLAN.
}			
VLANs *(v1.3+, deprecated v1.7* {	object		The link to a collection of VLANs. This property is used only if the interface supports more than one VLAN. • This property shall contain a link to a resource collection of type VLanNetworkInterfaceCollection. If this property is used, the VLANEnabled and VLANId property shall not be used. Contains a link to a resource. *Deprecated in v1.7 and later. This property has been deprecated in favor of representing multiple VLANs as EthernetInterface resources.*
@odata.id	string	*read-only*	Link to Collection of *VLanNetworkInterface*. See the VLanNetworkInterface schema for details.
}			
}			
FibreChannel {	object		The Fibre Channel capabilities, status, and configuration values for this network device function. • This property shall contain Fibre Channel capabilities, status, and configuration values for this network device function.

Property	Type	Attributes	Notes
AllowFIPVLANDiscovery	boolean	*read-write (null)*	An indication of whether the FCoE Initialization Protocol (FIP) populates the FCoE VLAN ID. • For FCoE connections, this boolean property shall indicate whether the FIP VLAN Discovery Protocol determines the FCoE VLAN ID selected by the network device function for the FCoE connection. If `true` and the FIP VLAN discovery succeeds, the FCoEActiveVLANId property shall reflect the FCoE VLAN ID to use for all FCoE traffic. If `false` or if the FIP VLAN Discovery protocol fails, the FCoELocalVLANId shall be used for all FCoE traffic and the FCoEActiveVLANId shall reflect the FCoELocalVLANId.
BootTargets [{	array		An array of Fibre Channel boot targets configured for this network device function. • This property shall contain an array of Fibre Channel boot targets configured for this network device function.
BootPriority	integer	*read-write (null)*	The relative priority for this entry in the boot targets array. • This property shall contain the relative priority for this entry in the boot targets array. Lower numbers shall represent higher priority, with zero being the highest priority. The BootPriority shall be unique for all entries of the BootTargets array.
LUNID	string	*read-write (null)*	The logical unit number (LUN) ID from which to boot on the device to which the corresponding WWPN refers. • This property shall contain the logical unit number (LUN) ID from which to boot on the device to which the corresponding WWPN refers.
WWPN	string	*read-write (null)*	The World Wide Port Name (WWPN) from which to boot. • This property shall contain World Wide Port Name (WWPN) from which to boot.
}]			
FCoEActiveVLANId	integer	*read-only (null)*	The active FCoE VLAN ID. • For FCoE connections, this property shall contain `null` or a VLAN ID currently being used for FCoE traffic. When the FCoE link is down this value shall be null. When the FCoE link is up this value shall be either the FCoELocalVLANId property or a VLAN discovered through the FIP protocol.

Property	Type	Attributes	Notes
FCoELocalVLANId	integer	*read-write (null)*	The locally configured FCoE VLAN ID. • For FCoE connections, this property shall contain the VLAN ID configured locally by setting this property. This value shall be used for FCoE traffic to this network device function during boot unless AllowFIPVLANDiscovery is `true` and a valid FCoE VLAN ID is found through the FIP VLAN Discovery Protocol.
FibreChannelId *(v1.3+)*	string	*read-only (null)*	The Fibre Channel ID that the switch assigns for this interface. • This property shall indicate the Fibre Channel ID that the switch assigns for this interface.
PermanentWWNN	string	*read-only (null)*	The permanent World Wide Node Name (WWNN) address assigned to this function. • This property shall contain the permanent World Wide Node Name (WWNN) of this function. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: `^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})$`
PermanentWWPN	string	*read-only (null)*	The permanent World Wide Port Name (WWPN) address assigned to this function. • This property shall contain the permanent World Wide Port Name (WWPN) of this function. Typically, this value is programmed during manufacturing. This address is not assignable.
WWNN	string	*read-write (null)*	The currently configured World Wide Node Name (WWNN) address of this function. • This property shall contain the effective current World Wide Node Name (WWNN) of this function. If an assignable WWNN is not supported, this is a read-only alias of the permanent WWNN. Pattern: `^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})$`
WWNSource	string (enum)	*read-write (null)*	The configuration source of the World Wide Names (WWN) for this World Wide Node Name (WWNN) and World Wide Port Name (WWPN) connection. • This property shall contain the configuration source of the World Wide Name (WWN) for this World Wide Node Name (WWNN) and World Wide Port Name (WWPN) connection. *For the possible property values, see WWNSource in Property details.*

Property	Type	Attributes	Notes
WWPN	string	*read-write (null)*	The currently configured World Wide Port Name (WWPN) address of this function. • This property shall contain the effective current World Wide Port Name (WWPN) of this function. If an assignable WWPN is not supported, this is a read-only alias of the permanent WWPN. Pattern: `^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})$`
}			
HTTPBoot *(v1.9+)* {	object		The HTTP and HTTPS boot capabilities, status, and configuration values for this network device function. • This property shall contain HTTP and HTTPS boot capabilities, status, and configuration values for this network device function.
BootMediaURI *(v1.9+)*	string (URI)	*read-write (null)*	The URI of the boot media loaded with this network device function. • This property shall contain the URI of the boot media loaded with this network device function. An empty string shall indicate no boot media is configured. All other values shall begin with `http://` or `https://`.
}			
InfiniBand *(v1.5+)* {	object		The InfiniBand capabilities, status, and configuration values for this network device function. • This property shall contain InfiniBand capabilities, status, and configuration values for this network device function.
MTUSize *(v1.5+)*	integer	*read-write (null)*	The maximum transmission unit (MTU) configured for this network device function.
NodeGUID *(v1.5+)*	string	*read-only (null)*	This is the currently configured node GUID of the network device function. • This property shall contain the effective current node GUID of this virtual port of this network device function. If an assignable node GUID is not supported, this is a read-only alias of the PermanentNodeGUID. Pattern: `^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})$`
PermanentNodeGUID *(v1.5+)*	string	*read-only (null)*	The permanent node GUID assigned to this network device function. • This property shall contain the permanent node GUID of this network device function. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: `^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})$`

Property	Type	Attributes	Notes
PermanentPortGUID *(v1.5+)*	string	*read-only (null)*	The permanent port GUID assigned to this network device function. • This property shall contain the permanent port GUID of this network device function. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: `^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})$`
PermanentSystemGUID *(v1.5+)*	string	*read-only (null)*	The permanent system GUID assigned to this network device function. • This property shall contain the permanent system GUID of this network device function. Typically, this value is programmed during manufacturing. This address is not assignable. Pattern: `^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})$`
PortGUID *(v1.5+)*	string	*read-only (null)*	The currently configured port GUID of the network device function. • This property shall contain the effective current virtual port GUID of this network device function. If an assignable port GUID is not supported, this is a read-only alias of the PermanentPortGUID. Pattern: `^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})$`
SupportedMTUSizes *(v1.5+)* [ ]	array (integer, null)	*read-only*	The maximum transmission unit (MTU) sizes supported for this network device function. • This property shall contain an array of the maximum transmission unit (MTU) sizes supported for this network device function.
SystemGUID *(v1.5+)*	string	*read-only (null)*	This is the currently configured system GUID of the network device function. • This property shall contain the effective current system GUID of this virtual port of this network device function. If an assignable system GUID is not supported, this is a read-only alias of the PermanentSystemGUID. Pattern: `^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})$`
}			
iSCSIBoot {	object		The iSCSI boot capabilities, status, and configuration values for this network device function. • This property shall contain iSCSI boot capabilities, status, and configuration values for this network device function.

Property	Type	Attributes	Notes
AuthenticationMethod	string (enum)	*read-write (null)*	The iSCSI boot authentication method for this network device function. • This property shall contain the iSCSI boot authentication method for this network device function. *For the possible property values, see AuthenticationMethod in Property details.*
CHAPSecret	string	*read-write (null)*	The shared secret for CHAP authentication. • This property shall contain the shared secret for CHAP authentication.
CHAPUsername	string	*read-write (null)*	The user name for CHAP authentication. • This property shall contain the user name for CHAP authentication.
InitiatorDefaultGateway	string	*read-write (null)*	The IPv6 or IPv4 iSCSI boot default gateway. • This property shall contain the IPv6 or IPv4 iSCSI boot default gateway.
InitiatorIPAddress	string	*read-write (null)*	The IPv6 or IPv4 address of the iSCSI initiator. • This property shall contain the IPv6 or IPv4 address of the iSCSI boot initiator.
InitiatorName	string	*read-write (null)*	The iSCSI initiator name. • This property shall contain the iSCSI boot initiator name. This property should match formats defined in RFC3720 or RFC3721.
InitiatorNetmask	string	*read-write (null)*	The IPv6 or IPv4 netmask of the iSCSI boot initiator. • This property shall contain the IPv6 or IPv4 netmask of the iSCSI boot initiator.
IPAddressType	string (enum)	*read-write (null)*	The type of IP address being populated in the iSCSIBoot IP address fields. • This property shall contain the type of IP address being populated in the iSCSIBoot IP address fields. Mixing IPv6 and IPv4 addresses on the same network device function shall not be permissible. *For the possible property values, see IPAddressType in Property details.*
IPMaskDNSViaDHCP	boolean	*read-write (null)*	An indication of whether the iSCSI boot initiator uses DHCP to obtain the initiator name, IP address, and netmask. • This property shall indicate whether the iSCSI boot initiator uses DHCP to obtain the initiator name, IP address, and netmask.

Property	Type	Attributes	Notes
MutualCHAPSecret	string	*read-write (null)*	The CHAP secret for two-way CHAP authentication. • This property shall contain the CHAP secret for two-way CHAP authentication.
MutualCHAPUsername	string	*read-write (null)*	The CHAP user name for two-way CHAP authentication. • This property shall contain the CHAP user name for two-way CHAP authentication.
PrimaryDNS	string	*read-write (null)*	The IPv6 or IPv4 address of the primary DNS server for the iSCSI boot initiator. • This property shall contain the IPv6 or IPv4 address of the primary DNS server for the iSCSI boot initiator.
PrimaryLUN	integer	*read-write (null)*	The logical unit number (LUN) for the primary iSCSI boot target. • This property shall contain the logical unit number (LUN) for the primary iSCSI boot target.
PrimaryTargetIPAddress	string	*read-write (null)*	The IPv4 or IPv6 address for the primary iSCSI boot target. • This property shall contain the IPv4 or IPv6 address for the primary iSCSI boot target.
PrimaryTargetName	string	*read-write (null)*	The name of the iSCSI primary boot target. • This property shall contain the name of the primary iSCSI boot target. This property should match formats defined in RFC3720 or RFC3721.
PrimaryTargetTCPPort	integer	*read-write (null)*	The TCP port for the primary iSCSI boot target. • This property shall contain the TCP port for the primary iSCSI boot target.
PrimaryVLANEnable	boolean	*read-write (null)*	An indication of whether the primary VLAN is enabled. • This property shall indicate whether this VLAN is enabled for the primary iSCSI boot target.
PrimaryVLANId	integer	*read-write (null)*	The 802.1q VLAN ID to use for iSCSI boot from the primary target. • This property shall contain the 802.1q VLAN ID to use for iSCSI boot from the primary target. This VLAN ID is only used if PrimaryVLANEnable is true.

Property	Type	Attributes	Notes
RouterAdvertisementEnabled	boolean	*read-write (null)*	An indication of whether IPv6 router advertisement is enabled for the iSCSI boot target. • This property shall indicate whether IPv6 router advertisement is enabled for the iSCSI boot target. This setting shall apply to only IPv6 configurations.
SecondaryDNS	string	*read-write (null)*	The IPv6 or IPv4 address of the secondary DNS server for the iSCSI boot initiator. • This property shall contain the IPv6 or IPv4 address of the secondary DNS server for the iSCSI boot initiator.
SecondaryLUN	integer	*read-write (null)*	The logical unit number (LUN) for the secondary iSCSI boot target. • This property shall contain the logical unit number (LUN) for the secondary iSCSI boot target.
SecondaryTargetIPAddress	string	*read-write (null)*	The IPv4 or IPv6 address for the secondary iSCSI boot target. • This property shall contain the IPv4 or IPv6 address for the secondary iSCSI boot target.
SecondaryTargetName	string	*read-write (null)*	The name of the iSCSI secondary boot target. • This property shall contain the name of the secondary iSCSI boot target. This property should match formats defined in RFC3720 or RFC3721.
SecondaryTargetTCPPort	integer	*read-write (null)*	The TCP port for the secondary iSCSI boot target. • This property shall contain the TCP port for the secondary iSCSI boot target.
SecondaryVLANEnable	boolean	*read-write (null)*	An indication of whether the secondary VLAN is enabled. • This property shall indicate whether this VLAN is enabled for the secondary iSCSI boot target.
SecondaryVLANId	integer	*read-write (null)*	The 802.1q VLAN ID to use for iSCSI boot from the secondary target. • This property shall contain the 802.1q VLAN ID to use for iSCSI boot from the secondary target. This VLAN ID is only used if SecondaryVLANEnable is `true`.

Property	Type	Attributes	Notes
TargetInfoViaDHCP	boolean	*read-write (null)*	An indication of whether the iSCSI boot target name, LUN, IP address, and netmask should be obtained from DHCP. • This property shall indicate whether the iSCSI boot target name, LUN, IP address, and netmask should be obtained from DHCP.
}			
Limits *(v1.7+)* [{	array		The byte and packet limits for this network device function. • This property shall contain an array of byte and packet limits for this network device function.
BurstBytesPerSecond *(v1.7+)*	integer	*read-write (null)*	The maximum number of bytes per second in a burst for this network device function. • This property shall contain the maximum number of bytes per second in a burst allowed for this network device function.
BurstPacketsPerSecond *(v1.7+)*	integer	*read-write (null)*	The maximum number of packets per second in a burst for this network device function. • This property shall contain the maximum number of packets per second in a burst allowed for this network device function.
Direction *(v1.7+)*	string (enum)	*read-write (null)*	Indicates the direction of the data to which this limit applies. • This property shall indicate the direction of the data to which this limit applies for this network device function. *For the possible property values, see Direction in Property details.*
SustainedBytesPerSecond *(v1.7+)*	integer	*read-write (null)*	The maximum number of sustained bytes per second for this network device function. • This property shall contain the maximum number of sustained bytes per second allowed for this network device function.
SustainedPacketsPerSecond *(v1.7+)*	integer	*read-write (null)*	The maximum number of sustained packets per second for this network device function. • This property shall contain the maximum number of sustained packets per second allowed for this network device function.
}]			
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
Endpoints *(v1.2+)* [{	array		An array of links to endpoints associated with this network device function. • This property shall contain an array of links to resources of type Endpoint that are associated with this network device function.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
EthernetInterface *(v1.4+, deprecated v1.7* {	object		The link to a virtual Ethernet interface that was created when one of the network device function VLANs is represented as a virtual NIC for the purpose of showing the IP address associated with that VLAN. • This property shall contain a link to a resource of type EthernetInterface that represents a virtual interface that was created when one of the network device function VLANs is represented as a virtual NIC for the purpose of showing the IP address associated with that VLAN. The EthernetInterfaceType property of that resource shall contain the value `Virtual`. See the *EthernetInterface* schema for details on this property. *Deprecated in v1.7 and later. This property has been deprecated in favor of EthernetInterfaces as each NetworkDeviceFunction could have more than one EthernetInterface.*
@odata.id	string	*read-only*	Link to a EthernetInterface resource. See the Links section and the *EthernetInterface* schema for details.
}			
EthernetInterfaces *(v1.7+)* [{	array		The links to Ethernet interfaces that were created when one of the network device function VLANs is represented as a virtual NIC for the purpose of showing the IP address associated with that VLAN. • This property shall contain an array of links to resources of type EthernetInterface that represent the virtual interfaces that were created when one of the network device function VLANs is represented as a virtual NIC for the purpose of showing the IP address associated with that VLAN.
@odata.id	string	*read-only*	Link to a EthernetInterface resource. See the Links section and the *EthernetInterface* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
OffloadProcessors *(v1.7+)* [{	array		The processors that perform offload computation for this network function, such as with a SmartNIC. • This property shall contain an array of links to resources of type Processor that represent the processors that performs offload computation for this network function, such as with a SmartNIC. This property shall not be present if OffloadSystem is present.
@odata.id	string	*read-only*	Link to a Processor resource. See the Links section and the *Processor* schema for details.
}]			
OffloadSystem *(v1.7+)* {	object		The system that performs offload computation for this network function, such as with a SmartNIC. • This property shall contain a link to a resource of type ComputerSystem that represents the system that performs offload computation for this network function, such as with a SmartNIC. The SystemType property contained in the referenced ComputerSystem resource should contain the value `DPU`. This property shall not be present if OffloadProcessors is present. See the *ComputerSystem* schema for details on this property.
@odata.id	string	*read-only*	Link to a ComputerSystem resource. See the Links section and the *ComputerSystem* schema for details.
}			
PCIeFunction {	object		The link to the PCIe function associated with this network device function. • This property shall contain a link to a resource of type PCIeFunction that represents the PCIe function associated with this network device function. See the *PCIeFunction* schema for details on this property.
@odata.id	string	*read-only*	Link to a PCIeFunction resource. See the Links section and the *PCIeFunction* schema for details.
}			
PhysicalNetworkPortAssignment *(v1.5+)* {	object		The physical port to which this network device function is currently assigned. • This property shall contain a link to a resource of type Port to which this network device function is currently assigned. This value shall be one of the AssignablePhysicalPorts array members. See the *Port* schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to a Port resource. See the Links section and the *Port* schema for details.
}			
PhysicalPortAssignment *(v1.3+, deprecated v1.5* {	object		The physical port to which this network device function is currently assigned. • This property shall contain a link to a resource of type NetworkPort to which this network device function is currently assigned. This value shall be one of the AssignablePhysicalPorts array members. See the *NetworkPort* schema for details on this property. *Deprecated in v1.5 and later. This property has been deprecated in favor of the PhysicalNetworkPortAssignment property.*
@odata.id	string	*read-only*	Link to a NetworkPort resource. See the Links section and the *NetworkPort* schema for details.
}			
}			
MaxVirtualFunctions	integer	*read-only (null)*	The number of virtual functions that are available for this network device function. • This property shall contain the number of virtual functions that are available for this network device function.
Metrics *(v1.6+)* {	object	*(null)*	The link to the metrics associated with this network function. • This property shall contain a link to a resource of type NetworkDeviceFunctionMetrics that contains the metrics associated with this network function. See the *NetworkDeviceFunctionMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunctionMetrics resource. See the Links section and the *NetworkDeviceFunctionMetrics* schema for details.
}			
NetDevFuncCapabilities [ ]	array (string (enum))	*read-only (null)*	• An array of capabilities for this network device function. ◦ This property shall contain an array of capabilities for this network device function. *For the possible property values, see NetDevFuncCapabilities in Property details.*

Property	Type	Attributes	Notes
NetDevFuncType	string (enum)	*read-write (null)*	The configured capability of this network device function. • This property shall contain the configured capability of this network device function. *For the possible property values, see NetDevFuncType in Property details.*
PhysicalNetworkPortAssignment *(v1.5+, deprecated v1.8* {	object		The physical port to which this network device function is currently assigned. • This property shall contain a link to a resource of type Port that is the physical port to which this network device function is currently assigned. This value shall be one of the AssignablePhysicalNetworkPorts array members. See the *Port* schema for details on this property. *Deprecated in v1.8 and later. This property has been deprecated in favor of PhysicalNetworkPortAssignment within Links to avoid loops on expand.*
@odata.id	string	*read-only*	Link to a Port resource. See the Links section and the *Port* schema for details.
}			
PhysicalPortAssignment *(deprecated v1.3)* {	object		The physical port to which this network device function is currently assigned. • This property shall contain a link to a resource of type NetworkPort that is the physical port to which this network device function is currently assigned. This value shall be one of the AssignablePhysicalPorts array members. See the *NetworkPort* schema for details on this property. *Deprecated in v1.3 and later. This property has been deprecated and moved to the Links property to avoid loops on expand.*
@odata.id	string	*read-only*	Link to a NetworkPort resource. See the Links section and the *NetworkPort* schema for details.
}			
SAVIEnabled *(v1.7+)*	boolean	*read-write (null)*	Indicates if Source Address Validation Improvement (SAVI) is enabled for this network device function. • This property shall indicate if the RFC7039-defined Source Address Validation Improvement (SAVI) is enabled for this network device function.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
VirtualFunctionsEnabled	boolean	*read-only (null)*	An indication of whether single root input/output virtualization (SR-IOV) virtual functions are enabled for this network device function. • This property shall indicate whether single root input/output virtualization (SR-IOV) virtual functions are enabled for this network device function.

6.69.4 Property details

6.69.4.1 AuthenticationMethod:

The iSCSI boot authentication method for this network device function.

- This property shall contain the iSCSI boot authentication method for this network device function.

string	Description
CHAP	iSCSI Challenge Handshake Authentication Protocol (CHAP) authentication is used.
MutualCHAP	iSCSI Mutual Challenge Handshake Authentication Protocol (CHAP) authentication is used.
None	No iSCSI authentication is used.

6.69.4.2 BootMode:

The boot mode configured for this network device function.

- This property shall contain the boot mode configured for this network device function. If the value is not `Disabled`, this network device function shall be configured for boot by using the specified technology.

string	Description
Disabled	Do not indicate to UEFI/BIOS that this device is bootable.

string	Description
FibreChannel	Boot this device by using the embedded Fibre Channel support and configuration. Only applicable if the NetDevFuncType is `FibreChannel`.
FibreChannelOverEthernet	Boot this device by using the embedded Fibre Channel over Ethernet (FCoE) boot support and configuration. Only applicable if the NetDevFuncType is `FibreChannelOverEthernet`.
HTTP *(v1.9+)*	Boot this device by using the embedded HTTP/HTTPS support. Only applicable if the NetDevFuncType is `Ethernet`.
iSCSI	Boot this device by using the embedded iSCSI boot support and configuration. Only applicable if the NetDevFuncType is `iSCSI` or `Ethernet`.
PXE	Boot this device by using the embedded PXE support. Only applicable if the NetDevFuncType is `Ethernet` or `InfiniBand`.

6.69.4.3 Direction:

Indicates the direction of the data to which this limit applies.

- This property shall indicate the direction of the data to which this limit applies for this network device function.

string	Description
Egress	Indicates that this limit is enforced on packets and bytes transmitted by the network device function.
Ingress	Indicates that this limit is enforced on packets and bytes received by the network device function.
None	Indicates that this limit not enforced.

6.69.4.4 IPAddressType:

The type of IP address being populated in the iSCSIBoot IP address fields.

- This property shall contain the type of IP address being populated in the iSCSIBoot IP address fields. Mixing IPv6 and IPv4 addresses on the same network device function shall not be permissible.

string	Description
IPv4	IPv4 addressing is used for all IP-fields in this object.
IPv6	IPv6 addressing is used for all IP-fields in this object.

6.69.4.5 NetDevFuncCapabilities:

- An array of capabilities for this network device function.
  - This property shall contain an array of capabilities for this network device function.

string	Description
Disabled	Neither enumerated nor visible to the operating system.
Ethernet	Appears to the operating system as an Ethernet device.
FibreChannel	Appears to the operating system as a Fibre Channel device.
FibreChannelOverEthernet	Appears to the operating system as an FCoE device.
InfiniBand	Appears to the operating system as an InfiniBand device.
iSCSI	Appears to the operating system as an iSCSI device.

6.69.4.6 NetDevFuncType:

The configured capability of this network device function.

- This property shall contain the configured capability of this network device function.

string	Description
Disabled	Neither enumerated nor visible to the operating system.
Ethernet	Appears to the operating system as an Ethernet device.
FibreChannel	Appears to the operating system as a Fibre Channel device.
FibreChannelOverEthernet	Appears to the operating system as an FCoE device.
InfiniBand *(v1.5+)*	Appears to the operating system as an InfiniBand device.
iSCSI	Appears to the operating system as an iSCSI device.

6.69.4.7 WWNSource:

The configuration source of the World Wide Names (WWN) for this World Wide Node Name (WWNN) and World Wide Port Name (WWPN) connection.

- This property shall contain the configuration source of the World Wide Name (WWN) for this World Wide Node

Name (WWNN) and World Wide Port Name (WWPN) connection.

string	Description
ConfiguredLocally	The set of FC/FCoE boot targets was applied locally through API or UI.
ProvidedByFabric	The set of FC/FCoE boot targets was applied by the Fibre Channel fabric.

6.69.5 Example response


```
{
    "@odata.type": "#NetworkDeviceFunction.v1_9_0.NetworkDeviceFunction",
    "Id": "111111111100",
    "Name": "Network Device Function View",
    "NetDevFuncType": "Ethernet",
    "DeviceEnabled": true,
    "NetDevFuncCapabilities": [
        "Ethernet",
        "FibreChannel"
    ],
    "Ethernet": {
        "PermanentMACAddress": "00:0C:29:9A:98:ED",
        "MACAddress": "00:0C:29:9A:98:ED",
        "MTUSize": 1500,
        "VLAN": {
            "VLANEnable": true,
            "VLANId": 101
        }
    },
    "iSCSIBoot": {
        "IPAddressType": "IPv4",
        "InitiatorIPAddress": "16.0.11.6",
        "InitiatorName": "iqn.2005-03.com.acme:database-server",
        "InitiatorDefaultGateway": "169.0.16.1",
        "InitiatorNetmask": "255.255.252.0",
        "TargetInfoViaDHCP": false,
        "PrimaryTargetName": "iqn.2005-03.com.acme:image-server",
        "PrimaryTargetIPAddress": "169.0.15.1",
        "PrimaryTargetTCPPort": 3260,
        "PrimaryLUN": 5,
        "PrimaryVLANEnable": true,
        "PrimaryVLANId": 1001,
        "PrimaryDNS": "16.0.10.21",
        "SecondaryTargetName": "iqn.2005-03.com.acme:image-server",
        "SecondaryTargetIPAddress": "16.0.11.5",
        "SecondaryTargetTCPPort": 3260,
        "SecondaryLUN": 5,
        "SecondaryVLANEnable": true,
```

```
        "SecondaryVLANId": 1002,
        "SecondaryDNS": "169.0.10.22",
        "IPMaskDNSViaDHCP": false,
        "RouterAdvertisementEnabled": false,
        "AuthenticationMethod": "CHAP",
        "CHAPUsername": "yosemite",
        "CHAPSecret": "usrpasswd",
        "MutualCHAPUsername": "yosemite",
        "MutualCHAPSecret": "usrpasswd"
    },
    "FibreChannel": {
        "PermanentWWPN": "10:00:B0:5A:DD:BB:74:E0",
        "PermanentWWNN": "10:00:B0:5A:DD:BB:A1:B3",
        "WWPN": "10:00:B0:5A:DD:BB:74:E0",
        "WWNN": "10:00:B0:5A:DD:C4:D3:BB",
        "WWNSource": "ConfiguredLocally",
        "FCoELocalVLANId": 1001,
        "AllowFIPVLANDiscovery": true,
        "FCoEActiveVLANId": 2001,
        "BootTargets": [
            {
                "WWPN": "10:00:B0:5A:DD:BB:74:FA",
                "LUNID": "3",
                "BootPriority": 0
            }
        ]
    },
    "AssignablePhysicalNetworkPorts": [
        {
            "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/Ports/1"
        }
    ],
    "BootMode": "Disabled",
    "VirtualFunctionsEnabled": true,
    "MaxVirtualFunctions": 16,
    "Links": {
        "PCIeFunction": {
            "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC/PCIeFunctions/1"
        },
        "PhysicalNetworkPortAssignment": {
            "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/Ports/1"
        }
    },
    "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkDeviceFunctions/111111111100"
}
```

6.70 NetworkDeviceFunctionMetrics 1.1.0

Version	*v1.1*	*v1.0*
Release	2021.2	2021.1

6.70.1 Description

The NetworkDeviceFunctionMetrics schema contains usage and health statistics for a network function of a network adapter.

- This resource shall represent the network metrics for a single network function of a network adapter in a Redfish implementation.

6.70.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/NetworkDeviceFunctions/*{NetworkDeviceFunctionId}*/Metrics

6.70.3 Properties

Property	Type	Attributes	Notes
Ethernet {	object		The network function metrics specific to Ethernet adapters. • This property shall contain network function metrics specific to Ethernet adapters.
NumOffloadedIPv4Conns	integer	*read-only (null)*	The total number of offloaded TCP/IPv4 connections. • This property shall contain the total number of offloaded TCP/IPv4 connections.
NumOffloadedIPv6Conns	integer	*read-only (null)*	The total number of offloaded TCP/IPv6 connections. • This property shall contain the total number of offloaded TCP/IPv6 connections.
}			

Property	Type	Attributes	Notes
FibreChannel *(v1.1+)* {	object		The network function metrics specific to Fibre Channel adapters. • This property shall contain network function metrics specific to Fibre Channel adapters.
PortLoginAccepts *(v1.1+)*	integer	*read-only (null)*	The total number of port login (PLOGI) accept (ACC) responses. • This property shall contain the total number of PLOGI ACC responses received by this Fibre Channel function.
PortLoginRejects *(v1.1+)*	integer	*read-only (null)*	The total number of port login (PLOGI) reject (RJT) responses. • This property shall contain the total number of PLOGI RJT responses received by this Fibre Channel function.
PortLoginRequests *(v1.1+)*	integer	*read-only (null)*	The total number of port login (PLOGI) requests transmitted. • This property shall contain the total number of PLOGI requests sent by this function.
RXCongestionFPINs *(v1.1+)*	integer	*read-only (null)*	The total number of Congestion Fabric Performance Impact Notifications (FPINs) received. • This property shall contain the total number of Congestion FPINs received by this Fibre Channel function.
RXDeliveryFPINs *(v1.1+)*	integer	*read-only (null)*	The total number of Delivery Fabric Performance Impact Notifications (FPINs) received. • This property shall contain the total number of Delivery FPINs received by this Fibre Channel function.
RXExchanges *(v1.1+)*	integer	*read-only (null)*	The total number of Fibre Channel exchanges received. • This property shall contain the total number of Fibre Channel exchanges received.
RXLinkIntegrityFPINs *(v1.1+)*	integer	*read-only (null)*	The total number of Link Integrity Fabric Performance Impact Notifications (FPINs) received. • This property shall contain the total number of Link Integrity FPINs received by this Fibre Channel function.
RXPeerCongestionFPINs *(v1.1+)*	integer	*read-only (null)*	The total number of Peer Congestion Fabric Performance Impact Notifications (FPINs) received. • This property shall contain the total number of Peer Congestion FPINs received by this Fibre Channel function.

Property	Type	Attributes	Notes
RXSequences *(v1.1+)*	integer	*read-only (null)*	The total number of Fibre Channel sequences received. • This property shall contain the total number of Fibre Channel sequences received.
TXCongestionFPINs *(v1.1+)*	integer	*read-only (null)*	The total number of Congestion Fabric Performance Impact Notifications (FPINs) sent. • This property shall contain the total number of Congestion FPINs sent by this Fibre Channel function.
TXDeliveryFPINs *(v1.1+)*	integer	*read-only (null)*	The total number of Delivery Fabric Performance Impact Notifications (FPINs) sent. • This property shall contain the total number of Delivery FPINs sent by this Fibre Channel function.
TXExchanges *(v1.1+)*	integer	*read-only (null)*	The total number of Fibre Channel exchanges transmitted. • This property shall contain the total number of Fibre Channel exchanges transmitted.
TXLinkIntegrityFPINs *(v1.1+)*	integer	*read-only (null)*	The total number of Link Integrity Fabric Performance Impact Notifications (FPINs) sent. • This property shall contain the total number of Link Integrity FPINs sent by this Fibre Channel function.
TXPeerCongestionFPINs *(v1.1+)*	integer	*read-only (null)*	The total number of Peer Congestion Fabric Performance Impact Notifications (FPINs) sent. • This property shall contain the total number of Peer Congestion FPINs sent by this Fibre Channel function.
TXSequences *(v1.1+)*	integer	*read-only (null)*	The total number of Fibre Channel sequences transmitted. • This property shall contain the total number of Fibre Channel sequences transmitted.
}			
RXAvgQueueDepthPercent	number (%)	*read-only (null)*	The average RX queue depth as the percentage. • This property shall contain the average RX queue depth as the percentage.

Property	Type	Attributes	Notes
RXBytes	integer (bytes)	*read-only (null)*	The total number of bytes received on a network function. • This property shall contain the total number of bytes received on a network function, inclusive of all protocol overhead.
RXFrames	integer	*read-only (null)*	The total number of frames received on a network function. • This property shall contain the total number of frames received on a network function.
RXMulticastFrames	integer	*read-only (null)*	The total number of good multicast frames received on a network function since reset. • This property shall contain the total number of good multicast frames received on a network function since reset, including host and remote management passthrough traffic.
RXQueuesEmpty	boolean	*read-only (null)*	Whether nothing is in a network function's RX queues to DMA. • This property shall indicate whether nothing is in a network function's RX queues to DMA.
RXQueuesFull	integer	*read-only (null)*	The number of RX queues that are full. • This property shall contain the number of RX queues that are full.
RXUnicastFrames	integer	*read-only (null)*	The total number of good unicast frames received on a network function since reset. • This property shall contain the total number of good unicast frames received on a network function since reset.
TXAvgQueueDepthPercent	number (%)	*read-only (null)*	The average TX queue depth as the percentage. • This property shall contain the average TX queue depth as the percentage.
TXBytes	integer (bytes)	*read-only (null)*	The total number of bytes sent on a network function. • This property shall contain the total number of bytes sent on a network function, inclusive of all protocol overhead.
TXFrames	integer	*read-only (null)*	The total number of frames sent on a network function. • This property shall contain the total number of frames sent on a network function.

Property	Type	Attributes	Notes
TXMulticastFrames	integer	*read-only (null)*	The total number of good multicast frames transmitted on a network function since reset. • This property shall contain the total number of good multicast frames transmitted on a network function since reset, including host and remote management passthrough traffic.
TXQueuesEmpty	boolean	*read-only (null)*	Whether all TX queues for a network function are empty. • This property shall indicate whether all TX queues for a network function are empty.
TXQueuesFull	integer	*read-only (null)*	The number of TX queues that are full. • This property shall contain the number of TX queues that are full.
TXUnicastFrames	integer	*read-only (null)*	The total number of good unicast frames transmitted on a network function since reset. • This property shall contain the total number of good unicast frames transmitted on a network function since reset, including host and remote management passthrough traffic.

6.70.4 Example response


```
{
    "@odata.type": "#NetworkDeviceFunctionMetrics.v1_1_0.NetworkDeviceFunctionMetrics",
    "Id": "NetworkDeviceFunctionMetrics",
    "Name": "Network Device Function Metrics",
    "TXAvgQueueDepthPercent": 13.7,
    "RXAvgQueueDepthPercent": 21.2,
    "RXFrames": 27193387,
    "RXBytes": 7754199970,
    "RXUnicastFrames": 26193387,
    "RXMulticastFrames": 1000000,
    "TXFrames": 18205770,
    "TXBytes": 9436506547,
    "TXUnicastFrames": 17205770,
    "TXMulticastFrames": 1000000,
    "TXQueuesEmpty": false,
    "RXQueuesEmpty": false,
    "TXQueuesFull": 0,
    "RXQueuesFull": 0,
    "Ethernet": {
        "NumOffloadedIPv4Conns": 0,
        "NumOffloadedIPv6Conns": 0
```

```
    },
    "@odata.id": "/redfish/v1/Chassis/1U/NetworkAdapters/Slot1/NetworkDeviceFunctions/SC2KP1F0/Metrics"
}
```

6.71 NetworkInterface 1.2.1

Version	*v1.2*	*v1.1*	*v1.0*
Release	2020.3	2017.1	2016.3

6.71.1 Description

The NetworkInterface schema describes links to the network adapters, network ports, and network device functions, and represents the functionality available to the containing system.

- This resource contains links to the network adapters, network ports, and network device functions, and represents the functionality available to the containing system.

6.71.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/NetworkInterfaces/*{NetworkInterfaceId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*
/redfish/v1/Systems/*{ComputerSystemId}*/NetworkInterfaces/*{NetworkInterfaceId}*

6.71.3 Properties

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
NetworkAdapter {	object		The link to the network adapter that contains this network interface. • This property shall contain a link to a resource of type NetworkAdapter that represents the physical container associated with this network interface. See the *NetworkAdapter* schema for details on this property.
@odata.id	string	*read-only*	Link to a NetworkAdapter resource. See the Links section and the *NetworkAdapter* schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
NetworkDeviceFunctions {	object		The link to the network device functions associated with this network interface. • This property shall contain a link to a resource collection of type NetworkDeviceFunctionCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *NetworkDeviceFunction*. See the NetworkDeviceFunction schema for details.
}			
NetworkPorts *(deprecated v1.2)* {	object		The link to the network ports associated with this network interface. • This property shall contain a link to a resource collection of type NetworkPortCollection. Contains a link to a resource. *Deprecated in v1.2 and later. This property has been deprecated in favor of the Ports property.*
@odata.id	string	*read-only*	Link to Collection of *NetworkPort*. See the NetworkPort schema for details.
}			
Ports *(v1.2+)* {	object		The link to the ports associated with this network interface. • This property shall contain a link to a resource collection of type PortCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.71.4 Example response

```
{
    "@odata.type": "#NetworkInterface.v1_2_1.NetworkInterface",
    "Id": "9fa725a1",
    "Name": "Network Device View",
    "NetworkPorts": {
        "@odata.id": "/redfish/v1/Systems/1/NetworkInterfaces/9fd725a1/NetworkPorts"
    },
    "NetworkDeviceFunctions": {
        "@odata.id": "/redfish/v1/Systems/1/NetworkInterfaces/9fd725a1/NetworkDeviceFunctions"
    },
    "Links": {
        "NetworkAdapter": {
            "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1"
        }
    },
    "@odata.id": "/redfish/v1/Systems/1/NetworkInterfaces/9fd725a1"
}
```

6.72 NetworkPort 1.4.1 (deprecated)

Version	*v1.4 Deprecated*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.4	2020.3	2018.2	2017.1	2016.3

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of the Port schema.

6.72.1 Description

The NetworkPort schema describes a network port, which is a discrete physical port that can connect to a network.

- This resource shall represent a discrete physical port that can connect to a network in a Redfish implementation.

6.72.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/NetworkPorts/*{NetworkPortId}*

6.72.3 Properties

Property	Type	Attributes	Notes
ActiveLinkTechnology	string (enum)	*read-write (null)*	Network port active link technology. • This property shall contain the configured link technology of this port. *For the possible property values, see ActiveLinkTechnology in Property details.*
AssociatedNetworkAddresses [ ]	array (string, null)	*read-only*	An array of configured MAC or WWN network addresses that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. • This property shall contain an array of configured network addresses that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses.
CurrentLinkSpeedMbps *(v1.2+)*	integer (Mbit/s)	*read-write (null)*	Network port current link speed. • This property shall contain the current configured link speed of this port.
EEEEnabled	boolean	*read-write (null)*	An indication of whether IEEE 802.3az Energy-Efficient Ethernet (EEE) is enabled for this network port. • This property shall indicate whether IEEE 802.3az Energy-Efficient Ethernet (EEE) is enabled for this network port.
FCFabricName *(v1.2+)*	string	*read-only (null)*	The FC Fabric Name provided by the switch. • This property shall indicate the FC Fabric Name provided by the switch.
FCPortConnectionType *(v1.2+)*	string (enum)	*read-only (null)*	The connection type of this port. • This property shall contain the connection type for this port. *For the possible property values, see FCPortConnectionType in Property details.*

Property	Type	Attributes	Notes
FlowControlConfiguration	string (enum)	*read-write (null)*	The locally configured 802.3x flow control setting for this network port. • This property shall contain the locally configured 802.3x flow control setting for this network port. *For the possible property values, see FlowControlConfiguration in Property details.*
FlowControlStatus	string (enum)	*read-only (null)*	The 802.3x flow control behavior negotiated with the link partner for this network port (Ethernet-only). • This property shall contain the 802.3x flow control behavior negotiated with the link partner for this network port (Ethernet-only). *For the possible property values, see FlowControlStatus in Property details.*
LinkStatus	string (enum)	*read-only (null)*	The status of the link between this port and its link partner. • This property shall contain the link status between this port and its link partner. *For the possible property values, see LinkStatus in Property details.*
MaxFrameSize *(v1.2+)*	integer (bytes)	*read-only (null)*	The maximum frame size supported by the port. • This property shall contain the maximum frame size supported by the port.
NetDevFuncMaxBWAlloc [{	array		An array of maximum bandwidth allocation percentages for the network device functions associated with this port. • This property shall contain an array of maximum bandwidth allocation percentages for the network device functions associated with this port.
MaxBWAllocPercent	integer (%)	*read-write (null)*	The maximum bandwidth allocation percentage allocated to the corresponding network device function instance. • This property shall contain the maximum bandwidth percentage allocation for the associated network device function.
NetworkDeviceFunction {	object		The link to the network device function associated with this bandwidth setting of this network port. • This property shall contain a link to a resource of type NetworkDeviceFunction that represents the network device function associated with this bandwidth setting of this network port. See the *NetworkDeviceFunction* schema for details on this property.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}			

Property	Type	Attributes	Notes
}]			
NetDevFuncMinBWAlloc [{	array		An array of minimum bandwidth allocation percentages for the network device functions associated with this port. • This property shall contain an array of minimum bandwidth percentage allocations for each of the network device functions associated with this port.
MinBWAllocPercent	integer (%)	*read-write (null)*	The minimum bandwidth allocation percentage allocated to the corresponding network device function instance. • This property shall contain the minimum bandwidth percentage allocation for the associated network device function. The sum total of all minimum percentages shall not exceed 100.
NetworkDeviceFunction {	object		The link to the network device function associated with this bandwidth setting of this network port. • This property shall contain a link to a resource of type NetworkDeviceFunction that represents the network device function associated with this bandwidth setting of this network port. See the *NetworkDeviceFunction* schema for details on this property.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}			
}]			
NumberDiscoveredRemotePorts *(v1.2+)*	integer	*read-only (null)*	The number of ports not on this adapter that this port has discovered. • This property shall contain the number of ports not on this adapter that this port has discovered.
PhysicalPortNumber	string	*read-only (null)*	The physical port number label for this port. • This property shall contain the physical port number on the network adapter hardware that this network port corresponds to. This value should match a value visible on the hardware.
PortMaximumMTU	integer	*read-only (null)*	The largest maximum transmission unit (MTU) that can be configured for this network port. • This property shall contain the largest maximum transmission unit (MTU) that can be configured for this network port.

Property	Type	Attributes	Notes
SignalDetected	boolean	*read-only (null)*	An indication of whether the port has detected enough signal on enough lanes to establish a link. • This property shall indicate whether the port has detected enough signal on enough lanes to establish a link.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedEthernetCapabilities [ ]	array (string (enum))	*read-only (null)*	• The set of Ethernet capabilities that this port supports. ◦ This property shall contain an array of zero or more Ethernet capabilities supported by this port. *For the possible property values, see SupportedEthernetCapabilities in Property details.*
SupportedLinkCapabilities [{	array		The link capabilities of this port. • This property shall describe the static capabilities of the port, irrespective of transient conditions such as cabling, interface module presence, or remote link partner status or configuration.
AutoSpeedNegotiation *(v1.2+)*	boolean	*read-only (null)*	An indication of whether the port is capable of autonegotiating speed. • This property shall indicate whether the port is capable of autonegotiating speed.
CapableLinkSpeedMbps *(v1.2+)* [ ]	array (integer, null)	*read-only*	The set of link speed capabilities of this port. • This property shall contain all of the possible network link speed capabilities of this port.
LinkNetworkTechnology	string (enum)	*read-only (null)*	The link network technology capabilities of this port. • This property shall contain a network technology capability of this port. *For the possible property values, see LinkNetworkTechnology in Property details.*
LinkSpeedMbps *(deprecated v1.2)*	integer (Mbit/s)	*read-only (null)*	The speed of the link in Mbit/s when this link network technology is active. • This property shall contain the speed of the link in megabits per second (Mbit/s) for this port when this link network technology is active. *Deprecated in v1.2 and later. This property has been deprecated in favor of the CapableLinkSpeedMbps.*

Property	Type	Attributes	Notes
}]			
VendorId *(v1.2+)*	string	*read-only (null)*	The vendor Identification for this port. • This property shall indicate the vendor identification string information as provided by the manufacturer of this port.
WakeOnLANEnabled	boolean	*read-write (null)*	An indication of whether Wake on LAN (WoL) is enabled for this network port. • This property shall indicate whether Wake on LAN (WoL) is enabled for this network port.

6.72.4 Property details

6.72.4.1 ActiveLinkTechnology:

Network port active link technology.

- This property shall contain the configured link technology of this port.

string	Description
Ethernet	The port is capable of connecting to an Ethernet network.
FibreChannel	The port is capable of connecting to a Fibre Channel network.
InfiniBand	The port is capable of connecting to an InfiniBand network.

6.72.4.2 FCPortConnectionType:

The connection type of this port.

- This property shall contain the connection type for this port.

string	Description
ExtenderFabric	This port connection type is an extender fabric port.
Generic	This port connection type is a generic fabric port.
NotConnected	This port is not connected.

string	Description
NPort	This port connects through an N-port to a switch.
PointToPoint	This port connects in a point-to-point configuration.
PrivateLoop	This port connects in a private loop configuration.
PublicLoop	This port connects in a public configuration.

6.72.4.3 FlowControlConfiguration:

The locally configured 802.3x flow control setting for this network port.

- This property shall contain the locally configured 802.3x flow control setting for this network port.

string	Description
None	No IEEE 802.3x flow control is enabled on this port.
RX	The link partner can initiate IEEE 802.3x flow control.
TX	This station can initiate IEEE 802.3x flow control.
TX_RX	This station or the link partner can initiate IEEE 802.3x flow control.

6.72.4.4 FlowControlStatus:

The 802.3x flow control behavior negotiated with the link partner for this network port (Ethernet-only).

- This property shall contain the 802.3x flow control behavior negotiated with the link partner for this network port (Ethernet-only).

string	Description
None	No IEEE 802.3x flow control is enabled on this port.
RX	The link partner can initiate IEEE 802.3x flow control.
TX	This station can initiate IEEE 802.3x flow control.
TX_RX	This station or the link partner can initiate IEEE 802.3x flow control.

6.72.4.5 LinkNetworkTechnology:

The link network technology capabilities of this port.

- This property shall contain a network technology capability of this port.

string	Description
Ethernet	The port is capable of connecting to an Ethernet network.
FibreChannel	The port is capable of connecting to a Fibre Channel network.
InfiniBand	The port is capable of connecting to an InfiniBand network.

6.72.4.6 LinkStatus:

The status of the link between this port and its link partner.

- This property shall contain the link status between this port and its link partner.

string	Description
Down	The port is enabled but link is down.
Starting *(v1.3+)*	This link on this interface is starting. A physical link has been established, but the port is not able to transfer data.
Training *(v1.3+)*	This physical link on this interface is training.
Up	The port is enabled and link is good (up).

6.72.4.7 SupportedEthernetCapabilities:

- The set of Ethernet capabilities that this port supports.
  - This property shall contain an array of zero or more Ethernet capabilities supported by this port.

string	Description
EEE	IEEE 802.3az Energy-Efficient Ethernet (EEE) is supported on this port.
WakeOnLAN	Wake on LAN (WoL) is supported on this port.

6.72.5 Example response


```
{
    "@odata.type": "#NetworkPort.v1_4_1.NetworkPort",
    "Id": "1",
    "Name": "Network Port View",
    "PhysicalPortNumber": "1",
    "LinkStatus": "Up",
    "SupportedLinkCapabilities": [
        {
            "AutoSpeedNegotiation": true,
            "LinkNetworkTechnology": "Ethernet",
            "CapableLinkSpeedMbps": [
                10,
                100,
                10000
            ]
        }
    ],
    "ActiveLinkTechnology": "Ethernet",
    "SupportedEthernetCapabilities": [
        "WakeOnLAN",
        "EEE"
    ],
    "NetDevFuncMinBWAlloc": [
        {
            "NetworkDeviceFunction": {
                "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkDeviceFunctions/111111111100"
            },
            "MinBWAllocPercent": 25
        }
    ],
    "NetDevFuncMaxBWAlloc": [
        {
            "NetworkDeviceFunction": {
                "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkDeviceFunctions/111111111100"
            },
            "MaxBWAllocPercent": 100
        }
    ],
    "AssociatedNetworkAddresses": [
        "00:0C:29:9A:98:ED",
        "00:0C:29:9A:98:EF"
    ],
    "EEEEnabled": true,
    "WakeOnLANEnabled": true,
    "PortMaximumMTU": 1500,
    "FlowControlStatus": "None",
    "FlowControlConfiguration": "None",
```

```
    "SignalDetected": true,
    "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/9fd725a1/NetworkPorts/1"
}
```


6.73 OperatingConfig 1.0.2

Version	*v1.0*
Release	2020.2

6.73.1 Description

The OperatingConfig schema specifies a configuration that can be used when the processor is operational.

- This resource shall represent an operational configuration for a processor in the Redfish Specification.

6.73.2 URIs

/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/OperatingConfigs/*{OperatingConfigId}*

6.73.3 Properties

Property	Type	Attributes	Notes
BaseSpeedMHz	integer (MHz)	*read-only (null)*	The base (nominal) clock speed of the processor in MHz. • This property shall contain the base (nominal) clock speed of the processor in MHz.
BaseSpeedPrioritySettings [{	array		The clock speed for sets of cores when the configuration is operational. • This property shall contain an array of objects that specify the clock speed for sets of cores when the configuration is operational.
BaseSpeedMHz	integer (MHz)	*read-only (null)*	The clock speed to configure the set of cores in MHz. • This property shall contain the clock speed to configure the set of cores in MHz.

Property	Type	Attributes	Notes
CoreCount	integer	*read-only (null)*	The number of cores to configure with a specified speed. • This property shall contain the number of cores to configure with the speed specified by the BaseSpeedMHz property. The sum of all CoreCount properties shall equal the value of the TotalAvailableCoreCount property.
CoreIDs [ ]	array (integer, null)	*read-only*	The identifier of the cores to configure with the specified speed. • This property shall contain an array identifying the cores to configure with the speed specified by the BaseSpeedMHz property. The length of the array shall equal the value of the CoreCount property.
}]			
MaxJunctionTemperatureCelsius	integer (Celsius)	*read-only (null)*	The maximum temperature of the junction in degrees Celsius. • This property shall contain the maximum temperature of the junction in degrees Celsius.
MaxSpeedMHz	integer (MHz)	*read-only (null)*	The maximum clock speed to which the processor can be configured in MHz. • This property shall contain the maximum clock speed to which the processor can be configured in MHz.
TDPWatts	integer (Watts)	*read-only (null)*	The thermal design point of the processor in watts. • This property shall contain the thermal design point of the processor in watts.
TotalAvailableCoreCount	integer	*read-only (null)*	The number of cores in the processor that can be configured. • This property shall contain the number of cores in the processor that can be configured.
TurboProfile [{	array		The turbo profiles for the processor. A turbo profile is the maximum turbo clock speed as a function of the number of active cores. • The property shall contain an array of objects that specify the turbo profile for a set of active cores.
ActiveCoreCount	integer	*read-only (null)*	The number of active cores to be configured with the specified maximum clock speed. • This property shall contain the number of cores to be configured with the maximum turbo clock speed. The value shall be less than or equal the TotalAvailableCoreCount property.

Property	Type	Attributes	Notes
MaxSpeedMHz	integer (MHz)	*read-only (null)*	The maximum turbo clock speed that correspond to the number of active cores in MHz. • This property shall contain the maximum turbo clock speed that correspond to the number of active cores in MHz.
}]			

6.73.4 Example response


```
{
    "@odata.type": "#OperatingConfig.v1_0_2.OperatingConfig",
    "Id": "0",
    "Name": "Processor Profile",
    "TotalAvailableCoreCount": 28,
    "TDPWatts": 150,
    "BaseSpeedMHz": 2500,
    "MaxSpeedMHz": 4100,
    "MaxJunctionTemperatureCelsius": 90,
    "TurboProfile": [
        {
            "ActiveCoreCount": 2,
            "MaxSpeedMHz": 4100
        },
        {
            "ActiveCoreCount": 4,
            "MaxSpeedMHz": 4000
        },
        {
            "ActiveCoreCount": 8,
            "MaxSpeedMHz": 3800
        },
        {
            "ActiveCoreCount": 28,
            "MaxSpeedMHz": 3200
        }
    ],
    "BaseSpeedPrioritySettings": [
        {
            "CoreCount": 8,
            "CoreIDs": [
                0,
                2,
                3,
                4,
                5,
```

```
                6,
                7,
                8
            ],
            "BaseSpeedMHz": 2900
        },
        {
            "CoreCount": 20,
            "BaseSpeedMHz": 2200
        }
    ],
    "@odata.id": "/redfish/v1/Systems/operating-config-example/Processors/CPU1/OperatingConfigs/0"
}
```


6.74 Outlet 1.4.0

Version	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2021.4	2021.3	2021.2	2020.3	2019.4

6.74.1 Description

The Outlet schema contains definition for an electrical outlet.

- This resource shall be used to represent an electrical outlet for a Redfish implementation.

6.74.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Outlets/*{OutletId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Outlets/*{OutletId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Outlets/*{OutletId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Outlets/*{OutletId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Outlets/*{OutletId}*

6.74.3 Properties

Property	Type	Attributes	Notes
ConfigurationLocked *(v1.4+)*	boolean	*read-write*	Indicates whether the configuration is locked. • This property shall indicate whether modification requests to this resource are not permitted. If `true`, services shall reject modification requests to other properties in this resource.
CurrentAmps {}	object		The current (A) for this single phase outlet. • This property shall contain the current, in ampere units, for this single phase outlet. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This property shall not appear in resource instances representing poly-phase outlets. For more information about this property, see SensorCurrentExcerpt in Property Details.
ElectricalConsumerNames *(v1.3+)* [ ]	array (string, null)	*read-write*	An array of names of downstream devices that are powered by this outlet. • This property shall contain an array of user-assigned identifying strings that describe downstream devices that are powered by this outlet.
ElectricalContext	string (enum)	*read-only (null)*	The combination of current-carrying conductors. • This property shall contain the combination of current-carrying conductors that distribute power. *For the possible property values, see ElectricalContext in Property details.*
EnergykWh {	object (excerpt)		The energy (kWh) for this outlet. • This property shall contain the total energy, in kilowatt-hour units, for this outlet, that represents the `Total` ElectricalContext sensor when multiple energy sensors exist for this outlet. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentkVAh *(v1.5+)*	number (kV.A.h)	*read-only (null)*	Apparent energy (kVAh). • This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading *(v1.1+)*	number	*read-only (null)*	The total accumulation value for this sensor. • This property shall contain the total accumulation of the Reading property over the sensor's life time. This value shall not be reset by the ResetMetrics action.
ReactivekVARh *(v1.5+)*	number (kV.A.h)	*read-only (null)*	Reactive energy (kVARh). • This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
SensorResetTime	string (date-time)	*read-only (null)*	The date and time when the time-based properties were last reset. • This property shall contain the date and time when the ResetMetrics action was last performed or the service last reset the time-based property values.
}			
FrequencyHz {	object (excerpt)		The frequency (Hz) for this outlet. • This property shall contain the frequency, in hertz units, for this outlet. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Frequency`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}			

Property	Type	Attributes	Notes
IndicatorLED *(deprecated v1.1)*	string (enum)	*read-write (null)*	The state of the indicator LED, which identifies the outlet. • This property shall contain the indicator light state for the indicator light associated with this outlet. *For the possible property values, see IndicatorLED in Property details. Deprecated in v1.1 and later. This property has been deprecated in favor of the LocationIndicatorActive property.*
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
BranchCircuit {	object	*(null)*	A reference to the branch circuit related to this outlet. • This property shall contain a link to a resource of type Circuit that represent the branch circuit associated with this outlet. See the *Circuit* schema for details on this property.
@odata.id	string	*read-only*	Link to a Circuit resource. See the Links section and the *Circuit* schema for details.
}			
Chassis *(v1.3+)* [{	array		Any array of links to chassis connected to this outlet. • This property shall contain an array of links to resources of type Chassis that represent the chassis connected to this outlet.
@odata.id	string	*read-write*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			
DistributionCircuits *(v1.3+)* [{	array		An array of links to mains or input circuits powered by this outlet. • This property shall contain an array of links to resources of type Circuit that represent the circuits powered by this outlet. This property is used to show a connection to an input circuit downstream in a power distribution chain.
@odata.id	string	*read-write*	Link to a Circuit resource. See the Links section and the *Circuit* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PowerSupplies *(v1.3+)* [{	array		An array of links to the power supplies connected to this outlet. • This property shall contain an array of links to resources of type PowerSupply that represent the power supplies connected to this outlet.
@odata.id	string	*read-write*	Link to a PowerSupply resource. See the Links section and the *PowerSupply* schema for details.
}]			
}			
LocationIndicatorActive *(v1.1+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
NominalVoltage	string (enum)	*read-only (null)*	The nominal voltage for this outlet. • This property shall contain the nominal voltage for this outlet, in Volts. *For the possible property values, see NominalVoltage in Property details.*
OutletType	string (enum)	*read-only (null)*	The type of receptacle according to NEMA, IEC, or regional standards. • This property shall contain the type of physical receptacle used for this outlet, as defined by IEC, NEMA, or regional standard. *For the possible property values, see OutletType in Property details.*
PhaseWiringType	string (enum)	*read-only (null)*	The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires). • This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires). *For the possible property values, see PhaseWiringType in Property details.*
PolyPhaseCurrentAmps {	object	*(null)*	The current readings for this outlet. • This property shall contain the current readings for this outlet. For single phase outlets this property shall contain a duplicate copy of the current sensor referenced in the CurrentAmps property, if present. For poly-phase outlets this property should contain multiple current sensor readings used to fully describe the outlet.

Property	Type	Attributes	Notes
Line1 {}	object		Line 1 current (A). • This property shall contain the line current, in ampere units, for L1. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This property shall not be present if the equipment does not include an L1 measurement. For more information about this property, see SensorCurrentExcerpt in Property Details.
Line2 {}	object		Line 2 current (A). • This property shall contain the line current, in ampere units, for L2. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This property shall not be present if the equipment does not include an L2 measurement. For more information about this property, see SensorCurrentExcerpt in Property Details.
Line3 {}	object		Line 3 current (A). • This property shall contain the line current, in ampere units, for L3. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This property shall not be present if the equipment does not include an L3 measurement. For more information about this property, see SensorCurrentExcerpt in Property Details.
Neutral {}	object		Neutral line current (A). • This property shall contain the line current, in ampere units, for the Neutral line. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This property shall not be present if the equipment does not include a Neutral line measurement. For more information about this property, see SensorCurrentExcerpt in Property Details.
}			
PolyPhaseVoltage {	object	*(null)*	The voltage readings for this outlet. • This property shall contain the voltage readings for this outlet. For single phase outlets this property shall contain a duplicate copy of the voltage sensor referenced in the Voltage property, if present. For poly-phase outlets this property should contain multiple voltage sensor readings used to fully describe the outlet.

Property	Type	Attributes	Notes
Line1ToLine2 {}	object		The Line 1 to Line 2 voltage (V) for this outlet. • This property shall contain the line-to-line voltage, in volt units, between L1 and L2. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L1-L2 measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.
Line1ToNeutral {}	object		The Line 1 to Neutral voltage (V) for this outlet. • This property shall contain the line-to-line voltage, in volt units, between L1 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L1-Neutral measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.
Line2ToLine3 {}	object		The Line 2 to Line 3 voltage (V) for this outlet. • This property shall contain the line-to-line voltage, in volt units, between L2 and L3. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L2-L3 measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.
Line2ToNeutral {}	object		The Line 2 to Neutral voltage (V) for this outlet. • This property shall contain the line-to-line voltage, in volt units, between L2 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L2-Neutral measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.
Line3ToLine1 {}	object		The Line 3 to Line 1 voltage (V) for this outlet. • This property shall contain the line-to-line voltage, in volt units, between L3 and L1. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L3-L1 measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.

Property	Type	Attributes	Notes
Line3ToNeutral {}	object		The Line 3 to Neutral voltage (V) for this outlet. • This property shall contain the line-to-line voltage, in volt units, between L3 and Neutral. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not be present if the equipment does not include an L3-Neutral measurement. For more information about this property, see SensorVoltageExcerpt in Property Details.
}			
PowerControlLocked *(v1.4+)*	boolean	*read-write*	Indicates whether power control requests are locked. • This property shall indicate whether requests to the PowerControl action are locked. If `true`, services shall reject requests to the PowerControl action.
PowerCycleDelaySeconds	number	*read-write* *(null)*	The number of seconds to delay power on after a PowerControl action to cycle power. Zero seconds indicates no delay. • This property shall contain the number of seconds to delay power on after a PowerControl action to cycle power. The value `0` shall indicate no delay to power on.
PowerEnabled	boolean	*read-only* *(null)*	Indicates if the outlet can be powered. • This property shall indicate the power enable state of the outlet. The value `true` shall indicate that the outlet can be powered on, and `false` shall indicate that the outlet cannot be powered.
PowerLoadPercent *(v1.2+)* {	object (excerpt)		The power load (percent) for this outlet. • This property shall contain the power load, in percent units, for this outlet, that represents the `Total` ElectricalContext for this outlet. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Percent`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only* *(null)*	The sensor value. • This property shall contain the sensor value.

Property	Type	Attributes	Notes
}			
PowerOffDelaySeconds	number	*read-write (null)*	The number of seconds to delay power off after a PowerControl action. Zero seconds indicates no delay to power off. • This property shall contain the number of seconds to delay power off after a PowerControl action. The value `0` shall indicate no delay to power off.
PowerOnDelaySeconds	number	*read-write (null)*	The number of seconds to delay power up after a power cycle or a PowerControl action. Zero seconds indicates no delay to power up. • This property shall contain the number of seconds to delay power up after a power cycle or a PowerControl action. The value `0` shall indicate no delay to power up.
PowerRestoreDelaySeconds	number	*read-write (null)*	The number of seconds to delay power on after power has been restored. Zero seconds indicates no delay. • This property shall contain the number of seconds to delay power on after a power fault. The value `0` shall indicate no delay to power on.
PowerRestorePolicy	string (enum)	*read-write*	The desired power state of the outlet when power is restored after a power loss. • This property shall contain the desired PowerState of the outlet when power is applied. The value `LastState` shall return the outlet to the PowerState it was in when power was lost. *For the possible property values, see PowerRestorePolicy in Property details.*
PowerState	string (enum)	*read-only (null)*	The power state of the outlet. • This property shall contain the power state of the outlet. *For the possible property values, see PowerState in Property details.*
PowerStateInTransition *(v1.4+)*	boolean	*read-only*	Indicates whether the power state is undergoing a delayed transition. • This property shall indicate whether the PowerState property will undergo a transition between on and off states due to a configured delay. The transition may be due to the configuration of the power on, off, or restore delay properties. If `true`, the PowerState property will transition at the conclusion of a configured delay.

Property	Type	Attributes	Notes
PowerWatts {	object (excerpt)		The power (W) for this outlet. • This property shall contain the total power, in watt units, for this outlet, that represents the `Total` ElectricalContext sensor when multiple power sensors exist for this outlet. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentVA	number (V.A)	*read-only (null)*	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees *(v1.5+)*	number	*read-only (null)*	The phase angle (degrees) between the current and voltage waveforms. • This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a ReadingType containing `Power`, and shall not appear in sensors with other ReadingType values.
PowerFactor	number	*read-only (null)*	The power factor for this sensor. • This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. PowerFactor is expressed in unit-less 1/100ths. This property can appear in sensors containing a ReadingType value of `Power`, and shall not appear in sensors of other ReadingType values.
ReactiveVAR	number (V.A)	*read-only (null)*	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. • This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.

Property	Type	Attributes	Notes
}			
RatedCurrentAmps	number (A)	*read-only (null)*	The rated maximum current allowed for this outlet. • This property shall contain the rated maximum current for this outlet, in ampere units, after any required de-rating, due to safety agency or other regulatory requirements, has been applied.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
UserLabel *(v1.3+)*	string	*read-write*	A user-assigned label. • This property shall contain a user-assigned label used to identify this resource. If a value has not been assigned by a user, the value of this property shall be an empty string.
Voltage {}	object		The voltage (V) for this single phase outlet. • This property shall contain the voltage, in volt units, for this single phase outlet. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This property shall not appear in resource instances representing poly-phase outlets. For more information about this property, see SensorVoltageExcerpt in Property Details.
VoltageType	string (enum)	*read-only (null)*	The type of voltage applied to the outlet. • This property shall contain the type of voltage applied to the outlet. *For the possible property values, see VoltageType in Property details.*

6.74.4 Actions

6.74.4.1 PowerControl

Description

This action turns the outlet on or off.

- This action shall control the power state of the outlet.

Action URI: {Base URI of target resource}/Actions/Outlet.PowerControl

Action parameters

Parameter Name	Type	Attributes	Notes
PowerState	string (enum)	*optional*	The desired power state of the outlet. • This parameter shall contain the desired power state of the outlet. *For the possible property values, see PowerState in Property details.*

Request Example

```
{
    "ResetType": "Off"
}
```

6.74.4.2 ResetMetrics

Description

This action resets metrics related to this outlet.

- This action shall reset any time intervals or counted values for this outlet.

Action URI: {Base URI of target resource}/Actions/Outlet.ResetMetrics

Action parameters

This action takes no parameters.

6.74.5 Property details

6.74.5.1 ElectricalContext:

The combination of current-carrying conductors.

- This property shall contain the combination of current-carrying conductors that distribute power.

string	Description
Line1	The circuits that share the L1 current-carrying conductor. • This value shall represent a circuit that shares the L1 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToLine2	The circuit formed by L1 and L2 current-carrying conductors. • This value shall represent a circuit formed by L1 and L2 current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToNeutral	The circuit formed by L1 and neutral current-carrying conductors. • This value shall represent a circuit formed by L1 and neutral current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToNeutralAndL1L2	The circuit formed by L1, L2, and neutral current-carrying conductors. • This value shall represent circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase/ 4-Wire or Three-phase / 5-Wire.
Line2	The circuits that share the L2 current-carrying conductor. • This value shall represent a circuit that shares the L2 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 4-Wire or 5-Wire.
Line2ToLine3	The circuit formed by L2 and L3 current-carrying conductors. • This value shall represent a circuit formed by L2 and L3 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line2ToNeutral	The circuit formed by L2 and neutral current-carrying conductors. • This value shall represent a circuit formed by L2 and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL1L2	The circuit formed by L1, L2, and Neutral current-carrying conductors. • This value shall represent a circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase/ 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL2L3	The circuits formed by L2, L3, and neutral current-carrying conductors. • This value shall represent a circuit formed by L2, L3, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.

string	Description
Line3	The circuits that share the L3 current-carrying conductor. • This value shall represent a circuit that shares the L3 current-carrying conductor, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line3ToLine1	The circuit formed by L3 and L1 current-carrying conductors. • This value shall represent a circuit formed by L3 and L1 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line3ToNeutral	The circuit formed by L3 and neutral current-carrying conductors. • This value shall represent a circuit formed by L3 and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
Line3ToNeutralAndL3L1	The circuit formed by L3, L1, and neutral current-carrying conductors. • This value shall represent a circuit formed by L3, L1, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
LineToLine	The circuit formed by two current-carrying conductors. • This value shall represent a circuit formed by two current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
LineToNeutral	The circuit formed by a line and neutral current-carrying conductor. • This value shall represent a circuit formed by a line and neutral current-carrying conductor, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Neutral	The grounded current-carrying return circuit of current-carrying conductors. • This value shall represent the grounded current-carrying return circuit of current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 5-Wire.
Total	The circuit formed by all current-carrying conductors. • This value shall represent the circuits formed by all current-carrying conductors for any phase wiring type.

6.74.5.2 IndicatorLED:

The state of the indicator LED, which identifies the outlet.

- This property shall contain the indicator light state for the indicator light associated with this outlet.

string	Description
Blinking	The indicator LED is blinking. • This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Lit	The indicator LED is lit. • This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Off	The indicator LED is off. • This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.

6.74.5.3 NominalVoltage:

The nominal voltage for this outlet.

- This property shall contain the nominal voltage for this outlet, in Volts.

string	Description
AC100To127V	AC 100-127V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-127VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To240V	AC 100-240V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To277V	AC 100-277V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC120V	AC 120V nominal. • This value shall indicate the device supports a nominal voltage of 120VAC. Specific values are generally used to describe support on device outputs or outlets.

string	Description
AC200To240V	AC 200-240V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC200To277V	AC 200-277V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC208V	AC 208V nominal. • This value shall indicate the device supports a nominal voltage of 208VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC230V	AC 230V nominal. • This value shall indicate the device supports a nominal voltage of 230AC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC240AndDC380V	AC 200-240V and DC 380V. • This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC240V	AC 240V nominal. • This value shall indicate the device supports a nominal voltage of 240VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC277AndDC380V	AC 200-277V and DC 380V. • This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC277V	AC 277V nominal. • This value shall indicate the device supports a nominal voltage of 277VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
AC400V	AC 400V or 415V nominal. • This value shall indicate the device supports a nominal voltage of 400VAC or 415VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
AC480V	AC 480V nominal. • This value shall indicate the device supports a nominal voltage of 480VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.

string	Description
DC12V	DC 12V nominal. • This value shall indicate the device supports a nominal voltage of 12VDC.
DC16V	DC 16V nominal. • This value shall indicate the device supports a nominal voltage of 16VDC.
DC1_8V	DC 1.8V nominal. • This value shall indicate the device supports a nominal voltage of 1.8VDC.
DC240V	DC 240V nominal. • This value shall indicate the device supports a nominal voltage of 240VDC.
DC380V	High Voltage DC (380V). • This value shall indicate the device supports a nominal voltage of 380VDC.
DC3_3V	DC 3.3V nominal. • This value shall indicate the device supports a nominal voltage of 3.3VDC.
DC48V	DC 48V nominal. • This value shall indicate the device supports a nominal voltage of 48VDC.
DC5V	DC 5V nominal. • This value shall indicate the device supports a nominal voltage of 5VDC.
DC9V	DC 9V nominal. • This value shall indicate the device supports a nominal voltage of 9VDC.
DCNeg48V	-48V DC. • This value shall indicate the device supports a nominal voltage of -48VDC.

6.74.5.4 OutletType:

The type of receptacle according to NEMA, IEC, or regional standards.

- This property shall contain the type of physical receptacle used for this outlet, as defined by IEC, NEMA, or regional standard.

string	Description
BS_1363_Type_G	BS 1363 Type G (250V; 13A). • This value shall represent a receptacle that matches the British BS 1363 Type G receptacle (250V; 13A).
BusConnection *(v1.3+)*	Electrical bus connection. • This value shall represent a direct connection to an electrical bus.
CEE_7_Type_E	CEE 7/7 Type E (250V; 16A). • This value shall represent a receptacle that matches the French specified CEE 7/7 Type E receptacle (250V; 16A).
CEE_7_Type_F	CEE 7/7 Type F (250V; 16A). • This value shall represent a receptacle that matches the Schuko specified CEE 7/7 Type F receptacle (250V; 16A).
IEC_60320_C13	IEC C13 (250V; 10A or 15A). • This value shall represent a receptacle that matches the IEC 60320 Sheet F C13 specified receptacle (250V; 10A per IEC, 15A per UL).
IEC_60320_C19	IEC C19 (250V; 16A or 20A). • This value shall represent a receptacle that matches the IEC 60320 Sheet J C19 specified receptacle (250V; 16A per IEC, 20A per UL).
NEMA_5_15R	NEMA 5-15R (120V; 15A). • This value shall represent a receptacle that matches the NEMA specified 5-15 receptacle (120V; 15A). The current is commonly de-rated to 12A if it is protected by a 15A breaker.
NEMA_5_20R	NEMA 5-20R (120V; 20A). • This value shall represent a receptacle that matches the NEMA specified 5-20 receptacle that exhibits a T-slot (120V; 20A). The current is commonly de-rated to 16A if it is protected by a 20A breaker.
NEMA_L5_20R	NEMA L5-20R (120V; 20A). • This value shall represent a receptacle that matches the NEMA specified locking L5-20 receptacle (120V; 20A). The current is commonly de-rated to 16A if it is protected by a 20A breaker.
NEMA_L5_30R	NEMA L5-30R (120V; 30A). • This value shall represent a receptacle that matches the NEMA specified locking L5-30 receptacle (120V; 30A). The current is commonly de-rated to 24A if it is protected by a 30A breaker.

string	Description
NEMA_L6_20R	NEMA L6-20R (250V; 20A). • This value shall represent a receptacle that matches the NEMA specified locking L6-20 receptacle (250V; 20A). The current is commonly de-rated to 16A if it is protected by a 20A breaker.
NEMA_L6_30R	NEMA L6-30R (250V; 30A). • This value shall represent a receptacle that matches the NEMA specified locking L6-30 receptacle (250V; 30A). The current is commonly de-rated to 24A if it is protected by a 30A breaker.
SEV_1011_TYPE_12	SEV 1011 Type 12 (250V; 10A). • This value shall represent a receptacle that matches the SEV 1011 specified Type 12 receptacle (250V; 10A).
SEV_1011_TYPE_23	SEV 1011 Type 23 (250V; 16A). • This value shall represent a receptacle that matches the SEV 1011 specified Type 23 receptacle (250V; 16A).

6.74.5.5 PhaseWiringType:

The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires).

- This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires).

string	Description
OneOrTwoPhase3Wire	Single or Two-Phase / 3-Wire (Line1, Line2 or Neutral, Protective Earth). • This value shall represent a Single or Two-Phase / 3-Wire (Line1, Line2 or Neutral, Protective Earth) wiring. This value shall be used when both phase configurations are supported. This is most common where detachable cordsets are used.
OnePhase3Wire	Single-phase / 3-Wire (Line1, Neutral, Protective Earth). • This value shall represent a Single-phase / 3-Wire (Line1, Neutral, Protective Earth) wiring.
ThreePhase4Wire	Three-phase / 4-Wire (Line1, Line2, Line3, Protective Earth). • This value shall represent a Three-phase / 4-Wire (Line1, Line2, Line3, Protective Earth) wiring.

string	Description
ThreePhase5Wire	Three-phase / 5-Wire (Line1, Line2, Line3, Neutral, Protective Earth). • This value shall represent a Three-phase / 5-Wire (Line1, Line2, Line3, Neutral, Protective Earth) wiring.
TwoPhase3Wire	Two-phase / 3-Wire (Line1, Line2, Protective Earth). • This value shall represent a Two-phase / 3-Wire (Line1, Line2, Protective Earth) wiring.
TwoPhase4Wire	Two-phase / 4-Wire (Line1, Line2, Neutral, Protective Earth). • This value shall represent a Two-phase / 4-Wire (Line1, Line2, Neutral, Protective Earth) wiring.

6.74.5.6 PowerRestorePolicy:

The desired power state of the outlet when power is restored after a power loss.

- This property shall contain the desired PowerState of the outlet when power is applied. The value `LastState` shall return the outlet to the PowerState it was in when power was lost.

string	Description
AlwaysOff	Always remain powered off when external power is applied.
AlwaysOn	Always power on when external power is applied.
LastState	Return to the last power state (on or off) when external power is applied.

6.74.5.7 PowerState:

6.74.5.7.1 In top level:

The power state of the outlet.

- This property shall contain the power state of the outlet.

string	Description
Off	The state is powered off.
On	The state is powered on.
Paused	The state is paused.

string	Description
PoweringOff	A temporary state between on and off.
PoweringOn	A temporary state between off and on.

6.74.5.7.2 In Actions: PowerControl:

The desired power state of the outlet.

- This parameter shall contain the desired power state of the outlet.

string	Description
Off	Power off.
On	Power on.
PowerCycle *(v1.4+)*	Power cycle. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.

6.74.5.8 SensorCurrentExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.

6.74.5.9 SensorVoltageExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.

6.74.5.10 VoltageType:

The type of voltage applied to the outlet.

- This property shall contain the type of voltage applied to the outlet.

string	Description
AC	Alternating Current (AC) outlet.
DC	Direct Current (DC) outlet.

6.74.6 Example response

```
{
    "@odata.type": "#Outlet.v1_4_0.Outlet",
    "Id": "A1",
    "Name": "Outlet A1, Branch Circuit A",
    "Status": {
        "Health": "OK",
```

```
        "State": "Enabled"
    },
    "PhaseWiringType": "OnePhase3Wire",
    "VoltageType": "AC",
    "OutletType": "NEMA_5_20R",
    "RatedCurrentAmps": 20,
    "NominalVoltage": "AC120V",
    "LocationIndicatorActive": true,
    "PowerOnDelaySeconds": 4,
    "PowerOffDelaySeconds": 0,
    "PowerState": "On",
    "PowerEnabled": true,
    "Voltage": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/VoltageA1",
        "Reading": 117.5
    },
    "PolyPhaseVoltage": {
        "Line1ToNeutral": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/VoltageA1",
            "Reading": 117.5
        }
    },
    "CurrentAmps": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/CurrentA1",
        "Reading": 1.68
    },
    "PolyPhaseCurrentAmps": {
        "Line1": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/CurrentA1",
            "Reading": 1.68
        }
    },
    "PowerWatts": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PowerA1",
        "Reading": 197.4,
        "ApparentVA": 197.4,
        "ReactiveVAR": 0,
        "PowerFactor": 1
    },
    "FrequencyHz": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/FrequencyA1",
        "Reading": 60
    },
    "EnergykWh": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/EnergyA1",
        "Reading": 36166
    },
    "Actions": {
        "#Outlet.PowerControl": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1/Outlet.PowerControl"
```

```
        },
        "#Outlet.ResetMetrics": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1/Outlet.ResetMetrics"
        }
    },
    "Links": {
        "BranchCircuit": {
            "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A"
        }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1"
}
```


6.75 OutletGroup 1.1.0

Version	*v1.1*	*v1.0*
Release	2021.4	2019.4

6.75.1 Description

The OutletGroup schema contains definitions for an electrical outlet group.

- This resource shall be used to represent an electrical outlet group for a Redfish implementation.

6.75.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/OutletGroups/*{OutletGroupId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/OutletGroups/*{OutletGroupId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/OutletGroups/*{OutletGroupId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/OutletGroups/*{OutletGroupId}*

6.75.3 Properties

Property	Type	Attributes	Notes
ConfigurationLocked *(v1.1+)*	boolean	*read-write*	Indicates whether the configuration is locked. • This property shall indicate whether modification requests to this resource are not permitted. If `true`, services shall reject modification requests to other properties in this resource.
CreatedBy	string	*read-write* *(null)*	The creator of this outlet group. • This property shall contain the name of the person or application that created this outlet group.
EnergykWh {	object (excerpt)		The energy (kWh) for this outlet group. • This property shall contain the total energy, in kilowatt-hour units, for this outlet group, that represents the `Total` ElectricalContext sensor when multiple energy sensors exist for this outlet group. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentkVAh *(v1.5+)*	number (kV.A.h)	*read-only* *(null)*	Apparent energy (kVAh). • This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading *(v1.1+)*	number	*read-only* *(null)*	The total accumulation value for this sensor. • This property shall contain the total accumulation of the Reading property over the sensor's life time. This value shall not be reset by the ResetMetrics action.
ReactivekVARh *(v1.5+)*	number (kV.A.h)	*read-only* *(null)*	Reactive energy (kVARh). • This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.

Property	Type	Attributes	Notes
Reading	number	*read-only* *(null)*	The sensor value. • This property shall contain the sensor value.
SensorResetTime	string (date-time)	*read-only* *(null)*	The date and time when the time-based properties were last reset. • This property shall contain the date and time when the ResetMetrics action was last performed or the service last reset the time-based property values.
}			
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Outlets [{	array		The set of outlets in this outlet group. • This property shall be an array of links to resources of type Outlet that represent the outlets in this outlet group.
@odata.id	string	*read-write*	Link to a Outlet resource. See the Links section and the *Outlet* schema for details.
}]			
}			
PowerControlLocked *(v1.1+)*	boolean	*read-write*	Indicates whether power control requests are locked. • This property shall indicate whether requests to the PowerControl action are locked. If `true`, services shall reject requests to the PowerControl action.
PowerCycleDelaySeconds	number	*read-write* *(null)*	The number of seconds to delay power on after a PowerControl action to cycle power. Zero seconds indicates no delay. • This property shall contain the number of seconds to delay power on after a PowerControl action to cycle power. The value `0` shall indicate no delay to power on.
PowerEnabled	boolean	*read-only* *(null)*	Indicates if the outlet group can be powered. • This property shall contain the power enable state of the outlet group. True shall indicate that the group can be powered on, and false shall indicate that the group cannot be powered.

Property	Type	Attributes	Notes
PowerOffDelaySeconds	number	*read-write (null)*	The number of seconds to delay power off after a PowerControl action. Zero seconds indicates no delay to power off. • This property shall contain the number of seconds to delay power off after a PowerControl action. The value `0` shall indicate no delay to power off.
PowerOnDelaySeconds	number	*read-write (null)*	The number of seconds to delay power up after a power cycle or a PowerControl action. Zero seconds indicates no delay to power up. • This property shall contain the number of seconds to delay power up after a power cycle or a PowerControl action. The value `0` shall indicate no delay to power up.
PowerRestoreDelaySeconds	number	*read-write (null)*	The number of seconds to delay power on after power has been restored. Zero seconds indicates no delay. • This property shall contain the number of seconds to delay power on after a power fault. The value `0` shall indicate no delay to power on.
PowerRestorePolicy	string (enum)	*read-write*	The desired power state of the outlet group when power is restored after a power loss. • This property shall contain the desired PowerState of the outlet group when power is applied. The value `LastState` shall return the outlet group to the PowerState it was in when power was lost. *For the possible property values, see PowerRestorePolicy in Property details.*
PowerState	string (enum)	*read-only (null)*	The power state of the outlet group. • This property shall contain the power state of the outlet group. *For the possible property values, see PowerState in Property details.*
PowerStateInTransition *(v1.1+)*	boolean	*read-only*	Indicates whether the power state is undergoing a delayed transition. • This property shall indicate whether the PowerState property will undergo a transition between on and off states due to a configured delay. The transition may be due to the configuration of the power on, off, or restore delay properties. If `true`, the PowerState property will transition at the conclusion of a configured delay.
PowerWatts {	object (excerpt)		The power (W) for this outlet group. • This property shall contain the total power, in watt units, for this outlet group, that represents the `Total` ElectricalContext sensor when multiple power sensors exist for this outlet group. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

Property	Type	Attributes	Notes
ApparentVA	number (V.A)	*read-only (null)*	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees *(v1.5+)*	number	*read-only (null)*	The phase angle (degrees) between the current and voltage waveforms. • This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a ReadingType containing `Power`, and shall not appear in sensors with other ReadingType values.
PowerFactor	number	*read-only (null)*	The power factor for this sensor. • This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. PowerFactor is expressed in unit-less 1/100ths. This property can appear in sensors containing a ReadingType value of `Power`, and shall not appear in sensors of other ReadingType values.
ReactiveVAR	number (V.A)	*read-only (null)*	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. • This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.75.4 Actions

6.75.4.1 PowerControl

Description

This action turns the outlet group on or off.

- This action shall control the power state of the outlet group.

Action URI: {Base URI of target resource}/Actions/OutletGroup.PowerControl

Action parameters

Parameter Name	Type	Attributes	Notes
PowerState	string (enum)	*optional*	The desired power state of the outlet group. • This parameter shall contain the desired power state of the outlet group. *For the possible property values, see PowerState in Property details.*

Request Example

```
{
    "ResetType": "Off"
}
```

6.75.4.2 ResetMetrics

Description

This action resets metrics related to this outlet group.

- This action shall reset any time intervals or counted values for this outlet group.

Action URI: {Base URI of target resource}/Actions/OutletGroup.ResetMetrics

Action parameters

This action takes no parameters.

6.75.5 Property details

6.75.5.1 PowerRestorePolicy:

The desired power state of the outlet group when power is restored after a power loss.

- This property shall contain the desired PowerState of the outlet group when power is applied. The value `LastState` shall return the outlet group to the PowerState it was in when power was lost.

string	Description
AlwaysOff	Always remain powered off when external power is applied.
AlwaysOn	Always power on when external power is applied.
LastState	Return to the last power state (on or off) when external power is applied.

6.75.5.2 PowerState:

6.75.5.2.1 In top level:

The power state of the outlet group.

- This property shall contain the power state of the outlet group.

string	Description
Off	The state is powered off.
On	The state is powered on.
Paused	The state is paused.
PoweringOff	A temporary state between on and off.
PoweringOn	A temporary state between off and on.

6.75.5.2.2 In Actions: PowerControl:

The desired power state of the outlet group.

- This parameter shall contain the desired power state of the outlet group.

string	Description
Off	Power off.
On	Power on.
PowerCycle *(v1.1+)*	Power cycle. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.

6.75.6 Example response


```
{
    "@odata.type": "#OutletGroup.v1_1_0.OutletGroup",
    "Id": "Rack5Storage",
    "Name": "Outlet Group Rack5Storage",
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "CreatedBy": "Bob",
    "PowerOnDelaySeconds": 4,
    "PowerOffDelaySeconds": 0,
    "PowerState": "On",
    "PowerEnabled": true,
    "PowerWatts": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/GroupPowerA",
        "Reading": 412.36
    },
    "EnergykWh": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/GroupEnergyA",
        "Reading": 26880
    },
    "Links": {
        "Outlets": [
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1"
            },
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A2"
            },
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A3"
            }
        ]
    },
    "Actions": {
```

```
        "#OutletGroup.PowerControl": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups/Rack5Storage/OutletGroup.PowerControl"
        },
        "#OutletGroup.ResetMetrics": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups/Rack5Storage/OutletGroup.ResetMetrics"
        }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups/Rack5Storage"
}
```


6.76 PCIeDevice 1.10.0

Version	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2021.4	2021.3	2021.1	2020.4	2020.3	2019.2	2018.2	2017.3	2017.1	2016.2

6.76.1 Description

The PCIeDevice schema describes the properties of a PCIe device that is attached to a system.

- This resource shall represent a PCIe device in a Redfish implementation.

6.76.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/PCIeDevices/*{PCIeDeviceId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*
/redfish/v1/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*

6.76.3 Properties

Property	Type	Attributes	Notes
Assembly *(v1.2+)* {	object		The link to the assembly associated with this PCIe device. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
AssetTag	string	*read-write (null)*	The user-assigned asset tag for this PCIe device. • This property shall contain an identifying string that tracks the PCIe device for inventory purposes.
DeviceType	string (enum)	*read-only*	The device type for this PCIe device. • This property shall contain the device type of the PCIe device such as `SingleFunction` or `MultiFunction`. *For the possible property values, see DeviceType in Property details.*
EnvironmentMetrics *(v1.7+)* {	object		The link to the environment metrics for this PCIe device. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the environment metrics for this PCIe device. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			
FirmwareVersion	string	*read-only (null)*	The version of firmware for this PCIe device. • This property shall contain the firmware version of the PCIe device.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis [{	array		An array of links to the chassis in which the PCIe device is contained. • This property shall contain an array of links to resources of type Chassis that represent the physical containers associated with this resource.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PCIeFunctions *(deprecated v1.4)* [{	array		An array of links to PCIe functions exposed by this device. • This property shall contain an array of links to resources of type PCIeFunction that represent the PCIe functions this device exposes. *Deprecated in v1.4 and later. This property has been deprecated in favor of the PCIeFunctions property in the root that provides a link to a resource collection.*
@odata.id	string	*read-only*	Link to a PCIeFunction resource. See the Links section and the *PCIeFunction* schema for details.
}]			
Switch *(v1.10+)* {	object	*(null)*	The link to a switch that is associated with this PCIe device. • This property shall contain a link to a resource of type Switch that is associated with this PCIe device. See the *Switch* schema for details on this property.
@odata.id	string	*read-only*	Link to a Switch resource. See the Links section and the *Switch* schema for details.
}			
}			
Manufacturer	string	*read-only* *(null)*	The manufacturer of this PCIe device. • This property shall contain the name of the organization responsible for producing the PCIe device. This organization may be the entity from whom the PCIe device is purchased, but this is not necessarily true.
Model	string	*read-only* *(null)*	The model number for the PCIe device. • This property shall contain the name by which the manufacturer generally refers to the PCIe device.
PartNumber	string	*read-only* *(null)*	The part number for this PCIe device. • This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the PCIe device.
PCIeFunctions *(v1.4+)* {	object		The link to the collection of PCIe functions associated with this PCIe device. • This property shall contain a link to a Resource Collection of type PCIeFunctionCollection. This property should not be present if DeviceType contains `Retimer`. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PCIeFunction*. See the PCIeFunction schema for details.
}			

Property	Type	Attributes	Notes
PCIeInterface *(v1.3+)* {	object		The PCIe interface details for this PCIe device. • This property shall contain details for the PCIe interface that connects this PCIe device to its host or upstream switch.
LanesInUse *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes in use by this device. • This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the MaxLanes property value.
MaxLanes *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes supported by this device. • This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The highest version of the PCIe specification supported by this device. • This property shall contain the maximum PCIe specification that this device supports. *For the possible property values, see MaxPCIeType in Property details.*
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
PCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The version of the PCIe specification in use by this device. • This property shall contain the negotiated PCIe interface version in use by this device. *For the possible property values, see PCIeType in Property details.*
}			
ReadyToRemove *(v1.7+)*	boolean	*read-write (null)*	An indication of whether the PCIe device is prepared by the system for removal. • This property shall indicate whether the PCIe device is ready for removal. Setting the value to `true` shall cause the service to perform appropriate actions to quiesce the device. A task may spawn while the device is quiescing.
SerialNumber	string	*read-only (null)*	The serial number for this PCIe device. • This property shall contain a manufacturer-allocated number that identifies the PCIe device.
SKU	string	*read-only (null)*	The SKU for this PCIe device. • This property shall contain the stock-keeping unit number for this PCIe device.
Slot *(v1.9+)* {	object	*(null)*	Information about the slot for this PCIe device. • This property shall contain information about the PCIe slot for this PCIe device.

Property	Type	Attributes	Notes
Lanes *(v1.9+)*	integer	*read-only (null)*	The number of PCIe lanes supported by this slot. • This property shall contain the maximum number of PCIe lanes supported by the slot.
LaneSplitting *(v1.9+)*	string (enum)	*read-only (null)*	The lane splitting strategy used in the PCIe slot. • This property shall contain lane splitting information of the associated PCIe slot. *For the possible property values, see LaneSplitting in Property details.*
Location *(v1.9+)* {}	object		The location of the PCIe slot. • This property shall contain part location information, including a ServiceLabel property, of the associated PCIe slot. For property details, see Location.
PCIeType *(v1.9+)*	string (enum)	*read-only (null)*	The PCIe specification this slot supports. • This property shall contain the maximum PCIe specification that this slot supports. *For the possible property values, see PCIeType in Property details.*
SlotType *(v1.9+)*	string (enum)	*read-only (null)*	The PCIe slot type. • This property shall contain the PCIe slot type. *For the possible property values, see SlotType in Property details.*
}			
SparePartNumber *(v1.6+)*	string	*read-only (null)*	The spare part number of the PCIe device. • This property shall contain the spare part number of the PCIe device.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
UUID *(v1.5+)*	string	*read-only (null)*	The UUID for this PCIe device. • This property shall contain the universal unique identifier number for this PCIe device. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`

6.76.4 Property details

6.76.4.1 DeviceType:

The device type for this PCIe device.

- This property shall contain the device type of the PCIe device such as `SingleFunction` or `MultiFunction`.

string	Description
MultiFunction	A multi-function PCIe device.
Retimer *(v1.10+)*	A PCIe retimer device.
Simulated	A PCIe device that is not currently physically present, but is being simulated by the PCIe infrastructure.
SingleFunction	A single-function PCIe device.

6.76.4.2 LaneSplitting:

The lane splitting strategy used in the PCIe slot.

- This property shall contain lane splitting information of the associated PCIe slot.

string	Description
Bifurcated	The slot is bifurcated to split the lanes with associated devices.
Bridged	The slot has a bridge to share the lanes with associated devices.
None	The slot has no lane splitting.

6.76.4.3 MaxPCIeType:

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.

string	Description
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.76.4.4 PCIeType:

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.76.4.5 SlotType:

The PCIe slot type.

- This property shall contain the PCIe slot type.

string	Description
FullLength	Full-Length PCIe slot.
HalfLength	Half-Length PCIe slot.
LowProfile	Low-Profile or Slim PCIe slot.
M2	PCIe M.2 slot.
Mini	Mini PCIe slot.

string	Description
OCP3Large	Open Compute Project 3.0 large form factor slot.
OCP3Small	Open Compute Project 3.0 small form factor slot.
OEM	An OEM-specific slot.
U2	U.2 / SFF-8639 slot or bay.

6.76.5 Example response


```
{
    "@odata.type": "#PCIeDevice.v1_10_0.PCIeDevice",
    "Id": "NIC",
    "Name": "Simple Two-Port NIC",
    "Description": "Simple Two-Port NIC PCIe Device",
    "AssetTag": "ORD-4302015-18432RS",
    "Manufacturer": "Contoso",
    "Model": "SuperNIC 2000",
    "SKU": "89587433",
    "SerialNumber": "2M220100SL",
    "PartNumber": "232-4598D7",
    "DeviceType": "MultiFunction",
    "FirmwareVersion": "12.342-343",
    "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
    },
    "PCIeInterface": {
        "PCIeType": "Gen2",
        "MaxPCIeType": "Gen3",
        "LanesInUse": 4,
        "MaxLanes": 4
    },
    "PCIeFunctions": {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC/PCIeFunctions"
    },
    "Links": {
        "Chassis": [
            {
                "@odata.id": "/redfish/v1/Chassis/1"
            }
        ],
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC"
```

```
}
```

6.77 PCIeFunction 1.4.0

Version	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2021.1	2018.1	2017.1	2016.2

6.77.1 Description

The schema definition for the PCIeFunction Resource. It represents the properties of a PCIeFunction attached to a System.

- This Resource shall represent a PCIeFunction attached to a System.

6.77.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/PCIeDevices/*{PCIeDeviceId}*/PCIeFunctions/*{PCIeFunctionId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*/PCIeFunctions/*{PCIeFunctionId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*/PCIeFunctions/*{PCIeFunctionId}*
/redfish/v1/Systems/*{ComputerSystemId}*/PCIeDevices/*{PCIeDeviceId}*/PCIeFunctions/*{PCIeFunctionId}*

6.77.3 Properties

Property	Type	Attributes	Notes
ClassCode	string	*read-only (null)*	The Class Code of this PCIe function. • This property shall contain the PCI Class Code of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){3}$`
DeviceClass	string (enum)	*read-only*	The class for this PCIe function. • This property shall contain the device class of the PCIe device function, such as storage, network, or memory. *For the possible property values, see DeviceClass in Property details.*

Property	Type	Attributes	Notes
DeviceId	string	*read-only (null)*	The Device ID of this PCIe function. • This property shall contain the PCI Device ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
Enabled *(v1.3+)*	boolean	*read-write*	An indication of whether this PCIe device function is enabled. • The value of this property shall indicate if this PCIe device function is enabled.
FunctionId	integer	*read-only (null)*	The PCIe Function Number. • This property shall contain the PCIe Function Number within a given PCIe device.
FunctionType	string (enum)	*read-only*	The type of the PCIe function. • This property shall contain the function type of the PCIe device function such as Physical or Virtual. *For the possible property values, see FunctionType in Property details.*
Links {	object		The links to other Resources that are related to this Resource. • This property shall contain links to Resources that are related to but are not contained by, or subordinate to, this Resource.
Drives [{	array		An array of links to the drives that the PCIe device produces. • This property shall link to a Resource of type Drive that represents the storage drives associated with this Resource.
@odata.id	string	*read-only*	Link to a Drive resource. See the Links section and the *Drive* schema for details.
}]			
EthernetInterfaces [{	array		An array of links to the Ethernet interfaces that the PCIe device produces. • This property shall link to a Resource of type EthernetInterface that represents the network interfaces associated with this Resource.
@odata.id	string	*read-only*	Link to a EthernetInterface resource. See the Links section and the *EthernetInterface* schema for details.
}]			

Property	Type	Attributes	Notes
NetworkDeviceFunctions *(v1.2+)* [{	array		An array of links to the network device functions that the PCIe device produces. • This property shall contain an array of links to Resources of the NetworkDeviceFunction type that represents the network device functions associated with this Resource.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeDevice {	object		The link to the PCIe device on which this function resides. • This property shall contain a link to a Resource of type PCIeDevice of which this function is a part. See the *PCIeDevice* schema for details on this property.
@odata.id	string	*read-only*	Link to a PCIeDevice resource. See the Links section and the *PCIeDevice* schema for details.
}			
Processor *(v1.4+)* {	object	*(null)*	The link to a processor that is hosted on this PCIe device function. • This property shall link to a resource of type Processor that is hosted on this PCIe device function. See the *Processor* schema for details on this property.
@odata.id	string	*read-only*	Link to a Processor resource. See the Links section and the *Processor* schema for details.
}			
StorageControllers [{	array		An array of links to the storage controllers that the PCIe device produces. • This property shall link to a Resource of type StorageController that represents the storage controllers associated with this Resource.
@odata.id	string	*read-only*	Link to a StorageController resource. See the Links section and the *Storage* schema for details.
}]			
}			

Property	Type	Attributes	Notes
RevisionId	string	*read-only (null)*	The Revision ID of this PCIe function. • This property shall contain the PCI Revision ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){1}$`
Status {}	object		The status and health of the Resource and its subordinate or dependent Resources. • This property shall contain any status or health properties of the Resource. For property details, see Status.
SubsystemId	string	*read-only (null)*	The Subsystem ID of this PCIe function. • This property shall contain the PCI Subsystem ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
SubsystemVendorId	string	*read-only (null)*	The Subsystem Vendor ID of this PCIe function. • This property shall contain the PCI Subsystem Vendor ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`
VendorId	string	*read-only (null)*	The Vendor ID of this PCIe function. • This property shall contain the PCI Vendor ID of the PCIe device function. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){2}$`

6.77.4 Property details

6.77.4.1 DeviceClass:

The class for this PCIe function.

- This property shall contain the device class of the PCIe device function, such as storage, network, or memory.

string	Description
Bridge	A bridge.
CommunicationController	A communication controller.
Coprocessor	A coprocessor.
DisplayController	A display controller.

string	Description
DockingStation	A docking station.
EncryptionController	An encryption controller.
GenericSystemPeripheral	A generic system peripheral.
InputDeviceController	An input device controller.
IntelligentController	An intelligent controller.
MassStorageController	A mass storage controller.
MemoryController	A memory controller.
MultimediaController	A multimedia controller.
NetworkController	A network controller.
NonEssentialInstrumentation	A non-essential instrumentation.
Other	A other class. The function Device Class Id needs to be verified.
ProcessingAccelerators	A processing accelerators.
Processor	A processor.
SatelliteCommunicationsController	A satellite communications controller.
SerialBusController	A serial bus controller.
SignalProcessingController	A signal processing controller.
UnassignedClass	An unassigned class.
UnclassifiedDevice	An unclassified device.
WirelessController	A wireless controller.

6.77.4.2 FunctionType:

The type of the PCIe function.

- This property shall contain the function type of the PCIe device function such as Physical or Virtual.

string	Description
Physical	A physical PCIe function.

string	Description
Virtual	A virtual PCIe function.

6.77.5 Example response

```
{
    "@odata.type": "#PCIeFunction.v1_4_0.PCIeFunction",
    "Id": "2",
    "Name": "FC Port 2",
    "Description": "FC Port 2",
    "FunctionId": 2,
    "FunctionType": "Physical",
    "DeviceClass": "NetworkController",
    "DeviceId": "0xABCD",
    "VendorId": "0xABCD",
    "ClassCode": "0x010802",
    "RevisionId": "0x00",
    "SubsystemId": "0xABCD",
    "SubsystemVendorId": "0xABCD",
    "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
    },
    "Links": {
        "PCIeDevice": {
            "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/FC"
        }
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/FC/PCIeFunctions/2"
}
```

6.78 PCIeSlots 1.5.0

Version	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2021.3	2020.3	2020.1	2019.4	2019.1	2018.2

6.78.1 Description

The PCIeSlots schema describes PCIe slot properties.

- This Resource shall represent a set of PCIe slot information for a Redfish implementation.

6.78.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/PCIeSlots

6.78.3 Properties

Property	Type	Attributes	Notes
Slots [{	array		An array of PCI Slot information. • This array shall contain an entry for each PCIe slot, including empty slots (with no device or card installed).
HotPluggable *(v1.1+)*	boolean	*read-only (null)*	An indication of whether this PCIe slot supports hotplug. • This property shall contain indicating whether this PCIe slot supports hotplug.
Lanes	integer	*read-only (null)*	The number of PCIe lanes supported by this slot. • This property shall contain the maximum number of PCIe lanes supported by the slot.
Links {	object		The links to other Resources that are related to this Resource. • The Redfish Specification-described type shall contain links to Resources related to but not subordinate to this Resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeDevice [{	array		An array of links to the PCIe devices contained in this slot. • This property shall contain an array of links to the Resources of the PCIeDevice type with which this physical slot is associated. If the Status.State of this slot is `Absent`, this property shall not appear in the Resource.
@odata.id	string	*read-only*	Link to a PCIeDevice resource. See the Links section and the *PCIeDevice* schema for details.
}]			

Property	Type	Attributes	Notes
Processors *(v1.5+)* [{	array		An array of links to the processors that are directly connected or directly bridged to this PCIe slot. • This property shall contain an array of links to resources of type Processor that represent processors that are directly connected or directly bridged to this PCIe slot.
@odata.id	string	*read-only*	Link to a Processor resource. See the Links section and the *Processor* schema for details.
}]			
}			
Location {}	object		The location of the PCIe slot. • This property shall contain part location information, including a ServiceLabel of the associated PCIe Slot. For property details, see Location.
LocationIndicatorActive *(v1.4+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeType	string (enum)	*read-only (null)*	The PCIe specification supported by this slot. • This property shall contain the maximum PCIe specification that this slot supports. *For the possible property values, see PCIeType in Property details.*
SlotType	string (enum)	*read-only (null)*	The PCIe slot type for this slot. • This property shall contain the slot type as specified by the PCIe specification. *For the possible property values, see SlotType in Property details.*
Status {}	object		The status and health of the Resource and its subordinate or dependent Resources. • This property shall contain any status or health properties of the Resource. For property details, see Status.
}]			

6.78.4 Property details

6.78.4.1 PCIeType:

The PCIe specification supported by this slot.

- This property shall contain the maximum PCIe specification that this slot supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.78.4.2 SlotType:

The PCIe slot type for this slot.

- This property shall contain the slot type as specified by the PCIe specification.

string	Description
FullLength	Full-Length PCIe slot.
HalfLength	Half-Length PCIe slot.
LowProfile	Low-Profile or Slim PCIe slot.
M2	PCIe M.2 slot.
Mini	Mini PCIe slot.
OCP3Large *(v1.2+)*	Open Compute Project 3.0 large form factor slot.
OCP3Small *(v1.2+)*	Open Compute Project 3.0 small form factor slot.
OEM	An OEM-specific slot.
U2 *(v1.3+)*	U.2 / SFF-8639 slot or bay.

6.78.5 Example response


```
{
    "@odata.type": "#PCIeSlots.v1_5_0.PCIeSlots",
    "Id": "1",
    "Name": "PCIe Slot Information",
    "Slots": [
        {
            "PCIeType": "Gen3",
            "Lanes": 16,
            "SlotType": "FullLength",
            "Status": {
                "State": "Enabled"
            },
            "Location": {
                "PartLocation": {
                    "ServiceLabel": "Slot 1",
                    "LocationOrdinalValue": 1,
                    "LocationType": "Slot",
                    "Orientation": "LeftToRight",
                    "Reference": "Rear"
                }
            },
            "Links": {
                "PCIeDevice": [
                    {
                        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC"
                    }
                ]
            }
        },
        {
            "PCIeType": "Gen4",
            "Lanes": 4,
            "SlotType": "FullLength",
            "Status": {
                "State": "Absent"
            },
            "Location": {
                "PartLocation": {
                    "ServiceLabel": "Slot 2",
                    "LocationOrdinalValue": 2,
                    "LocationType": "Slot",
                    "Orientation": "LeftToRight",
                    "Reference": "Rear"
                }
            }
        },
        {
```

```
            "PCIeType": "Gen3",
            "Lanes": 1,
            "SlotType": "HalfLength",
            "Status": {
                "State": "Absent"
            },
            "Location": {
                "PartLocation": {
                    "ServiceLabel": "Slot 3",
                    "LocationOrdinalValue": 3,
                    "LocationType": "Slot",
                    "Orientation": "LeftToRight",
                    "Reference": "Rear"
                }
            }
        }
    ],
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1/PCIeSlots"
}
```


6.79 Port 1.7.0

Version	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2021.4	2021.2	2021.1	2020.3	2019.4	2017.3	2016.2

6.79.1 Description

The Port schema contains properties that describe a port of a switch, controller, chassis, or any other device that could be connected to another entity.

- This resource contains a simple port for a Redfish implementation.

6.79.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*
/redfish/v1/Chassis/*{ChassisId}*/MediaControllers/*{MediaControllerId}*/Ports/*{PortId}*
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Ports/*{PortId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/

{StorageControllerId}/Ports/*{PortId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports/*{PortId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports/*{PortId}*
/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*
/redfish/v1/Managers/*{ManagerId}*/DedicatedNetworkPorts/*{PortId}*
/redfish/v1/Managers/*{ManagerId}*/USBPorts/*{PortId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports/*{PortId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports/*{PortId}*
/redfish/v1/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*
/redfish/v1/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports/*{PortId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*
/redfish/v1/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports/*{PortId}*

6.79.3 Properties

Property	Type	Attributes	Notes
ActiveWidth *(v1.2+)*	integer	*read-only*	The number of active lanes for this interface. • This property shall contain the number of active lanes for this interface.
CapableProtocolVersions *(v1.4+)* [ ]	array (string, null)	*read-only*	The protocol versions capable of being sent over this port. • This property shall contain the protocol versions capable of being sent over this port. This property should only be used for protocols where the version and not the speed is of primary interest such as USB, DisplayPort, or HDMI.
CurrentProtocolVersion *(v1.4+)*	string	*read-only (null)*	The protocol version being sent over this port. • This property shall contain the protocol version being sent over this port. This property should only be used for protocols where the version and not the speed is of primary interest such as USB, DisplayPort, or HDMI.
CurrentSpeedGbps	number (Gbit/s)	*read-only (null)*	The current speed of this port. • This property shall contain the speed of this port currently negotiated and running. This value includes overhead associated with the protocol.
Enabled *(v1.4+)*	boolean	*read-write*	An indication of whether this port is enabled. • The value of this property shall indicate if this port is enabled. Disabling a port will disconnect any devices only connected to the system through this port.
EnvironmentMetrics *(v1.4+)* {	object		The link to the environment metrics for this port or any attached small form-factor pluggable (SFP) device. • This property shall contain a link to a resource of type EnvironmentMetrics that represents the environment metrics for this port or any attached small form-factor pluggable (SFP) device. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			

Property	Type	Attributes	Notes
Ethernet *(v1.3+)* {	object	*(null)*	Ethernet properties for this port. • This property shall contain Ethernet-specific properties of the port.
AssociatedMACAddresses *(v1.4+)* [ ]	array (string, null)	*read-only*	An array of configured MAC addresses that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. • This property shall contain an array of configured MAC addresses that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses. Pattern: `^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$`
EEEEnabled *(v1.5+)*	boolean	*read-write (null)*	Indicates whether IEEE 802.3az Energy-Efficient Ethernet (EEE) is enabled on this port. • This property shall indicate whether IEEE 802.3az Energy-Efficient Ethernet (EEE) is enabled on this port.
FlowControlConfiguration *(v1.3+)*	string (enum)	*read-write (null)*	The locally configured 802.3x flow control setting for this port. • This property shall contain the locally configured 802.3x flow control setting for this port. *For the possible property values, see FlowControlConfiguration in Property details.*
FlowControlStatus *(v1.3+)*	string (enum)	*read-only (null)*	The 802.3x flow control behavior negotiated with the link partner for this port. • This property shall contain the 802.3x flow control behavior negotiated with the link partner for this port. *For the possible property values, see FlowControlStatus in Property details.*
LLDPEnabled *(v1.4+)*	boolean	*read-write*	Enable/disable LLDP for this port. • This property shall contain the state indicating whether to enable LLDP for a port. If LLDP is disabled at the adapter level, this property shall be ignored.
LLDPReceive *(v1.4+)* {	object	*(null)*	LLDP data being received on this link. • This property shall contain the LLDP data being received on this link.

Property	Type	Attributes	Notes
ChassisId *(v1.4+)*	string	*read-only (null)*	Link Layer Data Protocol (LLDP) chassis ID received from the remote partner across this link. • This property shall contain the chassis ID received from the remote partner across this link. If no such chassis ID has been received, this property should not be present.
ChassisIdSubtype *(v1.4+)*	string (enum)	*read-only (null)*	The type of identifier used for the chassis ID received from the remote partner across this link. • This property shall contain the IEEE 802.1AB-2009 chassis ID subtype received from the remote partner across this link. If no such chassis ID subtype has been received, this property should not be present. *For the possible property values, see ChassisIdSubtype in Property details.*
ManagementAddressIPv4 *(v1.4+)*	string	*read-only (null)*	The IPv4 management address received from the remote partner across this link. • This property shall contain the IPv4 management address received from the remote partner across this link. If no such management address has been received, this property should not be present. Pattern: `^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$`
ManagementAddressIPv6 *(v1.4+)*	string	*read-only (null)*	The IPv6 management address received from the remote partner across this link. • This property shall contain the IPv6 management address received from the remote partner across this link. If no such management address has been received, this property should not be present.
ManagementAddressMAC *(v1.4+)*	string	*read-only (null)*	The management MAC address received from the remote partner across this link. • This property shall contain the management MAC address received from the remote partner across this link. If no such management address has been received, this property should not be present. Pattern: `^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$`
ManagementVlanId *(v1.4+)*	integer	*read-only (null)*	The management VLAN ID received from the remote partner across this link. • This property shall contain the management VLAN ID received from the remote partner across this link. If no such management VLAN ID has been received, this property should not be present.

Property	Type	Attributes	Notes
PortId *(v1.4+)*	string	*read-only (null)*	A colon delimited string of hexadecimal octets identifying a port. • This property shall contain a colon delimited string of hexadecimal octets identifying the port received from the remote partner across this link. If no such port ID has been received, this property should not be present. Pattern: `^([0-9A-F]{2})([:]([0-9A-F]){2}){0,63}$`
PortIdSubtype *(v1.4+)*	string (enum)	*read-only (null)*	The port ID subtype received from the remote partner across this link. • This property shall contain the port ID subtype from IEEE 802.1AB-2009 Table 8-3 received from the remote partner across this link. If no such port ID subtype has been received, this property should not be present. *For the possible property values, see PortIdSubtype in Property details.*
}			
LLDPTransmit *(v1.4+)* {	object	*(null)*	LLDP data being transmitted on this link. • This property shall contain the LLDP data being transmitted on this link.
ChassisId *(v1.4+)*	string	*read-write (null)*	Link Layer Data Protocol (LLDP) chassis ID. • This property shall contain the chassis ID to be transmitted from this endpoint. If no such chassis ID is to be transmitted, this value shall be an empty string.
ChassisIdSubtype *(v1.4+)*	string (enum)	*read-write (null)*	The type of identifier used for the chassis ID. • This property shall contain the IEEE 802.1AB-2009 chassis ID subtype to be transmitted from this endpoint. If no such chassis ID subtype is to be transmitted, this value shall be `NotTransmitted`. *For the possible property values, see ChassisIdSubtype in Property details.*
ManagementAddressIPv4 *(v1.4+)*	string	*read-write (null)*	The IPv4 management address to be transmitted from this endpoint. • This property shall contain the IPv4 management address to be transmitted from this endpoint. If no such management address is to be transmitted, this value shall be an empty string. Pattern: `(^(?:[0-9]{1,3}\.){3}[0-9]{1,3}$)|(^$)`
ManagementAddressIPv6 *(v1.4+)*	string	*read-write (null)*	The IPv6 management address to be transmitted from this endpoint. • This property shall contain the IPv6 management address to be transmitted from this endpoint. If no such management address is to be transmitted, this value shall be an empty string.

Property	Type	Attributes	Notes
ManagementAddressMAC *(v1.4+)*	string	*read-write (null)*	The management MAC address to be transmitted from this endpoint. • This property shall contain the management MAC address to be transmitted from this endpoint. If no such management address is to be transmitted, this value shall be an empty string. Pattern: `(^([0-9A-Fa-f]{2}[:-]){5}([0-9A-Fa-f]{2})$)\|(^$)`
ManagementVlanId *(v1.4+)*	integer	*read-write (null)*	The management VLAN ID to be transmitted from this endpoint. • This property shall contain the management VLAN ID to be transmitted from this endpoint. If no such port ID is to be transmitted, this value shall be `4095`.
PortId *(v1.4+)*	string	*read-write (null)*	A colon delimited string of hexadecimal octets identifying a port to be transmitted from this endpoint. • This property shall contain a colon delimited string of hexadecimal octets identifying the port for an LLDP endpoint. If no such port ID is to be transmitted, this value shall be an empty string. Pattern: `(^([0-9A-F]{2})([:]([0-9A-F]){2}){0,63}$)\|(^$)`
PortIdSubtype *(v1.4+)*	string (enum)	*read-write (null)*	The port ID subtype to be transmitted from this endpoint. • This property shall contain the port ID subtype from IEEE 802.1AB-2009 Table 8-3 to be transmitted from this endpoint. If no such port ID subtype is to be transmitted, this value shall be `NotTransmitted`. *For the possible property values, see PortIdSubtype in Property details.*
}			
SupportedEthernetCapabilities *(v1.3+, deprecated v1.5* [ ]	array (string (enum))	*read-only (null)*	• The set of Ethernet capabilities that this port supports. ◦ This property shall contain an array of Ethernet capabilities supported by this port. *For the possible property values, see SupportedEthernetCapabilities in Property details. Deprecated in v1.5 and later. This property has been deprecated in favor of individual fields for the various properties.*
WakeOnLANEnabled *(v1.5+)*	boolean	*read-write (null)*	Indicates whether Wake on LAN (WoL) is enabled on this port. • This property shall indicate whether Wake on LAN (WoL) is enabled on this port.
}			

Property	Type	Attributes	Notes
FibreChannel *(v1.3+)* {	object	*(null)*	Fibre Channel properties for this port. • This property shall contain Fibre Channel-specific properties of the port.
AssociatedWorldWideNames *(v1.4+)* [ ]	array (string, null)	*read-only*	An array of configured World Wide Names (WWN) that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. • This property shall contain an array of configured World Wide Names (WWN) that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses. Pattern: `^([0-9A-Fa-f]{2}[:-]){7}([0-9A-Fa-f]{2})$`
FabricName *(v1.3+)*	string	*read-only (null)*	The Fibre Channel Fabric Name provided by the switch. • This property shall indicate the Fibre Channel Fabric Name provided by the switch.
NumberDiscoveredRemotePorts *(v1.3+)*	integer	*read-only (null)*	The number of ports not on the associated device that the associated device has discovered through this port. • This property shall contain the number of ports not on this associated device that this port has discovered.
PortConnectionType *(v1.3+)*	string (enum)	*read-only (null)*	The connection type of this port. • This property shall contain the connection type for this port. *For the possible property values, see PortConnectionType in Property details.*
}			
FunctionMaxBandwidth *(v1.4+)* [{	array		An array of maximum bandwidth allocation percentages for the functions associated with this port. • This property shall contain an array of maximum bandwidth allocation percentages for the functions associated with this port.
AllocationPercent *(v1.4+)*	integer (%)	*read-write (null)*	The maximum bandwidth allocation percentage allocated to the corresponding network device function instance. • This property shall contain the maximum bandwidth percentage allocation for the associated network device function.

Property	Type	Attributes	Notes
NetworkDeviceFunction *(v1.4+)* {	object		The link to the network device function associated with this bandwidth setting of this network port. • This property shall contain a link to a resource of type NetworkDeviceFunction that represents the network device function associated with this bandwidth setting of this network port. See the *NetworkDeviceFunction* schema for details on this property.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}			
}]			
FunctionMinBandwidth *(v1.4+)* [{	array		An array of minimum bandwidth allocation percentages for the functions associated with this port. • This property shall contain an array of minimum bandwidth percentage allocations for each of the functions associated with this port.
AllocationPercent *(v1.4+)*	integer (%)	*read-write (null)*	The minimum bandwidth allocation percentage allocated to the corresponding network device function instance. • This property shall contain the minimum bandwidth percentage allocation for the associated network device function. The sum total of all minimum percentages shall not exceed 100.
NetworkDeviceFunction *(v1.4+)* {	object		The link to the network device function associated with this bandwidth setting of this network port. • This property shall contain a link to a resource of type NetworkDeviceFunction that represents the network device function associated with this bandwidth setting of this network port. See the *NetworkDeviceFunction* schema for details on this property.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}			
}]			
GenZ *(v1.2+)* {	object		Gen-Z specific properties. • This property shall contain Gen-Z specific properties for this interface.

Property	Type	Attributes	Notes
LPRT *(v1.2+)* {	object		The Linear Packet Relay Table for the port. • This property shall contain a link to a resource collection of type RouteEntryCollection, and shall represent the Gen-Z Core Specification-defined Linear Packet Relay Table for this port. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *RouteEntry*. See the RouteEntry schema for details.
}			
MPRT *(v1.2+)* {	object		the Multi-subnet Packet Relay Table for the port. • This property shall contain a link to a resource collection of type RouteEntryCollection, and shall represent the Gen-Z Core Specification-defined Multi-subnet Packet Relay Table for this port. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *RouteEntry*. See the RouteEntry schema for details.
}			
VCAT *(v1.2+)* {	object		the Virtual Channel Action Table for the port. • This property shall contain a link to a resource collection of type VCATEntryCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *VCATEntry*. See the VCATEntry schema for details.
}			
}			
InfiniBand *(v1.6+)* {	object	*(null)*	InfiniBand properties for this port. • This property shall contain InfiniBand-specific properties of the port.
AssociatedNodeGUIDs *(v1.6+)* [ ]	array (string, null)	*read-only*	An array of configured node GUIDs that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. • This property shall contain an array of configured node GUIDs that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses. Pattern: `^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})$`

Property	Type	Attributes	Notes
AssociatedPortGUIDs *(v1.6+)* [ ]	array (string, null)	*read-only*	An array of configured port GUIDs that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. • This property shall contain an array of configured port GUIDs that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses. Pattern: `^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})$`
AssociatedSystemGUIDs *(v1.6+)* [ ]	array (string, null)	*read-only*	An array of configured system GUIDs that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses. • This property shall contain an array of configured system GUIDs that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address if applicable, the address for hardware port teaming, or other network addresses. Pattern: `^([0-9A-Fa-f]{4}[:-]){3}([0-9A-Fa-f]{4})$`
}			
InterfaceEnabled *(v1.2+)*	boolean	*read-write (null)*	An indication of whether the interface is enabled. • This property shall indicate whether the interface is enabled.
LinkConfiguration *(v1.3+)* [{	array		The link configuration of this port. • This property shall contain the static capabilities and configuration settings of the port.
AutoSpeedNegotiationCapable *(v1.3+)*	boolean	*read-only (null)*	An indication of whether the port is capable of autonegotiating speed. • This property shall indicate whether the port is capable of autonegotiating speed.
AutoSpeedNegotiationEnabled *(v1.3+)*	boolean	*read-write (null)*	Controls whether this port is configured to enable autonegotiating speed. • This property shall indicate whether the port is configured to autonegotiate speed.

Property	Type	Attributes	Notes
CapableLinkSpeedGbps *(v1.3+)* [ ]	array (Gbit/s) (number, null)	*read-only*	The set of link speed capabilities of this port. • This property shall contain all of the possible network link speed capabilities of this port. This value includes overhead associated with the protocol.
ConfiguredNetworkLinks *(v1.3+)* [{	array		The set of link speed and width pairs this port is configured to use for autonegotiation. • This property shall contain the set of link speed and width pairs to which this port is restricted for autonegotiation purposes.
ConfiguredLinkSpeedGbps *(v1.3+)*	number (Gbit/s)	*read-write (null)*	The link speed per lane this port is configured to use for autonegotiation. • This property shall contain the network link speed per lane this port is configured to allow for autonegotiation purposes. This value includes overhead associated with the protocol.
ConfiguredWidth *(v1.3+)*	integer	*read-write (null)*	The link width this port is configured to use for autonegotiation in conjunction with the link speed. • This property shall contain the network link width this port is configured to use for autonegotiation purposes.
}]			
}]			
LinkNetworkTechnology *(v1.2+)*	string (enum)	*read-only (null)*	The link network technology capabilities of this port. • This property shall contain a network technology capability of this port. *For the possible property values, see LinkNetworkTechnology in Property details.*
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AssociatedEndpoints [{	array		An array of links to the endpoints at the other end of the link. • This property shall contain an array of links to resources of type Endpoint that represent the endpoints to which this port is connected.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			

Property	Type	Attributes	Notes
Cables *(v1.5+)* [{	array		An array of links to the cables connected to this port. • This property shall contain an array of links to resources of type Cable that represent the cables connected to this port.
@odata.id	string	*read-only*	Link to a Cable resource. See the Links section and the *Cable* schema for details.
}]			
ConnectedPorts *(v1.2+)* [{	array		An array of links to the remote device ports at the other end of the link. • This property shall contain an array of links to resources of type Port that represent the remote device ports to which this port is connected.
@odata.id	string	*read-only*	Link to another Port resource.
}]			
ConnectedSwitches [{	array		An array of links to the switches at the other end of the link. • This property shall contain an array of links to resources of type Switch that represent the switches to which this port is connected.
@odata.id	string	*read-only*	Link to a Switch resource. See the Links section and the *Switch* schema for details.
}]			
ConnectedSwitchPorts [{	array		An array of links to the switch ports at the other end of the link. • This property shall contain an array of links to resources of type Port that represent the switch ports to which this port is connected.
@odata.id	string	*read-only*	Link to another Port resource.
}]			
EthernetInterfaces *(v1.7+)* [{	array		The links to the Ethernet interfaces this port provides. • This property shall contain an array of links to resources of type EthernetInterface that represent the Ethernet interfaces this port provides. This property shall not include Ethernet interfaces that are not directly associated to a physical port.
@odata.id	string	*read-only*	Link to a EthernetInterface resource. See the Links section and the *EthernetInterface* schema for details.
}]			

Property	Type	Attributes	Notes
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
LinkState *(v1.2+)*	string (enum)	*read-write*	The desired link state for this interface. • This property shall contain the desired link state for this interface. *For the possible property values, see LinkState in Property details.*
LinkStatus *(v1.2+)*	string (enum)	*read-only*	The link status for this interface. • This property shall contain the link status for this interface. *For the possible property values, see LinkStatus in Property details.*
LinkTransitionIndicator *(v1.2+)*	integer	*read-write*	The number of link state transitions for this interface. • This property shall contain the number of link state transitions for this interface.
Location *(v1.1+)* {}	object		The location of the port. • This property shall contain location information of the associated port. For property details, see Location.
LocationIndicatorActive *(v1.3+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
MaxFrameSize *(v1.3+)*	integer (bytes)	*read-only (null)*	The maximum frame size supported by the port. • This property shall contain the maximum frame size supported by the port.
MaxSpeedGbps	number (Gbit/s)	*read-only (null)*	The maximum speed of this port as currently configured. • This property shall contain the maximum speed of which this port is capable of being configured. If capable of autonegotiation, the system shall attempt to negotiate at the maximum speed set. This value includes overhead associated with the protocol.
Metrics *(v1.2+)* {	object	*(null)*	The link to the metrics associated with this port. • This property shall contain a link to the metrics associated with this port. See the *PortMetrics* schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to a PortMetrics resource. See the Links section and the *PortMetrics* schema for details.
}			
PortId	string	*read-only* *(null)*	The label of this port on the physical package for this port. • This property shall contain the name of the port as indicated on the device containing the port.
PortMedium *(v1.2+)*	string (enum)	*read-only* *(null)*	The physical connection medium for this port. • This property shall contain the physical connection medium for this port. *For the possible property values, see PortMedium in Property details.*
PortProtocol	string (enum)	*read-only* *(null)*	The protocol being sent over this port. • This property shall contain the protocol being sent over this port. *For the possible property values, see PortProtocol in Property details.*
PortType	string (enum)	*read-only* *(null)*	The type of this port. • This property shall contain the port type for this port. *For the possible property values, see PortType in Property details.*
SFP *(v1.4+)* {	object	*(null)*	The small form-factor pluggable (SFP) device associated with this port. • This property shall contain data about the small form-factor pluggable (SFP) device currently occupying this port.
FiberConnectionType *(v1.4+)*	string (enum)	*read-only* *(null)*	The type of fiber connection currently used by this SFP. • This property shall contain the fiber connection type used by the SFP. *For the possible property values, see FiberConnectionType in Property details.*
Manufacturer *(v1.4+)*	string	*read-only* *(null)*	The manufacturer of this SFP. • This property shall contain the name of the organization responsible for producing the SFP. This organization may be the entity from which the SFP is purchased, but this is not necessarily true.
MediumType *(v1.4+)*	string (enum)	*read-only* *(null)*	The medium type connected to this SFP. • This property shall contain the medium type used by the SFP. *For the possible property values, see MediumType in Property details.*

Property	Type	Attributes	Notes
PartNumber *(v1.4+)*	string	*read-only (null)*	The part number for this SFP. • This property shall contain the manufacturer-provided part number for the SFP.
SerialNumber *(v1.4+)*	string	*read-only (null)*	The serial number for this SFP. • This property shall contain a manufacturer-allocated number that identifies the SFP.
Status *(v1.4+)* {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedSFPTypes *(v1.4+)* [ ]	array (string (enum))	*read-only (null)*	• The types of SFP devices that can be attached to this port. ◦ This property shall contain an array of SFP device types supported by this port. *For the possible property values, see SupportedSFPTypes in Property details.*
Type *(v1.4+)*	string (enum)	*read-only (null)*	The type of SFP device that is attached to this port. • This property shall contain the SFP device type currently attached to this port. *For the possible property values, see Type in Property details.*
}			
SignalDetected *(v1.2+)*	boolean	*read-only (null)*	An indication of whether a signal is detected on this interface. • This property shall indicate whether a signal that is appropriate for this link technology is detected for this port.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
Width	integer	*read-only (null)*	The number of lanes, phys, or other physical transport links that this port contains. • This property shall contain the number of physical transport links that this port contains.

6.79.4 Actions

6.79.4.1 Reset

Description

This action resets this port.

- This action shall reset this port.

Action URI: {Base URI of target resource}/Actions/Port.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation specific default reset. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ForceRestart"
}
```

6.79.5 Property details

6.79.5.1 ChassisIdSubtype:

The type of identifier used for the chassis ID received from the remote partner across this link.

- This property shall contain the IEEE 802.1AB-2009 chassis ID subtype received from the remote partner across this link. If no such chassis ID subtype has been received, this property should not be present.

string	Description
AgentId	Agent circuit ID, based on the agent-local identifier of the circuit as defined in RFC3046.
ChassisComp	Chassis component, based in the value of entPhysicalAlias in RFC4133.
IfAlias	Interface alias, based on the ifAlias MIB object.
IfName	Interface name, based on the ifName MIB object.
LocalAssign	Locally assigned, based on a alpha-numeric value locally assigned.
MacAddr	MAC address, based on an agent detected unicast source address as defined in IEEE Std. 802.
NetworkAddr	Network address, based on an agent detected network address.
NotTransmitted	No data to be sent to/received from remote partner.
PortComp	Port component, based in the value of entPhysicalAlias in RFC4133.

6.79.5.2 FiberConnectionType:

The type of fiber connection currently used by this SFP.

- This property shall contain the fiber connection type used by the SFP.

string	Description
MultiMode	The connection is using multi mode operation.
SingleMode	The connection is using single mode operation.

6.79.5.3 FlowControlConfiguration:

The locally configured 802.3x flow control setting for this port.

- This property shall contain the locally configured 802.3x flow control setting for this port.

string	Description
None	No IEEE 802.3x flow control is enabled on this port.
RX	IEEE 802.3x flow control may be initiated by the link partner.
TX	IEEE 802.3x flow control may be initiated by this station.

string	Description
TX_RX	IEEE 802.3x flow control may be initiated by this station or the link partner.

6.79.5.4 FlowControlStatus:

The 802.3x flow control behavior negotiated with the link partner for this port.

- This property shall contain the 802.3x flow control behavior negotiated with the link partner for this port.

string	Description
None	No IEEE 802.3x flow control is enabled on this port.
RX	IEEE 802.3x flow control may be initiated by the link partner.
TX	IEEE 802.3x flow control may be initiated by this station.
TX_RX	IEEE 802.3x flow control may be initiated by this station or the link partner.

6.79.5.5 LinkNetworkTechnology:

The link network technology capabilities of this port.

- This property shall contain a network technology capability of this port.

string	Description
Ethernet	The port is capable of connecting to an Ethernet network.
FibreChannel	The port is capable of connecting to a Fibre Channel network.
GenZ	The port is capable of connecting to a Gen-Z fabric.
InfiniBand	The port is capable of connecting to an InfiniBand network.

6.79.5.6 LinkState:

The desired link state for this interface.

- This property shall contain the desired link state for this interface.

string	Description
Disabled	This link is disabled.
Enabled	This link is enabled.

6.79.5.7 LinkStatus:

The link status for this interface.

- This property shall contain the link status for this interface.

string	Description
LinkDown	The link on this interface is down.
LinkUp	This link on this interface is up.
NoLink	No physical link detected on this interface.
Starting	This link on this interface is starting. A physical link has been established, but the port is not able to transfer data.
Training	This physical link on this interface is training.

6.79.5.8 MediumType:

The medium type connected to this SFP.

- This property shall contain the medium type used by the SFP.

string	Description
Copper	The medium connected is copper.
FiberOptic	The medium connected is fiber optic.

6.79.5.9 PortConnectionType:

The connection type of this port.

- This property shall contain the connection type for this port.

string	Description
DPort *(v1.5+)*	This port connection type is a diagnostic port.
EPort *(v1.5+)*	This port connection type is an extender fabric port.
EXPort *(v1.5+)*	This port connection type is an external fabric port.
ExtenderFabric	This port connection type is an extender fabric port.
FLPort *(v1.5+)*	This port connects in a fabric loop configuration.
FPort *(v1.5+)*	This port connection type is a fabric port.
Generic	This port connection type is a generic fabric port.
GPort *(v1.5+)*	This port connection type is a generic fabric port.
NLPort *(v1.5+)*	This port connects in a node loop configuration.
NotConnected	This port is not connected.
NPort	This port connects through an N-Port to a switch.
NPPort *(v1.5+)*	This port connection type is a proxy N port for N-Port virtualization.
PointToPoint	This port connects in a Point-to-point configuration.
PrivateLoop	This port connects in a private loop configuration.
PublicLoop	This port connects in a public configuration.
TEPort *(v1.5+)*	This port connection type is an trunking extender fabric port.
UPort *(v1.5+)*	This port connection type is unassigned.

6.79.5.10 PortIdSubtype:

The port ID subtype received from the remote partner across this link.

- This property shall contain the port ID subtype from IEEE 802.1AB-2009 Table 8-3 received from the remote partner across this link. If no such port ID subtype has been received, this property should not be present.

string	Description
AgentId	Agent circuit ID, based on the agent-local identifier of the circuit as defined in RFC3046.
ChassisComp	Chassis component, based in the value of entPhysicalAlias in RFC4133.
IfAlias	Interface alias, based on the ifAlias MIB object.

string	Description
IfName	Interface name, based on the ifName MIB object.
LocalAssign	Locally assigned, based on a alpha-numeric value locally assigned.
MacAddr	MAC address, based on an agent detected unicast source address as defined in IEEE Std. 802.
NetworkAddr	Network address, based on an agent detected network address.
NotTransmitted	No data to be sent to/received from remote partner.
PortComp	Port component, based in the value of entPhysicalAlias in RFC4133.

6.79.5.11 PortMedium:

The physical connection medium for this port.

- This property shall contain the physical connection medium for this port.

string	Description
Electrical	This port has an electrical cable connection.
Optical	This port has an optical cable connection.

6.79.5.12 PortProtocol:

The protocol being sent over this port.

- This property shall contain the protocol being sent over this port.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.

string	Description
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.

string	Description
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.

string	Description
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.

string	Description
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.79.5.13 PortType:

The type of this port.

- This property shall contain the port type for this port.

string	Description
BidirectionalPort	This port connects to any type of device.
DownstreamPort	This port connects to a target device.
InterswitchPort	This port connects to another switch.
ManagementPort	This port connects to a switch manager.
UnconfiguredPort	This port has not yet been configured.
UpstreamPort	This port connects to a host device.

6.79.5.14 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and

perform an implementation specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.

string	Description
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.79.5.15 SupportedEthernetCapabilities:

- The set of Ethernet capabilities that this port supports.
  - This property shall contain an array of Ethernet capabilities supported by this port.

string	Description
EEE	IEEE 802.3az Energy-Efficient Ethernet (EEE) is supported on this port.
WakeOnLAN	Wake on LAN (WoL) is supported on this port.

6.79.5.16 SupportedSFPTypes:

- The types of SFP devices that can be attached to this port.
  - This property shall contain an array of SFP device types supported by this port.

string	Description
cSFP	The SFP conforms to the CSFP MSA Specification.

string	Description
MiniSASHD	The SFP conforms to the SFF Specification SFF-8644.
QSFP	The SFP conforms to the SFF Specification for QSFP.
QSFP14	The SFP conforms to the SFF Specification for QSFP14.
QSFP28	The SFP conforms to the SFF Specification for QSFP28.
QSFP56	The SFP conforms to the SFF Specification for QSFP56.
QSFPPlus	The SFP conforms to the SFF Specification for QSFP+.
SFP	The SFP conforms to the SFF Specification for SFP.
SFP28	The SFP conforms to the SFF Specification for SFP+ and IEEE 802.3by Specification.
SFPDD	The SFP conforms to the SFP-DD MSA Specification.
SFPPlus	The SFP conforms to the SFF Specification for SFP+.

6.79.5.17 Type:

The type of SFP device that is attached to this port.

- This property shall contain the SFP device type currently attached to this port.

string	Description
cSFP	The SFP conforms to the CSFP MSA Specification.
MiniSASHD	The SFP conforms to the SFF Specification SFF-8644.
QSFP	The SFP conforms to the SFF Specification for QSFP.
QSFP14	The SFP conforms to the SFF Specification for QSFP14.
QSFP28	The SFP conforms to the SFF Specification for QSFP28.
QSFP56	The SFP conforms to the SFF Specification for QSFP56.
QSFPPlus	The SFP conforms to the SFF Specification for QSFP+.
SFP	The SFP conforms to the SFF Specification for SFP.
SFP28	The SFP conforms to the SFF Specification for SFP+ and IEEE 802.3by Specification.
SFPDD	The SFP conforms to the SFP-DD MSA Specification.

string	Description
SFPPlus	The SFP conforms to the SFF Specification for SFP+.

6.79.6 Example response

```
{
    "@odata.type": "#Port.v1_7_0.Port",
    "Id": "1",
    "Name": "SAS Port 1",
    "Description": "SAS Port 1",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "PortId": "1",
    "PortProtocol": "SAS",
    "PortType": "BidirectionalPort",
    "CurrentSpeedGbps": 48,
    "Width": 4,
    "MaxSpeedGbps": 48,
    "Actions": {
        "Oem": {}
    },
    "Links": {
        "AssociatedEndpoints": [
            {
                "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator1"
            }
        ]
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1/Ports/1"
}
```

6.80 PortMetrics 1.3.0

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2021.2	2021.1	2019.4

6.80.1 Description

The PortMetrics schema contains usage and health statistics for a switch device or component port summary.

- This resource shall represent the port metrics for a switch device or component port summary in a Redfish implementation.

6.80.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Chassis/*{ChassisId}*/MediaControllers/*{MediaControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Ports/*{PortId}*/Metrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*/Metrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/Metrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*/Metrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Managers/*{ManagerId}*/DedicatedNetworkPorts/*{PortId}*/Metrics
/redfish/v1/Managers/*{ManagerId}*/USBPorts/*{PortId}*/Metrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*/Metrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/Metrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*/Metrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports/

{PortId}/Metrics
/redfish/v1/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Systems/*{ComputerSystemId}*/GraphicsControllers/*{ControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StorageControllers/*{StorageControllerId}*/Ports/*{PortId}*/Metrics
/redfish/v1/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*/Ports/*{PortId}*/Metrics

6.80.3 Properties

Property	Type	Attributes	Notes
FibreChannel *(v1.2+)* {	object		The Fibre Channel-specific port metrics for network ports. • This property shall contain Fibre Channel-specific port metrics for network ports.
CorrectableFECErrors *(v1.2+)*	integer	*read-only (null)*	The total number of correctable forward error correction (FEC) errors. • This property shall contain the total number of times this port has received traffic with correctable forward error correction (FEC) errors.
InvalidCRCs *(v1.2+)*	integer	*read-only (null)*	The total number of invalid cyclic redundancy checks (CRCs). • This property shall contain the total number of invalid cyclic redundancy checks (CRCs) observed on this port.
InvalidTXWords *(v1.2+)*	integer	*read-only (null)*	The total number of invalid transmission words. • This property shall contain the total number of times this port has received invalid transmission words.
LinkFailures *(v1.2+)*	integer	*read-only (null)*	The total number of link failures. • This property shall contain the total number of link failures observed on this port.
LossesOfSignal *(v1.2+)*	integer	*read-only (null)*	The total number of losses of signal. • This property shall contain the total number of times this port has lost signal.

Property	Type	Attributes	Notes
LossesOfSync *(v1.2+)*	integer	*read-only (null)*	The total number of losses of sync. • This property shall contain the total number of times this port has lost sync.
RXBBCreditZero *(v1.2+)*	integer	*read-only (null)*	The number of times the receive buffer-to-buffer credit count transitioned to zero. • This property shall contain the number of times the receive buffer-to-buffer credit count transitioned to zero since last counter reset.
RXExchanges *(v1.2+)*	integer	*read-only (null)*	The total number of Fibre Channel exchanges received. • This property shall contain the total number of Fibre Channel exchanges received.
RXSequences *(v1.2+)*	integer	*read-only (null)*	The total number of Fibre Channel sequences received. • This property shall contain the total number of Fibre Channel sequences received.
TXBBCredits *(v1.2+)*	integer	*read-only (null)*	The number of transmit buffer-to-buffer credits the port is configured to use. • This property shall contain the number of transmit buffer-to-buffer credits the port is configured to use.
TXBBCreditZero *(v1.2+)*	integer	*read-only (null)*	The number of times the transmit buffer-to-buffer credit count transitioned to zero. • This property shall contain the number of times the transmit buffer-to-buffer credit count transitioned to zero since last counter reset.
TXBBCreditZeroDurationMilliseconds *(v1.2+)*	integer (ms)	*read-only (null)*	The total amount of time the port has been blocked from transmitting due to lack of buffer credits. • This property shall contain the total amount of time in milliseconds the port has been blocked from transmitting due to lack of buffer credits since the last counter reset.
TXExchanges *(v1.2+)*	integer	*read-only (null)*	The total number of Fibre Channel exchanges transmitted. • This property shall contain the total number of Fibre Channel exchanges transmitted.

Property	Type	Attributes	Notes
TXSequences *(v1.2+)*	integer	*read-only (null)*	The total number of Fibre Channel sequences transmitted. • This property shall contain the total number of Fibre Channel sequences transmitted.
UncorrectableFECErrors *(v1.2+)*	integer	*read-only (null)*	The total number of uncorrectable forward error correction (FEC) errors. • This property shall contain the total number of times this port has received traffic with uncorrectable forward error correction (FEC) errors.
}			
GenZ {	object		The port metrics specific to Gen-Z ports. • This property shall contain the port metrics specific to Gen-Z ports.
AccessKeyViolations	integer	*read-only (null)*	The total number of Access Key Violations detected. • This property shall contain the total number of Access Key Violations detected for packets received or transmitted on this interface.
EndToEndCRCErrors	integer	*read-only (null)*	The total number of ECRC transient errors detected. • This property shall contain total number of ECRC transient errors detected in received link-local and end-to-end packets.
LinkNTE	integer	*read-only (null)*	The total number of link-local non-transient errors detected. • This property shall contain the total number of link-local non-transient errors detected on this interface.
LLRRecovery	integer	*read-only (null)*	The total number of times Link-Level Reliability (LLR) recovery has been initiated. • This property shall contain the total number of times Link-level Reliability (LLR) recovery has been initiated by this interface. This is not to be confused with the number of packets retransmitted due to initiating LLR recovery.
MarkedECN	integer	*read-only (null)*	The number of packets with the Congestion ECN bit set. • This property shall contain the number of packets that the component set the Congestion ECN bit prior to transmission through this interface.

Property	Type	Attributes	Notes
NonCRCTransientErrors	integer	*read-only (null)*	The total number transient errors detected that are unrelated to CRC validation. • This property shall contain the total number of transient errors detected that are unrelated to CRC validation, which covers link-local and end-to-end packets, such as malformed Link Idle packets or PLA signal errors.
PacketCRCErrors	integer	*read-only (null)*	The total number of PCRC transient errors detected. • This property shall contain the total number of PCRC transient errors detected in received link-local and end-to-end packets.
PacketDeadlineDiscards	integer	*read-only (null)*	The number of packets discarded due to the Congestion Deadline sub-field reaching zero. • This property shall contain the number of packets discarded by this interface due to the Congestion Deadline sub-field reaching zero prior to packet transmission.
ReceivedECN	integer	*read-only (null)*	The number of packets received on this interface with the Congestion ECN bit set. • This property shall contain the number of packets received on this interface with the Congestion ECN bit set.
RXStompedECRC	integer	*read-only (null)*	The total number of packets received with a stomped ECRC field. • This property shall contain the total number of packets that this interface received with a stomped ECRC field.
TXStompedECRC	integer	*read-only (null)*	The total number of packets that this interface stomped the ECRC field. • This property shall contain the total number of packets that this interfaced stomped the ECRC field.
}			
Networking *(v1.1+)* {	object		The port metrics for network ports, including Ethernet, Fibre Channel, and InfiniBand, that are not specific to one of these protocols. • This property shall contain port metrics for network ports, including Ethernet, Fibre Channel, and InfiniBand, that are not specific to one of these protocols.

Property	Type	Attributes	Notes
RDMAProtectionErrors *(v1.1+)*	integer	*read-only (null)*	The total number of RDMA protection errors. • This property shall contain the total number of RDMA protection errors.
RDMAProtocolErrors *(v1.1+)*	integer	*read-only (null)*	The total number of RDMA protocol errors. • This property shall contain the total number of RDMA protocol errors.
RDMARXBytes *(v1.1+)*	integer	*read-only (null)*	The total number of RDMA bytes received on a port since reset. • This property shall contain the total number of RDMA bytes received on a port since reset.
RDMARXRequests *(v1.1+)*	integer	*read-only (null)*	The total number of RDMA requests received on a port since reset. • This property shall contain the total number of RDMA requests received on a port since reset.
RDMATXBytes *(v1.1+)*	integer	*read-only (null)*	The total number of RDMA bytes transmitted on a port since reset. • This property shall contain the total number of RDMA bytes transmitted on a port since reset.
RDMATXReadRequests *(v1.1+)*	integer	*read-only (null)*	The total number of RDMA read requests transmitted on a port since reset. • This property shall contain the total number of RDMA read requests transmitted on a port since reset.
RDMATXRequests *(v1.1+)*	integer	*read-only (null)*	The total number of RDMA requests transmitted on a port since reset. • This property shall contain the total number of RDMA requests transmitted on a port since reset.
RDMATXSendRequests *(v1.1+)*	integer	*read-only (null)*	The total number of RDMA send requests transmitted on a port since reset. • This property shall contain the total number of RDMA send requests transmitted on a port since reset.
RDMATXWriteRequests *(v1.1+)*	integer	*read-only (null)*	The total number of RDMA write requests transmitted on a port since reset. • This property shall contain the total number of RDMA write requests transmitted on a port since reset.

Property	Type	Attributes	Notes
RXBroadcastFrames *(v1.1+)*	integer	*read-only (null)*	The total number of valid broadcast frames received on a port since reset. • This property shall contain the total number of valid broadcast frames received on a port since reset, including host and remote management passthrough traffic.
RXDiscards *(v1.1+)*	integer	*read-only (null)*	The total number of frames discarded in a port's receive path since reset. • This property shall contain the total number of frames discarded in a port's receive path since reset.
RXFalseCarrierErrors *(v1.1+)*	integer	*read-only (null)*	The total number of false carrier errors received from phy on a port since reset. • This property shall contain the total number of false carrier errors received from phy on a port since reset.
RXFCSErrors *(v1.1+)*	integer	*read-only (null)*	The total number of frames received with frame check sequence (FCS) errors on a port since reset. • This property shall contain the total number of frames received with frame check sequence (FCS) errors on a port since reset.
RXFrameAlignmentErrors *(v1.1+)*	integer	*read-only (null)*	The total number of frames received with alignment errors on a port since reset. • This property shall contain the total number of frames received with alignment errors on a port since reset.
RXFrames *(v1.1+)*	integer	*read-only (null)*	The total number of frames received on a port since reset. • This property shall contain the total number of frames received on a port since reset.
RXMulticastFrames *(v1.1+)*	integer	*read-only (null)*	The total number of valid multicast frames received on a port since reset. • This property shall contain the total number of valid multicast frames received on a port since reset, including host and remote management passthrough traffic.
RXOversizeFrames *(v1.1+)*	integer	*read-only (null)*	The total number of frames that exceed the maximum frame size. • This property shall contain the total number of frames that exceed the maximum frame size.

Property	Type	Attributes	Notes
RXPauseXOFFFrames *(v1.1+)*	integer	*read-only (null)*	The total number of flow control frames from the network to pause transmission. • This property shall contain the total number of flow control frames from the network to pause transmission.
RXPauseXONFrames *(v1.1+)*	integer	*read-only (null)*	The total number of flow control frames from the network to resume transmission. • This property shall contain the total number of flow control frames from the network to resume transmission.
RXPFCFrames *(v1.1+)*	integer	*read-only (null)*	The total number of priority flow control (PFC) frames received on a port since reset. • This property shall contain the total number of priority flow control (PFC) frames received on a port since reset.
RXUndersizeFrames *(v1.1+)*	integer	*read-only (null)*	The total number of frames that are smaller than the minimum frame size of 64 bytes. • This property shall contain the total number of frames that are smaller than the minimum frame size of 64 bytes.
RXUnicastFrames *(v1.1+)*	integer	*read-only (null)*	The total number of valid unicast frames received on a port since reset. • This property shall contain the total number of valid unicast frames received on a port since reset.
TXBroadcastFrames *(v1.1+)*	integer	*read-only (null)*	The total number of good broadcast frames transmitted on a port since reset. • This property shall contain the total number of good broadcast frames transmitted on a port since reset, including host and remote management passthrough traffic.
TXDiscards *(v1.1+)*	integer	*read-only (null)*	The total number of frames discarded in a port's transmit path since reset. • This property shall contain the total number of frames discarded in a port's transmit path since reset.
TXExcessiveCollisions *(v1.1+)*	integer	*read-only (null)*	The number of times a single transmitted frame encountered more than 15 collisions. • This property shall contain the number of times a single transmitted frame encountered more than 15 collisions.

Property	Type	Attributes	Notes
TXFrames *(v1.1+)*	integer	*read-only (null)*	The total number of frames transmitted on a port since reset. • This property shall contain the total number of frames transmitted on a port since reset.
TXLateCollisions *(v1.1+)*	integer	*read-only (null)*	The total number of collisions that occurred after one slot time as defined by IEEE 802.3. • This property shall contain the total number of collisions that occurred after one slot time as defined by IEEE 802.3.
TXMulticastFrames *(v1.1+)*	integer	*read-only (null)*	The total number of good multicast frames transmitted on a port since reset. • This property shall contain the total number of good multicast frames transmitted on a port since reset, including host and remote management passthrough traffic.
TXMultipleCollisions *(v1.1+)*	integer	*read-only (null)*	The times that a transmitted frame encountered 2-15 collisions. • This property shall contain the times that a transmitted frame encountered 2-15 collisions.
TXPauseXOFFFrames *(v1.1+)*	integer	*read-only (null)*	The total number of XOFF frames transmitted to the network. • This property shall contain the total number of XOFF frames transmitted to the network.
TXPauseXONFrames *(v1.1+)*	integer	*read-only (null)*	The total number of XON frames transmitted to the network. • This property shall contain the total number of XON frames transmitted to the network.
TXPFCFrames *(v1.1+)*	integer	*read-only (null)*	The total number of priority flow control (PFC) frames sent on a port since reset. • This property shall contain the total number of priority flow control (PFC) frames sent on a port since reset.
TXSingleCollisions *(v1.1+)*	integer	*read-only (null)*	The times that a successfully transmitted frame encountered a single collision. • This property shall contain the times that a successfully transmitted frame encountered a single collision.

Property	Type	Attributes	Notes
TXUnicastFrames *(v1.1+)*	integer	*read-only (null)*	The total number of good unicast frames transmitted on a port since reset. • This property shall contain the total number of good unicast frames transmitted on a port since reset, including host and remote management passthrough traffic.
}			
PCIeErrors *(v1.3+)* {	object		The PCIe errors associated with this port. • This property shall contain the PCIe errors associated with this port.
CorrectableErrorCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe correctable errors for this device. • This property shall contain the total number of the PCIe correctable errors for this device.
FatalErrorCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe fatal errors for this device. • This property shall contain the total number of the PCIe fatal errors for this device.
L0ToRecoveryCount *(v1.8+)*	integer	*read-only (null)*	The total number of times the PCIe link states transitioned from L0 to the recovery state for this device. • This property shall contain the total number of times the PCIe link transitioned from L0 to the recovery state for this device.
NAKReceivedCount *(v1.8+)*	integer	*read-only (null)*	The total number of NAKs issued on the PCIe link by the receiver. • This property shall contain the total number of NAKs issued on the PCIe link by the receiver. A NAK is issued by the receiver when it detects that a TLP from this device was missed. This could be because this device did not transmit it, or because the receiver could not properly decode the packet.
NAKSentCount *(v1.8+)*	integer	*read-only (null)*	The total number of NAKs issued on the PCIe link by this device. • This property shall contain the total number of NAKs issued on the PCIe link by this device. A NAK is issued by the device when it detects that a TLP from the receiver was missed. This could be because the receiver did not transmit it, or because this device could not properly decode the packet.

Property	Type	Attributes	Notes
NonFatalErrorCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe non-fatal errors for this device. • This property shall contain the total number of the PCIe non-fatal errors for this device.
ReplayCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe replays issued by this device. • This property shall contain the total number of the replays issued on the PCIe link by this device. A replay is a retransmission of a TLP and occurs because the ACK timer is expired, which means that the receiver did not send the ACK or this device did not properly decode the ACK.
ReplayRolloverCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe replay rollovers issued by this device. • This property shall contain the total number of the replay rollovers issued on the PCIe link by this device. A replay rollover occurs when consecutive replays failed to resolve the errors on the link, which means that this device forced the link into the recovery state.
}			
RXBytes *(v1.1+)*	integer (bytes)	*read-only (null)*	The total number of bytes received on a port since reset. • This property shall contain the total number of bytes received on a port since reset, including host and remote management passthrough traffic, and inclusive of all protocol overhead.
RXErrors *(v1.1+)*	integer	*read-only (null)*	The total number of received errors on a port since reset. • This property shall contain the total number of received errors on a port since reset.
SAS *(v1.1+)* [{	array		The physical (phy) metrics for Serial Attached SCSI (SAS). Each member represents a single phy. • This property shall contain an array of physical related metrics for Serial Attached SCSI (SAS). Each member in the array shall represent a single phy.
InvalidDwordCount *(v1.1+)*	integer	*read-only (null)*	The number of invalid dwords that have been received by the phy outside of phy reset sequences. • This property shall contain the number of invalid dwords that have been received by the phy outside of phy reset sequences.

Property	Type	Attributes	Notes
LossOfDwordSynchronizationCount *(v1.1+)*	integer	*read-only (null)*	The number of times the phy has restarted the link reset sequence because it lost dword synchronization. • This property shall contain the number of times the phy has restarted the link reset sequence because it lost dword synchronization.
RunningDisparityErrorCount *(v1.1+)*	integer	*read-only (null)*	The number of dwords containing running disparity errors that have been received by the phy outside of phy reset sequences. • This property shall contain the number of dwords containing running disparity errors that have been received by the phy outside of phy reset sequences.
}]			
Transceivers *(v1.1+)* [{	array		The metrics for the transceivers in this port. Each member represents a single transceiver. • This property shall contain an array of transceiver related metrics for this port. Each member in the array shall represent a single transceiver.
RXInputPowerMilliWatts *(v1.1+)*	number (milliWatts)	*read-only (null)*	The RX input power value of a small form-factor pluggable (SFP) transceiver. • This property shall contain the RX input power value of a small form-factor pluggable (SFP) transceiver.
SupplyVoltage *(v1.1+)*	number (Volts)	*read-only (null)*	The supply voltage of a small form-factor pluggable (SFP) transceiver. • This property shall contain the supply voltage of a small form-factor pluggable (SFP) transceiver.
TXBiasCurrentMilliAmps *(v1.1+)*	number (mA)	*read-only (null)*	The TX bias current value of a small form-factor pluggable (SFP) transceiver. • This property shall contain the TX bias current value of a small form-factor pluggable (SFP) transceiver.
TXOutputPowerMilliWatts *(v1.1+)*	number (milliWatts)	*read-only (null)*	The TX output power value of a small form-factor pluggable (SFP) transceiver. • This property shall contain the TX output power value of a small form-factor pluggable (SFP) transceiver.
}]			

Property	Type	Attributes	Notes
TXBytes *(v1.1+)*	integer (bytes)	*read-only (null)*	The total number of bytes transmitted on a port since reset. • This property shall contain the total number of bytes transmitted on a port since reset, including host and remote management passthrough traffic, and inclusive of all protocol overhead.
TXErrors *(v1.1+)*	integer	*read-only (null)*	The total number of transmission errors on a port since reset. • This property shall contain the total number of transmission errors on a port since reset.

6.80.4 Example response

```
{
    "@odata.type": "#PortMetrics.v1_3_0.PortMetrics",
    "Id": "Metrics",
    "Name": "Gen-Z Port 1 Metrics",
    "GenZ": {
        "PacketCRCErrors": 24,
        "EndToEndCRCErrors": 3,
        "RXStompedECRC": 1,
        "TXStompedECRC": 2,
        "NonCRCTransientErrors": 2,
        "LLRRecovery": 1,
        "MarkedECN": 1,
        "PacketDeadlineDiscards": 1,
        "AccessKeyViolations": 1,
        "LinkNTE": 1,
        "ReceivedECN": 1
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/GenZ/Switches/Switch1/Ports/1/Metrics"
}
```

6.81 Power 1.7.1 (deprecated)

Version	*v1.7 Deprecated*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.4	2019.3	2017.3	2017.2	2017.1	2016.2	2016.1	1.0

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of the PowerSubsystem schema.

6.81.1 Description

The Power schema describes power metrics and represents the properties for power consumption and power limiting.

- This resource shall contain the power metrics for a Redfish implementation.

6.81.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/Power

6.81.3 Properties

Property	Type	Attributes	Notes
PowerControl [{	array		The set of power control functions, including power reading and limiting. • This property shall contain the set of power control readings and settings.
@odata.id	string (URI)	*read-only required*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions *(v1.3+)* {}	object		The available actions for this resource. • This property shall contain the available actions for this resource.
MemberId	string	*read-only required*	The identifier for the member within the collection. • This property shall uniquely identify the member within the collection. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
Name	string	*read-only (null)*	The power control function name. • This property shall contain the name of the power control function name.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PhysicalContext *(v1.4+)*	string (enum)	*read-only*	The area, device, or set of devices to which this power control applies. • This property shall contain a description of the affected device(s) or region within the chassis to which this power control applies. *For the possible property values, see PhysicalContext in Property details.*

Property	Type	Attributes	Notes
PowerAllocatedWatts	number (Watts)	*read-only (null)*	The total amount of power that has been allocated or budgeted to chassis. • This property shall represent the total power currently allocated or budgeted to the chassis.
PowerAvailableWatts	number (Watts)	*read-only (null)*	The amount of reserve power capacity, in watts, that remains. This value is the PowerCapacityWatts value minus the PowerAllocatedWatts value. • This property shall represent the amount of reserve power capacity, in watts, that remains. This value is the PowerCapacityWatts value minus the PowerAllocatedWatts value.
PowerCapacityWatts	number (Watts)	*read-only (null)*	The total amount of power that can be allocated to the chassis. This value can be either the power supply capacity or the power budget that an upstream chassis assigns to this chassis. • This property shall represent the total power capacity that can be allocated to the chassis.
PowerConsumedWatts	number (Watts)	*read-only (null)*	The actual power that the chassis consumes, in watts. • This property shall represent the actual power that the chassis consumes, in watts.
PowerLimit {	object		The power limit status and configuration information for this chassis. • This property shall contain power limit status and configuration information for this chassis.
CorrectionInMs	integer (ms)	*read-write (null)*	The time required for the limiting process to reduce power consumption to below the limit. • This property shall represent the time interval in ms required for the limiting process to react and reduce the power consumption below the limit.
LimitException	string (enum)	*read-write (null)*	The action that is taken if the power cannot be maintained below the LimitInWatts. • This property shall represent the action to be taken if the resource power consumption cannot be limited below the specified limit after several correction time periods. *For the possible property values, see LimitException in Property details.*
LimitInWatts	number (Watts)	*read-write (null)*	The power limit, in watts. If `null`, power capping is disabled. • This property shall represent the power capping limit, in watts, for the resource. If `null`, power capping shall be disabled.

Property	Type	Attributes	Notes
}			
PowerMetrics {	object		The power readings for this chassis. • This property shall contain power metrics for power readings, such as interval, minimum, maximum, and average power consumption, for the chassis.
AverageConsumedWatts	number (Watts)	*read-only (null)*	The average power level over the measurement window over the last IntervalInMin minutes. • This property shall represent the average power level that occurred over the last IntervalInMin minutes.
IntervalInMin	integer (min)	*read-only (null)*	The time interval, or window, over which the power metrics are measured. • This property shall represent the time interval or window, in minutes, over which the power metrics are measured.
MaxConsumedWatts	number (Watts)	*read-only (null)*	The highest power consumption level, in watts, that has occurred over the measurement window within the last IntervalInMin minutes. • This property shall represent the maximum power level, in watts, that occurred within the last IntervalInMin minutes.
MinConsumedWatts	number (Watts)	*read-only (null)*	The lowest power consumption level, in watts, over the measurement window that occurred within the last IntervalInMin minutes. • This property shall represent the minimum power level, in watts, that occurred within the last IntervalInMin minutes.
}			
PowerRequestedWatts	number (Watts)	*read-only (null)*	The potential power, in watts, that the chassis requests, which might be higher than the current level being consumed because the requested power includes a budget that the chassis wants for future use. • This property shall represent the amount of power, in watts, that the chassis currently requests to be budgeted for future use.
RelatedItem [{	array		An array of links to resources or objects associated with this power limit. • This property shall contain an array of links to resources or objects associated with this power limit.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

Property	Type	Attributes	Notes
}]			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
}]			
PowerSupplies [{	array		The set of power supplies associated with this system or device. • This property shall contain the set of power supplies associated with this system or device.
@odata.id	string (URI)	*read-only required*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions *(v1.3+)* {}	object		The available actions for this resource. • This property shall contain the available actions for this resource.
Assembly *(v1.5+)* {	object		The link to the assembly resource associated with this power supply. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
EfficiencyPercent *(v1.5+)*	number (%)	*read-only (null)*	The measured efficiency of this power supply as a percentage. • This property shall contain the measured power efficiency, as a percentage, of the associated power supply.
FirmwareVersion	string	*read-only (null)*	The firmware version for this power supply. • This property shall contain the firmware version as defined by the manufacturer for the associated power supply.

Property	Type	Attributes	Notes
HotPluggable *(v1.5+)*	boolean	*read-only (null)*	An indication of whether this device can be inserted or removed while the equipment is in operation. • This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Devices indicated as hot-pluggable shall allow the device to become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot-pluggable.
IndicatorLED *(v1.2+)*	string (enum)	*read-write (null)*	The state of The indicator LED, which identifies the power supply. • This property shall contain the indicator light state for the indicator light associated with this power supply. *For the possible property values, see IndicatorLED in Property details.*
InputRanges *(v1.1+)* [{	array		The input ranges that the power supply can use. • This property shall contain a collection of ranges usable by the power supply unit.
InputType *(v1.1+)*	string (enum)	*read-only (null)*	The Input type (AC or DC). • This property shall contain the input type (AC or DC) of the associated range. *For the possible property values, see InputType in Property details.*
MaximumFrequencyHz *(v1.1+)*	number (Hz)	*read-only (null)*	The maximum line input frequency at which this power supply input range is effective. • This property shall contain the value, in Hertz, of the maximum line input frequency that the power supply is capable of consuming for this range.
MaximumVoltage *(v1.1+)*	number (Volts)	*read-only (null)*	The maximum line input voltage at which this power supply input range is effective. • This property shall contain the value, in volts, of the maximum line input voltage that the power supply is capable of consuming for this range.
MinimumFrequencyHz *(v1.1+)*	number (Hz)	*read-only (null)*	The minimum line input frequency at which this power supply input range is effective. • This property shall contain the value, in Hertz, of the minimum line input frequency that the power supply is capable of consuming for this range.

Property	Type	Attributes	Notes
MinimumVoltage *(v1.1+)*	number (Volts)	*read-only (null)*	The minimum line input voltage at which this power supply input range is effective. • This property shall contain the value, in volts, of the minimum line input voltage that the power supply is capable of consuming for this range.
Oem *(v1.1+)* {}	object		See the OEM object definition in the Using this guide clause.
OutputWattage *(v1.1+)*	number (Watts)	*read-only (null)*	The maximum capacity of this power supply when operating in this input range. • This property shall contain the maximum amount of power, in watts, that the associated power supply is rated to deliver while operating in this input range.
}]			
LastPowerOutputWatts	number (Watts)	*read-only (null)*	The average power output of this power supply. • This property shall contain the average power output, measured in watts, of the associated power supply.
LineInputVoltage	number (Volts)	*read-only (null)*	The line input voltage at which the power supply is operating. • This property shall contain the value in Volts of the line input voltage (measured or configured for) that the power supply has been configured to operate with or is currently receiving.
LineInputVoltageType	string (enum)	*read-only (null)*	The line voltage type supported as an input to this power supply. • This property shall contain the type of input line voltage supported by the associated power supply. *For the possible property values, see LineInputVoltageType in Property details.*
Location *(v1.5+)* {}	object		The location of the power supply. • This property shall contain location information of the associated power supply. For property details, see Location.
Manufacturer *(v1.1+)*	string	*read-only (null)*	The manufacturer of this power supply. • This property shall contain the name of the organization responsible for producing the power supply. This organization may be the entity from whom the power supply is purchased, but this is not necessarily true.

Property	Type	Attributes	Notes
MemberId	string	*read-only required*	The identifier for the member within the collection. • This property shall uniquely identify the member within the collection. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
Model	string	*read-only (null)*	The model number for this power supply. • This property shall contain the model information as defined by the manufacturer for the associated power supply.
Name	string	*read-only (null)*	The name of the power supply. • This property shall contain a descriptive name for the associated power supply.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PartNumber	string	*read-only (null)*	The part number for this power supply. • This property shall contain the part number as defined by the manufacturer for the associated power supply.
PowerCapacityWatts	number (Watts)	*read-only (null)*	The maximum capacity of this power supply. • This property shall contain the maximum amount of power, in watts, that the associated power supply is rated to deliver.
PowerInputWatts *(v1.5+)*	number (Watts)	*read-only (null)*	The measured input power of this power supply. • This property shall contain the measured input power, in watts, of the associated power supply.
PowerOutputWatts *(v1.5+)*	number (Watts)	*read-only (null)*	The measured output power of this power supply. • This property shall contain the measured output power, in watts, of the associated power supply.
PowerSupplyType	string (enum)	*read-only (null)*	The power supply type (AC or DC). • This property shall contain the input power type (AC or DC) of the associated power supply. *For the possible property values, see PowerSupplyType in Property details.*

Property	Type	Attributes	Notes
Redundancy [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. • The set of redundancy groups for this power supply. ◦ This property shall contain an array of links to the redundancy groups to which this power supply belongs. For property details, see Redundancy.
RelatedItem [{	array		An array of links to resources or objects associated with this power supply. • This property shall contain an array of links to resources or objects associated with this power supply.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
SerialNumber	string	*read-only (null)*	The serial number for this power supply. • This property shall contain the serial number as defined by the manufacturer for the associated power supply.
SparePartNumber	string	*read-only (null)*	The spare part number for this power supply. • This property shall contain the spare or replacement part number as defined by the manufacturer for the associated power supply.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
}]			
Redundancy [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. • The redundancy information for the set of power supplies in this chassis. ◦ This property shall contain redundancy information for the set of power supplies in this system or device. For property details, see Redundancy.

Property	Type	Attributes	Notes
Voltages [{	array		The set of voltage sensors for this chassis. • This property shall contain the set of voltage sensors for this chassis.
@odata.id	string (URI)	*read-only required*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions *(v1.3+)* {}	object		The available actions for this resource. • This property shall contain the available actions for this resource.
LowerThresholdCritical	number (Volts)	*read-only (null)*	The value at which the reading is below normal range but not yet fatal. • This property shall contain the value at which the ReadingVolts property is below the normal range but is not yet fatal. The value of the property shall use the same units as the ReadingVolts property.
LowerThresholdFatal	number (Volts)	*read-only (null)*	The value at which the reading is below normal range and fatal. • This property shall contain the value at which the ReadingVolts property is below the normal range and is fatal. The value of the property shall use the same units as the ReadingVolts property.
LowerThresholdNonCritical	number (Volts)	*read-only (null)*	The value at which the reading is below normal range. • This property shall contain the value at which the ReadingVolts property is below normal range. The value of the property shall use the same units as the ReadingVolts property.
MaxReadingRange	number (Volts)	*read-only (null)*	Maximum value for this sensor. • This property shall indicate the highest possible value for the ReadingVolts property. The value of the property shall use the same units as the ReadingVolts property.
MemberId	string	*read-only required*	The identifier for the member within the collection. • This property shall uniquely identify the member within the collection. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
MinReadingRange	number (Volts)	*read-only (null)*	Minimum value for this sensor. • This property shall indicate the lowest possible value for the ReadingVolts property. The value of the property shall use the same units as the ReadingVolts property.

Property	Type	Attributes	Notes
Name	string	*read-only (null)*	Voltage sensor name. • This property shall contain the name of the Voltage sensor.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PhysicalContext	string (enum)	*read-only*	The area or device to which this voltage measurement applies. • This property shall contain a description of the affected device or region within the chassis to which this voltage measurement applies. *For the possible property values, see PhysicalContext in Property details.*
ReadingVolts	number (Volts)	*read-only (null)*	The reading of the voltage sensor. • This property shall contain the voltage sensor's reading.
RelatedItem [{	array		An array of links to resources or objects to which this voltage measurement applies. • This property shall contain an array of links to resources or objects to which this voltage measurement applies.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
SensorNumber	integer	*read-only (null)*	A numerical identifier to represent the voltage sensor. • This property shall contain a numerical identifier for this voltage sensor that is unique within this resource.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
UpperThresholdCritical	number (Volts)	*read-only (null)*	The value at which the reading is above normal range but not yet fatal. • This property shall contain the value at which the ReadingVolts property is above the normal range but is not yet fatal. The value of the property shall use the same units as the ReadingVolts property.

Property	Type	Attributes	Notes
UpperThresholdFatal	number (Volts)	*read-only (null)*	The value at which the reading is above normal range and fatal. • This property shall contain the value at which the ReadingVolts property is above the normal range and is fatal. The value of the property shall use the same units as the ReadingVolts property.
UpperThresholdNonCritical	number (Volts)	*read-only (null)*	The value at which the reading is above normal range. • This property shall contain the value at which the ReadingVolts property is above the normal range. The value of the property shall use the same units as the ReadingVolts property.
`}]`			

6.81.4 Actions

6.81.4.1 PowerSupplyReset *(v1.6+)*

Description

This action resets the targeted power supply.

- This action shall reset a power supply specified by the MemberId from the PowerSupplies array. A `GracefulRestart` ResetType shall reset the power supply but shall not affect the power output. A `ForceRestart` ResetType can affect the power supply output.

Action URI: {Base URI of target resource}/Actions/Power.PowerSupplyReset

Action parameters

Parameter Name	Type	Attributes	Notes
MemberId	string	*required*	The MemberId of the power supply within the PowerSupplies array on which to perform the reset. • This parameter shall contain the identifier of the member within the PowerSupplies array on which to perform the reset.
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a `GracefulRestart`. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "MemberId": "0",
    "ResetType": "ForceRestart"
}
```

6.81.5 Property details

6.81.5.1 IndicatorLED:

The state of The indicator LED, which identifies the power supply.

- This property shall contain the indicator light state for the indicator light associated with this power supply.

string	Description
Blinking	The indicator LED is blinking. • This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Lit	The indicator LED is lit. • This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Off	The indicator LED is off. • This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.

6.81.5.2 InputType:

The Input type (AC or DC).

- This property shall contain the input type (AC or DC) of the associated range.

string	Description
AC	Alternating Current (AC) input range.
DC	Direct Current (DC) input range.

6.81.5.3 LimitException:

The action that is taken if the power cannot be maintained below the LimitInWatts.

- This property shall represent the action to be taken if the resource power consumption cannot be limited below the specified limit after several correction time periods.

string	Description
HardPowerOff	Turn the power off immediately when the limit is exceeded.
LogEventOnly	Log an event when the limit is exceeded, but take no further action.
NoAction	Take no action when the limit is exceeded.
Oem	Take an OEM-defined action.

6.81.5.4 LineInputVoltageType:

The line voltage type supported as an input to this power supply.

- This property shall contain the type of input line voltage supported by the associated power supply.

string	Description
AC120V *(v1.1+)*	AC 120V nominal input.
AC240V *(v1.1+)*	AC 240V nominal input.
AC277V *(v1.1+)*	AC 277V nominal input.
ACandDCWideRange *(v1.1+)*	Wide range AC or DC input.
ACHighLine *(deprecated v1.1)*	277V AC input. *Deprecated in v1.1 and later. This value has been deprecated in favor of AC277V.*
ACLowLine *(deprecated v1.1)*	100-127V AC input. *Deprecated in v1.1 and later. This value has been deprecated in favor of AC120V.*
ACMidLine *(deprecated v1.1)*	200-240V AC input. *Deprecated in v1.1 and later. This value has been deprecated in favor of AC240V.*
ACWideRange *(v1.1+)*	Wide range AC input.

string	Description
DC240V *(v1.1+)*	DC 240V nominal input.
DC380V	High Voltage DC input (380V).
DCNeg48V	-48V DC input.
Unknown	The power supply line input voltage type cannot be determined.

6.81.5.5 PhysicalContext:

The area, device, or set of devices to which this power control applies.

- This property shall contain a description of the affected device(s) or region within the chassis to which this power control applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.

string	Description
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.

string	Description
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.81.5.6 PowerSupplyType:

The power supply type (AC or DC).

- This property shall contain the input power type (AC or DC) of the associated power supply.

string	Description
AC	Alternating Current (AC) power supply.
ACorDC	The power supply supports both DC or AC.
DC	Direct Current (DC) power supply.
Unknown	The power supply type cannot be determined.

6.81.5.7 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a `GracefulRestart`.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.

string	Description
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.81.6 Example response


```
{
    "@odata.type": "#Power.v1_7_1.Power",
    "Id": "Power",
    "Name": "Power",
    "PowerControl": [
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Power#/PowerControl/0",
            "MemberId": "0",
            "Name": "Server Power Control",
            "PowerConsumedWatts": 344,
            "PowerRequestedWatts": 800,
            "PowerAvailableWatts": 0,
            "PowerCapacityWatts": 800,
            "PowerAllocatedWatts": 800,
            "PowerMetrics": {
                "IntervalInMin": 30,
                "MinConsumedWatts": 271,
                "MaxConsumedWatts": 489,
                "AverageConsumedWatts": 319
            },
            "PowerLimit": {
```

```
                "LimitInWatts": 500,
                "LimitException": "LogEventOnly",
                "CorrectionInMs": 50
            },
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Systems/437XR1138R2"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U"
                }
            ],
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            },
            "Oem": {}
        }
    ],
    "Voltages": [
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Power#/Voltages/0",
            "MemberId": "0",
            "Name": "VRM1 Voltage",
            "SensorNumber": 11,
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            },
            "ReadingVolts": 12,
            "UpperThresholdNonCritical": 12.5,
            "UpperThresholdCritical": 13,
            "UpperThresholdFatal": 15,
            "LowerThresholdNonCritical": 11.5,
            "LowerThresholdCritical": 11,
            "LowerThresholdFatal": 10,
            "MinReadingRange": 0,
            "MaxReadingRange": 20,
            "PhysicalContext": "VoltageRegulator",
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Systems/437XR1138R2"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U"
                }
            ]
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Power#/Voltages/1",
```

```
            "MemberId": "1",
            "Name": "VRM2 Voltage",
            "SensorNumber": 12,
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            },
            "ReadingVolts": 5,
            "UpperThresholdNonCritical": 5.5,
            "UpperThresholdCritical": 7,
            "LowerThresholdNonCritical": 4.75,
            "LowerThresholdCritical": 4.5,
            "MinReadingRange": 0,
            "MaxReadingRange": 20,
            "PhysicalContext": "VoltageRegulator",
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Systems/437XR1138R2"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U"
                }
            ]
        }
    ],
    "PowerSupplies": [
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Power#/PowerSupplies/0",
            "MemberId": "0",
            "Name": "Power Supply Bay",
            "Status": {
                "State": "Enabled",
                "Health": "Warning"
            },
            "Oem": {},
            "PowerSupplyType": "AC",
            "LineInputVoltageType": "ACWideRange",
            "LineInputVoltage": 120,
            "PowerCapacityWatts": 800,
            "LastPowerOutputWatts": 325,
            "Model": "499253-B21",
            "Manufacturer": "ManufacturerName",
            "FirmwareVersion": "1.00",
            "SerialNumber": "1Z0000001",
            "PartNumber": "0000001A3A",
            "SparePartNumber": "0000001A3A",
            "InputRanges": [
                {
                    "InputType": "AC",
                    "MinimumVoltage": 100,
```

```
                    "MaximumVoltage": 120,
                    "OutputWattage": 800
                },
                {
                    "InputType": "AC",
                    "MinimumVoltage": 200,
                    "MaximumVoltage": 240,
                    "OutputWattage": 1300
                }
            ],
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Chassis/1U"
                }
            ]
        }
    ],
    "Actions": {
        "#Power.PowerSupplyReset": {
            "target": "/redfish/v1/Chassis/1U/Power/Actions/Power.PowerSupplyReset"
        }
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1U/Power"
}
```


6.82 PowerDistribution 1.2.2

Version	*v1.2*	*v1.1*	*v1.0*
Release	2021.3	2021.2	2019.4

6.82.1 Description

This is the schema definition for a power distribution component or unit, such as a floor power distribution unit (PDU) or switchgear.

- This resource shall be used to represent a power distribution component or unit for a Redfish implementation.

6.82.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*

/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*

6.82.3 Properties

Property	Type	Attributes	Notes
AssetTag	string	*read-write (null)*	The user-assigned asset tag for this equipment. • This property shall contain the user-assigned asset tag, which is an identifying string that tracks the equipment for inventory purposes.
Branches {	object		A link to the branch circuits for this equipment. • This property shall contain a link to a resource collection of type CircuitCollection that contains the branch circuits for this equipment. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Circuit*. See the Circuit schema for details.
}			
EquipmentType	string (enum)	*read-only required*	The type of equipment this resource represents. • This property shall contain the type of equipment this resource represents. *For the possible property values, see EquipmentType in Property details.*
Feeders {	object		A link to the feeder circuits for this equipment. • This property shall contain a link to a resource collection of type CircuitCollection that contains the feeder circuits for this equipment. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Circuit*. See the Circuit schema for details.
}			
FirmwareVersion	string	*read-only*	The firmware version of this equipment. • This property shall contain a string describing the firmware version of this equipment as provided by the manufacturer.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
Chassis [{	array		An array of links to the chassis that contain this equipment. • This property shall contain an array of links to resources of type Chassis that represents the physical container associated with this resource.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			
Facility {	object		A link to the facility that contains this equipment. • This property shall contain a link to a resource of type Facility that represents the facility that contains this equipment. See the *Facility* schema for details on this property.
@odata.id	string	*read-only*	Link to a Facility resource. See the Links section and the *Facility* schema for details.
}			
ManagedBy [{	array		An array of links to the managers responsible for managing this equipment. • This property shall contain an array of links to resources of type Manager that represent the managers that manage this equipment.
@odata.id	string	*read-only*	Link to a Manager resource. See the Links section and the *Manager* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
Location {}	object		The location of the equipment. • This property shall contain location information of the associated equipment. For property details, see Location.
Mains {	object		A link to the power input circuits for this equipment. • This property shall contain a link to a resource collection of type CircuitCollection that contains the power input circuits for this equipment. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to Collection of *Circuit*. See the Circuit schema for details.
}			
MainsRedundancy *(v1.1+)* {}	object		The redundancy information for the mains (input) circuits for this equipment. • This property shall contain redundancy information for the mains (input) circuits for this equipment. The values of the RedundancyGroup array shall reference resources of type Circuit. For property details, see RedundantGroup.
Manufacturer	string	*read-only* *(null)*	The manufacturer of this equipment. • This property shall contain the name of the organization responsible for producing the equipment. This organization may be the entity from which the equipment is purchased, but this is not necessarily true.
Metrics {	object		A link to the summary metrics for this equipment. • This property shall contain a link to a resource of type PowerDistributionMetrics. See the *PowerDistributionMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a PowerDistributionMetrics resource. See the Links section and the *PowerDistributionMetrics* schema for details.
}			
Model	string	*read-only* *(null)*	The product model number of this equipment. • This property shall contain the manufacturer-provided model information of this equipment.
OutletGroups {	object		A link to the outlet groups for this equipment. • This property shall contain a link to a resource collection of type OutletCollection that contains the outlet groups for this equipment. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *OutletGroup*. See the OutletGroup schema for details.
}			

Property	Type	Attributes	Notes
Outlets {	object		A link to the outlets for this equipment. • This property shall contain a link to a resource collection of type OutletCollection that contains the outlets for this equipment. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Outlet*. See the Outlet schema for details.
}			
PartNumber	string	*read-only* *(null)*	The part number for this equipment. • This property shall contain the manufacturer-provided part number for the equipment.
PowerSupplies *(v1.1+)* {	object		The link to the collection of power supplies for this equipment. • This property shall contain a link to a resource collection of type PowerSupplyCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PowerSupply*. See the PowerSupply schema for details.
}			
PowerSupplyRedundancy *(v1.1+)* [{ }]	array (object)		The redundancy information for the devices in a redundancy group. • The redundancy information for the set of power supplies for this equipment. ◦ This property shall contain redundancy information for the set of power supplies for this equipment. The values of the RedundancyGroup array shall reference resources of type PowerSupply. For property details, see RedundantGroup.
ProductionDate	string (date-time)	*read-only* *(null)*	The production or manufacturing date of this equipment. • This property shall contain the date of production or manufacture for this equipment.
Sensors {	object		A link to the collection of sensors located in the equipment and sub-components. • This property shall be a link to a resource collection of type SensorCollection that contains the sensors located in the equipment and sub-components. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Sensor*. See the Sensor schema for details.

Property	Type	Attributes	Notes
}			
SerialNumber	string	*read-only* *(null)*	The serial number for this equipment. • This property shall contain a manufacturer-allocated number that identifies the equipment.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
Subfeeds {	object		A link to the subfeed circuits for this equipment. • This property shall contain a link to a resource collection of type CircuitCollection that contains the subfeed circuits for this equipment. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Circuit*. See the Circuit schema for details.
}			
TransferConfiguration {	object	*(null)*	The configuration settings for an automatic transfer switch. • This property shall contain the configuration information regarding an automatic transfer switch function for this resource.
ActiveMainsId	string	*read-write* *(null)*	The mains circuit that is switched on and qualified to supply power to the output circuit. • This property shall contain the mains circuit that is switched on and qualified to supply power to the output circuit. The value shall be a string that matches the Id property value of a circuit contained in the collection referenced by the Mains property.
AutoTransferEnabled	boolean	*read-write* *(null)*	Indicates if the qualified alternate mains circuit is automatically switched on when the preferred mains circuit becomes unqualified and is automatically switched off. • This property shall indicate if the qualified alternate mains circuit is automatically switched on when the preferred mains circuit becomes unqualified and is automatically switched off.

Property	Type	Attributes	Notes
ClosedTransitionAllowed	boolean	*read-write (null)*	Indicates if a make-before-break switching sequence of the mains circuits is permitted when they are both qualified and in synchronization. • This property shall indicate if a make-before-break switching sequence of the mains circuits is permitted when they are both qualified and in synchronization.
ClosedTransitionTimeoutSeconds	integer	*read-write (null)*	The time in seconds to wait for a closed transition to occur. • This property shall contain the time in seconds to wait for a closed transition to occur.
PreferredMainsId	string	*read-write (null)*	The preferred source for the mains circuit to this equipment. • This property shall contain the preferred source for mains circuit to this equipment. The value shall be a string that matches the Id property value of a circuit contained in the collection referenced by the Mains property.
RetransferDelaySeconds	integer	*read-write (null)*	The time in seconds to delay the automatic transfer from the alternate mains circuit back to the preferred mains circuit. • This property shall contain the time in seconds to delay the automatic transfer from the alternate mains circuit back to the preferred mains circuit.
RetransferEnabled	boolean	*read-write (null)*	Indicates if the automatic transfer is permitted from the alternate mains circuit back to the preferred mains circuit after the preferred mains circuit is qualified again and the Retransfer Delay time has expired. • This property shall indicate if the automatic transfer is permitted from the alternate mains circuit back to the preferred mains circuit after the preferred mains circuit is qualified again and the RetransferDelaySeconds time has expired.
TransferDelaySeconds	integer	*read-write (null)*	The time in seconds to delay the automatic transfer from the preferred mains circuit to the alternate mains circuit when the preferred mains circuit is disqualified. • This property shall contain the time in seconds to delay the automatic transfer from the preferred mains circuit to the alternate mains circuit when the preferred mains circuit is disqualified. A value of zero shall mean it transfers as fast as possible.
TransferInhibit	boolean	*read-write (null)*	Indicates if any transfer is inhibited. • This property shall indicate if any transfer is inhibited.
}			

Property	Type	Attributes	Notes
TransferCriteria {	object	*(null)*	The criteria used to initiate a transfer for an automatic transfer switch. • This property shall contain the criteria for initiating a transfer within an automatic transfer switch function for this resource.
OverNominalFrequencyHz	number (Hz)	*read-write (null)*	The frequency in hertz over the nominal value that satisfies a criterion for transfer. • This property shall contain the frequency in hertz over the nominal value that satisfies a criterion for transfer.
OverVoltageRMSPercentage	number (%)	*read-write (null)*	The positive percentage of voltage RMS over the nominal value that satisfies a criterion for transfer. • This property shall contain the positive percentage of voltage RMS over the nominal value that satisfies a criterion for transfer.
TransferSensitivity	string (enum)	*read-write (null)*	The sensitivity to voltage waveform quality to satisfy the criterion for initiating a transfer. • This property shall contain the setting that adjusts the analytical sensitivity of the detection of the quality of voltage waveform that satisfies a criterion for transfer. *For the possible property values, see TransferSensitivity in Property details.*
UnderNominalFrequencyHz	number (Hz)	*read-write (null)*	The frequency in hertz under the nominal value that satisfies a criterion for transfer. • This property shall contain the frequency in hertz under the nominal value that satisfies a criterion for transfer.
UnderVoltageRMSPercentage	number (%)	*read-write (null)*	The negative percentage of voltage RMS under the nominal value that satisfies a criterion for transfer. • This property shall contain the negative percentage of voltage RMS under the nominal value that satisfies a criterion for transfer.
}			
UUID	string	*read-only (null)*	The UUID for this equipment. • This property shall contain the UUID for the equipment. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`

Property	Type	Attributes	Notes
Version	string	*read-only (null)*	The hardware version of this equipment. • This property shall contain the hardware version of this equipment as determined by the vendor or supplier.

6.82.4 Actions

6.82.4.1 TransferControl

Description

This action transfers control to the alternative input circuit.

- This action shall transfer power input from the existing mains circuit to the alternative mains circuit.

Action URI: {Base URI of target resource}/Actions/PowerDistribution.TransferControl

Action parameters

This action takes no parameters.

6.82.5 Property details

6.82.5.1 EquipmentType:

The type of equipment this resource represents.

- This property shall contain the type of equipment this resource represents.

string	Description
AutomaticTransferSwitch	An automatic power transfer switch.
Bus *(v1.2+)*	An electrical bus.
FloorPDU	A power distribution unit providing feeder circuits for further power distribution.
ManualTransferSwitch	A manual power transfer switch.
PowerShelf *(v1.1+)*	A power shelf.
RackPDU	A power distribution unit providing outlets for a rack or similar quantity of devices.

string	Description
Switchgear	Electrical switchgear.

6.82.5.2 TransferSensitivity:

The sensitivity to voltage waveform quality to satisfy the criterion for initiating a transfer.

- This property shall contain the setting that adjusts the analytical sensitivity of the detection of the quality of voltage waveform that satisfies a criterion for transfer.

string	Description
High	High sensitivity for initiating a transfer.
Low	Low sensitivity for initiating a transfer.
Medium	Medium sensitivity for initiating a transfer.

6.82.6 Example response


```
{
    "@odata.type": "#PowerDistribution.v1_2_2.PowerDistribution",
    "Id": "1",
    "EquipmentType": "RackPDU",
    "Name": "RackPDU1",
    "FirmwareVersion": "4.3.0",
    "Version": "1.03b",
    "ProductionDate": "2017-01-11T08:00:00Z",
    "Manufacturer": "Contoso",
    "Model": "ZAP4000",
    "SerialNumber": "29347ZT536",
    "PartNumber": "AA-23",
    "UUID": "32354641-4135-4332-4a35-313735303734",
    "AssetTag": "PDX-92381",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Location": {
        "Placement": {
            "Row": "North 1"
        }
    },
    "Mains": {
```

```
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Mains"
    },
    "Branches": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches"
    },
    "Outlets": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets"
    },
    "OutletGroups": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups"
    },
    "Metrics": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Metrics"
    },
    "Sensors": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors"
    },
    "Links": {
        "Facility": {
            "@odata.id": "/redfish/v1/Facilities/Room237"
        }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1"
}
```


6.83 PowerDistributionMetrics 1.3.0

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2021.4	2021.2	2021.1	2019.4

6.83.1 Description

This is the schema definition for the metrics of a power distribution component or unit, such as a floor power distribution unit (PDU) or switchgear.

- This resource shall be used to represent the metrics of a power distribution component or unit for a Redfish implementation.

6.83.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Metrics
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Metrics

/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Metrics
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Metrics
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Metrics
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Metrics

6.83.3 Properties

Property	Type	Attributes	Notes
AbsoluteHumidity *(v1.3+)* {}	object		Absolute humidity (g/cu m). • This property shall contain the absolute (volumetric) humidity sensor reading, in grams/cubic meter units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `AbsoluteHumidity`. For more information about this property, see SensorExcerpt in Property Details.
EnergykWh {	object (excerpt)		Energy consumption (kWh). • This property shall contain the total energy, in kilowatt-hours, for this resource, that represents the `Total` ElectricalContext sensor when multiple energy sensors exist. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentkVAh *(v1.5+)*	number (kV.A.h)	*read-only* *(null)*	Apparent energy (kVAh). • This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading *(v1.1+)*	number	*read-only* *(null)*	The total accumulation value for this sensor. • This property shall contain the total accumulation of the Reading property over the sensor's life time. This value shall not be reset by the ResetMetrics action.

Property	Type	Attributes	Notes
ReactivekVARh *(v1.5+)*	number (kV.A.h)	*read-only* *(null)*	Reactive energy (kVARh). • This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
Reading	number	*read-only* *(null)*	The sensor value. • This property shall contain the sensor value.
SensorResetTime	string (date-time)	*read-only* *(null)*	The date and time when the time-based properties were last reset. • This property shall contain the date and time when the ResetMetrics action was last performed or the service last reset the time-based property values.
}			
HumidityPercent *(v1.1+)* {}	object		Humidity (percent). • This property shall contain the humidity, in percent units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Humidity`. For more information about this property, see SensorExcerpt in Property Details.
PowerLoadPercent *(v1.2+)* {}	object		The power load (percent) for this equipment. • This property shall contain the power load, in percent units, for this device, that represents the `Total` ElectricalContext for this device. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Percent`. For more information about this property, see SensorExcerpt in Property Details.
PowerWatts {	object (excerpt)		Power consumption (W). • This property shall contain the total power, in watt units, for this resource, that represents the `Total` ElectricalContext sensor when multiple power sensors exist. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentVA	number (V.A)	*read-only* *(null)*	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees *(v1.5+)*	number	*read-only (null)*	The phase angle (degrees) between the current and voltage waveforms. • This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a ReadingType containing `Power`, and shall not appear in sensors with other ReadingType values.
PowerFactor	number	*read-only (null)*	The power factor for this sensor. • This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. PowerFactor is expressed in unit-less 1/100ths. This property can appear in sensors containing a ReadingType value of `Power`, and shall not appear in sensors of other ReadingType values.
ReactiveVAR	number (V.A)	*read-only (null)*	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. • This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}			
TemperatureCelsius *(v1.1+)* {}	object		Temperature (Celsius). • This property shall contain the temperature, in degrees Celsius units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Temperature`. For more information about this property, see SensorExcerpt in Property Details.

6.83.4 Actions

6.83.4.1 ResetMetrics

Description

This action resets the summary metrics related to this equipment.

- This action shall reset any time intervals or counted values for this equipment.

Action URI: {Base URI of target resource}/Actions/PowerDistributionMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.83.5 Property details

6.83.5.1 SensorExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.

6.83.6 Example response

```
{
    "@odata.type": "#PowerDistributionMetrics.v1_3_0.PowerDistributionMetrics",
    "Id": "Metrics",
    "Name": "Summary Metrics",
    "PowerWatts": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PDUPower",
        "Reading": 6438,
        "ApparentVA": 6300,
        "ReactiveVAR": 100,
        "PowerFactor": 0.93
    },
    "EnergykWh": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PDUEnergy",
        "Reading": 56438
    },
    "TemperatureCelsius": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PDUTemp",
```

```
            "Reading": 26.3
        },
        "HumidityPercent": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PDUHumidity",
            "Reading": 52.7
        },
        "Actions": {
            "#PowerDistributionMetrics.ResetMetrics": {
                "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Metrics/PowerDistributionMetrics.ResetMetrics"
            }
        },
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Metrics"
    }
```


6.84 PowerDomain 1.2.0

Version	*v1.2*	*v1.1*	*v1.0*
Release	2021.3	2021.2	2019.4

6.84.1 Description

The PowerDomain schema contains definition for the DCIM power domain.

- This resource shall be used to represent a DCIM power domain for a Redfish implementation.

6.84.2 URIs

/redfish/v1/Facilities/*{FacilityId}*/PowerDomains/*{PowerDomainId}*

6.84.3 Properties

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
ElectricalBuses *(v1.2+)* [{	array		An array of links to the electrical buses in this power domain. • This property shall contain an array of links to resources of type PowerDistribution that represent the electrical buses in this power domain.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
FloorPDUs [{	array		An array of links to the floor power distribution units in this power domain. • This property shall contain an array of links to resources of type PowerDistribution that represents the floor power distribution units in this power domain.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
ManagedBy [{	array		An array of links to the managers responsible for managing this power domain. • This property shall contain an array of links to resources of type Manager that represent the managers that manage this power domain.
@odata.id	string	*read-only*	Link to a Manager resource. See the Links section and the *Manager* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PowerShelves *(v1.1+)* [{	array		An array of links to the power shelves in this power domain. • This property shall contain an array of links to resources of type PowerDistribution that represents the power shelves in this power domain.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
RackPDUs [{	array		An array of links to the rack-level power distribution units in this power domain. • This property shall contain an array of links to resources of type PowerDistribution that represents the rack-level power distribution units in this power domain.

Property	Type	Attributes	Notes
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
Switchgear [{	array		An array of links to the switchgear in this power domain. • This property shall contain an array of links to resources of type PowerDistribution that represents the switchgear in this power domain.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
TransferSwitches [{	array		An array of links to the transfer switches in this power domain. • This property shall contain an array of links to resources of type PowerDistribution that represents the transfer switches in this power domain.
@odata.id	string	*read-write*	Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details.
}]			
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.84.4 Example response

```
{
    "@odata.type": "#PowerDomain.v1_2_0.PowerDomain",
    "Id": "Row1",
    "Name": "Row #1 Domain",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Links": {
        "ManagedBy": [
            {
                "@odata.id": "/redfish/v1/Managers/BMC"
            }
```

```
        ],
        "RackPDUs": [
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1"
            }
        ]
    },
    "@odata.id": "/redfish/v1/Facilities/Room237/PowerDomains/Row1"
}
```


6.85 PowerEquipment 1.2.0

Version	*v1.2*	*v1.1*	*v1.0*
Release	2021.3	2021.2	2019.4

6.85.1 Description

This is the schema definition for the set of power equipment.

- This resource shall be used to represent the set of power equipment for a Redfish implementation.

6.85.2 URIs

/redfish/v1/PowerEquipment

6.85.3 Properties

Property	Type	Attributes	Notes
ElectricalBuses *(v1.2+)* {	object		The link to a collection of electrical buses. • This property shall contain a link to a resource collection of type PowerDistributionCollection that contains a set of electrical bus units. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details.
}			

Property	Type	Attributes	Notes
FloorPDUs {	object		A link to a collection of floor power distribution units. • This property shall contain a link to a resource collection of type PowerDistributionCollection that contains a set of floor power distribution units. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details.
}			
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by or subordinate to this resource.
ManagedBy [{	array		An array of links to the managers responsible for managing this power equipment. • This property shall contain an array of links to resources of type Manager that represent the managers that manage this power equipment.
@odata.id	string	*read-only*	Link to a Manager resource. See the Links section and the *Manager* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
PowerShelves *(v1.1+)* {	object		A link to a collection of power shelves. • This property shall contain a link to a resource collection of type PowerDistributionCollection that contains a set of power shelves. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details.
}			
RackPDUs {	object		A link to a collection of rack-level power distribution units. • This property shall contain a link to a resource collection of type PowerDistributionCollection that contains a set of rack-level power distribution units. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details.
}			

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
Switchgear {	object		A link to a collection of switchgear. • This property shall contain a link to a resource collection of type PowerDistributionCollection that contains a set of switchgear. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details.
}			
TransferSwitches {	object		A link to a collection of transfer switches. • This property shall contain a link to a resource collection of type PowerDistributionCollection that contains a set of transfer switches. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details.
}			

6.85.4 Example response

```
{
    "@odata.type": "#PowerEquipment.v1_2_0.PowerEquipment",
    "Id": "PowerEquipment",
    "Name": "DCIM Power Equipment",
    "Status": {
        "State": "Enabled",
        "HealthRollup": "OK"
    },
    "FloorPDUs": {
        "@odata.id": "/redfish/v1/PowerEquipment/FloorPDUs"
    },
    "RackPDUs": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs"
    },
    "TransferSwitches": {
        "@odata.id": "/redfish/v1/PowerEquipment/TransferSwitches"
    },
    "Links": {},
    "@odata.id": "/redfish/v1/PowerEquipment"
}
```

6.86 PowerSubsystem 1.1.0

Version	*v1.1*	*v1.0*
Release	2021.2	2020.4

6.86.1 Description

This PowerSubsystem schema contains the definition for the power subsystem of a chassis.

- This resource shall represent a power subsystem for a Redfish implementation.

6.86.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem

6.86.3 Properties

Property	Type	Attributes	Notes
Allocation {	object		Power allocation for this subsystem. • This property shall contain the set of properties describing the allocation of power for this subsystem.
AllocatedWatts	number (Watts)	*read-only (null)*	The total amount of power that has been allocated or budgeted to this subsystem. • This property shall represent the total power currently allocated or budgeted to this subsystem.
RequestedWatts	number (Watts)	*read-only (null)*	The potential power, in watts, that the subsystem requests, which might be higher than the current level being consumed because the requested power includes a budget that the subsystem wants for future use. • This property shall represent the amount of power, in watts, that the subsystem currently requests to be budgeted for future use.
}			

Property	Type	Attributes	Notes
Batteries *(v1.1+)* {	object		The link to the collection of batteries within this subsystem. • This property shall contain a link to a resource collection of type BatteryCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Battery*. See the Battery schema for details.
}			
CapacityWatts	number (Watts)	*read-only* *(null)*	The total amount of power that can be allocated to this subsystem. This value can be either the power supply capacity or the power budget that an upstream chassis assigns to this subsystem. • This property shall represent the total power capacity that can be allocated to this subsystem.
PowerSupplies {	object		The link to the collection of power supplies within this subsystem. • This property shall contain a link to a resource collection of type PowerSupplyCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *PowerSupply*. See the PowerSupply schema for details.
}			
PowerSupplyRedundancy [{}]	array (object)		The redundancy information for the devices in a redundancy group. • The redundancy information for the set of power supplies in this subsystem. ◦ This property shall contain redundancy information for the set of power supplies in this subsystem. The values of the RedundancyGroup array shall reference resources of type PowerSupply. For property details, see RedundantGroup.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.86.4 Example response

```
{
    "@odata.type": "#PowerSubsystem.v1_1_0.PowerSubsystem",
    "Id": "PowerSubsystem",
    "Name": "Power Subsystem for Chassis",
```

```
    "CapacityWatts": 2000,
    "Allocation": {
        "RequestedWatts": 1500,
        "AllocatedWatts": 1200
    },
    "PowerSupplyRedundancy": [
        {
            "RedundancyType": "Failover",
            "MaxSupportedInGroup": 2,
            "MinNeededInGroup": 1,
            "RedundancyGroup": [
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay2"
                }
            ],
            "Status": {
                "State": "UnavailableOffline",
                "Health": "OK"
            }
        }
    ],
    "PowerSupplies": {
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies"
    },
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem"
}
```


6.87 PowerSupply 1.5.0

Version	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2022.1	2021.4	2021.3	2021.1	2020.4

6.87.1 Description

The PowerSupply schema describes a power supply unit.

- This resource shall represent a power supply for a Redfish implementation.

6.87.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/PowerSupplies/*{PowerSupplyId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/PowerSupplies/*{PowerSupplyId}*

6.87.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this power supply. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
EfficiencyRatings [{	array		The efficiency ratings of this power supply. • This property shall contain an array of efficiency ratings for this power supply.
EfficiencyPercent	number (%)	*read-only (null)*	The rated efficiency of this power supply at the specified load. • This property shall contain the rated efficiency, as a percentage, of this power supply at the specified load.
LoadPercent	number (%)	*read-only (null)*	The electrical load for this rating. • This property shall contain the load, as a percentage, of this power supply at which this efficiency rating is valid.
}]			
ElectricalSourceManagerURIs *(v1.2+)* [ ]	array (URI) (string, null)	*read-write*	The URIs of the management interfaces for the upstream electrical source connections for this power supply. • This property shall contain an array of URIs to the management applications or devices that provide monitoring or control of the upstream electrical sources that provide power to this power supply.

Property	Type	Attributes	Notes
ElectricalSourceNames *(v1.2+)* [ ]	array (string, null)	*read-write*	The names of the upstream electrical sources, such as circuits or outlets, connected to this power supply. • This property shall contain an arrays of strings that identify the upstream electrical sources, such as the names of circuits or outlets, that provide power to this power supply.
FirmwareVersion	string	*read-only (null)*	The firmware version for this power supply. • This property shall contain the firmware version as defined by the manufacturer for this power supply.
HotPluggable	boolean	*read-only (null)*	An indication of whether this device can be inserted or removed while the equipment is in operation. • This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Devices indicated as hot-pluggable shall allow the device to become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot-pluggable.
InputNominalVoltageType	string (enum)	*read-only (null)*	The nominal voltage type of the line input to this power supply. • This property shall contain the nominal voltage type of the input line voltage in use by this power supply. This value shall be one of the values shown in the NominalVoltageType property in the InputRanges array, if present. *For the possible property values, see InputNominalVoltageType in Property details.*
InputRanges [{	array		The input ranges that the power supply can use. • This property shall contain a collection of ranges usable by this power supply.
CapacityWatts	number (Watts)	*read-only (null)*	The maximum capacity of this power supply when operating in this input range. • This property shall contain the maximum amount of power, in watts, that the associated power supply is rated to deliver while operating in this input range.
NominalVoltageType	string (enum)	*read-only (null)*	The input voltage range. • This property shall contain the input voltage type of the associated range. *For the possible property values, see NominalVoltageType in Property details.*

Property	Type	Attributes	Notes
}]			
LineInputStatus *(v1.3+)*	string (enum)	*read-only* *(null)*	The status of the line input. • This property shall contain the status of the power line input for this power supply. *For the possible property values, see LineInputStatus in Property details.*
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Outlet *(deprecated v1.4)* {	object		A link to the outlet connected to this power supply. • This property shall contain a link to a resource of type Outlet that represents the outlet connected to this power supply. See the *Outlet* schema for details on this property. *Deprecated in v1.4 and later. This property has been deprecated in favor of the PowerOutlets property to allow for consistent modeling of power supplies with multiple outlet support.*
@odata.id	string	*read-write*	Link to a Outlet resource. See the Links section and the *Outlet* schema for details.
}			
PoweringChassis *(v1.4+)* [{	array		An array of links to the chassis that are directly powered by this power supply. • This property shall contain an array of links to resources of type Chassis that represent the chassis directly powered by this power supply. This property shall not be present if the power supply is only providing power to its containing parent chassis.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			
PowerOutlets *(v1.2+)* [{	array		An array of links to the outlets that provide power to this power supply. • This property shall contain an array of links to resources of type Outlet that represent the outlets that provide power to this power supply.
@odata.id	string	*read-write*	Link to a Outlet resource. See the Links section and the *Outlet* schema for details.
}]			

Property	Type	Attributes	Notes
}			
Location {}	object		The location of the power supply. • This property shall contain location information of this power supply. For property details, see Location.
LocationIndicatorActive	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource.
Manufacturer	string	*read-only (null)*	The manufacturer of this power supply. • This property shall contain the name of the organization responsible for producing the power supply. This organization may be the entity from whom the power supply is purchased, but this is not necessarily true.
Metrics {	object		The link to the power supply metrics resource associated with this power supply. • This property shall contain a link to a resource of type PowerSupplyMetrics. See the *PowerSupplyMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a PowerSupplyMetrics resource. See the Links section and the *PowerSupplyMetrics* schema for details.
}			
Model	string	*read-only (null)*	The model number for this power supply. • This property shall contain the model information as defined by the manufacturer for this power supply.
OutputNominalVoltageType *(v1.5+)*	string (enum)	*read-only (null)*	The nominal output voltage type of this power supply. • This property shall contain the nominal voltage type of the single output line of this power supply. This property is intended to describe power supply types that connect to additional power infrastructure components, such as a rectifier component in a modular power system. This property shall not be present for power supplies not intended to connect to additional power infrastructure components. *For the possible property values, see OutputNominalVoltageType in Property details.*

Property	Type	Attributes	Notes
OutputRails [{	array		The output power rails provided by this power supply. • This property shall contain an array of output power rails provided by this power supply. The elements shall be ordered in ascending nominal voltage order. This ordering is necessary for consistency with Sensor properties in an associated PowerSupplyMetrics resource.
NominalVoltage	number	*read-only (null)*	The nominal voltage of this output power rail. • This property shall contain the nominal voltage of the associated output power rail.
PhysicalContext	string (enum)	*read-only*	The area or device to which this power rail applies. • This property shall contain a description of the device or region within the chassis to which this power rail applies. *For the possible property values, see PhysicalContext in Property details.*
}]			
PartNumber	string	*read-only (null)*	The part number for this power supply. • This property shall contain the part number as defined by the manufacturer for this power supply.
PhaseWiringType	string (enum)	*read-only (null)*	The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires) provided for the power supply input connector. • This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires) included in the input connector for the power supply. *For the possible property values, see PhaseWiringType in Property details.*
PlugType	string (enum)	*read-only (null)*	The type of plug according to NEMA, IEC, or regional standards. • This property shall contain the type of physical plug used for the input to this power supply, as defined by IEC, NEMA, or regional standard. *For the possible property values, see PlugType in Property details.*
PowerCapacityWatts	number (Watts)	*read-only (null)*	The maximum capacity of this power supply. • This property shall contain the maximum amount of power, in watts, that this power supply is rated to deliver.
PowerSupplyType	string (enum)	*read-only (null)*	The power supply type (AC or DC). • This property shall contain the input power type (AC or DC) of this power supply. *For the possible property values, see PowerSupplyType in Property details.*

Property	Type	Attributes	Notes
ProductionDate *(v1.1+)*	string (date-time)	*read-only (null)*	The production or manufacturing date of this power supply. • This property shall contain the date of production or manufacture for this power supply.
Replaceable *(v1.5+)*	boolean	*read-only (null)*	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. • This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of `false` indicates the component needs to be replaced by policy, as part of another component. If the `LocationType` property of this component contains `Embedded`, this property shall contain `false`.
SerialNumber	string	*read-only (null)*	The serial number for this power supply. • This property shall contain the serial number as defined by the manufacturer for this power supply.
SparePartNumber	string	*read-only (null)*	The spare part number for this power supply. • This property shall contain the spare or replacement part number as defined by the manufacturer for this power supply.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
Version *(v1.1+)*	string	*read-only (null)*	The hardware version of this power supply. • This property shall contain the hardware version of this power supply as determined by the vendor or supplier.

6.87.4 Actions

6.87.4.1 Reset

Description

This action resets the power supply.

- This action shall reset a power supply. A `GracefulRestart` ResetType shall reset the power supply but shall not affect the power output. A `ForceRestart` ResetType can affect the power supply output.

Action URI: {Base URI of target resource}/Actions/PowerSupply.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a `GracefulRestart`. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ForceRestart"
}
```

6.87.5 Property details

6.87.5.1 InputNominalVoltageType:

The nominal voltage type of the line input to this power supply.

- This property shall contain the nominal voltage type of the input line voltage in use by this power supply. This value shall be one of the values shown in the NominalVoltageType property in the InputRanges array, if present.

string	Description
AC100To127V	AC 100-127V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-127VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To240V	AC 100-240V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To277V	AC 100-277V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-277VAC. Range values are generally used to describe support on device inputs or inlets.

string	Description
AC120V	AC 120V nominal. • This value shall indicate the device supports a nominal voltage of 120VAC. Specific values are generally used to describe support on device outputs or outlets.
AC200To240V	AC 200-240V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC200To277V	AC 200-277V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC208V	AC 208V nominal. • This value shall indicate the device supports a nominal voltage of 208VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC230V	AC 230V nominal. • This value shall indicate the device supports a nominal voltage of 230AC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC240AndDC380V	AC 200-240V and DC 380V. • This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC240V	AC 240V nominal. • This value shall indicate the device supports a nominal voltage of 240VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC277AndDC380V	AC 200-277V and DC 380V. • This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC277V	AC 277V nominal. • This value shall indicate the device supports a nominal voltage of 277VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
AC400V	AC 400V or 415V nominal. • This value shall indicate the device supports a nominal voltage of 400VAC or 415VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.

string	Description
AC480V	AC 480V nominal. • This value shall indicate the device supports a nominal voltage of 480VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
DC12V	DC 12V nominal. • This value shall indicate the device supports a nominal voltage of 12VDC.
DC16V	DC 16V nominal. • This value shall indicate the device supports a nominal voltage of 16VDC.
DC1_8V	DC 1.8V nominal. • This value shall indicate the device supports a nominal voltage of 1.8VDC.
DC240V	DC 240V nominal. • This value shall indicate the device supports a nominal voltage of 240VDC.
DC380V	High Voltage DC (380V). • This value shall indicate the device supports a nominal voltage of 380VDC.
DC3_3V	DC 3.3V nominal. • This value shall indicate the device supports a nominal voltage of 3.3VDC.
DC48V	DC 48V nominal. • This value shall indicate the device supports a nominal voltage of 48VDC.
DC5V	DC 5V nominal. • This value shall indicate the device supports a nominal voltage of 5VDC.
DC9V	DC 9V nominal. • This value shall indicate the device supports a nominal voltage of 9VDC.
DCNeg48V	-48V DC. • This value shall indicate the device supports a nominal voltage of -48VDC.

6.87.5.2 LineInputStatus:

The status of the line input.

- This property shall contain the status of the power line input for this power supply.

string	Description
LossOfInput	No power detected at line input.
Normal	Line input is within normal operating range.
OutOfRange	Line input voltage or current is outside of normal operating range.

6.87.5.3 NominalVoltageType:

The input voltage range.

- This property shall contain the input voltage type of the associated range.

string	Description
AC100To127V	AC 100-127V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-127VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To240V	AC 100-240V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To277V	AC 100-277V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC120V	AC 120V nominal. • This value shall indicate the device supports a nominal voltage of 120VAC. Specific values are generally used to describe support on device outputs or outlets.
AC200To240V	AC 200-240V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC200To277V	AC 200-277V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC. Range values are generally used to describe support on device inputs or inlets.

string	Description
AC208V	AC 208V nominal. • This value shall indicate the device supports a nominal voltage of 208VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC230V	AC 230V nominal. • This value shall indicate the device supports a nominal voltage of 230AC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC240AndDC380V	AC 200-240V and DC 380V. • This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC240V	AC 240V nominal. • This value shall indicate the device supports a nominal voltage of 240VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC277AndDC380V	AC 200-277V and DC 380V. • This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC277V	AC 277V nominal. • This value shall indicate the device supports a nominal voltage of 277VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
AC400V	AC 400V or 415V nominal. • This value shall indicate the device supports a nominal voltage of 400VAC or 415VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
AC480V	AC 480V nominal. • This value shall indicate the device supports a nominal voltage of 480VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
DC12V	DC 12V nominal. • This value shall indicate the device supports a nominal voltage of 12VDC.
DC16V	DC 16V nominal. • This value shall indicate the device supports a nominal voltage of 16VDC.

string	Description
DC1_8V	DC 1.8V nominal. • This value shall indicate the device supports a nominal voltage of 1.8VDC.
DC240V	DC 240V nominal. • This value shall indicate the device supports a nominal voltage of 240VDC.
DC380V	High Voltage DC (380V). • This value shall indicate the device supports a nominal voltage of 380VDC.
DC3_3V	DC 3.3V nominal. • This value shall indicate the device supports a nominal voltage of 3.3VDC.
DC48V	DC 48V nominal. • This value shall indicate the device supports a nominal voltage of 48VDC.
DC5V	DC 5V nominal. • This value shall indicate the device supports a nominal voltage of 5VDC.
DC9V	DC 9V nominal. • This value shall indicate the device supports a nominal voltage of 9VDC.
DCNeg48V	-48V DC. • This value shall indicate the device supports a nominal voltage of -48VDC.

6.87.5.4 OutputNominalVoltageType:

The nominal output voltage type of this power supply.

- This property shall contain the nominal voltage type of the single output line of this power supply. This property is intended to describe power supply types that connect to additional power infrastructure components, such as a rectifier component in a modular power system. This property shall not be present for power supplies not intended to connect to additional power infrastructure components.

string	Description
AC100To127V	AC 100-127V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-127VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To240V	AC 100-240V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC100To277V	AC 100-277V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 100-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC120V	AC 120V nominal. • This value shall indicate the device supports a nominal voltage of 120VAC. Specific values are generally used to describe support on device outputs or outlets.
AC200To240V	AC 200-240V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC. Range values are generally used to describe support on device inputs or inlets.
AC200To277V	AC 200-277V nominal. • This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC. Range values are generally used to describe support on device inputs or inlets.
AC208V	AC 208V nominal. • This value shall indicate the device supports a nominal voltage of 208VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC230V	AC 230V nominal. • This value shall indicate the device supports a nominal voltage of 230AC. Specific AC voltage values are generally used to describe support on device outputs or outlets.
AC240AndDC380V	AC 200-240V and DC 380V. • This value shall indicate the device supports a nominal voltage in the complete range of 200-240VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC240V	AC 240V nominal. • This value shall indicate the device supports a nominal voltage of 240VAC. Specific AC voltage values are generally used to describe support on device outputs or outlets.

string	Description
AC277AndDC380V	AC 200-277V and DC 380V. • This value shall indicate the device supports a nominal voltage in the complete range of 200-277VAC or a value of 380VDC. Range values are generally used to describe support on device inputs or inlets.
AC277V	AC 277V nominal. • This value shall indicate the device supports a nominal voltage of 277VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
AC400V	AC 400V or 415V nominal. • This value shall indicate the device supports a nominal voltage of 400VAC or 415VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
AC480V	AC 480V nominal. • This value shall indicate the device supports a nominal voltage of 480VAC. Specific AC high voltage values may be used to describe support on device inputs or outputs.
DC12V	DC 12V nominal. • This value shall indicate the device supports a nominal voltage of 12VDC.
DC16V	DC 16V nominal. • This value shall indicate the device supports a nominal voltage of 16VDC.
DC1_8V	DC 1.8V nominal. • This value shall indicate the device supports a nominal voltage of 1.8VDC.
DC240V	DC 240V nominal. • This value shall indicate the device supports a nominal voltage of 240VDC.
DC380V	High Voltage DC (380V). • This value shall indicate the device supports a nominal voltage of 380VDC.
DC3_3V	DC 3.3V nominal. • This value shall indicate the device supports a nominal voltage of 3.3VDC.
DC48V	DC 48V nominal. • This value shall indicate the device supports a nominal voltage of 48VDC.

string	Description
DC5V	DC 5V nominal. • This value shall indicate the device supports a nominal voltage of 5VDC.
DC9V	DC 9V nominal. • This value shall indicate the device supports a nominal voltage of 9VDC.
DCNeg48V	-48V DC. • This value shall indicate the device supports a nominal voltage of -48VDC.

6.87.5.5 PhaseWiringType:

The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires) provided for the power supply input connector.

- This property shall contain the number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires) included in the input connector for the power supply.

string	Description
OneOrTwoPhase3Wire	Single or Two-Phase / 3-Wire (Line1, Line2 or Neutral, Protective Earth). • This value shall represent a Single or Two-Phase / 3-Wire (Line1, Line2 or Neutral, Protective Earth) wiring. This value shall be used when both phase configurations are supported. This is most common where detachable cordsets are used.
OnePhase3Wire	Single-phase / 3-Wire (Line1, Neutral, Protective Earth). • This value shall represent a Single-phase / 3-Wire (Line1, Neutral, Protective Earth) wiring.
ThreePhase4Wire	Three-phase / 4-Wire (Line1, Line2, Line3, Protective Earth). • This value shall represent a Three-phase / 4-Wire (Line1, Line2, Line3, Protective Earth) wiring.
ThreePhase5Wire	Three-phase / 5-Wire (Line1, Line2, Line3, Neutral, Protective Earth). • This value shall represent a Three-phase / 5-Wire (Line1, Line2, Line3, Neutral, Protective Earth) wiring.
TwoPhase3Wire	Two-phase / 3-Wire (Line1, Line2, Protective Earth). • This value shall represent a Two-phase / 3-Wire (Line1, Line2, Protective Earth) wiring.

string	Description
TwoPhase4Wire	Two-phase / 4-Wire (Line1, Line2, Neutral, Protective Earth). • This value shall represent a Two-phase / 4-Wire (Line1, Line2, Neutral, Protective Earth) wiring.

6.87.5.6 PhysicalContext:

The area or device to which this power rail applies.

- This property shall contain a description of the device or region within the chassis to which this power rail applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.

string	Description
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).

string	Description
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.87.5.7 PlugType:

The type of plug according to NEMA, IEC, or regional standards.

- This property shall contain the type of physical plug used for the input to this power supply, as defined by IEC, NEMA, or regional standard.

string	Description
California_CS8265	California Standard CS8265 (Single-phase 250V; 50A; 2P3W). • This value shall represent a plug that matches the 'California Standard' CS8265 style plug (Three-phase 250V; 50A; 3P4W).
California_CS8365	California Standard CS8365 (Three-phase 250V; 50A; 3P4W). • This value shall represent a plug that matches the 'California Standard' CS8365 style plug (Three-phase 250V; 50A; 3P4W).
Field_208V_3P4W_60A	Field-wired; Three-phase 200-250V; 60A; 3P4W. • This value shall represent field-wired input is three-phase 200-250V; 60A; 3P4W. It is appropriate for use on a 60A branch circuit.
Field_400V_3P5W_32A	Field-wired; Three-phase 200-240/346-415V; 32A; 3P5W. • This value shall represent field-wired input is three-phase 200-240/346-415V; 32A; 3P5W. It is appropriate for use on a 30, 32A, or 40A branch circuit.
IEC_60309_316P6	IEC 60309 316P6 (Single-phase 200-250V; 16A; 1P3W; Blue, 6-hour). • This value shall represent a plug that matches the IEC 60309 316P6 plug (Single-phase 200-250V; 16A; 1P3W; Blue, 6-hour).

string	Description
IEC_60309_332P6	IEC 60309 332P6 (Single-phase 200-250V; 32A; 1P3W; Blue, 6-hour). • This value shall represent a plug that matches the IEC 60309 332P6 plug (Single-phase 200-250V; 32A; 1P3W; Blue, 6-hour).
IEC_60309_363P6	IEC 60309 363P6 (Single-phase 200-250V; 63A; 1P3W; Blue, 6-hour). • This value shall represent a plug that matches the IEC 60309 363P6 plug (Single-phase 200-250V; 63A; 1P3W; Blue, 6-hour).
IEC_60309_460P9	IEC 60309 460P9 (Three-phase 200-250V; 60A; 3P4W; Blue; 9-hour). • This value shall represent a plug that matches the IEC 60309 460P9 plug (Three-phase 200-250V; 60A; 3P4W; Blue; 9-hour).
IEC_60309_516P6	IEC 60309 516P6 (Three-phase 200-240/346-415V; 16A; 3P5W; Red; 6-hour). • This value shall represent a plug that matches the IEC 60309 516P6 plug (Three-phase 200-240/346-415V; 16A; 3P5W; Red; 6-hour).
IEC_60309_532P6	IEC 60309 532P6 (Three-phase 200-240/346-415V; 32A; 3P5W; Red; 6-hour). • This value shall represent a plug that matches the IEC 60309 plug 532P6 (Three-phase 200-240/346-415V; 32A; 3P5W; Red; 6-hour).
IEC_60309_560P9	IEC 60309 560P9 (Three-phase 120-144/208-250V; 60A; 3P5W; Blue; 9-hour). • This value shall represent a plug that matches the IEC 60309 plug 560P9 (Three-phase 120-144/208-250V; 60A; 3P5W; Blue; 9-hour).
IEC_60309_563P6	IEC 60309 563P6 (Three-phase 200-240/346-415V; 63A; 3P5W; Red; 6-hour). • This value shall represent a plug that matches the IEC 60309 563P6 plug (Three-phase 200-240/346-415V; 63A; 3P5W; Red; 6-hour).
IEC_60320_C14	IEC C14 (Single-phase 250V; 10A; 1P3W). • This value shall represent a plug that matches the IEC 60320 specified C14 input (Single-phase 250V; 10A; 1P3W).
IEC_60320_C20	IEC C20 (Single-phase 250V; 16A; 1P3W). • This value shall represent a plug that matches the IEC 60320 specified C20 input (Single-phase 250V; 16A; 1P3W).
NEMA_5_15P	NEMA 5-15P (Single-phase 125V; 15A; 1P3W). • This value shall represent a plug that matches the NEMA specified 5-15 straight (non-locking) plug (Single-phase 125V; 15A; 1P3W).

string	Description
NEMA_5_20P	NEMA 5-20P (Single-phase 125V; 20A; 1P3W). • This value shall represent a plug that matches the NEMA specified 5-20 straight (non-locking) plug that exhibits a T-slot (Single-phase 125V; 20A; 1P3W).
NEMA_6_15P	NEMA 6-15P (Single-phase 250V; 15A; 2P3W). • This value shall represent a plug that matches the NEMA specified 6-15 straight (non-locking) plug (Single-phase 250V; 15A; 2P3W).
NEMA_6_20P	NEMA 6-20P (Single-phase 250V; 20A; 2P3W). • This value shall represent a plug that matches the NEMA specified 6-20 straight (non-locking) plug (Single-phase 250V; 20A; 2P3W).
NEMA_L14_20P	NEMA L14-20P (Split-phase 125/250V; 20A; 2P4W). • This value shall represent a plug that matches the NEMA specified locking L14-20 plug (Split-phase 125/250V; 20A; 2P4W).
NEMA_L14_30P	NEMA L14-30P (Split-phase 125/250V; 30A; 2P4W). • This value shall represent a plug that matches the NEMA specified locking L14-30 plug (Split-phase 125/250V; 30A; 2P4W).
NEMA_L15_20P	NEMA L15-20P (Three-phase 250V; 20A; 3P4W). • This value shall represent a plug that matches the NEMA specified locking L15-20 plug (Three-phase 250V; 20A; 3P4W).
NEMA_L15_30P	NEMA L15-30P (Three-phase 250V; 30A; 3P4W). • This value shall represent a plug that matches the NEMA specified locking L15-30 plug (Three-phase 250V; 30A; 3P4W).
NEMA_L21_20P	NEMA L21-20P (Three-phase 120/208V; 20A; 3P5W). • This value shall represent a plug that matches the NEMA specified locking L21-20 plug (Three-phase 120/208V; 20A; 3P5W).
NEMA_L21_30P	NEMA L21-30P (Three-phase 120/208V; 30A; 3P5W). • This value shall represent a plug that matches the NEMA specified locking L21-30 plug (Three-phase 120/208V; 30A; 3P5W).
NEMA_L22_20P	NEMA L22-20P (Three-phase 277/480V; 20A; 3P5W). • This value shall represent a plug that matches the NEMA specified locking L22-20 plug (Three-phase 277/480V; 20A; 3P5W).

string	Description
NEMA_L22_30P	NEMA L22-30P (Three-phase 277/480V; 30A; 3P5W). • This value shall represent a plug that matches the NEMA specified locking L22-30 plug (Three-phase 277/480V; 30A; 3P5W).
NEMA_L5_15P	NEMA L5-15P (Single-phase 125V; 15A; 1P3W). • This value shall represent a plug that matches the NEMA specified locking L5-15 plug (Single-phase 125V; 15A; 1P3W).
NEMA_L5_20P	NEMA L5-20P (Single-phase 125V; 20A; 1P3W). • This value shall represent a plug that matches the NEMA specified locking L5-20 plug (Single-phase 125V; 20A; 1P3W).
NEMA_L5_30P	NEMA L5-30P (Single-phase 125V; 30A; 1P3W). • This value shall represent a plug that matches the NEMA specified locking L5-30 plug (Single-phase 125V; 30A; 1P3W).
NEMA_L6_15P	NEMA L6-15P (Single-phase 250V; 15A; 2P3W). • This value shall represent a plug that matches the NEMA specified locking L6-15 plug (Single-phase 250V; 15A; 2P3W).
NEMA_L6_20P	NEMA L6-20P (Single-phase 250V; 20A; 2P3W). • This value shall represent a plug that matches the NEMA specified locking L6-20 plug (Single-phase 250V; 20A; 2P3W).
NEMA_L6_30P	NEMA L6-30P (Single-phase 250V; 30A; 2P3W). • This value shall represent a plug that matches the NEMA specified locking L6-30 plug (Single-phase 250V; 30A; 2P3W).

6.87.5.8 PowerSupplyType:

The power supply type (AC or DC).

- This property shall contain the input power type (AC or DC) of this power supply.

string	Description
AC	Alternating Current (AC) power supply.
ACorDC	The power supply supports both DC or AC.

string	Description
DC	Direct Current (DC) power supply.
DCRegulator *(v1.5+)*	Direct Current (DC) voltage regulator.

6.87.5.9 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and shall perform a `GracefulRestart`.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

string	Description
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.87.6 Example response

```
{
    "@odata.type": "#PowerSupply.v1_5_0.PowerSupply",
    "Id": "Bay1",
    "Name": "Power Supply Bay 1",
    "Status": {
```

```
        "State": "Enabled",
        "Health": "Warning"
    },
    "LineInputStatus": "Normal",
    "Model": "RKS-440DC",
    "Manufacturer": "Contoso Power",
    "FirmwareVersion": "1.00",
    "SerialNumber": "3488247",
    "PartNumber": "23456-133",
    "SparePartNumber": "93284-133",
    "LocationIndicatorActive": false,
    "HotPluggable": false,
    "PowerCapacityWatts": 400,
    "PhaseWiringType": "OnePhase3Wire",
    "PlugType": "IEC_60320_C14",
    "InputRanges": [
        {
            "NominalVoltageType": "AC200To240V",
            "CapacityWatts": 400
        },
        {
            "NominalVoltageType": "AC120V",
            "CapacityWatts": 350
        },
        {
            "NominalVoltageType": "DC380V",
            "CapacityWatts": 400
        }
    ],
    "EfficiencyRatings": [
        {
            "LoadPercent": 25,
            "EfficiencyPercent": 75
        },
        {
            "LoadPercent": 50,
            "EfficiencyPercent": 85
        },
        {
            "LoadPercent": 90,
            "EfficiencyPercent": 80
        }
    ],
    "OutputRails": [
        {
            "NominalVoltage": 3.3,
            "PhysicalContext": "SystemBoard"
        },
        {
            "NominalVoltage": 5,
```

```
            "PhysicalContext": "SystemBoard"
        },
        {
            "NominalVoltage": 12,
            "PhysicalContext": "StorageDevice"
        }
    ],
    "Location": {
        "PartLocation": {
            "ServiceLabel": "PSU 1",
            "LocationType": "Bay",
            "LocationOrdinalValue": 0
        }
    },
    "Links": {
        "Outlet": {
            "@odata.id": "https://redfishpdu.contoso.com/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A4"
        }
    },
    "Assembly": {
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/Assembly"
    },
    "Metrics": {
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/Metrics"
    },
    "Actions": {
        "#PowerSupply.Reset": {
            "target": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/PowerSupply.Reset"
        }
    },
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1"
}
```


6.88 PowerSupplyMetrics 1.0.1

Version	*v1.0*
Release	2020.4

6.88.1 Description

The PowerSupplyMetrics schema contains definitions for the metrics of a power supply.

- This resource shall be used to represent the metrics of a power supply unit for a Redfish implementation.

6.88.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/PowerSupplies/*{PowerSupplyId}*/Metrics
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/PowerSupplies/*{PowerSupplyId}*/Metrics

6.88.3 Properties

Property	Type	Attributes	Notes
EnergykWh {	object (excerpt)		The energy consumption (kWh) of this unit. • This property shall contain the total energy, in kilowatt-hours units, for this unit, that represents the `Total` ElectricalContext sensor when multiple energy sensors exist. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `EnergykWh`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentkVAh *(v1.5+)*	number (kV.A.h)	*read-only (null)*	Apparent energy (kVAh). • This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
LifetimeReading *(v1.1+)*	number	*read-only (null)*	The total accumulation value for this sensor. • This property shall contain the total accumulation of the Reading property over the sensor's life time. This value shall not be reset by the ResetMetrics action.
ReactivekVARh *(v1.5+)*	number (kV.A.h)	*read-only (null)*	Reactive energy (kVARh). • This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.

Property	Type	Attributes	Notes
SensorResetTime	string (date-time)	*read-only (null)*	The date and time when the time-based properties were last reset. • This property shall contain the date and time when the ResetMetrics action was last performed or the service last reset the time-based property values.
}			
FanSpeedPercent {	object (excerpt)		The fan speed (percent) for this power supply. • This property shall contain the fan speed, in percent units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Percent`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
SpeedRPM *(v1.2+)*	number ({rev}/min)	*read-only (null)*	The rotational speed. • This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
}			
FrequencyHz {	object (excerpt)		The frequency (Hz) for this power supply. • This property shall contain the frequency, in hertz units, for this power supply. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}			

Property	Type	Attributes	Notes
InputCurrentAmps {	object (excerpt)		The input current (A) for this power supply. • This property shall contain the input current, in ampere units, for this power supply. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
}			
InputPowerWatts {	object (excerpt)		The input power (W) for this power supply. • This property shall contain the input power, in watt units, for this power supply. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentVA	number (V.A)	*read-only (null)*	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.

Property	Type	Attributes	Notes
PhaseAngleDegrees *(v1.5+)*	number	*read-only* *(null)*	The phase angle (degrees) between the current and voltage waveforms. • This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a ReadingType containing `Power`, and shall not appear in sensors with other ReadingType values.
PowerFactor	number	*read-only* *(null)*	The power factor for this sensor. • This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. PowerFactor is expressed in unit-less 1/100ths. This property can appear in sensors containing a ReadingType value of `Power`, and shall not appear in sensors of other ReadingType values.
ReactiveVAR	number (V.A)	*read-only* *(null)*	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. • This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
Reading	number	*read-only* *(null)*	The sensor value. • This property shall contain the sensor value.
}			
InputVoltage {	object (excerpt)		The input voltage (V) for this power supply. • This property shall contain the input voltage, in volt units, for this power supply. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
CrestFactor *(v1.1+)*	number	*read-only* *(null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.

Property	Type	Attributes	Notes
Reading	number	*read-only* *(null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only* *(null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
}			
OutputPowerWatts {	object (excerpt)		The total power output (W) for this power supply. • This property shall contain the total output power, in watt units, for this power supply. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentVA	number (V.A)	*read-only* *(null)*	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees *(v1.5+)*	number	*read-only* *(null)*	The phase angle (degrees) between the current and voltage waveforms. • This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a ReadingType containing `Power`, and shall not appear in sensors with other ReadingType values.
PowerFactor	number	*read-only* *(null)*	The power factor for this sensor. • This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. PowerFactor is expressed in unit-less 1/100ths. This property can appear in sensors containing a ReadingType value of `Power`, and shall not appear in sensors of other ReadingType values.

Property	Type	Attributes	Notes
ReactiveVAR	number (V.A)	*read-only (null)*	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. • This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}			
RailCurrentAmps [{	array (excerpt)		The output currents (A) for this power supply. • This property shall contain the output currents, in ampere units, for this power supply. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Current`. The sensors shall appear in the same array order as the OutputRails property in the associated PowerSupply resource. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
}]			

Property	Type	Attributes	Notes
RailPowerWatts [{	array (excerpt)		The output power readings (W) for this power supply. • This property shall contain the output power readings, in watt units, for this power supply. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Power`. The sensors shall appear in the same array order as the OutputRails property in the associated PowerSupply resource. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
ApparentVA	number (V.A)	*read-only (null)*	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
PhaseAngleDegrees *(v1.5+)*	number	*read-only (null)*	The phase angle (degrees) between the current and voltage waveforms. • This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a ReadingType containing `Power`, and shall not appear in sensors with other ReadingType values.
PowerFactor	number	*read-only (null)*	The power factor for this sensor. • This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. PowerFactor is expressed in unit-less 1/100ths. This property can appear in sensors containing a ReadingType value of `Power`, and shall not appear in sensors of other ReadingType values.
ReactiveVAR	number (V.A)	*read-only (null)*	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. • This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}]			

Property	Type	Attributes	Notes
RailVoltage [{	array (excerpt)		The output voltages (V) for this power supply. • This property shall contain the output voltages, in volt units, for this power supply. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. The sensors shall appear in the same array order as the OutputRails property in the associated PowerSupply resource. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
}]			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
TemperatureCelsius {	object (excerpt)		The temperature (C) for this power supply. • This property shall contain the temperature, in degrees Celsius units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Temperature`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

Property	Type	Attributes	Notes
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
}			

6.88.4 Actions

6.88.4.1 ResetMetrics

Description

This action resets the summary metrics related to this equipment.

- This action shall reset any time intervals or counted values for this equipment.

Action URI: {Base URI of target resource}/Actions/PowerSupplyMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.88.5 Example response


```
{
    "@odata.type": "#PowerSupplyMetrics.v1_0_1.PowerSupplyMetrics",
    "Id": "Metrics",
    "Name": "Metrics for Power Supply 1",
    "Status": {
        "State": "Enabled",
        "Health": "Warning"
    },
    "InputVoltage": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputVoltage",
        "Reading": 230.2
    },
    "InputCurrentAmps": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputCurrent",
```

```
        "Reading": 5.19
    },
    "InputPowerWatts": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputPower",
        "Reading": 937.4
    },
    "RailVoltage": [
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_3VOutput",
            "Reading": 3.31
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_5VOutput",
            "Reading": 5.03
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_12VOutput",
            "Reading": 12.06
        }
    ],
    "RailCurrentAmps": [
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_3VCurrent",
            "Reading": 9.84
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_5VCurrent",
            "Reading": 1.25
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_12Current",
            "Reading": 2.58
        }
    ],
    "OutputPowerWatts": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1OutputPower",
        "Reading": 937.4
    },
    "RailPowerWatts": [
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_3VPower",
            "Reading": 79.84
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_5VPower",
            "Reading": 26.25
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_12VPower",
            "Reading": 91.58
```

```
            }
        ],
        "EnergykWh": {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1Energy",
            "Reading": 325675
        },
        "FrequencyHz": {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputFrequency",
            "Reading": 60
        },
        "TemperatureCelsius": {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1Temp",
            "Reading": 43.9
        },
        "FanSpeedPercent": {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1Fan",
            "Reading": 68,
            "SpeedRPM": 3290
        },
        "Actions": {
            "#PowerSupplyMetrics.ResetMetrics": {
                "target": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/Metrics/PowerSupplyMetrics.ResetMetrics"
            }
        },
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/Metrics"
    }
```


6.89 PrivilegeRegistry 1.1.4

Version	*v1.1*	*v1.0*
Release	2017.1	2016.3

6.89.1 Description

The PrivilegeRegistry schema describes the operation-to-privilege mappings.

- This Resource contains operation-to-privilege mappings.

6.89.2 Properties

Property	Type	Attributes	Notes
Mappings [{	array		The mappings between entities and the relevant privileges that access those entities. • This property shall describe the mappings between entities and the relevant privileges that access those entities.
Entity	string	*read-only*	The Resource name, such as `Manager`. • This property shall contain the Resource name, such as `Manager`.
OperationMap {	object		List mapping between HTTP methods and privilege required for the Resource. • This property shall list the mapping between HTTP methods and the privilege required for the Resource.
DELETE [{	array		The privilege required to complete an HTTP DELETE operation. • This property shall contain the privilege required to complete an HTTP DELETE operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
GET [{	array		The privilege required to complete an HTTP GET operation. • This property shall contain the privilege required to complete an HTTP GET operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			

Property	Type	Attributes	Notes
HEAD [{	array		The privilege required to complete an HTTP HEAD operation. • This property shall contain the privilege required to complete an HTTP HEAD operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
PATCH [{	array		The privilege required to complete an HTTP PATCH operation. • This property shall contain the privilege required to complete an HTTP PATCH operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
POST [{	array		The privilege required to complete an HTTP POST operation. • This property shall contain the privilege required to complete an HTTP POST operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
PUT [{	array		The privilege required to complete an HTTP PUT operation. • This property shall contain the privilege required to complete an HTTP PUT operation.

Property	Type	Attributes	Notes
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
}			
PropertyOverrides [{	array		The privilege overrides of properties within a Resource. • This property shall contain the privilege overrides of properties, such as the `Password` property in the `ManagerAccount` Resource.
OperationMap {	object		The mapping between the HTTP operation and the privilege required to complete the operation. • This property shall contain the mapping between the HTTP operation and the privilege required to complete the operation.
DELETE [{	array		The privilege required to complete an HTTP DELETE operation. • This property shall contain the privilege required to complete an HTTP DELETE operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
GET [{	array		The privilege required to complete an HTTP GET operation. • This property shall contain the privilege required to complete an HTTP GET operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			

Property	Type	Attributes	Notes
HEAD [{	array		The privilege required to complete an HTTP HEAD operation. • This property shall contain the privilege required to complete an HTTP HEAD operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
PATCH [{	array		The privilege required to complete an HTTP PATCH operation. • This property shall contain the privilege required to complete an HTTP PATCH operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
POST [{	array		The privilege required to complete an HTTP POST operation. • This property shall contain the privilege required to complete an HTTP POST operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
PUT [{	array		The privilege required to complete an HTTP PUT operation. • This property shall contain the privilege required to complete an HTTP PUT operation.

Property	Type	Attributes	Notes
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
}			
Targets [ ]	array (string, null)	*read-only*	The set of URIs, Resource types, or properties. • This property shall contain the array of URIs, Resource types, or properties. For example, `/redfish/v1/Systems/1`, `Manager`, or `Password`. When the Targets property is not present, no override is specified.
}]			
ResourceURIOverrides [{	array		The privilege overrides of Resource URIs. • This property shall contain the privilege overrides of Resource URIs. The target lists the Resource URI and the new privileges.
OperationMap {	object		The mapping between the HTTP operation and the privilege required to complete the operation. • This property shall contain the mapping between the HTTP operation and the privilege required to complete the operation.
DELETE [{	array		The privilege required to complete an HTTP DELETE operation. • This property shall contain the privilege required to complete an HTTP DELETE operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
GET [{	array		The privilege required to complete an HTTP GET operation. • This property shall contain the privilege required to complete an HTTP GET operation.

Property	Type	Attributes	Notes
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
HEAD [{	array		The privilege required to complete an HTTP HEAD operation. • This property shall contain the privilege required to complete an HTTP HEAD operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
PATCH [{	array		The privilege required to complete an HTTP PATCH operation. • This property shall contain the privilege required to complete an HTTP PATCH operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
POST [{	array		The privilege required to complete an HTTP POST operation. • This property shall contain the privilege required to complete an HTTP POST operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			

Property	Type	Attributes	Notes
PUT [{	array		The privilege required to complete an HTTP PUT operation. • This property shall contain the privilege required to complete an HTTP PUT operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
}			
Targets [ ]	array (string, null)	*read-only*	The set of URIs, Resource types, or properties. • This property shall contain the array of URIs, Resource types, or properties. For example, `/redfish/v1/Systems/1`, `Manager`, or `Password`. When the Targets property is not present, no override is specified.
}]			
SubordinateOverrides [{	array		The privilege overrides of the subordinate Resource. • This property shall contain the privilege overrides of the subordinate Resource. The target lists are identified by Resource type.
OperationMap {	object		The mapping between the HTTP operation and the privilege required to complete the operation. • This property shall contain the mapping between the HTTP operation and the privilege required to complete the operation.
DELETE [{	array		The privilege required to complete an HTTP DELETE operation. • This property shall contain the privilege required to complete an HTTP DELETE operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			

Property	Type	Attributes	Notes
GET [{	array		The privilege required to complete an HTTP GET operation. • This property shall contain the privilege required to complete an HTTP GET operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
HEAD [{	array		The privilege required to complete an HTTP HEAD operation. • This property shall contain the privilege required to complete an HTTP HEAD operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
PATCH [{	array		The privilege required to complete an HTTP PATCH operation. • This property shall contain the privilege required to complete an HTTP PATCH operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
POST [{	array		The privilege required to complete an HTTP POST operation. • This property shall contain the privilege required to complete an HTTP POST operation.

Property	Type	Attributes	Notes
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
PUT [{	array		The privilege required to complete an HTTP PUT operation. • This property shall contain the privilege required to complete an HTTP PUT operation.
Privilege [ ]	array (string)	*read-only*	An array of privileges that are required to complete a specific HTTP operation on a Resource. • This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.
}]			
}			
Targets [ ]	array (string, null)	*read-only*	The set of URIs, Resource types, or properties. • This property shall contain the array of URIs, Resource types, or properties. For example, `/redfish/v1/Systems/1`, `Manager`, or `Password`. When the Targets property is not present, no override is specified.
}]			
}]			
OEMPrivilegesUsed [ ]	array (string)	*read-only*	The set of OEM privileges used in this mapping. • This property shall contain an array of OEM privileges used in this mapping.
PrivilegesUsed [ ]	array (string (enum))	*read-only*	• The set of Redfish standard privileges used in this mapping. ◦ This property shall contain an array of Redfish standard privileges used in this mapping. *For the possible property values, see PrivilegesUsed in Property details.*

6.89.3 Property details

6.89.3.1 PrivilegesUsed:

- The set of Redfish standard privileges used in this mapping.
  - This property shall contain an array of Redfish standard privileges used in this mapping.

string	Description
AdministrateStorage	Administrator for storage subsystems and storage systems found in the storage collection and storage system collection respectively.
AdministrateSystems	Adminsitrator for systems found in the systems collection. Able to manage boot configuration, keys, and certificates for systems.
ConfigureComponents	Can configure components that this service manages.
ConfigureCompositionInfrastructure	Can view and configure composition service resources. • This value shall be used to indicate the user can view and configure composition service resources without matching the Client property in the ResourceBlock or CompositionReservation resources.
ConfigureManager	Can configure managers.
ConfigureSelf	Can change the password for the current user account and log out of their own sessions.
ConfigureUsers	Can configure users and their accounts.
Login	Can log in to the service and read Resources.
NoAuth	Authentication is not required. • This value shall be used to indicate an operation does not require authentication. This privilege shall not be used in Redfish Roles.
OperateStorageBackup	Operator for storage backup functionality for storage subsystems and storage systems found in the storage collection and storage system collection respectively.
OperateSystems	Operator for systems found in the systems colletion. Able to perform resets and configure interfaces.

6.89.4 Example response

```
{
    "@odata.type": "#PrivilegeRegistry.v1_1_4.PrivilegeRegistry",
    "Id": "Contoso_1.0.1_PrivilegeRegistry",
```

```
"Name": "Privilege Map",
"PrivilegesUsed": [
    "Login",
    "ConfigureManager",
    "ConfigureUsers",
    "ConfigureComponents",
    "ConfigureSelf"
],
"OEMPrivilegesUsed": [],
"Mappings": [
    {
        "Entity": "Manager",
        "OperationMap": {
            "GET": [
                {
                    "Privilege": [
                        "Login"
                    ]
                }
            ],
            "HEAD": [
                {
                    "Privilege": [
                        "Login"
                    ]
                }
            ],
            "PATCH": [
                {
                    "Privilege": [
                        "ConfigureManager"
                    ]
                }
            ],
            "POST": [
                {
                    "Privilege": [
                        "ConfigureManager"
                    ]
                }
            ],
            "PUT": [
                {
                    "Privilege": [
                        "ConfigureManager"
                    ]
                }
            ],
            "DELETE": [
                {
```

```
                        "Privilege": [
                            "ConfigureManager"
                        ]
                    }
                ]
            }
        }
    ],
    "@odata.id": "/redfish/v1/JobService"
}
```


6.90 Processor 1.16.0

Version	*v1.16*	*v1.15*	*v1.14*	*v1.13*	*v1.12*	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	...
Release	2022.2	2022.1	2021.4	2021.2	2021.1	2020.4	2020.3	2020.2	2020.1	2019.4	2019.3	...

6.90.1 Description

The Processor schema describes the information about a single processor that a system contains. A processor includes both performance characteristics, clock speed, architecture, core count, and so on, and compatibility, such as the CPU ID instruction results.

- This resource shall represent a single processor that a system contains. A processor includes both performance characteristics, clock speed, architecture, core count, and so on, and compatibility, such as the CPU ID instruction results.

6.90.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*

6.90.3 Properties

Property	Type	Attributes	Notes
AccelerationFunctions *(v1.4+)* {	object		The link to the collection of acceleration functions associated with this processor. • This property shall contain a link to a resource collection of type AccelerationFunctionCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *AccelerationFunction*. See the AccelerationFunction schema for details.
}			
AdditionalFirmwareVersions *(v1.15+)* {	object		The additional firmware versions of the processor. • This property shall contain the additional firmware versions of the processor.
Bootloader *(v1.7+)*	string	*read-only* *(null)*	The bootloader version contained in this software, such as U-Boot or UEFI. • This property shall contain the bootloader version contained in this software.

Property	Type	Attributes	Notes
Kernel *(v1.7+)*	string	*read-only (null)*	The kernel version contained in this software. • This property shall contain the kernel version contained in this software. For strict POSIX software, the value shall contain the output of `uname -srm`. For Microsoft Windows, the value shall contain the output of `ver`.
Microcode *(v1.7+)*	string	*read-only (null)*	The microcode version contained in this software, such as processor microcode. • This property shall contain the microcode version contained in this software.
Oem *(v1.7+)* {}	object		See the OEM object definition in the Using this guide clause.
OSDistribution *(v1.8+)*	string	*read-only (null)*	The operating system name of this software. • This property shall contain the operating system name of this software.
}			
AppliedOperatingConfig *(v1.9+)* {	object		The link to the operating configuration that is applied to this processor. • This property shall contain a link to a resource of type OperatingConfig that specifies the configuration is applied to this processor. See the *OperatingConfig* schema for details on this property.
@odata.id	string	*read-write*	Link to a OperatingConfig resource. See the Links section and the *OperatingConfig* schema for details.
}			
Assembly *(v1.2+)* {	object		The link to an assembly associated with this processor. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
BaseSpeedMHz *(v1.10+)*	integer (MHz)	*read-only (null)*	The base (nominal) clock speed of the processor in MHz. • This property shall contain the base (nominal) clock speed of the processor in MHz.

Property	Type	Attributes	Notes
BaseSpeedPriorityState *(v1.9+)*	string (enum)	*read-only* *(null)*	The state of the base frequency settings of the operation configuration applied to this processor. • This property shall contain the state of the base frequency settings of the operating configuration applied to this processor. *For the possible property values, see BaseSpeedPriorityState in Property details.*
Certificates *(v1.11+)* {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
Enabled *(v1.12+)*	boolean	*read-write*	An indication of whether this processor is enabled. • The value of this property shall indicate if this processor is enabled.
EnvironmentMetrics *(v1.11+)* {	object		The link to the environment metrics for this processor. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the environment metrics for this processor. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			
Family *(v1.16+)*	string	*read-only* *(null)*	The processor family. • This property shall contain a string that identifies the processor family, as specified by the combination of the EffectiveFamily and EffectiveModel properties.
FirmwareVersion *(v1.7+)*	string	*read-only*	The firmware version of the processor. • This property shall contain a string describing the firmware version of the processor as provided by the manufacturer.
FPGA *(v1.4+)* {	object		The properties for processors of the FPGA type. • This property shall contain an object containing properties for processors of type FPGA.

Property	Type	Attributes	Notes
ExternalInterfaces *(v1.4+)* [{	array		An array of the FPGA external interfaces. • This property shall contain an array of objects that describe the external connectivity of the FPGA.
Ethernet *(v1.4+)* {	object		The Ethernet-related information for this interface. • This property shall contain an object the describes the Ethernet-related information for this interface.
MaxLanes *(v1.4+)*	integer	*read-only (null)*	The number of lanes supported by this interface. • This property shall contain the maximum number of lanes supported by this interface.
MaxSpeedMbps *(v1.4+)*	integer (Mbit/s)	*read-only (null)*	The maximum speed supported by this interface. • This property shall contain the maximum speed supported by this interface.
Oem *(v1.4+)* {}	object		See the OEM object definition in the Using this guide clause.
}			
InterfaceType *(v1.4+)*	string (enum)	*read-only (null)*	The interface type. • This property shall contain an enumerated value that describes the type of interface between the system, or external connection, and the processor. *For the possible property values, see InterfaceType in Property details.*
PCIe *(v1.4+)* {	object		The PCIe-related information for this interface. • This property shall contain an object the describes the PCIe-related information for this interface.
LanesInUse *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes in use by this device. • This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the MaxLanes property value.
MaxLanes *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes supported by this device. • This property shall contain the maximum number of PCIe lanes supported by this device.

Property	Type	Attributes	Notes
MaxPCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The highest version of the PCIe specification supported by this device. • This property shall contain the maximum PCIe specification that this device supports. *For the possible property values, see MaxPCIeType in Property details.*
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
PCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The version of the PCIe specification in use by this device. • This property shall contain the negotiated PCIe interface version in use by this device. *For the possible property values, see PCIeType in Property details.*
}			
}]			
FirmwareId *(v1.4+)*	string	*read-only*	The FPGA firmware identifier. • This property shall contain a string describing the FPGA firmware identifier.
FirmwareManufacturer *(v1.4+)*	string	*read-only*	The FPGA firmware manufacturer. • This property shall contain a string describing the FPGA firmware manufacturer.
FirmwareVersion *(v1.4+, deprecated v1.9*	string	*read-only*	The FPGA firmware version. • This property shall contain a string describing the FPGA firmware version. *Deprecated in v1.9 and later. This property has been deprecated in favor of the FirmwareVersion property in the root of this resource.*
FpgaType *(v1.4+)*	string (enum)	*read-only*	The FPGA type. • This property shall contain a type of the FPGA device. *For the possible property values, see FpgaType in Property details.*
HostInterface *(v1.4+, deprecated v1.8* {	object		The FPGA interface to the host. • This property shall contain an object that describes the connectivity to the host for system software to use. *Deprecated in v1.8 and later. This property has been deprecated in favor of the SystemInterface property in the root of this resource.*

Property	Type	Attributes	Notes
Ethernet *(v1.4+)* {	object		The Ethernet-related information for this interface. • This property shall contain an object the describes the Ethernet-related information for this interface.
MaxLanes *(v1.4+)*	integer	*read-only (null)*	The number of lanes supported by this interface. • This property shall contain the maximum number of lanes supported by this interface.
MaxSpeedMbps *(v1.4+)*	integer (Mbit/s)	*read-only (null)*	The maximum speed supported by this interface. • This property shall contain the maximum speed supported by this interface.
Oem *(v1.4+)* {}	object		See the OEM object definition in the Using this guide clause.
}			
InterfaceType *(v1.4+)*	string (enum)	*read-only (null)*	The interface type. • This property shall contain an enumerated value that describes the type of interface between the system, or external connection, and the processor. *For the possible property values, see InterfaceType in Property details.*
PCIe *(v1.4+)* {	object		The PCIe-related information for this interface. • This property shall contain an object the describes the PCIe-related information for this interface.
LanesInUse *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes in use by this device. • This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the MaxLanes property value.
MaxLanes *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes supported by this device. • This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The highest version of the PCIe specification supported by this device. • This property shall contain the maximum PCIe specification that this device supports. *For the possible property values, see MaxPCIeType in Property details.*
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The version of the PCIe specification in use by this device. • This property shall contain the negotiated PCIe interface version in use by this device. *For the possible property values, see PCIeType in Property details.*
}			
}			
Model *(v1.4+)*	string	*read-only*	The FPGA model. • This property shall contain a model of the FPGA device. *For more information about this property, see Property details.*
Oem *(v1.4+)* {}	object		See the OEM object definition in the Using this guide clause.
PCIeVirtualFunctions *(v1.4+)*	integer	*read-write*	The number of the PCIe Virtual Functions. • This property shall contain an integer that describes the number of PCIe Virtual Functions configured within the FPGA.
ProgrammableFromHost *(v1.4+)*	boolean	*read-write (null)*	An indication of whether the FPGA firmware can be reprogrammed from the host by using system software. • This property shall indicate whether the FPGA firmware can be reprogrammed from the host by using system software. If `false`, system software shall not be able to program the FPGA firmware from the system interface. In either state, a management controller may be able to program the FPGA firmware by using the sideband interface.
ReconfigurationSlots *(v1.4+)* [{	array		An array of the FPGA reconfiguration slots. An FPGA uses a reconfiguration slot to contain an acceleration function that can change as the FPGA is provisioned. • This property shall contain an array of the structures that describe the FPGA reconfiguration slots that the acceleration functions can program.
AccelerationFunction *(v1.4+)* {	object		The link to the acceleration function that the code programmed into a reconfiguration slot provides. • This property shall contain a link to a resource of type AccelerationFunction that represents the code programmed into this reconfiguration slot. See the *AccelerationFunction* schema for details on this property.
@odata.id	string	*read-only*	Link to a AccelerationFunction resource. See the Links section and the *AccelerationFunction* schema for details.

Property	Type	Attributes	Notes
}			
ProgrammableFromHost *(v1.4+)*	boolean	*read-write (null)*	An indication of whether the reconfiguration slot can be reprogrammed from the host by using system software. • This property shall indicate whether the reconfiguration slot can be reprogrammed from the host by using system software. If `false`, system software shall not be able to program the reconfiguration slot from the system interface. In either state, a management controller may be able to program the reconfiguration slot by using the sideband interface.
SlotId *(v1.4+)*	string	*read-only (null)*	The FPGA reconfiguration slot identifier. • This property shall contain the FPGA reconfiguration slot identifier.
UUID *(v1.4+)*	string	*read-only (null)*	The UUID for this reconfiguration slot. • This property shall contain a universal unique identifier number for the reconfiguration slot. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`
}]			
}			
HighSpeedCoreIDs *(v1.9+)* [ ]	array (integer, null)	*read-only*	The list of core identifiers corresponding to the cores that have been configured with the higher clock speed from the operating configuration applied to this processor. • This property shall contain an array of core identifiers corresponding to the cores that have been configured with the higher clock speed from the operating configuration applied to this processor.
InstructionSet	string (enum)	*read-only (null)*	The instruction set of the processor. • This property shall contain the string that identifies the instruction set of the processor contained in this socket. *For the possible property values, see InstructionSet in Property details.*
Links *(v1.1+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
Chassis *(v1.1+)* {	object		The link to the chassis that contains this processor. • This property shall contain a link to a resource of type Chassis that represents the physical container associated with this processor. See the *Chassis* schema for details on this property.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}			
ConnectedProcessors *(v1.4+)* [{	array		An array of links to the processors directly connected to this processor. • This property shall contain an array of links to resources of type Processor that are directly connected to this processor.
@odata.id	string	*read-only*	Link to another Processor resource.
}]			
Endpoints *(v1.4+)* [{	array		An array of links to the endpoints that connect to this processor. • This property shall contain an array of links to resources of type Endpoint that represent endpoints associated with this processor.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
GraphicsController *(v1.12+)* {	object	*(null)*	A link to the graphics controller associated with this processor. • This property shall contain a link to resource of type GraphicsController that is associated with this processor. See the *GraphicsController* schema for details on this property.
@odata.id	string	*read-only*	Link to a GraphicsController resource. See the Links section and the *GraphicsController* schema for details.
}			
Memory *(v1.11+)* [{	array		An array of links to the memory associated with this processor. • This property shall contain an array of links to resources of type Memory that are associated with this processor.
@odata.id	string	*read-only*	Link to a Memory resource. See the Links section and the *Memory* schema for details.
}]			

Property	Type	Attributes	Notes
NetworkDeviceFunctions *(v1.13+)* [{	array		The network device functions to which this processor performs offload computation, such as with a SmartNIC. • This property shall contain an array of links to resources of type NetworkDeviceFunction that represent the network device functions to which this processor performs offload computation, such as with a SmartNIC.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeDevice *(v1.4+)* {	object		The link to the PCIe device associated with this processor. • This property shall contain a link to a resource of type PCIeDevice that represents the PCIe device associated with this processor. See the *PCIeDevice* schema for details on this property.
@odata.id	string	*read-only*	Link to a PCIeDevice resource. See the Links section and the *PCIeDevice* schema for details.
}			
PCIeFunctions *(v1.4+)* [{	array		An array of links to the PCIeFunctions associated with this processor. • This property shall contain an array of links to resources of type PCIeFunction that represent the PCIe functions associated with this processor.
@odata.id	string	*read-only*	Link to a PCIeFunction resource. See the Links section and the *PCIeFunction* schema for details.
}]			
}			
Location *(v1.2+)* {}	object		The location of the processor. • This property shall contain location information of the associated processor. For property details, see Location.

Property	Type	Attributes	Notes
LocationIndicatorActive *(v1.10+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
Manufacturer	string	*read-only (null)*	The processor manufacturer. • This property shall contain a string that identifies the manufacturer of the processor.
MaxSpeedMHz	integer (MHz)	*read-only (null)*	The maximum clock speed of the processor. • This property shall indicate the maximum rated clock speed of the processor in MHz.
MaxTDPWatts *(v1.4+)*	integer (Watts)	*read-only (null)*	The maximum Thermal Design Power (TDP) in watts. • This property shall contain the maximum Thermal Design Power (TDP) in watts.
Measurements *(v1.11+, deprecated v1.14* [{	array		An array of DSP0274-defined measurement blocks. • This property shall contain an array of DSP0274-defined measurement blocks. *Deprecated in v1.14 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
@odata.id	string	*read-only*	Link to a MeasurementBlock resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
MemorySummary *(v1.11+)* {	object		The summary of all memory associated with this processor. • This property shall contain properties that describe the summary of all memory that are associated with this processor.
ECCModeEnabled *(v1.13+)*	boolean	*read-write (null)*	An indication of whether memory ECC mode is enabled for this processor. • The value of this property shall indicate if memory ECC mode is enabled for this processor. This value shall not affect system memory ECC mode.

Property	Type	Attributes	Notes
Metrics *(v1.11+)* {	object		The link to the memory metrics associated with all memory of this processor. • This property shall contain a link to a resource of type MemoryMetrics that contains the metrics associated with all memory of this processor. See the *MemoryMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a MemoryMetrics resource. See the Links section and the *MemoryMetrics* schema for details.
}			
TotalCacheSizeMiB *(v1.11+)*	integer (mebibytes)	*read-only* *(null)*	Total size of cache memory of this processor. • This property shall contain the total size of cache memory of this processor.
TotalMemorySizeMiB *(v1.11+)*	integer (mebibytes)	*read-only* *(null)*	Total size of volatile memory attached to this processor. • This property shall contain the total size of non-cache, volatile memory attached to this processor. This value indicates the size of memory directly attached or with strong affinity to this processor, not the total memory accessible by the processor. This property shall not be present for implementations where all processors have equal memory performance or access characteristics, such as hop count, for all system memory.
}			
Metrics *(v1.4+)* {	object		The link to the metrics associated with this processor. • This property shall contain a link to a resource of type ProcessorMetrics that contains the metrics associated with this processor. See the *ProcessorMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a ProcessorMetrics resource. See the Links section and the *ProcessorMetrics* schema for details.
}			
MinSpeedMHz *(v1.8+)*	integer (MHz)	*read-only* *(null)*	The minimum clock speed of the processor in MHz. • This property shall indicate the minimum rated clock speed of the processor in MHz.

Property	Type	Attributes	Notes
Model	string	*read-only* *(null)*	The product model number of this device. • This property shall indicate the model information as provided by the manufacturer of this processor. *For more information about this property, see Property details.*
OperatingConfigs *(v1.9+)* {	object		The link to the collection operating configurations that can be applied to this processor. • This property shall contain a link to a resource collection of type OperatingConfigCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *OperatingConfig*. See the OperatingConfig schema for details.
}			
OperatingSpeedMHz *(v1.8+)*	integer (MHz)	*read-only* *(null)*	Operating speed of the processor in MHz. • This property shall contain the operating speed of the processor in MHz. The operating speed of the processor may change more frequently than the manager is able to monitor.
OperatingSpeedRangeMHz *(v1.13+)* {	object (excerpt)		Range of allowed operating speeds (MHz). • This property shall contain the operating speed control, measured in megahertz units, for this resource. The value of the DataSourceUri property, if present, shall reference a resource of type Control with the ControlType property containing the value of `FrequencyMHz`. This object is an excerpt of the *Control* resource located at the URI shown in DataSourceUri.
AllowableMax	number	*read-only* *(null)*	The maximum possible setting for this control. • This property shall indicate the maximum possible value of the SetPoint or SettingMax properties for this control. Services shall not accept values for SetPoint or SettingMax above this value.
AllowableMin	number	*read-only* *(null)*	The minimum possible setting for this control. • This property shall indicate the minimum possible value of the SetPoint or SettingMin properties for this control. Services shall not accept values for SetPoint or SettingMin below this value.

Property	Type	Attributes	Notes
AllowableNumericValues [ ]	array (number, null)	*read-only*	The supported values for the set point. • This property shall contain the supported values for this control. The units shall follow the value of SetPointUnits. This property should only be present when the set point or range has a limited set of supported values that cannot be accurately described using the Increment property.
ControlMode	string (enum)	*read-write (null)*	The current operating mode of the control. • This property shall contain the operating mode of the control. *For the possible property values, see ControlMode in Property details.*
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this control. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy. If no source resource is implemented, meaning the excerpt represents the only available data, this property shall not be present.
Reading	number	*read-only (null)*	The reading of the sensor associated with this control. • This property shall contain the value of the Reading property of the Sensor resource directly associated with this control. This property shall not be present if multiple sensors are associated with a single control.
ReadingUnits	string	*read-only (null)*	The units of the sensor reading associated with this control. • This property shall contain the units of the sensor's reading and thresholds. This property shall not be present if multiple sensors are associated with a single control.
SettingMax	number	*read-write (null)*	The maximum set point in the allowed range. • This property shall contain the maximum desired set point within the acceptable range. The service shall reject values greater than the value of AllowableMax. The units shall follow the value of SetPointUnits.
SettingMin	number	*read-write (null)*	The minimum set point in the allowed range. • This property shall contain the minimum desired set point within the acceptable range. The service shall reject values less than the value of AllowableMin. The units shall follow the value of SetPointUnits.
}			

Property	Type	Attributes	Notes
PartNumber *(v1.7+)*	string	*read-only (null)*	The part number of the processor. • This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the processor.
Ports *(v1.13+)* {	object		The link to the collection of ports for this processor. • This property shall contain a link to a resource collection of type PortCollection. It shall contain the interconnect ports of this processor. It shall not contain ports of for GraphicsController resources, USBController resources, or other adapter-related type of resources. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			
ProcessorArchitecture	string (enum)	*read-only (null)*	The architecture of the processor. • This property shall contain the string that identifies the architecture of the processor contained in this socket. *For the possible property values, see ProcessorArchitecture in Property details.*
ProcessorId {	object		The identification information for this processor. • This object shall contain identification information for this processor. *For more information about this property, see Property details.*
EffectiveFamily	string	*read-only (null)*	The effective family for this processor. • This property shall indicate the effective Family information as provided by the manufacturer of this processor. *For more information about this property, see Property details.*
EffectiveModel	string	*read-only (null)*	The effective model for this processor. • This property shall indicate the effective Model information as provided by the manufacturer of this processor. *For more information about this property, see Property details.*
IdentificationRegisters	string	*read-only (null)*	The raw manufacturer-provided processor identification registers for this processor. • This property shall contain the raw manufacturer-provided processor-specific identification registers of this processor's features. *For more information about this property, see Property details.*

Property	Type	Attributes	Notes
MicrocodeInfo	string	*read-only* *(null)*	The microcode information for this processor. • This property shall indicate the microcode information as provided by the manufacturer of this processor. *For more information about this property, see Property details.*
ProtectedIdentificationNumber *(v1.10+)*	string	*read-only* *(null)*	The Protected Processor Identification Number (PPIN) for this processor. • This property shall contain the Protected Processor Identification Number (PPIN) for this processor.
Step	string	*read-only* *(null)*	The step value for this processor. • This property shall indicate the Step or revision string information as provided by the manufacturer of this processor. *For more information about this property, see Property details.*
VendorId	string	*read-only* *(null)*	The vendor identification for this processor. • This property shall indicate the vendor Identification string information as provided by the manufacturer of this processor. *For more information about this property, see Property details.*
}			
ProcessorIndex *(v1.16+)*	integer	*read-only* *(null)*	The logical index of this processor within the system. • This property shall contain the zero-based index of the processor, indexed within the next unit of containment. The value of this property shall match the ordering in the operating system topology interfaces, with offset adjustments, if needed.
ProcessorMemory *(v1.4+)* [{	array		The memory directly attached or integrated within this processor. • This property shall contain the memory directly attached or integrated within this processor.
CapacityMiB *(v1.4+)*	integer (mebibytes)	*read-only* *(null)*	The memory capacity in MiB. • This property shall contain the memory capacity in MiB.
IntegratedMemory *(v1.4+)*	boolean	*read-only* *(null)*	An indication of whether this memory is integrated within the processor. • This property shall indicate whether this memory is integrated within the processor. Otherwise, it is discrete memory attached to the processor.

Property	Type	Attributes	Notes
MemoryType *(v1.4+)*	string (enum)	*read-only (null)*	The type of memory used by this processor. • This property shall contain a type of the processor memory type. *For the possible property values, see MemoryType in Property details.*
SpeedMHz *(v1.4+)*	integer	*read-only (null)*	The operating speed of the memory in MHz. • This property shall contain the operating speed of the memory in MHz.
}]			
ProcessorType	string (enum)	*read-only (null)*	The type of processor. • This property shall contain the string that identifies the type of processor contained in this socket. *For the possible property values, see ProcessorType in Property details.*
Replaceable *(v1.16+)*	boolean	*read-only (null)*	An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. • This property shall indicate whether this component can be independently replaced as allowed by the vendor's replacement policy. A value of `false` indicates the component needs to be replaced by policy, as part of another component. If the `LocationType` property of this component contains `Embedded`, this property shall contain `false`.
SerialNumber *(v1.7+)*	string	*read-only (null)*	The serial number of the processor. • This property shall contain a manufacturer-allocated number that identifies the processor.
Socket	string	*read-only (null)*	The socket or location of the processor. • This property shall contain the string that identifies the physical location or socket of the processor.
SparePartNumber *(v1.11+)*	string	*read-only (null)*	The spare part number of the processor. • This property shall contain the spare part number of the processor.
SpeedLimitMHz *(v1.10+)*	integer (MHz)	*read-write (null)*	The clock limit of the processor in MHz. • This property shall contain the clock limit of the processor in MHz. This value shall be within the range of MinSpeedMHz and MaxSpeedMHz as provided by the manufacturer of this processor.

Property	Type	Attributes	Notes
SpeedLocked *(v1.10+)*	boolean	*read-write (null)*	Indicates whether the clock speed of the processor is fixed at the value specified in the SpeedLimitMHz property. • This property shall indicate whether the clock speed of the processor is fixed, where a value `true` shall indicate that the clock speed is fixed at the value specified in the SpeedLimitMHz property.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SubProcessors *(v1.3+)* {	object		The link to the collection of sub-processors associated with this processor, such as cores or threads, that are part of a processor. • This property shall contain a link to a resource collection of type ProcessorCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Processor*. See the Processor schema for details.
}			
SystemInterface *(v1.8+)* {	object		The interface between the system and the processor. • This property shall contain an object that describes the connectivity between the host system and the processor.
Ethernet *(v1.4+)* {	object		The Ethernet-related information for this interface. • This property shall contain an object the describes the Ethernet-related information for this interface.
MaxLanes *(v1.4+)*	integer	*read-only (null)*	The number of lanes supported by this interface. • This property shall contain the maximum number of lanes supported by this interface.
MaxSpeedMbps *(v1.4+)*	integer (Mbit/s)	*read-only (null)*	The maximum speed supported by this interface. • This property shall contain the maximum speed supported by this interface.
Oem *(v1.4+)* {}	object		See the OEM object definition in the Using this guide clause.
}			

Property	Type	Attributes	Notes
InterfaceType *(v1.4+)*	string (enum)	*read-only (null)*	The interface type. • This property shall contain an enumerated value that describes the type of interface between the system, or external connection, and the processor. *For the possible property values, see InterfaceType in Property details.*
PCIe *(v1.4+)* {	object		The PCIe-related information for this interface. • This property shall contain an object the describes the PCIe-related information for this interface.
LanesInUse *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes in use by this device. • This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the MaxLanes property value.
MaxLanes *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes supported by this device. • This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The highest version of the PCIe specification supported by this device. • This property shall contain the maximum PCIe specification that this device supports. *For the possible property values, see MaxPCIeType in Property details.*
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
PCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The version of the PCIe specification in use by this device. • This property shall contain the negotiated PCIe interface version in use by this device. *For the possible property values, see PCIeType in Property details.*
}			
}			
TDPWatts *(v1.4+)*	integer (Watts)	*read-only (null)*	The nominal Thermal Design Power (TDP) in watts. • This property shall contain the nominal Thermal Design Power (TDP) in watts.

Property	Type	Attributes	Notes
ThrottleCauses *(v1.16+)* [ ]	array (string (enum))	*read-only (null)*	• The causes of the processor being throttled. ◦ This property shall contain the causes of the processor being throttled. If Throttled contains `false`, this property shall contain an empty array. *For the possible property values, see ThrottleCauses in Property details.*
Throttled *(v1.16+)*	boolean	*read-only (null)*	An indication of whether the processor is throttled. • This property shall indicate whether the processor is throttled.
TotalCores	integer	*read-only (null)*	The total number of cores that this processor contains. • This property shall indicate the total count of independent processor cores contained within this processor.
TotalEnabledCores *(v1.5+)*	integer	*read-only (null)*	The total number of enabled cores that this processor contains. • This property shall indicate the total count of enabled independent processor cores contained within this processor.
TotalThreads	integer	*read-only (null)*	The total number of execution threads that this processor supports. • This property shall indicate the total count of independent execution threads that this processor supports.
TurboState *(v1.9+)*	string (enum)	*read-only (null)*	The state of the turbo for this processor. • This property shall contain the state of turbo for this processor. *For the possible property values, see TurboState in Property details.*
UUID *(v1.4+)*	string	*read-only (null)*	The UUID for this processor. • This property shall contain a universal unique identifier number for the processor. RFC4122 describes methods to use to create the value. The value should be considered to be opaque. Client software should only treat the overall value as a universally unique identifier and should not interpret any sub-fields within the UUID. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`
Version *(v1.7+)*	string	*read-only (null)*	The hardware version of the processor. • This property shall contain the hardware version of the processor as determined by the vendor or supplier.

6.90.4 Actions

6.90.4.1 Reset *(v1.6+)*

Description

This action resets the processor.

- This action shall reset the processor.

Action URI: {Base URI of target resource}/Actions/Processor.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation specific default reset. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ForceRestart"
}
```

6.90.4.2 ResetToDefaults *(v1.15+)*

Description

The action resets the values of writable properties to factory defaults.

- This action shall reset the values of writable properties in this resource to their default values as specified by the manufacturer.

Action URI: {Base URI of target resource}/Actions/Processor.ResetToDefaults

Action parameters

This action takes no parameters.

6.90.5 Property details

6.90.5.1 BaseSpeedPriorityState:

The state of the base frequency settings of the operation configuration applied to this processor.

- This property shall contain the state of the base frequency settings of the operating configuration applied to this processor.

string	Description
Disabled	Base speed priority is disabled.
Enabled	Base speed priority is enabled.

6.90.5.2 ControlMode:

The current operating mode of the control.

- This property shall contain the operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

6.90.5.3 EffectiveFamily:

The effective family for this processor.

- This property shall indicate the effective Family information as provided by the manufacturer of this processor.

For resources with a `ProcessorArchitecture` value of `x86`, this string is derived from the execution of the processor's CPUID instruction using this algorithm:

```
(eax, ebx, ecx, edx) = cpuid(eax=0x1);
EffectiveFamily = ((eax & 0x00FF00000) >> 20) + ((eax & 0x0F00) >> 8);
```

6.90.5.4 EffectiveModel:

The effective model for this processor.

- This property shall indicate the effective Model information as provided by the manufacturer of this processor.

For resources with a `ProcessorArchitecture` value of `x86`, this string is derived from register values resulting from the execution of the processor's CPUID instruction using this algorithm:

```
(eax, ebx, ecx, edx) = cpuid(eax=0x1);
EffectiveModel = ((eax & 0x000F0000) >> 12) + ((eax & 0x00F0) >> 4);
```

6.90.5.5 FpgaType:

The FPGA type.

- This property shall contain a type of the FPGA device.

string	Description
Discrete	The discrete FPGA device.
Integrated	The FPGA device integrated with other processor in the single chip.

6.90.5.6 IdentificationRegisters:

The raw manufacturer-provided processor identification registers for this processor.

- This property shall contain the raw manufacturer-provided processor-specific identification registers of this processor's features.

For resources with a `ProcessorArchitecture` value of x86, this string is derived from register values resulting from execution of the processor's CPUID instruction using this algorithm:

```
(eax, ebx, ecx, edx) = cpuid(eax=0xD);
IdentificationRegisters  = (edx << 32) + eax;
```

6.90.5.7 InstructionSet:

The instruction set of the processor.

- This property shall contain the string that identifies the instruction set of the processor contained in this socket.

string	Description
ARM-A32	ARM 32-bit.
ARM-A64	ARM 64-bit.
IA-64	Intel IA-64.
MIPS32	MIPS 32-bit.
MIPS64	MIPS 64-bit.
OEM	OEM-defined.
PowerISA *(v1.4+)*	PowerISA-64 or PowerISA-32.
x86	x86 32-bit.
x86-64	x86 64-bit.

6.90.5.8 InterfaceType:

The interface type.

- This property shall contain an enumerated value that describes the type of interface between the system, or external connection, and the processor.

string	Description
AMBA *(v1.8+)*	The Arm Advanced Microcontroller Bus Architecture interface.
CCIX *(v1.8+)*	The Cache Coherent Interconnect for Accelerators interface.
CXL *(v1.8+)*	The Compute Express Link interface.
Ethernet	An Ethernet interface.
OEM	An OEM-defined interface.
PCIe	A PCI Express interface.

string	Description
QPI	The Intel QuickPath Interconnect.
UPI	The Intel UltraPath Interconnect.

6.90.5.9 MaxPCIeType:

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.90.5.10 MemoryType:

The type of memory used by this processor.

- This property shall contain a type of the processor memory type.

string	Description
DDR	Double data rate synchronous dynamic random-access memory.
DDR2	Double data rate type two synchronous dynamic random-access memory.
DDR3	Double data rate type three synchronous dynamic random-access memory.
DDR4	Double data rate type four synchronous dynamic random-access memory.
DDR5	Double data rate type five synchronous dynamic random-access memory.
Flash	Flash memory.
GDDR	Synchronous graphics random-access memory.

string	Description
GDDR2	Double data rate type two synchronous graphics random-access memory.
GDDR3	Double data rate type three synchronous graphics random-access memory.
GDDR4	Double data rate type four synchronous graphics random-access memory.
GDDR5	Double data rate type five synchronous graphics random-access memory.
GDDR5X	Double data rate type five X synchronous graphics random-access memory.
GDDR6	Double data rate type six synchronous graphics random-access memory.
HBM1	High Bandwidth Memory.
HBM2	The second generation of High Bandwidth Memory.
HBM3	The third generation of High Bandwidth Memory.
L1Cache	L1 cache.
L2Cache	L2 cache.
L3Cache	L3 cache.
L4Cache	L4 cache.
L5Cache	L5 cache.
L6Cache	L6 cache.
L7Cache	L7 cache.
OEM	OEM-defined.
SDRAM	Synchronous dynamic random-access memory.
SGRAM	Synchronous graphics RAM.
SRAM	Static random-access memory.

6.90.5.11 MicrocodeInfo:

The microcode information for this processor.

- This property shall indicate the microcode information as provided by the manufacturer of this processor.

For resources with a `ProcessorArchitecture` value of `x86`, this string shall contain a 64-bit value derived from register values resulting from the execution of the processor's RDMSR instruction using this algorithm:

```
(eax, edx) = rdmsr(ecx=0x8B);
MicrocodeInfo = (edx << 32) + eax;
```

6.90.5.12 Model:

The FPGA model.

- This property shall contain a model of the FPGA device.

For resources with a `ProcessorArchitecture` value of `x86`, this string shall contain the 48-byte, little-endian, ASCII string derived from register values resulting from the execution of the processor's CPUID instruction using this algorithm:

```
// Let Model[48] be a 48-byte, little-endian character array
// Let reg, eax, ebx, ecx, edx be 32-bit unsigned integer registers

for (leaf = 0; leaf <= 2; leaf++)
{
    (eax, ebx, ecx, edx) = cpuid(eax = 0x80000002 + leaf);
    regidx = 0;

    for regval in (eax, ebx, ecx, edx)
    {
        ##NB: order must be eax, ebx, ecx, edx
        for (byte = 0; byte <= 3; byte++)
 {
            Model[leaf*16 + regidx*4 + byte] = regval & 0xFF;

           regval = regval >> 8;
        }
        regidx++;
    }
}
```

6.90.5.13 PCIeType:

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.

string	Description
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.90.5.14 ProcessorArchitecture:

The architecture of the processor.

- This property shall contain the string that identifies the architecture of the processor contained in this socket.

string	Description
ARM	ARM.
IA-64	Intel Itanium.
MIPS	MIPS.
OEM	OEM-defined.
Power *(v1.4+)*	Power.
x86	x86 or x86-64.

6.90.5.15 ProcessorId:

The identification information for this processor.

- This object shall contain identification information for this processor.

This object's properties shall contain values that depend on the `ProcessorArchitecture` property value. For resources with a `ProcessorArchitecture` value of `x86`, some property values are defined using register values resulting from the execution of the CPUID or RDMSR instructions.

6.90.5.16 ProcessorType:

The type of processor.

- This property shall contain the string that identifies the type of processor contained in this socket.

string	Description
Accelerator	An accelerator.
Core *(v1.3+)*	A core in a processor.
CPU	A CPU.
DSP	A DSP.
FPGA	An FPGA.
GPU	A GPU.
OEM	An OEM-defined processing unit.
Thread *(v1.3+)*	A thread in a processor.

6.90.5.17 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without the parameter and perform an implementation specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.

string	Description
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.

string	Description
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.90.5.18 Step:

The step value for this processor.

- This property shall indicate the Step or revision string information as provided by the manufacturer of this processor.

For resources with a `ProcessorArchitecture` value of `x86`, this string is derived from register values resulting from the execution of the processor's CPUID instruction using this algorithm:

```
(eax, ebx, ecx, edx) = cpuid(eax=0x1);
Step = (eax & 0x000F);
```

6.90.5.19 ThrottleCauses:

- The causes of the processor being throttled.
  - This property shall contain the causes of the processor being throttled. If Throttled contains `false`, this property shall contain an empty array.

string	Description
ClockLimit	The cause of the processor being throttled is a clock limit.
OEM	The cause of the processor being throttled is OEM-specific.
PowerLimit	The cause of the processor being throttled is a power limit.
ThermalLimit	The cause of the processor being throttled is a thermal limit.
Unknown	The cause of the processor being throttled is not known.

6.90.5.20 TurboState:

The state of the turbo for this processor.

- This property shall contain the state of turbo for this processor.

string	Description
Disabled	Turbo is disabled.
Enabled	Turbo is enabled.

6.90.5.21 VendorId:

The vendor identification for this processor.

- This property shall indicate the vendor Identification string information as provided by the manufacturer of this processor.

For resources with a `ProcessorArchitecture` value of `x86`, this string shall contain the 12-byte, little-endian, ASCII string that results from the execution of the processor's CPUID instruction using this algorithm:

```
// Let VendorID[12] be a 12-byte, little-endian character array
// Let reg, eax, ebx, ecx, edx be 32-bit unsigned integer registers

regidx = 0;
(eax, ebx, ecx, edx) = cpuid(eax=0x0);

for regval in (ebx, edx, ecx)
{
##NB: order must be ebx, edx, ecx
  for (byte = 0; byte <= 3; byte++)
  {
    VendorID[regidx*4 +
   byte] = regval & 0xFF;
    regval = regval >> 8;
  }
  regidx++;
}
```

6.90.6 Example response

```
{
    "@odata.type": "#Processor.v1_16_0.Processor",
    "Name": "Processor",
    "Id": "1",
    "Socket": "CPU 1",
    "ProcessorType": "CPU",
```

```
    "ProcessorArchitecture": "x86",
    "InstructionSet": "x86-64",
    "Manufacturer": "Intel(R) Corporation",
    "Model": "Multi-Core Intel(R) Xeon(R) processor 7xxx Series",
    "ProcessorId": {
        "VendorId": "GenuineIntel",
        "IdentificationRegisters": "0x34AC34DC8901274A",
        "EffectiveFamily": "0x42",
        "EffectiveModel": "0x61",
        "Step": "0x1",
        "MicrocodeInfo": "0x429943"
    },
    "MaxSpeedMHz": 3700,
    "TotalCores": 8,
    "TotalThreads": 16,
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Location": {
        "PartLocation": {
            "ServiceLabel": "Processor 1",
            "LocationType": "Socket",
            "LocationOrdinalValue": 0
        }
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/1"
}
```


6.91 ProcessorMetrics 1.6.0

Version	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2022.1	2021.3	2021.2	2020.4	2020.1	2018.3

6.91.1 Description

The ProcessorMetrics schema contains usage and health statistics for a processor.

- This resource contains the processor metrics for a single processor in a Redfish implementation.

6.91.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*/ProcessorMetrics

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics
/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/ProcessorMetrics
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/ProcessorSummary/ProcessorMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/ProcessorMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/ProcessorMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/ProcessorMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/ProcessorMetrics
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/ProcessorSummary/ProcessorMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/ProcessorMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/SubProcessors/*{ProcessorId3}*/ProcessorMetrics
/redfish/v1/Systems/*{ComputerSystemId}*/ProcessorSummary/ProcessorMetrics

6.91.3 Properties

Property	Type	Attributes	Notes
AverageFrequencyMHz *(deprecated v1.1)*	number (MHz)	*read-only (null)*	The average frequency of the processor. • This property shall contain average frequency in MHz, across all enabled cores in the processor. When this resource is subordinate to the ProcessorSummary object, this property is not applicable. *Deprecated in v1.1 and later. This property has been deprecated in favor of OperatingSpeedMHz property.*
BandwidthPercent	number (%)	*read-only (null)*	The bandwidth usage of this processor as a percentage. • This property shall contain the bandwidth usage of the processor as a percentage. When this resource is subordinate to the ProcessorSummary object, this property shall be the CPU utilization over all processors as a percentage.
Cache [{	array		The processor cache metrics. • This property shall contain properties that describe this processor's cache. When this resource is subordinate to the ProcessorSummary object, this property is not applicable.
CacheMiss	number	*read-only (null)*	The number of cache line misses in millions. • This property shall contain the number of cache line misses of the processor or core in millions.
CacheMissesPerInstruction	number	*read-only (null)*	The number of cache misses per instruction. • This property shall contain the number of cache misses per instruction of the processor or core.
HitRatio	number	*read-only (null)*	The cache line hit ratio. • This property shall contain the cache hit ratio of the processor or core.
Level	string	*read-only (null)*	The cache level. • This property shall contain the level of the cache in the processor or core.
OccupancyBytes	integer (bytes)	*read-only (null)*	The total cache level occupancy in bytes. • This property shall contain the total cache occupancy of the processor or core in bytes.

Property	Type	Attributes	Notes
OccupancyPercent	number (%)	*read-only (null)*	The total cache occupancy percentage. • This property shall contain the total cache occupancy percentage of the processor or core.
}]			
CacheMetricsTotal *(v1.2+)* {	object		The total cache metrics for this processor. • This property shall contain properties that describe the metrics for all of the cache memory of this processor.
CurrentPeriod *(v1.2+)* {	object		The cache metrics since the last reset or ClearCurrentPeriod action for this processor. • This property shall contain properties that describe the metrics for the current period of cache memory for this processor.
CorrectableECCErrorCount *(v1.2+)*	integer	*read-only (null)*	The number of the correctable errors of cache memory since reset or ClearCurrentPeriod action for this processor. • This property shall contain the number of correctable errors of cache memory since reset or ClearCurrentPeriod action for this processor. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of CorrectableECCErrorCount over all processors.
UncorrectableECCErrorCount *(v1.2+)*	integer	*read-only (null)*	The number of the uncorrectable errors of cache memory since reset or ClearCurrentPeriod action for this processor. • This property shall contain the number of uncorrectable errors of cache memory since reset or ClearCurrentPeriod action for this processor. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of UncorrectableECCErrorCount over all processors.
}			
LifeTime *(v1.2+)* {	object		The cache metrics for the lifetime of this processor. • This property shall contain properties that describe the metrics for the lifetime of cache memory for this processor.

Property	Type	Attributes	Notes
CorrectableECCErrorCount *(v1.2+)*	integer	*read-only (null)*	The number of the correctable errors for the lifetime of the cache memory. • This property shall contain the number of the correctable errors for the lifetime of cache memory. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of CorrectableECCErrorCount over all processors.
UncorrectableECCErrorCount *(v1.2+)*	integer	*read-only (null)*	The number of the uncorrectable errors for the lifetime of the cache memory. • This property shall contain the number of the uncorrectable errors for the lifetime of cache memory. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of UncorrectableECCErrorCount over all processors.
}			
}			
ConsumedPowerWatt *(deprecated v1.2)*	number (Watts)	*read-only (null)*	The power, in watts, that the processor has consumed. • This property shall contain the power, in watts, that the processor has consumed. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of power, in watts, that all processors have consumed. *Deprecated in v1.2 and later. This property has been deprecated in favor of the properties in EnvironmentMetrics.*
CoreMetrics [{	array		The processor core metrics. • This property shall contain properties that describe the cores of this processor. When this resource is subordinate to the ProcessorSummary object, this property is not applicable.
CoreCache [{	array		The cache metrics of this core in the processor. • This property shall contain properties that describe the cache metrics of this core in the processor.
CacheMiss	number	*read-only (null)*	The number of cache line misses in millions. • This property shall contain the number of cache line misses of the processor or core in millions.
CacheMissesPerInstruction	number	*read-only (null)*	The number of cache misses per instruction. • This property shall contain the number of cache misses per instruction of the processor or core.

Property	Type	Attributes	Notes
HitRatio	number	*read-only (null)*	The cache line hit ratio. • This property shall contain the cache hit ratio of the processor or core.
Level	string	*read-only (null)*	The cache level. • This property shall contain the level of the cache in the processor or core.
OccupancyBytes	integer (bytes)	*read-only (null)*	The total cache level occupancy in bytes. • This property shall contain the total cache occupancy of the processor or core in bytes.
OccupancyPercent	number (%)	*read-only (null)*	The total cache occupancy percentage. • This property shall contain the total cache occupancy percentage of the processor or core.
}]			
CoreId	string	*read-only (null)*	The processor core identifier. • This property shall contain the identifier of the core within the processor.
CorrectableCoreErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of the correctable core errors. • This property shall contain the number of correctable core errors, such as TLB or cache errors. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of CorrectableCoreErrorCount over all processors.
CorrectableOtherErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of the correctable errors of all other components. • This property shall contain the number of the correctable errors of all other components. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of CorrectableOtherErrorCount over all processors.
CStateResidency [{	array		The C-state residency of this core in the processor. • This property shall contain properties that describe the C-state residency of this core in the processor.

Property	Type	Attributes	Notes
Level	string	*read-only (null)*	The C-state level, such as C0, C1, or C2. • This property shall contain the C-state level, such as C0, C1, or C2. When this resource is subordinate to the ProcessorSummary object, this property is not applicable.
ResidencyPercent	number (%)	*read-only (null)*	The percentage of time that the processor or core has spent in this particular level of C-state. • This property shall contain the percentage of time that the processor or core has spent in this particular level of C-state. When this resource is subordinate to the ProcessorSummary object, this property is not applicable.
}]			
InstructionsPerCycle	number	*read-only (null)*	The number of instructions per clock cycle of this core. • This property shall contain the number of instructions per clock cycle of this core in the processor.
IOStallCount	number	*read-only (null)*	The number of stalled cycles due to I/O operations. • This property shall contain the number of stalled cycles due to I/O operations of this core in the processor.
MemoryStallCount	number	*read-only (null)*	The number of stalled cycles due to memory operations. • This property shall contain the number of stalled cycles due to memory operations of this core in the processor.
UncorrectableCoreErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of the uncorrectable core errors. • This property shall contain the number of uncorrectable core errors, such as TLB or cache errors. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of UncorrectableCoreErrorCount over all processors.
UncorrectableOtherErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of the uncorrectable errors of all other components. • This property shall contain the number of the uncorrectable errors of all other components. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of UncorrectableOtherErrorCount over all processors.
UnhaltedCycles	number	*read-only (null)*	The unhalted cycles count of this core. • This property shall contain the number of unhalted cycles of this core in the processor.

Property	Type	Attributes	Notes
}]			
CoreVoltage *(v1.3+)* {	object (excerpt)		The core voltage (V) of this processor. • The value of this property shall contain the core voltage, in volt units, of this processor. The core voltage of the processor may change more frequently than the manager is able to monitor. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Voltage`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
}			
CorrectableCoreErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of the correctable core errors. • This property shall contain the number of correctable core errors, such as TLB or cache errors. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of CorrectableCoreErrorCount over all processors.
CorrectableOtherErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of the correctable errors of all other components. • This property shall contain the number of the correctable errors of all other components. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of CorrectableOtherErrorCount over all processors.

Property	Type	Attributes	Notes
FrequencyRatio	number	*read-only (null)*	The frequency relative to the nominal processor frequency ratio. • This property shall contain the frequency relative to the nominal processor frequency ratio of this processor. When this resource is subordinate to the ProcessorSummary object, this property shall be the average FrequencyRatio over all processors.
KernelPercent	number (%)	*read-only (null)*	The percentage of time spent in kernel mode. • This property shall contain total percentage of time the processor has spent in kernel mode. When this resource is subordinate to the ProcessorSummary object, this property shall be the average KernelPercent over all processors.
LocalMemoryBandwidthBytes	integer (bytes)	*read-only (null)*	The local memory bandwidth usage in bytes. • This property shall contain the local memory bandwidth usage of this processor in bytes. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of LocalMemoryBandwidthBytes over all processors.
OperatingSpeedMHz *(v1.1+)*	integer (MHz)	*read-only (null)*	Operating speed of the processor in MHz. • This property shall contain the operating speed of the processor in MHz. The operating speed of the processor may change more frequently than the manager is able to monitor.
PCIeErrors *(v1.4+)* {	object		The PCIe errors associated with this processor. • This property shall contain the PCIe errors associated with this processor.
CorrectableErrorCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe correctable errors for this device. • This property shall contain the total number of the PCIe correctable errors for this device.
FatalErrorCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe fatal errors for this device. • This property shall contain the total number of the PCIe fatal errors for this device.
L0ToRecoveryCount *(v1.8+)*	integer	*read-only (null)*	The total number of times the PCIe link states transitioned from L0 to the recovery state for this device. • This property shall contain the total number of times the PCIe link transitioned from L0 to the recovery state for this device.

Property	Type	Attributes	Notes
NAKReceivedCount *(v1.8+)*	integer	*read-only (null)*	The total number of NAKs issued on the PCIe link by the receiver. • This property shall contain the total number of NAKs issued on the PCIe link by the receiver. A NAK is issued by the receiver when it detects that a TLP from this device was missed. This could be because this device did not transmit it, or because the receiver could not properly decode the packet.
NAKSentCount *(v1.8+)*	integer	*read-only (null)*	The total number of NAKs issued on the PCIe link by this device. • This property shall contain the total number of NAKs issued on the PCIe link by this device. A NAK is issued by the device when it detects that a TLP from the receiver was missed. This could be because the receiver did not transmit it, or because this device could not properly decode the packet.
NonFatalErrorCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe non-fatal errors for this device. • This property shall contain the total number of the PCIe non-fatal errors for this device.
ReplayCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe replays issued by this device. • This property shall contain the total number of the replays issued on the PCIe link by this device. A replay is a retransmission of a TLP and occurs because the ACK timer is expired, which means that the receiver did not send the ACK or this device did not properly decode the ACK.
ReplayRolloverCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe replay rollovers issued by this device. • This property shall contain the total number of the replay rollovers issued on the PCIe link by this device. A replay rollover occurs when consecutive replays failed to resolve the errors on the link, which means that this device forced the link into the recovery state.
}			
PowerLimitThrottleDuration *(v1.6+)*	string	*read-only (null)*	The total duration of throttling caused by a power limit of the processor since reset. • This property shall contain the total duration of throttling caused by a power limit of the processor since reset. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`

Property	Type	Attributes	Notes
RemoteMemoryBandwidthBytes	integer (bytes)	*read-only (null)*	The remote memory bandwidth usage in bytes. • This property shall contain the remote memory bandwidth usage of this processor in bytes. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of RemoteMemoryBandwidthBytes over all processors.
TemperatureCelsius *(deprecated v1.2)*	number (Celsius)	*read-only (null)*	The temperature of the processor. • This property shall contain the temperature, in Celsius, of the processor. When this resource is subordinate to the ProcessorSummary object, this property shall be the average temperature, in Celsius, over all processors. *Deprecated in v1.2 and later. This property has been deprecated in favor of the properties in EnvironmentMetrics.*
ThermalLimitThrottleDuration *(v1.6+)*	string	*read-only (null)*	The total duration of throttling caused by a thermal limit of the processor since reset. • This property shall contain the total duration of throttling caused by a thermal limit of the processor since reset. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
ThrottlingCelsius	number (Celsius)	*read-only (null)*	The CPU margin to throttle (temperature offset in degree Celsius). • This property shall contain the CPU margin to throttle based on an offset between the maximum temperature in which the processor can operate, and the processor's current temperature. When this resource is subordinate to the ProcessorSummary object, this property is not applicable.
UncorrectableCoreErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of the uncorrectable core errors. • This property shall contain the number of uncorrectable core errors, such as TLB or cache errors. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of UncorrectableCoreErrorCount over all processors.
UncorrectableOtherErrorCount *(v1.5+)*	integer	*read-only (null)*	The number of the uncorrectable errors of all other components. • This property shall contain the number of the uncorrectable errors of all other components. When this resource is subordinate to the ProcessorSummary object, this property shall be the sum of UncorrectableOtherErrorCount over all processors.

Property	Type	Attributes	Notes
UserPercent	number (%)	*read-only (null)*	The percentage of time spent in user mode. • This property shall contain total percentage of time the processor has spent in user mode. When this resource is subordinate to the ProcessorSummary object, this property shall be the average UserPercent over all processors.

6.91.4 Actions

6.91.4.1 ClearCurrentPeriod *(v1.2+)*

Description

This action sets the CurrentPeriod property's values to 0.

- This action shall set the CurrentPeriod property's values to 0.

Action URI: {Base URI of target resource}/Actions/ProcessorMetrics.ClearCurrentPeriod

Action parameters

This action takes no parameters.

6.91.5 Example response


```
{
    "@odata.type": "#ProcessorMetrics.v1_6_0.ProcessorMetrics",
    "Id": "Metrics",
    "Name": "Processor Metrics",
    "BandwidthPercent": 62,
    "OperatingSpeedMHz": 2400,
    "ThrottlingCelsius": 65,
    "FrequencyRatio": 0.00432,
    "Cache": [
        {
            "Level": "3",
            "CacheMiss": 0.12,
            "HitRatio": 0.719,
            "CacheMissesPerInstruction": 0.00088,
            "OccupancyBytes": 3030144,
            "OccupancyPercent": 90.1
        }
    ],
```

```
    "LocalMemoryBandwidthBytes": 18253611008,
    "RemoteMemoryBandwidthBytes": 81788928,
    "KernelPercent": 2.3,
    "UserPercent": 34.7,
    "CoreMetrics": [
        {
            "CoreId": "core0",
            "InstructionsPerCycle": 1.16,
            "UnhaltedCycles": 6254383746,
            "MemoryStallCount": 58372,
            "IOStallCount": 2634872,
            "CoreCache": [
                {
                    "Level": "2",
                    "CacheMiss": 0.472,
                    "HitRatio": 0.57,
                    "CacheMissesPerInstruction": 0.00346,
                    "OccupancyBytes": 198231,
                    "OccupancyPercent": 77.4
                }
            ],
            "CStateResidency": [
                {
                    "Level": "C0",
                    "Residency": 1.13
                },
                {
                    "Level": "C1",
                    "Residency": 26
                },
                {
                    "Level": "C3",
                    "Residency": 0.00878
                },
                {
                    "Level": "C6",
                    "Residency": 0.361
                },
                {
                    "Level": "C7",
                    "Residency": 72.5
                }
            ]
        }
    ],
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/Processors/FPGA1/ProcessorMetrics"
}
```

6.92 RegisteredClient 1.0.0

Version	*v1.0*
Release	2021.4

6.92.1 Description

The RegisteredClient schema defines the record format for a registered client. It is designed to allow well behaved clients to register with a Redfish service such that other clients are aware the service might be configured or monitored by the client.

- This resource shall represent a registered client for a Redfish implementation. It is not expected that transient tools, such as a short lived CLI tool, register. Clients and management tools that live for long periods of time can create RegisteredClient resources so that other clients are aware the service might be configured or monitored by the client.

6.92.2 URIs

/redfish/v1/RegisteredClients/*{RegisteredClientId}*

6.92.3 Properties

Property	Type	Attributes	Notes
ClientType	string (enum)	*read-write required*	The type of registered client. • This property shall contain the type of registered client. *For the possible property values, see ClientType in Property details.*
ClientURI	string	*read-write*	The URI of the registered client. • This property shall contain the URI of the registered client.
CreatedDate	string (date-time)	*read-only*	The date and time when the client entry was created. • This property shall contain the date and time when the client entry was created.

Property	Type	Attributes	Notes
ExpirationDate	string (date-time)	*read-write*	The date and time when the client entry will expire. • This property shall contain the date and time when the client entry expires. Registered clients that are actively managing or monitoring should periodically update this value. The value should not be more than 7 days after the date when it was last set. If the current date is beyond this date, the service may delete this client entry.
ManagedResources [{	array		An array of resources that the registered client monitors or configures. • This property shall contain an array of resources that the registered client monitors or configures. Other clients can use this property to understand which resources are monitored or configured by the registered client.
IncludesSubordinates	boolean	*read-write (null)*	Indicates whether the subordinate resources of the managed resource are also managed by the registered client. • This property shall indicate whether the subordinate resources of the managed resource referenced by the ManagedResourceURI property are also managed by the registered client. If not specified, the value is assumed to be `false` unless ManagedResourceURI references a resource collection.
ManagedResourceURI	string (URI)	*read-write (null)*	The URI of the resource or resource collection managed by the registered client. • This property shall contain the URI of the Redfish resource or Redfish resource collection managed by the registered client. When the URI references a resource collection, all members of the resource collection may be monitored or configured by the client, and the IncludesSubordinates property shall contain `true`.
PreferExclusive	boolean	*read-write (null)*	Indicates whether the registered client expects to have exclusive access to the managed resource. • This property shall indicate whether the registered client expects to have exclusive access to the managed resource referenced by the ManagedResourceURI property, and its subordinate resources if IncludesSubordinates contains `true`. If not specified, the value is assumed to be `false`.
}]			

6.92.4 Property details

6.92.4.1 ClientType:

The type of registered client.

- This property shall contain the type of registered client.

string	Description
Configure	The registered client performs update, create, and delete operations on the resources listed in the ManagedResources property as well as read operations on the service.
Monitor	The registered client only performs read operations on this service.

6.92.5 Example response

```
{
    "@odata.type": "#RegisteredClient.v1_0_0.RegisteredClient",
    "Id": "2",
    "Name": "ContosoConfigure",
    "ClientType": "Configure",
    "CreatedDate": "2021-09-25T20:12:24Z",
    "Description": "Contoso manager access",
    "ExpirationDate": "2022-10-03T20:00:00Z",
    "ManagedResources": [
        {
            "ManagedResourceURI": "/redfish/v1/Systems",
            "PreferExclusive": true,
            "IncludesSubordinates": true
        },
        {
            "ManagedResourceURI": "/redfish/v1/Chassis",
            "PreferExclusive": true,
            "IncludesSubordinates": true
        }
    ],
    "ClientURI": "https://4.5.6.2/ContosoManager",
    "@odata.id": "/redfish/v1/RegisteredClients/2"
}
```

6.93 ResourceBlock 1.4.0

Version	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.4	2018.3	2018.2	2018.1	2017.1

6.93.1 Description

The ResourceBlock schema contains definitions resource blocks, its components, and affinity to composed devices.

- This resource shall represent a resource block for a Redfish implementation.

6.93.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*

6.93.3 Properties

Property	Type	Attributes	Notes
Client *(v1.4+)*	string	*read-write (null)*	The client to which this resource block is assigned. • This property shall contain the client to which this resource block is assigned.
CompositionStatus {	object	*required*	The composition status details for this resource block. • This property shall contain composition status information about this resource block.
CompositionState	string (enum)	*read-only required (null)*	The current state of the resource block from a composition perspective. • This property shall contain an enumerated value that describes the composition state of the resource block. *For the possible property values, see CompositionState in Property details.*
MaxCompositions *(v1.1+)*	integer	*read-only (null)*	The maximum number of compositions in which this resource block can participate simultaneously. • This property shall contain a number indicating the maximum number of compositions in which this resource block can participate simultaneously. Services can have additional constraints that prevent this value from being achieved, such as due to system topology and current composed resource utilization. If SharingCapable is `false`, this value shall be set to `1`. The service shall support this property if SharingCapable supported.

Property	Type	Attributes	Notes
NumberOfCompositions *(v1.1+)*	integer	*read-only* *(null)*	The number of compositions in which this resource block is currently participating. • This property shall contain the number of compositions in which this resource block is currently participating.
Reserved	boolean	*read-write* *(null)*	An indication of whether any client has reserved the resource block. • This property shall indicate whether any client has reserved the resource block. A client sets this property after the resource block is identified as composed. It shall provide a way for multiple clients to negotiate the ownership of the resource block.
SharingCapable *(v1.1+)*	boolean	*read-only* *(null)*	An indication of whether this resource block can participate in multiple compositions simultaneously. • This property shall indicate whether this resource block can participate in multiple compositions simultaneously. If this property is not provided, it shall be assumed that this resource block is not capable of being shared.
SharingEnabled *(v1.1+)*	boolean	*read-write* *(null)*	An indication of whether this resource block is allowed to participate in multiple compositions simultaneously. • This property shall indicate whether this resource block can participate in multiple compositions simultaneously. The service shall reject modifications of this property with HTTP 400 Bad Request if this resource block is already being used as part of a composed resource. If `false`, the service shall not use the `ComposedAndAvailable` state for this resource block.
}			
ComputerSystems [{	array		An array of links to the computer systems available in this resource block. • This property shall contain an array of links to resource of type ComputerSystem that this resource block contains.
@odata.id	string	*read-only*	Link to a ComputerSystem resource. See the Links section and the *ComputerSystem* schema for details.
}]			
Drives *(v1.3+)* [{	array		An array of links to the drives available in this resource block. • This property shall contain an array of links to resource of type Drive that this resource block contains.
@odata.id	string	*read-only*	Link to a Drive resource. See the Links section and the *Drive* schema for details.

Property	Type	Attributes	Notes
}]			
EthernetInterfaces [{	array		An array of links to the Ethernet interfaces available in this resource block. • This property shall contain an array of links to resource of type EthernetInterface that this resource block contains.
@odata.id	string	*read-only*	Link to a EthernetInterface resource. See the Links section and the *EthernetInterface* schema for details.
}]			
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis [{	array		An array of links to the chassis in which this resource block is contained. • This property shall contain an array of links to resources of type Chassis that represent the physical container associated with this resource block.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			
ComputerSystems [{	array		An array of links to the computer systems that are composed from this resource block. • This property shall contain an array of links to resources of type ComputerSystem that represent the computer systems composed from this resource block.
@odata.id	string	*read-only*	Link to a ComputerSystem resource. See the Links section and the *ComputerSystem* schema for details.
}]			
ConsumingResourceBlocks *(v1.4+)* [{	array		An array of links to resource blocks that depend on this resource block. • This property shall contain an array of links to resources of type ResourceBlock that represent the resource blocks that depend on this resource block as a component.
@odata.id	string	*read-only*	Link to another ResourceBlock resource.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
SupplyingResourceBlocks *(v1.4+)* [{	array		An array of links to resource blocks that this resource block depends on. • This property shall contain an array of links to resources of type ResourceBlock that represent the resource blocks that this resource block depends on as components.
@odata.id	string	*read-only*	Link to another ResourceBlock resource.
}]			
Zones [{	array		An array of links to the zones in which this resource block is bound. • This property shall contain an array of links to resources of type Zone that represent the binding constraints associated with this resource block.
@odata.id	string	*read-only*	Link to a Zone resource. See the Links section and the *Zone* schema for details.
}]			
}			
Memory [{	array		An array of links to the memory available in this resource block. • This property shall contain an array of links to resource of type Memory that this resource block contains.
@odata.id	string	*read-only*	Link to a Memory resource. See the Links section and the *Memory* schema for details.
}]			
NetworkInterfaces [{	array		An array of links to the Network Interfaces available in this resource block. • This property shall contain an array of links to resource of type NetworkInterface that this resource block contains.
@odata.id	string	*read-only*	Link to a NetworkInterface resource. See the Links section and the *NetworkInterface* schema for details.
}]			
Pool *(v1.4+)*	string (enum)	*read-write (null)*	The pool to which this resource block belongs. • This property shall contain the pool to which this resource block belongs. If this resource block is not assigned to a client, this property shall contain the value `Unassigned`. If this resource block is assigned to a client, this property shall not contain the value `Unassigned`. *For the possible property values, see Pool in Property details.*

Property	Type	Attributes	Notes
Processors [{	array		An array of links to the processors available in this resource block. • This property shall contain an array of links to resource of type Processor that this resource block contains.
@odata.id	string	*read-only*	Link to a Processor resource. See the Links section and the *Processor* schema for details.
}]			
ResourceBlockType [ ]	array (string (enum))	*read-only*	• The types of resources available on this resource block. ◦ This property shall contain an array of enumerated values that describe the type of resources available. *For the possible property values, see ResourceBlockType in Property details.*
SimpleStorage [{	array		An array of links to the simple storage available in this resource block. • This property shall contain an array of links to resource of type SimpleStorage that this resource block contains.
@odata.id	string	*read-only*	Link to a SimpleStorage resource. See the Links section and the *SimpleStorage* schema for details.
}]			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
Storage [{	array		An array of links to the storage available in this resource block. • This property shall contain an array of links to resource of type Storage that this resource block contains.
@odata.id	string	*read-only*	Link to a Storage resource. See the Links section and the *Storage* schema for details.
}]			

6.93.4 Property details

6.93.4.1 CompositionState:

The current state of the resource block from a composition perspective.

- This property shall contain an enumerated value that describes the composition state of the resource block.

string	Description
Composed	Final successful state of a resource block that has participated in composition.
ComposedAndAvailable *(v1.1+)*	The resource block is currently participating in one or more compositions, and is available to use in more compositions.
Composing	Intermediate state indicating composition is in progress.
Failed	The final composition resulted in failure and manual intervention might be required to fix it.
Unavailable *(v1.2+)*	The resource block has been made unavailable by the service, such as due to maintenance being performed on the resource block.
Unused	The resource block is free and can participate in composition.

6.93.4.2 Pool:

The pool to which this resource block belongs.

- This property shall contain the pool to which this resource block belongs. If this resource block is not assigned to a client, this property shall contain the value `Unassigned`. If this resource block is assigned to a client, this property shall not contain the value `Unassigned`.

string	Description
Active	This resource block is in the active pool and is contributing to at least one composed resource as a result of a composition request.
Free	This resource block is in the free pool and is not contributing to any composed resources.
Unassigned	This resource block is not assigned to any pools.

6.93.4.3 ResourceBlockType:

- The types of resources available on this resource block.

- This property shall contain an array of enumerated values that describe the type of resources available.

string	Description
Compute	This resource block contains resources of type `Processor` and `Memory` in a manner that creates a compute complex.
ComputerSystem	This resource block contains resources of type `ComputerSystem`.
Expansion	This resource block is capable of changing over time based on its configuration. Different types of devices within this resource block can be added and removed over time.
IndependentResource	This resource block is capable of being consumed as a standalone component. This resource block can represent things such as a software platform on one or more computer systems or an appliance that provides composable resources and other services, and can be managed independently of the Redfish service.
Memory	This resource block contains resources of type `Memory`.
Network	This resource block contains network resources, such as resource of type `EthernetInterface` and `NetworkInterface`.
Processor	This resource block contains resources of type `Processor`.
Storage	This resource block contains storage resources, such as resources of type `Storage` and `SimpleStorage`.

6.93.5 Example response


```
{
    "@odata.type": "#ResourceBlock.v1_4_0.ResourceBlock",
    "Id": "ComputeBlock1",
    "Name": "Compute Block 1",
    "ResourceBlockType": [
        "Compute",
        "Network"
    ],
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "CompositionStatus": {
        "Reserved": false,
        "CompositionState": "Composed",
        "SharingCapable": false,
        "MaxCompositions": 1,
        "NumberOfCompositions": 1
    },
    "Processors": [
        {
```

```
            "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Processors/Block1CPU0"
        },
        {
            "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Processors/Block1CPU1"
        }
    ],
    "Memory": [
        {
            "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Memory/Block1DIMM0"
        },
        {
            "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Memory/Block1DIMM1"
        },
        {
            "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Memory/Block1DIMM2"
        },
        {
            "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/Memory/Block1DIMM3"
        }
    ],
    "EthernetInterfaces": [
        {
            "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1/EthernetInterfaces/Block1OnboardNIC"
        }
    ],
    "ComputerSystems": [],
    "Links": {
        "ComputerSystems": [
            {
                "@odata.id": "/redfish/v1/Systems/ComposedSystem"
            }
        ],
        "Chassis": [
            {
                "@odata.id": "/redfish/v1/Chassis/ComposableModule1"
            }
        ],
        "Zones": [
            {
                "@odata.id": "/redfish/v1/CompositionService/ResourceZones/1"
            }
        ]
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock1"
}
```

6.94 Role 1.3.1

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.4	2017.2	2017.1	1.0

6.94.1 Description

The Role schema contains a Redfish role to use in conjunction with a manager account.

- This resource represents the Redfish role for the user account.

6.94.2 URIs

/redfish/v1/AccountService/Roles/*{RoleId}*
/redfish/v1/Managers/*{ManagerId}*/RemoteAccountService/Roles/*{RoleId}*

6.94.3 Properties

Property	Type	Attributes	Notes
AlternateRoleId *(v1.3+)*	string	*read-only*	An equivalent role to use when this role is restricted. • This property shall contain a non-restricted `RoleId` intended to be used in its place when the Restricted property contains the value `true`.
AssignedPrivileges [ ]	array (string (enum))	*read-write*	• The Redfish privileges for this role. ◦ This property shall contain the Redfish privileges for this role. For predefined roles, this property shall be read-only. For custom roles, some implementations may prevent writing to this property. *For the possible property values, see AssignedPrivileges in Property details.*
IsPredefined	boolean	*read-only*	An indication of whether the role is predefined by Redfish or an OEM rather than a client-defined role. • This property shall indicate whether the role is predefined by Redfish or an OEM as contrasted with a client-defined role.

Property	Type	Attributes	Notes
OemPrivileges [ ]	array (string)	*read-write*	The OEM privileges for this role. • This property shall contain the OEM privileges for this role. For predefined roles, this property shall be read-only. For custom roles, some implementations may prevent writing to this property.
Restricted *(v1.3+)*	boolean	*read-only*	An indication of whether use of the role is restricted. • This property shall indicate whether use of the role is restricted by a service as defined by the 'Restricted roles and restricted privileges' clause of the Redfish Specification. If this property is not present, the value shall be assumed to be `false`.
RoleId *(v1.2+)*	string	*read-only required on create*	The name of the role. • This property shall contain the string name of the role. This property shall contain the same value as the Id property.

6.94.4 Property details

6.94.4.1 AssignedPrivileges:

- The Redfish privileges for this role.
  - This property shall contain the Redfish privileges for this role. For predefined roles, this property shall be read-only. For custom roles, some implementations may prevent writing to this property.

string	Description
AdministrateStorage	Administrator for storage subsystems and storage systems found in the storage collection and storage system collection respectively.
AdministrateSystems	Adminsitrator for systems found in the systems collection. Able to manage boot configuration, keys, and certificates for systems.
ConfigureComponents	Can configure components that this service manages.
ConfigureCompositionInfrastructure	Can view and configure composition service resources. • This value shall be used to indicate the user can view and configure composition service resources without matching the Client property in the ResourceBlock or CompositionReservation resources.
ConfigureManager	Can configure managers.
ConfigureSelf	Can change the password for the current user account and log out of their own sessions.

string	Description
ConfigureUsers	Can configure users and their accounts.
Login	Can log in to the service and read Resources.
NoAuth	Authentication is not required. • This value shall be used to indicate an operation does not require authentication. This privilege shall not be used in Redfish Roles.
OperateStorageBackup	Operator for storage backup functionality for storage subsystems and storage systems found in the storage collection and storage system collection respectively.
OperateSystems	Operator for systems found in the systems colletion. Able to perform resets and configure interfaces.

6.94.5 Example response

```
{
    "@odata.type": "#Role.v1_3_1.Role",
    "Id": "Administrator",
    "Name": "User Role",
    "Description": "Admin User Role",
    "IsPredefined": true,
    "AssignedPrivileges": [
        "Login",
        "ConfigureManager",
        "ConfigureUsers",
        "ConfigureSelf",
        "ConfigureComponents"
    ],
    "OemPrivileges": [
        "OemClearLog",
        "OemPowerControl"
    ],
    "@odata.id": "/redfish/v1/AccountService/Roles/Administrator"
}
```

6.95 RouteEntry 1.0.1

Version	*v1.0*
Release	2019.4

6.95.1 Description

The RouteEntry schema describes the content of route entry rows. Each route entry contains route sets that list the possible routes for the route entry.

- This Resource shall represent the content of route entry rows in the Redfish Specification.

6.95.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/MSDT/*{MSDTId}*
/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*
/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*
/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/SSDT/*{SSDTId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/MSDT/*{MSDTId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/SSDT/*{SSDTId}*
/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*
/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/MSDT/*{MSDTId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/SSDT/*{SSDTId}*
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/MSDT/*{MSDTId}*
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/SSDT/*{SSDTId}*

6.95.3 Properties

Property	Type	Attributes	Notes
MinimumHopCount	integer	*read-write*	The minimum number of hops. • This property shall indicate the minimum hop count used to calculate the computed hop count.
RawEntryHex	string	*read-write*	The raw data of route entry rows. • This property shall contain a binary data that represents the content of route entry rows. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){8}$`
RouteSet {	object		The link to the collection of route set entries associated with this route. • This property shall contain a link to a Resource Collection of type RouteSetEntryCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *RouteSetEntry*. See the RouteSetEntry schema for details.
}			

6.95.4 Example response

```
{
    "@odata.type": "#RouteEntry.v1_0_1.RouteEntry",
    "Id": "0",
    "Name": "LPRT0",
    "Description": "Gen-Z Port 1 LPRT Entry 0",
    "RawEntryHex": "0x34EF124500000000",
    "RouteSet": {
        "@odata.id": "/redfish/v1/Fabrics/GenZ/Switches/Switch1/Ports/1/LPRT/0/RouteSet"
    },
    "MinimumHopCount": 1,
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/GenZ/Switches/Switch1/Ports/1/LPRT/0"
}
```

6.96 RouteSetEntry 1.0.1

Version	*v1.0*
Release	2019.4

6.96.1 Description

The RouteSetEntry schema contains the information about a route. It is part of a larger set that contains possible routes for a particular route entry.

- This Resource contains the content of a route set in the Redfish Specification.

6.96.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/MSDT/*{MSDTId}*/RouteSet/*{RouteId}*
/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*/RouteSet/*{RouteId}*
/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*/RouteSet/*{RouteId}*
/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/SSDT/*{SSDTId}*/RouteSet/*{RouteId}*
/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*/RouteSet/*{RouteId}*
/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*/RouteSet/*{RouteId}*
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/MSDT/*{MSDTId}*/RouteSet/*{RouteId}*
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/LPRT/*{LPRTId}*/RouteSet/*{RouteId}*
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/MPRT/*{MPRTId}*/RouteSet/*{RouteId}*
/redfish/v1/Systems/*{ComputerSystemId}*/FabricAdapters/*{FabricAdapterId}*/SSDT/*{SSDTId}*/RouteSet/*{RouteId}*

6.96.3 Properties

Property	Type	Attributes	Notes
EgressIdentifier	integer	*read-write*	The egress interface identifier. • This property shall contain the interface identifier corresponding to this route.
HopCount	integer	*read-write*	The number of hops. • This property shall contain the number of hops to the destination component from the indicated egress interface.

Property	Type	Attributes	Notes
Valid	boolean	*read-write*	An indication of whether the entry is valid. • This property shall indicate whether the entry is valid.
VCAction	integer	*read-write*	The Virtual Channel Action index. • This property shall contain the index to the VCAT entry corresponding to this route.

6.96.4 Example response

```
{
    "@odata.type": "#RouteSetEntry.v1_0_1.RouteSetEntry",
    "Id": "0",
    "Name": "RouteSet0",
    "Description": "Gen-Z Port 1 LPRT Entry 0 Route 0",
    "Valid": false,
    "VCAction": 1,
    "HopCount": 2,
    "EgressIdentifier": 0,
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/GenZ/Switches/Switch1/Ports/1/LPRT/0/RouteSet/0"
}
```

6.97 SecureBoot 1.1.0

Version	*v1.1*	*v1.0*
Release	2020.1	2016.1

6.97.1 Description

The SecureBoot schema contains UEFI Secure Boot information and represents properties for managing the UEFI Secure Boot functionality of a system.

- This resource contains UEFI Secure Boot information for a Redfish implementation.

6.97.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot
/redfish/v1/Systems/*{ComputerSystemId}*/SecureBoot

6.97.3 Properties

Property	Type	Attributes	Notes
SecureBootCurrentBoot	string (enum)	*read-only (null)*	The UEFI Secure Boot state during the current boot cycle. • This property shall indicate the UEFI Secure Boot state during the current boot cycle. *For the possible property values, see SecureBootCurrentBoot in Property details.*
SecureBootDatabases *(v1.1+)* {	object		A link to the collection of UEFI Secure Boot databases. • The value of this property shall be a link to a resource collection of type SecureBootDatabaseCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *SecureBootDatabase*. See the SecureBootDatabase schema for details.
}			
SecureBootEnable	boolean	*read-write (null)*	An indication of whether UEFI Secure Boot is enabled. • This property shall indicate whether the UEFI Secure Boot takes effect on next boot. This property can be enabled in UEFI boot mode only.
SecureBootMode	string (enum)	*read-only (null)*	The current UEFI Secure Boot Mode. • This property shall contain the current UEFI Secure Boot mode, as defined in the UEFI Specification. *For the possible property values, see SecureBootMode in Property details.*

6.97.4 Actions

6.97.4.1 ResetKeys

Description

This action resets the UEFI Secure Boot keys.

- This action shall reset the UEFI Secure Boot key databases. The `ResetAllKeysToDefault` value shall reset all UEFI Secure Boot key databases to their default values. The `DeleteAllKeys` value shall delete the content of all UEFI Secure Boot key databases. The `DeletePK` value shall delete the content of the PK Secure Boot key database.

Action URI: {Base URI of target resource}/Actions/SecureBoot.ResetKeys

Action parameters

Parameter Name	Type	Attributes	Notes
ResetKeysType	string (enum)	*required*	The type of reset or delete to perform on the UEFI Secure Boot databases. • This parameter shall specify the type of reset or delete to perform on the UEFI Secure Boot databases. *For the possible property values, see ResetKeysType in Property details.*

Request Example

```
{
    "ResetKeysType": "DeleteAllKeys"
}
```

6.97.5 Property details

6.97.5.1 ResetKeysType:

The type of reset or delete to perform on the UEFI Secure Boot databases.

- This parameter shall specify the type of reset or delete to perform on the UEFI Secure Boot databases.

string	Description
DeleteAllKeys	Delete the contents of all UEFI Secure Boot key databases, including the PK key database. This puts the system in Setup Mode.
DeletePK	Delete the contents of the PK UEFI Secure Boot database. This puts the system in Setup Mode.
ResetAllKeysToDefault	Reset the contents of all UEFI Secure Boot key databases, including the PK key database, to the default values.

6.97.5.2 SecureBootCurrentBoot:

The UEFI Secure Boot state during the current boot cycle.

- This property shall indicate the UEFI Secure Boot state during the current boot cycle.

string	Description
Disabled	UEFI Secure Boot is currently disabled.
Enabled	UEFI Secure Boot is currently enabled.

6.97.5.3 SecureBootMode:

The current UEFI Secure Boot Mode.

- This property shall contain the current UEFI Secure Boot mode, as defined in the UEFI Specification.

string	Description
AuditMode	UEFI Secure Boot is currently in Audit Mode.
DeployedMode	UEFI Secure Boot is currently in Deployed Mode.
SetupMode	UEFI Secure Boot is currently in Setup Mode.
UserMode	UEFI Secure Boot is currently in User Mode.

6.97.6 Example response

```
{
    "@odata.type": "#SecureBoot.v1_1_0.SecureBoot",
    "Id": "SecureBoot",
    "Name": "UEFI Secure Boot",
    "Actions": {
        "#SecureBoot.ResetKeys": {
            "target": "/redfish/v1/Systems/1/SecureBoot/Actions/SecureBoot.ResetKeys",
            "ResetKeysType@Redfish.AllowableValues": [
                "ResetAllKeysToDefault",
                "DeleteAllKeys",
                "DeletePK"
            ]
        },
        "Oem": {}
    },
    "SecureBootEnable": false,
    "SecureBootCurrentBoot": "Disabled",
    "SecureBootMode": "UserMode",
    "SecureBootDatabases": {
        "@odata.id": "/redfish/v1/Systems/1/SecureBoot/SecureBootDatabases"
    },
    "Oem": {},
```

```
    "@odata.id": "/redfish/v1/Systems/1/SecureBoot"
}
```

6.98 SecureBootDatabase 1.0.1

Version	*v1.0*
Release	2020.1

6.98.1 Description

The SecureBootDatabase schema describes a UEFI Secure Boot database used to store certificates or hashes.

- This resource shall be used to represent a UEFI Secure Boot database for a Redfish implementation.

6.98.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*
/redfish/v1/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*

6.98.3 Properties

Property	Type	Attributes	Notes
Certificates {	object		A link to the collection of certificates contained in this UEFI Secure Boot database. • The value of this property shall be a link to a resource collection of type CertificateCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			

Property	Type	Attributes	Notes
DatabaseId	string	*read-only*	This property contains the name of the UEFI Secure Boot database. • This property shall contain the name of the UEFI Secure Boot database. This property shall contain the same value as the Id property. The value shall be one of the UEFI-defined Secure Boot databases: `PK`, `KEK` `db`, `dbx`, `dbr`, `dbt`, `PKDefault`, `KEKDefault`, `dbDefault`, `dbxDefault`, `dbrDefault`, or `dbtDefault`.
Signatures {	object		A link to the collection of signatures contained in this UEFI Secure Boot database. • The value of this property shall be a link to a resource collection of type SignatureCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Signature*. See the Signature schema for details.
}			

6.98.4 Actions

6.98.4.1 ResetKeys

Description

This action is used to reset the UEFI Secure Boot keys of this database.

- This action shall perform a reset of this UEFI Secure Boot key database. The `ResetAllKeysToDefault` value shall reset this UEFI Secure Boot key database to the default values. The `DeleteAllKeys` value shall delete the content of this UEFI Secure Boot key database.

Action URI: {Base URI of target resource}/Actions/SecureBootDatabase.ResetKeys

Action parameters

Parameter Name	Type	Attributes	Notes
ResetKeysType	string (enum)	*required*	The type of reset or delete to perform on this UEFI Secure Boot database. • This parameter shall specify the type of reset or delete to perform on this UEFI Secure Boot database. *For the possible property values, see ResetKeysType in Property details.*

Request Example

```
{
    "ResetKeysType": "ResetAllKeysToDefault"
}
```

6.98.5 Property details

6.98.5.1 ResetKeysType:

The type of reset or delete to perform on this UEFI Secure Boot database.

- This parameter shall specify the type of reset or delete to perform on this UEFI Secure Boot database.

string	Description
DeleteAllKeys	Delete the content of this UEFI Secure Boot key database.
ResetAllKeysToDefault	Reset the content of this UEFI Secure Boot key database to the default values.

6.98.6 Example response

```
{
    "@odata.type": "#SecureBootDatabase.v1_0_1.SecureBootDatabase",
    "Id": "PK",
    "Name": "PK - Platform Key",
    "Description": "UEFI PK Secure Boot Database",
    "DatabaseId": "PK",
    "Certificates": {
        "@odata.id": "/redfish/v1/Systems/1/SecureBoot/SecureBootDatabases/PK/Certificates/"
    },
    "Actions": {
        "#SecureBootDatabase.ResetKeys": {
            "target": "/redfish/v1/Systems/1/SecureBoot/SecureBootDatabases/PK/Actions/SecureBootDatabase.ResetKeys",
            "ResetKeysType@Redfish.AllowableValues": [
                "ResetAllKeysToDefault",
                "DeleteAllKeys"
            ]
        },
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/SecureBoot/SecureBootDatabases/PK"
}
```

6.99 SecurityPolicy 1.0.0

Version	*v1.0*
Release	2022.2

6.99.1 Description

The SecurityPolicy resource provides a central point to configure the security policy of a manager.

- This resource shall represent configurable security related policies managed by a manager. All security parameters in other resources that are controlled by the manager shall follow to the related settings in this security policy. For example, an outbound TLS connection established per an EventDestination resource will follow the values of the properties in the TLS property.

6.99.2 URIs

/redfish/v1/Managers/*{ManagerId}*/SecurityPolicy

6.99.3 Properties

Property	Type	Attributes	Notes
OverrideParentManager	boolean	*read-write*	Override the security policy of the parent manager. • This property shall indicate whether this security policy overrides the security policy of the managers referenced by the ManagedBy property within the Links property of the Manager resource for this security policy. If this property is absent, the value shall be assumed to be `false`.
SPDM {	object		The SPDM policy. • This property shall contain the policy requirements for SPDM communication and usage.
Allowed {	object	*(null)*	The SPDM policy settings that are allowed, such as the allowable SPDM versions and algorithms. • This property shall contain the SPDM policy settings that are allowed, such as the allowable SPDM versions and algorithms.

Property	Type	Attributes	Notes
Algorithms {	object	*(null)*	The SPDM algorithms. • This property shall contain the SPDM algorithms.
AEAD [ ]	array (string, null)	*read-write*	The AEAD algorithms. • This property shall contain an array of AEAD algorithms. The allowable values for this property shall be the AEAD algorithm names found in the 'AlgSupported' field of the 'AEAD structure' table in DSP0274, `ALL`, and `NONE`. An array containing one element with the value of `ALL` or an empty array shall indicate all AEAD algorithms. An array containing one element with a value of `NONE` shall indicate no AEAD algorithms.
BaseAsym [ ]	array (string, null)	*read-write*	The asymmetric signature algorithms. • This property shall contain an array of asymmetric signature algorithms. The allowable values for this property shall be the asymmetric key signature algorithm names found in the 'BaseAsymAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274, `ALL`, and `NONE`. An array containing one element with the value of `ALL` or an empty array shall indicate all asymmetric signature algorithms. An array containing one element with a value of `NONE` shall indicate no asymmetric signature algorithms.
BaseHash [ ]	array (string, null)	*read-write*	The hash algorithms. • This property shall contain an array of hash algorithms. The allowable values for this property shall be the hash algorithm names found in the 'BaseHashAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274, `ALL`, and `NONE`. An array containing one element with the value of `ALL` or an empty array shall indicate all hash algorithms. An array containing one element with a value of `NONE` shall indicate no hash algorithms.
}			
Versions [ ]	array (string, null)	*read-write*	The SPDM versions. • This property shall contain an array of SPDM versions. An array containing one element with the value of `ALL` or an empty array shall indicate all versions. An array containing one element with a value of `NONE` shall indicate no versions. Pattern: `^\d+\.\d+$\|^NONE$|^ALL$`
}			

Property	Type	Attributes	Notes
AllowExtendedAlgorithms	boolean	*read-write (null)*	An indication of whether SPDM extended algorithms are allowed. • This property shall indicate whether SPDM extended algorithms as defined in DSP0274 are allowed.
Denied {	object	*(null)*	The SPDM policy settings that are prohibited, such as the prohibited SPDM versions and algorithms. • This property shall contain the SPDM policy settings that are prohibited, such as the prohibited SPDM versions and algorithms.
Algorithms {	object	*(null)*	The SPDM algorithms. • This property shall contain the SPDM algorithms.
AEAD [ ]	array (string, null)	*read-write*	The AEAD algorithms. • This property shall contain an array of AEAD algorithms. The allowable values for this property shall be the AEAD algorithm names found in the 'AlgSupported' field of the 'AEAD structure' table in DSP0274, `ALL`, and `NONE`. An array containing one element with the value of `ALL` or an empty array shall indicate all AEAD algorithms. An array containing one element with a value of `NONE` shall indicate no AEAD algorithms.
BaseAsym [ ]	array (string, null)	*read-write*	The asymmetric signature algorithms. • This property shall contain an array of asymmetric signature algorithms. The allowable values for this property shall be the asymmetric key signature algorithm names found in the 'BaseAsymAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274, `ALL`, and `NONE`. An array containing one element with the value of `ALL` or an empty array shall indicate all asymmetric signature algorithms. An array containing one element with a value of `NONE` shall indicate no asymmetric signature algorithms.
BaseHash [ ]	array (string, null)	*read-write*	The hash algorithms. • This property shall contain an array of hash algorithms. The allowable values for this property shall be the hash algorithm names found in the 'BaseHashAlgo' field of the 'NEGOTIATE_ALGORITHMS' request message in DSP0274, `ALL`, and `NONE`. An array containing one element with the value of `ALL` or an empty array shall indicate all hash algorithms. An array containing one element with a value of `NONE` shall indicate no hash algorithms.
}			

Property	Type	Attributes	Notes
Versions [ ]	array (string, null)	*read-write*	The SPDM versions. • This property shall contain an array of SPDM versions. An array containing one element with the value of `ALL` or an empty array shall indicate all versions. An array containing one element with a value of `NONE` shall indicate no versions. Pattern: `^\d+\.\d+$\|^NONE$|^ALL$`
}			
Enabled	boolean	*read-write (null)*	An indication of whether SPDM communication with devices is enabled. • This property shall indicate whether SPDM communication with devices as defined in DSP0274 is enabled.
RevokedCertificates {	object	*(null)*	The revoked SPDM device certificates. • This property shall contain a link to a resource collection of type CertificateCollection that represents the set of revoked SPDM device certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If `VerifyCertificate` contains the value `true` and if an SPDM endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that SPDM endpoint shall fail authentication. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
SecureSessionEnabled	boolean	*read-write (null)*	An indication of whether SPDM secure sessions with devices is enabled. • This property shall indicate whether SPDM secure sessions with devices as defined in DSP0274 is enabled.
TrustedCertificates {	object	*(null)*	The trusted SPDM device certificates. • This property shall contain a link to a resource collection of type CertificateCollection that represents the set of trusted SPDM device certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If `VerifyCertificate` contains the value `true` and if an SPDM endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that SPDM endpoint shall be considered verified and other authentications checks are performed. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.

Property	Type	Attributes	Notes
}			
VerifyCertificate	boolean	*read-write (null)*	An indication of whether the manager will verify the certificate of the SPDM endpoint. • This property shall indicate whether the manager will verify the certificate of the SPDM endpoint. If `true`, the manager shall verify the device certificate with the certificates found in the collections referenced by the `RevokedCertificates` and `TrustedCertificates` properties. If `false`, the manager shall not perform verification of the endpoint certificate.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
TLS {	object		The TLS policy. • This property shall contain the policy requirements for TLS communication and usage.
Client {	object		The TLS policy. • This property shall contain the policy requirements and usage for TLS connections where the manager acts as a TLS client.
Allowed {}	object	*(null)*	The TLS policy settings that are allowed, such as the allowable TLS versions and algorithms. • This property shall contain the TLS policy settings that are allowed, such as the allowable TLS versions and algorithms. If a value is missing for the same property in 'Allowed' and 'Denied' object, the missing value shall be behave as if the value is present in the same property under the 'Denied' object. If a value conflicts for the same property between the 'Allowed' and 'Denied' object, the value of the same property in the 'Denied' object shall take precedence. A Redfish service can resolve or prevent conflicts at time of request as well. For more information about this property, see TLSParameterSet in Property Details.

Property	Type	Attributes	Notes
Denied {}	object	*(null)*	The TLS policy settings that are prohibited, such as the prohibited TLS versions and algorithms. • This property shall contain the TLS policy settings that are prohibited, such as the prohibited TLS versions and algorithms. If a value is missing for the same property in 'Allowed' and 'Denied' object, the missing value shall be behave as if the value is present in the same property under the 'Denied' object. If a value conflicts for the same property between the 'Allowed' and 'Denied' object, the value of the same property in the 'Denied' object shall take precedence. A Redfish service can resolve or prevent conflicts at time of request as well. For more information about this property, see TLSParameterSet in Property Details.
RevokedCertificates {	object	*(null)*	The revoked TLS server certificates. • This property shall contain a link to a resource collection of type CertificateCollection that represents the set of revoked TLS certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If `VerifyCertificate` contains the value `true` and if a TLS endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that TLS endpoint shall fail authentication. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
TrustedCertificates {	object	*(null)*	The trusted TLS server certificates. • This property shall contain a link to a resource collection of type CertificateCollection that represents the set of trusted TLS certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If `VerifyCertificate` contains the value `true` and if a TLS endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that TLS endpoint shall be considered verified and other authentications checks are performed. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			

Property	Type	Attributes	Notes
VerifyCertificate	boolean	*read-write* *(null)*	An indication of whether the manager will verify the certificate of the remote TLS endpoint. • This property shall indicate whether the manager will verify the certificate of the remote endpoint in a TLS connection. If `true`, the manager shall verify the remote endpoint certificate with the certificates found in the collections referenced by the `RevokedCertificates` and `TrustedCertificates` properties. If `false` or not present, the manager shall not perform verification of the endpoint certificate.
}			
Server {	object		The TLS policy. • This property shall contain the policy requirements and usage for TLS connections where the manager acts as a TLS server.
Allowed {}	object	*(null)*	The TLS policy settings that are allowed, such as the allowable TLS versions and algorithms. • This property shall contain the TLS policy settings that are allowed, such as the allowable TLS versions and algorithms. If a value is missing for the same property in 'Allowed' and 'Denied' object, the missing value shall be behave as if the value is present in the same property under the 'Denied' object. If a value conflicts for the same property between the 'Allowed' and 'Denied' object, the value of the same property in the 'Denied' object shall take precedence. A Redfish service can resolve or prevent conflicts at time of request as well. For more information about this property, see TLSParameterSet in Property Details.
Denied {}	object	*(null)*	The TLS policy settings that are prohibited, such as the prohibited TLS versions and algorithms. • This property shall contain the TLS policy settings that are prohibited, such as the prohibited TLS versions and algorithms. If a value is missing for the same property in 'Allowed' and 'Denied' object, the missing value shall be behave as if the value is present in the same property under the 'Denied' object. If a value conflicts for the same property between the 'Allowed' and 'Denied' object, the value of the same property in the 'Denied' object shall take precedence. A Redfish service can resolve or prevent conflicts at time of request as well. For more information about this property, see TLSParameterSet in Property Details.

Property	Type	Attributes	Notes
RevokedCertificates {	object	*(null)*	The revoked TLS server certificates. • This property shall contain a link to a resource collection of type CertificateCollection that represents the set of revoked TLS certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If `VerifyCertificate` contains the value `true` and if a TLS endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that TLS endpoint shall fail authentication. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
TrustedCertificates {	object	*(null)*	The trusted TLS server certificates. • This property shall contain a link to a resource collection of type CertificateCollection that represents the set of trusted TLS certificates. Certificates in this collection may contain leaf certificates, partial certificate chains, or complete certificate chains, where a partial certificate chain is a chain containing only CA certificates. If `VerifyCertificate` contains the value `true` and if a TLS endpoint verifies successfully against a partial chain or exactly matches a leaf certificate, that TLS endpoint shall be considered verified and other authentications checks are performed. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
VerifyCertificate	boolean	*read-write* *(null)*	An indication of whether the manager will verify the certificate of the remote TLS endpoint. • This property shall indicate whether the manager will verify the certificate of the remote endpoint in a TLS connection. If `true`, the manager shall verify the remote endpoint certificate with the certificates found in the collections referenced by the `RevokedCertificates` and `TrustedCertificates` properties. If `false` or not present, the manager shall not perform verification of the endpoint certificate.
}			
}			

6.99.4 Property details

6.99.4.1 TLSParameterSet:

The TLS policy settings.

Algorithms {	object	*(null)*	The TLS algorithms. • This property shall contain the TLS algorithms.							
CipherSuites [ ]	array (string, null)	*read-write*	The TLS cipher suites. • This property shall contain an array of TLS cipher suites. The allowable values for this property shall be the TLS cipher suites listed in 'CipherSuites' defined in, but not limited to, RFC4346, RFC5246, or RFC8446, `ALL`, and `NONE`. An array containing one element with the value of `ALL` or an empty array shall indicate all TLS cipher suites. An array containing one element with a value of `NONE` shall indicate no TLS cipher suites.							

[ ]	**SignatureAlgorithms**	array (string, null)	*read-write*	The TLS signature algorithms. • This property shall contain an array of TLS signature algorithms. The allowable values for this property shall be the TLS signature algorithms listed in 'SignatureScheme' or the concatenation of 'SignatureAlgorithm', '_', and 'HashAlgorithm' defined in, but not limited to, RFC4346, RFC5246, or RFC8446, `ALL`, and `NONE`. An array containing one element with the value of `ALL` or an empty array shall indicate all TLS signature algorithms. An array containing one element with a value of `NONE` shall indicate no TLS signature algorithms.							
}											

Versions [ ]	array (string, null)	*read-write*	The TLS versions. • This property shall contain an array of TLS versions. An array containing one element with the value of `ALL` or an empty array shall indicate all versions. An array containing one element with a value of `NONE` shall indicate no versions. Pattern: `^\d+\.\d+$\|^NONE$|^ALL$`							

6.99.5 Example response

```
{
    "@odata.type": "#SecurityPolicy.v1_0_0.SecurityPolicy",
    "Id": "ManagerGlobalSecurityPolicy",
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "Oem": {},
    "OverrideParentManager": true,
    "SPDM": {
        "Enabled": true,
        "SecureSessionEnabled": true,
        "VerifyCertificate": true,
        "TrustedCertificates": {
            "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/SPDM/TrustedCertificates"
        },
        "RevokedCertificates": {
            "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/SPDM/RevokedCertificates"
        },
        "Allowed": {
            "Versions": [
                "ALL"
            ],
            "Algorithms": {
                "AEAD": [
                    "AES-GCM-256",
                    "AES-GCM-128"
                ],
                "BaseAsym": [
```

```
                    "TPM_ALG_RSASSA_2048",
                    "TPM_ALG_ECDSA_ECC_NIST_P384",
                    "TPM_ALG_SM2_ECC_SM2_P256"
                ],
                "BaseHash": [
                    "TPM_ALG_SHA_512",
                    "TPM_ALG_SHA3_512"
                ]
            }
        },
        "Denied": {
            "Versions": [
                "NONE"
            ],
            "Algorithms": {
                "AEAD": [],
                "BaseAsym": [
                    "EdDSA ed25519"
                ],
                "BaseHash": [
                    "TPM_ALG_SHA_256"
                ]
            }
        },
        "AllowExtendedAlgorithms": false
    },
    "TLS": {
        "Client": {
            "VerifyCertificate": true,
            "TrustedCertificates": {
                "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/TLS/Server/TrustedCertificates"
            },
            "RevokedCertificates": {
                "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/TLS/Server/RevokedCertificates"
            },
            "Allowed": {
                "Versions": [
                    "1.2",
                    "1.3"
                ],
                "Algorithms": {
                    "CipherSuites": [
                        "TLS_AES_128_GCM_SHA256",
                        "TLS_AES_128_GCM_SHA384"
                    ],
                    "SignatureAlgorithms": []
                }
            },
            "Denied": {
                "Versions": [
```

```
                    "1.1"
                ],
                "Algorithms": {
                    "CipherSuites": [],
                    "SignatureAlgorithms": [
                        "rsa_pkcs1_sha1",
                        "ecdsa_sha1"
                    ]
                }
            }
        },
        "Server": {
            "VerifyCertificate": false,
            "TrustedCertificates": {
                "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/TLS/Client/TrustedCertificates"
            },
            "RevokedCertificates": {
                "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy/TLS/Client/RevokedCertificates"
            },
            "Allowed": {
                "Versions": [
                    "1.3"
                ],
                "Algorithms": {
                    "CipherSuites": [
                        "TLS_AES_128_GCM_SHA256",
                        "TLS_AES_128_GCM_SHA384"
                    ],
                    "SignatureAlgorithms": []
                }
            },
            "Denied": {
                "Versions": [
                    "1.1",
                    "1.2"
                ],
                "Algorithms": {
                    "CipherSuites": [],
                    "SignatureAlgorithms": [
                        "rsa_pkcs1_sha1",
                        "ecdsa_sha1"
                    ]
                }
            }
        }
    },
    "@odata.id": "/redfish/v1/Managers/BMC/SecurityPolicy"
}
```

6.100 Sensor 1.6.0

Version	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2021.4	2021.2	2021.1	2020.4	2019.4	2018.3

6.100.1 Description

The Sensor schema describes a sensor and its properties.

- This resource shall represent a sensor for a Redfish implementation.

6.100.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Sensors/*{SensorId}*

6.100.3 Properties

Property	Type	Attributes	Notes
Accuracy	number (%)	*read-only (null)*	The estimated percent error of measured versus actual values. • This property shall contain the percent error +/- of the measured versus actual values of the Reading property.
AdjustedMaxAllowableOperatingValue	number	*read-only (null)*	The adjusted maximum allowable operating value for this equipment based on the environmental conditions. • This property shall contain the adjusted maximum allowable operating value for the equipment that this sensor monitors, as specified by a standards body, manufacturer, or both. The value is adjusted based on environmental conditions. For example, liquid inlet temperature can be adjusted based on the available liquid pressure.

Property	Type	Attributes	Notes
AdjustedMinAllowableOperatingValue	number	*read-only (null)*	The adjusted minimum allowable operating value for this equipment based on the environmental conditions. • This property shall contain the adjusted minimum allowable operating value for the equipment that this sensor monitors, as specified by a standards body, manufacturer, or both. This value is adjusted based on environmental conditions. For example, liquid inlet temperature can be adjusted based on the available liquid pressure.
ApparentkVAh *(v1.5+)*	number (kV.A.h)	*read-only (null)*	Apparent energy (kVAh). • This property shall contain the apparent energy, in kilovolt-ampere-hour units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
ApparentVA	number (V.A)	*read-only (null)*	The product of voltage and current for an AC circuit, in volt-ampere units. • This property shall contain the product of voltage (RMS) multiplied by current (RMS) for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
AverageReading *(v1.4+)*	number	*read-only (null)*	The average sensor value. • This property shall contain the average sensor value over the time specified by the value of the AveragingInterval property. The value shall be reset by the ResetMetrics action.
AveragingInterval *(v1.4+)*	string	*read-write (null)*	The interval over which the average sensor value is calculated. • This property shall contain the interval over which the sensor value is averaged to produce the value of the AverageReading property. This property shall only be present if the AverageReading property is present. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
AveragingIntervalAchieved *(v1.4+)*	boolean	*read-only (null)*	Indicates that enough readings were collected to calculate the average sensor reading over the averaging interval time. • This property shall indicate that enough readings were collected to calculate the AverageReading value over the interval specified by the AveragingInterval property. The value shall be reset by the ResetMetrics action. This property shall only be present if the AveragingInterval property is present.

Property	Type	Attributes	Notes
Calibration *(v1.4+)*	number	*read-write (null)*	The calibration offset applied to the Reading. • This property shall contain the offset applied to the raw sensor value to provide a calibrated value for the sensor as returned by the Reading property. The value of this property shall follow the units of the Reading property for this sensor instance. Updating the value of this property shall not affect the value of the CalibrationTime property.
CalibrationTime *(v1.4+)*	string (date-time)	*read-write (null)*	The date and time that the sensor was last calibrated. • This property shall contain the date and time that the sensor was last calibrated. This property is intended to reflect the actual time the calibration occurred.
CrestFactor *(v1.1+)*	number	*read-only (null)*	The crest factor for this sensor. • This property shall contain the ratio of the peak measurement divided by the RMS measurement and calculated over same N line cycles. A sine wave would have a value of 1.414.
ElectricalContext	string (enum)	*read-only (null)*	The combination of current-carrying conductors. • This property shall represent the combination of current-carrying conductors that distribute power. *For the possible property values, see ElectricalContext in Property details.*
Implementation *(v1.1+)*	string (enum)	*read-only (null)*	The implementation of the sensor. • This property shall contain the implementation of the sensor. *For the possible property values, see Implementation in Property details.*
LifetimeReading *(v1.1+)*	number	*read-only (null)*	The total accumulation value for this sensor. • This property shall contain the total accumulation of the Reading property over the sensor's life time. This value shall not be reset by the ResetMetrics action.
Links *(v1.3+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AssociatedControls *(v1.4+)* [{	array		An array of links to the controls that can affect this sensor. • This property shall contain an array of links to resources of type Control that represent the controls that can affect this sensor.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to a Control resource. See the Links section and the *Control* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
LoadPercent *(deprecated v1.1)*	number (%)	*read-only (null)*	The power load utilization for this sensor. • This property shall indicate the power load utilization percent for this sensor. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values. *Deprecated in v1.1 and later. This property has been deprecated in favor of using a sensor instance with a ReadingType of* `Percent` *to show utilization values when needed.*
Location {}	object		The location information for this sensor. • This property shall indicate the location information for this sensor. For property details, see Location.
LowestReading *(v1.4+)*	number	*read-only (null)*	The lowest sensor value. • This property shall contain the lowest sensor value since the last ResetMetrics action was performed or the service last reset the time-based property values.
LowestReadingTime *(v1.4+)*	string (date-time)	*read-only (null)*	The time when the lowest sensor value occurred. • This property shall contain the date and time when the lowest sensor value was observed.
MaxAllowableOperatingValue	number	*read-only (null)*	The maximum allowable operating value for this equipment. • This property shall contain the maximum allowable operating value for the equipment that this sensor monitors, as specified by a standards body, manufacturer, or both.
MinAllowableOperatingValue	number	*read-only (null)*	The minimum allowable operating value for this equipment. • This property shall contain the minimum allowable operating value for the equipment that this sensor monitors, as specified by a standards body, manufacturer, or both.

Property	Type	Attributes	Notes
PeakReading	number	*read-only (null)*	The peak sensor value. • This property shall contain the peak sensor value since the last ResetMetrics action was performed or the service last reset the time-based property values.
PeakReadingTime	string (date-time)	*read-only (null)*	The time when the peak sensor value occurred. • This property shall contain the date and time when the peak sensor value was observed.
PhaseAngleDegrees *(v1.5+)*	number	*read-only (null)*	The phase angle (degrees) between the current and voltage waveforms. • This property shall contain the phase angle, in degree units, between the current and voltage waveforms for an electrical measurement. This property can appear in sensors with a ReadingType containing `Power`, and shall not appear in sensors with other ReadingType values.
PhysicalContext	string (enum)	*read-only (null)*	The area or device to which this sensor measurement applies. • This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies. *For the possible property values, see PhysicalContext in Property details.*
PhysicalSubContext	string (enum)	*read-only (null)*	The usage or location within a device to which this sensor measurement applies. • This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same PhysicalContext instance. *For the possible property values, see PhysicalSubContext in Property details.*
PowerFactor	number	*read-only (null)*	The power factor for this sensor. • This property shall identify the quotient of real power (W) and apparent power (VA) for a circuit. PowerFactor is expressed in unit-less 1/100ths. This property can appear in sensors containing a ReadingType value of `Power`, and shall not appear in sensors of other ReadingType values.

Property	Type	Attributes	Notes
Precision	number	*read-only* *(null)*	The number of significant digits in the reading. • This property shall contain the number of significant digits in the Reading property.
ReactivekVARh *(v1.5+)*	number (kV.A.h)	*read-only* *(null)*	Reactive energy (kVARh). • This property shall contain the reactive energy, in kilovolt-ampere-hours (reactive) units, for an electrical energy measurement. This property can appear in sensors with a ReadingType containing `EnergykWh`, and shall not appear in sensors with other ReadingType values.
ReactiveVAR	number (V.A)	*read-only* *(null)*	The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. • This property shall contain the arithmetic mean of product terms of instantaneous voltage and quadrature current measurements calculated over an integer number of line cycles for a circuit. This property can appear in sensors of the Power ReadingType, and shall not appear in sensors of other ReadingType values.
Reading	number	*read-only* *(null)*	The sensor value. • This property shall contain the sensor value.
ReadingRangeMax	number	*read-only* *(null)*	The maximum possible value for this sensor. • This property shall indicate the maximum possible value of the Reading property for this sensor. This value is the range of valid readings for this sensor. Values outside this range are discarded as reading errors.
ReadingRangeMin	number	*read-only* *(null)*	The minimum possible value for this sensor. • This property shall indicate the minimum possible value of the Reading property for this sensor. This value is the range of valid readings for this sensor. Values outside this range are discarded as reading errors.
ReadingTime *(v1.1+)*	string (date-time)	*read-only* *(null)*	The date and time that the reading was acquired from the sensor. • This property shall contain the date and time that the reading data was acquired from the sensor. This value is used to synchronize readings from multiple sensors, and does not represent the time at which the resource was accessed.

Property	Type	Attributes	Notes
ReadingType	string (enum)	*read-only (null)*	The type of sensor. • This property shall contain the type of the sensor. *For the possible property values, see ReadingType in Property details.*
ReadingUnits	string	*read-only (null)*	The units of the reading and thresholds. • This property shall contain the units of the sensor's reading and thresholds.
RelatedItem *(v1.2+)* [{	array		An array of links to resources or objects that this sensor services. • This property shall contain an array of links to resources or objects that this sensor services.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
SensingFrequency *(deprecated v1.1)*	number	*read-only (null)*	The time interval between readings of the physical sensor. • This property shall contain the time interval between readings of the physical sensor. *Deprecated in v1.1 and later. This property has been deprecated in favor of the SensingInterval property, which uses the duration time format for interoperability.*
SensingInterval *(v1.1+)*	string	*read-only (null)*	The time interval between readings of the sensor. • This property shall contain the time interval between readings of data from the sensor. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
SensorGroup *(v1.4+)* {}	object		The group of sensors that provide readings for this sensor. • This property shall contain information for a group of sensors that provide input for the value of this sensor's reading. If this property is present, the Implementation property shall contain the value `Synthesized` . The group may be created for redundancy or to improve the accuracy of the reading through multiple sensor inputs. For property details, see RedundantGroup.

Property	Type	Attributes	Notes
SensorResetTime	string (date-time)	*read-only (null)*	The date and time when the time-based properties were last reset. • This property shall contain the date and time when the ResetMetrics action was last performed or the service last reset the time-based property values.
SpeedRPM *(v1.2+)*	number ({rev}/min)	*read-only (null)*	The rotational speed. • This property shall contain a reading of the rotational speed of the device in revolutions per minute (RPM) units.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
THDPercent *(v1.1+)*	number	*read-only (null)*	The total harmonic distortion (THD). • This property shall contain the total harmonic distortion of the Reading property in percent units.
Thresholds {	object		The set of thresholds defined for this sensor. • This property shall contain the set of thresholds that derive a sensor's health and operational range.
LowerCaution {}	object		The value at which the reading is below normal range. • This property shall contain the value at which the Reading property is below normal range. The value of the property shall use the same units as the Reading property. For more information about this property, see Threshold in Property Details.
LowerCautionUser *(v1.2+)* {}	object		The value at which the reading is below normal range. • This property shall contain the value at which the Reading property is below normal range. The value of the property shall use the same units as the Reading property. For more information about this property, see Threshold in Property Details.

Property	Type	Attributes	Notes
LowerCritical {}	object		The value at which the reading is below normal range but not yet fatal. • This property shall contain the value at which the Reading property is below the normal range but is not yet fatal. The value of the property shall use the same units as the Reading property. For more information about this property, see Threshold in Property Details.
LowerCriticalUser *(v1.2+)* {}	object		The value at which the reading is below normal range but not yet fatal. • This property shall contain the value at which the Reading property is below the normal range but is not yet fatal. The value of the property shall use the same units as the Reading property. For more information about this property, see Threshold in Property Details.
LowerFatal {}	object		The value at which the reading is below normal range and fatal. • This property shall contain the value at which the Reading property is below the normal range and is fatal. The value of the property shall use the same units as the Reading property. For more information about this property, see Threshold in Property Details.
UpperCaution {}	object		The value at which the reading is above normal range. • This property shall contain the value at which the Reading property is above the normal range. The value of the property shall use the same units as the Reading property. For more information about this property, see Threshold in Property Details.
UpperCautionUser *(v1.2+)* {}	object		The value at which the reading is above normal range. • This property shall contain the value at which the Reading property is above the normal range. The value of the property shall use the same units as the Reading property. For more information about this property, see Threshold in Property Details.
UpperCritical {}	object		The value at which the reading is above normal range but not yet fatal. • This property shall contain the value at which the Reading property is above the normal range but is not yet fatal. The value of the property shall use the same units as the Reading property. For more information about this property, see Threshold in Property Details.

Property	Type	Attributes	Notes
UpperCriticalUser *(v1.2+)* {}	object		The value at which the reading is above normal range but not yet fatal. • This property shall contain the value at which the Reading property is above the normal range but is not yet fatal. The value of the property shall use the same units as the Reading property. For more information about this property, see Threshold in Property Details.
UpperFatal {}	object		The value at which the reading is above normal range and fatal. • This property shall contain the value at which the Reading property is above the normal range and is fatal. The value of the property shall use the same units as the Reading property. For more information about this property, see Threshold in Property Details.
}			
VoltageType	string (enum)	*read-only (null)*	The voltage type for this sensor. • This property shall represent the type of input voltage the sensor monitors. *For the possible property values, see VoltageType in Property details.*

6.100.4 Actions

6.100.4.1 ResetMetrics

Description

Resets metrics related to this sensor.

- This action shall reset any time intervals or counted values for this sensor. The SensorResetTime property shall be updated to reflect the time that this action was performed.

Action URI: {Base URI of target resource}/Actions/Sensor.ResetMetrics

Action parameters

This action takes no parameters.

6.100.4.2 ResetToDefaults *(v1.6+)*

Description

The action resets the values of writable properties to factory defaults.

- This action shall reset the values of writable properties in this resource to their default values as specified by the manufacturer.

Action URI: {Base URI of target resource}/Actions/Sensor.ResetToDefaults

Action parameters

This action takes no parameters.

6.100.5 Property details

6.100.5.1 Activation:

The direction of crossing that activates this threshold.

- This property shall indicate the direction of crossing of the reading for this sensor that activates the threshold.

string	Description
Decreasing	Value decreases below the threshold. • This threshold is activated when the reading changes from a value higher than the threshold to a value lower than the threshold.
Either	Value crosses the threshold in either direction. • This threshold is activated when either the increasing or decreasing conditions are met.
Increasing	Value increases above the threshold. • This threshold is activated when the reading changes from a value lower than the threshold to a value higher than the threshold.

6.100.5.2 ElectricalContext:

The combination of current-carrying conductors.

- This property shall represent the combination of current-carrying conductors that distribute power.

string	Description
Line1	The circuits that share the L1 current-carrying conductor. • This value shall represent a circuit that shares the L1 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToLine2	The circuit formed by L1 and L2 current-carrying conductors. • This value shall represent a circuit formed by L1 and L2 current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToNeutral	The circuit formed by L1 and neutral current-carrying conductors. • This value shall represent a circuit formed by L1 and neutral current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Line1ToNeutralAndL1L2	The circuit formed by L1, L2, and neutral current-carrying conductors. • This value shall represent circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase/ 4-Wire or Three-phase / 5-Wire.
Line2	The circuits that share the L2 current-carrying conductor. • This value shall represent a circuit that shares the L2 current-carrying conductor, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 4-Wire or 5-Wire.
Line2ToLine3	The circuit formed by L2 and L3 current-carrying conductors. • This value shall represent a circuit formed by L2 and L3 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line2ToNeutral	The circuit formed by L2 and neutral current-carrying conductors. • This value shall represent a circuit formed by L2 and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase / 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL1L2	The circuit formed by L1, L2, and Neutral current-carrying conductors. • This value shall represent a circuit formed by L1, L2, and neutral current-carrying conductors, such as circuits with phase wiring types of Two-phase/ 4-Wire or Three-phase / 5-Wire.
Line2ToNeutralAndL2L3	The circuits formed by L2, L3, and neutral current-carrying conductors. • This value shall represent a circuit formed by L2, L3, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.

string	Description
Line3	The circuits that share the L3 current-carrying conductor. • This value shall represent a circuit that shares the L3 current-carrying conductor, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line3ToLine1	The circuit formed by L3 and L1 current-carrying conductors. • This value shall represent a circuit formed by L3 and L1 current-carrying conductors, such as circuits with phase wiring types of Three-phase / 4-Wire or 5-Wire.
Line3ToNeutral	The circuit formed by L3 and neutral current-carrying conductors. • This value shall represent a circuit formed by L3 and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
Line3ToNeutralAndL3L1	The circuit formed by L3, L1, and neutral current-carrying conductors. • This value shall represent a circuit formed by L3, L1, and neutral current-carrying conductors, such as circuits with a phase wiring type of Three-phase / 5-Wire.
LineToLine	The circuit formed by two current-carrying conductors. • This value shall represent a circuit formed by two current-carrying conductors, such as circuits with phase wiring types of Two-phase / 3-Wire or 4-Wire, or Three-phase / 4-Wire or 5-Wire.
LineToNeutral	The circuit formed by a line and neutral current-carrying conductor. • This value shall represent a circuit formed by a line and neutral current-carrying conductor, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 4-Wire or 5-Wire.
Neutral	The grounded current-carrying return circuit of current-carrying conductors. • This value shall represent the grounded current-carrying return circuit of current-carrying conductors, such as circuits with phase wiring types of Single-phase / 3-Wire, Two-phase / 4-Wire, or Three-phase / 5-Wire.
Total	The circuit formed by all current-carrying conductors. • This value shall represent the circuits formed by all current-carrying conductors for any phase wiring type.

6.100.5.3 Implementation:

The implementation of the sensor.

- This property shall contain the implementation of the sensor.

string	Description
PhysicalSensor	The reading is acquired from a physical sensor.
Reported	The reading is obtained from software or a device.
Synthesized	The reading is obtained by applying a calculation on one or more properties or multiple sensors. The calculation is not provided.

6.100.5.4 PhysicalContext:

The area or device to which this sensor measurement applies.

- This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).

string	Description
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.

string	Description
SystemBoard	The system board (PCB).
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.100.5.5 PhysicalSubContext:

The usage or location within a device to which this sensor measurement applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same PhysicalContext instance.

string	Description
Input	The input.
Output	The output.

6.100.5.6 ReadingType:

The type of sensor.

- This property shall contain the type of the sensor.

string	Description
AbsoluteHumidity *(v1.5+)*	Absolute humidity (g/cu m). • This value shall indicate an absolute (volumetric) humidity measurement, in grams per cubic meter units, and the ReadingUnits value shall be `g/m3`.

string	Description
AirFlow	Airflow (cu ft/min). • This value shall indicate a measurement of a volume of gas per unit of time, in cubic feet per minute units, that flows through a particular junction. The ReadingUnits shall be `[ft_i]3/min`.
Altitude	Altitude (m). • This value shall indicate a measurement of altitude, in meter units, defined as the elevation above sea level. The ReadingUnits value shall be `m`.
Barometric	Barometric pressure (mm). • This value shall indicate a measurement of barometric pressure, in millimeters of a mercury column, and the ReadingUnits value shall be `mm[Hg]`.
ChargeAh *(v1.4+)*	Charge (Ah). • This value shall indicate the amount of charge of the monitored item. If representing metered power consumption, integral of real power over time, the value shall reflect the power consumption since the sensor metrics were last reset. The value of the Reading property shall be in ampere-hour units and the ReadingUnits value shall be `A.h`.
Current	Current (A). • This value shall indicate a measurement of the root mean square (RMS) of instantaneous current calculated over an integer number of line cycles for a circuit. Current is expressed in ampere units and the ReadingUnits value shall be `A`.
EnergyJoules	Energy (J). • This value shall indicate the energy, integral of real power over time, of the monitored item. If representing metered power consumption the value shall reflect the power consumption since the sensor metrics were last reset. The value of the Reading property shall be in joule units and the ReadingUnits value shall be `J`. This value is used for device-level energy consumption measurements, while EnergykWh is used for large-scale consumption measurements.
EnergykWh	Energy (kWh). • This value shall indicate the energy, integral of real power over time, of the monitored item. If representing metered power consumption the value shall reflect the power consumption since the sensor metrics were last reset. The value of the Reading property shall be in kilowatt-hour units and the ReadingUnits value shall be `kW.h`. This value is used for large-scale energy consumption measurements, while EnergyJoules and EnergyWh are used for device-level consumption measurements.

string	Description
EnergyWh *(v1.4+)*	Energy (Wh). • This value shall indicate the energy, integral of real power over time, of the monitored item. If representing metered power consumption the value shall reflect the power consumption since the sensor metrics were last reset. The value of the Reading property shall be in watt-hour units and the ReadingUnits value shall be `W.h`. This value is used for device-level energy consumption measurements, while EnergykWh is used for large-scale consumption measurements.
Frequency	Frequency (Hz). • This value shall indicate a frequency measurement, in hertz units, and the ReadingUnits value shall be `Hz`.
Humidity	Relative humidity (percent). • This value shall indicate a relative humidity measurement, in percent units, and the ReadingUnits value shall be '%'.
LiquidFlow	Liquid flow (L/s). • This value shall indicate a measurement of a volume of liquid per unit of time, in liters per second units, that flows through a particular junction. The ReadingUnits shall be `L/s`.
LiquidLevel	Liquid level (cm). • This value shall indicate a measurement of fluid height, in centimeter units, relative to a specified vertical datum and the ReadingUnits value shall be `cm`.
Percent *(v1.1+)*	Percent (%). • This value shall indicate a percentage measurement, in percent units, and the ReadingUnits value shall be `%`.
Power	Power (W). • This value shall indicate the arithmetic mean of product terms of instantaneous voltage and current values measured over integer number of line cycles for a circuit, in watt units, and the ReadingUnits value shall be 'W'.
Pressure	Pressure (Pa). • This value shall indicate a measurement of force, in pascal units, applied perpendicular to the surface of an object per unit area over which that force is distributed. The ReadingUnits shall be `Pa`.
PressurekPa *(v1.5+)*	Pressure (kPa). • This value shall indicate a measurement of pressure, in kilopascal units, relative to atmospheric pressure. The ReadingUnits value shall be `kPa`.

string	Description
Rotational	Rotational (RPM). • This value shall indicate a measurement of rotational frequency, in revolutions per minute unit, and the ReadingUnits value shall be either `{rev}/min`, which is preferred, or `RPM`, which is a deprecated value.
Temperature	Temperature (C). • This value shall indicate a temperature measurement, in degrees Celsius units, and the ReadingUnits value shall be 'Cel'.
Voltage	Voltage (VAC or VDC). • This value shall indicate a measurement of the root mean square (RMS) of instantaneous voltage calculated over an integer number of line cycles for a circuit. Voltage is expressed in volt units and the ReadingUnits value shall be `V`.

6.100.5.7 Threshold:

The threshold definition for a sensor.

Activation	string (enum)	*read-write (null)*	The direction of crossing that activates this threshold. • This property shall indicate the direction of crossing of the reading for this sensor that activates the threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	*read-write (null)*	The duration the sensor value must violate the threshold before the threshold is activated. • This property shall indicate the duration the sensor value violates the threshold before the threshold is activated. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
Reading	number	*read-write (null)*	The threshold value. • This property shall indicate the reading for this sensor that activates the threshold. The value of the property shall use the same units as the Reading property.

6.100.5.8 VoltageType:

The voltage type for this sensor.

- This property shall represent the type of input voltage the sensor monitors.

string	Description
AC	Alternating current.
DC	Direct current.

6.100.6 Example response

```
{
    "@odata.type": "#Sensor.v1_6_0.Sensor",
    "Id": "CabinetTemp",
    "Name": "Rack Temperature",
    "ReadingType": "Temperature",
    "ReadingTime": "2019-12-25T04:14:33+06:00",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Reading": 31.6,
    "ReadingUnits": "C",
    "ReadingRangeMin": 0,
    "ReadingRangeMax": 70,
    "Accuracy": 0.25,
    "Precision": 1,
    "SensingInterval": "PT3S",
    "PhysicalContext": "Chassis",
    "Thresholds": {
        "UpperCritical": {
            "Reading": 40,
            "Activation": "Increasing"
        },
        "UpperCaution": {
            "Reading": 35,
            "Activation": "Increasing"
        },
        "LowerCaution": {
            "Reading": 10,
            "Activation": "Increasing"
        }
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1/Sensors/CabinetTemp"
}
```

6.101 SerialInterface 1.1.8

Version	*v1.1*	*v1.0*
Release	2017.1	1.0

6.101.1 Description

The SerialInterface schema describes an asynchronous serial interface, such as an RS-232 interface, available to a system or device.

- This resource shall represent a serial interface as part of the Redfish Specification.

6.101.2 URIs

/redfish/v1/Managers/*{ManagerId}*/SerialInterfaces/*{SerialInterfaceId}*

6.101.3 Properties

Property	Type	Attributes	Notes
BitRate	string (enum)	*read-write*	The receive and transmit rate of data flow, typically in bits per second (bit/s), over the serial connection. • This property shall indicate the transmit and receive speed of the serial connection. *For the possible property values, see BitRate in Property details.*
ConnectorType	string (enum)	*read-only*	The type of connector used for this interface. • This property shall indicate the type of physical connector used for this serial connection. *For the possible property values, see ConnectorType in Property details.*
DataBits	string (enum)	*read-write*	The number of data bits that follow the start bit over the serial connection. • This property shall indicate number of data bits for the serial connection. *For the possible property values, see DataBits in Property details.*
FlowControl	string (enum)	*read-write*	The type of flow control, if any, that is imposed on the serial connection. • This property shall indicate the flow control mechanism for the serial connection. *For the possible property values, see FlowControl in Property details.*

Property	Type	Attributes	Notes
InterfaceEnabled	boolean	*read-write (null)*	An indication of whether this interface is enabled. • This property shall indicate whether this interface is enabled.
Parity	string (enum)	*read-write*	The type of parity used by the sender and receiver to detect errors over the serial connection. • This property shall indicate parity information for a serial connection. *For the possible property values, see Parity in Property details.*
PinOut	string (enum)	*read-only (null)*	The physical pinout configuration for a serial connector. • This property shall indicate the physical pinout for the serial connector. *For the possible property values, see PinOut in Property details.*
SignalType	string (enum)	*read-only*	The type of signal used for the communication connection. • This property shall contain the type of serial signaling in use for the serial connection. *For the possible property values, see SignalType in Property details.*
StopBits	string (enum)	*read-write*	The period of time before the next start bit is transmitted. • This property shall indicate the stop bits for the serial connection. *For the possible property values, see StopBits in Property details.*

6.101.4 Property details

6.101.4.1 BitRate:

The receive and transmit rate of data flow, typically in bits per second (bit/s), over the serial connection.

- This property shall indicate the transmit and receive speed of the serial connection.

string	Description
115200	A bit rate of 115200 bit/s.
1200	A bit rate of 1200 bit/s.
19200	A bit rate of 19200 bit/s.
230400	A bit rate of 230400 bit/s.
2400	A bit rate of 2400 bit/s.

string	Description
38400	A bit rate of 38400 bit/s.
4800	A bit rate of 4800 bit/s.
57600	A bit rate of 57600 bit/s.
9600	A bit rate of 9600 bit/s.

6.101.4.2 ConnectorType:

The type of connector used for this interface.

- This property shall indicate the type of physical connector used for this serial connection.

string	Description
DB25 Female	A DB25 Female connector.
DB25 Male	A DB25 Male connector.
DB9 Female	A DB9 Female connector.
DB9 Male	A DB9 Male connector.
mUSB	A mUSB connector.
RJ11	An RJ11 connector.
RJ45	An RJ45 connector.
USB	A USB connector.
uUSB	A uUSB connector.

6.101.4.3 DataBits:

The number of data bits that follow the start bit over the serial connection.

- This property shall indicate number of data bits for the serial connection.

string	Description
5	Five bits of data following the start bit.

string	Description
6	Six bits of data following the start bit.
7	Seven bits of data following the start bit.
8	Eight bits of data following the start bit.

6.101.4.4 FlowControl:

The type of flow control, if any, that is imposed on the serial connection.

- This property shall indicate the flow control mechanism for the serial connection.

string	Description
Hardware	Out-of-band flow control imposed.
None	No flow control imposed.
Software	XON/XOFF in-band flow control imposed.

6.101.4.5 Parity:

The type of parity used by the sender and receiver to detect errors over the serial connection.

- This property shall indicate parity information for a serial connection.

string	Description
Even	An even parity bit.
Mark	A mark parity bit.
None	No parity bit.
Odd	An odd parity bit.
Space	A space parity bit.

6.101.4.6 PinOut:

The physical pinout configuration for a serial connector.

- This property shall indicate the physical pinout for the serial connector.

string	Description
Cisco	The Cisco pinout configuration.
Cyclades	The Cyclades pinout configuration.
Digi	The Digi pinout configuration.

6.101.4.7 SignalType:

The type of signal used for the communication connection.

- This property shall contain the type of serial signaling in use for the serial connection.

string	Description
Rs232	The serial interface follows RS232.
Rs485	The serial interface follows RS485.

6.101.4.8 StopBits:

The period of time before the next start bit is transmitted.

- This property shall indicate the stop bits for the serial connection.

string	Description
1	One stop bit following the data bits.
2	Two stop bits following the data bits.

6.101.5 Example response

```
{
    "@odata.type": "#SerialInterface.v1_1_8.SerialInterface",
    "Id": "TTY0",
    "Name": "Manager Serial Interface 1",
    "Description": "Management for Serial Interface",
    "InterfaceEnabled": true,
    "SignalType": "Rs232",
    "BitRate": "115200",
```

```
    "Parity": "None",
    "DataBits": "8",
    "StopBits": "1",
    "FlowControl": "None",
    "ConnectorType": "RJ45",
    "PinOut": "Cyclades",
    "@odata.id": "/redfish/v1/Managers/BMC/SerialInterfaces/TTY0"
}
```


6.102 ServiceConditions 1.0.0

Version	*v1.0*
Release	2021.4

6.102.1 Description

The ServiceConditions schema contains definitions for reporting the conditions present in the service that require attention.

- This resource shall be used to represent the overall conditions present in a service for a Redfish implementation.

6.102.2 URIs

/redfish/v1/ServiceConditions

6.102.3 Properties

Property	Type	Attributes	Notes
Conditions [{ }]	array (object)	*(null)*	A condition that requires attention. • Conditions reported by this service that require attention. ◦ This property shall represent a roll-up of the active conditions requiring attention in resources of this Redfish service. The service may roll up any number of conditions originating from resources in the service, using the `ConditionInRelatedResource` message from Base Message Registry. For property details, see Condition.

Property	Type	Attributes	Notes
HealthRollup	string (enum)	*read-only*	The health roll-up for all resources. • This property shall contain the highest severity of any messages included in the Conditions property. *For the possible property values, see HealthRollup in Property details.*

6.102.4 Property details

6.102.4.1 HealthRollup:

The health roll-up for all resources.

- This property shall contain the highest severity of any messages included in the Conditions property.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.102.5 Example response

```
{
    "@odata.type": "#ServiceConditions.v1_0_0.ServiceConditions",
    "Name": "Redfish Service Conditions",
    "HealthRollup": "Warning",
    "Conditions": [
        {
            "MessageId": "ThermalEvents.1.0.OverTemperature",
            "Timestamp": "2020-11-08T12:25:00-05:00 ",
            "Message": "Temperature exceeds rated limit in power supply `A`.",
            "Severity": "Warning",
            "MessageArgs": [
                "A"
            ],
            "OriginOfCondition": {
                "@odata.id": "/redfish/v1/Chassis/1/Power"
            },
            "LogEntry": {
                "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/1"
```

```
            }
        },
        {
            "MessageId": "Base.1.9.ConditionInRelatedResource",
            "Message": "One or more conditions exist in a related resource. See the OriginOfCondition property.",
            "Severity": "Warning",
            "OriginOfCondition": {
                "@odata.id": "/redfish/v1/Systems/cpu-memory-example"
            }
        }
    ],
    "Oem": {},
    "@odata.id": "/redfish/v1/ServiceConditions"
}
```


6.103 ServiceRoot 1.14.0

Version	*v1.14*	*v1.13*	*v1.12*	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	...
Release	2022.1	2021.4	2021.3	2021.2	2021.1	2020.3	2020.2	2020.1	2019.4	2018.3	2018.2	...

6.103.1 Description

The ServiceRoot schema describes the root of the Redfish Service, located at the '/redfish/v1' URI. All other Resources accessible through the Redfish interface on this device are linked directly or indirectly from the Service Root.

- This Resource represents the root Redfish Service. All values that this schema describes for Resources shall comply with the Redfish Specification-described requirements.

6.103.2 URIs

/redfish/v1
/redfish/v1/

6.103.3 Properties

Property	Type	Attributes	Notes
AccountService {	object		The link to the Account Service. • This property shall contain a link to a Resource of type AccountService. See the *AccountService* schema for details on this property.
@odata.id	string	*read-only*	Link to a AccountService resource. See the Links section and the *AccountService* schema for details.
}			
AggregationService *(v1.8+)* {	object		The link to the aggregation service. • This property shall contain a link to a resource of type AggregationService. See the *AggregationService* schema for details on this property.
@odata.id	string	*read-only*	Link to a AggregationService resource. See the Links section and the *AggregationService* schema for details.
}			
Cables *(v1.11+)* {	object		The link to a collection of cables. • This property shall contain a link to a resource collection of type CableCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Cable*. See the Cable schema for details.
}			
CertificateService *(v1.5+)* {	object		The link to the Certificate Service. • This property shall contain a link to a Resource of type CertificateService. See the *CertificateService* schema for details on this property.
@odata.id	string	*read-only*	Link to a CertificateService resource. See the Links section and the *CertificateService* schema for details.
}			
Chassis {	object		The link to a collection of chassis. • This property shall contain a link to a Resource Collection of type ChassisCollection. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to Collection of *Chassis*. See the Chassis schema for details.
}			
ComponentIntegrity *(v1.13+)* {	object		The link to a collection of component integrity information. • This property shall contain a link to a resource collection of type ComponentIntegrityCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *ComponentIntegrity*. See the ComponentIntegrity schema for details.
}			
CompositionService *(v1.2+)* {	object		The link to the Composition Service. • This property shall contain a link to a Resource of type CompositionService. See the *CompositionService* schema for details on this property.
@odata.id	string	*read-only*	Link to a CompositionService resource. See the Links section and the *CompositionService* schema for details.
}			
EventService {	object		The link to the Event Service. • This property shall contain a link to a Resource of type EventService. See the *EventService* schema for details on this property.
@odata.id	string	*read-only*	Link to a EventService resource. See the Links section and the *EventService* schema for details.
}			
Fabrics *(v1.1+)* {	object		The link to a collection of all fabric entities. • This property shall contain a link to a Resource Collection of type FabricCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Fabric*. See the Fabric schema for details.
}			

Property	Type	Attributes	Notes
Facilities *(v1.6+)* {	object		The link to a collection of facilities. • This property shall contain a link to a resource collection of type FacilityCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Facility*. See the Facility schema for details.
}			
JobService *(v1.4+)* {	object		The link to the JobService. • This property shall contain a link to a Resource of type JobService. See the *JobService* schema for details on this property.
@odata.id	string	*read-only*	Link to a JobService resource. See the Links section and the *JobService* schema for details.
}			
JsonSchemas {	object		The link to a collection of JSON Schema files. • This property shall contain a link to a Resource Collection of type JsonSchemaFileCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *JsonSchemaFile*. See the JsonSchemaFile schema for details.
}			
KeyService *(v1.11+)* {	object		The link to the key service. • This property shall contain a link to a resource of type KeyService. See the *KeyService* schema for details on this property.
@odata.id	string	*read-only*	Link to a KeyService resource. See the Links section and the *KeyService* schema for details.
}			
LicenseService *(v1.12+)* {	object		The link to the license service. • This property shall contain a link to a resource of type LicenseService. See the *LicenseService* schema for details on this property.
@odata.id	string	*read-only*	Link to a LicenseService resource. See the Links section and the *LicenseService* schema for details.
}			

Property	Type	Attributes	Notes
Links {	object	*required*	The links to other Resources that are related to this Resource. • The Redfish Specification-described Links Property shall contain links to Resources related to but not subordinate to this Resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Sessions {	object	*required*	The link to a collection of Sessions. • This property shall contain a link to a Resource Collection of type SessionCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Session*. See the Session schema for details.
}			
}			
Managers {	object		The link to a collection of managers. • This property shall contain a link to a Resource Collection of type ManagerCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Manager*. See the Manager schema for details.
}			
NVMeDomains *(v1.10+)* {}	object		The link to a collection of NVMe domains. • This property shall contain a link to a resource collection of type NVMeDomainCollection.
PowerEquipment *(v1.6+)* {	object		The link to a set of power equipment. • This property shall contain a link to a resource of type PowerEquipment. See the *PowerEquipment* schema for details on this property.
@odata.id	string	*read-only*	Link to a PowerEquipment resource. See the Links section and the *PowerEquipment* schema for details.
}			
Product *(v1.3+)*	string	*read-only* *(null)*	The product associated with this Redfish Service. • This property shall include the name of the product represented by this Redfish Service.

Property	Type	Attributes	Notes
ProtocolFeaturesSupported *(v1.3+)* {	object		The information about protocol features that the service supports. • This property shall contain information about protocol features that the service supports.
DeepOperations *(v1.7+)* {	object		The information about deep operations that the service supports. • This property shall contain information about deep operations that the service supports.
DeepPATCH *(v1.7+)*	boolean	*read-only*	An indication of whether the service supports the deep PATCH operation. • This property shall indicate whether this service supports the Redfish Specification-defined deep PATCH operation.
DeepPOST *(v1.7+)*	boolean	*read-only*	An indication of whether the service supports the deep POST operation. • This property shall indicate whether this service supports the Redfish Specification-defined deep POST operation.
MaxLevels *(v1.7+)*	integer	*read-only*	The maximum levels of resources allowed in deep operations. • This property shall contain the maximum levels of resources allowed in deep operations.
}			
ExcerptQuery *(v1.4+)*	boolean	*read-only*	An indication of whether the service supports the excerpt query parameter. • This property shall indicate whether this service supports the excerpt query parameter.
ExpandQuery *(v1.3+)* {	object		The information about the use of $expand in the service. • This property shall contain information about the support of the $expand query parameter by the service.
ExpandAll *(v1.3+)*	boolean	*read-only*	An indication of whether the service supports the asterisk (`*`) option of the $expand query parameter. • This property shall indicate whether this service supports the asterisk (`*`) option of the $expand query parameter.
Levels *(v1.3+)*	boolean	*read-only*	An indication of whether the service supports the $levels option of the $expand query parameter. • This property shall indicate whether the service supports the $levels option of the $expand query parameter.

Property	Type	Attributes	Notes
Links *(v1.3+)*	boolean	*read-only*	An indication of whether this service supports the tilde (`~`) option of the $expand query parameter. • This property shall indicate whether this service supports the supports the tilde (~) option of the $expand query parameter.
MaxLevels *(v1.3+)*	integer	*read-only*	The maximum $levels option value in the $expand query parameter. • This property shall contain the maximum $levels option value in the $expand query parameter. Shall be included only if $levels is true.
NoLinks *(v1.3+)*	boolean	*read-only*	An indication of whether the service supports the period (`.`) option of the $expand query parameter. • This property shall indicate whether the service supports the period (`.`) option of the $expand query parameter.
}			
FilterQuery *(v1.3+)*	boolean	*read-only*	An indication of whether the service supports the $filter query parameter. • This property shall indicate whether this service supports the $filter query parameter.
MultipleHTTPRequests *(v1.14+)*	boolean	*read-only*	An indication of whether the service supports multiple outstanding HTTP requests. • This property shall indicate whether this service supports multiple outstanding HTTP requests.
OnlyMemberQuery *(v1.4+)*	boolean	*read-only*	An indication of whether the service supports the only query parameter. • This property shall indicate whether this service supports the only query parameter.
SelectQuery *(v1.3+)*	boolean	*read-only*	An indication of whether the service supports the $select query parameter. • This property shall indicate whether this service supports the $select query parameter.
}			
RedfishVersion	string	*read-only*	The version of the Redfish Service. • This property shall represent the Redfish protocol version, as specified in the Protocol Version clause of the Redfish Specification, to which this Service conforms. Pattern: `^\d+\.\d+\.\d+$`

Property	Type	Attributes	Notes
RegisteredClients *(v1.13+)* {	object		The link to a collection of registered clients. • This property shall contain a link to a resource collection of type RegisteredClientCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *RegisteredClient*. See the RegisteredClient schema for details.
}			
Registries {	object		The link to a collection of Registries. • This property shall contain a link to a Resource Collection of type MessageRegistryFileCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *MessageRegistryFile*. See the MessageRegistryFile schema for details.
}			
ResourceBlocks *(v1.5+)* {	object		The link to a collection of all Resource Block Resources. This collection is intended for implementations that do not contain a Composition Service but that expose Resources to an orchestrator that implements a Composition Service. • This property shall contain a link to a Resource Collection of type ResourceBlockCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *ResourceBlock*. See the ResourceBlock schema for details.
}			
ServiceConditions *(v1.13+)* {	object		The link to the service conditions. • This property shall contain a link to a resource of type ServiceConditions. See the *ServiceConditions* schema for details on this property.
@odata.id	string	*read-only*	Link to a ServiceConditions resource. See the Links section and the *ServiceConditions* schema for details.
}			

Property	Type	Attributes	Notes
ServiceIdentification *(v1.14+)*	string	*read-only*	The vendor or user-provided product and service identifier. • This property shall contain a vendor or user-provided value that identifies and associates a discovered Redfish service with a particular product instance. The value of the property shall contain the value of the `ServiceIdentification` property in the Manager resource providing the Redfish service root resource. The value of this property can be used during deployment processes to match user credentials or other a priori product instance information to the appropriate Redfish service.
SessionService {	object		The link to the Sessions Service. • This property shall contain a link to a Resource of type SessionService. See the *SessionService* schema for details on this property.
@odata.id	string	*read-only*	Link to a SessionService resource. See the Links section and the *SessionService* schema for details.
}			
Storage *(v1.9+)* {	object		The link to a collection of storage subsystems. • This property shall contain a link to a resource collection of type StorageCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Storage*. See the Storage schema for details.
}			
StorageServices *(v1.1+)* {}	object		The link to a collection of all storage service entities. • This property shall contain a link to a Resource Collection of type StorageServiceCollection.
StorageSystems *(v1.1+)* {}	object		The link to a collection of storage systems. • This property shall contain a link to a Resource Collection of type StorageSystemCollection. This collection shall contain computer systems that act as storage servers. The HostingRoles attribute of each such computer system shall have a StorageServer entry.
Systems {	object		The link to a collection of systems. • This property shall contain a link to a Resource Collection of type ComputerSystemCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *ComputerSystem*. See the ComputerSystem schema for details.

Property	Type	Attributes	Notes
}			
Tasks {	object		The link to the Task Service. • This property shall contain a link to a Resource of type TaskService. See the *TaskService* schema for details on this property.
@odata.id	string	*read-only*	Link to a TaskService resource. See the Links section and the *TaskService* schema for details.
}			
TelemetryService *(v1.4+)* {	object		The link to the Telemetry Service. • This property shall contain a link to a Resource of type TelemetryService. See the *TelemetryService* schema for details on this property.
@odata.id	string	*read-only*	Link to a TelemetryService resource. See the Links section and the *TelemetryService* schema for details.
}			
UpdateService *(v1.1+)* {	object		The link to the Update Service. • This property shall contain a link to a Resource of type UpdateService. See the *UpdateService* schema for details on this property.
@odata.id	string	*read-only*	Link to a UpdateService resource. See the Links section and the *UpdateService* schema for details.
}			
UUID	string	*read-only* *(null)*	Unique identifier for a service instance. When SSDP is used, this value should be an exact match of the UUID value returned in a 200 OK from an SSDP M-SEARCH request during discovery. • This property shall represent the id of the Redfish Service instance. The format of this string shall contain a 32-byte value in the form 8-4-4-4-12. If SSDP is used, this value shall be an exact match of the UUID value returned in a 200 OK from an SSDP M-SEARCH request during discovery. RFC4122 describes methods to use to create a UUID value. The value should be considered to be opaque. Client software should only treat the overall value as a universally unique identifier and should not interpret any sub-fields within the UUID. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`

Property	Type	Attributes	Notes
Vendor *(v1.5+)*	string	*read-only* *(null)*	The vendor or manufacturer associated with this Redfish Service. • This property shall include the name of the manufacturer or vendor represented by this Redfish Service. If this property is supported, the vendor name shall not be included in the Product property value.

6.103.4 Property details

6.103.4.1 idRef:

@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

6.103.5 Example response


```
{
    "@odata.type": "#ServiceRoot.v1_14_0.ServiceRoot",
    "Id": "RootService",
    "Name": "Root Service",
    "RedfishVersion": "1.15.0",
    "UUID": "92384634-2938-2342-8820-489239905423",
    "Product": "UR99 1U Server",
    "ProtocolFeaturesSupported": {
        "ExpandQuery": {
            "ExpandAll": true,
            "Levels": true,
            "MaxLevels": 6,
            "Links": true,
            "NoLinks": true
        },
        "SelectQuery": false,
        "FilterQuery": false,
        "OnlyMemberQuery": true,
        "ExcerptQuery": true,
        "MultipleHTTPRequests": true
    },
    "ServiceConditions": {
        "@odata.id": "/redfish/v1/ServiceConditions"
    },
    "Systems": {
```

```
        "@odata.id": "/redfish/v1/Systems"
    },
    "Chassis": {
        "@odata.id": "/redfish/v1/Chassis"
    },
    "Managers": {
        "@odata.id": "/redfish/v1/Managers"
    },
    "UpdateService": {
        "@odata.id": "/redfish/v1/UpdateService"
    },
    "CompositionService": {
        "@odata.id": "/redfish/v1/CompositionService"
    },
    "Tasks": {
        "@odata.id": "/redfish/v1/TaskService"
    },
    "SessionService": {
        "@odata.id": "/redfish/v1/SessionService"
    },
    "AccountService": {
        "@odata.id": "/redfish/v1/AccountService"
    },
    "EventService": {
        "@odata.id": "/redfish/v1/EventService"
    },
    "Links": {
        "Sessions": {
            "@odata.id": "/redfish/v1/SessionService/Sessions"
        }
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/"
}
```


6.104 Session 1.5.0

Version	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2022.1	2020.3	2019.1	2017.1	1.0

6.104.1 Description

The Session resource describes a single connection (session) between a client and a Redfish service instance.

- This resource shall represent a session for a Redfish implementation.

6.104.2 URIs

/redfish/v1/SessionService/Sessions/*{SessionId}*

6.104.3 Properties

Property	Type	Attributes	Notes
ClientOriginIPAddress *(v1.3+)*	string	*read-only* *(null)*	The IP address of the client that created the session. • This property shall contain the IP address of the client that created the session.
Context *(v1.5+)*	string	*read-only* *(null)*	A client-supplied string that is stored with the session. • This property shall contain a client-supplied context that remains with the session through the session's lifetime.
CreatedTime *(v1.4+)*	string (date-time)	*read-only* *(null)*	The date and time when the session was created. • This property shall contain the date and time when the session was created.
OemSessionType *(v1.2+)*	string	*read-only* *(null)*	The active OEM-defined session type. • This property shall contain the OEM-specific session type that is currently active if SessionType contains `OEM`.
Password	string	*read-only* *required on create* *(null)*	The password for this session. The value is `null` in responses. • This property shall contain the password for this session. The value shall be `null` in responses.
SessionType *(v1.2+)*	string (enum)	*read-only* *(null)*	The active session type. • This property shall represent the type of session that is currently active. *For the possible property values, see SessionType in Property details.*
UserName	string	*read-only* *required on create* *(null)*	The username for the account for this session. • This property shall contain the username that matches an account recognized by the account service.

6.104.4 Property details

6.104.4.1 SessionType:

The active session type.

- This property shall represent the type of session that is currently active.

string	Description
HostConsole	The host's console, which could be connected through Telnet, SSH, or other protocol.
IPMI	Intelligent Platform Management Interface.
KVMIP	Keyboard-Video-Mouse over IP Session.
ManagerConsole	The manager's console, which could be connected through Telnet, SSH, SM CLP, or other protocol.
OEM	OEM type. For OEM session types, see the OemSessionType property.
Redfish	A Redfish session.
VirtualMedia	Virtual media.
WebUI	A non-Redfish web user interface session, such as a graphical interface or another web-based protocol.

6.104.5 Example response

```
{
    "@odata.type": "#Session.v1_5_0.Session",
    "Id": "1234567890ABCDEF",
    "Name": "User Session",
    "Description": "Manager User Session",
    "UserName": "Administrator",
    "Oem": {},
    "@odata.id": "/redfish/v1/SessionService/Sessions/1234567890ABCDEF"
}
```

6.105 SessionService 1.1.8

Version	*v1.1*	*v1.0*

Release	2016.2	1.0

6.105.1 Description

The SessionService schema describes the session service and its properties, with links to the actual list of sessions.

- This resource contains the session service properties for a Redfish implementation.

6.105.2 URIs

/redfish/v1/SessionService

6.105.3 Properties

Property	Type	Attributes	Notes
ServiceEnabled	boolean	*read-write (null)*	An indication of whether this service is enabled. If `true`, this service is enabled. If `false`, it is disabled, and new sessions cannot be created, old sessions cannot be deleted, and established sessions can continue operating. • This property shall indicate whether this service is enabled. If `true`, this service is enabled. If `false`, it is disabled, and new sessions shall not be created, old sessions shall not be deleted, and established sessions can continue operating.
Sessions {	object		The link to a collection of sessions. • This property shall contain a link to a resource collection of type SessionCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Session*. See the Session schema for details.
}			
SessionTimeout	integer (seconds)	*read-write*	The number of seconds of inactivity that a session can have before the session service closes the session due to inactivity. • This property shall contain the threshold of time in seconds between requests on a specific session at which point the session service shall close the session due to inactivity. The session service shall support any value between the Validation.Minimum and Validation.Maximum.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.105.4 Example response

```
{
    "@odata.type": "#SessionService.v1_1_8.SessionService",
    "Id": "SessionService",
    "Name": "Session Service",
    "Description": "Session Service",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "ServiceEnabled": true,
    "SessionTimeout": 30,
    "Sessions": {
        "@odata.id": "/redfish/v1/SessionService/Sessions"
    },
    "@odata.id": "/redfish/v1/SessionService"
}
```

6.106 Signature 1.0.2

Version	*v1.0*
Release	2020.1

6.106.1 Description

The Signature schema describes a signature or a hash.

- This resource contains a signature for a Redfish implementation.

6.106.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Signatures/*{SignatureId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Signatures/*{SignatureId}*
/redfish/v1/Systems/*{ComputerSystemId}*/SecureBoot/SecureBootDatabases/*{DatabaseId}*/Signatures/*{SignatureId}*

6.106.3 Properties

Property	Type	Attributes	Notes
SignatureString	string	*read-only required on create (null)*	The string for the signature. • This property shall contain the string of the signature, and the format shall follow the requirements specified by the value of the SignatureType property. If the signature contains any private keys, they shall be removed from the string in responses. If the private key for the signature is not known by the service and is needed to use the signature, the client shall provide the private key as part of the string in the POST request.
SignatureType	string	*read-only required on create (null)*	The format of the signature. • This property shall contain the format type for the signature. The format is qualified by the value of the SignatureTypeRegistry property.
SignatureTypeRegistry	string (enum)	*read-only required on create (null)*	The type of the signature. • This property shall contain the type for the signature. *For the possible property values, see SignatureTypeRegistry in Property details.*
UefiSignatureOwner	string	*read-only (null)*	The UEFI signature owner for this signature. • The value of this property shall contain the GUID of the UEFI signature owner for this signature as defined by the UEFI Specification. This property shall only be present if the SignatureTypeRegistry property is `UEFI`. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`

6.106.4 Property details

6.106.4.1 SignatureTypeRegistry:

The type of the signature.

- This property shall contain the type for the signature.

string	Description
UEFI	A signature defined in the UEFI Specification. • This value shall indicate that the SignatureType string contains the #define name of the SignatureType member of the EFI_SIGNATURE_LIST, as defined by the UEFI Specification. This value shall also indicate that the format of the SignatureString is a big-endian hex-encoded string of the binary value specified in the UEFI SignatureData array in EFI_SIGNATURE_DATA, as defined by the UEFI Specification.

6.106.5 Example response

```
{
    "@odata.type": "#Signature.v1_0_2.Signature",
    "Id": "1",
    "Name": "SHA256 Signature",
    "SignatureString": "80B4D96931BF0D02FD91A61E19D14F1DA452E66DB2408CA8604D411F92659F0A",
    "SignatureTypeRegistry": "UEFI",
    "SignatureType": "EFI_CERT_SHA256_GUID",
    "UefiSignatureOwner": "28d5e212-165b-4ca0-909b-c86b9cee0112",
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/SecureBoot/SecureBootDatabases/db/Signatures/1"
}
```

6.107 SimpleStorage 1.3.1

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.3	2017.1	2016.1	1.0

6.107.1 Description

The SimpleStorage schema represents the properties of a storage controller and its directly-attached devices.

- This Resource contains a storage controller and its directly-attached devices.

6.107.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/SimpleStorage/*{SimpleStorageId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SimpleStorage/*{SimpleStorageId}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/SimpleStorage/*{SimpleStorageId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/SimpleStorage/*{SimpleStorageId}*
/redfish/v1/Systems/*{ComputerSystemId}*/SimpleStorage/*{SimpleStorageId}*

6.107.3 Properties

Property	Type	Attributes	Notes
Devices [{	array		The storage devices. • This property shall contain a list of storage devices related to this Resource.
CapacityBytes *(v1.1+)*	integer (bytes)	*read-only (null)*	The size, in bytes, of the storage device. • This property shall represent the size, in bytes, of the storage device.
Manufacturer	string	*read-only (null)*	The name of the manufacturer of this device. • This property shall indicate the name of the manufacturer of this storage device.
Model	string	*read-only (null)*	The product model number of this device. • This property shall indicate the model information as provided by the manufacturer of this storage device.
Name	string	*read-only required*	The name of the Resource or array member. • This object represents the name of this Resource or array member. The Resource values shall comply with the Redfish Specification-described requirements. This string value shall be of the 'Name' reserved word format.
Oem {}	object		See the OEM object definition in the Using this guide clause.
Status {}	object		The status and health of the Resource and its subordinate or dependent Resources. • This property shall contain any status or health properties of the Resource. For property details, see Status.
}]			
Links *(v1.2+)* {	object		The links to other Resources that are related to this Resource. • The Redfish Specification-described Links Property shall contain links to Resources related to but not subordinate to this Resource.
Chassis *(v1.2+)* {	object		The link to the chassis that contains this simple storage. • This property shall contain a link to a Resource of type Chassis that represents the physical container associated with this Resource. See the *Chassis* schema for details on this property.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
Storage *(v1.3+)* {	object		The link to the storage instance that corresponds to this simple storage. • This property shall contain a link to a Resource of type Storage that represents the same storage subsystem as this Resource. See the *Storage* schema for details on this property.
@odata.id	string	*read-only*	Link to a Storage resource. See the Links section and the *Storage* schema for details.
}			
}			
Status {}	object		The status and health of the Resource and its subordinate or dependent Resources. • This property shall contain any status or health properties of the Resource. For property details, see Status.
UefiDevicePath	string	*read-only* *(null)*	The UEFI device path to access this storage controller. • This property shall contain the UEFI device path that identifies and locates the specific storage controller.

6.107.4 Example response

```
{
    "@odata.type": "#SimpleStorage.v1_3_1.SimpleStorage",
    "Id": "1",
    "Name": "Simple Storage Controller",
    "Description": "System SATA",
    "UefiDevicePath": "Acpi(PNP0A03,0)/Pci(1F|1)/Ata(Primary,Master)/HD(Part3, Sig00110011)",
    "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "Warning"
    },
    "Devices": [
        {
            "Name": "SATA Bay 1",
            "Manufacturer": "Contoso",
            "Model": "3000GT8",
            "CapacityBytes": 8000000000000,
```

```
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            }
        },
        {
            "Name": "SATA Bay 2",
            "Manufacturer": "Contoso",
            "Model": "3000GT7",
            "CapacityBytes": 4000000000000,
            "Status": {
                "State": "Enabled",
                "Health": "Warning"
            }
        },
        {
            "Name": "SATA Bay 3",
            "Status": {
                "State": "Absent"
            }
        },
        {
            "Name": "SATA Bay 4",
            "Status": {
                "State": "Absent"
            }
        }
    ],
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/SimpleStorage/1"
}
```


6.108 SoftwareInventory 1.8.0

Version	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.2	2022.1	2021.4	2021.2	2020.4	2020.1	2018.1	2016.3	2016.2

6.108.1 Description

The SoftwareInventory schema contains an inventory of software components. This can include software components such as BIOS, BMC firmware, firmware for other devices, system drivers, or provider software.

- This Resource contains a single software component that this Redfish Service manages.

6.108.2 URIs

/redfish/v1/UpdateService/FirmwareInventory/*{SoftwareInventoryId}*
/redfish/v1/UpdateService/SoftwareInventory/*{SoftwareInventoryId}*

6.108.3 Properties

Property	Type	Attributes	Notes
AdditionalVersions *(v1.7+)* {	object		The additional versions of this software. • This property shall contain the additional versions of this software.
Bootloader *(v1.7+)*	string	*read-only (null)*	The bootloader version contained in this software, such as U-Boot or UEFI. • This property shall contain the bootloader version contained in this software.
Kernel *(v1.7+)*	string	*read-only (null)*	The kernel version contained in this software. • This property shall contain the kernel version contained in this software. For strict POSIX software, the value shall contain the output of `uname -srm`. For Microsoft Windows, the value shall contain the output of `ver`.
Microcode *(v1.7+)*	string	*read-only (null)*	The microcode version contained in this software, such as processor microcode. • This property shall contain the microcode version contained in this software.
Oem *(v1.7+)* {}	object		See the OEM object definition in the Using this guide clause.
OSDistribution *(v1.8+)*	string	*read-only (null)*	The operating system name of this software. • This property shall contain the operating system name of this software.
}			
LowestSupportedVersion *(v1.1+)*	string	*read-only (null)*	The lowest supported version of this software. • This property shall represent the lowest supported version of this software. This string is formatted using the same format used for the Version property.
Manufacturer *(v1.2+)*	string	*read-only (null)*	The manufacturer or producer of this software. • This property shall represent the name of the manufacturer or producer of this software.

Property	Type	Attributes	Notes
Measurement *(v1.4+, deprecated v1.6* {	object		A DSP0274-defined measurement block. • This property shall contain a DSP0274-defined measurement block. *Deprecated in v1.6 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
Measurement *(v1.4+)*	string	*read-only (null)*	The hexadecimal string representation of the numeric value of the DSP0274-defined Measurement field of the measurement block. • This property shall contain the value of the hexadecimal string representation of the numeric value of the DSP0274-defined Measurement field of the measurement block. Pattern: `^[0-9a-fA-F]+$`
MeasurementIndex *(v1.5+)*	integer	*read-only (null)*	The DSP0274-defined Index field of the measurement block. • This property shall contain the value of DSP0274-defined Index field of the measurement block.
MeasurementSize *(v1.4+)*	integer	*read-only (null)*	The DSP0274-defined MeasurementSize field of the measurement block. • This property shall contain the value of DSP0274-defined MeasurementSize field of the measurement block.
MeasurementSpecification *(v1.4+)*	integer	*read-only (null)*	The DSP0274-defined MeasurementSpecification field of the measurement block. • This property shall contain the value of DSP0274-defined MeasurementSpecification field of the measurement block.
}			
RelatedItem *(v1.1+)* [{	array		The IDs of the Resources associated with this software inventory item. • This property shall contain an array of IDs for pointers consistent with JSON Pointer syntax to the Resource that is associated with this software inventory item.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			

Property	Type	Attributes	Notes
ReleaseDate *(v1.2+)*	string (date-time)	*read-only (null)*	The release date of this software. • This property shall contain the date of release or production for this software. If the time of day is unknown, the time of day portion of the property shall contain `00:00:00Z`.
SoftwareId *(v1.1+)*	string	*read-only*	The implementation-specific label that identifies this software. • This property shall represent an implementation-specific label that identifies this software. This string correlates with a component repository or database.
Status {}	object		The status and health of the Resource and its subordinate or dependent Resources. • This property shall contain any status or health properties of the Resource. For property details, see Status.
UefiDevicePaths *(v1.1+)* [ ]	array (string, null)	*read-only*	The list of UEFI device paths of the components associated with this software inventory item. • This property shall contain a list UEFI device paths of the components associated with this software inventory item. The UEFI device paths shall be formatted as defined by the UEFI Specification.
Updateable	boolean	*read-only (null)*	An indication of whether the Update Service can update this software. • This property shall indicate whether the Update Service can update this software. If `true`, the Service can update this software. If `false`, the Service cannot update this software and the software is for reporting purposes only.
Version	string	*read-only (null)*	The version of this software. • This property shall contain the version of this software.
WriteProtected *(v1.3+)*	boolean	*read-write (null)*	Indicates if the software is write-protected. • This property shall indicate whether the software image can be overwritten, where a value `true` shall indicate that the software cannot be altered or overwritten.

6.108.4 Example response

```
{
```

```
    "@odata.type": "#SoftwareInventory.v1_8_0.SoftwareInventory",
    "Id": "BMC",
    "Name": "Contoso BMC Firmware",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Updateable": true,
    "Manufacturer": "Contoso",
    "ReleaseDate": "2017-08-22T12:00:00",
    "Version": "1.45.455b66-rev4",
    "SoftwareId": "1624A9DF-5E13-47FC-874A-DF3AFF143089",
    "LowestSupportedVersion": "1.30.367a12-rev1",
    "UefiDevicePaths": [
        "BMC(0x1,0x0ABCDEF)"
    ],
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Managers/1"
        }
    ],
    "Actions": {
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/BMC"
}
```


6.109 Storage 1.13.0

Version	*v1.13*	*v1.12*	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	...
Release	2022.1	2021.4	2021.2	2020.4	2020.3	2019.3	2019.1	2018.3	2018.2	2017.3	2017.2	...

6.109.1 Description

The Storage schema defines a storage subsystem and its respective properties. A storage subsystem represents a set of physical or virtual storage controllers and the resources, such as volumes, that can be accessed from that subsystem.

- This resource shall represent a storage subsystem in the Redfish Specification.

6.109.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*
/redfish/v1/Storage/*{StorageId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*

6.109.3 Properties

Property	Type	Attributes	Notes
ConsistencyGroups *(v1.8+)* {}	object		The consistency groups, each of which contains a set of volumes that are treated by an application or set of applications as a single resource, that are managed by this storage subsystem. • This property shall contain a link to a resource collection of type ConsistencyGroupCollection. The property shall be used when groups of volumes are treated as a single resource by an application or set of applications.
Controllers *(v1.9+)* {	object		The set of controllers instantiated by this storage subsystem. • This property shall contain a link to a resource collection of type StorageControllerCollection that contains the set of storage controllers allocated to this storage subsystem. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *StorageController*. See the StorageController schema for details.
}			
Drives [{	array		The set of drives attached to the storage controllers that this resource represents. • This property shall contain a set of the drives attached to the storage controllers that this resource represents.
@odata.id	string	*read-only*	Link to a Drive resource. See the Links section and the *Drive* schema for details.
}]			

Property	Type	Attributes	Notes
EndpointGroups *(v1.8+)* {	object		All of the endpoint groups, each of which contains a set of endpoints that are used for a common purpose such as an ACL or logical identification, that belong to this storage subsystem. • This property shall contain a link to a resource collection of type EndpointGroupCollection. This property shall be implemented when atomic control is needed to perform mapping, masking and zoning operations. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *EndpointGroup*. See the EndpointGroup schema for details.
}			
FileSystems *(v1.8+)* {}	object		All file systems that are allocated by this storage subsystem. • This property shall contain a link to a resource collection of type FileSystemCollection. This property shall be used when file systems are shared or exported by the storage subsystem.
Identifiers *(v1.9+)* [{ }]	array (object)		Any additional identifiers for a resource. • The durable names for the storage subsystem. ◦ This property shall contain a list of all known durable names for the storage subsystem. For property details, see Identifier.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Enclosures [{	array		An array of links to the chassis to which this storage subsystem is attached. • This property shall contain an array of links to resources of type Chassis that represent the physical containers attached to this resource.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}]			

Property	Type	Attributes	Notes
HostingStorageSystems *(v1.11+)* [{	array		The storage systems that host this storage subsystem. • This property shall contain an array of links to resources of type ComputerSystem that represent the storage systems that host this storage subsystem. The members of this array shall be in the StorageSystems resource collection off the service root.
@odata.id	string	*read-only*	Link to a ComputerSystem resource. See the Links section and the *ComputerSystem* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
SimpleStorage *(v1.9+)* {	object		The link to the simple storage instance that corresponds to this storage. • This property shall contain a link to a resource of type SimpleStorage that represents the same storage subsystem as this resource. See the *SimpleStorage* schema for details on this property.
@odata.id	string	*read-only*	Link to a SimpleStorage resource. See the Links section and the *SimpleStorage* schema for details.
}			
StorageServices *(v1.9+)* [{	array		An array of links to the storage services that connect to this storage subsystem. • This property shall contain an array of links to resources of type StorageService with which this storage subsystem is associated.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
Redundancy [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. • Redundancy information for the storage subsystem. ◦ This property shall contain redundancy information for the storage subsystem. For property details, see Redundancy.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
StorageControllers *(deprecated v1.13)* [{	array		The set of storage controllers that this resource represents. • This property shall contain a set of the storage controllers that this resource represents. *Deprecated in v1.13 and later. This property has been deprecated in favor of Controllers to allow for storage controllers to be represented as their own resources.*
@odata.id	string (URI)	*read-only required*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions *(v1.2+)* {}	object		The available actions for this resource. • This property shall contain the available actions for this resource.
Assembly *(v1.4+)* {	object		The link to the assembly associated with this storage controller. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
AssetTag	string	*read-write (null)*	The user-assigned asset tag for this storage controller. • This property shall track the storage controller for inventory purposes.
CacheSummary *(v1.5+)* {	object		The cache memory of the storage controller in general detail. • This property shall contain properties that describe the cache memory for this resource.

Property	Type	Attributes	Notes
PersistentCacheSizeMiB *(v1.5+)*	integer (mebibytes)	*read-only (null)*	The portion of the cache memory that is persistent, measured in MiB. • This property shall contain the amount of cache memory that is persistent as measured in mebibytes. This size shall be less than or equal to the TotalCacheSizeMiB.
Status *(v1.5+)* {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
TotalCacheSizeMiB *(v1.5+)*	integer (mebibytes)	*read-only required (null)*	The total configured cache memory, measured in MiB. • This property shall contain the amount of configured cache memory as measured in mebibytes.
}			
Certificates *(v1.10+)* {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
ControllerRates *(v1.7+)* {	object		This property describes the various controller rates used for processes such as volume rebuild or consistency checks. • This object shall contain all the rate settings available on the controller.
ConsistencyCheckRatePercent *(v1.7+)*	integer	*read-write (null)*	The percentage of controller resources used for performing a data consistency check on volumes. • This property shall contain the percentage of controller resources used for checking data consistency on volumes.
RebuildRatePercent *(v1.7+)*	integer	*read-write (null)*	The percentage of controller resources used for rebuilding/repairing volumes. • This property shall contain the percentage of controller resources used for rebuilding volumes.

Property	Type	Attributes	Notes
TransformationRatePercent *(v1.7+)*	integer	*read-write (null)*	The percentage of controller resources used for transforming volumes from one configuration to another. • This property shall contain the percentage of controller resources used for transforming volumes.
}			
FirmwareVersion	string	*read-only (null)*	The firmware version of this storage controller. • This property shall contain the firmware version as defined by the manufacturer for the associated storage controller.
Identifiers [{ }]	array (object)		Any additional identifiers for a resource. • The durable names for the storage controller. ◦ This property shall contain a list of all known durable names for the associated storage controller. For property details, see Identifier.
Links *(v1.1+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Endpoints *(v1.1+)* [{	array		An array of links to the endpoints that connect to this controller. • This property shall contain an array of links to resources of type Endpoint with which this controller is associated.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeFunctions *(v1.7+)* [{	array		An array of links to the PCIe functions that the storage controller produces. • This property shall contain an array of links to resources of type PCIeFunction that represents the PCIe functions associated with this resource.
@odata.id	string	*read-only*	Link to a PCIeFunction resource. See the Links section and the *PCIeFunction* schema for details.
}]			

Property	Type	Attributes	Notes
StorageServices *(v1.4+, deprecated v1.9* [{	array		An array of links to the storage services that connect to this controller. • This property shall contain an array of links to resources of type StorageService with which this controller is associated. *Deprecated in v1.9 and later. This property has been deprecated in favor of StorageServices within the Links property at the root level.*
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
Location *(v1.4+)* {}	object		The location of the storage controller. • This property shall contain location information of the associated storage controller. For property details, see Location.
Manufacturer	string	*read-only (null)*	The manufacturer of this storage controller. • This property shall contain the name of the organization responsible for producing the storage controller. This organization may be the entity from which the storage controller is purchased, but this is not necessarily true.
Measurements *(v1.10+, deprecated v1.12* [{	array		An array of DSP0274-defined measurement blocks. • This property shall contain an array of DSP0274-defined measurement blocks. *Deprecated in v1.12 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
@odata.id	string	*read-only*	Link to a MeasurementBlock resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
MemberId	string	*read-only required*	The unique identifier for the member within an array. • This property shall contain the unique identifier for this member within an array. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.

Property	Type	Attributes	Notes
Model	string	*read-only (null)*	The model number for the storage controller. • This property shall contain the name by which the manufacturer generally refers to the storage controller.
Name *(v1.3+)*	string	*read-only (null)*	The name of the storage controller. • This property shall contain the name of the storage controller.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PartNumber	string	*read-only (null)*	The part number for this storage controller. • This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the storage controller.
PCIeInterface *(v1.5+)* {	object		The PCIe interface details for this controller. • This property shall contain details on the PCIe interface that connects this PCIe-based controller to its host.
LanesInUse *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes in use by this device. • This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the MaxLanes property value.
MaxLanes *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes supported by this device. • This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The highest version of the PCIe specification supported by this device. • This property shall contain the maximum PCIe specification that this device supports. *For the possible property values, see MaxPCIeType in Property details.*
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
PCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The version of the PCIe specification in use by this device. • This property shall contain the negotiated PCIe interface version in use by this device. *For the possible property values, see PCIeType in Property details.*
}			

Property	Type	Attributes	Notes
Ports *(v1.7+)* {	object		The link to the collection of ports that exist on the storage controller. • This property shall contain a link to a resource collection of type PortCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			
SerialNumber	string	*read-only (null)*	The serial number for this storage controller. • This property shall contain a manufacturer-allocated number that identifies the storage controller.
SKU	string	*read-only (null)*	The SKU for this storage controller. • This property shall contain the stock-keeping unit number for this storage storage controller.
SpeedGbps	number (Gbit/s)	*read-only (null)*	The maximum speed of the storage controller's device interface. • This property shall represent the maximum supported speed of the storage bus interface, in Gbit/s. The specified interface connects the controller to the storage devices, not the controller to a host. For example, SAS bus not PCIe host bus.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedControllerProtocols [ ]	array (string (enum))	*read-only*	• The supported set of protocols for communicating to this storage controller. ◦ This property shall contain the supported set of protocols for communicating to this storage controller. *For the possible property values, see SupportedControllerProtocols in Property details.*
SupportedDeviceProtocols [ ]	array (string (enum))	*read-only*	• The protocols that the storage controller can use to communicate with attached devices. ◦ This property shall contain the set of protocols this storage controller can use to communicate with attached devices. *For the possible property values, see SupportedDeviceProtocols in Property details.*

Property	Type	Attributes	Notes
SupportedRAIDTypes *(v1.6+)* [ ]	array (string (enum))	*read-only (null)*	• The set of RAID types supported by the storage controller. ◦ This property shall contain an array of all the RAID types supported by this controller. *For the possible property values, see SupportedRAIDTypes in Property details.*
}]			
StorageGroups *(v1.8+)* {}	object		All of the storage groups, each of which contains a set of volumes and endpoints that are managed as a group for mapping and masking, that belong to this storage subsystem. • This property shall contain a link to a resource collection of type StorageGroupsCollection. This property shall be used when implementing mapping and masking.
StoragePools *(v1.8+)* {}	object		The set of all storage pools that are allocated by this storage subsystem. A storage pool is the set of storage capacity that can be used to produce volumes or other storage pools. • This property shall contain a link to a resource collection of type StoragePoolCollection. This property shall be used when an abstraction of media, rather than references to individual media, are used as the storage data source.
Volumes {}	object		The set of volumes that the storage controllers produce. • This property shall contain a link to a resource collection of type VolumeCollection.

6.109.4 Actions

6.109.4.1 ResetToDefaults *(v1.11+)*

Description

The reset action resets the storage device to factory defaults. This can cause the loss of data.

- This action shall reset the storage device. This action can impact other resources.

Action URI: {Base URI of target resource}/Actions/Storage.ResetToDefaults

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*required*	The type of reset to defaults. • This parameter shall contain the type of reset to defaults. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ResetAll"
}
```

6.109.4.2 SetEncryptionKey

Description

This action sets the encryption key for the storage subsystem.

- This action shall set the encryption key for the storage subsystem.

Action URI: {Base URI of target resource}/Actions/Storage.SetEncryptionKey

Action parameters

Parameter Name	Type	Attributes	Notes
EncryptionKey	string	*required*	The encryption key to set on the storage subsystem. • This parameter shall contain the encryption key to set on the storage subsystem.

Request Example

```
{
    "EncryptionKey": "566b523d3f955a7fba38a28ec708ca10"
}
```

6.109.5 Property details

6.109.5.1 idRef:

@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

6.109.5.2 MaxPCIeType:

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.109.5.3 PCIeType:

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.

string	Description
Gen5	A PCIe v5.0 slot.

6.109.5.4 ResetType:

The type of reset to defaults.

- This parameter shall contain the type of reset to defaults.

string	Description
PreserveVolumes	Reset all settings to factory defaults but preserve the configured volumes on the controllers.
ResetAll	Reset all settings to factory defaults and remove all volumes.

6.109.5.5 SupportedControllerProtocols:

- The supported set of protocols for communicating to this storage controller.
  - This property shall contain the supported set of protocols for communicating to this storage controller.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.

string	Description
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.

string	Description
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.

string	Description
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.

string	Description
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.109.5.6 SupportedDeviceProtocols:

- The protocols that the storage controller can use to communicate with attached devices.
  - This property shall contain the set of protocols this storage controller can use to communicate with attached devices.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.

string	Description
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.

string	Description
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.

string	Description
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.109.5.7 SupportedRAIDTypes:

- The set of RAID types supported by the storage controller.
  - This property shall contain an array of all the RAID types supported by this controller.

string	Description
None	A placement policy with no redundancy at the device level.
RAID0	A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. • A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. This is commonly referred to as data striping. This form of RAID will encounter data loss with the failure of any storage device in the set.
RAID00	A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. • A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. This is commonly referred to as RAID 0+0. This form of data layout is not fault tolerant; if any storage device fails there will be data loss.
RAID01	A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). • A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). This is commonly referred to as RAID 0+1 or RAID 0/1. Data stored using this form of RAID is able to survive a single RAID 0 data set failure without data loss.
RAID1	A placement policy where each logical block of data is stored on more than one independent storage device. • A placement policy where each logical block of data is stored on more than one independent storage device. This is commonly referred to as mirroring. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID10	A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). • A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). This is commonly referred to as RAID 1/0. Data stored using this form of RAID is able to survive storage device failures in each RAID 1 set without data loss.
RAID10E	A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. • A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. This is commonly referred to as Enhanced RAID 10. Data stored using this form of RAID is able to survive a single device failure within each nested RAID 1 set without data loss.
RAID10Triple	A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). • A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). This form of RAID can survive up to two failures in each triple mirror set without data loss.

string	Description
RAID1E	A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. • A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. This is commonly referred to as RAID 1 Enhanced. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID1Triple	A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. • A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. This is commonly referred to as three-way mirroring. This form of RAID can survive two device failures without data loss.
RAID3	A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. • A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss. If the storage devices use rotating media, they are assumed to be rotationally synchronized, and the data stripe size should be no larger than the exported block size.
RAID4	A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. • A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID5	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. • A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive a single storage device failure without data loss.

string	Description
RAID50	A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. • A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. Data stored using this form of RAID is able to survive a single storage device failure within each RAID 5 set without data loss.
RAID6	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. • A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive any two independent storage device failures without data loss.
RAID60	A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. • A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. Data stored using this form of RAID is able to survive two device failures within each RAID 6 set without data loss.
RAID6TP	A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. • A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. This is commonly referred to as Triple Parity RAID. Data stored using this form of RAID is able to survive any three independent storage device failures without data loss.

6.109.6 Example response


```
{
    "@odata.type": "#Storage.v1_13_0.Storage",
    "Id": "1",
    "Name": "Local Storage Controller",
    "Description": "Integrated RAID Controller",
    "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
    },
    "StorageControllers": [
```

```
        {
            "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1#/StorageControllers/0",
            "MemberId": "0",
            "Name": "Contoso Integrated RAID",
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            },
            "Identifiers": [
                {
                    "DurableNameFormat": "NAA",
                    "DurableName": "345C59DBD970859C"
                }
            ],
            "Manufacturer": "Contoso",
            "Model": "12Gbs Integrated RAID",
            "SerialNumber": "2M220100SL",
            "PartNumber": "CT18754",
            "SpeedGbps": 12,
            "FirmwareVersion": "1.0.0.7",
            "SupportedControllerProtocols": [
                "PCIe"
            ],
            "SupportedDeviceProtocols": [
                "SAS",
                "SATA"
            ]
        }
    ],
    "Drives": [
        {
            "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Drives/35D38F11ACEF7BD3"
        },
        {
            "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Drives/3F5A8C54207B7233"
        },
        {
            "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Drives/32ADF365C6C1B7BD"
        },
        {
            "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Drives/3D58ECBC375FD9F2"
        }
    ],
    "Volumes": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Volumes"
    },
    "Links": {},
    "Actions": {
        "#Storage.SetEncryptionKey": {
            "target": "/redfish/v1/Systems/437XR1138R2/Storage/1/Actions/Storage.SetEncryptionKey"
```

```
        }
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1"
}
```


6.110 StorageController 1.6.0

Version	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2021.4	2021.3	2021.2	2021.1	2020.4	2020.3

6.110.1 Description

The StorageController schema describes a storage controller and its properties. A storage controller represents a physical or virtual storage device that produces volumes.

- This resource shall represent a storage controller in the Redfish Specification.

6.110.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{ControllerId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{ControllerId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Controllers/*{ControllerId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{ControllerId}*
/redfish/v1/Storage/*{StorageId}*/Controllers/*{ControllerId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Controllers/*{ControllerId}*

6.110.3 Properties

Property	Type	Attributes	Notes
Assembly {	object		The link to the assembly associated with this storage controller. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
AssetTag	string	*read-write (null)*	The user-assigned asset tag for this storage controller. • This property shall track the storage controller for inventory purposes.
CacheSummary {	object		The cache memory of the storage controller in general detail. • This property shall contain properties that describe the cache memory for this resource.
PersistentCacheSizeMiB	integer (mebibytes)	*read-only (null)*	The portion of the cache memory that is persistent, measured in MiB. • This property shall contain the amount of cache memory that is persistent as measured in mebibytes. This size shall be less than or equal to the TotalCacheSizeMiB.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

Property	Type	Attributes	Notes
TotalCacheSizeMiB	integer (mebibytes)	*read-only required (null)*	The total configured cache memory, measured in MiB. • This property shall contain the amount of configured cache memory as measured in mebibytes.
}			
Certificates *(v1.1+)* {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
ControllerRates {	object		This property describes the various controller rates used for processes such as volume rebuild or consistency checks. • This object shall contain all the rate settings available on the controller.
ConsistencyCheckRatePercent	integer	*read-write (null)*	The percentage of controller resources used for performing a data consistency check on volumes. • This property shall contain the percentage of controller resources used for checking data consistency on volumes.
RebuildRatePercent	integer	*read-write (null)*	The percentage of controller resources used for rebuilding/repairing volumes. • This property shall contain the percentage of controller resources used for rebuilding volumes.

Property	Type	Attributes	Notes
TransformationRatePercent	integer	*read-write (null)*	The percentage of controller resources used for transforming volumes from one configuration to another. • This property shall contain the percentage of controller resources used for transforming volumes.
}			
EnvironmentMetrics *(v1.2+)* {	object		The link to the environment metrics for this storage controller. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the environment metrics for this storage controller. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			
FirmwareVersion	string	*read-only (null)*	The firmware version of this storage controller. • This property shall contain the firmware version as defined by the manufacturer for the associated storage controller.
Identifiers [{ }]	array (object)		Any additional identifiers for a resource. • The durable names for the storage controller. ◦ This property shall contain a list of all known durable names for the associated storage controller. For property details, see Identifier.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.

Property	Type	Attributes	Notes
AttachedVolumes [{	array		An array of links to volumes that are attached to this controller instance. • This property shall contain an array of links to resources of type Volume that are attached to this instance of storage controller.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Batteries *(v1.6+)* [{	array		The batteries that provide power to this storage controller during a power loss event. • This property shall contain an array of links to resources of type Battery that represent the batteries that provide power to this storage controller during a power loss event, such as with battery-backed RAID controllers. This property shall not be present if the batteries power the containing chassis as a whole rather than the individual storage controller.
@odata.id	string	*read-only*	Link to a Battery resource. See the Links section and the *Battery* schema for details.
}]			
Endpoints [{	array		An array of links to the endpoints that connect to this controller. • This property shall contain an array of links to resources of type Endpoint with which this controller is associated.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			

Property	Type	Attributes	Notes
NetworkDeviceFunctions *(v1.3+)* [{	array		The network device functions that provide connectivity to this controller. • This property shall contain an array of links to resources of type NetworkDeviceFunction that represent the devices that provide connectivity to this controller.
@odata.id	string	*read-only*	Link to a NetworkDeviceFunction resource. See the Links section and the *NetworkDeviceFunction* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeFunctions [{	array		An array of links to the PCIe functions that the storage controller produces. • This property shall contain an array of links to resources of type PCIeFunction that represents the PCIe functions associated with this resource.
@odata.id	string	*read-only*	Link to a PCIeFunction resource. See the Links section and the *PCIeFunction* schema for details.
}]			
}			
Location {}	object		The location of the storage controller. • This property shall contain location information of the associated storage controller. For property details, see Location.
Manufacturer	string	*read-only* *(null)*	The manufacturer of this storage controller. • This property shall contain the name of the organization responsible for producing the storage controller. This organization may be the entity from which the storage controller is purchased, but this is not necessarily true.

Property	Type	Attributes	Notes
Measurements *(v1.1+, deprecated v1.5* [{	array		An array of DSP0274-defined measurement blocks. • This property shall contain an array of DSP0274-defined measurement blocks. *Deprecated in v1.5 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
@odata.id	string	*read-only*	Link to a MeasurementBlock resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
Model	string	*read-only (null)*	The model number for the storage controller. • This property shall contain the name by which the manufacturer generally refers to the storage controller.
NVMeControllerProperties {	object		The NVMe related properties for this storage controller. • This property shall contain NVMe related properties for this storage controller.
AllocatedCompletionQueues *(v1.4+)*	integer	*read-only (null)*	The number of I/O completion queues allocated to this NVMe I/O controller. • This property shall contain the number of I/O completion queues allocated to this NVMe I/O controller.
AllocatedSubmissionQueues *(v1.4+)*	integer	*read-only (null)*	The number of I/O submission queues allocated to this NVMe I/O controller. • This property shall contain the number of I/O submission queues allocated to this NVMe I/O controller.
ANACharacteristics [{	array		The ANA characteristics and volume information. • This property shall contain the ANA characteristics and volume information.

Property	Type	Attributes	Notes
AccessState	string (enum)	*read-only* *(null)*	Reported ANA access state. • This property shall contain the reported ANA access state. *For the possible property values, see AccessState in Property details.*
Volume {	object		The specified volume. • This property shall contain a link to a resource of type Volume.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
}]			
ControllerType	string (enum)	*read-only* *(null)*	The type of NVMe controller. • This property shall contain the type of NVMe controller. *For the possible property values, see ControllerType in Property details.*
MaxQueueSize	integer	*read-only* *(null)*	The maximum individual queue size that an NVMe IO controller supports. • This property shall contain the maximum individual queue entry size supported per queue. This is a zero-based value, where the minimum value is one, indicating two entries. For PCIe, this applies to both submission and completion queues. For NVMe-oF, this applies to only submission queues.
NVMeControllerAttributes {	object	*(null)*	The NVMe controller attributes. • This property shall contain NVMe controller attributes.

Property	Type	Attributes	Notes
ReportsNamespaceGranularity	boolean	*read-only (null)*	Indicates whether or not the controller supports reporting of Namespace Granularity. • This property shall indicate whether or not the controller supports reporting of Namespace Granularity.
ReportsUUIDList	boolean	*read-only (null)*	Indicates whether or not the controller supports reporting of a UUID list. • This property shall indicate whether or not the controller supports reporting of a UUID list.
Supports128BitHostId	boolean	*read-only (null)*	Indicates whether or not the controller supports a 128-bit Host Identifier. • This property shall indicate whether or not the controller supports a 128-bit Host Identifier.
SupportsEnduranceGroups	boolean	*read-only (null)*	Indicates whether or not the controller supports Endurance Groups. • This property shall indicate whether or not the controller supports Endurance Groups.
SupportsExceedingPowerOfNonOperationalState	boolean	*read-only (null)*	Indicates whether or not the controller supports exceeding Power of Non-Operational State in order to execute controller initiated background operations in a non-operational power state. • This property shall indicate whether or not the controller supports exceeding Power of Non-Operational State in order to execute controller initiated background operations in a non-operational power state.
SupportsNVMSets	boolean	*read-only (null)*	Indicates whether or not the controller supports NVM Sets. • This property shall indicate whether or not the controller supports NVM Sets.
SupportsPredictableLatencyMode	boolean	*read-only (null)*	Indicates whether or not the controller supports Predictable Latency Mode. • This property shall indicate whether or not the controller supports Predictable Latency Mode.

Property	Type	Attributes	Notes
SupportsReadRecoveryLevels	boolean	*read-only* *(null)*	Indicates whether or not the controller supports Read Recovery Levels. • This property shall indicate whether or not the controller supports Read Recovery Levels.
SupportsReservations *(v1.2+)*	boolean	*read-only* *(null)*	Indicates if the controller supports reservations. • This property shall indicate if the controller supports reservations.
SupportsSQAssociations	boolean	*read-only* *(null)*	Indicates whether or not the controller supports SQ Associations. • This property shall indicate whether or not the controller supports SQ Associations.
SupportsTrafficBasedKeepAlive	boolean	*read-only* *(null)*	Indicates whether or not the controller supports restarting Keep Alive Timer if traffic is processed from an admin command or IO during a Keep Alive Timeout interval. • This property shall indicate whether or not the controller supports restarting Keep Alive Timer if traffic is processed from an admin command or IO during a Keep Alive Timeout interval.
}			
NVMeSMARTCriticalWarnings {	object	*(null)*	The NVMe SMART Critical Warnings for this storage controller. This property contains possible triggers for the predictive drive failure warning for the corresponding drive. • This property shall contain the NVMe SMART Critical Warnings for this storage controller. This property can contain possible triggers for the predictive drive failure warning for the corresponding drive.
MediaInReadOnly	boolean	*read-only* *(null)*	Indicates the media has been placed in read only mode. • This property shall indicate the media has been placed in read only mode. This is not set when the read-only condition on the media is a result of a change in the write protection state of a namespace.

Property	Type	Attributes	Notes
OverallSubsystemDegraded	boolean	*read-only (null)*	Indicates that the NVM subsystem reliability has been compromised. • This property shall indicate that the NVM subsystem reliability has been compromised.
PMRUnreliable	boolean	*read-only (null)*	The Persistent Memory Region has become unreliable. • This property shall indicate that the Persistent Memory Region has become unreliable. PCIe memory reads can return invalid data or generate poisoned PCIe TLP(s). Persistent Memory Region memory writes might not update memory or might update memory with undefined data. The Persistent Memory Region might also have become non-persistent.
PowerBackupFailed	boolean	*read-only (null)*	Indicates that the volatile memory backup device has failed. • This property shall indicate that the volatile memory backup device has failed.
SpareCapacityWornOut	boolean	*read-only (null)*	Indicates that the available spare capacity has fallen below the threshold. • This property shall indicate that the available spare capacity has fallen below the threshold.
}			
NVMeVersion	string	*read-only (null)*	The version of the NVMe Base Specification supported. • This property shall contain the version of the NVMe Base Specification supported.
}			
PartNumber	string	*read-only (null)*	The part number for this storage controller. • This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the storage controller.

Property	Type	Attributes	Notes
PCIeInterface {	object		The PCIe interface details for this controller. • This property shall contain details on the PCIe interface that connects this PCIe-based controller to its host.
LanesInUse *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes in use by this device. • This property shall contain the number of PCIe lanes in use by this device, which shall be equal to or less than the MaxLanes property value.
MaxLanes *(v1.3+)*	integer	*read-only (null)*	The number of PCIe lanes supported by this device. • This property shall contain the maximum number of PCIe lanes supported by this device.
MaxPCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The highest version of the PCIe specification supported by this device. • This property shall contain the maximum PCIe specification that this device supports. *For the possible property values, see MaxPCIeType in Property details.*
Oem *(v1.3+)* {}	object		See the OEM object definition in the Using this guide clause.
PCIeType *(v1.3+)*	string (enum)	*read-only (null)*	The version of the PCIe specification in use by this device. • This property shall contain the negotiated PCIe interface version in use by this device. *For the possible property values, see PCIeType in Property details.*
}			
Ports {	object		The link to the collection of ports that exist on the storage controller. • This property shall contain a link to a resource collection of type PortCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			

Property	Type	Attributes	Notes
SerialNumber	string	*read-only (null)*	The serial number for this storage controller. • This property shall contain a manufacturer-allocated number that identifies the storage controller.
SKU	string	*read-only (null)*	The SKU for this storage controller. • This property shall contain the stock-keeping unit number for this storage storage controller.
SpeedGbps	number (Gbit/s)	*read-only (null)*	The maximum speed of the storage controller's device interface. • This property shall represent the maximum supported speed of the storage bus interface, in Gbit/s. The specified interface connects the controller to the storage devices, not the controller to a host. For example, SAS bus not PCIe host bus.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedControllerProtocols [ ]	array (string (enum))	*read-only*	• The supported set of protocols for communicating to this storage controller. ◦ This property shall contain the supported set of protocols for communicating to this storage controller. *For the possible property values, see SupportedControllerProtocols in Property details.*
SupportedDeviceProtocols [ ]	array (string (enum))	*read-only*	• The protocols that the storage controller can use to communicate with attached devices. ◦ This property shall contain the set of protocols this storage controller can use to communicate with attached devices. *For the possible property values, see SupportedDeviceProtocols in Property details.*

Property	Type	Attributes	Notes
SupportedRAIDTypes [ ]	array (string (enum))	*read-only (null)*	• The set of RAID types supported by the storage controller. ◦ This property shall contain an array of all the RAID types supported by this controller. *For the possible property values, see SupportedRAIDTypes in Property details.*

6.110.4 Property details

6.110.4.1 AccessState:

Reported ANA access state.

- This property shall contain the reported ANA access state.

string	Description
Inaccessible	Namespaces in this group are inaccessible. Commands are not able to access user data of namespaces in the ANA Group.
NonOptimized	Commands processed by a controller that reports this state for an ANA Group provide non-optimized access characteristics, such as lower performance or non-optimal use of subsystem resources, to any namespace in the ANA Group.
Optimized	Commands processed by a controller provide optimized access to any namespace in the ANA group.
PersistentLoss	The group is persistently inaccessible. Commands are persistently not able to access user data of namespaces in the ANA Group.

6.110.4.2 ControllerType:

The type of NVMe controller.

- This property shall contain the type of NVMe controller.

string	Description
Admin	The NVMe controller is an admin controller.
Discovery	The NVMe controller is a discovery controller.

string	Description
IO	The NVMe controller is an IO controller.

6.110.4.3 MaxPCIeType:

The highest version of the PCIe specification supported by this device.

- This property shall contain the maximum PCIe specification that this device supports.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.110.4.4 PCIeType:

The version of the PCIe specification in use by this device.

- This property shall contain the negotiated PCIe interface version in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

6.110.4.5 SupportedControllerProtocols:

- The supported set of protocols for communicating to this storage controller.
  - This property shall contain the supported set of protocols for communicating to this storage controller.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.

string	Description
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.

string	Description
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.

string	Description
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.110.4.6 SupportedDeviceProtocols:

- The protocols that the storage controller can use to communicate with attached devices.
  - This property shall contain the set of protocols this storage controller can use to communicate with attached devices.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.

string	Description
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.

string	Description
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.

string	Description
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.110.4.7 SupportedRAIDTypes:

- The set of RAID types supported by the storage controller.
  - This property shall contain an array of all the RAID types supported by this controller.

string	Description
None	A placement policy with no redundancy at the device level.
RAID0	A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. • A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. This is commonly referred to as data striping. This form of RAID will encounter data loss with the failure of any storage device in the set.
RAID00	A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. • A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. This is commonly referred to as RAID 0+0. This form of data layout is not fault tolerant; if any storage device fails there will be data loss.
RAID01	A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). • A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). This is commonly referred to as RAID 0+1 or RAID 0/1. Data stored using this form of RAID is able to survive a single RAID 0 data set failure without data loss.
RAID1	A placement policy where each logical block of data is stored on more than one independent storage device. • A placement policy where each logical block of data is stored on more than one independent storage device. This is commonly referred to as mirroring. Data stored using this form of RAID is able to survive a single storage device failure without data loss.

string	Description
RAID10	A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). • A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). This is commonly referred to as RAID 1/0. Data stored using this form of RAID is able to survive storage device failures in each RAID 1 set without data loss.
RAID10E	A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. • A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. This is commonly referred to as Enhanced RAID 10. Data stored using this form of RAID is able to survive a single device failure within each nested RAID 1 set without data loss.
RAID10Triple	A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). • A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). This form of RAID can survive up to two failures in each triple mirror set without data loss.
RAID1E	A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. • A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. This is commonly referred to as RAID 1 Enhanced. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID1Triple	A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. • A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. This is commonly referred to as three-way mirroring. This form of RAID can survive two device failures without data loss.
RAID3	A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. • A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss. If the storage devices use rotating media, they are assumed to be rotationally synchronized, and the data stripe size should be no larger than the exported block size.

string	Description
RAID4	A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. • A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID5	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. • A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID50	A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. • A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. Data stored using this form of RAID is able to survive a single storage device failure within each RAID 5 set without data loss.
RAID6	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. • A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive any two independent storage device failures without data loss.
RAID60	A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. • A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. Data stored using this form of RAID is able to survive two device failures within each RAID 6 set without data loss.

string	Description
RAID6TP	A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. • A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. This is commonly referred to as Triple Parity RAID. Data stored using this form of RAID is able to survive any three independent storage device failures without data loss.

6.110.5 Example response


```
{
    "@odata.type": "#StorageController.v1_6_0.StorageController",
    "Id": "1",
    "Name": "NVMe IO Controller",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "SupportedControllerProtocols": [
        "NVMeOverFabrics"
    ],
    "NVMeControllerProperties": {
        "NVMeVersion": "1.4",
        "ControllerType": "IO",
        "NVMeControllerAttributes": {
            "ReportsUUIDList": false,
            "SupportsSQAssociations": false,
            "ReportsNamespaceGranularity": false,
            "SupportsTrafficBasedKeepAlive": false,
            "SupportsPredictableLatencyMode": false,
            "SupportsEnduranceGroups": false,
            "SupportsReadRecoveryLevels": false,
            "SupportsNVMSets": false,
            "SupportsExceedingPowerOfNonOperationalState": false,
            "Supports128BitHostId": false
        },
        "NVMeSMARTCriticalWarnings": {
            "PMRUnreliable": false,
            "PowerBackupFailed": false,
            "MediaInReadOnly": false,
            "OverallSubsystemDegraded": false,
            "SpareCapacityWornOut": false
        }
    },
```

```
    "Links": {
        "Endpoints": [
            {
                "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Endpoints/Initiator1"
            },
            {
                "@odata.id": "/redfish/v1/Fabrics/NVMeoF/Endpoints/Target1"
            }
        ],
        "AttachedVolumes": [
            {
                "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/1"
            },
            {
                "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/3"
            },
            {
                "@odata.id": "/redfish/v1/Storage/NVMeoF/Volumes/4"
            }
        ]
    },
    "@odata.id": "/redfish/v1/Storage/NVMeoF/Controllers/1"
}
```


6.111 Switch 1.8.0

Version	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2021.4	2021.3	2021.1	2020.4	2020.3	2019.4	2019.2	2017.3	2016.2

6.111.1 Description

The Switch schema contains properties that describe a fabric switch.

- This resource contains a switch for a Redfish implementation.

6.111.2 URIs

/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*

6.111.3 Properties

Property	Type	Attributes	Notes
AssetTag	string	*read-write (null)*	The user-assigned asset tag for this switch. • This property shall contain the user-assigned asset tag, which is an identifying string that tracks the drive for inventory purposes.
Certificates *(v1.5+)* {	object		The link to a collection of certificates for device identity and attestation. • This property shall contain a link to a resource collection of type CertificateCollection that contains certificates for device identity and attestation. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
CurrentBandwidthGbps *(v1.4+)*	number (Gbit/s)	*read-only (null)*	The current internal bandwidth of this switch. • This property shall contain the internal bandwidth of this switch currently negotiated and running.
DomainID	integer	*read-only (null)*	The domain ID for this switch. • This property shall contain The domain ID for this switch. This property has a scope of uniqueness within the fabric of which the switch is a member.
Enabled *(v1.6+)*	boolean	*read-write*	An indication of whether this switch is enabled. • The value of this property shall indicate if this switch is enabled.
EnvironmentMetrics *(v1.6+)* {	object		The link to the environment metrics for this switch. • This property shall contain a link to a resource of type EnvironmentMetrics that specifies the environment metrics for this switch. See the *EnvironmentMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a EnvironmentMetrics resource. See the Links section and the *EnvironmentMetrics* schema for details.
}			
FirmwareVersion *(v1.2+)*	string	*read-only (null)*	The firmware version of this switch. • This property shall contain the firmware version as defined by the manufacturer for the associated switch.

Property	Type	Attributes	Notes
IndicatorLED *(deprecated v1.4)*	string (enum)	*read-write (null)*	The state of the indicator LED, which identifies the switch. • This property shall contain the state of the indicator light associated with this switch. *For the possible property values, see IndicatorLED in Property details. Deprecated in v1.4 and later. This property has been deprecated in favor of the LocationIndicatorActive property.*
IsManaged	boolean	*read-write (null)*	An indication of whether the switch is in a managed or unmanaged state. • This property shall indicate whether this switch is in a managed or unmanaged state.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Chassis {	object		The link to the chassis that contains this switch. • This property shall contain a link to a resource of type Chassis with which this switch is associated. See the *Chassis* schema for details on this property.
@odata.id	string	*read-only*	Link to a Chassis resource. See the Links section and the *Chassis* schema for details.
}			
Endpoints *(v1.3+)* [{	array		An array of links to the endpoints that connect to this switch. • This property shall contain an array of links to resources of type Endpoint with which this switch is associated.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
ManagedBy [{	array		An array of links to the managers that manage this switch. • This property shall contain an array of links to resources of type Manager with which this switch is associated.
@odata.id	string	*read-only*	Link to a Manager resource. See the Links section and the *Manager* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PCIeDevice *(v1.4+)* {	object	*(null)*	The link to the PCIe device providing this switch. • This property shall contain a link to a resource of type PCIeDevice that represents the PCIe device providing this switch. See the *PCIeDevice* schema for details on this property.
@odata.id	string	*read-only*	Link to a PCIeDevice resource. See the Links section and the *PCIeDevice* schema for details.
}			
}			
Location *(v1.1+)* {}	object		The location of the switch. • This property shall contain location information of the associated switch. For property details, see Location.
LocationIndicatorActive *(v1.4+)*	boolean	*read-write (null)*	An indicator allowing an operator to physically locate this resource. • This property shall contain the state of the indicator used to physically identify or locate this resource. A write to this property shall update the value of IndicatorLED in this resource, if supported, to reflect the implementation of the locating function.
LogServices {	object		The link to the collection of log services associated with this switch. • This property shall contain a link to a resource collection of type LogServiceCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *LogService*. See the LogService schema for details.
}			
Manufacturer	string	*read-only (null)*	The manufacturer of this switch. • This property shall contain the name of the organization responsible for producing the switch. This organization may be the entity from which the switch is purchased, but this is not necessarily true.
MaxBandwidthGbps *(v1.4+)*	number (Gbit/s)	*read-only (null)*	The maximum internal bandwidth of this switch as currently configured. • This property shall contain the maximum internal bandwidth this switch is capable of being configured. If capable of autonegotiation, the switch shall attempt to negotiate to the specified maximum bandwidth.

Property	Type	Attributes	Notes
Measurements *(v1.5+, deprecated v1.8* [{	array		An array of DSP0274-defined measurement blocks. • This property shall contain an array of DSP0274-defined measurement blocks. *Deprecated in v1.8 and later. This property has been deprecated in favor of the ComponentIntegrity resource.*
@odata.id	string	*read-only*	Link to a MeasurementBlock resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
Metrics *(v1.7+)* {	object		The link to the metrics associated with this switch. • This property shall contain a link to the metrics associated with this switch. See the *SwitchMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a SwitchMetrics resource. See the Links section and the *SwitchMetrics* schema for details.
}			
Model	string	*read-only (null)*	The product model number of this switch. • This property shall contain the manufacturer-provided model information of this switch.
PartNumber	string	*read-only (null)*	The part number for this switch. • This property shall contain the manufacturer-provided part number for the switch.
Ports {	object		The link to the collection ports for this switch. • This property shall contain a link to a resource collection of type PortCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			
PowerState	string (enum)	*read-only (null)*	The current power state of the switch. • This property shall contain the power state of the switch. *For the possible property values, see PowerState in Property details.*

Property	Type	Attributes	Notes
Redundancy [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. • Redundancy information for the switches. ◦ This property shall contain an array that shows how this switch is grouped with other switches for form redundancy sets. For property details, see Redundancy.
SerialNumber	string	*read-only* *(null)*	The serial number for this switch. • This property shall contain a manufacturer-allocated number that identifies the switch.
SKU	string	*read-only* *(null)*	The SKU for this switch. • This property shall contain the SKU number for this switch.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedProtocols *(v1.3+)* [ ]	array (string (enum))	*read-only*	• The protocols this switch supports. ◦ The property shall contain an array of protocols this switch supports. If the value of SwitchType is `MultiProtocol`, this property shall be required. *For the possible property values, see SupportedProtocols in Property details.*
SwitchType	string (enum)	*read-only* *(null)*	The protocol being sent over this switch. • This property shall contain the protocol being sent over this switch. For a switch that supports multiple protocols, the value should be `MultiProtocol` and the SupportedProtocols property should be used to describe the supported protocols. *For the possible property values, see SwitchType in Property details.*
TotalSwitchWidth	integer	*read-only* *(null)*	The total number of lanes, phys, or other physical transport links that this switch contains. • This property shall contain the number of physical transport lanes, phys, or other physical transport links that this switch contains. For PCIe, this value shall be the lane count.
UUID *(v1.3+)*	string	*read-only* *(null)*	The UUID for this switch. • This property shall contain a universal unique identifier number for the switch. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`

6.111.4 Actions

6.111.4.1 Reset

Description

This action resets this switch.

- This action shall reset this switch.

Action URI: {Base URI of target resource}/Actions/Switch.Reset

Action parameters

Parameter Name	Type	Attributes	Notes
ResetType	string (enum)	*optional*	The type of reset. • This parameter shall contain the type of reset. The service can accept a request without this parameter and can complete an implementation-specific default reset. *For the possible property values, see ResetType in Property details.*

Request Example

```
{
    "ResetType": "ForceRestart"
}
```

6.111.5 Property details

6.111.5.1 IndicatorLED:

The state of the indicator LED, which identifies the switch.

- This property shall contain the state of the indicator light associated with this switch.

string	Description
Blinking	The indicator LED is blinking. • This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Lit	The indicator LED is lit. • This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Off	The indicator LED is off. • This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.

6.111.5.2 PowerState:

The current power state of the switch.

- This property shall contain the power state of the switch.

string	Description
Off	The state is powered off.
On	The state is powered on.
Paused	The state is paused.
PoweringOff	A temporary state between on and off.
PoweringOn	A temporary state between off and on.

6.111.5.3 ResetType:

The type of reset.

- This parameter shall contain the type of reset. The service can accept a request without this parameter and can complete an implementation-specific default reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown). • This value shall indicate the resource will transition to a power off state. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
ForceOn	Turn on the unit immediately. • This value shall indicate the resource will transition to a power on state. The transition will start immediately. Upon successful completion, the PowerState property shall contain the value `On`.
ForceRestart	Shut down immediately and non-gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start immediately. Upon successful completion, the PowerState property, if supported, shall shall contain the value `On`.
GracefulRestart	Shut down gracefully and restart the system. • This value shall indicate the resource will transition to a power on state, after transiting through a restart. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutting down processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
GracefulShutdown	Shut down gracefully and power off. • This value shall indicate the resource will transition to a power off state. The transition will start after first performing tasks to safely shutdown the resource. For example, when shutting down a computer system, the hosted operating system is allowed to safely shutdown processes and close connections. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system. • This value shall indicate the resource will generate a diagnostic interrupt.
On	Turn on the unit. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Pause	Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a paused state. Upon successful completion, the PowerState property, if supported, shall contain the value `Paused`.

string	Description
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource. • This value shall indicate the resource will transition to a power off state, then transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
PushPowerButton	Simulate the pressing of the physical power button on this unit. • This value shall indicate the resource will behave as if the physical power button is pressed. The behavior of pressing the physical power button may be dependent on the state of the unit and the behavior may be configurable.
Resume	Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. • This value shall indicate the resource will transition to a power on state. Upon successful completion, the PowerState property, if supported, shall contain the value `On`.
Suspend	Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. • This value shall indicate the resource will have any state information written to persistent memory and then transition to a power off state. Upon successful completion, the PowerState property, if supported, shall contain the value `Off`.

6.111.5.4 SupportedProtocols:

- The protocols this switch supports.
  - The property shall contain an array of protocols this switch supports. If the value of SwitchType is `MultiProtocol`, this property shall be required.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.

string	Description
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.

string	Description
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.

string	Description
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.

string	Description
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.111.5.5 SwitchType:

The protocol being sent over this switch.

- This property shall contain the protocol being sent over this switch. For a switch that supports multiple protocols, the value should be `MultiProtocol` and the SupportedProtocols property should be used to describe the supported protocols.

string	Description
AHCI	Advanced Host Controller Interface (AHCI). • This value shall indicate conformance to the Intel Advanced Host Controller Interface (AHCI) Specification.
DisplayPort	DisplayPort. • This value shall indicate conformance to the VESA DisplayPort Specification.
DVI	DVI. • This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification.
Ethernet	Ethernet. • This value shall indicate conformance to the IEEE 802.3 Ethernet specification.
FC	Fibre Channel. • This value shall indicate conformance to the T11 Fibre Channel Physical and Signaling Interface Specification.
FCoE	Fibre Channel over Ethernet (FCoE). • This value shall indicate conformance to the T11 FC-BB-5 Specification.

string	Description
FCP	Fibre Channel Protocol for SCSI. • This value shall indicate conformance to the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON). • This value shall indicate conformance to the ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. Fibre Connection (FICON) is the IBM-proprietary name for this protocol.
FTP	File Transfer Protocol (FTP). • This value shall indicate conformance to the RFC114-defined File Transfer Protocol (FTP).
GenZ	GenZ. • This value shall indicate conformance to the Gen-Z Core Specification.
HDMI	HDMI. • This value shall indicate conformance to the HDMI Forum HDMI Specification.
HTTP	Hypertext Transport Protocol (HTTP). • This value shall indicate conformance to the Hypertext Transport Protocol (HTTP) as defined by RFC3010 or RFC5661.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS). • This value shall indicate conformance to the Hypertext Transfer Protocol Secure (HTTPS) as defined by RFC2068 or RFC2616, which uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
I2C	Inter-Integrated Circuit Bus. • This value shall indicate conformance to the NXP Semiconductors I2C-bus Specification.
InfiniBand	InfiniBand. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol.
iSCSI	Internet SCSI. • This value shall indicate conformance to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.

string	Description
iWARP	Internet Wide Area RDMA Protocol (iWARP). • This value shall indicate conformance to the RFC5042-defined Internet Wide Area RDMA Protocol (iWARP) that uses the transport layer mechanisms as defined by RFC5043 or RFC5044.
MultiProtocol	Multiple Protocols. • This value shall indicate conformance to multiple protocols.
NFSv3	Network File System (NFS) version 3. • This value shall indicate conformance to the RFC1813-defined Network File System (NFS) protocol.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink. • This value shall indicate conformance to the NVIDIA NVLink protocol.
NVMe	Non-Volatile Memory Express (NVMe). • This value shall indicate conformance to the Non-Volatile Memory Host Controller Interface Specification.
NVMeOverFabrics	NVMe over Fabrics. • This value shall indicate conformance to the NVM Express over Fabrics Specification.
OEM	OEM-specific. • This value shall indicate conformance to an OEM-specific architecture and the OEM section may include additional information.
PCIe	PCI Express. • This value shall indicate conformance to the PCI-SIG PCI Express Base Specification.
RoCE	RDMA over Converged Ethernet Protocol. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2. • This value shall indicate conformance to the InfiniBand Architecture Specification-defined RDMA over Converged Ethernet Protocol version 2.
SAS	Serial Attached SCSI. • This value shall indicate conformance to the T10 SAS Protocol Layer Specification.

string	Description
SATA	Serial AT Attachment. • This value shall indicate conformance to the Serial ATA International Organization Serial ATA Specification.
SFTP	SSH File Transfer Protocol (SFTP). • This value shall indicate conformance to the RFC114-defined SSH File Transfer Protocol (SFTP) that uses Transport Layer Security (TLS) as defined by RFC5246 or RFC6176.
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS). • This value shall indicate conformance to the Server Message Block (SMB), or Common Internet File System (CIFS), protocol.
TCP	Transmission Control Protocol (TCP). • This value shall indicate conformance to the IETF-defined Transmission Control Protocol (TCP). For example, RFC7414 defines the roadmap of the TCP specification.
TFTP	Trivial File Transfer Protocol (TFTP). • This value shall indicate conformance to the IETF-defined Trivial File Transfer Protocol (TFTP). For example, RFC1350 defines the core TFTP version 2 specification.
UDP	User Datagram Protocol (UDP). • This value shall indicate conformance to the IETF-defined User Datagram Protocol (UDP). For example, RFC768 defines the core UDP specification.
UHCI	Universal Host Controller Interface (UHCI). • This value shall indicate conformance to the Intel Universal Host Controller Interface (UHCI) Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface Specification.
USB	Universal Serial Bus (USB). • This value shall indicate conformance to the USB Implementers Forum Universal Serial Bus Specification.
VGA	VGA. • This value shall indicate conformance to the VESA SVGA Specification.

6.111.6 Example response


```
{
    "@odata.type": "#Switch.v1_8_0.Switch",
    "Id": "Switch1",
    "Name": "SAS Switch",
    "SwitchType": "SAS",
    "Manufacturer": "Contoso",
    "Model": "SAS1000",
    "SKU": "67B",
    "SerialNumber": "2M220100SL",
    "PartNumber": "76-88883",
    "Ports": {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1/Ports"
    },
    "Redundancy": [
        {
            "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1#/Redundancy/0",
            "MemberId": "Redundancy",
            "Mode": "Sharing",
            "MaxNumSupported": 2,
            "MinNumNeeded": 1,
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            },
            "RedundancySet": [
                {
                    "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1"
                },
                {
                    "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch2"
                }
            ]
        }
    ],
    "Links": {
        "Chassis": {
            "@odata.id": "/redfish/v1/Chassis/Switch1"
        },
        "ManagedBy": [
            {
                "@odata.id": "/redfish/v1/Managers/Switch1"
            },
            {
                "@odata.id": "/redfish/v1/Managers/Switch2"
            }
        ],
        "Oem": {}
```

```
    },
    "Actions": {
        "#Switch.Reset": {
            "target": "/redfish/v1/Fabrics/SAS/Switches/Switch1/Actions/Switch.Reset",
            "ResetType@Redfish.AllowableValues": [
                "ForceRestart",
                "GracefulRestart"
            ]
        },
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1"
}
```


6.112 SwitchMetrics 1.0.0

Version	*v1.0*
Release	2021.3

6.112.1 Description

The SwitchMetrics schema contains usage and health statistics for a switch device.

- This resource shall represent the metrics for a switch device in a Redfish implementation.

6.112.2 URIs

/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/SwitchMetrics

6.112.3 Properties

Property	Type	Attributes	Notes
InternalMemoryMetrics {	object		The memory metrics for a switch. • This property shall contain properties that describe the memory metrics for a switch.

Property	Type	Attributes	Notes
CurrentPeriod {	object		The memory metrics since the last reset for this switch. • This property shall contain properties that describe the metrics for the current period of memory for this switch.
CorrectableECCErrorCount	integer	*read-only (null)*	The number of the correctable errors of memory since reset. • This property shall contain the number of correctable errors of memory since reset.
UncorrectableECCErrorCount	integer	*read-only (null)*	The number of the uncorrectable errors of memory since reset. • This property shall contain the number of uncorrectable errors of memory since reset.
}			
LifeTime {	object		The memory metrics for the lifetime of this switch. • This property shall contain properties that describe the metrics for the lifetime of memory for this switch.
CorrectableECCErrorCount	integer	*read-only (null)*	The number of the correctable errors for the lifetime of the memory. • This property shall contain the number of the correctable errors for the lifetime of memory.
UncorrectableECCErrorCount	integer	*read-only (null)*	The number of the uncorrectable errors for the lifetime of the memory. • This property shall contain the number of the uncorrectable errors for the lifetime of memory.
}			
}			
PCIeErrors {	object		The PCIe errors associated with this switch. • This property shall contain the PCIe errors associated with this switch.
CorrectableErrorCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe correctable errors for this device. • This property shall contain the total number of the PCIe correctable errors for this device.
FatalErrorCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe fatal errors for this device. • This property shall contain the total number of the PCIe fatal errors for this device.

Property	Type	Attributes	Notes
L0ToRecoveryCount *(v1.8+)*	integer	*read-only (null)*	The total number of times the PCIe link states transitioned from L0 to the recovery state for this device. • This property shall contain the total number of times the PCIe link transitioned from L0 to the recovery state for this device.
NAKReceivedCount *(v1.8+)*	integer	*read-only (null)*	The total number of NAKs issued on the PCIe link by the receiver. • This property shall contain the total number of NAKs issued on the PCIe link by the receiver. A NAK is issued by the receiver when it detects that a TLP from this device was missed. This could be because this device did not transmit it, or because the receiver could not properly decode the packet.
NAKSentCount *(v1.8+)*	integer	*read-only (null)*	The total number of NAKs issued on the PCIe link by this device. • This property shall contain the total number of NAKs issued on the PCIe link by this device. A NAK is issued by the device when it detects that a TLP from the receiver was missed. This could be because the receiver did not transmit it, or because this device could not properly decode the packet.
NonFatalErrorCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe non-fatal errors for this device. • This property shall contain the total number of the PCIe non-fatal errors for this device.
ReplayCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe replays issued by this device. • This property shall contain the total number of the replays issued on the PCIe link by this device. A replay is a retransmission of a TLP and occurs because the ACK timer is expired, which means that the receiver did not send the ACK or this device did not properly decode the ACK.
ReplayRolloverCount *(v1.8+)*	integer	*read-only (null)*	The total number of the PCIe replay rollovers issued by this device. • This property shall contain the total number of the replay rollovers issued on the PCIe link by this device. A replay rollover occurs when consecutive replays failed to resolve the errors on the link, which means that this device forced the link into the recovery state.
}			

6.112.4 Actions

6.112.4.1 ClearCurrentPeriod

Description

This action sets the CurrentPeriod property's values to 0.

- This action shall set the CurrentPeriod property's values to 0.

Action URI: {Base URI of target resource}/Actions/SwitchMetrics.ClearCurrentPeriod

Action parameters

This action takes no parameters.

6.112.5 Example response


```
{
    "@odata.type": "#SwitchMetrics.v1_0_0.SwitchMetrics",
    "Id": "SwitchMetrics",
    "Name": "PCIe Switch Metrics",
    "PCIeErrors": {
        "CorrectableErrorCount": 0,
        "NonFatalErrorCount": 0,
        "FatalErrorCount": 0,
        "L0ToRecoveryCount": 0,
        "ReplayCount": 0,
        "ReplayRolloverCount": 0,
        "NAKSentCount": 0,
        "NAKReceivedCount": 0
    },
    "InternalMemoryMetrics": {
        "CurrentPeriod": {
            "CorrectableECCErrorCount": 0,
            "UncorrectableECCErrorCount": 0
        },
        "LifeTime": {
            "CorrectableECCErrorCount": 0,
            "UncorrectableECCErrorCount": 0
        }
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/PCIe/Switches/1/SwitchMetrics"
}
```

6.113 Task 1.6.1

Version	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2022.1	2020.3	2018.3	2018.2	2018.1	2017.1	1.0

6.113.1 Description

The Task schema contains information about a task that the Redfish task service schedules or executes. Tasks represent operations that take more time than a client typically wants to wait.

- This resource contains a task for a Redfish implementation.

6.113.2 URIs

/redfish/v1/TaskService/Tasks/*{TaskId}*
/redfish/v1/TaskService/Tasks/*{TaskId}*/SubTasks/*{TaskId2}*

6.113.3 Properties

Property	Type	Attributes	Notes
EndTime	string (date-time)	*read-only*	The date and time when the task was completed. This property will only appear when the task is complete. • This property shall indicate the date and time when the task was completed. This property shall not appear if the task is running or otherwise has not been completed. This property shall appear only if the TaskState is Completed, Killed, Cancelled, or Exception.
EstimatedDuration *(v1.6+)*	string	*read-only* *(null)*	The estimated total time required to complete the task. • This property shall indicate the estimated total time needed to complete the task. The value is not expected to change while the task is in progress, but the service may update the value if it obtains new information that significantly changes the expected duration. Services should be conservative in the reported estimate and clients should treat this value as an estimate. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`

Property	Type	Attributes	Notes
HidePayload *(v1.3+)*	boolean	*read-only*	An indication of whether the contents of the payload are hidden from view after the task has been created. If `true`, responses do not return the payload. If `false`, responses return the payload. If this property is not present when the task is created, the default is `false`. • This property shall indicate whether the contents of the payload should be hidden from view after the task has been created. If `true`, responses shall not return the Payload property. If `false`, responses shall return the Payload property. If this property is not present when the task is created, the default is `false`. This property shall be supported if the Payload property is supported.
Messages [{ }]	array (object)		The message that the Redfish service returns. • An array of messages associated with the task. ◦ This property shall contain an array of messages associated with the task. For property details, see Message.
Payload *(v1.3+)* {	object		The HTTP and JSON payload details for this task, unless they are hidden from view by the service. • This object shall contain information detailing the HTTP and JSON payload information for executing this task. This property shall not be included in the response if the HidePayload property is `true`.
HttpHeaders *(v1.3+)* [ ]	array (string)	*read-only*	An array of HTTP headers that this task includes. • This property shall contain an array of HTTP headers that this task includes.
HttpOperation *(v1.3+)*	string	*read-only*	The HTTP operation to perform to execute this task. • This property shall contain the HTTP operation to execute for this task.
JsonBody *(v1.3+)*	string	*read-only*	The JSON payload to use in the execution of this task. • This property shall contain JSON formatted payload used for this task.
TargetUri *(v1.3+)*	string (URI)	*read-only*	The URI of the target for this task. • This property shall contain a link to the location to use as the target for an HTTP operation.
}			
PercentComplete *(v1.4+)*	integer (%)	*read-only* *(null)*	The completion percentage of this task. • This property shall indicate the completion progress of the task, reported in percent of completion. If the task has not been started, the value shall be zero.

Property	Type	Attributes	Notes
StartTime	string (date-time)	*read-only*	The date and time when the task was started. • This property shall indicate the date and time when the task was started.
SubTasks *(v1.5+)* {	object		The link to a collection of sub-tasks for this task. • This property shall contain a link to a resource collection of type TaskCollection. This property shall not be present if this resource represents a sub-task for a task. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Task*. See the Task schema for details.
}			
TaskMonitor *(v1.2+)*	string (URI)	*read-only*	The URI of the Task Monitor for this task. • This property shall contain a URI to task monitor as defined in the Redfish Specification.
TaskState	string (enum)	*read-only*	The state of the task. • This property shall indicate the state of the task. *For the possible property values, see TaskState in Property details.*
TaskStatus	string (enum)	*read-only*	The completion status of the task. • This property shall contain the completion status of the task and shall not be set until the task completes. This property should contain `Critical` if one or more messages in the Messages array contains the severity `Critical`. This property should contain `Warning` if one or more messages in the Messages array contains the severity `Warning` and no messages contain the severity `Critical`. This property should contain `OK` if all messages in the Messages array contain the severity `OK` or the array is empty. *For the possible property values, see TaskStatus in Property details.*

6.113.4 Property details

6.113.4.1 TaskState:

The state of the task.

- This property shall indicate the state of the task.

string	Description
Cancelled *(v1.2+)*	Task has been cancelled by an operator or internal process. • This value shall represent that either a DELETE operation on a task monitor or Task resource or by an internal process cancelled the task.
Cancelling *(v1.2+)*	Task is in the process of being cancelled. • This value shall represent that the task is in the process of being cancelled.
Completed	Task was completed. • This value shall represent that the task completed successfully or with warnings.
Exception	Task has stopped due to an exception condition. • This value shall represent that the task completed with errors.
Interrupted	Task has been interrupted. • This value shall represent that the task has been interrupted but is expected to restart and is therefore not complete.
Killed *(deprecated v1.2)*	Task was terminated. • This value shall represent that the task is complete because an operator killed it. *Deprecated in v1.2 and later. This value has been deprecated and is being replaced by the* `Cancelled` *value, which has more determinate semantics.*
New	A new task. • This value shall represent that the task is newly created, but has not started.
Pending	Task is pending and has not started. • This value shall represent that the task is pending some condition and has not yet begun to execute.
Running	Task is running normally. • This value shall represent that the task is executing.
Service	Task is running as a service. • This value shall represent that the task is now running as a service and expected to continue operation until stopped or killed.
Starting	Task is starting. • This value shall represent that the task is starting.

string	Description
Stopping	Task is in the process of stopping. • This value shall represent that the task is stopping but is not yet complete.
Suspended	Task has been suspended. • This value shall represent that the task has been suspended but is expected to restart and is therefore not complete.

6.113.4.2 TaskStatus:

The completion status of the task.

- This property shall contain the completion status of the task and shall not be set until the task completes. This property should contain `Critical` if one or more messages in the Messages array contains the severity `Critical`. This property should contain `Warning` if one or more messages in the Messages array contains the severity `Warning` and no messages contain the severity `Critical`. This property should contain `OK` if all messages in the Messages array contain the severity `OK` or the array is empty.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.113.5 Example response

```
{
    "@odata.type": "#Task.v1_6_1.Task",
    "Id": "545",
    "Name": "Task 545",
    "TaskMonitor": "/taskmon/545",
    "TaskState": "Completed",
    "StartTime": "2012-03-07T14:44+06:00",
    "EndTime": "2012-03-07T14:45+06:00",
    "TaskStatus": "OK",
    "Messages": [
        {
            "MessageId": "Base.1.0.PropertyNotWriteable",
            "RelatedProperties": [
```

```
                "SKU"
            ],
            "Message": "The property SKU is a read only property and cannot be assigned a value",
            "MessageArgs": [
                "SKU"
            ],
            "Severity": "Warning"
        }
    ],
    "@odata.id": "/redfish/v1/TaskService/Tasks/545"
}
```


6.114 TaskService 1.2.0

Version	*v1.2*	*v1.1*	*v1.0*
Release	2021.1	2017.1	1.0

6.114.1 Description

The TaskService schema describes a task service that enables management of long-duration operations, includes the properties for the task service itself, and has links to the resource collection of tasks.

- This resource contains a task service for a Redfish implementation.

6.114.2 URIs

/redfish/v1/TaskService

6.114.3 Properties

Property	Type	Attributes	Notes
CompletedTaskOverWritePolicy	string (enum)	*read-only*	The overwrite policy for completed tasks. This property indicates if the task service overwrites completed task information. • This property shall contain the overwrite policy for completed tasks. This property shall indicate if the task service overwrites completed task information. *For the possible property values, see CompletedTaskOverWritePolicy in Property details.*

Property	Type	Attributes	Notes
DateTime	string (date-time)	*read-only (null)*	The current date and time, with UTC offset, setting that the task service uses. • This property shall contain the current date and time for the task service, with UTC offset.
LifeCycleEventOnTaskStateChange	boolean	*read-only*	An indication of whether a task state change sends an event. • This property shall indicate whether a task state change sends an event. Services should send an event containing a message defined in the Task Event Message Registry when the state of a task changes.
ServiceEnabled	boolean	*read-write (null)*	An indication of whether this service is enabled. • This property shall indicate whether this service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
TaskAutoDeleteTimeoutMinutes *(v1.2+)*	integer	*read-write*	The number of minutes after which a completed task is deleted by the service. • This property shall contain the number of minutes after which a completed task, where TaskState contains the value `Completed`, `Killed`, `Cancelled`, or `Exception`, is deleted by the service.
Tasks {	object		The links to the collection of tasks. • This property shall contain a link to a resource collection of type TaskCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Task*. See the Task schema for details.
}			

6.114.4 Property details

6.114.4.1 CompletedTaskOverWritePolicy:

The overwrite policy for completed tasks. This property indicates if the task service overwrites completed task information.

- This property shall contain the overwrite policy for completed tasks. This property shall indicate if the task service overwrites completed task information.

string	Description
Manual	Completed tasks are not automatically overwritten.
Oldest	Oldest completed tasks are overwritten.

6.114.5 Example response

```
{
    "@odata.type": "#TaskService.v1_2_0.TaskService",
    "Id": "TaskService",
    "Name": "Tasks Service",
    "DateTime": "2015-03-13T04:14:33+06:00",
    "CompletedTaskOverWritePolicy": "Manual",
    "LifeCycleEventOnTaskStateChange": true,
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "ServiceEnabled": true,
    "Tasks": {
        "@odata.id": "/redfish/v1/TaskService/Tasks"
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/TaskService"
}
```

6.115 TelemetryService 1.3.1

Version	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.4	2019.4	2018.3	2018.2

6.115.1 Description

The TelemetryService schema describes a telemetry service. The telemetry service is used to for collecting and reporting metric data within the Redfish Service.

- This resource contains a telemetry service for a Redfish implementation.

6.115.2 URIs

/redfish/v1/TelemetryService

6.115.3 Properties

Property	Type	Attributes	Notes
LogService {	object		The link to a log service that the telemetry service uses. This service can be a dedicated log service or a pointer a log service under another resource, such as a manager. • This property shall contain a link to a resource of type LogService that this telemetry service uses. See the *LogService* schema for details on this property.
@odata.id	string	*read-only*	Link to a LogService resource. See the Links section and the *LogService* schema for details.
}			
MaxReports	integer	*read-only (null)*	The maximum number of metric reports that this service supports. • This property shall contain the maximum number of metric reports that this service supports.
MetricDefinitions {	object		The link to the collection of metric definitions. • This property shall contain a link to a resource collection of type MetricDefinitionCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *MetricDefinition*. See the MetricDefinition schema for details.
}			
MetricReportDefinitions {	object		The link to the collection of metric report definitions. • This property shall contain a link to a resource collection of type MetricReportDefinitionCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *MetricReportDefinition*. See the MetricReportDefinition schema for details.
}			

Property	Type	Attributes	Notes
MetricReports {	object		The link to the collection of metric reports. • This property shall contain a link to a resource collection of type MetricReportCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *MetricReport*. See the MetricReport schema for details.
}			
MinCollectionInterval	string	*read-only* *(null)*	The minimum time interval between gathering metric data that this service allows. • This property shall contain the minimum time interval between gathering metric data that this service allows. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
ServiceEnabled *(v1.2+)*	boolean	*read-write* *(null)*	An indication of whether this service is enabled. • This property shall indicate whether this service is enabled.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
SupportedCollectionFunctions [ ]	array (string (enum))	*read-write* *(null)*	An operation to perform over the sample. • The functions that can be performed over each metric. ◦ This property shall contain the function to apply over the collection duration. *For the possible property values, see SupportedCollectionFunctions in Property details.*
Triggers {	object		The link to the collection of triggers that apply to metrics. • This property shall contain a link to a resource collection of type TriggersCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Triggers*. See the Triggers schema for details.
}			

6.115.4 Actions

6.115.4.1 ClearMetricReports *(v1.3+)*

Description

The action to clear the metric reports for this telemetry service.

- This action shall delete all entries found in the metric report collection for this telemetry service.

Action URI: {Base URI of target resource}/Actions/TelemetryService.ClearMetricReports

Action parameters

This action takes no parameters.

6.115.4.2 ResetMetricReportDefinitionsToDefaults *(v1.3+)*

Description

The action to reset the metric report definitions to factory defaults.

- This action shall reset all entries found in the metric report definition collection to factory defaults. This action may delete members of the metric report definition collection.

Action URI: {Base URI of target resource}/Actions/TelemetryService.ResetMetricReportDefinitionsToDefaults

Action parameters

This action takes no parameters.

6.115.4.3 ResetTriggersToDefaults *(v1.3+)*

Description

The action to reset the triggers to factory defaults.

- This action shall reset all entries found in the triggers collection to factory defaults. This action may delete members of the triggers collection.

Action URI: {Base URI of target resource}/Actions/TelemetryService.ResetTriggersToDefaults

Action parameters

This action takes no parameters.

6.115.4.4 SubmitTestMetricReport

Description

This action generates a metric report.

- This action shall cause the Event Service to immediately generate the metric report as an alert event. Then, this message should be sent to any appropriate event destinations.

Action URI: {Base URI of target resource}/Actions/TelemetryService.SubmitTestMetricReport

Action parameters

Parameter Name	Type	Attributes	Notes
GeneratedMetricReportValues *(v1.1+)* [{	array	*required*	The content of the MetricReportValues in the generated metric report. • This parameter shall contain the contents of the MetricReportValues array property in the generated metric report.
MetricDefinition *(v1.1+)* {	object		The link to the metric definition for this metric. • This property shall contain a link to a resource of type MetricDefinition that describes what this metric value captures. See the *MetricDefinition* schema for details on this property.
@odata.id	string	*read-only*	Link to a MetricDefinition resource. See the Links section and the *MetricDefinition* schema for details.
}			
MetricId *(v1.1+)*	string	*read-only (null)*	The metric definitions identifier for this metric. • This property shall contain the same value as the Id property of the source metric within the associated metric definition.
MetricProperty *(v1.1+)*	string (URI)	*read-only (null)*	The URI for the property from which this metric is derived. • The value shall be URI to the property following the JSON fragment notation, as defined by RFC6901, to identify an individual property in a Redfish resource.
MetricValue *(v1.1+)*	string	*read-only (null)*	The metric value, as a string. • This property shall contain the metric value, as a string.

Parameter Name	Type	Attributes	Notes
Timestamp *(v1.1+)*	string (date-time)	*read-only (null)*	The date and time when the metric is obtained. A management application can establish a time series of metric data by retrieving the instances of metric value and sorting them according to their timestamp. • The value shall time when the metric value was obtained. Note that this value may be different from the time when this instance is created.
}]			
MetricReportName	string	*required*	The name of the metric report in generated metric report. • This parameter shall contain the name of the generated metric report.
MetricReportValues *(deprecated v1.1)*	string	*optional*	The contents of MetricReportValues array in the generated metric report. • This parameter shall contain the contents of the MetricReportValues array property in the generated metric report. *Deprecated in v1.1 and later. This property has been deprecated in favor of using the property 'GeneratedMetricReportValues'.*

Request Example

```
{
    "MetricReportName": "TestMetricReport",
    "GeneratedMetricReportValues": [
        {
            "MetricId": "AverageReadingCelsius",
            "MetricValue": "50",
            "Timestamp": "2020-12-06T12:00:00Z",
            "MetricProperty": "/redfish/v1/Chassis/Tray_1/Thermal#/Temperatures/0/ReadingCelsius",
            "MetricDefinition": {
                "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/AverageReadingCelsius"
            }
        },
        {
            "MetricId": "AverageReadingCelsius",
            "MetricValue": "53",
            "Timestamp": "2020-12-06T12:00:01Z",
            "MetricProperty": "/redfish/v1/Chassis/Tray_1/Thermal#/Temperatures/0/ReadingCelsius",
            "MetricDefinition": {
                "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/AverageReadingCelsius"
            }
        }
    ]
}
```

6.115.5 Property details

6.115.5.1 SupportedCollectionFunctions:

An operation to perform over the sample.

- The functions that can be performed over each metric.
  - This property shall contain the function to apply over the collection duration.

string	Description
Average	An averaging function.
Maximum	A maximum function.
Minimum	A minimum function.
Summation	A summation function.

6.115.6 Example response

```
{
    "@odata.type": "#TelemetryService.v1_3_1.TelemetryService",
    "Id": "TelemetryService",
    "Name": "Telemetry Service",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "SupportedCollectionFunctions": [
        "Average",
        "Minimum",
        "Maximum"
    ],
    "MetricDefinitions": {
        "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions"
    },
    "MetricReportDefinitions": {
        "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions"
    },
    "MetricReports": {
        "@odata.id": "/redfish/v1/TelemetryService/MetricReports"
    },
    "Triggers": {
        "@odata.id": "/redfish/v1/TelemetryService/Triggers"
```

```
    },
    "LogService": {
        "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1"
    },
    "@odata.id": "/redfish/v1/TelemetryService"
}
```


6.116 Thermal 1.7.1 (deprecated)

Version	*v1.7 Deprecated*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.4	2019.4	2018.2	2017.3	2017.1	2016.3	2016.1	1.0

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of the ThermalSubsystem schema.

6.116.1 Description

The Thermal schema describes temperature monitoring and thermal management subsystems, such as cooling fans, for a computer system or similar devices contained within a chassis.

- This resource shall contain the thermal management properties for temperature monitoring and management of cooling fans for a Redfish implementation.

6.116.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/Thermal

6.116.3 Properties

Property	Type	Attributes	Notes
Fans [{	array		The set of fans for this chassis. • This property shall contain the set of fans for this chassis.

Property	Type	Attributes	Notes
@odata.id	string (URI)	*read-only required*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions *(v1.3+)* {}	object		The available actions for this resource. • This property shall contain the available actions for this resource.
Assembly *(v1.4+)* {	object		The link to the assembly associated with this fan. • This property shall contain a link to a resource of type Assembly. See the *Assembly* schema for details on this property.
@odata.id	string	*read-only*	Link to a Assembly resource. See the Links section and the *Assembly* schema for details.
}			
FanName *(deprecated v1.1)*	string	*read-only (null)*	The name of the fan. • This property shall contain the name of the fan. *Deprecated in v1.1 and later. This property has been deprecated in favor of the Name property.*
HotPluggable *(v1.4+)*	boolean	*read-only (null)*	An indication of whether this device can be inserted or removed while the equipment is in operation. • This property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Hot-pluggable devices can become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be not hot-pluggable.
IndicatorLED *(v1.2+)*	string (enum)	*read-write (null)*	The state of the indicator LED, which identifies this fan. • This property shall contain the state of the indicator light associated with this fan. *For the possible property values, see IndicatorLED in Property details.*

Property	Type	Attributes	Notes
Location *(v1.4+)* {}	object		The location of the fan. • This property shall contain location information of the associated fan. For property details, see Location.
LowerThresholdCritical	integer	*read-only (null)*	The value at which the reading is below normal range but not yet fatal. • This property shall contain the value at which the Reading property is below the normal range but is not yet fatal. The value of the property shall use the same units as the Reading property.
LowerThresholdFatal	integer	*read-only (null)*	The value at which the reading is below normal range and fatal. • This property shall contain the value at which the Reading property is below the normal range and is fatal. The value of the property shall use the same units as the Reading property.
LowerThresholdNonCritical	integer	*read-only (null)*	The value at which the reading is below normal range. • This property shall contain the value at which the Reading property is below normal range. The value of the property shall use the same units as the Reading property.
Manufacturer *(v1.2+)*	string	*read-only (null)*	The manufacturer of this fan. • This property shall contain the name of the organization responsible for producing the fan. This organization may be the entity from whom the fan is purchased, but this is not necessarily true.
MaxReadingRange	integer	*read-only (null)*	Maximum value for this sensor. • This property shall indicate the highest possible value for the Reading property. The value of the property shall use the same units as the Reading property.
MemberId	string	*read-only required*	The identifier for the member within the collection. • This property shall uniquely identify the member within the collection. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.

Property	Type	Attributes	Notes
MinReadingRange	integer	*read-only* *(null)*	Minimum value for this sensor. • This property shall indicate the lowest possible value for the Reading property. The value of the property shall use the same units as the Reading property.
Model *(v1.2+)*	string	*read-only* *(null)*	The model number for this fan. • This property shall contain the model information as defined by the manufacturer for the associated fan.
Name *(v1.1+)*	string	*read-only* *(null)*	Name of the fan. • This property shall contain the name of the fan.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PartNumber *(v1.2+)*	string	*read-only* *(null)*	The part number for this fan. • This property shall contain the part number as defined by the manufacturer for the associated fan.
PhysicalContext	string (enum)	*read-only*	The area or device associated with this fan. • This property shall contain a description of the affected device or region within the chassis with which this fan is associated. *For the possible property values, see PhysicalContext in Property details.*
Reading	integer	*read-only* *(null)*	The fan speed. • This property shall contain the fan sensor reading.
ReadingUnits *(v1.0.1+)*	string (enum)	*read-only* *(null)*	The units in which the fan reading and thresholds are measured. • This property shall contain the units in which the fan reading and thresholds are measured. *For the possible property values, see ReadingUnits in Property details.*
Redundancy [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. • The set of redundancy groups for this fan. ◦ This property shall contain an array of links to the redundancy groups to which this fan belongs. For property details, see Redundancy.

Property	Type	Attributes	Notes
RelatedItem [{	array		An array of links to resources or objects that this fan services. • This property shall contain an array of links to resources or objects that this fan services.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
SensorNumber *(v1.5+)*	integer	*read-only (null)*	The numerical identifier for this fan speed sensor. • This property shall contain a numerical identifier for this fan speed sensor that is unique within this resource.
SerialNumber *(v1.2+)*	string	*read-only (null)*	The serial number for this fan. • This property shall contain the serial number as defined by the manufacturer for the associated fan.
SparePartNumber *(v1.2+)*	string	*read-only (null)*	The spare part number for this fan. • This property shall contain the spare or replacement part number as defined by the manufacturer for the associated fan.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
UpperThresholdCritical	integer	*read-only (null)*	The value at which the reading is above normal range but not yet fatal. • This property shall contain the value at which the Reading property is above the normal range but is not yet fatal. The value of the property shall use the same units as the Reading property.
UpperThresholdFatal	integer	*read-only (null)*	The value at which the reading is above normal range and fatal. • This property shall contain the value at which the Reading property is above the normal range and is fatal. The value of the property shall use the same units as the Reading property.

Property	Type	Attributes	Notes
UpperThresholdNonCritical	integer	*read-only* *(null)*	The value at which the reading is above normal range. • This property shall contain the value at which the Reading property is above the normal range. The value of the property shall use the same units as the Reading property.
}]			
Redundancy [{ }]	array (object)		The common redundancy definition and structure used in other Redfish schemas. • The redundancy information for the set of fans in this chassis. ◦ This property shall contain redundancy information for the fans in this chassis. For property details, see Redundancy.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
Temperatures [{	array		The set of temperature sensors for this chassis. • This property shall contain the set of temperature sensors for this chassis.
@odata.id	string (URI)	*read-only* *required*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
Actions *(v1.3+)* {}	object		The available actions for this resource. • This property shall contain the available actions for this resource.
AdjustedMaxAllowableOperatingValue *(v1.4+)*	integer (Celsius)	*read-only* *(null)*	Adjusted maximum allowable operating temperature for this equipment based on the current environmental conditions present. • This property shall indicate the adjusted maximum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination, and adjusted based on environmental conditions present. For example, liquid inlet temperature can be adjusted based on the available liquid pressure.

Property	Type	Attributes	Notes
AdjustedMinAllowableOperatingValue *(v1.4+)*	integer (Celsius)	*read-only (null)*	Adjusted minimum allowable operating temperature for this equipment based on the current environmental conditions present. • This property shall indicate the adjusted minimum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination, and adjusted based on environmental conditions present. For example, liquid inlet temperature can be adjusted based on the available liquid pressure.
DeltaPhysicalContext *(v1.4+)*	string (enum)	*read-only*	The area or device to which the DeltaReadingCelsius temperature measurement applies, relative to PhysicalContext. • This property shall contain a description of the affected device or region within the chassis to which the DeltaReadingCelsius temperature measurement applies, relative to PhysicalContext. *For the possible property values, see DeltaPhysicalContext in Property details.*
DeltaReadingCelsius *(v1.4+)*	number (Celsius)	*read-only (null)*	The delta temperature reading. • This property shall contain the delta of the values of the temperature readings across this sensor and the sensor at DeltaPhysicalContext.
LowerThresholdCritical	number (Celsius)	*read-only (null)*	The value at which the reading is below normal range but not yet fatal. • This property shall contain the value at which the ReadingCelsius property is below the normal range but is not yet fatal. The value of the property shall use the same units as the ReadingCelsius property.
LowerThresholdFatal	number (Celsius)	*read-only (null)*	The value at which the reading is below normal range and fatal. • This property shall contain the value at which the ReadingCelsius property is below the normal range and is fatal. The value of the property shall use the same units as the ReadingCelsius property.
LowerThresholdNonCritical	number (Celsius)	*read-only (null)*	The value at which the reading is below normal range. • This property shall contain the value at which the ReadingCelsius property is below normal range. The value of the property shall use the same units as the ReadingCelsius property.

Property	Type	Attributes	Notes
LowerThresholdUser *(v1.6+)*	integer (Celsius)	*read-write (null)*	The value at which the reading is below the user-defined range. • This property shall contain the value at which the ReadingCelsius property is below the user-defined range. The value of the property shall use the same units as the ReadingCelsius property. The value shall be equal to the value of LowerThresholdNonCritical, LowerThresholdCritical, or LowerThresholdFatal, unless set by a user.
MaxAllowableOperatingValue *(v1.4+)*	integer (Celsius)	*read-only (null)*	Maximum allowable operating temperature for this equipment. • This property shall indicate the maximum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination.
MaxReadingRangeTemp	number (Celsius)	*read-only (null)*	Maximum value for this sensor. • This property shall indicate the highest possible value for the ReadingCelsius property. The value of the property shall use the same units as the ReadingCelsius property.
MemberId	string	*read-only required*	The identifier for the member within the collection. • This property shall uniquely identify the member within the collection. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index.
MinAllowableOperatingValue *(v1.4+)*	integer (Celsius)	*read-only (null)*	Minimum allowable operating temperature for this equipment. • This property shall indicate the minimum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination.
MinReadingRangeTemp	number (Celsius)	*read-only (null)*	Minimum value for this sensor. • This property shall indicate the lowest possible value for the ReadingCelsius property. The value of the property shall use the same units as the ReadingCelsius property.
Name	string	*read-only (null)*	The temperature sensor name. • This property shall contain the name of the temperature sensor.
Oem {}	object		See the OEM object definition in the Using this guide clause.

Property	Type	Attributes	Notes
PhysicalContext	string (enum)	*read-only*	The area or device to which this temperature measurement applies. • This property shall contain a description of the affected device or region within the chassis to which this temperature applies. *For the possible property values, see PhysicalContext in Property details.*
ReadingCelsius	number (Celsius)	*read-only* *(null)*	The temperature in degrees Celsius. • This property shall contain the temperature in Celsius degrees.
RelatedItem [{	array		An array of links to resources or objects that represent areas or devices to which this temperature applies. • This property shall contain an array of links to resources or objects that represent areas or devices to which this temperature applies.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
SensorNumber	integer	*read-only* *(null)*	The numerical identifier of the temperature sensor. • This property shall contain a numerical identifier for this temperature sensor that is unique within this resource.
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
UpperThresholdCritical	number (Celsius)	*read-only* *(null)*	The value at which the reading is above normal range but not yet fatal. • This property shall contain the value at which the ReadingCelsius property is above the normal range but is not yet fatal. The value of the property shall use the same units as the ReadingCelsius property.

Property	Type	Attributes	Notes
UpperThresholdFatal	number (Celsius)	*read-only (null)*	The value at which the reading is above normal range and fatal. • This property shall contain the value at which the ReadingCelsius property is above the normal range and is fatal. The value of the property shall use the same units as the ReadingCelsius property.
UpperThresholdNonCritical	number (Celsius)	*read-only (null)*	The value at which the reading is above normal range. • This property shall contain the value at which the ReadingCelsius property is above the normal range. The value of the property shall use the same units as the ReadingCelsius property.
UpperThresholdUser *(v1.6+)*	integer (Celsius)	*read-write (null)*	The value at which the reading is above the user-defined range. • This property shall contain the value at which the ReadingCelsius property is above the user-defined range. The value of the property shall use the same units as the ReadingCelsius property. The value shall be equal to the value of UpperThresholdNonCritical, UpperThresholdCritical, or UpperThresholdFatal, unless set by a user.
}]			

6.116.4 Property details

6.116.4.1 DeltaPhysicalContext:

The area or device to which the DeltaReadingCelsius temperature measurement applies, relative to PhysicalContext.

- This property shall contain a description of the affected device or region within the chassis to which the DeltaReadingCelsius temperature measurement applies, relative to PhysicalContext.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.

string	Description
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.

string	Description
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.116.4.2 IndicatorLED:

The state of the indicator LED, which identifies this fan.

- This property shall contain the state of the indicator light associated with this fan.

string	Description
Blinking	The indicator LED is blinking. • This value shall represent that the indicator LED is in a blinking state where the LED is being turned on and off in repetition. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Lit	The indicator LED is lit. • This value shall represent that the indicator LED is in a solid on state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.
Off	The indicator LED is off. • This value shall represent that the indicator LED is in a solid off state. If the service does not support this value, it shall reject PATCH or PUT requests containing this value by returning the HTTP 400 (Bad Request) status code.

6.116.4.3 PhysicalContext:

The area or device associated with this fan.

- This property shall contain a description of the affected device or region within the chassis with which this fan is associated.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.

string	Description
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.

string	Description
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.116.4.4 ReadingUnits:

The units in which the fan reading and thresholds are measured.

- This property shall contain the units in which the fan reading and thresholds are measured.

string	Description
Percent	The fan reading and thresholds are measured as a percentage.
RPM	The fan reading and thresholds are measured in revolutions per minute.

6.116.5 Example response

```
{
    "@odata.type": "#Thermal.v1_7_1.Thermal",
    "Id": "Thermal",
    "Name": "Thermal",
```

```
"Temperatures": [
    {
        "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Temperatures/0",
        "MemberId": "0",
        "Name": "CPU1 Temp",
        "SensorNumber": 5,
        "Status": {
            "State": "Enabled",
            "Health": "OK"
        },
        "ReadingCelsius": 41,
        "UpperThresholdNonCritical": 42,
        "UpperThresholdCritical": 45,
        "UpperThresholdFatal": 48,
        "MinReadingRangeTemp": 0,
        "MaxReadingRangeTemp": 60,
        "PhysicalContext": "CPU",
        "RelatedItem": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/CPU1"
            }
        ]
    },
    {
        "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Temperatures/1",
        "MemberId": "1",
        "Name": "CPU2 Temp",
        "SensorNumber": 6,
        "Status": {
            "State": "Disabled"
        },
        "UpperThresholdNonCritical": 42,
        "UpperThresholdCritical": 45,
        "UpperThresholdFatal": 48,
        "MinReadingRangeTemp": 0,
        "MaxReadingRangeTemp": 60,
        "PhysicalContext": "CPU",
        "RelatedItem": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/CPU2"
            }
        ]
    },
    {
        "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Temperatures/2",
        "MemberId": "2",
        "Name": "Chassis Intake Temp",
        "SensorNumber": 9,
        "Status": {
            "State": "Enabled",
```

```
            "Health": "OK"
        },
        "ReadingCelsius": 25,
        "UpperThresholdUser": 28,
        "UpperThresholdNonCritical": 30,
        "UpperThresholdCritical": 40,
        "UpperThresholdFatal": 50,
        "LowerThresholdUser": 20,
        "LowerThresholdNonCritical": 10,
        "LowerThresholdCritical": 5,
        "LowerThresholdFatal": 0,
        "MinReadingRangeTemp": 0,
        "MaxReadingRangeTemp": 60,
        "PhysicalContext": "Intake",
        "RelatedItem": [
            {
                "@odata.id": "/redfish/v1/Chassis/1U"
            },
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2"
            }
        ]
    }
],
"Fans": [
    {
        "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Fans/0",
        "MemberId": "0",
        "Name": "BaseBoard System Fan",
        "PhysicalContext": "Backplane",
        "Status": {
            "State": "Enabled",
            "Health": "OK"
        },
        "Reading": 2100,
        "ReadingUnits": "RPM",
        "LowerThresholdFatal": 0,
        "MinReadingRange": 0,
        "MaxReadingRange": 5000,
        "Redundancy": [
            {
                "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Redundancy/0"
            }
        ],
        "RelatedItem": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2"
            },
            {
                "@odata.id": "/redfish/v1/Chassis/1U"
```

```
                }
            ]
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Fans/1",
            "MemberId": "1",
            "Name": "BaseBoard System Fan Backup",
            "PhysicalContext": "Backplane",
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            },
            "Reading": 2050,
            "ReadingUnits": "RPM",
            "LowerThresholdFatal": 0,
            "MinReadingRange": 0,
            "MaxReadingRange": 5000,
            "Redundancy": [
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Redundancy/0"
                }
            ],
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Systems/437XR1138R2"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U"
                }
            ]
        }
    ],
    "Redundancy": [
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Redundancy/0",
            "MemberId": "0",
            "Name": "BaseBoard System Fans",
            "RedundancySet": [
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Fans/0"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/Thermal#/Fans/1"
                }
            ],
            "Mode": "N+m",
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            },
```

```
            "MinNumNeeded": 1,
            "MaxNumSupported": 2
        }
    ],
    "@odata.id": "/redfish/v1/Chassis/1U/Thermal"
}
```


6.117 ThermalMetrics 1.0.1

Version	*v1.0*
Release	2020.4

6.117.1 Description

The ThermalMetrics schema represents the thermal metrics of a chassis.

- This resource shall represent the thermal metrics of a chassis for a Redfish implementation.

6.117.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/ThermalSubsystem/ThermalMetrics

6.117.3 Properties

Property	Type	Attributes	Notes
TemperatureReadingsCelsius [{	array (excerpt)		The temperatures (Celsius) from all related sensors for this device. • This property shall contain the temperatures, in degrees Celsius units, for this subsystem. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Temperature`. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.
DataSourceUri	string (URI)	*read-only* *(null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.

Property	Type	Attributes	Notes
DeviceName *(v1.2+)*	string	*read-only* *(null)*	The name of the device. • This property shall contain the name of the device associated with this sensor. If the device is represented by a resource, the value shall contain the value of the Name property of the associated resource.
PhysicalContext	string (enum)	*read-only* *(null)*	The area or device to which this sensor measurement applies. • This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies. *For the possible property values, see PhysicalContext in Property details.*
PhysicalSubContext	string (enum)	*read-only* *(null)*	The usage or location within a device to which this sensor measurement applies. • This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same PhysicalContext instance. *For the possible property values, see PhysicalSubContext in Property details.*
Reading	number	*read-only* *(null)*	The sensor value. • This property shall contain the sensor value.
}]			
TemperatureSummaryCelsius {	object	*(null)*	The summary temperature readings for this chassis. • This property shall contain the temperature sensor readings for this subsystem.
Ambient {}	object		The ambient temperature (Celsius) of this subsystem. • This property shall contain the temperature, in degrees Celsius units, for the ambient temperature of this subsystem. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Temperature`. For more information about this property, see SensorExcerpt in Property Details.
Exhaust {}	object		The exhaust temperature (Celsius) of this subsystem. • This property shall contain the temperature, in degrees Celsius units, for the exhaust temperature of this subsystem. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Temperature`. For more information about this property, see SensorExcerpt in Property Details.

Property	Type	Attributes	Notes
Intake {}	object		The intake temperature (Celsius) of this subsystem. • This property shall contain the temperature, in degrees Celsius units, for the intake temperature of this subsystem. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Temperature`. For more information about this property, see SensorExcerpt in Property Details.
Internal {}	object		The internal temperature (Celsius) of this subsystem. • This property shall contain the temperature, in degrees Celsius units, for the internal temperature of this subsystem. The value of the DataSourceUri property, if present, shall reference a resource of type Sensor with the ReadingType property containing the value `Temperature`. For more information about this property, see SensorExcerpt in Property Details.
}			

6.117.4 Actions

6.117.4.1 ResetMetrics

Description

This action resets the summary metrics related to this equipment.

- This action shall reset any time intervals or counted values for this equipment.

Action URI: {Base URI of target resource}/Actions/ThermalMetrics.ResetMetrics

Action parameters

This action takes no parameters.

6.117.5 Property details

6.117.5.1 PhysicalContext:

The area or device to which this sensor measurement applies.

- This property shall contain a description of the affected component or region within the equipment to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Battery	A battery.
Board	A circuit board. • This value shall indicate a circuit board that is not the primary or system board within a context that cannot be described by other defined values.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.

string	Description
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Pump	A pump.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transceiver	A transceiver. • This value shall indicate a transceiver attached to a device.
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

6.117.5.2 PhysicalSubContext:

The usage or location within a device to which this sensor measurement applies.

- This property shall contain a description of the usage or sub-region within the equipment to which this sensor measurement applies. This property generally differentiates multiple sensors within the same PhysicalContext instance.

string	Description
Input	The input.
Output	The output.

6.117.5.3 SensorExcerpt:

The Sensor schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

DataSourceUri	string (URI)	*read-only (null)*	The link to the resource that provides the data for this sensor. • This property shall contain a URI to the resource that provides the source of the excerpt contained within this copy.
Reading	number	*read-only (null)*	The sensor value. • This property shall contain the sensor value.

6.117.6 Example response

```
{
    "@odata.type": "#ThermalMetrics.v1_0_1.ThermalMetrics",
    "Id": "ThermalMetrics",
    "Name": "Chassis Thermal Metrics",
    "TemperatureSummaryCelsius": {
        "Internal": {
            "Reading": 39,
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPU1Temp"
        },
        "Intake": {
            "Reading": 24.8,
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/IntakeTemp"
        },
        "Ambient": {
            "Reading": 22.5,
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/AmbientTemp"
        },
        "Exhaust": {
```

```
            "Reading": 40.5,
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/ExhaustTemp"
        }
    },
    "TemperatureReadingsCelsius": [
        {
            "Reading": 40,
            "DeviceName": "SystemBoard",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/SysBrdTemp"
        },
        {
            "Reading": 24.8,
            "DeviceName": "Intake",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/IntakeTemp"
        },
        {
            "Reading": 39,
            "DeviceName": "CPUSubsystem",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPUTemps"
        },
        {
            "Reading": 42,
            "DeviceName": "MemorySubsystem",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/MemoryTemp"
        },
        {
            "Reading": 33,
            "DeviceName": "PowerSupply",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PSTemp"
        },
        {
            "Reading": 40.5,
            "DeviceName": "Exhaust",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/ExhaustTemp"
        }
    ],
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/ThermalMetrics"
}
```


6.118 ThermalSubsystem 1.0.0

Version	*v1.0*
Release	2020.4

6.118.1 Description

This ThermalSubsystem schema contains the definition for the thermal subsystem of a chassis.

- This resource shall represent a thermal subsystem for a Redfish implementation.

6.118.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/ThermalSubsystem

6.118.3 Properties

Property	Type	Attributes	Notes
FanRedundancy [{ }]	array (object)		The redundancy information for the devices in a redundancy group. • The redundancy information for the groups of fans in this subsystem. ◦ This property shall contain redundancy information for the groups of fans in this subsystem. For property details, see RedundantGroup.
Fans {	object		The link to the collection of fans within this subsystem. • This property shall contain a link to a resource collection of type FanCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Fan*. See the Fan schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
ThermalMetrics {	object		The link to the summary of thermal metrics for this subsystem. • This property shall contain a link to a resource collection of type ThermalMetrics. See the *ThermalMetrics* schema for details on this property.
@odata.id	string	*read-only*	Link to a ThermalMetrics resource. See the Links section and the *ThermalMetrics* schema for details.
}			

6.118.4 Example response


```
{
    "@odata.type": "#ThermalSubsystem.v1_0_0.ThermalSubsystem",
    "Id": "ThermalSubsystem",
    "Name": "Thermal Subsystem for Chassis",
    "FanRedundancy": [
        {
            "RedundancyType": "NPlusM",
            "MaxSupportedInGroup": 2,
            "MinNeededInGroup": 1,
            "RedundancyGroup": [
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/Bay1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/Bay2"
                }
            ],
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            }
        },
        {
            "RedundancyType": "NPlusM",
            "MaxSupportedInGroup": 2,
            "MinNeededInGroup": 1,
            "RedundancyGroup": [
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/CPU1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/CPU2"
                }
            ],
            "Status": {
                "State": "Disabled"
            }
        }
    ],
    "Fans": {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans"
    },
    "ThermalMetrics": {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/ThermalMetrics"
    },
    "Status": {
        "State": "Enabled",
```

```
        "Health": "OK"
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem"
}
```

6.119 Triggers 1.2.0

Version	*v1.2*	*v1.1*	*v1.0*
Release	2021.2	2019.1	2018.2

6.119.1 Description

The Triggers schema describes a trigger that applies to metrics.

- This resource shall contain a trigger that applies to metrics.

6.119.2 URIs

/redfish/v1/TelemetryService/Triggers/*{TriggersId}*

6.119.3 Properties

Property	Type	Attributes	Notes
DiscreteTriggerCondition	string (enum)	*read-only (null)*	The conditions when a discrete metric triggers. • This property shall contain the conditions when a discrete metric triggers. *For the possible property values, see DiscreteTriggerCondition in Property details.*
DiscreteTriggers [{	array		The list of discrete triggers. • This property shall contain a list of values to which to compare a metric reading. This property shall be present when the DiscreteTriggerCondition property is `Specified`.

Property	Type	Attributes	Notes
DwellTime	string	*read-write (null)*	The amount of time that a trigger event persists before the metric action is performed. • This property shall contain the amount of time that a trigger event persists before the TriggerActions are performed. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
Name	string	*read-only (null)*	The name of trigger. • This property shall contain a name for the trigger.
Severity	string (enum)	*read-write (null)*	The severity of the event message. • This property shall contain the Severity property to be used in the event message. *For the possible property values, see Severity in Property details.*
Value	string	*read-write (null)*	The discrete metric value that constitutes a trigger event. • This property shall contain the value discrete metric that constitutes a trigger event. The DwellTime shall be measured from this point in time.
}]			
EventTriggers *(v1.1+)* [ ]	array (string, null)	*read-write*	The array of MessageIds that specify when a trigger condition is met based on an event. • This property shall contain an array of MessageIds that specify when a trigger condition is met based on an event. When the service generates an event and if it contains a MessageId within this array, a trigger condition shall be met. The MetricType property should not be present if this resource is configured for event-based triggers. Pattern: `^[A-Za-z0-9]+\.\d+\.\d+\.[A-Za-z0-9.]+$`
Links *(v1.1+)* {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
MetricReportDefinitions *(v1.1+)* [{	array		The metric report definitions that generate new metric reports when a trigger condition is met and when the TriggerActions property contains `RedfishMetricReport` . • This property shall contain a set of links to metric report definitions that generate new metric reports when a trigger condition is met and when the TriggerActions property contains `RedfishMetricReport` .
@odata.id	string	*read-write*	Link to a MetricReportDefinition resource. See the Links section and the *MetricReportDefinition* schema for details.

Property	Type	Attributes	Notes
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
}			
MetricIds *(v1.2+)* [ ]	array (string, null)	*read-write*	The label for the metric definitions that contain the property identifiers for this trigger. It matches the Id property of the corresponding metric definition. • This property shall contain the labels for the metric definitions that contain the property identifiers for this trigger. This property shall match the value of the Id property of the corresponding metric definitions.
MetricProperties [ ]	array (URI) (string, null)	*read-write*	An array of URIs with wildcards and property identifiers for this trigger. Each wildcard shall be replaced with its corresponding entry in the Wildcard array property. • This property shall contain an array of URIs with wildcards and property identifiers for this trigger. Use a set of curly braces to delimit each wildcard in the URI. Replace each wildcard with its corresponding entry in the Wildcard array property. A URI that contains wildcards shall link to a resource property to which the metric definition applies after all wildcards are replaced with their corresponding entries in the Wildcard array property. The property identifiers portion of the URI shall follow the RFC6901-defined JSON fragment notation rules.
MetricType	string (enum)	*read-only (null)*	The metric type of the trigger. • This property shall contain the metric type of the trigger. *For the possible property values, see MetricType in Property details.*
NumericThresholds {	object		The thresholds when a numeric metric triggers. • This property shall contain the list of thresholds to which to compare a numeric metric value.
LowerCritical {}	object		The value at which the reading is below normal range and requires attention. • This property shall contain the value at which the MetricProperties property is below the normal range and may require attention. The value of the property shall use the same units as the MetricProperties property. For more information about this property, see Threshold in Property Details.
LowerWarning {}	object		The value at which the reading is below normal range. • This property shall contain the value at which the MetricProperties property is below the normal range. The value of the property shall use the same units as the MetricProperties property. For more information about this property, see Threshold in Property Details.

Property	Type	Attributes	Notes
UpperCritical {}	object		The value at which the reading is above normal range and requires attention. • This property shall contain the value at which the MetricProperties property is above the normal range and may require attention. The value of the property shall use the same units as the MetricProperties property. For more information about this property, see Threshold in Property Details.
UpperWarning {}	object		The value at which the reading is above normal range. • This property shall contain the value at which the MetricProperties property is above the normal range. The value of the property shall use the same units as the MetricProperties property. For more information about this property, see Threshold in Property Details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
TriggerActions [ ]	array (string (enum))	*read-only*	The actions to perform when a trigger condition is met. • The actions that the trigger initiates. ◦ This property shall contain the actions that the trigger initiates. *For the possible property values, see TriggerActions in Property details.*
Wildcards [{	array		The wildcards and their substitution values for the entries in the MetricProperties array property. • This property shall contain the wildcards and their substitution values for the entries in the MetricProperties array property. Each wildcard shall have a corresponding entry in this array property.
Name	string	*read-only (null)*	The wildcard. • This property shall contain the string used as a wildcard.
Values [ ]	array (string, null)	*read-only*	An array of values to substitute for the wildcard. • This array property shall contain the list of values to substitute for the wildcard.
}]			

6.119.4 Property details

6.119.4.1 Activation:

The direction of crossing that activates this threshold.

- This property shall indicate the direction of crossing of the reading for this sensor that activates the threshold.

string	Description
Decreasing	Value decreases below the threshold. • This threshold is activated when the reading changes from a value higher than the threshold to a value lower than the threshold.
Either	Value crosses the threshold in either direction. • This threshold is activated when either the Increasing or Decreasing conditions are met.
Increasing	Value increases above the threshold. • This threshold is activated when the reading changes from a value lower than the threshold to a value higher than the threshold.

6.119.4.2 DiscreteTriggerCondition:

The conditions when a discrete metric triggers.

- This property shall contain the conditions when a discrete metric triggers.

string	Description
Changed	A discrete trigger condition is met whenever the metric value changes.
Specified	A discrete trigger condition is met when the metric value becomes one of the values that the DiscreteTriggers property lists.

6.119.4.3 MetricType:

The metric type of the trigger.

- This property shall contain the metric type of the trigger.

string	Description
Discrete	The trigger is for a discrete sensor.
Numeric	The trigger is for numeric sensor.

6.119.4.4 Severity:

The severity of the event message.

- This property shall contain the Severity property to be used in the event message.

string	Description
Critical	A critical condition requires immediate attention.
OK	Normal.
Warning	A condition requires attention.

6.119.4.5 Threshold:

A threshold definition for a sensor.

Activation	string (enum)	*read-write (null)*	The direction of crossing that activates this threshold. • This property shall indicate the direction of crossing of the reading for this sensor that activates the threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	*read-write (null)*	The duration the sensor value must violate the threshold before the threshold is activated. • This property shall indicate the duration the sensor value violates the threshold before the threshold is activated. Pattern: `-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+(.\d+)?S)?)?`
Reading	number	*read-write (null)*	The threshold value. • This property shall indicate the reading for this sensor that activates the threshold. The value of the property shall use the same units as the MetricProperties property.

6.119.4.6 TriggerActions:

The actions to perform when a trigger condition is met.

- The actions that the trigger initiates.
  - This property shall contain the actions that the trigger initiates.

string	Description
LogToLogService	When a trigger condition is met, record in a log. • This value indicates that when a trigger condition is met, the service shall log the occurrence of the condition to the log that the LogService property in the telemetry service resource describes.
RedfishEvent	When a trigger condition is met, the service sends an event to subscribers. • This value indicates that when a trigger condition is met, the service shall send an event to subscribers.
RedfishMetricReport	When a trigger condition is met, force an update of the specified metric reports. • This value indicates that when a trigger condition is met, the service shall force the metric reports managed by the MetricReportDefinitions specified by the MetricReportDefinitions property to be updated, regardless of the MetricReportDefinitionType property value. The actions specified in the ReportActions property of each MetricReportDefinition shall be performed.

6.119.5 Example response

```
{
    "@odata.type": "#Triggers.v1_2_0.Triggers",
    "Id": "PlatformPowerCapTriggers",
    "Name": "Triggers for platform power consumed",
    "MetricType": "Numeric",
    "TriggerActions": [
        "RedfishEvent"
    ],
    "NumericThresholds": {
        "UpperCritical": {
            "Reading": 50,
            "Activation": "Increasing",
            "DwellTime": "PT0.001S"
        },
        "UpperWarning": {
            "Reading": 48.1,
            "Activation": "Increasing",
            "DwellTime": "PT0.004S"
        }
    },
    "MetricProperties": [
        "/redfish/v1/Chassis/1/Power#/PowerControl/0/PowerConsumedWatts"
    ],
    "@odata.id": "/redfish/v1/TelemetryService/Triggers/PlatformPowerCapTriggers"
```

```
}
```

6.120 TrustedComponent 1.0.0

Version	*v1.0*
Release	2022.2

6.120.1 Description

The TrustedComponent resource represents a trusted device, such as a TPM.

- This resource shall represent a trusted component in a Redfish implementation.

6.120.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/TrustedComponents/*{TrustedComponentId}*

6.120.3 Properties

Property	Type	Attributes	Notes
Certificates {	object		The link to a collection of device identity certificates of the trusted component. • This property shall contain a link to a resource collection of type CertificateCollection that contains device identity certificates of the trusted component. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
FirmwareVersion	string	*read-only* *(null)*	The software version of the active software image on the trusted component. • This property shall contain a version number associated with the active software image on the trusted component.

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
ActiveSoftwareImage {	object		The link to the software inventory resource that represents the active firmware image for this trusted component. • This property shall contain a link to a resource of type SoftwareInventory that represents the active firmware image for this trusted component. See the *SoftwareInventory* schema for details on this property.
@odata.id	string	*read-write*	Link to a SoftwareInventory resource. See the Links section and the *SoftwareInventory* schema for details.
}			
ComponentIntegrity [{	array		An array of links to ComponentIntegrity resources for which the trusted component is responsible. • This property shall contain an array of links to resources of type ComponentIntegrity that represent the communication established with the trusted component by other resources. The TargetComponentURI property in the referenced ComponentIntegrity resources shall reference this trusted component.
@odata.id	string	*read-only*	Link to a ComponentIntegrity resource. See the Links section and the *ComponentIntegrity* schema for details.
}]			
ComponentsProtected [{	array		An array of links to resources that the target component protects. • This property shall contain an array of links to resources whose integrity is measured or reported by the trusted component.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
IntegratedInto {	object		A link to a resource to which this trusted component is integrated. • This property shall contain a link to a resource to which this trusted component is physically integrated. This property shall be present if TrustedComponentType contains `Integrated`.

Property	Type	Attributes	Notes
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}			
Oem {}	object		See the OEM object definition in the Using this guide clause.
SoftwareImages [{	array		The images that are associated with this trusted component. • This property shall contain an array of links to resource of type SoftwareInventory that represent the firmware images that apply to this trusted component.
@odata.id	string	*read-only*	Link to a SoftwareInventory resource. See the Links section and the *SoftwareInventory* schema for details.
}]			
}			
Manufacturer	string	*read-only (null)*	The manufacturer of this trusted component. • This property shall contain the name of the organization responsible for producing the trusted component. This organization may be the entity from whom the trusted component is purchased, but this is not necessarily true.
Model	string	*read-only (null)*	The model number of the trusted component. • This property shall contain the name by which the manufacturer generally refers to the trusted component.
PartNumber	string	*read-only (null)*	The part number of the trusted component. • This property shall contain a part number assigned by the organization that is responsible for producing or manufacturing the trusted component.
SerialNumber	string	*read-only (null)*	The serial number of the trusted component. • This property shall contain a manufacturer-allocated number that identifies the trusted component.
SKU	string	*read-only (null)*	The SKU of the trusted component. • This property shall contain the stock-keeping unit number for this trusted component.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
TrustedComponentType	string (enum)	*read-only required*	The type of trusted component, such as any physical distinction about the trusted component. • This property shall contain the type of trusted component. *For the possible property values, see TrustedComponentType in Property details.*
UUID	string	*read-only (null)*	The UUID for this trusted component. • This property shall contain a universal unique identifier number for the trusted component. Pattern: `([0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12})`

6.120.4 Property details

6.120.4.1 TrustedComponentType:

The type of trusted component, such as any physical distinction about the trusted component.

- This property shall contain the type of trusted component.

string	Description
Discrete	A discrete trusted component. • This value shall indicate that the entity has a well-defined physical boundary within the chassis.
Integrated	An integrated trusted component. • This value shall indicate that the entity is integrated into another device.

6.120.5 Example response

```
{
    "@odata.type": "#TrustedComponent.v1_0_0.TrustedComponent",
    "Id": "iRoT0",
```

```
    "UUID": "A3981CF9-576A-4335-A19F-B8CD7EC2821E",
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "TrustedComponentType": "Integrated",
    "Certificates": {
        "@odata.id": "/redfish/v1/Chassis/1U/TrustedComponents/iRoT0/Certificates"
    },
    "Links": {
        "ComponentsProtected": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/CPU1"
            }
        ],
        "IntegratedInto": {
            "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/CPU1"
        },
        "ComponentIntegrity": [
            {
                "@odata.id": "/redfish/v1/ComponentIntegrity/SS-SPDM-1"
            }
        ]
    },
    "@odata.id": "/redfish/v1/Chassis/1U/TrustedComponents/iRoT0"
}
```


6.121 UpdateService 1.11.1

Version	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	...
Release	2021.4	2021.2	2021.1	2019.4	2019.3	2019.2	2019.1	2018.3	2018.2	2017.1	2016.3	...

6.121.1 Description

The UpdateService schema describes the update service and the properties for the service itself with links to collections of firmware and software inventory. The update service also provides methods for updating software and firmware of the resources in a Redfish service.

- This resource shall represent an update service and the properties that affect the service itself for a Redfish implementation.

6.121.2 URIs

/redfish/v1/UpdateService

6.121.3 Properties

Property	Type	Attributes	Notes
ClientCertificates *(v1.10+)* {	object		The link to a collection of client identity certificates provided to the server referenced by the ImageURI property in SimpleUpdate. • This property shall contain a link to a resource collection of type CertificateCollection that represents the client identity certificates that are provided to the server referenced by the ImageURI property in SimpleUpdate as part of TLS handshaking. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
FirmwareInventory {	object		An inventory of firmware. • This property shall contain a link to a resource collection of type SoftwareInventoryCollection. The resource collection should contain the set of software components generally referred to as platform firmware or that does not execute within a host operating system. Software in this collection is generally updated using platform-specific methods or utilities. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *SoftwareInventory*. See the SoftwareInventory schema for details.
}			

Property	Type	Attributes	Notes
HttpPushUri *(v1.1+)*	string (URI)	*read-only*	The URI used to perform an HTTP or HTTPS push update to the update service. The format of the message is vendor-specific. • This property shall contain a URI at which the update service supports an HTTP or HTTPS POST of a software image for the purpose of installing software contained within the image. Access to this URI shall require the same privilege as access to the update service. If the service requires the `Content-Length` header for POST requests to this URI, the service should return HTTP 411 if the client does not include this header in the POST request. The value of this property should not contain a URI of a Redfish resource.
HttpPushUriOptions *(v1.4+)* {	object		The options for HttpPushUri-provided software updates. • This property shall contain options and requirements of the service for HttpPushUri-provided software updates.
ForceUpdate *(v1.11+)*	boolean	*read-write*	An indication of whether the service should bypass update policies when applying the HttpPushUri-provided image. • This property shall indicate whether the service should bypass update policies when applying the HttpPushUri-provided image, such as allowing a component to be downgraded. Services may contain update policies that are never bypassed, such as minimum version enforcement. If this property is not present, it shall be assumed to be `false`.
HttpPushUriApplyTime *(v1.4+)* {	object		The settings for when to apply HttpPushUri-provided firmware. • This property shall contain settings for when to apply HttpPushUri-provided firmware.
ApplyTime *(v1.4+)*	string (enum)	*read-write*	The time when to apply the HttpPushUri-provided software update. • This property shall indicate the time when to apply the HttpPushUri-provided software update. *For the possible property values, see ApplyTime in Property details.*

Property	Type	Attributes	Notes
MaintenanceWindowDurationInSeconds *(v1.4+)*	integer (seconds)	*read-write*	The expiry time, in seconds, of the maintenance window. • This property shall indicate the end of the maintenance window as the number of seconds after the time specified by the MaintenanceWindowStartTime property. This property shall be required if the HttpPushUriApplyTime property value is `AtMaintenanceWindowStart` or `InMaintenanceWindowOnReset`.
MaintenanceWindowStartTime *(v1.4+)*	string (date-time)	*read-write*	The start time of a maintenance window. • This property shall indicate the date and time when the service can start to apply the HttpPushUri-provided software as part of a maintenance window. This property shall be required if the HttpPushUriApplyTime property value is `AtMaintenanceWindowStart` or `InMaintenanceWindowOnReset`.
}			
}			
HttpPushUriOptionsBusy *(v1.4+)*	boolean	*read-write (null)*	An indication of whether a client has reserved the HttpPushUriOptions properties for software updates. • This property shall indicate whether a client uses the HttpPushUriOptions properties for software updates. When a client uses any HttpPushUriOptions properties for software updates, it should set this property to `true`. When a client no longer uses HttpPushUriOptions properties for software updates, it should set this property to `false`. This property can provide multiple clients a way to negotiate ownership of HttpPushUriOptions properties. Clients can use this property to determine whether another client uses HttpPushUriOptions properties for software updates. This property has no functional requirements for the service.
HttpPushUriTargets *(v1.2+)* [ ]	array (URI) (string, null)	*read-write*	An array of URIs that indicate where to apply the update image. • This property shall contain zero or more URIs that indicate where to apply the update image when using the URI specified by the HttpPushUri property to push a software image. These targets should correspond to SoftwareInventory instances or their related items. If this property is not present or contains no targets, the service shall apply the software image to all applicable targets, as determined by the service.

Property	Type	Attributes	Notes
HttpPushUriTargetsBusy *(v1.2+)*	boolean	*read-write (null)*	An indication of whether any client has reserved the HttpPushUriTargets property. • This property shall indicate whether any client has reserved the HttpPushUriTargets property for firmware updates. A client should set this property to `true` when it uses HttpPushUriTargets for firmware updates. A client should set it to `false` when it is no longer uses HttpPushUriTargets for updates. The property can provide multiple clients a way to negotiate ownership of HttpPushUriTargets and helps clients determine whether another client is using HttpPushUriTargets to make firmware updates. This property has no functional requirements for the service.
MaxImageSizeBytes *(v1.5+)*	integer (bytes)	*read-only (null)*	The maximum size in bytes of the software update image that this service supports. • This property shall indicate the maximum size of the software update image that clients can send to this update service.
MultipartHttpPushUri *(v1.6+)*	string (URI)	*read-only*	The URI used to perform a Redfish Specification-defined Multipart HTTP or HTTPS push update to the update service. • This property shall contain a URI used to perform a Redfish Specification-defined Multipart HTTP or HTTPS POST of a software image for the purpose of installing software contained within the image. The value of this property should not contain a URI of a Redfish resource.
RemoteServerCertificates *(v1.9+)* {	object		The link to a collection of server certificates for the server referenced by the ImageURI property in SimpleUpdate. • This property shall contain a link to a resource collection of type CertificateCollection that represents the server certificates for the server referenced by the ImageURI property in SimpleUpdate. If VerifyRemoteServerCertificate is `true`, services shall compare the certificates in this collection with the certificate obtained during handshaking with the image server in order to verify the identify of the image server prior to transferring the image. If the server cannot be verified, the service shall not send the transfer request. If VerifyRemoteServerCertificate is `false`, the service shall not perform certificate verification. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.

Property	Type	Attributes	Notes
}			
ServiceEnabled	boolean	*read-write (null)*	An indication of whether this service is enabled. • This property shall indicate whether this service is enabled.
SoftwareInventory {	object		An inventory of software. • This property shall contain a link to a resource collection of type SoftwareInventoryCollection. The resource collection should contain the set of software components executed in the context of a host operating system. This can include device drivers, applications, or offload workloads. Software in this collection is generally updated using operating system-centric methods. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *SoftwareInventory*. See the SoftwareInventory schema for details.
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
VerifyRemoteServerCertificate *(v1.9+)*	boolean	*read-write (null)*	An indication of whether the service will verify the certificate of the server referenced by the ImageURI property in SimpleUpdate prior to sending the transfer request. • This property shall indicate whether whether the service will verify the certificate of the server referenced by the ImageURI property in SimpleUpdate prior to sending the transfer request. If this property is not supported by the service, it shall be assumed to be `false`. This property should default to `false` in order to maintain compatibility with older clients.

6.121.4 Actions

6.121.4.1 SimpleUpdate

Description

This action updates software components.

- This action shall update installed software components in a software image file located at an ImageURI parameter-specified URI.

Action URI: {Base URI of target resource}/Actions/UpdateService.SimpleUpdate

Action parameters

Parameter Name	Type	Attributes	Notes
ForceUpdate *(v1.11+)*	boolean	*optional*	An indication of whether the service should bypass update policies when applying the provided image. The default is `false`. • This parameter shall indicate whether the service should bypass update policies when applying the provided image, such as allowing a component to be downgraded. Services may contain update policies that are never bypassed, such as minimum version enforcement. If the client does not provide this parameter, the service shall default this value to `false`.
ImageURI	string	*required*	The URI of the software image to install. • This parameter shall contain an RFC3986-defined URI that links to a software image that the update service retrieves to install software in that image. This URI should contain a scheme that describes the transfer protocol. If the TransferProtocol parameter is absent or not supported, and a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to get the image.
Password *(v1.4+)*	string	*optional*	The password to access the URI specified by the ImageURI parameter. • This parameter shall represent the password to access the URI specified by the ImageURI parameter.
Targets *(v1.2+)* [ ]	array (URI) (string)	*optional*	An array of URIs that indicate where to apply the update image. • This array property shall contain zero or more URIs that indicate where to apply the update image. These targets should correspond to software inventory instances or their related items. If this parameter is not present or contains no targets, the service shall apply the software image to all applicable targets, as determined by the service.

Parameter Name	Type	Attributes	Notes
TransferProtocol	string (enum)	*optional*	The network protocol that the update service uses to retrieve the software image file located at the URI provided in ImageURI. This parameter is ignored if the URI provided in ImageURI contains a scheme. • This parameter shall contain the network protocol that the update service shall use to retrieve the software image located at the ImageURI. Services should ignore this parameter if the URI provided in ImageURI contains a scheme. If this parameter is not provided (or supported), and a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to retrieve the image. *For the possible property values, see TransferProtocol in Property details.*
Username *(v1.4+)*	string	*optional*	The user name to access the URI specified by the ImageURI parameter. • This parameter shall represent the user name to access the URI specified by the ImageURI parameter.

Request Example

```
{
    "ImageURI": "https://images.contoso.org/bmc_0260_2021.bin"
}
```

6.121.4.2 StartUpdate *(v1.7+)*

Description

This action starts updating all images that have been previously invoked using an OperationApplyTime value of `OnStartUpdateRequest`.

- This action shall start an update of software component that have been scheduled with the OperationApplyTime value of `OnStartUpdateRequest`.

Action URI: {Base URI of target resource}/Actions/UpdateService.StartUpdate

Action parameters

This action takes no parameters.

6.121.5 Property details

6.121.5.1 ApplyTime:

The time when to apply the HttpPushUri-provided software update.

- This property shall indicate the time when to apply the HttpPushUri-provided software update.

string	Description
AtMaintenanceWindowStart	Apply during an administrator-specified maintenance window. • This value shall indicate the HttpPushUri-provided software is applied during the maintenance window specified by the MaintenanceWindowStartTime and MaintenanceWindowDurationInSeconds properties. A service may perform resets during this maintenance window.
Immediate	Apply immediately. • This value shall indicate the HttpPushUri-provided software is applied immediately.
InMaintenanceWindowOnReset	Apply after a reset but within an administrator-specified maintenance window. • This value shall indicate the HttpPushUri-provided software is applied during the maintenance window specified by the MaintenanceWindowStartTime and MaintenanceWindowDurationInSeconds properties, and if a reset occurs within the maintenance window.
OnReset	Apply on a reset. • This value shall indicate the HttpPushUri-provided software is applied when the system or service is reset.
OnStartUpdateRequest *(v1.11+)*	Apply when the StartUpdate action of the update service is invoked. • This value shall indicate the HttpPushUri-provided software is applied when the StartUpdate action of the update service is invoked.

6.121.5.2 TransferProtocol:

The network protocol that the update service uses to retrieve the software image file located at the URI provided in ImageURI. This parameter is ignored if the URI provided in ImageURI contains a scheme.

- This parameter shall contain the network protocol that the update service shall use to retrieve the software image located at the ImageURI. Services should ignore this parameter if the URI provided in ImageURI contains a scheme. If this parameter is not provided (or supported), and a transfer protocol is not specified by a scheme contained within this URI, the service shall use HTTP to retrieve the image.

string	Description
CIFS	Common Internet File System (CIFS).
FTP	File Transfer Protocol (FTP).
HTTP	Hypertext Transfer Protocol (HTTP).
HTTPS	Hypertext Transfer Protocol Secure (HTTPS).
NFS *(v1.3+)*	Network File System (NFS).
NSF *(deprecated v1.3)*	Network File System (NFS). *Deprecated in v1.3 and later. This value has been deprecated in favor of NFS.*
OEM	A manufacturer-defined protocol.
SCP	Secure Copy Protocol (SCP).
SFTP *(v1.1+)*	Secure File Transfer Protocol (SFTP).
TFTP	Trivial File Transfer Protocol (TFTP).

6.121.6 Example response

```
{
    "@odata.type": "#UpdateService.v1_11_1.UpdateService",
    "Id": "UpdateService",
    "Name": "Update service",
    "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
    },
    "ServiceEnabled": true,
    "HttpPushUri": "/FWUpdate",
    "FirmwareInventory": {
        "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
    },
    "SoftwareInventory": {
        "@odata.id": "/redfish/v1/UpdateService/SoftwareInventory"
    },
    "Actions": {
        "#UpdateService.SimpleUpdate": {
            "target": "/redfish/v1/UpdateService/Actions/SimpleUpdate",
            "@Redfish.ActionInfo": "/redfish/v1/UpdateService/SimpleUpdateActionInfo"
        },
        "Oem": {}
    },
```

```
    "Oem": {},
    "@odata.id": "/redfish/v1/UpdateService"
}
```

6.122 USBController 1.0.0

Version	*v1.0*
Release	2021.1

6.122.1 Description

The USBController schema defines a Universal Serial Bus controller.

- This resource shall represent a USB controller in a Redfish implementation.

6.122.2 URIs

/redfish/v1/Systems/*{ComputerSystemId}*/USBControllers/*{ControllerId}*

6.122.3 Properties

Property	Type	Attributes	Notes
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
Oem {}	object		See the OEM object definition in the Using this guide clause.
PCIeDevice {	object	*(null)*	A link to the PCIe device that represents this USB controller. • This property shall contain a link to a resource of type PCIeDevice that represents this USB controller. See the *PCIeDevice* schema for details on this property.
@odata.id	string	*read-only*	Link to a PCIeDevice resource. See the Links section and the *PCIeDevice* schema for details.
}			

Property	Type	Attributes	Notes
Processors [{	array		An array of links to the processors that can utilize this USB controller. • This property shall contain an array of links to resources of type Processor that represent processors that can utilize this USB controller.
@odata.id	string	*read-only*	Link to a Processor resource. See the Links section and the *Processor* schema for details.
}]			
}			
Manufacturer	string	*read-only* *(null)*	The manufacturer of this USB controller. • This property shall contain the name of the organization responsible for producing the USB controller. This organization may be the entity from which the USB controller is purchased, but this is not necessarily true.
Model	string	*read-only* *(null)*	The product model number of this USB controller. • This property shall contain the manufacturer-provided model information of this USB controller.
PartNumber	string	*read-only* *(null)*	The part number for this USB controller. • This property shall contain the manufacturer-provided part number for the USB controller.
Ports {	object		The ports of the USB controller. • This property shall contain a link to a resource collection of type PortCollection. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Port*. See the Port schema for details.
}			
SerialNumber	string	*read-only* *(null)*	The serial number for this USB controller. • This property shall contain a manufacturer-allocated number that identifies the USB controller.
SKU	string	*read-only* *(null)*	The SKU for this USB controller. • This property shall contain the SKU number for this USB controller.
SparePartNumber	string	*read-only* *(null)*	The spare part number of the USB controller. • This property shall contain the spare part number of the USB controller.

Property	Type	Attributes	Notes
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.

6.122.4 Example response

```
{
    "@odata.type": "#USBController.v1_0_0.USBController",
    "Id": "USB1",
    "Name": "Contoso USB Controller 1",
    "Manufacturer": "Contoso",
    "Model": "USBv3",
    "SKU": "80937",
    "SerialNumber": "2M220100SL",
    "PartNumber": "G37891",
    "SparePartNumber": "G37890",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Ports": {
        "@odata.id": "/redfish/v1/Systems/1/USBControllers/USB1/Ports"
    },
    "Links": {
        "Processors": [
            {
                "@odata.id": "/redfish/v1/Systems/1/Processors/1"
            },
            {
                "@odata.id": "/redfish/v1/Systems/1/Processors/2"
            }
        ],
        "PCIeDevice": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/USBControllers/USB1"
}
```

6.123 VCATEntry 1.0.1

Version	*v1.0*

Release	2019.4

6.123.1 Description

The VCATEntry schema defines an entry in a Virtual Channel Action Table. A Virtual Channel is a mechanism used to create multiple, logical communication streams across a physical link.

- This resource shall represent and entry of Virtual Channel Action Table in a Redfish implementation.

6.123.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/VCAT/*{VCATEntryId}*
/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/REQ-VCAT/*{VCATEntryId}*
/redfish/v1/Chassis/*{ChassisId}*/FabricAdapters/*{FabricAdapterId}*/RSP-VCAT/*{VCATEntryId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/VCAT/*{VCATEntryId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/REQ-VCAT/*{VCATEntryId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/RSP-VCAT/*{VCATEntryId}*
/redfish/v1/Fabrics/*{FabricId}*/Switches/*{SwitchId}*/Ports/*{PortId}*/VCAT/*{VCATEntryId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/VCAT/*{VCATEntryId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/REQ-VCAT/*{VCATEntryId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/RSP-VCAT/*{VCATEntryId}*
/redfish/v1/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/Ports/*{PortId}*/VCAT/*{VCATEntryId}*
/redfish/v1/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/REQ-VCAT/*{VCATEntryId}*
/redfish/v1/Systems/*{SystemId}*/FabricAdapters/*{FabricAdapterId}*/RSP-VCAT/*{VCATEntryId}*

6.123.3 Properties

Property	Type	Attributes	Notes
RawEntryHex	string	*read-write (null)*	The hexadecimal value of the Virtual Channel Action Table entries. • This property shall contain the hexadecimal value of the Virtual Channel Action Table entries. The length of hexadecimal value depends on the number of Virtual Channel Action entries supported by the component. Pattern: `^0[xX](([a-fA-F]|[0-9])*)$`

Property	Type	Attributes	Notes
VCEntries [{	array		An array of entries of the Virtual Channel Action Table. • This property shall contain an array of entries of the Virtual Channel Action Table. The length of the array depends on the number of Virtual Channel Action entries supported by the component.
Threshold	string	*read-write (null)*	The configured threshold. • This property shall contain the Gen-Z Core Specification-defined 'TH' 7-bit threshold. Pattern: `^0[xX]([a-fA-F]|[0-9]){2}$`
VCMask	string	*read-write (null)*	The bits corresponding to the supported Virtual Channel. • This property shall contain a 32-bit value where the bits correspond to a supported Virtual Channel. Pattern: `^0[xX](([a-fA-F]|[0-9]){2}){4}$`
}]			

6.123.4 Example response

```
{
    "@odata.type": "#VCATEntry.v1_0_1.VCATEntry",
    "Id": "0",
    "Name": "VCAT Entry 0",
    "Description": "Gen-Z Port 1 Virtual Channel Action Table Entry 0",
    "RawEntryHex": "0x123456",
    "VCEntries": [
        {
            "VCMask": "0x00000034",
            "Threshold": "0x12"
        },
        {
            "VCMask": "0x00000034",
            "Threshold": "0x12"
        },
        {
            "VCMask": "0x00000034",
            "Threshold": "0x12"
        },
        {
            "VCMask": "0x00000034",
            "Threshold": "0x12"
        }
    ],
    "Oem": {},
```

```
    "@odata.id": "/redfish/v1/Fabrics/GenZ/Switches/Switch1/Ports/1/VCAT/0"
}
```

6.124 VirtualMedia 1.5.1

Version	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2021.2	2021.1	2018.3	2017.3	2017.1	1.0

6.124.1 Description

The VirtualMedia schema contains properties related to the monitor and control of an instance of virtual media, such as a remote CD, DVD, or USB device. A manager for a system or device provides virtual media functionality.

- This resource shall represent a virtual media service for a Redfish implementation.

6.124.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*
/redfish/v1/Managers/*{ManagerId}*/VirtualMedia/*{VirtualMediaId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*
/redfish/v1/Systems/*{ComputerSystemId}*/VirtualMedia/*{VirtualMediaId}*

6.124.3 Properties

Property	Type	Attributes	Notes
Certificates *(v1.4+)* {	object		The link to a collection of server certificates for the server referenced by the Image property. • This property shall contain a link to a resource collection of type CertificateCollection that represents the server certificates for the server referenced by the Image property. If VerifyCertificate is `true`, services shall compare the certificates in this collection with the certificate obtained during handshaking with the image server in order to verify the identify of the image server prior to completing the remote media connection. If the server cannot be verified, the service shall not complete the remote media connection. If VerifyCertificate is `false`, the service shall not perform certificate verification. Contains a link to a resource.

Property	Type	Attributes	Notes
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
ClientCertificates *(v1.5+)* {	object		The link to a collection of client identity certificates provided to the server referenced by the Image property. • This property shall contain a link to a resource collection of type CertificateCollection that represents the client identity certificates that are provided to the server referenced by the Image property as part of TLS handshaking. Contains a link to a resource.
@odata.id	string	*read-only*	Link to Collection of *Certificate*. See the Certificate schema for details.
}			
ConnectedVia	string (enum)	*read-only* *(null)*	The current virtual media connection method. • This property shall contain the current connection method from a client to the virtual media that this resource represents. *For the possible property values, see ConnectedVia in Property details.*
Image	string (URI)	*read-write* *(null)*	The URI of the location of the selected image. • This property shall contain the URI of the media attached to the virtual media. This value may specify an absolute URI to remote media or a relative URI to media local to the implementation. A service may allow a relative URI to reference a SoftwareInventory resource. The value `null` shall indicates no image connection.
ImageName	string	*read-only* *(null)*	The current image name. • This property shall contain the name of the image.
Inserted	boolean	*read-write* *(null)*	An indication of whether virtual media is inserted into the virtual device. • This property shall indicate whether media is present in the virtual media device.
MediaTypes [ ]	array (string (enum))	*read-only*	• The media types supported as virtual media. ◦ This property shall contain an array of the supported media types for this connection. *For the possible property values, see MediaTypes in Property details.*
Password *(v1.3+)*	string	*read-write* *(null)*	The password to access the Image parameter-specified URI. This property is null in responses. • This parameter shall represent the password to access the Image parameter-specified URI. The value shall be null in responses.

Property	Type	Attributes	Notes
Status *(v1.4+)* {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
TransferMethod *(v1.3+)*	string (enum)	*read-write (null)*	The transfer method to use with the Image. • This parameter shall describe how the image transfer occurs. *For the possible property values, see TransferMethod in Property details.*
TransferProtocolType *(v1.3+)*	string (enum)	*read-write (null)*	The network protocol to use with the image. • This parameter shall represent the network protocol to use with the specified image URI. *For the possible property values, see TransferProtocolType in Property details.*
UserName *(v1.3+)*	string	*read-write (null)*	The user name to access the Image parameter-specified URI. • This parameter shall represent the user name to access the Image parameter-specified URI.
VerifyCertificate *(v1.4+)*	boolean	*read-write (null)*	An indication of whether the service will verify the certificate of the server referenced by the Image property prior to completing the remote media connection. • This property shall indicate whether whether the service will verify the certificate of the server referenced by the Image property prior to completing the remote media connection. If this property is not supported by the service, it shall be assumed to be `false`. This property should default to `false` in order to maintain compatibility with older clients.
WriteProtected	boolean	*read-write (null)*	An indication of whether the media is write-protected. • This property shall indicate whether the remote device media prevents writing to that media.

6.124.4 Actions

6.124.4.1 EjectMedia *(v1.2+)*

Description

This action detaches remote media from virtual media.

- This action shall detach the remote media from the virtual media. At the completion of the operation, inserted shall be set to `false` and the image name shall be cleared.

Action URI: {Base URI of target resource}/Actions/VirtualMedia.EjectMedia

Action parameters

This action takes no parameters.

6.124.4.2 InsertMedia *(v1.2+)*

Description

This action attaches remote media to virtual media.

- This action shall attach remote media to virtual media.

Action URI: {Base URI of target resource}/Actions/VirtualMedia.InsertMedia

Action parameters

Parameter Name	Type	Attributes	Notes
Image	string	*required*	The URI of the media to attach to the virtual media. • This parameter shall contain the URI of the media to be attached to the virtual media. This parameter may specify an absolute URI to remote media or a relative URI to media local to the implementation. A service may allow a relative URI to reference a SoftwareInventory resource.
Inserted	boolean	*optional*	An indication of whether the image is treated as inserted upon completion of the action. The default is `true`. • This parameter shall contain whether the image is treated as inserted upon completion of the action. If the client does not provide this parameter, the service shall default this value to `true`.
Password *(v1.3+)*	string	*optional*	The password to access the URI specified by the Image parameter. • This parameter shall contain the password to access the URI specified by the Image parameter.
TransferMethod *(v1.3+)*	string (enum)	*optional*	The transfer method to use with the image. • This parameter shall contain the transfer method to use with the specified image URI. *For the possible property values, see TransferMethod in Property details.*

Parameter Name	Type	Attributes	Notes
TransferProtocolType *(v1.3+)*	string (enum)	*optional*	The network protocol to use with the image. • This parameter shall contain the network protocol to use with the specified image URI. *For the possible property values, see TransferProtocolType in Property details.*
UserName *(v1.3+)*	string	*optional*	The username to access the URI specified by the Image parameter. • This parameter shall contain the username to access the URI specified by the Image parameter.
WriteProtected	boolean	*optional*	An indication of whether the remote media is treated as write-protected. The default is `true`. • This parameter shall contain whether the remote media is treated as write-protected. If the client does not provide this parameter, the service shall default this value to `true`.

Request Example

```
{
    "Image": "https://192.168.1.225/boot_image.iso",
    "Inserted": true,
    "WriteProtected": true
}
```

6.124.5 Property details

6.124.5.1 ConnectedVia:

The current virtual media connection method.

- This property shall contain the current connection method from a client to the virtual media that this resource represents.

string	Description
Applet	Connected to a client application.
NotConnected	No current connection.
Oem	Connected through an OEM-defined method.

string	Description
URI	Connected to a URI location.

6.124.5.2 MediaTypes:

- The media types supported as virtual media.
  - This property shall contain an array of the supported media types for this connection.

string	Description
CD	A CD-ROM format (ISO) image.
DVD	A DVD-ROM format image.
Floppy	A floppy disk image.
USBStick	An emulation of a USB storage device.

6.124.5.3 TransferMethod:

The transfer method to use with the image.

- This parameter shall contain the transfer method to use with the specified image URI.

string	Description
Stream	Stream image file data from the source URI.
Upload	Upload the entire image file from the source URI to the service.

6.124.5.4 TransferProtocolType:

The network protocol to use with the image.

- This parameter shall contain the network protocol to use with the specified image URI.

string	Description
CIFS	Common Internet File System (CIFS).
FTP	File Transfer Protocol (FTP).

string	Description
HTTP	Hypertext Transfer Protocol (HTTP).
HTTPS	Hypertext Transfer Protocol Secure (HTTPS).
NFS	Network File System (NFS).
OEM	A manufacturer-defined protocol.
SCP	Secure Copy Protocol (SCP).
SFTP	Secure File Transfer Protocol (SFTP).
TFTP	Trivial File Transfer Protocol (TFTP).

6.124.6 Example response

```
{
    "@odata.type": "#VirtualMedia.v1_5_1.VirtualMedia",
    "Id": "CD1",
    "Name": "Virtual CD",
    "MediaTypes": [
        "CD",
        "DVD"
    ],
    "Image": "redfish.dmtf.org/freeImages/freeOS.1.1.iso",
    "ImageName": "mymedia-read-only",
    "ConnectedVia": "Applet",
    "Inserted": true,
    "WriteProtected": false,
    "@odata.id": "/redfish/v1/Managers/BMC/VirtualMedia/CD1"
}
```

6.125 VLanNetworkInterface 1.3.0 (deprecated)

Version	*v1.3 Deprecated*	*v1.2*	*v1.1*	*v1.0*
Release	2021.2	2020.4	2017.1	1.0

This schema has been deprecated and use in new implementations is discouraged except to retain compatibility with existing products. This schema has been deprecated in favor of using individual EthernetInterface resources to show VLAN information.

6.125.1 Description

The VLanNetworkInterface schema describes a VLAN network instance that is available on a manager, system, or other device.

- This resource contains information for a VLAN network instance that is available on a manager, system, or other device for a Redfish implementation.

6.125.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/NetworkAdapters/*{NetworkAdapterId}*/NetworkDeviceFunctions/*{NetworkDeviceFunctionId}*/Ethernet/VLANs/*{VLanNetworkInterfaceId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs/*{VLanNetworkInterfaceId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs/*{VLanNetworkInterfaceId}*
/redfish/v1/Managers/*{ManagerId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs/*{VLanNetworkInterfaceId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs/*{VLanNetworkInterfaceId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs/*{VLanNetworkInterfaceId}*
/redfish/v1/Systems/*{ComputerSystemId}*/EthernetInterfaces/*{EthernetInterfaceId}*/VLANs/*{VLanNetworkInterfaceId}*

6.125.3 Properties

Property	Type	Attributes	Notes
VLANEnable	boolean	*read-write* *required on create* *(null)*	An indication of whether this VLAN is enabled for this interface. • This property shall indicate whether this VLAN is enabled for this interface.
VLANId	integer	*read-write* *required on create* *(null)*	The ID for this VLAN. • This property shall contain the ID for this VLAN.
VLANPriority *(v1.2+)*	integer	*read-write* *(null)*	The priority for this VLAN. • This property shall contain the priority for this VLAN.

6.125.4 Example response

```
{
    "@odata.type": "#VLanNetworkInterface.v1_3_0.VLanNetworkInterface",
    "Id": "1",
    "Name": "VLAN Network Interface",
    "Description": "System NIC 1 VLAN",
    "VLANEnable": true,
    "VLANId": 101,
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/EthernetInterfaces/12446A3B0411/VLANs/1"
}
```

6.126 Volume 1.8.0

Version	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*
Release	WIP v1.2.4	WIP v1.2.3	TP v1.2.1	WIP v1.2.0	WIP v1.1.0	TP v1.0.6a	WIP v1.0.5

6.126.1 Description

Volume contains properties used to describe a volume, virtual disk, LUN, or other logical storage entity for any system.

- This resource shall be used to represent a volume, virtual disk, logical disk, LUN, or other logical storage for a Redfish implementation.

6.126.2 URIs

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Volumes/*{VolumeId}*
/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Volumes/*{VolumeId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Volumes/*{VolumeId}*
/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Volumes/*{VolumeId}*
/redfish/v1/Storage/*{StorageId}*/ConsistencyGroups/*{ConsistencyGroupId}*/Volumes/*{VolumeId}*
/redfish/v1/Storage/*{StorageId}*/FileSystems/*{FileSystemId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes/*{VolumeId}*
/redfish/v1/Storage/*{StorageId}*/StoragePools/*{StoragePoolId}*/AllocatedVolumes/*{VolumeId}*
/redfish/v1/Storage/*{StorageId}*/StoragePools/*{StoragePoolId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes/*{VolumeId}*

/redfish/v1/Storage/*{StorageId}*/Volumes/*{VolumeId}*
/redfish/v1/StorageServices/*{StorageServiceId}*/ConsistencyGroups/*{ConsistencyGroupId}*/Volumes/*{VolumeId}*
/redfish/v1/StorageServices/*{StorageServiceId}*/FileSystems/*{FileSystemId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes/*{VolumeId}*
/redfish/v1/StorageServices/*{StorageServiceId}*/StoragePools/*{StoragePoolId}*/AllocatedVolumes/*{VolumeId}*
/redfish/v1/StorageServices/*{StorageServiceId}*/StoragePools/*{StoragePoolId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes/*{VolumeId}*
/redfish/v1/StorageServices/*{StorageServiceId}*/Volumes/*{VolumeId}*
/redfish/v1/StorageServices/*{StorageServiceId}*/Volumes/*{VolumeId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes/*{ProvidingVolumeId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/ConsistencyGroups/*{ConsistencyGroupId}*/Volumes/*{VolumeId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/FileSystems/*{FileSystemId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes/*{VolumeId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StoragePools/*{StoragePoolId}*/AllocatedVolumes/*{VolumeId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/StoragePools/*{StoragePoolId}*/CapacitySources/*{CapacitySourceId}*/ProvidingVolumes/*{VolumeId}*
/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Volumes/*{VolumeId}*

6.126.3 Properties

Property	Type	Attributes	Notes
AccessCapabilities *(v1.1+)* [ ]	array (string (enum))	*read-write (null)*	Values of StorageAccessCapability describe abilities to read or write storage. • Supported IO access capabilities. ◦ Each entry shall specify a current storage access capability. *For the possible property values, see AccessCapabilities in Property details.*
AllocatedPools *(v1.1+)* {}	object		An array of references to StoragePools allocated from this Volume. • The value of this property shall contain references to all storage pools allocated from this volume.
BlockSizeBytes	integer (bytes)	*read-only (null)*	The size of the smallest addressable unit (Block) of this volume in bytes. • This property shall contain size of the smallest addressable unit of the associated volume.

Property	Type	Attributes	Notes
Capacity *(v1.1+)* {}	object		Capacity utilization. • Information about the utilization of capacity allocated to this storage volume. For property details, see Capacity v1.0.0).
CapacityBytes	integer (bytes)	*read-write (null)*	The size in bytes of this Volume. • This property shall contain the size in bytes of the associated volume.
CapacitySources *(v1.1+)* [{	array		An array of space allocations to this volume. • Fully or partially consumed storage from a source resource. Each entry provides capacity allocation information from a named source resource.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Compressed *(v1.4+)*	boolean	*read-write (null)*	Indicator of whether or not the Volume has compression enabled. • This property shall contain a boolean indicator if the Volume is currently utilizing compression or not.
Deduplicated *(v1.4+)*	boolean	*read-write (null)*	Indicator of whether or not the Volume has deduplication enabled. • This property shall contain a boolean indicator if the Volume is currently utilizing deduplication or not.
DisplayName *(v1.4+)*	string	*read-write (null)*	A user-configurable string to name the volume. • This property shall contain a user-configurable string to name the volume.
Encrypted	boolean	*read-write (null)*	Is this Volume encrypted. • This property shall contain a boolean indicator if the Volume is currently utilizing encryption or not.

Property	Type	Attributes	Notes
EncryptionTypes [ ]	array (string (enum))	*read-write*	• The types of encryption used by this Volume. ◦ This property shall contain the types of encryption used by this Volume. *For the possible property values, see EncryptionTypes in Property details.*
Identifiers [{ }]	array (object)		Any additional identifiers for a resource. • The Durable names for the volume. ◦ This property shall contain a list of all known durable names for the associated volume. For property details, see Identifier.
InitializeMethod *(v1.6+)*	string (enum)	*read-only (null)*	Indicates the Initialization Method used for this volume. If InitializeMethod is not specified, the InitializeMethod should be Foreground. • This property shall indicate the initialization method used for this volume. If InitializeMethod is not specified, the InitializeMethod should be Foreground. This value reflects the most recently used Initialization Method, and may be changed using the Initialize Action. *For the possible property values, see InitializeMethod in Property details.*
IOPerfModeEnabled *(v1.5+)*	boolean	*read-write (null)*	Indicates the IO performance mode setting for the volume. • This property shall indicate whether IO performance mode is enabled for the volume.
IOStatistics *(v1.2+)* {}	object		Statistics for this volume. • The value shall represent IO statistics for this volume. For property details, see IOStatistics v1.0.4).
IsBootCapable *(v1.7+)*	boolean	*read-write (null)*	This property indicates whether or not the Volume contains a boot image and is capable of booting. • This property shall indicate whether or not the Volume contains a boot image and is capable of booting. This property may be settable by an admin or client with visibility into the contents of the volume. This property should only be set to true when VolumeUsage is either not specified, or when VolumeUsage is set to Data or SystemData.

Property	Type	Attributes	Notes
Links {	object		Contains references to other resources that are related to this resource. • The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource.
CacheDataVolumes *(v1.6+)* [{	array		A pointer to the data volumes this volume serves as a cache volume. • This shall be a pointer to the cache data volumes this volume serves as a cache volume. The corresponding VolumeUsage property shall be set to CacheOnly when this property is used.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
CacheVolumeSource *(v1.6+)* {}	object	*(null)*	A pointer to the cache volume source for this volume. • This shall be a pointer to the cache volume source for this volume. The corresponding VolumeUsage property shall be set to Data when this property is used.
ClassOfService *(v1.1+)* {}	object		The ClassOfService that this storage volume conforms to. • This property shall contain a reference to the ClassOfService that this storage volume conforms to.
ClientEndpoints *(v1.4+)* [{	array		An array of references to the client Endpoints associated with this volume. • The value of this property shall be references to the client Endpoints this volume is associated with.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			

Property	Type	Attributes	Notes
ConsistencyGroups *(v1.4+)* [{	array		An array of references to the ConsistencyGroups associated with this volume. • The value of this property shall be references to the ConsistencyGroups this volume is associated with.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
DedicatedSpareDrives *(v1.2+)* [{	array		An array of references to the drives which are dedicated spares for this volume. • The value of this property shall be a reference to the resources that this volume is associated with and shall reference resources of type Drive. This property shall only contain references to Drive entities which are currently assigned as a dedicated spare and are able to support this Volume.
@odata.id	string	*read-write*	Link to a Drive resource. See the Links section and the *Drive* schema for details.
}]			
Drives [{	array		An array of references to the drives which contain this volume. This will reference Drives that either wholly or only partly contain this volume. • The value of this property shall be a reference to the resources that this volume is associated with and shall reference resources of type Drive. This property shall only contain references to Drive entities which are currently members of the Volume, not hot spare Drives which are not currently a member of the volume.
@odata.id	string	*read-only*	Link to a Drive resource. See the Links section and the *Drive* schema for details.
}]			

Property	Type	Attributes	Notes
JournalingMedia *(v1.5+)* {}	object	*(null)*	A pointer to the Resource that serves as a journaling media for this volume. • This shall be a pointer to the journaling media used for this Volume to address the write hole issue. Valid when WriteHoleProtectionPolicy property is set to 'Journaling'.
Oem {}	object		See the OEM object definition in the Using this guide clause.
OwningStorageResource *(v1.5+)* {	object		A pointer to the Storage resource that owns or contains this volume. • This shall be a pointer to the Storage resource that owns or contains this volume. See the *Storage* schema for details on this property.
@odata.id	string	*read-only*	Link to a Storage resource. See the Links section and the *Storage* schema for details.
}			
OwningStorageService *(v1.4+)* {}	object		A pointer to the StorageService that owns or contains this volume. • This shall be a pointer to the StorageService that owns or contains this volume.
ServerEndpoints *(v1.4+)* [{	array		An array of references to the server Endpoints associated with this volume. • The value of this property shall be references to the server Endpoints this volume is associated with.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}]			
SpareResourceSets *(v1.3+)* [{	array		An array of references to SpareResourceSets. • Each referenced SpareResourceSet shall contain resources that may be utilized to replace the capacity provided by a failed resource having a compatible type.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

Property	Type	Attributes	Notes
}]			
StorageGroups *(v1.4+)* [{	array		An array of references to the StorageGroups associated with this volume. • The value of this property shall be references to the StorageGroups this volume is associated with.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
}			
LogicalUnitNumber *(v1.4+)*	integer	*read-only (null)*	Indicates the host-visible LogicalUnitNumber assigned to this Volume. • This property shall contain host-visible LogicalUnitNumber assigned to this Volume. This property shall only be used when in a single connect configuration and no StorageGroup configuration is used.
LowSpaceWarningThresholdPercents *(v1.1+)* [ ]	array (%) (integer, null)	*read-write*	Low space warning. • Each time the following value is less than one of the values in the array the LOW_SPACE_THRESHOLD_WARNING event shall be triggered: Across all CapacitySources entries, percent = (SUM(AllocatedBytes) - SUM(ConsumedBytes))/SUM(AllocatedBytes).
Manufacturer *(v1.1+)*	string	*read-only (null)*	The manufacturer or OEM of this storage volume. • This property shall contain a value that represents the manufacturer or implementer of the storage volume.
MaxBlockSizeBytes *(v1.1+)*	integer (bytes)	*read-only (null)*	Max Block size in bytes. • This property shall contain size of the largest addressable unit of this storage volume.

Property	Type	Attributes	Notes
MediaSpanCount *(v1.4+)*	integer	*read-only (null)*	Indicates the number of media elements used per span in the secondary RAID for a hierarchical RAID type. • This property shall indicate the number of media elements used per span in the secondary RAID for a hierarchical RAID type.
Model *(v1.1+)*	string	*read-only (null)*	The model number for this storage volume. • The value is assigned by the manufacturer and shall represents a specific storage volume implementation.
NVMeNamespaceProperties *(v1.5+)* {	object	*(null)*	This property contains properties to use when Volume is used to describe an NVMe Namespace. • This property shall contain properties to use when Volume is used to describe an NVMe Namespace.
FormattedLBASize *(v1.5+)*	string	*read-only (null)*	The LBA data size and metadata size combination that the namespace has been formatted with. • This property shall contain the LBA data size and metadata size combination that the namespace has been formatted with. This is a 4-bit data structure.
IsShareable *(v1.5+)*	boolean	*read-write (null)*	Indicates the namespace is shareable. • This property shall indicate whether the namespace is shareable.
LBAFormatsSupported *(v1.8+)* [ ]	array (string (enum))	*read-only (null)*	LBAFormatType is defined in the NVMe specification set. This field indicates the LBA data size supported; implementations may report up to 16 values. For more details refer to the appropriate NVMe specification. • A list of the LBA format types supported for the namespace, or potential namespaces. ◦ This shall be a list of the LBA formats supported for the namespace, or potential namespaces. *For the possible property values, see LBAFormatsSupported in Property details.*
MetadataTransferredAtEndOfDataLBA *(v1.5+)*	boolean	*read-only (null)*	This property indicates whether or not the metadata is transferred at the end of the LBA creating an extended data LBA. • This property shall indicate whether or not the metadata is transferred at the end of the LBA creating an extended data LBA.

Property	Type	Attributes	Notes
NamespaceFeatures *(v1.5+)* {	object	*(null)*	This property contains a set of Namespace Features. • This property shall contain a set of Namespace Features.
SupportsAtomicTransactionSize *(v1.5+)*	boolean	*read-only (null)*	Indicates that the NVM fields for Namespace preferred write granularity (NPWG), write alignment (NPWA), deallocate granularity (NPDG), deallocate alignment (NPDA) and optimal write size (NOWS) are defined for this namespace and should be used by the host for I/O optimization. • This property shall indicate whether or not the NVM fields for Namespace preferred write granularity (NPWG), write alignment (NPWA), deallocate granularity (NPDG), deallocate alignment (NPDA) and optimal write size (NOWS) are defined for this namespace and should be used by the host for I/O optimization.
SupportsDeallocatedOrUnwrittenLBError *(v1.5+)*	boolean	*read-only (null)*	This property indicates that the controller supports deallocated or unwritten logical block error for this namespace. • This property shall indicate that the controller supports deallocated or unwritten logical block error for this namespace.
SupportsIOPerformanceHints *(v1.5+)*	boolean	*read-only (null)*	Indicates that the Namespace Atomic Write Unit Normal (NAWUN), Namespace Atomic Write Unit Power Fail (NAWUPF), and Namespace Atomic Compare and Write Unit (NACWU) fields are defined for this namespace and should be used by the host for this namespace instead of the controller-level properties AWUN, AWUPF, and ACWU. • This property shall indicate that the Namespace Atomic Write Unit Normal (NAWUN), Namespace Atomic Write Unit Power Fail (NAWUPF), and Namespace Atomic Compare and Write Unit (NACWU) fields are defined for this namespace and should be used by the host for this namespace instead of the controller-level properties AWUN, AWUPF, and ACWU.
SupportsNGUIDReuse *(v1.5+)*	boolean	*read-only (null)*	This property indicates that the namespace supports the use of an NGUID (namespace globally unique identifier) value. • This property shall indicate that the namespace supports the use of an NGUID (namespace globally unique identifier) value.

Property	Type	Attributes	Notes
SupportsThinProvisioning *(v1.5+)*	boolean	*read-only (null)*	This property indicates whether or not the NVMe Namespace supports thin provisioning. • This property shall indicate whether or not the NVMe Namespace supports thin provisioning. Specifically, the namespace capacity reported may be less than the namespace size.
}			
NamespaceId *(v1.5+)*	string	*read-only (null)*	The NVMe Namespace Identifier for this namespace. • This property shall contain the NVMe Namespace Identifier for this namespace. This property shall be a hex value. Namespace identifiers are not durable and do not have meaning outside the scope of the NVMe subsystem. NSID 0x0, 0xFFFFFFFF, 0xFFFFFFFE are special purpose values. Pattern: `^0[xX](([a-fA-F]|[0-9])*)$`
NumberLBAFormats *(v1.5+)*	integer (bytes)	*read-only (null)*	The number of LBA data size and metadata size combinations supported by this namespace. The value of this property is between 0 and 16. • This property shall contain the number of LBA data size and metadata size combinations supported by this namespace. The value of this property is between 0 and 16. LBA formats with an index set beyond this value will not be supported.
NVMeVersion *(v1.5+)*	string	*read-only (null)*	The version of the NVMe Base Specification supported. • This property shall contain the version of the NVMe Base Specification supported.
}			
Operations [{	array		The operations currently running on the Volume. • This property shall contain a list of all currently running on the Volume.
AssociatedFeaturesRegistry {}	object		A reference to the task associated with the operation if any. • This resource shall be used to represent a Feature registry for a Redfish implementation.
OperationName	string	*read-only (null)*	The name of the operation.

Property	Type	Attributes	Notes
PercentageComplete	integer	*read-only (null)*	The percentage of the operation that has been completed.
}]			
OptimumIOSizeBytes	integer (bytes)	*read-only (null)*	The size in bytes of this Volume's optimum IO size. • This property shall contain the optimum IO size to use when performing IO on this volume. For logical disks, this is the stripe size. For physical disks, this describes the physical sector size.
ProvisioningPolicy *(v1.4+)*	string (enum)	*read-write (null)*	This property specifies the volume's storage allocation, or provisioning policy. • This property shall specify the volume's supported storage allocation policy. *For the possible property values, see ProvisioningPolicy in Property details.*
RAIDType *(v1.3.1+)*	string (enum)	*read-only (null)*	The RAID type of this volume. • This property shall contain the RAID type of the associated Volume. *For the possible property values, see RAIDType in Property details.*
ReadCachePolicy *(v1.4+)*	string (enum)	*read-write (null)*	Indicates the read cache policy setting for the Volume. • This property shall contain a boolean indicator of the read cache policy for the Volume. *For the possible property values, see ReadCachePolicy in Property details.*
RecoverableCapacitySourceCount *(v1.3+)*	integer	*read-write (null)*	Current number of capacity source resources that are available as replacements. • The value is the number of available capacity source resources currently available in the event that an equivalent capacity source resource fails.
RemainingCapacityPercent *(v1.2+)*	integer	*read-only (null)*	The percentage of the capacity remaining in the Volume. • If present, this value shall return {[(SUM(AllocatedBytes) - SUM(ConsumedBytes)]/SUM(AllocatedBytes)}*100 represented as an integer value.

Property	Type	Attributes	Notes
ReplicaInfo *(v1.1+)* {}	object		Describes this storage volume in its role as a target replica. • This property shall describe the replica relationship between this storage volume and a corresponding source volume. For property details, see ReplicaInfo v1.3.0).
ReplicaTargets *(v1.3+)* [{	array		The resources that are target replicas of this source. • The value shall reference the target replicas that are sourced by this replica.
@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
}]			
Status {}	object		The property contains the status of the Volume. • The property shall contain the status of the Volume. For property details, see Status.
StorageGroups *(v1.1+)* {}	object		An array of references to Storage Groups that includes this volume. • The value of this property shall contain references to all storage groups that include this volume.
StripSizeBytes *(v1.4+)*	integer (bytes)	*read-write (null)*	The number of blocks (bytes) in a strip in a disk array that uses striped data mapping. • The number of consecutively addressed virtual disk blocks (bytes) mapped to consecutively addressed blocks on a single member extent of a disk array. Synonym for stripe depth and chunk size.
VolumeType	string (enum)	*read-only (null)*	The type of this volume. • This property shall contain the type of the associated Volume. *For the possible property values, see VolumeType in Property details.*

Property	Type	Attributes	Notes
VolumeUsage *(v1.4+)*	string (enum)	*read-only (null)*	Indicates the Volume usage type setting for the Volume. • This property shall contain the volume usage type for the Volume. *For the possible property values, see VolumeUsage in Property details.*
WriteCachePolicy *(v1.4+)*	string (enum)	*read-write (null)*	Indicates the write cache policy setting for the Volume. • This property shall contain a boolean indicator of the write cache policy for the Volume. *For the possible property values, see WriteCachePolicy in Property details.*
WriteCacheState *(v1.4+)*	string (enum)	*read-only (null)*	Indicates the WriteCacheState policy setting for the Volume. • This property shall contain the WriteCacheState policy setting for the Volume. *For the possible property values, see WriteCacheState in Property details.*
WriteHoleProtectionPolicy *(v1.4+)*	string (enum)	*read-write*	The policy that the RAID volume is using to address the write hole issue. • This property specifies the policy that is enabled to address the write hole issue on the RAID volume. If no policy is enabled at the moment, this property shall be set to 'Off'. *For the possible property values, see WriteHoleProtectionPolicy in Property details.*

6.126.4 Actions

6.126.4.1 AssignReplicaTarget *(v1.4+)*

Description

This action is used to establish a replication relationship by assigning an existing volume to serve as a target replica for an existing source volume.

- This action shall be used to establish a replication relationship by assigning an existing volume to serve as a target replica for an existing source volume.

Action URI: {Base URI of target resource}/Actions/Volume.AssignReplicaTarget

Action parameters

Parameter Name	Type	Attributes	Notes
ReplicaType	string (enum)	*required*	The type of replica relationship to be created. • This parameter shall contain the type of replica relationship to be created (e.g., Clone, Mirror, Snap). *For the possible property values, see ReplicaType in Property details.*
ReplicaUpdateMode	string (enum)	*required*	The replica update mode (synchronous vs asynchronous). • This parameter shall specify the replica update mode. *For the possible property values, see ReplicaUpdateMode in Property details.*
TargetVolume	string	*required*	The Uri to the existing target volume. • This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
    "ReplicaUpdateMode": "Synchronous",
    "TargetVolume": "/redfish/v1/Storage/1/ConsistencyGroup/CG_DB2",
    "ReplicaType": "Mirror"
}
```

6.126.4.2 ChangeRAIDLayout *(v1.5+)*

Description

Request system change the RAID layout of the volume.

- This action shall request the system to change the RAID layout of the volume. Depending on the combination of the submitted parameters, this could be changing the RAID type, changing the span count, changing the number of drives used by the volume, or another configuration change supported by the system. Note that usage of this action while online may potentially cause data loss if the available capacity is reduced.

Action URI: {Base URI of target resource}/Actions/Volume.ChangeRAIDLayout

Action parameters

Parameter Name	Type	Attributes	Notes
Drives [{	array	*optional*	An array of the drives to be used by the volume. • This parameter shall contain an array of the drives to be used by the volume.
@odata.id	string	*read-only*	Link to a Drive resource. See the Links section and the *Drive* schema for details.
}]			
MediaSpanCount	integer	*optional*	The requested number of media elements used per span in the secondary RAID for a hierarchical RAID type. • This parameter shall contain the requested number of media elements used per span in the secondary RAID for a hierarchical RAID type.
RAIDType	string (enum)	*optional*	The requested RAID type for the volume. • This parameter shall contain the requested RAID type for the volume. *For the possible property values, see RAIDType in Property details.*
StripSizeBytes	integer	*optional*	The number of blocks (bytes) requested for new strip size. • This parameter shall contain the number of blocks (bytes) requested for the strip size.

Request Example

```
{
    "Drives": [
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Drives/Bay1A"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Drives/Bay2A"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Drives/Bay3B"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1U/Drives/Bay4B"
        }
    ],
    "RAIDType": "RAID6"
}
```

6.126.4.3 CheckConsistency

Description

This action is used to force a check of the Volume's parity or redundant data to ensure it matches calculated values.

- This defines the name of the custom action supported on this resource.

Action URI: {Base URI of target resource}/Actions/Volume.CheckConsistency

Action parameters

This action takes no parameters.

6.126.4.4 CreateReplicaTarget *(v1.4+)*

Description

This action is used to create a new volume resource to provide expanded data protection through a replica relationship with the specified source volume.

- This action shall be used to create a new volume resource to provide expanded data protection through a replica relationship with the specified source volume.

Action URI: {Base URI of target resource}/Actions/Volume.CreateReplicaTarget

Action parameters

Parameter Name	Type	Attributes	Notes
ReplicaType	string (enum)	*required*	The type of replica relationship to be created. • This parameter shall contain the type of replica relationship to be created (e.g., Clone, Mirror, Snap). *For the possible property values, see ReplicaType in Property details.*
ReplicaUpdateMode	string (enum)	*required*	The replica update mode (synchronous vs asynchronous). • This parameter shall specify the replica update mode. *For the possible property values, see ReplicaUpdateMode in Property details.*
TargetStoragePool	string	*required*	The Uri to the existing target Storage Pool. • This parameter shall contain the Uri to the existing StoragePool in which to create the target volume.

Parameter Name	Type	Attributes	Notes
VolumeName	string	*optional*	The Name for the new target volume. • This parameter shall contain the Name for the target volume.

Request Example

```
{
    "VolumeName": "Mirror of Volume 65",
    "ReplicaUpdateMode": "Synchronous",
    "TargetStoragePool": "/redfish/v1/Storage/1/StoragePools/PrimaryPool",
    "ReplicaType": "Mirror"
}
```

6.126.4.5 ForceEnable *(v1.5+)*

Description

Request system force the volume to an enabled state regardless of data loss.

- This action shall request the system to force the volume to enabled state regardless of data loss scenarios.

Action URI: {Base URI of target resource}/Actions/Volume.ForceEnable

Action parameters

This action takes no parameters.

6.126.4.6 Initialize *(v1.5+)*

Description

This action is used to prepare the contents of the volume for use by the system. If InitializeMethod is not specified in the request body, but the property InitializeMethod is specified, the property InitializeMethod value should be used. If neither is specified, the InitializeMethod should be Foreground.

- This defines the name of the custom action supported on this resource. If InitializeMethod is not specified in the request body, but the property InitializeMethod is specified, the property InitializeMethod value should be used. If neither is specified, the InitializeMethod should be Foreground.

Action URI: {Base URI of target resource}/Actions/Volume.Initialize

Action parameters

Parameter Name	Type	Attributes	Notes
InitializeMethod	string (enum)	*optional*	The type of initialization to be performed. • This defines the property name for the action. *For the possible property values, see InitializeMethod in Property details.*
InitializeType	string (enum)	*optional*	The type of initialization to be performed. • This defines the property name for the action. *For the possible property values, see InitializeType in Property details.*

Request Example

```
{
    "InitializeMethod": "Background",
    "InitializeType": "Fast"
}
```

6.126.4.7 RemoveReplicaRelationship *(v1.4+)*

Description

This action is used to disable data synchronization between a source and target volume, remove the replication relationship, and optionally delete the target volume.

- This action shall be used to disable data synchronization between a source and target volume, remove the replication relationship, and optionally delete the target volume.

Action URI: {Base URI of target resource}/Actions/Volume.RemoveReplicaRelationship

Action parameters

Parameter Name	Type	Attributes	Notes
DeleteTargetVolume	boolean	*optional*	Indicate whether or not to delete the target volume as part of the operation. • This parameter shall indicate whether or not to delete the target volume as part of the operation. If not defined, the system should use its default behavior.

Parameter Name	Type	Attributes	Notes
TargetVolume	string	*required*	The Uri to the existing target volume. • This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
    "TargetVolume": "/redfish/v1/Storage/1/StoragePools/PrimaryPool/AllocatedVolumes/650973452245",
    "DeleteTargetVolume": "false"
}
```

6.126.4.8 ResumeReplication *(v1.4+)*

Description

This action is used to resume the active data synchronization between a source and target volume, without otherwise altering the replication relationship.

- This action shall be used to resume the active data synchronization between a source and target volume, without otherwise altering the replication relationship.

Action URI: {Base URI of target resource}/Actions/Volume.ResumeReplication

Action parameters

Parameter Name	Type	Attributes	Notes
TargetVolume	string	*required*	The Uri to the existing target volume. • This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
    "TargetVolume": "/redfish/v1/Storage/1/StoragePools/PrimaryPool/AllocatedVolumes/650973452245"
}
```

6.126.4.9 ReverseReplicationRelationship *(v1.4+)*

Description

This action is used to reverse the replication relationship between a source and target volume.

- This action shall be used to reverse the replication relationship between a source and target volume.

Action URI: {Base URI of target resource}/Actions/Volume.ReverseReplicationRelationship

Action parameters

Parameter Name	Type	Attributes	Notes
TargetVolume	string	*required*	The Uri to the existing target volume. • This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
    "TargetVolume": "/redfish/v1/Storage/1/StoragePools/PrimaryPool/AllocatedVolumes/650973452245"
}
```

6.126.4.10 SplitReplication *(v1.4+)*

Description

This action is used to split the replication relationship and suspend data synchronization between a source and target volume.

- This action shall be used to split the replication relationship and suspend data synchronization between a source and target volume.

Action URI: {Base URI of target resource}/Actions/Volume.SplitReplication

Action parameters

Parameter Name	Type	Attributes	Notes
TargetVolume	string	*required*	The Uri to the existing target volume. • This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
    "TargetVolume": "/redfish/v1/Storage/1/StoragePools/PrimaryPool/AllocatedVolumes/650973452245"
}
```

6.126.4.11 SuspendReplication *(v1.4+)*

Description

This action is used to suspend active data synchronization between a source and target volume, without otherwise altering the replication relationship.

- This action shall be used to suspend active data synchronization between a source and target volume, without otherwise altering the replication relationship.

Action URI: {Base URI of target resource}/Actions/Volume.SuspendReplication

Action parameters

Parameter Name	Type	Attributes	Notes
TargetVolume	string	*required*	The Uri to the existing target volume. • This parameter shall contain the Uri to the existing target volume.

Request Example

```
{
    "TargetVolume": "/redfish/v1/Storage/1/StoragePools/PrimaryPool/AllocatedVolumes/650973452245"
}
```

6.126.5 Property details

6.126.5.1 AccessCapabilities:

Values of StorageAccessCapability describe abilities to read or write storage.

- Supported IO access capabilities.
  - Each entry shall specify a current storage access capability.

string	Description
Append	AppendOnly. • This enumeration literal shall indicate that the storage may be written only to append.
Execute	Execute access is allowed by the file share. • This value shall indicate that Execute access is allowed by the file share.
Read	Read. • This enumeration literal shall indicate that the storage may be read.
Streaming	Streaming. • This enumeration literal shall indicate that the storage may be read sequentially.
Write	Write Many. • This enumeration literal shall indicate that the storage may be written multiple times.
WriteOnce	WriteOnce. • This enumeration literal shall indicate that the storage may be written only once.

6.126.5.2 EncryptionTypes:

- The types of encryption used by this Volume.
  - This property shall contain the types of encryption used by this Volume.

string	Description
ControllerAssisted	The volume is being encrypted by the storage controller entity.
NativeDriveEncryption	The volume is utilizing the native drive encryption capabilities of the drive hardware.

string	Description
SoftwareAssisted	The volume is being encrypted by software running on the system or the operating system.

6.126.5.3 idRef:

@odata.id	string (URI)	*read-only*	The unique identifier for a resource. • The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.

6.126.5.4 InitializeMethod:

The type of initialization to be performed.

- This defines the property name for the action.

string	Description
Background	The volume will be available for use immediately, with data erasure and preparation to happen as background tasks.
Foreground	Data erasure and preparation tasks will complete before the volume is presented as available for use.
Skip	The volume will be available for use immediately, with no preparation.

6.126.5.5 InitializeType:

The type of initialization to be performed.

- This defines the property name for the action.

string	Description
Fast	The volume is prepared for use quickly, typically by erasing just the beginning and end of the space so that partitioning can be performed.
Slow	The volume is prepared for use slowly, typically by completely erasing the volume.

6.126.5.6 LBAFormatsSupported:

LBAFormatType is defined in the NVMe specification set. This field indicates the LBA data size supported; implementations may report up to 16 values. For more details refer to the appropriate NVMe specification.

- A list of the LBA format types supported for the namespace, or potential namespaces.
  - This shall be a list of the LBA formats supported for the namespace, or potential namespaces.

string	Description
LBAFormat0	LBAFormat0 is a required type. Indicates the LBA data size supported.
LBAFormat1	Indicates the LBA data size if supported.
LBAFormat10	Indicates the LBA data size supported if supported.
LBAFormat11	Indicates the LBA data size supported if supported.
LBAFormat12	Indicates the LBA data size supported if supported.
LBAFormat13	Indicates the LBA data size supported if supported.
LBAFormat14	Indicates the LBA data size supported if supported.
LBAFormat15	Indicates the LBA data size supported if supported.
LBAFormat2	Indicates the LBA data size supported if supported.
LBAFormat3	Indicates the LBA data size supported if supported.
LBAFormat4	Indicates the LBA data size supported if supported.
LBAFormat5	Indicates the LBA data size supported if supported.
LBAFormat6	Indicates the LBA data size supported if supported.
LBAFormat7	Indicates the LBA data size supported if supported.
LBAFormat8	Indicates the LBA data size supported if supported.
LBAFormat9	Indicates the LBA data size supported if supported.

6.126.5.7 ProvisioningPolicy:

This property specifies the volume's storage allocation, or provisioning policy.

- This property shall specify the volume's supported storage allocation policy.

string	Description
Fixed	Storage is fully allocated. • This enumeration literal specifies storage shall be fully allocated.
Thin	Storage may be over allocated. • This enumeration literal specifies storage may be over allocated.

6.126.5.8 RAIDType:

The requested RAID type for the volume.

- This parameter shall contain the requested RAID type for the volume.

string	Description
None	A placement policy with no redundancy at the device level.
RAID0	A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. • A placement policy where consecutive logical blocks of data are uniformly distributed across a set of independent storage devices without offering any form of redundancy. This is commonly referred to as data striping. This form of RAID will encounter data loss with the failure of any storage device in the set.
RAID00	A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. • A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets. This is commonly referred to as RAID 0+0. This form of data layout is not fault tolerant; if any storage device fails there will be data loss.
RAID01	A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). • A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0). This is commonly referred to as RAID 0+1 or RAID 0/1. Data stored using this form of RAID is able to survive a single RAID 0 data set failure without data loss.
RAID1	A placement policy where each logical block of data is stored on more than one independent storage device. • A placement policy where each logical block of data is stored on more than one independent storage device. This is commonly referred to as mirroring. Data stored using this form of RAID is able to survive a single storage device failure without data loss.

string	Description
RAID10	A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). • A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1). This is commonly referred to as RAID 1/0. Data stored using this form of RAID is able to survive storage device failures in each RAID 1 set without data loss.
RAID10E	A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. • A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets. This is commonly referred to as Enhanced RAID 10. Data stored using this form of RAID is able to survive a single device failure within each nested RAID 1 set without data loss.
RAID10Triple	A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). • A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple). This form of RAID can survive up to two failures in each triple mirror set without data loss.
RAID1E	A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. • A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices. This is commonly referred to as RAID 1 Enhanced. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID1Triple	A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. • A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices. This is commonly referred to as three-way mirroring. This form of RAID can survive two device failures without data loss.
RAID3	A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. • A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss. If the storage devices use rotating media, they are assumed to be rotationally synchronized, and the data stripe size should be no larger than the exported block size.

string	Description
RAID4	A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. • A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID5	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. • A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive a single storage device failure without data loss.
RAID50	A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. • A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices. Data stored using this form of RAID is able to survive a single storage device failure within each RAID 5 set without data loss.
RAID6	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. • A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices. Data stored using this form of RAID is able to survive any two independent storage device failures without data loss.
RAID60	A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. • A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices. Data stored using this form of RAID is able to survive two device failures within each RAID 6 set without data loss.

string	Description
RAID6TP	A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. • A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity and data blocks are interleaved across the storage devices. This is commonly referred to as Triple Parity RAID. Data stored using this form of RAID is able to survive any three independent storage device failures without data loss.

6.126.5.9 ReadCachePolicy:

Indicates the read cache policy setting for the Volume.

- This property shall contain a boolean indicator of the read cache policy for the Volume.

string	Description
AdaptiveReadAhead	A caching technique in which the controller dynamically determines whether to pre-fetch data anticipating future read requests, based on previous cache hit ratio.
Off	The read cache is disabled.
ReadAhead	A caching technique in which the controller pre-fetches data anticipating future read requests.

6.126.5.10 ReplicaType:

The type of replica relationship to be created.

- This parameter shall contain the type of replica relationship to be created (e.g., Clone, Mirror, Snap).

string	Description
Clone	Create a point in time, full copy the source. • This enumeration literal shall indicate that replication shall create a point in time, full copy the source.
Mirror	Create and maintain a copy of the source. • This enumeration literal shall indicate that replication shall create and maintain a copy of the source.

string	Description
Snapshot	Create a point in time, virtual copy of the source. • This enumeration literal shall indicate that replication shall create a point in time, virtual copy of the source.
TokenizedClone	Create a token based clone. • This enumeration literal shall indicate that replication shall create a token based clone.

6.126.5.11 ReplicaUpdateMode:

The replica update mode (synchronous vs asynchronous).

- This parameter shall specify the replica update mode.

string	Description
Active	Active-Active (i.e. bidirectional) synchronous updates. • This enumeration literal shall indicate Active-Active (i.e. bidirectional) synchronous updates.
Adaptive	Allows implementation to switch between synchronous and asynchronous modes. • This enumeration literal shall indicate that an implementation may switch between synchronous and asynchronous modes.
Asynchronous	Asynchronous updates. • This enumeration literal shall indicate Asynchronous updates.
Synchronous	Synchronous updates. • This enumeration literal shall indicate Synchronous updates.

6.126.5.12 VolumeType:

The type of this volume.

- This property shall contain the type of the associated Volume.

string	Description
Mirrored	The volume is a mirrored device.

string	Description
NonRedundant	The volume is a non-redundant storage device.
RawDevice	The volume is a raw physical device without any RAID or other virtualization applied.
SpannedMirrors	The volume is a spanned set of mirrored devices.
SpannedStripesWithParity	The volume is a spanned set of devices which uses parity to retain redundant information.
StripedWithParity	The volume is a device which uses parity to retain redundant information.

6.126.5.13 VolumeUsage:

Indicates the Volume usage type setting for the Volume.

- This property shall contain the volume usage type for the Volume.

string	Description
CacheOnly	The volume is allocated for use as a non-consumable cache only volume. • The volume shall be allocated for use as a non-consumable cache only volume.
Data	The volume is allocated for use as a consumable data volume. • The volume shall be allocated for use as a consumable data volume.
ReplicationReserve	The volume is allocated for use as a non-consumable reserved volume for replication use. • The volume shall be allocated for use as a non-consumable reserved volume for replication use.
SystemData	The volume is allocated for use as a consumable data volume reserved for system use. • The volume shall be allocated for use as a consumable data volume reserved for system use.
SystemReserve	The volume is allocated for use as a non-consumable system reserved volume. • The volume shall be allocated for use as a non-consumable system reserved volume.

6.126.5.14 WriteCachePolicy:

Indicates the write cache policy setting for the Volume.

- This property shall contain a boolean indicator of the write cache policy for the Volume.

string	Description
Off	The write cache is disabled. • Indicates that the write cache shall be disabled.
ProtectedWriteBack	A caching technique in which the completion of a write request is signaled as soon as the data is in cache, and actual writing to non-volatile media is guaranteed to occur at a later time.
UnprotectedWriteBack	A caching technique in which the completion of a write request is signaled as soon as the data is in cache; actual writing to non-volatile media is not guaranteed to occur at a later time.
WriteThrough	A caching technique in which the completion of a write request is not signaled until data is safely stored on non-volatile media.

6.126.5.15 WriteCacheState:

Indicates the WriteCacheState policy setting for the Volume.

- This property shall contain the WriteCacheState policy setting for the Volume.

string	Description
Degraded	Indicates an issue with the cache state in which the cache space is diminished or disabled due to a failure or an outside influence such as a discharged battery.
Protected	Indicates that the cache state type in use generally protects write requests on non-volatile media.
Unprotected	Indicates that the cache state type in use generally does not protect write requests on non-volatile media.

6.126.5.16 WriteHoleProtectionPolicy:

The policy that the RAID volume is using to address the write hole issue.

- This property specifies the policy that is enabled to address the write hole issue on the RAID volume. If no policy is enabled at the moment, this property shall be set to 'Off'.

string	Description
DistributedLog	The policy that distributes additional log among the volume's capacity sources to address write hole issue. • The policy that distributes additional log (e.g. checksum of the parity) among the volume's capacity sources to address write hole issue. Additional data is used to detect data corruption on the volume.

string	Description
Journaling	The policy that uses separate block device for write-ahead logging to address write hole issue. • The policy that uses separate block device for write-ahead logging to address write hole issue. All write operations on the RAID volume are first logged on dedicated journaling device that is not part of the volume.
Oem	The policy that is Oem specific. • The policy that is Oem specific. The mechanism details are unknown unless provided separately by the Oem.
Off	The volume is not using any policy to address the write hole issue. • The support for addressing the write hole issue is disabled. The volume is not performing any additional activities to close the RAID write hole.

6.126.6 Example response


```
{
    "@odata.type": "#Volume.v1_8_0.Volume",
    "Id": "2",
    "Name": "Virtual Disk 2",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Encrypted": false,
    "RAIDType": "RAID0",
    "CapacityBytes": 107374182400,
    "Identifiers": [
        {
            "DurableNameFormat": "UUID",
            "DurableName": "0324c96c-8031-4f5e-886c-50cd90aca854"
        }
    ],
    "Links": {
        "Drives": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Drives/3D58ECBC375FD9F2"
            }
        ]
    },
    "Actions": {
        "#Volume.Initialize": {
            "target": "/redfish/v1/Systems/3/Storage/RAIDIntegrated/Volumes/1/Actions/Volume.Initialize",
            "InitializeType@Redfish.AllowableValues": [
```

```
                "Fast",
                "Slow"
            ]
        }
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Volumes/2"
}
```

6.127 Zone 1.6.1

Version	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	*v1.0*
Release	2020.4	2020.3	2019.4	2019.1	2017.3	2017.1	2016.2

6.127.1 Description

The Zone schema describes a simple fabric zone for a Redfish implementation.

- This resource shall represent a simple fabric zone for a Redfish implementation.

6.127.2 URIs

/redfish/v1/CompositionService/ResourceZones/*{ZoneId}*
/redfish/v1/Fabrics/*{FabricId}*/Zones/*{ZoneId}*

6.127.3 Properties

Property	Type	Attributes	Notes
DefaultRoutingEnabled *(v1.4+)*	boolean	*read-write (null)*	This property indicates whether routing within this zone is enabled. • This property shall indicate whether routing within this zone is enabled.
ExternalAccessibility *(v1.3+)*	string (enum)	*read-write (null)*	Indicates accessibility of endpoints in this zone to endpoints outside of this zone. • This property shall contain and indication of accessibility of endpoints in this zone to endpoints outside of this zone. *For the possible property values, see ExternalAccessibility in Property details.*

Property	Type	Attributes	Notes
Identifiers *(v1.2+)* [{ }]	array (object)		Any additional identifiers for a resource. • The durable names for the zone. ◦ This property shall contain a list of all known durable names for the associated zone. For property details, see Identifier.
Links {	object		The links to other resources that are related to this resource. • This property shall contain links to resources that are related to but are not contained by, or subordinate to, this resource.
AddressPools *(v1.4+)* [{	array		An array of links to the address pools associated with this zone. • This property shall contain an array of links to resources of type AddressPool with which this zone is associated.
@odata.id	string	*read-only*	Link to a AddressPool resource. See the Links section and the *AddressPool* schema for details.
}]			
ContainedByZones *(v1.4+)* [{	array		An array of links to the zone that contain this zone. • This property shall contain an array of links to resources of type Zone that represent the zones that contain this zone. The zones referenced by this property shall not be contained by other zones.
@odata.id	string	*read-only*	Link to another Zone resource.
}]			
ContainsZones *(v1.4+)* [{	array		An array of links to the zones that are contained by this zone. • This property shall contain an array of links to resources of type Zone that represent the zones that are contained by this zone. The zones referenced by this property shall not contain other zones.
@odata.id	string	*read-write*	Link to another Zone resource.
}]			
Endpoints [{	array		The links to the endpoints that this zone contains. • This property shall contain an array of links to resources of type Endpoint that this zone contains.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.

Property	Type	Attributes	Notes
}]			
InvolvedSwitches [{	array		The links to the collection of switches in this zone. • This property shall contain an array of links to resources of type Switch in this zone.
@odata.id	string	*read-only*	Link to a Switch resource. See the Links section and the *Switch* schema for details.
}]			
Oem {}	object		See the OEM object definition in the Using this guide clause.
ResourceBlocks *(v1.1+)* [{	array		The links to the resource blocks with which this zone is associated. • This property shall contain an array of links to resources of type ResourceBlock with which this zone is associated.
@odata.id	string	*read-only*	Link to a ResourceBlock resource. See the Links section and the *ResourceBlock* schema for details.
}]			
}			
Status {}	object		The status and health of the resource and its subordinate or dependent resources. • This property shall contain any status or health properties of the resource. For property details, see Status.
ZoneType *(v1.4+)*	string (enum)	*read-write (null)*	The type of zone. • This property shall contain the type of zone that this zone represents. *For the possible property values, see ZoneType in Property details.*

6.127.4 Actions

6.127.4.1 AddEndpoint *(v1.5+)*

Description

This action adds an endpoint to a zone.

- This action shall add an endpoint to a zone.

Action URI: {Base URI of target resource}/Actions/Zone.AddEndpoint

Action parameters

Parameter Name	Type	Attributes	Notes
Endpoint {	object	*required*	The endpoint to add to the zone. • This parameter shall contain a link to the specified endpoint to add to the zone. See the *Endpoint* schema for details on this property.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}			
EndpointETag	string	*optional*	The current ETag of the endpoint to add to the zone. • This parameter shall contain the current ETag of the endpoint to add to the zone. If the client-provided ETag does not match the current ETag of the endpoint that the Endpoint parameter specifies, the service shall return the HTTP 428 (Precondition Required) status code to reject the request.
ZoneETag	string	*optional*	The current ETag of the zone. • This parameter shall contain the current ETag of the zone. If the client-provided ETag does not match the current ETag of the zone, the service shall return the HTTP 428 (Precondition Required) status code to reject the request.

Request Example

```
{
    "Endpoint": {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator1"
    },
    "EndpointETag": "W/\"19472363938\"",
    "ZoneETag": "W/\"99374369273\""
}
```

6.127.4.2 RemoveEndpoint *(v1.5+)*

Description

This action removes an endpoint from a zone.

- This action shall remove an endpoint from a zone.

Action URI: {Base URI of target resource}/Actions/Zone.RemoveEndpoint

Action parameters

Parameter Name	Type	Attributes	Notes
Endpoint {	object	*required*	The endpoint to remove from the zone. • This parameter shall contain a link to the specified endpoint to remove from the zone. See the *Endpoint* schema for details on this property.
@odata.id	string	*read-only*	Link to a Endpoint resource. See the Links section and the *Endpoint* schema for details.
}			
EndpointETag	string	*optional*	The current ETag of the endpoint to remove from the system. • This parameter shall contain the current ETag of the endpoint to remove from the system. If the client-provided ETag does not match the current ETag of the endpoint that the Endpoint parameter specifies, the service shall return the HTTP 428 (Precondition Required) status code to reject the request.
ZoneETag	string	*optional*	The current ETag of the zone. • This parameter shall contain the current ETag of the zone. If the client-provided ETag does not match the current ETag of the zone, the service shall return the HTTP 428 (Precondition Required) status code to reject the request.

Request Example

```
{
    "Endpoint": {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator1"
    },
    "EndpointETag": "W/\"19472363938\"",
    "ZoneETag": "W/\"99374369273\""
}
```

6.127.5 Property details

6.127.5.1 ExternalAccessibility:

Indicates accessibility of endpoints in this zone to endpoints outside of this zone.

- This property shall contain and indication of accessibility of endpoints in this zone to endpoints outside of this zone.

string	Description
GloballyAccessible	Any external entity with the correct access details, which may include authorization information, can access the endpoints that this zone lists. • This value shall indicate that any external entity with the correct access details, which may include authorization information, can access the endpoints that this zone lists, regardless of zone.
NoInternalRouting	Routing is not enabled within this zone. • This value shall indicate that implicit routing within this zone is not defined.
NonZonedAccessible	Any external entity that another zone does not explicitly list can access the endpoints that this zone lists. • This value shall indicate that any external entity that another zone does not explicitly list can access the endpoints that this zone lists.
ZoneOnly	Only accessible by endpoints that this zone explicitly lists. • This value shall indicate that endpoints in this zone are only accessible by endpoints that this zone explicitly lists.

6.127.5.2 ZoneType:

The type of zone.

- This property shall contain the type of zone that this zone represents.

string	Description
Default	The zone in which all endpoints are added by default when instantiated. • This value shall indicate a zone in which all endpoints are added by default when instantiated. This value shall only be used for zones subordinate to the fabric collection.
ZoneOfEndpoints	A zone that contains endpoints. • This value shall indicate a zone that contains resources of type Endpoint. This value shall only be used for zones subordinate to the fabric collection.
ZoneOfResourceBlocks *(v1.6+)*	A zone that contains resource blocks. • This value shall indicate a zone that contains resources of type ResourceBlock. This value shall only be used for zones subordinate to the composition service.

string	Description
ZoneOfZones	A zone that contains zones. • This value shall indicate a zone that contains resources of type Zone. This value shall only be used for zones subordinate to the fabric collection.

6.127.6 Example response

```
{
    "@odata.type": "#Zone.v1_6_1.Zone",
    "Id": "1",
    "Name": "SAS Zone 1",
    "Description": "SAS Zone 1",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Links": {
        "Endpoints": [
            {
                "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator1"
            },
            {
                "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator2"
            },
            {
                "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Drive1"
            },
            {
                "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Drive3"
            }
        ]
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/SAS/Zones/1"
}
```

7 Redfish documentation generator

This document was created using the Redfish Documentation Generator utility, which uses the contents of the Redfish schema files (in JSON schema format) to automatically generate the bulk of the text. The source code for the utility is available for download at the DMTF's GitHub repository located at https://www.github.com/DMTF/Redfish-Tools.

8 ANNEX A (informative) Change log

Version	Date	Description
2022.2	2022-08-04	DSP8010 version 2022.2
2022.1	2022-04-15	DSP8010 version 2022.1
2021.4	2021-12-02	DSP8010 version 2021.4
		Added Collection Capabilities section.
2021.3	2021-10-15	DSP8010 version 2021.3
2021.2	2021-08-13	DSP8010 version 2021.2
		Corrected format of UUID from RFC4122.
2021.1	2021-04-16	DSP8010 version 2021.1
		Document formatting updated for Documentation Generator v3.
2020.4	2020-12-01	DSP8010 version 2020.4
2020.3	2020-08-14	DSP8010 version 2020.3
		Corrected issue that caused read-write links to be listed as read-only.
2020.2.1	2020-07-10	Errata release to correct truncated Processor supplemental text.
2020.2	2020-05-08	DSP8010 version 2020.2
2020.1	2020-03-27	DSP8010 version 2020.1
2019.4	2019-12-06	DSP8010 version 2019.4
2019.3	2019-10-11	DSP8010 version 2019.3
2019.2	2019-09-13	DSP8010 version 2019.2
2019.1a	2019-05-03	DSP8010 version 2019.1 Work-in-progress release