

Intel® Rack Scale Design (Intel® RSD) Storage Services

API Specification
Software v2.5

July 2019

Revision 001



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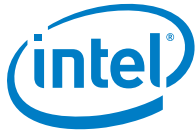


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Revision History

Revision	Description	Date
001	Initial release for Intel® RSD Storage Services software v2.5.	July 2019

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1.0 Introduction

The Intel® Rack Scale Design (Intel® RSD) Storage Services Software v2.5 API specification defines the interface to the Intel® RSD Storage Services module to support the discovery, composability, and manageability of Intel® RSD storage system. This API specification covers the functionality designed and implemented in the Intel® RSD Software v2.5.

1.1 Scope

The interface specified is based on the *Distributed Management Task Force's (DMTF) Redfish Interface Specification* (DSP0266 v1.6.1) and schema (DSP8010 v2018.3) and *Storage Networking Industry Association (SNIA) Swordfish** v1.0.7a (refer to [Table 2](#)).

1.2 Intended Audience

The intended audiences for this document include designers and engineers working with the Intel® RSD Software v2.5 release, such as:

- Independent software vendors (ISVs) of POD Management software, who make use of the storage service API to discover, compose and manage Rack Scale drawers, regardless of the hardware vendor and/or manage drawers in a multivendor environment.
- Software vendors (OxMs) who implement storage services software for hardware platforms, providing Intel® RSD-compliant systems.

1.3 Conventions

The key words/phrases "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in *Key words for use in RFCs to Indicate Requirement Levels*, March 1997, RFC 2119. Refer to [Table 2](#).

1.4 Notes and Symbol Convention

Symbol and note conventions are similar to typographical conventions used in the *Cloud Infrastructure Management Interface 6 (CIMI) Model and RESTful HTTP-based Protocol 7 An Interface for Managing Cloud Infrastructure*, DSP0263. Refer to [Table 2](#).

The notation used in JSON* serialization description:

- Manddatory values in italics indicate data types instead of literal mandatory values.
- * Characters are appended to items to indicate cardinality:
 - ? (0 or 1)
 - * (0 or more)
 - + (1 or more)
- Vertical bars, |, denote choice. For example, a|b means a choice between a and b.
- Parentheses, (), indicate the scope of the operators ?, *, +, and |.
- Ellipses, ..., indicate points of extensibility.



Note: The lack of an ellipsis does not mean no extensibility point exists; rather, it is just not explicitly called out.

1.5 Terminology

Table 1. Terminology

Term	Definition
API	Application Programming Interface
BMC	Baseboard Management Controller
CIMI	Cloud Infrastructure Management Interface
CRC	Cyclic Redundancy Check
ECC	Error-correcting Code
HTTP	Hypertext Transfer Protocol
IETF	Internet Engineering Task Force
iQN	ISCSI Qualified Name Format Defined in RFC3720 and RFC3721
ISCSI	Internet Small Computer Systems Interface. Specification Available at RFC3720 and RFC3721
ISV	Independent Software Vendor
JSON*	JavaScript* Object Notation
LBA	Logical Block Address
LUN	Logical Unit Number
NIC	Network Interface Card
NQN	NVMe Qualified Name
NVMe*	Non-Volatile Memory Express* Specification
Odata*	Open Data Protocol*
ODM	Original Design Manufacturer
OEM	Original Equipment Manufacturer
OxM	OEM and ODM
POD	Physical collection of multiple racks
PODM	POD Manager
PSME	Pooled System Management Engine
PXE	Pre-boot Execution
REST	Representational State Transfer
SKU	Stock Keeping Unit
SSDP	Simple Service Discovery Protocol
URI	Uniform Resource Identifier
UUID	Universally Unique Identifier



1.6 References and Resources

Table 2. Reference Documents and Resources

Doc ID	Title	Location
613314	Intel® Rack Scale Design (Intel® RSD) Pooled System Management Engine (PSME) User Guide Software v2.5	Note: https://www.intel.com/content/www/us/en/architecture-and-technology/rack-scale-design/rack-scale-design-resources.html
613315	Intel® Rack Scale Design (Intel® RSD) Getting Started Guide v2.5.	
613316	Intel® Rack Scale Design (Intel® RSD) POD Manager (PODM) Release Notes Software v2.5	
613317	Intel® Rack Scale Design (Intel® RSD) POD Manager (PODM) User Guide Software v2.5	
613318	Intel® Rack Scale Design (Intel® RSD) Pooled System Management (PSME) Release Notes Software v2.5	
613319	Intel® Rack Scale Design (Intel® RSD) Architecture Specification Software v2.5	
613320	Intel® Rack Scale Design (Intel® RSD) Pod Manager (PODM) Representational State Transfer (REST) API Specification Software v2.5	
613321	Intel® Rack Scale Design (Intel® RSD) Rack Management Module (RMM) Representational State Transfer (REST) API Specification Software v2.5	
613324	Intel® Rack Scale Design (Intel® RSD) Generic Assets Management Interface (GAMI) API Specification v2.5	
613325	Intel® Rack Scale Design (Intel® RSD) Pooled System Management Engine (PSME) REST API Specification Software v2.5	
613326	Intel® Rack Scale Design (Intel® RSD) Conformance Test Suite (CTS) Release Notes	See Note
608298	Field Programmable Gate Array (FPGA) over Fabric Protocol Architecture Specification	https://cdrdv2.intel.com/v1/dl/getContent/608298
596167	Intel® Rack Scale Design (Intel® RSD) for Cascade Lake Platform Firmware Extension Specification	https://cdrdv2.intel.com/v1/dl/getContent/596167
DSP0263	Cloud Infrastructure Management Interface (CIMI) Model and RESTful HTTP-based Protocol specification	https://www.dmtf.org/sites/default/files/standards/documents/DSP0263_1.0.1.pdf
DSP0266	Redfish Scalable Platforms Management API Specification v1.6.1	https://www.dmtf.org/sites/default/files/standards/documents/DSP0266_1.6.1.pdf
DSP8010	Redfish API Schema bundle v2018.3	https://www.dmtf.org/sites/default/files/standards/documents/DSP8010_2018.3.zip
RFC114	A File Transfer Protocol	https://ietf.org/rfc/rfc114.txt
RFC1813	NFS Version 3 Protocol Specification	https://ietf.org/rfc/rfc1813.txt
RFC2068	Hypertext Transfer Protocol -- HTTP/1.1	https://ietf.org/rfc/rfc2068.txt
RFC2119	Key Words for Use in RFCs to Indicate Requirement Levels, March 1997	https://ietf.org/rfc/rfc2119.txt
RFC2616	Hypertext Transfer Protocol -- HTTP/1.1 (Obsoletes RFC2068)	https://ietf.org/rfc/rfc2616.txt
RFC3720	Internet Small Computer Systems Interface (iSCSI)	https://ietf.org/rfc/rfc3720.txt
RFC3721	Internet Small Computer Systems Interface (iSCSI) Naming and Discovery	https://ietf.org/rfc/rfc3721.txt
RFC4122	Universally Unique Identifier (UUID) URN Namespace	https://www.ietf.org/rfc/rfc4122.txt



Doc ID	Title	Location
RFC5042	<i>Direct Data Placement Protocol (DDP)/Remote Direct Memory Access Protocol (RDMA) Security</i>	https://ietf.org/rfc/rfc5042.txt
RFC5043	<i>Stream Control Transmission Protocol (SCTP) Direct Data Placement (DDP) Adaptation</i>	https://ietf.org/rfc/rfc5043.txt
RFC5044	<i>Marker PDU Aligned Framing for TCP Specification</i>	https://ietf.org/rfc/rfc5044.txt
RFC5246	<i>The Transport Layer Security (TLS) Protocol Version 1.2 (Obsoletes: RFC3268, RFC4346, and RFC4366)</i>	https://ietf.org/rfc/rfc5246.txt
RFC5789	<i>PATCH Method for HTTP</i>	https://tools.ietf.org/html/rfc5789
RFC6176	<i>Prohibiting Secure Sockets Layer (SSL) Version 2.0</i>	https://ietf.org/rfc/rfc6176.txt
RFC7143	<i>IETF* Internet Small Computer Systems Interface (iSCSI) Specification.</i>	https://tools.ietf.org/html/rfc7143
NA	<i>Date and time format - ISO 8601</i>	https://www.iso.org/iso-8601-date-and-time-format.html
N/A	<i>NVMe Base Specification, NVMe Qualified Name Section 7.9</i>	www.nvmexpress.org/specifications
N/A	<i>Storage Networking Industry Association (SNIA) Swordfish* Scalable Storage Management Schema bundle v1.0.7a</i>	https://www.snia.org/sites/default/files/technical_work/Swordfish/Swordfish_v1.0.7a_Specification.pdf
NA	<i>Redfish Base Registry v1.0.0</i>	https://www.dmtf.org/sites/default/files/standards/documents/DSP8011_1.0.0a.json

NOTE: Documents referenced in this table which have a Document ID, but cannot be accessed, can be obtained by calling 1-800-548-4725 or by visiting www.intel.com/design/literature.htm obtain a cop.



2.0 Intel® RSD Storage Services Application Programming Interface (API)

The Intel® RSD Storage Services API provides a representational state transfer (REST)-based interface that allows full management of the storage system, including asset discovery and configuration.

2.1 API Structure and Relations

Figure 1 shows the hierarchy of resources shared between RSD Storage Service and other RSD services.

Figure 1. Common Resources Hierarchy

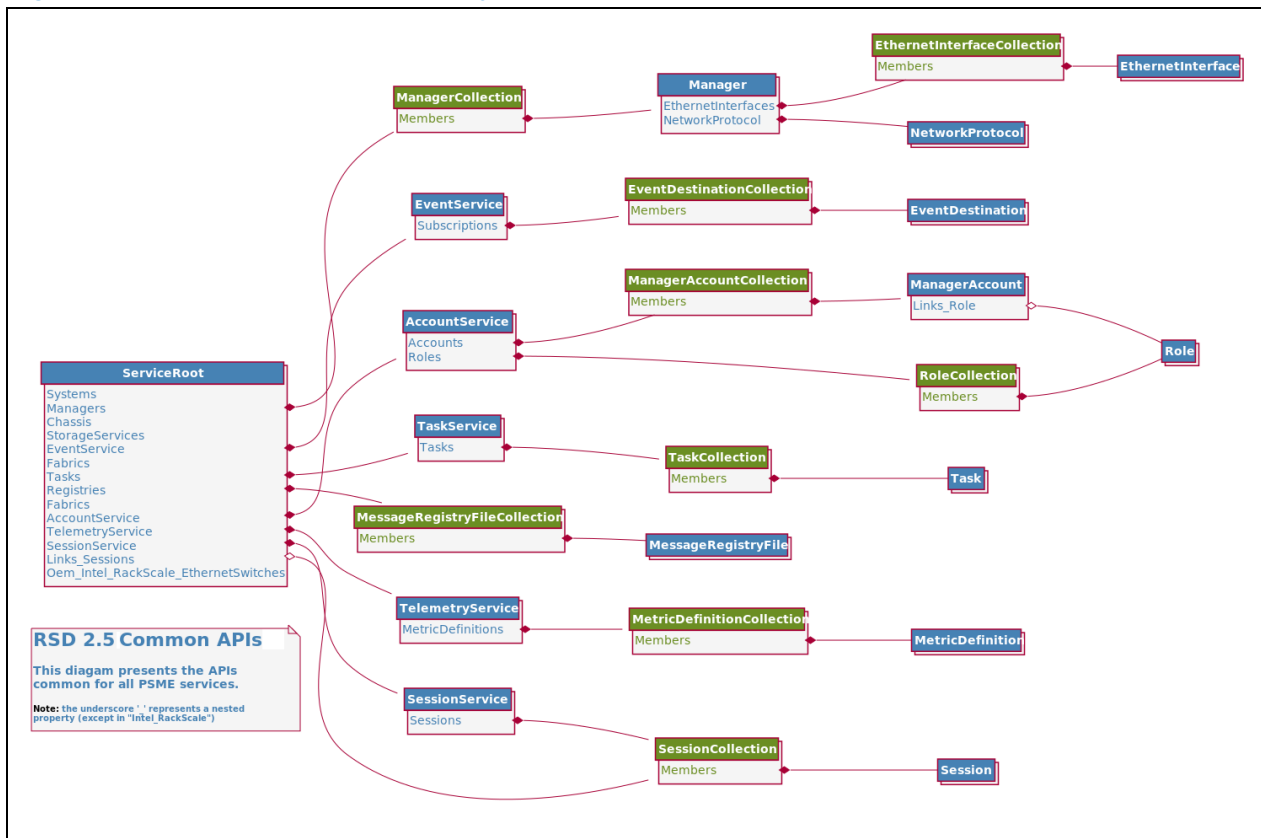




Figure 2 shows the hierarchy of resources shared between RSD Storage Service and other RSD services.

Figure 2. Hierarchy and Relations

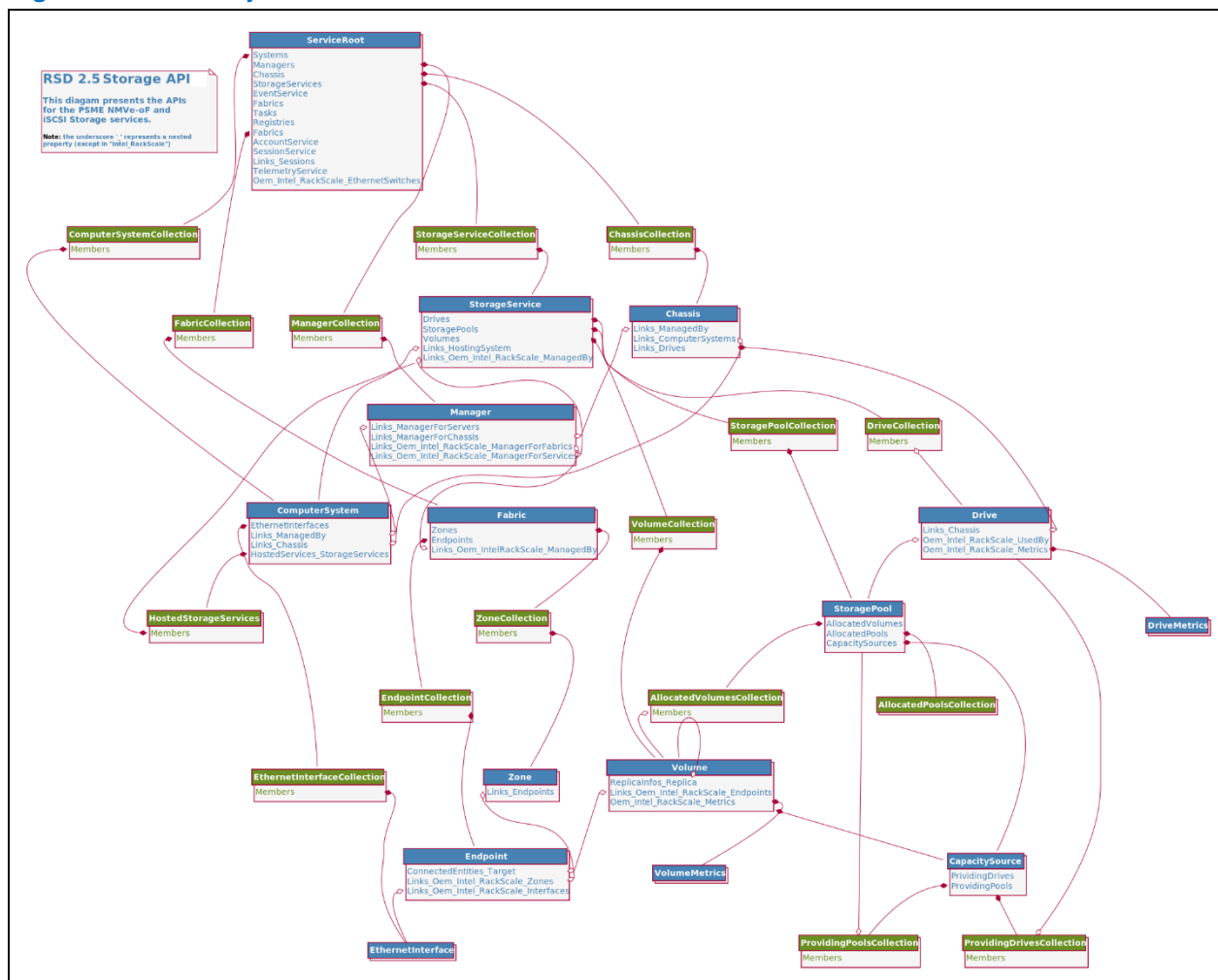


Table 3 describes the API Resources and Uniform Resource Identifiers (URIs) hierarchy.

Table 3. API Resources and URIs

Resource	Schema Version	OEM Extended	URI
Account Service	V1_3_0	No	/redfish/v1/AccountService
Chassis	V1_7_0	Yes	/redfish/v1/Chassis/{chassisID}
Chassis Collection	-	No	/redfish/v1/Chassis
Computer System	V1_3_0	Yes	/redfish/v1/Systems/{systemID}
Computer System Collection	-	No	/redfish/v1/Systems
Drive Metrics	V1_0_0	No	/redfish/v1/Chassis/{chassisID}/Drives/{driveID}/Metrics
Drive	V1_1_1	Yes	/redfish/v1/Chassis/{chassisID}/Drives/{driveID}
Endpoint	V1_1_0	Yes	/redfish/v1/Fabrics/{fabricID}/Endpoints/{endpointID}



Resource	Schema Version	OEM Extended	URI
Endpoint Collection	-	-	/redfish/v1/Fabrics/{fabricID}/Endpoints
Ethernet Interface	V1_4_0	Yes	/redfish/v1/Systems/{systemID}/EthernetInterfaces/{nicID}
Ethernet Interface Collection	-	-	/redfish/v1/Systems/{systemID}/EthernetInterfaces /redfish/v1/Managers/{managerID}/EthernetInterfaces
Event Service	V1_1_0	No	/redfish/v1/EventService
Event Subscription	V1_3_0	No	/redfish/v1/EventService/Subscriptions/{subscriptionID}
Event Subscription Collection	-	-	/redfish/v1/EventService/Subscriptions
Fabric	V1_0_0	No	/redfish/v1/Fabrics/{fabricID}
Fabric Collection	-	-	/redfish/v1/Fabrics
Fabric Zone	V1_0_0	No	/redfish/v1/Fabrics/{fabricID}/Zones/{zoneID}
Fabric Zone Collection	-	-	/redfish/v1/Fabrics/{fabricID}/Zones
Manager	V1_4_0	No	/redfish/v1/Managers/{managerID}
Manager Collection	-	-	/redfish/v1/Managers
Manager Account	V1_1_2	No	/redfish/v1/AccountService/Accounts/{accountID}
Manager Account Collection	-	No	/redfish/v1/AccountService/Accounts
Memory Collection	-	-	/redfish/v1/Systems/{systemID}/Memory
Network Interfaces Collection	-	-	/redfish/v1/Systems/{systemID}/NetworkInterfaces
Network Protocol	V1_0_0	No	/redfish/v1/Managers/{managerID}/NetworkProtocol
Processor Collection	-	No	/redfish/v1/Systems/{systemID}/Processors
Role	V1_2_1	No	/redfish/v1/AccountService/Roles/{roleID}
Role Collection	-	No	/redfish/v1/AccountService/Roles
Session Service	v1_1_3	No	/redfish/v1/SessionService
Session	v1_1_0	No	/redfish/v1/SessionService/Sessions/{sessionID}
Session Collection	-	No	/redfish/v1/SessionService/Sessions
Service Root	v1_5_0	Yes	/redfish/v1
Storage Pool	v1_0_0	No	/redfish/v1/StorageServices/{serviceID}/{storageID}/ StoragePools/{poolID}
Storage Pool Collection	-	-	/redfish/v1/StorageServices/{storageID}/StoragePools
Storage Service	v1_1_0	No	/redfish/v1/StorageServices/{serviceID}
Storage Service Collection	-	-	/redfish/v1/StorageServices/
Storage Subsystem Collection	-	-	/redfish/v1/Systems/{systemID}/Storage
Task	V1_2_0	No	/redfish/v1/TaskService/Tasks/{taskID}
Task Collection	-	-	/redfish/v1//TaskService/Tasks
Task Service	V1_2_0	No	/redfish/v1/TaskService
Volume	v1_2_0	No	/redfish/v1/StorageServices/{serviceID}/Volumes/{volumeID}
Volume Metrics	v1_0_0	No	/redfish/v1/StorageServices/{serviceID}/Volumes/{volumeID}/Metrics
Volume Collection	-	-	/redfish/v1/StorageServices/{serviceID}/Volumes
Telemetry Service	v1_1_0	-	/redfish/v1/TelemetryService



Resource	Schema Version	OEM Extended	URI
Metric Definition Collection	-	-	/redfish/v1/TelemetryService/MetricDefinitions
Metric Definition	v1_0_0	-	/redfish/v1/TelemetryService/MetricDefinitions/{metricDefinitionId}
Metric Report Definition Collection	-	-	/redfish/v1/TelemetryService/MetricReportDefinitions
Triggers Collection	WIP	-	/redfish/v1/TelemetryService/Triggers

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3.0 REST API Error Codes

This section contains descriptions of all error codes that may be returned by the REST calls implemented in the Storage Services REST API of the Intel® RSD v2.5 release.

3.1 API Error Response

In case of an error, the Storage Services REST API responds with a status code, as defined by the *HTTP 1.1 specification* (listed in [Table 2](#)), and constrained by additional requirements defined in this specification.

Note: HTTP response status codes alone often do not provide enough information to enable deterministic error semantics.

The Storage Services REST API returns extended error information as a JSON object with a single property named `"error"`. The value of this property shall be a JSON object with the properties shown in [Table 4](#).

Table 4. API Error Response Attributes

Attribute	Description
<code>code</code>	A string indicating a specific <code>MessageId</code> from the message registry. "Base.1.0.GeneralError" should be used only when no other message is better.
<code>message</code>	A human-readable error message is corresponding to the message in the message registry.
<code>@Message.ExtendedInfo</code>	An array of message objects describing one or more error message(s).

3.1.1 Message Object

Message objects provide additional information about an object, property, or error response. Messages are represented as JSON objects with the properties shown in [Table 5](#).

Table 5. Message Object Attributes

Attribute	Description
<code>MessageId</code>	The string is indicating a specific error or message (not to be confused with the HTTP status code). This code can be used to access a detailed message from a message registry.
<code>Message</code>	A human-readable error message indicating the semantics associated with the error. This is the complete message and does not rely on substitution variables.
<code>MessageArgs</code>	An optional array of strings representing the substitution parameter values for the message. This is included in the response if a <code>MessageId</code> is specified for a parameterized message.
<code>Severity</code>	An optional string representing the severity of an error.
<code>Resolution</code>	An optional string describing recommended action(s) to take to resolve an error.
<code>RelatedProperties</code>	An optional array of JSON pointers defining the specific properties in a JSON payload described by the message.

3.1.2 Error Message Definitions

The messages returned by a Redfish service are defined in Message Registries. In the current implementation, the Storage Services REST API responds with messages from two registries:

- The *Redfish Base Registry v1.0.0*, refer to [Table 2](#).
- The Intel RackScale Registry, presented in the next section.

The URLs of the registries may also be obtained from the service by querying the Message Registry File API at [/redfish/v1/Registries](#).



3.1.3 Intel RackScale Message Registry

The registry contains two RSD-specific error messages.

Request:

```
GET /registries/Intel_RackScale
Content-Type: application/json
```

Response:

```
{
  "@odata.type": "#MessageRegistry.v1_0_0.MessageRegistry",
  "Id": "Intel_RackScale.1.0.0",
  "Name": "Intel RackScale Message Registry",
  "Language": "en",
  "Description": "This registry defines messages specific to Intel RackScale",
  "RegistryPrefix": "Intel_RackScale",
  "RegistryVersion": "1.0.0",
  "OwningEntity": "Intel Corporation",
  "Messages": {
    "PropertyNotModifiable": {
      "Description": "Indicates that a property cannot be modified even though the
metadata specifies it as writable",
      "Message": "The service is unable to modify the property %1 even though metadata
specifies it as writeable.",
      "Severity": "Warning",
      "NumberOfArgs": 1,
      "ParamTypes": [
        "string"
      ],
      "Resolution": "Remove the unmodifiable property from the request body and
resubmit the request."
    },
    "PropertyValueRestricted": {
      "Description": "Indicates that the value given for a property is not within
restrictions imposed by the Service (even though it may be correct according to
metadata)",
      "Message": "The value %1 for property %2 is not within restrictions imposed by
the Service.",
      "Severity": "Warning",
      "NumberOfArgs": 1,
      "ParamTypes": [
        "string",
        "string"
      ],
      "Resolution": "Correct the value for the property in the request body and
resubmit the request."
    }
  }
}
```

3.1.4 Example Error JSON Object

```
{
  "error": {
    "code": "Base.1.0.GeneralError",
    "message": "A general error has occurred. See ExtendedInfo for more
information.",
    "@Message.ExtendedInfo": [
```



```
{
  {
    "@odata.type" : "/redfish/v1/$metadata#Message.v1_0_5.Message",
    "MessageId": "Base.1.0.MalformedJSON",
    "Message": "The request body submitted was malformed JSON and could
not be parsed by the receiving service",
    "Severity": "Error"
  },
  {
    "@odata.type" : "/redfish/v1/$metadata#Message.v1_0_5.Message",
    "MessageId": "Base.1.0.PropertyNotWriteable",
    "RelatedProperties": [
      "#/Name"
    ],
    "Message": "The property Name is a read only property and cannot be
assigned a value",
    "MessageArgs": [
      "Name"
    ],
    "Severity": "Warning",
    "Resolution": "Remove the property from the request body and resubmit
the request if the operation failed"
  }
]
```

3.2 API Error Codes

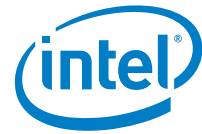
If an error is not described in any of the following tables, it is to be mapped into HTTP 500 Internal Error code.

3.2.1 General Error Codes

For a detailed list of error codes, review the *Redfish Scalable Platforms Management API Specification*, Section 6.5.2 (refer to [Table 2](#)). The client should be prepared to handle the error codes shown in [Table 6](#).

Table 6. HTTP Error Status Codes

HTTP Status Code	Description
400 Bad Request	The request could not be processed because it contains missing or invalid information (such as validation error on an input field, a missing required value, and so on). An extended error shall be returned in the response body.
401 Unauthorized	The authentication credentials included with this request are missing or invalid.
404 Not Found	The request specified a URI of a resource that does not exist.
405 Method Not Allowed	The HTTP verb specified in the request (for example, DELETE, GET, HEAD, POST, PUT, PATCH) is not supported for the request URI. The response shall include an Allow header, that provides a list of methods supported by the resource identified by request URI.
409 Conflict	A creation or update request could not be completed, because it would cause a conflict in the current state of the resources supported by the platform (for example, an attempt to set multiple attributes that work in a linked manner using incompatible values).
500 Internal Server Error	The server encountered an unexpected condition that prevented it from fulfilling the request. An extended error shall be returned in the response body.
501 Not Implemented	The server does not (currently) support the functionality required to fulfill the request. This is the appropriate response when the server does not recognize the request method and is not capable of supporting it for any resource.
503 Service Unavailable	The server is currently unable to handle the request due to temporary overloading or maintenance of the server.



3.2.2 PATCH Method Error Codes

For the PATCH method error codes, the Intel® RSD service conforms to the *PATCH Method for HTTP*, RFC 5789 standard (refer to [Table 2](#)). The service responds with the following error codes in the cases listed:

- **400 Bad Request** - Malformed JSON in the request (such as values not in range, an unknown property, and so on). The code, message, and extended information within the error response explain why a request was rejected.

Of special concern are the RSD-specific messages from the Intel_RackScale registry. `PropertyNotModifiable` is returned when a `PATCH` request was sent for a property that, while writable according to metadata, is read-only on the Storage Services REST API. `PropertyValueRestricted` is returned when a `PATCH` request contains a value for a property that is compliant with metadata, but the service has additional restrictions on the acceptable values for that property that were not met by request.
- **405 Method Not Allowed** - Resource does not support `PATCH` method.
- **409 Conflict** - Update cannot be executed at this moment. The user might be able to resolve the conflict and resubmit the request.
- **501 Not Implemented** - Resource supports `PATCH` method, but current implementation does not.
- **500 Internal Server Error** - All other situations in which the previous codes do not fit. Specifically, this response is returned if the `PATCH` request is supported by the Resource, but one of the `PATCH`-ed properties cannot be updated, for instance, if underlying layers do not allow the execution of a particular request.

§



4.0 REST API Definition

The JSON examples in this document are informative, not normative. Metadata files referenced in this specification are normative.

4.1 OData* v4.0 Support

Intel® RSD supports OData* v4.0 as it is defined in *Redfish Scalable Platforms Management API Specification* (refer to [Table 2](#)).

All resources within this RESTful API are identified by a unique identifier property named "@odata.id". Resource identifiers shall be represented in JSON payloads as URI paths relative to the Redfish Schema portion of the URI. For example, they shall always start with `"/redfish/"`. The resource identifier is the canonical URL for the resource and can be used to retrieve or edit the resource, as appropriate.

4.2 Asynchronous Operations

While the majority of operations in this architecture are synchronous in nature, some operations can take a long time to execute, more time than a client typically wants to wait. For this reason, some operations can be asynchronous at the discretion of the service. The request portion of an asynchronous operation is no different from the request portion of a synchronous operation.

The use of HTTP Response codes enables a client to determine if the operation was completed synchronously or asynchronously. Clients shall be prepared to handle both synchronous and asynchronous responses for requests using HTTP DELETE, POST, PATCH and PUT methods.

For details, review *Redfish Scalable Platforms Management API Specification*, Section 8.2 (refer to [Table 2](#)).

4.3 Protocol Version

The protocol version is separate from the version of the resources or the version of the Redfish Schema supported by them. Each version of the Redfish protocol is strongly typed. This is accomplished using the URI of the Redfish service in combination with the resource obtained at that URI, called the `ServiceRoot`.

The root URI for this version of the Redfish protocol shall be `"/redfish/v1/"`.

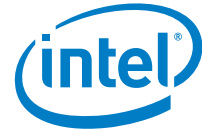
While the major version of the protocol is represented in the URI, the major version, minor version, and errata version of the protocol are represented in the version property of the `ServiceRoot` resource, as defined in the Redfish Schema for that resource. The protocol version is a string of the form:

```
MajorVersion.MinorVersion.Errata
```

Where:

- `MajorVersion` = integer: something in the class changed in a backwards incompatible way.
- `MinorVersion` = integer: a minor update. New functionality may have been added, but nothing was removed. Compatibility is preserved with previous minor versions.
- `Errata` = integer: something in the prior version was broken and needed to be fixed.

Any resource discovered through links found by accessing the root service, or any service or resource referenced using references from the root service, shall conform to the same version of the protocol supported by the root service.



4.3.1 Operations

4.3.1.1 GET

Request:

```
GET /redfish
Content-Type: application/json
```

Response:

```
{
  "v1": "/redfish/v1/"
}
```

4.4 Odata* Service Document

The OData service document provides a standard format for enumerating the resources exposed by the service, enabling generic hypermedia-driven OData clients to navigate to the resources of the service.

4.4.1 Operations

4.4.1.1 GET

Request:

```
GET /redfish/v1/odata
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata",
  "value": [
    {
      "name": "Service",
      "kind": "Singleton",
      "url": "/redfish/v1/"
    },
    {
      "name": "Systems",
      "kind": "Singleton",
      "url": "/redfish/v1/Systems"
    },
    {
      "name": "Chassis",
      "kind": "Singleton",
      "url": "/redfish/v1/Chassis"
    },
    {
      "name": "Managers",
      "kind": "Singleton",
      "url": "/redfish/v1/Managers"
    },
    {
      "name": "StorageServices",
      "kind": "Singleton",
      "url": "/redfish/v1/StorageServices"
    }
  ]
}
```

```

    },
    {
      "name": "EventService",
      "kind": "Singleton",
      "url": "/redfish/v1/EventService"
    },
    {
      "name": "Tasks",
      "kind": "Singleton",
      "url": "/redfish/v1/TaskService"
    },
    {
      "name": "Registries",
      "kind": "Singleton",
      "url": "/redfish/v1/Registries"
    },
    {
      "name": "Fabrics",
      "kind": "Singleton",
      "url": "/redfish/v1/Fabrics"
    },
    {
      "name": "AccountService",
      "kind": "Singleton",
      "url": "/redfish/v1/AccountService"
    },
    {
      "name": "SessionService",
      "kind": "Singleton",
      "url": "/redfish/v1/SessionService"
    },
    {
      "name": "TelemetryService",
      "kind": "Singleton",
      "url": "/redfish/v1/TelemetryService"
    }
  ]
}

```

4.5 Intel® RSD Original Equipment Manufactures (OEM) Extensions

All Intel® RSD original equipment manufacturers (OEM) extensions to all resources defined in this document shall be supported.

4.6 Service Root

The service root resource is an entry point. Properties details are available in the [ServiceRoot_v1.xml](#) metadata file. OEM extensions details are available in [IntelRackScaleOem_v1.xml](#). [Table 7](#) shows the [ServiceRoot](#) OEM attributes. [Table 8](#) shows the [ServiceRoot](#) OEM extensions.

**Table 7. ServiceRoot Attributes**

Attribute	Type	Nullable	Description
RedfishVersion	Edm.String	False	The value of this string shall represent the version of the Redfish service. The format of this string shall be of the format <code>majorversion.minorversion.errata</code> in compliance with Protocol Version section of the Redfish specification. Refer to Table 2 for Redfish specifications.
UUID	Resource.UUID	True	The value of this string shall represent the id of the Redfish service instance. The format of this string shall be a 32-byte value in the form <code>8-4-4-4-12</code> . If SSDP is used, this value shall be an exact match of the UUID value returned in a <code>2000 K</code> from an SSDP M-SEARCH request during discovery. RFC4122 describes methods that can be used 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. Refer to Table 2 for Redfish specifications.
Links	ServiceRoot.v1_0_0.Links	False	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. Refer to Table 2 for Redfish specifications.
Systems	ComputerSystemCollection.ComputerSystemCollection	False	This object shall only contain a reference to a collection of resources that comply with the Systems schema.
Chassis	ChassisCollection.ChassisCollection	False	This object shall only contain a reference to a collection of resources that comply with the Chassis schema.
Managers	ManagerCollection.ManagerCollection	False	This object shall only contain a reference to a collection of resources that comply with the Managers schema.
Tasks	TaskService.TaskService	False	The classes structure shall only contain a reference to a resource that complies to the TaskService schema.
SessionService	SessionService.SessionService	False	The classes structure shall only contain a reference to a resource that complies to the SessionService schema.
AccountService	AccountService.AccountService	False	The classes structure shall only contain a reference to a resource that complies to the AccountService schema.
EventService	EventService.EventService	False	The classes structure shall only contain a reference to a resource that complies to the EventService schema.
Registries	MessageRegistryFileCollection.MessageRegistryFileCollection	False	This object shall contain a reference to Message Registry.
JsonSchemas	JsonSchemaFileCollection.JsonSchemaFileCollection	False	This object shall only contain a reference to a collection of resources that comply with the SchemaFile schema where the files are JSON-Schema files.



Attribute	Type	Nullable	Description
StorageSystems	StorageSystemCollection.StorageSystemCollection	False	The referenced collection shall contain computer systems that act as storage servers. The HostingRoles attribute of each such computer system shall have an entry for StorageServer .
StorageServices	StorageServiceCollection.StorageServiceCollection	False	The referenced collection shall contain references to all StorageService instances.
Fabrics	FabricCollection.FabricCollection	False	The referenced collection shall contain references to all Fabric instances.
UpdateService	UpdateService.UpdateService	False	The classes structure shall only contain a reference to a resource that complies to the UpdateService schema.
CompositionService	CompositionService.CompositionService	False	The classes structure shall only contain a reference to a resource that complies to the CompositionService schema.
Product	Edm.String	False	The value of this string shall include the name of the product represented by the Redfish service.
ProtocolFeaturesSupported	ServiceRoot.v1_3_0.ProtocolFeaturesSupported	False	This type contains information about protocol features supported by the service.
JobService	JobService.JobService	False	The classes structure shall only contain a reference to a resource that conforms to the JobService schema.
TelemetryService	TelemetryService.TelemetryService	False	The value shall be a link to the TelemetryService .
Vendor	Edm.String	True	The value of this string 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 value of the Product property. Refer to Table 2 for Redfish specifications.
CertificateService	CertificateService.CertificateService	False	The value shall be a link to the CertificateService .
ResourceBlocks	ResourceBlockCollection.ResourceBlockCollection	False	The referenced collection shall contain references to all Resource Block instances.

Intel® RSD OEM extensions:

Table 8. ServiceRoot OEM Extensions

Attribute	Type	Nullable	Description
ApiVersion	Edm.String	False	A version of Intel® RSD API exposed by this service.
EthernetSwitches	EthernetSwitchCollection.EthernetSwitchCollection	True	The classes structure shall only contain a reference to a resource that complies to the EthernetSwitch schema.
Nodes	ComposedNodeCollection.ComposedNodeCollection	True	This object shall only contain a reference to a collection of resources that comply with the Nodes schema.



Attribute	Type	Nullable	Description
TelemetryService	Intel_RackScale.TelemetryService.TelemetryService	True	The classes structure shall only contain a reference to a resource that complies to the TelemetryService schema. Deprecated: This value has been Deprecated in favor of ServiceRoot/TelemetryService.

4.6.1 Operations

4.6.1.1 GET

Request:

```
GET /redfish/v1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#ServiceRoot.ServiceRoot",
  "@odata.id": "/redfish/v1/",
  "@odata.type": "#ServiceRoot.v1_5_1.ServiceRoot",
  "Id": "RootService",
  "Name": "Root Service",
  "Description": "description-as-string",
  "RedfishVersion": "1.5.0",
  "UUID": "92384634-2938-2342-8820-489239905423",
  "Systems": {
    "@odata.id": "/redfish/v1/Systems"
  },
  "Chassis": {
    "@odata.id": "/redfish/v1/Chassis"
  },
  "Managers": {
    "@odata.id": "/redfish/v1/Managers"
  },
  "EventService": {
    "@odata.id": "/redfish/v1/EventService"
  },
  "Fabrics": {
    "@odata.id": "/redfish/v1/Fabrics"
  },
  "Tasks": {
    "@odata.id": "/redfish/v1/TaskService"
  },
  "Registries": {
    "@odata.id": "/redfish/v1/Registries"
  },
  "StorageServices": {
    "@odata.id": "/redfish/v1/StorageServices"
  },
  "AccountService": {
    "@odata.id": "/redfish/v1/AccountService"
  },
  "SessionService": {
    "@odata.id": "/redfish/v1/SessionService"
  },
}
```



```
"TelemetryService": {
  "@odata.id": "/redfish/v1/TelemetryService"
},
"Oem": {
  "Intel_RackScale": {
    "@odata.type": "#Intel.Oem.ServiceRoot",
    "ApiVersion": "2.5.0",
    "EthernetSwitches": {
      "@odata.id": "/redfish/v1/EthernetSwitches"
    }
  }
},
"Links": {}
}
```

4.6.1.2 PUT

The PUT operation is not allowed on service root resource.

4.6.1.3 PATCH

The PATCH operation is not allowed on service root resource.

4.6.1.4 POST

The POST operation is not allowed on service root resource.

4.6.1.5 DELETE

The DELETE operation is not allowed on service root resource.

4.7 Storage Service Collection

This resource represents a collection of storage services. Properties details are available in [StorageServiceCollection_v1.xml](#) metadata file. [Table 9](#) describes the `StorageServiceCollection` attribute.

Table 9. StorageServiceCollection Attribute

Attribute	Type	Nullable	Description
Members	Collection (StorageService.StorageService)	True	The value of each member entry shall reference a StorageService resource.

4.7.1 Operations

4.7.1.1 GET

Request:

```
GET /redfish/v1/StorageServices
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#StorageService.StorageService",

```



```

"@odata.id": "/redfish/v1/StorageServices",
"@odata.type": "#StorageServiceCollection.StorageServiceCollection",
"Name": "Storage Services Collection",
"Description": "Storage Service Collection",
"Members@odata.count": 1,
"Members": [
  {
    "@odata.id": "/redfish/v1/StorageServices/NVMeoE1"
  }
]
}

```

4.7.1.2 PUT

The PUT operation is not allowed on the storage service collection resource.

4.7.1.3 PATCH

The PATCH operation is not allowed on the storage service collection resource.

4.7.1.4 POST

The POST operation is not allowed on the storage service collection resource.

4.7.1.5 DELETE

The DELETE operation is not allowed on the storage service collection resource.

4.8 Storage Service

The storage service is a collection of resources that the system can make available to one or more host systems. The collection can contain block, file, or object storage and local system access points through which the collection is made available - hosts or host access points to which the collection is made available.

Details of this resource are described in the [Drive.xml](#) metadata file. OEM extensions details are available in [StorageService_v1.xml](#). [Table 10](#) shows the [StorageService](#) attributes; [Table 12](#) describes the [StorageServiceLinks](#) attributes for OEM extensions, [Table 12](#), provides [StorageServiceLinks](#) Attributes .

Table 10. StorageService Attributes

Attribute	Type	Nullable	Description
Identifier	Resource.Identifier	True	The value identifies this resource. The value shall be unique within the managed ecosystem.
Status	Resource.Status	True	-
Links	StorageService.v1_0_0.Links	False	Contains links to other resources that are related to this resource.
Actions	StorageService.v1_0_0.Actions	False	The Actions property shall contain the available actions for this resource.
StorageGroups	StorageGroupCollection.StorageGroupCollection	True	The value of each entity in the array shall reference a StorageGroup .
EndpointGroups	EndpointGroupCollection.EndpointGroupCollection	True	The value of each entry in the array shall reference an EndpointGroup .



Attribute	Type	Nullable	Description
ClientEndpointGroups	EndpointGroupCollection.EndpointGroupCollection	True	The value of each entry in the array shall reference an EndpointGroup . Deprecated: Deprecated in favor of EndpointGroups . The GroupType property of EndpointGroup already distinguishes between use for Server or Client.
ServerEndpointGroups	EndpointGroupCollection.EndpointGroupCollection	True	The value of each entry in the array shall reference an EndpointGroup . Deprecated: Deprecated in favor of EndpointGroups . The GroupType property of EndpointGroup already distinguishes between use for Server or Client.
Volumes	VolumeCollection.VolumeCollection	False	An array of references to Volumes managed by this storage service.
FileSystems	FileSystemCollection.FileSystemCollection	False	An array of references to FileSystems managed by this storage service.
StoragePools	StoragePoolCollection.StoragePoolCollection	False	An array of references to StoragePools .
Drives	DriveCollection.DriveCollection	False	A collection that indicates all the drives managed by this storage service.
Endpoints	EndpointCollection.EndpointCollection	True	The value of each entry in the array shall reference an Endpoint managed by this service.
Redundancy	Collection(Redundancy.Redundancy)	True	Redundancy information for the storage subsystem
ClassesOfService	ClassOfServiceCollection.ClassOfServiceCollection	True	The value of each entry in the array shall reference a ClassOfService supported by this service.
StorageSubsystems	StorageCollection.StorageCollection	False	The value shall be a link to a collection of type StorageCollection having members that represent storage subsystems managed by this storage service.
IOStatistics	IOStatistics.IOStatistics	True	The value shall represent IO statistics for this StorageService.
SpareResourceSets	Collection(SpareResourceSet.SpareResourceSet)	True	Each contained SpareResourceSet shall contain resources that may be utilized to replace the capacity provided by a failed resource having a compatible type.
DataProtectionLoSCapabilities	DataProtectionLoSCapabilities.DataProtectionLoSCapabilities	True	The value shall reference the data protection capabilities of this service.
DataSecurityLoSCapabilities	DataSecurityLoSCapabilities.DataSecurityLoSCapabilities	True	The value shall reference the data security capabilities of this service.
DataStorageLoSCapabilities	DataStorageLoSCapabilities.DataStorageLoSCapabilities	True	The value shall reference the data storage capabilities of this service.
IOConnectivityLoSCapabilities	IOConnectivityLoSCapabilities.IOConnectivityLoSCapabilities	True	The value shall reference the IO connectivity capabilities of this service.
IOPerformanceLoSCapabilities	IOPerformanceLoSCapabilities.IOPerformanceLoSCapabilities	True	The value shall reference the IO performance capabilities of this service.



Attribute	Type	Nullable	Description
DefaultClassOfService	ClassOfService . ClassOfService	True	If present, this property shall reference the default class of service for entities allocated by this storage service. This default may be overridden by the DefaultClassOfService property values within contained StoragePools .

Table 11. Links Attributes

Attribute	Type	Nullable	Description
HostingSystem	Resource . Resource	True	The value shall reference the ComputerSystem or StorageController that hosts this service.
DefaultClassOfService	ClassOfService . ClassOfService	True	If present, this property shall reference the default class of service for entities allocated by this storage service. This default may be overridden by the DefaultClassOfService property values within contained StoragePools . Deprecated: DefaultClassOfService moved outside of Links complex type.
DataProtectionLoSCapabilities	DataProtectionLoSCapabilities . DataProtectionLoSCapabilities	True	The value shall reference the data protection capabilities of this service. Deprecated: Moved up to StorageServices
DataSecurityLoSCapabilities	DataSecurityLoSCapabilities . DataSecurityLoSCapabilities	True	The value shall reference the data security capabilities of this service. Deprecated: Moved up to StorageServices
DataStorageLoSCapabilities	DataStorageLoSCapabilities . DataStorageLoSCapabilities	True	The value shall reference the data storage capabilities of this service. Deprecated: Moved up to StorageServices
IOConnectivityLoSCapabilities	IOConnectivityLoSCapabilities . IOConnectivityLoSCapabilities	True	The value shall reference the I/O connectivity capabilities of this service. Deprecated: Moved up to StorageServices
IOPerformanceLoSCapabilities	IOPerformanceLoSCapabilities . IOPerformanceLoSCapabilities	True	The value shall reference the I/O performance capabilities of this service. Deprecated: Moved up to StorageServices

Intel® RSD OEM extensions:**Table 12. StorageServiceLinks Attribute**

Attribute	Type	Nullable	Description
ManagedBy	Collection (Manager . Manager)	True	Collection of managers managing the service.



4.8.1 Operations

4.8.1.1 GET

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#StorageService.StorageService",
  "@odata.id": "/redfish/v1/StorageServices/NVMeoE1",
  "@odata.type": "#StorageService.v1_1_0.StorageService",
  "Id": "NVMeoE1",
  "Name": "Storage Service",
  "Description": "Storage Service description",
  "Drives": {
    "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/Drives"
  },
  "Endpoints": {
    "@odata.id": "/redfish/v1/Fabrics/1/Endpoints"
  },
  "Links": {
    "HostingSystem": {
      "@odata.id": "/redfish/v1/Systems/Target"
    },
    "Oem": {
      "Intel_RackScale": {
        "@odata.type": "#Intel.Oem.StorageServiceLinks",
        "ManagedBy": [
          {
            "@odata.id": "/redfish/v1/Managers/1"
          }
        ]
      }
    }
  },
  "Oem": {},
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "StoragePools": {
    "@odata.id": "/redfish/v1/StorageServices/1/StoragePools"
  },
  "Volumes": {
    "@odata.id": "/redfish/v1/StorageServices/1/Volumes"
  }
}
```

4.8.1.2 PUT

The PUT operation is not allowed on the storage service resource.



4.8.1.3 PATCH

The PATCH operation is not allowed on the storage service resource.

4.8.1.4 POST

The POST operation is not allowed on the storage service resource.

4.8.1.5 DELETE

The DELETE operation is not allowed on the storage service resource.

4.9 Storage Pool Collection

The `StoragePool` resource represents a factory that has an amount of storage capacity and has the ability to produce storage volumes or other storage pools. Properties details are available in the `StoragePoolCollection_v1.xml` metadata file. [Table 13](#) describes the `StoragePoolCollection` attribute.

Table 13. StoragePoolCollection Attribute

Attribute	Type	Nullable	Description
Members	Collection(<code>StoragePool.StoragePool</code>)	True	The value of each member entry shall reference a <code>StoragePool</code> resource.

4.9.1 Operations

4.9.1.1 GET

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/StoragePools
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#StoragePools",
  "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/StoragePools",
  "@odata.type": "#StoragePoolCollection.StoragePoolCollection",
  "Description": "Collection of Storage Pools",
  "Members": [
    {
      "@odata.id": "/redfish/v1/StorageServices/1/StoragePools/1"
    },
    {
      "@odata.id": "/redfish/v1/StorageServices/1/StoragePools/2"
    }
  ],
  "Members@odata.count": 2,
  "Name": "StoragePools Collection"
}
```

4.9.1.2 PUT

The PUT operation is not allowed on the storage pool collection of resources.



4.9.1.3 PATCH

The PATCH operation is not allowed on the storage pool collection of resources.

4.9.1.4 POST

The POST operation is not allowed on the storage pool collection of resources.

4.9.1.5 DELETE

The DELETE operation is not allowed on the storage pool collection of resources.

4.10 Storage Pool

The `StoragePool` resource represents a factory that has the amount of storage capacity and ability to produce storage volumes or other storage pools. Properties details are available in the `StoragePool_v1.xml` metadata file. [Table 14](#) describes the `StoragePool` attributes. The following tables provide more information; [Table 15](#) describes the `Identifier` attributes, [Table 16](#) describes the `Capacity` attributes, and [Table 17](#) describes the `CapacityInfo` attributes.

Table 14. StoragePool Attributes

Attribute	Type	Nullable	Description
Identifier	<code>Resource.Identifier</code>	True	The value identifies this resource. The value shall be unique within the managed ecosystem.
BlockSizeBytes	<code>Edm.Int64</code>	True	Maximum size in bytes of the blocks which form this Volume. If the block size is variable, then the maximum block size in bytes should be specified. If the block size is unknown or if a block concept is not valid (for example, with Memory), enter a 1. Deprecated: This property has been Deprecated in favor of <code>StoragePool.v1_1_1.StoragePool.MaximumBlockSizeBytes</code>
Capacity	<code>Capacity.Capacity</code>	True	The value of this property shall provide a piece of information about the actual utilization of the capacity within this storage pool.
LowSpaceWarningThresholdPercents	<code>Collection(Edm.Int64)</code>	True	Each time the following value is less than one of the values in the array the <code>LOW_SPACE_THRESHOLD_WARNING</code> event shall be triggered: Across all <code>CapacitySources</code> entries, <code>percent = (SUM(AllocatedBytes) - SUM(ConsumedBytes)) / SUM(AllocatedBytes)</code> .
Links	<code>StoragePool.v1_0_0.Links</code>	False	This structure shall contain references to resources that are not contained within this resource.
Status	<code>Resource.Status</code>	True	-



Attribute	Type	Nullable	Description
CapacitySources	Collection (Capacity.CapacitySource)	True	Fully or partially consumed storage from a source resource. Each entry shall provide capacity allocation data from a named source resource.
AllocatedVolumes	VolumeCollection.VolumeCollection	True	The value of this property shall contain a reference to the collection of volumes allocated from this storage pool.
AllocatedPools	StoragePoolCollection.StoragePoolCollection	True	The value of this property shall contain a reference to the collection of storage pools allocated from this storage pool.
ClassesOfService	ClassOfServiceCollection.ClassOfServiceCollection	True	This property shall contain references to all classes of service supported by this storage pool. Capacity allocated from this storage pool shall conform to one of the referenced classes of service.
RemainingCapacityPercent	Edm.Int64	True	If present, this value shall return $\{ [(SUM(AllocatedBytes) - SUM(ConsumedBytes)) / SUM(AllocatedBytes)] * 100 \}$ represented as an integer value.
MaxBlockSizeBytes	Edm.Int64	True	If present, the value is the maximum block size of an allocated resource. If the block size is unknown or if a block concept is not valid (for example, with Memory), this property shall be NULL.
IOStatistics	IOStatistics.IOStatistics	True	The value shall represent IO statistics for this StoragePool.
RecoverableCapacitySourceCount	Edm.Int64	True	The value is the number of available capacity source resources currently available in the event that an equivalent capacity source resource fails.
DefaultClassOfService	ClassOfService.ClassOfService	True	If present, this property shall reference the default class of service for entities allocated from this storage pool. If the ClassesOfService collection is not empty, then the value of this property shall be one of its entries. If not present, the default class of service of the containing StorageService entity shall be used.

Table 15. Identifier Attributes

Attribute	Type	Nullable	Description
DurableName	Edm.String	True	This property shall contain the world wide unique identifier for the resource. The string shall be in the format described by the value of the Identifier.DurableNameFormat property.
DurableNameFormat	Resource.v1_1_0.DurableNameFormat	True	This property shall represent the format of the DurableName property.

**Table 16. Capacity Attributes**

Attribute	Type	Nullable	Description
Data	Capacity.v1_0_0.CapacityInfo	True	The value shall be capacity information relating to provisioned user data.
Metadata	Capacity.v1_0_0.CapacityInfo	True	The value shall be capacity information relating to the provisioned system (non-user accessible) data.
Snapshot	Capacity.v1_0_0.CapacityInfo	True	The value shall be capacity information relating to provisioned snapshot or backup data.
IsThinProvisioned	Edm.Boolean	True	If the value is false, the capacity shall be fully allocated. The default value shall be false.

Table 17. CapacityInfo Attributes

Attribute	Type	Nullable	Description
ConsumedBytes	Edm.Int64	True	The value shall be the number of logical bytes currently consumed in this data store for this data type.
AllocatedBytes	Edm.Int64	True	The value shall be the number of bytes currently allocated by the storage system in this data store for this data type.
GuaranteedBytes	Edm.Int64	True	The value shall be the number of bytes the storage system guarantees can be allocated in this data store for this data type.
ProvisionedBytes	Edm.Int64	True	The value shall be the maximum number of bytes that can be allocated in this data store for this data type.

4.10.1 Operations

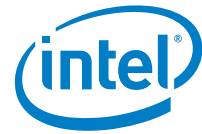
4.10.1.1 GET

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/StoragePools/2
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#StoragePool.StoragePool",
  "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/StoragePools/2",
  "@odata.type": "#StoragePool.v1_1_1.StoragePool",
  "Description": "Base storage pool",
  "Id": "2",
  "Name": "BasePool",
  "AllocatedVolumes": {
    "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/StoragePools/2/AllocatedVolumes"
  },
  "AllocatedPools": {
    "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/StoragePools/2/AllocatedPools"
  },
  "Capacity": { "@odata.type": "#Capacity.v1_0_0.Capacity",
    "Data": {
      "AllocatedBytes": 512174850048,
```



```

        "ConsumedBytes": 3071983104
    }
},
"CapacitySources": [
    {
        "@odata.id":
"/redfish/v1/StorageServices/NVMeoE1/StoragePools/2/CapacitySources/1"
    }
],
"Oem": {},
"Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
}
}

```

4.10.1.2 PUT

The PUT operation is not allowed on the storage pool resource.

4.10.1.3 PATCH

The PATCH operation is not allowed on the storage pool resource.

4.10.1.4 POST

The POST operation is not allowed on the storage pool resource.

4.10.1.5 DELETE

Request:

```
DELETE redfish/v1/StorageServices/NVMeoE1/StoragePools/2
```

Response:

```
HTTP/1.1 204 No Content
```

Or (when a task is created):

```

HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
    "@odata.context": "/redfish/v1/$metadata#Task.Task",
    "@odata.id": "/redfish/v1/TaskService/Tasks/1",
    "@odata.type": "#Task.v1_0_0.Task",
    "Id": "1",
    "Name": "Task 1",
    "TaskState": "New",
    "StartTime": "2017-12-06T04:45+01:00",
    "TaskStatus": "OK",
    "Messages": []
}

```



4.11 Allocated Volumes

This collection shall contain references to all Volume resource instances allocated from the same Storage Pool. Details of this resource are described in the `VolumeCollection_v1.xml` metadata file. [Table 18](#) describes the `VolumeCollection` attribute.

Table 18. VolumeCollection Attributes

Attribute	Type	Nullable	Description
Members	Collection (Volume.Volume)	True	The value of each member entry shall reference a Volume resource.

4.11.1 Operations

4.11.1.1 GET

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/StoragePools/2/AllocatedVolumes
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#VolumeCollection.VolumeCollection",
  "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/StoragePools/2/AllocatedVolumes",
  "@odata.type": "#VolumeCollection.VolumeCollection",
  "Description": "Volume Collection",
  "Members": [
    {
      "@odata.id": "/redfish/v1/StorageServices/1/Volumes/1"
    }
  ],
  "Members@odata.count": 1,
  "Name": "Allocated Volumes Collection"
}
```

4.11.1.2 PUT

The PUT operation is not allowed on the allocated volumes collection.

4.11.1.3 PATCH

The PATCH operation is not allowed on the allocated volumes collection.

4.11.1.4 POST

The POST operation is not allowed on the allocated volumes collection.

4.11.1.5 DELETE

The DELETE operation is not allowed on the allocated volumes collection.



4.12 Volume Collection

This collection shall contain references to all volume resource instances sharing the same parent resource. Details of this resource are described in the [VolumeCollection_v1.xml](#) metadata file. [Table 19](#) describes the [VolumeCollection](#) attribute.

Table 19. VolumeCollection Attributes

Attribute	Type	Nullable	Description
Members	Collection (Volume.Volum e)	True	The value of each member entry shall reference a Volume resource.

4.12.1 Operations

4.12.1.1 GET

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/Volumes
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#VolumeCollection.VolumeCollection",
  "@odata.id": "/redfish/v1/StorageServices/1/Volumes",
  "@odata.type": "#VolumeCollection.VolumeCollection",
  "Description": "Volume Collection",
  "Members": [
    {
      "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/Volumes/1"
    }
  ],
  "Members@odata.count": 1,
  "Name": "Volume Collection"
}
```

4.12.1.2 PUT

The PUT operation is not allowed on the volume collection of resources.

4.12.1.3 PATCH

The PATCH operation is not allowed on the volume collection of resources.

4.12.1.4 POST

The properties shown in [Table 20](#) can be provided as a body to a POST operation to create a new volume. In addition, [Table 21](#) describes the [ReplicaInfo](#) format, [Table 22](#) describes the [CapacitySources](#) format, and [Table 23](#) describes the [StorageAccessCapability](#) attributes.

Table 20. Volume POST Properties

Attribute	Type	Nullable	Description
CapacityBytes	Int64	Yes	Volume capacity in bytes.



CapacitySources->ProvidingPools	array of Capacity.v1_0_0.CapacitySource	No	An array of StoragePools on that the volume is created. If none is provided, the service uses any pool with enough available capacity.
AccessCapabilities	Array of StorageAccessCapability.v1_0_0.StorageAccessCapability	No	Supported I/O access capabilities. In the current release, limiting access rights is implemented only for volumes exposed via the iSCSI protocol.
Identifiers	Array of Resource.Identifier	No	An array with a single identifier with UUID format should be provided for NVMe-oF volumes.
ReplicaInfos	Array of StorageReplicaInfo.v1_0_0.ReplicaInfo	No	Should be provided if created volume shall be a replica of another volume. Only a single ReplicaInfo can be provided in the current service implementation. The detailed format of ReplicaInfo is provided in Table 21.
Oem->Intel_RackScale->Bootable	Boolean	No	Determines if the volume should be bootable.

Table 21. ReplicaInfo Format

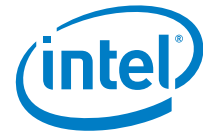
Attribute	Type	Nullable	Description
ReplicaType	StorageReplicaInfo.v1_0_0.ReplicaType	Yes	The <code>ReplicaType</code> enumeration literal shall describe the intended outcome of the replication.
Replica	Resource.v1_0_0.Resource	Yes	The value shall reference the resource that is the source of the replica.

Table 22. CapacitySources Format

Attribute	Type	Nullable	Description
ProvidingPools	Collection (StoragePool, StoragePool)	Yes	Reference to a contributing storage pool.

Table 23. Identifier Attributes

Attribute	Type	Nullable	Description
DurableName	Edm.String	True	This property shall contain the world wide unique identifier for the resource. The string shall be in the format described by the value of the Identifier.DurableNameFormat property.
DurableNameFormat	Resource.v1_1_0.DurableNameFormat	True	This property shall represent the format of the DurableName property.

**Request:**

```
POST /redfish/v1/StorageServices/NVMeoE1/Volumes
Content-Type: application/json
{
  "AccessCapabilities": [
    "Read",
    "Write"
  ],
  "CapacityBytes": 10737418240,
  "CapacitySources": [
    {
      "ProvidingPools": [
        {
          "@odata.id": "/redfish/v1/StorageServices/1/StoragePools/2"
        }
      ]
    }
  ],
  "Identifiers": [
    {
      "DurableName": "12345678-90ab-cdef-0000-000000000000",
      "DurableNameFormat": "UUID"
    }
  ],
  "ReplicaInfos": [
    {
      "ReplicaType": "Clone",
      "Replica": {
        "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/Volumes/1"
      }
    }
  ],
  "Oem": {
    "Intel_RackScale": {
      "Bootable": true
    }
  }
}
```

Response:

```
HTTP/1.1 201 Created
Location: http://<IP>:<PORT>/redfish/v1/StorageServices/NVMeoE1/Volumes/2
((created resource body))
```

Or (when task is created):

```
HTTP/1.1 202 Accepted
Location: http://<IP:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "New",
  "StartTime": "2016-09-01T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```



4.12.1.5 DELETE

The DELETE operation is not allowed on the volume collection of resources.

4.13 Volume

The volume resource represents a block-addressable container of storage, referred to as a Logical Unit, LU, LUN, or [StorageVolume](#) in the storage industry. Volumes represent block-addressable capacity that is conformant to a [ClassOfService](#). Properties details are discussed in the [Volume_v1.xml](#) metadata file. [Table 24](#) describes the Volume attributes. In addition, [Table 25](#) shows the ReplicaInfo attributes, [Table 26](#) shows the Capacity attributes, [Table 27](#) describes the Links attribute, and [Table 28](#) shows the Intel® RSD OEM extensions volume attributes.

Table 24. Volume Attributes

Attribute	Type	Nullable	Description
Status	Resource.Status	False	-
CapacityBytes	Edm.Int64	True	This property shall contain the size in bytes of the associated volume.
Volume Type	Volume.v1_0_0.VolumeType	True	This property shall contain the type of the associated Volume. Deprecated: Deprecated in favor of explicit use of RAIDType.
Encrypted	Edm.Boolean	True	This property shall contain a Boolean indicator if the Volume is currently utilizing encryption or not.
Encryption Types	Collection(Volume.v1_0_0.EncryptionTypes)	False	This property shall contain the types of encryption used by this Volume.
Identifiers	Collection(Resource.Identifier)	False	This property shall contain a list of all known durable names for the associated volume.
BlockSizeBytes	Edm.Int64	True	This property shall contain the size of the smallest addressable unit of the associated volume.
Operations	Collection(Volume.v1_0_0.Operation)	False	This property shall contain a list of all currently running on the Volume.
OptimumIOSizeBytes	Edm.Int64	True	This property shall contain the optimum I/O size to use when performing I/O on this volume. For logical disks, this is the stripe size. For physical disks, this describes the physical sector size.
Links	Volume.v1_0_0.Links	False	The Links property, as described by the Redfish Specification, refer to Table 2 shall contain references to resources that are related to, but not contained by (subordinate to), this resource.
Actions	Volume.v1_0_0.Actions	False	The Actions property shall contain the available actions for this resource.
AccessCapabilities	Collection(DataStorageLsoSCapabilities.StorageAccessCapability)	True	Each entry shall specify a current storage access capability.
MaxBlockSizeBytes	Edm.Int32	True	This property shall contain the size of the largest addressable unit of this storage volume.



Attribute	Type	Nullable	Description
Capacity	Capacity.Capacity	True	Information about the utilization of capacity allocated to this storage volume.
LowSpaceWarningThresholdPercents	Collection (Edm.Int64)	True	Each time the following value is less than one of the values in the array the <code>LOW_SPACE_THRESHOLD_WARNING</code> event shall be triggered: Across all <code>CapacitySources</code> entries, $\text{percent} = (\text{SUM}(\text{AllocatedBytes}) - \text{SUM}(\text{ConsumedBytes})) / \text{SUM}(\text{AllocatedBytes})$.
Manufacturer	Edm.String	True	This property shall contain a value that represents the manufacturer or implementer of the storage volume.
Model	Edm.String	True	The value is assigned by the manufacturer and shall represent a specific storage volume implementation.
ReplicaInfos	Collection (StorageReplicaInfo.ReplicaInfo)	True	This property shall describe the replica relationship between this storage volume and a corresponding source and/or target volume.
CapacitySources	Collection (Capacity.CapacitySource)	True	Fully or partially consumed storage from a source resource. Each entry provides capacity allocation information from a named source resource.
StorageGroups	StorageGroupCollection.StorageGroupCollection	True	The value of this property shall contain references to all storage groups that include this volume.
AllocatedPools	StoragePoolCollection.StoragePoolCollection	True	The value of this property shall contain references to all storage pools allocated from this volume.
IOStatistics	IOStatistics.IOStatistics	True	The value shall represent IO statistics for this volume.
RemainingCapacityPercent	Edm.Int64	True	If present, this value shall return $\{ (\text{SUM}(\text{AllocatedBytes}) - \text{SUM}(\text{ConsumedBytes})) / \text{SUM}(\text{AllocatedBytes}) \} * 100$ represented as an integer value.
ReplicaTargets	Collection (Resource.Item)	True	The value shall reference the target replicas that are sourced by this replica.
RAIDType	Volume.RAIDType	True	This property shall contain the RAID type of the associated Volume.

Table 25. ReplicaInfo Attributes

Attribute	Type	Nullable	Description
ReplicaPriority	StorageReplicaInfo.v1_0_0.ReplicaPriority	True	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.
ReplicaReadOnlyAccess	StorageReplicaInfo.v1_0_0.ReplicaReadOnlyAccesses	True	The enumeration literal shall specify whether the source, the target, or both elements are read only to the host.



Attribute	Type	Nullable	Description
UndiscoveredElement	StorageReplicaInfo.v1_0_0.UndiscoveredElement	True	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.
WhenSynced	Edm.String	True	The value shall be a <i>Date and time format</i> – ISO 8601 conformant time of day that specifies when the elements were synchronized, refer to Table 2 .
SyncMaintained	Edm.Boolean	True	If true, Synchronization shall be maintained. The default value for this property is false.
ReplicaRecoveryMode	StorageReplicaInfo.v1_0_0.ReplicaRecoveryMode	True	The enumeration literal shall specify whether the copy operation continues after a broken link is restored.
ReplicaUpdateMode	StorageReplicaInfo.ReplicaUpdateMode	True	The enumeration literal shall specify whether the target elements will be updated synchronously or asynchronously.
PercentSynced	Edm.Int64	True	Specifies the percent of the work completed to reach synchronization. Shall not be instantiated if an 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.
FailedCopyStopsHostIO	Edm.Boolean	True	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.
WhenActivated	Edm.String	True	The value shall be a <i>Date and time format</i> – 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, refer to Table 2 . This property shall be null if the implementation is not capable of providing this information.
WhenDeactivated	Edm.String	True	The value shall be a <i>Date and time format</i> – ISO 8601 conformant time of day that specifies when the replication relationship is deactivated, refer to Table 2 . Do not instantiate this property if an implementation is not capable of providing this information.
WhenEstablished	Edm.String	True	The value shall be a <i>Date and time format</i> – 8601 conformant time of day that specifies when the replication relationship is established, refer to Table 2 . Do not instantiate this property if the implementation is not capable of providing this information.



Attribute	Type	Nullable	Description
WhenSuspended	Edm.String	True	The value shall be a <i>Date and time format</i> – 8601 conformant time of day that specifies when the replication relationship is suspended, refer to Table 2 . Do not instantiate this property if the implementation is not capable of providing this information.
WhenSynchronized	Edm.String	True	The value shall be a <i>Date and time format</i> – 8601 conformant time of day that specifies when the replication relationship is synchronized, refer to Table 2 . Do not instantiate this property if the implementation is not capable of providing this information.
ReplicaSkewBytes	Edm.Int64	True	Applies to Adaptive mode and it describes the 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.
ReplicaType	StorageReplicaInfo.ReplicaType	True	The ReplicaType enumeration literal shall describe the intended outcome of the replication.
ReplicaProgressStatus	StorageReplicaInfo.v1_0_0.ReplicaProgressStatus	True	The ReplicaProgressStatus enumeration literal shall specify the status of the session with respect to Replication activity.
ReplicaState	StorageReplicaInfo.v1_0_0.ReplicaState	True	The ReplicaState enumeration literal shall specify the state of the relationship with respect to Replication activity.
RequestedReplicaState	StorageReplicaInfo.v1_0_0.ReplicaState	True	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.
ConsistencyEnabled	Edm.Boolean	True	If true, consistency shall be enabled across the source and its associated target replica(s). The default value for this property is false.
ConsistencyType	StorageReplicaInfo.v1_0_0.ConsistencyType	True	The ConsistencyType enumeration literal shall indicate the consistency type used by the source and its associated target group.
ConsistencyState	StorageReplicaInfo.v1_0_0.ConsistencyState	True	The ConsistencyState enumeration literal shall indicate the current state of consistency.
ConsistencyStatus	StorageReplicaInfo.v1_0_0.ConsistencyStatus	True	The ConsistencyStatus enumeration literal shall specify the current status of consistency. Consistency may have been disabled or is experiencing an error condition.
ReplicaRole	StorageReplicaInfo.v1_0_0.ReplicaRole	True	The ReplicaRole enumeration literal shall represent the source or target role of this replica as known to the containing resource.



Attribute	Type	Nullable	Description
Replica	Resource.Item	True	The value shall reference the resource that is the source of this replica.

Table 26. Capacity Attributes

Attribute	Type	Nullable	Description
Data	Capacity.v1_0_0.CapacityInfo	True	The value shall be capacity information relating to provisioned user data.
Metadata	Capacity.v1_0_0.CapacityInfo	True	The value shall be capacity information relating to the provisioned system (non-user accessible) data.
Snapshot	Capacity.v1_0_0.CapacityInfo	True	The value shall be capacity information relating to provisioned snapshot or backup data.
IsThinProvisioned	Edm.Boolean	True	If the value is false, the capacity shall be fully allocated. The default value shall be false.

Table 27. Links Attributes

Attribute	Type	Nullable	Description
Drives	Collection(Drive.Drive)	True	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 that are currently members of the Volume, not hot spare Drives that are not currently a member of the volume.

Intel® RSD OEM extensions:**Table 28. Volume Attributes for Intel® RSD OEM Extensions**

Attribute	Type	Nullable	Description
Bootable	Edm.Boolean	True	This property provides information about the bootable capability of the volume.
Assigned	Edm.Boolean	True	This property determines if the volume is reserved for usage by a specific host, user or service, for example for an NVMe-oF* Initiator.
EraseOnDetach	Edm.Boolean	True	This property shall represent the state of policy for protecting data stored on a drive connected to an initiator host. If set to null, it is interpreted as true. Deprecated: This value has been deprecated. Volume will be erased by default, to prevent it from being erased, the administrator should detach the volume from a node first.
Erased	Edm.Boolean	True	This property shall be set to true if the volume was erased. Deprecated: This value has been deprecated. Volumes are automatically erased after node is being deleted.



Attribute	Type	Nullable	Description
Metrics	VolumeMetrics.VolumeMetrics	False	A reference to the metrics associated with this volume.

4.13.1 Operations

4.13.1.1 GET

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/Volumes/1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Volume.Volume",
  "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/Volumes/1",
  "@odata.type": "#Volume.v1_2_0.Volume",
  "Description": "Volume description",
  "Id": "1",
  "Model": null,
  "Manufacturer": null,
  "Name": "nvmeInlp1",
  "AccessCapabilities": [
    "Read",
    "Write"
  ],
  "CapacityBytes": 3071983104,
  "Actions": {
    "#Volume.Initialize": {
      "target":
"/redfish/v1/StorageServices/NVMeoE1/Volumes/1/Actions/Volume.Initialize"
    },
    "Oem": {}
  },
  "Capacity": { "@odata.type": "#Capacity.v1_0_0.Capacity",
    "Data": {
      "AllocatedBytes": 3071983104
    }
  },
  "CapacitySources": [
    {
      "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/Volumes/1/CapacitySources/1"
    }
  ],
  "Identifiers": [
    {
      "@odata.type": "#Resource.v1_1_0.Identifier",
      "DurableName": "397f9b78-7e94-11e7-9ea4-001e67dfa170",
      "DurableNameFormat": "UUID"
    }
  ],
  "Links": {
    "Oem": {
      "Intel_RackScale": {
        "@odata.type": "#Intel.Oem.VolumeLinks",
        "Endpoints": [
```



```
{
  "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/1"
}
],
"Drives": []
},
"ReplicaInfos": [
  {
    "@odata.type": "#StorageReplicaInfo.v1_0_0.ReplicaInfo",
    "ReplicaReadOnlyAccess": "SourceElement",
    "ReplicaType": "Snapshot",
    "ReplicaRole": "Target",
    "Replica": {
      "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/Volumes/2"
    }
  }
],
"Status": {
  "Health": "OK",
  "HealthRollup": "OK",
  "State": "Enabled"
},
"Oem": {
  "Intel_RackScale": {
    "@odata.type": "#Intel.Oem.Volume",
    "Bootable": false,
    "Assigned": true,
    "Metrics": {
      "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/Volumes/1/Metrics"
    }
  }
}
}
```

4.13.1.2 PUT

The PUT operation is not allowed on the volume resource.

4.13.1.3 PATCH

[Table 29](#) shows the volume of PATCH properties.

Table 29. CapacityInfo Attributes

Attribute	Type	Nullable	Description
AllocatedBytes	Edm.Int64	True	The value shall be the number of bytes currently allocated by the storage system in this data store for this data type.

The OEM object property described in [Table 30](#) can be patched:

Table 30. Volume Attribute

Attribute	Type	Nullable	Description
Bootable	Edm.Boolean	True	This property provides information about the bootable capability of the volume.

**Request:**

```
PATCH /redfish/v1/StorageServices/NVMeoE1/Volumes/1
Content-Type: application/json
{
  "Capacity": {
    "Data": {
      "AllocatedBytes": 20740833280
    }
  },
  "Oem": {
    "Intel_RackScale": {
      "Bootable": true
    }
  }
}
```

Response:

```
HTTP/1.1 200 OK
((updated resource body))
```

Or:

```
HTTP/1.1 204 No Content
{}
```

Or (when task is created):

```
HTTP/1.1 202 Accepted
Location: http://<IP:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": " New",
  "StartTime": "2016-09-01T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```

4.13.1.4 POST

The Actions parameter is used for volume initialization (erase). [Table 31](#) shows the volume POST `InitializeType` attributes.

Table 31. InitializeType Attributes

Attribute	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.

Request:

```
POST /redfish/v1/StorageServices/NVMeoE1/Volumes/1/Actions/Volume.Initialize
Content-Type: application/json
{
  "InitializeType": "Slow"
}
```

**Response:**

```
HTTP/1.1 204 No Content
```

Or (when task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip>:<port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "New",
  "StartTime": "2016-09-01T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```

4.13.1.5 DELETE

Request:

```
DELETE redfish/v1/StorageServices/NVMeoE1/Volumes/2
```

Response:

```
HTTP/1.1 204 No Content
```

Or (when a task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "New",
  "StartTime": "2017-12-06T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```

4.14 Volume Metrics

Volume metrics contains metrics, health data and lifetime information describing a single volume of a physical disk drive. Details of this resource are described in the `VolumeMetrics_v1.xml` metadata file. [Table 32](#) describes the `VolumeMetrics` attribute.

Table 32. VolumeMetrics Attributes

Attribute	Type	Nullable	Description
<code>CapacityUsedBytes</code>	<code>Edm.Int64</code>	True	This property shall contain the size in bytes of the volume's capacity used for storing files.



4.14.1 Operations

4.14.1.1 GET

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/Volumes/1/Metrics
Content-Type: application/json
```

Response:

```
{
  "@odata.context":
"/redfish/v1/$metadata#StorageServices/Members/1/Volume/Metrics/$entity",
  "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/Volumes/1/Metrics",
  "@odata.type": "#VolumeMetrics.v1_0_0.VolumeMetrics",
  "Name": "Volume Metrics",
  "Description": "Metrics for Volume 1",
  "Id": "Metrics",
  "CapacityUsedBytes": 6799708160
}
```

4.14.1.2 PUT

The PUT operation is not allowed on the volume metrics resource.

4.14.1.3 PATCH

The PATCH operation is not allowed on the volume metrics resource.

4.14.1.4 POST

The POST operation is not allowed on the volume metrics resource.

4.14.1.5 DELETE

The DELETE operation is not allowed on the volume metrics resource.

4.15 CapacitySource

The [CapacitySource](#) resource represents the capacity composing a [StoragePool](#) or a Volume resource. Properties details are available in the [Capacity_v1.xml](#) metadata file. [Table 33](#) describes the [CapacitySource](#) attributes.

Table 33. CapacitySource Attributes

Attribute	Type	Nullable	Description
ProvidedCapacity	Capacity.v1_0_0.Capacity	True	The value shall be the amount of space that has been provided from the ProvidingDrives , ProvidingVolumes , ProvidingMemory or ProvidingPools .
ProvidedClassOfService	ClassOfService.ClassOfService	True	The value shall reference the provided ClassOfService from the ProvidingDrives , ProvidingVolumes , ProvidingMemoryChunks , ProvidingMemory or ProvidingPools .



Attribute	Type	Nullable	Description
ProvidingVolumes	VolumeCollection.VolumeCollection	True	If present, the value shall be a reference to a contributing volume or volumes.
ProvidingPools	StoragePoolCollection.StoragePoolCollection	True	If present, the value shall be a reference to a contributing storage pool or storage pools.
ProvidingDrives	DriveCollection.DriveCollection	True	If present, the value shall be a reference to a contributing drive or drives.
ProvidingMemoryChunks	MemoryChunksCollection.MemoryChunksCollection	True	If present, the value shall be a reference to the contributing memory chunks.
ProvidingMemory	MemoryCollection.MemoryCollection	True	If present, the value shall be a reference to the contributing memory.

4.15.1 Operations

4.15.1.1 GET (CapacitySource for StoragePool)

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/StoragePools/2/CapacitySources/1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Capacity.CapacitySource",
  "@odata.id": "/redfish/v1/StorageServices/1/StoragePools/2/CapacitySources/1",
  "@odata.type": "#Capacity.v1_1_0.CapacitySource",
  "Description": "Storage pool capacity source",
  "Id": "1",
  "Name": "CapacitySource",
  "ProvidingDrives": {
    "@odata.id":
"/redfish/v1/StorageServices/1/StoragePools/2/CapacitySources/1/ProvidingDrives"
  },
  "ProvidedCapacity": {
    "Data": {
      "AllocatedBytes": 512174850048,
      "ConsumedBytes": 3071983104
    }
  },
  "Oem": {},
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  }
}
```

4.15.1.2 GET (CapacitySource for Volume)

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/Volumes/1/CapacitySources/1
Content-Type: application/json
```

**Response:**

```
{
  "@odata.context": "/redfish/v1/$metadata#Capacity.CapacitySource",
  "@odata.id": "/redfish/v1/StorageServices/1/Volumes/1/CapacitySources/1",
  "@odata.type": "#Capacity.v1_1_0.CapacitySource",
  "Description": "Volume capacity source",
  "Id": "1",
  "Name": "CapacitySource",
  "ProvidingPools": {
    "@odata.id":
"/redfish/v1/StorageServices/1/Volumes/1/CapacitySources/1/ProvidingPools"
  },
  "ProvidedCapacity": {
    "Data": {
      "AllocatedBytes": 3071983104
    }
  },
  "Oem": {},
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  }
}
```

4.15.1.3 PUT

The PUT operation is not allowed on the capacity source resource.

4.15.1.4 PATCH

The PATCH operation is not allowed on the capacity source resource.

4.15.1.5 POST

The POST operation is not allowed on the capacity source resource.

4.15.1.6 DELETE

The DELETE operation is not allowed on the capacity source resource.

4.16 Providing Drives

This collection shall contain references to all Drive resource instances providing storage capacity to the same Capacity Source. Details of this resource are described in the [DriveCollection_v1.xml](#) metadata file. [Table 34](#) describes the [DriveCollection](#) attribute.

Table 34. DriveCollection Attributes

Attribute	Type	Nullable	Description
Members	Collection(Drive.Drive)	True	The value of each entry of this property shall reference a Drive resource.



4.16.1 Operations

4.16.1.1 GET

Request:

```
GET
/redfish/v1/StorageServices/NVMeoEl/StoragePools/2/CapacitySources/1/ProvidingDrives
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#DriveCollection.DriveCollection",
  "@odata.id":
"/redfish/v1/StorageServices/1/StoragePools/2/CapacitySources/1/ProvidingDrives",
  "@odata.type": "#DriveCollection.v1_0_0.DriveCollection",
  "Name": "Drives Providing Capacity",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Chassis/1/Drives/2"
    }
  ]
}
```

4.16.1.2 PUT

The PUT operation is not allowed on the providing drives collection.

4.16.1.3 PATCH

The PATCH operation is not allowed on the providing drives collection.

4.16.1.4 POST

The POST operation is not allowed on the providing drives collection.

4.16.1.5 DELETE

The DELETE operation is not allowed on the providing drives collection.

4.17 Providing Pools

This collection shall contain references to all Storage Pool resource instances providing storage capacity to the same Capacity Source. Details of this resource are described in the [StoragePoolCollection_v1.xml](#) metadata file. [Table 40](#) describes the [StoragePoolCollection](#) attribute.

Table 35. StoragePoolCollection Attributes

Attribute	Type	Nullable	Description
Members	Collection(StoragePool.StoragePool)	True	The value of each member entry shall reference a StoragePool resource.



4.17.1 Operations

4.17.1.1 GET

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/Volumes/1/CapacitySources/1/ProvidingPools
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#StoragePools",
  "@odata.id":
"/redfish/v1/StorageServices/1/Volumes/1/CapacitySources/1/ProvidingPools",
  "@odata.type": "#StoragePoolCollection.StoragePoolCollection",
  "Description": "Collection of Storage Pools Providing Capacity for a Volume",
  "Members": [
    {
      "@odata.id": "/redfish/v1/StorageServices/1/StoragePools/2"
    }
  ],
  "Members@odata.count": 1,
  "Name": "StoragePools Providing Capacity"
}
```

4.17.1.2 PUT

The PUT operation is not allowed on the providing pools collection.

4.17.1.3 PATCH

The PATCH operation is not allowed on the providing pools collection.

4.17.1.4 POST

The POST operation is not allowed on the providing pools collection.

4.17.1.5 DELETE

The DELETE operation is not allowed on the providing pools collection.

4.18 Drive Collection

The drive collection shall contain references to all drive resources connected to the storage service. Details of this resource are described in the [DriveCollection_v1.xml](#) metadata file. [Table 36](#) describes the [DriveCollection](#) attribute.

Table 36. DriveCollection Attributes

Attribute	Type	Nullable	Description
Members	Collection (Drive.Drive)	True	The value of each entry of this property shall reference a Drive resource.



4.18.1 Operations

4.18.1.1 GET

Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/Drives
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#DriveCollection.DriveCollection",
  "@odata.id": "/redfish/v1/StorageServices/NVMeoE1/Drives",
  "@odata.type": "#DriveCollection.v1_0_0.DriveCollection",
  "Name": "Drives",
  "Members@odata.count": 2,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Chassis/1/Drives/1"
    },
    {
      "@odata.id": "/redfish/v1/Chassis/1/Drives/2"
    }
  ]
}
```

4.18.1.2 PUT

The PUT operation is not allowed on the drive collection of resources.

4.18.1.3 PATCH

The PATCH operation is not allowed on the drive collection of resources.

4.18.1.4 POST

The POST operation is not allowed on the drive collection of resources.

4.18.1.5 DELETE

The DELETE operation is not allowed on the drive collection of resources.

4.19 Drive

The drive contains properties describing a single physical disk drive for any system. Details of this resource are described in the [Drive.xml](#) metadata file. The OEM extensions details are available in [IntelRackScaleOem_v1.xml](#). [Table 37](#) describes the Drive attributes. In addition, [Table 38](#) describes the Location attributes, [Table 39](#) describes the Identifier attributes, [Table 40](#) describes the Protocol attributes, and [Table 41](#) describes the Media Type attributes. The Intel® RSD OEM extensions Drive attributes are shown in [Table 42](#).

**Table 37. Drive Attributes**

Attribute	Type	Nullable	Description
StatusIndicator	Drive.v1_0_0.StatusIndicator	True	The value of this property shall contain the status indicator state for the status indicator associated with this drive. The valid values for this property are specified through the Redfish.AllowableValues annotation.
IndicatorLED	Resource.IndicatorLED	True	This value of this property shall contain the indicator light state for the indicator light associated with this drive.
Model	Edm.String	True	The value of this property shall be the name by that the manufacturer generally refers to the drive.
Revision	Edm.String	True	This property shall contain the revision as defined by the manufacturer for the associated drive.
Status	Resource.Status	False	-
CapacityBytes	Edm.Int64	True	This property shall contain the raw size in bytes of the associated drive.
FailurePredicted	Edm.Boolean	True	This property shall contain failure information as defined by the manufacturer for the associated drive.
Protocol	Protocol.Protocol	True	This property shall contain the protocol the associated drive is using to communicate to the storage controller for this system.
MediaType	Drive.v1_0_0.MediaType	True	This property shall contain the type of media contained in the associated drive.
Manufacturer	Edm.String	True	The value of this property shall be the name of the organization responsible for producing the drive. This organization might be the entity from whom the drive is purchased, but this is not necessarily true.
SKU	Edm.String	True	The value of this property shall be the stock-keeping unit number for this drive.
SerialNumber	Edm.String	True	The value of this property shall be a manufacturer-allocated number used to identify the drive.
PartNumber	Edm.String	True	The value of this property shall be a part number assigned by the organization that is responsible for producing or manufacturing the drive.
AssetTag	Edm.String	True	The value of this property shall be an identifying string used to track the drive for inventory purposes.
Identifiers	Collection (Resource.Identifier)	False	This property shall contain a list of all known durable names for the associated drive.
Location	Collection (Resource.Location)	False	This property shall contain location information of the associated drive.



Attribute	Type	Nullable	Description
HotspareType	Drive.v1_0_0.HotspareType	True	This property shall contain the hot spare type for the associated drive. If the drive is currently serving as a hot spare its <code>Status.State</code> field shall be 'StandbySpare' and 'Enabled' when it is being used as part of a Volume.
EncryptionAbility	Drive.v1_0_0.EncryptionAbility	True	This property shall contain the encryption ability for the associated drive.
EncryptionStatus	Drive.v1_0_0.EncryptionStatus	True	This property shall contain the encryption status for the associated drive.
RotationSpeedRPM	Edm.Decimal	True	This property shall contain rotation speed of the associated drive.
BlockSizeBytes	Edm.Int64	True	This property shall contain the size of the smallest addressable unit of the associated drive.
CapableSpeedGbs	Edm.Decimal	True	This property shall contain the fastest capable bus speed of the associated drive.
NegotiatedSpeedGbs	Edm.Decimal	True	This property shall contain the current bus speed of the associated drive.
PredictedMediaLifeLeftPercent	Edm.Decimal	True	This property shall contain an indicator of the percentage of life remaining in the Drive's media.
Links	Drive.v1_0_0.Links	False	The Links property, as described by the Redfish Specification, Table 2 , shall contain references to resources that are related to, but not contained by (subordinate to), this resource.
Actions	Drive.v1_0_0.Actions	False	The <code>Actions</code> property shall contain the available actions for this resource.
Operations	Collection(Drive.v1_1_0.Operations)	False	This property shall contain a list of all operations currently running on the Drive.
Assembly	Assembly.Assembly	False	The value of this property shall be a link to a resource of type Assembly.
PhysicalLocation	Resource.Location	False	This property shall contain location information of the associated drive.
HotspareReplacementMode	Drive.v1_5_0.HotspareReplacementModeType	True	This property shall specify if a commissioned hotspare will continue to serve as a hotspare once the failed drive is replaced.

Table 38. Location Attributes

Attribute	Type	Nullable	Description
Info	Edm.String	True	This property shall represent the location of the resource.
InfoFormat	Edm.String	True	This property shall represent the format of the Info property.
Oem	Resource.Oem	False	-

**Table 39. Identifier Attributes**

Attribute	Type	Nullable	Description
<code>DurableName</code>	<code>Edm.String</code>	True	This property shall contain the world wide unique identifier for the resource. The string shall be in the format described by the value of the <code>Identifier.DurableNameFormat</code> property.
<code>DurableNameFormat</code>	<code>Resource.v1_1_0.DurableNameFormat</code>	True	This property shall represent the format of the <code>DurableName</code> property.

Table 40. Protocol Attributes

Attribute	Description
PCIe*	This value shall mean that this device conforms to the PCI-SIG PCIexpress Base Specification only beyond that it uses some vendor proprietary mechanism to communicate.
AHCI	This value shall mean that this device conforms to the Intel Advanced Host Controller Interface Specification.
UHCI	This value shall mean that this device conforms to the Intel Universal Host Controller Interface Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface specification.
SAS	This value shall mean that this device conforms to the T10 SAS Protocol Layer Specification.
SATA	This value shall mean that this device conforms to the Serial ATA International Organization Serial ATA Specification.
USB	This value shall mean that this device conforms to the USB Implementers Forum Universal Serial Bus Specification.
NVMe	This value shall mean that this device conforms to the Non-Volatile Memory Host Controller Interface Specification.
FC	This value shall mean that this device conforms to the T11 Fibre Channel Physical and Signaling Interface Specification.
iSCSI	This value shall mean that this device conforms to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
FCoE	This value shall mean that this device conforms to the T11 FC-BB-5 Specification.
FCP	This enumeration literal shall indicate the INCITS 481: Information technology - Fibre Channel Protocol for SCSI. The Fibre Channel SCSI Protocol.
FICON	This enumeration literal shall indicate the (ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. FICON (Fibre CONnection) is the IBM proprietary name for this protocol.
NVMe-over Fabrics	This value shall mean that this device conforms to the NVM Express over Fabrics Specification.
SMB	This value shall mean that this device conforms to the Microsoft Server Message Block Protocol.
NFSv3	This value shall mean that this device conforms to the Network File System protocol as defined by RFC 1813.
NFSv4	This value shall mean that this device conforms to the Network File System protocol as defined by RFC 3010 or RFC 5661.
HTTP	This value shall mean that this device conforms to the Hypertext Transfer protocol as defined by RFC 2068 or RFC 2616.
HTTPS	This value shall mean that this device conforms to the Hypertext Transfer protocol as defined by RFC 2068 or RFC 2616 utilizing Transport Layer Security as specified by RFC 5246 or RFC 6176.
FTP	This value shall mean that this device conforms to the File Transfer protocol as defined by RFC 114.



Attribute	Description
SFTP	This value shall mean that this device conforms to the File Transfer protocol as defined by RFC 114 utilizing Transport Layer Security as specified by RFC 5246 or RFC 6176.
iWARP	This value shall mean that this device conforms to the iWARP protocol as defined by RFC 5042 utilizing Transport Layer mechanisms as specified by RFC 5043 or RFC 5044.
RoCE	This value shall mean that this device conforms to the RDMA over Converged Ethernet protocol as defined by the Infiniband Architecture Specification.
RoCEv2	This value shall mean that this device conforms to the RDMA over Converged Ethernet version 2 protocol as defined by the Infiniband Architecture Specification.
I2C	This value shall mean that this device conforms to the NXP Semiconductors I2C-bus Specification.
OEM	This value shall mean that this device conforms to an OEM specific architecture and additional information may be included in the OEM section.

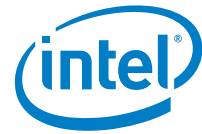
Table 41. Media Type Attributes

Attribute	Description
HDD	The drive media type is traditional magnetic platters.
SSD	The drive media type is solid state or flash memory.
SMR	The drive media type is shingled magnetic recording.

Intel® RSD OEM extensions:

Table 42. Drive Attributes

Attribute	Type	Nullable	Description
EraseOnDetach	Edm.Boolean	True	This property shall represent the state of policy for protecting data stored on drive connected to PCI switch. If set to null it is interpreted as it would be set to true. Deprecated: This value has been deprecated, to prevent drive from being erased, the administrator should detach the drive from a node first.
DriveErased	Edm.Boolean	False	This property shall represent the erase state of the drive.
FirmwareVersion	Edm.String	True	This indicates the drive firmware version.
LatencyTrackingEnabled	Edm.Boolean	True	This indicates if latency tracking is enabled in drive firmware.
Storage	Storage.Storage	True	A reference to the storage controller where this drive is connected.
PCIeFunction	PCIeFunction.PCIeFunction	True	A reference to the PCIe function that provides this drive functionality.
UsedBy	Collection(StoragePool.StoragePool)	True	The value of this property shall be a reference to the resources that this drive is associated with and shall reference a resource of the type storage pool.
Metrics	DriveMetrics.DriveMetrics	False	A reference to the Metrics associated with this Drive.



4.19.1 Operations

4.19.1.1 GET

Request:

```
GET /redfish/v1/Chassis/1/Drives/2
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Drive.Drive",
  "@odata.id": "/redfish/v1/Chassis/1/Drives/2",
  "@odata.type": "#Drive.v1_4_0.Drive",
  "Name": "nvme2",
  "Id": "2",
  "Protocol": "NVMe",
  "Type": "NVMe",
  "MediaType": "SSD",
  "CapacityBytes": 2442408680913,
  "Manufacturer": "Intel Corporation",
  "Model": "E323",
  "Revision": null,
  "SKU": null,
  "SerialNumber": "123fed3029c-b23394-121",
  "PartNumber": null,
  "AssetTag": null,
  "RotationSpeedRPM": null,
  "Identifiers": [],
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Oem": {
    "Intel_RackScale": {
      "odata.type": "Intel.Oem.Drive",
      "DriveErased": false,
      "FirmwareVersion": "1.0",
      "LatencyTrackingEnabled": false,
      "Storage": null,
      "PCIeFunction": null,
      "UsedBy": [
        {
          "@odata.id": "/redfish/v1/StorageServices/1/StoragePools/2"
        }
      ]
    }
  },
  "Links": {
    "odata.type": "Drive.v1_2_0.Links",
    "Chassis": {
      "@odata.id": "/redfish/v1/Chassis/1"
    },
    "Oem": {},
    "Volumes": [],
    "Endpoints": []
  },
  "StatusIndicator": null,
```



```
"IndicatorLED": null,
"CapableSpeedGbs": null,
"NegotiatedSpeedGbs": null,
"PredictedMediaLifeLeftPercent": 95,
"Actions": {
  "Oem": {}
}
```

4.19.1.2 PUT

The PUT operation is not allowed on the drive resource.

4.19.1.3 PATCH

The OEM object properties listed in [Table 43](#) can be updated by the PATCH operation.

Table 43. Drive Attributes Updatable by PATCH

Attribute	Type	Nullable	Description
LatencyTrackingEnabled	Edm.Boolean	True	This indicates if latency tracking is enabled in drive firmware.

Request:

```
PATCH /redfish/v1/Chassis/1/Drives/1
Content-Type: application/json
{
  "Oem": {
    "Intel_RackScale": {
      "LatencyTrackingEnabled": true
    }
  }
}
```

Response:

```
HTTP/1.1 204 No Content
```

Or:

```
HTTP/1.1 200 OK
((updated resource body))
```

Or (when task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "New",
  "StartTime": "2016-09-01T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```



4.19.1.4 POST

The POST operation is not allowed on the drive resource.

4.19.1.5 DELETE

Request:

```
DELETE redfish/v1/Chassis/1/Drives/1
```

Response:

```
HTTP/1.1 204 No Content
```

Or (when a task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "New",
  "StartTime": "2017-12-06T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```

4.20 Drive Metrics

Drive metrics include metrics, health data, and lifetime information describing a single physical disk drive. Details of this resource are described in the [DriveMetrics_v1.xml](#) metadata file. Table 44 describes the [DriveMetrics](#) attributes. In addition, [Table 45](#) describes the [LifeTime](#) attributes, and [Table 46](#) describes the [HealthData](#) attributes. OEM properties for Latency are described in [Table 47](#), for [IOSubmissionQueue](#) in [Table 48](#), and for [IOCompletionQueue](#) in [Table 49](#).

Table 44. DriveMetrics Attributes

Attribute	Type	Nullable	Description
TemperatureKelvin	Edm.Decimal	True	The value of this property shall be the temperature of the Drive resource in Kelvin degrees.
LifeTime	DriveMetrics.v1_0_0.LifeTime	false	This object shall contain properties which describe the LifeTime metrics for the current resource.
HealthData	DriveMetrics.v1_0_0.HealthData	false	This object shall contain properties which describe the HealthData metrics for the current resource.
ReadsLatencyHistogram	DriveMetrics.v1_0_0.LatencyHistogram	false	The value of this property shall provide a way to track latencies experienced internally by the controller for reading commands.
WritesLatencyHistogram	DriveMetrics.v1_0_0.LatencyHistogram	false	The value of this property shall provide a way to track latencies experienced internally by the controller for write commands.



NOTE: `LatencyHistogram` is an extensible type which can contain any number of properties representing histogram buckets. Refer to Section [4.20.1.1](#) GET for an example histogram object.

Table 45. LifeTime Attributes

Attribute	Type	Nullable	Description
<code>UnitSizeBytes</code>	<code>Edm.Int64</code>	True	The value of this property shall be the size of a unit (the value is reported in bytes) that is utilized by <code>UnitRead</code> / <code>UnitWrite</code> properties as a basic unit.
<code>UnitsRead</code>	<code>Edm.Decimal</code>	True	The value of this property shall be a number of units of a size <code>UnitSizeBytes</code> read since reset. This can be used to compute average bandwidth by polling the drive at regular intervals.
<code>UnitsWritten</code>	<code>Edm.Decimal</code>	True	The value of this property shall be a number of units of a size <code>UnitSizeBytes</code> written since reset. This can be used to compute average bandwidth by polling the drive at regular intervals.
<code>HostReadCommands</code>	<code>Edm.Decimal</code>	True	The value of this property shall be a number of read commands completed by Disk controller since reset. For NVMe Disk controller specifically, this is the number of Compare and Read commands.
<code>HostWriteCommands</code>	<code>Edm.Decimal</code>	True	The value of this property shall be a number of write commands completed by Disk controller since reset.
<code>PowerCycles</code>	<code>Edm.Decimal</code>	True	The value of this property shall be a number of power cycles of the physical drive.
<code>PowerOnHours</code>	<code>Edm.Decimal</code>	True	The value of this property shall be the number of hours the physical drive was powered on. This may not include the time that the controller was powered and remained in a non-operational power state.
<code>ControllerBusyTimeMinutes</code>	<code>Edm.Decimal</code>	True	The value of this property shall be the amount of time (in minutes) the drive controller is busy with I/O commands.

Table 46. HealthData Attributes

Attribute	Type	Nullable	Description
<code>AvailableSparePercentage</code>	<code>Edm.Decimal</code>	True	The value of this property shall be a normalized percentage (0 to 100%) of the remaining spare capacity available.
<code>PredictedMediaLifeUsedPercent</code>	<code>Edm.Decimal</code>	True	This property shall contain an indicator of the percentage of life remaining in the Drive's media.
<code>UnsafeShutdowns</code>	<code>Edm.Decimal</code>	True	The value of this property shall be a number of unsafe shutdowns of a drive.
<code>MediaErrors</code>	<code>Edm.Decimal</code>	True	The value of this property shall be a number of media and data integrity errors of a drive. This includes ECC, CRC checksum failure or LBA tag mismatch errors.

4.20.1 Operations

4.20.1.1 GET

Request:

```
GET /redfish/v1/Chassis/1/Drives/1/Metrics
Content-Type: application/json
```


**Response:**

```
{
  "@odata.context": "/redfish/v1/$metadata#Chassis/Members/1/Drive/Metrics/$entity",
  "@odata.id": "/redfish/v1/Chassis/1/Drives/1/Metrics",
  "@odata.type": "#DriveMetrics.v1_0_0.DriveMetrics",
  "Name": "Drive Metrics for Drive",
  "Description": "Metrics for Drive 1",
  "Id": "Metrics",
  "TemperatureKelvin": 318,
  "LifeTime": {
    "UnitSizeBytes": 512000,
    "UnitsRead": 1640,
    "UnitsWritten": 2,
    "HostReadCommands": 12344,
    "HostWriteCommands": 2323,
    "PowerCycles": 244,
    "PowerOnHours": 34566566,
    "ControllerBusyTimeMinutes": 545465665656
  },
  "HealthData": {
    "AvailableSparePercentage": 67,
    "PredictedMediaLifeUsedPercent": 120,
    "UnsafeShutdowns": 23,
    "MediaErrors": 10
  },
  "ReadsLatencyHistogram": {
    "From0To31MicroSeconds": 0,
    "From32To63MicroSeconds": 0,
    "From992To1023MicroSeconds": 0,
    "From1To2MilliSeconds": 0,
    "From2To3MilliSeconds": 0,
    "From31To32MilliSeconds": 0,
    "From32To63MilliSeconds": 0,
    "From64To95MilliSeconds": 0,
    "From992To1023MilliSeconds": 0,
    "From1024To2047MilliSeconds": 0,
    "From2048To4095MilliSeconds": 0,
    "From4096MilliSeconds": 0
  },
  "WritesLatencyHistogram": {
    "From0To31MicroSeconds": 0,
    "From32To63MicroSeconds": 0,
    "From992To1023MicroSeconds": 0,
    "From1To2MilliSeconds": 0,
    "From2To3MilliSeconds": 0,
    "From31To32MilliSeconds": 0,
    "From32To63MilliSeconds": 0,
    "From64To95MilliSeconds": 0,
    "From992To1023MilliSeconds": 0,
    "From1024To2047MilliSeconds": 0,
    "From2048To4095MilliSeconds": 0,
    "From4096MilliSeconds": 0
  }
}
```

4.20.1.2 PUT

The PUT operation is not allowed on drive metrics resource.



4.20.1.3 PATCH

The PATCH operation is not allowed on drive metrics resource.

4.20.1.4 POST

The POST operation is not allowed on drive metrics resource.

4.20.1.5 DELETE

The DELETE operation is not allowed on drive metrics resource.

4.21 Chassis Collection

Table 47 shows the `ChassisCollection` attribute.

Table 47. ChassisCollection Attributes

Attribute	Type	Nullable	Description
Members	Collection (Chassis.Chassis)	True	This property shall contain the members of this collection.

4.21.1 Operations

4.21.1.1 GET

Request:

```
GET /redfish/v1/Chassis
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Chassis",
  "@odata.id": "/redfish/v1/Chassis",
  "@odata.type": "#ChassisCollection.ChassisCollection",
  "Name": "Chassis Collection",
  "Description": "description-as-string",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Chassis/1"
    }
  ]
}
```

4.21.1.2 PUT

The PUT operation is not allowed on the chassis collection of resources.

4.21.1.3 PATCH

The PATCH operation is not allowed on the chassis collection of resources.



4.21.1.4 POST

The POST operation is not allowed on the chassis collection of resources.

4.21.1.5 DELETE

The DELETE operation is not allowed on the chassis collection of resources.

4.22 Chassis

This is the schema definition for the Chassis resource. It represents the properties for physical components for any system. This resource is intended to represent racks, rackmount servers, blades, standalone, modular systems, enclosures, and all other containers. The non-cpu/device centric parts of the schema are accessed either directly or indirectly through this resource.

Details of this resource are described in the [Chassis_v1.xml](#) metadata file. OEM extensions details are available in [IntelRackScaleOem_v1.xml](#). [Table 48](#) describes the [Chassis](#) attributes. In addition, [Table 49](#) describes the [Location](#) attribute, [Table 50](#) shows the [ChassisType](#) attribute values, and [Table 51](#) shows the Links attributes. For the Intel® RSD OEM Links extensions, [Table 52](#) shows the [ChassisLinks](#) attributes. For the Intel® RSD OEM extensions, [Table 53](#) describes the [Chassis](#) attribute.

Table 48. Chassis Attributes

Attribute	Type	Nullable	Description
ChassisType	Chassis.v1_0_0.ChassisType	False	ChassisType shall indicate the physical form factor for the type of chassis.
Manufacturer	Edm.String	True	The value of this property shall be the name of the organization responsible for producing the chassis. This organization might be the entity from whom the chassis is purchased, but this is not necessarily true.
Model	Edm.String	True	The value of this property shall be the name by that the manufacturer generally refers to the chassis.
SKU	Edm.String	True	The value of this property shall be the stock-keeping unit number for this chassis.
SerialNumber	Edm.String	True	The value of this property shall be a manufacturer-allocated number used to identify the chassis.
PartNumber	Edm.String	True	The value of this property shall be a part number assigned by the organization that is responsible for producing or manufacturing the chassis.
AssetTag	Edm.String	True	The value of this property shall be an identifying string used to track the chassis for inventory purposes.
IndicatorLED	Chassis.v1_0_0.IndicatorLED	True	This value of this property shall contain the indicator light state for the indicator light associated with this system.
Links	Chassis.v1_0_0.Links	False	The Links property, as described by the Redfish Specification, Table 2 shall contain references to resources that are related to, but not contained by (subordinate to), this resource.



Attribute	Type	Nullable	Description
Actions	Chassis.v1_0_0.Actions	False	The Actions property shall contain the available actions for this resource.
Status	Resource.Status	False	-
LogServices	LogServiceCollection.LogServiceCollection	False	The value of this property shall be a link to a collection of type LogServiceCollection .
Thermal	Thermal.Thermal	False	The value of this property shall be a reference to the resource that represents the thermal characteristics of this chassis and shall be of type Thermal.
Power	Power.Power	False	The value of this property shall be a reference to the resource that represents the power characteristics of this chassis and shall be of type Power.
PowerState	Chassis.v1_0_1.PowerState	True	The value of this property shall contain the power state of the chassis.
PhysicalSecurity	Chassis.v1_1_0.PhysicalSecurity	False	This value of this property shall contain the sensor state of physical security.
Location	Resource.Location	False	-
HeightMm	Edm.Decimal	True	The value of this property shall represent the height of the chassis (in millimeters) as specified by the manufacturer.
WidthMm	Edm.Decimal	True	The value of this property shall represent the width of the chassis (in millimeters) as specified by the manufacturer.
DepthMm	Edm.Decimal	True	The value of this property shall represent the depth (length) of the chassis (in millimeters) as specified by the manufacturer.
WeightKg	Edm.Decimal	True	The value of this property shall represent the published mass (commonly referred to as weight) of the chassis (in kilograms).
NetworkAdapters	NetworkAdapterCollection.NetworkAdapterCollection	False	The value of this property shall be a link to a collection of type NetworkAdapterCollection .
Assembly	Assembly.Assembly	False	The value of this property shall be a link to a resource of type Assembly.
UUID	Resource.UUID	True	The value of this property shall contain the universally unique identifier number for the chassis.
PCIESlots	PCIESlots.PCIESlots	false	The value of this property shall be a reference to the resource that represents the PCIe Slot information for this chassis and shall be of type PCIeSlot.
EnvironmentalClass	Chassis.v1_9_0.EnvironmentalClass	True	The value of this property shall be the ASHRAE Environmental Specification Class for this Chassis, as defined by ASHRAE Thermal Guidelines for Data Processing Environments. These classes define respective environmental limits which include temperature, relative humidity, dew point, and maximum allowable elevation.



Attribute	Type	Nullable	Description
Sensors	SensorCollection.SensorCollection	false	This property shall be a reference to a resource of type SensorCollection that contains the sensors located in the Chassis and sub-components.

Table 49. Location Attributes

Attribute	Type	Nullable	Description
Info	Edm.String	True	This property shall represent the location of the resource.
InfoFormat	Edm.String	True	This property shall represent the format of the Info property.
Oem	Resource.Oem	False	-

Table 50. Chassis Type Attributes

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



Table 51. ChassisType Attribute Values

Attribute	Type	Nullable	Description
ComputerSystems	Collection (ComputerSystem.ComputerSystem)	True	The value of this property shall be a reference to the resource that this physical container is associated with and shall reference a resource of type ComputerSystem . If a ComputerSystem is also referenced in a Chassis that is referenced in a Contains link from this resource, that ComputerSystem shall not be referenced in this Chassis.
ManagedBy	Collection (Manager.Manager)	True	The value of this property shall be a reference to the resource that manages this chassis and shall reference a resource of type Manager.
ContainedBy	Chassis.Chassis	False	The value of this property shall be a reference to the resource that represents the chassis that contains this chassis and shall be of type Chassis.
Contains	Collection (Chassis.Chassis)	True	The value of this property shall be a reference to the resource that represents the chassis that this chassis contains and shall be of type Chassis.
PoweredBy	Collection (Resource.Item)	True	The value of this property shall be an array of IDs containing pointers consistent with JSON pointer syntax to the resource that powers this chassis.
CooledBy	Collection (Resource.Item)	True	The value of this property shall be an array of IDs containing pointers consistent with JSON pointer syntax to the resource that cools this chassis.
ManagersInChassis	Collection (Manager.Manager)	True	The value of this property shall reference one or more resources of type Manager that are in this Chassis.
Drives	Collection (Drive.Drive)	True	The value of this property shall reference one or more resources of type Drive that are in this Chassis.
Storage	Collection (Storage.Storage)	True	The value of this property shall reference one or more resources of type Storage that are connected to or contained inside this Chassis.
PCIeDevices	Collection (PCIeDevice.PCIeDevice)	True	The value of this property shall reference one or more resources of type PCIeDevices .

Intel® RSD OEM Links extensions:

Table 52. ChassisLinks Attribute

Attribute	Type	Nullable	Description
EthernetSwitches	Collection (EthernetSwitch.v1_0_0.EthernetSwitch)	True	The value of this property shall reference one or more resources of type EthernetSwitch that are in this Chassis.
Switches	Collection (EthernetSwitch.v1_0_0.EthernetSwitch)	True	The value of this property shall reference one or more resources of type EthernetSwitch that are in this Chassis.



Attribute	Type	Nullable	Description
			Deprecated: This value has been Deprecated in favor of EthernetSwitches.

Intel® RSD OEM extensions:

Table 53. Chassis Attribute for Intel® RSD OEM Extensions

Attribute	Type	Nullable	Description
Location	Intel.Oem.Location	True	Chassis location in relation to its parent.

4.22.1 Operations

4.22.1.1 GET

Request:

```
GET /redfish/v1/Chassis/1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Chassis/Members/$entity",
  "@odata.id": "/redfish/v1/Chassis/1",
  "@odata.type": "#Chassis.v1_7_0.Chassis",
  "AssetTag": "Asset Tag",
  "ChassisType": "Enclosure",
  "Description": "Chassis description",
  "Id": "1",
  "IndicatorLED": null,
  "Links": {
    "@odata.type": "#Chassis.v1_7_0.Links",
    "ComputerSystems": [
      {
        "@odata.id": "/redfish/v1/Systems/Target"
      }
    ],
  },
  "ContainedBy": null,
  "Contains": [],
  "Drives": [
    {
      "@odata.id": "/redfish/v1/Chassis/1/Drives/1"
    },
    {
      "@odata.id": "/redfish/v1/Chassis/1/Drives/2"
    }
  ],
  "ManagedBy": [
    {
      "@odata.id": "/redfish/v1/Managers/1"
    }
  ],
  "ManagersInChassis": [],
  "Switches": [],
  "Oem": {
    "Intel_Rackscale": {
```



```
        "EthernetSwitches": []
      }
    },
    "Oem": {},
    "Manufacturer": "Intel Corporation",
    "Model": "E234",
    "Name": "Chassis",
    "Oem": {},
    "PartNumber": "29ee2220939",
    "SKU": "SKU",
    "SerialNumber": "123fed3029c-b23094-12",
    "Status": {
      "Health": "OK",
      "HealthRollup": "OK",
      "State": "Enabled"
    },
    "UUID": null
  }
}
```

4.22.1.2 PUT

The PUT operation is not allowed on the chassis resource.

4.22.1.3 PATCH

Request:

```
PATCH /redfish/v1/Chassis/1
Content-Type: application/json
{
  "AssetTag": "My Asset Tag"
}
```

Response:

```
HTTP/1.1 204 No Content
```

Or:

```
HTTP/1.1 200 OK
(updated resource body)
```

Or (when the task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "New",
  "StartTime": "2016-09-01T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```




4.22.1.4 POST

The POST operation is not allowed on the chassis resource.

4.22.1.5 DELETE

The DELETE operation is not allowed on the chassis resource.

4.23 Fabric Collection

The Fabric properties details available in `FabricCollection_v1.xml` metadata file. [Table 54](#) describes the `FabricCollection` attribute.

Table 54. FabricCollection Attribute

Attribute	Type	Nullable	Description
Members	<code>Collection(Fabric.Fabric)</code>	True	Contains the members of this collection.

4.23.1 Operations

4.23.1.1 GET

Request:

```
GET /redfish/v1/Fabrics
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#FabricCollection.FabricCollection",
  "@odata.id": "/redfish/v1/Fabrics",
  "@odata.type": "#FabricCollection.FabricCollection",
  "Name": "Fabric Collection",
  "Description": " Fabric Collection",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Fabrics/NVMeoE"
    }
  ]
}
```

4.23.1.2 PUT

The PUT operation is not allowed on the fabric collection of resources.

4.23.1.3 PATCH

The PATCH operation is not allowed on the fabric collection of resources.

4.23.1.4 POST

The POST operation is not allowed on the fabric collection of resources.



4.23.1.5 DELETE

The DELETE operation is not allowed on the fabric collection of resources.

4.24 Fabric

The Fabric resource shall be used to represent a simple fabric for a Redfish implementation. The properties details are available in the [Fabric_v1.xml metadata](#) file. [Table 55](#) describes the Fabric attributes, and [Table 56](#) describes the [FabricType](#) attribute values. [Table 57](#) describes the [FabricLinks](#) attribute.

Table 55. Fabric Attributes

Attribute	Type	Nullable	Description
FabricType	Protocol.Protocol	True	The value of this property shall contain the type of fabric being represented by this simple fabric.
Status	Resource.Status	False	-
MaxZones	Edm.Int64	True	The value of this property shall contain the maximum number of zones the switch can currently configure. This value can change based on changes in the logical or physical configuration of the system.
Links	Fabric.v1_0_0.Links	False	The Links property, as described by the Redfish Specification, Table 2 , shall contain references to resources that are related to, but not contained by (subordinate to), this resource.
Actions	Fabric.v1_0_0.Actions	False	The Actions property shall contain the available actions for this resource.
Zones	ZoneCollection.ZoneCollection	False	The value of this property shall be a reference to the resources that this fabric uses and shall reference a resource of type Zone .
Endpoints	EndpointCollection.EndpointCollection	False	The value of this property shall be a reference to the resources that this fabric uses and shall reference a resource of type Endpoint .
Switches	SwitchCollection.SwitchCollection	False	The value of this property shall be a reference to the resources that this fabric uses and shall reference a resource of type Switch .

Table 56. FabricType Attribute (Protocol) Values

Member	Description
PCIe	This value shall mean that this device conforms to the PCI-SIG PCIe Base Specification only; beyond that, it uses some vendor-proprietary mechanism to communicate.
AHCI	This value shall mean that this device conforms to the Intel Advanced Host Controller Interface Specification.
UHCI	This value shall mean that this device conforms to the Intel Universal Host Controller Interface Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface specification.
SAS	This value shall mean that this device conforms to the T10 SAS Protocol Layer Specification.
SATA	This value shall mean that this device conforms to the Serial ATA International Organization Serial ATA Specification.



Member	Description
USB	This value shall mean that this device conforms to the USB Implementers Forum Universal Serial Bus Specification.
NVMe	This value shall mean that this device conforms to the Non-Volatile Memory Host Controller Interface Specification.
FC	This value shall mean that this device conforms to the T11 Fibre Channel Physical and Signaling Interface Specification.
iSCSI	This value shall mean that this device conforms to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
FCoE	This value shall mean that this device conforms to the T11 FC-BB-5 Specification.
FCP	This enumeration literal shall indicate the INCITS 481: Information technology - Fibre Channel Protocol for SCSI. The Fibre Channel SCSI Protocol.
FICON	This enumeration literal shall indicate the (ANSI FC-SB-3 Single-Byte Command Code Sets-3 Mapping Protocol for the Fibre Channel (FC) protocol. FICON (Fibre CONnection) is the IBM proprietary name for this protocol.
NVMe- over Fabrics*	This value shall mean that this device conforms to the NVM Express-over Fabrics Specification.
SMB	This value shall mean that this device conforms to the Microsoft Server Message Block Protocol.
NFSv3	This value shall mean that this device conforms to the Network File System protocol as defined by RFC 1813.
NFSv4	This value shall mean that this device conforms to the Network File System protocol as defined by RFC 3010 or RFC 5661.
HTTP	This value shall mean that this device conforms to the Hypertext Transfer protocol as defined by RFC 2068 or RFC 2616.
HTTPS	This value shall mean that this device conforms to the Hypertext Transfer protocol as defined by RFC 2068 or RFC 2616 utilizing Transport Layer Security as specified by RFC 5246 or RFC 6176.
FTP	This value shall mean that this device conforms to the File Transfer protocol as defined by RFC 114.
SFTP	This value shall mean that this device conforms to the File Transfer protocol as defined by RFC 114 utilizing Transport Layer Security as specified by RFC 5246 or RFC 6176.
iWARP	This value shall mean that this device conforms to the iWARP protocol as defined by RFC 5042 utilizing Transport Layer mechanisms as specified by RFC 5043 or RFC 5044.
RoCE	This value shall mean that this device conforms to the RDMA over Converged Ethernet protocol as defined by the Infiniband Architecture Specification.
RoCEv2	This value shall mean that this device conforms to the RDMA over Converged Ethernet version 2 protocol as defined by the Infiniband Architecture Specification.
I2C	This value shall mean that this device conforms to the NXP Semiconductors I2C-bus Specification.
OEM	This value shall mean that this device conforms to an OEM specific architecture and additional information may be included in the OEM section.

Intel® RSD OEM extensions:

Table 57. FabricLinks Attribute

Attribute	Type	Nullable	Description
ManagedBy	Collection (Manager.Manager)	True	Collection of managers managing the service.

4.24.1 Operations

4.24.1.1 GET

**Request:**

```
GET /redfish/v1/Fabrics/NVMeoE
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Fabric.Fabric",
  "@odata.id": "/redfish/v1/Fabrics/NVMeoE",
  "@odata.type": "#Fabric.v1_0_0.Fabric",
  "Id": "NVMeoE",
  "Actions": {
    "Oem": null
  },
  "Zones": {
    "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Zones"
  },
  "Endpoints": {
    "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints"
  },
  "FabricType": "NVMeOverFabrics",
  "Links": {
    "Oem": {
      "Intel_RackScale": {
        "@odata.type": "#Intel.Oem.FabricLinks",
        "ManagedBy": [
          {
            "@odata.id": "/redfish/v1/Managers/1"
          }
        ]
      }
    }
  },
  "Oem": {},
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  }
}
```

4.24.1.2 PUT

The PUT operation is not allowed on the fabric resource.

4.24.1.3 PATCH

The PATCH operation is not allowed on the fabric resource.

4.24.1.4 POST

The POST operation is not allowed on the fabric resource.

4.24.1.5 DELETE

The DELETE operation is not allowed on the fabric resource.



4.25 Zones Collection

The Zones properties details are available in the [ZoneCollection_v1.xml](#) metadata file. [Table 58](#) describes the `ZoneCollection` attribute.

Table 58. ZoneCollection Attribute

Attribute	Type	Nullable	Description
<code>Members</code>	<code>Collection (Zone.Zone)</code>	True	Contains the members of this collection.

4.25.1 Operations

4.25.1.1 GET

Request:

```
GET /redfish/v1/Fabrics/NVMeoE/Zones
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#ZoneCollection.ZoneCollection",
  "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Zones",
  "@odata.type": "#ZoneCollection.ZoneCollection",
  "Description": "Zone Collection",
  "Members": [
    {
      "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Zones/1"
    }
  ],
  "Members@odata.count": 1,
  "Name": "Zone Collection"
}
```

4.25.1.2 PUT

The PUT operation is not allowed on the zones collection of resources.

4.25.1.3 PATCH

The PATCH operation is not allowed on the zones collection of resources.

4.25.1.4 POST

To create a new Fabric zone, the initial Zones structure should be posted.

Request:

```
POST /redfish/v1/Fabrics/NVMeoE/Zones
Content-Type: application/json
{
  "Links": {
    "Endpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/1"
      },
      {

```



```
"@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/2"
    }
  ]
}
}
```

Response:

```
HTTP/1.1 201 Created
Location: http://<IP>:<PORT>/redfish/v1/Fabrics/NVMeoE/Zones/2
((created resource body))
```

4.25.1.5 DELETE

Operation is not allowed on the zones collection of resources.

4.25.1.6 OPTIONS

This operation can be used to determine the HTTP methods allowed on this resource. The response will depend on the service's implementation.

Request:

```
OPTIONS redfish/v1/Fabrics/NVMeoE/Zones
```

Response:

```
HTTP/1.1 200 No Content
Allow: OPTIONS, GET, POST
```

4.26 Zone

The Zone properties details are available in the [Zone_v1.xml](#) metadata file. [Table 59](#) shows the Zone attributes, and [Table 60](#) shows the Links attributes.

Table 59. Zone Attributes

Attribute	Type	Nullable	Description
Status	Resource.Status	False	-
Links	Zone.v1_0_0.Links	False	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.
Actions	Zone.v1_1_0.Actions	False	The Actions property shall contain the available actions for this resource.
Identifiers	Collection (Resource.Identifier)	True	Identifiers for this zone shall be unique in the context of other zones.

Table 60. Links Attributes

Attribute	Type	Nullable	Description
Endpoints	Collection (Endpoint.Endpoint)	True	The value of this property shall be a reference to the resources that this zone is associated with and shall reference a resource of type Endpoint .



Attribute	Type	Nullable	Description
InvolvedSwitches	Collection (Switch.Switch)	True	The value of this property shall be a reference to the resources that this zone is associated with and shall reference a resource of type Switch.

4.26.1 Operations

4.26.1.1 GET

Request:

```
GET /redfish/v1/Fabrics/NVMeoE/Zones/1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Zone.Zone",
  "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Zones/1",
  "@odata.type": "#Zone.v1_0_0.Zone",
  "Id": "1",
  "Name": "Zone 1",
  "Description": "Zone 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Links": {
    "Endpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/1"
      },
      {
        "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/2"
      }
    ],
    "InvolvedSwitches": [],
    "Oem": {}
  },
  "Oem": {}
}
```

4.26.1.2 PUT

The PUT operation is not allowed on the zone resource.

4.26.1.3 PATCH

Note: PATCH operation on Zone is not Redfish-compliant. Support for this action will be added to the standard in a future version (see Redfish issue #2912).

The PATCH method can be used to add or remove [Endpoints](#) from a Zone. The service requires to always provide a complete representation of the [Endpoints](#) array. A partial update is not supported.

**Request:**

```
PATCH /redfish/v1/Fabrics/NVMeoE/Zones/1
Content-Type: application/json
{
  "Links": {
    "Endpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/Initiator2"
      },
      {
        "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/1"
      }
    ]
  }
}
```

Response:

```
HTTP/1.1 200 OK
((updated resource body))
```

Or (when task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "New",
  "StartTime": "2016-09-01T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```

4.26.1.4 POST

The POST operation is not allowed on the zone resource.

4.26.1.5 DELETE

Request:

```
DELETE redfish/v1/Fabrics/NVMeoE/Zones/1
```

Response:

```
HTTP/1.1 204 No Content
```

Or (when a task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",

```




```

"TaskState": "New",
"StartTime": "2017-12-06T04:45+01:00",
"TaskStatus": "OK",
"Messages": []
}

```

4.26.1.6 OPTIONS

This operation can be used to determine the HTTP methods allowed on this resource. The response will depend on the service's implementation.

Request:

```
OPTIONS redfish/v1/Fabrics/NVMeoE/Zones/1
```

Response:

```

HTTP/1.1 200 No Content
Allow: OPTIONS, GET, PATCH, DELETE

```

4.27 Endpoint Collection

The [Endpoint](#) properties details are available in the [EndpointCollection_v1.xml](#) metadata file. [Table 61](#) shows the [EndpointCollection](#) attribute.

Table 61. EndpointCollection Attribute

Attribute	Type	Nullable	Description
Members	Collection (Endpoint.Endpoint)	True	Contains the members of this collection.

4.27.1 Operations

4.27.1.1 GET

Request:

```

GET /redfish/v1/Fabrics/NVMeoE/Endpoints
Content-Type: application/json

```

Response:

```

{
  "@odata.context": "/redfish/v1/$metadata#EndpointCollection.EndpointCollection",
  "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints",
  "@odata.type": "#EndpointCollection.EndpointCollection",
  "Members": [
    {
      "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/1"
    },
    {
      "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/2"
    }
  ],
  "Members@odata.count": 1,
  "Name": "Endpoint Collection",
  "Description": "Endpoint Collection"
}

```



4.27.1.2 PUT

The PUT operation is not allowed on the endpoint collection of resources.

4.27.1.3 PATCH

The PATCH operation is not allowed on the endpoint collection of resources.

4.27.1.4 POST

[Table 62](#) describes the `Endpoint` POST properties. In addition, [Table 63](#) shows the `Identifiers` POST properties, [Table 64](#) shows `ConnectedEntities` POST properties, [Table 65](#) shows `IPTransportDetails` POST properties, [Table 66](#) shows the `DurableNameFormat` attribute values, and [Table 67](#) shows the `EntityRole` attribute values.

Table 62. Endpoint POST Properties

Attribute	Type	Required	Description
<code>EndpointProtocol</code>	String (enum)	No	Indicates the protocol used by the endpoint.
<code>Identifiers</code>	Array of <code>Resource.v1_1_0.Identifier</code>	Yes	Provides <code>iQN</code> or <code>NQN</code> of created entity (will be generated if not provided).
<code>ConnectedEntities</code>	Array of <code>Endpoint.v1_0_0.ConnectedEntity</code>	Yes	Provides information about entities connected to the endpoint.
<code>IPTransportDetails</code>	Array of <code>Endpoint.v1_1_0.IPTransportDetails</code>	No	Provides information about the transport used for accessing the endpoint.
<code>Links->Oem->Interfaces</code>	Collection (<code>Resource.Resource</code>)	No	Provides information about the interfaces that should be used for endpoint connectivity.
<code>Oem->Authentication</code>	<code>Resource.Resource</code>	No	Provides authentication data for target-initiator authentication. Currently supported only for the iSCSI protocol.

Table 63. Identifiers POST Properties

Attribute	Type	Required	Description
<code>DurableNameFormat</code>	<code>Resource.v1_1_0.DurableNameFormat</code>	Yes	This represents the format of the <code>DurableName</code> property. Allowed values: <code>"NQN"</code> , <code>"iQN"</code>
<code>DurableName</code>	String	Yes	This property contains the world wide unique identifier for the resource. The string is in the format described by the value of the <code>Identifier.DurableNameFormat</code> property.

Table 64. ConnectedEntities POST Properties

Attribute	Type	Required	Description
<code>EntityLink</code>	Object (link)	Yes	A link to the associated entity.
<code>EntityRole</code>	<code>Endpoint.v1_0_0.EntityRole</code>	Yes	This property contains the world wide unique identifier for the resource. The string is in the format described by the value of the <code>Identifier.DurableNameFormat</code> property.



Attribute	Type	Required	Description
Oem->Intel_RackScale->LUN	Int64	No	Logical Unit Number. Shall be provided for iSCSI target endpoints

Table 65. IPTransportDetails POST Properties

Attribute	Type	Required	Description
TransportProtocol	Protocol.Protocol	No	The protocol used by IP transport.
IPv4Address	IPAddresses.IPv4Address	No	IPv4 address for the transport.
IPv6Address	IPAddresses.IPv6Address	No	IPv6 address for the transport.
Port	Edm.Decimal	No	UDP or TCP port number used for communication with the endpoint.

Table 66. DurableNameFormat Attribute Values

Attribute	Description
NAA	This durable name shall be a hexadecimal representation of the Name Address Authority structure as defined in the T11 Fibre Channel - Framing and Signaling - 3 (FC-FS-3) specification.
iQN	This durable name shall be in the iSCSI Qualified Name format as defined in RFC 3720 and RFC 3721.
FC_WWN	This durable name shall be a hexadecimal representation of the World Wide Name format as defined in the T11 Fibre Channel Physical and Signaling Interface Specification.
UUID	This durable name shall be the hexadecimal representation of the Universal Unique Identifier as defined in the International Telecommunication Union's OSI networking and system aspects - Naming, Addressing and Registration Specification.
EUI	This durable name shall be the hexadecimal representation of the IEEE-defined 64-bit Extended Unique Identifier as defined in the IEEE's Guidelines for 64-bit Global Identifier (EUI-64) Specification.
NQN	This durable name shall be in the NVMe* Qualified Name format as defined in the NVN Express over Fabric* Specification.
NSID	This durable name shall be in the NVM Namespace Identifier format as defined in the NVN Express Specification.

Table 67. EntityRole Attribute Values

Attribute	Description
Initiator	The entity is acting as an initiator.
Target	The entity is acting as a target.
Both	The entity is acting as both an initiator and a target.

The following example shows how to create an NVMeOverFabrics endpoint.

Request:

```
POST /redfish/v1/Fabrics/NVMeoE/Endpoints
Content-Type: application/json
{
  "EndpointProtocol": "NVMeOverFabrics",
  "Identifiers": [
    {
      "DurableNameFormat": "NQN",
      "DurableName": "nqn.2014-08.org.nvmexpress:uuid:397f9b78-7e94-11e7-9ea4-001e67dfa170"
    }
  ],
  "ConnectedEntities": [
```

```
{
  "EntityLink": {
    "@odata.id": "/redfish/v1/StorageServices/1/Volumes/1"
  },
  "EntityRole": "Target"
},
"Links": {
  "Oem": {
    "Intel_RackScale": {
      "Interfaces": [
        {
          "@odata.id": "/redfish/v1/Systems/Target/EthernetInterfaces/1"
        }
      ]
    }
  }
}
}
```

Response:

```
HTTP/1.1 201 Created
Location: http://<IP>:<PORT>/redfish/v1/Fabrics/NVMeoE/Endpoints/3
((created resource body))
```

The next example shows how to create an iSCSI endpoint.

Request:

```
POST /redfish/v1/Fabrics/iSCSI/Endpoints
Content-Type: application/json
{
  "EndpointProtocol": "iSCSI",
  "Identifiers": [
    {
      "DurableName": "iqn.1986-03.com.intel:storagearray-uuid:397f9b78-7e94-11e7-9ea4-001e67dfa170",
      "DurableNameFormat": "iQN"
    }
  ],
  "ConnectedEntities": [
    {
      "EntityLink": {
        "@odata.id": "/redfish/v1/StorageServices/1/Volumes/1"
      },
      "EntityRole": "Target",
      "Oem": {
        "Intel_RackScale": {
          "LUN": 1
        }
      }
    }
  ],
  "Oem": {
    "Intel_RackScale": {
      "Authentication": {
        "Username": "userA",
        "Password": "passB"
      }
    }
  }
}
```



```

    }
  }
}

```

Response:

```

HTTP/1.1 201 Created
Location: http://<IP>:<PORT>/redfish/v1/Fabrics/iSCSI/Endpoints/3
((created resource body))

```

4.27.1.5 DELETE

The DELETE operation is not allowed on the endpoint collection of resources.

4.27.1.6 OPTIONS

This operation can be used to determine the HTTP methods allowed on this resource. The response will depend on the service's implementation.

Request:

```
OPTIONS redfish/v1/Fabrics/NVMeoE/Endpoints
```

Response:

```

HTTP/1.1 200 No Content
Allow: OPTIONS, GET, POST

```

4.28 Endpoint

Endpoint properties details are available in the [Endpoint_v1.xml](#) metadata file. [Table 68](#) describes the [Endpoint](#) attributes. In addition, [Table 69](#) shows the [ConnectedEntity](#) attributes, [Table 70](#) shows the [IPTransportDetails](#) attributes, [Table 71](#) shows the [Links](#) attributes, [Table 72](#) shows the [EntityRole](#) attribute values, and [Table 73](#) shows the [Protocol](#) attribute values. For the Intel® RSD OEM extensions, [Table 74](#) shows the [Endpoint](#) attributes, [Table 75](#) shows the [EndpointAuthentication](#) attributes, and [Table 76](#) shows the [EndpointLinks](#) attributes.

Table 68. Endpoint Attributes

Attribute	Type	Nullable	Description
Status	Resource.Status	False	-
EndpointProtocol	Protocol.Protocol	True	The value of this property shall contain the protocol this endpoint uses to communicate with other endpoints on this fabric.
ConnectedEntities	Collection(Endpoint.v1_0_0.ConnectedEntity)	True	This value of this property shall contain all the entities that this endpoint allows access to.
Identifiers	Collection(Resource.Identifier)	True	Identifiers for this endpoint shall be unique in the context of other endpoints that can be reached over the connected network.
PciId	Endpoint.v1_0_0.PciId	True	The value of this property shall be the PCI ID of the endpoint.
HostReservationMemoryBytes	Edm.Int64	True	The value of this property shall be the amount of memory in Bytes that the Host should allocate to connect to this endpoint.



Attribute	Type	Nullable	Description
Links	Endpoint.v1_0_0.Links	False	The links object contains the links to other resources that are related to this resource.
Actions	Endpoint.v1_0_0.Actions	False	The Actions object contains the available custom actions on this resource.
Redundancy	Collection (Redundancy.Redundancy)	True	Redundancy information for the lower level endpoints supporting this endpoint.
IPTransportDetails	Collection (Endpoint.v1_0_0.IPTransportDetails)	True	This array shall contain the details for each IP transport supported by this endpoint.

Table 69. ConnectedEntity Attributes

Attribute	Type	Nullable	Description
EntityType	Endpoint.v1_0_0.EntityType	True	The value of this property shall indicate if the type of connected entity.
EntityRole	Endpoint.v1_0_0.EntityRole	True	The value of this property shall indicate if the specified entity is an initiator, target, or both.
EntityPciId	Endpoint.v1_0_0.PciId	True	The value of this property shall be the PCI ID of the connected PCIe entity.
PciFunctionNumber	Edm.Int64	True	The value of this property shall be the PCI Function Number of the connected PCIe entity.
PciClassCode	Edm.String	True	The value of this property shall be the PCI Class Code, Subclass code, and Programming Interface code of the PCIe device function.
Identifiers	Collection (Resource.Identifier)	False	Identifiers for the remote entity shall be unique in the context of other resources that can be reached over the connected network.
Oem	Resource.Oem	True	-
EntityLink	Resource.Resource	True	This property shall be a reference to an entity of the type specified by the description of the value of the EntityType property.

Table 70. IPTransportDetails Attributes

Attribute	Type	Nullable	Description
TransportProtocol	Protocol.Protocol	False	The value shall be the protocol used by the connection entity.
IPv4Address	IPAddresses.IPv4Address	False	The value of this property shall specify the IPv4Address.
IPv6Address	IPAddresses.IPv6Address	False	The value of this property shall specify the IPv6Address.
Port	Edm.Decimal	False	The value of this property shall specify a UDP or TCP port number used for communication with the Endpoint.

**Table 71. Links Attributes**

Attribute	Type	Nullable	Description
<code>MutuallyExclusiveEndpoints</code>	<code>Collection (Endpoint.Endpoint)</code>	True	The value of this property shall be an array of references of type Endpoint that cannot be used in a zone if this endpoint is used in a zone.
<code>Ports</code>	<code>Collection (Port.Port)</code>	True	The value of this property shall be an array of references of type Port that are utilized by this endpoint.
<code>NetworkDeviceFunction</code>	<code>Collection (NetworkDeviceFunction.NetworkDeviceFunction)</code>	True	The value of this property shall be a reference to a <code>NetworkDeviceFunction</code> resource, with that this endpoint is associated.

Table 72. EntityRole Attribute Values

Member	Description
Initiator	The entity is acting as an initiator.
Target	The entity is acting as a target.
Both	The entity is acting as both an initiator and a target.

Table 73. Protocol Attribute Values

Member	Description
<code>PCIe</code>	This value shall mean that this device conforms to the PCI-SIG PCIe Base Specification only beyond that it uses some vendor proprietary mechanism to communicate.
<code>AHCI</code>	This value shall mean that this device conforms to the Intel Advanced Host Controller Interface Specification.
<code>UHCI</code>	This value shall mean that this device conforms to the Intel Universal Host Controller Interface Specification, Enhanced Host Controller Interface Specification, or the Extensible Host Controller Interface specification.
<code>SAS</code>	This value shall mean that this device conforms to the T10 SAS Protocol Layer Specification.
<code>SATA</code>	This value shall mean that this device conforms to the Serial ATA International Organization Serial ATA Specification.
<code>USB</code>	This value shall mean that this device conforms to the USB Implementers Forum Universal Serial Bus Specification.
<code>NVMe</code>	This value shall mean that this device conforms to the Non-Volatile Memory Host Controller Interface Specification.
<code>FC</code>	This value shall mean that this device conforms to the T11 Fibre Channel Physical and Signaling Interface Specification.
<code>iSCSI</code>	This value shall mean that this device conforms to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.
<code>FCoE</code>	This value shall mean that this device conforms to the T11 FC-BB-5 Specification.
<code>FCP</code>	This enumeration literal shall indicate the INCITS 481: Information technology - Fibre Channel Protocol for SCSI. The Fibre Channel SCSI Protocol.
<code>FICON</code>	This enumeration literal shall indicate 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.
<code>NVMeOverFabrics</code>	This value shall mean that this device conforms to the NVM Express -over Fabrics* Specification.
<code>SMB</code>	This value shall mean that this device conforms to the Microsoft Server Message Block Protocol.
<code>NFSv3</code>	This value shall mean that this device conforms to the Network File System protocol as defined by RFC 1813.



Member	Description
NFSv4	This value shall mean that this device conforms to the Network File System protocol as defined by RFC 3010 or RFC 5661.
HTTP	This value shall mean that this device conforms to the Hypertext Transfer protocol as defined by RFC 2068 or RFC 2616.
HTTPS	This value shall mean that this device conforms to the Hypertext Transfer protocol as defined by RFC2068 or RFC2616 utilizing Transport Layer Security as specified by RFC5246 or RFC6176.
FTP	This value shall mean that this device conforms to the File Transfer protocol as defined by RFC114.
SFTP	This value shall mean that this device conforms to the File Transfer protocol as defined by RFC114 utilizing Transport Layer Security as specified by RFC5246 or RFC6176.
iWARP	This value shall mean that this device conforms to the iWARP protocol as defined by RFC5042 utilizing Transport Layer mechanisms as specified by RFC 5043 or RFC 5044.
RoCE	This value shall mean that this device conforms to the RDMA over Converged Ethernet protocol as defined by the Infiniband Architecture Specification.
RoCEv2	This value shall mean that this device conforms to the RDMA over Converged Ethernet v2 protocol as defined by the Infiniband Architecture Specification.
OEM	This value shall mean that this device conforms to an OEM specific architecture and additional information may be included in the OEM section.

NOTE: Refer to [Table 2](#) for a list of all of the Redfish comments (RFC).

Intel® RSD OEM extensions:

Table 74. Endpoint Attributes

Attribute	Type	Nullable	Description
Authentication	Intel.Oem.EndpointAuthentication	True	This property provides information about endpoint authentication required credentials.
EndpointProtocol	Intel.Oem.Protocol	True	Additional specification for OEM EndpointProtocol . Shall be specified if the Redfish EndpointProtocol is OEM, refer to Table 2 .

Table 75. EndpointAuthentication Attributes

Attribute	Type	Nullable	Description
Username	Edm.String	True	This property provides an endpoint username that is used to authenticate it on another side of the communication channel.
Password	Edm.String	True	This property is used to provide an endpoint password. It provides write only access. On read, it shall return a null value.

Table 76. EndpointLinks Attributes

Attribute	Type	Nullable	Description
Zones	Collection (Zone.Zone)	True	The value of the property is a reference to the resources that the endpoint is associated with and references a resource of type Zone.
Interfaces	Collection (Resource.Resource)	True	This property is an array of references to resources representing interface where this endpoint is available.



4.28.1 Operations

4.28.1.1 GET

4.28.1.1.1 Target Endpoint

Request:

```
GET /redfish/v1/Fabrics/NVMeoE/Endpoints/1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Endpoint.Endpoint",
  "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/1",
  "@odata.type": "#Endpoint.v1_1_0.Endpoint",
  "ConnectedEntities": [
    {
      "EntityLink": {
        "@odata.id": "/redfish/v1/StorageServices/1/Volumes/1"
      },
      "EntityRole": "Target"
    }
  ],
  "Description": "Fabric Endpoint",
  "EndpointProtocol": "NVMeOverFabrics",
  "Id": "1",
  "Identifiers": [
    {
      "@odata.type": "#Resource.v1_1_0.Identifier",
      "DurableName": "nqn.2014-08.org.nvmexpress:uuid:397f9b78-7e94-11e7-9ea4-001e67dfa170",
      "DurableNameFormat": "NQN"
    }
  ],
  "Links": {
    "Ports": [],
    "Endpoints": [],
    "Oem": {
      "Intel_RackScale": {
        "@odata.type": "#Intel.Oem.EndpointLinks",
        "Zones": [
          {
            "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Zones/1"
          }
        ]
      },
      "Interfaces": [
        {
          "@odata.id": "/redfish/v1/Systems/Target/EthernetInterfaces/1"
        }
      ]
    }
  },
  "Name": "Fabric Endpoint",
  "IPTransportDetails": [
    {
      "TransportProtocol": "RoCEv2",

```



```
{
  "IPv4Address": {
    "Address": "192.168.0.10"
  },
  "IPv6Address": {},
  "Port": 1023
},
{
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Oem": {
    "Intel_RackScale": {
      "@odata.type": "#Intel.Oem.Endpoint",
      "Authentication": null
    }
  }
}
```

4.28.1.1.2 Initiator Endpoint

Request:

```
GET /redfish/v1/Fabrics/NVMeoE/Endpoints/2
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Endpoint.Endpoint",
  "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/2",
  "@odata.type": "#Endpoint.v1_1_0.Endpoint",
  "Name": "Fabric Endpoint",
  "Id": "1",
  "Description": "Fabric Initiator Endpoint",
  "ConnectedEntities": [
    {
      "EntityLink": null,
      "EntityRole": "Initiator"
    }
  ],
  "EndpointProtocol": "NVMeOverFabrics",
  "Identifiers": [
    {
      "@odata.type": "#Resource.v1_1_0.Identifier",
      "DurableName": "nqn.2014-08.org.nvmexpress:uuid:12345678-90ab-cdef-0000-000000000000",
      "DurableNameFormat": "NQN"
    }
  ],
  "Links": {
    "Ports": [],
    "Endpoints": [],
    "Oem": {
      "Intel_RackScale": {
        "@odata.type": "#Intel.Oem.EndpointLinks",
        "Zones": [
          {
            "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Zones/1"
          }
        ]
      }
    }
  }
}
```



```

    "Interfaces": []
  }
},
"IPTransportDetails": [
  {
    "TransportProtocol": "RoCEv2",
    "IPv4Address": {
      "Address": "192.168.0.10"
    },
    "IPv6Address": {},
    "Port": 4791
  }
],
"Status": {
  "Health": null,
  "HealthRollup": null,
  "State": null
},
"Oem": {
  "Intel_RackScale": {
    "@odata.type": "#Intel.Oem.Endpoint",
    "Authentication": null
  }
}
}

```

4.28.1.2 PUT

The PUT operation is not allowed on the endpoint resource.

4.28.1.3 PATCH

[Table 77](#) shows the attributes that can be updated by the PATCH operation. [Table 78](#) shows the `EndpointAuthentication` attributes.

Table 77. Endpoint Attributes Updatable by PATCH

Attribute	Type	Nullable	Description
<code>Authentication</code>	<code>Intel.Oem.EndpointAuthentication</code>	True	This property provides information about endpoint authentication required credentials.
<code>EndpointProtocol</code>	<code>Intel.Oem.Protocol</code>	True	Additional specification for OEM EndpointProtocol. Shall be specified if the Redfish EndpointProtocol is OEM.

Table 78. EndpointAuthentication Attributes

Attribute	Type	Nullable	Description
<code>Username</code>	<code>Edm.String</code>	True	This property provides an endpoint username that is used to authenticate it on another side of the communication channel.
<code>Password</code>	<code>Edm.String</code>	True	This property is used to provide an endpoint password. It provides write only access. On read, it shall return a null value.

**Request:**

```
PATCH /redfish/v1/Fabrics/iSCSI/Endpoints/1
Content-Type: application/json
{
  "Oem": {
    "Intel_RackScale": {
      "@odata.type": "#Intel.Oem.Endpoint",
      "Authentication": {
        "Username": "user1",
        "Password": "mysecret"
      }
    }
  }
}
```

Response:

```
HTTP/1.1 204 No Content
```

Or:

```
HTTP/1.1 200 OK
((updated resource body))
```

Or (when task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "New",
  "StartTime": "2016-09-01T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```

4.28.1.4 POST

The POST operation is not allowed on the endpoint resource.

4.28.1.5 DELETE

Request:

```
DELETE redfish/v1/Fabrics/NVMeoE/Endpoints/1
```

Response:

```
HTTP/1.1 204 No Content
```

Or (when a task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",

```



```

    "Id": "1",
    "Name": "Task 1",
    "TaskState": "New",
    "StartTime": "2017-12-06T04:45+01:00",
    "TaskStatus": "OK",
    "Messages": []
  }

```

4.28.1.6 OPTIONS

This operation can be used to determine the HTTP methods allowed on this resource. The response will depend on the service's implementation.

Request:

```
OPTIONS redfish/v1/Fabrics/NVMeoE/Endpoints/1
```

Response:

```

HTTP/1.1 200 No Content
Allow: OPTIONS, GET, PATCH, DELETE

```

4.29 Computer System Collection

[Table 79](#) shows the `ComputerSystemCollection` attribute.

Table 79. ComputerSystemCollection Attributes

Attribute	Type	Nullable	Description
Members	Collection (ComputerSystem, ComputerSystem)	True	Contains the members of this collection.

4.29.1 Operations

4.29.1.1 GET

Request:

```

GET /redfish/v1/Systems
Content-Type: application/json

```

Response:

```

{
  "@odata.context": "/redfish/v1/$metadata#Systems",
  "@odata.id": "/redfish/v1/Systems",
  "@odata.type": "#ComputerSystemCollection.ComputerSystemCollection",
  "Name": "Computer System Collection",
  "Description": "description-as-string",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Systems/Target"
    }
  ]
}

```



4.29.1.2 PUT

The PUT operation is not allowed on the computer system collection of resources.

4.29.1.3 PATCH

The PATCH operation is not allowed on the computer system collection of resources.

4.29.1.4 POST

The POST operation is not allowed on the computer system collection of resources.

4.29.1.5 DELETE

The DELETE operation is not allowed on the computer system collection of resources.

4.30 Computer System

This schema defines a computer system and its respective properties. A computer system represents a machine (physical or virtual) and the local resources, such as memory, CPU, and other devices that can be accessed from the machine.

Details of this resource are described in the [ComputerSystem_v1.xml](#) metadata file. OEM extensions details are available in [IntelRackScaleOem_v1.xml](#). [Table 80](#) describes the [ComputerSystem](#) attributes.

Table 80. ComputerSystem Attributes

Attribute	Type	Nullable	Description
SystemType	ComputerSystem.v1_0_0.SystemType	False	An enumeration that indicates the kind of system that this resource represents.
Links	ComputerSystem.v1_0_0.Links	False	The Links property, as described by the Redfish Specification, Table 2 , shall contain references to resources that are related to, but not contained by (subordinate to), this resource.
AssetTag	Edm.String	True	The value of this property shall contain the value of the asset tag of the system.
Manufacturer	Edm.String	True	The value of this property shall contain a value that represents the manufacturer of the system.
Model	Edm.String	True	The value of this property shall contain information about how the manufacturer references this system. This is typically the product name, without the manufacturer name.
SKU	Edm.String	True	The value of this property shall contain the Stock Keeping Unit (SKU) for the system.
SerialNumber	Edm.String	True	The value of this property shall contain the serial number for the system.
PartNumber	Edm.String	True	The value of this property shall contain the part number for the system as defined by the manufacturer.



Attribute	Type	Nullable	Description
UUID	Resource.UUID	True	The value of this property shall be used to contain a universally unique identifier number for the system. <i>Universally Unique Identifier (UUID) URN Namespace</i> , RFC4122, Table 2 describes methods that can be used 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. If the system supports SMBIOS, the value of the property should be formed by following the SMBIOS 2.6+ recommendation for converting the SMBIOS 16-byte UUID structure into the redfish canonical <code>xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx</code> string format so that the property value matches the byte order presented by current OS APIs such as WMI and dmidecode .
HostName	Edm.String	True	The value of this property shall be the host name for this system, as reported by the operating system or hypervisor. This value is typically provided to the Manager by a service running in the host operating system.
IndicatorLED	ComputerSystem.v1_0_0.IndicatorLED	True	The value of this property shall contain the indicator light state for the indicator light associated with this system.
PowerState	ComputerSystem.v1_0_0.PowerState	True	The value of this property shall contain the power state of the system.
Boot	ComputerSystem.v1_0_0.Boot	False	This object shall contain properties that describe boot information for the current resource. Changes to this object do not alter the BIOS persistent boot order configuration.
BiosVersion	Edm.String	True	The value of this property shall be the version string of the currently installed and running BIOS (for x86 systems). For other systems, the value may contain a version string representing the primary system firmware.
ProcessorSummary	ComputerSystem.v1_0_0.ProcessorSummary	False	This object shall contain properties that describe the central processors for the current resource.
MemorySummary	ComputerSystem.v1_0_0.MemorySummary	False	This object shall contain properties that describe the central memory for the current resource.
Actions	ComputerSystem.v1_0_0.Actions	False	The Actions property shall contain the available actions for this resource.
Status	Resource.Status	False	-
Processors	ProcessorCollection.ProcessorCollection	False	The value of this property shall be a link to a collection of type ProcessorCollection .



Attribute	Type	Nullable	Description
EthernetInterfaces	EthernetInterfaceCollection.EthernetInterfaceCollection	False	The value of this property shall be a link to a collection of type EthernetInterfaceCollection .
SimpleStorage	SimpleStorageCollection.SimpleStorageCollection	False	The value of this property shall be a link to a collection of type SimpleStorageCollection .
LogServices	LogServiceCollection.LogServiceCollection	False	The value of this property shall be a link to a collection of type LogServiceCollection .
TrustedModules	Collection(ComputerSystem.v1_1_0.TrustedModules)	False	This object shall contain an array of objects with properties that describe the trustedmodules for the current resource.
SecureBoot	SecureBoot.SecureBoot	False	The value of this property shall be a link to a resource of type SecureBoot .
Bios	Bios.Bios	False	The value of this property shall be a link to a resource of type BIOS that lists the BIOS settings for this system.
Memory	MemoryCollection.MemoryCollection	False	The value of this property shall be a link to a collection of type MemoryCollection .
Storage	StorageCollection.StorageCollection	False	The value of this property shall be a link to a collection of type StorageCollection .
HostingRoles	Collection(ComputerSystem.v1_2_0.HostingRole)	False	The values of this collection shall be the hosting roles supported by this computer system.
HostedServices	ComputerSystem.v1_2_0.HostedServices	False	The values of this collection shall describe services supported by this computer system.
PCIeDevices	Collection(PCIeDevice.PCIeDevice)	True	The value of this property shall be an array of references of type PCIeDevice .
PCIeFunctions	Collection(PCIeFunction.PCIeFunction)	True	The value of this property shall be an array of references of type PCIeFunction .
MemoryDomains	MemoryDomainCollection.MemoryDomainCollection	True	The value of this property shall be a link to a collection of type MemoryDomainCollection .
NetworkInterfaces	NetworkInterfaceCollection.NetworkInterfaceCollection	False	The value of this property shall be a link to a collection of type NetworkInterfaceCollection .
HostWatchdogTimer	ComputerSystem.v1_5_0.WatchdogTimer	False	This object shall contain properties that describe the host watchdog timer functionality for this ComputerSystem .
SubModel	Edm.String	True	The value of this property shall contain the information about the sub-model (or config) of the system. This shall not include the model/product name or the manufacturer name.
Redundancy	Collection(Redundancy.Redundancy)	True	If present, each entry shall reference a redundancy entity that specifies a kind and level of redundancy and a collection (RedundancySet) of other ComputerSystems that provide the specified redundancy to this ComputerSystem .



Attribute	Type	Nullable	Description
PowerRestorePolicy	ComputerSystem.v1_6_0.PowerRestorePolicyTypes	false	This property shall indicate the desired PowerState of the system when power is applied to the system. A value of 'LastState' shall return the system to the PowerState it was in when power was lost.

4.30.1 Operations

4.30.1.1 GET

Request:

```
GET /redfish/v1/Systems/Target
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#ComputerSystem.ComputerSystem",
  "@odata.id": "/redfish/v1/Systems/Target",
  "@odata.type": "#ComputerSystem.v1_5_0.ComputerSystem",
  "Id": "Target",
  "Name": "Computer System",
  "SystemType": "Virtual",
  "Description": "NVMe over Fabric target system",
  "Actions": {},
  "AssetTag": null,
  "BiosVersion": null,
  "Boot": {
    "@odata.type": "#ComputerSystem.v1_1_0.Boot",
    "BootSourceOverrideEnabled": null,
    "BootSourceOverrideMode": null,
    "BootSourceOverrideMode@Redfish.AllowableValues": [],
    "BootSourceOverrideTarget": null,
    "BootSourceOverrideTarget@Redfish.AllowableValues": []
  },
  "EthernetInterfaces": {
    "@odata.id": "/redfish/v1/Systems/Target/EthernetInterfaces"
  },
  "HostName": null,
  "IndicatorLED": null,
  "Links": {
    "@odata.type": "#ComputerSystem.v1_2_0.Links",
    "Chassis": [
      {
        "@odata.id": "/redfish/v1/Chassis/1"
      }
    ],
    "Endpoints": [],
    "ManagedBy": [
      {
        "@odata.id": "/redfish/v1/Managers/1"
      }
    ],
    "Oem": {}
  },
  "Manufacturer": "Intel Corporation",
  "Memory": {
```



```
{
  "@odata.id": "/redfish/v1/Systems/1/Memory"
},
"MemoryDomains": {
  "@odata.id": "/redfish/v1/Systems/System1/MemoryDomains"
},
"MemorySummary": {
  "Status": {
    "Health": null,
    "HealthRollup": null,
    "State": null
  },
  "TotalSystemMemoryGiB": null
},
"Model": "E323",
"Oem": {
  "Intel_RackScale": {
    "@odata.type": "#Intel.Oem.ComputerSystem",
    "PCIeConnectionId": [],
    "PciDevices": [],
    "PerformanceConfiguration": null
  }
},
"PCIeDevices": [],
"PCIeFunctions": [],
"PartNumber": "29ee2220939",
"PowerState": "On",
"ProcessorSummary": {
  "Count": null,
  "Model": null,
  "Status": {
    "Health": null,
    "HealthRollup": null,
    "State": null
  }
},
"Processors": {
  "@odata.id": "/redfish/v1/Systems/Target/Processors"
},
"SKU": "SKU",
"SerialNumber": "123fed3029c-b23394-12",
"Status": {
  "Health": "OK",
  "HealthRollup": "OK",
  "State": "Enabled"
},
"Storage": {
  "@odata.id": "/redfish/v1/Systems/Target/Storage"
},
"UUID": "xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx",
"HostedServices": {
  "StorageServices": {
    "@odata.id": "/redfish/v1/Systems/Target/StorageServices"
  }
},
"HostingRoles": [
  "StorageServer"
]
}
```



4.30.1.2 PUT

The PUT operation is not allowed on the computer system resource.

4.30.1.3 PATCH

The PATCH operation is not allowed on the computer system resource.

4.30.1.4 POST

The POST operation is not allowed on the computer system resource.

4.30.1.5 DELETE

The DELETE operation is not allowed on the computer system resource.

4.31 Network Interface

The Ethernet Network Interface resource contains the properties needed to describe and configure a single, logical Ethernet interface. Details of this resource are described in the [EthernetInterface_v1.xml](#) metadata file. OEM extensions details are available in [IntelRackScaleOem_v1.xml](#). [Table 81](#) describes the [EthernetInterface](#) attributes. [Table 82](#) describes the Intel® RSD OEM extensions for the [EthernetInterface](#) attributes.

Table 81. EthernetInterface Attributes

Attribute	Type	Nullable	Description
UefiDevicePath	Edm.String	True	The value of this property shall be the UEFI device path to the device that implements this interface (port).
Status	Resource.Status	False	This property shall contain any status or health properties of the resource.
InterfaceEnabled	Edm.Boolean	True	The value of this property shall be a Boolean indicating whether this interface is enabled.
PermanentMACAddress	EthernetInterface.v1_0_0.MACAddress	True	The value of this property shall be the Permanent MAC Address of this interface (port). This value is typically programmed during the manufacturing time. This address is not assignable.
MACAddress	EthernetInterface.v1_0_0.MACAddress	True	The value of this property shall be the effective current MAC Address of this interface. If an assignable MAC address is not supported, this is a read only alias of the PermanentMACAddress .
SpeedMbps	Edm.Int64	True	The value of this property shall be the link speed of the interface in Mbps.
AutoNeg	Edm.Boolean	True	The value of this property shall be true if auto negotiation of speed and duplex is enabled on this interface and False if it is disabled.
FullDuplex	Edm.Boolean	True	The value of this property shall represent the duplex status of the Ethernet connection on this interface.



Attribute	Type	Nullable	Description
MTUSize	Edm.Int64	True	The value of this property shall be the size in bytes of the largest Protocol Data Unit (PDU) that can be passed in an Ethernet (MAC) frame on this interface.
HostName	Edm.String	True	The value of this property shall be the host name for this interface.
FQDN	Edm.String	True	The value of this property shall be the fully qualified domain name for this interface.
MaxIPv6StaticAddresses	Edm.Int64	True	The value of this property shall indicate the number of array items supported by IPv6StaticAddresses .
VLAN	VlanNetworkInterface.VLAN	True	The value of this property shall be the VLAN for this interface. If this interface supports more than one VLAN, the VLAN property shall not be present and the VLANs collection link shall be present instead.
IPv4Addresses	Collection(IPAddresses.IPv4Address)	False	The value of this property shall be an array of objects used to represent the IPv4 connection characteristics for this interface. It is recommended that this property is regarded as read-only, with the configuration of static addresses performed by updating the values within IPv4StaticAddresses . Services may reject updates to this array for this reason.
IPv6AddressPolicyTable	Collection(EthernetInterface.vl_0_0.IPv6AddressPolicyEntry)	False	The value of this property shall be an array of objects used to represent the Address Selection Policy Table as defined in the <i>Default Address Selection for Internet Protocol Version 6 (IPv6)</i> , RFC 6724, see Table 2 .
IPv6Addresses	Collection(IPAddresses.IPv6Address)	False	The value of this property shall be an array of objects used to represent the IPv6 connection characteristics for this interface.
IPv6StaticAddresses	Collection(IPAddresses.IPv6StaticAddress)	False	The value of this property shall be an array of objects used to represent the IPv6 static connection characteristics for this interface.
IPv6DefaultGateway	Edm.String	True	The value of this property shall be the current IPv6 default gateway address that is in use on this interface.
NameServers	Collection(Edm.String)	False	The value of this property shall be the DNS name servers used on this interface.
VLANs	VlanNetworkInterfaceCollection.VlanNetworkInterfaceCollection	False	The value of this property shall reference a collection of VLAN resources. If this property is used, the VLANEnabled and VLANId property shall not be used.
LinkStatus	EthernetInterface.vl_1_0.LinkStatus	True	The value of this property shall be the link status of this interface (port).
Links	EthernetInterface.vl_1_0.Links	False	The Links property, as described by the Redfish Specification, Table 2 , shall contain references to resources that are related to, but not contained by (subordinate to), this resource.



Attribute	Type	Nullable	Description
Actions	EthernetInterface.v1_3_0.Actions	False	The Actions property shall contain the available actions for this resource.
DHCPv4	EthernetInterface.v1_4_0.DHCPv4Configuration	True	This property shall contain the configuration of DHCP v4.
DHCPv6	EthernetInterface.v1_4_0.DHCPv6Configuration	True	This property shall contain the configuration of DHCP v6.
StatelessAddressAutoConfig	EthernetInterface.v1_4_0.StatelessAddressAutoConfiguration	True	This object shall contain the IPv4 and IPv6 Stateless Address Automatic Configuration (SLAAC) properties for this interface.
IPv6StaticDefaultGateways	Collection (IPAddresses. IPv6StaticAddress)	False	The values in this array shall represent the IPv6 static default gateway addresses for this interface.
StaticNameServers	Collection (Edm.String)	False	A statically defined set of DNS server IP addresses to be used when DHCP provisioning is not in enabled for name server configuration. As an implementation option, they may also be used in addition to DHCP provided addresses, or in cases where the DHCP server provides no DNS assignments.
IPv4StaticAddresses	Collection (IPAddresses. IPv4Address)	False	The value of this property shall be an array of objects used to represent all IPv4 static addresses assigned (but not necessarily in use) to this interface. Addresses in use by this interface shall also appear in the IPv4Addresses property.

Intel® RSD OEM extensions:

Table 82. EthernetInterface Attributes for Intel® RSD OEM Extensions

Attribute	Type	Nullable	Description
SupportedProtocols	Collection (Protocol.Protocol)	True	This property shall represent an array of supported protocol types by the Ethernet interface.

4.31.1 Operations

4.31.1.1 GET

Request:

```
GET /redfish/v1/Systems/Target/EthernetInterfaces/1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#EthernetInterface.EthernetInterface",
  "@odata.id": "/redfish/v1/Systems/Target/EthernetInterfaces/1",
  "@odata.type": "@odata.type": "#Task.v1_3_0.Task",
  "AutoNeg": true,
  "Description": "Ethernet Interface description",
  "FQDN": null,
  "FullDuplex": true,
  "HostName": null,
```



```
"IPv4Addresses": [
  {
    "@odata.type": "#IPAddresses.v1_0_0.IPv4Address",
    "Address": "1.1.1.1",
    "AddressOrigin": "DHCP",
    "Gateway": "10.6.0.1",
    "SubnetMask": "255.255.255.0"
  }
],
"IPv4StaticAddresses": [],
"IPv6AddressPolicyTable": [],
"IPv6Addresses": [
  {
    "@odata.type": "#IPAddresses.v1_0_0.IPv6Address",
    "Address": "fe80::268a:7ff:fe4a:4b10",
    "AddressOrigin": "DHCPv6",
    "AddressState": "Preferred",
    "PrefixLength": 16
  }
],
"IPv6DefaultGateway": "fe80::268a:7ff:fe4a:4b10",
"IPv6StaticAddresses": [],
"IPv6StaticDefaultGateways": [],
"Id": "1",
"InterfaceEnabled": true,
"LinkStatus": null,
"Links": {
  "AssociatedEndpoints": [],
  "Chassis": {
    "@odata.id": "/redfish/v1/Chassis/1"
  },
  "Oem": {
    "Intel_RackScale": {
      "@odata.type": "#Intel.Oem.EthernetInterfaceLinks",
      "NeighborPort": null
    }
  }
},
"MACAddress": "35:8a:07:12:4b:70",
"MTUSize": null,
"MaxIPv6StaticAddresses": 1,
"Name": "Ethernet Interface",
"NameServers": [],
"Oem": {
  "Intel_RackScale": {
    "@odata.type": "#Intel.Oem.EthernetInterface",
    "SupportedProtocols": [
      "RoCEv2"
    ]
  }
},
"PermanentMACAddress": "35:8a:07:12:4b:70",
"SpeedMbps": 25600,
"StaticNameServers": [],
"Status": {
  "Health": "OK",
  "HealthRollup": "OK",
  "State": "Enabled"
},
"VLANs": null
}
```



4.31.1.2 PUT

The PUT operation is not allowed on the Ethernet network interface resource.

4.31.1.3 PATCH

The PATCH operation is not allowed on the Ethernet network interface resource.

4.31.1.4 POST

The POST operation is not allowed on the Ethernet network interface resource.

4.31.1.5 DELETE

The DELETE operation is not allowed on the Ethernet network interface resource.

4.32 Hosted Storage Services

The Hosted Storage Services shall contain references to all storage services hosted on the computer system. Details of this resource are described in the [HostedStorageServices_v1.xml](#) metadata file. [Table 83](#) describes [HostedStorageServices](#) attributes.

Table 83. HostedStorageServices Attributes

Attribute	Type	Nullable	Description
Members	Collection(StorageService.StorageService)	True	The value of each member entry shall reference a StorageService resource.

4.32.1 Operations

4.32.1.1 GET

Request:

```
GET /redfish/v1/Systems/Target/StorageServices
Content-Type: application/json
```

Response:

```
{
  "@odata.context":
"/redfish/v1/$metadata#HostedStorageServices.HostedStorageServices",
  "@odata.id": "/redfish/v1/Systems/1/StorageServices",
  "@odata.type": "#HostedStorageServices.HostedStorageServices",
  "Name": "Hosted Storage Services Collection",
  "Description": "Collection of Storage Services hosted on the Computer System",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/StorageServices/NVMeoE1"
    }
  ]
}
```



4.32.1.2 PUT

The PUT operation is not allowed on the Hosted Storage Services of resources.

4.32.1.3 PATCH

The PATCH operation is not allowed on the Hosted Storage Services of resources.

4.32.1.4 POST

The POST operation is not allowed on the Hosted Storage Services of resources.

4.32.1.5 DELETE

The DELETE operation is not allowed on the Hosted Storage Services of resources.

4.33 Manager Collection

The manager collection resource provides a collection of all managers available in a drawer. Detailed information about these resource properties can be obtained from the [Manager_v1.xml](#) metadata file. OEM extensions details are available in [IntelRackScaleOem_v1.xml](#). [Table 84](#) shows the [ManagerCollection](#) attribute.

Table 84. ManagerCollection Attribute

Attribute	Type	Nullable	Description
Members	Collection (Manager.Manager)	True	Contains the members of this collection.

4.33.1 Operations

4.33.1.1 GET

Request:

```
GET /redfish/v1/Managers
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#ManagerCollection.ManagerCollection",
  "@odata.id": "/redfish/v1/Managers",
  "@odata.type": "#ManagerCollection.ManagerCollection",
  "Name": "Manager Collection",
  "Description": "description-as-string",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Managers/1"
    }
  ]
}
```

4.33.1.2 PUT

The PUT operation is not allowed on the manager collection resources.



4.33.1.3 PATCH

The PATCH operation is not allowed on the manager collection resources.

4.33.1.4 POST

The POST operation is not allowed on the manager collection resources.

4.33.1.5 DELETE

The DELETE operation is not allowed on the manager collection resources.

4.34 Manager

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 assigned manageability functions. Multiple Managers can be in implementation, and they may or may not be directly accessible via a Redfish-defined interface. Details of this resource are described in the [Manager_v1.xml](#) metadata file. [Table 85](#) describes Manager attributes.

Table 85. Manager Attributes

Attribute	Type	Nullable	Description
ManagerType	Manager.v1_0_0.ManagerType	False	The value of this property shall describe the function of this manager. The value EnclosureManager shall be used if this manager controls one or more services through aggregation. The value BMC shall be used if this manager represents a traditional server management controller. The value ManagementController shall be used if none of the other enumerations apply.
Links	Manager.v1_0_0.Links	False	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.
ServiceEntryPointUUID	Resource.UUID	True	This property shall contain the UUID of the Redfish Service provided 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.
UUID	Resource.UUID	True	The value of this property shall contain the universally unique identifier number for the manager.
Model	Edm.String	True	The value of this property shall contain information about how the manufacturer references this manager.



Attribute	Type	Nullable	Description
DateTime	Edm.DateTimeOffset	True	The value of this property shall represent the current DateTime value for the manager, with an offset from UTC, in Redfish Timestamp format.
DateTimeLocalOffset	Edm.String	True	The value is property shall represent the offset from UTC time that the current value of DataTime property contains.
FirmwareVersion	Edm.String	True	This property shall contain the firmware version as defined by the manufacturer for the associated manager.
SerialConsole	Manager.v1_0_0.SerialConsole	False	The value of this property shall contain information about the Serial Console service of this manager.
CommandShell	Manager.v1_0_0.CommandShell	False	The value of this property shall contain information about the Command Shell service of this manager.
GraphicalConsole	Manager.v1_0_0.GraphicalConsole	False	The value of this property shall contain information about the Graphical Console (KVM-IP) service of this manager.
Actions	Manager.v1_0_0.Actions	False	The Actions property shall contain the available actions for this resource.
Status	Resource.Status	False	-
EthernetInterfaces	EthernetInterfaceCollection.EthernetInterfaceCollection	False	The value of this property shall be a link to a collection of type EthernetInterfaceCollection .
SerialInterfaces	SerialInterfaceCollection.SerialInterfaceCollection	False	The value of this property shall be a link to a collection of type SerialInterfaceCollection that are for the use of this manager.
NetworkProtocol	ManagerNetworkProtocol.ManagerNetworkProtocol	False	The value of this property shall contain a reference to a resource of type ManagerNetworkProtocol that represents the network services for this manager.
LogServices	LogServiceCollection.LogServiceCollection	False	The value of this property shall contain a reference to a collection of type LogServiceCollection that are for the use of this manager.
VirtualMedia	VirtualMediaCollection.VirtualMediaCollection	False	The value of this property shall contain a reference to a collection of type VirtualMediaCollection that are for the use of this manager.
Redundancy	Collection (Redundancy.Redundancy)	True	Redundancy information for the managers of this system.
PowerState	Resource.PowerState	True	The value of this property shall contain the power state of the Manager.
HostInterfaces	HostInterfaceCollection.HostInterfaceCollection	False	The value of this property shall be a link to a collection of type HostInterfaceCollection .



Attribute	Type	Nullable	Description
AutoDSTEnabled	Edm.Boolean	False	The value of this property shall contain the enabled status of the automatic Daylight Saving Time (DST) adjustment of the manager's DateTime. It shall be true if Automatic DST adjustment is enabled and false if disabled.
RemoteRedfishServiceUri	Edm.String	True	This property shall contain the URI of the Redfish Service Root for the remote Manager represented by this resource. This property shall only be present when providing aggregation of Redfish services.
RemoteAccountService	AccountService.AccountService	false	This property shall contain a reference to the AccountService resource for the remote Manager represented by this resource. This property shall only be present when providing aggregation of Redfish services.

Table 86. Links Attributes

Attribute	Type	Nullable	Description
ManagerForServers	Collection (ComputerSystem.ComputerSystem)	True	This property shall contain an array of references to ComputerSystem resources of that this Manager instance has control.
ManagerForChassis	Collection (Chassis.Chassis)	True	This property shall contain an array of references to Chassis resources of that this Manager instance has control.
ManagerInChassis	Chassis.Chassis	False	This property shall contain a reference to the chassis that this manager is located in.

Intel® RSD OEM extensions:

Table 87. ManagerLinks Attributes

Attribute	Type	Nullable	Description
ManagerForServices	Collection (StorageService.StorageService)	True	This property is an array of references to services that this manager has control over.
ManagerForEthernetSwitches	Collection (EthernetSwitch.v1_0_0.EthernetSwitch)	True	This property is an array of references to Ethernet switches that this manager has control over.
ManagerForSwitches	Collection (EthernetSwitch.v1_0_0.EthernetSwitch)	True	This property is an array of references to switches that this manager has control over. Deprecated: This value has been Deprecated in favor of ManagerForEthernetSwitches.
ManagerForFabrics	Collection (Fabric.Fabric)	True	This property is an array of references to fabrics that this manager has control over.

4.34.1 Operations

4.34.1.1 GET

Request:

```
GET /redfish/v1/Managers/1
Content-Type: application/json
```

**Response:**

```
{
  "@odata.context": "/redfish/v1/$metadata#Manager.Manager",
  "@odata.id": "/redfish/v1/Managers/1",
  "@odata.type": "#Manager.v1_4_0.Manager",
  "DateTime": null,
  "DateTimeLocalOffset": null,
  "Description": "Manager description",
  "EthernetInterfaces": {
    "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces"
  },
  "FirmwareVersion": "2.58",
  "Id": "1",
  "Links": {
    "@odata.type": "#Manager.v1_4_0.Links",
    "ManagerForChassis": [
      {
        "@odata.id": "/redfish/v1/Chassis/1"
      }
    ],
    "ManagerForServers": [
      {
        "@odata.id": "/redfish/v1/Systems/Target"
      }
    ],
    "ManagerForSwitches": [
      {
        "@odata.id": "/redfish/v1/Fabrics/PCIe/Switches/1"
      }
    ],
    "ManagerInChassis": {
      "@odata.id": "/redfish/v1/Chassis/1"
    }
  },
  "Oem": {
    "Intel_RackScale": {
      "@odata.type": "#Intel.Oem.ManagerLinks",
      "ManagerForServices": [
        {
          "@odata.id": "/redfish/v1/StorageServices/NVMeoE1"
        }
      ],
      "ManagerForFabrics": [
        {
          "@odata.id": "/redfish/v1/Fabrics/NVMeoE"
        }
      ],
      "ManagerForEthernetSwitches": []
    }
  },
  "ManagerType": "ManagementController",
  "Model": null,
  "Name": "Manager",
  "NetworkProtocol": {
    "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol"
  },
  "Oem": {},
  "PowerState": "On",
  "Status": {
```



```

    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "UUID": "123e4567-e89b-ffff-a456-426655440000"
}

```

4.34.1.2 PUT

The PUT operation is not allowed on the manager resource.

4.34.1.3 PATCH

The PATCH operation is not allowed on the manager resource.

4.34.1.4 POST

The POST operation is not allowed on the manager resource.

4.34.1.5 DELETE

The DELETE operation is not allowed on the manager resource.

4.35 Manger Network Protocol

This resource is used to obtain or modify the network services managed by a given manager. Details of this resource are described in the [ManagerNetworkProtocol_v1.xml](#) metadata file. [Table 88](#) describes [ManagerNetworkProtocol](#) attributes.

Table 88. ManagerNetworkProtocol Attributes

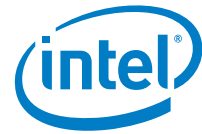
Attribute	Type	Nullable	Description
HostName	Edm.String	True	The value of this property shall contain the host name without any domain information.
FQDN	Edm.String	True	The value of this property shall contain the fully qualified domain name for the manager.
HTTP	ManagerNetworkProtocol.v1_0_0.Protocol	False	This object shall contain information for the HTTP protocol settings for the manager. The default value of the Port property should be 80 for compatibility with established client implementations.
HTTPS	ManagerNetworkProtocol.v1_0_0.Protocol	False	This object shall contain information for the HTTPS/SSL protocol settings for this manager. The default value of the Port property should be 443 for compatibility with established client implementations.
SNMP	ManagerNetworkProtocol.v1_0_0.Protocol	False	This object shall contain information for the SNMP protocol settings for this manager. The default value of the Port property should be 161 for compatibility with established client implementations.



Attribute	Type	Nullable	Description
VirtualMedia	ManagerNetworkProtocol.v1_0_0.Protocol	False	This object shall contain information for the Virtual Media protocol settings for this manager. The value of the Port property shall contain the TCP port assigned for Virtual Media usage.
Telnet	ManagerNetworkProtocol.v1_0_0.Protocol	False	This object shall contain information for the Telnet protocol settings for this manager. The default value of the Port property should be 23 for compatibility with established client implementations.
SSDP	ManagerNetworkProtocol.v1_0_0.SSDPProtocol	False	This object shall contain information for the SSDP protocol settings for this manager. Simple Service Discovery Protocol (SSDP) is for network discovery of devices supporting the Redfish service. The default value of the Port property should be 1900 for compatibility with established client implementations.
IPMI	ManagerNetworkProtocol.v1_0_0.Protocol	False	This object shall contain information for the IPMI over LAN protocol settings for the manager. The default value of the Port property should be 623 for compatibility with established client implementations.
SSH	ManagerNetworkProtocol.v1_0_0.Protocol	False	This object shall contain information for the SSH protocol settings for the manager. The default value of the Port property should be 22 for compatibility with established client implementations.
KVMIP	ManagerNetworkProtocol.v1_0_0.Protocol	False	This object shall contain information for the KVM-IP (Keyboard, Video, Mouse) protocol settings for the manager.
Status	Resource.Status	False	-
DHCP	ManagerNetworkProtocol.v1_0_0.Protocol	False	This object shall contain information for the DHCP protocol settings for the manager.
NTP	ManagerNetworkProtocol.v1_2_0.NTPProtocol	False	This object shall contain information for the NTP protocol settings for the manager.
Actions	ManagerNetworkProtocol.v1_2_0.Actions	False	The Actions property shall contain the available actions for this resource.
DHCPv6	ManagerNetworkProtocol.v1_0_0.Protocol	false	This object shall contain information for the DHCPv6 protocol settings for the manager.
RDP	ManagerNetworkProtocol.v1_0_0.Protocol	false	This object shall contain information for the Remote Desktop Protocol settings for the manager.
RFB	ManagerNetworkProtocol.v1_0_0.Protocol	false	This object shall contain information for the Remote Frame Buffer protocol settings for the manager.

4.35.1 Operations

4.35.1.1 GET

**Request:**

```
GET /redfish/v1/Managers/1/NetworkProtocol
Content-Type: application/json
```

Response:

```
{
  "@odata.context":
"/redfish/v1/$metadata#ManagerNetworkProtocol.ManagerNetworkProtocol",
  "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol",
  "@odata.type": "#ManagerNetworkProtocol.v1_2_0.ManagerNetworkProtocol",
  "Id": "NetworkProtocol",
  "Name": "Manager Network Protocol",
  "Description": "Manager Network Protocol description",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": null
  },
  "DHCP": {
    "Port": null,
    "ProtocolEnabled": null
  },
  "FQDN": null,
  "HTTP": {
    "Port": null,
    "ProtocolEnabled": null
  },
  "HTTPS": {
    "Port": null,
    "ProtocolEnabled": null
  },
  "HostName": null,
  "IPMI": {
    "Port": 0,
    "ProtocolEnabled": false
  },
  "KVMIP": {
    "Port": null,
    "ProtocolEnabled": null
  },
  "NTP": {
    "Port": null,
    "ProtocolEnabled": null
  },
  "SNMP": {
    "Port": null,
    "ProtocolEnabled": null
  },
  "SSDP": {
    "NotifyIPv6Scope": null,
    "NotifyMulticastIntervalSeconds": null,
    "NotifyTTL": 2,
    "Port": 1900,
    "ProtocolEnabled": true
  },
  "SSH": {
    "Port": 0,
    "ProtocolEnabled": false
  }
}
```



```
},
"Telnet": {
  "Port": 0,
  "ProtocolEnabled": false
},
"VirtualMedia": {
  "Port": null,
  "ProtocolEnabled": null
},
"Actions": {
  "Oem": {}
},
"Oem": {}
}
```

4.35.1.2 PUT

The PUT operation is not allowed on the manager network protocol resource.

4.35.1.3 PATCH

The PATCH operation is not allowed on the manager network protocol resource.

4.35.1.4 POST

The POST operation is not allowed on the manager network protocol resource.

4.35.1.5 DELETE

The DELETE operation is not allowed on the manager network protocol resource.

4.36 Ethernet Interface Collection

The Ethernet interface collection resource provides a collection of all Ethernet interfaces supported by a manager. [Table 89](#) shows the `EthernetInterfaceCollection` attribute.

Table 89. EthernetInterfaceCollection Attributes

Attribute	Type	Nullable	Description
Members	Collection(EthernetInterface.EthernetInterface)	True	Contains the members of this collection.

4.36.1 Operations

4.36.1.1 GET

Request:

```
GET /redfish/v1/Managers/1/EthernetInterfaces
Content-Type: application/json
```


**Response:**

```
{
  "@odata.context":
"/redfish/v1/$metadata#EthernetInterfaceCollection.EthernetInterfaceCollection",
  "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces",
  "@odata.type": "#EthernetInterfaceCollection.EthernetInterfaceCollection",
  "Name": "Ethernet Network Interface Collection",
  "Description": "Collection of EthernetInterfaces for this Manager",
  "Members@odata.count": 0,
  "Members": [],
  "Oem": {}
}
```

4.36.1.2 PUT

The PUT operation is not allowed on the Ethernet interface collection of resources.

4.36.1.3 PATCH

The PATCH operation is not allowed on the Ethernet interface collection of resources.

4.36.1.4 POST

The POST operation is not allowed on the Ethernet interface collection of resources.

4.36.1.5 DELETE

The DELETE operation is not allowed on the Ethernet interface collection of resources.

4.37 Event Service

The event service resource is responsible for sending events to subscribers. [Table 90](#) shows the `EventService` attributes.

Table 90. EventService Attributes

Attribute	Type	Nullable	Description
<code>ServiceEnabled</code>	<code>Edm.Boolean</code>	True	The value of this property shall be a Boolean indicating whether this service is enabled.
<code>DeliveryRetryAttempts</code>	<code>Edm.Int64</code>	False	The value of this property shall be the number of retries attempted for any given event to the subscription destination before the subscription is terminated. This retry is at the service level, meaning the HTTP POST to the Event Destination was returned by the HTTP operation as unsuccessful (4xx or 5xx return code) or an HTTP timeout occurred this many times before the Event Destination subscription is terminated.
<code>DeliveryRetryIntervalSeconds</code>	<code>Edm.Int64</code>	False	The value of this property shall be the interval in seconds between the retry attempts for any given event to the subscription destination.



Attribute	Type	Nullable	Description
EventTypesForSubscription	Collection(Event.EventType)	False	The value of this property shall be the types of events that subscriptions can subscribe to. The semantics associated with the enumeration's values are defined in the Redfish specification, refer to Table 2 .
Actions	EventService.v1_0_0.Actions	False	The Actions property shall contain the available actions for this resource.
Status	Resource.Status	False	-
Subscriptions	EventDestinationCollection.EventDestinationCollection	False	The value of this property shall contain the link to a collection of type EventDestinationCollection .
ServerSentEventUri	Edm.String	False	The value of this property shall be a URI that specifies an HTML5 Server-Sent Event conformant endpoint.
RegistryPrefixes	Collection(Edm.String)	True	The value of this property is the array of the Prefixes of the Message Registries that shall be allowed for an Event Subscription.
ResourceTypes	Collection(Edm.String)	True	The value of this property shall specify an array of the valid @odata.type values that can be used for an Event Subscription.
SubordinateResourcesSupported	Edm.Boolean	True	When set to true, the service is indicating that it supports the SubordinateResource property on Event Subscriptions and on generated Events.
EventFormatTypes	Collection(EventDestination.EventFormatType)	True	The value of this property shall indicate 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.
SSEFilterPropertiesSupported	EventService.v1_2_0.SSEFilterPropertiesSupported	false	The value of this property shall contain a set of properties that indicate which properties are supported in the \$filter query parameter for the URI indicated by the ServerSentEventUri property.

4.37.1 Operations

4.37.1.1 GET

Request:

```
GET /redfish/v1/EventService
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#EventService.EventService",
  "@odata.id": "/redfish/v1/EventService",
  "@odata.type": "#EventService.v1_1_0.EventService",
  "Id": "EventService",
  "Name": "Event Service",
  "Description": "Event Service",
  "Status": {
```



```

    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": null
  },
  "ServiceEnabled": true,
  "DeliveryRetryAttempts": 3,
  "DeliveryRetryIntervalSeconds": 60,
  "EventTypesForSubscription": [
    "StatusChange",
    "ResourceUpdated",
    "ResourceAdded",
    "ResourceRemoved",
    "Alert"
  ],
  "Subscriptions": {
    "@odata.id": "/redfish/v1/EventService/Subscriptions"
  },
  "Actions": {
    "#EventService.SendTestEvent": {
      "target": "/redfish/v1/EventService/Actions/EventService.SendTestEvent",
      "EventType@Redfish.AllowableValues": [
        "StatusChange",
        "ResourceUpdated",
        "ResourceAdded",
        "ResourceRemoved",
        "Alert"
      ]
    }
  },
  "Oem": {}
},
"Oem": {}
}

```

4.37.1.2 PUT

The PUT operation is not allowed on the event service resource.

4.37.1.3 PATCH

The PATCH operation is not allowed on the event service resource.

4.37.1.4 POST

The POST operation is not allowed on the event service resource.

4.37.1.5 DELETE

The DELETE operation is not allowed on the event service resource.

4.38 Event Subscription Collection

The event subscription collection is a collection of event destination resources. [Table 91](#) shows the `EventDestinationCollection` attributes.

**Table 91. EventDestinationCollection Attributes**

Attribute	Type	Nullable	Description
Members	Collection (EventDestination.EventDestination)	True	Contains the members of this collection.

4.38.1 Operations

4.38.1.1 GET

Request:

```
GET /redfish/v1/EventService/Subscriptions
Content-Type: application/json
```

Response:

```
{
  "@odata.context":
"/redfish/v1/$metadata#EventDestinationCollection.EventDestinationCollection",
  "@odata.type": "#EventDestinationCollection.EventDestinationCollection",
  "@odata.id": "/redfish/v1/EventService/Subscriptions",
  "Name": "Event Subscriptions Collection",
  "Description": "description-as-string",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/EventService/Subscriptions/1"
    }
  ]
}
```

4.38.1.2 PUT

The PUT operation is not allowed on the event subscription collection of resources.

4.38.1.3 PATCH

The PATCH operation is not allowed on the event subscription collection of resources.

4.38.1.4 POST

Request:

```
POST /redfish/v1/EventService/Subscriptions
Content-Type: application/json
{
  "Name": "EventSubscription 2",
  "Destination": "http://10.0.0.1/Destination1",
  "EventTypes": [
    "ResourceAdded",
    "ResourceRemoved"
  ],
  "Context": "HotSwap events",
  "Protocol": "Redfish",
  "SubscriptionType": "RedfishEvent"
}
```

**Response:**

```
HTTP/1.1 201 Created
Location: http://<IP>:<PORT>/redfish/v1/EventService/Subscriptions/2
((created resource body))
```

4.38.1.5 DELETE

The DELETE operation is not allowed on the event subscription collection of resources.

4.39 Event Subscription

The event subscription contains information about the types of events a user subscribed for and should be sent. [Table 92](#) describes `EventDestination` attributes.

Table 92. EventDestination Attributes

Attribute	Type	Nullable	Description
<code>Destination</code>	<code>Edm.String</code>	False	This property shall contain a URI to the destination where the events will be sent.
<code>EventTypes</code>	<code>Collection(Event.EventType)</code>	False	This property shall contain the types of events that shall be sent to the destination.
<code>Context</code>	<code>Edm.String</code>	True	This property shall contain a client supplied context that will remain with the connection through the connections lifetime.
<code>Protocol</code>	<code>EventDestination.v1_0_0.EventDestinationProtocol</code>	False	This property shall contain the protocol type that the event will use for sending the event to the destination. A value of <code>Redfish</code> shall be used to indicate that the event type shall adhere to that defined in the Redfish specification, refer to Table 2 .
<code>HttpHeaders</code>	<code>Collection(EventDestination.v1_0_0.HttpHeaderProperty)</code>	False	This property shall contain an object consisting of the names and values of HTTP header to be included with every event POST to the Event Destination. This property shall be null on a GET.
<code>MessageIds</code>	<code>Collection(Edm.String)</code>	True	The value of this property shall specify an array of <code>MessageIds</code> that are the only allowable values for the <code>MessageId</code> property within an <code>EventRecord</code> sent to the subscriber. Events with <code>MessageIds</code> 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 Events with any <code>MessageId</code> to the subscriber.



Attribute	Type	Nullable	Description
OriginResources	Collection (Resource.ItemOrCollection)	True	The value of 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 EventRecord sent to the subscriber. Events originating from Resources, Resource Collections, or Referenceable Members 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 Events originating from any Resource, Resource Collection, or Referenceable Member to the subscriber.
Actions	EventDestination.v1_2_0.Actions	False	The Actions property shall contain the available actions for this resource.
SubscriptionType	EventDestination.v1_3_0.SubscriptionType	True	The value of this property shall indicate the type of subscription for events. If this property is not present, the SubscriptionType shall be assumed to be a RedfishEvent .
RegistryPrefixes	Collection (Edm.String)	True	The value of this property is the array of the Prefixes of the Message Registries that contain the MessageIds in the Events that shall be sent to the EventDestination. If this property is absent or the array is empty, the service shall send Events with MessageIds from any Message Registry.
ResourceTypes	Collection (Edm.String)	True	The value of this property shall specify an array of Resource Type values. When an event is generated, if the OriginOfCondition 's Resource Type matches a value in this array, the event shall be sent to the event destination (unless it would be filtered by other property conditions such as RegistryPrefix). If this property is absent or the array is empty, the service shall send Events from any Resource Type to the subscriber. The value of this property shall be only the general namespace for the type and not the versioned value. For example, it shall not be Task.v1_2_0.Task and instead shall just be Task .
SubordinateResources	Edm.Boolean	True	When set to true and OriginResources is specified, indicates the subscription shall be for events from the OriginsResources specified and all subordinate resources. When set to false and OriginResources is specified, indicates subscription shall be for events only from the OriginResources . If OriginResources is not specified, it has no relevance.



Attribute	Type	Nullable	Description
EventFormatType	EventDestination.EventFormatType	True	The value of this property shall indicate the content types of the message that this service will send to the EventDestination. If this property is not present, the EventFormatType shall be assumed to be Event.

Table 93. EventTypes Attribute Values

Attribute	Description
StatusChange	The status of this resource has changed.
ResourceUpdated	The value of this resource has been updated.
ResourceAdded	A resource has been added.
ResourceRemoved	A resource has been removed.
Alert	A condition exists that requires attention.

4.39.1 Metadata

The definition of the resource is available in the http://redfish.dmtf.org/schemas/EventDestination_v1.xml metadata file.

4.39.2 Operations

4.39.2.1 GET

Request:

```
GET /redfish/v1/EventService/Subscriptions/1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#EventDestination.EventDestination",
  "@odata.id": "/redfish/v1/EventService/Subscriptions/1",
  "@odata.type": "#EventDestination.v1_3_0.EventDestination",
  "Id": "1",
  "Name": "EventSubscription 1",
  "Description": "description-as-string",
  "Destination": "http://www.dnsname.com/Destination1",
  "EventTypes": [
    "Alert"
  ],
  "Context": "ABCDEFGHJLKJ",
  "Protocol": "Redfish",
  "SubscriptionType": "RedfishEvent",
  "Actions": {
    "Oem": {}
  }
}
```

4.39.2.2 PUT

The PUT operation is not allowed on the event subscription resource.



4.39.2.3 PATCH

The PATCH operation is not allowed on the event subscription resource.

4.39.2.4 POST

The POST operation is not allowed on the event subscription resource.

4.39.2.5 DELETE

Request:

```
DELETE redfish/v1/EventService/Subscriptions/1
```

Response:

```
HTTP/1.1 204 No Content
```

Or (when a task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "New",
  "StartTime": "2017-12-06T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```

4.40 Event Array

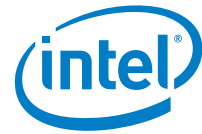
This resource represents the collection of events that are sent by the Event Service to active subscribers. It represents the properties for the events themselves and not subscriptions or other resources. Each event in the array has a set of properties that describe the event. Because this is an array, more than one event can be sent simultaneously. [Table 94](#) describes the [Events](#) attributes.

Table 94. Events Attributes

Attribute	Type	Nullable	Description
Events	Collection(Event.v1_0_0.EventRecord)	True	The value of this resource shall be an array of Event objects used to represent the occurrence of one or more events.
Context	Edm.String	False	This property shall contain a client supplied context for the Event Destination to which this event is being sent.
Actions	Event.v1_2_0.Actions	False	The Actions property shall contain the available actions for this resource.

4.40.1 Metadata

The definition of the resource is available in the [Event_v1.xml](#) metadata file.



4.40.2 Operations

4.40.2.1 GET

The GET operation is not allowed on the event array resource.

4.40.2.2 PUT

The PUT operation is not allowed on the event array resource.

4.40.2.3 PATCH

The PATCH operation is not allowed on the event array resource.

4.40.2.4 POST

Request:

```
POST http://192.168.1.1/Destination1
Content-Type: application/json
{
  "@odata.context": "/redfish/v1/$metadata#EventService/Members/Events/1",
  "@odata.id": "/redfish/v1/EventService/Events/1",
  "@odata.type": "#Event.v1_2_0.Event",
  "Id": "1",
  "Name": "Event Array",
  "Description": "Events",
  "Events": [
    {
      "EventType": "ResourceRemoved",
      "EventId": "ABC132489713478812346",
      "Severity": "Ok",
      "EventTimestamp": "2015-02-23T14:44:44+00:00",
      "Message": "The Blade was removed",
      "MessageId": "Base.1.0.Success",
      "MessageArgs": [],
      "OriginOfCondition": {
        "@odata.id": "/redfish/v1/Systems/System1"
      },
      "Context": "HotSwap event"
    }
  ]
}
```

Response:

```
HTTP/1.1 204 No Content
```

4.40.2.5 DELETE

The DELETE operation is not allowed on the event array resource.



4.41 Task Service

The task service resource represents task services that contain all actual tasks created by a service. This resource is required to be supported by services supporting asynchronous operations (refer to Section [4.2, Asynchronous Operations](#)).

The properties details are available in the `TaskService_v1.xml` metadata file. [Table 95](#) describes the `TaskService` attributes.

Table 95. TaskService Attributes

Attribute	Type	Nullable	Description
CompletedTaskOverWritePolicy	TaskService.v1_0_0.OverWritePolicy	False	The value of this property shall indicate how completed tasks are handled should the task service need to track more tasks.
DateTime	Edm.DateTimeOffset	True	The value of this property shall represent the current <code>DateTime</code> value for the <code>TaskService</code> , with an offset from UTC, in Redfish Timestamp format.
LifeCycleEventOnTaskStateChange	Edm.Boolean	False	The value of this property, if set to true, shall indicate that the service shall send a Life cycle event to Event Destinations Subscriptions registered for such events upon a change of task state. Life cycle events are defined in the Eventing section of the Redfish Specification.
ServiceEnabled	Edm.Boolean	True	The value of this property shall be a boolean indicating whether this service is enabled.
Status	Resource.Status	False	
Tasks	TaskCollection.TaskCollection	False	The value of this property shall be a link to a resource of type <code>TaskCollection</code> .
Actions	TaskService.v1_1_0.Actions	False	The <code>Actions</code> property shall contain the available actions for this resource.

4.41.1 Operations

4.41.1.1 GET

Request:

```
GET /redfish/v1/TaskService
Content-Type: application/json
```

Response:

```
{
  "@Redfish.Copyright": "Copyright 2014-2016 Distributed Management Task Force, Inc. (DMTF). All rights reserved.",
  "@odata.context": "/redfish/v1/$metadata/TaskService.TaskService",
  "@odata.id": "/redfish/v1/TaskService",
  "@odata.type": "#TaskService.v1_0_0.TaskService",
  "Id": "TaskService",
  "Name": "Tasks Service",
  "DateTime": "2015-03-13T04:14:33+06:00",
  "OverWritePolicy": "Never",
  "LifeCycleEventOnTaskStateChange": true,
  "Status": {
```



```

    "State": "Enabled",
    "Health": "OK"
  },
  "ServiceEnabled": true,
  "Tasks": {
    "@odata.id": "/redfish/v1/TaskService/Tasks"
  },
  "Oem": {}
}

```

4.41.1.2 PUT

The PUT operation is not allowed on the task service resource.

4.41.1.3 PATCH

The PATCH operation is not allowed on the task service resource.

4.41.1.4 POST

The POST operation is not allowed on the task service resource.

4.41.1.5 DELETE

The DELETE operation is not allowed on the task service resource.

4.42 Task Collection

The task collection resource represents a collection of resources of Task type. The properties details are available in the [TaskCollection_v1.xml](#) metadata file. [Table 96](#) shows the [TaskCollection](#) attribute.

Table 96. TaskCollection Attributes

Attribute	Type	Nullable	Description
Members	Collection (Task.Task)	True	Contains the members of this collection.

4.42.1 Operations

4.42.1.1 GET

Request:

```

GET /redfish/v1/TaskService/Tasks
Content-Type: application/json

```

Response:

```

{
  "@Redfish.Copyright": "Copyright 2014-2016 Distributed Management Task Force, Inc. (DMTF). All rights reserved.",
  "@odata.context": "/redfish/v1/$metadata#TasksCollection.TaskCollection",
  "@odata.type": "#TasksCollection.TaskCollection",
  "Name": "Task Collection",
  "Members@odata.count": 1,
  "Members": [

```



```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/1"
}
```

4.42.1.2 PUT

The PUT operation is not allowed on the task collection of resources.

4.42.1.3 PATCH

The PATCH operation is not allowed on the task collection of resources.

4.42.1.4 POST

The POST operation is not allowed on the task collection of resources.

4.42.1.5 DELETE

The DELETE operation is not allowed on the task collection of resources.

4.43 Task

The task resource contains information about a specific task scheduled by or being executed by a Redfish service's task service. The properties details are available in the [Task_v1.xml](#) metadata file. [Table 97](#) describes the Task attributes.

Table 97. Task Attributes

Attribute	Type	Nullable	Description
TaskState	Task.v1_0_0.TaskState	False	The value of this property shall indicate the state of the task. New shall be used to indicate that the task is a new task that has just been instantiated and is in the initial state and indicates it has never been started. Starting shall be used to indicate that the task is moving from the New, Suspended, or Service states into the Running state. Running shall be used to indicate that the Task is running. Suspended shall be used to indicate that the Task is stopped (e.g., by a user), but can be restarted in a seamless manner. Interrupted shall be used to indicate that the Task was interrupted (e.g., by a server crash) in the middle of processing, and the user should either re-run/restart the Task. Pending shall be used to indicate that the Task has been queued and will be scheduled for processing as soon as resources are available to handle the request. Stopping shall be used to indicate that the Task is in the process of moving to a Completed, Killed, or Exception state. Completed shall be used to indicate that the task has completed normally. Killed shall be used to indicate that the task has been stopped by a Kill state change request (non-graceful shutdown). The exception shall be used to indicate that the Task is in an abnormal state that might be indicative of an error condition. Service shall be used to indicate that the Task is in a state that supports problem discovery, or resolution, or both. This state is used when corrective action is possible.
StartTime	Edm.DateTimeOffset	False	The value of this property shall indicate the time the task was started.



Attribute	Type	Nullable	Description
EndTime	Edm.DateTimeOffset	False	The value of this property shall indicate the time the task was completed.
TaskStatus	Resource.Health	False	The value of this property shall be the completion status of the task, as defined in the Status section of the Redfish specification and shall not be set until the task has completed. Refer to Table 2 for redfish specifications.
Messages	Collection(Message.Message)	False	The value of this property shall be an array of messages associated with the task.
Actions	Task.v1_1_0.Actions	False	The Actions property shall contain the available actions for this resource.
TaskMonitor	Edm.String	False	This property shall contain a URI to Task Monitor as defined in the Redfish Specification.
Payload	Task.v1_3_0.Payload	False	This object shall contain information detailing the HTTP and JSON payload information for executing this task. This object shall not be included in the response if the HidePayload property is set to True.
HidePayload	Edm.Boolean	False	This property shall be set to True if the Payload object shall not be returned on GET operations, and set to False if the contents can be returned normally. If this property is not specified when the Task is created, the default value shall be False.
PercentComplete	Edm.Int64	True	The value of 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.

4.43.1 Operations

4.43.1.1 GET

Request:

```
GET /redfish/v1/TaskService/Tasks/1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_2_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "Completed",
  "StartTime": "2016-08-18T12:00+01:00",
  "EndTime": "2016-08-18T13:13+01:00",
  "TaskStatus": "OK",
  "Messages": [
    {
      "MessageId": "Base.1.0.Created",
      "RelatedProperties": [],
      "Message": "The resource has been created successfully",
      "MessageArgs": [],
      "Severity": "OK"
    }
  ]
}
```



4.43.1.2 PUT

The PUT operation is not allowed on the task resource.

4.43.1.3 PATCH

The PATCH operation is not allowed on the task resource.

4.43.1.4 POST

The POST operation is not allowed on the task resource.

4.43.1.5 DELETE

Request:

```
DELETE redfish/v1/TaskService/Tasks/1
```

Response:

```
HTTP/1.1 204 No Content
```

Or (when a task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": "New",
  "StartTime": "2017-12-06T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```

4.44 Account Service

The Account Service resource contains properties common to all user accounts, such as password requirements, and control features such as account lockout.

It also contains links to the collections of Manager Accounts and Roles. In Rack Scale Design v2.5 there is always one Role ("Administrator") and one Account with this role.

[Table 98](#) shows the `AccountService` attributes.

Table 98. AccountService Attributes

Attribute	Type	Nullable	Description
Status	Resource.Status	False	This property shall contain any status or health properties of the resource.



Attribute	Type	Nullable	Description
ServiceEnabled	Edm.Boolean	True	The value of this property shall be a Boolean indicating whether this service is enabled. If this is set to false, the AccountService is disabled. This means no users can be created, deleted or modified. Any service is attempting to access the Account Service , like the Session Service, will fail to access. Thus new sessions cannot be started with the service disabled (though established sessions may still continue operating). Note: This does not affect Basic AUTH connections.
AuthFailureLoggingThreshold	Edm.Int64	False	This property shall reference the threshold for when an authorization failure is logged. This represents a modulo function value. Thus the failure shall be logged every nth occurrence where n represents the value of this property.
MinPasswordLength	Edm.Int64	False	This property shall reference the minimum password length that the implementation will allow a password to be set to.
MaxPasswordLength	Edm.Int64	False	This property shall reference the maximum password length that the implementation will allow a password to be set to.
AccountLockoutThreshold	Edm.Int64	true	This property shall reference the threshold of failed login attempts at that point the user's account is locked. If set to 0, no lockout shall ever occur.
AccountLockoutDuration	Edm.Int64	true	This property shall reference the period of time in seconds that an account is locked after the number of failed login attempts reaches the threshold referenced by AccountLockoutThreshold , within the window of time referenced by AccountLockoutCounterResetAfter . The value shall be greater than or equal to the value of AccountLockoutResetAfter . If set to 0, no lockout shall occur.
AccountLockoutCounterResetAfter	Edm.Int64	False	This property shall reference the threshold of time in seconds from the last failed login attempt at that point the AccountLockoutThreshold counter (that counts a number of failed login attempts) is reset back to zero (at that point AccountLockoutThreshold failures would be required before the account is locked). This value shall be less than or equal to AccountLockoutDuration . The threshold counter also resets to zero after each successful login.
Accounts	ManagerAccountCollection.ManagerAccountCollection	False	This property shall contain the link to a collection of type ManagerAccountCollection .
Roles	RoleCollection.RoleCollection	False	This property shall contain the link to a collection of type RoleCollection .
PrivilegeMap	PrivilegeRegistry.PrivilegeRegistry	False	The value of this property shall be a link to a resource of type PrivilegeMapping that defines the privileges a user context needs in order to perform a requested operation on a URI associated with this service.
Actions	AccountService.v1_2_0.Actions	False	The Actions property shall contain the available actions for this resource.



Attribute	Type	Nullable	Description
LocalAccountAuth	AccountService.v1_3_0.LocalAccountAuth	False	This property shall govern how the service uses the Accounts collection within this AccountService as part of authentication. Details about each of the modes are found in the description of the enum values.
LDAP	AccountService.v1_3_0.ExternalAccountProvider	False	This property shall contain the first LDAP external account provider this AccountService supports. If the AccountService supports 1 or more LDAP services as an external account provider, this entity must be populated by default. This entity shall not be present in the AdditionalExternalAccountProviders collection.
ActiveDirectory	AccountService.v1_3_0.ExternalAccountProvider	False	This property shall contain the first ActiveDirectory external account provider this AccountService supports. If the AccountService supports 1 or more ActiveDirectory services as an external account provider, this entity must be populated by default. This entity shall not be present in the AdditionalExternalAccountProviders collection.
AdditionalExternalAccountProviders	ExternalAccountProviderCollection.ExternalAccountProviderCollection	False	This property shall contain an additional external account providers this AccountService is using.

4.44.1 Operations

4.44.1.1 GET

Request:

```
GET /redfish/v1/AccountService
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#AccountService.AccountService",
  "@odata.id": "/redfish/v1/AccountService",
  "@odata.type": "#AccountService.v1_3_0.AccountService",
  "Id": "AccountService",
  "Name": "Account Service",
  "Description": "Account Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "ServiceEnabled": true,
  "LocalAccountAuth": "Enabled",
  "Accounts": {
    "@odata.id": "/redfish/v1/AccountService/Accounts"
  },
  "Roles": {
    "@odata.id": "/redfish/v1/AccountService/Roles"
  }
}
```




4.44.1.2 PUT

The PUT operation is not allowed on the Account Service resource.

4.44.1.3 PATCH

Implementation of this action is not required in Intel® Rack Scale Design v2.5.

4.44.1.4 POST

The POST operation is not allowed on the Account Service resource.

4.44.1.5 DELETE

The DELETE operation is not allowed on the Account Service resource.

4.45 Manager Account Collection

The Manager Account Collection contains a collection of [ManagerAccount](#) resource instances.

[Table 99](#) shows the [ManagerAccountCollection](#) attribute.

Table 99. ManagerAccountCollection Attribute

Attribute	Type	Nullable	Description
Members	Collection (ManagerAccount.ManagerAccount)	True	Contains the members of this collection.

4.45.1 Operations

4.45.1.1 GET

Request:

```
GET /redfish/v1/AccountService/Accounts
Content-Type: application/json
```

Response:

```
{
  "@odata.context":
"/redfish/v1/$metadata#ManagerAccountCollection.ManagerAccountCollection",
  "@odata.id": "/redfish/v1/AccountService/Accounts",
  "@odata.type": "#ManagerAccountCollection.ManagerAccountCollection",
  "Name": "Accounts Collection",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/AccountService/Accounts/Account1"
    }
  ]
}
```

4.45.1.2 PUT

The PUT operation is not allowed on the Manager Account Collection resource.



4.45.1.3 PATCH

The PATCH operation is not allowed on the Manager Account Collection resource.

4.45.1.4 POST

Implementation of this action is not required in Intel® Rack Scale Design v2.5.

4.45.1.5 DELETE

The DELETE operation is not allowed on the Manager Account Collection resource.

4.46 Manager Account

The Manager Account Resource Defines User Accounts.

[Table 100](#) shows the Manager Account attributes.

Table 100. ManagerAccount Attributes

Attribute	Type	Nullable	Description
Password	Edm.String	True	The value of this property shall be the password for this account. The value shall be null for GET requests.
UserName	Edm.String	False	The value of this property shall be the user name for this account.
RoleId	Edm.String	False	The value of this property shall be the ID (the RoleId) of the Role resource that configured for this account. The service shall reject POST , PATCH , or PUT operations that provide a RoleId that does not exist by returning HTTP 400 (Bad Request).
Locked	Edm.Boolean	False	This property (when set to true) shall indicate that the account service has automatically locked the account due to the accountLockoutThreshold having been exceeded. If set to true, the account is locked. If set to false, the account is not locked. A user admin shall be able to write a false to the property to clear the lockout condition, prior to the lockout duration period.
Enabled	Edm.Boolean	False	This property shall enable (if set to true) or disable (if set to false) the account for future logins. The value of Enable overrides the locked property.
Links	ManagerAccount.v1_0_0.Links	False	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.
Actions	ManagerAccount.v1_1_0.Actions	False	The Actions property shall contain the available actions for this resource.
Certificates	CertificateCollection.CertificateCollection	False	The value of this property shall be a link to a collection of type CertificateCollection.

4.46.1 Operations



4.46.1.1 GET

Request:

```
GET /redfish/v1/AccountService/Accounts/Account1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#ManagerAccount.ManagerAccount",
  "@odata.id": "/redfish/v1/AccountService/Accounts/Account1",
  "@odata.type": "#ManagerAccount.v1_1_2.ManagerAccount",
  "Id": "Account1",
  "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"
    }
  }
}
```

4.46.1.2 PUT

The PUT operation is not allowed on the Manager Account resource.

4.46.1.3 PATCH

Implementation of this action is not required in Intel® Rack Scale Design v2.5.

4.46.1.4 POST

The POST operation is not allowed on the Manager Account resource.

4.46.1.5 DELETE

Implementation of this action is not required in Intel® Rack Scale Design v2.5.

4.47 Role Collection

The Role Collection contains a collection of Role resource instances.

[Table 101](#) shows the `RoleCollection` attribute.

Table 101. RoleCollection Attribute

Attribute	Type	Nullable	Description
Members	Collection(Role.Role)	True	Contains the members of this collection.



4.47.1.1 Operations

4.47.1.2 GET

Request:

```
GET /redfish/v1/AccountService/Roles
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#RoleCollection.RoleCollection",
  "@odata.id": "/redfish/v1/AccountService/Roles",
  "@odata.type": "#RoleCollection.RoleCollection",
  "Name": "Roles Collection",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/AccountService/Roles/Administrator"
    }
  ]
}
```

4.47.1.3 PUT

The PUT operation is not allowed on the Role Collection resource.

4.47.1.4 PATCH

The PATCH operation is not allowed on the Role Collection resource.

4.47.1.5 POST

Implementation of this action is not required in Intel® Rack Scale Design v2.5.

4.47.1.6 DELETE

The DELETE operation is not allowed on the Role Collection resource.

4.48 Role

The Role resource defines a user role to be used in conjunction with an Account.

[Table 102](#) shows the Role attributes.

Table 102. Role Attributes

Attribute	Type	Nullable	Description
IsPredefined	Edm.Boolean	False	The value of this property shall indicate if the role is a predefined role.
AssignedPrivileges	Collection(Privileges.PrivilegeType)	False	The value of this property shall be the redfish privileges that the role includes. For pre-defined roles, this property shall be readOnly . For custom roles, some implementations may not allow writing this property.



Attribute	Type	Nullable	Description
OemPrivileges	Collection (Edm.String)	False	The value of this property shall be the OEM privileges that this role includes. For pre-defined roles, this property shall be readOnly. For custom roles, some implementations may not allow writing this property.
Actions	Role.v1_1_0.Actions	False	The Actions property shall contain the available actions for this resource.
RoleId	Edm.String	False	This property shall contain the string name of the Role. This property shall contain the same value as the Id property.

4.48.1 Operations

4.48.1.1 GET

Request:

```
GET /redfish/v1/AccountService/Roles/Administrator
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Role.Role",
  "@odata.id": "/redfish/v1/AccountService/Roles/Administrator",
  "@odata.type": "#Role.v1_2_1.Role",
  "Id": "Administrator",
  "RoleId": "Administrator",
  "Name": "User Role",
  "Description": "Administrator Role",
  "IsPredefined": true,
  "AssignedPrivileges": [
    "Login",
    "ConfigureManager",
    "ConfigureUsers",
    "ConfigureSelf",
    "ConfigureComponents"
  ],
  "OemPrivileges": []
}
```

4.48.1.2 PUT

The PUT operation is not allowed on the Role resource.

4.48.1.3 PATCH

Implementation of this action is not required in Intel® Rack Scale Design v2.5.

[Table 103](#) describes the attributes that can be updated by PATCH operation.

Table 103. Role Attributes Updatable by PATCH

Attribute	Type	Nullable	Description



Attribute	Type	Nullable	Description
OemPrivileges	Collection (Edm.String)	False	The value of this property shall be the OEM privileges that this role includes. For pre-defined roles, this property shall be readOnly . For custom roles, some implementations may not allow writing this property.
AssignedPrivileges	Collection(Privileges.PrivilegeType)	False	The value of this property shall be the redfish privileges that the role includes. For pre-defined roles, this property shall be readOnly . For custom roles, some implementations may not allow writing this property.

Request:

```
PATCH /redfish/v1/AccountService/Roles/Administrator
Content-Type: application/json
{
  "AssignedPrivileges": [
    "Login",
    "ConfigureManager",
    "ConfigureUsers",
    "ConfigureSelf",
    "ConfigureComponents"
  ],
  "OemPrivileges": []
}
```

Response:

```
HTTP/1.1 200 OK
((updated resource body))
```

Or:

```
HTTP/1.1 204 No Content
```

Or (when task is created):

```
HTTP/1.1 202 Accepted
Location: http://<IP:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
  "Name": "Task 1",
  "TaskState": " New",
  "StartTime": "2016-09-01T04:45+01:00",
  "TaskStatus": "OK",
  "Messages": []
}
```

4.48.1.4 POST

The POST operation is not allowed on the Role resource.

4.48.1.5 DELETE

The DELETE operation is not allowed on the Role resource.



4.49 Session Service

The Session Service resource represents the properties for the service itself and has links to the actual list of sessions.

[Table 104](#) shows the `SessionService` attributes.

Table 104. SessionService Attributes

Attribute	Type	Nullable	Description
Status	Resource.Status	False	This property shall contain any status or health properties of the resource.
ServiceEnabled	Edm.Boolean	True	The value of this property shall be a Boolean indicating whether this service is enabled. This means new sessions cannot be created; old sessions cannot be deleted though established sessions may continue operating.
SessionTimeout	Edm.Int64	False	This property shall reference the threshold of time in seconds between requests on a specific session at that 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 .
Sessions	SessionCollection.SessionCollection	False	This property shall contain the link to a collection of Sessions.
Actions	SessionService.v1_1_0.Actions	False	The Actions object contains the available custom actions on this resource.

4.49.1 Operations

4.49.1.1 GET

Request:

```
GET /redfish/v1/SessionService
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#SessionService.SessionService",
  "@odata.id": "/redfish/v1/SessionService",
  "@odata.type": "#SessionService.v1_1_3.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"
  }
}
```



```
}  
}
```

4.49.1.2 PUT

The PUT operation is not allowed on the Session Service resource.

4.49.1.3 PATCH

Implementation of this action is not required in Intel® Rack Scale Design v2.5.

[Table 105](#) describes the attributes that can be updated by PATCH operation:

Table 105. SessionService Attributes Updatable by PATCH

Attribute	Type	Required	Description
ServiceEnabled	Edm.Boolean	No	The value of this property shall be a Boolean indicating whether this service is enabled. This means new sessions cannot be created; old sessions cannot be deleted though established sessions may continue operating.
SessionTimeout	Edm.Int64	No	This property shall reference the threshold of time in seconds between requests on a specific session at that point the session service shall close the session due to inactivity. Values between 30 and 86400 are supported.

Request:

```
PATCH /redfish/v1/SessionService  
Content-Type: application/json  
{  
  "ServiceEnabled": true,  
  "SessionTimeout": "30"  
}
```

Response:

```
HTTP/1.1 200 OK  
((updated resource body))
```

Or:

```
HTTP/1.1 204 No Content
```

Or (when task is created):

```
HTTP/1.1 202 Accepted  
Location: http://<IP:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor  
{  
  "@odata.context": "/redfish/v1/$metadata#Task.Task",  
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",  
  "@odata.type": "#Task.v1_0_0.Task",  
  "Id": "1",  
  "Name": "Task 1",  
  "TaskState": " New",  
  "StartTime": "2016-09-01T04:45+01:00",  
  "TaskStatus": "OK",  
  "Messages": []  
}
```




4.49.1.4 POST

The POST operation is not allowed on the Session Service resource.

4.49.1.5 DELETE

The DELETE operation is not allowed on the Session Service resource.

4.50 Session Collection

The Session Collection contains a collection of Session resource instances.

[Table 106](#) shows the `SessionCollection` attribute.

Table 106. SessionCollection Attribute

Attribute	Type	Nullable	Description
<code>Members</code>	<code>Collection (Session.Session)</code>	True	Contains the members of this collection.

4.50.1 Operations

4.50.1.1 GET

Request:

```
GET /redfish/v1/SessionService/Sessions
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#SessionCollection.SessionCollection",
  "@odata.id": "/redfish/v1/SessionService/Sessions",
  "@odata.type": "#SessionCollection.SessionCollection",
  "Name": "Session Collection",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/SessionService/Sessions/Session1"
    }
  ]
}
```

4.50.1.2 PUT

The PUT operation is not allowed on the Session Collection resource.

4.50.1.3 PATCH

The PATCH operation is not allowed on the Session Collection resource.

4.50.1.4 POST

The attributes shown in [Table 107](#) can be provided as a body to a POST operation to create a new session.

**Table 107. Session Attributes Usable by POST**

Attribute	Type	Nullable	Description
UserName	Edm.String	True	The value of this property shall be the UserName that matches a registered account identified by a ManagerAccount resource registered with the Account Service.
Password	Edm.String	True	The value of this property shall be the password for this session. The value shall be null for GET requests.

Request:

```
POST /redfish/v1/SessionService/Sessions
Content-Type: application/json
{
  "UserName": "Administrator",
  "Password": "password"
}
```

Response:

```
HTTP/1.1 201 Created
Location: http://<IP>:<PORT>/redfish/v1/SessionService/Sessions/Session1
X-Auth-Token: <session-auth-token>
{
  "@odata.context": "/redfish/v1/$metadata#Session.Session",
  "@odata.id": "/redfish/v1/SessionService/Sessions/Session1",
  "@odata.type": "#Session.v1_1_0.Session",
  "Id": "Session1",
  "Name": "User Session",
  "Description": "User Session",
  "UserName": "Administrator",
  "Password": null,
  "Oem": {}
}
```

4.50.1.5 DELETE

The DELETE operation is not allowed on the Session Collection resource.

4.51 Session

The Session resource describes a single connection (session) between a client and a Redfish service instance.

[Table 108](#) describes the [Session](#) attributes.

Table 108. Session Attributes

Attribute	Type	Nullable	Description
UserName	Edm.String	True	The value of this property shall be the UserName that matches a registered account identified by a ManagerAccount resource registered with the Account Service.
Password	Edm.String	True	The value of this property shall be the password for this session. The value shall be null for GET requests.



Attribute	Type	Nullable	Description
Actions	Session.v1_1_0.Actions	False	The Actions property shall contain the available actions for this resource.

4.51.1 Operations

4.51.1.1 GET

Request:

```
GET /redfish/v1/SessionService/Sessions/Session1
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Session.Session",
  "@odata.id": "/redfish/v1/SessionService/Sessions/Session1",
  "@odata.type": "#Session.v1_1_0.Session",
  "Id": "Session1",
  "Name": "User Session",
  "Description": "User Session",
  "UserName": "Administrator",
  "Password": null,
  "Oem": {}
}
```

4.51.1.2 PUT

The PUT operation is not allowed on the Session resource.

4.51.1.3 PATCH

Implementation of this action is not required in Intel® Rack Scale Design v2.5.

4.51.1.4 POST

The POST operation is not allowed on the Session resource.

4.51.1.5 DELETE

Request:

```
DELETE redfish/v1/SessionService/Sessions/Session1
```

Response:

```
HTTP/1.1 204 No Content
```

Or (when a task is created):

```
HTTP/1.1 202 Accepted
Location: http://<ip:port>/redfish/v1/TaskService/Tasks/1/TaskMonitor
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_0_0.Task",
  "Id": "1",
```



```
"Name": "Task 1",
"TaskState": "New",
"StartTime": "2017-12-06T04:45+01:00",
"TaskStatus": "OK",
"Messages": []
}
```

4.52 Registries (MessageRegistryFileCollection)

The registries resource represents collection of the Schema File locator resources. The properties details are available in the `MessageRegistryFileCollection_v1.xml` metadata file. [Table 109](#) shows the `MessageRegistryFileCollection` attribute.

Table 109. MessageRegistryFileCollection Attributes

Attribute	Type	Nullable	Description
Members	Collection (MessageRegistryFile.MessageRegistryFile)	True	Contains the members of this collection.

4.52.1 Operations

4.52.1.1 GET

Request:

```
GET /redfish/v1/Registries
Content-Type: application/json
```

Response:

```
{
  "@odata.context":
"/redfish/v1/$metadata#MessageRegistryFileCollection.MessageRegistryFileCollection",
  "@odata.id": "/redfish/v1/Registries",
  "@odata.type": "#MessageRegistryFileCollection.MessageRegistryFileCollection",
  "Name": "Registry File Collection",
  "Description": "Registry Repository",
  "Members@odata.count": 2,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Registries/Base"
    },
    {
      "@odata.id": "/redfish/v1/Registries/Intel_RackScale"
    }
  ]
}
```

4.52.1.2 PUT

The PUT operation is not allowed on the registries resource.

4.52.1.3 PATCH

The PATCH operation is not allowed on the registries resource.



4.52.1.4 POST

The POST operation is not allowed on the registries resource.

4.52.1.5 DELETE

The DELETE operation is not allowed on the registries resource.

4.53 Message Registry File

This resource shall be used to represent the Schema File locator resource for a Redfish implementation.

Properties details are available in the [MessageRegistryFile_v1.xml](#) metadata file. [Table 110](#) shows the [MessageRegistryFileCollection](#) attribute.

Table 110. MessageRegistryFile Attributes

Attribute	Type	Nullable	Description
Languages	Collection(Edm.String)	False	The value of this property shall be a string consisting of an RFC 5646 language code.
Registry	Edm.String	False	The value of this property shall be the value of the Registry Name, Major and Minor version and shall conform to the syntax specified in the Redfish specification for the MessageId property without the MessageKey .
Location	Collection(MessageRegistryFile.v1_0_0.Location)	False	Location information for this schema file.
Actions	MessageRegistryFile.v1_1_0.Actions	False	The Actions property shall contain the available actions for this resource.

4.53.1 Operations

4.53.1.1 GET

4.53.1.1.1 Redfish Base Registry

Request:

```
GET /redfish/v1/Registries/Base
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Registries/Members/$entity",
  "@odata.id": "/redfish/v1/Registries/Base",
  "@odata.type": "#MessageRegistryFile.v1_1_0.MessageRegistryFile",
  "Id": "Base",
  "Name": "Base Message Registry File",
  "Description": "Base Message Registry File locations",
```



```
"Languages": [
  "en"
],
"Registry": "Base.1.0.0",
"Location": [
  {
    "Language": "en",
    "Uri": null,
    "ArchiveUri": null,
    "PublicationUri":
"https://www.dmtf.org/sites/default/files/standards/documents/DSP8011_1.0.0a.json",
    "ArchiveFile": null
  }
],
"Oem": {}
}
```

4.53.1.1.2 Intel RackScale Registry

Request:

```
GET /redfish/v1/Registries/Intel_RackScale
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Registries/Members/$entity",
  "@odata.id": "/redfish/v1/Registries/Intel_RackScale",
  "@odata.type": "#MessageRegistryFile.v1_1_0.MessageRegistryFile",
  "Id": "Intel_RackScale.1.0.0",
  "Name": "Intel RackScale Message Registry File",
  "Description": "Message Registry File for Intel RackScale Message Registry",
  "Languages": [
    "en"
  ],
  "Registry": "Intel_RackScale.1.0.0",
  "Location": [
    {
      "Language": "en",
      "Uri": "/registries/Intel_RackScale.1.0.0.json",
      "ArchiveUri": null,
      "PublicationUri": null,
      "ArchiveFile": null
    }
  ],
  "Oem": {}
}
```

4.53.1.2 PUT

The PUT operation is not allowed on this resource.

4.53.1.3 PATCH

The PATCH operation is not allowed on this resource.



4.53.1.4 POST

The POST operation is not allowed on this resource.

4.53.1.5 DELETE

The DELETE operation is not allowed on this resource.

4.54 Telemetry Service

Properties details are available in the `TelemetryService_v1.xml` metadata file. [Table 109](#) shows the `TelemetryService` attributes.

Table 111. TelemetryService Attributes

Attribute	Type	Nullable	Description
Status	Resource.Status	True	
MaxReports	Edm.Int64	True	If present, the value shall specify the maximum number of metric collectors that can be supported by this service.
MinCollectionInterval	Edm.String	True	If present, the value shall be an ISO 8601 duration specifying the minimum time between collections.
SupportedCollectionFunctions	Collection(TelemetryService.v1_0_0.CollectionFunction)	True	If present, the value shall define the function to apply over the collection duration.
Actions	TelemetryService.v1_0_0.Actions	False	The Actions object contains the available custom actions on this resource.
MetricDefinitions	Intel_RackScale.MetricDefinitionCollection.MetricDefinitionCollection	True	The entries of shall be resources of type MetricDefinitionCollection .
MetricReportDefinitions	Intel_RackScale.MetricReportDefinitionCollection.MetricReportDefinitionCollection	True	The value shall be a link to a resource of type MetricReportDefinitionCollection .
MetricReports	Intel_RackScale.MetricReportCollection.MetricReportCollection	True	The value shall be a link to a resource of type MetricReportCollection .
Triggers	Intel_RackScale.TriggersCollection.TriggersCollection	True	The value shall be a link to a resource of type TriggersCollection .
Status	Resource.Status	false	This property shall contain any status or health properties of the resource.
MaxReports	Edm.Int64	True	The value shall be the maximum number of metric reports supported by this service.



Attribute	Type	Nullable	Description
MinCollectionInterval	Edm.Duration	True	The value shall be the minimum time interval between collections supported by this service. The value shall conform to the Duration format.
SupportedCollectionFunctions	Collection(TelemetryService.v1_0_0.CollectionFunction)	True	The value shall define the function to apply over the collection duration.
Actions	TelemetryService.v1_0_0.Actions	false	The Actions property shall contain the available actions for this resource.
MetricDefinitions	MetricDefinitionCollection.MetricDefinitionCollection	false	The entries of shall be resources of type MetricDefinitionCollection.
MetricReportDefinitions	MetricReportDefinitionCollection.MetricReportDefinitionCollection	false	The value shall be a link to a resource of type MetricReportDefinitionCollection.
MetricReports	MetricReportCollection.MetricReportCollection	false	The value shall be a link to a resource of type MetricReportCollection.
Triggers	TriggersCollection.TriggersCollection	false	The value shall be a link to a resource of type TriggersCollection.
LogService	LogService.LogService	false	The value of this property shall contain a reference to a LogService for the use by this Telemetry Service.

4.54.1 Operations

4.54.1.1 GET

Request:

```
GET /redfish/v1/TelemetryService
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#TelemetryService.TelemetryService",
  "@odata.type": "#TelemetryService.v1_0_0.TelemetryService",
  "@odata.id": "/redfish/v1/TelemetryService",
  "Id": "TelemetryService",
  "Name": "Telemetry Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "MetricDefinitions": {
    "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions"
  }
}
```




4.54.1.2 PUT

The PUT operation is not allowed on this resource.

4.54.1.3 PATCH

The PATCH operation is not allowed on this resource.

4.54.1.4 POST

The POST operation is not allowed on this resource.

4.54.1.5 DELETE

The DELETE operation is not allowed on this resource.

4.55 Metric Definition Collection

Properties details are available in the `MetricDefinitionCollection_v1.xml` metadata file. [Table 112](#) shows the `MetricDefinitionCollection` attribute.

Table 112. MetricDefinitionCollection Attribute

Attribute	Type	Nullable	Description
Members	<code>Collection(MetricDefinition .MetricDefinition)</code>	True	Contains the members of this collection.

4.55.1 Operations

4.55.1.1 GET

Request:

```
GET /redfish/v1/TelemetryService/MetricDefinitions
Content-Type: application/json
```

Response:

```
{
  "@odata.context":
"/redfish/v1/$metadata#Intel_RackScale.MetricDefinitionCollection.MetricDefinitionColl
ection",
  "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions",
  "@odata.type": "#MetricDefinitionCollection.MetricDefinitionCollection",
  "Name": "Metric Definitions Collection",
  "Description": "description-as-string",
  "Members@odata.count": 4,
  "Members": [
    {
      "@odata.id":
"/redfish/v1/TelemetryService/MetricDefinitions/DriveAvailableSpare"
    },
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/DriveTemperature"
    },
    {

```

```

    "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/DriveUnitsRead"
  },
  {
    "@odata.id":
"/redfish/v1/TelemetryService/MetricDefinitions/DriveLatencyHistogramBucket"
  }
]
}

```

4.55.1.2 PUT

The PUT operation is not allowed on this resource.

4.55.1.3 PATCH

The PATCH operation is not allowed on this resource.

4.55.1.4 POST

The POST operation is not allowed on this resource.

4.55.1.5 DELETE

The DELETE operation is not allowed on this resource.

4.56 Metric Definition

Properties details are available in the [ScaleMetricDefinition_v1.xml](#) metadata file. Metric Definition describes either a metric associated with a physical sensor (e.g., exposed by BMC) or a metric associated with a specific resource (e.g., statistics of an Ethernet Switch Port).

[Table 113](#) shows the [MetricDefinition](#) attributes. [Error! Reference source not found.](#) shows the [MetricDefinition](#) attributes extending the WIP model.

Table 113. MetricDefinition Attributes

Attribute	Type	Nullable	Description
MetricType	MetricDefinition.v1_0_0.MetricType	True	The value shall specify the type of metric.
MetricDataType	MetricDefinition.v1_0_0.MetricDataType	True	The value shall specify the data-type of the metric.
Units	Edm.String	True	The value shall specify the units of the metric. shall be consistent with the case sensitive <i>Unified Code for Units of Measure</i> as defined at http://unitsofmeasure.org/ucum.html . Note: The units of measure is not covered in UCUM.
Implementation	MetricDefinition.v1_0_0.ImplementationType	True	The value shall specify the implementation of the metric.
Calculable	MetricDefinition.v1_0_0.Calculable	True	The value shall specify whether the metric can be used in a calculation.
IsLinear	Edm.Boolean	True	The value shall specify that the corresponding metric values shall be



Attribute	Type	Nullable	Description
			linear or non-linear. Linear metrics may be compared using a greater than relation. An example of linear metrics include performance metrics. Examples of non-linear metrics include error codes.
Wildcards	<code>Collection(MetricDefinition.v1_0_0.Wildcard)</code>	True	The property shall contain a list of wildcards and their replacement strings, which are applied to the <code>MetricProperties</code> array property. Each wildcard shall have a corresponding entry in this array property.
MetricProperties	<code>Collection(Edm.String)</code>	True	This array property shall contain a list of URIs with wildcards and property identifiers for which this metric definition is defined. Each wildcard in the URI shall be delimited by a set of curly braces. Each wildcard shall be substituted as specified by the corresponding entry in the Wildcard array property. Once an URI with wildcards has had its wildcards fully substituted, it shall reference a resource property for which the metric definition applies. The property identifiers portion of the URI shall follow JSON fragment notation rules defined by RFC6901.
CalculationParameters	<code>Collection(MetricDefinition.v1_0_0.CalculationParamsType)</code>	True	Shall list the metric properties which are part of the synthesis calculation. When <code>MetricType=Synthesis</code> , this property may be present.
PhysicalContext	<code>PhysicalContext.PhysicalContext</code>	True	The value of this property shall specify the physical context of the metric.
SensingInterval	<code>Edm.Duration</code>	True	The value shall specify the time interval between when a metric is updated. The format of the value shall conform to the Duration format.
DiscreteValues	<code>Collection(Edm.String)</code>	True	The values of the property shall specify the possible values of the discrete metric. This property shall have values when the <code>MetricType</code> property has the value 'Discrete'.
Precision	<code>Edm.Int64</code>	True	The value of the property shall specify the number of significant digits in the metric reading. The property is not meaningful, when the <code>MetricType</code> property has the value 'Discrete'.
Accuracy	<code>Edm.Decimal</code>	True	The value of the property shall be the percent error +/- of the measured vs. actual values. The property is not meaningful, when the <code>MetricType</code> property has the value 'Discrete'.



Attribute	Type	Nullable	Description
Calibration	Edm.Decimal	True	The value shall be the calibration offset added to the metric reading. The value shall have the units specified in the property Units. The property is not meaningful, when the MetricType property has the value 'Discrete'.
TimestampAccuracy	Edm.Duration	True	The value shall specify the expected + or - variability of the timestamp. The format of the value shall conform to the Duration format.
MinReadingRange	Edm.Decimal	True	The value shall be 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 has the value 'Discrete'.
MaxReadingRange	Edm.Decimal	True	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 has the value 'Discrete'.
CalculationAlgorithm	MetricDefinition.v1_0_0.CalculationAlgorithmEnum	True	The value of this property shall specify the calculation performed to obtain the metric.
CalculationTimeInterval	Edm.Duration	True	The value shall specify the time interval over the metric calculation is performed. The format of the value shall conform to the Duration format.
Actions	MetricDefinition.v1_0_0.Actions	false	The Actions property shall contain the available actions for this resource.
CalculationPrecision	Edm.Double	True	The value of the property shall specify the precision of a calculated metric (calculated metric shall be aligned to a value specified by this property)
DiscreteMetricType	Intel.Oem.MetricValueType	True	The values of the property shall specify type of the discrete metric. It specifies whether single or multiple values defined in DiscreteValues array are valid for specific metric, metric property shall be defined accordingly. This property shall be defined only when the MetricType property has the value 'Discrete'.



4.56.1 Operations

4.56.1.1 GET (Metric Definition for Drive Read/Write Latency Histogram Bucket)

Request:

```
GET /redfish/v1/TelemetryService/MetricDefinitions/DriveLatencyHistogramBucket
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Intel_RackScale.MetricDefinition.MetricDefinition",
  "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/DriveLatencyHistogramBucket",
  "@odata.type": "#MetricDefinition.v1_0_0.MetricDefinition",
  "Description": "MetricDefinition for a Bucket of the histogram of latencies of read or write commands",
  "Name": "Drive Latency Tracking Histogram Bucket MetricDefinition",
  "Id": "DriveLatencyTrackingHistogramBucket",
  "Implementation": "Physical",
  "Calculable": "Summable",
  "SensingInterval": "PT10S",
  "PhysicalContext": "StorageDevice",
  "MinReadingRange": 0,
  "Precision": 1,
  "MetricProperties": [
    "/redfish/v1/Chassis/1/Drives/1/Metrics#ReadsLatencyHistogram/From0To31MicroSeconds",
    "/redfish/v1/Chassis/1/Drives/1/Metrics#ReadsLatencyHistogram/From2048To4095MilliSeconds",
    "/redfish/v1/Chassis/1/Drives/1/Metrics#ReadsLatencyHistogram/From4096MilliSeconds",
    "/redfish/v1/Chassis/1/Drives/1/Metrics#WritesLatencyHistogram/From0To31MicroSeconds",
    "/redfish/v1/Chassis/1/Drives/1/Metrics#WritesLatencyHistogram/From2048To4095MilliSeconds",
    "/redfish/v1/Chassis/1/Drives/1/Metrics#WritesLatencyHistogram/From4096MilliSeconds"
  ]
}
```

4.56.1.2 GET (Metric Definition for Drive Temperature)

Request:

```
GET /redfish/v1/TelemetryService/MetricDefinitions/DriveTemperature
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Intel_RackScale.MetricDefinition.MetricDefinition",
  "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/DriveTemperature",
  "@odata.type": "#MetricDefinition.v1_0_0.MetricDefinition",
  "Description": "CPU1 Temperature MetricDefinition",
  "Name": "NVMe Drive1 Temperature",
  "Id": "DriveTemperature",
  "Implementation": "Physical",
  "SensingInterval": "PT1S",
  "MetricType": "Numeric",
  "PhysicalContext": "StorageDevice",
  "Units": "Cel",
  "MinReadingRange": 0,
  "MaxReadingRange": 105,
  "Precision": 1,
  "Calibration": 2,
  "MetricProperties": [
    "/redfish/v1/Chassis/1/Drives/1/Metrics#/TemperatureKelvin"
  ]
}
```



4.56.1.3 GET (Metric Definition for Drive Units Read)

Request:

```
GET /redfish/v1/TelemetryService/MetricDefinitions/DriveUnitsRead
Content-Type: application/json
```

Response:

```
{
  "@odata.context":
"/redfish/v1/$metadata#Intel_RackScale.MetricDefinition.MetricDefinition",
  "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/DriveUnitsReadWritten",
  "@odata.type": "#MetricDefinition.v1_0_0.MetricDefinition",
  "Description": "Fan Speed MetricDefinition",
  "Name": "Drive Data Units Read Written",
  "Id": "DriveUnitsReadWritten",
  "Implementation": "Physical",
  "SensingInterval": "PT1S",
  "MetricType": "Numeric",
  "PhysicalContext": "StorageDevice",
  "MinReadingRange": 0,
  "Precision": 1,
  "MetricProperties": [
    "/redfish/v1/Chassis/1/Drives/1/Metrics#/LifeTime/UnitsRead"
  ]
}
```

4.56.1.4 PUT

The PUT operation is not allowed on this resource.

4.56.1.5 PATCH

The PATCH operation is not allowed on this resource.

4.56.1.6 POST

The POST operation is not allowed on this resource.

4.56.1.7 DELETE

The DELETE operation is not allowed on this resource.

§



5.0 Common Property Descriptions

5.1 Status

Table 114. Status Attributes

Attribute	Type	Nullable	Description
State	String	Yes	This indicates the known state of the resource, such as if it is enabled. Allowed values: See section below.
Health	String	Yes	This represents the health state of this resource in the absence of its dependent resources. Allowed values: See section below.
HealthRollup	String	Yes	This represents the overall health state from the view of this resource. Allowed values: See section below.

5.2 Status – State

Member	Description
Enabled	This function or resource has been enabled.
Disabled	This function or resource has been disabled.
StandbyOffline	This function or resource is enabled, but awaiting an external action to activate it.
StandbySpare	This function or resource is part of a redundancy set and is awaiting a failover or other external action to activate it.
InTest	This function or resource is undergoing testing.
Starting	This function or resource is starting.
Absent	This function or resource is not present or not detected.
UnavailableOffline	This function or resource is present but cannot be used.
Deferring	The element will not process any commands but will queue new requests.
Quiesced	The element is enabled but only processes a restricted set of commands.
Updating	The element is updating and may be unavailable or degraded.

5.3 Status – Health

Member	Description
OK	Normal.
Warning	A condition exists that requires attention.
Critical	A critical condition exists that requires immediate attention.

5.4 ComputerSystem.Reset

Note: Some Reset Types defined by Redfish are not accepted by RSD software. The table below includes them for completeness.

Member	Description
On	Turn the unit on.
ForceOff	Turn the unit off immediately (non-graceful shutdown).
GracefulShutdown	Perform a graceful shutdown and power off.



Member	Description
GracefulRestart	Perform a graceful shutdown followed by a restart of the system.
ForceRestart	Perform an immediate (non-graceful) shutdown, followed by a restart.
Nmi	Generate a Diagnostic Interrupt (usually an NMI on x86 systems) to cease normal operations, perform diagnostic actions and typically halt the system.
ForceOn	Turn the unit on immediately.
PushPowerButton	Simulate the pressing of the physical power button on this unit.
PowerCycle	Perform a power cycle of the unit.

5.5 BootSourceOverrideTarget/Supported

Note: Some Boot Sources defined by Redfish are not accepted by RSD software. The table below includes them for completeness.

Member	Description
None	Boot from the normal boot device.
Pxe	Boot from the Pre-Boot EXecution (PXE) environment.
Floppy	Boot from the floppy disk drive.
Cd	Boot from the CD/DVD disc.
Usb	Boot from a USB device as specified by the system BIOS.
Hdd	Boot from a hard drive.
BiosSetup	Boot to the BIOS Setup Utility.
Utilities	Boot the manufacturer's Utilities program(s).
Diags	Boot the manufacturer's Diagnostics program.
UefiShell	Boot to the UEFI Shell.
UefiTarget	Boot to the UEFI Device specified in the UefiTargetBootSourceOverride property.
SDCard	Boot from an SD Card.
UefiHttp	Boot from a UEFI HTTP network location.
RemoteDrive	Boot from a remote drive (e.g. iSCSI).
UefiBootNext	Boot to the UEFI Device specified in the BootNext property.