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## Revision History

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<th>Date</th>
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<td>July 2019</td>
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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 (OEMs) 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:

- Mandatory 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.
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

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

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<td>Field Programmable Gate Array (FPGA) over Fabric Protocol Architecture Specification</td>
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<td>N/A</td>
<td>NVMe Base Specification, NVMe Qualified Name Section 7.9</td>
<td><a href="http://www.nvmexpress.org/specifications">www.nvmexpress.org/specifications</a></td>
</tr>
<tr>
<td>N/A</td>
<td>Storage Networking Industry Association (SNIA) Swordfish* Scalable Storage Management Schema bundle v1.0.7a</td>
<td><a href="https://www.snia.org/sites/default/files/technical_work/Swordfish/Swordfish_v1.0.7a_Specification.pdf">https://www.snia.org/sites/default/files/technical_work/Swordfish/Swordfish_v1.0.7a_Specification.pdf</a></td>
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</table>

**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.

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

<table>
<thead>
<tr>
<th>Resource</th>
<th>Schema Version</th>
<th>OEM Extended</th>
<th>URI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account Service</td>
<td>V1_3_0</td>
<td>No</td>
<td>/redfish/v1/AccountService</td>
</tr>
<tr>
<td>Chassis Collection</td>
<td>-</td>
<td>No</td>
<td>/redfish/v1/Chassis</td>
</tr>
<tr>
<td>Computer System</td>
<td>V1_3_0</td>
<td>Yes</td>
<td>/redfish/v1/Systems/{systemID}</td>
</tr>
<tr>
<td>Computer System Collection</td>
<td>-</td>
<td>No</td>
<td>/redfish/v1/Systems</td>
</tr>
<tr>
<td>Drive Metrics</td>
<td>V1_0_0</td>
<td>No</td>
<td>/redfish/v1/Chassis/{chassisID}/Drives/{driveID}/Metrics</td>
</tr>
<tr>
<td>Drive</td>
<td>V1_1_1</td>
<td>Yes</td>
<td>/redfish/v1/Chassis/{chassisID}/Drives/{driveID}</td>
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<td>Endpoint</td>
<td>V1_1_0</td>
<td>Yes</td>
<td>/redfish/v1/Fabrics/{fabricID}/Endpoints/{endpointID}</td>
</tr>
<tr>
<td>Resource</td>
<td>Schema Version</td>
<td>OEM Extended</td>
<td>URI</td>
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<tr>
<td>-------------------------------</td>
<td>----------------</td>
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<td>V1_0_0</td>
<td>No</td>
<td>/redfish/v1/Managers/{managerID}/NetworkProtocol</td>
</tr>
<tr>
<td>Processor Collection</td>
<td></td>
<td>No</td>
<td>/redfish/v1/Systems/{systemID}/Processors</td>
</tr>
<tr>
<td>Role</td>
<td>V1_2_1</td>
<td>No</td>
<td>/redfish/v1/AccountService/Roles/{roleID}</td>
</tr>
<tr>
<td>Role Collection</td>
<td></td>
<td></td>
<td>/redfish/v1/AccountService/Roles/RoleCollection</td>
</tr>
<tr>
<td>Session Service</td>
<td>v1_1_3</td>
<td>No</td>
<td>/redfish/v1/SessionService/Sessions/{sessionID}</td>
</tr>
<tr>
<td>Session</td>
<td>v1_1_0</td>
<td>No</td>
<td>/redfish/v1/SessionService/Sessions/Sessions</td>
</tr>
<tr>
<td>Session Collection</td>
<td></td>
<td>No</td>
<td>/redfish/v1/SessionService/Sessions</td>
</tr>
<tr>
<td>Service Root</td>
<td>v1_5_0</td>
<td>Yes</td>
<td>/redfish/v1/ServiceRoot</td>
</tr>
<tr>
<td>Storage Pool</td>
<td>v1_0_0</td>
<td>No</td>
<td>/redfish/v1/StorageServices/{serviceId}/{storageId}/StoragePools</td>
</tr>
<tr>
<td>Storage Pool Collection</td>
<td></td>
<td></td>
<td>/redfish/v1/StorageServices/{serviceId}/StoragePools</td>
</tr>
<tr>
<td>Storage Service</td>
<td>v1_1_0</td>
<td>No</td>
<td>/redfish/v1/StorageServices/{serviceId}</td>
</tr>
<tr>
<td>Storage Service Collection</td>
<td></td>
<td></td>
<td>/redfish/v1/StorageServices/</td>
</tr>
<tr>
<td>Storage Subsystem Collection</td>
<td></td>
<td></td>
<td>/redfish/v1/Systems/{systemID}/Storage</td>
</tr>
<tr>
<td>Task</td>
<td>V1_2_0</td>
<td>No</td>
<td>/redfish/v1/TaskService/Tasks/{taskID}</td>
</tr>
<tr>
<td>Task Collection</td>
<td></td>
<td></td>
<td>/redfish/v1/TaskService/Tasks</td>
</tr>
<tr>
<td>Task Service</td>
<td>V1_2_0</td>
<td>No</td>
<td>/redfish/v1/TaskService</td>
</tr>
<tr>
<td>Volume</td>
<td>v1_2_0</td>
<td>No</td>
<td>/redfish/v1/StorageServices/{serviceId}/Volumes/{volumeID}</td>
</tr>
<tr>
<td>Volume Metrics</td>
<td>v1_0_0</td>
<td>No</td>
<td>/redfish/v1/StorageServices/{serviceId}/Volumes/{volumeID}/Metrics</td>
</tr>
<tr>
<td>Volume Collection</td>
<td></td>
<td></td>
<td>/redfish/v1/StorageServices/{serviceId}/Volumes</td>
</tr>
<tr>
<td>Telemetry Service</td>
<td>v1_1_0</td>
<td></td>
<td>/redfish/v1/TelemetryService</td>
</tr>
<tr>
<td>Resource</td>
<td>Schema Version</td>
<td>OEM Extended</td>
<td>URI</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------</td>
<td>--------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Metric Definition Collection</td>
<td>-</td>
<td>-</td>
<td>/redfish/v1/TelemetryService/MetricDefinitions</td>
</tr>
<tr>
<td>Metric Definition</td>
<td>v1_0_0</td>
<td>-</td>
<td>/redfish/v1/TelemetryService/MetricDefinitions/{metricDefinitionId}</td>
</tr>
<tr>
<td>Metric Report Definition Collection</td>
<td>-</td>
<td>-</td>
<td>/redfish/v1/TelemetryService/MetricReportDefinitions</td>
</tr>
<tr>
<td>Triggers Collection</td>
<td>WIP</td>
<td>-</td>
<td>/redfish/v1/TelemetryService/Triggers</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>code</td>
<td>A string indicating a specific MessageId from the message registry. &quot;Base.1.0.GeneralError&quot; should be used only when no other message is better.</td>
</tr>
<tr>
<td>message</td>
<td>A human-readable error message is corresponding to the message in the message registry.</td>
</tr>
<tr>
<td>@Message.ExtendedInfo</td>
<td>An array of message objects describing one or more error message(s).</td>
</tr>
</tbody>
</table>

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>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MessageId</td>
<td>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.</td>
</tr>
<tr>
<td>Message</td>
<td>A human-readable error message indicating the semantics associated with the error. This is the complete message and does not rely on substitution variables.</td>
</tr>
<tr>
<td>MessageArgs</td>
<td>An optional array of strings representing the substitution parameter values for the message. This is included in the response if a MessageId is specified for a parameterized message.</td>
</tr>
<tr>
<td>Severity</td>
<td>An optional string representing the severity of an error.</td>
</tr>
<tr>
<td>Resolution</td>
<td>An optional string describing recommended action(s) to take to resolve an error.</td>
</tr>
<tr>
<td>RelatedProperties</td>
<td>An optional array of JSON pointers defining the specific properties in a JSON payload described by the message.</td>
</tr>
</tbody>
</table>

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."
        },
        "PropertyValueChanged": {
            "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": {
```
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

<table>
<thead>
<tr>
<th>HTTP Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 Bad Request</td>
<td>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.</td>
</tr>
<tr>
<td>401 Unauthorized</td>
<td>The authentication credentials included with this request are missing or invalid.</td>
</tr>
<tr>
<td>404 Not Found</td>
<td>The request specified a URI of a resource that does not exist.</td>
</tr>
<tr>
<td>405 Method Not Allowed</td>
<td>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.</td>
</tr>
<tr>
<td>409 Conflict</td>
<td>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).</td>
</tr>
<tr>
<td>500 Internal Server Error</td>
<td>The server encountered an unexpected condition that prevented it from fulfilling the request. An extended error shall be returned in the response body.</td>
</tr>
<tr>
<td>501 Not Implemented</td>
<td>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.</td>
</tr>
<tr>
<td>503 Service Unavailable</td>
<td>The server is currently unable to handle the request due to temporary overloading or maintenance of the server.</td>
</tr>
</tbody>
</table>
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"
  ]
}
4.5 Intel® RSD Original Equipment Manufacturers (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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RedfishVersion</td>
<td>Edm.String</td>
<td>False</td>
<td>The value of this string shall represent the version of the Redfish service. The format of this string shall be of the format majorversion.minorversion.errata in compliance with Protocol Version section of the Redfish specification. Refer to Table 2 for Redfish specifications.</td>
</tr>
<tr>
<td>UUID</td>
<td>Resource.UUID</td>
<td>True</td>
<td>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 8-4-4-4-12. If SSDP is used, this value shall be an exact match of the UUID value returned in a 2000 R 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.</td>
</tr>
<tr>
<td>Links</td>
<td>ServiceRoot.v1_0_0.Links</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Systems</td>
<td>ComputerSystemCollection.ComputerSystemCollection</td>
<td>False</td>
<td>This object shall only contain a reference to a collection of resources that comply with the Systems schema.</td>
</tr>
<tr>
<td>Chassis</td>
<td>ChassisCollection.ChassisCollection</td>
<td>False</td>
<td>This object shall only contain a reference to a collection of resources that comply with the Chassis schema.</td>
</tr>
<tr>
<td>Managers</td>
<td>ManagerCollection.ManagerCollection</td>
<td>False</td>
<td>This object shall only contain a reference to a collection of resources that comply with the Managers schema.</td>
</tr>
<tr>
<td>Tasks</td>
<td>TaskService.TaskService</td>
<td>False</td>
<td>The classes structure shall only contain a reference to a resource that complies to the TaskService schema.</td>
</tr>
<tr>
<td>SessionService</td>
<td>SessionService.SessionService</td>
<td>False</td>
<td>The classes structure shall only contain a reference to a resource that complies to the SessionService schema.</td>
</tr>
<tr>
<td>AccountService</td>
<td>AccountService.AccountService</td>
<td>False</td>
<td>The classes structure shall only contain a reference to a resource that complies to the AccountService schema.</td>
</tr>
<tr>
<td>EventService</td>
<td>EventService.EventService</td>
<td>False</td>
<td>The classes structure shall only contain a reference to a resource that complies to the EventService schema.</td>
</tr>
<tr>
<td>Registries</td>
<td>MessageRegistryFileCollection.MessageRegistryFileCollection</td>
<td>False</td>
<td>This object shall contain a reference to Message Registry.</td>
</tr>
<tr>
<td>JsonSchemas</td>
<td>JsonSchemaFileCollection.JsonSchemaFileCollection</td>
<td>False</td>
<td>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.</td>
</tr>
</tbody>
</table>
### REST API Definition

#### Intel® RSD Storage Services

**Intel® RSD Storage Services**

**Document Number:** 613329-001

**July 2019**

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<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>StorageSystems</td>
<td>StorageSystemCollection.StorageSystemCollection</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>StorageServices</td>
<td>StorageServiceCollection.StorageServiceCollection</td>
<td>False</td>
<td>The referenced collection shall contain references to all StorageService instances.</td>
</tr>
<tr>
<td>Fabrics</td>
<td>FabricCollection.FabricCollection</td>
<td>False</td>
<td>The referenced collection shall contain references to all Fabric instances.</td>
</tr>
<tr>
<td>UpdateService</td>
<td>UpdateService.UpdateService</td>
<td>False</td>
<td>The classes structure shall only contain a reference to a resource that complies to the UpdateService schema.</td>
</tr>
<tr>
<td>CompositionService</td>
<td>CompositionService.CompositionService</td>
<td>False</td>
<td>The classes structure shall only contain a reference to a resource that complies to the CompositionService schema.</td>
</tr>
<tr>
<td>Product</td>
<td>Edm.String</td>
<td>False</td>
<td>The value of this string shall include the name of the product represented by the Redfish service.</td>
</tr>
<tr>
<td>ProtocolFeaturesSupported</td>
<td>ServiceRoot.v1_1_0.ProtocolFeaturesSupport</td>
<td>False</td>
<td>This type contains information about protocol features supported by the service.</td>
</tr>
<tr>
<td>JobService</td>
<td>JobService.JobService</td>
<td>False</td>
<td>The classes structure shall only contain a reference to a resource that conforms to the JobService schema.</td>
</tr>
<tr>
<td>TelemetryService</td>
<td>TelemetryService.TelemetryService</td>
<td>False</td>
<td>The value shall be a link to the TelemetryService.</td>
</tr>
<tr>
<td>Vendor</td>
<td>Edm.String</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ResourceBlocks</td>
<td>ResourceCollection.ResourceBlockCollection</td>
<td>False</td>
<td>The referenced collection shall contain references to all Resource Block instances.</td>
</tr>
</tbody>
</table>

**Intel® RSD OEM extensions:**

**Table 8. ServiceRoot OEM Extensions**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ApiVersion</td>
<td>Edm.String</td>
<td>False</td>
<td>A version of Intel® RSD API exposed by this service.</td>
</tr>
<tr>
<td>EthernetSwitches</td>
<td>EthernetSwitchCollection.EthernetSwitchCollection</td>
<td>True</td>
<td>The classes structure shall only contain a reference to a resource that complies to the EthernetSwitch schema.</td>
</tr>
<tr>
<td>Nodes</td>
<td>ComposedNodeCollection.ComposedNodeCollection</td>
<td>True</td>
<td>This object shall only contain a reference to a collection of resources that comply with the Nodes schema.</td>
</tr>
</tbody>
</table>
**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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection (StorageService.StorageService)</td>
<td>True</td>
<td>The value of each member entry shall reference a StorageService resource.</td>
</tr>
</tbody>
</table>

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",
]
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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifier</td>
<td>Resource.Identifier</td>
<td>True</td>
<td>The value identifies this resource. The value shall be unique within the managed ecosystem.</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>True</td>
<td>-</td>
</tr>
<tr>
<td>Links</td>
<td>StorageService.v1_0_0.Links</td>
<td>False</td>
<td>Contains links to other resources that are related to this resource.</td>
</tr>
<tr>
<td>Actions</td>
<td>StorageService.v1_0_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>StorageGroups</td>
<td>StorageGroupCollection</td>
<td>True</td>
<td>The value of each entity in the array shall reference a StorageGroup.</td>
</tr>
<tr>
<td>EndpointGroups</td>
<td>EndpointGroupCollection</td>
<td>True</td>
<td>The value of each entry in the array shall reference an EndpointGroup.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ClientEndpointGroups</td>
<td>EndpointGroupCollection.EndpointGroupCollection</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ServerEndpointGroups</td>
<td>EndpointGroupCollection.EndpointGroupCollection</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>Volumes</td>
<td>VolumeCollection.VolumeCollection</td>
<td>False</td>
<td>An array of references to Volumes managed by this storage service.</td>
</tr>
<tr>
<td>FileSystems</td>
<td>FileSystemCollection.FileSystemCollection</td>
<td>False</td>
<td>An array of references to FileSystems managed by this storage service.</td>
</tr>
<tr>
<td>Drives</td>
<td>DriveCollection.DriveCollection</td>
<td>False</td>
<td>A collection that indicates all the drives managed by this storage service.</td>
</tr>
<tr>
<td>Endpoints</td>
<td>EndpointCollection.EndpoinCollection</td>
<td>True</td>
<td>The value of each entry in the array shall reference an Endpoint managed by this service.</td>
</tr>
<tr>
<td>Redundancy</td>
<td>Collection(Redundancy.Redundancy)</td>
<td>True</td>
<td>Redundancy information for the storage subsystem</td>
</tr>
<tr>
<td>ClassesOfService</td>
<td>ClassOfServiceCollection.ClassOfServiceCollection</td>
<td>True</td>
<td>The value of each entry in the array shall reference a ClassOfService supported by this service.</td>
</tr>
<tr>
<td>StorageSubsystems</td>
<td>StorageCollection.StorageCollection</td>
<td>False</td>
<td>The value shall be a link to a collection of type StorageCollection having members that represent storage subsystems managed by this storage service.</td>
</tr>
<tr>
<td>IOStatistics</td>
<td>IOStatistics.IOStatistics</td>
<td>True</td>
<td>The value shall represent IO statistics for this StorageService.</td>
</tr>
<tr>
<td>SpareResourceSets</td>
<td>Collection(SpareResourceSet.SpareResourceSet)</td>
<td>True</td>
<td>Each contained SpareResourceSet shall contain resources that may be utilized to replace the capacity provided by a failed resource having a compatible type.</td>
</tr>
<tr>
<td>DataProtectionLoSCapabilities</td>
<td>DataProtectionLoSCapabilities.DataProtectionLoSCapabilities</td>
<td>True</td>
<td>The value shall reference the data protection capabilities of this service.</td>
</tr>
<tr>
<td>DataSecurityLoSCapabilities</td>
<td>DataSecurityLoSCapabilities.DataSecurityLoSCapabilities</td>
<td>True</td>
<td>The value shall reference the data security capabilities of this service.</td>
</tr>
<tr>
<td>DataStorageLoSCapabilities</td>
<td>DataStorageLoSCapabilities.DataStorageLoSCapabilities</td>
<td>True</td>
<td>The value shall reference the data storage capabilities of this service.</td>
</tr>
<tr>
<td>IOConnectivityLoSCapabilities</td>
<td>IOConnectivityLoSCapabilities.IOConnectivityLoSCapabilities</td>
<td>True</td>
<td>The value shall reference the IO connectivity capabilities of this service.</td>
</tr>
<tr>
<td>IOPerformanceLoSCapabilities</td>
<td>IOPerformanceLoSCapabilities.IOPerformanceLoSCapabilities</td>
<td>True</td>
<td>The value shall reference the IO performance capabilities of this service.</td>
</tr>
</tbody>
</table>
### DefaultClassOfService

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DefaultClassOfService</td>
<td>ClassOfService.ClassOfService</td>
<td>True</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Table 11. Links Attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HostingSystem</td>
<td>Resource.Resource</td>
<td>True</td>
<td>The value shall reference the ComputerSystem or StorageController that hosts this service.</td>
</tr>
<tr>
<td>DefaultClassOfService</td>
<td>ClassOfService.ClassOfService</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>DataProtectionLoSCapabilities</td>
<td>DataProtectionLoSCapabilities.DataProtectionLoSCapabilities</td>
<td>True</td>
<td>The value shall reference the data protection capabilities of this service.</td>
</tr>
<tr>
<td>DataSecurityLoSCapabilities</td>
<td>DataSecurityLoSCapabilities.DataSecurityLoSCapabilities</td>
<td>True</td>
<td>The value shall reference the data security capabilities of this service.</td>
</tr>
<tr>
<td>DataStorageLoSCapabilities</td>
<td>DataStorageLoSCapabilities.DataStorageLoSCapabilities</td>
<td>True</td>
<td>The value shall reference the data storage capabilities of this service.</td>
</tr>
<tr>
<td>IOConnectivityLoSCapabilities</td>
<td>IOConnectivityLoSCapabilities.IOConnectivityLoSCapabilities</td>
<td>True</td>
<td>The value shall reference the I/O connectivity capabilities of this service.</td>
</tr>
<tr>
<td>IOPerformanceLoSCapabilities</td>
<td>IOPerformanceLoSCapabilities.IOPerformanceLoSCapabilities</td>
<td>True</td>
<td>The value shall reference the I/O performance capabilities of this service.</td>
</tr>
</tbody>
</table>

**Intel® RSD OEM extensions:**

**Table 12. StorageServiceLinks Attribute**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ManagedBy</td>
<td>Collection(Manager.Manager)</td>
<td>True</td>
<td>Collection of managers managing the service.</td>
</tr>
</tbody>
</table>
4.8.1 Operations

4.8.1.1 GET

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

Response:

```json
{
   "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(StoragePool, StoragePool)</td>
<td>True</td>
<td>The value of each member entry shall reference a StoragePool resource.</td>
</tr>
</tbody>
</table>

4.9.1 Operations

4.9.1.1 GET

Request:

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

Response:

```json
{
    "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifier</td>
<td>Resource.Identifier</td>
<td>True</td>
<td>The value identifies this resource. The value shall be unique within the managed ecosystem.</td>
</tr>
<tr>
<td>BlockSizeBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>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 StoragePool.v1_1_1.StoragePool.MaxBlockSizeBytes.</td>
</tr>
<tr>
<td>Capacity</td>
<td>Capacity.Capacity</td>
<td>True</td>
<td>The value of this property shall provide a piece of information about the actual utilization of the capacity within this storage pool.</td>
</tr>
<tr>
<td>LowSpaceWarningThresholdPercents</td>
<td>Collection(Edm.Int64)</td>
<td>True</td>
<td>Each time the following value is less than one of the values in the array the LOW_SPACE_THRESHOLD_WARNING event shall be triggered: Across all CapacitySources entries, percent = (SUM(AllocatedBytes) - SUM(ConsumedBytes))/SUM(Allocated Bytes).</td>
</tr>
<tr>
<td>Links</td>
<td>StoragePool.v1_0_0.Links</td>
<td>False</td>
<td>This structure shall contain references to resources that are not contained within this resource.</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>True</td>
<td>-</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------</td>
<td>----------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>CapacitySources</td>
<td>Collection(Capacity.CapacitySource)</td>
<td>True</td>
<td>Fully or partially consumed storage from a source resource. Each entry shall provide capacity allocation data from a named source resource.</td>
</tr>
<tr>
<td>AllocatedVolumes</td>
<td>VolumeCollection.VolumeCollection</td>
<td>True</td>
<td>The value of this property shall contain a reference to the collection of volumes allocated from this storage pool.</td>
</tr>
<tr>
<td>AllocatedPools</td>
<td>StoragePoolCollection.StoragePoolCollection</td>
<td>True</td>
<td>The value of this property shall contain a reference to the collection of storage pools allocated from this storage pool.</td>
</tr>
<tr>
<td>ClassesOfService</td>
<td>ClassOfServiceCollection.ClassOfServiceCollection</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>RemainingCapacityPercent</td>
<td>Edm.Int64</td>
<td>True</td>
<td>If present, this value shall return $\frac{\text{SUM(AllocatedBytes)} - \text{SUM(ConsumedBytes)}}{\text{SUM(Allocated Bytes)}} \times 100$ represented as an integer value.</td>
</tr>
<tr>
<td>MaxBlockSizeBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>IOStatistics</td>
<td>IOStatistics.IOStatistics</td>
<td>True</td>
<td>The value shall represent IO statistics for this StoragePool.</td>
</tr>
<tr>
<td>RecoverableCapacitySourceCount</td>
<td>Edm.Int64</td>
<td>True</td>
<td>The value is the number of available capacity source resources currently available in the event that an equivalent capacity source resource fails.</td>
</tr>
<tr>
<td>DefaultClassOfService</td>
<td>ClassOfService.ClassOfService</td>
<td>True</td>
<td>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.</td>
</tr>
</tbody>
</table>

Table 15. Identifier Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DurableName</td>
<td>Edm.String</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>DurableNameFormat</td>
<td>Resource.v1_1_0.DurableNameFormat</td>
<td>True</td>
<td>This property shall represent the format of the DurableName property.</td>
</tr>
</tbody>
</table>
### Table 16. Capacity Attributes

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

### Table 17. CapacityInfo Attributes

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

### 4.10.1 Operations

#### 4.10.1.1 GET

**Request:**

GET /redfish/v1/StorageServices/NVMeoE1/StoragePools/2

Content-Type: application/json

**Response:**

```json
{
    "@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": "2017-12-06T04:45:01Z",
  "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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Volume.Volume)</td>
<td>True</td>
<td>The value of each member entry shall reference a Volume resource.</td>
</tr>
</tbody>
</table>

4.11.1 Operations

4.11.1.1 GET

Request:

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

Response:

```json
{
  "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Volume.Volume)</td>
<td>True</td>
<td>The value of each member entry shall reference a Volume resource.</td>
</tr>
</tbody>
</table>

4.12.1 Operations

4.12.1.1 GET

Request:

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

Response:

```json
{
    "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CapacityBytes</td>
<td>Int64</td>
<td>Yes</td>
<td>Volume capacity in bytes.</td>
</tr>
</tbody>
</table>
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**

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

**Table 22. CapacitySources Format**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProvidingPools</td>
<td>Collection(StoragePool. StoragePool)</td>
<td>Yes</td>
<td>Reference to a contributing storage pool.</td>
</tr>
</tbody>
</table>

**Table 23. Identifier Attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DurableName</td>
<td>Edm.String</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>DurableNameFormat</td>
<td>Resource.v1_1_0.DurableNameFormat</td>
<td>True</td>
<td>This property shall represent the format of the DurableName property.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>-</td>
</tr>
<tr>
<td>CapacityBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>This property shall contain the size in bytes of the associated volume.</td>
</tr>
<tr>
<td>Volume Type</td>
<td>Volume.v1_0_0.VolumeType</td>
<td>True</td>
<td>This property shall contain the type of the associated Volume.</td>
</tr>
<tr>
<td>Encrypted</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>This property shall contain a Boolean indicator if the Volume is currently utilizing encryption or not.</td>
</tr>
<tr>
<td>Encryption Types</td>
<td>Collection(Volume.v1_0_0.EncryptionTypes)</td>
<td>False</td>
<td>This property shall contain the types of encryption used by this Volume.</td>
</tr>
<tr>
<td>Identifiers</td>
<td>Collection(Resource.Identifier)</td>
<td>False</td>
<td>This property shall contain a list of all known durable names for the associated volume.</td>
</tr>
<tr>
<td>BlockSizeBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>This property shall contain the size of the smallest addressable unit of the associated volume.</td>
</tr>
<tr>
<td>Operations</td>
<td>Collection(Volume.v1_0_0.Operation)</td>
<td>False</td>
<td>This property shall contain a list of all currently running on the Volume.</td>
</tr>
<tr>
<td>OptimumIOSizeBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>Links</td>
<td>Volume.v1_0_0.Links</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Actions</td>
<td>Volume.v1_0_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>AccessCapabilities</td>
<td>Collection(DataStorageLoSCapabilities.StorageAccessCapability)</td>
<td>True</td>
<td>Each entry shall specify a current storage access capability.</td>
</tr>
<tr>
<td>MaxBlockSizeBytes</td>
<td>Edm.Int32</td>
<td>True</td>
<td>This property shall contain the size of the largest addressable unit of this storage volume.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Capacity</td>
<td>Capacity.Capacity</td>
<td>True</td>
<td>Information about the utilization of capacity allocated to this storage volume.</td>
</tr>
<tr>
<td>LowSpaceWarningThresholdPercents</td>
<td>Collection(Edm.Int64)</td>
<td>True</td>
<td>Each time the following value is less than one of the values in the array the LOW_SPACE_THRESHOLD_WARNING event shall be triggered: Across all CapacitySources entries, ( \text{percent} = \frac{\text{SUM(AllocatedBytes)} - \text{SUM(ConsumedBytes)}}{\text{SUM(AllocatedBytes)}} ).</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Edm.String</td>
<td>True</td>
<td>This property shall contain a value that represents the manufacturer or implementer of the storage volume.</td>
</tr>
<tr>
<td>Model</td>
<td>Edm.String</td>
<td>True</td>
<td>The value is assigned by the manufacturer and shall represent a specific storage volume implementation.</td>
</tr>
<tr>
<td>ReplicaInfos</td>
<td>Collection(StorageReplicaInfo.ReplicaInfo)</td>
<td>True</td>
<td>This property shall describe the replica relationship between this storage volume and a corresponding source and/or target volume.</td>
</tr>
<tr>
<td>CapacitySources</td>
<td>Collection(Capacity.CapacitySource)</td>
<td>True</td>
<td>Fully or partially consumed storage from a source resource. Each entry provides capacity allocation information from a named source resource.</td>
</tr>
<tr>
<td>StorageGroups</td>
<td>StorageGroupCollection.StorageGroupCollection</td>
<td>True</td>
<td>The value of this property shall contain references to all storage groups that include this volume.</td>
</tr>
<tr>
<td>AllocatedPools</td>
<td>StoragePoolCollection.StoragePoolCollection</td>
<td>True</td>
<td>The value of this property shall contain references to all storage pools allocated from this volume.</td>
</tr>
<tr>
<td>IOStatistics</td>
<td>IOSTatistics.IOSTatistics</td>
<td>True</td>
<td>The value shall represent IO statistics for this volume.</td>
</tr>
<tr>
<td>RemainingCapacityPercent</td>
<td>Edm.Int64</td>
<td>True</td>
<td>If present, this value shall return ( \left{ \frac{\text{SUM(AllocatedBytes)} - \text{SUM(ConsumedBytes)}}{\text{SUM(AllocatedBytes)}} \right} \times 100 ) represented as an integer value.</td>
</tr>
<tr>
<td>ReplicaTargets</td>
<td>Collection(Resource.Item)</td>
<td>True</td>
<td>The value shall reference the target replicas that are sourced by this replica.</td>
</tr>
<tr>
<td>RAIDType</td>
<td>Volume.RAIDType</td>
<td>True</td>
<td>This property shall contain the RAID type of the associated Volume.</td>
</tr>
</tbody>
</table>

### Table 25. ReplicaInfo Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReplicaPriority</td>
<td>StorageReplicaInfo.v1_0_0.ReplicaPriority</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ReplicaReadOnlyAccess</td>
<td>StorageReplicaInfo.v1_0_0.ReplicaReadOnlyAccess</td>
<td>True</td>
<td>The enumeration literal shall specify whether the source, the target, or both elements are read only to the host.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------------------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>UndiscoveredElement</td>
<td>StorageReplicaInfo.v1_0._0.UndiscoveredElement</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>WhenSynced</td>
<td>Edm.String</td>
<td>True</td>
<td>The value shall be a Date and time format – ISO 8601 conformant time of day that specifies when the elements were synchronized, refer to Table 2.</td>
</tr>
<tr>
<td>SyncMaintained</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>If true, Synchronization shall be maintained. The default value for this property is false.</td>
</tr>
<tr>
<td>ReplicaRecoveryMode</td>
<td>StorageReplicaInfo.v1_0._0.ReplicaRecoveryMode</td>
<td>True</td>
<td>The enumeration literal shall specify whether the copy operation continues after a broken link is restored.</td>
</tr>
<tr>
<td>ReplicaUpdateMode</td>
<td>StorageReplicaInfo.ReplicaUpdateMode</td>
<td>True</td>
<td>The enumeration literal shall specify whether the target elements will be updated synchronously or asynchronously.</td>
</tr>
<tr>
<td>PercentSynced</td>
<td>Edm.Int64</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>FailedCopyStopsHostIO</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>WhenActivated</td>
<td>Edm.String</td>
<td>True</td>
<td>The value shall be a Date and time format – 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.</td>
</tr>
<tr>
<td>WhenDeactivated</td>
<td>Edm.String</td>
<td>True</td>
<td>The value shall be a Date and time format – 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.</td>
</tr>
<tr>
<td>WhenEstablished</td>
<td>Edm.String</td>
<td>True</td>
<td>The value shall be a Date and time format – ISO 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.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>WhenSuspended</td>
<td>Edm.String</td>
<td>True</td>
<td>The value shall be a Date and time format – 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.</td>
</tr>
<tr>
<td>WhenSynchronized</td>
<td>Edm.String</td>
<td>True</td>
<td>The value shall be a Date and time format – 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.</td>
</tr>
<tr>
<td>ReplicaSkewBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ReplicaType</td>
<td>StorageReplicaInfo.ReplType</td>
<td>True</td>
<td>The ReplicaType enumeration literal shall describe the intended outcome of the replication.</td>
</tr>
<tr>
<td>ReplicaProgressStatus</td>
<td>StorageReplicaInfo.v1_0.ReplProgressStatus</td>
<td>True</td>
<td>The ReplicaProgressStatus enumeration literal shall specify the status of the session with respect to Replication activity.</td>
</tr>
<tr>
<td>ReplicaState</td>
<td>StorageReplicaInfo.v1_0.ReplState</td>
<td>True</td>
<td>The ReplicaState enumeration literal shall specify the state of the relationship with respect to Replication activity.</td>
</tr>
<tr>
<td>RequestedReplicaState</td>
<td>StorageReplicaInfo.v1_0.ReplState</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ConsistencyEnabled</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>If true, consistency shall be enabled across the source and its associated target replica(s). The default value for this property is false.</td>
</tr>
<tr>
<td>ConsistencyType</td>
<td>StorageReplicaInfo.v1_0.ConsistencyType</td>
<td>True</td>
<td>The ConsistencyType enumeration literal shall indicate the consistency type used by the source and its associated target group.</td>
</tr>
<tr>
<td>ConsistencyState</td>
<td>StorageReplicaInfo.v1_0.ConsistencyState</td>
<td>True</td>
<td>The ConsistencyState enumeration literal shall indicate the current state of consistency.</td>
</tr>
<tr>
<td>ConsistencyStatus</td>
<td>StorageReplicaInfo.v1_0.ConsistencyStatus</td>
<td>True</td>
<td>The ConsistencyStatus enumeration literal shall specify the current status of consistency. Consistency may have been disabled or is experiencing an error condition.</td>
</tr>
<tr>
<td>ReplicaRole</td>
<td>StorageReplicaInfo.v1_0.ReplRole</td>
<td>True</td>
<td>The ReplicaRole enumeration literal shall represent the source or target role of this replica as known to the containing resource.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Replica</td>
<td>Resource.Item</td>
<td>True</td>
<td>The value shall reference the resource that is the source of this replica.</td>
</tr>
</tbody>
</table>

**Table 26. Capacity Attributes**

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

**Table 27. Links Attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drives</td>
<td>Collection(Drive.Drive)</td>
<td>True</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Intel® RSD OEM extensions:**

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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bootable</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>This property provides information about the bootable capability of the volume.</td>
</tr>
<tr>
<td>Assigned</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>This property determines if the volume is reserved for usage by a specific host, user or service, for example for an NVMe-oF* Initiator.</td>
</tr>
<tr>
<td>EraseOnDetach</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>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. <strong>Deprecated:</strong> 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.</td>
</tr>
<tr>
<td>Erased</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>This property shall be set to true if the volume was erased. <strong>Deprecated:</strong> This value has been deprecated. Volumes are automatically erased after node is being deleted.</td>
</tr>
</tbody>
</table>
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": "nvme1n1p1",
   "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": "39f9b78-7e94-11e7-9ea4-001e67d1a70",
         "DurableNameFormat": "UUID"
      }
   ],
   "Links": {
      "Oem": {
         "Intel_RackScale": {
            "@odata.type": "#Intel.Oem.VolumeLinks",
            "Endpoints": []
         }
      }
   }
}
```
```json
{
    "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AllocatedBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>The value shall be the number of bytes currently allocated by the storage system in this data store for this data type.</td>
</tr>
</tbody>
</table>

The OEM object property described in Table 30 can be patched:

#### Table 30. Volume Attribute

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bootable</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>This property provides information about the bootable capability of the volume.</td>
</tr>
</tbody>
</table>
**Request:**

```
PATCH /redfish/v1/StorageServices/NVMeoE1/Volumes/1
Content-Type: application/json
{
    "Capacity": {
        "Data": {
            "AllocatedBytes": 2074083280
        }
    },
    "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+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**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast</td>
<td>The volume is prepared for use quickly, typically by erasing just the beginning and end of the space so that partitioning can be performed.</td>
</tr>
<tr>
<td>Slow</td>
<td>The volume is prepared for use slowly, typically by completely erasing the volume.</td>
</tr>
</tbody>
</table>

**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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CapacityUsedBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>This property shall contain the size in bytes of the volume’s capacity used for storing files.</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProvidedCapacity</td>
<td>Capacity.v1_0_0.Capacity</td>
<td>True</td>
<td>The value shall be the amount of space that has been provided from the</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ProvidingDrives, ProvidingVolumes, ProvidingMemory or ProvidingPools.</td>
</tr>
<tr>
<td>ProvidedClassOfService</td>
<td>ClassOfService.ClassOfService</td>
<td>True</td>
<td>The value shall reference the provided ClassOfService from the ProvidingDrives, ProvidingVolumes, ProvidingMemoryChunks, ProvidingMemory or ProvidingPools.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ProvidingVolumes</td>
<td>VolumeCollection.VolumeCollection</td>
<td>True</td>
<td>If present, the value shall be a reference to a contributing volume or volumes.</td>
</tr>
<tr>
<td>ProvidingPools</td>
<td>StoragePoolCollection.StoragePoolCollection</td>
<td>True</td>
<td>If present, the value shall be a reference to a contributing storage pool or storage pools.</td>
</tr>
<tr>
<td>ProvidingDrives</td>
<td>DriveCollection.DriveCollection</td>
<td>True</td>
<td>If present, the value shall be a reference to a contributing drive or drives.</td>
</tr>
<tr>
<td>ProvidingMemoryChunks</td>
<td>MemoryChunksCollection.MemoryChunksCollection</td>
<td>True</td>
<td>If present, the value shall be a reference to the contributing memory chunks.</td>
</tr>
<tr>
<td>ProvidingMemory</td>
<td>MemoryCollection.MemoryCollection</td>
<td>True</td>
<td>If present, the value shall be a reference to the contributing memory.</td>
</tr>
</tbody>
</table>

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:

```json
{
  "@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:

```json
{
   "@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**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Drive.Drive)</td>
<td>True</td>
<td>The value of each entry of this property shall reference a Drive resource.</td>
</tr>
</tbody>
</table>
4.16.1 Operations

4.16.1.1 GET
Request:

```
GET /redfish/v1/StorageServices/NVMeoE1/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 35 describes the StoragePoolCollection attribute.

**Table 35. StoragePoolCollection Attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection{StoragePool.StoragePool}</td>
<td>True</td>
<td>The value of each member entry shall reference a StoragePool resource.</td>
</tr>
</tbody>
</table>
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:

```json
{
  "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Drive.Drive)</td>
<td>True</td>
<td>The value of each entry of this property shall reference a Drive resource.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>StatusIndicator</td>
<td>Drive.v1_0_0.StatusIndicator</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>IndicatorLED</td>
<td>Resource.IndicatorLED</td>
<td>True</td>
<td>This value of this property shall contain the indicator light state for the indicator light associated with this drive.</td>
</tr>
<tr>
<td>Model</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the name by that the manufacturer generally refers to the drive.</td>
</tr>
<tr>
<td>Revision</td>
<td>Edm.String</td>
<td>True</td>
<td>This property shall contain the revision as defined by the manufacturer for the associated drive.</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>-</td>
</tr>
<tr>
<td>CapacityBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>This property shall contain the raw size in bytes of the associated drive.</td>
</tr>
<tr>
<td>FailurePredicted</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>This property shall contain failure information as defined by the manufacturer for the associated drive.</td>
</tr>
<tr>
<td>Protocol</td>
<td>Protocol.Protocol</td>
<td>True</td>
<td>This property shall contain the protocol the associated drive is using to communicate to the storage controller for this system.</td>
</tr>
<tr>
<td>MediaType</td>
<td>Drive.v1_0_0.MediaType</td>
<td>True</td>
<td>This property shall contain the type of media contained in the associated drive.</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Edm.String</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>SKU</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the stock-keeping unit number for this drive.</td>
</tr>
<tr>
<td>SerialNumber</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be a manufacturer-allocated number used to identify the drive.</td>
</tr>
<tr>
<td>PartNumber</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be a part number assigned by the organization that is responsible for producing or manufacturing the drive.</td>
</tr>
<tr>
<td>AssetTag</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be an identifying string used to track the drive for inventory purposes.</td>
</tr>
<tr>
<td>Identifiers</td>
<td>Collection(Resource.Identifier)</td>
<td>False</td>
<td>This property shall contain a list of all known durable names for the associated drive.</td>
</tr>
<tr>
<td>Location</td>
<td>Collection(Resource.Location)</td>
<td>False</td>
<td>This property shall contain location information of the associated drive.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>HotspareType</td>
<td>Drive.v1_0_0.HotspareType</td>
<td>True</td>
<td>This property shall contain the hot spare type for the associated drive. If the drive is currently serving as a hot spare its Status.State field shall be 'StandbySpare' and 'Enabled' when it is being used as part of a Volume.</td>
</tr>
<tr>
<td>EncryptionAbility</td>
<td>Drive.v1_0_0.EncryptionAbility</td>
<td>True</td>
<td>This property shall contain the encryption ability for the associated drive.</td>
</tr>
<tr>
<td>EncryptionStatus</td>
<td>Drive.v1_0_0.EncryptionStatus</td>
<td>True</td>
<td>This property shall contain the encryption status for the associated drive.</td>
</tr>
<tr>
<td>RotationSpeedRPM</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>This property shall contain rotation speed of the associated drive.</td>
</tr>
<tr>
<td>BlockSizeBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>This property shall contain the size of the smallest addressable unit of the associated drive.</td>
</tr>
<tr>
<td>CapableSpeedGbs</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>This property shall contain the fastest capable bus speed of the associated drive.</td>
</tr>
<tr>
<td>NegotiatedSpeedGbs</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>This property shall contain the current bus speed of the associated drive.</td>
</tr>
<tr>
<td>PredictedMediaLifeLeftPercent</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>This property shall contain an indicator of the percentage of life remaining in the Drive's media.</td>
</tr>
<tr>
<td>Links</td>
<td>Drive.v1_0_0.Links</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Actions</td>
<td>Drive.v1_0_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>Operations</td>
<td>Collection(Drive.v1_1_0.Operations)</td>
<td>False</td>
<td>This property shall contain a list of all operations currently running on the Drive.</td>
</tr>
<tr>
<td>Assembly</td>
<td>Assembly.Assembly</td>
<td>False</td>
<td>The value of this property shall be a link to a resource of type Assembly.</td>
</tr>
<tr>
<td>PhysicalLocation</td>
<td>Resource.Location</td>
<td>False</td>
<td>This property shall contain location information of the associated drive.</td>
</tr>
<tr>
<td>HotspareReplacementMode</td>
<td>Drive.v1_5_0.HotspareReplacementModeType</td>
<td>True</td>
<td>This property shall specify if a commissioned hotspare will continue to serve as a hotspare once the failed drive is replaced.</td>
</tr>
</tbody>
</table>

**Table 38. Location Attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Info</td>
<td>Edm.String</td>
<td>True</td>
<td>This property shall represent the location of the resource.</td>
</tr>
<tr>
<td>InfoFormat</td>
<td>Edm.String</td>
<td>True</td>
<td>This property shall represent the format of the Info property.</td>
</tr>
<tr>
<td>Oem</td>
<td>Resource.Oem</td>
<td>False</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 39. Identifier Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DurableName</td>
<td>Edm.String</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>DurableNameFormat</td>
<td>Resource.v1_1_0.DurableNameFormat</td>
<td>True</td>
<td>This property shall represent the format of the DurableName property.</td>
</tr>
</tbody>
</table>

Table 40. Protocol Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCIe*</td>
<td>This value shall mean that this device conforms to the PCI-SIG PCIeExpress Base Specification only beyond that is uses some vendor proprietary mechanism to communicate.</td>
</tr>
<tr>
<td>AHCI</td>
<td>This value shall mean that this device conforms to the Intel Advanced Host Controller Interface Specification.</td>
</tr>
<tr>
<td>UHCI</td>
<td>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.</td>
</tr>
<tr>
<td>SAS</td>
<td>This value shall mean that this device conforms to the T10 SAS Protocol Layer Specification.</td>
</tr>
<tr>
<td>SATA</td>
<td>This value shall mean that this device conforms to the Serial ATA International Organization Serial ATA Specification.</td>
</tr>
<tr>
<td>USB</td>
<td>This value shall mean that this device conforms to the USB Implementers Forum Universal Serial Bus Specification.</td>
</tr>
<tr>
<td>NVMe</td>
<td>This value shall mean that this device conforms to the Non-Volatile Memory Host Controller Interface Specification.</td>
</tr>
<tr>
<td>FC</td>
<td>This value shall mean that this device conforms to the T11 Fibre Channel Physical and Signaling Interface Specification.</td>
</tr>
<tr>
<td>iSCSI</td>
<td>This value shall mean that this device conforms to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.</td>
</tr>
<tr>
<td>FCoE</td>
<td>This value shall mean that this device conforms to the T11 FC-BB-5 Specification.</td>
</tr>
<tr>
<td>FCP</td>
<td>This enumeration literal shall indicate the INCITS 481: Information technology - Fibre Channel Protocol for SCSI. The Fibre Channel SCSI Protocol.</td>
</tr>
<tr>
<td>FICON</td>
<td>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.</td>
</tr>
<tr>
<td>NVMe-over Fabrics</td>
<td>This value shall mean that this device conforms to the NVM Express over Fabrics Specification.</td>
</tr>
<tr>
<td>SMB</td>
<td>This value shall mean that this device conforms to the Microsoft Server Message Block Protocol.</td>
</tr>
<tr>
<td>NFSv3</td>
<td>This value shall mean that this device conforms to the Network File System protocol as defined by RFC 1813.</td>
</tr>
<tr>
<td>NFSv4</td>
<td>This value shall mean that this device conforms to the Network File System protocol as defined by RFC 3010 or RFC 5661.</td>
</tr>
<tr>
<td>HTTP</td>
<td>This value shall mean that this device conforms to the Hypertext Transfer protocol as defined by RFC 2068 or RFC 2616.</td>
</tr>
<tr>
<td>HTTPS</td>
<td>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.</td>
</tr>
<tr>
<td>FTP</td>
<td>This value shall mean that this device conforms to the File Transfer protocol as defined by RFC 114.</td>
</tr>
</tbody>
</table>
### Attribute Description

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFTP</td>
<td>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.</td>
</tr>
<tr>
<td>iWARP</td>
<td>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.</td>
</tr>
<tr>
<td>RoCE</td>
<td>This value shall mean that this device conforms to the RDMA over Converged Ethernet protocol as defined by the Infiniband Architecture Specification.</td>
</tr>
<tr>
<td>RoCEv2</td>
<td>This value shall mean that this device conforms to the RDMA over Converged Ethernet version 2 protocol as defined by the Infiniband Architecture Specification.</td>
</tr>
<tr>
<td>I2C</td>
<td>This value shall mean that this device conforms to the NXP Semiconductors I2C-bus Specification.</td>
</tr>
<tr>
<td>OEM</td>
<td>This value shall mean that this device conforms to an OEM specific architecture and additional information may be included in the OEM section.</td>
</tr>
</tbody>
</table>

#### Table 41. Media Type Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDD</td>
<td>The drive media type is traditional magnetic platters.</td>
</tr>
<tr>
<td>SSD</td>
<td>The drive media type is solid state or flash memory.</td>
</tr>
<tr>
<td>SMR</td>
<td>The drive media type is shingled magnetic recording.</td>
</tr>
</tbody>
</table>

#### Intel® RSD OEM extensions:

#### Table 42. Drive Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EraseOnDetach</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>DriveErased</td>
<td>Edm.Boolean</td>
<td>False</td>
<td>This property shall represent the erase state of the drive.</td>
</tr>
<tr>
<td>FirmwareVersion</td>
<td>Edm.String</td>
<td>True</td>
<td>This indicates the drive firmware version.</td>
</tr>
<tr>
<td>LatencyTrackingEnabled</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>This indicates if latency tracking is enabled in drive firmware.</td>
</tr>
<tr>
<td>Storage</td>
<td>Storage.Storage</td>
<td>True</td>
<td>A reference to the storage controller where this drive is connected.</td>
</tr>
<tr>
<td>PCIeFunction</td>
<td>PCIeFunction.PCIeFunction</td>
<td>True</td>
<td>A reference to the PCIe function that provides this drive functionality.</td>
</tr>
<tr>
<td>UsedBy</td>
<td>Collection(StoragePool, StoragePool)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>Metrics</td>
<td>DriveMetrics.DriveMetrics</td>
<td>False</td>
<td>A reference to the Metrics associated with this Drive.</td>
</tr>
</tbody>
</table>
4.19.1 Operations

4.19.1.1 GET

Request:

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

Response:

```json
{
  "@odata.context": "/redfish/v1/$metadata#Drive.Drive",
  "@odata.id": "/redfish/v1/Chassis/1/Drives/2",
  "@odata.type": ">
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```
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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LatencyTrackingEnabled</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>This indicates if latency tracking is enabled in drive firmware.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UnitSizeBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>The value of this property shall be the size of a unit (the value is reported in bytes) that is utilized by UnitRead / UnitWrite properties as a basic unit.</td>
</tr>
<tr>
<td>UnitsRead</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall be a number of units of a size UnitSizeBytes read since reset. This can be used to compute average bandwidth by polling the drive at regular intervals.</td>
</tr>
<tr>
<td>UnitsWritten</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall be a number of units of a size UnitSizeBytes written since reset. This can be used to compute average bandwidth by polling the drive at regular intervals.</td>
</tr>
<tr>
<td>HostReadCommands</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall be a number of read commands completed by Disk controller since reset. For NMVe Disk controller specifically, this is the number of Compare and Read commands.</td>
</tr>
<tr>
<td>HostWriteCommands</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall be a number of write commands completed by Disk controller since reset.</td>
</tr>
<tr>
<td>PowerCycles</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall be a number of power cycles of the physical drive.</td>
</tr>
<tr>
<td>PowerOnHours</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ControllerBusyTimeMinutes</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall be the amount of time (in minutes) the drive controller is busy with I/O commands.</td>
</tr>
</tbody>
</table>

### Table 46. HealthData Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AvailableSparePercentage</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall be a normalized percentage (0 to 100%) of the remaining spare capacity available.</td>
</tr>
<tr>
<td>PredictedMediaLifeUsedPerc</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>This property shall contain an indicator of the percentage of life remaining in the Drive's media.</td>
</tr>
<tr>
<td>UnsafeShutdowns</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall be a number of unsafe shutdowns of a drive.</td>
</tr>
<tr>
<td>MediaErrors</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>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.</td>
</tr>
</tbody>
</table>

### 4.20.1 Operations

#### 4.20.1.1 GET

**Request:**

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

```json
{
    "@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": 54546566566
    },
    "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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Chassis.Chasis)</td>
<td>True</td>
<td>This property shall contain the members of this collection.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChassisType</td>
<td>Chassis.v1_0_0.ChassisType</td>
<td>False</td>
<td>ChassisType shall indicate the physical form factor for the type of chassis.</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Edm.String</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>Model</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the name by that the manufacturer generally refers to the chassis.</td>
</tr>
<tr>
<td>SKU</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the stock-keeping unit number for this chassis.</td>
</tr>
<tr>
<td>SerialNumber</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be a manufacturer-allocated number used to identify the chassis.</td>
</tr>
<tr>
<td>PartNumber</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be a part number assigned by the organization that is responsible for producing or manufacturing the chassis.</td>
</tr>
<tr>
<td>AssetTag</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be an identifying string used to track the chassis for inventory purposes.</td>
</tr>
<tr>
<td>IndicatorLED</td>
<td>Chassis.v1_0_0.IndicatorLED</td>
<td>True</td>
<td>This value of this property shall contain the indicator light state for the indicator light associated with this system.</td>
</tr>
<tr>
<td>Links</td>
<td>Chassis.v1_0_0.Links</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------</td>
<td>----------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Actions</td>
<td>Chassis.v1_0_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>-</td>
</tr>
<tr>
<td>LogServices</td>
<td>LogServiceCollection.LogServiceCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type LogServiceCollection.</td>
</tr>
<tr>
<td>Thermal</td>
<td>Thermal.Thermal</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Power</td>
<td>Power.Power</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>PowerState</td>
<td>Chassis.v1_0_1.PowerState</td>
<td>True</td>
<td>The value of this property shall contain the power state of the chassis.</td>
</tr>
<tr>
<td>PhysicalSecurity</td>
<td>Chassis.v1_1_0.PhysicalSecurity</td>
<td>False</td>
<td>This value of this property shall contain the sensor state of physical security.</td>
</tr>
<tr>
<td>Location</td>
<td>Resource.Location</td>
<td>False</td>
<td>-</td>
</tr>
<tr>
<td>HeightMm</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall represent the height of the chassis (in millimeters) as specified by the manufacturer.</td>
</tr>
<tr>
<td>WidthMm</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall represent the width of the chassis (in millimeters) as specified by the manufacturer.</td>
</tr>
<tr>
<td>DepthMm</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall represent the depth (length) of the chassis (in millimeters) as specified by the manufacturer.</td>
</tr>
<tr>
<td>WeightKg</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of this property shall represent the published mass (commonly referred to as weight) of the chassis (in kilograms).</td>
</tr>
<tr>
<td>NetworkAdapters</td>
<td>NetworkAdapterCollection.NetworkAdapterCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type NetworkAdapterCollection.</td>
</tr>
<tr>
<td>Assembly</td>
<td>Assembly.Assembly</td>
<td>False</td>
<td>The value of this property shall be a link to a resource of type Assembly.</td>
</tr>
<tr>
<td>UUID</td>
<td>Resource.UUID</td>
<td>True</td>
<td>The value of this property shall contain the universally unique identifier number for the chassis.</td>
</tr>
<tr>
<td>PCIeSlots</td>
<td>PCIeSlots.PCIeSlots</td>
<td>false</td>
<td>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.</td>
</tr>
<tr>
<td>EnvironmentalClass</td>
<td>Chassis.v1_9_0.EnvironmentalClass</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sensors</td>
<td>SensorCollection.SensorCollection</td>
<td>false</td>
<td>This property shall be a reference to a resource of type SensorCollection that contains the sensors located in the Chassis and sub-components.</td>
</tr>
</tbody>
</table>

Table 49. Location Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Info</td>
<td>Edm.String</td>
<td>True</td>
<td>This property shall represent the location of the resource.</td>
</tr>
<tr>
<td>InfoFormat</td>
<td>Edm.String</td>
<td>True</td>
<td>This property shall represent the format of the Info property.</td>
</tr>
<tr>
<td>Oem</td>
<td>Resource.Oem</td>
<td>False</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 50. Chassis Type Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rack</td>
<td>An equipment rack, typically a 19-inch wide freestanding unit.</td>
</tr>
<tr>
<td>Blade</td>
<td>An enclosed or semi-enclosed, typically vertically-oriented, system chassis that must be plugged into a multi-system chassis to function normally.</td>
</tr>
<tr>
<td>Enclosure</td>
<td>A generic term for a chassis that does not fit any other description.</td>
</tr>
<tr>
<td>StandAlone</td>
<td>A single, free-standing system, commonly called a tower or desktop chassis.</td>
</tr>
<tr>
<td>RackMount</td>
<td>A single system chassis designed specifically for mounting in an equipment rack.</td>
</tr>
<tr>
<td>Card</td>
<td>A loose device or circuit board intended to be installed in a system or other enclosure.</td>
</tr>
<tr>
<td>Cartridge</td>
<td>A small self-contained system intended to be plugged into a multi-system chassis.</td>
</tr>
<tr>
<td>Row</td>
<td>A collection of equipment racks.</td>
</tr>
<tr>
<td>Pod</td>
<td>A collection of equipment racks in a large, likely transportable, container.</td>
</tr>
<tr>
<td>Expansion</td>
<td>A chassis that expands the capabilities or capacity of another chassis.</td>
</tr>
<tr>
<td>Sidecar</td>
<td>A chassis that mates mechanically with another chassis to expand its capabilities or capacity.</td>
</tr>
<tr>
<td>Zone</td>
<td>A logical division or a portion of a physical chassis that contains multiple devices or systems that cannot be physically separated.</td>
</tr>
<tr>
<td>Sled</td>
<td>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.</td>
</tr>
<tr>
<td>Shelf</td>
<td>An enclosed or semi-enclosed, typically horizontally-oriented, system chassis that must be plugged into a multi-system chassis to function normally.</td>
</tr>
<tr>
<td>Drawer</td>
<td>An enclosed or semi-enclosed, typically horizontally-oriented, system chassis that may be slid into a multi-system chassis.</td>
</tr>
<tr>
<td>Module</td>
<td>A small, typically removable, chassis or card that contains devices for a particular subsystem or function.</td>
</tr>
<tr>
<td>Component</td>
<td>A small chassis, card, or device that contains devices for a particular subsystem or function.</td>
</tr>
<tr>
<td>IPBasedDrive</td>
<td>A chassis in a drive form factor with IP-based network connections.</td>
</tr>
<tr>
<td>RackGroup</td>
<td>A group of racks that form a single entity or share infrastructure.</td>
</tr>
<tr>
<td>StorageEnclosure</td>
<td>A chassis that encloses storage.</td>
</tr>
<tr>
<td>Other</td>
<td>A chassis that does not fit any of these definitions.</td>
</tr>
</tbody>
</table>
## Table 51. ChassisType Attribute Values

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ComputerSystems</td>
<td>Collection(ComputerSystem.ComputerSystem)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ManagedBy</td>
<td>Collection(Manager.Manager)</td>
<td>True</td>
<td>The value of this property shall be a reference to the resource that manages this chassis and shall reference a resource of type Manager.</td>
</tr>
<tr>
<td>ContainedBy</td>
<td>Chassis.Chassis</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Contains</td>
<td>Collection(Chassis.Chassis)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>PoweredBy</td>
<td>Collection(Resource.Item)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>CooledBy</td>
<td>Collection(Resource.Item)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ManagersInChassis</td>
<td>Collection(Manager.Manager)</td>
<td>True</td>
<td>The value of this property shall reference one or more resources of type Manager that are in this Chassis.</td>
</tr>
<tr>
<td>Drives</td>
<td>Collection(Drive.Drive)</td>
<td>True</td>
<td>The value of this property shall reference one or more resources of type Drive that are in this Chassis.</td>
</tr>
<tr>
<td>Storage</td>
<td>Collection(Storage.Storage)</td>
<td>True</td>
<td>The value of this property shall reference one or more resources of type Storage that are connected to or contained inside this Chassis.</td>
</tr>
<tr>
<td>PCIeDevices</td>
<td>Collection(PCIEDevice.PCIEDevice)</td>
<td>True</td>
<td>The value of this property shall reference one or more resources of type PCIEDevices.</td>
</tr>
</tbody>
</table>

**Intel® RSD OEM Links extensions:**

## Table 52. ChassisLinks Attribute

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EthernetSwitches</td>
<td>Collection(EthernetSwitch.v1_0_0.EthernetSwitch)</td>
<td>True</td>
<td>The value of this property shall reference one or more resources of type EthernetSwitch that are in this Chassis.</td>
</tr>
<tr>
<td>Switches</td>
<td>Collection(EthernetSwitch.v1_0_0.EthernetSwitch)</td>
<td>True</td>
<td>The value of this property shall reference one or more resources of type EthernetSwitch that are in this Chassis.</td>
</tr>
</tbody>
</table>
Intel® RSD OEM extensions:

Table 53. Chassis Attribute for Intel® RSD OEM Extensions

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Intel.Oem.Location</td>
<td>True</td>
<td>Chassis location in relation to its parent.</td>
</tr>
</tbody>
</table>

4.22.1 Operations

4.22.1.1 GET

Request:

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

Response:

```json
{
  "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Fabric.Fabric)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FabricType</td>
<td>Protocol.Protocol</td>
<td>True</td>
<td>The value of this property shall contain the type of fabric being represented by this simple fabric.</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>-</td>
</tr>
<tr>
<td>MaxZones</td>
<td>Edm.Int64</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>Links</td>
<td>Fabric.v1_0_0.Links</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Actions</td>
<td>Fabric.v1_0_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>Zones</td>
<td>ZoneCollection.ZoneCollection</td>
<td>False</td>
<td>The value of this property shall be a reference to the resources that this fabric uses and shall reference a resource of type Zone.</td>
</tr>
<tr>
<td>Endpoints</td>
<td>EndpointCollection.EndpointCollection</td>
<td>False</td>
<td>The value of this property shall be a reference to the resources that this fabric uses and shall reference a resource of type Endpoint.</td>
</tr>
<tr>
<td>Switches</td>
<td>SwitchCollection.SwitchCollection</td>
<td>False</td>
<td>The value of this property shall be a reference to the resources that this fabric uses and shall reference a resource of type Switch.</td>
</tr>
</tbody>
</table>

Table 56. FabricType Attribute (Protocol) Values

<table>
<thead>
<tr>
<th>Member</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCIe</td>
<td>This value shall mean that this device conforms to the PCI-SIG PCIe xpress Base Specification only; beyond that, it uses some vendor-proprietary mechanism to communicate.</td>
</tr>
<tr>
<td>AHCI</td>
<td>This value shall mean that this device conforms to the Intel Advanced Host Controller Interface Specification.</td>
</tr>
<tr>
<td>UHCI</td>
<td>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.</td>
</tr>
<tr>
<td>SAS</td>
<td>This value shall mean that this device conforms to the T10 SAS Protocol Layer Specification.</td>
</tr>
<tr>
<td>SATA</td>
<td>This value shall mean that this device conforms to the Serial ATA International Organization Serial ATA Specification.</td>
</tr>
<tr>
<td>Member</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>USB</td>
<td>This value shall mean that this device conforms to the USB Implementers Forum Universal Serial Bus Specification.</td>
</tr>
<tr>
<td>NVMe</td>
<td>This value shall mean that this device conforms to the Non-Volatile Memory Host Controller Interface Specification.</td>
</tr>
<tr>
<td>FC</td>
<td>This value shall mean that this device conforms to the T11 Fibre Channel Physical and Signaling Interface Specification.</td>
</tr>
<tr>
<td>iSCSI</td>
<td>This value shall mean that this device conforms to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.</td>
</tr>
<tr>
<td>FCoE</td>
<td>This value shall mean that this device conforms to the T11 FC-BB-5 Specification.</td>
</tr>
<tr>
<td>FCP</td>
<td>This enumeration literal shall indicate the INCITS 481: Information technology - Fibre Channel Protocol for SCSI. The Fibre Channel SCSI Protocol.</td>
</tr>
<tr>
<td>FICON</td>
<td>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.</td>
</tr>
<tr>
<td>NVMe-over Fabrics*</td>
<td>This value shall mean that this device conforms to the NVM Express-over Fabrics Specification.</td>
</tr>
<tr>
<td>SMB</td>
<td>This value shall mean that this device conforms to the Microsoft Server Message Block Protocol.</td>
</tr>
<tr>
<td>NFSv3</td>
<td>This value shall mean that this device conforms to the Network File System protocol as defined by RFC 1813.</td>
</tr>
<tr>
<td>NFSv4</td>
<td>This value shall mean that this device conforms to the Network File System protocol as defined by RFC 3010 or RFC 5661.</td>
</tr>
<tr>
<td>HTTP</td>
<td>This value shall mean that this device conforms to the Hypertext Transfer protocol as defined by RFC 2068 or RFC 2616.</td>
</tr>
<tr>
<td>HTTPS</td>
<td>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.</td>
</tr>
<tr>
<td>FTP</td>
<td>This value shall mean that this device conforms to the File Transfer protocol as defined by RFC 114.</td>
</tr>
<tr>
<td>SFTP</td>
<td>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.</td>
</tr>
<tr>
<td>iWARP</td>
<td>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.</td>
</tr>
<tr>
<td>RoCE</td>
<td>This value shall mean that this device conforms to the RDMA over Converged Ethernet protocol as defined by the Infiniband Architecture Specification.</td>
</tr>
<tr>
<td>RoCEv2</td>
<td>This value shall mean that this device conforms to the RDMA over Converged Ethernet version 2 protocol as defined by the Infiniband Architecture Specification.</td>
</tr>
<tr>
<td>I2C</td>
<td>This value shall mean that this device conforms to the NXP Semiconductors I2C-bus Specification.</td>
</tr>
<tr>
<td>OEM</td>
<td>This value shall mean that this device conforms to an OEM specific architecture and additional information may be included in the OEM section.</td>
</tr>
</tbody>
</table>

**Intel® RSD OEM extensions:**

**Table 57. FabricLinks Attribute**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ManagedBy</td>
<td>Collection(Manager.Manager)</td>
<td>True</td>
<td>Collection of managers managing the service.</td>
</tr>
</tbody>
</table>

**4.24.1 Operations**

**4.24.1.1 GET**
### Request:

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

### Response:

```json
{
  "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Zone.Zone)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

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

```json
{
   "Links": {
      "Endpoints": [
         {
            "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/1"
         }
      ],
      "Members@odata.count": 1,
      "Name": "Zone Collection"
   }
}
```
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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>-</td>
</tr>
<tr>
<td>Links</td>
<td>Zone.v1_0_0.Links</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Actions</td>
<td>Zone.v1_1_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>Identifiers</td>
<td>Collection(Resource.Identifier)</td>
<td>True</td>
<td>Identifiers for this zone shall be unique in the context of other zones.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endpoints</td>
<td>Collection(Endpoint.End point)</td>
<td>True</td>
<td>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.</td>
</tr>
</tbody>
</table>
### Attribute Definition

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>InvolvedSwitches</td>
<td>Collection(Switch.Switch)</td>
<td>True</td>
<td>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.</td>
</tr>
</tbody>
</table>

### 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": {
    "Endpoint": [  
      {  
        "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Endpoint.End point)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EndpointProtocol</td>
<td>String (enum)</td>
<td>No</td>
<td>Indicates the protocol used by the endpoint.</td>
</tr>
<tr>
<td>Identifiers</td>
<td>Array of Resource.v1_1_0.Identifier</td>
<td>Yes</td>
<td>Provides iQN or NQN of created entity (will be generated if not provided).</td>
</tr>
<tr>
<td>ConnectedEntities</td>
<td>Array of Endpoint.v1_0_0.ConnectedEntity</td>
<td>Yes</td>
<td>Provides information about entities connected to the endpoint.</td>
</tr>
<tr>
<td>IPTransportDetails</td>
<td>Array of Endpoint.v1_1_0.IPTransportDetails</td>
<td>No</td>
<td>Provides information about the transport used for accessing the endpoint.</td>
</tr>
<tr>
<td>Links-&gt;Oem-&gt;Interfaces</td>
<td>Collection(Resource.Resource)</td>
<td>No</td>
<td>Provides information about the interfaces that should be used for endpoint connectivity.</td>
</tr>
</tbody>
</table>

**Table 63. Identifiers POST Properties**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DurableNameFormat</td>
<td>Resource.v1_1_0.DurableNameFormat</td>
<td>Yes</td>
<td>This represents the format of the DurableName property. Allowed values: &quot;NQN&quot;, &quot;iQN&quot;</td>
</tr>
<tr>
<td>DurableName</td>
<td>String</td>
<td>Yes</td>
<td>This property contains the world wide unique identifier for the resource. The string is in the format described by the value of the Identifier.DurableNameFormat property.</td>
</tr>
</tbody>
</table>

**Table 64. ConnectedEntities POST Properties**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EntityLink</td>
<td>Object (link)</td>
<td>Yes</td>
<td>A link to the associated entity.</td>
</tr>
<tr>
<td>EntityRole</td>
<td>Endpoint.v1_0_0.EntityRole</td>
<td>Yes</td>
<td>This property contains the world wide unique identifier for the resource. The string is in the format described by the value of the Identifier.DurableNameFormat property.</td>
</tr>
</tbody>
</table>
### Table 65. ITPTransportDetails POST Properties

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPv4Address</td>
<td>IPAddresses.IPv4Address</td>
<td>No</td>
<td>IPv4 address for the transport.</td>
</tr>
<tr>
<td>IPv6Address</td>
<td>IPAddresses.IPv6Address</td>
<td>No</td>
<td>IPv6 address for the transport.</td>
</tr>
<tr>
<td>Port</td>
<td>Edm.Decimal</td>
<td>No</td>
<td>UDP or TCP port number used for communication with the endpoint.</td>
</tr>
</tbody>
</table>

### Table 66. DurableNameFormat Attribute Values

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAA</td>
<td>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.</td>
</tr>
<tr>
<td>IQN</td>
<td>This durable name shall be in the iSCSI Qualified Name format as defined in RFC 3720 and RFC 3721.</td>
</tr>
<tr>
<td>FC_WWN</td>
<td>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.</td>
</tr>
<tr>
<td>UUID</td>
<td>This durable name shall be the hexadecimal representation of the Universal Unique Identifier as defined in the Internation Telecom Union's OSI networking and system aspects - Naming, Addressing and Registration Specification.</td>
</tr>
<tr>
<td>EUI</td>
<td>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.</td>
</tr>
<tr>
<td>NQN</td>
<td>This durable name shall be in the NVMe* Qualified Name format as defined in the NVN Express over Fabric* Specification.</td>
</tr>
<tr>
<td>NSID</td>
<td>This durable name shall be in the NVM Namespace Identifier format as defined in the NVN Express Specification.</td>
</tr>
</tbody>
</table>

### Table 67. EntityRole Attribute Values

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiator</td>
<td>The entity is acting as an initiator.</td>
</tr>
<tr>
<td>Target</td>
<td>The entity is acting as a target.</td>
</tr>
<tr>
<td>Both</td>
<td>The entity is acting as both an initiator and a target.</td>
</tr>
</tbody>
</table>

The following example shows how to create an NVMeOverFabrics endpoint.

**Request:**

```plaintext
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": [  
```
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": {
        "Interfaces": [
          {
            "@odata.id": "/redfish/v1/Systems/Target/EthernetInterfaces/1"
          }
        ]
      }
    }
  ],
  "Oem": {
    "Intel_RackScale": {
      "Authentication": {
        "Username": "userA",
        "Password": "passB"
      }
    }
  }
}

Response:

HTTP/1.1 201 Created
Location: http://<IP>:<PORT>/redfish/v1/Fabrics/NVMeoE/Endpoints/3
((created resource body))
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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>-</td>
</tr>
<tr>
<td>EndpointProtocol</td>
<td>Protocol.Protocol</td>
<td>True</td>
<td>The value of this property shall contain the protocol this endpoint uses to communicate with other endpoints on this fabric.</td>
</tr>
<tr>
<td>ConnectedEntities</td>
<td>Collection(Endpoint.v1_0_0.ConnectedEntity)</td>
<td>True</td>
<td>This value of this property shall contain all the entities that this endpoint allows access to.</td>
</tr>
<tr>
<td>Identifiers</td>
<td>Collection(Resource.Identifier)</td>
<td>True</td>
<td>Identifiers for this endpoint shall be unique in the context of other endpoints that can be reached over the connected network.</td>
</tr>
<tr>
<td>PciId</td>
<td>Endpoint.v1_0_0.PciId</td>
<td>True</td>
<td>The value of this property shall be the PCI ID of the endpoint.</td>
</tr>
<tr>
<td>HostReservationMemoryBytes</td>
<td>Edm.Int64</td>
<td>True</td>
<td>The value of this property shall be the amount of memory in Bytes that the Host should allocate to connect to this endpoint.</td>
</tr>
</tbody>
</table>
## REST API Definition

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Links</td>
<td>Endpoint.v1_0_0.Links</td>
<td>False</td>
<td>The links object contains the links to other resources that are related to this resource.</td>
</tr>
<tr>
<td>Actions</td>
<td>Endpoint.v1_0_0.Actions</td>
<td>False</td>
<td>The Actions object contains the available custom actions on this resource.</td>
</tr>
<tr>
<td>Redundancy</td>
<td>Collection(Redundancy.Redundancy)</td>
<td>True</td>
<td>Redundancy information for the lower level endpoints supporting this endpoint.</td>
</tr>
<tr>
<td>IPTransportDetails</td>
<td>Collection(Endpoint.v1_1_0.IPTransportDetails)</td>
<td>True</td>
<td>This array shall contain the details for each IP transport supported by this endpoint.</td>
</tr>
</tbody>
</table>

### Table 69. ConnectedEntity Attributes

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

### Table 70. IPTransportDetails Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TransportProtocol</td>
<td>Protocol.Protocol</td>
<td>False</td>
<td>The value shall be the protocol used by the connection entity.</td>
</tr>
<tr>
<td>IPv4Address</td>
<td>IPAddresses.IPv4Address</td>
<td>False</td>
<td>The value of this property shall specify the IPv4Address.</td>
</tr>
<tr>
<td>IPv6Address</td>
<td>IPAddresses.IPv6Address</td>
<td>False</td>
<td>The value of this property shall specify the IPv6Address.</td>
</tr>
<tr>
<td>Port</td>
<td>Edm.Decimal</td>
<td>False</td>
<td>The value of this property shall specify a UDP or TCP port number used for communication with the Endpoint.</td>
</tr>
</tbody>
</table>
### Table 71. Links Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MutuallyExclusiveEndpoints</td>
<td>Collection(Endpoint.Endpoint)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>Ports</td>
<td>Collection(Port.Port)</td>
<td>True</td>
<td>The value of this property shall be an array of references of type Port that are utilized by this endpoint.</td>
</tr>
<tr>
<td>NetworkDeviceFunction</td>
<td>Collection(NetworkDeviceFunction.NetworkDeviceFunction)</td>
<td>True</td>
<td>The value of this property shall be a reference to a NetworkDeviceFunction resource, with that this endpoint is associated.</td>
</tr>
</tbody>
</table>

### Table 72. EntityRole Attribute Values

<table>
<thead>
<tr>
<th>Member</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiator</td>
<td>The entity is acting as an initiator.</td>
</tr>
<tr>
<td>Target</td>
<td>The entity is acting as a target.</td>
</tr>
<tr>
<td>Both</td>
<td>The entity is acting as both an initiator and a target.</td>
</tr>
</tbody>
</table>

### Table 73. Protocol Attribute Values

<table>
<thead>
<tr>
<th>Member</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCIe</td>
<td>This value shall mean that this device conforms to the PCI-SIG PCIe xpress Base Specification only beyond that is uses some vendor proprietary mechanism to communicate.</td>
</tr>
<tr>
<td>AHCI</td>
<td>This value shall mean that this device conforms to the Intel Advanced Host Controller Interface Specification.</td>
</tr>
<tr>
<td>UHCI</td>
<td>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.</td>
</tr>
<tr>
<td>SAS</td>
<td>This value shall mean that this device conforms to the T10 SAS Protocol Layer Specification.</td>
</tr>
<tr>
<td>SATA</td>
<td>This value shall mean that this device conforms to the Serial ATA International Organization Serial ATA Specification.</td>
</tr>
<tr>
<td>USB</td>
<td>This value shall mean that this device conforms to the USB Implementers Forum Universal Serial Bus Specification.</td>
</tr>
<tr>
<td>NVMe</td>
<td>This value shall mean that this device conforms to the Non-Volatile Memory Host Controller Interface Specification.</td>
</tr>
<tr>
<td>FC</td>
<td>This value shall mean that this device conforms to the T11 Fibre Channel Physical and Signaling Interface Specification.</td>
</tr>
<tr>
<td>iSCSI</td>
<td>This value shall mean that this device conforms to the IETF Internet Small Computer Systems Interface (iSCSI) Specification.</td>
</tr>
<tr>
<td>FCoE</td>
<td>This value shall mean that this device conforms to the T11 FC-BB-5 Specification.</td>
</tr>
<tr>
<td>FCP</td>
<td>This enumeration literal shall indicate the INCITS 481: Information Technology - Fibre Channel Protocol for SCSI. The Fibre Channel SCSI Protocol.</td>
</tr>
<tr>
<td>FICON</td>
<td>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.</td>
</tr>
<tr>
<td>NVMeOverFabrics</td>
<td>This value shall mean that this device conforms to the NVM Express -over Fabrics* Specification.</td>
</tr>
<tr>
<td>SMB</td>
<td>This value shall mean that this device conforms to the Microsoft Server Message Block Protocol.</td>
</tr>
<tr>
<td>NFSv3</td>
<td>This value shall mean that this device conforms to the Network File System protocol as defined by RFC 1813.</td>
</tr>
<tr>
<td>Member</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>NFSv4</td>
<td>This value shall mean that this device conforms to the Network File System protocol as defined by RFC 3010 or RFC 5661.</td>
</tr>
<tr>
<td>HTTP</td>
<td>This value shall mean that this device conforms to the Hypertext Transfer protocol as defined by RFC 2068 or RFC 2616.</td>
</tr>
<tr>
<td>HTTPS</td>
<td>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.</td>
</tr>
<tr>
<td>FTP</td>
<td>This value shall mean that this device conforms to the File Transfer protocol as defined by RFC114.</td>
</tr>
<tr>
<td>SFTP</td>
<td>This value shall mean that this device conforms to the File Transfer protocol as defined by RFC5042 utilizing Transport Layer Security as specified by RFC5043 or RFC5044.</td>
</tr>
<tr>
<td>iWARP</td>
<td>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.</td>
</tr>
<tr>
<td>RoCE</td>
<td>This value shall mean that this device conforms to the RDMA over Converged Ethernet protocol as defined by the Infiniband Architecture Specification.</td>
</tr>
<tr>
<td>RoCEv2</td>
<td>This value shall mean that this device conforms to the RDMA over Converged Ethernet v2 protocol as defined by the Infiniband Architecture Specification.</td>
</tr>
<tr>
<td>OEM</td>
<td>This value shall mean that this device conforms to an OEM specific architecture and additional information may be included in the OEM section.</td>
</tr>
</tbody>
</table>

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

**Intel® RSD OEM extensions:**

**Table 74. Endpoint Attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authentication</td>
<td>Intel.Oem.EndpointAuthentication</td>
<td>True</td>
<td>This property provides information about endpoint authentication required credentials.</td>
</tr>
</tbody>
</table>

**Table 75. EndpointAuthentication Attributes**

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

**Table 76. EndpointLinks Attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zones</td>
<td>Collection(Zone.Zone)</td>
<td>True</td>
<td>The value of the property is a reference to the resources that the endpoint is associated with and references a resource of type Zone.</td>
</tr>
<tr>
<td>Interfaces</td>
<td>Collection(Resource.Resource)</td>
<td>True</td>
<td>This property is an array of references to resources representing interface where this endpoint is available.</td>
</tr>
</tbody>
</table>
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/$metadata#Endpoint.Endpoint",
  "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Endpoints/1",
  "@odata.type": ":Endpoint.v1_1_0.Endpoint",
  "ConnectedEntities": [
    {
      "EntityLink": {
        "@odata.id": "/redfish/v1/StorageServices/1/Volumes/1"
      },
      "EntityRole": "Target"
    }
  ],
  "Description": "Fabric Endpoint",
  "EndpointProtocol": "NVMeOverFabrics",
  "Id": "1",
  "Identifiers": [
    {
      "@odata.type": ":Resource.v1_1_0.Identifier",
      "DurableName": "nqn.2014-08.org.nvmexpress:uuid:397f9b78-7e94-11e7-9ea4-001e67dfe170",
      "DurableNameFormat": "NQN"
    }
  ],
  "Links": {
    "Ports": [],
    "Endpoints": [],
    "Oem": {
      "Intel_RackScale": {
        "@odata.type": ":Intel.Oem.EndpointLinks",
        "Zones": [
          {
            "@odata.id": "/redfish/v1/Fabrics/NVMeoE/Zones/1"
          }
        ],
        "Interfaces": [
          {
            "@odata.id": "/redfish/v1/Systems/Target/EthernetInterfaces/1"
          }
        ]
      }
    },
    "Name": "Fabric Endpoint",
    "IPTransportDetails": [
      {
        "TransportProtocol": "RoCEv2",
      }
    ]
  }
}
"IPv4Address": {
  "Address": "192.168.0.10"
},
"IPv6Address": {},
"Port": 1023
},
"Status": {
  "Health": "OK",
  "HealthRollup": "OK",
  "State": "Enabled"
},
"Oem": {
  "Intel_RackScale": {
    "$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": [
    {"$odata.type":("#Resource.v1_1_0.Identifier",
      "DurableName": "nqn.2014-08.org.nvmexpress:uuid:1234567890ab-cdef-0000-000000000000",
      "DurableNameFormat": "NQN"
    }
  ],
  "Links": {
    "Ports": [],
    "Endpoints": [],
    "Oem": {
      "Intel_RackScale": {
        "$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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authentication</td>
<td>Intel.Oem.EndpointAuthentication</td>
<td>True</td>
<td>This property provides information about endpoint authentication required credentials.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Username</td>
<td>Edm.String</td>
<td>True</td>
<td>This property provides an endpoint username that is used to authenticate it on another side of the communication channel.</td>
</tr>
<tr>
<td>Password</td>
<td>Edm.String</td>
<td>True</td>
<td>This property is used to provide an endpoint password. It provides write only access. On read, it shall return a null value.</td>
</tr>
</tbody>
</table>
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",
}
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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(ComputerSystem.ComputerSystem)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

4.29.1 Operations

4.29.1.1 GET

Request:

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

Response:

```json
{
"@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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SystemType</td>
<td>ComputerSystem.v1_0_0.0.SystemType</td>
<td>False</td>
<td>An enumeration that indicates the kind of system that this resource represents.</td>
</tr>
<tr>
<td>Links</td>
<td>ComputerSystem.v1_0_0.Links</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>AssetTag</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall contain the value of the asset tag of the system.</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall contain a value that represents the manufacturer of the system.</td>
</tr>
<tr>
<td>Model</td>
<td>Edm.String</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>SKU</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall contain the Stock Keeping Unit (SKU) for the system.</td>
</tr>
<tr>
<td>SerialNumber</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall contain the serial number for the system.</td>
</tr>
<tr>
<td>PartNumber</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall contain the part number for the system as defined by the manufacturer.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------</td>
<td>----------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>UUID</td>
<td>Resource.UUID</td>
<td>True</td>
<td>The value of this property shall be used to contain a universally unique identifier number for the system. <strong>Universally Unique Identifier (UUID)</strong> URN Namespace, 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 xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx string format so that the property value matches the byte order presented by current OS APIs such as WMI and <code>dmidecode</code>.</td>
</tr>
<tr>
<td>HostName</td>
<td>Edm.String</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>IndicatorLED</td>
<td>ComputerSystem.v1_0_0.IndicatorLED</td>
<td>True</td>
<td>The value of this property shall contain the indicator light state for the indicator light associated with this system.</td>
</tr>
<tr>
<td>PowerState</td>
<td>ComputerSystem.v1_0_0.PowerState</td>
<td>True</td>
<td>The value of this property shall contain the power state of the system.</td>
</tr>
<tr>
<td>Boot</td>
<td>ComputerSystem.v1_0_0.Boot</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>BiosVersion</td>
<td>Edm.String</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ProcessorSummary</td>
<td>ComputerSystem.v1_0_0.ProcessorSummary</td>
<td>False</td>
<td>This object shall contain properties that describe the central processors for the current resource.</td>
</tr>
<tr>
<td>MemorySummary</td>
<td>ComputerSystem.v1_0_0.MemorySummary</td>
<td>False</td>
<td>This object shall contain properties that describe the central memory for the current resource.</td>
</tr>
<tr>
<td>Actions</td>
<td>ComputerSystem.v1_0_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>-</td>
</tr>
</tbody>
</table>
| Processors    | ProcessorCollection.Proc
<p>|essorCollection | False    | The value of this property shall be a link to a collection of type ProcessorCollection. |</p>
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EthernetInterfaces</td>
<td>EthernetInterfaceCollection.EthernetInterfaceCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type EthernetInterfaceCollection.</td>
</tr>
<tr>
<td>SimpleStorage</td>
<td>SimpleStorageCollection.SimpleStorageCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type SimpleStorageCollection.</td>
</tr>
<tr>
<td>LogServices</td>
<td>LogServiceCollection.LogServiceCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type LogServiceCollection.</td>
</tr>
<tr>
<td>TrustedModules</td>
<td>Collection(ComputerSystem.v1_1_0.TrustedModules)</td>
<td>False</td>
<td>This object shall contain an array of objects with properties that describe the trusted modules for the current resource.</td>
</tr>
<tr>
<td>SecureBoot</td>
<td>SecureBoot.SecureBoot</td>
<td>False</td>
<td>The value of this property shall be a link to a resource of type SecureBoot.</td>
</tr>
<tr>
<td>Bios</td>
<td>Bios.Bios</td>
<td>False</td>
<td>The value of this property shall be a link to a resource of type BIOS that lists the BIOS settings for this system.</td>
</tr>
<tr>
<td>Memory</td>
<td>MemoryCollection.MemoyCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type MemoryCollection.</td>
</tr>
<tr>
<td>Storage</td>
<td>StorageCollection.StorageCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type StorageCollection.</td>
</tr>
<tr>
<td>HostingRoles</td>
<td>Collection(ComputerSystem.v1_2_0.HostingRole)</td>
<td>False</td>
<td>The values of this collection shall be the hosting roles supported by this computer system.</td>
</tr>
<tr>
<td>HostedServices</td>
<td>ComputerSystem.v1_2_0.HostedServices</td>
<td>False</td>
<td>The values of this collection shall describe services supported by this computer system.</td>
</tr>
<tr>
<td>PCIeDevices</td>
<td>Collection(PCieDevice.PCIeDevice)</td>
<td>True</td>
<td>The value of this property shall be an array of references of type PCIeDevice.</td>
</tr>
<tr>
<td>PCIeFunctions</td>
<td>Collection(PCieFunction.PCIeFunction)</td>
<td>True</td>
<td>The value of this property shall be an array of references of type PCIeFunction.</td>
</tr>
<tr>
<td>MemoryDomains</td>
<td>MemoryDomainCollection.MemoryDomainCollection</td>
<td>True</td>
<td>The value of this property shall be a link to a collection of type MemoryDomainCollection.</td>
</tr>
<tr>
<td>NetworkInterfaces</td>
<td>NetworkInterfaceCollection.NetworkInterfaceCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type NetworkInterfaceCollection.</td>
</tr>
<tr>
<td>HostWatchdogTimer</td>
<td>ComputerSystem.v1_5_0.HostWatchdogTimer</td>
<td>False</td>
<td>This object shall contain properties that describe the host watchdog timer functionality for this ComputerSystem.</td>
</tr>
<tr>
<td>SubModel</td>
<td>Edm.String</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>Redundancy</td>
<td>Collection(Redundancy.Redundancy)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PowerRestorePolicy</td>
<td>ComputerSystem.v1_6_0.PowerRestorePolicyTypes</td>
<td>false</td>
<td>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.</td>
</tr>
</tbody>
</table>

### 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": {
    "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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UefiDevicePath</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the UEFI device path to the device that implements this interface (port).</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>This property shall contain any status or health properties of the resource.</td>
</tr>
<tr>
<td>InterfaceEnabled</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>The value of this property shall be a Boolean indicating whether this interface is enabled.</td>
</tr>
<tr>
<td>PermanentMACAddress</td>
<td>EthernetInterface.v1_0_0.MACAddress</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>MACAddress</td>
<td>EthernetInterface.v1_0_0.MACAddress</td>
<td>True</td>
<td>The value of this property shall be the current MAC Address of this interface. If an assignable MAC address is not supported, this is a read only alias of the PermanentMACAddress.</td>
</tr>
<tr>
<td>SpeedMbps</td>
<td>Edm.Int64</td>
<td>True</td>
<td>The value of this property shall be the link speed of the interface in Mbps.</td>
</tr>
<tr>
<td>AutoNeg</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>FullDuplex</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>The value of this property shall represent the duplex status of the Ethernet connection on this interface.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>MTUSize</td>
<td>Edm.Int64</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>HostName</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the host name for this interface.</td>
</tr>
<tr>
<td>FQDN</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the fully qualified domain name for this interface.</td>
</tr>
<tr>
<td>MaxIPv6StaticAddresses</td>
<td>Edm.Int64</td>
<td>True</td>
<td>The value of this property shall indicate the number of array items supported by IPv6StaticAddresses.</td>
</tr>
<tr>
<td>VLAN</td>
<td>VLanNetworkInterface.VLAN</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>IPv4Addresses</td>
<td>Collection(IPAddresses.IPv4Address)</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>IPv6AddressPolicyTable</td>
<td>Collection(EthernetInterface.v1_0_0.IPv6AddressPolicyEntry)</td>
<td>False</td>
<td>The value of this property shall be an array of objects used to represent the Address Selection Policy Table as defined in the Default Address Selection for Internet Protocol Version 6 (IPv6), RFC 6724, see Table 2.</td>
</tr>
<tr>
<td>IPv6Addresses</td>
<td>Collection(IPAddresses.IPv6Address)</td>
<td>False</td>
<td>The value of this property shall be an array of objects used to represent the IPv6 connection characteristics for this interface.</td>
</tr>
<tr>
<td>IPv6StaticAddresses</td>
<td>Collection(IPAddresses.IPv6StaticAddress)</td>
<td>False</td>
<td>The value of this property shall be an array of objects used to represent the IPv6 static connection characteristics for this interface.</td>
</tr>
<tr>
<td>IPv6DefaultGateway</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the current IPv6 default gateway address that is in use on this interface.</td>
</tr>
<tr>
<td>NameServers</td>
<td>Collection(Edm.String)</td>
<td>False</td>
<td>The value of this property shall be the DNS name servers used on this interface.</td>
</tr>
<tr>
<td>VLANS</td>
<td>VLanNetworkInterfaceCollection.VLanNetworkInterfaceCollection</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>LinkStatus</td>
<td>EthernetInterface.v1_1_0.LinkStatus</td>
<td>True</td>
<td>The value of this property shall be the link status of this interface (port).</td>
</tr>
<tr>
<td>Links</td>
<td>EthernetInterface.v1_1_0.Links</td>
<td>False</td>
<td>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.</td>
</tr>
</tbody>
</table>
REST API Definition

Intel® RSD Storage Services

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<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actions</td>
<td>EthernetInterface.v1_3_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>DHCPv4</td>
<td>EthernetInterface.v1_4_0.DHCPv4Configuration</td>
<td>True</td>
<td>This property shall contain the configuration of DHCP v4.</td>
</tr>
<tr>
<td>DHCPv6</td>
<td>EthernetInterface.v1_4_0.DHCPv6Configuration</td>
<td>True</td>
<td>This property shall contain the configuration of DHCP v6.</td>
</tr>
<tr>
<td>StatelessAddressAutoConfig</td>
<td>EthernetInterface.v1_4_0.StatelessAddressAutoC configuration</td>
<td>True</td>
<td>This object shall contain the IPv4 and IPv6 Stateless Address Automatic Configuration (SLAAC) properties for this interface.</td>
</tr>
<tr>
<td>IPv6StaticDefaultGateways</td>
<td>Collection(IPAddresses.IPv6StaticAddress)</td>
<td>False</td>
<td>The values in this array shall represent the IPv6 static default gateway addresses for this interface.</td>
</tr>
<tr>
<td>StaticNameServers</td>
<td>Collection(Edm.String)</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>IPv4StaticAddresses</td>
<td>Collection(IPAddresses.IPv4Address)</td>
<td>False</td>
<td>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.</td>
</tr>
</tbody>
</table>

Intel® RSD OEM extensions:

Table 82. EthernetInterface Attributes for Intel® RSD OEM Extensions

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SupportedProtocols</td>
<td>Collection(Protocol.Protocol)</td>
<td>True</td>
<td>This property shall represent an array of supported protocol types by the Ethernet interface.</td>
</tr>
</tbody>
</table>

4.31.1 Operations

4.31.1.1 GET

Request:

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

Response:

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

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"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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(StorageService.StorageService)</td>
<td>True</td>
<td>The value of each member entry shall reference a StorageService resource.</td>
</tr>
</tbody>
</table>

4.32.1 Operations

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

Response:

```json
{
"@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Manager.Manager)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

4.33.1 Operations

4.33.1.1 GET

Request:

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

Response:

```json
{
    
    "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ManagerType</td>
<td>Manager.v1_0_0.ManagerType</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Links</td>
<td>Manager.v1_0_0.Links</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>ServiceEntryPointUUID</td>
<td>Resource.UUID</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>UUID</td>
<td>Resource.UUID</td>
<td>True</td>
<td>The value of this property shall contain the universally unique identifier number for the manager.</td>
</tr>
<tr>
<td>Model</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall contain information about how the manufacturer references this manager.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DateTime</td>
<td>Edm.DateTimeOffset</td>
<td>True</td>
<td>The value of this property shall represent the current DateTime value for the manager, with an offset from UTC, in Redfish Timestamp format.</td>
</tr>
<tr>
<td>DateTimeLocalOffset</td>
<td>Edm.String</td>
<td>True</td>
<td>The value is property shall represent the offset from UTC time that the current value of DateTime property contains.</td>
</tr>
<tr>
<td>FirmwareVersion</td>
<td>Edm.String</td>
<td>True</td>
<td>This property shall contain the firmware version as defined by the manufacturer for the associated manager.</td>
</tr>
<tr>
<td>SerialConsole</td>
<td>Manager.v1_0_0.SerialConsole</td>
<td>False</td>
<td>The value of this property shall contain information about the Serial Console service of this manager.</td>
</tr>
<tr>
<td>CommandShell</td>
<td>Manager.v1_0_0.CommandShell</td>
<td>False</td>
<td>The value of this property shall contain information about the Command Shell service of this manager.</td>
</tr>
<tr>
<td>GraphicalConsole</td>
<td>Manager.v1_0_0.GraphicalConsole</td>
<td>False</td>
<td>The value of this property shall contain information about the Graphical Console (KVM-IP) service of this manager.</td>
</tr>
<tr>
<td>Actions</td>
<td>Manager.v1_0_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>-</td>
</tr>
<tr>
<td>EthernetInterfaces</td>
<td>EthernetInterfaceCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type EthernetInterfaceCollection.</td>
</tr>
<tr>
<td>SerialInterfaces</td>
<td>SerialInterfaceCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type SerialInterfaceCollection that are for the use of this manager.</td>
</tr>
<tr>
<td>NetworkProtocol</td>
<td>ManagerNetworkProtocol</td>
<td>False</td>
<td>The value of this property shall contain a reference to a resource of type ManagerNetworkProtocol that represents the network services for this manager.</td>
</tr>
<tr>
<td>LogServices</td>
<td>LogServiceCollection</td>
<td>False</td>
<td>The value of this property shall contain a reference to a collection of type LogServiceCollection that are for the use of this manager.</td>
</tr>
<tr>
<td>VirtualMedia</td>
<td>VirtualMediaCollection</td>
<td>False</td>
<td>The value of this property shall contain a reference to a collection of type VirtualMediaCollection that are for the use of this manager.</td>
</tr>
<tr>
<td>Redundancy</td>
<td>Collection(Redundancy.Redundancy)</td>
<td>True</td>
<td>Redundancy information for the managers of this system.</td>
</tr>
<tr>
<td>PowerState</td>
<td>Resource.PowerState</td>
<td>True</td>
<td>The value of this property shall contain the power state of the Manager.</td>
</tr>
<tr>
<td>HostInterfaces</td>
<td>HostInterfaceCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type HostInterfaceCollection.</td>
</tr>
</tbody>
</table>
### Table 86. Links Attributes

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

### Intel® RSD OEM extensions:

#### Table 87. ManagerLinks Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ManagerForServices</td>
<td>Collection(StorageService.StorageService)</td>
<td>True</td>
<td>This property is an array of references to services that this manager has control over.</td>
</tr>
<tr>
<td>ManagerForEthernetSwitches</td>
<td>Collection(EthernetSwitch.v1_0_0.EthernetSwitch)</td>
<td>True</td>
<td>This property is an array of references to Ethernet switches that this manager has control over.</td>
</tr>
<tr>
<td>ManagerForSwitches</td>
<td>Collection(EthernetSwitch.v1_0_0.EthernetSwitch)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ManagerForFabrics</td>
<td>Collection(Fabric.Fabric)</td>
<td>True</td>
<td>This property is an array of references to fabrics that this manager has control over.</td>
</tr>
</tbody>
</table>

### 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 Manager 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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HostName</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall contain the host name without any domain information.</td>
</tr>
<tr>
<td>FQDN</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall contain the fully qualified domain name for the manager.</td>
</tr>
<tr>
<td>HTTP</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>HTTPS</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>SNMP</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>VirtualMedia</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Telnet</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>SSDP</td>
<td>ManagerNetworkProtocol.v1_0_0.SSDProtocol</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>IPMI</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>SSH</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>KVMIP</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>This object shall contain information for the KVM-IP (Keyboard, Video, Mouse) protocol settings for the manager.</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>-</td>
</tr>
<tr>
<td>DHCP</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>This object shall contain information for the DHCP protocol settings for the manager.</td>
</tr>
<tr>
<td>NTP</td>
<td>ManagerNetworkProtocol.v1_2_0.NTPProtocol</td>
<td>False</td>
<td>This object shall contain information for the NTP protocol settings for the manager.</td>
</tr>
<tr>
<td>Actions</td>
<td>ManagerNetworkProtocol.v1_2_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>DHCPv6</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>This object shall contain information for the DHCPv6 protocol settings for the manager.</td>
</tr>
<tr>
<td>RDP</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>This object shall contain information for the Remote Desktop Protocol settings for the manager.</td>
</tr>
<tr>
<td>RFB</td>
<td>ManagerNetworkProtocol.v1_0_0.Protocol</td>
<td>False</td>
<td>This object shall contain information for the Remote Frame Buffer protocol settings for the manager.</td>
</tr>
</tbody>
</table>

**4.35.1 Operations**

**4.35.1.1 GET**
Request:

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

Response:

```json
{
  "@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
  }
}
```
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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(EthernetInterface.EthernetInterface)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

4.36.1 Operations

4.36.1.1 GET
Request:

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

```json
{
    "@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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServiceEnabled</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>The value of this property shall be a Boolean indicating whether this service is enabled.</td>
</tr>
<tr>
<td>DeliveryRetryAttempts</td>
<td>Edm.Int64</td>
<td>False</td>
<td>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 times before the Event Destination subscription is terminated.</td>
</tr>
<tr>
<td>DeliveryRetryIntervalSeconds</td>
<td>Edm.Int64</td>
<td>False</td>
<td>The value of this property shall be the interval in seconds between the retry attempts for any given event to the subscription destination.</td>
</tr>
</tbody>
</table>
### Attribute Table

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EventTypesForSubscription</td>
<td>Collection(Event.EventType)</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Actions</td>
<td>EventService.v1_0_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>-</td>
</tr>
<tr>
<td>Subscriptions</td>
<td>EventDestinationCollection.EventDestinationCollection</td>
<td>False</td>
<td>The value of this property shall contain the link to a collection of type EventDestinationCollection.</td>
</tr>
<tr>
<td>ServerSentEventUri</td>
<td>Edm.String</td>
<td>False</td>
<td>The value of this property shall be a URI that specifies an HTML5 Server-Sent Event conformant endpoint.</td>
</tr>
<tr>
<td>RegistryPrefixes</td>
<td>Collection(Edm.String)</td>
<td>True</td>
<td>The value of this property is the array of the Prefixes of the Message Registries that shall be allowed for an Event Subscription.</td>
</tr>
<tr>
<td>ResourceTypes</td>
<td>Collection(Edm.String)</td>
<td>True</td>
<td>The value of this property shall specify an array of the valid @odata.type values that can be used for an Event Subscription.</td>
</tr>
<tr>
<td>SubordinateResourcesSupported</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>When set to true, the service is indicating that it supports the SubordinateResource property on Event Subscriptions and on generated Events.</td>
</tr>
<tr>
<td>EventFormatTypes</td>
<td>Collection(EventDestination.EventFormatType)</td>
<td>True</td>
<td>The value of this property shall indicate the 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.</td>
</tr>
<tr>
<td>SSEFilterPropertiesSupported</td>
<td>EventService.v1_2_0.SSEFilterPropertiesSupported</td>
<td>false</td>
<td>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.</td>
</tr>
</tbody>
</table>

### 4.37.1 Operations

#### 4.37.1.1 GET

**Request:**

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

**Response:**

```json
{
   "@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": {}
}

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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(EventDestination.EventDestination)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

4.38.1 Operations

4.38.1.1 GET

Request:

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

Response:

```json
{
    "@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

```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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destination</td>
<td>Edm.String</td>
<td>False</td>
<td>This property shall contain a URI to the destination where the events will be sent.</td>
</tr>
<tr>
<td>EventTypes</td>
<td>Collection(Event.EventType)</td>
<td>False</td>
<td>This property shall contain the types of events that shall be sent to the destination.</td>
</tr>
<tr>
<td>Context</td>
<td>Edm.String</td>
<td>True</td>
<td>This property shall contain a client supplied context that will remain with the connection through the connections lifetime.</td>
</tr>
<tr>
<td>Protocol</td>
<td>EventDestination.v1_0_0.EventDestinationProtocol</td>
<td>False</td>
<td>This property shall contain the protocol type that the event will use for sending the event to the destination. A value of Redfish shall be used to indicate that the event type shall adhere to that defined in the Redfish specification, refer to Table 2.</td>
</tr>
<tr>
<td>HttpHeaders</td>
<td>Collection(EventDestination.v1_0_0.HttpHeaderProperty)</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>MessageIds</td>
<td>Collection(Edm.String)</td>
<td>True</td>
<td>The value of this property shall specify an array of MessageIds that are the only allowable values for the MessageId property within an EventRecord sent to the subscriber. Events with MessageIds 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 MessageId to the subscriber.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>OriginResources</td>
<td>Collection(Resource.ItemOrCollection)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>Actions</td>
<td>EventDestination.v1_2_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>SubscriptionType</td>
<td>EventDestination.v1_3_0.SubscriptionType</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>RegistryPrefixes</td>
<td>Collection(Edm.String)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>ResourceTypes</td>
<td>Collection(Edm.String)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>SubordinateResources</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>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 relevence.</td>
</tr>
</tbody>
</table>
**EventFormatType**

**Type**: EventDestination.EventFormatType

**Nullable**: 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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>StatusChange</td>
<td>The status of this resource has changed.</td>
</tr>
<tr>
<td>ResourceUpdated</td>
<td>The value of this resource has been updated.</td>
</tr>
<tr>
<td>ResourceAdded</td>
<td>A resource has been added.</td>
</tr>
<tr>
<td>ResourceRemoved</td>
<td>A resource has been removed.</td>
</tr>
<tr>
<td>Alert</td>
<td>A condition exists that requires attention.</td>
</tr>
</tbody>
</table>

### 4.39.1 Metadata

The definition of the resource is available in the [http://redfish.dmtf.org/schemas/EventDestination_v1.xml](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

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

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:

```http
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**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CompletedTaskOverWritePolicy</td>
<td>TaskService.v1_0_0.OverWritePolicy</td>
<td>False</td>
<td>The value of this property shall indicate how completed tasks are handled should the task service need to track more tasks.</td>
</tr>
<tr>
<td>DateTime</td>
<td>Edm.DateTimeOffset</td>
<td>True</td>
<td>The value of this property shall represent the current DateTime value for the TaskService, with an offset from UTC, in Redfish Timestamp format.</td>
</tr>
<tr>
<td>LifeCycleEventOnTaskStateChange</td>
<td>Edm.Boolean</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>ServiceEnabled</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>The value of this property shall be a boolean indicating whether this service is enabled.</td>
</tr>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td></td>
</tr>
<tr>
<td>Tasks</td>
<td>TaskCollection.TaskCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a resource of type TaskCollection.</td>
</tr>
<tr>
<td>Actions</td>
<td>TaskService.v1_1_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
</tbody>
</table>

### 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": 
```

REST API Definition
"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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection (Task.Task)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

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."
]
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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TaskState</td>
<td>Task.v1_0_0.TaskState</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>StartTime</td>
<td>Edm.DateTimeOFFSET</td>
<td>False</td>
<td>The value of this property shall indicate the time the task was started.</td>
</tr>
</tbody>
</table>
## 4.43.1 Operations

### 4.43.1.1 GET

**Request:**

GET /redfish/v1/TaskService/Tasks/1

Content-Type: application/json

**Response:**

```json
{
    "@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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>This property shall contain any status or health properties of the resource.</td>
</tr>
</tbody>
</table>

Table 98. AccountService Attributes
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServiceEnabled</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>AuthFailureLoggingThreshold</td>
<td>Edm.Int64</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>MinPasswordLength</td>
<td>Edm.Int64</td>
<td>False</td>
<td>This property shall reference the minimum password length that the implementation will allow a password to be set to.</td>
</tr>
<tr>
<td>MaxPasswordLength</td>
<td>Edm.Int64</td>
<td>False</td>
<td>This property shall reference the maximum password length that the implementation will allow a password to be set to.</td>
</tr>
<tr>
<td>AccountLockoutThreshold</td>
<td>Edm.Int64</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>AccountLockoutDuration</td>
<td>Edm.Int64</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>AccountLockoutCounterResetAfter</td>
<td>Edm.Int64</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Accounts</td>
<td>ManagerAccountCollection.ManagerAccountCollection</td>
<td>False</td>
<td>This property shall contain the link to a collection of type ManagerAccountCollection.</td>
</tr>
<tr>
<td>Roles</td>
<td>RoleCollection.RoleCollection</td>
<td>False</td>
<td>This property shall contain the link to a collection of type RoleCollection.</td>
</tr>
<tr>
<td>PrivilegeMap</td>
<td>PrivilegeRegistry.PrivilegeRegistry</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Actions</td>
<td>AccountService.v1_2_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
</tbody>
</table>
### Attribute Definition

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LocalAccountAuth</td>
<td>AccountService.v1_3_0.LocalAccountAuth</td>
<td>False</td>
<td>This property shall govern how the service uses the Accounts collection within this <code>AccountService</code> as part of authentication. Details about each of the modes are found in the description of the enum values.</td>
</tr>
<tr>
<td>LDAP</td>
<td>AccountService.v1_3_0.ExternalAccountProvider</td>
<td>False</td>
<td>This property shall contain the first LDAP external account provider this <code>AccountService</code> supports. If the <code>AccountService</code> 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 <code>AdditionalExternalAccountProviders</code> collection.</td>
</tr>
<tr>
<td>ActiveDirectory</td>
<td>AccountService.v1_3_0.ExternalAccountProvider</td>
<td>False</td>
<td>This property shall contain the first ActiveDirectory external account provider this <code>AccountService</code> supports. If the <code>AccountService</code> 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 <code>AdditionalExternalAccountProviders</code> collection.</td>
</tr>
<tr>
<td>AdditionalExternalAccountProviders</td>
<td>ExternalAccountProviderCollection.ExternalAccountProviderCollection</td>
<td>False</td>
<td>This property shall contain an additional external account providers this <code>AccountService</code> is using.</td>
</tr>
</tbody>
</table>

### 4.44.1 Operations

#### 4.44.1.1 GET

**Request:**

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

**Response:**

```json
{
  "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(ManagerAccount.ManagerAccount)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Password</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the password for this account. The value shall be null for GET requests.</td>
</tr>
<tr>
<td>UserName</td>
<td>Edm.String</td>
<td>False</td>
<td>The value of this property shall be the user name for this account.</td>
</tr>
<tr>
<td>RoleId</td>
<td>Edm.String</td>
<td>False</td>
<td>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).</td>
</tr>
<tr>
<td>Locked</td>
<td>Edm.Boolean</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Enabled</td>
<td>Edm.Boolean</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Links</td>
<td>ManagerAccount.v1_0_0.Links</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Actions</td>
<td>ManagerAccount.v1_1_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>Certificates</td>
<td>CertificateCollection</td>
<td>False</td>
<td>The value of this property shall be a link to a collection of type CertificateCollection.</td>
</tr>
</tbody>
</table>

4.46.1 Operations
4.46.1.1 GET

Request:

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

Response:

```json
{
  "@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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Role.Role)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>
4.47.1.1 Operations

4.47.1.2 GET

Request:

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

Response:

```json
{
   "@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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IsPredefined</td>
<td>Edm.Boolean</td>
<td>False</td>
<td>The value of this property shall indicate if the role is a predefined role.</td>
</tr>
<tr>
<td>AssignedPrivileges</td>
<td>Collection(Privileges.PrivilegeType)</td>
<td>False</td>
<td>The value of this property shall be the redfish privileges that the role includes. For pre-defined roles, this property shall be <code>readOnly</code>. For custom roles, some implementations may not allow writing this property.</td>
</tr>
</tbody>
</table>

Table 102. Role Attributes
### Attribute Table

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OemPrivileges</td>
<td>Collection(Edm.String)</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Actions</td>
<td>Role.v1_1_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>RoleId</td>
<td>Edm.String</td>
<td>False</td>
<td>This property shall contain the string name of the Role. This property shall contain the same value as the Id property.</td>
</tr>
</tbody>
</table>

### 4.48.1 Operations

#### 4.48.1.1 GET

**Request:**

GET /redfish/v1/AccountService/Roles/Administrator

**Content-Type: application/json**

**Response:**

```json
{
  "@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**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
</table>

---

*Intel® RSD Storage Services*  
*API Specification*  
*Document Number: 613329-001*  
*July 2019*
### Attribute Description

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

### Request:

```plaintext
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

```plaintext
{
  "@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+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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>Resource.Status</td>
<td>False</td>
<td>This property shall contain any status or health properties of the resource.</td>
</tr>
<tr>
<td>ServiceEnabled</td>
<td>Edm.Boolean</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>SessionTimeout</td>
<td>Edm.Int64</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Sessions</td>
<td>SessionCollection.SessionCollection</td>
<td>False</td>
<td>This property shall contain the link to a collection of Sessions.</td>
</tr>
<tr>
<td>Actions</td>
<td>SessionService.v1_1_0.Actions</td>
<td>False</td>
<td>The Actions object contains the available custom actions on this resource.</td>
</tr>
</tbody>
</table>

4.49.1  Operations

4.49.1.1 GET

Request:

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

Response:

```json
{
  "@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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServiceEnabled</td>
<td>Edm.Boolean</td>
<td>No</td>
<td>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.</td>
</tr>
<tr>
<td>SessionTimeout</td>
<td>Edm.Int64</td>
<td>No</td>
<td>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.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(Session.Session)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UserName</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the <em>UserName</em> that matches a registered account identified by a ManagerAccount resource registered with the Account Service.</td>
</tr>
<tr>
<td>Password</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the password for this session. The value shall be null for GET requests.</td>
</tr>
</tbody>
</table>

#### 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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UserName</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the <em>UserName</em> that matches a registered account identified by a ManagerAccount resource registered with the Account Service.</td>
</tr>
<tr>
<td>Password</td>
<td>Edm.String</td>
<td>True</td>
<td>The value of this property shall be the password for this session. The value shall be null for GET requests.</td>
</tr>
</tbody>
</table>
### 4.51.1 Operations

#### 4.51.1.1 GET

**Request:**

GET /redfish/v1/SessionService/Sessions/Session1

**Content-Type: application/json**

**Response:**

```json
{
    "@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

```json
{
    "@odata.context": "/redfish/v1/$metadata#Task.Task",
    "@odata.id": "/redfish/v1/TaskService/Tasks/1",
    "@odata.type": "#Task.v1_0_0.Task",
    "Id": "1",
}
```
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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(MessageRegistryFile.MessageRegistryFile)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

4.52.1 Operations

4.52.1.1 GET

Request:

GET /redfish/v1/Registries

Response:

```json
{
    "@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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Languages</td>
<td>Collection(Edm.String)</td>
<td>False</td>
<td>The value of this property shall be a string consisting of an RFC 5646 language code.</td>
</tr>
<tr>
<td>Registry</td>
<td>Edm.String</td>
<td>False</td>
<td>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.</td>
</tr>
<tr>
<td>Location</td>
<td>Collection(MessageRegistryFile_v1_0_0.Location)</td>
<td>False</td>
<td>Location information for this schema file.</td>
</tr>
<tr>
<td>Actions</td>
<td>MessageRegistryFile.v1_1_0.Actions</td>
<td>False</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
</tbody>
</table>

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:

```json
{
  "@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",
}
4.53.1.2 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

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

#### 4.54.1.1 GET

**Request:**

GET /redfish/v1/TelemetryService

**Content-Type:** application/json

**Response:**

```json
{
    "@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**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
<td>Collection(MetricDefinition .MetricDefinition)</td>
<td>True</td>
<td>Contains the members of this collection.</td>
</tr>
</tbody>
</table>

4.55.1 Operations

4.55.1.1 GET
Request:

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

Response:

```json
{
    "@odata.context": "/redfish/v1/$metadata#Intel_RackScale.MetricDefinitionCollection.MetricDefinitionCollection",
    "@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"
        },
        {
```

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>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MetricType</td>
<td>MetricDefinition.v1_0_0.MetricType</td>
<td>True</td>
<td>The value shall specify the type of metric.</td>
</tr>
<tr>
<td>MetricDataType</td>
<td>MetricDefinition.v1_0_0.MetricDataType</td>
<td>True</td>
<td>The value shall specify the data-type of the metric.</td>
</tr>
<tr>
<td>Units</td>
<td>Edm.String</td>
<td>True</td>
<td>The value shall specify the units of the metric.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>shall be consistent with the case sensitive Unified Code for Units of Measure as defined at <a href="http://unitsofmeasure.org/ucum.html">http://unitsofmeasure.org/ucum.html</a>. Note: The units of measure is not covered in UCUM.</td>
</tr>
<tr>
<td>Implementation</td>
<td>MetricDefinition.v1_0_0.ImplementationType</td>
<td>True</td>
<td>The value shall specify the implementation of the metric.</td>
</tr>
<tr>
<td>Calculable</td>
<td>MetricDefinition.v1_0_0.Calculable</td>
<td>True</td>
<td>The value shall specify whether the metric can be used in a calculation.</td>
</tr>
</tbody>
</table>
| IsLinear       | Edm.Boolean                               | True     | The value shall specify that the corresponding metric values shall be
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>Wildcards</td>
<td>Collection(MetricDefinition.v1_0_0.Wildcard)</td>
<td>True</td>
<td>The property shall contain a list of wildcards and their replacement strings, which are applied to the MetricProperties array property. Each wildcard shall have a corresponding entry in this array property.</td>
</tr>
<tr>
<td>MetricProperties</td>
<td>Collection(Edm.String)</td>
<td>True</td>
<td>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.</td>
</tr>
<tr>
<td>CalculationParameters</td>
<td>Collection(MetricDefinition.v1_0_0.CalculationParamsType)</td>
<td>True</td>
<td>Shall list the metric properties which are part of the synthesis calculation. When MetricType=Synthesis, this property may be present.</td>
</tr>
<tr>
<td>PhysicalContext</td>
<td>PhysicalContext.PhysicalContext</td>
<td>True</td>
<td>The value of this property shall specify the physical context of the metric.</td>
</tr>
<tr>
<td>SensingInterval</td>
<td>Edm.Duration</td>
<td>True</td>
<td>The value shall specify the time interval between when a metric is updated. The format of the value shall conform to the Duration format.</td>
</tr>
<tr>
<td>DiscreteValues</td>
<td>Collection(Edm.String)</td>
<td>True</td>
<td>The values of the property shall specify the possible values of the discrete metric. This property shall have values when the MetricType property has the value 'Discrete'.</td>
</tr>
<tr>
<td>Precision</td>
<td>Edm.Int64</td>
<td>True</td>
<td>The value of the property shall specify the number of significant digits in the metric reading. The property is not meaningful, when the MetricType property has the value 'Discrete'.</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>The value of the property shall be the percent error +/- of the measured vs. actual values. The property is not meaningful, when the MetricType property has the value 'Discrete'.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Description</td>
</tr>
<tr>
<td>Linearity</td>
<td></td>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>

REST API Definition
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibration</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>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'.</td>
</tr>
<tr>
<td>TimestampAccuracy</td>
<td>Edm.Duration</td>
<td>True</td>
<td>The value shall specify the expected + or - variability of the timestamp. The format of the value shall conform to the Duration format.</td>
</tr>
<tr>
<td>MinReadingRange</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>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'.</td>
</tr>
<tr>
<td>MaxReadingRange</td>
<td>Edm.Decimal</td>
<td>True</td>
<td>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'.</td>
</tr>
<tr>
<td>CalculationAlgorithm</td>
<td>MetricDefinition.v1_0_0.Calculat</td>
<td>True</td>
<td>The value of this property shall specify the calculation performed to obtain the metric.</td>
</tr>
<tr>
<td>CalculationTimeInterval</td>
<td>Edm.Duration</td>
<td>True</td>
<td>The value shall specify the time interval over the metric calculation is performed. The format of the value shall conform to the Duration format.</td>
</tr>
<tr>
<td>Actions</td>
<td>MetricDefinition.v1_0_0.Actions</td>
<td>false</td>
<td>The Actions property shall contain the available actions for this resource.</td>
</tr>
<tr>
<td>CalculationPrecision</td>
<td>Edm.Double</td>
<td>True</td>
<td>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)</td>
</tr>
<tr>
<td>DiscreteMetricType</td>
<td>Intel.Oem.MetricValueType</td>
<td>True</td>
<td>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'.</td>
</tr>
</tbody>
</table>
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:

```json
{
  "@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:

```json
{
  "@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

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

5.2 Status – State

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

5.3 Status – Health

<table>
<thead>
<tr>
<th>Member</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
<td>Normal.</td>
</tr>
<tr>
<td>Warning</td>
<td>A condition exists that requires attention.</td>
</tr>
<tr>
<td>Critical</td>
<td>A critical condition exists that requires immediate attention.</td>
</tr>
</tbody>
</table>

5.4 ComputerSystem.Reset

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

<table>
<thead>
<tr>
<th>Member</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>Turn the unit on.</td>
</tr>
<tr>
<td>ForceOff</td>
<td>Turn the unit off immediately (non-graceful shutdown).</td>
</tr>
<tr>
<td>GracefulShutdown</td>
<td>Perform a graceful shutdown and power off.</td>
</tr>
</tbody>
</table>
### Common Property Descriptions

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

#### 5.5 BootSourceOverrideTarget/Supported

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

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