



Intel® Rack Scale Design Storage Services

API Specification

Software Version 1.0

September 2016

Revision 005



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Revision History

Revision	Description	Date
0.8	External review comments addressed	February 18, 2016
0.43	Fixed POST operations	June 16, 2015
0.42	Changes after internal review	May 25, 2015
0.41	Changes in data model	May 15, 2015
0.4	Ready for stakeholders review	April 10, 2015
0.3	Changes after review	March 5, 2015
0.1	First internal draft	February 20, 2015

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1 Introduction

1.1 Scope

This document contains information about the Intel® Rack Scale Design Storage Services REST API, which was designed and implemented for the Intel® Rack Scale Design Software v1.1 release for the Bulldog Creek SDV.

1.2 Intended audience

The intended audiences for this document include designers and engineers working with the Intel® Rack Scale Design Software v1.1 release.

1.3 Terminology

Table 1 Terminology

Term	Definition
BMC	Baseboard management controller
HTTP	Hypertext Transfer Protocol
JSON	JavaScript object notation
NIC	Network interface card
OCCI	Open Cloud Computing Interface
OData	Open data protocol
OVF	Open virtualization format
Pod	A physical collection of multiple racks
PODM	Pod Manager
PSME	Pooled System Management Engine
REST	Representational State Transfer
SDV	Software development vehicle
URI	Uniform resource identifier
UUID	Universally unique identifier
VM	Virtual machine
XML	Extensible Markup Language



1.4 References

Table 2 Reference documents

Doc ID	Title	Location
332868	Intel® Rack Scale Design GAMI API Specification	http://intel.com/intelRSD
332869	Intel® Rack Scale Design Pod Manager REST API Specification	http://intel.com/intelRSD
332870	Intel® Rack Scale Design Pod Manager Release Notes	http://intel.com/intelRSD
332871	Intel® Rack Scale Design Pod Manager User Guide	http://intel.com/intelRSD
332873	Intel® Rack Scale Design PSME REST API Specification	http://intel.com/intelRSD
332872	Intel® Rack Scale Design PSME Release Notes	http://intel.com/intelRSD
332874	Intel® Rack Scale Design PSME User Guide	http://intel.com/intelRSD
332877	Intel® Rack Scale Design RMM REST API Specification	http://intel.com/intelRSD
332876	Intel® Rack Scale Design RMM Release Notes	http://intel.com/intelRSD
332875	Intel® Rack Scale Design RMM User Guide	http://intel.com/intelRSD
332878	Intel® Rack Scale Design Storage Services API Specification	http://intel.com/intelRSD
332936	Intel® Rack Scale Design BIOS/BMC Tech Guide	http://intel.com/intelRSD
332937	Intel® Rack Scale Design Architectural Requirements Specification	http://intel.com/intelRSD
334611	Intel® Rack Scale Design Getting Started Guide	http://intel.com/intelRSD
n/a	Scalable Platforms Management API	http://dmtf.org/standards/redfish



2 Storage Services API

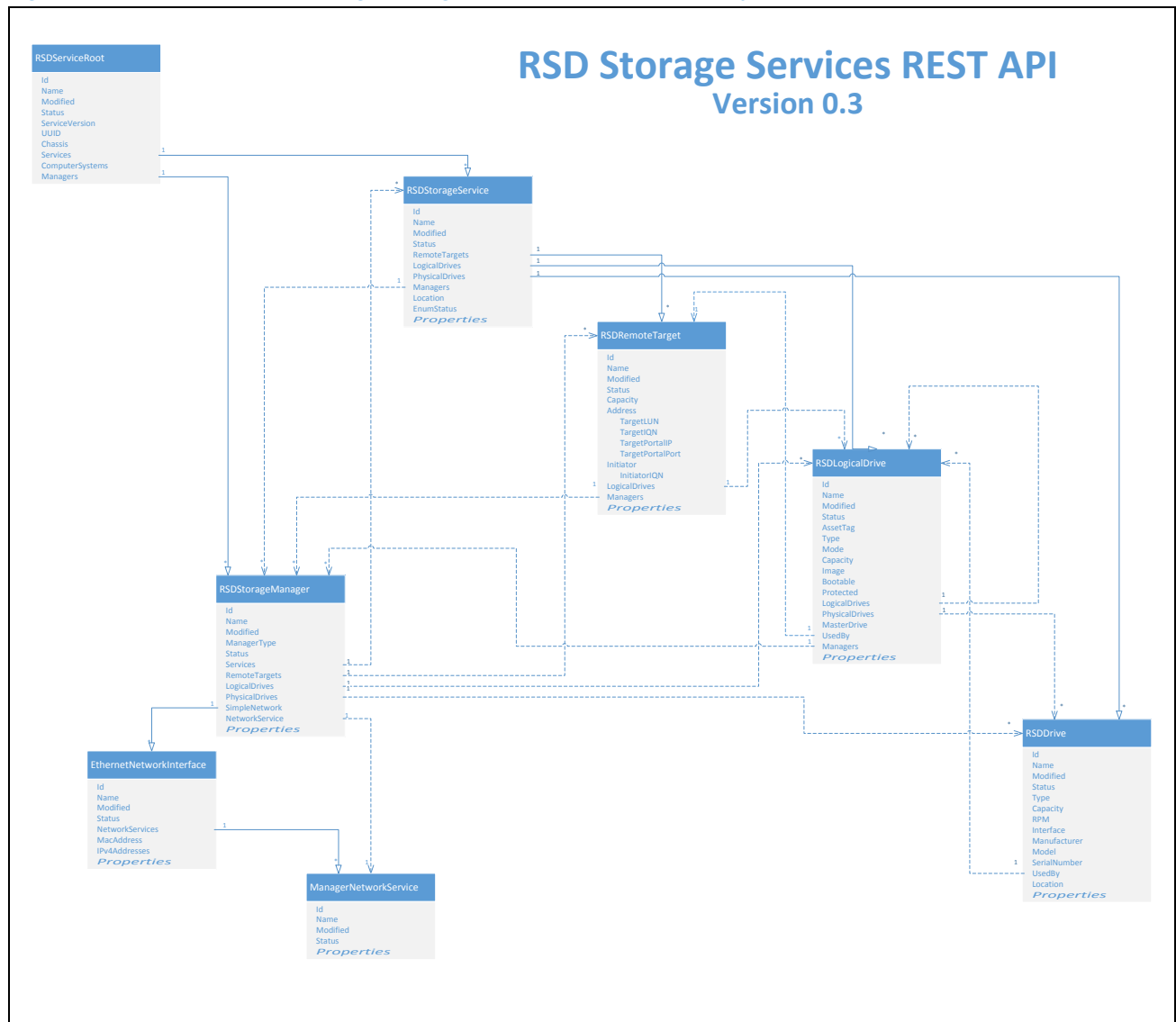
2.1 Storage Services API structure and relations

The Intel® Rack Scale Design Storage Services REST API provides the REST-based interface that allows full management of Storage Services including storage asset discovery and configuration.

2.1.1 Storage Services API physical resource hierarchy

Figure 1 shows the Intel® Rack Scale Design Storage Services REST API hierarchy.

Figure 1 Intel® Rack Scale Design Storage Services REST API hierarchy



**Table 3 Resources and URIs**

Resource	URI
Service Root	/redfish/v1
Manager Collection	/redfish/v1/Managers
Storage Service Collection	/redfish/v1/Services
Storage Service	/redfish/v1/Services/{serviceID}
Remote Target Collection	/redfish/v1/Services/1/Targets
Remote Target	/redfish/v1/Services/1/Targets/{targetID}
Logical Drive Collection	/redfish/v1/Services/1/LogicalDrives
Logical Drive	/redfish/v1/Services/1/LogicalDrives/{driveID}
Drive Collection	/redfish/v1/Services/1/Drives
Drive	/redfish/v1/Services/1/Drives/{driveID}
Manager	/redfish/v1/Managers/{managerID}
Network Service	/redfish/v1/Managers/{managerID}/NetworkService

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3 Storage Services REST API Error Codes

This chapter contains descriptions of all error codes that may be returned by the REST calls implemented in the Storage Services REST API of the Intel® Rack Scale Design v1.1 software release.

3.1 API error response

In the case of an error, Storage Services REST API responds with an HTTP status code, as defined by the HTTP 1.1 specification and constrained by additional requirements defined in this specification.

HTTP response status codes alone often do not provide enough information to determine the error cause. The PODM REST API returns extended error information as a JSON object with a single property named "error". The value of this property shall be the JSON object with the properties listed in Table 4.

Table 4 API error response attributes

Attribute	Description
MessageId	String 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.
Message	A human readable error message indicating the semantics associated with the error. This shall be the complete message, and not rely on substitution variables.
MessageArgs	An optional array of strings representing the substitution parameter values for the message. This shall be included in the response if a MessageId is specified for a parameterized message
Severity	An optional string representing the severity of the error.
Resolution	An optional string describing recommended action(s) to take to resolve the error.
RelatedProperties	An optional array of JSON Pointers defining the specific properties within a JSON payload described by the message.

3.1.1 Example error JSON object

```
{
  "error": {
    "code": "Base.1.0.GeneralError",
    "message": "A general error has occurred. See ExtendedInfo for more
information.",
    "@Message.ExtendedInfo": [
      {
        "@odata.type" :
"/redfish/v1/$metadata#Message.1.0.0.Message",
        "MessageId": "Base.1.0. MalformedJSON",
        "Message": "The request body submitted was malformed JSON and
could not be parsed by the receiving service",
        "Severity": "Error"
      }
    ],
    {
      "@odata.type" :
"/redfish/v1/$metadata#Message.1.0.0.Message",
      "MessageId": "Base.1.0.PropertyNotWriteable",
      "RelatedProperties": [
        "#/Name"
      ],
      "Message": "The property Name is a read only property and
cannot be assigned a value",
      "MessageArgs": [
        "Name"
      ]
    }
  ]
}
```



```
    ],  
    "Severity": "Warning",  
    "Resolution": "Remove the property from the request body and  
resubmit the request if the operation failed"  
  }  
]  
}  
}
```

3.2 API error codes

In general, 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

Table 5 General error codes

Error code	Description	HTTP status code
UnknownException	Exception that causes response generation to fail.	500 Internal Error

3.2.2 Request error codes

Table 6 Request error codes

Error code	Description	HTTP status code
InvalidEndpoint	Invalid endpoint.	404 Not Found
MalformedUri	URI is malformed.	400 Bad Request
InvalidPayload	Request payload is invalid or missing.	400 Bad Request

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4 Storage Services REST API Definition

4.1 Odata support

Intel® Rack Scale Design support Odata v4.0 as it is defined in Redfish specification.

All resources within this RESTfull API are identified by 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. That is, 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.

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 backward incompatible way.
- *MinorVersion* = integer: a minor update. New functionality may have been added but nothing removed. Compatibility will be preserved with previous minorversions.
- *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.

4.1.1 Operations

4.1.1.1 GET

Request:

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

Response:

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

4.2 Intel® Rack Scale Design service root

Rack Scale Design POD Manager Service Root resource – entry point. Table lists the attributes.

**Table 7 Intel® Rack Scale Design storage service root attributes**

Name	Service root					
Type URI	/redfish/v1/					
Attribute	Type	Redfish Required	Rack Scale Required	Nullable	Description	
Id	String	No		No	Resource identifier	
Name	String	Yes		No	Name of service root	
Description	String	No			Provides a description of this resource and is used for commonality in the schema definitions	
UUID	String	No			Unique identifier for a service instance – must be constant for particular drawer. The format of this string shall be a 32-byte value in the form 8-4-4-4-12	
RedfishVersion	String	No		No	The version of the Redfish service in format Major.Minor.Errata	
EventService	Object	No			This is the schema definition for the Event Service. It represents the properties for the service itself and has links to the actual list of subscriptions.	
Chassis	Object	No			Link to chassis collection (Drawers)	
Systems	Object	No			Link to Computer Systems collection (logical server nodes)	
Services	Object	No			Link to services collection	
Managers	Object	No			Link to Managers collection	
EthernetSwitches	Object	No			Link to Ethernet Switches collection	
Nodes	Object				Link to Composed Nodes collection (not supported in RSS implementation)	
Oem	Object	No			Oem extension object	
					“Intel_RackScale” extensions:	
					<table><tr><th>Attribute</th><th>Type</th><th>Description</th></tr><tr><td>ApiVersion</td><td>String</td><td>Version of Intel® Rack Scale Design API in format: Major.minor.errata</td></tr></table>	Attribute
Attribute	Type	Description				
ApiVersion	String	Version of Intel® Rack Scale Design API in format: Major.minor.errata				
Links	Object	Yes		No	Link sections	

4.2.1 Operations

4.2.1.1 GET

Request:

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

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#ServiceRoot.ServiceRoot",
  "@odata.id": "/redfish/v1/",
  "@odata.type": "#ServiceRoot.1.0.0.ServiceRoot",
  "Id": "RootService",
  "Name": "Root Service",
  "RedfishVersion": "1.0.0",
```



```
"UUID": "92384634-2938-2342-8820-489239905423",
"Systems": {
},
"Chassis": {
},
"Managers": {
  "@odata.id": "/redfish/v1/Managers"
},
"EventService": {
  "@odata.id": "/redfish/v1/EventService"
},
"Services": {
  "@odata.id": "/redfish/v1/Services"
},
"EthernetSwitches": {
},
"Oem": {
  "Intel_RackScale": {
    "@odata.type": "#Intel.Oem.ServiceRoot",
    "ApiVersion": "1.2.0",
  }
},
"Links": {}
}
```

4.2.1.2 PUT

Operation is not allowed on this resource.

4.2.1.3 PATCH

Operation is not allowed on this resource.

4.2.1.4 POST

Operation is not allowed on this resource.

4.2.1.5 DELETE

Operation is not allowed on this resource.

4.3 Intel® Rack Scale Design storage service collection

Intel® Rack Scale Design storage service collection resource – provides collection of available storage services.

Table 8 Intel® Rack Scale Design storage services collection attributes

Name	Intel® Rack Scale Design Storage Services		
Type URI	/redfish/v1/Services		
Attribute	Type	Required	Description
Name	String	Yes	Name of service collection.
Members	Array	No	Contain the members of this collection
<i>Members@odata.count</i>	Number	No	Collection member count.



4.3.1 Operations

4.3.1.1 Get

Request

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

Response

```
{
  "@odata.context": "/redfish/v1/$metadata#StorageServices",
  "@odata.id": "/redfish/v1/Services",
  "@odata.type": "#StorageServiceCollection.StorageServiceCollection",
  "Name": "Storage Services Collection",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Services/1"
    }
  ]
}
```

4.3.1.2 Put

Operation is not allowed on this resource.

4.3.1.3 Patch

Operation is not allowed on this resource.

4.3.1.4 Post

Operation is not allowed on this resource.

4.3.1.5 Delete

Operation is not allowed on this resource.

4.4 Intel® Rack Scale Design storage service

Intel® Rack Scale Design storage service resource – provides detailed information about a storage service provided by PSME.

Table 9 Intel® Rack Scale Design storage service attributes

Name	Intel® Rack Scale Design storage service		
Type URI	/redfish/v1/Services/{serviceId}		
Attribute	Type	Required	Description
Id	String	Yes	Resource identifier
Name	String	Yes	Name of service.
Description	String	No	Provides a description of this resource and is used for commonality in the schema definitions
Status	Object, null	No	See chapter 5.1 for resource status.
Oem	Object, null	No	OEM specific object.
RemoteTargets	Object	Yes	Link to remote targets collection available under this service.
LogicalDrives	Object	Yes	Link to logical volumes collection available under this service.
Drives	Object	Yes	Link to drives collection exposed by this service.



Name	Intel® Rack Scale Design storage service							
Type URI	/redfish/v1/Services/{serviceId}							
Attribute	Type	Required	Description					
Links	Object	No	Object containing links to related resources					
			<table><tr><td>Name</td><td>Type</td><td>Required</td><td>Description</td></tr><tr><td>ManagedBy</td><td>Array</td><td>No</td><td>Array of managers for this service.</td></tr></table>	Name	Type	Required	Description	ManagedBy
Name	Type	Required	Description					
ManagedBy	Array	No	Array of managers for this service.					

4.4.1 Operations

4.4.1.1 Get

Request

```
GET /redfish/v1/Services/1
Content-Type: applicaton/json
```

Response

```
{
  "@odata.context": "/redfish/v1/$metadata#Services/Members/1/$entity",
  "@odata.id": "/redfish/v1/Services/RSS1",
  "@odata.type": "#StorageService.1.0.0.StorageService",
  "Id": "RSS1",
  "Name": "Storage Service",
  "Description": "Storage Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "RemoteTargets": {
    "@odata.id": "/redfish/v1/Services/RSS1/Targets"
  },
  "LogicalDrives": {
    "@odata.id": "/redfish/v1/Services/RSS1/LogicalDrives"
  },
  "Drives": {
    "@odata.id": "/redfish/v1/Services/RSS1/Drives"
  },
  "Oem": {},
  "Links": {
    "ManagedBy": [
      {
        "@odata.id": "/redfish/v1/Managers/RSS"
      }
    ],
    "Oem": {}
  }
}
```

4.4.1.2 Put

Operation is not allowed on this resource.

4.4.1.3 Patch

Operation is not allowed on this resource.



4.4.1.4 Post

Operation is not allowed on this resource.

4.4.1.5 Delete

Operation is not allowed on this resource.

4.5 Intel® Rack Scale Design remote target collection

Intel® Rack Scale Design remote target collection resource – provides collection of available storage remote targets.

Table 10 Intel® Rack Scale Design remote targets collection attributes

Name	Intel® Rack Scale Design remote target collection		
Type URI	/redfish/v1/Services/{serviceID}/Targets		
Attribute	Type	Required	Description
Name	String	Yes	Name of collection.
Members	Array	No	Contain the members of this collection
<i>Members@odata.count</i>	Number	No	Collection member count.

4.5.1 Operations

4.5.1.1 Get

Request

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

Response

```
{
  "@odata.context": "/redfish/v1/$metadata#RemoteTargets",
  "@odata.id": "/redfish/v1/Services/1/Targets",
  "@odata.type": "#RemoteTargetCollection.RemoteTargetCollection",
  "Name": "Remote Targets Collection",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Services/1/Targets/1"
    }
  ]
}
```

4.5.1.2 Put

Operation is not allowed on this resource.

4.5.1.3 Patch

Operation is not allowed on this resource.

4.5.1.4 Post

POST operation is used to create new remote target resource. The following parameters should be used in this call:

**Table 11 Remote target POST attributes**

Attribute	Type	Required	Description
Name	String	No	Name of target.
Type	String	No	Type of target
Addresses	Array	Yes	Array of objects with address of target. Details for currently supported "iSCSI" object are in table 12 below.
Initiator	Array	Yes	Array of objects with initiator details. Details in table below.

Table 12 Details of Addresses "iSCSI" object

Attribute	Type	Required	Description				
TargetLUN	Array	Yes	Array of objects mapping Logical drives to LUN numbers:				
			Attribute	Type	Required	Description	
			LUN	Number	Yes	LUN (Logical Unit Number)	
			Logical Drive	Link Object	Yes	Object containing odata.id reference to Logical Drive assigned to LUN number	
TargetIQN	String	Yes	iSCSI target IQN				

Table 13 Details of Initiator "iSCSI" object

Attribute	Type	Required	Description
InitiatorIQN	String	Yes	String containing initiator IQN

Request

```
POST /redfish/v1/Services/1/Targets
Content-Type: application/json
{
  "Name": "Remote Target",
  "Type": "Network Storage",
  "Addresses": [
    {
      "iSCSI": {
        "TargetLUN": [
          {
            "LUN": 1,
            "LogicalDrive": {
              "@odata.id": "/redfish/v1/Services/1/LogicalDrives/1"
            }
          }
        ],
        "TargetIQN": "iqn.2015-01.com.example:ceph-ubuntu14"
      }
    }
  ],
  "Initiator": [
    {
      "iSCSI": {
        "InitiatorIQN": "iqn.2015-01.com.example:fedora21"
      }
    }
  ]
}
```



Response

HTTP/1.1 201 Created

Location: http://<IP>:<PORT>/redfish/v1/Services/1/Targets/2

4.5.1.5 Delete

Operation is not allowed on this resource.

4.6 Intel® Rack Scale Design remote target

Intel® Rack Scale Design remote target resource – provides detailed information about a storage remote target.

Table 14 Intel® Rack Scale Design remote target attributes

Name	Intel® Rack Scale Design remote target																						
Type URI	/redfish/v1/Services/{serviceld}/Targets/{targetID}																						
Attribute	Type	Required	Description																				
Id	String	Yes	Resource identifier																				
Name	String	Yes	Name of component.																				
Description	String	No	Provides a description of this resource and is used for commonality in the schema definitions																				
Status	Object, null	Yes	See chapter 5.1for resource status.																				
Type	String, null	No	Type of target																				
Addresses	Array	Yes	Array of objects with address of target. For "iSCSI" object contains following attributes:																				
			<table><tr><td>Name</td><td>Type</td><td>Required</td><td>Description</td></tr><tr><td>TargetLUN</td><td>Array</td><td>Yes</td><td>iSCSI target LUN and related logical drive URL</td></tr><tr><td>TargetIQN</td><td>String</td><td>Yes</td><td>iSCSI target IQN</td></tr><tr><td>TargetPortalIP</td><td>String</td><td>Yes</td><td>iSCSI target IP</td></tr><tr><td>TargetPortalPort</td><td>Number</td><td>YES</td><td>iSCSI target port number</td></tr></table>	Name	Type	Required	Description	TargetLUN	Array	Yes	iSCSI target LUN and related logical drive URL	TargetIQN	String	Yes	iSCSI target IQN	TargetPortalIP	String	Yes	iSCSI target IP	TargetPortalPort	Number	YES	iSCSI target port number
			Name	Type	Required	Description																	
			TargetLUN	Array	Yes	iSCSI target LUN and related logical drive URL																	
			TargetIQN	String	Yes	iSCSI target IQN																	
			TargetPortalIP	String	Yes	iSCSI target IP																	
TargetPortalPort	Number	YES	iSCSI target port number																				
Oem	Object, null	No	OEM specific object.																				
Initiator	Array	No	Array of iSCSI (or other type) addresses of initiators.																				
			<table><tr><td>Name</td><td>Type</td><td>Required</td><td>Description</td></tr><tr><td>iSCSI</td><td>Object</td><td>No</td><td>Object containing iSCSI initiator parameters: InitiatorIQN – string containing initiator IQN</td></tr></table>	Name	Type	Required	Description	iSCSI	Object	No	Object containing iSCSI initiator parameters: InitiatorIQN – string containing initiator IQN												
			Name	Type	Required	Description																	
iSCSI	Object	No	Object containing iSCSI initiator parameters: InitiatorIQN – string containing initiator IQN																				
Links	Object	No	Object containing links to related resources																				
			<table><tr><td>Name</td><td>Type</td><td>Required</td><td>Description</td></tr><tr><td>Oem</td><td>Object, null</td><td>No</td><td>Object containing Oem specific links to related resources</td></tr></table>	Name	Type	Required	Description	Oem	Object, null	No	Object containing Oem specific links to related resources												
Name	Type	Required	Description																				
Oem	Object, null	No	Object containing Oem specific links to related resources																				

Table 15 TargetLUN attributes

Attribute	Type	Required	Description
LUN	Number	Yes	Logical drive LUN
LogicalDrive	Object (link)	Yes	Link to logical drive



4.6.1 Operations

4.6.1.1 Get

Request

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

Response

```
{
  "@odata.context":
"/redfish/v1/$metadata#RemoteTargets/Links/Members/$entity",
  "@odata.id": "/redfish/v1/Services/1/Targets/1",
  "@odata.type": "#RemoteTarget.RemoteTarget",
  "Id": "1",
  "Name": "Remote Target",
  "Description": "Remote Target",
  "Status": {
    "State": < { "Enabled", "Disabled", "Offline", "InTest",
"Starting", "Absent" } >
    "Health": < { "OK", "Warning", "Critical" } >
  },
  "Type": "Network Storage",
  "Addresses": [
    {
      "iSCSI":
      {
        "TargetLUN": [
          {
            "LUN" : 1,
            "Drive":
"/redfish/v1/Services/1/LogicalDrives/1"
          }
        ],
        "TargetIQN": "iqn.2015-01.com.example:ceph-ubuntu14",
        "TargetPortalIP": "10.102.44.54",
        "TargetPortalPort": 3260
      }
    }
  ],
  "Initiator": [
    {
      "iSCSI":
      {
        "InitiatorIQN": "iqn.2015-01.com.example:fedora21"
      }
    }
  ]
  "Oem": {},
  "Links": {}
}
```

4.6.1.2 Put

Operation is not allowed on this resource.



4.6.1.3 Patch

Request

```
PATCH /redfish/v1/Services/1/Targets/2
Content-Type: application/json
{
  "Addresses": [
    {
      "iSCSI":
      {
        "TargetIQN": "iqn.2015-01.com.example:ceph-ubuntu14"
      }
    }
  ]
}
```

Response

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

4.6.1.4 Post

Operation is not allowed on this resource.

4.6.1.5 Delete

Request:

```
DELETE /redfish/v1/Services/1/Targets/2
```

Response:

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

4.7 Intel® Rack Scale Design logical drive collection

Intel® Rack Scale Design logical drive collection resource – provides collection of available storage logical drives (logical discs, partitions, volume groups, volumes, etc.).

Table 16 Intel® Rack Scale Design logical drive collection attributes

Name	Intel® Rack Scale Design logical drives		
Type URI	/redfish/v1/Services/{serviceID}/LogicalDrives		
Attribute	Type	Required	Description
Name	String	Yes	Name of collection
Members	Array	No	Contain the members of this collection
<i>Members@odata.count</i>	Number	No	Collection member count.

4.7.1 Operations

4.7.1.1 Get

Request

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

Response

```
{
```



```
{
  "@odata.context": "/redfish/v1/$metadata#LogicalDrives",
  "@odata.id": "/redfish/v1/Services/1/LogicalDrives",
  "@odata.type": "#LogicalDriveCollection.LogicalDriveCollection",
  "Name": "Logical Drives Collection",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Services/1/LogicalDrives/1"
    }
  ]
}
```

4.7.1.2 Put

Operation is not allowed on this resource.

4.7.1.3 Patch

Operation is not allowed on this resource.

4.7.1.4 Post

Attribute	Type	Required	Description
Name	String	Yes	REST name of drive
Type	String	Yes	Type of drive – currently only "LVM" is supported.
Mode	String	Yes	Drive mode – for Type=="LVM" only supported mode is "LV"
Protected	Boolean	Yes	If new drive should be protected
CapacityGiB	Number	Yes	New drive capacity in GiB
Image	String	No	Name of image that allow to identify drive.
Bootable	Boolean	Yes	If created drive be bootable.
Snapshot	Boolean	Yes	Type of drive replication – Yes – using Copy On Write, No – using disc clone
Links-> LogicalDrives	Link object	Yes	Must contain single link to LogicalDrive which is Logical Volume Group ("Mode" = "LVG").
Links-> MasterDrive	Link object	Yes	Shall contain link to single LogicalDrive which is Logical Volume ("Mode" = "LV") and which should be used as source for snapshot/clone.

Request

```
POST /redfish/v1/Services/1/LogicalDrives
Content-Type: application/json
{
  "Name": "Logical Drive",
  "Type": "LVM",
  "Mode": "LV",
  "Protected": false,
  "CapacityGiB": 8096,
  "Image": "Ubuntu 12.04.4LTS / Linux 3.11 / 2014.1",
  "Bootable": true,
  "Snapshot": true,
  "Links": {
    "LogicalDrives": [
      {
        "@odata.id": "/redfish/v1/Services/1/LogicalDrives/4"
      }
    ],
    "MasterDrive": {
```



```

    "@odata.id": "/redfish/v1/Services/1/LogicalDrives/12"
  }
}
}

```

Response:

HTTP/1.1 201 Created

Location: http://<IP>:<PORT>/redfish/v1/Services/1/LogicalDrives/2

4.7.1.5 Delete

Operation is not allowed on this resource.

4.8 Intel® Rack Scale Design logical drive

Intel® Rack Scale Design logical drive resource – provides detailed information about a single logical drive available in storage service.

Table 17 Intel® Rack Scale Design logical drive attributes

Name	Intel® Rack Scale Design logical drive		
Type URI	/redfish/v1/Services/{serviceId}/LogicalDrives/{driveId}		
Attribute	Type	Required	Description
Id	String	Yes	Resource identifier
Name	String	Yes	Name of component.
Description	String	No	Provides a description of this resource and is used for commonality in the schema definitions
Status	Object,null	No	See chapter 5.1 for resource status.
Type	String,null	No	Type of volume: "Generic" "LVM" "CEPH" "RSTe" "MDRAID"
Mode	String(enum)	Yes	Mode defines how the logical drive is built on top of underlying physical/logical drives. The value shall correspond to the logical drive type. Generic: "JBOD", "BlockDevice", "LogicalDrive" Logical Volume Manager: "PV", "LV", "LVG" CEPH: "OSD", "Pool" RSTe, MDRAID: "RAID0", "RAID1", "RAID10", "RAID5", "RAID6", "RAID50", "RAID60"
Protected	Bool	Yes	Write (modify) protection state.
Snapshot	Bool	No	Indicates if the logical drive should be created as a snapshot of the source master drive, or should be created as a full copy of an image from the source master drive.
CapacityGiB	Number	Yes	Drive capacity in GibiBytes.
Image	String,null	No	Image name.
Bootable	Bool	No	Specify if target is bootable.
Oem	Object,null	No	OEM specific object.



Name	Intel® Rack Scale Design logical drive																														
Type URI	/redfish/v1/Services/{serviceId}/LogicalDrives/{driveID}																														
Attribute	Type	Required	Description																												
Links	Object	No	Object containing links to related resources																												
			<table><tr><td>Name</td><td>Type</td><td>Required</td><td>Description</td></tr><tr><td>Oem</td><td>Object, null</td><td>No</td><td>Links to OEM specific objects</td></tr><tr><td>LogicalDrives</td><td>Array</td><td>Yes</td><td>Array of links to logical drives.</td></tr><tr><td>PhysicalDrives</td><td>Array</td><td>Yes</td><td>Array of links to physical drives.</td></tr><tr><td>MasterDrive</td><td>Object</td><td>No</td><td>Link to master copy of this logical drive (if created by cloning).</td></tr><tr><td>UsedBy</td><td>Array</td><td>No</td><td>Array of links to other logical drive using this volume.</td></tr><tr><td>Targets</td><td>Array</td><td>No</td><td>Array of targets using this logical drive.</td></tr></table>	Name	Type	Required	Description	Oem	Object, null	No	Links to OEM specific objects	LogicalDrives	Array	Yes	Array of links to logical drives.	PhysicalDrives	Array	Yes	Array of links to physical drives.	MasterDrive	Object	No	Link to master copy of this logical drive (if created by cloning).	UsedBy	Array	No	Array of links to other logical drive using this volume.	Targets	Array	No	Array of targets using this logical drive.
			Name	Type	Required	Description																									
			Oem	Object, null	No	Links to OEM specific objects																									
			LogicalDrives	Array	Yes	Array of links to logical drives.																									
			PhysicalDrives	Array	Yes	Array of links to physical drives.																									
			MasterDrive	Object	No	Link to master copy of this logical drive (if created by cloning).																									
			UsedBy	Array	No	Array of links to other logical drive using this volume.																									
Targets	Array	No	Array of targets using this logical drive.																												

4.8.1 Operations

4.8.1.1 Get

Request

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

Response

```
{
  "@odata.context":
"/redfish/v1/$metadata#LogicalDrives/Links/Members/$entity",
  "@odata.id": "/redfish/v1/Services/1/LogicalDrives/1",
  "@odata.type": "#LogicalDrive.LogicalDrive",
  "Id": "1",
  "Name": "Logical Drive",
  "Description": "Logical Drive",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
  },
  "Type": "LVM",
  "Mode": "RAID0",
  "Protected": false,
  "CapacityGiB": 8096,
  "Image": "Ubuntu 12.04.4LTS / Linux 3.11 / 2014.1",
  "Bootable": true,
  "Snapshot": false,
  "Oem": {},
  "Links": {
    "LogicalDrives": [
    ],
    "PhysicalDrives": [
    ]
  }
}
```




```

{
    "@odata.id": "/redfish/v1/Services/1/Drives/2"
},
"MasterDrive": {
    "@odata.id": "/redfish/v1/Services/1/LogicalDrives/12"
},
"UsedBy": [
    {
        "@odata.id": "/redfish/v1/Services/1/LogicalDrives/14"
    }
],
"Targets": [
    {
        "@odata.id": "/redfish/v1/Services/1/Targets/2"
    }
],
"Oem": {}
}

```

4.8.1.2 Put

Operation is not allowed on this resource.

4.8.1.3 Patch

Operation is not allowed on this resource.

4.8.1.4 Post

Operation is not allowed on this resource.

4.8.1.5 Delete

Request

```
DELETE /redfish/v1/Services/1/LogicalDrives/5
```

Response

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

4.9 Physical drive collection

Physical drive collection resource – provides collection of all storage drives available in a storage service.

Table 18 Physical drive collection attributes

Name	Physical drives		
Type URI	/redfish/v1/Services/{serviceId}/Drives		
Attribute	Type	Required	Description
Name	String	Yes	Name of collection
Members	Array	No	Contain the members of this collection
Members@odata.count	Number	No	Collection member count



4.9.1 Operations

4.9.1.1 Get

Request:

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

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Drives",
  "@odata.id": "/redfish/v1/Services/1/Drives",
  "@odata.type": "#PhysicalDriveCollection.PhysicalDriveCollection",
  "Name": "Physical Drives Collection",
  "Members@odata.count": 1,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Services/1/Drives/1"
    }
  ]
}
```

4.9.1.2 Put

Operation is not allowed on this resource.

4.9.1.3 Patch

Operation is not allowed on this resource.

4.9.1.4 Post

Operation is not allowed on this resource.

4.9.1.5 Delete

Operation is not allowed on this resource.

4.10 Physical drive

Physical drive resource – provides detailed information about a single drive identified by {driveID}.

Table 19 Physical drive attributes

Name	Physical drive		
Type URI	/redfish/v1/Services/{serviceId}/Drives/{driveID}		
Attribute	Type	Mandatory	Description
Id	String	Yes	Provides an ID of this resource
Name	String	Yes	Name of module.
Description	String	No	Provides a description of this resource and is used for commonality in the schema definitions
Interface	String (enum)	Yes	Controller interface: "PCIe*" "SAS" "SATA"
CapacityGiB	Number	Yes	Drive capacity in GibiBytes



Name	Physical drive														
Type URI	/redfish/v1/Services/{serviceId}/Drives/{driveID}														
Attribute	Type	Mandatory	Description												
Type	String	No	Drive type: "HDD" "SSD"												
RPM	Number	No	For traditional drive, rotation per minute.												
Manufacturer	String	No	Drive manufacturer name.												
Model	String	No	Drive model.												
SerialNumber	String	No	Drive serial number.												
Status	Object, null	No	See chapter 5.1 for resource status.												
Oem	Object	No	OEM defined object.												
Links	Object	No	Object containing links to related resources <table border="1"> <thead> <tr> <th>Name</th><th>Type</th><th>Required</th><th>Description</th></tr> </thead> <tbody> <tr> <td>Oem</td><td>Object, null</td><td>No</td><td>Links to OEM specific objects</td></tr> <tr> <td>UsedBy</td><td>Array</td><td>No</td><td>Array of links to block devices build on this drive.</td></tr> </tbody> </table>	Name	Type	Required	Description	Oem	Object, null	No	Links to OEM specific objects	UsedBy	Array	No	Array of links to block devices build on this drive.
Name	Type	Required	Description												
Oem	Object, null	No	Links to OEM specific objects												
UsedBy	Array	No	Array of links to block devices build on this drive.												

4.10.1 Operations

4.10.1.1 Get

Request:

```
GET /redfish/v1/Services/1/Drives/{driveID}
Content-Type: application/json
```

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Drive/Links/Members/$entity",
  "@odata.id": "/redfish/v1/Services/1/Drives/1",
  "@odata.type": "#PhysicalDrive.1.0.0.PhysicalDrive",
  "Id": "1",
  "Name": "Simple drive",
  "Description": "Physical drive",
  "Interface": < { "PCIe", "SAS", "SATA" } >
  "CapacityGiB": 500,
  "Type": < { "HDD", "SSD" } >,
  "RPM": 0,
  "Manufacturer": "Intel",
  "Model": "S3710",
  "SerialNumber": "XYZ123456789",
  "Status": {
    "State": < { "Enabled", "Disabled", "Offline", "InTest",
"Starting", "Absent" } >,
    "Health": < { "OK", "Warning", "Critical" } >,
    "HealthRollup": < { "OK", "Warning", "Critical" } >
  },
  "Oem": {},
  "Links": {
```



```
        "UsedBy": [
            {
                "@odata.id": "/redfish/v1/Services/1/LogicalDrives/1"
            }
        ],
        "Oem": {}
    }
}
```

4.10.1.2 Put

Operation is not allowed on this resource.

4.10.1.3 Patch

Operation is not allowed on this resource.

4.10.1.4 Post

Operation is not allowed on this resource.

4.10.1.5 Delete

Operation is not allowed on this resource.

4.11 Intel® Rack Scale Design storage manager collection

Intel® Rack Scale Design storage manager collection resource – provides collection of available storage managers.

Table 20 Intel® Rack Scale Design storage manager collection attributes

Name	Intel® Rack Scale Design storage manager collection		
Type URI	/redfish/v1/Managers		
Attribute	Type	Required	Description
Name	String	Yes	Name of service collection.
Members	Array	No	Contain the members of this collection
Members@odata.count	Number	No	Collection member count.

4.11.1 Operations

4.11.1.1 Get

Request

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

Response

```
{
    "@odata.context": "/redfish/v1/$metadata#StorageManagers",
    "@odata.id": "/redfish/v1/Managers",
    "@odata.type": "#ManagerCollection.ManagerCollection",
    "Name": "Storage Managers Collection",
    "Members@odata.count": 1,
    "Members": [
        {
            "@odata.id": "/redfish/v1/Managers/1"
        }
    ]
}
```



```
}
]
```

4.11.1.2 Put

Operation is not allowed on this resource.

4.11.1.3 Patch

Operation is not allowed on this resource.

4.11.1.4 Post

Operation is not allowed on this resource.

4.11.1.5 Delete

Operation is not allowed on this resource.

4.12 Intel® Rack Scale Design storage manager

Definition of resource in *Intel® Rack Scale Design PSME API Specification*.

4.12.1 Operations

4.12.1.1 Get

Request

```
GET /redfish/v1/Managers/1
```

Response

```
{
  "@odata.context": "/redfish/v1/$metadata#Manager.Manager",
  "@odata.id": "/redfish/v1/Managers/RSS",
  "@odata.type": "#Manager.1.0.0.Manager",
  "Id": "1",
  "Name": "Manager",
  "Description": "RSS Manager",
  "ManagerType": "BMC",
  "Description": "BMC",
  "ServiceEntryPointUUID": "92384634-2938-2342-8820-489239905423",
  "UUID": "00000000-0000-0000-0000-000000000000",
  "Model": "Joo Janta 200",
  "DateTime": "2015-03-13T04:14:33+06:00",
  "DateTimeLocalOffset": "+06:00",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "GraphicalConsole": {
    "ServiceEnabled": true,
    "MaxConcurrentSessions": 2,
    "ConnectTypesSupported": [
      "KVMIP"
    ]
  },
  "SerialConsole": {
    "ServiceEnabled": true,
```



```
    "MaxConcurrentSessions": 1,
    "ConnectTypesSupported": [
      "Telnet",
      "SSH",
      "IPMI"
    ]
  },
  "CommandShell": {
    "ServiceEnabled": true,
    "MaxConcurrentSessions": 4,
    "ConnectTypesSupported": [
      "Telnet",
      "SSH"
    ]
  },
  "FirmwareVersion": "1.00",
  "NetworkProtocol": {
    "@odata.id": "/redfish/v1/Managers/RSS/NetworkProtocol"
  },
  "EthernetInterfaces": {
    "@odata.id": "/redfish/v1/Managers/RSS/EthernetInterfaces"
  },
  "Links": {
    "ManagerForServers": [],
    "ManagerForChassis": [],
    "ManagerLocation": {
      "@odata.id": "/redfish/v1/Chassis/Drawer1"
    },
    "ManagerForSwitches": [],
    "Oem": {
      "Intel_RackScale": {
        "@odata.type": "#Intel.Oem.Manager",
        "ManagerForServices": {
          "@odata.id": "/redfish/v1/Services/RSS1"
        }
      }
    }
  },
  "Oem": {}
}
```

4.12.1.2 Put

Operation is not allowed on this resource.

4.12.1.3 Patch

Operation is not allowed on this resource.

4.12.1.4 Post

Operation is not allowed on this resource.

4.12.1.5 Delete

Operation is not allowed on this resource.



4.13 Network protocol

Refer to the *Intel® Rack Scale Design PSME API Specification*.

4.14 Ethernet interface collection

Refer to the *Intel® Rack Scale Design PSME API Specification*.

4.15 Ethernet interface

Refer to the *Intel® Rack Scale Design PSME API Specification*.





5 Common Property Description

5.1 Status

Attribute	Type	Nullable	Description
State	String	Yes	This indicates the known state of the resource, such as if it is enabled. Allowed values – see section 5.2.
Health	String	Yes	This represents the health state of this resource in the absence of its dependent resources. Allowed values – see Status -> Health
HealthRollup	String	Yes	This represents the overall health state from the view of this resource. Allowed values – see Status -> Health

5.2 Status -> State

- Enabled: This function or resource has been enabled
- Disabled: This function or resource has been disabled
- StandbyOffline: This function or resource is enabled, but awaiting an external action to activate it
- InTest: This function or resource is undergoing testing
- Starting: This function or resource is starting
- Absent: This function or resource is not installed
- UnavailableOffline - This function or resource is present but cannot be used
- StandbySpare - This function or resource is part of a redundancy set and is awaiting a failover or other external action to activate it

5.3 Status -> Health

- OK: Normal
- Warning: A condition exists that requires attention
- Critical: A critical condition exists that requires immediate attention

