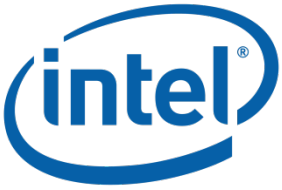

Intel® Rack Scale Design Rack Management Module (RMM)

RESTful API Specification
Software v2.2

December 19, 2017

Revision 001

Document Number: 336858-001

Contents

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Revision History

Revision	Description	Date
001	Initial release.	December 19, 2017

§

1 Introduction

1.1 Scope

This document defines the Intel® Rack Scale Design (Intel® RSD) Rack Management Module (RMM) RESTful API v2.2.

The interface specified in this document are based on the Distributed Management Task Force's Redfish* Scalable Platforms API Specification (DSP0266 1.1.0) and schema (DSP8010 2016.3) refer to Table 1.

1.2 Reference documents

Table 1. Reference Documents

Doc ID	Title	Location
336811	Intel® Rack Scale Design (RSD) Conformance and Software Reference Kit Getting Started Guide v2.2, Revision 001	*http://www.intel.com/intelRSD*
336814	Intel® Rack Scale Design Pod Manager (PDOM) Release Notes, Software v2.2, Revision 001	
336815	Intel® Rack Scale Design Pod Manager (PDOM) User Guide, Software v2.2, Revision 001	
336816	Intel® Rack Scale Design PSME Release Notes, Software v2.2, Revision 001	
336810	Intel® Rack Scale Design PSME User Guide, Software v2.2, Revision 001	
336855	Intel® Rack Scale Design PSME REST API Specification, Software v2.2, Revision 001	
336856	Intel® Rack Scale Design Storage Services API Specification, Software v2.2, Revision 001	
336857	Intel® Rack Scale Design Pod Manager REST API Specification, Software v2.2, Revision 001	
336859	Intel® Rack Scale Design Generic Assets Management Interface API Specification, Software v2.2, Revision 001	
336860	Intel® Rack Scale Design Firmware Extension Specification, Software v2.2, Revision 001	
336861	Intel® Rack Scale Design Architecture Specification, Software v2.2, Revision 001	
336862	Intel® RSD v2.2 Solid State Drive (SSD) Technical Advisory	
RFC2119	Key words for use in RFCs to Indicate Requirement Levels, March 1997	*https://www.ietf.org/rfc/rfc2119.txt*
SDP0266	Scalable Platforms Management API Specification v1.1.0	*https://www.dmtf.org/sites/default/files/standards/documents/DSP0266_1.1.0.pdf*
DSP8010	Redfish Schema v2016.3	*https://www.dmtf.org/sites/default/files/standards/documents/DSP8010_2016.3.zip*

1.3 Definition of terms

Table 2. Terminology

Term	Definition
BMC	Baseboard Management Controller
POD	A physical collection of multiple racks
PODM	Pod Manager aka RCPM
RMC	Rack Management Controller
RMM	Rack Management Module

1.4 Notes and Symbol Convention

Symbol and note convention are similar to typographical conventions used in CIMI specification.

Notation used in JSON serialization description:

Mandatory in italics indicate data types instead of literal Mandatory.

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, "(" and ")", are used to indicate the scope of the operators "?", "*", "+" and "|".

Ellipses (i.e., "...") indicate points of extensibility.

The lack of ellipses does not mean no extensibility point exists; rather it is just not explicitly called out.

1.5 JSON serialization convention

An object is an unordered set of name/value pairs. An object begins with { (left brace) and ends with } (right brace). Each name is followed by: (colon) and the name/value pairs are separated by , (comma).

An array is an ordered collection of values. An array begins with [(left bracket) and ends with] (right bracket). Values are separated by: (comma).

A value can be a string in double quotes; or a number; or true or false or null; or an object or an array. These structures can be nested.

A string is a sequence of zero or more Unicode characters, wrapped in double quotes, using backslash escapes. A character is represented as a single character string. A string is very much like a C or Java string.

A number is very much like a C or Java number, except that the octal and hexadecimal formats are not used.

1.6 HTTP response codes

Refer Table 1. Scalable Platforms Management API Specification, Section 6.5.2.

§

2 Overview

The Intel® RSD RMM RESTful API v2.2 provides the REST-based interface that allows full management of the RMM, including asset discovery and configuration.

2.1 API structure and relation

Table 3. Resources and URI

Resource	Schema Version	URI
Service Root	v1_1_1	/redfish/v1
Chassis Collection		/redfish/v1/Chassis
Chassis	V1_2_0	/redfish/v1/Chassis/{chassisID}
Power	V1_1_0	/redfish/v1/Chassis/{chassisID}/Power
Thermal	V1_1_0	/redfish/v1/Chassis/{chassisID}/Thermal
Manager Collection		/redfish/v1/Managers
Manager	V1_2_0	/redfish/v1/Managers/{managerID}
Network Protocol	V1_0_0	/redfish/v1/Managers/{managerID}/NetworkProtocol
Ethernet Interface Collection		/redfish/v1/Managers/{managerID}/EthernetInterfaces
Ethernet Interface	V1_0_0	/redfish/v1/Managers/{managerID}/EthernetInterfaces/{nicID}
VLAN Network Interface Collection		/redfish/v1/Managers/{managerID}/EthernetInterfaces/{nicID}/VLANs
VLAN Network Interface	V1_0_0	/redfish/v1/Managers/{managerID}/EthernetInterfaces/{nicID}/VLANs/{vlanID}
EventService	V1_0_0	/redfish/v1/EventService
Event Subscription Collection		/redfish/v1/EventService/Subscriptions
Event Subscription	V1_1_0	/redfish/v1/EventService/Subscriptions/{subscriptionID}
TaskService	V1_0_0	/redfish/v1/TaskService
TaskCollection		/redfish/v1/TaskService/Tasks
Task	V1_0_0	/redfish/v1/TaskService/Tasks/{taskID}
UpdateService	V1_0_0	/redfish/v1/UpdateService
ActionInfo	V1_0_0	/redfish/v1/UpdateService/SimpleUpdateActionInfo

2.2 Rack management model and terminologies

Figure 1 illustrates typical rack components managed by the RMM.

Figure 1. Rack Components

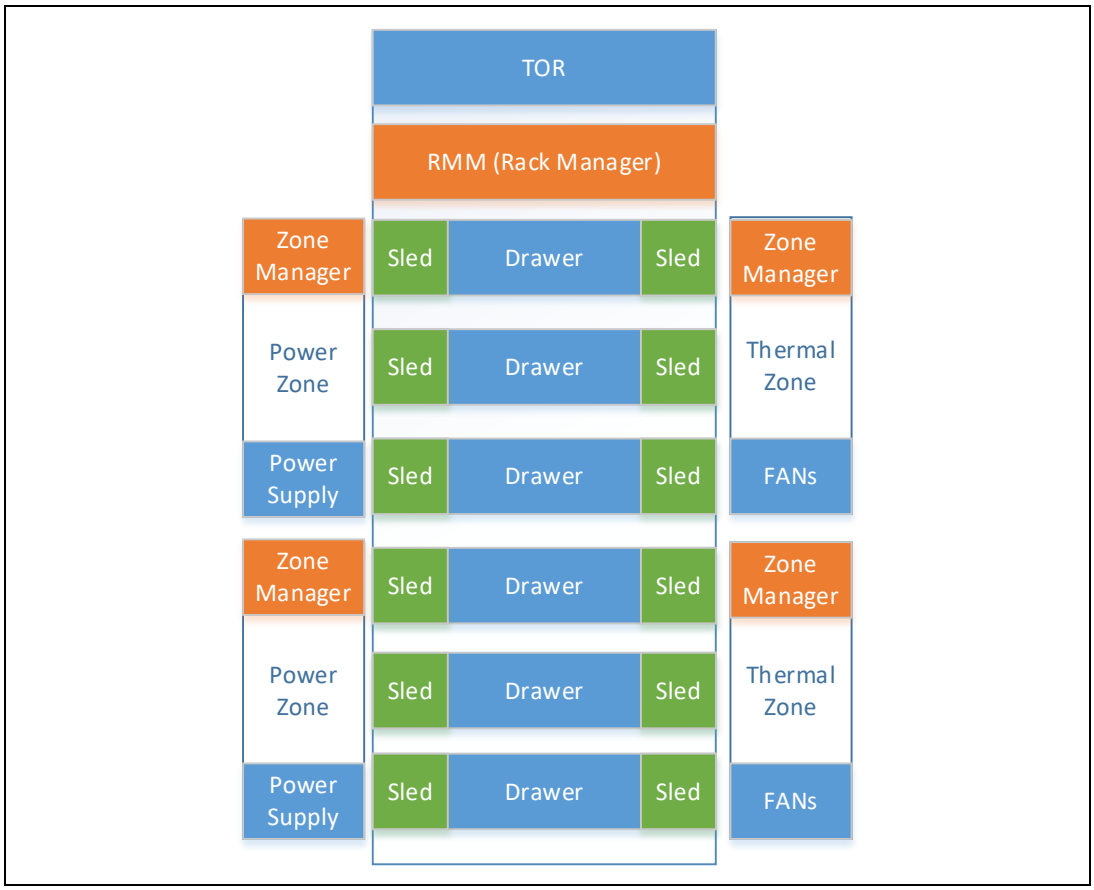

Table 4. Rack Management Terminologies

Term	Definition
Rack	Includes 1 or multiple Power and Thermal Zones.
Power Zone	The Power Zone is one power management domain; the servers in a power zone share the same PSUs, including a power shelf (or PSUs) and a number of trays powered by that power shelf.
Thermal Zone	The Thermal Zone is one thermal management domain; the servers in a thermal zone share the same cooling devices (Fans). Multiple trays are cooled by the devices in the zone.
Tray/Drawer	Includes 1 or multiple server modules.
RMM	Rack Management Module. RMM is the rack controller exposing and managing power and thermal resources. The logical concept of RMM is shown in **Error! Reference source not found.**. The rack in the figure contains 1 RMM.
CM or MBP	Controller Module or Management Backplane. The RMM contains 0 to n CM/MBP.

§

3 RMM REST API Error Codes

This chapter contains descriptions of all error codes that may be returned by the REST calls implemented in the Intel® RSD RMM RESTful API of the RSD software.

3.1 API error response

In the case of an error, the PSME 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 enable deterministic error semantics. PSME REST API returns extended error information as a JSON object with a single property named “error”. The value of this property is a JSON object with the properties shown in Table 5.

Table 5. API error response attributes

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

3.1.1 Message Object

Message Objects provide additional information about an object, property, or error response.

Messages are represented as a JSON object with the following properties:

Table 6. 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 is the complete message, and do not rely on substitution variables.
`MessageArgs`	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.
`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.

3.1.2 Example error JSON object

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

```
                "@odata.type" :
"/redfish/v1/$metadata#Message.v1_0_0.Message",
                "MessageId": "Base.1.0.MalformedJSON",
                "Message": "The request body submitted was malformed JSON and
could not be parsed by the receiving service",
                "Severity": "Error"
            }
            {
                "@odata.type" :
"/redfish/v1/$metadata#Message.v1_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 an HTTP 500 Internal Error code.

3.2.1 General error codes

For a detailed list of error codes, refer to *Redfish Scalable Platforms Management API Specification*, Section 6.5.2, refer to Table 1.

Table 7. HTTP Error Status Codes

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

HTTP Status Code	Description
503 Service Unavailable	The server is currently unable to handle the request due to temporary overloading or maintenance of the server.

3.2.2 PATCH method error codes

For the PATCH method, the Intel® RSD service must conform to IETF RFC 5789.

The service will respond with the following error codes in the cases listed below:

- 400 Bad Request – malformed JSON in the request (values not in range, unknown property, etc.).
- 405 Method Not Allowed – resource does not support PATCH method.
- 409 Conflict – update cannot be executed at this moment. User might be able to resolve the conflict and resubmit the request.
- 501 Not Implemented – resource supports PATCH method, but current implementation does not (e.g. underlying HW does not support such functionality).
- 500 Internal Server Error – all other situations where any of the above codes do not fit (e.g. underlying HW does not allow to execute this particular request).

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4 Rack Management Module API definition

4.1 Odata support

Intel® RSD supports the Odata v4.0 as it is defined in the *Redfish Scalable Platforms Management API Specification*, refer to Table 1.

All resources within this Intel® RSD RESTful API Specification are identified by a unique identifier property named `"@odata.id"`. Resource Identifiers are represented in JSON payloads as uri paths relative to the Redfish Schema portion of the uri. For example, they will 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 enable a client to determine if the operation was completed synchronously or asynchronously. Use of the HTTP Response codes prepares clients to handle both synchronous and asynchronous responses for requests using HTTP DELETE, POST, PATCH and PUT methods.

For details, refer to the *Redfish Scalable Platforms Management API Specification*, Section 8.2 Asynchronous Operations, refer to Table 1.

4.3 Protocol version

The protocol version is separate from the version of the resources, or the version of the Redfish Schema, Table 1, 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 is"/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 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, will 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

This 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": "Chassis",
            "kind": "Singleton",
            "url": "/redfish/v1/Chassis"
        },
        {
            "name": "Managers",
            "kind": "Singleton",
            "url": "/redfish/v1/Managers"
        },
        {
            "name": "EventService",
            "kind": "Singleton",
            "url": "/redfish/v1/EventService"
        },
        {
            "name": "Tasks",
            "kind": "Singleton",
            "url": "/redfish/v1/TaskService"
        },
```

```
        {
            "name": "Registries",
            "kind": "Singleton",
            "url": "/redfish/v1/Registries"
        },
        {
            "name": "UpdateService",
            "kind": "Singleton",
            "url": "/redfish/v1/UpdateService"
        }
    ]
}
```

4.5 Intel® RSD OEM extensions

All Intel® RSD OEM extensions to all resources defined in this document are supported.

4.6 Service root

Service root resource – entry point.

Properties' details are available in the `ServiceRoot.xml` metadata file.

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_1_1.ServiceRoot",
  "Id": "RootService",
  "Name": "RMM Root Service",
  "Description": "description-as-string",
  "RedfishVersion": "1.1.0",
  "UUID": "92384634-2938-2342-8820-489239905423",
  "Chassis": {
    "@odata.id": "/redfish/v1/Chassis"
  },
  "Managers": {
    "@odata.id": "/redfish/v1/Managers"
  },
  "EventService": {
    "@odata.id": "/redfish/v1/EventService"
  },
  "Tasks": {
    "@odata.id": "/redfish/v1/TaskService"
  },
  "Registries": {
    "@odata.id": "/redfish/v1/Registries"
```

```
  },
  "UpdateService": {
    "@odata.id": "/redfish/v1/UpdateService"
  },
  "Oem": {
    "Intel_RackScale": {
      "@odata.type": "#Intel.Oem.ServiceRoot",
      "ApiVersion": "2.2.0",
    }
  },
  "Links": {}
}
```

4.6.1.2 PUT

Operation is not allowed on this resource.

4.6.1.3 PATCH

Operation is not allowed on this resource.

4.6.1.4 POST

Operation is not allowed on this resource.

4.6.1.5 DELETE

Operation is not allowed on this resource.

4.7 Manager collection

The Manager collection resource provides a collection of all managers available in a rack, manageable through the RMM.

```
Metadata file: ManagerCollection.xml
```

4.7.1 Operations

4.7.1.1 GET

Request:

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

Response:

```
{
  "@odata.context":
"/redfish/v1/$metadata#ManagerCollection.ManagerCollection",
  "@odata.id": "/redfish/v1/Managers",
  "@odata.type": "#ManagerCollection.ManagerCollection",
  "Name": "Manager Collection",
  "Description": "description-as-string",
  "Members@odata.count": 2,
  "Members": [
    {
      "@odata.id": "/redfish/v1/Managers/RackManager"
    },
    {
```

```
      "@odata.id": "/redfish/v1/Managers/ZoneManager"
    }
  ]
}
```

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

Operation is not allowed on this resource.

4.7.1.5 DELETE

Operation is not allowed on this resource.

4.8 Manager

The Manager is a systems management entity which may implement or provide access to a Redfish service. Examples of managers are BMCs, Enclosure Managers, Management Controllers, and other subsystems that assign manageability functions. There can be multiple Managers in an implementation, and they may or may not be directly accessible through a Redfish-defined interface.

Properties' details are available in the `Manager.xml` metadata file.

4.8.1 Operations

4.8.1.1 GET

Request:

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

Response:

```
{
  "@odata.context": "/redfish/v1/$metadata#Manager.Manager",
  "@odata.id": "/redfish/v1/Managers/RackManager",
  "@odata.type": "#Manager.v1_2_0.Manager",
  "Id": "RackManager",
  "Name": "Manager",
  "ManagerType": "RackManager",
  "Description": "RackScale RMC",
  "ServiceEntryPointUUID": "11384622-2938-2342-8820-489239905423",
  "UUID": "00000000-0000-0000-0000-000000000000",
  "Model": "Joo Janta 200",
  "DateTime": "2015-03-13T04:14:33+06:00",
  "DateTimeLocalOffset": "+06:00",
  "PowerState": null,
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": null
  },
```

```
  "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": "2.1.71.0",
  "NetworkProtocol": {
    "@odata.id": "/redfish/v1/Managers/RackManager1/NetworkProtocol"
  },
  "EthernetInterfaces": {
    "@odata.id": "/redfish/v1/Managers/RackManager1/EthernetInterfaces"
  },
  "Links": {
    "ManagerForServers": [],
    "ManagerForChassis": [{
      "@odata.id": "/redfish/v1/Chassis/Rack1"
    }],
    "ManagerInChassis": {
      "@odata.id": "/redfish/v1/Chassis/Rack1"
    },
    "ManagerForSwitches": [],
    "Oem": {}
  },
  "Oem": {},
  "Actions": {
    "#Manager.Reset": {
      "target": "/redfish/v1/Managers/RackManager/Actions/Manager.Reset",
      "ResetType@Redfish.AllowableValues": ["GracefulRestart"]
    },
    "Oem": {
      "#Intel_RackScale.LoadFactoryDefaults": {
        "target":
"/redfish/v1/Managers/RackManager/Actions/Oem/Intel_RackScale.LoadFactoryDefa
ults"
      }
    }
```

```
  }
}
```

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

4.8.1.4.1 Manager reset

The Manager reset can be initiated using the action below.

Request:

```
POST /redfish/v1/Managers/RackManager/Actions/Manager.Reset
Content-Type: application/json

{
       "ResetType": "GracefulRestart"
}
```

Response:

```
HTTP/1.1 204 No Content
Or (when task is created)
HTTP/1.1 202 Accepted
Location: http://<ip>:<port>/redfish/v1/TaskService/TaskMonitors/1
{
    "@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": [
    ]
}
```

4.8.1.4.2 Reset to factory defaults

The Rack manager may support a reset to factory defaults. The following request action performs such a reset.

Request:

```
POST
/redfish/v1/Managers/RackManager/Actions/Oem/Intel_RackScale.LoadFactoryDefau
lt
Content-Type: application/json

{
}
```

Response:

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

Or (when task is created)

```
HTTP/1.1 202 Accepted
Location: http://<ip>:<port>/redfish/v1/TaskService/TaskMonitors/1
{
    "@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": [
    ]
}
```

4.8.1.5 DELETE

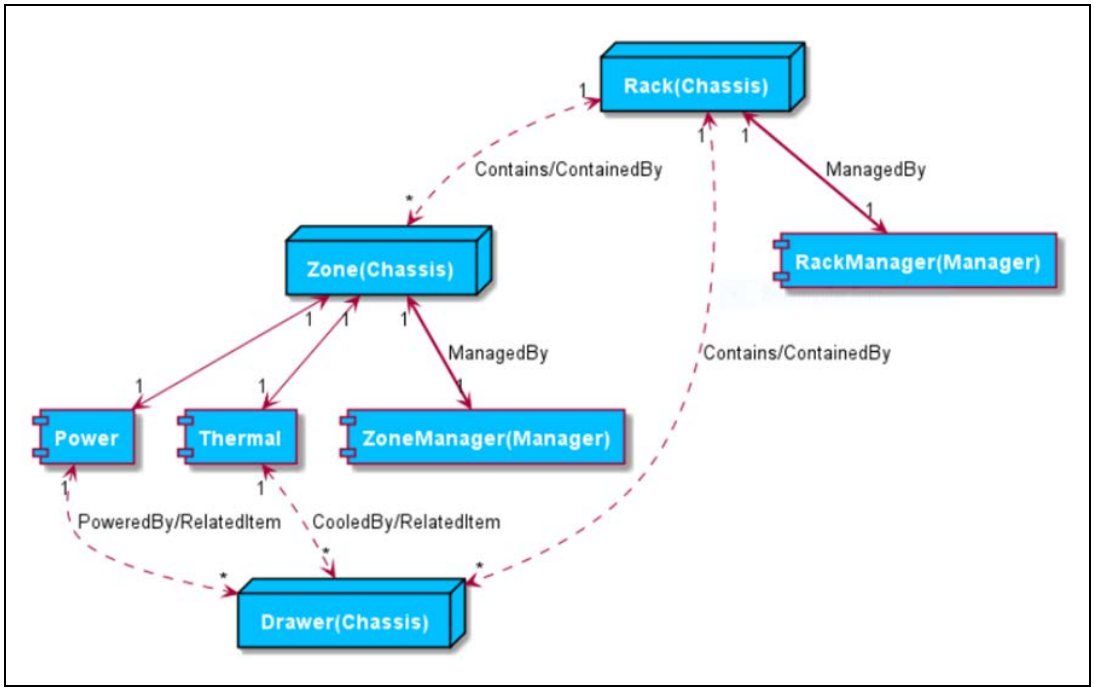
Operation is not allowed on this resource.

4.9 Chassis collection

The Chassis collection resource shown in Figure 2 illustrates the relationship between various chassis components in the Intel® RSD Rack.

Properties' details are available in the `ChassisCollection.xml` metadata file.

Figure 2. Chassis Collection Relationship between Components



4.9.1 Operations

4.9.1.1 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",
    "Members@odata.count": 3,
    "Members": [
        {
            "@odata.id": "/redfish/v1/Chassis/Rack1"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/Zone1"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/Drawer1"
        }
    ]
}
```

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 Chassis

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

Details of this resource are described in metadata file: `Chassis.xml`

4.10.1 Operations

4.10.1.1 GET

Request:

```
GET /redfish/v1/Chassis/Rack1
Content-Type: application/json
```

Response:


```
{
  "@odata.context": "/redfish/v1/$metadata#Chassis/Members/$entity",
  "@odata.id": "/redfish/v1/Chassis/Rack1",
  "@odata.type": "#Chassis.v1_2_0.Chassis",
  "Id": "Rack1",
  "ChassisType": "Rack",
  "Name": "name-as-string",
  "Description": "description-as-string",
  "Manufacturer": "Intel Corporation",
  "Model": "RackScale_Rack",
  "SKU": "sku-as-string",
  "SerialNumber": "serial-number-as-string",
  "PartNumber": "part-number-as-string",
  "AssetTag": null,
  "IndicatorLED": null,
  "PowerState": null,
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": null
  },
  "Oem": {
    "Intel_RackScale": {
      "@odata.type": "Intel.Oem.RackChassis",
      "Location": {
        "Id": "Rack1",
        "ParentId": null,
      },
      "RackSupportsDisaggregatedPowerCooling": false,
      "UUID": "123-124-134-234-13423534",
      "GeoTag": "1.234234, 54.234234"
    }
  },
  "Links": {
    "@odata.type": "#Chassis.v1_2_0.Links",
    "Contains": [{
      "@odata.id": "/redfish/v1/Chassis/Drawer1"
    }, {
      "@odata.id": "/redfish/v1/Chassis/Zone1"
    }
      }],
    "ContainedBy": [],
    "ComputerSystems": [],
    "ManagedBy": {
      "@odata.id": "/redfish/v1/Managers/RackManager1"
    },
```

```
    "ManagersInChassis": [{
      "@odata.id": "/redfish/v1/Managers/RackManager1"
    }],
    "PoweredBy": [],
    "CooledBy": [],
    "Storage": [],
    "Drives": [],
    "Oem": {
      "Intel_RackScale": {
        "@odata.type": "#Intel.Oem.ChassisLinks",
        "Switches": []
      }
    }
  },
  "Actions": {
    "#Chassis.Reset": {
      "target": "/redfish/v1/Chassis/Rack1/Actions/Chassis.Reset",
      "ResetType@Redfish.AllowableValues": [
      ]
    }
  }
}
```

4.10.1.2 PUT

Operation is not allowed on this resource.

4.10.1.3 PATCH

The following properties can be updated by the PATCH operation:

Table 8. Chassis Properties

Attribute	Type	Required	Description
`AssetTag`	String	No	The user assigned asset tag for this chassis.
`Oem->Intel_RackScale->Location`	Object	No	Object representing the physical location of the chassis. Valid only for resource type “Rack”. Following properties can be patched: “Id” - String containing physical location ID of this chassis.
`Oem->Intel_RackScale->GeoTag`	String	No	GeoTag – only for Rack chassis.

Request:

```
PATCH /redfish/v1/Chassis/1
Content-Type: application/json
{
    "AssetTag": "My rack"
    "Oem": {
       "Intel_RackScale": {
          "Location": {
            "Id": "Rack_1"
          }
       }
    }
}
```

Response:

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

Or:

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

4.10.1.4 POST

Chassis reset can be initiated using the action below:

Request:

```
POST /redfish/v1/Chassis/Drawer1/Actions/Chassis.Reset
Content-Type: application/json
{
       "ResetType": "ForceRestart"
}
```

Response:

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

Or (when task is created)

```
HTTP/1.1 202 Accepted
Location: http://<ip>:<port>/redfish/v1/TaskService/TaskMonitors/1
{
    "@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": [
    ]
}
```

4.10.1.5 DELETE

Operation is not allowed on this resource.

4.11 Power

Power metrics resource represents the properties for Power Consumption and Power Limiting.

Detailed information about this property can be obtained from metadata file: `Power.xml`

4.11.1 Operations

4.11.1.1 GET

Request:

```
GET /redfish/v1/Chassis/Zone1/Power
Content-Type: application/json
```

Response:


```
{
  "@odata.context": "/redfish/v1/$metadata#Power.Power",
  "@odata.id": "/redfish/v1/Chassis/Zone1/Power",
  "@odata.type": "#Power.v1_1_0.Power",
  "Id": "Power",
  "Name": "Power",
  "Description": "Power",
  "PowerControl": [ {
    "@odata.id": "/redfish/v1/Chassis/Zone1/Power#/PowerControl/0",
    "MemberId": "0",
    "Name": "System Power Control",
    "PowerConsumedWatts": 8000,
    "PowerRequestedWatts": 8500,
    "PowerAvailableWatts": 8500,
    "PowerCapacityWatts": 10000,
    "PowerAllocatedWatts": 8500,
    "PowerMetrics": {
      "IntervalInMin": null,
      "MinConsumedWatts": null,
      "MaxConsumedWatts": null,
      "AverageConsumedWatts": null
    },
    "PowerLimit": {
      "LimitInWatts": null,
      "LimitException": null,
      "CorrectionInMs": null
    },
    "RelatedItem": [ {
      "@odata.id": "/redfish/v1/Chassis/Drawer1"
    } ],
    "Status": {
      "State": "Enabled",
      "Health": "OK",
      "HealthRollup": "OK"
    },
    "Oem": {
    }
  } ],
  "Voltages": [ {
    "@odata.id": "/redfish/v1/Chassis/Zone1/Power#/Voltages/0",
    "MemberId": "0",
    "Name": "VRM1 Voltage",
    "SensorNumber": 11,
    "Status": {
      "State": "Enabled",
      "Health": "OK"
    },
    "ReadingVolts": 12,
    "UpperThresholdNonCritical": null,
    "UpperThresholdCritical": null,
    "UpperThresholdFatal": null,
    "LowerThresholdNonCritical": null,
    "LowerThresholdCritical": null,
    "LowerThresholdFatal": null,
```

```
    "MinReadingRange": null,
    "MaxReadingRange": null,
    "PhysicalContext": "VoltageRegulator",
    "RelatedItem": [ {
      "@odata.id": "/redfish/v1/Chassis/Drawer1"
    } ]
  } ],
  "PowerSupplies": [ {
    "@odata.id": "/redfish/v1/Chassis/Zone1/Power#/PowerSupplies/0",
    "MemberId": "0",
    "Name": "Power Supply Bay 1",
    "Status": {
      "State": "Enabled",
      "Health": "Warning"
    },
    "Oem": {
    },
    "PowerSupplyType": "DC",
    "LineInputVoltageType": "DCNeg48V",
    "LineInputVoltage": -48,
    "PowerCapacityWatts": 400,
    "LastPowerOutputWatts": 192,
    "Model": "499253-B21",
    "Manufacturer": "ManufacturerName",
    "FirmwareVersion": "1.00",
    "SerialNumber": "1z0000001",
    "PartNumber": "1z0000001A3a",
    "SparePartNumber": null,
    "InputRanges": [],
    "IndicatorLED": "Off",
    "RelatedItem": [ {
      "@odata.id": "/redfish/v1/Chassis/Drawer1"
    } ]
  } ],
  "Oem": {
    "Intel_RackScale": {
      "@odata.type": "#Intel.Oem.Power",
      "Actions": {
        "#Intel.Oem.RequestPowerSupplyStateChange": {
          "target":
"/redfish/v1/Chassis/Zone1/Power/Oem/Intel_RackScale/Actions/Intel.Oem.Reques
tPowerSupplyStateChange",
          "State@AllowableValues": ["Enabled", "Disabled"],
          "MemberId@AllowableValues": ["0"]
        }
      }
    }
  }
}
```


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

Power supplies can be enabled and disabled using the following action:

Request:

```
POST
/redfish/v1/Chassis/Zone1/Power/Oem/Intel_RackScale/Actions/Intel.Oem.Request
PowerSupplyStateChange
Content-Type: application/json
{
       "State": "Disabled",
       "MemberId”: "0"
}
```

Response:

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

Or (when task is created)

```
HTTP/1.1 202 Accepted
Location: http://<ip>:<port>/redfish/v1/TaskService/TaskMonitors/1
{
    "@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": [
    ]
}
```

4.11.1.5 DELETE

Operation is not allowed on this resource.

4.12 Thermal

Thermal metrics resource represents the properties for Temperature and Cooling.

Detailed infomation about the resource's properties can be obtained from the metadata file: `Thermal.xml`

4.12.1 Operations

4.12.1.1 GET

Request:

```
GET /redfish/v1/Chassis/Zone1/Thermal
Content-Type: application/json
```

Response:


```
{
  "@odata.context": "/redfish/v1/$metadata#Thermal.Thermal",
  "@odata.id": "/redfish/v1/Chassis/Zone1/Thermal",
  "@odata.type": "#Thermal.v1_1_0.Thermal",
  "Id": "Thermal",
  "Name": "Thermal",
  "Description": "Thermal",
  "Temperatures": [ {
    "@odata.id": "/redfish/v1/Chassis/Zone1/Thermal#/Temperatures/0",
    "MemberId": "0",
    "Name": "Drawer inlet Temp",
    "SensorNumber": 42,
    "Status": {
      "State": "Enabled",
      "Health": "OK"
    },
    "ReadingCelsius": 21,
    "UpperThresholdNonCritical": null,
    "UpperThresholdCritical": null,
    "UpperThresholdFatal": null,
    "LowerThresholdNonCritical": null,
    "LowerThresholdCritical": null,
    "LowerThresholdFatal": null,
    "MinReadingRangeTemp": null,
    "MaxReadingRangeTemp": null,
    "PhysicalContext": "Intake",
    "RelatedItem": [ {
      "@odata.id": "/redfish/v1/Chassis/Drawer1"
    } ]
  } ],
  "Fans": [ {
    "@odata.id": "/redfish/v1/Chassis/Zone1/Thermal#/Fans/0",
    "MemberId": "0",
    "Name": "BaseBoard System Fan",
    "PhysicalContext": "Backplane",
    "Status": {
      "State": "Enabled",
      "Health": "OK"
    },
    "Reading": 2100,
    "ReadingUnits": "RPM",
    "UpperThresholdNonCritical": null,
    "UpperThresholdCritical": null,
    "UpperThresholdFatal": null,
    "LowerThresholdNonCritical": null,
    "LowerThresholdCritical": null,
    "LowerThresholdFatal": null,
    "MinReadingRange": null,
    "MaxReadingRange": null,
    "RelatedItem": [ {
      "@odata.id": "/redfish/v1/Chassis/Drawer1"
    } ]
  } ],
  "Oem": {
```

```
    "Intel_RackScale": {
      "@odata.type": "#Intel.Oem.Thermal",
      "VolumetricAirflowCfm": 100,
      "DesiredSpeedRpm": 3000,
      "DesiredSpeedPwm": 50
    }
  }
}
```

4.12.1.2 PUT

Operation is not allowed on this resource.

4.12.1.3 PATCH

The following properties can be updated by the PATCH operation:

Table 9. Desired Fan Speed Properties

Attribute	Type	Required	Description
`Oem->Intel_RackScale->DesiredSpeedPwm`	Number	No	This property represents the desired speed of all FANs in the current chassis as a percentage of maximum fan speed. Allowed values are in range from 0 to 100.

Request:

```
PATCH /redfish/v1/Chassis/1
Content-Type: application/json
{
    "AssetTag": "My rack"
    "Oem": {
       "Intel_RackScale": {
          "DesiredSpeedPwm": 90
       }
    }
}
```

Response:

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

Or:

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

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 Update service

Update service resource represents the properties required to invoke the software/firmware update.

Note: In the current release, only the Manager Resources can be updated.

4.13.1 Operations

4.13.1.1 GET

Request:

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

Response:

```
{
  "@odata.type": "#UpdateService.v1_0_2.UpdateService",
  "Id": "UpdateService",
  "Name": "Update service",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "ServiceEnabled": true,
  "Actions": {
    "#UpdateService.SimpleUpdate": {
      "target": "/redfish/v1/UpdateService/Actions/SimpleUpdate",
      "@Redfish.ActionInfo":
"/redfish/v1/UpdateService/SimpleUpdateActionInfo"
    },
    "Oem": {}
  },
  "Oem": {},
  "@odata.context": "/redfish/v1/$metadata#UpdateService/$entity",
}
```

4.13.1.2 PUT

Operation is not allowed on this resource.

4.13.1.3 PATCH

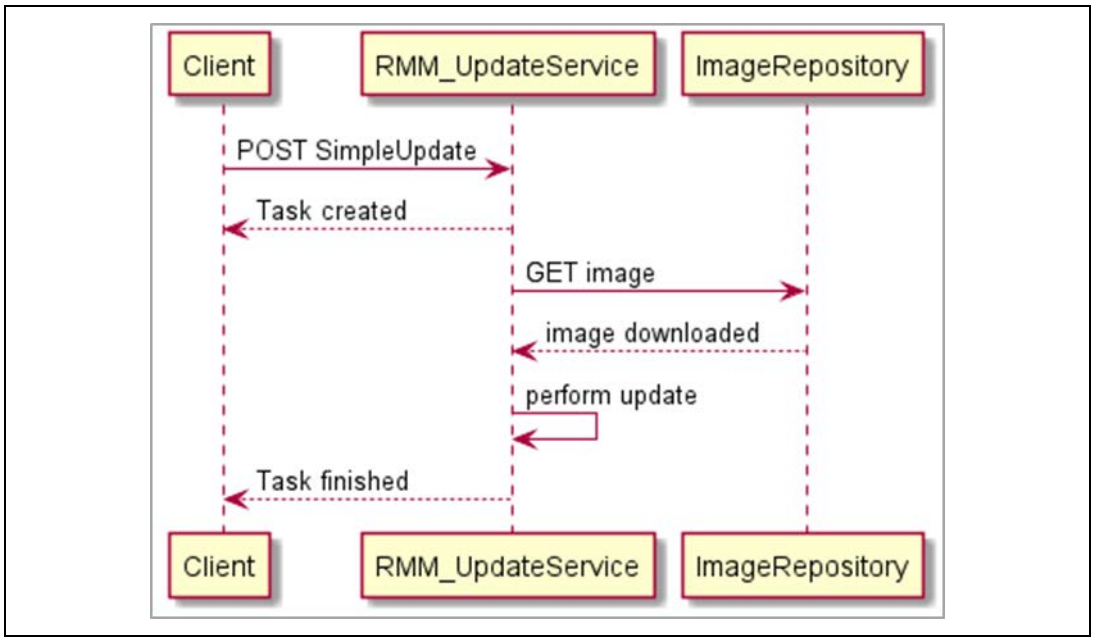
Operation is not allowed on this resource.

4.13.1.4 POST

4.13.1.4.1 Simple update action

The software/firmware update can be initiated using SimpleUpdate action. Figure 3 illustrates the interaction between components:

Figure 3. Simple Update Action Component Interactions



Request:

```
POST /redfish/v1/UpdateService/Actions/SimpleUpdate
Content-Type: application/json

{
       "ImageURI": "http://10.0.0.1/images/rmm_image.deb",
       "Targets": [
         "/redfish/v1/Managers/RackManager"
       ],
       "TransferProtocol": "HTTP"
}
```

Response:

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

Or (when task is created)

```
HTTP/1.1 202 Accepted
Location: http://<ip>:<port>/redfish/v1/TaskService/TaskMonitors/1
{
    "@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

Operation is not allowed on this resource.

4.14 Action Info

ActionInfo describes the parameters and other information necessary to perform a Redfish Action to a particular Action target. As parameter support may differ between implementations and even among instances of a resource, this data can be used to ensure Action requests from applications contain supported parameters.

4.14.1 Operations

4.14.1.1 GET (UpdateService SimpleUpdate action)

Request:

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

Response:

```
{
  "@odata.type": "#ActionInfo.v1_0_0.ActionInfo",
  "Parameters": [
    {
      "Name": "ImageURI",
      "Required": true,
      "DataType": "String"
    },
    {
      "Name": "TransferProtocol",
      "Required": false,
      "DataType": "String",
      "AllowableValues": [ "HTTP", "HTTPS", "FTP" ]
    },
    {
      "Name": "Targets",
      "Required": false,
      "DataType": "StringArray",
      "AllowableValues": ["RackManager", "ZoneManager"]
    }
  ],
  "Oem": {},
  "@odata.context": "/redfish/v1/$metadata#ActionInfo.ActionInfo",
  "@odata.id": "/redfish/v1/UpdateService/SimpleUpdateActionInfo"
}
```

4.14.1.2 PUT

Operation is not allowed on this resource.

4.14.1.3 PATCH

Operation is not allowed on this resource.

4.14.1.4 POST

Operation is not allowed on this resource.

4.14.1.5 DELETE

Operation is not allowed on this resource.

4.15 RMM - PSME common resources

Resources mentioned in Table 10 are shared in the PSME and RMM as common resources. Refer to Table 1, *Intel® Rack Scale Design PSME REST API Specification* for resources definition.

Table 10. PSME Common Resources

Resource Name	Supported Operations				
	GET	PATCH	POST	DELETE	Actions
`Network Interface`	X				
`VLAN`	X				
`Network Protocol`	X				
`EventService`	X				
`EventSubscription`	X		X	X	
`TaskService`	X				
`TaskCollection`	X				
`Task`	X				
`Registeries`	X				
`MessageRegistryFile`	X				

§