Lenovo

Lenovo XClarity Controller REST API Guide

Note: Before using this information, read the general information in “Notices” on page cci.

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Contents

Chapter 1. Introduction

The Lenovo XClarity Controller (XCC) provides support for the industry standard Redfish Scalable Platforms Management API. The Redfish API can be used to access XCC data and services from applications running outside of the XCC. This allows for easy integration of Lenovo XCC capabilities into Lenovo or 3rd party software. Redfish uses RESTful interface semantics and JSON resource payload to perform system management via the HTTPS protocol. It is suitable for a wide range of servers, from stand-alone servers to rack mount and bladed environments, and scales equally well for large scale cloud environments.

The XClarity Controller currently supports Redfish Specification v1.6.0 and Redfish Schema Bundle 2018.2. This document explains how to use the Redfish functions of the XClarity Controller on ThinkSystem servers.

For more information on the Redfish industry standard, please refer to the following resources:

- **DMTF Redfish Forum**: http://dmtf.org/redfish
  - Schemas, Specs, Mockups, White Papers, FAQ, Educational Material & more.
- **DMTF Redfish Developer Portal**: http://redfish.dmtf.org
  - Educational material, Hosted Schema files, documentation & other links.
- **DMTF Redfish Tools**: http://github.com/dmtf
  - Open source tools and libraries to help developers get started with Redfish .
- **Redfish User Forum**: http://www.redfishforum.com
  - DMTF forum for questions, suggestions and discussion of all Redfish topics.

Authentication Methods

Redfish requires the use of a compliant TLS connection to transport the data. XCC Redfish interface supports both “Basic Authentication” and “Session Login Authentication”. Per Redfish specification, the only resource that can accessed without requiring authentication is the service root “/redfish/v1/”.

HTTP Basic Authentication (as defined by RFC7235) uses HTTP "Authorization" header field to authenticate requests from a user agent or client (like a web browser) to XCC Redfish service. The value of this header consists of credentials containing the authentication information of the user agent for the realm of the resource being requested. Below is an an example of doing this operation in curl:

```
curl https://10.10.0.128/redfish/v1/Systems/1 -X GET -k -H "Content-type: application/json"
-H "Authorization: Basic VVNFUklEOlBBU1NXMFJE"
```

The credentials in this example are base64 encoding string of “USERID:PASSW0RD”.

A client or user agent can also create a Redfish login session via the Session management interface described in “Session Management” section of this guide. The client creating login session should save “session-auth-token” returned from the HTTP response header field “X-Auth-Token”. The “session-auth-token” is used to authenticate subsequent requests by setting the HTTP request header "X-Auth-Token” with the "session-auth-token". Below is an an example of doing this operation in curl:

```
curl https://10.10.0.128/redfish/v1/Systems/1 -X GET -k -H "Content-type: application/json"
-H "X-Auth-Token: session-auth-token"
```

The maximum open session count is set to 16 and session could have timeout.

Lenovo Extended Registries

Registry resourcess assist in interpreting Redfish resources beyond what is defined in the Redfish Schema. Examples of registries include Message Registries, Event Registries and BIOS Attribute Registries.

Registries are themselves resources which provide static, read-only JSON encoded information. Standard registries published by DMTF are available for download from https://redfish.dmtf.org/registries. The XCC Redfish service provides a a collection of Registries at "/redfish/v1/Registries", which contain DMTF standard registries as well as Lenovo extended registries.

- **Message Registry**
  - In addition to the the standard base message registry “Base.1.4.0.json”, XCC provides the OEM registry “ExtendedError.1.1.0.json” to extend messages used by XCC Redfish service. The URI for this registry is “/redfish/v1/schemas/registries/ ExtendedError.1.1.0.json”.
- **Event Registry**
  - XCC Redfish events reference messages that are defined in various message registries. There are two types of events in XCC:
    - “platform events” that are detected by hardware and software. This is a superset of the events corresponding to IPMI SEL. These events use the Redfish registry “/redfish/v1/schemas/registries/ EventRegistry.1.0.0.json”.
    - “audit events” that record actions performed by users. Audit events the Redfish use registry “/redfish/v1/schemas/registries/ AuditEvent.1.1.0.json".
- **Bios Attribute Registry**
  - BIOS attributes use attribute registry file “/redfish/v1/schemas/registries/BiosAttributeRegistry.1.0.0.json". The registry file contains inventory and configuration attribute information provided by Lenovo UEFI.

Tools for Redfish

Since Redfish is a REST API, standard REST clients can be used to interact with the service. This includes popular tools such as curl, as well as native access from scripting languages like Python and PowerShell. Postman is another example of an easy to use HTTP REST client tool. The tool is available from https://www.getpostman.com/.

Lenovo provides some several Python and PowerShell sample scripts to use Redfish. These are available as open source code on Lenovo’s Github page http://github.com/lenovo/.

For more information on the Redfish industry standard, please refer to the following resources:

- **Lenovo Python Redfish Scripts**: https://github.com/lenovo/python-redfish-lenovo
- **Lenovo PowerShell Redfish Scripts**: https://github.com/lenovo/powershell-redfish-lenovo

These scripts utilize Redfish API to manage Lenovo ThinkSystem servers. The list of scripts is growing over time. Currently, the scripts support hardware/firmware inventory, basic management of configuration and control, firmware updates, and alerts/eventing. The scripts can be used both remotely (out-of-band to the XCC Network) and locally (in-band on the ThinkSystem server, connecting to the XCC local host Network interface).

Other open source tools that support Redfish include Ansible, which added support for Redfish starting with version 2.7, in the form of three modules for Remote Hardware Management. These modules are tested on Lenovo ThinkSystem servers:

- **redfish_facts**: https://docs.ansible.com/ansible/latest/modules/redfish_facts_module.html
- **redfish_command**: https://docs.ansible.com/ansible/latest/modules/redfish_command_module.html
- **redfish_config**: https://docs.ansible.com/ansible/latest/modules/redfish_config_module.html

In addition, DMTF provides some open source tools for Redfish development and support. These are available at the DMTF Github page: https://github.com/DMTF.

DMTF Redfish Tool	Description of Tool
Redfish Mockup Creator	A python3.4 program that creates a Redfish Mockup folder structure from a real live Redfish service.
Redfish Service Validator	The Redfish Service Validator is a Python3 tool for checking conformance of any "device" with a Redfish service interface against Redfish CSDL schema.
Redfish Tool	A Python34 program that implements a command line tool for accessing the Redfish API.
Redfish Interface Emulator	The Redfish Interface Emulator can emulate a Redfish-based interface statically (GET) or dynamically (POST, PATCH, DELETE).
Redfish Mockup Server	A simple Python 3.4 program that can be copied into a folder at the top of any Redfish mockup and can serve Redfish requests on the specified IP/port.
Python Redfish Library	Python library for interacting with devices which support a Redfish Service.

Chapter 2. Service Root

Resource ServiceRoot

The resource represents the root of the Redfish service. All other resources accessible through the Redfish interface on the XCC are linked directly or indirectly from the Service Root.

Number of Resources	1
Resource Path	/redfish/v1/
Schema file	ServiceRoot_v1.xml

GET – Service root properties

Use the GET method to retrieve properties in Service Root (/redfish/v1/) for Redfish service.

Request URL

`https://<BMC_IPADDR>/redfish/v1/`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
id	String	“RootService”.
Name	String	“Root Service”.
SessionService	Link	A reference link to session service resource.
Managers	Link	A reference link to a collection of managers.
RedfishVersion	String	Version of the implemented Redfish service.
UUID	String	Unique identifier for the service instance.
Chassis	Link	A reference link to chassis resource.
Tasks	Link	A reference link to a collection of tasks.
EventService	Link	A reference link to event service resource.
JsonSchemeas	Link	A reference link to Json Schema resource.
AccountService	Link	A reference link to account service resource.
Systems	Link	A reference link to a collection of systems.
Registries	Link	A reference link to a collection of registries.
UpdateService	Link	A reference link to update service resource.
Links	Object	Expanded.
Sessions	Link	A reference link to a collection of sessions.
ProtocolFeaturesSupported	Object	Expanded.

Field	Type	Description
ExcerptQuery	Boolean	False. Indicates whether the 'excerpt' query parameter is supported.
FilterQuery	Boolean	True. Indicates whether the $filter query parameter is supported.
OnlyMemberQuery	Boolean	True. Indicates whether the 'only' query parameter is supported.
SelectQuery	Boolean	True. Indicates whether the $select query parameter is supported.
ExpandQuery	Object	Expanded.
ExpandAll	Boolean	True. Indicates whether the $expand support of asterisk (expand all entries) is supported.
Levels	Boolean	True. Indicates whether the expand support of the $levels qualifier is supported by the service.
Links	Boolean	True. Indicates whether the $expand support of tilde (expand only entries in the Links section) is supported.
MaxLevels	Integer	2. Indicates the maximum number value of the $levels qualifier in $expand operations.
NoLinks	Boolean	True. Indicates whether the $expand support of period (only expand entries not in the Links section) is supported.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

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

```
  "ProtocolFeaturesSupported": {
    "ExpandQuery": {
      "Levels": true,
      "NoLinks": true,
      "Links": true,
      "ExpandAll": true,
      "MaxLevels": 2
    },
    "FilterQuery": true,
    "OnlyMemberQuery": true,
    "ExcerptQuery": false,
    "SelectQuery": true
  },
  "Links": {
    "Sessions": {
      "@odata.id": "/redfish/v1/SessionService/Sessions"
    }
  },
  "RedfishVersion": "1.6.0",
  "@odata.context": "/redfish/v1/$metadata#ServiceRoot.ServiceRoot",
  "JsonSchemas": {
    "@odata.id": "/redfish/v1/JsonSchemas"
  },
  "Systems": {
    "@odata.id": "/redfish/v1/Systems"
  },
  "UpdateService": {
    "@odata.id": "/redfish/v1/UpdateService"
  },
  "Registries": {
    "@odata.id": "/redfish/v1/Registries"
  },
  "UUID": "0284C6D3-DBA8-11E6-AA6D-D6041EF2A6D2",
  "Name": "Root Service",
  "Managers": {
    "@odata.id": "/redfish/v1/Managers"
  },
  "EventService": {
    "@odata.id": "/redfish/v1/EventService"
  },
  "@odata.type": "#ServiceRoot.v1_4_0.ServiceRoot",
  "SessionService": {
    "@odata.id": "/redfish/v1/SessionService"
  },
  "Description": "This resource is used to represent a service root for a Redfish implementation.",
  "@odata.etag": "\"0348cf67fb06e522fea1f61e790828 0f\"",
  "AccountService": {
    "@odata.id": "/redfish/v1/AccountService"
  },
  "Id": "RootService"
}
```

Chapter 3. Session Management

Resource SessionService

The resource represents a collection of sessions for the Redfish service. All session resources accessible through the interface link from the SessionService resource.

Number of Resources	1
Resource Path	/redfish/v1/SessionService
Schema file	SessionService_v1.xml

GET – Session management properties

Use the GET method to retrieve properties in SessionService resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/SessionService
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	Fixed string "SessionService".
Sessions	Object	This property shall contain the link to a collection of Sessions.
ServiceEnabled	Boolean	The value of this property shall be a boolean indicating whether this service is enabled.
SessionTimeout	Number	This is the number of seconds of inactivity that a session may have before the session service closes the session due to inactivity. The value should between 30 and 86400.
Description	String	This string is used to represent the Session Service Properties for a Redfish implementation.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "Id": "SessionService",
    "Name": "SessionService",
    "@odata.context": "/redfish/v1/$metadata#SessionService.SessionService",
    "@odata.etag": "\"e863af1e936fd7556be8ebb637f07117\"",
```

```
    "@odata.type": "#SessionService.v1_1_4.SessionService",
    "SessionTimeout": 300,
    "@odata.id": "/redfish/v1/SessionService",
    "Sessions": {
        "@odata.id": "/redfish/v1/SessionService/Sessions"
    },
    "ServiceEnabled": true,
    "Description": "This resource is used to represent a session service for a Redfish implementation."
}
```

Resource Session

The resource represents a session implementation for the Redfish service.

Number of Resources	Number of sessions established
Resource Path	/redfish/v1/SessionService/Sessions/{1…N}
Schema file	Session_v1.xml

GET – Session properties

Use the GET method to retrieve properties in Session resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/SessionService/{1...N}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
UserName	String	The username who creates this session.
Password	String	This property is used in a POST to specify a password when creating a new session. This property is null on a GET.
Name	String	The session id:X(X=1~N).

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/SessionService/Sessions/3",
    "Name": "3",
    "@odata.context": "/redfish/v1/$metadata#Session.Session",
    "Password": null,
    "@odata.type": "#Session.v1_1_1.Session",
```

```
    "@odata.etag": "\"00477a86a79bede3f80bf4d4c9d162de\"",
    "Id": "3",
    "UserName": "USERID"
}
```

POST– Create a session

Create a session resource for further access authentications.

Request URL

`POST https://<BMC_IPADDR>/redfish/v1/SessionService/Sessions`

Request body

Field	Type	Description
UserName	String	The username who creates this session.
Password	String	This property is used in a POST to specify a password when creating a new session. This property is null on a GET.

Response body

Field	Type	Description
UserName	String	The username who creates this session.
Password	String	This property is used in a POST to specify a password when creating a new session. This property is null on a POST response.
Name	String	The session id:X(X=1~N).
Id	String	The session id:X(X=1~N).

Response header

Field	Description
Location	Link to the session resource created.
X-Auth-Token	An authentication code is generated when a new session is created.

Response codes

Code	Description
201	Created
401	NoValidSession
500	Internal server error

Response example

The following example is PATCH body.

```
{
   "UserName" : "USERID",
   "Password" : "PASSWORD"
}
```

The following example JSON response is returned:

```
{
    "@odata.id": "/redfish/v1/SessionService/Sessions/3",
    "Name": "3",
    "@odata.context": "/redfish/v1/$metadata#Session.Session",
    "Password": null,
    "@odata.type": "#Session.v1_1_1.Session",
    "@odata.etag": "\"00477a86a79bede3f80bf4d4c9d162de\"",
    "Id": "3",
    "UserName": "USERID"
}
```

DELETE– Delete a session

Use the DELETE method to delete session resource for Redfish service. Remove the session established for client access.

Request URL

`DELETE https://<BMC_IPADDR>/redfish/v1/SessionService/Sessions/{1...N}`

Request body

None

Response

None

Response codes

Code	Description
204	No content
500	Internal server error

Response example

None

Chapter 4. Account Management

Resource AccountService

The resource represents a collection of accounts and roles for the Redfish service. All existing sessions and roles resources accessible through the interface link from the AccountService resource.

Number of Resources	1
Resource Path	/redfish/v1/AccountService
Schema file	AccountService_v1.xml

GET – Account management properties

Use the GET method to retrieve properties in AccountService resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/AccountService
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
AccountLockoutThreshold	Number	The number of failed login attempts before a user account is locked for a specified duration. The value should be between 0 and 10.
AccountLockoutDuration	Number	The time in seconds an account is locked after the account lockout threshold is met. The value should be between 0 and 2880.
Name	String	Fixed string “AccountService”.
MaxPasswordLength	Number	The maximum password length that the implementation will allow a password to be set to. The value is 20 and cannot be modified.
MinPasswordLength	Number	The minimum password length that the implementation will allow a password to be set to. The value is 8 and cannot be modified.
Accounts	Object	This property shall contain the link to a collection of type ManagerAccountCollection.
Roles	Object	This property shall contain the link to a collection of type RoleCollection.
ServiceEnabled	Boolean	The value of this property shall be a boolean indicating whether this service is enabled. The value is “True” and cannot be modified.
Description	String	This resource is used to represent a management account service for a Redfish implementation.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:


```
{
    "Accounts": {
        "@odata.id": "/redfish/v1/AccountService/Accounts"
    },
    "AccountLockoutThreshold": 5,
    "@odata.id": "/redfish/v1/AccountService",
    "MaxPasswordLength": 20,
    "AccountLockoutDuration": 60,
    "Name": "AccountService",
    "Roles": {
        "@odata.id": "/redfish/v1/AccountService/Roles"
    },
    "@odata.context": "/redfish/v1/$metadata#AccountService.AccountService",
    "Oem": {
        "Lenovo": {
            "PasswordChangeOnNextLogin": false,
            "CurrentLoggedUsers": [
{
                    "LoginID" : "USERID",
                    "SessionType" : "SSH",
                    "IP_Hostname" : "192.168.0.2"
                }
],
            "AuthenticationMethod": "LDAPFirstThenLocal",
            "MinimumPasswordChangeIntervalHours": 24,
            "PasswordExpirationPeriodDays": 90,
            "PasswordChangeOnFirstAccess": true,
            "@odata.type": "#LenovoAccountService.v1_0_0.LenovoAccountServiceProperties",
            "MinimumPasswordReuseCycle": 5,
            "PasswordLength": 10,
            "WebInactivitySessionTimeout": 20,
            "GroupProfiles": {
                "@odata.id": "/redfish/v1/AccountService/Oem/Lenovo/GroupProfiles"
            },
            "PasswordExpirationWarningPeriod": 5
        }
    },
    "@odata.type": "#AccountService.v1_3_1.AccountService",
    "MinPasswordLength": 10,
    "ServiceEnabled": true,
    "@odata.etag": "\"408c077192a5f4b2fbcbd15df7eb1fbe\"",
    "Id": "AccountService",
    "Description": "This resource is used to represent a management account service for a Redfish implementation."
}
```


PATCH – Update global account lockout properties

Use the PATCH method to update properties in AccountService resource for Redfish service.

Request URL

```
PATCH https://<BMC_IPADDR>/redfish/v1/AccountService
```

Request body

Properties to be updated are shown as bellow, all of these properties can be changed individually.

Field	Type	Description
AccountLockoutThreshold	Number	The number of failed login attempts before a user account is locked for a specified duration. The value should be between 0 and 10.
AccountLockoutDuration	Number	The time in seconds an account is locked after the account lockout threshold is met. The value should be between 0 and 2880.

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
500	Internal server error

Response example

The following example is PATCH body.

```
{
"AccountLockoutThreshold": 10,
"Oem": {
         "Lenovo": {
              "PasswordChangeOnNextLogin": false,
              "AuthenticationMethod": " LocalOnly ",
              "MinimumPasswordChangeIntervalHours": 30,
              "PasswordExpirationPeriodDays": 100,
              "PasswordChangeOnFirstAccess": true,
              "MinimumPasswordReuseCycle": 10,
              "PasswordLength": 12,
              "WebInactivitySessionTimeout": 30,
              "PasswordExpirationWarningPeriod": 20
         }
    },
    "AccountLockoutDuration": 2
}
```

The following example JSON response is returned:

```
{
    "Accounts": {
        "@odata.id": "/redfish/v1/AccountService/Accounts"
    },
    "AccountLockoutThreshold": 10,
    "Id": "AccountService",
    "MinPasswordLength": 12,
    "AccountLockoutDuration": 2,
```

```
    "Name": "AccountService",
    "ServiceEnabled": true,
    "@odata.id": "/redfish/v1/AccountService",
    "Oem": {
        "Lenovo": {
            "PasswordChangeOnNextLogin": false,
            "CurrentLoggedUsers": [
{
                    "LoginID" : "USERID",
                    "SessionType" : "SSH",
                    "IP_Hostname" : "192.168.0.2"
                }
],
            "AuthenticationMethod": " LocalOnly ",
            "MinimumPasswordChangeIntervalHours": 30,
            "PasswordExpirationPeriodDays": 100,
            "PasswordChangeOnFirstAccess": true,
            "@odata.type": "#LenovoAccountService.v1_0_0.LenovoAccountServiceProperties",
            "MinimumPasswordReuseCycle": 10,
            "PasswordLength": 12,
            "WebInactivitySessionTimeout": 30,
            "GroupProfiles": {
                "@odata.id": "/redfish/v1/AccountService/Oem/Lenovo/GroupProfiles"
            },
            "PasswordExpirationWarningPeriod": 20
        }
    },
    "@odata.type": "#AccountService.v1_3_1.AccountService",
    "MaxPasswordLength": 20,
    "@odata.context": "/redfish/v1/$metadata#AccountService.AccountService",
    "@odata.etag": "\"6a6b0eababb310931047dd047e596908\"",
    "Roles": {
        "@odata.id": "/redfish/v1/AccountService/Roles"
    },
    "Description": "This resource is used to represent a management account service for a Redfish implementation."
}
```


Resource AccountService

The resource represents a collection of accounts and roles for the Redfish service. All existing sessions and roles resources accessible through the interface link from the AccountService resource.

Number of Resources	1
Resource Path	/redfish/v1/AccountService
Schema file	AccountService_v1.xml

GET – Account properties

Use the GET method to retrieve properties in Account resource for Redfish service.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/AccountService/Accounts/{1...12}`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	The format is UserX (X=1~12).
Password	String	****** (password should not be displayed).
RoleId	String	The value of this property shall be the ID of the Role resource that configured for this account.
Enabled	Boolean	This property shall enable (if set to true) or disable (if set to false) the account for next login.
UserName	String	The value of this property shall be the user name for this account.
Locked	Boolean	This property indicates that the account has been auto-locked by the account service because the lockout threshold has been exceeded. When set to true, the account is locked. A user admin can write the property false to manually unlock, or the account service will unlock it once the lockout duration period has passed.
Description	String	This resource is used to represent an account for the manager for a Redfish implementation.
Links	Object	Expand
Role	Link	Link to the Role instance which this account is mapped to.

Response header

Field	Description
If-Match	Get the authentication code of the account.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "Enabled": false,
    "Id": "2",
    "@odata.type": "#ManagerAccount.v1_1_3.ManagerAccount",
    "Links": {
        "Role": {
            "@odata.id": "/redfish/v1/AccountService/Roles/CustomRole2"
        }
    },
    "Name": "User2",
    "@odata.context": "/redfish/v1/$metadata#ManagerAccount.ManagerAccount",
    "UserName": "",
    "Oem": {
        "Lenovo": {
            "SSHPublicKey": [],
            "@odata.type": "#LenovoManagerAccount.v1_0_0.LenovoManagerAccount",
```

```
            "SNMPv3Settings": {
                "AccessType": "Get",
                "PrivacyProtocolPassword": null,
                "Destination": "",
                "AuthenticationProtocol": "None",
                "PrivacyProtocol": "None"
            }
        }
    },
    "RoleId": "CustomRole2",
    "@odata.id": "/redfish/v1/AccountService/Accounts/2",
    "Password": null,
    "@odata.etag": "\"c1fe9656a9c47752ee98b8fbe4d7dd92\"",
    "Locked": false,
    "Description": "This resource is used to represent an account for the manager for a Redfish implementation."
}
```

PATCH – Update userid/password/role

Use the PATCH method to update properties in Account resource for Redfish service.

Request URL

```
PATCH https://<BMC_IPADDR>/redfish/v1/AccountService/Accounts/{1...12}
```

Request body

Field	Type	Description
UserName	String	The value of this property shall be the user name for this account.
Password	String	The password of the account. Display null on a PATCH response.
RoleId	String	The value of this property shall be the ID of the Role resource that configured for this account.

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
500	Internal server error

Response example

The following example is **HTTP header** and **PATCH body**.

```
If-Match: W/"f4be30fa90b9528893dd6d83e1194ded"
{
    "UserName": "test123",
    "Password" : "poiu98ewFD",
    "Oem": {
        "Lenovo": {
            "SSHPublicKey": [],
            "SNMPv3Settings": {
                "AccessType": "Get",
                "PrivacyProtocolPassword": null,
```

```
                "AuthenticationProtocol": "HMAC_SHA",
                "PrivacyProtocol": "None"
            }
        }
    },
    "RoleId": "CustomRole2"
}
```

The following example JSON response is returned:

```
{
    "Enabled": true,
    "Id": "2",
    "@odata.type": "#ManagerAccount.v1_1_3.ManagerAccount",
    "Links": {
        "Role": {
            "@odata.id": "/redfish/v1/AccountService/Roles/CustomRole2"
        }
    },
    "Name": "User2",
    "@odata.context": "/redfish/v1/$metadata#ManagerAccount.ManagerAccount",
    "UserName": "test123",
    "Oem": {
        "Lenovo": {
            "SSHPublicKey": [],
            "@odata.type": "#LenovoManagerAccount.v1_0_0.LenovoManagerAccount",
            "SNMPv3Settings": {
                "AccessType": "Get",
                "PrivacyProtocolPassword": null,
                "Destination": "",
                "AuthenticationProtocol": "HMAC_SHA",
                "PrivacyProtocol": "None"
            }
        }
    },
    "RoleId": "CustomRole2",
    "@odata.id": "/redfish/v1/AccountService/Accounts/2",
    "Password": null,
    "@odata.etag": "\"5f4c9c6234d9f466ab0eccb02774ff35\"",
    "Locked": false,
    "Description": "This resource is used to represent an account for the manager for a Redfish implementation."
}
```

Resource Role

The resource represents a role implementation for the Redfish service.

Number of Resources	15
Resource Path	/redfish/v1/AccountService/Roles/{Administrator, Operator,ReadOnly and CustomRole{1..12}}
Schema file	Role_v1.xml

GET – Role properties

Use the GET method to retrieve properties in Role resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/AccountService/Roles/{Administrator,Operator,ReadOnly and CustomRole{1..12}}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	Any of “Administrator, Operator, ReadOnly, and CustomRole{1..12}”
OemPrivileges	Array	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. The value can be "Supervisor", "ReadOnly", "UserAccountManagement", "RemoteConsoleAccess", "RemoteConsoleAndVirtualMediaAcccess", "RemoteServerPowerRestartAccess", "AbilityClearEventLogs", "AdapterConfiguration_Basic", "AdapterConfiguration_NetworkingAndSecurity", "AdapterConfiguration_Advanced"
IsPredefined	Boolean	This role is pre-defined or not. Note: the pre-defined roles are Administrator, Operator, ReadOnly.
AssignedPrivileges	Array	DMTF Standard property.
Description	String	This resource is used to represent a user role for the user account for a Redfish implementation.

Response codes

Code	Description
500	Internal server error

Response example

The following example JSON responses are returned:

```
Resource /AccountService/Roles/Administrator:
{
    "IsPredefined": true,
    "Id": "Administrator",
```

```
    "AssignedPrivileges": [
        "Login",
        "ConfigureManager",
        "ConfigureUsers",
        "ConfigureSelf",
        "ConfigureComponents"
    ],
    "Name": "Administrator",
    "@odata.context": "/redfish/v1/$metadata#Role.Role",
    "RoleId": "Administrator",
    "OemPrivileges": [
        "Supervisor"
    ],
    "@odata.type": "#Role.v1_2_2.Role",
    "@odata.etag": "\"26aab611b9a3a05b210334405420b690\"",
    "@odata.id": "/redfish/v1/AccountService/Roles/Administrator",
    "Description": "This resource is used to represent a user role for the user account for a Redfish implementation."
}

Resource /AccountService/Roles/Operator:
{
    "IsPredefined": true,
    "@odata.id": "/redfish/v1/AccountService/Roles/Operator",
    "AssignedPrivileges": [
        "Login",
        "ConfigureSelf",
        "ConfigureComponents"
    ],
    "Name": "Operator",
    "@odata.context": "/redfish/v1/$metadata#Role.Role",
    "RoleId": "Operator",
    "OemPrivileges": [],
    "@odata.type": "#Role.v1_2_2.Role",
    "@odata.etag": "\"50a7a7de93c5303ec23154893b656b9f\"",
    "Id": "Operator",
    "Description": "This resource is used to represent a user role for the user account for a Redfish implementation."
}

Resource /AccountService/Roles/ReadOnly:
{
    "IsPredefined": true,
    "@odata.id": "/redfish/v1/AccountService/Roles/ReadOnly",
    "AssignedPrivileges": [
        "Login",
        "ConfigureSelf"
    ],
    "Name": "ReadOnly",
    "@odata.context": "/redfish/v1/$metadata#Role.Role",
    "RoleId": "ReadOnly",
    "OemPrivileges": [
        "ReadOnly"
    ],
    "@odata.type": "#Role.v1_2_2.Role",
    "@odata.etag": "\"93aa90ba5fe3027e4416ed66697d8508\"",
    "Id": "ReadOnly",
    "Description": "This resource is used to represent a user role for the user account for a Redfish implementation."
}


Resource /AccountService/Roles/CustomRole12:
{
```

```
    "IsPredefined": false,
    "Id": "CustomRole12",
    "AssignedPrivileges": [],
    "Name": "CustomRole12",
    "@odata.context": "/redfish/v1/$metadata#Role.Role",
    "RoleId": "CustomRole12",
    "OemPrivileges": [],
    "@odata.type": "#Role.v1_2_2.Role",
    "@odata.etag": "\"cf83f199c7a17fe2339c73cd23f0439f\"",
    "@odata.id": "/redfish/v1/AccountService/Roles/CustomRole12",
    "Description": "This resource is used to represent a user role for the user account for a Redfish implementation."
}
```


PATCH – Update custom role privileges

Use the PATCH method to update properties in Role resource for Redfish service.

Request URL

```
PATCH https://<BMC_IPADDR>/redfish/v1/AccountService/Roles/CustomRole{1..12}
```

Request body

Properties to be updated are shown as below, all of these properties can be changed individually.

Field	Type	Description
OemPrivileges	Array	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. The values can be the following: • "Supervisor" • "ReadOnly" • "UserAccountManagement" • "RemoteConsoleAccess" • "RemoteConsoleAndVirtualMediaAccess" • "RemoteServerPowerRestartAccess" • "AbilityClearEventLogs" • "AdapterConfiguration_Basic" • "AdapterConfiguration_NetworkingAndSecurity" • "AdapterConfiguration_Advanced"

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
500	Internal server error

Response example

The following example is PATCH body.

```
{
   "OemPrivileges" : [
      "Supervisor"
   ]
}
```

The following example JSON response is returned:

```
{
    "IsPredefined": false,
    "Id": "CustomRole12",
    "AssignedPrivileges": [],
    "Name": "CustomRole12",
    "@odata.context": "/redfish/v1/$metadata#Role.Role",
    "RoleId": "CustomRole12",
    "OemPrivileges": [
        "Supervisor"
    ],
    "@odata.type": "#Role.v1_2_2.Role",
    "@odata.etag": "\"9ba51500a39657098199faa796181ba5\"",
    "@odata.id": "/redfish/v1/AccountService/Roles/CustomRole12",
    "Description": "This resource is used to represent a user role for the user account for a Redfish implementation."
}
```

Chapter 5. Chassis Management

Resource Chassis

This resource is used to represent a chassis for a Redfish implementation.

Number of Resources	1
Resource Path	/redfish/v1/ Chassis/1
Schema file	Chassis_v1.xml

GET – Collection for chassis

Use the GET method to retrieve properties in Chassis collection for Redfish service.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/Chassis`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“ChassisCollection”.
Members	Array	Items: A reference link to an element of Chassis.
Description	String	"A collection of Chassis resource instances."

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Chassis",
    "Name": "ChassisCollection",
    "@odata.context": "/redfish/v1/$metadata#ChassisCollection.ChassisCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    ],
    "@odata.type": "#ChassisCollection.ChassisCollection",
    "@odata.etag": "\"af5a94479815eb5f87fe91ea08fde0ac\"",
    "Members@odata.count": 1,
    "Description": "A collection of Chassis resource instances."
```

}

GET – Chassis properties

Use the GET method to retrieve properties in Chassis resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Chassis
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Uniquely identifies the resource within the collection of Chassis. Always set to “1”.
Description	String	Provides a description of this chassis resource.
LogServices	Link	A reference link to the log services resource contained in this chassis.
Power	Link	A reference link to the power resource contained in this chassis.
AssetTag	String	The user assigned asset tag for this chassis.
ChassisType	String	This property indicates the type of physical form factor of this resource. Valid values include: • RackMount. The server is a rack-mounted server. • Blade. The server is a blade-based server. • StandAlone. The server is a tower-based server.
HeightMn	Number	The height of the chassis.
IndicatorLED	String	The state of the indicator LED, used to identify the chassis. Valid values include: • Off. The Indicator LED is off. • Lit. The Indicator LED is lit. • Blinking. The Indicator LED is blinking.
Links	Object	Expanded.
ComputerSystems	Array	An array of references to the computer systems contained in this chassis.
ComputerSystems[1]	Link	A reference link to a resource of computer system.
CooledBy	Array	An array of IDs of resources that cool this chassis.
CooledBy[N]	Link	A reference link to a resource of cooling device.
Drives	Array	An array of resources to disk drives of in this chassis.
Drives[N]	Link	A reference link to a resource of disk drive.
ManagedBy	Array	An array of references to the managers responsible for managing this chassis.

Field	Type	Description
ManagedBy[0]	Link	A reference link to a resource of manager responsible for managing this chassis.
ManagersInChassis	Array	An array of references to the managers contained in this chassis.
ManagerInChassis[0]	Link	A reference link to a resource of manager.
PCIeDevices	Array	An array of references to the PCIe devices located in this chassis.
PCIeDevices[N]	LInk	A reference link to a resource of PCIe device located in this chassis.
PoweredBy	Array	An array of IDs of resources that power this chassis.
PoweredBy[N]	Link	A reference link to a resource of power device.
Storage	Array	An array of references to the storage subsystems connected to or inside this chassis.
Storage[N]	Link	A reference link to a resource of storage device inside this chassis.
Manufacturer	String	The manufacturer of this chassis. Always set to “Lenovo” or “LNVO”.
Model	String	The model number for the chassis.
Name	String	The name of the Chassis resource. Always set to “Chassis”.
NetworkAdapters	Link	A reference link to a collection of network adapter resources contained in this chassis.
PartNumber	String	The part number of this chassis.
PowerState	String	The current power state of this chassis. Valid values include: • On • Off
SKU	String	The SKU for this chassis.
SerialNumber	String	The serial number of this chassis.
Thermal	Link	A reference link to the thermal resource contained in this chassis.
Status	Object	Contains the following elements.
Health	String	The current health of this chassis as indicated by the entries in the event log. Valid values include: • **OK**: Normal. No warning or critical events in the event log of this chassis. • **Critical**: A critical condition exists that requires immediate attention. At least one critical event in the event log of this chassis. • **Warning**: A condition exists that requires attention. At least one warning in the event log (but no critical events) of this chassis.
State	String	“Enabled”.

Response codes

Code	Description
500	Internal server error

Response example

The following example JSON response is returned:

```
{
  "SerialNumber": "1234567890",
  "Id": "1",
  "Links": {
    "Drives": [
      {
        "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot9/Drives/Disk.0"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot9/Drives/Disk.1"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot9/Drives/Disk.2"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot9/Drives/Disk.3"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot9/Drives/Disk.4"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot9/Drives/Disk.5"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot9/Drives/Disk.6"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot9/Drives/Disk.7"
      }
    ],
    "CooledBy": [],
    "ComputerSystems": [
      {
        "@odata.id": "/redfish/v1/Systems/1/"
      }
    ],
    "PCIeDevices": [
      {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/ob_1"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_8"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_9"
      },
      {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_10"
      }
    ],
    "PoweredBy": [
      {
        "@odata.id": "/redfish/v1/Chassis/1/Power/#/PowerSupplies/0"
      }
    ],
    "Storage": [
      {
        "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot9/"
      }
    ],
    "ManagedBy": [
```

```
    {
      "@odata.id": "/redfish/v1/Managers/1/"
    }
  ],
  "ManagersInChassis": [
    {
      "@odata.id": "/redfish/v1/Managers/1/"
    }
  ]
},
"PowerState": "Off",
"@odata.context": "/redfish/v1/$metadata#Chassis.Chassis",
"ChassisType": "RackMount",
"PartNumber": "THOMSONSDV",
"Description": "This resource is used to represent a chassis or other physical enclosure for a Redfish implementation.",
"Thermal": {
  "@odata.id": "/redfish/v1/Chassis/1/Thermal/"
},
"Model": "7X1925Z000",
"@odata.id": "/redfish/v1/Chassis/1/",
"@odata.type": "#Chassis.v1_5_0.Chassis",
"Status": {
  "State": "Enabled",
  "Health": "Warning"
},
"Oem": {
  "Lenovo": {
    "LocatedIn": {
      "ContactPerson": "",
      "FullPostalAddress": "",
      "Blade-Bay": 0,
      "Height": 2,
      "Position": 0,
      "Location": "",
      "Room": "",
      "Rack": "",
      "DescriptiveName": ""
    },
    "Sensors": {
      "@odata.id": "/redfish/v1/Chassis/1/Oem/Lenovo/Sensors/"
    },
    "ProductName": "ThinkSystem SR850",
    "Slots": {
      "@odata.id": "/redfish/v1/Chassis/1/Oem/Lenovo/Slots/"
    },
    "LEDs": {
      "@odata.id": "/redfish/v1/Chassis/1/Oem/Lenovo/LEDs/"
    }
  }
},
"Name": "Chassis",
"HeightMm": 88.9,
"Power": {
  "@odata.id": "/redfish/v1/Chassis/1/Power/"
},
"SKU": "THOMSONSDV",
"NetworkAdapters": {
  "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/"
},
"AssetTag": "",
"Manufacturer": "LNVO",
```

```
  "@odata.etag": "W/\"804e2822bacca5070d4ca216354f98ec\"",
  "LogServices": {
    "@odata.id": "/redfish/v1/Systems/1/LogServices/"
  },
  "IndicatorLED": "Off"
}
```

PATCH – Update chassis asset tag and location LED and other oem properties

Use the PATCH method to update properties in Chassis resource for Redfish service.

Request URL

`PATCH https://<BMC_IPADDR>/redfish/v1/Chassis/1`

Request body

Field	Type	Description
AssetTag	String	The user assigned asset tag for this chassis. Maximum string length of AssetTag is 32.
IndicatorLED	String	The state of the indicator LED, used to identify the chassis. Available value is either “Lit” or “Blinking” or “Off”.

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
500	Internal server error

Response example

The following example is PATCH body.

```
{
   "AssetTag" : "chassis in use"
}
```

After the PATCH operation runs successfully, querying the chassis resource returns below example JSON response:

```
{
    "SerialNumber": "1234567890",
    "Id": "1",
    "AssetTag": "chassis in use",
    "PowerState": "On",
    "@odata.context": "/redfish/v1/$metadata#Chassis.Chassis",
    "ChassisType": "Other",
    "PartNumber": "SB27A35572",
    "Description": "This resource is used to represent a chassis or other physical enclosure for a Redfish implementation.",
    "Thermal": {
        "@odata.id": "/redfish/v1/Chassis/1/Thermal"
    },
    "@odata.id": "/redfish/v1/Chassis/1",
    "SKU": "7X00CTO1WW",
```

```
"Links": {
    "Drives": [],
    "CooledBy": [],
    "ComputerSystems": [
        {
            "@odata.id": "/redfish/v1/Systems/1"
        }
    ],
    "PCIeDevices": [
        {
            "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/ob_1"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/ob_2"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_1"
        }
    ],
    "PoweredBy": [],
    "Storage": [],
    "ManagedBy": [
        {
            "@odata.id": "/redfish/v1/Managers/1"
        }
    ],
    "ManagersInChassis": [
        {
            "@odata.id": "/redfish/v1/Managers/1"
        }
    ]
},
"Status": {
    "State": "Enabled",
    "Health": "Critical"
},
"LogServices": {
    "@odata.id": "/redfish/v1/Systems/1/LogServices"
},
"Name": "Chassis",
"HeightMm": 44.45,
"Power": {
    "@odata.id": "/redfish/v1/Chassis/1/Power"
},
"Oem": {
    "Lenovo": {
        "LocatedIn": {
            "ContactPerson": "",
            "FullPostalAddress": "",
            "Height": 1,
            "DescriptiveName": "",
            "Room": "",
            "Rack": "",
            "Location": ""
        },
        "@odata.type": "#LenovoChassis.v1_0_0.LenovoChassisProperties",
        "ProductName": "Lenovo ThinkSystem SD650",
        "Sensors": {
            "@odata.id": "/redfish/v1/Chassis/1/Oem/Lenovo/Sensors"
        },
        "LEDs": {
```

```
                "@odata.id": "/redfish/v1/Chassis/1/Oem/Lenovo/LEDs"
            },
            "Slots": {
                "@odata.id": "/redfish/v1/Chassis/1/Oem/Lenovo/Slots"
            }
        }
    },
    "@odata.type": "#Chassis.v1_8_0.Chassis",
    "NetworkAdapters": {
        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters"
    },
    "Manufacturer": "Lenovo",
    "@odata.etag": "\"d198bc5bf4a9df9120f1bb8084761895\"",
    "Model": "7X00CTO1WW",
    "IndicatorLED": "Off"
}
```

Chapter 6. Network Adapter Devices

Resource NetworkAdapters

This resource is used to represent network adapters for a Redfish implementation.

Number of Resources	Number of adapters
Resource Path	/redfish/v1/ Chassis/1/NetworkAdapters/{Location} (Location= ob-X or slot-Y)
Schema file	NetworkAdapterCollection_v1.xm NetworkAdapter_v1. xml

GET – Collection of Network adapters

Use the GET method to retrieve properties in NetworkAdapter collection for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Chassis/1/NetworkAdapters
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“NetworkAdaptersCollection”.
Members	Array	Items: A reference link to an element of NetworkAdapters.
Description	String	"A collection of NetworkAdapter resource instances."

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters",
    "Name": "NetworkAdapterCollection",
    "@odata.context": "/redfish/v1/$metadata#NetworkAdapterCollection.NetworkAdapterCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/ob-2"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/slot-1"
```

```
        }
    ],
    "@odata.type": "#NetworkAdapterCollection.NetworkAdapterCollection",
    "@odata.etag": "\"0fc2e61d589d668552e2930fb65b27e0\"",
    "Members@odata.count": 2,
    "Description": "A collection of NetworkAdapter resource instances."
}
```


GET – Network adapter properties

Use the GET method to retrieve properties in NetworkAdapter resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Chassis/1/NetworkAdapters/{Location}
```

{Location}: Location of the corresponding NetworkAdapter device. {Location}=ob-X or slot-Y. ob stands for onboard device and slot stands for add-on card. X is the sequence number for onboard device starting from 1. Y is the slot number of add-on card.

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Only Ethernet, Fibre Channel, InfiniBand devices support to have the NetworkAdapter resource now: For add-on devices, the value is “slot-{$slot number}.” For on-board devices, the value is “ob-{$index}” .
Controllers	Object Array	The set of network controllers ASICs that make up this NetworkAdapter.
FirmwarePackageVersion	String	The version of the user-facing firmware package.
Links	Object	The version of the user-facing firmware package.
PCIeDevices	Reference Array	Links for this controller.
NetworkPorts	Reference Array	Link to related NetworkPorts.
NetworkDeviceFunctions	Reference Array	Link to related NetworkDeviceFunctions.
ControllerCapabilities	Object	The capabilities of a controller.
NetworkPortCount	Number	The count of physical port of this adapter.
NetworkDeviceFunction-Count	Number	The count of logical port of this adapter.
Description	String	A NetworkAdapter represents the physical network adapter capable of connecting to a computer network.

Field	Type	Description
Manufacturer	String	The manufacturer or OEM of this network adapter.
Model	String	The model string for this network adapter.
SKU	String	The manufacturer SKU for this network adapter.
Name	String	The card name for this network adapter.
PartNunber	String	The part number for this network adapter.
SerialNumber	String	The serial number for this network adapter.
Status	Object	Expand.
State	String	Enabled.
Health	String	This represents the health state of this resource.
NetworkPorts	Reference	Link to related NetworkPortsCollection.
NetworkDeviceFunctions	Reference	Link to related NetworkDeviceFunctionsCollection.

Response codes

Code	Description
500	Internal server error

Response example

The following example JSON response is returned:

```
{
    "SerialNumber": "N/A",
    "Id": "ob-2",
    "NetworkPorts": {
        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/ob-2/NetworkPorts"
    },
    "@odata.context": "/redfish/v1/$metadata#NetworkAdapter.NetworkAdapter",
    "PartNumber": "N/A",
    "Description": "A NetworkAdapter represents the physical network adapter capable of connecting to a computer network.",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Name": "Intel X722 LOM (onboard)",
    "Model": "N/A",
    "SKU": "N/A",
    "Oem": {
        "Lenovo": {
            "Location": {
                "InfoFormat": "OnBoard",
                "Info": "OnBoard"
            },
            "UUID": "00000000000000000008C0F6F7ED334"
        }
    },
    "@odata.type": "#NetworkAdapter.v1_2_0.NetworkAdapter",
    "Controllers": [
        {
```

```
            "Links": {
                "NetworkPorts": [],
                "NetworkDeviceFunctions": [
                    {
                        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/ob-2/NetworkDeviceFunctions/3.1"
                    }
                ],
                "PCIeDevices": [
                    {
                        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/ob_2"
                    }
                ]
            },
            "FirmwarePackageVersion": "1.1937.0",
            "ControllerCapabilities": {
                "NetworkDeviceFunctionCount": 1,
                "NetworkPortCount": 1
            }
        }
    ],
    "Manufacturer": "Intel",
    "@odata.etag": "\"70f321bef8ba4879634421aabeccae61\"",
    "NetworkDeviceFunctions": {
        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/ob-2/NetworkDeviceFunctions"
    },
    "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/ob-2"
}
```


Resource NetworkPort

This resource is used to represent network ports for a Redfish implementation.

Number of Resources	Number of network ports
Resource Path	/redfish/v1/Chassis/1/NetworkAdapters/{Location}/NetworkPorts/{1-N} (Location= ob-X or slot-Y)
Schema file	NetworkPortCollection_v1.xml NetworkPort_v1.xml

GET – Collection of network ports

Use the GET method to retrieve properties in NetworkPort collection for Redfish service.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/Chassis/1/NetworkAdapters/{Location}/NetworkPorts`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“NetworkPortsCollection”.
Members	Array	Items: A reference link to an element of NetworkPorts.
Description	String	"A Collection of NetworkPort resource instances."

Response codes

Code	Description
500	Internal server error

Response example

The following example JSON response is returned:

```
{
   "Members@odata.navigationLink" : "/redfish/v1/Chassis/1/NetworkAdapters/slot-2/NetworkPorts/Members",
   "@odata.context" : "/redfish/v1/$metadata#NetworkPortCollection.NetworkPortCollection",
   "Members@odata.count" : 2,
   "@odata.id" : "/redfish/v1/Chassis/1/NetworkAdapters/slot-2/NetworkPorts/",
   "@odata.etag" : "W/\"beef21b885ac5fcfddf74fca6a6b8370\"",
   "Members" : [
      {
         "@odata.id" : "/redfish/v1/Chassis/1/NetworkAdapters/slot-2/NetworkPorts/1"
      },
      {
         "@odata.id" : "/redfish/v1/Chassis/1/NetworkAdapters/slot-2/NetworkPorts/2"
      }
   ],
   "@odata.type" : "#NetworkPortCollection.NetworkPortCollection",
   "Description" : "A Collection of NetworkPort resource instances.",
   "Name" : "NetworkPortCollection"
}
```

GET – Network port properties

Use the GET method to retrieve properties in network port resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Chassis/1/NetworkAdapters/{Location}/NetworkPorts/{1-N}
```

{Location}: Location of the corresponding NetworkAdapter device. {Location}=ob-X or slot-Y. ob stands for onboard device and slot stands for add-on card. X is the sequence number for onboard device starting from 1. Y is the slot number of add-on card. {1-N}: Index of network physical port.

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Index.
ActiveLinkTechnology	Enum String	Network Port Active Link Technology.
AssociatedNetworkAddresses	String Array	The array of configured network addresses (MAC or WWN) that are associated with this Network Port.
Description	String	A Network Port represents a discrete physical port capable of connecting to a network.
LinkStatus	Enum String	The status of the link between this port and its link partner.
Name	String	"Phyical Port X" (X = the Id value).
NetDevFuncMaxBWAlloc	Object Array	The array of minimum bandwidth allocation percentages for the Network Device Functions associated with this port.
MaxBWAllocPercent	Number	The maximum bandwidth allocation percentage allocated to the corresponding network device function instance.
NetworkDeviceFunction	Refer-ence	Link to a NetworkDeviceFunction.
PhysicalPortNumber	String	The physical port number label for this port.
PortMaximumMTU	Number	The largest maximum transmission unit (MTU) that can be configured for this network port.
Status	Object	Expand.
State	String	Enabled.
Health	String	OK.
HealthRollup	String	This represents the health state of this resource and its dependent resources.

Response codes

Code	Description
500	Internal server error

Response example

The following example JSON response is returned:

```
{
   "@odata.context" : "/redfish/v1/$metadata#NetworkPort.NetworkPort",
   "PortMaximumMTU" : 72000,
   "Id" : "1",
   "PhysicalPortNumber" : "1",
   "Status" : {
      "HealthRollup" : "OK",
      "Health" : "OK",
      "State" : "Enabled"
   },
   "LinkStatus" : "Down",
   "NetDevFuncMaxBWAlloc" : [
      {
         "NetworkDeviceFunction" : {
```

```
            "@odata.id" : "/redfish/v1/Chassis/1/NetworkAdapters/slot-2/NetworkDeviceFunctions/1.1"
         },
         "MaxBWAllocPercent" : null
      }
   ],
   "@odata.etag" : "W/\"50c3095f382d20a4b3066c64d75a5c8f\"",
   "@odata.id" : "/redfish/v1/Chassis/1/NetworkAdapters/slot-2/NetworkPorts/1",
   "@odata.type" : "#NetworkPort.v1_1_0.NetworkPort",
   "AssociatedNetworkAddresses" : [
      "0090FAA2071E"
   ],
   "Description" : "A Network Port represents a discrete physical port capable of connecting to a network.",
   "Name" : "Phyical Port 1",
   "ActiveLinkTechnology" : "Ethernet"
}
```


Resource NetworkDeviceFunction

This resource is used to represent network device function for a Redfish implementation.

Number of Resources	Number of network device functions
Resource Path	/redfish/v1/Chassis/1/NetworkAdapters/{Location}/NetworkDeviceFunctions/{1-M}.{1-N} (Location= ob-X or slot-Y)
Schema file	NetworkDeviceFunctionCollection_v1.xm NetworkDeviceFunction_v1.xml

GET – Collection of Network device function

Use the GET method to retrieve properties in NetworkDeviceFunction collection for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Chassis/1/NetworkAdapters/{Locaton}/NetworkDeviceFunctions
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“NetworkDeviceFunctionCollection”.
Members	Array	Items: A reference link to an element of NetworkDeviceFunction.
Description	String	"A collection of NetworkDeviceFunction resource instances".

Response codes

Code	Description
500	Internal server error

Response example

The following example JSON response is returned:

```
{
    "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/ob-2/NetworkDeviceFunctions",
    "Name": "NetworkDeviceFunctionCollection",
    "@odata.context": "/redfish/v1/$metadata#NetworkDeviceFunctionCollection.NetworkDeviceFunctionCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/ob-2/NetworkDeviceFunctions/3.1"
        }
    ],
    "@odata.type": "#NetworkDeviceFunctionCollection.NetworkDeviceFunctionCollection",
    "@odata.etag": "\"e0a20918ac4ef18b30a66c924a47324f\"",
    "Members@odata.count": 1,
    "Description": "A collection of NetworkDeviceFunction resource instances."
}
```

GET – Network device PCIe functions

Use the GET method to retrieve properties in NetworkDeviceFunction resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Chassis/1/NetworkAdapters/{Locaton}/NetworkDeviceFunctions/{1-M}.{1-N}
```

{Location}: Location of the corresponding NetworkAdapter device. {Location}=ob-X or slot-Y. ob stands for onboard device and slot stands for add-on card. X is the sequence number for onboard device starting from 1. Y is the slot number of add-on card.

{1-M}: Index of physical network port.

{1-N}: Index of logical network port.

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Physical port index +"." + the logical port index, for the associated NetworkPort resource.
AssignablePhysicalPorts	Array	Items: link.
AssignablePhysicalPorts[N]	Link	Link to possible NetworkPorts.
PhysicalPortAssignment	Link	Link to related NetworkPort.
Description	String	A Network Device Function represents a logical interface exposed by the network adapter.
DeviceEnabled	Boolean	True.
Ethernet	Object	Expand (If this is Ethernet, the below items will be displayed).

Field	Type	Description
PermanentMACAddress	String	This is the permanent MAC address assigned to this network device function (physical function).
MACAddress	String	This is the currently configured MAC address of the (logical port) network device function.
MTUSize	Number	The Maximum Transmission Unit (MTU) configured for this network device function.
FibreChannel	Object	Expand (If this is FibreChannel, the below items will be displayed).
PermanentWWPN	String	This is the permanent WWPN address assigned to this network device function (physical function).
WWPN	String	This is the currently configured WWPN address of the network device function (physical function).
Links	Object	Expand.
PCIeFunction	Link	Link to a PCIeFunction.
Name	String	"Logical Port"+" "+$Index.
NetDevFuncType	Enum String	The configured capability of this network device function.
Status	Object	Expand.
State	String	Enabled.
Health	String	OK.
HealthRollup	String	This represents the health state of this resource and its dependent resources.

Response codes

Code	Description
500	Internal server error

Response example

The following example JSON response is returned:

```
{
    "Ethernet": {
        "MACAddress": "8C0F6F7ED336",
        "PermanentMACAddress": "8C0F6F7ED336",
        "MTUSize": 12000
    },
    "Id": "3.1",
    "Name": "Logical Port 1",
    "DeviceEnabled": true,
    "PhysicalPortAssignment": {
        "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/ob-2/NetworkPorts/3"
    },
    "Links": {
        "PCIeFunction": {
            "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/ob_2.02"
        }
    },
    "AssignablePhysicalPorts@odata.count": 1,
```

```
    "@odata.context": "/redfish/v1/$metadata#NetworkDeviceFunction.NetworkDeviceFunction",
    "AssignablePhysicalPorts": [
        {
            "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/ob-2/NetworkPorts/3"
        }
    ],
    "@odata.type": "#NetworkDeviceFunction.v1_3_0.NetworkDeviceFunction",
    "NetDevFuncType": "Ethernet",
    "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/ob-2/NetworkDeviceFunctions/3.1",
    "@odata.etag": "\"8e5f38a2a920d285a8b29d0e2791081d\"",
    "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
    },
    "Description": "A Network Device Function represents a logical interface exposed by the network adapter."
}
```

Chapter 7. Power, thermal and redundancy

Resource Power

This resource is used to represent power management for a Redfish implementation.

Number of Resources	1
Resource Path	/redfish/v1/Chassis/1/Power
Schema file	Power_v1.xml

GET – Power management properties

Use the GET method to retrieve properties in Power resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Chassis/1/Power
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	“Power”.
Name	String	The name of power resource. Always set to “Power”.
PowerControl	Array	This is the definition for power control function (power reading/ limiting). Item count is always set to 1.
PowerControl[1]	Object	This is the base type for addressable members of PowerControl array.
MemberId	String	Index of this PowerControl array.
Name	String, Null	Power Control Function name. Always set to “Server Power Control”.
PowerConsumedWatts	Number, Null	The actual power being consumed by the chassis.
PowerRequestedWatts	Number, Null	The potential power that the chassis resources are requesting which may be higher than the current level being consumed since requested power includes budget that the chassis resource wants for future use.
PowerAvailableWatts	Number, Null	The amount of power not already budgeted and therefore available for additional allocation. (powerCapacity - powerAllocated). This indicates how much reserve power capacity is left.
PowerCapacityWatts	Number, Null	The total amount of power available to the chassis for allocation. This may the power supply capacity, or power budget assigned to the chassis from an up-stream chassis.
PowerAllocatedWatts	Number, Null	The total amount of power that has been allocated (or budegeted)to chassis resources.

Field	Type	Description
Status	Object	Power limit status and configuration information for this chassis. Note: If the tier level of this system is less than 3, this value will be hiden.
State	String, Null	This indicates the known state of the resource, such as if it is enabled. Always set to “Enable”.
PowerLimit	Object	Power limit status and configuration information for this chassis. Note: If the tier level of this system is less than 3, this value will be hiden.
LimitInWatts	Number, Null	The Power limit in watts. Set to null to disable power capping.
LimitException	String, Null	The action that is taken if the power cannot be maintained below the LimitInWatts. Always set to “NoAction”. Valid values: “NoAction”: “Take no action when the limit is exceeded”.
CorrectionInMs	Number, Null	The time required for the limiting process to reduce power consumption to below the limit. Always set to null.
PowerMetrics	Object	Power readings for this chassis.
IntervalInMin	Number	The time interval (or window) in which the PowerMetrics are measured over. Always set to 60.
MinConsumedWatts	Number	The lowest power consumption level over the measurement window (the last IntervalInMin minutes).
MaxConsumedWatts	Number	The highest power consumption level that has occured over the measurement window (the last IntervalInMin minutes).
AverageConsumedWatts	Number	The average power level over the measurement window (the last IntervalInMin minutes).
PowerSupplies	Array	Details of the power supplies associated with this system or device. Items count is the number of installed power supplies in this system. If the system does not install any PSU, like Flex systems and high dense systems, this array will be hidden.
PowerSupplies[N]	Object	Details of the power supply associated with this system or device.
MemberId	String	This is the identifier for the member within the collection. The string starts with “PSU” and follows with PSU ID, like “PSU1”.
Name	String, Null	The name of the Power Supply. Always equals to MemberId.
PowerSupplyType	String, Null	The Power Supply type (AC or DC). Valid values: • "Unknown": "The power supply type cannot be determined" • "AC": "Alternating Current (AC) power supply". • "DC": "Direct Current (DC) power supply". • "ACorDC": "Power Supply supports both DC or AC".
LineInputVoltageType	String, Null	The line voltage type supported as an input to this Power Supply. Valid values: • "Unknown": "The power supply line input voltage type cannot be determined" • "ACLowLine": "100-127V AC input. Deprecated: Use AC120V". • "ACMidLine": "200-240V AC input. Deprecated: Use AC240V". • "DC240V": "DC 240V nominal input"

Field	Type	Description
PowerCapacityWatts	Number, Null	The maximum capacity of this Power Supply.
FirmwareVersion	String, Null	The firmware version for this Power Supply. The firmware string consists of primary firmware version and secondary firmware version, which are defined in PowerSupply OEM section.
SerialNumber	String, Null	The serial number for this Power Supply.
PartNumber	String, Null	The part number for this Power Supply.
SparePartNumber	String, Null	The spare part number for this Power Supply. Always set to null.
Status	Object	Describes the status and health of a resource and its children.
State	String, Null	This indicates the known state of this power supply. Valid values: “Enabled”: “This function or resource has been enabled”. “Disabled”: “This function or resource has been disabled”.
Health	String, Null	This indicates the health state of this power supply. Valid values: "OK": "Normal" "Warning": "A condition exists which requires attention" "Critical": "A critical condition exists which requires immediate attention"
Redundancy	Array	Redundancy information for the power subsystem of this system or device. Item count is always set to 1. If the system does not install any PSU, like Flex systems and high dense systems, this array will be hidden.
Redundancy[1]	Object	Details indicating power supplies redundancy.
MemberId		Index of this Redundancy array.
Name		“PSU Redundancy”.
Mode		“N+m”.
MaxNumSupported		Maximum number of members allowable for this particular redundancy group.
MinNumNeeded		Minumum number of members needed for this group to be redundant. The value is 2
RedundancyEnabled		Indicate whether redundancy is enabled.
Status		Describes the status and health of the resource and its children.
State		This indicates the known state of this redundancy. Valid values: Enabled”: “This function or resource has been enabled”. “Disabled”: “This function or resource has been disabled”.
Health		This indicates the health state of this redundancy. . Valid values: "OK": "Normal". "Warning": "A condition exists that requires attention". "Critical": "A critical condition exists that requires immediate attention".

Field	Type	Description
RedundancySet		This is the definition for redundancy set. Item count is the number of the Power's PowerSupplies.
RedundancySet[N]		The link to Power's PowerSupplies.
Voltages	Array	This is the definition for voltage sensors. Item count is the number of voltage sensors in this system.
Voltages[N]	Object	The definition for a voltage sensor.
Name	String, Null	Voltage sensor name.
SensorNumber	Number, Null	A numerical identifier to represent the voltage sensor.
Status	Object	Describes the status and health of a resource and its children.
State	String, Null	This indicates the known state of this voltage sensor. Valid values: "Enabled": "This function or resource has been enabled". "Disabled": "This function or resource has been disabled".
ReadingVolts	Number, Null	The current value of the voltage sensor. If the State of this voltage sensor is "disabled", "ReadingVolts" will be hiden.
UpperThresholdNonCritical	Number, Null	Above normal range.
UpperThresholdCritical	Number, Null	Above normal range but not yet fatal.
UpperThresholdFatal	Number, Null	Above normal range and is fatal.
LowerThresholdNonCritical	Number, Null	Below normal range.
LowerThresholdCritical	Number, Null	Below normal range but not yet fatal.
LowerThresholdFatal	Number, Null	Below normal range and is fatal.
MinReadingRange	Number, Null	Minimum value for CurrentReading.
MaxReadingRange	Number, Null	Maximum value for CurrentReading.
PhysicalContext	String	Describes the area or device to which this voltage measurement applies. Always set to "VoltageRegulator". "VoltageRegulator": "A voltage regulator device".
RelatedItem	Array	Describes the areas or devices to which this temperature measurement applies. Item count is 2.
RelatedItem[N]	Link	The element of the array provides a link to device applied. One element links to chassis resource. One element links to system resource.

Response codes

Code	Description
500	Internal server error

Response example

The following example JSON response is returned:


```
{
    "PowerControl@odata.count": 1,
    "Id": "Power",
    "Redundancy@odata.count": 1,
    "@odata.context": "/redfish/v1/$metadata#Power.Power",
    "Voltages": [
        {
            "MaxReadingRange": 3.95,
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Systems/1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1"
                }
            ],
            "@odata.id": "/redfish/v1/Chassis/1/Power#/Voltages/0",
            "Status": {
                "State": "Enabled"
            },
            "SensorNumber": 141,
            "Name": "SysBrd 3.3V",
            "PhysicalContext": "VoltageRegulator",
            "MemberId": "0",
            "RelatedItem@odata.count": 2,
            "LowerThresholdCritical": 2.98,
            "MinReadingRange": null,
            "ReadingVolts": 3.36,
            "UpperThresholdCritical": 3.63
        },
        {
            "MaxReadingRange": 5.92,
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Systems/1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1"
                }
            ],
            "@odata.id": "/redfish/v1/Chassis/1/Power#/Voltages/1",
            "Status": {
                "State": "Enabled"
            },
            "SensorNumber": 142,
            "Name": "SysBrd 5V",
            "PhysicalContext": "VoltageRegulator",
            "MemberId": "1",
            "RelatedItem@odata.count": 2,
            "LowerThresholdCritical": 4.5,
            "MinReadingRange": null,
```

```
            "ReadingVolts": 5.03,
            "UpperThresholdCritical": 5.5
        },
        {
            "MaxReadingRange": 14.28,
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Systems/1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1"
                }
            ],
            "@odata.id": "/redfish/v1/Chassis/1/Power#/Voltages/2",
            "Status": {
                "State": "Enabled"
            },
            "SensorNumber": 140,
            "Name": "SysBrd 12V",
            "PhysicalContext": "VoltageRegulator",
            "MemberId": "2",
            "RelatedItem@odata.count": 2,
            "LowerThresholdCritical": 10.81,
            "MinReadingRange": null,
            "ReadingVolts": 12.15,
            "UpperThresholdCritical": 13.22
        },
        {
            "MaxReadingRange": 3.32,
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Systems/1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1"
                }
            ],
            "@odata.id": "/redfish/v1/Chassis/1/Power#/Voltages/3",
            "Status": {
                "State": "Enabled"
            },
            "SensorNumber": 3,
            "Name": "CMOS Battery",
            "PhysicalContext": "VoltageRegulator",
            "MemberId": "3",
            "RelatedItem@odata.count": 2,
            "LowerThresholdCritical": 2.25,
            "MinReadingRange": null,
            "LowerThresholdNonCritical": 2.39,
            "ReadingVolts": 3.13
        }
    ],
    "Voltages@odata.count": 4,
    "Redundancy": [
        {
            "@odata.id": "/redfish/v1/Chassis/1/Power#/Redundancy/0",
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            },
            "Name": "PSU Redundancy",
```

```
        "MemberId": "0",
        "MaxNumSupported": 2,
        "Oem": {
            "Lenovo": {
                "NonRedundantAvailablePower": null,
                "PowerRedundancySettings": {
                    "EstimatedUsage": null,
                    "MaxPowerLimitWatts": null,
                    "PowerFailureLimit": null,
                    "PowerRedundancyPolicy": "RedundantWithThrottling"
                },
                "@odata.type": "#LenovoRedundancy.v1_0_0.LenovoRedundancyProperties"
            }
        },
        "RedundancyEnabled": true,
        "RedundancySet": [
            {
                "@odata.id": "/redfish/v1/Chassis/1/Power#/PowerSupplies/1"
            },
            {
                "@odata.id": "/redfish/v1/Chassis/1/Power#/PowerSupplies/0"
            }
        ],
        "MinNumNeeded": 2,
        "Mode": "N+m",
        "RedundancySet@odata.count": 2
    }
],
"Description": "Power Consumption and Power Limiting",
"Name": "Power",
"PowerSupplies@odata.count": 2,
"Oem": {
    "Lenovo": {
        "@odata.type": "#LenovoPower.v1_0_0.Capabilities",
        "LocalPowerControlEnabled": true,
        "PowerOnPermissionEnabled": true,
        "PowerRestorePolicy": "AlwaysOff",
        "WakeOnLANEnabled": true
    }
},
"@odata.type": "#Power.v1_5_1.Power",
"PowerControl": [
    {
        "PowerAllocatedWatts": 424,
        "RelatedItem": [
            {
                "@odata.id": "/redfish/v1/Chassis/1"
            }
        ],
        "@odata.id": "/redfish/v1/Chassis/1/Power#/PowerControl/0",
        "Status": {
            "HealthRollup": "Critical",
            "State": "Enabled"
        },
        "MemberId": "0",
        "Name": "Server Power Control",
        "PowerLimit": {
            "LimitException": "NoAction",
            "LimitInWatts": null
        },
        "PowerAvailableWatts": null,
```

```
        "Oem": {
            "Lenovo": {
                "PowerUtilization": {
                    "MaxLimitInWatts": 424,
                    "EnablePowerCapping": false,
                    "LimitMode": "AC",
                    "EnablePowerCapping@Redfish.Deprecated": "The property is deprecated.
                     Please use LimitInWatts instead.",
                    "CapacityMinAC": 259,
                    "MinLimitInWatts": 0,
                    "GuaranteedInWatts": 259,
                    "CapacityMinDC": 248,
                    "CapacityMaxDC": 405,
                    "CapacityMaxAC": 424
                },
                "HistoryPowerMetric": {
                    "@odata.id": "/redfish/v1/Chassis/1/Power/PowerControl/0/Oem/Lenovo/HistoryPowerMetric"
                },
                "@odata.type": "#LenovoPower.v1_0_0.PowerControl"
            }
        },
        "RelatedItem@odata.count": 1,
        "PowerCapacityWatts": null,
        "PowerMetrics": {
            "IntervalInMin": 60,
            "AverageConsumedWatts": 197.483337,
            "MinConsumedWatts": 190,
            "MaxConsumedWatts": 215
        },
        "PowerConsumedWatts": 207,
        "PowerRequestedWatts": 424
    }
],
"@odata.etag": "\"dcf189ea055a51e8463285d80ad892ac\"",
"@odata.id": "/redfish/v1/Chassis/1/Power",
"PowerSupplies": [
    {
        "SerialNumber": null,
        "InputRanges": [
            {
                "InputType": null,
                "OutputWattage": null,
                "MinimumVoltage": null,
                "MaximumVoltage": null
            }
        ],
        "@odata.id": "/redfish/v1/Chassis/1/Power#/PowerSupplies/0",
        "RelatedItem@odata.count": 1,
        "PowerCapacityWatts": null,
        "PartNumber": null,
        "FirmwareVersion": null,
        "Status": {
            "State": "Absent",
            "Health": null
        },
        "LineInputVoltage": null,
        "Name": "PSU1",
        "MemberId": "0",
        "Oem": {
            "Lenovo": {
                "Location": {
```

```
                "InfoFormat": "Slot X",
                "Info": "Slot 1"
            },
            "HistoryPowerSupplyMetric": {
                "@odata.id": "/redfish/v1/Chassis/1/Power/PowerSupplies/0/Oem/Lenovo/HistoryPowerSupplyMetric"
            },
            "@odata.type": "#LenovoPower.v1_0_0.PowerSupply"
        }
    },
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    ],
    "LineInputVoltageType": null,
    "Manufacturer": null,
    "PowerSupplyType": null,
    "Model": null,
    "LastPowerOutputWatts": null
},
{
    "SerialNumber": "",
    "InputRanges": [
        {
            "InputType": "AC",
            "OutputWattage": 65088,
            "MinimumVoltage": 200,
            "MaximumVoltage": 240
        }
    ],
    "@odata.id": "/redfish/v1/Chassis/1/Power#/PowerSupplies/1",
    "RelatedItem@odata.count": 1,
    "PowerCapacityWatts": 65088,
    "PartNumber": "SP50L09211",
    "FirmwareVersion": "5.12",
    "Status": {
        "State": "Enabled",
        "Health": "Critical"
    },
    "LineInputVoltage": 220,
    "Name": "PSU2",
    "MemberId": "1",
    "LineInputVoltageType": "ACMidLine",
    "Oem": {
        "Lenovo": {
            "Location": {
                "InfoFormat": "Slot X",
                "Info": "Slot 2"
            },
            "HistoryPowerSupplyMetric": {
                "@odata.id": "/redfish/v1/Chassis/1/Power/PowerSupplies/1/Oem/Lenovo/HistoryPowerSupplyMetric"
            },
            "@odata.type": "#LenovoPower.v1_0_0.PowerSupply"
        }
    },
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    ],
    "LastPowerOutputWatts": 198,
```

```
            "Manufacturer": "",
            "Model": "LENOVO-SP50L09211",
            "PowerSupplyType": "AC"
        }
    ]
}
```

PATCH – Update power management properties

Use the PATCH method to update properties in Power resource for Redfish service.

Request URL

`PATCH https://<BMC_IPADDR>/redfish/v1/Chassis/1/Power`

Request body

Properties to be updated are shown as below, all of these properties can be changed individually.

The response is a JSON object that contains the following parameters:

Field	Type	Description
PowerControl	object	Expanded.
PowerLimit	Object	Expanded.
LimitInWatts	Number	The Power limit in watts. Null means power capping disabled.

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
400	PropertyValueTypeError, Conflict
500	Internal server error

Response example

The following example is PATCH body.

```
{
    "PowerControl": [
        {
            "PowerLimit": {
                "LimitInWatts": 800
            }
        }
    ]
}
```

After the PATCH operation runs successfully, querying the Power resource returns below example JSON response:

```
{
    "PowerControl@odata.count": 1,
    "Id": "Power",
    "Redundancy@odata.count": 1,
```

```
    "@odata.context": "/redfish/v1/$metadata#Power.Power",
    "Voltages": [
        ...
    ],
    "Voltages@odata.count": 4,
    "Redundancy": [
        ...
    ],
    "Description": "Power Consumption and Power Limiting",
    "Name": "Power",
    "PowerSupplies@odata.count": 2,
    ...
    "@odata.type": "#Power.v1_5_1.Power",
    "PowerControl": [
        {
            ...
            "PowerLimit": {
                "LimitException": "NoAction",
                "LimitInWatts": 800
            },
            ...
        }
    ],
    "@odata.etag": "\"838a22fd58b15ebf48ba765c296c75e4\"",
    "@odata.id": "/redfish/v1/Chassis/1/Power",
    "PowerSupplies": [
        ...
    ]
}
```

Resource Thermal

This resource is used to represent thermal management for a Redfish implementation.

Number of Resources	1
Resource Path	/redfish/v1/Chassis/1/Thermal
Schema file	Thermal_v1.xml

GET – Thermal management properties

Use the GET method to retrieve properties in Thermal resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Chassis/1/Thermal
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Uniquely identifies the resource within the thermal resource. Always set to “1”.
Name	String	The name of thermal resource. Always sets to “Thermal”.
Description	String	Provides a description of the thermal resource.
Status	Object	Describes the status and health of a resource and its children.
State	String, Null	This indicates the known state of the resource, such as if it is enabled.
HealthRollup	String, Null	This represents the overall health state from the view of this resource.
Temperatures	Array	This is the definition for temperature sensors.
Temperatures[1]	Object	This is the definition for a specified temperature sensor.
MemberId	String	This is the identifier for the member within the collection.
Name	String	The name of this temperature sensor.
LowerThresholdCritical	Number, Null	Below normal range but not yet fatal.
LowerThresholdFatal	Number, Null	Below normal range and is fatal.
LowerThresholdNonCritical	Number, Null	Below normal range.
UpperThresholdCritical	Number, Null	Above normal range but not yet fatal.
UpperThresholdFatal	Number, Null	Above normal range and is fatal.
UpperThresholdNonCritical	Number, Null	Above normal range.
MinReadingRangeTemp	Number, Null	Minimum value for ReadingCelsius.
MaxReadingRangeTemp	Number, Null	Maximum value for ReadingCelsius.
PhysicalContext	String	Describes the area or device to which this temperature measurement applies.
ReadingCelsius	Number, Null	Temperature.
RelatedItem	Array	Describes the areas or devices to which this temperature measurement applies.
SensorNumber	Number, Null	A numerical identifier to represent the temperature sensor.
Status	Object	Describes the status and health of a resource and its children.
State	String, Null	This indicates the known state of the resource, such as if it is enabled.
Fans	Array	This is the definition for fans.
Fan[N]	Object	This is the definition for a specified fan.
MemberId	String	This is the identifier for the member within the collection.

Field	Type	Description
Name	String	Name of the fan.
MaxReadingRange	Number, Null	Maximum value for Reading.
MinReadingRange	Number, Null	Minimum value for Reading.
PhysicalContext	String	Describes the area or device associated with this fan.
Reading	Number, Null	Current fan speed.
ReadingUnits	String, Null	Units in which the reading and thresholds are measured. Always set to “Percent”.
RelatedItem	Array	The ID(s) of the resources serviced with this fan.
Status	Object	Describes the status and health of a resource and its children.
State	String, Null	This indicates the known state of the resource, such as if it is enabled.
Health	String, Null	This represents the health state of this resource in the absence of its dependent resources.
UpperThresholdCritical	Number, Null	Above normal range but not yet fatal.
UpperThresholdFatal	Number, Null	Above normal range and is fatal.
UpperThresholdNonCritical	Number, Null	Above normal range.
LowerThresholdCritical	Number, Null	Below normal range but not yet fatal.
LowerThresholdFatal	Number, Null	Below normal range and is fatal.
LowerThresholdNonCritical	Number, Null	Below normal range.

Response codes

Code	Description
500	Internal server error

Response example

The following example JSON response is returned:


```
{
    "Fans": [
        {
            "UpperThresholdFatal": null,
            "ReadingUnits": "Percent",
            "PhysicalContext": "SystemBoard",
            "LowerThresholdCritical": 5,
            "MinReadingRange": 0,
            "UpperThresholdCritical": null,
            "MaxReadingRange": 100,
            "RelatedItem": [
```

```
                {
                    "@odata.id": "/redfish/v1/Systems/1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1"
                }
            ],
            "Status": {
                "State": "Enabled",
                "Health": "Critical"
            },
            "FanName": "Fan_1_Tach",
            "Reading": 0,
            "UpperThresholdNonCritical": null,
            "Oem": {
                "Lenovo": {
                    "Location": {
                        "InfoFormat": "Slot X",
                        "Info": "Slot 1"
                    }
                }
            },
            "Name": "Fan_1_Tach",
            "MemberId": "0",
            "LowerThresholdNonCritical": null,
            "LowerThresholdFatal": null,
            "@odata.id": "/redfish/v1/Chassis/1/Thermal#/Fans/0"
        },
        ...
        ...
    ],
    "Id": "1",
    "Status": {
        "State": "Enabled",
        "HealthRollup": "Warning"
    },
    "Name": "Thermal",
    "@odata.context": "/redfish/v1/$metadata#Thermal.Thermal",
    "@odata.id": "/redfish/v1/Chassis/1/Thermal",
    "Oem": {
        "Lenovo": {
            "@odata.type": "#LenovoThermal.v1_0_0.Thermal",
            "HistoryTempMetric": {
                "@odata.id": "/redfish/v1/Chassis/1/Thermal/Oem/Lenovo/HistoryTempMetric"
            }
        }
    },
    "@odata.type": "#Thermal.v1_5_0.Thermal",
    "Temperatures": [
        {
            "@odata.id": "/redfish/v1/Chassis/1/Thermal#/Temperatures/0",
            "PhysicalContext": "Intake",
            "LowerThresholdFatal": null,
            "UpperThresholdCritical": 47,
            "RelatedItem": [
                {
                    "@odata.id": "/redfish/v1/Systems/1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1"
                }
```

```
    ],
    "Status": {
        "State": "Enabled"
    },
    "SensorNumber": 128,
    "Name": "Ambient Temp",
    "MaxReadingRangeTemp": 100,
    "UpperThresholdNonCritical": 43,
    "MinReadingRangeTemp": 0,
    "LowerThresholdCritical": null,
    "MemberId": "0",
    "LowerThresholdNonCritical": null,
    "UpperThresholdFatal": 50,
    "ReadingCelsius": 27
},
{
    "@odata.id": "/redfish/v1/Chassis/1/Thermal#/Temperatures/1",
    "PhysicalContext": "CPU",
    "LowerThresholdFatal": null,
    "UpperThresholdCritical": null,
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Systems/1"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Processors/1"
        }
    ],
    "Status": {
        "State": "Enabled"
    },
    "SensorNumber": 132,
    "Name": "CPU1 Temp",
    "MaxReadingRangeTemp": 255,
    "UpperThresholdNonCritical": null,
    "LowerThresholdCritical": null,
    "MinReadingRangeTemp": 0,
    "MemberId": "1",
    "LowerThresholdNonCritical": null,
    "UpperThresholdFatal": null,
    "ReadingCelsius": 40
},
...
...
{
    "@odata.id": "/redfish/v1/Chassis/1/Thermal#/Temperatures/6",
    "PhysicalContext": "Memory",
    "LowerThresholdFatal": null,
    "UpperThresholdCritical": null,
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Systems/1"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    ],
    "Status": {
```

```
                "State": "Enabled"
            },
            "SensorNumber": 48,
            "Name": "DIMM 1 Temp",
            "MaxReadingRangeTemp": 100,
            "UpperThresholdNonCritical": 35,
            "LowerThresholdCritical": null,
            "LowerThresholdNonCritical": null,
            "MinReadingRangeTemp": 0,
            "MemberId": "6",
            "UpperThresholdFatal": null,
            "ReadingCelsius": 32
        },
        ...
        ...
    ],
    "Temperatures@odata.count": 17,
    "@odata.etag": "\"05e0398caeccc2e59dec545336c1f73f\"",
    "Fans@odata.count": 6,
    "Description": "It represents the properties for Temperature and Cooling."
}
```

Chapter 8. BMC Management

Resource Manager

This resource is used to represent manager for a Redfish implementation.

Number of Resources	1
Resource Path	/redfish/v1/Managers/1
Schema file	Manager_v1.xml

GET – BMC management properties

Use the GET method to retrieve properties in manager resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Managers/1
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Always set to 1.
Name	String	“Manager”.
Actions	Object	Expanded.
#Manager.Reset	Object	Expanded.
title	String	“Reset”.
target	Link	The link of this action.
ResetType@Redfish.AllowableValues	Array	Items: string. Item count: 2.
ResetType@Redfish.AllowableValues[0]	String	“GracefulRestart”. It indicates BMC will be restarted in a graceful way.
ResetType@Redfish.AllowableValues[1]	String	“ForceRestart”. It indicates BMC will be immediately restarted.
CommandShell	Object	Expanded.
ServiceEnabled	Boolean	True, if SSH is enabled. False, if SSH is disabled.
MaxConcurrentSessions	Integer	2
ConnectTypesSupported	Array	SSH. Currently only SSH is supported.

Field	Type	Description
DateTime	String	The current DateTime (with offset) for the manager, used to set or read time.
DateTimeLocalOffset	String	The time offset from UTC that the DateTime property is set to in format: +06:00 .
Description	String	“This resource is used to represent a management subsystem for a Redfish implementation.”
GraphicalConsole	Object	Expanded.
ServiceEnabled	Boolean	True, if FOD key is installed.
MaxConcurrentSessions	Integer	6.
ConnectTypesSupported	Array	Items: string. Item count: 1.
ConnectTypesSupported[0]	String	“KVMIP”.
ManagerType	String	This property represents the type of manager that this resource represents. This property represents the type of manager that this resource represents. The value is “BMC(A controller which provides management functions for a single computer system)”.
Model	String	The model information of this Manager as defined by the manufacturer. The value is “Lenovo XClarity Controller”.
EthernetInterfaces	Link	A link to a URI reference to collection of Ethernet interface. This is a reference to a collection of NICs that this manager uses for network communication.
HostInterfaces	Link	A link to a URI reference to collection of host interface. This is a reference to a collection of NICs that host uses for network communication.
LogServices	Link	A link to a URI reference to collection of log service which is a collection of Logs used by the manager.
NetworkProtocol	Link	A link to a URI reference to collection of network protocol which is a reference to network services and their settings that the manager controls.
SerialInterfaces	Link	A link to a URI reference to collection of serial interface that this manager uses for serial and console communication.
VirtualMedia	Link	A link to a URI reference to collection of virtual media which are for the use of this manager.
FirmwareVersion	String	Firmware version of this Manager.
Links	Object	References to resources that are related to, but not contained by (subordinate to) this resource.
ManagerForChassis	Array	An array of references to the chassis that this manager has control over."
ManagerForChassis[0]	Link	The value of this property is a URI reference to a resource of chassis.
ManagerForServers	Array	An array of references to the systems that this manager has control over.
ManagerForServers[0]	Link	The value of this property is a URI reference to a resource of computer system.

Field	Type	Description
PowerState	Object	The value of this property indicates power state. It is always “On”.
SerialConsole	Object	Expanded.
ConnectTypesSupported	Array	Items: string. Item count: 2.
ConnectTypesSupported[0]	String	“IPMI”.
ConnectTypesSupported[1]	String	“SSH”.
MaxConcurrentSessions	Integer	2.
ServiceEnabled	Boolean	True, if SSH is enabled. False, if SSH is disabled.
ServiceEntryPointUUID	String	The value of this property indicates UUID of service entry point.
Status	Object	Expanded.
State	String	The value of this property indicates state of manager. It is always “Enabled”.
UUID	String	The value of this property indicates UUID of manager.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "DateTimeLocalOffset": "+00:00",
    "Id": "1",
    "NetworkProtocol": {
        "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol"
    },
    "ManagerType": "BMC",
    "@odata.context": "/redfish/v1/$metadata#Manager.Manager",
    "SerialConsole": {
        "MaxConcurrentSessions": 2,
        "ConnectTypesSupported": [
            "IPMI",
            "SSH"
        ],
        "ServiceEnabled": true
    },
    "Links": {
        "ManagerForChassis": [
            {
                "@odata.id": "/redfish/v1/Chassis/1"
            }
        ],
        "ManagerForServers": [
            {
                "@odata.id": "/redfish/v1/Systems/1"
```

```
        }
    ]
},
"Model": "Lenovo XClarity Controller",
"Oem": {
    "Lenovo": {
        "Configuration": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/Configuration"
        },
        "FoD": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/FoD"
        },
        "Security": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/Security"
        },
        "RemoteControl": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/RemoteControl"
        },
        "DateTimeService": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/DateTimeService"
        },
        "Watchdogs": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/Watchdogs"
        },
        "@odata.type": "#LenovoManager.v1_0_0.LenovoManagerProperties",
        "RemoteMap": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/RemoteMap"
        },
        "ServerProfile": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/ServerProfile"
        },
        "ServiceData": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/ServiceData"
        },
        "Recipients": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/Recipients"
        }
    }
},
"SerialInterfaces": {
    "@odata.id": "/redfish/v1/Managers/1/SerialInterfaces"
},
"VirtualMedia": {
    "@odata.id": "/redfish/v1/Managers/1/VirtualMedia"
},
"Description": "This resource is used to represent a management subsystem for a Redfish implementation.",
"CommandShell": {
    "MaxConcurrentSessions": 2,
    "ConnectTypesSupported": [
        "SSH"
    ],
    "ServiceEnabled": true
},
"@odata.id": "/redfish/v1/Managers/1",
"FirmwareVersion": "DVI999G 2.40 2018-11-16",
"UUID": "CODE1429-239C-B701-A5AE-000AF7B80C26",
"Status": {
    "State": "Enabled"
},
"HostInterfaces": {
    "@odata.id": "/redfish/v1/Managers/1/HostInterfaces"
```

```
    },
    "Name": "Manager",
    "Actions": {
        "#Manager.Reset": {
            "target": "/redfish/v1/Managers/1/Actions/Manager.Reset",
            "title": "Reset",
            "ResetType@Redfish.AllowableValues": [
                "GracefulRestart",
                "ForceRestart"
            ]
        }
    },
    "ServiceEntryPointUUID": "C0DE1429-239C-B701-A5AE-000AF7B80C26",
    "DateTime": "2019-01-02T09:38:21+00:00",
    "@odata.type": "#Manager.v1_5_0.Manager",
    "GraphicalConsole": {
        "MaxConcurrentSessions": 6,
        "ServiceEnabled": true,
        "ConnectTypesSupported": [
            "KVMIP"
        ]
    },
    "PowerState": "On",
    "@odata.etag": "\"471ef01ff9d0636cb4938256825f6f47\"",
    "LogServices": {
        "@odata.id": "/redfish/v1/Systems/1/LogServices"
    },
    "EthernetInterfaces": {
        "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces"
    }
}
```


PATCH – Update BMC time zone and other oem properties

Use the PATCH method to update properties in Manager resource for Redfish service.

Request URL

```
PATCH https://<BMC_IPADDR>/redfish/v1/Managers/1
```

Request parameters

Properties to be updated are shown as below, all of these properties can be changed individually.

Field	Type	Description
DateTime-LocalOffset	String	The time offset from UTC that the DateTime property is set to. Allowable values list as follows: “+00:00”, “+01:00”, “+02:00”, “+03:00”, “+03:30”, “+04:00”, “+04:30”, “+05:00”, “+05:30”, “+05:45”, “+06:00”, “+06:30”, “+07:00”, “+08:00”, “+09:00”, “+09:30”, “+10:00”, “+11:00”, “+12:00”, “+13:00”, “-12:00”, “-11:00”, “-10:00”, “-09:00”, “-08:00”, “-07:00”, “-06:00”, “-05:00”, “-04:30”, “-04:00”, “-03:30”, “-03:00”, “-02:00”, “-01:00” This property can’t be patched when DST is enabled or host time is local time.

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
500	Internal server error

Response example

The following example is PATCH body.

```
{
"DateTimeLocalOffset" : "+08:00"
}
```

The resource updated is returned.


```
{
    "DateTimeLocalOffset": "+08:00",
    "HostInterfaces": {
        "@odata.id": "/redfish/v1/Managers/1/HostInterfaces"
    },
    "NetworkProtocol": {
        "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol"
    },
    "PowerState": "On",
    "@odata.context": "/redfish/v1/$metadata#Manager.Manager",
    "@odata.etag": "\"f0e1d7b49cb0d49c10ba31c425c88789\"",
    "Description": "This resource is used to represent a management subsystem for a Redfish implementation.",
    "LogServices": {
        "@odata.id": "/redfish/v1/Systems/1/LogServices"
    },
    "Links": {
        "ManagerForChassis": [
            {
                "@odata.id": "/redfish/v1/Chassis/1"
            }
        ],
        "ManagerForServers": [
            {
                "@odata.id": "/redfish/v1/Systems/1"
            }
        ]
    },
    "DateTime": "2019-01-08T08:50:29+00:00",
    "VirtualMedia": {
        "@odata.id": "/redfish/v1/Managers/1/VirtualMedia"
    },
    "SerialInterfaces": {
        "@odata.id": "/redfish/v1/Managers/1/SerialInterfaces"
    },
    "ManagerType": "BMC",
    "Actions": {
        "#Manager.Reset": {
            "target": "/redfish/v1/Managers/1/Actions/Manager.Reset",
            "title": "Reset",
            "ResetType@Redfish.AllowableValues": [
                "GracefulRestart",
```

```
            "ForceRestart"
        ]
    }
},
"CommandShell": {
    "MaxConcurrentSessions": 2,
    "ConnectTypesSupported": [
        "SSH"
    ],
    "ServiceEnabled": true
},
"UUID": "C0B1BC89-B09C-B701-D9E3-000AF7B80C26",
"Status": {
    "State": "Enabled"
},
"FirmwareVersion": "DVI999G 2.40 2018-11-16",
"Name": "Manager",
"Id": "1",
"ServiceEntryPointUUID": "C0B1BC89-B09C-B701-D9E3-000AF7B80C26",
"Oem": {
    "Lenovo": {
        "Configuration": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/Configuration"
        },
        "FoD": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/FoD"
        },
        "ServiceData": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/ServiceData"
        },
        "RemoteControl": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/RemoteControl"
        },
        "DateTimeService": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/DateTimeService"
        },
        "@odata.type": "#LenovoManager.v1_0_0.LenovoManagerProperties",
        "Watchdogs": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/Watchdogs"
        },
        "RemoteMap": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/RemoteMap"
        },
        "ServerProfile": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/ServerProfile"
        },
        "Security": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/Security"
        },
        "Recipients": {
            "@odata.id": "/redfish/v1/Managers/1/Oem/Lenovo/Recipients"
        }
    }
},
"@odata.type": "#Manager.v1_5_0.Manager",
"GraphicalConsole": {
    "MaxConcurrentSessions": 6,
    "ConnectTypesSupported": [
        "KVMIP"
    ],
    "ServiceEnabled": true
```

```
    },
    "@odata.id": "/redfish/v1/Managers/1",
    "SerialConsole": {
        "MaxConcurrentSessions": 2,
        "ConnectTypesSupported": [
            "IPMI",
            "SSH"
        ],
        "ServiceEnabled": true
    },
    "Model": "Lenovo XClarity Controller",
    "EthernetInterfaces": {
        "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces"
    }
}
```

POST – BMC reset

Use the POST method to reset the BMC.

Request URL

`POST https://<BMC_IPADDR>/redfish/v1/Managers/1/Actions/Manager.Reset`

Request body

Code	Type	Description
Reset-Type	String	It indicates the reset type for bmc. Valid values: “GracefulRestart", “ForceRestart”

Response body

None

Response codes

Code	Description
500	Internal server error

Response example

The following example is POST body.

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

The following example JSON response is returned:

None

Chapter 9. Network management

Resource EthernetInterface (BMC NIC)

This resource is used to represent the BMC ethernet Interfaces for a Redfish implementation.

Number of Resources	2
Resource Path	/redfish/v1/Managers/1/EthernetInterfaces/{NIC, ToHost}
Schema file	EthernetInterfaceCollection_v1.xml EthernetInterface_v1.xml

GET – Collection of BMC ethernet interface properties

Use the GET method to retrieve properties in Ethernet interface collection resource for a BMC.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/Managers/1/EthernetInterfaces`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Members	Array	Items: A reference link of the elements of EthernetInterface.
Name	String	EthernetInterfaceCollection.
Descrpition	String	A collection of EthernetInterface resource instances.

Response codes

Code	Description
500	Internal server error

Response example

The following example JSON response is returned:

```
{
    "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/",
    "Members@odata.navigationLink": "/redfish/v1/Managers/1/EthernetInterfaces/Members",
    "@odata.context": "/redfish/v1/$metadata#EthernetInterfaceCollection.EthernetInterfaceCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/NIC"
        },
        {
            "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/ToHost/"
        }
```

```
    ],
    "@odata.type": "#EthernetInterfaceCollection.EthernetInterfaceCollection",
    "Members@odata.count": 2,
    "@odata.etag": "W/\"2c1c23716af1c5923cd282e099d381d6\"",
    "Name": "EthernetInterfaceCollection",
    "Description": "A Collection of EthernetInterface resource instances."
}
```

GET – BMC Ethernet properties

Use the GET method to retrieve properties in Ethernet interface resource for a BMC.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Managers/1/EthernetInterfaces/NIC
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
FQDN	String,	The complete, fully qualified domain name for this XCC interface
IPv6DefaultGateway	String	The current IPv6 default gateway address that is in use on this XCC interface
Id	String	{1..N}
IPv6StaticAddresses	Array	An array of objects used to represent the IPv6 static connection characteristics for this XCC interface
IPv6StaticAddresses	Object	Array element
PrefixLength	Nunber	The Prefix Length of this IPv6 address
Address	String	A valid IPv6 address
AutoNeg	Boolean	Indicates if the speed and duplex are automatically negotiated and configured on this XCC interface: • True. Auto negotiation of speed and duplex is enabled. • False. Auto negotiation of speed and duplex is disabled.
IPv6AddressPolicyTable	Array	An array of objects used to represent the Address Selection Policy Table as defined in RFC 6724
IPv6AddressPolicyEntry	Object	Array element
SpeedMbps	String	The current speed in Mbps of this XCC interface(units: Mbit/s)
HostName	String	The host name for this XCC interface, without any domain information.
IPv6Addresses	Array	An array of objects used to represent the IPv6 connection characteristics for this XCC interface
IPv6Address	Object	Array element
Address	String	The IPv6 Address
PrefixLength	Number	The IPv6 Address Prefix Length

Field	Type	Description
AddressOrigin	String	The type of the IPv6 address origin for this XCC interface: • Static. A static address as configured by the user. • DHCPv6. Address is provided by a DHCPv6 service. • LinkLocal. Address is valid only for this network segment (link). • SLAAC. Address is provided by a Stateless Address AutoConfiguration (SLAAC) service.
AddressState	String	The current state of this address as defined in RFC 4862: • Preferred. This address is currently within both it's valid and preferred lifetimes as defined in RFC 4862. • Deprecated. This address is currently within it's valid lifetime, but is now outside of it's preferred lifetime as defined in RFC 4862. • Tentative. This address is currently undergoing Duplicate Address Detection testing as defined in RFC 4862 section 5.4. • Failed. This address has failed Duplicate Address Detection testing as defined in RFC 4862 section 5.4 and is not currently in use."
FullDuplex	Boolean	The duplex status of the Ethernet connection on this XCC interface: • True. In Full Duplex mode. • False. Not in Full Duplex mode.
IPv4Address	Array	An array of objects used to represent the IPv4 connection characteristics for this XCC interface
IPv4Address	Object	Array element
Address	String	the IPv4 Address
SubnetMask	String	the IPv4 Subnet mask.
AddressOrigin	String	This indicates how the address was determined: • Static. A static address as configured by the user. • DHCP. Address is provided by a DHCPv4 service. • BOOTP. Address is provided by a BOOTP service. • IPv4LinkLocal . Address is valid only for this network segment (link).
Gateway	String	the IPv4 gateway for this address
NameServers	Array	DNS name servers that are currently in use on this XCC interface (IPv4 1st,2nd, 3rd ip address, IPv6 1st,2nd, 3rd ip address)
InterfaceEnabled	Boolean	A boolean indicating whether this interface is enabled
MACAddress	String	The currently configured MAC address of the (logical port) interface.
PermanentMACAddress	String	The permanent MAC address assigned to this interface (port).
Name	String	The name of the resource(eth1/eth0/usb0)
MTUSize	Number	The currently configured Maximum Transmission Unit (MTU) in bytes on this XCC interface
VLAN	Link	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.
VLANEnable	Boolean	The property of VLAN is Enable or not.

Field	Type	Description
VLANId	Number	The Id of VLAN.
MaxIPv6StaticAddresses	Number	The maximum number of IPv6 static address.
DHCPv4	Object	Expanded.
UseDNSServers	Boolean	Use DNS servers or not.
UseDomainName	Boolean	Use Domain Name or not.
DHCPEnabled	Boolean	The DHCP is Enabled or not.
UseNTPServers	Boolean	Not used, always null.
UseGateway	Boolean	Not used, always null.
UseStaticRoutes	Boolean	Not used, always null.
DHCPv6	Object	Expanded
UseDNSServers	Boolean	Use DNS servers or not.
UseDomainName	Boolean	Use Domain Name or not.
OperatingMode	String	The operating mode is Stateful or Disabled.
UseNTPServers	Boolean	Not used, always null.
UseRapidCommit	Boolean	Not used, always null.
IPv6StaticDefaultGateways	Array	Not used, always null.
StaticNameServers	Array	Items: string Items count: 6
StatelessAddressAutoConfig	Object	Expanded
IPv4AutoConfigEnabled	Boolean	Not used, always null. Only in NIC has this property.
IPv6AutoConfigEnabled	Boolean	Enable IPv6 Auto Config or not.
Description	String	Fixed string “Manager Ethernet Interface”

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "FQDN": "XCC.lenovo.com",
    "Id": "NIC",
    "Links": {
        "Chassis": {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    },
    "AutoNeg": true,
    "IPv6AddressPolicyTable": [
        {
            "Precedence": 10,
```

```
            "Prefix": "::1/128",
            "Label": 0
        },
        {
            "Precedence": 10,
            "Prefix": "::/96",
            "Label": 3
        },
        {
            "Precedence": 10,
            "Prefix": "::ffff:0.0.0.0/96",
            "Label": 4
        },
        {
            "Precedence": 10,
            "Prefix": "2001::/32",
            "Label": 6
        },
        {
            "Precedence": 10,
            "Prefix": "2001:10::/28",
            "Label": 7
        },
        {
            "Precedence": 10,
            "Prefix": "3ffe::/16",
            "Label": 12
        },
        {
            "Precedence": 10,
            "Prefix": "2002::/16",
            "Label": 2
        },
        {
            "Precedence": 10,
            "Prefix": "fec0::/10",
            "Label": 11
        },
        {
            "Precedence": 10,
            "Prefix": "fc00::/7",
            "Label": 5
        },
        {
            "Precedence": 10,
            "Prefix": "::/0",
            "Label": 1
        }
    ],
    "IPv6Addresses": [
        {
            "Address": "fe80::a94:efff:fe40:2e55",
            "AddressOrigin": "LinkLocal",
            "PrefixLength": 64,
            "AddressState": "Preferred"
        }
    ],
    "FullDuplex": null,
    "IPv4Addresses": [
        {
            "Address": "10.104.195.190",
```

```
            "SubnetMask": "255.255.255.0",
            "Gateway": "10.104.195.254",
            "AddressOrigin": "DHCP"
        }
    ],
    "IPv4StaticAddresses": [
        {
            "Address": "192.168.70.125",
            "SubnetMask": "255.255.255.0",
            "Gateway": "0.0.0.0",
            "AddressOrigin": "Static"
        }
    ],
    "IPv6StaticDefaultGateways": [],
    "Name": "Manager Ethernet Interface",
    "DHCPv6": {
        "OperatingMode": "Stateful",
        "UseNTPServers": null,
        "UseDomainName": true,
        "UseRapidCommit": null,
        "UseDNSServers": true
    },
    "@odata.type": "#EthernetInterface.v1_4_1.EthernetInterface",
    "LinkStatus": "LinkUp",
    "@odata.etag": "\"4d1a64abd6f2cf1bcfad5fcc8a82fdad\"",
    "IPv6DefaultGateway": "::",
    "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/NIC",
    "@odata.context": "/redfish/v1/$metadata#EthernetInterface.EthernetInterface",
    "SpeedMbps": null,
    "HostName": "XCC-7X00-1234567890",
    "StaticNameServers": [
        "0.0.0.0",
        "0.0.0.0",
        "0.0.0.0",
        "::",
        "::",
        "::"
    ],
    "DHCPv4": {
        "UseDNSServers": true,
        "UseGateway": null,
        "UseNTPServers": null,
        "UseDomainName": true,
        "DHCPEnabled": true,
        "UseStaticRoutes": null
    },
    "VLAN": {
        "VLANEnable": false,
        "VLANId": 1
    },
    "Status": {
        "State": "Enabled",
        "Health": null
    },
    "MACAddress": "08:94:ef:40:2e:55",
    "StatelessAddressAutoConfig": {
        "IPv4AutoConfigEnabled": null,
        "IPv6AutoConfigEnabled": true
    },
    "InterfaceEnabled": true,
    "NameServers": [
```

```
        "10.96.1.18",
        "10.96.1.19",
        "0.0.0.0",
        "::",
        "::",
        "::"
    ],
    "MaxIPv6StaticAddresses": 1,
    "MTUSize": 1500,
    "Oem": {
        "Lenovo": {
            "IPv6AddressAssignedby": [
                "LinkLocal",
                "DHCPv6",
                "SLAAC"
            ],
            "InterfaceFailoverMode": "None",
            "IPv4AddressAssignedby": "DHCPFirstThenStatic",
            "NetworkSettingSync": true,
            "IPv4Enabled": true,
            "@odata.type": "#LenovoEthernetInterface.v1_0_0.LenovoEthernetInterfaceProperties",
            "IPv6Enabled": true,
            "DomainName": "lenovo.com",
            "InterfaceNicMode": "Dedicated"
        }
    },
    "Description": "Manager Ethernet Interface",
    "PermanentMACAddress": "08:94:ef:40:2e:55",
    "IPv6StaticAddresses": [
        {
            "Address": "::",
            "PrefixLength": 64
        }
    ]
}
```


PATCH – Update BMC Ethernet configurations

Use the PATCH method to update properties in Ethernet interface resource for a BMC.

Request URL

`PATCH https://<BMC_IPADDR>/redfish/v1/Managers/1/EthernetInterfaces/NIC`

Request body

Properties to be updated are shown below:

Field	Type	Description
InterfaceEnabled	Boolean	A boolean indicating whether this interface is enabled.
MACAddress	String	The currently configured MAC address of the (logical port) interface.
SpeedMbps	String	The current speed in Mbps of this XCC interface(units: Mbit/s) The property value should be between 10 and 100.

Field	Type	Description
AutoNeg	Boolean	Indicate if the speed and duplex are automatically negotiated and configured on this XCC interface: True. Auto negotiation of speed and duplex is enabled. False. Auto negotiation of speed and duplex is disabled.
FullDuplex	Boolean	The duplex status of the Ethernet connection on this XCC interface: True. In Full Duplex mode. False. Not in Full Duplex mode.
MTUSize	Number	The currently configured Maximum Transmission Unit (MTU) in bytes on this XCC interface
HostName	String	The host name for this XCC interface, without any domain information.
IPv4StaticAddresses	Array	An array of objects used to represent the IPv4 connection characteristics for this XCC interface
IPv6StaticAddresses	Array	An array of objects used to represent the IPv6 static connection characteristics for this XCC interface
VLAN	Link	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.
VLANEnable	Boolean	The property of VLAN is Enable or not.
VLANId	Number	The Id of VLAN.
DHCPv4	Object	Expanded
DHCPEnabled	Boolean	The DHCP is Enabled or not.
UseDNSServers	Boolean	Use DNS servers or not.
UseDomainName	Boolean	Use Domain Name or not.
DHCPv6	Object	Expanded
OperatingMode	String	The property of operating mode. The value should be “Stateful” or “Disabled”.
UseDNSServers	Boolean	Use DNS servers or not.
UseDomainName	Boolean	Use Domain Name or not.
StaticNameServers	Array	Items: string Items count: 6
StatelessAddressAutoConfig	Object	Expanded
IPv6AutoConfigEnabled	Boolean	Enable IPv6 Auto Config or not.

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
400	PropertyValueNotInList, PropertyValueFormatError, PropertyValueTypeError, PropertyNotWritable
500	Internal server error

Response example

The following example is PATCH body.

```
{
"MTUSize": 1490,
"SpeedMbps": 100,
"FullDuplex": true
}
```

The resource after updated is returned.

```
{
    "FQDN": "XCC.lenovo.com",
    "Id": "NIC",
    "Links": {
        "Chassis": {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    },
    "AutoNeg": true,
    "IPv6AddressPolicyTable": [
        {
            "Precedence": 10,
            "Prefix": "::1/128",
            "Label": 0
        },
        {
            "Precedence": 10,
            "Prefix": "::/96",
            "Label": 3
        },
        {
            "Precedence": 10,
            "Prefix": "::ffff:0.0.0.0/96",
            "Label": 4
        },
        {
            "Precedence": 10,
            "Prefix": "2001::/32",
            "Label": 6
        },
        {
            "Precedence": 10,
            "Prefix": "2001:10::/28",
            "Label": 7
        },
        {
            "Precedence": 10,
            "Prefix": "3ffe::/16",
            "Label": 12
        },
        {
```

```
            "Precedence": 10,
            "Prefix": "2002::/16",
            "Label": 2
        },
        {
            "Precedence": 10,
            "Prefix": "fec0::/10",
            "Label": 11
        },
        {
            "Precedence": 10,
            "Prefix": "fc00::/7",
            "Label": 5
        },
        {
            "Precedence": 10,
            "Prefix": "::/0",
            "Label": 1
        }
    ],
    "IPv6Addresses": [
        {
            "Address": "fe80::a94:efff:fe40:2e55",
            "AddressOrigin": "LinkLocal",
            "PrefixLength": 64,
            "AddressState": "Preferred"
        }
    ],
    "FullDuplex": null,
    "IPv4Addresses": [
        {
            "Address": "10.104.195.190",
            "SubnetMask": "255.255.255.0",
            "Gateway": "10.104.195.254",
            "AddressOrigin": "DHCP"
        }
    ],
    "IPv4StaticAddresses": [
        {
            "Address": "192.168.70.125",
            "SubnetMask": "255.255.255.0",
            "Gateway": "0.0.0.0",
            "AddressOrigin": "Static"
        }
    ],
    "IPv6StaticDefaultGateways": [],
    "Name": "Manager Ethernet Interface",
    "DHCPv6": {
        "OperatingMode": "Stateful",
        "UseNTPServers": null,
        "UseDomainName": true,
        "UseRapidCommit": null,
        "UseDNSServers": true
    },
    "@odata.type": "#EthernetInterface.v1_4_1.EthernetInterface",
    "LinkStatus": "LinkUp",
    "@odata.etag": "\"967bc900882c80d89b846f82f5487fed\"",
    "IPv6DefaultGateway": "::",
    "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/NIC",
    "@odata.context": "/redfish/v1/$metadata#EthernetInterface.EthernetInterface",
    "SpeedMbps": null,
```

```
"HostName": "XCC-7X00-1234567890",
"StaticNameServers": [
    "0.0.0.0",
    "0.0.0.0",
    "0.0.0.0",
    "::",
    "::",
    "::"
],
"DHCPv4": {
    "UseDNSServers": true,
    "UseGateway": null,
    "UseNTPServers": null,
    "UseDomainName": true,
    "DHCPEnabled": true,
    "UseStaticRoutes": null
},
"VLAN": {
    "VLANEnable": false,
    "VLANId": 1
},
"Status": {
    "State": "Enabled",
    "Health": null
},
"MACAddress": "08:94:ef:40:2e:55",
"StatelessAddressAutoConfig": {
    "IPv4AutoConfigEnabled": null,
    "IPv6AutoConfigEnabled": true
},
"InterfaceEnabled": true,
"NameServers": [
    "10.96.1.18",
    "10.96.1.19",
    "0.0.0.0",
    "::",
    "::",
    "::"
],
"MaxIPv6StaticAddresses": 1,
"MTUSize": 1490,
"Oem": {
    "Lenovo": {
        "IPv6AddressAssignedby": [
            "LinkLocal",
            "DHCPv6",
            "SLAAC"
        ],
        "InterfaceFailoverMode": "None",
        "IPv4AddressAssignedby": "DHCPFirstThenStatic",
        "NetworkSettingSync": true,
        "IPv4Enabled": true,
        "@odata.type": "#LenovoEthernetInterface.v1_0_0.LenovoEthernetInterfaceProperties",
        "IPv6Enabled": true,
        "DomainName": "lenovo.com",
        "InterfaceNicMode": "Dedicated"
    }
},
"Description": "Manager Ethernet Interface",
"PermanentMACAddress": "08:94:ef:40:2e:55",
"IPv6StaticAddresses": [
```

```
        {
            "Address": "::",
            "PrefixLength": 64
        }
    ]
}
```

PATCH – Update BMC Ethernet over USB configurations

Use the PATCH method to update properties in Ethernet interface resource for a BMC.

Request URL

`PATCH https://<BMC_IPADDR>/redfish/v1/Managers/1/EthernetInterfaces/ToHost/`

Request body

Properties to be updated are shown as bellow, all of these properties can be changed individually.

Field	Type	Description
InterfaceEnabled	Boolean	A boolean indicating whether this interface is enabled.
IPv4StaticAddress-es	Array	An array of objects used to represent the IPv4 connection characteristics for this XCC interface. Only the static IPv4 address can be updated.

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
500	Internal server error

Response example

The following example is PATCH body.

```
{
"IPv4Addresses": [
        {
            "Address": "169.254.95.119",
            "SubnetMask": "255.255.0.0",
            "Gateway": "0.0.0.0",
            "AddressOrigin": "Static"
        }
    ]
}
```

The resource after updated is returned.

```
{
    "Id": "ToHost",
    "Links": {
        "Chassis": {
            "@odata.id": "/redfish/v1/Chassis/1"
        },
        "HostInterface": {
            "@odata.id": "/redfish/v1/Managers/1/HostInterfaces/1"
```

```
    }
},
"AutoNeg": false,
"@odata.context": "/redfish/v1/$metadata#EthernetInterface.EthernetInterface",
"SpeedMbps": 100,
"Description": "Management Network Interface",
"IPv6Addresses": [
    {
        "Address": "fe80::a94:efff:fe40:2e56",
        "AddressOrigin": "LinkLocal",
        "PrefixLength": 64,
        "AddressState": "Preferred"
    }
],
"FullDuplex": true,
"StaticNameServers": [
    "0.0.0.0",
    "0.0.0.0",
    "0.0.0.0",
    "::",
    "::",
    "::"
],
"DHCPv4": {
    "UseDNSServers": false,
    "UseGateway": null,
    "UseNTPServers": null,
    "UseDomainName": false,
    "DHCPEnabled": false,
    "UseStaticRoutes": null
},
"IPv4Addresses": [
    {
        "Address": "169.254.95.118",
        "SubnetMask": "255.255.0.0",
        "Gateway": "0.0.0.0",
        "AddressOrigin": "Static"
    }
],
"IPv4StaticAddresses": [
    {
        "Address": "169.254.95.119",
        "SubnetMask": "255.255.0.0",
        "Gateway": "0.0.0.0",
        "AddressOrigin": "Static"
    }
],
"@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/ToHost",
"IPv6StaticDefaultGateways": [],
"InterfaceEnabled": true,
"IPv6AddressPolicyTable": [
    {
        "Precedence": 10,
        "Prefix": "::1/128",
        "Label": 0
    },
    {
        "Precedence": 10,
        "Prefix": "::/96",
        "Label": 3
    },
```

```
        {
            "Precedence": 10,
            "Prefix": "::ffff:0.0.0.0/96",
            "Label": 4
        },
        {
            "Precedence": 10,
            "Prefix": "2001::/32",
            "Label": 6
        },
        {
            "Precedence": 10,
            "Prefix": "2001:10::/28",
            "Label": 7
        },
        {
            "Precedence": 10,
            "Prefix": "3ffe::/16",
            "Label": 12
        },
        {
            "Precedence": 10,
            "Prefix": "2002::/16",
            "Label": 2
        },
        {
            "Precedence": 10,
            "Prefix": "fec0::/10",
            "Label": 11
        },
        {
            "Precedence": 10,
            "Prefix": "fc00::/7",
            "Label": 5
        },
        {
            "Precedence": 10,
            "Prefix": "::/0",
            "Label": 1
        }
    ],
    "Status": {
        "State": "Enabled",
        "Health": null
    },
    "MACAddress": "08:94:ef:40:2e:56",
    "Name": "Manager Ethernet Over USB Interface",
    "MaxIPv6StaticAddresses": 0,
    "StatelessAddressAutoConfig": {
        "IPv4AutoConfigEnabled": null,
        "IPv6AutoConfigEnabled": false
    },
    "Oem": {
        "Lenovo": {
            "@odata.type": "#LenovoEthernetInterface.v1_0_0.LenovoEthernetInterfaceProperties",
            "OSIPv4Address": "169.254.95.120",
            "AddressMode": "IPv6LLA",
            "PortForwarding": {
                "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/ToHost/Oem/Lenovo/PortForwarding"
            }
        }
```

```
    },
    "@odata.type": "#EthernetInterface.v1_4_1.EthernetInterface",
    "MTUSize": 1500,
    "LinkStatus": "LinkDown",
    "@odata.etag": "\"4357f4e721c4bcaa2321f3fa3dd5280c\"",
    "PermanentMACAddress": "08:94:ef:40:2e:56",
    "DHCPv6": {
        "OperatingMode": "Disabled",
        "UseNTPServers": null,
        "UseDomainName": false,
        "UseRapidCommit": null,
        "UseDNSServers": false
    },
    "@Message.ExtendedInfo": [
        {
            "MessageArgs": [
                "AddressOrigin"
            ],
            "Resolution": "Remove the property from the request body and resubmit the request if the operation failed.",
            "MessageId": "Base.1.4.PropertyNotWritable",
            "Severity": "Warning",
            "Message": "The property AddressOrigin is a read only property and cannot be assigned a value.",
            "@odata.type": "#Message.v1_0_6.Message"
        },
        {
            "MessageArgs": [
                "Gateway"
            ],
            "Resolution": "Remove the property from the request body and resubmit the request if the operation failed.",
            "MessageId": "Base.1.4.PropertyNotWritable",
            "Severity": "Warning",
            "Message": "The property Gateway is a read only property and cannot be assigned a value.",
            "@odata.type": "#Message.v1_0_6.Message"
        }
    ]
}
```


Resource EthernetInterface (Server NIC)

This resource is used to represent the Server Ethernet Interfaces for a Redfish implementation.

Number of Resources	Number of server Ethernet interfaces
Resource Path	/redfish/v1/Systems/1/EthernetInterfaces/NIC{1-N}, ToManager
Schema file	EthernetInterfaceCollection_v1.xml EthernetInterface_v1.xml

GET – Collection of server Ethernet interfaces

Use the GET method to retrieve properties in Ethernet interface collection resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/EthernetInterfaces
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Members	Array	Items: A reference link of the elements of EthernetInterface
Name	String	EthernetInterfaceCollection
Description	String	A collection of EthernetInterface resource instances.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces",
    "Name": "EthernetInterfaceCollection",
    "@odata.context": "/redfish/v1/$metadata#EthernetInterfaceCollection.EthernetInterfaceCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces/ToManager"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces/NIC1"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces/NIC2"
        }
    ],
    "@odata.type": "#EthernetInterfaceCollection.EthernetInterfaceCollection",
    "@odata.etag": "\"796d097492fa96e3f9e0be275beba605\"",
    "Members@odata.count": 3,
    "Description": "A collection of EthernetInterface resource instances."
}
```

GET – Server Ethernet interface properties

Use the GET method to retrieve properties in Ethernet interface resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/EthernetInterfaces/NIC{1…N}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	NIC{1..N}
SpeedMbps	String, Null	The current speed in Mbps of this XCC interface(units: Mbit/s)
InterfaceEnabled	Boolean, Null	A boolean indicating whether this interface is enabled
MACAddress	String	The currently configured MAC address of the (logical port) interface.
PermanentMACAddress	String	The permanent MAC address assigned to this interface (port).
Name	String	"External Ethernet Interface"
LinkStatus	String	The link status of this interface (port)
Status	Object	Expand
State	String	“Enabled” if having agentless data
Health	String	“OK” if having agentless data.
Links	Object	Expand
Chassis	Link	The value is a reference to the resource “Chassis” that represent the physical container.
Description	String	External Network Interface

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "InterfaceEnabled": true,
    "Links": {
        "Chassis": {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    },
    "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces/NIC1",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "MACAddress": "00:90:FA:A2:07:1E",
    "Name": "External Ethernet Interface",
    "@odata.context": "/redfish/v1/$metadata#EthernetInterface.EthernetInterface",
    "SpeedMbps": null,
    "@odata.type": "#EthernetInterface.v1_4_1.EthernetInterface",
    "Id": "NIC1",
    "LinkStatus": "LinkDown",
    "@odata.etag": "\"cce97da666fb0d00b92816635ab500cb\"",
    "PermanentMACAddress": "00:90:FA:A2:07:1E",
    "Description": "External Network Interface"
}
```

GET – Server Ethernet over USB properties

Use the GET method to retrieve properties in Ethernet interface resource between the server and manager.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/EthernetInterfaces/ToManager
```

Request body

None

Response codes

Code	Description
500	Internal server error

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	NIC{1..N}
SpeedMbps	String	The current speed in Mbps of this XCC interface(units: Mbit/s)
InterfaceEnabled	Boolean	A boolean indicating whether this interface is enabled
MACAddress	String	The currently configured MAC address of the (logical port) interface.
PermanentMACAddress	String	The permanent MAC address assigned to this interface (port).
Name	String	"Host Ethernet Interface"
LinkStatus	String	The link status of this interface (port).
Status	Object	Expand
State	String	“Enabled”
Health	String	Null
Links	Object	Expand
Chassis	Link	The value is a reference to the resource “Chassis” that represent the physical container.
HostInterface	Link	A reference to the recource “HostInterface” which represents the interface used by the host to communicate with the manager.
Description	String	Host Network Interface

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "Links": {
        "Chassis": {
            "@odata.id": "/redfish/v1/Chassis/1"
        },
        "HostInterface": {
            "@odata.id": "/redfish/v1/Managers/1/HostInterfaces/1"
        }
```

```
    },
    "Id": "ToManager",
    "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces/ToManager",
    "Status": {
        "State": "Enabled",
        "Health": null
    },
    "MACAddress": "0a:94:ef:40:2e:57",
    "Name": "Host Ethernet Interface",
    "@odata.context": "/redfish/v1/$metadata#EthernetInterface.EthernetInterface",
    "SpeedMbps": 100,
    "@odata.type": "#EthernetInterface.v1_4_1.EthernetInterface",
    "InterfaceEnabled": true,
    "LinkStatus": "LinkDown",
    "@odata.etag": "\"7a018971fcc141eb8bdb70cc7edfd36b\"",
    "PermanentMACAddress": "0a:94:ef:40:2e:57",
    "Description": "Host Network Interface"
}
```


Resource HostInterface

Use the GET method to retrieve properties in Host interface resource for a server.

Number of Resources	1
Resource Path	/redfish/v1/Managers/1/HostInterfaces
Schema file	HostInterfaceCollection_v1.xml HostInterface_v1.xml

GET – Collection of host interface

Use the GET method to retrieve properties in HostInterface collection for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Managers/1/HostInterfaces/1
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“HostInterfaceCollection”
Members	Array	Items: A reference link to an element of Host interface
Description	String	"A collection of HostInterface resource instances."

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Managers/1/HostInterfaces",
    "Members@odata.count": 1,
    "@odata.context": "/redfish/v1/$metadata#HostInterfaceCollection.HostInterfaceCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Managers/1/HostInterfaces/1"
        }
    ],
    "@odata.type": "#HostInterfaceCollection.HostInterfaceCollection",
    "@odata.etag": "\"806b8bd9d1a64fa1ac993403401f40e0\"",
    "Name": "HostInterfaceCollection",
    "Description": "A collection of HostInterface resource instances."
}
```

GET – Host interface properties

Use the GET method to retrieve properties in HostInterface resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Managers/1/HostInterfaces/1
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Uniquely identifies the resource within the collection of Chassis. Always set to “1”.
Description	String	Provides a description of Host Interface resources.
ExternallyAccessible	Boolean	Always set to false
HostEthernetInterfaces	Link	A reference link to the collection of ethernet interfaces that the system uses for network communication with the host interface.
HostInterfaceType	String	“NetworkHostInterface”
InterfaceEnabled	Boolean	Indicates whether this interface is enabled.
Links	Object	Expanded
ComputerSystems	Array	An array of references to the computer systems connected to this host interface.
ComputerSystems[0]	Link	A reference link to a resource of computer system
ManagerEthernetInterface	Link	A reference link to a single ethernet interface that the manager uses for network communication with the host interface.
Name	String	The name of the host interface resource. Always set to “Host Interface”.
NetworkProtocol	Link	A reference link to the network services and their settings that the manager controls.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "HostInterfaceType": "NetworkHostInterface",
    "NetworkProtocol": {
        "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol"
    },
    "Id": "1",
    "InterfaceEnabled": true,
    "Links": {
        "ComputerSystems": [
            {
                "@odata.id": "/redfish/v1/Systems/1"
            }
        ]
    },
    "Name": "Host Interface",
    "@odata.context": "/redfish/v1/$metadata#HostInterface.HostInterface",
    "@odata.etag": "\"173c848afdf17b76c0b2defce1f48be7\"",
    "@odata.type": "#HostInterface.v1_2_0.HostInterface",
    "ManagerEthernetInterface": {
        "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/ToHost"
    },
    "@odata.id": "/redfish/v1/Managers/1/HostInterfaces/1",
    "ExternallyAccessible": false,
    "HostEthernetInterfaces": {
        "@odata.id": "/redfish/v1/Managers/1/HostInterfaces/1/HostEthernetInterfaces"
    },
    "Description": "This resource shall be used to represent Host Interface resources as part of the Redfish specification."
}
```

PATCH – Enable/disable host interface

Use the PATCH method to update properties in Host Interface resource for Redfish service.

Request URL

`PATCH https://<BMC_IPADDR>/redfish/v1/Managers/1/HostInterfaces/1/`

Request body

Properties to be updated are shown as bellow, all of these properties can be changed individually.

Field	Type	Description
InterfaceEnabled	Boolean	Indicate whether this interface is enabled.

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
500	Internal server error

Response example

The following example is PATCH body.

```
{
   "InterfaceEnabled" : false
}
```

After the PATCH operation runs successfully, querying the host interface resource returns below example JSON response:


```
{
    "HostInterfaceType": "NetworkHostInterface",
    "NetworkProtocol": {
        "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol"
    },
    "Id": "1",
    "InterfaceEnabled": false,
    "Links": {
        "ComputerSystems": [
            {
                "@odata.id": "/redfish/v1/Systems/1"
            }
        ]
    },
    "Name": "Host Interface",
    "@odata.context": "/redfish/v1/$metadata#HostInterface.HostInterface",
    "@odata.etag": "\"3d8fd8e9aa9e2d0aa76f0ac687eecbbd\"",
    "@odata.type": "#HostInterface.v1_2_0.HostInterface",
    "ManagerEthernetInterface": {
        "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/ToHost"
    },
    "@odata.id": "/redfish/v1/Managers/1/HostInterfaces/1",
    "ExternallyAccessible": false,
    "HostEthernetInterfaces": {
        "@odata.id": "/redfish/v1/Managers/1/HostInterfaces/1/HostEthernetInterfaces"
    },
    "Description": "This resource shall be used to represent Host Interface resources as part of the Redfish specification."
}
```


Resource ManagerNetworkProtocol

Use the GET method to retrieve properties in ManagerNetworkProtocol resource for a server.

Number of Resources	1
Resource Path	/redfish/v1/Managers/1/NetworkProtocol
Schema file	ManagerNetworkProtocol_v1.xml

GET – BMC network services

Use the GET method to retrieve properties definition for the network protocol in a BMC.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Managers/1/NetworkProtocol
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	“NetworkProtocol”.
Name	String	Fixed string “ManagerNetworkProtocol”.
Description	String	“The resource is used to represent the network service settings for the manager for a Redfish implementation.”
HostName	String	The DNS Host Name of this manager, without any domain information . The value is the hostname of this XCC.
FQDN	String	This is the fully qualified domain name for the manager obtained by DNS including the host name and top-level domain name. The FQDN of this XCC.
DHCP	Object	Settings for this Manager's DHCP support
ProtocolEnabled	Boolean	Indicate if the protocol is enabled or disabled.
SNMP	Object	Settings for this Manager's SNMP support
ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled. Fixed value “true”.
Port	Number	Indicates the protocol port.
NTP	Object	Settings for this Manager's NTP support.
NTPServers	Array	Items: string List of NTP servers IP.
HTTP	Object	Settings for this Manager's HTTP protocol support
ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled. Fixed value “true”.
Port	Number	Indicates the protocol port.
HTTPS	Object	Settings for this Manager's HTTPS protocol support.
ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled.
Port	Number	Indicates the protocol port.
VirtualMedia	Object	Settings for this Manager's Virtual Media support
ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled. Fixed value “true”.

Field	Type	Description
Port	Number	Indicates the protocol port.
KVMIP	Object	Settings for this Manager's KVM-IP protocol support.
ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled. Fixed value “true”.
Port	Number	Indicates the protocol port.
SSH	Object	Settings for this Manager's SSH (Secure Shell) protocol support
ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled.
Port	Number	Indicates the protocol port.
IPMI	Object	Settings for this Manager's IPMI-over-LAN protocol support.
ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled.
Port	Number	Indicates the protocol port. Fixed port “623”
SSDP	Object	Settings for this Manager's SSDP support.
ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled.Fixed value “true”.
Port	Number	Indicates the protocol port. Fixed port “1900”
NotifyMulticastIntervalSeconds	Number	Indicates how often the Multicast is done from this service for SSDP. Fixed value “60”
NotifyTTL	Number	Indicates the time to live hop count for SSDPs Notify messages. Fixed value “2”
NotifyIPv6Scope	String	Indicates the scope for the IPv6 Notify messages for SSDP. Fixed value “Organization”

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:


```
{
    "FQDN": "XCC-7X00-1234567890",
    "SNMP": {
        "ProtocolEnabled": true,
        "Port": 161
    },
    "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol",
    "@odata.context": "/redfish/v1/$metadata#ManagerNetworkProtocol.ManagerNetworkProtocol",
    "HostName": "XCC-7X00-1234567890",
    "VirtualMedia": {
        "ProtocolEnabled": true,
        "Port": 3900
    },
    "Description": "The resource is used to represent the network service settings for the manager for a Redfish implementatio
    "KVMIP": {
        "ProtocolEnabled": true,
        "Port": 3900
```

```
},
"HTTP": {
    "ProtocolEnabled": true,
    "Port": 80
},
"SSH": {
    "ProtocolEnabled": true,
    "Port": 22
},
"DHCP": {
    "ProtocolEnabled": true
},
"Name": "Manager Network Protocol",
"HTTPS": {
    "ProtocolEnabled": true,
    "Port": 443
},
"Oem": {
    "Lenovo": {
        "DNS": {
            "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/Oem/Lenovo/DNS"
        },
        "SLP": {
            "ProtocolEnabled": true,
            "MulticastAddress": "239.255.255.253",
            "AddressType": "Multicast",
            "Port": 427
        },
        "SNMP": {
            "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/Oem/Lenovo/SNMP"
        },
        "CimOverHTTPS": {
            "ProtocolEnabled": true,
            "Port": 5989
        },
        "SMTPClient": {
            "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/Oem/Lenovo/SMTPClient"
        },
        "LDAPClient": {
            "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/Oem/Lenovo/LDAPClient"
        },
        "OpenPorts": [
            "22",
            "80",
            "81",
            "115",
            "161",
            "199",
            "427",
            "443",
            "546",
            "623",
            "1900",
            "3306",
            "3389",
            "3900",
            "5351",
            "5900",
            "5989",
            "37240",
            "44822",
```

```
                "54483",
                "57433"
            ]
        }
    },
    "@odata.type": "#ManagerNetworkProtocol.v1_3_0.ManagerNetworkProtocol",
    "SSDP": {
        "ProtocolEnabled": true,
        "NotifyMulticastIntervalSeconds": 60,
        "NotifyTTL": 2,
        "NotifyIPv6Scope": "Organization",
        "Port": 1900
    },
    "IPMI": {
        "ProtocolEnabled": true,
        "Port": 623
    },
    "@odata.etag": "\"82917d99a2efd48f6bb7212373e365ca\"",
    "Id": "NetworkProtocol",
    "NTP": {
        "ProtocolEnabled": true,
        "NTPServers": [
            "154.16.245.246",
            "",
            "",
            ""
        ]
    }
}
```


PATCH – Update BMC network service configurations

Use the PATCH method to update properties in the network protocol resource in a BMC.

Request URL

```
PATCH https://<BMC_IPADDR>/redfish/v1/Managers/1/NetworkProtocol/
```

Request body

Properties to be updated are shown as bellow, all of these properties can be changed individually.

The response is a JSON object that contains the following parameters:

Field	Type	Description
HTTPS	Object	Settings for this Manager's HTTPS protocol support.
Port	Number	Indicates the protocol port.
SSH	Object	Settings for this Manager's SSH (Secure Shell) protocol support
ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled.
Port	Number	Indicates the protocol port.
VirtualMedia	Object	Settings for this Manager's Virtual Media support
Port	Number	Indicates the protocol port.
IPMI	Object	Settings for this Manager's IPMI-over-LAN protocol support.
ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled.

Field		Type	Description
SSDP		Object	Settings for this Manager's SSDP support.
	ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled. Fixed value “true”.
NTP		Object	Settings for this Manager's NTP support
	NTPServers	Array	Items: string List of NTP servers IP
	ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled.
SNMP		Object	Settings for this Manager's SNMP support
	ProtocolEnabled	Boolean	Indicates if the protocol is enabled or disabled. Fixed value “true”.
	Port	Number	Indicate the protocol port.

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
500	Internal server error

Response example

The following example is PATCH body.

```
{
   "HTTPS" : {
      "ProtocolEnabled" : true,
      "Port" : 445
   }
}
```

The following example JSON response is returned:

```
{
    "FQDN": "XCC-7X58-1234567890",
    "SNMP": {
        "ProtocolEnabled": true,
        "Port": 161
    },
    "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol",
    "@odata.context": "/redfish/v1/$metadata#ManagerNetworkProtocol.ManagerNetworkProtocol",
    "HostName": "XCC-7X00-1234567890",
    "VirtualMedia": {
        "ProtocolEnabled": true,
        "Port": 3900
    },
    "Description": "The resource is used to represent the network service settings for the manager
                    for a Redfish implementation.",
    "KVMIP": {
        "ProtocolEnabled": true,
        "Port": 3900
```

```
},
"HTTP": {
    "ProtocolEnabled": true,
    "Port": 80
},
"SSH": {
    "ProtocolEnabled": true,
    "Port": 22
},
"DHCP": {
    "ProtocolEnabled": true
},
"Name": "Manager Network Protocol",
"HTTPS": {
    "ProtocolEnabled": true,
    "Port": 445
},
"Oem": {
    "Lenovo": {
        "DNS": {
            "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/Oem/Lenovo/DNS"
        },
        "SLP": {
            "ProtocolEnabled": true,
            "MulticastAddress": "239.255.255.253",
            "AddressType": "Multicast",
            "Port": 427
        },
        "SNMP": {
            "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/Oem/Lenovo/SNMP"
        },
        "CimOverHTTPS": {
            "ProtocolEnabled": true,
            "Port": 5989
        },
        "SMTPClient": {
            "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/Oem/Lenovo/SMTPClient"
        },
        "LDAPClient": {
            "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/Oem/Lenovo/LDAPClient"
        },
        "OpenPorts": [
            "22",
            "80",
            "81",
            "115",
            "161",
            "199",
            "427",
            "443",
            "546",
            "623",
            "1900",
            "3306",
            "3389",
            "3900",
            "5900",
            "5989",
            "56163",
            "37240",
            "44822",
```

```
                "54483",
                "57433"
            ]
        }
    },
    "@odata.type": "#ManagerNetworkProtocol.v1_3_0.ManagerNetworkProtocol",
    "SSDP": {
        "ProtocolEnabled": true,
        "NotifyMulticastIntervalSeconds": 60,
        "NotifyTTL": 2,
        "NotifyIPv6Scope": "Organization",
        "Port": 1900
    },
    "IPMI": {
        "ProtocolEnabled": true,
        "Port": 623
    },
    "@odata.etag": "\"dd9721270ee64238f3756b3fada5ee82\"",
    "Id": "NetworkProtocol",
    "NTP": {
        "ProtocolEnabled": true,
        "NTPServers": [
            "154.16.245.246",
            "",
            "",
            ""
        ]
    },
    "@Message.ExtendedInfo": [
        {
            "MessageArgs": [
                "ProtocolEnabled"
            ],
            "Resolution": "Remove the property from the request body and resubmit the request if the operation failed.",
            "MessageId": "Base.1.4.PropertyNotWritable",
            "Severity": "Warning",
            "Message": "The property ProtocolEnabled is a read only property and cannot be assigned a value.",
            "@odata.type": "#Message.v1_0_6.Message"
        }
    ]
}
```

Chapter 10. Serial Interface Management

Resource SerialInterface

The resource represents the serial interface implementation for Redfish service.

Number of Resources	1
Resource Path	/redfish/v1/ Managers/1/SerialInterfaces/1
Schema file	SerialInterfaceCollection_v1.xml SerialInterface_v1.xml

GET – Collection of BMC serial interface

Use the GET method to retrieve properties in the serial interface collection for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Managers/1/SerialInterfaces
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“SerialInterfaceCollection”
Members	Array	Items: A reference link to an element of Serial Interface

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
   "@odata.id": "/redfish/v1/Managers/1/SerialInterfaces",
   "Members@odata.count": 1,
   "@odata.context": "/redfish/v1/$metadata#SerialInterfaceCollection.SerialInterfaceCollection",
   "Members": [
       {
           "@odata.id": "/redfish/v1/Managers/1/SerialInterfaces/1"
       }
   ],
   "@odata.type": "#SerialInterfaceCollection.SerialInterfaceCollection",
   "@odata.etag": "\"ca33897145cbc4d601528e54e3b4ba97\"",
   "Name": "SerialInterfaceCollection",
```

```
    "Description": "A collection of SerialInterface resource instances."
}
```

GET – BMC serial interface properties

Use the GET method to retrieve properties in the resource of serial interface for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Managers/1/SerialInterfaces/1
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
id	String	“1”
Name	String	“Serial Interface”
BitRate	String	Bit rate of the serial interface. Valid values include: 9600, 19200, 38400, 57600, 115200
SignalType	String	“Rs232”
Parity	String	Parity information for the serial interface, valid values include: None, Odd, Even.
StopBits	String	Serial interface stop bits
DataBits	String	8
Description	String	Serial Interface of Redfish
FlowControl	String	“None”
InterfaceEnabled	Boolean	Indicates whether this interfaces is enabled

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "SignalType": "Rs232",
    "BitRate": "115200",
    "@odata.id": "/redfish/v1/Managers/1/SerialInterfaces/1",
    "InterfaceEnabled": true,
    "Description": "Serial port redirection of the host.",
    "Name": "Serial Interface",
    "@odata.context": "/redfish/v1/$metadata#SerialInterface.SerialInterface",
    "StopBits": "1",
    "Oem": {
        "Lenovo": {
```

```
            "CLIMode": "UserDefined",
            "@odata.type": "#LenovoSerialInterface.v1_0_0.LenovoSerialInterfaceProperties",
            "EnterCLIKeySequence": "^[(",
            "SerialInterfaceState": "Enabled"
        }
    },
    "@odata.type": "#SerialInterface.v1_1_3.SerialInterface",
    "DataBits": "8",
    "Id": "1",
    "@odata.etag": "\"bc5c2883051b4e001123be789f9c8034\"",
    "Parity": "None",
    "FlowControl": "None"
}
```


PATCH – Update BMC serial interface configurations

Use the PATCH method to update properties in the resource of serial interface for Redfish service.

Request URL

`PATCH https://<BMC_IPADDR>/redfish/v1/Managers/1/SerialInterfaces/1`

Request body

Properties to be updated are shown as bellow, all of these properties can be changed individually.

Field	Type	Description
BitRate	String	Valid values: 9600, 19200, 38400, 57600, 115200
StopBits	String	Serial interface stop bits. Valid values: 1, 2
Parity	String	Valid values: None, Odd, Even.
InterfaceEnabled	Boolean	Valid values: True/False

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
500	Internal server error

Response example

The following example is PATCH body.


```
{
   "BitRate": "57600",
   "Parity": "Even"
}
```


After the PATCH operation runs successfully, querying the chassis resource returns below example JSON response:


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

```
   "BitRate" : "57600",
   "Parity" : "Even",
   "Id" : "1",
   "SignalType" : "Rs232",
   "Oem" : {
      "Lenovo" : {
         "EnterCLIKeySequence" : "^[(",
         "SerialInterfaceState" : "Enabled",
         "CLIMode" : "UserDefined"
      }
   },
   "StopBits" : "1",
   "DataBits" : "8",
   "@odata.etag" : "W/\"c27142bd8ebce22599a3beed29808fd3\"",
   "@odata.id" : "/redfish/v1/Managers/1/SerialInterfaces/1",
   "@odata.type" : "#SerialInterface.v1_1_0.SerialInterface",
   "Description" : "Serial port redirection of the host.",
   "Name" : "Serial Interface",
   "FlowControl" : "None",
   "InterfaceEnabled" : true
}
```

Chapter 11. Virtual Media Management

Resource VirtualMedia

This resource shall be used to represent a virtual media service for a Redfish implementation.

Number of Resources	10
Resource Path	/redfish/v1/Managers/1/VirtualMedia/{Id}
Schema file	VirtualMediaCollection_v1.xml VirtualMedia_v1.xml

GET – Collection of virtual media

Use the GET method to retrieve properties in virtual media collection for Redfish service.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/Managers/1/VirtualMedia`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“VirtualMediaCollection”
Members	Array	Items: A reference link to an element of virtual media

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Managers/1/VirtualMedia",
    "Name": "VirtualMediaCollection",
    "@odata.context": "/redfish/v1/$metadata#VirtualMediaCollection.VirtualMediaCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/RDOC1"
        },
        {
            "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/RDOC2"
        },
        {
```

```
            "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/EXT1"
        },
        {
            "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/EXT2"
        },
        {
            "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/EXT3"
        },
        {
            "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/EXT4"
        },
        {
            "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/Remote1"
        },
        {
            "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/Remote2"
        },
        {
            "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/Remote3"
        },
        {
            "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/Remote4"
        }
    ],
    "@odata.type": "#VirtualMediaCollection.VirtualMediaCollection",
    "@odata.etag": "\"c54172a08a2b5db8321ef2d79e8850b2\"",
    "Members@odata.count": 10,
    "Description": "A collection of VirtualMedia resource instances"
}
```


GET – Virtual media properties

Use the GET method to retrieve properties in virtual media resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Managers/1/VirtualMedia/{Id}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	This field shows the storage type with index value. The Id value will be TDM+index(TDM1, TDM2, …), Remote+index (Remote1, Remote2, …), RDOC+index(RDOC1, RDOC2, …), DSA/ EXT+index(DSAEXT1, DSAEXT2, …)
Description	String	"This resource is used to represent a virtual media service for a Redfish implementation"
Name	String	“VirtualMedia”
ImageName	String	Image name
Image	String	Image path and filename

Field	Type	Description
MediaTypes	Array	The media types supported as virtual media
ConnectedVia	String	Current virtual media connection methods “NotConnected”/”Oem”
WriteProtected	Boolean	Indicates the media is write protected

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "ConnectedVia": "URI",
    "Id": "EXT1",
    "MediaTypes": [
        "CD",
        "DVD"
    ],
    "Image": "http://192.168.1.2/Core-current.iso",
    "@odata.context": "/redfish/v1/$metadata#VirtualMedia.VirtualMedia",
    "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/EXT1",
    "ImageName": "Core-current.iso",
    "@odata.type": "#VirtualMedia.v1_3_0.VirtualMedia",
    "WriteProtected": true,
    "@odata.etag": "\"5fb9f3ba323469f34cf349a889ff49cf\"",
    "Inserted": true,
    "Name": "VirtualMedia",
    "Description": "This resource shall be used to represent a virtual media service for a Redfish implementation."
}
```

PATCH – Insert/Eject a virtual media

Use the PATCH method to insert or eject a virtual media.

Notes: In current implementation:

- Does not support insert/eject “Remote{N}” media.
- Does not support insert “RDOC{N}” media.
- Only support to insert “EXT{N}” media via protocol HTTP or no credential required NFS.

Request URL

```
PATCH https://<BMC_IPADDR>/redfish/v1/Managers/1/VirtualMedia/{id}
```

Request body

Properties to be updated are shown as bellow, all of these properties can be changed individually.

Field	Type	Description
Image	String	A URI providing the location of the selected image. Set to null to eject the virtual media.
Inserted	Boolean	Indicate if virtual media is inserted in the virtual device. set to false to eject the virtual media.
WriteProtected	Boolean	Indicate the media is write protected.

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
400	InsufficientPrivilege, Conflict, PropertyValueTypeError, PropertyMissing, PropertyNotWritable, SourceDoesNotSupportProtocol
500	Internal server error

Response example

The following example is PATCH body.

```
{
    "Image": "http://192.168.1.2/Core-current.iso",
    "Inserted": true,
    "WriteProtected": true
}
```

After the PATCH operation runs successfully, querying the chassis resource returns below example JSON response:

```
{
    "ConnectedVia": "URI",
    "Id": "EXT1",
    "MediaTypes": [
        "CD",
        "DVD"
    ],
    "Image": "http://192.168.1.2/Core-current.iso",
    "@odata.context": "/redfish/v1/$metadata#VirtualMedia.VirtualMedia",
    "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/EXT1",
    "ImageName": "Core-current.iso",
    "@odata.type": "#VirtualMedia.v1_3_0.VirtualMedia",
    "WriteProtected": true,
    "@odata.etag": "\"5fb9f3ba323469f34cf349a889ff49cf\"",
    "Inserted": true,
    "Name": "VirtualMedia",
    "Description": "This resource shall be used to represent a virtual media service for a Redfish implementation."
}
```

Chapter 12. Server Management

Resource ComputerSystem

This resource is used to represent computer system for a Redfish implementation.

Number of Resources	1
Resource Path	/redfish/v1/Systems/1
Schema file	ComputerSystemCollection_v1.xml ComputerSystem_v1.xml

GET – Collection for server

Use the GET method to retrieve properties in Systems collection for Redfish service.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/Systems`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“ComputerSystemCollection”.
Members	Array	Items: A reference link to an element of Systems.
Description	String	“A collection of ComputerSystem resource instances”.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Systems",
    "Members@odata.count": 1,
    "@odata.context": "/redfish/v1/$metadata#ComputerSystemCollection.ComputerSystemCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Systems/1"
        }
    ],
    "@odata.type": "#ComputerSystemCollection.ComputerSystemCollection",
```

```
    "@odata.etag": "\"1daba583ad7f7510727402be8f09f081\"",
    "Name": "ComputerSystemCollection",
    "Description": "A collection of ComputerSystem resource instances."
}
```

GET – Server properties

Use the GET method to retrieve properties in System resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	“1”
Name	String	“ComputerSystem”
Description	String	“Computer System Information of Redfish”
SystemType	String	The type of computer system represented by this resource
AssetTag	String	The asset tag of the system
Manufacturer	String	The manufacturer tag of the system
Model	String	Model of the system
SubModel	String	Sub model of the system
SerialNumber	String	Serial number of the system
PartNumber	String	Null
UUID	String	The universal unique identifier (UUID) for this system
HostName	String	The full name of this host: XCC-SubModel-SerialNumber
IndicatorLED	String	The indicator light state for the indicator light associated with this system
Boot	Object	Describes boot information for the current resource. Changes to this object do not alter the BIOS persistent boot order configuration
BootSourceOverrideEnabled	String	Describes the state of the Boot Source Override feature
BootSourceOverrideMode	String	The BIOS Boot Mode (either Legacy or UEFI) to be used when BootSourceOverrideTarget boot source is booted fro
UefiTargetBootSourceOverride	String	The UEFI Device Path of the device to boot from when BootSourceOverrideSupported is UefiTarget.
BootSourceOverrideTarget	String	The current boot source to be used at next boot instead of the normal boot device, if BootSourceOverrideEnabled is true
BootSourceOverrideTarget@Redfish.AllowableValues	Array	Items: string Item count: 8

Field	Type	Description
BootSourceOverrideTarget @Redfish.AllowableValues[0]	String	“None”
BootSourceOverrideTarget @Redfish.AllowableValues[1]	String	“Pxe”
BootSourceOverrideTarget @Redfish.AllowableValues[2]	String	“Cd”
BootSourceOverrideTarget @Redfish.AllowableValues[3]	String	“Usb”
BootSourceOverrideTarget @Redfish.AllowableValues[4]	String	“Hdd”
BootSourceOverrideTarget @Redfish.AllowableValues[5]	String	“BiosSetup”
BootSourceOverrideTarget @Redfish.AllowableValues[6]	String	“Diags”
BootSourceOverrideTarget @Redfish.AllowableValues[7]	String	“UefiTarget”
BootSourceOverrideEnabled @Redfish.AllowableValues	Array	Items: string Item count: 2
BiosVersion	String	The version of the system BIOS
ProcessorSummary	Object	This object describes the central processors of the system in general detail.
Count	Number	The number of processors in the system.
LogicalProcessorCount	Integer	The logical Processor Count
Model	String	The processor model for the primary or majority of processors in this system.
Status	Object	Reflect the processor summary status
HealthRollup	String	This represents the overall health state from the view of this resource.
Health	String	This represents the health state of this resource in the absence of its dependent resources.
MemorySummary	Object	This object describes the memory of the system in general detail.
TotalSystemMemoryGiB	Number	The total installed, operating system-accessible memory (RAM), measured in GiB.
Status	Object	Reflect the memory summary status.
State	String	“Enabled”.
HealthRollup	String	This represents the overall health state from the view of this resource.
Health	String	This represents the health state of this resource in the absence of its dependent resources.
Processors	Link	This object describes the processor of the system in general detail.
Status	Object	Expanded
State	String	“Enabled”

Field	Type	Description
HealthRollup	String	This represents the overall health state from the view of this resource.
Health	String	This represents the health state of this resource in the absence of its dependent resources.
Bios	Link	A reference to the BIOS settings associated with this system.
Status	Object	Reflect the resource status.
Health	String	This represents the health state of this resource in the absence of its dependent resources.
Links	Object	An object for reference links.
ManagedBy	Array	An array of references to Managers responsible for this system.
Chassis	Array	An array of references to the chassis in which this system is contained.
PoweredBy	Array	An array of references to power responsible for this system.
CooledBy	Array	An array of references to cooling device responsible for this system.
EthernetInterfaces	Link	A reference to the collection of Ethernet interfaces associated with this system.
NetworkInterfaces	Link	A reference to the collection of network interfaces associated with this system.
LogServices	Link	A reference to the collection of Log Services associated with this system.
PowerState	String	current power state of the system.
Bios	Link	A reference to the BIOS settings associated with this system.
Memory	Link	A reference to the collection of memory device associated with this system.
Storage	Link	A reference to the collection of storage device with this system.
SecureBoot	Link	A reference to the SecureBoot settings associated with this system.
HostWatchdogTimer	Object	This object describes the Host Watchdog Timer functionality for this system.
FunctionEnabled	Boolean	This indicates if the Host Watchdog Timer functionality has been enabled. Additional host-based software is necessary to activate the timer function.
Status	Object	Expanded
State	String	“Disabled”or“StandbyOffline”.
TimeoutAction	String	This property indicates the action to perform when the Watchdog Timer reaches its timeout value.
TimeoutAction@ Redfish. AllowableValues	Array	Item type: string Item count: 1 Item: [“PowerCycle”]
WarningAction	String	This property indicates the action to perform when the Watchdog Timer is close (typically 3-10 seconds) to reaching its timeout value.

Field	Type	Description
WarningAction@ Redfish. AllowableValues	Arrat	Item type: string Item count: 1 Item: [“None”]
PCIeDevices	Array	An array of references to pci devices in which this system is contained
PCIeFunctions	Array	An array of references to pci functions in which this system is contained
Actions	Object	The available actions for this resource.
#ComputerSystem.Reset	Object	This action shall perform a reset of the ComputerSystem. For systems which implement APCI Power Button functionality, the PushPowerButton value shall perform or emulate an ACPI Power Button push. The ForceOff value shall remove power from the system or perform an ACPI Power Button Override (commonly known as a 4-second hold of the Power Button). The ForceRestart value shall perform a ForceOff action followed by a On action.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "SerialNumber": "1234567890",
    "Id": "1",
    "IndicatorLED": "Off",
    "PowerState": "Off",
    "ProcessorSummary": {
        "Status": {
            "HealthRollup": "OK",
            "Health": "OK",
            "State": "Enabled"
        },
        "LogicalProcessorCount": 112,
        "Model": "Intel(R) Xeon(R) Platinum 8180M CPU @ 2.50GHz",
        "Count": 2
    },
    "NetworkInterfaces": {
        "@odata.id": "/redfish/v1/Systems/1/NetworkInterfaces"
    },
    "PCIeDevices@odata.count": 6,
    "PartNumber": null,
    "SubModel": "7X00",
    "Bios": {
        "@odata.id": "/redfish/v1/Systems/1/Bios"
    },
    "UUID": "a2fe9471-e17f-401e-9ad6-f705bbc26f74",
    "Name": "ComputerSystem",
    "HostWatchdogTimer": {
        "WarningAction": "None",
        "TimeoutAction@Redfish.AllowableValues": [
```

```
            "PowerCycle"
        ],
        "TimeoutAction": "PowerCycle",
        "Status": {
            "State": "Disabled"
        },
        "WarningAction@Redfish.AllowableValues": [
            "None"
        ],
        "FunctionEnabled": false
    },
    "Oem": {
        "Lenovo": {
            "ScheduledPowerActions": {
                "@odata.id": "/redfish/v1/Systems/1/Oem/Lenovo/ScheduledPowerActions"
            },
            "FrontPanelUSB": {
                "IDButton": "On",
                "PortSwitchingTo": "BMC",
                "InactivityTimeoutMins": 5,
                "FPMode": "Shared"
            },
            "Metrics": {
                "@odata.id": "/redfish/v1/Systems/1/Oem/Lenovo/Metrics"
            },
            "SystemStatus": "SystemPowerOff_StateUnknown",
            "NumberOfReboots": 1,
            "HistorySysPerf": {
                "@odata.id": "/redfish/v1/Systems/1/Oem/Lenovo/HistorySysPerf"
            },
            "BootSettings": {
                "@odata.id": "/redfish/v1/Systems/1/Oem/Lenovo/BootSettings"
            },
            "TotalPowerOnHours": 0,
            "TPMSettings": {
                "EnableRPP": true,
                "AssertRPP": false,
                "AssertDurationMins": 30
            },
            "Sensors": {
                "@odata.id": "/redfish/v1/Chassis/1/Oem/Lenovo/Sensors"
            },
            "@odata.type": "#LenovoComputerSystem.v1_0_0.LenovoSystemProperties"
        }
    },
    "@odata.type": "#ComputerSystem.v1_6_0.ComputerSystem",
    "Manufacturer": "",
    "@odata.etag": "\"1ce7c3fda8eece74c4421938180c374a\"",
    "Actions": {
        "#ComputerSystem.Reset": {
            "target": "/redfish/v1/Systems/1/Actions/ComputerSystem.Reset",
            "title": "Reset",
            "ResetType@Redfish.AllowableValues": [
                "On",
                "Nmi",
                "GracefulShutdown",
                "GracefulRestart",
                "ForceOn",
                "ForceOff",
                "ForceRestart"
            ],
```

```
        "@Redfish.ActionInfo": "/redfish/v1/ActionInfos/Systems/Reset"
    },
    "Oem": {
        "#LenovoComputerSystem.BootToBIOSSetup": {
            "target": "/redfish/v1/Systems/1/Actions/Oem/LenovoComputerSystem.BootToBIOSSetup",
            "title": "BootToBIOSSetup"
        },
        "#LenovoComputerSystem.CustomizedReset": {
            "target": "/redfish/v1/Systems/1/Actions/Oem/LenovoComputerSystem.CustomizedReset",
            "title": "CustomizedReset",
            "ResetType@Redfish.AllowableValues": [
                "On"
            ]
        }
    }
},
"EthernetInterfaces": {
    "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces"
},
"Boot": {
    "BootSourceOverrideTarget": "None",
    "BootSourceOverrideTarget@Redfish.AllowableValues": [
        "None",
        "Pxe",
        "Cd",
        "Usb",
        "Hdd",
        "BiosSetup",
        "Diags",
        "UefiTarget"
    ],
    "BootSourceOverrideEnabled@Redfish.AllowableValues": [
        "Once",
        "Disabled"
    ],
    "BootSourceOverrideEnabled": "Disabled",
    "UefiTargetBootSourceOverride": null,
    "BootSourceOverrideMode": "UEFI"
},
"@odata.id": "/redfish/v1/Systems/1",
"AssetTag": "chassis in use",
"PCIeFunctions": [
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/ob_1.00"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/slot_2.00"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/slot_6.00"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/slot_8.00"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/slot_9.00"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/slot_10.00"
    }
],
```

```
"@odata.context": "/redfish/v1/$metadata#ComputerSystem.ComputerSystem",
"BiosVersion": "TEE135Q",
"HostName": "XCC-7X00-1234567890",
"MemorySummary": {
    "TotalSystemMemoryGiB": 64,
    "Status": {
        "HealthRollup": "OK",
        "Health": "OK",
        "State": "Enabled"
    }
},
"Processors": {
    "@odata.id": "/redfish/v1/Systems/1/Processors"
},
"PCIeFunctions@odata.count": 6,
"Description": "This resource is used to represent a computing system for a Redfish implementation.",
"PCIeDevices": [
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/ob_1"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_2"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_6"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_8"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_9"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_10"
    }
],
"Status": {
    "HealthRollup": "Critical",
    "Health": "Critical",
    "State": "Enabled"
},
"Storage": {
    "@odata.id": "/redfish/v1/Systems/1/Storage"
},
"SKU": "7X0025Z000",
"SecureBoot": {
    "@odata.id": "/redfish/v1/Systems/1/SecureBoot"
},
"Links": {
    "CooledBy": [],
    "Chassis": [
        {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    ],
    "PoweredBy": [
        {
            "@odata.id": "/redfish/v1/Chassis/1/Power#/PowerSupplies/0"
        },
        {
            "@odata.id": "/redfish/v1/Chassis/1/Power#/PowerSupplies/1"
```

```
            }
        ],
        "ManagedBy": [
            {
                "@odata.id": "/redfish/v1/Managers/1"
            }
        ]
    },
    "Memory": {
        "@odata.id": "/redfish/v1/Systems/1/Memory"
    },
    "LogServices": {
        "@odata.id": "/redfish/v1/Systems/1/LogServices"
    },
    "Model": "ThinkSystem SR850",
    "SystemType": "Physical"
}
```

PATCH – Update next-one-time boot configurations and other properties

Use the PATCH method to update properties in System resource for Redfish service.

Request URL

`PATCH https://<BMC_IPADDR>/redfish/v1/Systems/1`

Request body

Properties to be updated are shown as below.

Field	Type	Description
Boot	Object	Describes boot information for the current resource. Changes to this object do not alter the BIOS persistent boot order configuration.
BootSourceOverrideEnabled	String	Describes the state of the Boot Source Override feature.
BootSourceOverrideMode	String	The BIOS Boot Mode (either Legacy or UEFI) to be used when BootSourceOverrideTarget boot source is booted from.
UefiTargetBootSourceOverride	String	The UEFI Device Path of the device to boot from when BootSourceOverrideSupported is UefiTarget.
BootSourceOverrideTarget	String	The current boot source to be used at next boot instead of the normal boot device, if BootSourceOverrideEnabled is true
HostWatchdogTimer	Object	This object describes the Host Watchdog Timer functionality for this system.
FunctionEnabled	Boolean	This indicates if the Host Watchdog Timer functionality has been enabled. Additional host-based software is necessary to activate the timer function.
AssetTag	String	The asset tag of the system.
IndicatorLED	Object	The indicator light state for the indicator light associated with this system

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
500	Internal server error

Response example

The following example is PATCH body.

```
{
   "Boot" : {
      "BootSourceOverrideMode" : "Legacy",
      "BootSourceOverrideTarget" : "Hdd",
      "BootSourceOverrideEnabled" : "Once",
      "UefiTargetBootSourceOverride" : null
   }
}
```

After the PATCH operation runs successfully, querying the system resource returns below example JSON response:

```
{
    "SerialNumber": "1234567890",
    "Id": "1",
    "Links": {
        "CooledBy": [],
        "Chassis": [
            {
                "@odata.id": "/redfish/v1/Chassis/1"
            }
        ],
        "PoweredBy": [],
        "ManagedBy": [
            {
                "@odata.id": "/redfish/v1/Managers/1"
            }
        ]
    },
    "PowerState": "On",
    "ProcessorSummary": {
        "Count": 0
    },
    "NetworkInterfaces": {
        "@odata.id": "/redfish/v1/Systems/1/NetworkInterfaces"
    },
    "PCIeDevices@odata.count": 6,
    "PartNumber": null,
    "Bios": {
        "@odata.id": "/redfish/v1/Systems/1/Bios"
    },
    "UUID": null,
    "Name": "ComputerSystem",
    "Oem": {
        "Lenovo": {
            "ScheduledPowerActions": {
                "@odata.id": "/redfish/v1/Systems/1/Oem/Lenovo/ScheduledPowerActions"
            },
            "FrontPanelUSB": {
                "IDButton": "On",
                "PortSwitchingTo": "BMC",
```

```
            "InactivityTimeoutMins": 5,
            "FPMode": "Shared"
        },
        "Sensors": {
            "@odata.id": "/redfish/v1/Chassis/1/Oem/Lenovo/Sensors"
        },
        "SystemStatus": "SystemRunningInUEFI",
        "NumberOfReboots": 1,
        "HistorySysPerf": {
            "@odata.id": "/redfish/v1/Systems/1/Oem/Lenovo/HistorySysPerf"
        },
        "@odata.type": "#LenovoComputerSystem.v1_0_0.LenovoSystemProperties",
        "BootSettings": {
            "@odata.id": "/redfish/v1/Systems/1/Oem/Lenovo/BootSettings"
        },
        "TotalPowerOnHours": 0,
        "Metrics": {
            "@odata.id": "/redfish/v1/Systems/1/Oem/Lenovo/Metrics"
        },
        "TPMSettings": {
            "EnableRPP": true,
            "AssertRPP": false,
            "AssertDurationMins": 30
        }
    }
},
"@odata.type": "#ComputerSystem.v1_5_1.ComputerSystem",
"Manufacturer": "",
"@odata.etag": "\"a5f04da0866a3739f018b3c32ca502ce\"",
"Actions": {
    "Oem": {
        "#LenovoComputerSystem.BootToBIOSSetup": {
            "target": "/redfish/v1/Systems/1/Actions/Oem/LenovoComputerSystem.BootToBIOSSetup",
            "title": "BootToBIOSSetup"
        },
        "#LenovoComputerSystem.CustomizedReset": {
            "target": "/redfish/v1/Systems/1/Actions/Oem/LenovoComputerSystem.CustomizedReset",
            "title": "CustomizedReset",
            "ResetType@Redfish.AllowableValues": [
                "On"
            ]
        }
    },
    "#ComputerSystem.Reset": {
        "target": "/redfish/v1/Systems/1/Actions/ComputerSystem.Reset",
        "title": "Reset",
        "ResetType@Redfish.AllowableValues": [
            "On",
            "Nmi",
            "GracefulShutdown",
            "GracefulRestart",
            "ForceOn",
            "ForceOff",
            "ForceRestart"
        ]
    }
},
"EthernetInterfaces": {
    "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces"
},
"Boot": {
```

```
    "UefiTargetBootSourceOverride": null,
    "BootSourceOverrideMode": "UEFI",
    "BootSourceOverrideTarget": "Hdd",
    "BootSourceOverrideTarget@Redfish.AllowableValues": [
        "None",
        "Pxe",
        "Cd",
        "Usb",
        "Hdd",
        "BiosSetup",
        "Diags",
        "UefiTarget"
    ],
    "BootSourceOverrideEnabled": "Once"
},
"@odata.id": "/redfish/v1/Systems/1",
"AssetTag": "chassis in use",
"PCIeFunctions": [
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/ob_1.00"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/slot_2.00"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/slot_6.00"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/slot_8.00"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/slot_9.00"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeFunctions/slot_10.00"
    }
],
"@odata.context": "/redfish/v1/$metadata#ComputerSystem.ComputerSystem",
"BiosVersion": "TEE135Q",
"HostName": "XCC-7X00-1234567890",
"MemorySummary": {
    "TotalSystemMemoryGiB": 0
},
"Processors": {
    "@odata.id": "/redfish/v1/Systems/1/Processors"
},
"PCIeFunctions@odata.count": 6,
"Description": "This resource is used to represent a computing system for a Redfish implementation.",
"PCIeDevices": [
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/ob_1"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_2"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_6"
    },
    {
        "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_8"
    },
```

```
        {
            "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_9"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_10"
        }
    ],
    "Status": {
        "HealthRollup": "OK",
        "Health": "OK",
        "State": "Enabled"
    },
    "Storage": {
        "@odata.id": "/redfish/v1/Systems/1/Storage"
    },
    "SKU": "7X0025Z000",
    "LogServices": {
        "@odata.id": "/redfish/v1/Systems/1/LogServices"
    },
    "SecureBoot": {
        "@odata.id": "/redfish/v1/Systems/1/SecureBoot"
    },
    "Model": "ThinkSystem SR850",
    "IndicatorLED": "Off",
    "Memory": {
        "@odata.id": "/redfish/v1/Systems/1/Memory"
    },
    "SystemType": "Physical"
}
```

POST – Server reset operations

Use the POST method for server reset operations.

Request URL

`POST https://<BMC_IPADDR>/redfish/v1/Systems/1/Actions/ComputerSystem.Reset`

Request body

Field	Description
ResetType	System reset type, possible values: On/ForceOff/GracefulShutdown/GracefulRestart/ForceRestart/Nmi/ForceOn

Response codes

Code	Description
500	Internal server error

Response example

The following example is POST body.

```
{
    "ResetType" : "On"
}"
```

The following example JSON response is returned:

None

Chapter 13. Log Service and Event Log

Resource LogService

This resource is used to provided Log Service and Event Log for a Redfish implementation.

Number of Resources	2
Resource Path	/redfish/v1/ Systems/1/LogServices/{StandardLog, ActiveLog}
Schema file	LogServiceCollection_v1.xml LogService_v1.xml

GET – Collection of BMC log services

Use the GET method to retrieve properties in log services resource for a server.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/Systems/1/LogServices`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	The name of the log services collection. Always set to “LogServiceCollection”.
Members	Array	Contains the members of log services collection.
Description	String	A collection of LogService resource instances.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Systems/1/LogServices",
    "Members@odata.count": 2,
    "@odata.context": "/redfish/v1/$metadata#LogServiceCollection.LogServiceCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Systems/1/LogServices/StandardLog"
        },
```

```
        {
            "@odata.id": "/redfish/v1/Systems/1/LogServices/ActiveLog"
        }
    ],
    "@odata.type": "#LogServiceCollection.LogServiceCollection",
    "@odata.etag": "\"5d9381f2a683d05f3c6a3148444ea4d3\"",
    "Name": "LogServiceCollection",
    "Description": "A collection of LogService resource instances."
}
```

GET – Service for BMC active logs

Use the GET method to retrieve properties in active log services resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/LogServices/ActiveLog
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Uniquely identifies the resource within the collection of the log services resource. Always set to “ActiveLog”.
Name	String	The name of the resource or array element.
DateTimeLocalOffset	String	The time offset from UTC that the DateTime property is set to in format: +06:00.
MaxNumberOfRecords	Number	The maximum number of log entries this service can have. Always set to 1024.
DateTime	String	The current DateTime (with offset) for the log service, used to set or read time.
ServiceEnabled	Boolean	Indicates whether this service is enabled.
Entries	Object	References to the log entry collection.
Description	String	This resource is used to represent a log service for a Redfish implementation.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "DateTimeLocalOffset": "+00:00",
    "Id": "ActiveLog",
    "Name": "LogService",
    "Entries": {
```

```
        "@odata.id": "/redfish/v1/Systems/1/LogServices/ActiveLog/Entries"
    },
    "MaxNumberOfRecords": 1024,
    "DateTime": "2019-03-13T01:17:57+00:00",
    "@odata.type": "#LogService.v1_1_1.LogService",
    "@odata.id": "/redfish/v1/Systems/1/LogServices/ActiveLog",
    "ServiceEnabled": true,
    "@odata.etag": "\"d6817129097e3e9716f315ce67f97ae2\"",
    "@odata.context": "/redfish/v1/$metadata#LogService.LogService",
    "Description": "This resource is used to represent a log service for a Redfish implementation."
}
```


GET – Service for BMC event logs

Use the GET method to retrieve properties in standard log services resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/LogServices/StandardLog
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Uniquely identifies the resource within the collection of the log services resource. Always set to “StandardLog”.
Name	String	The name of the resource or array element.
DateTimeLocalOffset	String	The time offset from UTC that the DateTime property is set to in format: +06:00.
MaxNumberOfRecords	Number	The maximum number of log entries this service can have. Always set to 3000.
DateTime	String, Null	The current DateTime (with offset) for the log service, used to set or read time.
OverWritePolicy	String	The overwrite policy for this service that takes place when the log is full. Always set to “WrapsWhenFull” – “When full, new entries to the Log will overwrite previous entries”.
ServiceEnabled	Boolean	Indicates whether this service is enabled.
Entries	Object	References to the log entry collection.
Actions	Object	The available actions for this resource.
#LogService.ClearLog	Object	This action is used to clear all standard log entries.
Description	String	This resource is used to represent a log service for a Redfish implementation.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:


```
{
    "DateTimeLocalOffset": "+00:00",
    "DateTime": "2019-03-13T01:19:12+00:00",
    "@odata.id": "/redfish/v1/Systems/1/LogServices/StandardLog",
    "Id": "StandardLog",
    "ServiceEnabled": true,
    "Name": "LogService",
    "@odata.context": "/redfish/v1/$metadata#LogService.LogService",
    "MaxNumberOfRecords": 4096,
    "Oem": {
        "Lenovo": {
            "AuditLastSeqNum": 48,
            "PlatformLastSeqNum": 0,
            "AuditFristSeqNum": 47,
            "SupportedCategories": 3087007930,
            "DesiredCategories": 2147483684,
            "@odata.type": "#LenovoLogService.v1_0_0.LenovoLogServiceProperties",
            "VMMoveCategory": [
                {
                    "VMMoveCategoryName": "RAS event VM movement support",
                    "VMMoveCategoryBit": 0,
                    "VMMoveCategoryType": "VMEFlag"
                }
            ],
            "PlatformFirstSeqNum": 0
        }
    },
    "@odata.type": "#LogService.v1_1_1.LogService",
    "OverWritePolicy": "WrapsWhenFull",
    "Entries": {
        "@odata.id": "/redfish/v1/Systems/1/LogServices/StandardLog/Entries"
    },
    "@odata.etag": "\"9615307b4b416893179fa85bf4f7b745\"",
    "Actions": {
        "Oem": {
            "#LenovoLogService.GetLogEntriesBySequenceNumber": {
                "target": "/redfish/v1/Systems/1/LogServices/StandardLog/Actions/Oem/
                           LenovoLogService.GetLogEntriesBySequenceNumber",
                "title": "GetLogEntriesBySequenceNumber"
            },
            "#LenovoLogService.ClearSpecifiedLog": {
                "target": "/redfish/v1/Systems/1/LogServices/StandardLog/Actions/Oem/LenovoLogService.ClearSpecifiedLog",
                "title": "ClearSpecifiedLog"
            }
        },
        "#LogService.ClearLog": {
            "target": "/redfish/v1/Systems/1/LogServices/StandardLog/Actions/LogService.ClearLog",
            "title": "ClearLog"
        }
    },
    "Description": "This resource is used to represent a log service for a Redfish implementation."
}
```


POST – Clear event logs

Use the POST method to clear event logs.

Request URL

```
POST https://<BMC_IPADDR>/redfish/v1/Systems/1/LogServices/StandardLog/Actions/LogService.ClearLog
```

Request body

None

Response body

None

Response codes

Code	Description
500	Internal server error

Response example

The following example is POST body.

None

The following example JSON response is returned:

None

Resource LogEntry

This resource is used to provide logs of LogEntry for a Redfish implementation

Number of Resources	Number of log entries
Resource Path	/redfish/v1/ Systems/1/LogServices/StandardLog/ Entries /redfish/v1/Systems/1/LogServices/ActiveLog/ Entries
Schema file	LogEntryCollection_v1.xml LogEntry_v1.xml

GET – BMC active log entries

Use the GET method to retrieve properties in active log entries for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/LogServices/ActiveLog/Entries
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Uniquely identifies the resource within the collection of the log entiries.
Name	String	The name of the resource or array element. Always set to “LogEntry”.
Severity	String	The severity of the log entry.
Created	String	The time the log entry was created.
EntryType	String	The type of log entry. Always set to “Oem”.
OemRecordFormat	String	If the entry type is Oem, this will contain more information about the record format from the Oem. Always set to “Lenovo”.
Message	String	The actual Log Entry.
MessageArgs	Array	Arguments for the message.
Description	String	A collection of LogEntryActiveLogEntry resource instances.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Systems/1/LogServices/ActiveLog/Entries",
    "Members@odata.count": 4,
    "@odata.context": "/redfish/v1/$metadata#LogEntryCollection.LogEntryCollection",
    "Members": [
        {
            "MessageArgs": [
                "PSU Mismatch"
            ],
            "@odata.id": "/redfish/v1/Systems/1/LogServices/ActiveLog/Entries/104",
            "Description": "This resource is used to represent a log entry for log services for a Redfish implementation.",
            "EntryType": "Oem",
            "Name": "LogEntry",
            "@odata.context": "/redfish/v1/$metadata#LogEntry.LogEntry",
            "Id": "104",
            "Oem": {
                "Lenovo": {
                    "RelatedEventID": "",
                    "IsLocalEvent": true,
                    "EventID": "0x800702091381FFFF",
                    "ReportingChain": "XCC",
                    "EventFlag": 0,
                    "EventType": 0,
                    "CommonEventID": "FQXSPPW0062M",
                    "Source": "Power",
                    "LenovoMessageID": "PLAT0522",
                    "RawDebugLogURL": "",
                    "TSLVersion": "16",
                    "@odata.type": "#LenovoLogEntry.v1_0_0.ActiveLogEntry"
                }
            },
```

```
            "@odata.type": "#LogEntry.v1_4_0.LogEntry",
            "OemRecordFormat": "Lenovo",
            "Message": "Sensor PSU Mismatch has transitioned to critical from a less severe state.",
            "Severity": "Critical",
            "Created": "2019-03-12T15:06:46.514+00:00"
        },
        {
            "MessageArgs": [
                "Power Supply 1"
            ],
            "@odata.id": "/redfish/v1/Systems/1/LogServices/ActiveLog/Entries/106",
            "Description": "This resource is used to represent a log entry for log services for a Redfish implementation.",
            "EntryType": "Oem",
            "Name": "LogEntry",
            "@odata.context": "/redfish/v1/$metadata#LogEntry.LogEntry",
            "Id": "106",
            "Oem": {
                "Lenovo": {
                    "RelatedEventID": "",
                    "IsLocalEvent": true,
                    "EventID": "0x806F03080A01FFFF",
                    "ReportingChain": "XCC",
                    "EventFlag": 0,
                    "EventType": 0,
                    "CommonEventID": "FQXSPPW0006I",
                    "Source": "Power",
                    "LenovoMessageID": "PLAT0100",
                    "RawDebugLogURL": "",
                    "TSLVersion": "16",
                    "@odata.type": "#LenovoLogEntry.v1_0_0.ActiveLogEntry"
                }
            },
            "@odata.type": "#LogEntry.v1_4_0.LogEntry",
            "OemRecordFormat": "Lenovo",
            "Message": "Power Supply 1 has lost input.",
            "Severity": "Warning",
            "Created": "2019-03-12T15:06:52.106+00:00"
        },
        …
        …
    ],
    "@odata.type": "#LogEntryCollection.LogEntryCollection",
    "@odata.etag": "\"fc0387fd62ad5ca77c090d0de2baab56\"",
    "Name": "LogEntryActiveLogEntryCollection",
    "Description": "A collection of LogEntryActiveLogEntry resource instances."
}
```


GET – BMC event log entries

Use the GET method to retrieve properties in standard log entries for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/LogServices/StandardLog/Entries
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Uniquely identifies the resource within the collection of the log entiries.
Name	String	The name of the resource or array element. Always set to “LogEntry”.
Severity	String	The severity of the log entry.
Created	String	The time the log entry was created.
EntryType	String	The type of log entry. Always set to “Oem”.
OemRecordFormat	String	If the entry type is Oem, this will contain more information about the record format from the Oem. Always set to “Lenovo”.
Message	String	The actual Log Entry.
MessageArgs	Array	Arguments for the message.
Description	String	A collection of LogEntryActiveLogEntry resource instances.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:


```
{
    "@odata.id": "/redfish/v1/Systems/1/LogServices/StandardLog/Entries/",
    "Members@odata.count": 212,
    "@odata.context": "/redfish/v1/$metadata#LogEntryStandardLogEntryCollection.LogEntryStandardLogEntryCollection",
    "Members": [
        {
            "MessageArgs": [
                "Low Security Jmp"
            ],
            "Id": "3",
            "EntryType": "Oem",
            "Name": "LogEntry",
            "@odata.context": "/redfish/v1/$metadata#LogEntry.LogEntry",
            "@odata.id": "/redfish/v1/Systems/1/LogServices/StandardLog/Entries/3",
            "Oem": {
                "Lenovo": {
                    "ReportingChain": "XCC",
                    "IsLocalEvent": true,
                    "RawDebugLogURL": "",
                    "AffectedIndicatorLEDs": [],
                    "EventFlag": 0,
                    "AuxiliaryData": "",
                    "Source": "System",
                    "FailingFRU": [
                        {
                            "FRUSerialNumber": "",
                            "FRUNumber": ""
                        }
                    ],
                    "TSLVersion": "16",
                    "RelatedEventID": "",
```

```
                    "Hidden": false,
                    "EventID": "0x800801282101ffff",
                    "EventSequenceNumber": 1,
                    "EventType": 0,
                    "LenovoMessageID": "PLAT0536",
                    "Serviceable": "Not Serviceable",
                    "CommonEventID": "FQXSPUN0026I"
                }
            },
            "@odata.type": "#LogEntry.v1_1_0.LogEntry",
            "OemRecordFormat": "Lenovo",
            "Message": "Device Low Security Jmp has been added.",
            "Severity": "OK",
            "Created": "2018-03-07T14:17:40.532+00:00",
            "Description": "This resource is used to represent a log entry for log services for a Redfish implementation."
        }
}
```

Chapter 14. Server Inventory

Resource Memory

This resource is used to represent memory for a Redfish implementation.

Number of Resources	Number of memories supported
Resource Path	/redfish/v1/Systems/1/Memory/{1-N}
Schema file	MemoryCollection_v1.xml Memory_v1.xml

GET – Collection of server memory

Use the GET method to retrieve properties in Memory collection for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/Memory
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“Memory Collection”
Members	Array	Items: A reference link to an element of memory resource
Description	String	A Collection of memory resource instances.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Systems/1/Memory",
    "Name": "Memory Collection",
    "@odata.context": "/redfish/v1/$metadata#MemoryCollection.MemoryCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/1"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/2"
```

```
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/3"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/4"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/5"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/6"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/7"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/8"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/9"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/10"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/11"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Memory/12"
        }
    ],
    "Oem": {
        "Lenovo": {
            "HistoryMemMetric": {
                "@odata.id": "/redfish/v1/Systems/1/Memory/Oem/Lenovo/HistoryMemMetric"
            }
        }
    },
    "@odata.type": "#MemoryCollection.MemoryCollection",
    "@odata.etag": "\"ace8c79b95cdfe2824d8960c841845c6\"",
    "Members@odata.count": 12,
    "Description": "A collection of memory resource instances."
}
```


GET – Server memory properties

Use the GET method to retrieve properties in Memory resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/Memory/{1-N}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	1 – number of memories supported.
Name	String	In format “DIMM n”, n is the index of memory resource.
Description	String	“This resource is used to represent a memory for a Redfish implementation”.
AllowedSpeedsMHz	Array	The value of this property shall be the speed supported by this Memory.
BaseModuleType	String	The value of this property shall be the base module type of Memory.
BusWidthBits	Number	The value of this property shall be the bus width in bits.
CapacityMiB	Number	The value of this property shall be the Memory capacity in MiB.
DataWidthBits	Number	The value of this property shall be the data width in bits.
DeviceID	String	The value of this property shall be the device ID of the Memory.
DeviceLocator	String	Location of the Memory in the platform.
FunctionClasses	Array	Function Classes by the Memory. For DRAM, the valid value is [“Volatile”].
Manufacturer	String	The Memory manufacturer.
MemoryDeviceType	String	The value of this property shall be the Memory Device Type as defined by SMBIOS.
MemoryLocation	Object	Memory connection information to sockets and memory controllers.
Socket	Number	Socket number in which Memory is connected.
MemoryController	Number	Memory controller number in which Memory is connected.
Channel	Number	Channel number in which Memory is connected.
Slot	Number	Slot number in which Memory is connected.
MemoryMedia	Array	The value of this property shall be the media types of this Memory. For DRAM, the valid value is [“DRAM”].
MemoryType	String	The value of this property shall be the type of Memory represented by this resource. For DRAM, the value is “DRAM”.
OperatingMemoryModes	Array	Memory modes supported by the Memory. For DRAM, the valid value is [“Volatile”].
OperatingSpeedMhz	Number	Operating speed of Memory in MHz.
PartNumber	String	The product part number of this device.
RankCount	Number	Number of ranks available in the Memory.
SerialNumber	String	The product serial number of this device.
Status	Object	Contains the following elements.

Field	Type	Description
Health	String	The current health of this chassis as indicated by the entries in the event log. Valid values include: • **OK**: Normal. No warning or critical events in the event log of this chassis. • **Critical**: A critical condition exists that requires immediate attention. At least one critical event in the event log of this chassis. • **Warning**: A condition exists that requires attention. At least one warning in the event log (but no critical events) of this chassis.
State	String	“Enabled”: memory is present. “Absent”: memory is not present.
SubsystemDeviceID	String	Subsystem Device ID.
SubsystemVendorID	String	SubSystem Vendor ID.
VendorID	String	The value of this property shall be the vendor ID of the Memory.
PersistentRegionSizeLimitMiB	Number	Total size of persistent regions in mebibytes (MiB).
Regions	Array	Memory regions information within the Memory.
VolatileRegionSizeLimitMiB	Number	Total size of volatile regions in mebibytes (MiB).
Links	Object	Expanded.
Chassis	Link	A reference to the Chassis which contains this Memory.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "SerialNumber": "0301C5F3",
    "VolatileRegionSizeLimitMiB": null,
    "MemoryDeviceType": "DDR4",
    "Id": "1",
    "Links": {
        "Chassis": {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    },
    "MemoryMedia": [
        "DRAM"
    ],
    "PartNumber": "M393A1K43BB1-CTD",
    "MemoryLocation": {
        "Channel": 2,
        "MemoryController": 0,
        "Slot": 1,
        "Socket": 1
    },
    "MemoryType": "DRAM",
```

```
    "DeviceLocator": "DIMM 1",
    "DataWidthBits": 64,
    "Oem": {
        "Lenovo": {
            "@odata.type": "#LenovoMemory.v1_0_0.LenovoMemory",
            "PN": ""
        }
    },
    "@odata.type": "#Memory.v1_6_0.Memory",
    "RankCount": 0,
    "BaseModuleType": "RDIMM",
    "@odata.etag": "\"6ac09781367ad8e0a4eed61655920de0\"",
    "VendorID": "Samsung",
    "Regions": [],
    "SecurityCapabilities": {},
    "@odata.id": "/redfish/v1/Systems/1/Memory/1",
    "@odata.context": "/redfish/v1/$metadata#Memory.Memory",
    "CapacityMiB": 8192,
    "Description": "This resource is used to represent a memory for a Redfish implementation.",
    "SubsystemDeviceID": "0x0000",
    "OperatingMemoryModes": [
        "Volatile"
    ],
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "BusWidthBits": 72,
    "DeviceID": "DIMM_1",
    "SubsystemVendorID": "0x0000",
    "AllowedSpeedsMHz": [
        2666
    ],
    "Manufacturer": "Samsung",
    "OperatingSpeedMhz": 2400,
    "PersistentRegionSizeLimitMiB": 1919905125,
    "Name": "DIMM 1",
    "FunctionClasses": [
        "Volatile"
    ]
}
```


Resource NetworkInterface

This resource is used to represent network interfaces for a Redfish implementation.

Number of Resources	1
Resource Path	/redfish/v1/ Systems/1/NetworkInterfaces/{1-N}
Schema file	NetworkInterfaceCollection_v1.xml NetworkInterface_v1.xml

GET – Collection of network interfaces

Use the GET method to retrieve properties in server network interfaces collection for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/NetworkInterfaces
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“NetworkInterfaceCollection”
Members	Array	Items: A reference link to an element of network interface resource
Description	String	A Collection of NetworkInterface resource instances.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
   "@odata.context" : "/redfish/v1/$metadata#NetworkInterfaceCollection.NetworkInterfaceCollection",
   "Members@odata.count" : 3,
   "@odata.id" : "/redfish/v1/Systems/1/NetworkInterfaces",
   "@odata.etag" : "\"f274d6bbbebc305a01d229c86400b764\"",
   "Members" : [
      {
         "@odata.id" : "/redfish/v1/Systems/1/NetworkInterfaces/1"
      },
      {
         "@odata.id" : "/redfish/v1/Systems/1/NetworkInterfaces/2"
      },
      {
         "@odata.id" : "/redfish/v1/Systems/1/NetworkInterfaces/3"
      }
   ],
   "@odata.type" : "#NetworkInterfaceCollection.NetworkInterfaceCollection",
   "Name" : "NetworkInterfaceCollection",
   "Description" : "A collection of NetworkInterface resource instances."
}
```

GET – Server network interfaces

Use the GET method to retrieve properties in Network interface for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/NetworkInterfaces/{1-N}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Index
Description	String	A NetworkInterface contains references linking NetworkAdapter, NetworkPort, and NetworkDeviceFunction resources and represents the functionality available to the containing system.
Name	String	Network Interface X (X=1-N)
Status	Object	expand
State	String	Enabled
Health	String	OK
Links	Object	expand
NetworkAdapter	Reference	Link to related NetworkAdapter.
NetworkPorts	Reference	Link to related NetworkPortCollection.
NetworkDeviceFunctions	Reference	Link to related NetworkDeviceFunctionCollection.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
   "@odata.context" : "/redfish/v1/$metadata#NetworkInterface.NetworkInterface",
   "Id" : "1",
   "Status" : {
      "Health" : "OK",
      "State" : "Enabled"
   },
   "NetworkPorts" : {
      "@odata.id" : "/redfish/v1/Chassis/1/NetworkAdapters/ob-1/NetworkPorts"
   },
   "Links" : {
      "NetworkAdapter" : {
         "@odata.id" : "/redfish/v1/Chassis/1/NetworkAdapters/ob-1"
      }
   },
   "NetworkDeviceFunctions" : {
      "@odata.id" : "/redfish/v1/Chassis/1/NetworkAdapters/ob-1/NetworkDeviceFunctions"
   },
   "@odata.etag" : "\"dc20bec25dc27d97279c8bada95185d6\"",
   "@odata.id" : "/redfish/v1/Systems/1/NetworkInterfaces/1",
   "@odata.type" : "#NetworkInterface.v1_1_1.NetworkInterface",
   "Description" : "A NetworkInterface contains references linking NetworkAdapter, NetworkPort, and
                    NetworkDeviceFunction resources and represents the functionality available to the
```

```
                    containing system.",
   "Name" : "Network Interface 1"
}
```

Resource PCIeDevice

This resource is used to represent PCIe device for a Redfish implementation.

Number of Resources	Number of PCIe devices
Resource Path	/redfish/v1/Systems/1/PCIeDevices/{Location} (Location= ob_X or slot_Y)
Schema file	PCIeDevice_v1.xml

GET – Server PCIe devices

Use the GET method to retrieve properties in PCIeDevice collection for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/PCIeDevices/{Location}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	The Id property uniquely identifies this PCIe device.
DeviceType	String	The device type for this PCIe device
FirmwareVersion	String	The version of firmware for this PCIe device
SKU	String	This is the SKU for this PCIe device
Links	Object	Expand
Chassis	Reference	Link to chassis resource
PCIeFunctions	Reference	Link to the related PCIeFunctions For example: if the URI of PCIeDevice is /redfish/v1/Systems/1/PCIeDevice/ob_1, the related PCIeFunction URI will be like /redfish/v1/Systems/1/PCIeFunctions/ob_1.00
Manufacturer	String	This is the manufacturer of this PCIe device
Model	String	This is the model number for the PCIe device
Name	String	The card name in VPD for this PCIe device, if it is an on-board PCIe device, add “(onboard)” in the end. If there is no VPD data, this property will be “Adapter”.
PartNumber	String	The part number for this PCIe device
SerialNumber	String	The serial number for this PCIe device

Field	Type	Description
Status	Object	“None”
State	String	Enabled
Health	String	This represents the health state of this resource
Description	String	This resource represents the properties of a PCIeDevice attached to a System.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
   "Oem" : {
      "Lenovo" : {
         "@odata.type" : "#LenovoDeviceInfo.v1_0_0.LenovoDeviceInfo",
         "Location" : {
            "InfoFormat" : "Slot X",
            "Info" : "Slot 1"
         }
      }
   },
   "Status" : {
      "Health" : "OK",
      "State" : "Enabled"
   },
   "FirmwareVersion" : "212.0.168.0",
   "Model" : "BCMSAMPLE",
   "PartNumber" : "SN30LSAMPLE",
   "DeviceType" : "MultiFunction",
   "Manufacturer" : "Broadcom Limited",
   "SerialNumber" : "0123",
   "@odata.context" : "/redfish/v1/$metadata#PCIeDevice.PCIeDevice",
   "Id" : "slot_1",
   "Links" : {
      "PCIeFunctions" : [
         {
            "@odata.id" : "/redfish/v1/Systems/1/PCIeFunctions/slot_1.01"
         },
         {
            "@odata.id" : "/redfish/v1/Systems/1/PCIeFunctions/slot_1.00"
         }
      ],
      "Chassis" : [
         {
            "@odata.id" : "/redfish/v1/Chassis/1"
         }
      ]
   },
   "@odata.id" : "/redfish/v1/Systems/1/PCIeDevices/slot_1",
   "@odata.etag" : "\"43f39765d26f66d828f786babb264de7\"",
   "@odata.type" : "#PCIeDevice.v1_3_0.PCIeDevice",
   "Description" : "This resource represents the properties of a PCIeDevice attached to a System.",
```

```
   "Name" : "Broadcom SAMPLE ML2 10Gb 2-Port Base-T Ethernet Adapter",
   "SKU" : "00YKSAMPLE"
}
```

Resource PCIeFunction

This resource is used to represent PCIe function information for a Redfish implementation.

Number of Resources	Number of PCIe functions
Resource Path	/redfish/v1/Systems/1/PCIeFunctions/{Location} (Location=ob_X.YY or slot_W.ZZ)
Schema file	PCIeFunction_v1.xml

GET – Functions of server PCIe devices

Use the GET method to retrieve properties in PCIeFunction collection for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/PCIeFunctions/{Location}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	The Id property uniquely identifies this PCIe function.
ClassCode	String	The Class Code of this PCIe function
Description	String	This resource represents the properties of a PCIeFunction attached to a System.
DeviceClass	Enum String	The class for this PCIe Function
DeviceId	String	The Device ID of this PCIe function
FunctionId	String	The the PCIe Function identifier
FunctionType	Enum String	Physical
Links	Object	expand
Drives	Array	Link to related the Drive resources
EthernetInterfaces	Array	Link to related the EthernetInterface resources
StorageControllers	Array	Link to related the StorageController resources
PCIeDevice	Refer-ence	Link to related the PCIeDevice resource

Field	Type	Description
Name	String	$The card name in VPD + $bus number + $device number + $function number If there is no VPD data, using “Adapter” instead of card name.
Status	Object	expand
State	String	Enabled
Health	String	OK
HealthRollup	String	The data is come from the API immdb_get_adapter_health_status. 0 is mapped to “Critical” 1 is mapped to “Warning” 2 is mapped to “OK” Other values are mapped “null” that is indicated the backend data is not available.
RevisionId	String	The Revision ID of this PCIe function
SubsystemId	String	The Subsystem ID of this PCIe function
SubsystemVendorId	String	The Subsystem Vendor ID of this PCIe function
VendorId	String	The Vendor ID of this PCIe function

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
   "SubsystemVendorId" : "0x17aa",
   "DeviceClass" : "NetworkController",
   "Status" : {
      "HealthRollup" : "OK",
      "Health" : "OK",
      "State" : "Enabled"
   },
   "DeviceId" : "0x16d8",
   "FunctionType" : "Physical",
   "FunctionId" : 0,
   "@odata.context" : "/redfish/v1/$metadata#PCIeFunction.PCIeFunction",
   "Id" : "slot_1.00",
   "RevisionId" : "0x00",
   "Links" : {
      "Drives" : [],
      "EthernetInterfaces" : [
         {
            "@odata.id" : "/redfish/v1/Systems/1/EthernetInterfaces/NIC5"
         }
      ],
```

```
      "StorageControllers" : [],
      "PCIeDevice" : {
         "@odata.id" : "/redfish/v1/Systems/1/PCIeDevices/slot_1"
      }
   },
   "@odata.id" : "/redfish/v1/Systems/1/PCIeFunctions/slot_1.00",
   "@odata.etag" : "\"5275f887df50b39310ef5e5e93d24fa4\"",
   "VendorId" : "0x14e4",
   "@odata.type" : "#PCIeFunction.v1_2_1.PCIeFunction",
   "SubsystemId" : "0x4161",
   "ClassCode" : "0x020000",
   "Description" : "This resource represents the properties of a PCIeFunction attached to a System.",
   "Name" : "Broadcom SAMPLE ML2 10Gb 2-Port Base-T Ethernet Adapter 08:00:00"
}
```


Resource Processor

This resource is used to represent processor for a Redfish implementation.

Number of Resources	Number of processors supported
Resource Path	/redfish/v1/Systems/1/Processors/{1-N}
Schema file	ProcessorCollection_v1.xml Processor_v1.xml

GET – Collection of CPUs

Use the GET method to retrieve properties in Processor collection for Redfish service.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/Systems/1/Processors`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Name	String	“ProcessorCollection”
Members	Array	Items: A reference link to an element of processor resource
Description	String	A Collection of Processor resource instances.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Systems/1/Processors",
    "Name": "ProcessorCollection",
    "@odata.context": "/redfish/v1/$metadata#ProcessorCollection.ProcessorCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Systems/1/Processors/1"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Processors/2"
        }
    ],
    "Oem": {
        "Lenovo": {
            "HistoryCPUMetric": {
                "@odata.id": "/redfish/v1/Systems/1/Processors/Oem/Lenovo/HistoryCPUMetric"
            }
        }
    },
    "@odata.type": "#ProcessorCollection.ProcessorCollection",
    "@odata.etag": "\"70be1e1cd02f7e3e91cbdcf744254ffa\"",
    "Members@odata.count": 2,
    "Description": "A collection of Processor resource instances."
}
```


GET – CPU properties

Use the GET method to retrieve properties in Processor collection for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/Processors/{1-N}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Description	String	"This resource is used to represent a processor for a Redfish implementation."
Id	String	1~{N}, N=1- number of processors
InstructionSet	String	"x86-64"
Manufacturer	String	The processor manufacturer.
MaxSpeedMHz	Number	The maximum clock speed of the processor.
Model	String	The product model of the processor.
Name	String	"Processor {N}", N=1- number of processor
ProcessorArchitecture	String	"x86"
ProcessorId	Object	Expanded
EffectiveFamily	String	The effective Family for this processor.

Field	Type	Description
EffectiveModel	String	The effective Model for this processor.
IdentificationRegisters	String	The contents of the Identification Registers (CPUID) for this processor.
MicrocodeInfo	String	null
Step	String	The Step value for this processor.
VendorId	String	The Vendor Identification for this processor.
ProcessorType	String	“CPU”
Socket	String	The socket or location of the processor.
Status	Object	Contains the following elements
Health	String	The current health of this chassis as indicated by the entries in the event log. Valid values include: • **OK**: Normal. No warning or critical events in the event log of this chassis. • **Critical**: A critical condition exists that requires immediate attention. At least one critical event in the event log of this chassis. • **Warning**: A condition exists that requires attention. At least one warning in the event log (but no critical events) of this chassis.
State	String	“Enabled”: processor is present “Absent”: processor is not present
TotalCores	Number	The total number of cores contained in this processor.
TotalThreads	Number	The total number of execution threads supported by this processor.
Links	Object	Expand
Chassis	Link	/redfish/v1/Chassis/1/

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Systems/1/Processors/1",
    "Links": {
        "Chassis": {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    },
    "@odata.context": "/redfish/v1/$metadata#Processor.Processor",
    "InstructionSet": "x86-64",
    "Description": "This resource is used to represent a processor for a Redfish implementation.",
    "@odata.etag": "\"e475b4fee354ef6cd70c741b1007bbcc\"",
    "ProcessorArchitecture": "x86",
    "TotalThreads": 32,
```

```
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "ProcessorType": "CPU",
    "Name": "Processor 1",
    "ProcessorId": {
        "Step": "0x05",
        "VendorId": "GenuineIntel",
        "EffectiveModel": "0x55",
        "EffectiveFamily": "0x06",
        "IdentificationRegisters": "0x00050655bfebfbff",
        "MicrocodeInfo": null
    },
    "Model": "Intel(R) Xeon(R) Gold 5218T CPU @ 2.10GHz",
    "Oem": {
        "Lenovo": {
            "ProcessorFamily": 179,
            "CacheInfo": [
                {
                    "InstalledSizeKByte": 1024,
                    "MaxCacheSizeKByte": 1024,
                    "CacheLevel": "L1"
                },
                {
                    "InstalledSizeKByte": 16384,
                    "MaxCacheSizeKByte": 16384,
                    "CacheLevel": "L2"
                },
                {
                    "InstalledSizeKByte": 22528,
                    "MaxCacheSizeKByte": 22528,
                    "CacheLevel": "L3"
                }
            ],
            "@odata.type": "#LenovoProcessor.v1_0_0.LenovoProcessor",
            "NumberOfEnabledCores": 16,
            "ExternalBusClockSpeedMHz": 100,
            "CurrentClockSpeedMHz": 2100
        }
    },
    "@odata.type": "#Processor.v1_3_1.Processor",
    "Id": "1",
    "Manufacturer": "Intel(R) Corporation",
    "MaxSpeedMHz": 3800,
    "TotalCores": 16,
    "Socket": "CPU 1"
}
```

Chapter 15. Storage Management

Resource Storage

This Resource is used to represent Storage for a Redfish implementation.

Number of Resources	Number of storage controllers
Resource Path	/redfish/v1/ Systems/1/Storage/{Id}
Schema file	StorageCollection_v1.xml Storage_v1.xml

GET – Collection of storage controllers

Use the GET method to retrieve the properties storage collection resource for a server.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/Systems/1/Storage`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Members	Array	Items: A reference link of the elements of Storage.
Name	String	StorageCollection
Description	String	A collection of storage resource instances.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/Systems/1/Storage",
    "Name": "StorageCollection",
    "@odata.context": "/redfish/v1/$metadata#StorageCollection.StorageCollection",
    "Members": [
        {
            "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot2"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot8"
```

```
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot10"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Storage/M.2_Slot6"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/Storage/Slot_9"
        }
    ],
    "@odata.type": "#StorageCollection.StorageCollection",
    "@odata.etag": "\"28d9f02343db5f85d565f889d3e3f50f\"",
    "Members@odata.count": 5,
    "Description": "A collection of storage resource instances"
}
```


GET – Storage controller properties

Use the GET method to retrieve the properties of storage resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/Storage/{Id}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Description	String	"This resource is used to represent a storage for a Redfish implementation.
Id	String	Storage Id with slot info
Links	Object	Expanded.
Enclosures	Array	A URI reference to a resource of chassis.
Enclosures[N]	Object	Link. {SR}/Chassis/1
Name	String	"RAID Storage".
Status	Object	Expanded.
State	String	"Enabled".
HealthRollup	String	This represents the overall health state from the view of this resource.
Health	String	Total health info of selected storage, including the controller, drive and volume.
StorageControllers	Array	Controller info of the selected storage.
StorageControllers[N]	Object	Expended.
FirmwareVersion	String	Controller's firmware info.
Identifiers	Array	Items: the durable names of the storage controller. Item count: 1

Field	Type	Description
Identifiers[N]	Object	Expanded.
DurableNameFormat	Enum-String	“UUID”.
DurableName	String	Controller’s uuid info.
Manufacturer	String	Manufacture.
Model	String	Model.
MemberId	String	This is the identifier for the member within the collection.
Name	String	The name of the Storage Controller.
Cachesummary	Object	Expanded
TotalCacheSizeMiB	Integer	The total configured cache memory, measured in MiB.
Status	Object	Expanded
State	String	If the value of TotalCacheSizeMiB = 0, the value shall be “Disabled”; otherwise, “Enabled”.
Health	String	“OK”.
Location	Object	Expanded.
InfoFormat	String	“Slot X”.
Info	String	The value is “Slot X“.
PartNumber	String	partNo.
SerialNumber	String	SerialNo .
SpeedGbps	Number	12
Status	Object	The storage controller’s health info.
State	String	“Enabled”.
Health	String	One of{“Ok”, “Warning”, “Critical”}.
Drives	Array	Drives connected to selected controller.
Drives[N]	Object	Link.
Volumes	Array	The volume created by the controller.
Volumes[N]	Object	Link.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "Drives": [],
    "Links": {
        "Enclosures": [
```

```
        {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    ]
},
"Id": "RAID_Slot2",
"Volumes": {
    "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot2/Volumes"
},
"StorageControllers": [
    {
        "SerialNumber": "SP71602589",
        "FirmwareVersion": "1.125.10.0",
        "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot2#/StorageControllers/0",
        "Status": {
            "State": "Enabled",
            "Health": "OK"
        },
        "CacheSummary": {
            "Status": {
                "State": "Disabled"
            },
            "TotalCacheSizeMiB": 0
        },
        "Name": "ThinkSystem 430-8i SAS/SATA 12Gb HBA",
        "MemberId": "0",
        "Identifiers": [
            {
                "DurableNameFormat": "UUID",
                "DurableName": "00000000000000000500605B00CED9610"
            }
        ],
        "Oem": {
            "Lenovo": {
                "SupportedRaidLevels": "",
                "Mode": "JBOD"
            }
        },
        "PartNumber": "SR10K17081",
        "SpeedGbps": 12,
        "Manufacturer": "Lenovo",
        "Model": "SAS3408",
        "Location": {
            "InfoFormat": "Slot X",
            "Info": "Slot 2"
        }
    }
],
"Name": "RAID Storage",
"@odata.context": "/redfish/v1/$metadata#Storage.Storage",
"Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
},
"@odata.type": "#Storage.v1_5_0.Storage",
"@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot2",
"StorageControllers@odata.count": 1,
"@odata.etag": "\"9230c2cd0f2d7ac251ad8ae548fe90c6\"",
"Drives@odata.count": 0,
"Description": "This resource is used to represent a storage for a Redfish implementation."
```

}

Resource Drive

This Resource is used to represent drive information for a Redfish implementation.

Number of Resources	Number of drives managed by storage controller
Resource Path	/redfish/v1/Systems/1/Storage/Id/Drives/{DriveId}
Schema file	Drive_v1.xml

GET – Drives managed by storage controller

Use the GET method to retrieve the drive resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/Storage/Id/Drives/{DriveId}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Description	String	"This resource is used to represent a drive for a Redfish implementation."
BlockSizeBytes	Number	Size of the smallest addressible unit of the associated drive.
CapableSpeedGbs	Number	Fastest capable bus speed of the associated drive.
CapacityBytes	Number	Size in bytes of this Drive.
EncryptionAbility	String	One of {“None”, “SelfEncryptingDrive”}.
EncryptionStatus	String	One of {“Unlocked”, “Locked”, “Unencrypted”}.
HotspareType	String	One of {“None” ,“Global”}.
Id	String	Drive slot id.
FailurePredicted	Boolean	Indicate this drive currently predicting a failure in the near future.
Identifiers	Array	The Durable names for the drive.
Identifiers[N]	Object	Expanded.
DurableNameFormat	Enum String	“UUID”.
DurableName	String	Drive’s uuid info
Links	Object	Expanded.
Chassis	Refer-ence	A URI reference to a resource of chassis.
Volumes	Array	An array of references to the volumes contained in this drive.

Field	Type	Description
Volumes[n]	Refer-ence	Link.
PhysicalLocation	Object	Expanded.
Info	String	Slot number of the drive.
InfoFormat	String	"Slot Number".
Manufacturer	String	Drive's manufacturer.
MediaType	String	Drive's media type.
Model	String	Model.
Name	String	0-100. disk info remaining life
PredictedMediaLifeLeftPercent	Number	Part number of the drive.
PartNumber	String	partNo.
Protocol	String	The protocol this drive is using to communicate to storage controller.
Revision	String	Drive's firmware/hardware version.
RotationSpeedRPM	Number	Drive's rotation speed.
SerialNumber	String	SerialNo.
Status	Object	Expanded.
State	String	"Enabled".
Health	String	Drive's health info.

Note: The resource "Drive" can describe multiple types of drives. For some cases, such as NVMe added on M.2 card, partial info may not be available.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "SerialNumber": "S0M7KYYG",
    "Id": "Disk.8",
    "Revision": "F500",
    "@odata.context": "/redfish/v1/$metadata#Drive.Drive",
    "EncryptionAbility": "SelfEncryptingDrive",
    "CapableSpeedGbs": 12,
    "@odata.type": "#Drive.v1_5_0.Drive",
    "Links": {
        "Volumes": [],
        "Chassis": {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    },
    "PartNumber": "00WG714",
    "EncryptionStatus": "Unencrypted",
```

```
    "MediaType": "HDD",
    "Description": "This resource is used to represent a drive for a Redfish implementation.",
    "BlockSizeBytes": 512,
    "RotationSpeedRPM": 10500,
    "Oem": {
        "Lenovo": {
            "DriveStatus": "Unconfigured good",
            "@odata.type": "#LenovoDrive.v1_0_0.LenovoDrive"
        }
    },
    "Manufacturer": "LENOVO-X",
    "FailurePredicted": false,
    "Protocol": "SAS",
    "Name": "600GB 10K 12Gbps SAS 2.5 HDD (SED)",
    "HotspareType": "None",
    "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot8/Drives/Disk.8",
    "Identifiers": [
        {
            "DurableName": "",
            "DurableNameFormat": "UUID"
        }
    ],
    "CapacityBytes": 600127266816,
    "PhysicalLocation": {
        "InfoFormat": "Slot Number",
        "Info": "Slot 8"
    },
    "PredictedMediaLifeLeftPercent": null,
    "@odata.etag": "\"12923b40ab51a3552172b6bd2b708077\"",
    "Model": "ST600MM0218",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    }
}
```


Resource Volume

This resource is used to represent volume information for a Redfish implementation.

Number of Resources	Number of volumes managed by storage controller
Resource Path	/redfish/v1/Systems/1/Storage/Id/Volumes/{VolumeId}
Schema file	Volume_v1.xml

GET – Volumes managed by storage controller

Use the GET method to retrieve the volume resource for a server.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/Systems/1/Storage/Id/Volumes/{VolumeId}`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Description	String	"This resource is used to represent voulme in Redfish implementation" .
BlockSizeBytes	Number	Size of the smallest addressible unit of the associated volume.
CapacityBytes	Number	Size in bytes of this volume.
Id	String	Volume Id.
Links	Object	Expanded.
Drives	Array	An array of references to the drives that are used to creat the volume.
Drives[n]	Reference	Each Drive URI.
Name	String	Volume info name.
Status	Object	Expanded.
State	String	"Enabled".
Health	String	Volume info status.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "Id": "2",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "BlockSizeBytes": 512,
    "Name": "VD_1",
    "@odata.context": "/redfish/v1/$metadata#Volume.Volume",
    "Oem": {
        "Lenovo": {
            "DriveCachePolicy": "",
            "AccessPolicy": "",
            "WritePolicy": "",
            "ReadPolicy": "",
            "Bootable": true,
            "IOPolicy": "",
            "RaidLevel": "RAID 0"
        }
    },
    "CapacityBytes": 298999349248,
    "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot8/Volumes/2",
    "@odata.type": "#Volume.v1_0_3.Volume",
    "@odata.etag": "\"6a1541323374cbc07f58a33f90124fcd\"",
    "Links": {
        "Drives": [
            {
                "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot8/Drives/Disk.9"
```

```
            }
        ]
    },
    "Description": "This resource is used to represent a volume for a Redfish implementation."
}
```

Chapter 16. BIOS Setting and Boot Management

Resource Bios

This resource is used to represent the BIOS setting for a Redfish implementation.

Number of Resources	2
Resource Path	/redfish/v1/Systems/1/Bios /redfish/v1/Systems/1/Bios/Pending
Schema file	Bios_v1.xml

GET – Resource for BIOS

Use the GET method to retrieve properties in BIOS resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/Bios
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	“Bios”.
Name	String	“Bios”.
Description	String	“System Bios”.
AttributeRegistry	String	”BiosAttributeRegistryV1”.
Attributes	Object	This is the manufacturer/provider specific list of BIOS attributes.
Actions	Object	Expanded.
#Bios.ChangePassword	Object	Refer the section Actions.
PasswordName@Redfish.AllowableValues	Array	Items: string Item count: 2
PasswordName@Redfish.AllowableValues[0]	String	"UefiAdminPassword".
PasswordName@Redfish.AllowableValues[1]	String	"UefiPowerOnPassword".
#Bios.ResetBios	Object	Refer the section Actions.
@Redfish.Settings	Object	Expanded.
Messages	Array	Items:object.

Field	Type	Description
Messages[N]	Object	Expanded.
MessageId	String	“RebootRequired”.
RelatedProperties	Array	Items:string.
RelatedProperties[N]	String	The setting name of BIOS attributes. The format will be “#/Attributes/” + the name of attribute.
Severity	String	“Warning”.
Message	String	“Changes completed successfully, but these changes will not take effect until next reboot.”
Resolution	String	“Reboot the computer system for the changes to take effect.”
SettingsObject	Link	/redfish/v1/Systems/1/Bios/Pending/.
Time	String	Indicate the time when the Attributes last applied.
SupportedApplyTimes	Array	Items: string Item count: 1
SupportedApplyTimes[0]	String	“OnReset”.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "Id": "Bios",
    "@Redfish.Settings": {
        "@odata.type": "#Settings.v1_2_1.Settings",
        "Messages": [],
        "SupportedApplyTimes": [
            "OnReset"
        ],
        "Time": "2019-03-19T02:58:38+00:00",
        "SettingsObject": {
            "@odata.id": "/redfish/v1/Systems/1/Bios/Pending"
        }
    },
    "Name": "Bios",
    "@odata.context": "/redfish/v1/$metadata#Bios.Bios",
    "@odata.id": "/redfish/v1/Systems/1/Bios",
    "@odata.type": "#Bios.v1_0_5.Bios",
    "@odata.etag": "\"6513c01c2c7ee2bcf69d37096604 0f5c\"",
    "AttributeRegistry": "BiosAttributeRegistry.1.0.0",
    "Attributes": {},
    "Actions": {
        "#Bios.ResetBios": {
            "target": "/redfish/v1/Systems/1/Bios/Actions/Bios.ResetBios",
            "title": "ResetBios"
        },
        "#Bios.ChangePassword": {
```

```
            "target": "/redfish/v1/Systems/1/Bios/Actions/Bios.ChangePassword",
            "title": "ChangePassword",
            "PasswordName@Redfish.AllowableValues": [
                "UefiAdminPassword",
                "UefiPowerOnPassword"
            ],
            "@Redfish.ActionInfo": "/redfish/v1/Systems/1/Bios/ChangePasswordActionInfo"
        }
    },
    "Description": "System Bios"
}
```


POST – Change BIOS password settings

Use the POST method to change BIOS password settings

Request URL

`POST https://<BMC_IPADDR>/redfish/v1/Systems/1/Bios/Actions/Bios.ChangePassword`

Request body

Field	Type	Description
PasswordName	String	"UefiAdminPassword" or "UefiPowerOnPassword"
NewPassword	String	Configure parameter NewPassword, empty value will clear current password. If it's not empty, the password length must be at least 8 and at most 20.The password rule shall follow the lenovo uefi password rule, no three continuous and same characters appear in password.

Response body

None

Response codes

Code	Description
200	RebootRequired
400	ActionParamFormatError
403	InsufficientPrivilege
500	Internal server error

Response example

The following example is POST body.


```
{
    "PasswordName" : "UefiAdminPassword"
"NewPasswOrd" : "*******"
}
```


The following response is returned:


```
{
    "@Message.ExtendedInfo": [
        {
            "MessageArgs": [],
            "Resolution": "Reboot the computer system for the changes to take effect.",
```

```
            "MessageId": "ExtendedError.1.1.RebootRequired",
            "Severity": "Warning",
            "Message": "Changes completed successfully, but these changes will not take effect until next reboot.",
            "@odata.type": "#Message.v1_0_6.Message"
        }
    ]
}
```

POST – Reset BIOS operation

Use the POST method to reset BIOS password settings

Request URL

`POST https://<BMC_IPADDR>/redfish/v1/Systems/1/Bios/Actions/Bios.ResetBios`

Request body

None

Response body

None

Response codes

Code	Description
200	RebootRequired
403	Forbidden
500	Internal server error
503	ServiceUnavailable

Response example

POST body is empty.

The following response is returned:

```
{
    "@Message.ExtendedInfo": [
        {
            "MessageArgs": [],
            "Resolution": "Reboot the computer system for the changes to take effect.",
            "MessageId": "ExtendedError.1.1.RebootRequired",
            "Severity": "Warning",
            "Message": "Changes completed successfully, but these changes will not take effect until next reboot.",
            "@odata.type": "#Message.v1_0_6.Message"
        }
    ]
}
```

GET – The pending BIOS settings

Use the GET method to retrieve properties in Bios resource (pending) for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/Bios/Pending
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	“Pending”
Name	String	“Pending”
Description	String	“Bios Pending Setting”
AttributeRegistry	String	”BiosAttributeRegistryV1”
Attributes	Object	Expanded, the pending data of BIOS attributes

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "Id": "Pending",
    "Name": "Pending",
    "@odata.context": "/redfish/v1/$metadata#Bios.Bios",
    "@odata.type": "#Bios.v1_0_5.Bios",
    "AttributeRegistry": "BiosAttributeRegistry.1.0.0",
    "Attributes": {
        "DevicesandIOPorts_Device_Slot6" : "Enable",
        "Memory_MemorySpeed" : "MaxPerformance",
        “Processors_CPUPstateControl" : "Autonomous",
        "Processors_CStates" : "Disable",
        …
        …
},
    "@odata.etag": "\"55e794278a844299f0ee2f8eb5c57a9e\"",
    "@odata.id": "/redfish/v1/Systems/1/Bios/Pending",
    "Description": "Bios Pending Setting"
}
```

PATCH – Update pending BIOS settings

Use the PATCH method to update properties in BIOS resource for Redfish service.

Request URL

```
PATCH https://<BMC_IPADDR>/redfish/v1/Systems/1/Bios/Pending
```

Request body

Properties to be updated are shown as bellow, all of these properties can be changed individually.

Field	Type	Description
Attributes	Object	Expanded, the pending data of BIOS attributes

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
200	RebootRequired
403	InsufficientPrivilege
500	Internal server error
503	ServiceUnavailable

Response example

The following example is PATCH body.

```
{
   "Attributes":{
       "DevicesandIOPorts_Device_Slot6":"Disable"
   }
}
```

After the PATCH operation runs successfully, querying the system resource returns below example JSON response:

```
{
   "@odata.context" : "/redfish/v1/$metadata#Bios.Bios",
   "Id" : "Pending",
   "AttributeRegistry" : "BiosAttributeRegistryV1",
   "@odata.id" : "/redfish/v1/Systems/1/Bios/Pending",
   "@odata.etag" : "W/\"150413e15fe8f09a9a53b1f0edf68cfe\"",
   "Attributes" : {
      "DevicesandIOPorts_Device_Slot6" : "Disable",
      "Memory_MemorySpeed" : "MaxPerformance",
      "Processors_CPUPstateControl" : "Autonomous",
      …
}
}
```

Resource AttributeRegistry

This resource is used to represent the attribute registry for a Redfish implementation.

Number of Resources	1
Resource Path	/redfish/v1/schemas/registries/ BiosAttributeRegistry.1.0.0.json
Schema file	AttributeRegistry_v1.xml

GET – BIOS attribute registries

Use the GET method to retrieve properties in AttributeRegistry for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/schemas/registries/BiosAttributeRegistry.1.0.0.json
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	“BiosAttributeRegistryV1”
Language	String	“en”
Name	String	“Bios Attribute Registry Version 1”
OwningEntity	String	“Lenovo”
RegistryEntries	Object	List of all attributes and their metadata for this component
Attributes	Array	The array containing the attributes and their possible values
Attributes[N]	Object	An attribute and its possible values
AttributeName	String	The unique name of the attribute
CurrentValue	String	”null”
DefaultValue	String	The default current value of the attribute
DisplayName	String	pattr.short_desc
DisplayOrder	Number	The numeric value describing the ascending order that the attribute is displayed relative to other attributes
GrayOut	Boolean	The gray-out state of this attribute
HelpText	String	The help text for the attribute
Hidden	Boolean	The hidden state of this attribute
LowerBound	Number	The lower limit of the value of an attribute of type 'Integer'.
MaxLength	Number, Null	The maximum character length of the value of an attribute of type 'String'
MenuPath	String	A path that describes the menu hierarchy of this attribute
MinLength	Number, Null	The minimum character length of the value of an attribute of type 'String'
ReadOnly	Boolean	The read-only state of this attribute
ScalarIncrement	Number, Null	The amount to increment or decrement the value of an attribute of type 'Integer' each time a user requests a value change
Type	String	The type of the attribute.
UpperBound	Number, Null	The upper limit of the value of an attribute of type 'Integer'

Field	Type	Description
Value	Array, Null	The array containing possible values for attributes of type 'Enumeration'
Value[N]	Object	Expanded
ValueDisplayName	String	A user-readable display string of the value of the attribute in the defined 'Language'
ValueName	String	The value name of the attribute
ValueExpression	String, Null	A regular expression that is used to validate the value of the attribute. This is only applicable to attributes of type 'String' or 'Integer'
WarningText	String	The warning text for changing the attribute
WriteOnly	Boolean	Defines whether this attribute is write-only. Such attributes revert back to their initial value after settings are applied
Dependencies	Array	The array containing a list of dependencies of attributes on this component
Dependencies[N]	Object	A dependency of attributes on this component
Dependency	Object	The dependency expression for one or more Attributes in this Attribute Registry
MapFrom	Array	Array of the map-from conditions for mapping dependency
MapFrom[N]	Ibject	A map-from condition for mapping dependency
MapFromAttribute	String	The attribute that is used to evaluate this dependency expression
MapFromCondition	String	The condition that is used to evaluate this dependency expression
MapFromProperty	String	“CurrentValue”
MapFromValue	String	The value that the is used property specified in MapFromProperty that is used to evaluate this dependency expression.
MapTerms	String	The logical term used to combine two or more MapFrom conditions in this dependency expression
MapToAttribute	String	The Name of the attribute that is affected by this dependency expression
MapToProperty	String	The meta-data property of the attribute specified in MapFromAttribute that is used to evaluate this dependency expression
MapToValue	Boolean	true
DependencyFor	String	The AttributeName of the attribute whose change triggers the evaluation of this dependency expression
Type	String	“Map”
Menus	Array	The array containing the attributes menus and their hierarchy.
Menus[N]	Object	A menu and its hierarchy
DisplayName	String	The user-readable display string of this menu in the defined 'Language'
DisplayOrder	Number	The numeric value describing the ascending order in which this menu is displayed relative to other menus
GrayOut	Boolean	false

Field	Type	Description
MenuName	String	The unique name string of this menu
MenuPath	String	A path that describes this menu hierarchy relative to other menus
ReadOnly	Boolean	false
RegistryVersion	String	“1.0.0”
SupportedSystems	Array	Array of systems supported by this attribute registry
SupportedSystems[N]	Object	A system supported by this attribute registry
ProductName	String	Use The product name of the system
SystemId	String	The system ID of the system
FirmwareVersion	String	Firmware version

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
   "@odata.context" : "/redfish/v1/$metadata#AttributeRegistry.AttributeRegistry",
   "Id" : "BiosAttributeRegistryV1",
   "RegistryVersion" : "1.0.0",
   "Language" : "en",
   "RegistryEntries" : {
      "Attributes" : [
         {
            "WriteOnly" : false,
            "ReadOnly" : false,
            "Value" : [
               {
                  "ValueName" : "Disable",
                  "ValueDisplayName" : "Disable"
               },
               {
                  "ValueName" : "Enable",
                  "ValueDisplayName" : "Enable"
               }
            ],
            "WarningText" : "POST Watchdog Timer changes require a system reboot to take effect.",
            "GrayOut" : false,
            "AttributeName" : "SystemRecovery_POSTWatchdogTimer",
            "DisplayOrder" : 1,
            "Type" : "Enumeration",
            "MenuPath" : "./SystemRecovery",
            "CurrentValue" : null,
            "DisplayName" : "POST Watchdog Timer",
            "HelpText" : "Enable/Disable POST Watchdog Timer.",
            "Hidden" : false,
            "DefaultValue" : "Disable"
         },
         {
```

```
    "WriteOnly" : false,
    "WarningText" : "POST Watchdog Timer Value changes require a system reboot to take effect.",
    "AttributeName" : "SystemRecovery_POSTWatchdogTimerValue",
    "DisplayOrder" : 2,
    "Type" : "Integer",
    "UpperBound" : 20,
    "DisplayName" : "POST Watchdog Timer Value",
    "ScalarIncrement" : 1,
    "LowerBound" : 5,
    "DefaultValue" : "5",
    "ReadOnly" : false,
    "GrayOut" : false,
    "CurrentValue" : null,
    "MenuPath" : "./SystemRecovery",
    "HelpText" : "Enter POST loader Watchdog timer value in minutes from the specified range(5-20).",
    "Hidden" : false
},
{
    "WriteOnly" : false,
    "ReadOnly" : false,
    "Value" : [
       {
          "ValueName" : "Disable",
          "ValueDisplayName" : "Disable"
       },
       {
          "ValueName" : "Enable",
          "ValueDisplayName" : "Enable"
       }
    ],
    "WarningText" : "Reboot System on NMI changes require a system reboot to take effect.",
    "GrayOut" : false,
    "AttributeName" : "SystemRecovery_RebootSystemOnNMI",
    "DisplayOrder" : 3,
    "Type" : "Enumeration",
    "MenuPath" : "./SystemRecovery",
    "CurrentValue" : null,
    "DisplayName" : "Reboot System on NMI",
    "HelpText" : "Enable/Disable reboot of the system during non-maskable interrupt.",
    "Hidden" : false,
    "DefaultValue" : "Enable"
},
…
{
    "WriteOnly" : false,
    "ReadOnly" : true,
    "Value" : [
       {
          "ValueName" : "UserMode",
          "ValueDisplayName" : "UserMode"
       },
       {
          "ValueName" : "SetupMode",
          "ValueDisplayName" : "SetupMode"
       },
       {
          "ValueName" : "AuditMode",
          "ValueDisplayName" : "AuditMode"
       },
       {
          "ValueName" : "DeployedMode",
```

```
            "ValueDisplayName" : "DeployedMode"
         }
      ],
      "WarningText" : "Secure Boot Mode changes require a system reboot to take effect.",
      "GrayOut" : false,
      "AttributeName" : "SecureBootConfiguration_SecureBootMode",
      "DisplayOrder" : 136,
      "Type" : "Enumeration",
      "MenuPath" : "./SecureBootConfiguration",
      "CurrentValue" : null,
      "DisplayName" : "Secure Boot Mode",
      "HelpText" : "Display the current secure boot mode",
      "Hidden" : false,
      "DefaultValue" : "null"
   }
],
"Dependencies" : [
   {
      "Type" : "Map",
      "Dependency" : {
         "MapToValue" : true,
         "MapToProperty" : "GrayOut",
         "MapToAttribute" : "BootModes_SystemBootMode",
         "MapFrom" : [
            {
               "MapFromCondition" : "NEQ",
               "MapFromProperty" : "CurrentValue",
               "MapFromAttribute" : "LegacyBIOS_LegacyBIOS",
               "MapFromValue" : "0x0001"
            }
         ]
      },
      "DependencyFor" : "BootModes_SystemBootMode"
   },
   {
      "Type" : "Map",
      "Dependency" : {
         "MapToValue" : true,
         "MapToProperty" : "Hidden",
         "MapToAttribute" : "DevicesandIOPorts_Com1ActiveAfterBoot",
         "MapFrom" : [
            {
               "MapFromCondition" : "EQU",
               "MapFromProperty" : "CurrentValue",
               "MapFromAttribute" : "DevicesandIOPorts_COMPort1",
               "MapFromValue" : "0x0000"
            }
         ]
      },
      "DependencyFor" : "DevicesandIOPorts_Com1ActiveAfterBoot"
   },
   {
      "Type" : "Map",
      "Dependency" : {
         "MapToValue" : true,
         "MapToProperty" : "Hidden",
         "MapToAttribute" : "DevicesandIOPorts_Com1BaudRate",
         "MapFrom" : [
            {
               "MapFromCondition" : "EQU",
               "MapFromProperty" : "CurrentValue",
```

```
                    "MapFromAttribute" : "DevicesandIOPorts_COMPort1",
                    "MapFromValue" : "0x0000"
                }
            ]
        },
        "DependencyFor" : "DevicesandIOPorts_Com1BaudRate"
    },
    …
    {
        "Type" : "Map",
        "Dependency" : {
            "MapToValue" : true,
            "MapToProperty" : "GrayOut",
            "MapToAttribute" : "SystemRecovery_POSTWatchdogTimerValue",
            "MapFrom" : [
                {
                    "MapFromCondition" : "EQU",
                    "MapFromProperty" : "CurrentValue",
                    "MapFromAttribute" : "SystemRecovery_POSTWatchdogTimer",
                    "MapFromValue" : "0x0000"
                }
            ]
        },
        "DependencyFor" : "SystemRecovery_POSTWatchdogTimerValue"
    }
],
"Menus" : [
    {
        "ReadOnly" : false,
        "MenuPath" : "./",
        "GrayOut" : false,
        "MenuName" : "BiosMainMenu",
        "DisplayName" : "BIOS Configuration",
        "DisplayOrder" : 1
    },
    {
        "ReadOnly" : false,
        "MenuPath" : "./AdvancedRAS",
        "GrayOut" : false,
        "MenuName" : "AdvancedRAS",
        "DisplayName" : "AdvancedRAS",
        "DisplayOrder" : 2
    },
    {
        "ReadOnly" : false,
        "MenuPath" : "./BootModes",
        "GrayOut" : false,
        "MenuName" : "BootModes",
        "DisplayName" : "BootModes",
        "DisplayOrder" : 2
    },
    {
        "ReadOnly" : false,
        "MenuPath" : "./DevicesandIOPorts",
        "GrayOut" : false,
        "MenuName" : "DevicesandIOPorts",
        "DisplayName" : "DevicesandIOPorts",
        "DisplayOrder" : 2
    },
…
…
```

```
      ]
   },
   "SupportedSystems" : [
      {
         "SystemId" : "7X0025Z000",
         "FirmwareVersion" : "DVI999G",
         "ProductName" : "ThinkSystem SR850"
      }
   ],
   "@odata.type" : "#AttributeRegistry.v1_1_0.AttributeRegistry",
   "Name" : "Bios Attribute Registry Version 1",
   "OwningEntity" : "Lenovo"
}
```

Resource SecureBoot

This resource is used to represent secure boot information for a Redfish implementation.

Number of Resources	1
Resource Path	/redfish/v1/Systems/1/SecureBoot
Schema file	SecureBoot_v1.xml

GET – Secure boot properties

Use the GET method to retrieve properties in SecureBoot resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/Systems/1/SecureBoot
```

Request body

None

Response codes

Code	Description
500	Internal server error

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	“SecureBoot”.
Name	String	“Secure Boot”.
Description	String	“UEFI Secure Boot Configuration”.
SecureBootEnable	Boolean, Null	Enable or disable UEFI Secure Boot (takes effect on next boot).
SecureBootCurrentBoot	String, Null	Secure Boot state during the current boot cycle.

Field	Type	Description
SecureBootMode	String, Null	Current Secure Boot Mode Property value: • “UserMode” • “SetupMode” • “AuditMode” • “DeployedMode”
Actions	Object	Expanded.
#SecureBoot.ResetKeys	Object	Refer to the Post section.
@Redfish.ActionInfo	Link	/redfish/v1/Systems/1/SecureBoot/ResetKeysActionInfo.

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "SecureBootCurrentBoot": "Disabled",
    "@odata.id": "/redfish/v1/Systems/1/SecureBoot",
    "Name": "Secure Boot",
    "@odata.context": "/redfish/v1/$metadata#SecureBoot.SecureBoot",
    "Id": "SecureBoot",
    "@odata.type": "#SecureBoot.v1_0_4.SecureBoot",
    "SecureBootEnable": true,
    "SecureBootMode": "SetupMode",
    "@odata.etag": "\"9523Od5e00821715e4de6085f28c564e\"",
    "Actions": {
        "#SecureBoot.ResetKeys": {
            "target": "/redfish/v1/Systems/1/SecureBoot/Actions/SecureBoot.ResetKeys",
            "title": "ResetKeys",
            "@Redfish.ActionInfo": "/redfish/v1/Systems/1/SecureBoot/ResetKeysActionInfo"
        }
    },
    "Description": "UEFI Secure Boot Configuration"
}
```

PATCH – Update secure boot properties

Use the PATCH method to update properties in SecureBoot resource for Redfish service.

Request URL

```
PATCH https://<BMC_IPADDR>/redfish/v1/Systems/1/SecureBoot
```

Request body

Properties to be updated are shown as below, all of these properties can be changed individually.

Field	Description

SecureBootEnable	Enable or disable UEFI Secure Boot (takes effect on next boot).
	
	XCC will do the RPP assert internally when receiving this cmd.
	
	If assert RPP successfully, return code 200 + @Message.ExtendedInfo “RebootRequired”:
	
	"RebootRequired": {
	
	"Description": "Indicates that one or more properties were changed, and/or actions completed successfully. However, these changes will not take effect until the next system reboot.",
	
	"Message": "Changes completed successfully, but these changes will not take effect until next reboot.",
	
	"Severity": "Warning",
	
	"NumberOfArgs": 0,
	
	"ParamTypes": [],
	
	"Resolution": "Reboot the computer system for the changes to take effect."
	
	},
	
	else return code 200 + @Message.ExtendedInfo “PhysicalPresenceError”:
	
	"PhysicalPresenceError": {
	
	"Description": "The operation failed because Physical Presence or Remote Physical Presence was not asserted.",
	
	"Message": " The operation failed because of Remote Physical Presence security requirements.",
	
	"Severity": "Warning",
	
	"NumberOfArgs": 0,
	
	"ParamTypes": [],
	
	"Resolution": "Attempt asserting Physical Presence or Remote Physical Presence, and retry the operation."
	
	},

Response body

The response returns same content as GET operation with updated properties.

Response codes

Code	Description
200	RebootRequired
403	InsufficientPrivilege
500	Internal server error

Response example

The following example is PATCH body.

```
{
"SecureBootEnable": true
}
```

Get the following response:

```
{
    "SecureBootCurrentBoot": "Disabled",
    "@odata.id": "/redfish/v1/Systems/1/SecureBoot",
    "Name": "Secure Boot",
    "@odata.context": "/redfish/v1/$metadata#SecureBoot.SecureBoot",
    "Id": "SecureBoot",
    "@odata.type": "#SecureBoot.v1_0_4.SecureBoot",
    "SecureBootEnable": true,
    "SecureBootMode": "SetupMode",
    "@odata.etag": "\"9523Od5e00821715e4de6085f28c564e\"",
    "Actions": {
        "#SecureBoot.ResetKeys": {
            "target": "/redfish/v1/Systems/1/SecureBoot/Actions/SecureBoot.ResetKeys",
            "title": "ResetKeys",
            "@Redfish.ActionInfo": "/redfish/v1/Systems/1/SecureBoot/ResetKeysActionInfo"
        }
    },
    "Description": "UEFI Secure Boot Configuration",
    "@Message.ExtendedInfo": [
        {
            "MessageArgs": [],
            "Resolution": "Reboot the computer system for the changes to take effect.",
            "MessageId": "ExtendedError.1.1.RebootRequired",
            "Severity": "Warning",
            "Message": "Changes completed successfully, but these changes will not take effect until next reboot.",
            "@odata.type": "#Message.v1_0_6.Message"
        }
    ]
}
```

POST – Reset secure boot keys

Use the POST method to reset secure boot keys.

Request URL

```
POST https://<BMC_IPADDR>/redfish/v1/Systems/1/SecureBoot/Actions/SecureBoot.ResetKeys
```

Request body

Field	Type	Description

ResetKeysType	String	This action is used to reset the Secure Boot keys(takes effect on next boot):
		
		Value:
		• “ResetAllKeysToDefault”
		• “DeleteAllKeys”
		• “DeletePK”
		
		XCC will do the RPP assert internally when receiving this cmd.
		
		If assert RPP successfully, return code 200 + @Message.ExtendedInfo “RebootRequired”:
		
		"RebootRequired": {
		
		"Description": "Indicates that one or more properties were changed, and/or actions completed successfully. However, these changes will not take effect until the next system reboot.",
		
		"Message": "Changes completed successfully, but these changes will not take effect until next reboot.",
		
		"Severity": "Warning",
		
		"NumberOfArgs": 0,
		
		"ParamTypes": [],
		
		"Resolution": "Reboot the computer system for the changes to take effect."
		
		},
		
		else return code 200 + @Message.ExtendedInfo “PhysicalPresenceError”:
		
		"PhysicalPresenceError": {
		
		"Description": "The operation failed because Physical Presence or Remote Physical Presence was not asserted.",
		
		"Message": " The operation failed because of Remote Physical Presence security requirements.",
		
		"Severity": "Warning",
		
		"NumberOfArgs": 0,
		
		"ParamTypes": [],
		
		"Resolution": "Attempt asserting Physical Presence or Remote Physical Presence, and retry the operation."
		
		},

Response codes

Code	Description
200	RebootRequired, PhysicalPresenceError
403	Forbidden
500	Internal server error

Response example

The following example is PATCH body.

```
{
"ResetKeysType": "DeletePK"
}
```

Get the following response:

```
{
    "@Message.ExtendedInfo": [
        {
            "MessageArgs": [],
            "Resolution": "Reboot the computer system for the changes to take effect.",
            "MessageId": "ExtendedError.1.1.RebootRequired",
            "Severity": "Warning",
            "Message": "Changes completed successfully, but these changes will not take effect until next reboot.",
            "@odata.type": "#Message.v1_0_6.Message"
        }
    ]
}
```

Chapter 17. Firmware Inventory and Update Service

Resource UpdateService

This resource shall be used to represent update service information for a Redfish implementation. It represents the properties that affect the service itself.

Number of Resources	1
Resource Path	/redfish/v1/UpdateService
Schema file	UpdateService_v1.xml

GET – Properties for firmware update service

Use the GET method to retrieve the update service resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/UpdateService
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	“UpdateService”.
FirmwareInventory	Object	URI to the firmware info on the server.
Name	String	"Update Service".
Description	String	“Lenovo firmware update service”.
ServiceEnabled	Boolean	True.
Status	Object	Expanded.
HealthRollup	String	"OK".
Health	String	"OK".
State	String	"Enabled".
Actions	Object	Expanded.
#UpdateService.SimpleUpdate	Object	Expanded.
target	String	A link to the involved action.
title	String	"SimpleUpdate".
TransferProtocol @Redfish.AllowableValues	Object	"SFTP". "TFTP".

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "FirmwareInventory": {
        "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
    },
    "Id": "UpdateService",
    "Status": {
        "HealthRollup": "OK",
        "Health": "OK",
        "State": "Enabled"
    },
    "Name": "Update Service",
    "ServiceEnabled": true,
    "Oem": {
        "Lenovo": {
            "FirmwareServices": {
                "@odata.id": "/redfish/v1/UpdateService/Oem/Lenovo/FirmwareServices"
            },
            "@odata.type": "#LenovoUpdateService.v1_0_0.LenovoUpdateService"
        }
    },
    "@odata.type": "#UpdateService.v1_3_0.UpdateService",
    "@odata.context": "/redfish/v1/$metadata#UpdateService.UpdateService",
    "@odata.id": "/redfish/v1/UpdateService",
    "@odata.etag": "\"920275afe790667c76dc7418c688fc80\"",
    "Actions": {
        "#UpdateService.SimpleUpdate": {
            "target": "/redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate",
            "title": "SimpleUpdate",
            "TransferProtocol@Redfish.AllowableValues": [
                "TFTP",
                "SFTP"
            ]
        }
    },
    "Description": "Lenovo firmware update service."
}
```

POST – Simple update for firmware

This action can perform an update of installed software component(s) as contained within a software image file located at a URI referenced by the ImageURI parameter.

Request URL

`POST https://<BMC_IPADDR>/redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate`

Request body

Parameter	Type	Description
ImageURI	String	URI for the image file
Targets	String	URIs of the resource that is expected to update
TransferProtocol	String	Network protocol used by the Service to retrieve the firmware image file

Response body

Field	Type	Description
Id	String	The created task ID.
Name	String	Task name.
TaskMonitor	String	The URI of the Task Monitor for this task.
StartTime	String	The date-time stamp that the task was last started.
TaskState	String	The state of the task.
Messages	Array	This is an array of messages associated with the task.

Response codes

Code	Description
202	Accepted
400	BadRequest, ActionParamMissing , ActionParamTypeError , ActionParamFormatError
500	Internal server error

Response example

The following example is request for updating both XCC primary and backup. The POST body is filled as below:

```
{
"ImageURI": "sftp://userid:password@192.168.1.216:/home2/Downloads/imm3build/lnvgy_fw_xcc_anyos_noarch.uxz",
"Targets":
[
"https://192.168.0.1/redfish/v1/UpdateService/FirmwareInventory/BMC-Primary",
"https://192.168.0.1/redfish/v1/UpdateService/FirmwareInventory/BMC-Backup"
],
    "TransferProtocol":"SFTP"
}
```

The following example JSON response is returned.

```
{
    "StartTime": "2019-04-08T20:14:01+00:00",
    "@odata.id": "/redfish/v1/TaskService/Tasks/88de54d0-6757-4984-9495-d33917b3f7ba",
    "Name": "Task 88de54d0-6757-4984-9495-d33917b3f7ba",
    "@odata.context": "/redfish/v1/$metadata#Task.Task",
    "TaskMonitor": "/redfish/v1/TaskService/6823cdf7-f385-46d4-bcb3-65eba527729e",
    "@odata.type": "#Task.v1_3_0.Task",
    "@odata.etag": "\"1554754441444\"",
    "Messages": [],
    "TaskState": "New",
```

```
    "Id": "88de54d0-6757-4984-9495-d33917b3f7ba"
}
```

In the response body, a new created “task” resource is included. Then “Get” the URI to check the updating process. The following example JSON response is returned.

```
{
    "StartTime": "2019-04-08T20:14:01+00:00",
    "TaskState": "Running",
    "Name": "Task 88de54d0-6757-4984-9495-d33917b3f7ba",
    "@odata.context": "/redfish/v1/$metadata#Task.Task",
    "Oem": {
        "Lenovo": {
            "InstallFirmware": {
                "RunningProgress": "Downloading",
                "RunningProgressInPercent": 56
            },
            "@odata.type": "#LenovoTask.v1_0_0.LenovoTaskProperties"
        }
    },
    "TaskMonitor": "/redfish/v1/TaskService/6823cdf7-f385-46d4-bcb3-65eba527729e",
    "@odata.id": "/redfish/v1/TaskService/Tasks/88de54d0-6757-4984-9495-d33917b3f7ba",
    "Id": "88de54d0-6757-4984-9495-d33917b3f7ba",
    "Messages": [],
    "@odata.etag": "\"1554754454207\"",
    "@odata.type": "#Task.v1_3_0.Task"
}
```

The following example is request for updating a PCIe Adapter. The POST body is filled as:

```
{
"ImageURI": "sftp://userid:password@192.168.1.216:/home/userid/Downloads/pcie-adapter-firmware.bin",
"Targets":
[
"https://192.168.0.1/redfish/v1/UpdateService/FirmwareInventory/Slot_2.Bundle"
],
    "TransferProtocol":"SFTP"
}
```

The following example JSON response for “SimpleUpdate” is returned.

```
{
    "StartTime": "2019-04-08T08:35:34+00:00",
    "TaskState": "New",
    "Name": "Task c8ba9616-2d81-4d2e-a858-e0967e3bc3fd",
    "@odata.context": "/redfish/v1/$metadata#Task.Task",
    "@odata.etag": "\"1554712534443\"",
    "TaskMonitor": "/redfish/v1/TaskService/58161e3a-caab-47e7-b1ce-19cb93b055f3",
    "@odata.type": "#Task.v1_3_0.Task",
    "HidePayload": true,
    "@odata.id": "/redfish/v1/TaskService/Tasks/c8ba9616-2d81-4d2e-a858-e0967e3bc3fd",
    "Messages": [],
    "Id": "c8ba9616-2d81-4d2e-a858-e0967e3bc3fd",
    "Description": "This resource represents a task for a Redfish implementation."
}
```

In the response body, a new created “task” resource is included. Then “Get” the URI to check the updating process. The following example JSON response is returned.

```
{
    "StartTime": "2019-04-08T08:35:34+00:00",
    "@odata.id": "/redfish/v1/TaskService/Tasks/c8ba9616-2d81-4d2e-a858-e0967e3bc3fd",
    "@odata.etag": "\"1554712620728\"",
    "HidePayload": true,
    "@odata.context": "/redfish/v1/$metadata#Task.Task",
    "TaskMonitor": "/redfish/v1/TaskService/58161e3a-caab-47e7-b1ce-19cb93b055f3",
    "Oem": {
        "Lenovo": {
            "InstallFirmware": {
                "RunningProgressInPercent": 36,
                "RunningProgress": "Updating"
            },
            "@odata.type": "#LenovoTask.v1_0_0.LenovoTaskProperties"
        }
    },
    "@odata.type": "#Task.v1_3_0.Task",
    "Id": "c8ba9616-2d81-4d2e-a858-e0967e3bc3fd",
    "TaskState": "Running",
    "Messages": [],
    "Name": "Task c8ba9616-2d81-4d2e-a858-e0967e3bc3fd",
    "Description": "This resource represents a task for a Redfish implementation."
}
```


Resource FirmwareInventory

This resource shall be used to represent a single software component managed by this Redfish Service.

Number of Resources	Number of firmware entries managed
Resource Path	/redfish/v1/UpdateService/FirmwareInventory/{Id}
Schema file	SoftwareInventoryCollection_v1.xml SoftwareInventory_v1.xml

GET – Collection for firmware inventories on the server

Use the GET method to retrieve a firmware info list placed on the server.

Request URL

`GET https://<BMC_IPADDR>/redfish/v1/UpdateService/FirmwareInventory`

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Members	Array	Items: A reference link of the elements of Firmware
Name	String	SoftwareInventoryCollection
Description	String	"Firmware Inventory Collection."

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:


```
{
    "Members": [
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/BMC-Primary"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/BMC-Backup"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/UEFI"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/LXPM"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/LXPMWindowsDriver"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/LXPMLinuxDriver"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Slot_4.Bundle"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Ob_1.1"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Ob_2.1"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Slot_3.1"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Slot_3.2"
        },
        {
            "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Disk1"
        }
    ],
    "Members@odata.count": 15,
    "@odata.type": "#SoftwareInventoryCollection.SoftwareInventoryCollection",
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory",
    "Members@odata.navigationLink": "/redfish/v1/UpdateService/FirmwareInventory/Members",
    "@odata.etag": "W/\"2f84bcae16242Of035fd84e6bb2d13a0\"",
    "Name": "SoftwareInventoryCollection",
    "Description": "Firmware Inventory Collection.",
    "@odata.context": "/redfish/v1/$metadata#SoftwareInventoryCollection.SoftwareInventoryCollection"
}
```

GET – Firmware inventory properties

Use the GET method to retrieve each firmware info.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/UpdateService/FirmwareInventory/{Id}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	"BMC-Primary".
Description	String	"The information of BMC (Primary) firmware."
LowestSupportedVersion	String	A string representing the lowest supported version of this software.
Name	String	"BMC (Primary)".
RelatedItem	Array	URI of the resources associated with this software inventory item.
RelatedItem[N]	Object	Link to the manager resource.
SoftwareId	String	A specific ID for identifying this software.
Manufacturer	String	A string representing the manufacturer/producer of this software.
ReleaseDate	String	Release date of this software.
Status	Object	Expanded.
HealthRollup	String	"OK".
Health	String	"OK"
State	String	The firmware indevtory status such as “Enabled” or “StandbyOffline”.
UefiDevicePaths	Array	Items: string Item count: 1
Updateable	Boolean	Indicates whether the firmware is can be updated by redfish.
Version	String	The firmware version number.

Note: The “FirmwareInventory” is used to describe various types of firmware info. For each returned result, the properties may be partially implemented.

Response codes

Code	Description
500	Internal server error

Response example 1

When the request is successful, a message body similar to the following, which describes the XCC primary info, is returned:

```
{
    "Id": "BMC-Primary",
    "Version": "3.25",
    "RelatedItem@odata.count": 1,
    "Updateable": true,
    "LowestSupportedVersion": "090",
    "Description": "The information of BMC (Primary) firmware.",
    "UefiDevicePaths": [
        null
    ],
    "Status": {
        "HealthRollup": "OK",
        "Health": "OK",
        "State": "StandbySpare"
    },
    "Name": "BMC (Primary)",
    "ReleaseDate": "2019-03-25T00:00:00Z",
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/BMC-Primary",
    "Oem": {
        "Lenovo": {
            "Classifications": [
                "10"
            ],
            "FirmwareBuild": "DVI999G",
            "@odata.type": "#LenovoSoftwareInventory.v1_0_0.LenovoSoftwareInventory",
            "FirmwareRole": "Primary",
            "FirmwareType": "BMC",
            "FirmwareName": "XCC"
        }
    },
    "@odata.type": "#SoftwareInventory.v1_2_1.SoftwareInventory",
    "@odata.context": "/redfish/v1/$metadata#SoftwareInventory.SoftwareInventory",
    "Manufacturer": "Lenovo",
    "@odata.etag": "\"89b924f21e17999a38ea274a949623cd\"",
    "SoftwareId": "DVI9",
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Managers/1"
        }
    ]
}
```


Response example 2

When the request is successful, a message body similar to the following, which describes the firmware info of a RAID card, is returned:


```
{
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Slot_10.Bundle",
    "@odata.context": "/redfish/v1/$metadata#SoftwareInventory.SoftwareInventory",
    "RelatedItem@odata.count": 2,
    "Updateable": false,
    "Description": "The information of ThinkSystem RAID 530-8i firmware.",
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot10"
        },
        {
            "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/slot_10"
        }
```

```
    ],
    "Status": {
        "HealthRollup": "OK",
        "Health": "OK",
        "State": "Enabled"
    },
    "Name": "ThinkSystem RAID 530-8i",
    "ReleaseDate": "2017-06-15T00:00:00Z",
    "Oem": {
        "Lenovo": {
            "Classifications": [
                "13"
            ],
            "@odata.type": "#LenovoSoftwareInventory.v1_0_0.LenovoSoftwareInventory",
            "FirmwareStatus": "Active",
            "PLDMFWInfo": {
                "LastUpdErr": "NoError",
                "LastUpdErrStr": "",
                "SlotNO": 10,
                "PendingVersionStr": "",
                "PLDMUpdSupported": false,
                "Location": "addon",
                "FreshUpdated": false,
                "PendingReleaseDate": null
            }
        }
    },
    "@odata.type": "#SoftwareInventory.v1_2_1.SoftwareInventory",
    "Id": "Slot_10.Bundle",
    "Manufacturer": "AVAGO Technologies",
    "@odata.etag": "\"402c7ece44fa78c765e3ba601c647987\"",
    "SoftwareId": "1D490500",
    "Version": "50.0.1-0374"
}
```


Response example 3

When the request is successful, a message body similar to the following, which describes the firmware info of a Disk, is returned:


```
{
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Disk8",
    "Version": "SB35",
    "RelatedItem@odata.count": 1,
    "Updateable": false,
    "Description": "The firmware information of a disk controlled by a RAID, M.2 or NVMe controller.",
    "RelatedItem": [
        {
            "@odata.id": "/redfish/v1/Systems/1/Storage/RAID_Slot10/Drives/Disk.3"
        }
    ],
    "Status": {
        "HealthRollup": "OK",
        "Health": "OK",
        "State": "Enabled"
    },
    "Name": "Disk firmware",
    "ReleaseDate": null,
    "Oem": {
        "Lenovo": {
            "Classifications": [
```

```
                "10"
            ],
            "@odata.type": "#LenovoSoftwareInventory.v1_0_0.LenovoSoftwareInventory",
            "FirmwareStatus": "Active"
        }
    },
    "@odata.type": "#SoftwareInventory.v1_2_1.SoftwareInventory",
    "Id": "Disk8",
    "Manufacturer": "IBM-ESXS",
    "@odata.etag": "\"98819809dbd03023d1989add2fa9c299\"",
    "SoftwareId": "AL13SEB600",
    "@odata.context": "/redfish/v1/$metadata#SoftwareInventory.SoftwareInventory"
}
```

Chapter 18. Task Management

Resource TaskService

The resource represents a collection of tasks for the Redfish service. All existing tasks are accessible through the links from the TaskService resource.

Number of Resources	1
Resource Path	/redfish/v1/TaskService
Schema file	TaskService_v1.xml

GET – Task service properties

Use the GET method to retrieve properties in TaskService resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/TaskService
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	“TaskService”.
Name	String	“Task Service”.
DateTime	String	The current DateTime (with offset) setting that the task service is using.
CompletedTaskOverWritePolicy	String	“Oldest”.
LifeCycleEventOnTaskState-Change	Boolean	FALSE.
ServiceEnabled	Boolean	This indicates whether this service is enabled. Value: True
Status	Object	Expanded.
State	String	“Enabled”.
Health	String	“OK”.
HealthRollup	String	“OK”.
Tasks	Link	This property shall contain the link to a collection of type Task.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
   "DateTime" : "2018-12-31T13:56:40+00:00",
   "Tasks" : {
      "@odata.id" : "/redfish/v1/TaskService/Tasks"
   },
   "@odata.context" : "/redfish/v1/$metadata#TaskService.TaskService",
   "Id" : "TaskService",
   "Status" : {
      "Health" : "OK",
      "HealthRollup" : "OK",
      "State" : "Enabled"
   },
   "CompletedTaskOverWritePolicy" : "Oldest",
   "ServiceEnabled" : true,
   "@odata.etag" : "\"2a97e81535c7b6b3189048ef2d37970f\"",
   "@odata.id" : "/redfish/v1/TaskService",
   "LifeCycleEventOnTaskStateChange" : false,
   "@odata.type" : "#TaskService.v1_1_2.TaskService",
   "Name" : "Task Service"
}
```

Resource Task

The resource represents Task resource implementation for the Redfish service.

Number of Resources	Number of tasks available in Redfish service
Resource Path	/redfish/v1/TaskService/Tasks/{Id}
Schema file	Task_v1.xml

GET – Task properties

Use the GET method to retrieve properties in Task resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/TaskService/Tasks/{Id}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	The Id property uniquely identifies this task resource.
Name	String	Task {Id}.
StartTime	String	The date-time stamp that the task was last started.
EndTime	String	The date-time stamp that the task was last completed.
TaskMonitor	Link	The URI of the Task Monitor for this task. It is a URI for deleting the task when the TaskState is Completed, Exception or Killed.
TaskState	String	The state of the task.
TaskStatus	String	The completion status of the task. The mapping between TaskState and TaskStatus: • “Completed” (TaskState) –> “OK” (TaskStatus) • “Killed”(TaskState) –> “Warning”(TaskStatus) • “Exception”(TaskState) –> “Warning”(TaskStatus) • Others (TaskState) –> Do not expose TaskStatus (TaskStatus)
Messages	Object	Expand.
Messages[N]	String	A message associated with the task..

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "StartTime": "2019-04-08T20:14:01+00:00",
    "TaskState": "Running",
    "Name": "Task 88de54d0-6757-4984-9495-d33917b3f7ba",
    "@odata.context": "/redfish/v1/$metadata#Task.Task",
    …
    …
    "TaskMonitor": "/redfish/v1/TaskService/6823cdf7-f385-46d4-bcb3-65eba527729e",
    "@odata.id": "/redfish/v1/TaskService/Tasks/88de54d0-6757-4984-9495-d33917b3f7ba",
    "Id": "88de54d0-6757-4984-9495-d33917b3f7ba",
    "Messages": [],
    "@odata.etag": "\"1554754454207\"",
    "@odata.type": "#Task.v1_3_0.Task"
}
```

Chapter 19. Event Service

Resource EventService

This Resource is used to represent event service for a Redfish implementation.

Number of Resources	1
Resource Path	/redfish/v1/EventService
Schema file	EventService_v1.xml

GET – Event service properties

Use the GET method to retrieve properties in Event service resource for Redfish service.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/EventService
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	“EventService”
Name	String	“Event Service”
ServiceEnabled	Boolean	TRUE
SSEFilterPropertiesSupported	Object	Expanded
EventType	Boolean	FALSE
ResourceType	Boolean	FALSE
EventFormatType	Boolean	TRUE
RegistryPrefix	Boolean	FALSE
OriginResource	Boolean	FALSE
MetricReportDefinition	Boolean	FALSE
MessageId	Boolean	FALSE
DeliveryRetryAttempts	Integer	3
DeliveryRetryIntervalSeconds	Integer	60 (Unit: seconds)
ResourceTypes	Array	A list of @odata.type values (Schema names) that can be specified in a ResourceType on a subscription.
ResourceTypes[N]	String	Array element of ResourceTypes Note: Alert event cannot be filtered by ResourceType

Field	Type	Description
EventTypesForSubscription	Array	Items: type of Events that can be subscribed to. Items count: 5
EventTypesForSubscription[N]	String	Valid values: • "Alert" • "ResourceAdded" • "ResourceRemoved" • "ResourceUpdated" • "StatusChange"
Actions	Object	Expanded
#EventService.SubmitTestEvent	Object	Refer to Actions
Status	Object	Expanded
State	String	“Enabled”
Health	String	“OK”
EventFormatTypes	Array	Item: string Item count: 2
EventFormatTypes[N]	String	Valid values: “Event”, “MetricReport” (MetricReport type event is not supported yet)
SubordinateResourcesSupported	Boolean	Indicate if the service supports the SubordinateResource property on Event Subscriptions
RegistryPrefixes	Array	Item: string Item count: maps to members under the resource /redfish/v1/Registries
RegistryPrefixes[N]	String	Maps to members under the resource /redfish/v1/Registries
Subscriptions	Link	Reference to event subscriptions of EventDestinationCollection type
ServerSentEventUri	Link	“/redfish/v1/EventService/ServerSentEvent”

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "@odata.id": "/redfish/v1/EventService",
    "@odata.context": "/redfish/v1/$metadata#EventService.EventService",
    "DeliveryRetryIntervalSeconds": 60,
    "SSEFilterPropertiesSupported": {
        "EventType": false,
        "ResourceType": false,
        "EventFormatType": true,
```

```
        "RegistryPrefix": false,
        "OriginResource": false,
        "MetricReportDefinition": false,
        "MessageId": false
    },
    "DeliveryRetryAttempts": 3,
    "ResourceTypes": [
        "AccountService",
        …
        …
        "VolumeCollection"
    ],
    "Subscriptions": {
        "@odata.id": "/redfish/v1/EventService/Subscriptions"
    },
    "EventTypesForSubscription": [
        "Alert",
        "ResourceAdded",
        "ResourceRemoved",
        "ResourceUpdated",
        "StatusChange"
    ],
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "EventFormatTypes": [
        "Event",
        "MetricReport"
    ],
    "Name": "Event Service",
    "SubordinateResourcesSupported": true,
    "RegistryPrefixes": [
        "AuditEvent",
        "Base",
        "EventRegistry",
        "ExtendedError"
    ],
    "@odata.type": "#EventService.v1_2_0.EventService",
    "ServerSentEventUri": "/redfish/v1/EventService/ServerSentEvent",
    "ServiceEnabled": true,
    "@odata.etag": "\"7008c3b4657ee6e75078b8f573a79d7c\"",
    "Actions": {
        "#EventService.SubmitTestEvent": {
            "target": "/redfish/v1/EventService/Actions/EventService.SubmitTestEvent",
            "title": "SubmitTestEvent"
        }
    },
    "Id": "EventService"
}
```


POST – Submit a test event

Use the POST method to send a test event to subscribers.

Request URL

```
POST https://<BMC_IPADDR>/redfish/v1/EventService/Actions/EventService.SubmitTestEvent
```

Request body

Field	Type	Description
EventType	String	The type of event to be added
EventId	String	The ID of event to be added
EventTimes-tamp	String	The time stamp of event to be added
Severity	String	The severity of event to be added
Message	String	The event message text of event to be added
MessageId	String	The message ID of event to be added
MessageArgs	Array	The array of message arguments of event to be added
OriginOfCon-dition	String	"/redfish/v1/Systems/1/LogServices/StandardLog"

Response body

None

Response codes

Code	Description
204	NoContent
500	Internal server error

Response example

The following example is POST body.

```
{
    "OriginOfCondition": "/redfish/v1/Systems/1/LogServices/StandardLog",
    "Message":"Login ID: USERID from web at IP address 1.1.1.1 has logged off. ----Test Test",
    "EventType":"Alert",
    "MessageArgs":["USERID","web","1.1.1.1"],
    "Severity":"OK",
    "MessageId":"EventRegistry.1.0.FQXSPSE4032I",
    "EventTimestamp":"2018-12-31T00:00:00+00:00",
    "EventId": "0000003a"
}
```

The following example JSON response is returned.

None

Resource Event Subscription

This resource is used to provide event subscriptions for a Redfish implementation.

Number of Resources	1
Resource Path	/redfish/v1/EventService/Subscriptions /redfish/v1/EventService/Subscriptions/{Subscription ID}
Schema file	EventDestination_v1.xml EventDestinationCollection_v1.xml

GET – Collection of event subscriptions

Use the GET method to retrieve the properties of event subscription collection resource for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/EventService/Subscriptions
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Members	Array	Items: A reference link of the elements of event subscriptions.
Name	String	“Subscriptions”.

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "Members": [
        {
            "@odata.id": "/redfish/v1/EventService/Subscriptions/EE116883"
        }
    ],
    "@odata.type": "#EventDestinationCollection.EventDestinationCollection",
    "@odata.id": "/redfish/v1/EventService/Subscriptions",
    "Members@odata.count": 1,
    "@odata.etag": "\"1554223063641\"",
    "Name": "Subscriptions",
    "@odata.context": "/redfish/v1/$metadata#EventDestinationCollection.EventDestinationCollection"
}
```

GET – Event subscriptions

Use the GET method to retrieve properties in event subscription entries for a server.

Request URL

```
GET https://<BMC_IPADDR>/redfish/v1/EventService/Subscriptions/{Subscription ID}
```

Request body

None

Response body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Id	String	Uniquely identifies the resource within the collection of the subscriptions.
Name	String	“Destination”
Destination	String	This property shall contain a URI to the destination where the events will be sent.
EventTypes	Array	The types of events that will be sent to the destination.
EventTypes[N]	String	Valid values: • "Alert" • "ResourceAdded • "ResourceRemoved" • "ResourceUpdated” • "StatusChange"
Context	String	A client-supplied string that is stored with the event destination subscription.
Protocol	String	“Redfish”
HttpHeaders	Array	This is for setting HTTP headers, such as authorization information. This object will be null on a GET.
HttpHeaders[N]	Object	This is for setting HTTP headers, such as authorization information. This object will be null on a GET.
MessageIds	Array	A list of MessageIds that the service will only send. If this property is absent or the array is empty, then Events with any MessageId will be sent to the subscriber.
MessageIds[N]	String	Message Id that the service will send
SubordinateResources	Boolean	By setting this to true and specifying OriginResources, this indicates the subscription will be for events from the OriginsResources specified and also all subordinate resources
ResourceTypes	Array	A list of @odata.type values (Schema names) that can be specified in a ResourceType on a subscription.
ResourceTypes[N]	String	Array element of ResourceTypes Note: Alert event cannot be filtered by ResourceType
EventFormatType	String	Valid values: “Event”, “MetricReport” (MetricReport type event is not supported yet)

Field	Type	Description
RegistryPrefixes	Array	Item: string Item count: maps to members under the resource /redfish/v1/Registries
RegistryPrefixes[N]	String	Maps to members under the resource /redfish/v1/Registries
OriginResources	Array	A list of resources for which the service will only send related events. If this property is absent or the array is empty, then Events originating from any resource will be sent to the subscriber.
OriginResources[N]	Link	Reference to the resource for which the service will only send related events.
SubscriptionType	String	Valid values: “RedfishEvent”, “SSE”

Response codes

Code	Description
500	Internal server error

Response example

When the request is successful, a message body similar to the following is returned:

```
{
    "HttpHeaders": null,
    "@odata.id": "/redfish/v1/EventService/Subscriptions/6CD96AED",
    "SubordinateResources": null,
    "Context": "Test_Context",
    "MessageIds": [],
    "EventFormatType": "Event",
    "ResourceTypes": [],
    "OriginResources@odata.count": 0,
    "Protocol": "Redfish",
    "Name": "Destination",
    "@odata.context": "/redfish/v1/$metadata#EventDestination.EventDestination",
    "EventTypes": [
        "Alert"
    ],
    "RegistryPrefixes": [
        "EventRegistry"
    ],
    "@odata.type": "#EventDestination.v1_4_0.EventDestination",
    "SubscriptionType": "RedfishEvent",
    "Destination": "https://192.168.0.2:443",
    "@odata.etag": "\"1554745129592\"",
    "OriginResources": [],
    "Id": "6CD96AED"
}
```

POST – Create a subscription

Create a subscription for Redfish service to send event to subscriber.

Request URL

`POST https://<BMC_IPADDR>/redfish/v1/EventService/Subscriptions`

Request body

The response is a JSON object that contains the following parameters:

Field	Type	Description
Destination	String	This property shall contain a URI to the destination where the events will be sent.
EventTypes	Array	The types of events that will be sent to the destination.
EventTypes[N]	String	Valid values: • "Alert" • "ResourceAdded • "ResourceRemoved" • "ResourceUpdated” • "StatusChange"
Context	String	A client-supplied string that is stored with the event destination subscription.
Protocol	String	“Redfish”
HttpHeaders	Array	This is for setting HTTP headers, such as authorization information. This object will be null on a GET.
HttpHeaders[N]	Object	This is for setting HTTP headers, such as authorization information. This object will be null on a GET.
MessageIds	Array	A list of MessageIds that the service will only send. If this property is absent or the array is empty, then Events with any MessageId will be sent to the subscriber.
MessageIds[N]	String	Message Id that the service will send
SubordinateResources	Boolean	By setting this to true and specifying OriginResources, this indicates the subscription will be for events from the OriginsResources specified and also all subordinate resources
ResourceTypes	Array	A list of @odata.type values (Schema names) that can be specified in a ResourceType on a subscription.
ResourceTypes[N]	String	Array element of ResourceTypes Note: Alert event cannot be filtered by ResourceType
EventFormatType	String	Valid values: “Event”, “MetricReport” (MetricReport type event is not supported yet)
RegistryPrefixes	Array	Item: string Item count: maps to members under the resource /redfish/v1/Registries
RegistryPrefixes[N]	String	Maps to members under the resource /redfish/v1/Registries
OriginResources	Array	A list of resources for which the service will only send related events. If this property is absent or the array is empty, then Events originating from any resource will be sent to the subscriber.
OriginResources[N]	Link	Reference to the resource for which the service will only send related events.

Response body

The response is the creation of a subscription resource. Use the GET method to refer to the response body of the Event subscription.

Response codes

Code	Description
201	Created
400	BadRequest, PropertyValueNotInList
500	Internal server error

Response example

The following example is POST body.

```
{
    "Protocol": "Redfish",
    "Context": "Test_Context",
    "Destination": "https://192.168.0.2:443",
    "EventTypes": ["Alert"],
    "RegistryPrefixes": [
        "EventRegistry"
    ]
}
```

The following example JSON response is returned.

```
{
   "SubscriptionType" : "RedfishEvent",
   "HttpHeaders" : [],
   "RegistryPrefixes" : [
      "EventRegistry"
   ],
   "EventFormatType" : "Event",
   "OriginResources@odata.count" : 0,
   "OriginResources" : [],
   "EventTypes" : [
      "Alert"
   ],
   "@odata.context" : "/redfish/v1/$metadata#EventDestination.EventDestination",
   "Id" : "2FFDB097",
   "Destination" : "https://192.168.0.2:443",
   "Context" : "Test_Context",
   "MessageIds" : [],
   "SubordinateResources" : null,
   "@odata.etag" : "\"1554736254036\"",
   "@odata.id" : "/redfish/v1/EventService/Subscriptions/2FFDB097",
   "@odata.type" : "#EventDestination.v1_4_0.EventDestination",
   "Protocol" : "Redfish",
   "Name" : "Destination",
   "ResourceTypes" : []
}
```

Listening for Redfish events

After successfully creating a subscription for Redfish events, you have to set up event listener to capture the interested events sent by XCC Redfish service. In order to capture the events, the listener has to cooperate with XCC Redfish service and behave just as the eventing mechanisms defined in Redfish specification.

Development for an event listener is not in scope of this guide, while you can use the DMTF published tool, Redfish-Event-Listener (https://github.com/DMTF/Redfish-Event-Listener), to capture events, or reference it to develop your own listener.

DELETE– Delete a subscription

Use the DELETE method to delete subscription resource for Redfish service. Remove a subscription created for event to send to client listener.

Request URL

```
DELETE https://<BMC_IPADDR>/redfish/v1/EventService/Subscriptions/{Subscription ID}
```

Request body

None

Response

None

Response codes

Code	Description
204	No content
500	Internal server error

Response example

None

SSE subscription

Create a subscription of Server-Sent Events for Redfish service to send event to client and keep the connection open.

Request URL

```
POST https://<BMC_IPADDR>/{ServerSentEventUri}
```

ServerSentEventUri: as specified in ServerSentEventUri property of EventService.

Request body

None

Response body

None

Response codes

None

Example

Subscribe SSE events - curl

The following example of curl command is to create SSE connection and receive events through the connection.

```
$ curl "https://192.168.0.1/redfish/v1/EventService/ServerSentEvent" -X GET -k -u USERID:PASSWORD
```

Subscribe SSE events - browser

Use a web browser (e.g. Chrome) to access URI of https://192.168.0.1/redfish/v1/EventService/ServerSentEvent, and you will see browser displays the received events.

```
$ curl "https://192.168.0.1/redfish/v1/EventService/ServerSentEvent" -X GET -k -u USERID:PASSWORD
```

Event JSON data response

The following example JSON response is returned.

```
...
...

: stream keep-alive

id:25
data:{
data:    "@odata.type": "#Event.v1_3_0.Event",
data:    "Events": [
data:        {
data:            "OriginOfCondition": {
data:                "@odata.id": "/redfish/v1/Systems/1/LogServices/StandardLog"
data:            },
data:            "@odata.id": "/redfish/v1/EventService/Events/25#Events/1",
data:            "Message": "Remote Login Successful. Login ID: USERID using the standard password from web at
                             IP address 192.168.0.2.",
data:            "EventType": "Alert",
data:            "Oem": {
data:                "SystemSerialNumber": "DSYM09X",
data:                "SystemUUID": "D7C22FA8-8A7D-11E7-9DA0-EA80E0D4B8AC",
data:                "SystemMachineTypeModel": "7Y02RCZ000",
data:                "Lenovo": {
data:                    "ReportingChain": "",
data:                    "IsLocalEvent": true,
data:                    "RawDebugLogURL": "",
data:                    "AffectedIndicatorLEDs": [
data:                    ],
data:                    "EventFlag": 0,
data:                    "AuxiliaryData": "",
data:                    "Source": "System",
data:                    "FailingFRU": [
data:                        {
data:                            "FRUSerialNumber": "",
data:                            "FRUNumber": ""
data:                        }
data:                    ],
data:                    "TSLVersion": "0",
data:                    "CommonEventID": "FQXSPSE4001I",
data:                    "Hidden": false,
data:                    "EventID": "0x4000000e00000000",
data:                    "EventSequenceNumber": 1014,
data:                    "EventType": 0,
data:                    "@odata.type": "#LenovoLogEntry.v1_0_0.StandardLogEntry",
data:                    "LenovoMessageID": "Lenovo0014",
data:                    "Serviceable": "Not Serviceable",
data:                    "RelatedEventID": ""
data:                }
data:            },
data:            "EventId": "169FDD4375E",
data:            "MemberId": "0001",
```

```
data:             "MessageArgs": [
data:                 "USERID",
data:                 "the standard password",
data:                 "web",
data:                 "192.168.0.2"
data:             ],
data:             "Severity": "OK",
data:             "EventTimestamp": "2019-01-01T16:42:17+00:00",
data:             "MessageId": "EventRegistry.1.0.FQXSPSE4001I"
data:         }
data:     ],
data:     "@odata.id": "/redfish/v1/EventService/Events/25",
data:     "Id": "25",
data:     "Events@odata.count": 1,
data:     "Name": "Redfish Event",
data:     "@odata.context": "/redfish/v1/$metadata#Event.Event"
data:}

: stream keep-alive

: stream keep-alive
…
…
```

Event

This Resource is used to represent event information for a Redfish implementation.

Number of Resources	N/A
Resource Path	N/A
Schema file	Event_v1.xml

Event properties

Properties in Event service resource for Redfish service.

Request URL

Not available

Request body

None

Response body

Field	Type	Description
Id	String	Unique event Id
Name	String	“Redfish Event”
Context	String	A context can be supplied at subscription time. This property is the context value supplied by the subscriber.
Events	Array	Item: event record Item count: 1
Events[N]	Object	Expanded

Field	Type	Description
EventType	String	This indicates the type of event sent, according to the definitions in the EventService.
EventId	String	This is a unique instance identifier of an event. Client provides the EventId when it is sent with SubmitTestEvent action.
EventTimestamp	String	This is time the event occurred.
Severity	String	Valid values: • “OK” • “Warning” • “Critical”
Message	String	Message text
MessageId	String	This is the key for this message which can be used to look up the message in a message registry.
MessageArgs	Array	Array of message arguments
MessageArgs[N]	String	Message argument
OriginOfCondition	String	“/redfish/v1/Systems/1/LogServices/StandardLog”

Response codes

None

Example

The following is an example for event JSON data response:

```
{
   "@odata.context" : "/redfish/v1/$metadata#Event.Event",
   "Id" : "17",
   "Context" : "Test_Context",
   "@odata.id" : "/redfish/v1/EventService/Events/17",
   "Events" : [
      {
         "MessageArgs" : [
            "USERID",
            "the standard password",
            "SSH",
            "192.168.0.2"
         ],
         "EventTimestamp" : "2019-01-01T15:35:51+00:00",
         "Oem" : {
            "SystemUUID" : "D7C22FA8-8A7D-11E7-9DA0-EA80E0D4B8AC",
            "Lenovo" : {
               "IsLocalEvent" : true,
               "AffectedIndicatorLEDs" : {},
               "LenovoMessageID" : "Lenovo0014",
               "RelatedEventID" : "",
               "EventType" : 0,
               "RawDebugLogURL" : "",
               "AuxiliaryData" : "",
               "Source" : "System",
               "FailingFRU" : [
                  {
                     "FRUNumber" : "",
                     "FRUSerialNumber" : ""
```

```
                  }
               ],
               "EventSequenceNumber" : 945,
               "EventFlag" : 0,
               "TSLVersion" : "0",
               "CommonEventID" : "FQXSPSE4001I",
               "EventID" : "0x4000000e00000000",
               "Serviceable" : "Not Serviceable",
               "ReportingChain" : "",
               "@odata.type" : "#LenovoLogEntry.v1_0_0.StandardLogEntry",
               "Hidden" : false
            },
            "SystemMachineTypeModel" : "7Y02RCZ000",
            "SystemSerialNumber" : "DSYM09X"
         },
         "MemberId" : "0001",
         "MessageId" : "EventRegistry.1.0.FQXSPSE4001I",
         "OriginOfCondition" : {
            "@odata.id" : "/redfish/v1/Systems/1/LogServices/StandardLog"
         },
         "EventId" : "16953A588E7",
         "@odata.id" : "/redfish/v1/EventService/Events/17#Events/1",
         "Message" : "Remote Login Successful. Login ID:
                      USERID using the standard password from SSH at IP address 192.168.0.2.",
         "EventType" : "Alert",
         "Severity" : "OK"
      }
   ],
   "@odata.type" : "#Event.v1_3_0.Event",
   "Events@odata.count" : 1,
   "Name" : "Redfish Event"
}
```

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