Cisco Baseboard Management Controller REST API Guide for Cisco UCS C885A M8 Rack Server, Release 1.0

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Preface

This preface includes the following sections:

- Audience, on page vii
- Conventions, on page vii

Audience

This guide is intended primarily for data center administrators with responsibilities and expertise in one or more of the following:

- Server administration
- Storage administration
- Network administration
- Network security

Conventions

Text Type	Indication
GUI elements	GUI elements such as tab titles, area names, and field labels appear in **this font**. Main titles such as window, dialog box, and wizard titles appear in **this font**.
Document titles	Document titles appear in *this font*.
TUI elements	In a Text-based User Interface, text the system displays appears in `this font`.
System output	Terminal sessions and information that the system displays appear in `this font`.
CLI commands	CLI command keywords appear in **this font**. Variables in a CLI command appear in *this font*.
[ ]	Elements in square brackets are optional.

Text Type	Indication
{x | y | z}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

Tip Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

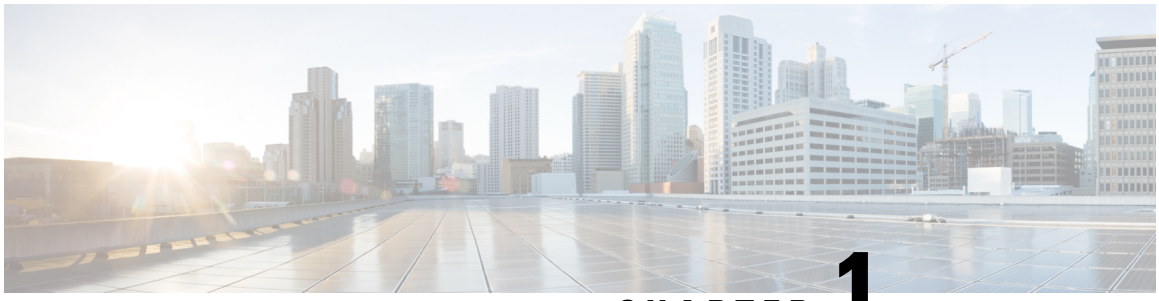
Timesaver Means *the described action saves time*. You can save time by performing the action described in the paragraph.

Caution Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

Warning IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS



CHAPTER 1

Cisco BMC REST API Overview

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- HTTP Methods, on page 2
- Status Code, on page 2
- Authentication, on page 5
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- Resource, on page 9
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Introduction

Representational state transfer (REST) or RESTful web services allow you to provide interoperability between computer systems on the Internet. Using the REST-compliant web services you can request systems to access and manipulate textual representations of web resources using a uniform and predefined set of stateless operations. Cisco has now built capabilities of using RESTful APIs to configure the UCS C-series servers using the Redfish™ technology.

Redfish™ is an open industry standard specification and schema that specifies a RESTful interface and utilizes JSON and OData to help customers integrate solutions within their existing tool chains. It utilizes a range of scalable IT technologies that are widely used, and by using these accepted technologies, it makes the use of Redfish™ easier. Redfish™ is sponsored and controlled by the Distributed Management Task Force, Inc. (DMTF), a peer-review standards body recognized throughout the industry.

For more information on DMTF and Redfish™ standards, see DMTF and Redfish™.

Redfish Schema and Specification

Table 1: Redfish Schema and Specification

Release	Redfish Schema	Redfish Specification
Release 1.0.0.240001	2022.2	v1.9.0

HTTP Methods

The following HTTP methods are used to implement different actions, as described below.

HTTP Method	Description
POST	The first method is used to create a new resource. The POST request is submitted to the resource collection in which the new resource is to belong. Submitting a POST request to a resource representing a collection is equivalent to submitting the same request to the Members property of that resource. The last method is used to initiate operations on the object (such as Actions). Services shall support the POST method for sending actions. The POST operation may not be idempotent.
GET	The GET method is used to retrieve a representation of a resource. That representation can either be a single resource or a collection.
PUT	The PUT method is used to completely replace a resource. Properties omitted from the request body are reset to their default value.
PATCH	The PATCH method is the preferred method used to perform updates on pre-existing resources. Changes to the resource are sent in the request body. Properties not specified in the request body are not directly changed by the PATCH request. The response is either empty or a representation of the resource after the update was done. The implementation may reject the update operation on certain fields based on its own policies and, if so, shall not apply any of the update requested.
DELETE	The DELETE method is used to remove a resource. Services shall support the DELETE method for resources that can be deleted.

Status Code

HTTP defines status codes that can be returned in response messages.

Status Code	Status Name	Description
200	OK	The request was successfully completed and includes a representation in its body.

Status Code	Status Name	Description
201	Created	A request that created a new resource completed successfully. The Location header shall be set to the canonical URI for the newly created resource. A representation of the newly created resource may be included in the response body.
202	Accepted	The request has been accepted for processing, but the processing has not been completed. The Location header shall be set to the URI of a Task resource that can later be queried to determine the status of the operation. A representation of the Task resource may be included in the response body.
204	No Content	The request succeeded, but no content is being returned in the body of the response.
301	Moved Permanently	The requested resource resides under a different URI.
302	Found	The requested resource resides temporarily under a different URI.
304	Not Modified	The service has performed a conditional GET request where access is allowed, but the resource content has not changed. Conditional requests are initiated using the headers If-Modified-Since and/or If-None-Match to save network bandwidth if there is no change.
401	Unauthorized	The authentication credentials included with this request are missing or invalid.
403	Forbidden	The server recognized the credentials in the request, but those credentials do not possess authorization to perform this request.
404	Not Found	The request specified a URI of a resource that does not exist.

Status Code	Status Name	Description
405	Method Not Allowed	The HTTP verb specified in the request (e.g., DELETE, GET, HEAD, POST, PUT, PATCH) is not supported for this request URI. The response shall include an Allow header which provides a list of methods that are supported by the resource identified by the Request-URI.
406	Not Acceptable	The Accept header was specified in the request and the resource identified by this request is not capable of generating a representation corresponding to one of the media types in the Accept header.
409	Conflict	A creation or update request could not be completed because it would cause a conflict in the current state of the resources supported by the platform (for example, an attempt to set multiple attributes that work in a linked manner using incompatible values).
410	Gone	The requested resource is no longer available at the server and no forwarding address is known. This condition is expected to be considered permanent. Clients with link editing capabilities SHOULD delete references to the Request-URI after user approval. If the server does not know, or has no facility to determine, whether or not the condition is permanent, the status code 404 (Not Found) SHOULD be used instead. This response is cacheable unless indicated otherwise.
411	Length Required	The request did not specify the length of its content using the Content-Length header (perhaps Transfer-Encoding: chunked was used instead). The addressed resource requires the Content-Length header.

Status Code	Status Name	Description
412	Precondition Failed	Precondition (such as OData-Version, If Match or If Not Modified headers) check failed.
415	Unsupported Media Type	The request specifies a Content-Type for the body that is not supported.
500	Internal Server Error	The server encountered an unexpected condition that prevented it from fulfilling the request.
501	Not Implemented	The server does not (currently) support the functionality required to fulfill the request. This is the appropriate response when the server does not recognize the request method and is not capable of supporting the method for any resource.
503	Service Unavailable	The server is currently unable to handle the request due to temporary overloading or maintenance of the server.

Authentication

The BMC is required to use authentication to access specific Redfish resources. Redfish offers a method of access known as HTTPS Basic Authentication, as defined by RFC7617, enabling users to access Redfish resources. This method uses only connections that conform to TLS to transport the data between any third-party authentication service and clients. Use local BMC authentication or remote authentication like LDAP or Active Directory to log in.

Example of applying for HTTPS basic Authentication using curl:

#

```
#UCS-Server: /logs$ curl -k -X GET https://<username>:<password>@<BMC IP>/redfish/v1 | jq.

%Total %Received %xferd Average Speed   Time    Time     Time     Current
                       Dload   Upload  Total   Spend    Left     Speed
100 1532 100 1532 0 0   10281       0--:--:--:--:--: :--: :--:   10281{
    "@odata.id": "/redfish/v1",
    "@odata.type": "#ServiceRoot.v1_11_0.ServiceRoot",
    "AccountService": {
        "@odata.id": "/redfish/v1/AccountService"
    },
    "Cables": {
        "@odata.id": "/redfish/v1/Cables"
    },
```

```
    "CertificateService": {
        "@odata.id": "/redfish/v1/CertificateService"
    },
    "Chassis": {
        "@odata.id": "/redfish/v1/Chassis"
    },
    "EventService": {
        "@odata.id": "/redfish/v1/EventService"
    },
    "Id": "RootService",
    "JsonSchemas": {
        "@odata.id": "/redfish/v1/JsonSchemas"
    },
    "Links": {
        "Sessions": {
            "@odata.id": "/redfish/v1/SessionService/Sessions"
        }
    },
    "Managers": {
        "@odata.id": "/redfish/v1/Managers"
    },
    "Name": "Root Service",
    "ProtocolFeaturesSupported": {
        "DeepOperations": {
            "DeepPATCH": false,
            "DeepPOST": false
        },
        "ExcerptQuery": false,
        "ExpandQuery": {
            "ExpandAll": false,
            "Levels": false,
            "Links": false,
            "NoLinks": false
        },
        "FilterQuery": false,
        "OnlyMemberQuery": true,
        "SelectQuery": true
    },
    "RedfishVersion": "1.9.0",
    "Registries": {
        "@odata.id": "/redfish/v1/Registries"
    },
    "SessionService": {
        "@odata.id": "/redfish/v1/SessionService"
    },
    "Systems": {
        "@odata.id": "/redfish/v1/Systems"
    },
    "Tasks": {
        "@odata.id": "/redfish/v1/TaskService"
    },
    "TelemetryService": {
        "@odata.id": "/redfish/v1/TelemetryService"
    },
    "UUID": "1b187d13-66a7-4429-8496-b497d28931ba",
    "UpdateService": {
        "@odata.id": "/redfish/v1/UpdateService"
    }
}
```

Available APIs

The following Redfish defined URIs are supported:

Resource	Resource URI
Service Root	/redfish/v1/
Account Service	/redfish/v1/AccountService
Manager Account Collection	/redfish/v1/AccountService/Accounts
Manager Account	/redfish/v1/AccountService/Accounts/{{account_instance}}
Role Collection	/redfish/v1/AccountService/Roles
Role	/redfish/v1/AccountService/Roles/{{role_instance}}
Certificate Management	/redfish/v1/CertificateService
Chassis Collection	/redfish/v1/Chassis
Chassis	/redfish/v1/Chassis/{{chassis_instance}}
Manager Collection	/redfish/v1/Managers
Manager	/redfish/v1/Managers/{{manager_instance}}
Managers Network Protocol	/redfish/v1/Managers/{{manager_instance}}/NetworkProtocol
Log Service Collection (Manager)	/redfish/v1/Managers/{{manager_instance}}/LogServices
Log Service Collection (Systems)	/redfish/v1/Systems/{{System_Instance}}/LogServices
Log Service	/redfish/v1/Managers/{{manager_instance}}/LogServices/ {{manager_log_instance}}
Task Service	/redfish/v1/TaskService
Task Collection	/redfish/v1/TaskService/Tasks
Task	/redfish/v1/TaskService/Tasks/*{{Task_Instance}}*
Log Entry Collection	/redfish/v1/Managers/{{manager_instance}}/LogServices/ {{manager_log_instance}}/Entries

Resource	Resource URI
Log Entry Collection (Systems)	/redfish/v1/Systems/{{System_Instance}}/LogServices/{{LogService_Instance}}/Entries redfish/v1/Managers/{{Manager_Instance}}/LogServices/{{LogService_Instance}}/Entries
Log Entry (Systems)	/redfish/v1/Managers/{{Manager_Instance}}/LogServices/{{LogService_Instance}}/Entries/{{Entry_Instance}} /redfish/v1/Systems/{{System_Instance}}/LogServices/{{LogService_Instance}}/Entries/{{Entry_Instance}}
Log Entry (Manager)	/redfish/v1/Managers/{{manager_instance}}/LogServices/{{manager_log_instance}}/Entries/{{manager_logentry_instance}}
Ethernet Interface Collection	/redfish/v1/Managers/{{manager_instance}}/EthernetInterfaces
Ethernet Interface	/redfish/v1/Managers/{{manager_instance}}/EthernetInterfaces/{{manager_ethifc_instance}}
Event Service	/redfish/v1/EventService
Session Service	/redfish/v1/SessionService
Session Collection	/redfish/v1/SessionService/Sessions
Session	/redfish/v1/SessionService/Sessions/{{session_id}}
Update Service	/redfish/v1/UpdateService
FirmwareInventory Collection	/redfish/v1/UpdateService/FirmwareInventory
FirmwareInventory	/redfish/v1/UpdateService/FirmwareInventory/{{firmwareinventory_instance}}
Registries	/redfish/v1/Registries
System	/redfish/v1/Systems

ODATA Properties

OData Properties are used to provide information on the resource like its ID, type, context, and so on accessed by an URI. The following are the properties used in REST API:

Table 2: OData Attributes

Name	Type	Read only	Description
@odata.id	String	True	This property is your unique identifier for the resource. It follows the format defined in the Redfish specification.
@odata.type	String	True	This property is an absolute URL that specifies the resource type. It follows the format defined in the Redfish specification. The type values for each Redfish entity indicate the schema it follows, as listed in the Redfish API under the Schema column.

Example

```
{
"@odata.id": "/redfish/v1/",
"@odata.type": "#ServiceRoot.v1_11_0.SesrviceRoot"
}
```

Resource

The resource properties specified in this topic are inherited by all APIs mentioned in this document. The following are the different Resource schema properties:

Table 3: Resource Type Definitions

Name	Type	Read only	Description
ID	String	True	This property uniquely identifies the resource among similar resources.
Description	Null, String	True	This property gives a description of the resource and ensures consistency in schema definitions.
Name	String	True	This property indicates the name of the resource.

Name	Type	Read only	Description
UUID	String	True	This property follows the pattern: ([0-9a-f]{8}-[0-9a-f]{4}-[0-9a-f]{4}-[0-9a-f]{4}-[0-9a-f]{12}).

Table 4: Location Definitions

Name	Type	Read only	Description
PartLocation	Object	True	This property indicates where the part is located within an enclosure.
ServiceLabel	String	True	This property is the label of the part location, such as a silk-screened name or a printed label.
LocationOrdinalValue	Number	True	This property represents the numerical position of the part. For example, if the LocationType is Slot and the unit is in slot 2, then this value is 2.
LocationType	String	True	This property specifies the type of location of the part. • Backplane: A backplane. • Bay: A bay. • Connector: A connector or port. • Embedded: Embedded within a part. • Slot: A slot. • Socket: A socket.

Table 5: Status Definitions

Name	Type	Read only	Description
Health	String	True	This property shows the health status of the resource without its dependent resources. Enum Options: • OK: Normal. • Warning: A condition needs your attention. • Critical: A critical condition needs immediate attention.
HealthRollup	String	True	This property indicates the overall health status from the perspective of this resource. Enum Options: • OK: Normal. • Warning: A condition needs your attention. • Critical: A critical condition needs immediate attention.
State	String	True	This property specifies whether the resource is enabled or disabled. Enum Options: • Enabled: This function or resource is enabled. • Disabled: This function or resource is disabled.

Service Root

This resource represents the root of the Redfish service, located at the "/redfish/v1/" URI. As a hypermedia API, all other resources accessible through the Redfish interface on this device are linked directly or indirectly from the Service Root.

GET

```
https://<username>:<password>@<BMC IP>/redfish/v1
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 6: Service Root Properties

Name	Type	Read only	Description
AccountService	Object	True	Provides a link to the Account Service.
Cables	Object	True	Not supported.
CertificateService	Object	True	Provides a link to the Certificate Service.
Chassis	Object	True	Provides a link to the collection of Chassis.
EventService	Object	True	Provides a link to the Event Service.
Id	String	True	See Resource, on page 9 for more details.
JsonSchemas	Object	True	Links to a collection of JSON schema files.
Links	Object	True	Contains links to related resources: • Sessions: Provides a link to the collection of Sessions. • ManagerProvidingService: Provides a link to the collection of Managers.
Managers	Object	True	Provides a link to the collection of Managers.

Name	Type	Read only	Description
Name	String	True	See Resource, on page 9 for more details.
Oem	Object	True	Contains OEM extensions.
ProtocolFeaturesSupported	Object	True	Details supported protocol features: • DeepOperations: See Table 7: DeepOperations Properties, on page 14 for properties. • ExcerptQuery: Indicates if the 'excerpt' query parameter is supported. • ExpandQuery: Contains details about using $expand in the service. See Table 8: ExpandQuery Properties, on page 14 for properties. • FilterQuery: Indicates if the $filter query parameter is supported. • OnlyMemberQuery: Indicates if the 'only' query parameter is supported. • SelectQuery: Indicates if the $select query parameter is supported.
RedfishVersion	String	True	This string represents the version of the Redfish service.
Registries	Object	True	Links to a collection of Registries.

Name	Type	Read only	Description
SessionService	Object	True	Provides a link to the Session Service.
Systems	Object	True	Provides a link to the collection of Systems.
Tasks	Object	True	Provides a link to the Task Service.
TelemetryService	Object	True	Provides a link to the Telemetry Service.
UUID	String	True	See Resource, on page 9 for more details.
UpdateService	Object	True	Provides a link to the Update Service.

Table 7: DeepOperations Properties

Name	Type	Read only	Description
DeepPATCH	Boolean	True	An indication of whether the service supports the deep PATCH operation.
DeepPOST	Boolean	True	An indication of whether the service supports the deep POST operation.

Table 8: ExpandQuery Properties

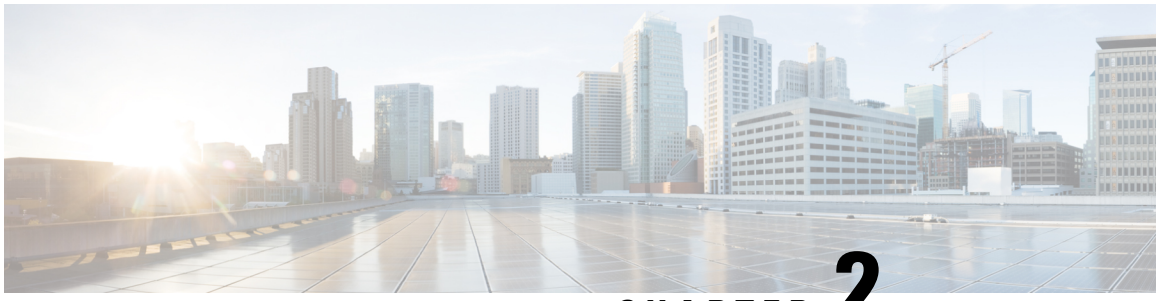
Name	Type	Read only	Description
Expand All	Boolean	True	Indicates if the service supports expanding all entries using the $expand asterisk (*).
Levels	Boolean	True	Indicates if the service supports the $levels qualifier for expansion.
Links	Boolean	True	Indicates if the service supports expanding only entries in the Links section using the $expand tilde (~).

Name	Type	Read only	Description
NoLinks	Boolean	True	Indicates if the service supports expanding only entries not in the Links section using the $expand period (.).

Collection

Table 9: Collection Properties

Name	Type	Read only	Description
@odata.id	String	True	See ODATA Properties, on page 8 for more details.
@odata.type	String	True	See ODATA Properties, on page 8 for more details.
Members	Array	True	Holds the members of this collection.
Members@odata.count	Number	True	Indicates the number of members in the collection.
Name	String	True	Specifies the name of the collection.
Description	String	True	Provides details about the resource.



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Viewing BMC Version

```
UCS:~$ curl -s -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/Managers/bmc/
{
  "@odata.id": "/redfish/v1/Managers/bmc",
  "@odata.type": "#Manager.v1_14_0.Manager",
  "Actions": {
    "#Manager.Reset": {
        "@Redfish.ActionInfo": "/redfish/v1/Managers/bmc/ResetActionInfo",
        "target": "/redfish/v1/Managers/bmc/Actions/Manager.Reset"
    },
    "#Manager.ResetToDefaults": {
```

```
        "ResetType@Redfish.AllowableValues": [
          "ResetAll",
        ],
         "target": "/redfish/v1/Managers/bmc/Actions/Manager.ResetToDefaults",
       }
    },
  "DateTime": "2023-12-26T05:56:02+00:00",
  "DateTimeLocalOffset": "+00:00",
  "Description": "Baseboard Management Controller",
  "EthernetInterfaces": {
    "@odata.id": "/redfish/v1/Managers/bmc/EthernetInterfaces"
    "FirmwareVersion": "release-1.1.0.0"
    "GraphicalConsole":......
```


Viewing Platform Firmware Version

Request

```
curl -s -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/Managers/bmc
```

Response

```
UCS#:~$ curl -s -k -X GET <username>:<password>@<BMC IP>/redfish/v1/Managers/bmc |
jq '.["Oem"]["Vendor"]["Firmware Version"]'
{
    "FirmwareVersion": {
    "BIOS": "1.1.20",
    "HIB_FPGA": "2.24",
    "MB_FPGA": "2.04",
    "RoT": "1.0.12",
    "SCM_FPGA": "2.04"
}
```

Viewing Power State

Request

```
curl -s -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/Systems/
system | grep -i powerstate
```

Response

```
UCS#:-$ curl -s -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/Systems
/system | grep -1 powerstate "PowerState": "On",
```

```
UCS#:-$ curl -s -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/Systems
/system | grep -1 powerstate "PowerState": "Off",
```

Powering On the Server

Request

```
curl -s -k -X POST username>:<password> https://<BMC IP>/redfish/v1/Systems/system
/Actions/ComputerSystem.Reset -H "Content-Type: application/json" -d '{"ResetType": "On"}'
```

Response

```
UCS#:~$ curl -s -k -X POST <username>:<password> https://<BMC IP>/redfish/v1/Systems/
system/Actions/ComputerSystem.Reset -H "Content-Type: application/json" -d '{"ResetType":
"On"}'
{
    *@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The request completed successfully.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.Success",
            "MessageSeverity": "OK",
            "Resolution": "None"
        }
    ]
}UCS#:~$ curl -s -k -X GET https://<username>:<password>@<BMC IP>/redfish/v1/Systems/system

| grep -i powerstate
"PowerState": "On",
```

Powering Down the Server

Request

```
curl -s -k -X POST <username>:<password> https://<BMC IP>/redfish/v1/Systems/system/Actions/
ComputerSystem.Reset -H "Content-Type: application/json" -d '{"ResetType": "ForceOff"}'
```

Response

```
UCS#:~$ curl -s -k -X POST username>:<password> https://<BMC IP>/redfish/v1/Systems/system/
Actions/ComputerSystem.Reset -H "Content-Type: application/json" -d '{"ResetType":
"ForceOff"}"
{
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The request completed successfully.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.Success",
            "MessageSeverity": "OK",
            "Resolution": "None"
        }
    ]
}UCS#:-$ curl -s -k -X GET https://<username>:<password>@<BMC IP>/redfish/v1/Systems/system

| grep -1 powerstate
"PowerState": "Off",
```

Obtaining Server Power Cycle

Request

```
curl -s -k -X POST <username>:<password> https://<BMC IP>/redfish/v1/Systems/system/Actions/
ComputerSystem.Reset -H "Content-Type: application/json" -d '{"ResetType": "PowerCycle"}'
```

Response

```
UCS#:-$ curl -s -k -X POST https://<username>:<password>@<BMC IP>/redfish/v1/Systems/
system/Actions/ComputerSystem.Reset
-H "Content-Type: application/json" -d '{"ResetType": "PowerCycle"}'
{
```

```
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The request completed successfully."
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.Success",
            "MessageSeverity": "OK",
            "Resolution": "None"
        }
    ]
}UCS#:~$
```

Viewing BMC Date and Time

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/bmc
| grep -i "DateTime"
```

Response

```
UCS#:~$ curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/bmc
| grep -i "DateTime" "DateTime": "2023-12-26T09:31:42+00:00",
"DateTimeLocalOffset": "+00:00",
```

Updating BMC Firmware

Configuring BMC Firmware Update Time

Request

```
curl -k -X PATCH <username>:<password> https://<BMC IP>/redfish/v1/UpdateService -H
"Content-Type:application/json" -d '{"HttpPushUriOptions":{"HttpPushUriApplyTime":
{"ApplyTime": "Immediate"}}}'
```

```
% curl -k -X PATCH <username>:<password> https://<BMC IP>/redfish/v1/UpdateService
-H "Content-Type:application/json" -d '{"HttpPushUriOptions":{"HttpPushUriApplyTime":{
"ApplyTime": "Immediate"}}}'
    {
    "@Message.ExtendedInfo": [
    {
        "@odata.type": "#Message.v1_1_1.Message",
        "Message": "The request completed successfully.",
        "MessageArgs": [],
        "MessageId": "Base.1.13.0.Success",
        "MessageSeverity": "OK",
        "Resolution": "None"
    }
]
}%
```

Downloading BMC Firmware Image and Updating BMC firmware

Request

```
curl -k -X POST <username>:<password> https://<BMC IP>/redfish/v1/UpdateService -H
"Content-Type:application/octet-stream" --data-binary @<BMC firmware image name>
```

```
% curl -k -X POST <username>:<password> https://<BMC IP>/redfish/v1/UpdateService -H
"Content-Type:application/octet-stream" --data-binary @Bronco_BMC_v1.0.21_DEV_signed_cap.bin
{
    "@odata.id": "/redfish/v1/TaskService/Tasks/0",
    "@odata.type": "#Task.v1_4_3.Task",
    "Id": "0",
    "Message": "BMC update is in progress. RoT will flash the BMC shortly. Please wait for
 approximately 15 minutes as the BMC will restart.",
    "TaskState": "Starting",
    "TaskStatus": "OK"
}%
```

Updating BIOS Firmware

Downloading BIOS Firmware Image

Request

```
curl -k -X POST <username>:<password> https://<BMC
IP>/redfish/v1/Managers/bmc/Oem/OemManagement/UploadFile -H
"Content-Type:application/octet-stream" -H "Filename:v1.x.x.bin" --data-binary @<BIOS
firmware image name>
```

Updating BIOS Firmware

Request

```
curl -k -X POST <username>:<password> https://<BMC
IP>/redfish/v1/Managers/bmc/Oem/OemManagement/OEMUpdate
-d '{"updateDevice": "bios"}'
```

Verifying Update Status

Request

```
curl -k -X GET <username>:<password> https://<BMC
IP>/redfish/v1/Managers/bmc/Oem/OemManagement/
OEMUpdate/CheckStatus
```

Updating FPGA Firmware

Downloading FPGA Firmware

Request

```
curl -k -X POST <username>:<password> https://<BMC
IP>/redfish/v1/Managers/bmc/Oem/OemManagement/
UploadFile -H "Content-Type:application/octet-stream" -H "Filename:oem.bin"
--data-binary @<FPGA firmware image name>
```

Updating DC-SCM FPGA, MB FPGA, or HIB FPGA Firmware

Request - DC-SCM FPGA:

```
curl -k -X POST <username>:<password> https://<BMC IP>/redfish/v1/Managers/bmc/
Oem/OemManagement/OEMUpdate -d '{"updateDevice": "dcscm-fpga"}'
```

Request - MB FPGA

```
curl -k -X POST <username>:<password> https://<BMC IP>/redfish/v1/bmc/
Oem/OemManagement/Wistron/OEMUpdate -d '{"updateDevice": "mb-fpga"}'
```

Request - HIB FPGA

```
curl -k -X POST <username>:<password> https://<BMC IP>/redfish/v1/Managers/bmc/
Oem/OemManagement/OEMUpdate -d '{"updateDevice": "hib-fpga"}'
```

Verifying Update Status

Request

```
curl -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/Managers/bmc/
Oem/OemManagement/OEMUpdate/CheckStatus
```

Viewing BMC Users

Request

```
curl -s -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/AccountService/Accounts
```

Response

```
UCS#:~$ curl -s -k -X GET <username>:<password> https://<BMC
IP>/redfish/v1/AccountService/Accounts
{
    "@odata.id": "/redfish/v1/AccountService/Accounts",
    "@odata.type": "#ManagerAccountCollection. ManagerAccountCollection",
    "Description": "BMC User Accounts",
    "Members": [
        {
            "@odata.id": "/redfish/v1/AccountService/Accounts/root"
        }
    ],
    "Members@odata.count": 1,
    "Name": "Accounts Collection"
}UCS#:~$
```

Creating BMC User

Request

```
curl -s -k -X POST <username>:<password> https://<BMC IP>/redfish/v1/AccountService/
Accounts -H "Content-Type: application/json" -d '{"UserName": "<Username>", "Password":
"<Password>", "RoleId": "<Privilege Level>" }'
```

Privilege Levels:

- Administrator
- Operator
- User

Response

```
UCS#:~$ curl -s -k -X POST username>:<password> https://<BMC IP>/redfish/v1/AccountService/
Accounts -H "Content-Type: application/json" -d '{"UserName": "test_user", Password":
"Pa$$word_123",
"RoleId": "Administrator" }''
{
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The resource has been created successfully.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0. Created",
            "MessageSeverity": "OK",
            "Resolution": "None."
        }
    ]
}UCS#:~$ curl -s -k -X GET https:<username>:<password>@<BMC IP>/redfish/v1/Account
Service/Accounts/
{
    "@odata.id": "/redfish/v1/AccountService/Accounts",
    "@odata.type": "#ManagerAccountCollection. ManagerAccountCollection",
    "Description": "BMC User Accounts",
    "Members": [
        {
            "@odata.id": "/redfish/v1/AccountService/Accounts/test_user"
        },
        {
            "@odata.id": "/redfish/v1/AccountService/Accounts/root"
        }
    ],
    "Members@odata.count": 2,
    "Name": "Accounts Collection"
    }UCS#:~$
```

Deleting BMC User

Request

```
curl -s -k -X DELETE <username>:<password> https://<BMC IP>/redfish/v1/AccountService/
Accounts/{Username}
```

Response

```
UCS#:~$ curl -s -k -X GET <username>:<password> https://<BMC
IP>/redfish/v1/AccountService/Accounts/
{
    "@odata.id": "/redfish/v1/AccountService/Accounts",
    "@odata.type": "#ManagerAccountCollection. ManagerAccountCollection",
    "Description": "BMC User Accounts",
    "Members": [
        {
            "@odata.id": "/redfish/v1/AccountService/Accounts/test_user"
        },
        {
            "@odata.id": "/redfish/v1/AccountService/Accounts/root"
        }
    ],
    "Members@odata.count": 2,
    "Name": "Accounts Collection"

}UCS#:~$ curl -s -k -X DELETE https://<username>:<password>@<BMC
IP>/redfish/v1/AccountService/Accounts/test_user
{
```

```
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The account was successfully removed.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.AccountRemoved",
            "MessageSeverity": "OK",
            "Resolution": "No resolution is required."
        }
    ]

}UCS#:~$ curl -s -k -X GET https://<username>:<password>@<BMC
IP>/redfish/v1/AccountService/Accounts/
{
    "@odata.id": "/redfish/v1/AccountService/Accounts",
    "@odata.type": "#ManagerAccountCollection. ManagerAccountCollection",
    "Description": "BMC User Accounts",
    "Members": [
        {
            "@odata.id": "/redfish/v1/AccountService/Accounts/root"
        }
    ],
    "Members@odata.count": 1,
    "Name": "Accounts Collection"
}UCS#:~$
```

Monitoring CPU Temperature

Request

```
curl -s -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/Chassis/
PlatformSensors/Thermal
```

Response

```
{
    "@odata.id": "@odata.type":
    "/redfish/v1/Chassis/PlatformSensors/Thermal#/Temperatures/1",
    "#Thermal.v1_3_0.Temperature",
    "Lower ThresholdCritical": 0.0,
    "Lower ThresholdNonCritical": 5.0,
    "MaxReadingRangeTemp": 127.0,
    "MemberId": "TEMP_MB_CPUO",
    "MinReadingRange Temp": -128.0,
    "Name": "TEMP MB CPUO",
    "ReadingCelsius": 53.875,
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "UpperThresholdCritical": 115.0,
    "UpperThresholdNonCritical": 110.0
},
```

Monitoring CPU Current Power Consumption

Request

```
curl -s -k -X GET <username>:<password> https://<BMC IP> /redfish/v1/Chassis
/Platform_Sensors/Sensors | grep -i CPU
```

```
curl -s -k -X GET https:// <username>:<password>@<BMC IP> /redfish/v1/Chassis/Platform_Sensors
/Sensors/{member}
```

Response

```
UCS#:~$ curl -s -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/Chassis/
Platform_Sensors/Sensors | grep -i CPU
    "@odata.id": "/redfish/v1/Chassis/Platform_Sensors/Sensors/power_PWR_MB_CPU_
    "@odata.id": "/redfish/v1/Chassis/Platform_Sensors/Sensors/power_PWR_MB_CPU1_"
```

```
UCS# ~ % curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Chassis/
PlatformSensors/Sensors/power_PWR_MB_CPU0_
{
    "@odata.id": "/redfish/v1/Chassis/PlatformSensors/Sensors/power_PWR_MB_CPU0_",
    "@odata.type": "#Sensor.v1_2_0.Sensor",
    "Id": "power_PWR_MB_CPU0_",
    "Name": "PWR_MB_CPU0_",
    "Reading": 125.0,
    "ReadingRangeMax": 500.0,
    "ReadingRangeMin": 0.0,
    "ReadingType": "Power",
    "ReadingUnits": "W",
    "Status": {
        "Health": "OK",
        "HealthRollup": "OK",
        "State": "Enabled"
    },
    "Thresholds": {
        "LowerCritical": {
            "Reading": null
        },
        "UpperCritical": {
            "Reading": 500.0
        }
    }
}
```

Viewing HRoT Firmware Version

Request

```
curl -s -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/Managers/bmc
```

Response

```
UCS#:~$ curl -s -k -X GET <username>:<password> https://<BMC IP>/redfish/v1/Managers/bmc |

jq '.["Oem"]["Wistron"]["Firmware Version"]'
{
    "BIOS": "v3.0.1",
    "HIB_FPGA": "v2.17",
    "MB_FPGA": "v1.5",
    "RoT": "v1.0",
    "SCM_FPGA": "v1.5"
}
```

Managing Account Service

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/AccountService
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 10: Account Service Properties

Name	Type	Read only	Description
AccountLockoutDuration	Number	False	The time in seconds an account remains locked after exceeding failed login attempts. A value of `0` means no lockout occurs. Ignored if AccountLockoutCounterResetEnabled is `false`.
AccountLockoutThreshold	Number	False	The number of failed login attempts before the account is locked. A value of `0` means the account is never locked.
Accounts	Object	True	Contains the collection of manager accounts.
ActiveDirectory	Object	True	See Table 11: ExternalAccountProvider Properties, on page 29 for ExternalAccountProvider properties.
Description	String	True	Refer to Resource, on page 9 for details.
Id	String	True	Refer to Resource, on page 9 for details.
LDAP	Object	False	See Table 11: ExternalAccountProvider Properties, on page 29 for ExternalAccountProvider properties.

Name	Type	Read only	Description
MaxPasswordLength	String	True	Maximum password length allowed. **Note** Maximum value by default is 20.
MinPasswordLength	String	True	Minimum password length required. **Note** Minimum value by default is 8.
Name	String	True	Refer to Resource, on page 9 for details.
Oem	Object	False	Contains OEM-specific properties: • BMC: OEM Authentication definition. See Table 13: Account Service OEM BMC Properties, on page 30.
Roles	Object	True	Provides a link to a collection of type RoleCollection.
ServiceEnabled	Boolean	False	Indicates if this service is enabled.

Table 11: ExternalAccountProvider Properties

Name	Type	Read only	Description
Authentication	Object	False	Contains authentication details needed for the external service: • AuthenticationType: Readonly - True. • Username: The username for connecting to the service. • Password: The password for the service, which is set via PATCH or PUT requests. It appears as **null** in responses.
Certificates	Object	True	Link to a collection of certificates used by the external account provider.
LDAPService	Object	False	Provides additional mapping information for parsing a generic LDAP service. **Note** Refer Table 12: LDAP Service Properties, on page 30, LDAP Service Properties, for more details.
RemoteRoleMapping	Array	False	Rules for mapping account information from the external account provider to local Redfish roles.
ServiceAddresses	Array	False	Addresses of the user account providers linked to this external account provider. The format varies by provider type.

Name	Type	Read only	Description
ServiceEnabled	Boolean	False	Indicates whether this service is currently enabled.

Table 12: LDAP Service Properties

Name	Type	Read only	Description
SearchSettings	Object	False	Settings required to search an external LDAP service: • BaseDistinguishedNames: Base distinguished names used for searching the LDAP service. • GroupsAttribute: Attribute name containing groups for a user in the LDAP entry. • UsernameAttribute: Attribute name containing the LDAP username entry.

Table 13: Account Service OEM BMC Properties

Name	Type	Read only	Description
@odata.id	String	True	See ODATA Properties, on page 8 for more details.
@odata.type	String	True	See ODATA Properties, on page 8 for more details.

Name	Type	Read only	Description
AuthMethods	Object	False	Different methods available for authentication: • BasicAuth: Toggle Basic Authentication on or off. • Cookie: Toggle Cookie Authentication on or off. • SessionToken: Toggle SessionToken Authentication on or off. • TLS: Toggle TLS Authentication on or off. • XToken: Toggle XToken Authentication on or off.

PATCH

Request

```
curl -sku {{user}}:{{password}} -X PATCH https://<username>:<password>@<BMC
IP>/redfish/v1/AccountService
-H "Content-Type:application/json" -d '{"AccountLockoutDuration": 30,
"AccountLockoutThreshold": 1}'
```

Response

```
{
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The request completed successfully.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.Success",
            "MessageSeverity": "OK",
            "Resolution": "None"
        }
    ]
}
]]
```

Managing Account Collections

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/AccountService/Accounts
Content-Type:application/js
```

Response

Refer for the JSON response properties.

POST

Request

```
curl -sku {{user}}:{{password}} -X POST <username>:<password> https://<BMC
IP>redfish/v1/AccountService/
Accounts -H "Content-Type:application/json" -d '{"Enabled": true, "Password": "A11009755",
 "UserName": "test_user",
"RoleId": "Operator"}'
```

Response

```
{
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The resource has been created successfully.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.Created",
            "MessageSeverity": "OK",
            "Resolution": "None."
        }
    ]
}
```

Configuring Manager Account

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/AccountService/Accounts/
{{Account_Instance}}Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 14: Manager Account Properties

Name	Type	Read only	Description
AccountTypes	Array	True	Lists the different account types applicable to the account.
Description	String	True	See Resource, on page 9 for more details.
Enabled	Boolean	False	Determines if the account is enabled for future logins. Overrides the locked property.
Id	String	True	See Resource, on page 9 for more details.
Links	Object	True	Contains references to related resources: • Role: Reference to the Role object defining privileges for this account. The Role ID matches the RoleId property.
Locked	Boolean	False	Indicates if the account is automatically locked due to exceeded lockout threshold. Admins can set to **false** to unlock manually.
Locked@Redfish.AllowableValues	Enum	True	Specifies acceptable string values for a property or action parameter.
Name	String	True	See Resource, on page 9 for more details.

Name	Type	Read only	Description
Password	String	False	Stores the account password, appearing as **null** in responses. Format requirements: • Must be 8-20 characters. • Cannot contain the username. • Cannot be a palindrome. • Consecutive or repeated characters cannot exceed half.
PasswordChangeRequired	Boolean	True	Indicates if a password change is required before further account access.
RoleId	String	False	Defines the account role. Possible values: Administrator, Operator, and ReadOnly.
UserName	String	True	The username for the account.

PATCH

Request

```
curl -sku {{user}}:{{password}} -X PATCH https://<username>:<password>@<BMC IP>/redfish/v1/
AccountService/Accounts/test_user -H "Content-Type:application/json" -d
'{"RoleId":"ReadOnly"}'
```

Response

```
{
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The request completed successfully.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.Success",
            "MessageSeverity": "OK",
            "Resolution": "None"
        }
    ]
}
```

DELETE

Request

```
curl -sku <username>:<password>@<BMC IP>/redfish/v1/AccountService/Accounts/
{{Account_Instance}}Content-Type:application/json
```

Response

```
{
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The account was successfully removed.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.AccountRemoved",
            "MessageSeverity": "OK",
            "Resolution": "No resolution is required."
        }
    ]
}
```

Viewing Role Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/AccountService/
Accounts/Roles Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Role

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/AccountService/Roles/
{{Role_Instance}}
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 15: Role Properties

Name	Type	Read only	Description
AssignedPrivileges	Array	True	Lists the Redfish privileges included in the role. ReadOnly for predefined roles, but some implementations may allow changes for custom roles. • Login: Can log into the service and read resources. • ConfigureManager: Can configure managers. • ConfigureUsers: Can configure users and their accounts. • ConfigureSelf: Can change the password for the current user account. • ConfigureComponents: Can configure components managed by this service.
Description	String	True	See Resource, on page 9 for more details.
Id	String	True	See Resource, on page 9 for more details.
IsPredefined	Boolean	True	Indicates if the role is a predefined Redfish role or a custom role.
Name	String	True	See Resource, on page 9 for more details.
OemPrivileges	Array	False	Defines the OEM-specific privileges for this role.
RoleId	String	True	Contains the name of the role, matching the Id property.

Configuring Certificate Service

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/CertificateService
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 16: Certificate Service Property

Name	Type	Read only	Description
Actions	Object	True	Contains actions available for this resource, under the O property if applicable.
CertificateLocations	Object	True	Describes resources administrators use to find all certificates installed on a service.
Description	String	True	See Resource, on page 9 for more details.
Id	String	True	See Resource, on page 9 for more details.
Name	String	True	See Resource, on page 9 for more details.

POST – Generate CSR

Request

```
curl -sku {{user}}:{{password}} -X POST https://<username>:<password>@<BMC IP>/redfish/v1/
CertificateService/Actions/CertificateService.GenerateCSR/ -d @csr_file.json
csr_file.json
{
    "City": "Austin",
    "CertificateCollection": {
        "@odata.id": "/redfish/v1/Managers/bmc/NetworkProtocol/HTTPS/Certificates/"
    },
    "CommonName": "xx.xx.xx.xx",
    "Country": "US",
    "Organization": "ABC Limited",
    "OrganizationalUnit": "IT",
    "State": "AU",
    "KeyPairAlgorithm": "RSA"
}
```

Response

```
{
    "CSRString": "-----BEGIN CERTIFICATE REQUEST----- ……  -----END CERTIFICATE
REQUEST-----\n",
    "CertificateCollection": {"@odata.id":
"/redfish/v1/Managers/bmc/NetworkProtocol/HTTPS/Certificates/"
}
```

POST – ReplaceCertificate

Request

```
curl -sku {{user}}:{{password}} -X POST https://<username>:<password>@<BMC IP>/redfish/v1/
CertificateService/Actions/CertificateService.ReplaceCertificate/ -d @certificate.json
certificate.json
{
    "CertificateString":"-----BEGIN CERTIFICATE-----……----END CERTIFICATE-----",
    "CertificateType": "PEM",
    "CertificateUri":
    {
        "@odata.id": "/redfish/v1/Managers/bmc/NetworkProtocol/HTTPS/Certificates/1"
    }
}
```

Response

```
{
    "@odata.id": "/redfish/v1/Managers/bmc/NetworkProtocol/HTTPS/Certificates/1",
    "@odata.type": "#Certificate.v1_0_0.Certificate",
    "CertificateString": "-----BEGIN CERTIFICATE-----…….-----END CERTIFICATE-----\n",
    "Description": "HTTPS certificate",
    "Id": "1",
    "Issuer": {
        "City": "TW",
        "CommonName": "TW",
        "Country": "TW",
        "Organization": "TW",
        "OrganizationalUnit": "TW",
        "State": "TW"
    },
    "KeyUsage": [],
    "Name": "HTTPS certificate",
    "Subject": {
        "City": "Austin",
        "CommonName": "xx.xx.xx.xx",
        "Country": "US",
        "Organization": "ABC Limited",
        "OrganizationalUnit": "IT",
        "State": "AU"
    },
    "ValidNotAfter": "2025-11-06T09:58:51+00:00",
    "ValidNotBefore": "2024-06-24T09:58:51+00:00"
}
```

Viewing Certificate Location

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/CertificateService/
CertificateLocations
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 17: Certificate Locations Property

Name	Type	Read only	Description
Description	String	True	See Resource, on page 9 for more details.
Id	String	True	See Resource, on page 9 for more details.
Links	Object	True	See Resource, on page 9 for more details.
Name	String	True	See Resource, on page 9 for more details.

Viewing Chassis Location

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/CertificateService/
CertificateLocations
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Chassis Properties

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

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Chassis/{{Chassis_Instance}}
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 18: Chassis Properties

Name	Type	Read only	Description
Actions	Object	True	Available actions for this resource.
AssetTag	String	True	User-assigned asset tag for this instance.
Extra	String	True	Extra information about this chassis.
BuildDate	String	True	Build date of the PCB board or system.
Id	String	True	See Resource, on page 9 for more details.
Links	Object	True	Contains links to related resources.
Manufacturer	String	True	Manufacturer of the chassis.
Model	String	True	Model number of the chassis.
Name	String	True	See Resource, on page 9 for more details.
PCIeDevices	Object	True	Reference to the PCIe Devices Collection in this chassis.
PCIeSlots	Object	True	Link to the PCIe slot properties for this chassis.
PartNumber	String	True	Part number of the chassis.
Power	Object	True	Power collection in the equipment and subcomponents.
PowerState	String	True	Current power state of the chassis.
PowerSubsystem	Object	True	Link to the power subsystem properties for this chassis.
ProductExtra	String	True	Extra product information for this chassis.

Name	Type	Read only	Description
ProductManufacturer	String	True	Manufacturer of the product.
ProductModel	String	True	Model of the product.
ProductPartNumber	String	True	Part number of the product.
ProductSerialNumber	String	True	Serial number of the product.
Sensors	Object	True	Sensor collection in the equipment and subcomponents.
SerialNumber	String	True	Serial number of the chassis.
Status	Object	True	See Resource, on page 9 for more details.
Thermal	Object	True	Thermal collection in the equipment and subcomponents.
NetworkAdapters	Object	True	Link to the collection of network adapters associated with this chassis.

Viewing Sensor Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Chassis/
{Chassis_Instance}/Sensors
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Sensor Properties

GET

Request

```
https://<username>:<password>@<BMC IP>/redfish/v1/Chassis/{Chassis_Instance}}/Sensors/
{{Sensor_Instance}}
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 19: Sensor Properties

Name	Type	Read only	Description
Id	String	True	See Resource, on page 9 for more details.
Name	String	True	See Resource, on page 9 for more details.
Reading	Number	True	The current sensor value.
ReadingRangeMax	Number	True	The maximum possible sensor value, using the same units as the Reading property.
ReadingRangeMin	Number	True	The minimum possible sensor value, using the same units as the Reading property.
ReadingType	String	True	Type of sensor reading: • Power: Measures power. • Discrete: Functions as an event sensor.
ReadingUnits	String	True	The units used for the sensor reading.
Status	Object	True	See Resource, on page 9 for more details.

Viewing Thermal Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Chassis/
{Chassis_Instance}/Thermal
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables.

Table 20: Thermal Properties

Name	Type	Read only	Description
Fans	Object	True	See Table 21: Fans Properties, on page 43 for more details.
Id	String	True	See Resource, on page 9 for more details.
Name	String	True	See Resource, on page 9 for more details.
Temperatures	Object	True	See Table 22: Temperatures Properties, on page 44 for more details.

Table 21: Fans Properties

Name	Type	Read only	Description
LowerThresholdCritical	Number	True	Indicates the reading is below the normal range but not yet fatal. Uses the same units as the Reading property.
LowerThresholdNonCritical	Number	True	Indicates the reading is below the normal range but not critical. Uses the same units as the Reading property.
MaxReadingRange	Number	True	Maximum possible reading value. Uses the same units as the Reading property.
MemberId	String	True	Uniquely identifies the member within the collection. For Redfish v1.6 or higher, this is the zero-based array index.
MinReadingRange	Number	True	Minimum possible reading value. Uses the same units as the Reading property.

Name	Type	Read only	Description
Name	String	True	See Resource, on page 9 for more details.
PartNumber	String	True	Part number of the fan.
Reading	Number	True	Current value of the fan sensor's reading.
ReadingUnits	String	True	The units of the reading and thresholds.
SerialNumber	String	True	Serial number of the fan.
Status	Object	True	See Resource, on page 9 for more details.
UpperThresholdCritical	Number	True	Indicates the reading is above the normal range but not yet fatal. Uses the same units as the Reading property.
UpperThresholdNonCritical	Number	True	Indicates the reading is below the normal range but not critical. Uses the same units as the Reading property.

Table 22: Temperatures Properties

Name	Type	Read only	Description
LowerThresholdCritical	Number	True	Indicates the reading is below the normal range but not yet fatal. Uses the same units as the ReadingCelsius property.
LowerThresholdNonCritical	Number	True	Indicates the reading is below the normal range but not critical. Uses the same units as the ReadingCelsius property.
MaxReadingRangeTemp	Number	True	Maximum possible value for CurrentReading. Uses the same units as the ReadingCelsius property.

Name	Type	Read only	Description
MemberId	String	True	Uniquely identifies the member within the collection. For Redfish v1.6 or higher, this is the zero-based array index.
MinReadingRangeTemp	Number	True	Minimum possible value for CurrentReading. Uses the same units as the ReadingCelsius property.
Name	String	True	See Resource, on page 9 for more details.
ReadingCelsius	Number	True	Current temperature sensor reading.
Status	Object	True	See Resource, on page 9 for more details.
UpperThresholdCritical	Number	True	Indicates the reading is above the normal range but not yet fatal. Uses the same units as the ReadingCelsius property.
UpperThresholdNonCritical	Number	True	Indicates the reading is above the normal range but not critical. Uses the same units as the ReadingCelsius property.

Viewing Power Subsystem Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Chassis/{{Chassis_Instance}}
/PowerSubsystem/PowerSupplies
Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Chassis/{{Chassis_Instance}}/
PowerSubsystem/PowerSupplies/{{PowerSupplies_Instance}}
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 23: Power Subsystem Properties

Name	Type	Read only	Description
Id	String	True	See Resource, on page 9 for more details.
Manufacturer	String	True	Manufacturer of the power supply.
Model	String	True	Model number of the power supply.
Name	String	True	See Resource, on page 9 for more details.
PartNumber	String	True	Part number of the power supply.
ProductVersion	String	True	Product version of the power supply.
SerialNumber	String	True	Serial number of the power supply.
Status	Object	True	See Resource, on page 9 for more details.

Viewing Network Adapters Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC
IP>/redfish/v1/Chassis/{{Chassis_Instance}}/NetworkAdapters
Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

GET

Request

```
curl -k -u <username>:<password> https://<BMC
IP>/redfish/v1/Chassis/{{Chassis_Instance}}/NetworkAdapters/
{{NetworkAdapters_Instance}}Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 24: Network Adapters Properties

Name	Type	Read only	Description
Id	String	True	See Resource, on page 9 for more details.
Description	String	True	See Resource, on page 9 for more details.
Manufacturer	String	True	Manufacturer of the network adapter.
Model	String	True	Model number of the network adapter.
Name	String	True	See Resource, on page 9 for more details.
PartNumber	String	True	Part number of the network adapter.
Controllers	Array	True	Set of network controller ASICs that comprise the network adapter. **Note** Refer Table 25: Controllers Properties, on page 49 for more details.
SerialNumber	String	True	Serial number of the network adapter.

Name	Type	Read only	Description
NetworkDeviceFunctions	Array	True	Links to network device functions associated with this network controller: • @odata.id: Link to a NetworkDeviceFunction resource. • MACAddress: Configured MAC address of the interface or logical port. • PermanentMACAddress: Permanent MAC address assigned to the interface or port.
NetworkPorts	Object	True	Link to the network ports associated with this network interface.
SKU	String	True	Manufacturer SKU for the network adapter.
Vendor	String	True	Vendor of the network adapter.
Status	Object	True	See Resource, on page 9 for more details.

Table 25: Controllers Properties

Name	Type	Read only	Description
ControllerCapabilities	Object	True	Capabilities of this controller include: • DataCenterBridging: Data center bridging (DCB) capabilities. • NPAR: NIC Partitioning (NPAR) capabilities. • NPIV: N_Port ID Virtualization (NPIV) capabilities. • NetworkDeviceFunctionCount: Maximum number of physical functions available. • NetworkPortCount: Number of physical ports. • VirtualizationOffload: Virtualization offload capabilities.
FirmwarePackageVersion	String	True	Version of the user-facing firmware package.

Name	Type	Read only	Description
Links	Object	True	Links to related resources include: • NetworkDeviceFunctions: Links to network device functions. • NetworkDeviceFunctions@odata.count: See Collection, on page 15 for more details. • NetworkPorts: Links to network ports associated with this controller. • NetworkPorts@odata.count: See Collection, on page 15 for more details. • PCIeDevices: Links to PCIe devices associated with this controller. • PCIeDevices@odata.count: See Collection, on page 15 for more details.
PCIeInterface	Object	True	Details of the PCIe interface include: • LanesInUse: Number of PCIe lanes currently in use by the device. • MaxLanes: Maximum number of PCIe lanes supported by the device.

Viewing PCIe Slot Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Chassis/
{{Chassis_Instance}}/PCIeSlots Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 26: Network Adapters Properties

Name	Type	Read only	Description
Id	String	True	See Resource, on page 9 for more details.
Description	String	True	See Resource, on page 9 for more details.
Name	String	True	See Resource, on page 9 for more details.
Slot	Array	True	Contains PCI Slot information. **Note** Refer Table 27: Slot Properties, on page 51 for more details.

Table 27: Slot Properties

Name	Type	Read only	Description
HotPluggable	Boolean	True	Indicates whether this PCIe slot supports hot plugging.
Lanes	Number	True	Number of PCIe lanes supported by this slot.

Name	Type	Read only	Description
Links	Object	True	Links to related resources include: • PCIeDevices: Links to PCIe devices associated with this network controller. • PCIeDevices@odata.count: See Collection, on page 15 for more details.
Location	Number	True	Location of the processor. **Note** See Resource, on page 9 for more details.
PCIeType	String	True	Version of the PCIe specification used by this device: • Gen1: PCIe v1.0 slot. • Gen2: PCIe v2.0 slot. • Gen3: PCIe v3.0 slot. • Gen4: PCIe v4.0 slot. • Gen5: PCIe v5.0 slot.
Status	Object	True	See Resource, on page 9 for more details.

Viewing JSON File Schema Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/JsonSchemas
Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing JSON File Schema Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC
IP>/redfish/v1/JsonSchemas/{{JsonSchemas_Instance}}
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 28: Event Subscription Properties

Name	Type	Read only	Description
Description	String	True	See Resource, on page 9 for more details.
Id	String	True	See Resource, on page 9 for more details.
Languages	Array	True	Description consisting of an RFC 5646 language code.
Languages@odata.count	Number	True	See Collection, on page 15 for more details.
Location	Array	True	Location information for this schema file.
Location@odata.count	Number	True	See Collection, on page 15 for more details.
Name	String	True	See Resource, on page 9 for more details.
Schema	String	True	Value of the @odata.type property for the schema, conforming to Redfish specification syntax for the Type property.

Viewing Manager Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers
Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Manager Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/
{{Manager_Instance}} Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 29: Manager Properties

Name	Type	Read only	Description
Actions	Object	True	Available actions for this resource.
DateTime	String	False	Current DateTime (with offset) for the manager, used to set or read time.
DateTimeLocalOffset	String	False	Time offset from UTC that the DateTime property is set to, in format: +06:00.
Description	String	True	See Resource, on page 9 for more details.
EthernetInterfaces	Object	True	Reference to NICs used by the manager for network communication, including configuration options and settings.
FirmwareVersion	String	True	Firmware version of the Manager.

Name	Type	Read only	Description
GraphicalConsole	Object	True	Information about the Graphical Console (KVM-IP) service of the manager.
Id	String	True	See Resource, on page 9 for more details.
LastResetTime	String	True	Date and time when the manager was last reset or rebooted.
Links	Object	True	Contains references to resources related to this resource but not contained by it, as per the Redfish Specification.
LogServices	Object	True	Reference to a collection of Logs used by the manager.
ManagerDiagnosticData	Object	True	Diagnostic data for the manager.
ManagerType	String	True	Enumeration representing the type of manager this resource represents.
Model	String	True	Model number of this manager, as defined by the manufacturer.
Name	String	True	See Resource, on page 9 for more details.
NetworkProtocol	Object	True	Reference to network services and settings controlled by the manager, including configuration options and network services.

Name	Type	Read only	Description
Oem	Object	True	Used to store OEM data, includes: • @odata.id: Refer ODATA Properties, on page 8. • @odata.type: Refer ODATA Properties, on page 8. • Bmc: Refer Table 30: Manager BMC Properties, on page 57. • OemManagement: Refer Table 31: Manager OemManagement Properties, on page 58.
PowerState	String	True	Contains the power state of the Manager.
SerialConsole	Object	True	Information about the Serial Console service provided by the manager. **Note** Refer Table 32: Serial Console Properties, on page 58, Serial Console Properties, for more details.
ServiceEntryPointUUID	String	True	UUID of the Redfish Service provided by this manager.
Status	Object	True	See Resource, on page 9 for more details.

Name	Type	Read only	Description
TechSupportLogs	Object	True	Tech-support log service, includes: • @odata.id: Refer ODATA Properties, on page 8. • AdditionalDataURI: URI to access additional data such as diagnostic data or image captures. • Description: Tech-support log service.
UUID	String	True	Universal Unique Identifier (UUID) for this Manager.

Table 30: Manager BMC Properties

Name	Type	Read only	Description
@odata.id	String	True	See ODATA Properties, on page 8 for more details.
@odata.type	String	True	See ODATA Properties, on page 8 for more details.
Certificates	Object	True	Link to the Truststore Certificate.

Table 31: Manager OemManagement Properties

Name	Type	Read only	Description
FirmwareVersion	Object	True	Displays firmware versions of all OEM devices, including: • BIOS: BIOS firmware version. • HIB_FPGA: HIB FPGA firmware version. • MB_FPGA: MB FPGA firmware version. • RoT: RoT firmware version. • SCM_FPGA: DC-SCM FPGA firmware version.
GPU	Object	True	Link to the GPU OEM management, including sensor reading, power capping, and firmware update.
NVMe	Object	True	Link to the NVMePresence.

Table 32: Serial Console Properties

Name	Type	Read only	Description
ConnectTypesSupported	Array	True	Lists the serial console connection types supported by the implementation.
MaxConcurrentSessions	Number	True	Maximum number of service sessions this manager can support, regardless of protocol.
ServiceEnabled	Boolean	True	Indicates if the service is enabled for this manager.

POST

Request

```
curl -k -u <username>:<password> POST https://<BMC IP>/redfish/v1/Managers/
{{Manager_Instance}}/Actions/Manager.Reset -H "Content-Type:application/json" -d
'{"ResetType": "ForceRestart"}'
```

or

```
curl -k -u <username>:<password> POST https://<BMC IP>/ redfish/v1/Managers/
{{Manager_Instance}}/Actions/Manager.Reset -H "Content-Type:application/json" -d
'{"ResetToDefaults": "ResetAll"}'
```

Response

```
{
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The request completed successfully.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.Success",
            "MessageSeverity": "OK",
            "Resolution": "None"
        }
    ]
}
```

Table 33: Post Manager Reset Properties

Name	Type	Read only	Description
ResetType	String	False	ForceRestart, which will do a cold reset of the BMC.
ResetToDefaults	String	False	ResetAll, which will do a factory reset of the BMC.

Configuring Manager Network Protocol

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/
{{Manager_Instance}} /NetworkProtocol Content-Type: application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 34: Managers Network Protocol Properties

Name	Type	Read only	Description
Description	String	True	See Resource, on page 9 for more details.

Name	Type	Read only	Description
FQDN	String	True	Fully qualified domain name for the manager, including the host name and top-level domain name.
HTTP	Object	True	Settings for the manager's HTTP protocol support.
HTTPS	Object	True	Information for HTTPS/SSL protocol settings. Default port is 443.
HostName	String	True	DNS Host Name of the manager, without domain information.
IPMI	Object	False	Information for IPMI over LAN protocol settings. Default port is 623.
Id	String	True	See Resource, on page 9 for more details.
NTP	Object	False	Information for NTP protocol settings.
Name	String	True	See Resource, on page 9 for more details.
SSH	Object	False	Information for SSH protocol settings. Default port is 22.
Status	Object	True	See Resource, on page 9 for more details.

PATCH

Request

```
curl -sku {{user}}:{{password}} -X PATCH https://<username>:<password>@<BMC IP>/
redfish/v1/Managers/bmc/NetworkProtocol -H "Content-Type: application/json" -d
'{"NTP": {"NTPServers":["time.stdtime.gov.tw."], "ProtocolEnabled": true}}'
```

Response

No response.

Viewing Ethernet Interface Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/
{{Manager_Instance}}/EthernetInterfaces Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

View Ethernet Interface Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/{{Manager_Instance}}/
EthernetInterfaces/{{EthernetInterface_Instance}}Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 35: Ethernet Interface Properties

Name	Type	Read only	Description
DHCPv4	Object	False	This property shall contain the configuration of DHCPv4 as given in Table 36: DHCPv4 Properties, on page 64.
DHCPv6	Object	False	This property shall contain the configuration of DHCPv6 as given in Table 37: DHCPv6 Properties, on page 64.
Description	String	True	Refer Resource, on page 9.
FQDN	String	False	This is the complete, fully qualified domain name obtained by DNS for this interface.
HostName	String	False	DNS Hostname without any domain information.

Name	Type	Read only	Description
IPv4Addresses	Array	False	This array of objects represents all of the IPv4 addresses to be assigned on this interface. Refer Table 38: IPv4 Addresses Properties, on page 65.
IPv4StaticAddresses	Array	False	The value of this property shall be an array of objects used to represent all IPv4 static addresses assigned (but not necessarily in use) to this interface. Addresses in use by this interface shall also appear in the IPv4Addresses property. Refer Table 38: IPv4 Addresses Properties, on page 65.
IPv6Addresses	Array	True	This array of objects enumerates all of the currently assigned IPv6 addresses on this interface. Refer Table 39: IPv6 Addresses Properties, on page 65.
IPv6DefaultGateway	String	True	This is the IPv6 default gateway address that is currently in use on this interface.
IPv6StaticAddresses	Array	False	The value of this property shall be an array of objects used to represent the IPv6 static connection characteristics for this interface. Refer Table 39: IPv6 Addresses Properties, on page 65.
Id	String	True	Refer Resource, on page 9.
InterfaceEnabled	Boolean	False	This indicates whether this interface is enabled.

Name	Type	Read only	Description
LinkStatus	String	True	The value of this property shall be the link status of this interface (port).
MACAddress	String	True	The value of this property shall be the effective current MAC Address of this interface. If an assignable MAC address is not supported, this is a read only alias of the PermanentMACAddress
MTUSize	Number	False	The value of this property shall be the size in bytes of largest Protocol Data Unit (PDU) that can be passed in an Ethernet (MAC) frame on this interface.
Name	String	True	Refer Resource, on page 9.
NameServers	Array	True	This represents DNS name servers that are currently in use on this interface.
SpeedMbps	Number	True	The current link speed of the interface in Mbps.
StaticNameServers	Array	False	Statically defined set of DNS server IPv4 and IPv6 addresses.
Status	Object	True	Refer Resource, on page 9.
VLANs	Object	True	This is a reference to a collection of VLANs and is only used if the interface supports more than one VLANs.

Table 36: DHCPv4 Properties

Name	Type	Read only	Description
DHCPEnabled	Boolean	False	Determines whether DHCPv4 is enabled on this interface
UseDNSServers	Boolean	True	Determines whether to use DHCPv4-supplied DNS servers.
UseDomainName	Boolean	True	Determines whether to use a DHCPv4-supplied domain name.
UseNTPServers	Boolean	True	Determines whether to use DHCPv4-supplied NTP servers.

Table 37: DHCPv6 Properties

Name	Type	Read only	Description
OperatingMode	String	False	This property shall control the operating mode of DHCPv6 on this interface. DHCPv6 stateful mode is used to configure addresses, and when it is enabled, stateless mode is also implicitly enabled.
UseDNSServers	Boolean	True	When enabled, DNS server addresses supplied through DHCPv6 stateless mode will be used.
UseDomainName	Boolean	True	When enabled, the domain name supplied through DHCPv6 stateless mode will be used.
UseNTPServers	Boolean	True	When enabled, NTP server addresses supplied through DHCPv6 stateless mode will be used.

Table 38: IPv4 Addresses Properties

Name	Type	Read only	Description
Address	String	False	This is the IPv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only.
AddressOrigin	String	False	This is the IPv4 gateway for this address. • Static: A static address as configured by the user. • DHCP: Address is provided by a DHCPv4 service.
Gateway	String	False	This is the IPv4 default gateway address for this interface. If DHCPv4 is enabled on the interface and is configured to set the IPv4 default gateway address, this property becomes read-only.
SubnetMask	String	False	This is the IPv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only. **Note** String with pattern "^(?:[0-9]{1,3}\\.){3}[0-9]{1,3}$"

Table 39: IPv6 Addresses Properties

Name	Type	Read only	Description
Address	String	False	A static IPv6 address that is currently assigned on a network interface.

Name	Type	Read only	Description
AddressOrigin	String	False	This is the IPv6 address origin for this interface. • Static: A static address as configured by the user. • DHCPv6: Address sis provided by a DHCPv6 service.
PrefixLength	Number	False	Provides the IPv6 network prefix length in bits for this address. **Note** Min: 0, Max: 128

PATCH

Request

```
curl -sku {{user}}:{{password}} -X PATCH https://<username>:<password>@<BMC
IP>/redfish/v1/Managers/bmc/
EthernetInterfaces/eth0 -H "Content-Type:application/json" -d '{"DHCPv4": {"DHCPEnabled":
false},"IPv4StaticAddresses":
[{"Address":"10.36.34.11", "SubnetMask":"255.255.252.0", "Gateway":"10.36.32.1"}],
"StaticNameServers":["8.8.8.8"]}'
```

Response

No response.

Viewing Certificate Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/
{{Manager_Instance}}/ NetworkProtocol/HTTPS/Certificates Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Certificate Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/
{{Manager_Instance}}/NetworkProtocol/HTTPS/ Certificates/{{Certificate_Instance}}
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 40: Certificate Properties

Name	Type	Read only	Description
CertificateString	String	True	This parameter shall contain the string of the certificate, and the format shall follow the requirements specified by the CertificateType property value. If the certificate contains any private keys, they shall be removed from the string in responses. If the service does not know the private key for the certificate and it is needed to use the certificate, the client shall provide the private key as part of the string in the POST request.
Description	String	True	Refer Resource, on page 9.
Id	String	True	Refer Resource, on page 9.
Issuer	Object	True	The issuer of the certificate. Refer Table 41: Identifier Information about a Certificate, on page 68.

Name	Type	Read only	Description
KeyUsage	Array	True	The key usage extension, which defines the purpose of the public keys in this certificate. • KeyEncipherment: Enciphers private or secret keys.
Name	String	True	Refer Resource, on page 9.
Subject	Object	True	The subject of the certificate. Refer Table 41: Identifier Information about a Certificate, on page 68. The identifier information about a certificate.
ValidNotAfter	String	True	The date when the certificate is no longer valid.
ValidNotBefore	String	True	The date when the certificate becomes valid.

Table 41: Identifier Information about a Certificate

Name	Type	Read only	Description
City	String	True	The city or locality of the organization of the entity.
CommonName	String	True	The fully qualified domain name of the entity.
Country	String	True	The country of the organization of the entity.
Organization	String	True	The name of the organization of the entity.
OrganizationalUnit	String	True	The name of the unit or division of the organization of the entity.
State	String	True	The state, province, or region of the organization of the entity.

Viewing Message Registry File Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Registries
Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Message Registry File Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Registries/
{{Registry_Instance}}Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 42: Certificate Properties

Name	Type	Read only	Description
Description	String	True	Refer Resource, on page 9.
Id	String	True	Refer Resource, on page 9.
Languages	Array	True	This is the RFC 5646 compliant language code for the registry. The value of this property shall be a Description consisting of an RFC 5646 language code.
Languages@odata.count	Number	True	Refer Collection, on page 15.
Location	Object	True	Refer Table 43: Location Information for a Registry File, on page 70.
Location@odata.count	Number	True	Refer Collection, on page 15.

Name	Type	Read only	Description
Name	String	True	Refer Collection, on page 15.
Registry	String	True	The registry name and its major and minor versions. This registry can be any type of registry, such as a message registry, privilege registry, or attribute registry.

Table 43: Location Information for a Registry File

Name	Type	Read only	Description
Language	String	True	The language code for the registry file.
PublicationUri	String	True	The link to the publicly available (canonical) URI for the registry.
Uri	String	True	The link to the locally available URI for the registry.

Viewing Message Registry Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Registries/
{{Registry_Instance}}/ {{Instance}} Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 44: Certificate Properties

Name	Type	Read only	Description
Description	String	True	Refer Resource, on page 9.
Id	String	True	Refer Resource, on page 9.

Name	Type	Read only	Description
Language	String	True	This is the RFC 5646 compliant language code for the registry. The value of this property shall be a Description consisting of an RFC 5646 language code.
Messages	Object	True	The pattern property shall represent the suffix to be used in the MessageId and shall be unique within this message registry.
Name	String	True	Refer Resource, on page 9.
OwningEntity	String	True	The value of this property shall be a Description that represents the publisher of this registry.
RegistryPrefix	String	True	This is the single word prefix used in messageIDs which uniquely identifies all of the messages in this registry as belonging to this registry.
RegistryVersion	String	True	This is the message registry version which is used in the middle portion of a messageID. The format of this Description shall be of the format majorversion.minorversion.errata in compliance with Protocol Version Section of the Redfish specification.

Viewing Computer System Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems
Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Computer System Properties

GET – Computer System Instance

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/{{System_Instance}}
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 45: Computer System Properties

Name	Type	Read only	Description
Actions	Object	True	The available actions for this resource.
AssetTag	String	False	The user-assigned asset tag of this system.
Bios	Object	True	The link to the BIOS settings associated with this system.
Boot	Object	True	Contains properties describing boot information for the current resource. Changes do not alter the BIOS persistent boot order configuration.
Description	String	True	Refer Resource, on page 9.
GraphicalConsole	Object	True	Information about the Graphical Console (KVM-IP) service of this manager.
HostWatchdogTimer	Object	True	Host watchdog timer functionality for this system. Refer Table 46: HostWatchdogTimer Properties, on page 76.
Id	String	True	Refer Resource, on page 9.

Name	Type	Read only	Description
LastResetTime	String	True	The date and time when the system was last reset or rebooted.
Links	Object	True	Contains references to resources related to, but not contained by, this resource as per the Redfish Specification.
LocationIndicatorActive	Boolean	False	An indicator allowing an operator to physically locate this resource.
LogServices	Object	True	Reference to the collection of Log Services associated with this system.
Manufacturer	String	True	The manufacturer of this system.
Memory	Object	True	Reference to the collection of Memory associated with this system.
MemorySummary	Object	True	Describes the central memory of the system in general detail. Refer Table 47: MemorySummary Properties, on page 76.
Model	String	True	The model of this system.
Name	String	True	Refer Resource, on page 9.
PCIeDevices	Object	True	Link to a collection of PCIe devices that this computer system uses.
PCIeDevices@odata.count	Number	True	Refer Collection, on page 15.
PartNumber	String	True	The part number of this system.

Name	Type	Read only	Description
PowerRestorePolicy	String	False	Indicates the desired PowerState of the system when power is applied to the system. • **AlwaysOn**: The system always powers on when power is applied. • **AlwaysOff**: The system always remains powered off when power is applied. • **LastState**: The system returns to its last on or off power state when power is applied.
PowerState	String	True	The current power state of the system.
ProcessorSummary	Object	True	Describes the central processors of the system in general detail. Refer Table 48: ProcessorSummary Properties, on page 77.
Processors	Object	True	Reference to the collection of Processors associated with this system.
SerialConsole	Object	True	The serial console services that this system provides. Refer Table 49: SerialConsole Properties, on page 77.
SerialNumber	String	True	The serial number for this system.
Status	Object	True	Refer Resource, on page 9.

Name	Type	Read only	Description
Storage	Object	True	Reference to the collection of storage devices associated with this system.
SubModel	String	True	The sub-model for this system. This shall not include the model/product name or the manufacturer's name.
SystemType	String	True	Indicates the kind of system that this resource represents. • **Physical**: A computer system.
TrustedModules	Array	True	An array of trusted modules in the system, including: • Description: String, True • Firmware Revision: String, True - The firmware revision of this Trusted Module. • OEM-specific Information: String, True - The OEM-specific Information of this Trusted Module. • Specification Version: String, True - The Specification Version of this Trusted Module. • Vendor ID: String, True - The Vendor ID of this Trusted Module. • Status: Object, True - Refer Resource, on page 9.

Name	Type	Read only	Description
UUID	String	True	Refer Resource, on page 9.

Table 46: HostWatchdogTimer Properties

Name	Type	Read only	Description
FunctionEnabled	Boolean	True	An indication of whether a user has enabled the host watchdog timer functionality. This property indicates only that a user has enabled the timer. To activate the timer, installation of additional host-based software is necessary; an update to this property does not initiate the timer.
Status	Object	True	Refer Resource, on page 9.
TimeoutAction	String	True	The enumerations of **WatchdogTimeoutActions** specify the choice of action to take when the host watchdog timer reaches its timeout value. • **None**: No action taken. • **ResetSystem**: Reset the system. • **PowerCycle**: Power cycle the system. • **PowerDown**: Power down the system.

Table 47: MemorySummary Properties

Name	Type	Read only	Description
Status	Object	True	Refer Resource, on page 9.

Name	Type	Read only	Description
TotalSystemMemoryGiB	Number	True	The total configured operating system-accessible memory (RAM), measured in GiB.

Table 48: ProcessorSummary Properties

Name	Type	Read only	Description
Count	Number	True	The number of physical processors in the system.
Status	Object	True	Refer Resource, on page 9.

Table 49: SerialConsole Properties

Name	Type	Read only	Description
ConnectTypesSupported	Array	True	This property enumerates the serial console connection types that the implementation allows: • **IPMI**: The controller supports a serial console connection through the IPMI Serial Over LAN (SOL) protocol. • **Oem**: The controller supports a serial console connection through an OEM-specific protocol. • **SSH**: The controller supports a serial console connection through the SSH protocol. • **Telnet**: The controller supports a serial console connection through the Telnet protocol.

Name	Type	Read only	Description
MaxConcurrentSessions	Number	True	The maximum number of service sessions, regardless of protocol, that this system can support.
SSH	Object	True	The connection details for an SSH serial console service, including: • HotKeySequenceDisplay: String, True - The hotkey sequence available for the user to exit the serial console session. • Port: Number, True - The protocol port. • ServiceEnabled: Boolean, True - An indication of whether the service is enabled for this system.

POST

Request

```
curl -sku {{user}}:{{password}} -X POST <username>:<password> https://<BMC IP>/redfish/
v1/Systems/{{System_Instance}}/Actions/ComputerSystem.Reset -H "Content-Type:application/json"
 -d '
{"ResetType": "ForceOff"}'
```

Response

```
{
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The request completed successfully.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.Success",
            "MessageSeverity": "OK",
            "Resolution": "None"
        }
    ]
}
```

GET – BIOS Instance

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/{{System_Instance}}/Bios
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 50: Computer System Properties

Name	Type	Read only	Description
@Redfish.Settings	Object	True	The available actions for this resource.
@odata.id	String	True	Refer ODATA Properties, on page 8.
@odata.type	String	True	Refer ODATA Properties, on page 8.
Actions	Object	True	The available actions for this resource.
Attributes	Object	True	The list of BIOS attributes and their values as determined by the manufacturer or provider. Refer Table 51: Attributes Properties, on page 79.
Id	String	True	Refer Resource, on page 9.
Description	Null, String	True	Refer Resource, on page 9.
Name	String	True	Refer Resource, on page 9.
ResetBios	Boolean	False	This action resets the BIOS attributes to default.

Table 51: Attributes Properties

Name	Type	Read only	Description
(Pattern)	Array, Boolean, Integer, Number, Object, String	False	Property names follow regular expression pattern "[illegible]"
(Pattern)	String, Boolean, Number	False	Property names follow regular expression pattern "^[A-Za-z][A-Za-z0-9_]+$".

POST – BIOS Setting

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/
system/Bios/Actions/Bios.ResetBios -X POST -d '{"ResetBios":True}'
```

Response

No response.

PATCH – BIOS Setting

Request

```
curl -k -H "Content-Type: application/json" -X PATCH https://<username>:<password>@<BMC
IP>/redfish
/v1/Systems/system -d '{"Boot":{"BootOrder":["Boot0002", "Boot0001"]}}'
```

Response

No response.

Viewing Memory Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/
{{System_Instance}}/Memory Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Memory Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/
{{System_Instance}}/Memory/Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 52: Memory Properties

Name	Type	Read only	Description
AllocationAlignmentMiB	Number	True	The boundary that memory regions are allocated on, measured in mebibytes (MiB).

Name	Type	Read only	Description
AllocationIncrementMiB	Number	True	The size of the smallest unit of allocation for a memory region in mebibytes (MiB).
AllowedSpeedsMHz	Array	True	Speed supported by this memory device.
BaseModuleType	String	True	The base module type of the memory device. • RDIMM: Registered DIMM. • UDIMM: UDIMM. • SO_DIMM: SO_DIMM. • LRDIMM: Load Reduced. • Mini_RDIMM: Mini_RDIMM. • Mini_UDIMM: Mini_UDIMM. • SO_RDIMM_72b: SO_RDIMM_72b. • SO_UDIMM_72b: SO_UDIMM_72b. • SO_DIMM_16b: SO_DIMM_16b. • SO_DIMM_32b: SO_DIMM_32b. • Die: A die within a package.
BusWidthBits	Number	True	The bus width, in bits.
CacheSizeMiB	Number	True	Total size of the cache portion memory in MiB.
CapacityMiB	Number	True	Memory capacity in mebibytes (MiB).
EnvironmentMetrics	Object	True	The link to the environment metrics for this memory.

Name	Type	Read only	Description
ConfigurationLocked	Boolean	True	An indication of whether the configuration of this memory device is locked and cannot be altered.
DataWidthBits	Number	True	Data width in bits.
ErrorCorrection	String	True	Error correction scheme supported for this memory device. • NoECC: No ECC available. • SingleBitECC: Single bit data errors can be corrected by ECC. • MultiBitECC: Multibit data errors can be corrected by ECC. • AddressParity: Address parity errors can be corrected.
FirmwareRevision	String	True	Revision of firmware on the memory controller.
Id	String	True	Refer Resource, on page 9.
Links	Object	True	The links to other resources that are related to this resource.
IsRankSpareEnabled	Boolean	True	An indication of whether rank spare is enabled for this memory device.
IsSpareDeviceEnabled	Boolean	True	An indication of whether a spare device is enabled for this memory device.
Location	Object	True	Refer Resource, on page 9.
Manufacturer	String	True	The memory device manufacturer.

Name	Type	Read only	Description
MaxTDPMilliWatts	Array	True	Set of maximum power budgets supported by the memory device in milliwatts.
MemoryDeviceType	String	True	Type details of the memory device. • DDR4: DDR4. • DDR4_SDRAM: DDR4 SDRAM. • DDR5: Double data rate type five synchronous dynamic random-access memory.
MemoryLocation	Object	True	Memory connection information to sockets and memory controllers. Refer Table 53: Memory Location Properties, on page 86.
MemoryMedia	Array	True	Media of this memory device. • DRAM: DRAM media. • NAND: Intel 3D XPoint media. • Intel3DXPoint: NAND media.
MemorySubsystemController ManufacturerID	String	True	The manufacturer ID of the memory subsystem controller of this memory device.
MemorySubsystemController ProductID	String	True	The product ID of the memory subsystem controller of this memory device.

Name	Type	Read only	Description
MemoryType	String	True	The type of memory device. • DRAM: The memory device is comprised of volatile memory. • NVDIMM_N: The memory device is comprised of volatile memory backed by non-volatile memory. • NVDIMM_F: The memory device is comprised of non-volatile memory. • NVDIMM_P: The memory device is comprised of a combination of non-volatile and volatile memory. • IntelOptane: The memory device is an Intel Optane Persistent Memory Module.
Metrics	Object	True	The link to the metrics associated with this memory device.
Model	String	True	The product model number of this device.
ModuleManufacturerID	String	True	The manufacturer ID of this memory device.
ModuleProductID	String	True	The product ID of this memory device.
Name	String	True	Refer Resource, on page 9.

Name	Type	Read only	Description
NonVolatileSizeMiB	Number	True	Total size of the non-volatile portion memory in MiB.
OperatingMemoryModes	Array	True	Memory modes supported by the memory device. • Volatile: Volatile memory. • PMEM: Persistent memory, byte-accessible through system address space. • Block: Block-accessible system memory.
OperatingSpeedMhz	Number	True	Operating speed of the memory device in MHz or MT/s as appropriate.
PartNumber	String	True	The part number of the memory.
PersistentRegionNumberLimit	Number	True	Total number of persistent regions this memory device can support.
PersistentRegionSizeLimitMiB	Number	True	Total size of persistent regions in mebibytes (MiB).
PersistentRegionSizeMaxMiB	Number	True	Maximum size of a single persistent region in mebibytes (MiB).
RankCount	Number	True	Number of ranks available in the memory device.
SecurityCapabilities	Object	True	Security capabilities of the memory device. Refer to the Table 59, SecurityCapabilities Properties.
SerialNumber	String	True	The product serial number of this device.

Name	Type	Read only	Description
SpareDeviceCount	Number	True	Number of unused spare devices available in the memory device.
SparePartNumber	String	True	The spare part number of the memory.
Status	Object	True	Refer Resource, on page 9.
VolatileRegionNumberLimit	Number	True	Total number of volatile regions this memory device can support.
VolatileRegionSizeLimitMiB	Number	True	Total size of volatile regions in mebibytes (MiB).
VolatileRegionSizeMaxMiB	Number	True	Maximum size of a single volatile region in mebibytes (MiB).
VolatileSizeMiB	Number	True	Total size of the volatile portion memory in MiB.

Table 53: Memory Location Properties

Name	Type	Read only	Description
Channel	Number	True	The channel number to which the memory device is connected.
MemoryController	Number	True	The memory controller number to which the memory device is connected.
Slot	Number	True	The slot number to which the memory device is connected.
Socket	Number	True	The socket number to which the memory device is connected.

Table 54: Security Capabilities Properties

Name	Type	Read only	Description
ConfigurationLockCapable	Boolean	True	An indication of whether this memory device supports the locking, or freezing, of the configuration.
DataLockCapable	Boolean	True	An indication of whether this memory device supports data locking.
MaxPassphraseCount	Number	True	Maximum number of passphrases supported for this memory device.
PassphraseCapable	Boolean	True	An indication of whether the memory device is passphrase capable.
PassphraseLockLimit	Number	True	The maximum number of incorrect passphrase attempts allowed before the memory device is locked.

Viewing Processor Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/
{{System_Instance}}/Processors Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Processor Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/
{{System_Instance}}/Processors/{{Processor _Instance}} Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 55: Processor Properties

Name	Type	Read only	Description
ConnectedProcessors	Array	True	An array of links to the processors directly connected to this processor.
ConnectedProcessors@odata.count	Number	True	The number of items in a collection.
Id	String	True	Refer Resource, on page 9.
InstructionSet	String	True	The instruction set of the processor. • ARM-A32: ARM 32-bit. • ARM-A64: ARM 64-bit. • IA-64: Intel IA-64. • MIPS32: MIPS 32-bit. • MIPS64: MIPS 64-bit. • OEM: OEM-defined. • PowerISA: PowerISA-64 or PowerISA-32. • RV32: RISC-V 32-bit. • RV64: RISC-V 64-bit. • x86: x86 32-bit. • x86-64: x86 64-bit.
Location	Object	True	Refer Resource, on page 9.
Manufacturer	String	True	The processor manufacturer.

Name	Type	Read only	Description
MaxSpeedMHz	Number	True	The maximum clock speed of the processor.
Model	String	True	The product model number of this device.
Name	String	True	Refer Resource, on page 9.
PartNumber	String	True	The part number of the processor.
ProcessorArchitecture	String	True	The architecture of the processor. • x86: x86 or x86-64. • IA-64: Intel Itanium. • ARM: ARM. • MIPS: MIPS. • Power: Power. • OEM: OEM-defined.
ProcessorMemory	Array	True	This type describes the memory directly attached or integrated within a processor. Refer Table 56: Processor Memory Properties, on page 90.
ProcessorType	String	True	The type of processor. Refer Table 57: Processor Type Enum, on page 94.
SerialNumber	String	True	The serial number of the processor.
Socket	String	True	The socket or location of the processor.
Status	Object	True	Refer Resource, on page 9.
SubProcessors	Object	True	The link to the collection of sub-processors associated with this processor, such as cores or threads, that are part of a processor.

Name	Type	Read only	Description
TotalCores	Number	True	The total number of cores that this processor contains.
TotalThreads	Number	True	The total number of execution threads that this processor supports.
Version	String	True	The hardware version of the processor.

Table 56: Processor Memory Properties

Name	Type	Read only	Description
CapacityMiB	Number	True	The memory capacity in MiB.
IntegratedMemory	Boolean	True	An indication of whether this memory is integrated within the processor.

Name	Type	Read only	Description
MemoryType	String	True	

Name	Type	Read only	Description
			The type of memory used by this processor. • DDR: Double data rate synchronous dynamic random-access memory. • DDR2: Double data rate type two synchronous dynamic random-access memory. • DDR3: Double data rate type three synchronous dynamic random-access memory. • DDR4: Double data rate type four synchronous dynamic random-access memory. • DDR5: Double data rate type five synchronous dynamic random-access memory. • Flash: Flash memory. • GDDR: Synchronous graphics random-access memory. • GDDR2: Double data rate type two synchronous graphics random-access memory. • GDDR3: Double

Name	Type	Read only	Description
			data rate type three synchronous graphics random-access memory. • GDDR4: Double data rate type four synchronous graphics random-access memory. • GDDR5: Double data rate type five synchronous graphics random-access memory. • GDDR5X: Double data rate type five X synchronous graphics random-access memory. • GDDR6: Double data rate type six synchronous graphics random-access memory. • HBM1: High Bandwidth Memory. • HBM2: The second generation of High Bandwidth Memory. • HBM3: The third generation of High Bandwidth Memory. • L1Cache: L1 cache. • L2Cache: L2 cache. • L3Cache: L3 cache. • L4Cache: L4 cache. • L5Cache: L5 cache.

Name	Type	Read only	Description
			• L6Cache: L6 cache. • L7Cache: L7 cache. • OEM: OEM-defined. • SDRAM: Synchronous dynamic random-access memory. • SGRAM: Synchronous graphics RAM. • SRAM: Static random-access memory.

Table 57: Processor Type Enum

Enum	Description
Accelerator	An accelerator.
CPU	A CPU.
Core	A core in a processor.
DSP	A DSP.
FPGA	An FPGA.
GPU	A GPU.
OEM	An OEM-defined processing unit.
Partition	A partition in a single processor.
Thread	A thread in a processor.

Viewing Sub Processor Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/{{System_Instance}}/
Processors/{{Processor_Instance}}/SubProcessors Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Sub Processor and Thread Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC
IP>/redfish/v1/Systems/{{System_Instance}}/Processors/
{{Processor_Instance}}/SubProcessors/{{SubProcessor _Instance}}Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 58: Sub Processor Properties

Name	Type	Read only	Description
Id	String	True	Refer Resource, on page 9.
Links	Object	True	The links object contains the links to other resources that are related to this resource, including: • ConnectedProcessors: Array, True - An array of links to the processors directly connected to this processor. • ConnectedProcessors@odata.count Number, True - The number of items in a collection.
Name	String	True	Refer Resource, on page 9.
ProcessorType	String	True	The type of processor. Refer Table 57: Processor Type Enum, on page 94.
TotalThreads	Number	True	The total number of execution threads that this processor supports.

Viewing PCIe Device Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/
{{System_Instance}}/ PCIeDevices Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing PCIe Device Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/
{{System_Instance}}/ PCIeDevices/{{PCIeDevices_Instance}} Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 59: PCIe Devices Properties

Name	Type	Read only	Description
Id	String	True	Refer Resource, on page 9.
Manufacturer	String	True	The manufacturer of this PCIe device.
Model	String	True	The model number for the PCIe device.
Name	String	True	Refer Resource, on page 9.
PCIeFunctions	Object	True	The link to the collection of PCIe functions associated with this PCIe device.
PCIeInterface	Object	True	The PCIe interface details for this PCIe device. Refer Table 60: PCIe Interface Properties, on page 97.

Name	Type	Read only	Description
PartNumber	String	True	The part number for this PCIe device.
SerialNumber	String	True	The serial number for this PCIe device.
Slot	Array	True	An array of PCI Slot information. Refer Table 27: Slot Properties, on page 51.
Status	Object	True	Refer Resource, on page 9.

Table 60: PCIe Interface Properties

Name	Type	Read only	Description
LanesInUse	Number	True	The number of PCIe lanes in use by this device.
MaxLanes	Number	True	The number of PCIe lanes supported by this device.
MaxPCIeType	String	True	The highest version of the PCIe specification supported by this device. • Gen1: A PCIe v1.0 slot. • Gen2: A PCIe v2.0 slot. • Gen3: A PCIe v3.0 slot. • Gen4: A PCIe v4.0 slot. • Gen5: A PCIe v5.0 slot.

Name	Type	Read only	Description
PCIeType	String	True	The version of the PCIe specification in use by this device. • Gen1: A PCIe v1.0 slot. • Gen2: A PCIe v2.0 slot. • Gen3: A PCIe v3.0 slot. • Gen4: A PCIe v4.0 slot. • Gen5: A PCIe v5.0 slot.

Viewing PCIe Function Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/
{System_Instance}}/PCIeDevices/{{PCIeDevices_Instance}}/PCIeFunctions
Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing PCIe Function Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/
{{System_Instance}}/PCIeDevices/{{PCIeDevices_Instance}}/PCIeFunctions/
{{PCIeFunctions_Instance}}Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 61: PCIe Functions Properties

Name	Type	Read only	Description
ClassCode	String	True	The Class Code of this PCIe function.
DeviceClass	String	True	The class for this PCIe function.
DeviceId	String	True	The Device ID of this PCIe function.
FunctionId	Number	True	The PCIe Function Number.
FunctionType	String	True	The type of the PCIe function. • Physical: A physical PCIe function. • Virtual: A virtual PCIe function.
Id	String	True	Refer Resource, on page 9.
Links	Object	True	The links to other resources that are related to this resource.
Name	String	True	Refer Resource, on page 9.
Status	Object	True	Refer Resource, on page 9.
RevisionId	String	True	The Revision ID of this PCIe function.
SubsystemId	String	True	The Subsystem ID of this PCIe function.
SubsystemVendorId	String	True	The Subsystem Vendor ID of this PCIe function.
VendorId	String	True	The Vendor ID of this PCIe function.

Viewing Log Service Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/
{{Manager_Instance}} /LogServices Content-Type:application/json
```

OR

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/
{{System_Instance}} /LogServices Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Configuring Log Service

GET – Managers Log Service

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/
{{Manager_Instance}}/ LogServices/{{LogService_Instance}} Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 62: Managers Log Service Properties

Name	Type	Read only	Description
DateTime	String	True	The current DateTime (with offset from UTC) for the log service in Redfish Timestamp format.
DateTimeLocalOffset	String	True	The time offset from UTC that the DateTime property is set to in format: +06:00.
Description	String	True	Refer Resource, on page 9.
Entries	Object	True	The value of this property shall reference a collection of resources of type LogEntry.

Name	Type	Read only	Description
Id	String	True	Refer Resource, on page 9.
Name	String	True	Refer Resource, on page 9.
OverWritePolicy	String	True	Indicates the policy of the log service when the MaxNumberOfRecords has been reached or when the log is full.

GET – Systems Log Service

Request

```
https://<username>:<password>/redfish/v1/Systems/{{System_Instance}}/
LogServices/{{LogService_Instance}}
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 63: Systems Log Service Properties

Name	Type	Read only	Description
Actions	Object	True	The available actions for this resource.
DateTime	String	True	The current DateTime (with offset from UTC) for the log service in Redfish Timestamp format.
DateTimeLocalOffset	String	True	The time offset from UTC that the DateTime property is set to in format: +06:00.
Description	String	True	Refer Resource, on page 9.
Entries	Object	True	The value of this property shall reference a collection of resources of type LogEntry.
Id	String	True	Refer Resource, on page 9.

Name	Type	Read only	Description
Name	String	True	Refer Resource, on page 9.
OverWritePolicy	String	True	Indicates the policy of the log service when the MaxNumberOfRecords has been reached or when the log is full.

POST – Systems Log Service Action

Request

```
curl -sku {{user}}:{{password}} -X POST https://<username>:<password>/redfish/v1/Systems/
system/LogServices/PostCodes/Actions/LogService.ClearLog
```

Or

```
curl -sku {{user}}:{{password}} -X POST https://<username>:<password>/redfish/v1/Systems/
system/LogServices/EventLog/Actions/LogService.ClearLog
```

Response

No response.

Viewing Log Entry Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/{{Manager_Instance}}/
LogServices/{{LogService_Instance}}/Entries
Content-Type:application/json
```

Or

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Systems/{{System_Instance}}/
LogServices/{{LogService_Instance}}/Entries
Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Configuring Log Entry

GET – Managers Journal Log Entry

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/Managers/{{Manager_Instance}}/
LogServices/Journal/Entries/{{Entry_Instance}} Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 64: Managers Journal Log Entry Properties

Name	Type	Read only	Description
Created	String	True	The time the log entry was created.
EntryType	String	True	The type of LogEntry: Event, SEL, or Oem.
Id	String	True	Refer Resource, on page 9.
Message	String	True	The message property of the event, decoded from EntryType: Event, SEL, or Oem.
MessageArgs	Array	True	Message arguments for substitution in the message.
Name	String	True	Refer Resource, on page 9.
OemRecordFormat	String	True	The OEM-specific format of the entry if the type is Oem.
Resolved	Boolean	False	Indicates if the log entry issue has been resolved.
Severity	String	True	The severity of the log entry: OK, Warning, or Critical.

GET – Systems PostCode Log Entry

Request

```
https://<username>:<password>/redfish/v1/Managers/{{Manager_Instance}}/
LogServices/PostCode/Entries/{{Entry_Instance}}
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 65: Systems PostCode Log Entry Properties

Name	Type	Read only	Description
Created	String	True	The time the log entry was created.
EntryType	String	True	The type of LogEntry: Event, SEL, or Oem.
Id	String	True	Refer Resource, on page 9.
Message	String	True	The message property of the event, decoded from EntryType: Event, SEL, or Oem.
MessageArgs	Array	True	Message arguments for substitution in the message.
MessageId	String	True	The MessageId property of the event, decoded from EntryType.
Name	String	True	Refer Resource, on page 9.
Severity	String	True	The severity of the log entry: OK, Warning, or Critical.

GET – Systems EventLog Log Entry

Request

```
https://<username>:<password>/redfish/v1/Managers/{{Manager_Instance}}/
LogServices/EventLog/Entries/{{Entry_Instance}}
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 66: Systems EventLog Log Entry Properties

Name	Type	Read only	Description
AdditionalDataURI	String	True	The URI to access additional data for this log entry.
Created	String	True	The time the log entry was created.

Name	Type	Read only	Description
EntryType	String	True	The type of LogEntry: Event, SEL, or Oem.
Id	String	True	Refer Resource, on page 9.
Message	String	True	The message property of the event, decoded from EntryType: Event, SEL, or Oem.
Modified	String	True	The date and time when the log entry was last modified.
Name	String	True	Refer Resource, on page 9.
Resolved	Boolean	False	Indicates if the log entry issue has been resolved.
Severity	String	True	The severity of the log entry: OK, Warning, or Critical.

Configuring Session Service

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/SessionService
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 67: Session Service Properties

Name	Type	Read only	Description
Description	String	True	Refer Resource, on page 9.
Id	String	True	Refer Resource, on page 9.
Name	String	True	Refer Resource, on page 9.

Name	Type	Read only	Description
ServiceEnabled	Boolean	True	This indicates whether this service is enabled. Default value is null.
SessionTimeout	Number	False	The number of seconds of inactivity before the session service closes the session. Minimum: 30, Maximum: 86400.
Sessions	Object	True	This property contains the link to a collection of Sessions.

PATCH

Request

```
curl -sku {{user}}:{{password}} -X PATCH
https://<username>:<password>/redfish/v1/SessionService
-H "Content-Type:application/json" -d '{"SessionTimeout": 100}'
```

Response

```
{
    "SessionTimeOut@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The property SessionTimeOut was assigned the value '100' due to
modification by the service.",
            "MessageArgs": [
                "SessionTimeOut",
                "100"
            ],
            "MessageId": "Base.1.13.0.PropertyValueModified",
            "MessageSeverity": "Warning",
            "Resolution": "No resolution is required."
        }
    ]
}
```

Configuring Session Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/SessionService/Sessions
Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

POST

Request

```
curl -sku {{user}}:{{password}} -X POST https://<username>:<password>/redfish/v1/
SessionService/Sessions -H "Content-Type:application/json" -d '{"UserName": "root",
"Password": "0penBmc", "Context": "test"}'
```

Response

```
{
    "@odata.id": "/redfish/v1/SessionService/Sessions/LtSHscNj2a",
    "@odata.type": "#Session.v1_5_0.Session",
    "ClientOriginIPAddress": "10.36.25.248",
    "Context": "test",
    "Description": "Manager User Session",
    "Id": "LtSHscNj2a",
    "Name": "User Session",
    "UserName": "root"
}
```

Viewing Session Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/SessionService/
Sessions/{{Session_Instance}}Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 68: Session Properties

Name	Type	Read only	Description
ClientOriginIPAddress	String	True	The IP address of the client that created the session.
Description	String	True	Refer Resource, on page 9.
Id	String	True	Refer Resource, on page 9.
Name	String	True	Refer Resource, on page 9.

Name	Type	Read only	Description
UserName	String	True	The UserName for the account for this session. This value matches a registered account identified by a ManagerAccount resource registered with the Account Service.

Viewing Task Service Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/TaskService
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 69: Task Service Properties

Name	Type	Read only	Description
CompletedTaskOverWritePolicy	String	True	Indicates how completed tasks are handled if the task service needs to track more tasks.
DateTime	String	True	The current DateTime value for the TaskService, with offset from UTC, in Redfish Timestamp format.
Id	String	True	Refer Resource, on page 9.
LifeCycleEventOnTaskStateChange	Boolean	True	Indicates if the service sends a Life Cycle event to Listener Destinations registered for such events upon change of task state.
Name	String	True	Refer Resource, on page 9.

Name	Type	Read only	Description
ServiceEnabled	Boolean	True	This indicates whether this service is enabled.
Status	Object	True	Refer Resource, on page 9.
Tasks	Object	True	A link to a resource of type Task Collection.

Viewing Task Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/TaskService/Tasks
Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Task Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/TaskService/
Tasks/{{Task_Instance}}Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 70: Task Properties

Name	Type	Read only	Description
EndTime	String	True	The date and time when the task was completed. Appears only when the task is complete.
Id	String	True	Refer Resource, on page 9.

Name	Type	Read only	Description
Messages	Array	True	An array of messages associated with the task. Refer Table 71: Messages Properties, on page 111 for object format.
Name	String	True	Refer Resource, on page 9.
Payload	Object	True	The HTTP and JSON payload details for this task, unless hidden by the service.
PercentComplete	Number	True	The completion percentage of this task.
StartTime	String	True	The date and time when the task was started.
TaskMonitor	String	True	The URI of the Task Monitor for this task.

Name	Type	Read only	Description
TaskState	String	True	The state of the task. • Cancelled: Task has been cancelled. • Cancelling: Task is being cancelled. • Completed: Task was completed. • Exception: Task stopped due to an exception. • Interrupted: Task has been interrupted. • Killed: Task was terminated. • New: A new task. • Pending: Task is pending and has not started. • Running: Task is running normally. • Service: Task is running as a service. • Starting: Task is starting. • Stopping: Task is stopping. • Suspended: Task has been suspended.
TaskStatus	String	True	The completion status of the task, as defined in the Redfish specification.

Table 71: Messages Properties

Name	Type	Read only	Description
@odata.type	String	True	Refer ODATA Properties, on page 8.

Name	Type	Read only	Description
Message	String	True	The human-readable message.
MessageArgs	Array	True	An array of message arguments for substitution in the message.
MessageId	String	True	The identifier for the message.
MessageSeverity	String	True	The severity of the message.
Resolution	String	True	The resolution of the message, which may be more specific than the default.

Configuring Update Service

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/UpdateService
Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following tables:

Table 72: UpdateService Properties

Name	Type	Read only	Description
Description	String	True	Refer Resource, on page 9.
FirmwareInventory	Object	True	Link to a Resource of type SoftwareInventoryCollection.
HttpPushUri	String	True	The URI used to perform an HTTP or HTTPS push update to the Update Service.
HttpPushUriOptions	Object	False	URI for Multipart HTTP or HTTPS push update. Refer Table 73: HttpPushUriApplyTime Properties, on page 113.

Name	Type	Read only	Description
HttpPushUriApplyTime	Object	False	This property contains settings for when firmware is to be applied when provided through HttpPushUri. Refer Table 73: HttpPushUriApplyTime Properties, on page 113.
Id	String	True	Refer Resource, on page 9.
MaxImageSizeBytes	Number	True	The maximum size in bytes of the software update image supported.
Name	String	True	Refer Resource, on page 9.
ServiceEnabled	Boolean	True	This indicates whether this service is enabled.

Table 73: HttpPushUriApplyTime Properties

Name	Type	Read only	Description
ApplyTime	String	False	Indicates when the software update should be applied. • Immediate: Apply immediately. • OnReset: Apply on a reset.

PATCH

Request

```
curl -sku {{user}}:{{password}} -X PATCH https://<username>:<password>/redfish/v1/
UpdateService -H "Content-Type:application/json" -d '{"HttpPushUriOptions":
{"HttpPushUriApplyTime": {"ApplyTime": "Immediate"}}}'
```

Response

```
{
    "@Message.ExtendedInfo": [
        {
            "@odata.type": "#Message.v1_1_1.Message",
            "Message": "The request completed successfully.",
            "MessageArgs": [],
            "MessageId": "Base.1.13.0.Success",
```

```
            "MessageSeverity": "OK",
            "Resolution": "None"
        }
    ]
}
```

POST

Request

```
curl -sku {{user}}:{{password}} -X POST https://<username>:<password>/redfish/v1/
UpdateService/ -H "Content-Type:application/octet-stream" --data-binary @$file
```

Response

```
{
    "@odata.id": "/redfish/v1/TaskService/Tasks/0",
    "@odata.type": "#Task.v1_4_3.Task",
    "Id": "0",
    "TaskState": "Running",
    "TaskStatus": "OK"
}
```

Viewing Software Inventory Collection

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/UpdateService
/FirmwareInventory Content-Type:application/json
```

Response

Refer Collection, on page 15 for the JSON response properties.

Viewing Software Inventory Properties

GET

Request

```
curl -k -u <username>:<password> https://<BMC IP>/redfish/v1/UpdateService/
FirmwareInventory/{{SoftwareInventory_Instance}}Content-Type:application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned in the following table:

Table 74: Software Inventory Properties

Name	Type	Read only	Description
Description	String	True	Refer Resource, on page 9.

Name	Type	Read only	Description
Id	String	True	Refer Resource, on page 9.
Name	String	True	Refer Resource, on page 9.
RelatedItem	Array: Object	True	The ID(s) of the resources associated with this software inventory item. • @odata.id: Refer ODATA Properties, on page 8.
RelatedItem@odata.count	Number	True	Refer Collection, on page 15.
Status	Object	True	Refer Resource, on page 9.
Updateable	Boolean	True	An indication of whether the Update Service can update this firmware.
Version	String	True	The version of this software.