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Release Date: April 22, 2022

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<tr>
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1 Applicable or Supported Platforms

The Redfish Reference Guide applies to X12 and H12 platforms. The supported platforms are as follows:

- X12DPI-N(T)6
- X12DPU-6
- X12DDW-A6
- X12DPT-B6
- X12DPG-QT6
- X12DPFR-AN6
- X12DGO-6
- X12DPD-A6M25
- X12DPG-OA6
- B12DPT-6
- X12DAi-N6
- X12DHM
- X12SPI-TF
- X12SPW-F/TF
- X12SPPO-F/NTF
- X12SPM-LN4F/LN6TF/TF
- X12SPL-F/LN4F
- X12SPA-TF
- H12DSG-O-CPU
- H12SSW-iNR/NTR
- H12SSL-i/C/CT/NT
- H12DSG-Q-CPU6
- H12SSFR-AN6
- H12SSFF-AN6
- M12SWA-TF
- H12DGO-6
- H12SSW-AN6
- H12DSI-6/NT6
- H12SSG-6
- BH12SSi-M25
- H12DSU-iN
- H12SSW-iN/NT
- H12DST-B
- H12SST-PS
2 Introduction

The Redfish Scalable Platforms Management API ("Redfish") uses RESTful interface semantics to access data defined in a model format to perform systems management. It is suitable for a wide range of servers, from stand-alone to rack mount, blade and even cloud environments.

As a management standard, Redfish uses data model representation inside of a hypermedia RESTful interface. Being based on REST makes it easier to use and implement than many other solutions. Since it is model oriented, it is capable of expressing the relationships between components in modern systems as well as the semantics of the services and components within them. It is also easily extensible. By using a hypermedia approach to REST, Redfish can express a large variety of systems from multiple vendors. Utilizing JSON (JavaScript Object Notation) data format, which is in plain text, allows many types of parameters to be available such that it enables scalability, human readability, and flexibility for most programming environments by easily interpreting payload.

The model is displayed in terms of an interoperable OData Schema with the payload of the messages being expressed in JSON following OData JSON conventions. The schema (available in both XML and JSON formats) includes annotations to facilitate the automatic translation of the schema to JSON Schema. The ability to externally host the schema definition of the resources in a machine-readable format allows the metadata to be associated with the data without encumbering Redfish services with the metadata, thus enabling more advanced client scenarios as found in many data center and cloud environments.

Supermicro enables Redfish feature sets on Intel-based X10 and AMD-based H11 and later generation platforms. These features are covered under SFT-OOB-LIC and SFT-DCMS-SINGLE licenses.

This document provides you with an overview of Restful API services and describes how to receive Redfish API responses directly from a Supermicro BMC (Baseboard Management Controller).
3 HTTP Request Methods

The following HTTP methods are used to implement different actions:

<table>
<thead>
<tr>
<th>Method</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>Read Requests</td>
<td>The method requests a representation of a specified resource. The representation can be either a single resource or a collection.</td>
</tr>
<tr>
<td>PATCH</td>
<td>Update</td>
<td>The method applies partial modifications to a resource.</td>
</tr>
<tr>
<td>PUT</td>
<td>Replace</td>
<td>The method completely replaces a resource. Any properties omitted from the body of the request are reset to their default value.</td>
</tr>
<tr>
<td>POST</td>
<td>Create</td>
<td>The method creates a new resource. This request is submitted to the resource collection in which the new resource is meant to belong.</td>
</tr>
<tr>
<td>POST</td>
<td>Actions</td>
<td>The method initiates operations on the object (Actions). The POST operation may not be idempotent.</td>
</tr>
<tr>
<td>DELETE</td>
<td>Delete</td>
<td>The method removes a resource.</td>
</tr>
</tbody>
</table>

3.1 Responses

There are four types of responses:

<table>
<thead>
<tr>
<th>Response</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metadata</td>
<td>Resources and types are exposed by the service to generic clients.</td>
</tr>
<tr>
<td>Resource Responses</td>
<td>An individual resource is displayed in JSON format.</td>
</tr>
<tr>
<td>Resource Collection</td>
<td>JSON representation of a collection of resources.</td>
</tr>
<tr>
<td>Error</td>
<td>Top-level JSON response providing additional information in the case of an HTTP error.</td>
</tr>
</tbody>
</table>
### 3.2 HTTP Status Code Description

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>OK</td>
</tr>
<tr>
<td>201</td>
<td>Created</td>
</tr>
<tr>
<td>202</td>
<td>Accepted</td>
</tr>
<tr>
<td>204</td>
<td>No Content</td>
</tr>
<tr>
<td>301</td>
<td>Moved Permanently</td>
</tr>
<tr>
<td>302</td>
<td>Found</td>
</tr>
<tr>
<td>304</td>
<td>Not Modified</td>
</tr>
<tr>
<td>400</td>
<td>Bad Request</td>
</tr>
<tr>
<td>401</td>
<td>Unauthorized</td>
</tr>
<tr>
<td>403</td>
<td>Forbidden</td>
</tr>
<tr>
<td>404</td>
<td>Not Found</td>
</tr>
<tr>
<td>405</td>
<td>Method Not Allowed</td>
</tr>
<tr>
<td>406</td>
<td>Not Acceptable</td>
</tr>
<tr>
<td>409</td>
<td>Conflict</td>
</tr>
<tr>
<td>410</td>
<td>Gone</td>
</tr>
<tr>
<td>411</td>
<td>Length Required</td>
</tr>
<tr>
<td>412</td>
<td>Precondition Failed</td>
</tr>
<tr>
<td>415</td>
<td>Unsupported Media Type</td>
</tr>
<tr>
<td>500</td>
<td>Internal Server Error</td>
</tr>
<tr>
<td>501</td>
<td>Not Implemented</td>
</tr>
<tr>
<td>503</td>
<td>Service Unavailable</td>
</tr>
</tbody>
</table>
To receive API responses through programming, install Postman or any other Rest API client application(s).

4.1 Authentication
You are required to have authentication to access certain resources. Redfish offers two methods users to access Redfish URLs: “basic authentication” and “Redfish session login authentication.” The Service does not require you to create a session when Basic Authentication is used.

4.1.1 Basic Authentication
HTTP basic authentication uses compliant TLS connections to transport the data between any third-party authentication service and clients. Use local BMC credentials or remote protocol like LDAP, Active Directory or RADIUS to log in with basic authentication.
4.1.2 Session Management

You can use session management to implement authentication. This includes orphaned session timeouts and a number of simultaneous open sessions. You can create up to 16 sessions.

**Step 1:** You can post the following username/password information in the payload field, which will create a new session.

```json
{
  "UserName": "<username>",
  "Password": "<password>
}
```

Example of applying for Authentication using a Chrome-based app (Advanced Rest Client): The user will receive the “201” message code with X-AUTH token created.

- **Session lifetime:** For Redfish sessions, as long as you send requests for the session within the session timeout period, the session will remain open and the session authentication token will remain valid. If the session times out, the session will be automatically terminated.
- **According to Redfish specification, a user can define session time from 30 to 86400 seconds.** If you are not active in the defined time frame, the token will be rendered invalid. You can always patch “SessionTimeout” value if needed.

  Example: [PATCH] https://BMC IP/redfish/v1/SessionService/Sessions/
  Payload: 
  ```json
  {"SessionTimeout": 50}
  ```

- **Session termination or logout:** A Redfish session is terminated when you log out. This is accomplished by performing the DELETE method on the session resource identified by the link returned in the location header either when the session is created or if the Session ID is returned in the response data. Using the DELETE method on a session by specifying the session resource ID allows an administrator with sufficient privilege to terminate other users’ sessions from a different session.
Example: [DELETE] https://IP/redfish/v1/SessionService/Sessions/2(num) - >Send->Status Code: 200 OK

<table>
<thead>
<tr>
<th>Log in</th>
<th>Log out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation: POST</td>
<td>Operation: DELETE</td>
</tr>
<tr>
<td>URI: /redfish/v1/SessionService/Sessions/</td>
<td>URI: redfish/v1/SessionService/Sessions/(num)</td>
</tr>
<tr>
<td>Request headers:</td>
<td>Request headers:</td>
</tr>
<tr>
<td>Content-Type: application/json</td>
<td>Content-Type: application/json</td>
</tr>
<tr>
<td>Request body:</td>
<td>Request body:</td>
</tr>
<tr>
<td>{&quot;UserName&quot;:&quot;UserName&quot;,&quot;Password&quot;:&quot;Password&quot;}</td>
<td>Requestbody: NONE</td>
</tr>
<tr>
<td>Response: 201 created</td>
<td>Response: 200 OK</td>
</tr>
<tr>
<td>X-Auth Token header displays Location and session ID ex: Location: /redfish/v1/SessionService/Sessions/5</td>
<td></td>
</tr>
</tbody>
</table>

**Step 2:** The response will include an X-Auth-token header with a session token and a location header. Parse X-Auth token value to get an API response.

**Note:** You can apply basic authentication as well.
5 FirmwareInventory and UpdateService

5.1 FirmwareInventory
FirmwareInventory represents firmware version information for each component on the server.

URI: /redfish/v1/UpdateService/FirmwareInventory
Method: GET
Response: 200
5.1.1 Firmware Resiliency Actions

5.1.1.1 Updating the Golden Image
Set the current active image as the golden template. If the current image is used as the golden image by golden template under Supermicro’s recommendation or the administrator’s preference, then use this option to update the golden firmware image with active firmware image.

Allowable values for Targets:
BMC: Use "/redfish/v1/Managers/1" to update golden firmware image for BMC.
BIOS: Use "/redfish/v1/Systems/1" to update golden firmware image for BIOS.

URI: /redfish/v1/UpdateService/Actions/Oem/SmcUpdateService.Install
Method: POST
Payload: {"Targets": ["/redfish/v1/Managers/1"], "InstallOptions": ["UpdateGolden"]}
Response: 200

5.1.1.2 Recovering BIOS or BMC from Backup Firmware Image
If the administrator suspects any issue with current image or if the current image is compromised, then the administrator can manually recover BMC or BIOS from the backup firmware image.

Allowable values for Targets:
BMC: Use "/redfish/v1/Managers/1" to recover BMC from the backup image.
BIOS: Use "/redfish/v1/Systems/1" to recover BIOS from the backup image.

URI: /redfish/v1/UpdateService/Actions/Oem/SmcUpdateService.Install
Method: POST
Payload: {"Targets": ["/redfish/v1/Managers/1"], "InstallOptions": ["Recover"]}
Response: 200

5.1.1.3 Downloading Evidence
If BMC or BIOS is recovered manually or automatically, RoT places the Active Image in the evidence region before recovery is initiated. You can download Image for further analysis.
5.2 Updating BIOS Firmware

To perform BIOS firmware update, use the image file available on the local system:

Allowable values for @Redfish.OperationApplyTime:
- Immediate: Start BIOS firmware update immediately after POST action to /redfish/v1/UpdateService/upload
- OnStartUpdateRequest: upload firmware with POST action upload API and then BIOS firmware update will only start after POST action to /redfish/v1/UpdateService/Actions/UpdateService.StartUpdate. StartUpdate API doesn't require any parameter in payload.

URI: /redfish/v1/UpdateService/upload
Method: POST
Response: 202
UpdateParameters: {"Targets": ["/redfish/v1/Systems/1/Bios"], "@Redfish.OperationApplyTime": "Immediate", "Oem": { "Supermicro": { "BIOS": "PreserveME": true, "PreserveNVRAM": true, "PreserveSMBIOS": true, "BackupBIOS": false }
UpdateFile:<File>

Check BIOS update status in TaskService API.
URI: /redfish/v1/TaskService
Method: GET
Response: 200

When the update completes, check the BIOS version in UpdateService/FirmwareInventory.
5.3 Updating BMC Firmware

Use the image file available on the local system to update BMC firmware:

Allowable values for @Redfish.OperationApplyTime:
- Immediate: Start BMC firmware update immediately after POST action to /redfish/v1/UpdateService/upload
- OnStartUpdateRequest: upload firmware with POST action upload API and then BMC firmware update will only start after POST action to /redfish/v1/UpdateService/Actions/UpdateService.StartUpdate. StartUpdate API doesn’t require any parameter in payload.

URI: /redfish/v1/UpdateService/upload
Method: POST
Response: 202
UpdateParameters: {
  "Targets": ["/redfish/v1/Managers/1"],
  "@Redfish.OperationApplyTime": "Immediate",
  "Oem": {
    "Supermicro": {
      "BMC": {
        "PreserveCfg": true,
        "PreserveSdr": true,
        "PreserveSsl": true,
        "BackupBMC": true
      }
    }
  }
}
UpdateFile:<File>

Check BMC update status in TaskService API
URI: /redfish/v1/TaskService
Method: GET
Response: 200

When the the update completes, check the BMC version in UpdateService/FirmwareInventory.
5.4 Updating CPLD Firmware

There are two types of CPLD firmware to be updated:

- Use the image file available on the local system to update CPLD motherboard firmware:

  URI: /redfish/v1/UpdateService/upload
  Method: POST
  Response: 202
  UpdateParameters:
  "Targets": [ /redfish/v1/UpdateService/FirmwareInventory/CPLD_Motherboard" ], "@Redfish.OperationApplyTime": "Immediate"
  UpdateFile: <File>

- Use the image file available on the local system to update CPLD backplane firmware:

  URI: /redfish/v1/UpdateService/FirmwareInventory
  Method: POST
  Response: 202
  UpdateParameters:
  "Targets": [ /redfish/v1/UpdateService/FirmwareInventory/CPLD_Backplane_<id>" ], "@Redfish.OperationApplyTime": "Immediate"
  UpdateFile: <File>
5.5 Simple Update

You can update the installed software component(s) as contained within a software image file located at a URI referenced by the ImageURI parameter, and preserve BMC config, SSL, SDR, and SMBIOS, BIOS BootConfig by default.

You are required to prepare the FTP, HTTP or HTTPs file server to put BMC or BIOS firmware image file.

**URI:** /redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate

**Method:** POST

**Response:** 202

**Payload:**

```json
{
    "ImageURI": "<file ip>/<path and image file name>",
    "TransferProtocol": "FTP",
    "Targets": ["/redfish/v1/Managers/1"]
}
```

**Target value:**

For BIOS Update, use "'/redfish/v1/Systems/1'."
For BMC Update, use "'/redfish/v1/Managers/1'."
5.6 Updating Broadcom Storage Controller Firmware

You can check if the controller firmware update is supported or not under /redfish/v1/UpdateService/FirmwareInventory/Broadcom<num>.

To update Broadcom firmware using the image file available on the local system:

URI: /redfish/v1/UpdateService/upload
Method: POST
Response: 202

UpdateParameters: {"Targets": ["/redfish/v1/Systems/1/Storage/HA-RAID#/StorageControllers/<num>"],"@Redfish.OperationApplyTime":"OnStartUpdateRequest"}
UpdateFile: <File>

Note: Currently, it is supported to update HA-RAID 3108, 39xx and BCOM 3916 firmware.
5.7 Updating Marvel Storage Controller Firmware

You can check if the controller firmware update is supported or not under
/redfish/v1/UpdateService/FirmwareInventory/Marvell<num>.

To update Marvell firmware using the image file on the local system:

URI: /redfish/v1/UpdateService/upload
Method: POST
Response: 202
UpdateParameters: "{"Targets": ["/redfish/v1/Systems/1/Storage/MRVL.HA-RAID#/StorageControllers/<num>"],"@Redfish.OperationApplyTime": "OnStartUpdateRequest"}
UpdateFile: <File>
5.8 Updating SSL Certificate and Key

Update SSL certificate and key for secure web server connection.

**URI:** /redfish/v1/UpdateService/Oem/Supermicro/SSLCert/Actions/SmcSSLCert.Upload

**Payload:**
1. Change the type to “form-data”.
2. Select cert_file and key_file as keys, and browse and select the respective files to upload.
6 Account Service

You can perform the following operations under /redfish/v1/AccountService.

Available Methods: Get, Post, Patch and Delete

6.1 Creating a User

You can use the API and payload to create a new account and delete the respective accounts.

URI: /redfish/v1/AccountService/Accounts/
Method: POST
Payload:
{
"UserName":"User_Name",
"Password":"User_Password",
"RoleId":"Administrator",
"Enabled":true
}

Note that the allowed values for “RoleId” are “Administator,” “Operator,” and “ReadOnly”. You can also verify the assigned privileges for different roles (“Administrator,” “Operator, and “ReadOnly”) under /redfish/v1/AccountService/Roles.

6.2 Configuring User Lockout

URI: /redfish/v1/AccountService
Method: PATCH
Payload:
{"AuthFailureLoggingThreshold": 5,
"AccountLockoutThreshold": 2,
"AccountLockoutDuration": 300,
"AccountLockoutCounterResetAfter": 300}

6.3 Active Directory

URI: /redfish/v1/AccountService
Method: PATCH
Payload:
{"ActiveDirectory": {"ServiceEnabled": true,
"ServiceAddresses": ["ldap://<IP>:389"],
"RemoteRoleMapping": [{"RemoteGroup": "cn=ipmiswga,dc=satc,dc=com",
"LocalRole": "Administrator"}]
}}
6.4 LDAP

URI: /redfish/v1/AccountService
Method: PATCH
Payload:
{"LDAP": {"ServiceEnabled": true,
    "ServiceAddresses": ["ldap://<IP>:389"],
    "Authentication": {"Username": "cn=Manager, dc=satc, dc=com",
        "Password": "secret"},
    "RemoteRoleMapping": [{"RemoteUser": "tester001", "LocalRole": "Administrator"}],
    "LDAPService": {"SearchSettings": {"BaseDistinguishedNames": [
        "dc=satc, dc=com"], "UsernameAttribute": "cn"}}
}
7 System Management

Use BIOS APIs to configure properties related to BIOS. The Attribute Registry contains system-specific BIOS attributes and its dependent attributes.

Note: Changes in BIOS attributes require a system reboot to take effect.

7.1 Changing a Password

URI: /redfish/v1/Systems/1/Bios/Actions/Bios.ChangePassword
Method: POST
Payload:
{"PasswordName":"AdministratorPassword" or "UserPassword",
 "OldPassword":"
,  
"NewPassword":"Password"}

7.2 Configuring BIOS over Redfish

BIOS registry will show Menu of Key (Menus), Keys (Attributes), and Keys’ dependencies (Dependencies).

URI: /redfish/v1/Registries/BiosAttributeRegistry.v1_0_0
Method: GET
Response:

```json
{  

@Redfish.Copyright: "Copyright 2016 Distributed Management Task Force, Inc. (DMTF). All rights reserved",
  
@odata.type: "#AttributeRegistry.v1_0_0.AttributeRegistry",
  
Description: "This registry defines a representation of BIOS Attribute instances",
  
ID: "BiosAttributeRegistry.v1_0_0",
  
Language: "en",
  
Name: "BIOS Attribute Registry",
  
OwningEntity: "SMI",
  
RegistryVersion: "1.0.0",
  
SupportedSystems: [  
    
  ],
  
RegistryEntries: [  
    
      Attributes: [  
        CurrentValue: true, DisplayName: "Quiet Boot", HelpText: "Enables or disables Quiet Boot",  
        Value: "true"
      ]
    ],
  
  
Conditions: [  
    
      ValidValues: [  
        "true",
        "false"
      ]
    ],
  
  
Dependencies: [  
    
      Dependency: [  
        MapFrom: [  
          MapFromAttribute: "WatchDogFunction",  
          MapFromCondition: "WatchDogFunction"
        ]
      ]
    ]
  
}

```
• **Attributes:** Contains the attributes and their possible values.

```json
"CurrentValue": "Force BIOS",
"DisplayName": "Option ROM Messages",
"HelpText": "Set display mode for Option ROM",
"MenuPath": ".:/Advanced/BootFeature",
"AttributeName": "OptionROMMessages",
"IsFunCallBack": false,
"ReadOnly": false,
"GrayOut": false,
"Hidden": false,
"Type": "Enumeration",
"Value": [{
    "ValueDisplayName": "Force BIOS"
},
{ "ValueDisplayName": "Keep Current"
}]
```

• **Menu:** Contains the attributes menus and their hierarchy.

```json
[
    { "DisplayName": "PCIe|PCI|PnP Configuration",
      "DisplayOrder": 26,
      "MenuPath": ".:/Advanced/PCIe|PCI|PnPConfiguration",
      "MenuName": "PCIe|PCI|PnPConfiguration",
      "Hidden": false,
      "ReadOnly": false
    }
]
```

• **Dependencies:** Lists dependencies of attributes on each component.

```json
[{
    "Dependency": [
      "MapFrom": [
        { "MapFromAttribute": "PowerTechnology",
          "MapFromCondition": "NEQ",
          "MapFromProperty": "CurrentValue",
          "MapFromValue": "Custom",
          "MapTerms": "AND"
        },
        { "MapFromAttribute": "PowerPerformanceTuning",
          "MapFromCondition": "EQ",
          "MapFromProperty": "CurrentValue",
          "MapFromValue": "OS Controls EPB"
        }
      ],
      "MapToAttribute": "ENERGY_PERF_BIAS_CFGmode",
      "MapToProperty": "GrayOut",
      "MapToValue": true
    },
    "DependencyFor": "ENERGY_PERF_BIAS_CFGmode",
    "Type": "Map"
}]
```

**Example:** If (PowerTechnology’s **CurrentValue** != "Custom" AND PowerPerformanceTuning’s **CurrentValue** == "OS Controls EPB") ENERGY_PERF_BIAS_CFGmode’s **GrayOut** = true
7.2.1 Modifying BIOS Attributes
You can GET current setting and PATCH desired settings.

URI: /redfish/v1/Systems/1/Bios
Method: PATCH
Response: 202
Payload:
{
    "Attributes": {
        "QuietBoot": false,
        "PowerButtonFunction": "4 Seconds Override"
    }
}

**Note:** After PATCH, you need to reset the system to apply the values to BIOS.

7.2.2 Viewing Pending Settings
You can view any pending settings after PATCH.

URI: /redfish/v1/Systems/1/Bios/SD
Method: GET
Response: 200

```json
{
    "odata.context": ""/redfish/v1/$metadata#Bios.Bios",
    "@odata.type": "#Bios.Bios",
    "@odata.id": "/redfish/v1/Systems/1/Bios/SD",
    "Id": "SD",
    "Name": "BIOS Configuration Pending Settings",
    "AttributeRegistry": "BiosAttributeRegistry.v1_0_0",
    "Description": "BIOS Configuration Pending Settings. These settings will be applied on next system reboot.",
    "Attributes": {
        "ASPMSupport": "Auto"
    }
}
```

7.3 Resetting BIOS
POST a reset of the BIOS attributes to default values. After POST, you need to reset the system to apply values to BIOS.

URI: /redfish/v1/Systems/1/Bios/Actions/Bios.ResetBios
Method: POST
Response: 200
7.4 Boot Options

7.4.1 Configuring the Boot Order in System BIOS

Use Redfish to change system boot order.

- **BootSourceOverrideEnabled**: Describes the state of the Boot Source Override feature.
  - **Disabled**: The system will boot normally
  - **Once**: The system will boot (one time) to the Boot Source OverrideTarget
  - **Continuous**: The system will boot to the target specified in the Boot SourceOverrideTarget until this property is set to Disabled.

- **BootSourceOverrideMode**: The BIOS Boot Mode (either Legacy or UEFI) to be used when BootSourceOverrideTarget boot source is booted from.
  - **Legacy**: The system will boot in non-UEFI boot mode to the Boot Source Override Target.
  - **UEFI**: The system will boot in UEFI boot mode to the Boot Source Override Target.

- **BootSourceOverrideTarget**: The current boot source to be used at next boot instead of the normal boot device if BootSourceOverrideEnabled is true.

The values are allowed to set BootSourceOverrideTarget

- **BootSourceOVerRideMode: UEFI**
  - Pxe
  - Cd
  - Usb
  - Hdd

- **BootSourceOVerRideMode: Legacy**
  - None
  - Pxe
  - Cd
  - Floppy
  - Usb
  - Hdd

**Example**: Change BootSourceOverrideTarget to BiosSetup.

URI: /redfish/v1/Systems/1

**Method**: PATCH

**Payload**:
```
{"Boot":{
   "BootSourceOverrideEnabled":"Once",
   "BootSourceOverrideMode":"Legacy",
   "BootSourceOverrideTarget": "BiosSetup"
   }
}
```
7.4.2 Configuring UefiBootNext

URI: /redfish/v1/Systems/1
Method: PATCH
Payload:

```
{ "Boot": {
    "BootSourceOverrideTarget": "UefiBootNext",
    "BootNext": "Hdd"}}
```
7.5 Secure Boot

UEFI Secure Boot is created to enhance security in the pre-boot environment. Secure Boot helps firmware, operating system and hardware providers cooperate to thwart the efforts of malware developers.

Note: Please use the supported BIOS to use this function.

7.5.1 Enabling Redfish Secure Boot by GET

URI: /redfish/v1/Systems/1/SecureBoot

Method: GET

Response: 200

```json
{
    @odata.context: '@redfish/v1/$metadata#SecureBootSecureBoot',
    @odata.type: '#SecureBoot.v1_0_0.SecureBoot',
    @odata.id: '/redfish/v1/Systems/1/SecureBoot',
    ID: "SecureBoot",
    Name: "Security Boot",
    SecureBootCurrentBoot: "Disabled",
    SecureBoot: "Disabled",
    SecureBootMode: "SetupMode",
    Actions: {
        Oem: {},
        #SecureBoot.ResetKeys: {
            target: '@redfish/v1/Systems/1/SecureBoot/Actions/SecureBoot.ResetKeys',
            @Redfish.ActionInfo: '@redfish/v1/Systems/1/SecureBoot/ResetKeysActionInfo'
        }
    }
}
```

7.5.2 Enabling Redfish Secure Boot by PATCH

URI: /redfish/v1/Systems/1/SecureBoot

Method: PATCH

Payload: { "SecureBootEnable" : true }

Response: 202
7.5.3 Confirming in Pending Settings

URI: /redfish/v1/Systems/1/Bios/SD
Method: GET
Response: 200

```
{
  @odata.type: "#Bios.v1_0_7.Bios",
  @odata.id: "@redfish/v1/Systems/1/Bios/SD",
  Id: "sp",
  Name: "BIOS Configuration Pending Settings",
  AttributeRegistry: "BiosAttributeRegistry.v1_0_0",
  Description: "BIOS Configuration Pending Settings. These settings will be applied on next system reboot."
  Attributes: {
    SecureBoot: "Enabled"
  }
}
```

ResetKeyTypes

URI: /redfish/v1/Systems/1/SecureBoot/Actions/SecureBoot.ResetKeys
Method: POST
Payload: {"ResetKeysType": "DeleteAllKeys"}
ResetKeysType Allowable Values:
"ResetAllKeysToDefault",
"DeleteAllKeys",
"DeletePK"
7.5.4 Enabling Secureboot in BIOS
Set the three attributes below to BIOS to enable secureboot.

URI: /redfish/v1/Systems/1/Bios
Method: PATCH
Payload:
{
    "Attributes": {
        "SecureBoot": "Enabled",
        "SecureBootMode": "User",
        "ResetKeysType": "Delete PK Key"
    }
}

SecureBoot Allowable Values:
"Enabled",
"Disabled"
SecureBootMode allowable values:
"Setup",
"User",
"Audit",
"Deployed"

ResetKeyType allowable values:
"Disabled",
"Reset all keys to default",
"Delete all keys",
"Delete PK key"
8 CertificateService

The CertificateService describes a Certificate Service that represents the actions available to manage certificates and links to the certificates.

URI: /redfish/v1/CertificateService
Method: GET
Payload: {}
Response: 200
8.1 Generating CSR

Generate a certificate signing request (CSR) for the SSL certificate.

8.1.1 Generating CSR Action Info

View the list of supported and required parameters to generate CSR.

URI: /redfish/v1/CertificateService/GenerateCSRActionInfo
Method: GET
Response: 200
8.1.2 Generating a CSR Request

This action is used to perform a certificate signing request.

**URI:** /redfish/v1/CertificateService/Actions/CertificateService.GenerateCSR

**Method:** POST

**Payload:**
```
{
    "Country": "US",
    "State": "California",
    "City": "San Jose",
    "Organization": "Supermicro Computer",
    "OrganizationalUnit": "PM",
    "CommonName": "Supermicro.com",
    "KeyPairAlgorithm": "TPM_ALG_RSA",
    "CertificateCollection": {
        "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates"
    }
}
```

**Response:** 200
8.1.3 Viewing Certificate Details

**URI:** /redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates/1

**Method:** GET

**Response:** 200
8.2 Replacing a Certificate

You can replace an existing certificate.

8.2.1 Replacing Certificate Action Info

View the list of supported and required parameters to generate CSR.

URI: /redfish/v1/CertificateService/ReplaceCertificateActionInfo
Method: GET
Payload: {}
Response:

8.2.2 Replacing a Certificate

Method: Post
Payload:

```
    "CertificateString":"-----BEGIN CERTIFICATE REQUEST-----
    \n    MIICvjCCAQAwgUHEwMBQAwggECAwIBAgIBADANBgcgECAwEw\n    \n    "CertificateType": "PEM",
    "CertificateUri": "\n```

Response: 200
8.3 Rekey Certificate

This action shall generate a new key pair for an existing certificate using the existing certificate data. The response shall contain a signing request that is to be signed by a certificate authority (CA). The service should retain the private key used for the generation of this request for when the certificate is installed. The private key should not be part of the response.

URI: redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates/1/Actions/Certificate.Rekey
Method: POST
Payload: {
   "KeyPairAlgorithm": "TPM_ALG_RSA"
}
Response: 200
9 Event Service

The event service is an alert mechanism for Redfish. This alert will be sent out through HTTP or HTTPS to a web service that is subscribed to the service.

9.1 Adding a Subscription

Edit a subscription to configure alerts/events.

URI: /redfish/v1/EventService/Subscriptions/[id]
Method: PATCH
Payload:
{
  "Destination":"example@main.com",
  "Context":"user1_test",
  "EventTypes":["Alert","StatusChange"],
  "Protocol":"SMTP",
  "Oem":{"Supermicro":{
    "Severity": "Information",
    "EnableSubscription": true}}
}
Response: 200

- **Destination**: Value shall contain a URI or email to the destination where the events will be sent.
- **Context**: Value is a client-supplied string that is stored with the event destination subscription.
- **EnableSubscription**: Enable or Disable subscription by setting value true or false
- **Protocol**: This property shall contain the protocol type that the event will use for sending the event to the destination. A value of Redfish shall be used to indicate that the event type shall adhere to that defined in the Redfish specification.
  
  Allowable values:
  o SNMPv1
  o SMTP
  o Redfish
  o SNMPv3
- **EventTypes**: This property shall contain types of events you want to receive.
  
  Allowable values:
  o StatusChange
  o ResourceUpdated
  o ResourceAdded
  o ResourceRemoved
  o Alert
- **Severity**: This property shall contain severity of event that you want to configure.
  
  Allowable values:
  o Information
  o Warning
  o Critical
9.2 Viewing All Subscriptions

To view all subscriptions, follow these steps.
URI: /redfish/v1/EventService/Subscriptions/
Method: GET

9.3 Deleting a Subscription

You can delete or erase a subscription.

URI: /redfish/v1/EventService/Subscriptions/(num)
Method: DELETE

9.4 Testing an Event Subscription

You can send a test event with “SendTestEvent” or generate an event in the BMC, Redfish will then automatically send event alerts to subscriber(s).

URI: /redfish/v1/EventService/Actions/EventService.SendTestEvent
Payload: {"EventType": "Alert"}

You need to implement a RESTful event listener that can receive HTTP or HTTPS POST data that describes the Redfish event format. It can also subscribe to multiple services.

Refer to the Redfish-Event-Listener project page at GitHub to test Event Subscriptions or setup a Redfish Event Listener.

Example of data from Redfish Event Listener:
Time: Tue Feb 12 16:49:28 2019 Count:1
Host IP: ('BMC_IP', 38486)
Event Details: {'@odata.context': '/redfish/v1/$metadata:EventService/Members/Events/58', '@odata.id': '/redfish/v1/EventService/Events/58', '@odata.type': '#EventService.v1_0_0.Event', 'Id': '58', 'Name': 'Event Array', 'Events': [{'EventType': 'Alert', 'Severity': 'OK', 'EventTimestamp': '2019/02/13 00:49:04', 'Message': 'Submit Test Event', 'MessageArgs': ['/redfish/v1/EventService/Actions'], 'MessageId': '0', 'OriginOfCondition': {'@odata.id': '/redfish/v1/EventService'}, 'Context': 'Public'}}

Time: Tue Feb 12 16:52:24 2019 Count:2
Host IP: ('BMC_IP', 38500)
Event Details: {'@odata.context': '/redfish/v1/$metadata:EventService/Members/Events/59', '@odata.id': '/redfish/v1/EventService/Events/59', '@odata.type': '#EventService.v1_0_0.Event', 'Id': '59', 'Name': 'Event Array', 'Events': [{'EventType': 'Alert', 'Severity': 'Info', 'EventTimestamp': '2019/02/13 00:49:04', 'Message': 'Submit Test Event', 'MessageArgs': ['/redfish/v1/EventService/Actions'], 'MessageId': '0', 'OriginOfCondition': {'@odata.id': '/redfish/v1/EventService'}, 'Context': 'Public'}}
'EventTimestamp': '2019/02/13 00:52:00', 'Message': 'Web login was successful.', 'MessageArgs': [''''], 'MessageId': 'Alert.1.0.LoginWeb', 'OriginOfCondition': {}, 'Context': 'Public'}}}
10 Virtual Media Management

10.1 Mounting and Configuring the Virtual Media Settings

URI: /redfish/v1-Managers/1/VirtualMedia/CD[mounted_dev_num]/Actions/VirtualMedia.InsertMedia
Method: POST
Payload: 
"Image": "<host>/<path>",
"UserName": "some_username",
"Password": "some_password"
}
Response: 202
### 10.1.1 Verifying If the ISO is Mounted by Redfish Command

**URI:** `/redfish/v1/Managers/1/VirtualMedia/CD[mounted_dev_num]`  
**Method:** GET  
**Payload:** `{}`

```json
{
    "@odata.type": "#VirtualMedia.v1_3_2.VirtualMedia",
    "@odata.id": "/redfish/v1/Managers/1/VirtualMedia/CD1",
    "Id": "CD1",
    "Name": "Virtual Removable Media",
    "MediaTypes": ["CD",
                   "DVD"],
    "ImageName": "windows2016-66.iso",
    "ConnectedVia": "USB",
    "Inserted": true,
    "WriteProtected": true,
    "TransferProtocolType": "HTTP",
    "TransferMethod": "Stream",
}
```

### 10.2 Unmounting the ISO

**URI:**  
`/redfish/v1/Managers/1/VirtualMedia/CD[mounted_dev_num]/Actions/VirtualMedia.EjectMedia`  
**Method:** POST  
**Body:** `{}`

```json
{
    "Success": {
        "code": "Base.v1_4_0.Success",
        "Message": "Successfully Completed Request. See ExtendedInfo for more information.",
        "@Message.ExtendedInfo": [ 
            {
                "MessageId": "SVC.v1_0.0xMVUnmounted",
                "Severity": "Ok",
                "Resolution": "No resolution was required.",
                "Message": "The Virtual Media was unmounted successfully."
            }
        ]
    }
}
```
10.2.1 Verifying If the ISO Is Unmounted from Redfish Command

Verify whether the ISO is unmounted from Redfish command; the node should be removed.

URI: /redfish/v1/Managers/1/VirtualMedia/CD[mounted_dev_num]
Method: GET
Response: 200

```
@odata.type: "#VirtualMedia.v1_3_2.VirtualMedia",
@odata.id: "/redfish/v1/Managers/1/VirtualMedia/CD1",
Id: "CD1",
Name: "Virtual Removable Media",
MediaTypes: ["CD", "DVD"],
ImageName: "windows2016-66.iso",
ConnectedVia: "NotConnected",
Inserted: false,
WriteProtected: true,
TransferProtocolType: "HTTP",
TransferMethod: "Stream",
```
11 Device Management

You can find details about all available network devices under /redfish/v1/Chassis/1/PCIeDevices.

11.1 NIC Device

URI: /redfish/v1/Chassis/1/PCIeDevices/NIC1
Method: GET
Response: 200
11.2 GPU

URI: /redfish/v1/Chassis/1/PCIeDevices/GPU1
Method: GET
Response: 200

```json
{
    "@odata.type": "#PCIeDevice.v1_4_0.PCIeDevice",
    "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/GPU1",
    "Id": "GPU1",
    "Name": "GPU1",
    "Description": "GPU Device 1",
    "Model": "",
    "SerialNumber": "",
    "PartNumber": "",
    "FirmwareVersion": "",
    "DeviceType": "MultiFunction",
    "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
    },
    "PCIeInterface": {
        "PCIeType": "Gen3",
        "MaxPCIeType": "Gen3",
        "LanesInUse": 16,
        "MaxLanes": 16
    },
    "PCIeFunctions": {
        "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/GPU1/PCIeFunctions"
    },
    "Links": {
        "Chassis": {
            "@odata.id": "/redfish/v1/Chassis/1"
        }
    },
    "Oem": {
        "Supermicro": {
            "@odata.type": "#SuperGPUExtensions.v1_0_0.GPU",
            "GPU Slot": 1,
            "Board part number": "",
            "Driver": "Loaded",
            "Memory vendor": "",
            "Memory part number": "",
            "GPU GUID": "00000000000000000000000000000000",
            "InfoROM version": ""
        }
    }
}
```
11.3 NVMeSSD

URI: /redfish/v1/Chassis/1/PCIeDevices/NVMeSSD1
Method: GET
Response: 200

```json
{
   "@odata.type": "#PCIeDevice.v1_4_0.PCIeDevice",
   "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/NVMeSSD1",
   "Id": "1",
   "Name": "NVMeSSD1",
   "Description": "NVMe SSD Device 1",
   "Manufacturer": "Intel",
   "Model": "INTEL SSDPE2KX450G7",
   "PartNumber": "INTEL SSDPE2KX450G7",
   "SerialNumber": "CVF7162004450G7",
   "DeviceType": "Simulated",
   "Status": {
      "State": "Enabled",
      "Health": "OK",
      "HealthRollup": "OK"
   },
   "PCIeFunctions": {
      "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/NVMeSSD1/PCIeFunctions"
   },
   "Links": {
      "Chassis": {
         "@odata.id": "/redfish/v1/Chassis/1"
      }
   },
   "Oem": {
      "Supermicro": {
         "Temperature": "38",
         "PortMaxLinkSpeed": "8.0 GT/s",
         "PortMaxLinkWidth": "4",
         "PortMaxLinkSpeed": "N/A",
         "PortMaxLinkWidth": "N/A",
         "InitialPowerRequirement": "10",
         "MaxPowerRequirement": "25"
      }
   }
}
```
11.4 PCIe Functions

URI: /redfish/v1/Chassis/1/PCIeDevices/GPU1/PCIeFunctions/1
Method: GET
Response: 200
12 RAID Management

You can manage RAID using storage subsystem schema and its properties. Storage APIs represent set of controllers and its resources like volumes, drives, etc. For details about storage controller firmware update, see 4.6 Updating Broadcom Storage Controller Firmware or 4.7 Updating Marvel Storage Controller Firmware.

URI: /redfish/v1/Systems/1/Storage
Method: GET
Response: 200

12.1 Viewing Details of HA-RAID Controller, Drive and Volume

URI: /redfish/v1/Systems/1/Storage/HA-RAID
Method: GET
Response: 200
12.2 Viewing Details of HBA Controller, Drive and Volume

URI: /redfish/v1/Systems/1/Storage/HBA
Method: GET
Response: 200

```json
StorageControllers: [ 
  
  { 
    @odata.id: "#/redfish/v1/Systems/1/Storage/HBA#StorageControllers/0",
    @odata.type: "$Storage.v1_7_1.StorageController",
    Manufacturer: "Broadcom",
    Model: "SMC3616",
    SerialNumber: "506304001f9c5900",
    FirmwareVersion: "14.00.00.00",
    Status: {State: "Enabled", Health: "OK"},
    Identifiers: [ {DurableName: ""} ],
    SupportedControllerProtocols: [ "PCIe" ],
    SupportedDeviceProtocols: [ "SATA", "SAS" ],
    Oem: [ ]
  },

  { 
    @odata.id: "#/redfish/v1/Systems/1/Storage/HBA#StorageControllers/1",
    @odata.type: "$Storage.v1_7_1.StorageController",
    Manufacturer: "ADIC-S316L-1161T",
    Model: "ADIC-S316L-1161T",
    SerialNumber: "506304001b433e02",
    FirmwareVersion: "16.00.11.00",
    Status: {State: "Enabled", Health: "OK"},
    Identifiers: [ {DurableName: ""} ],
    SupportedControllerProtocols: [ "PCIe" ],
    SupportedDeviceProtocols: [ "SATA", "SAS" ],
    Oem: [ ]
  }
],

Drives: [ 
  
  { 
    @odata.id: "#/redfish/v1/Chassis/HBA.1.StorageEnclosure.0/Drives/Disk.Bay.0"
  }
],

Volumes: [ 
  
  { 
    @odata.id: "#/redfish/v1/Systems/1/Storage/HBA/Volumes"
  }
],

Links: [ 
  
  Enclosures: [ 
    
    { 
      @odata.id: "#/redfish/v1/Chassis/HBA.1.StorageEnclosure.0"
    }
  ]
]
```

12.3 Creating LSI3108 Logical Volume

URI: /redfish/v1/Systems/1/Storage/HA-RAID/Actions/Oem/SmcStorage.CreateVolume
Method: POST
Body:
```
"ControllerId":0,
"Raid": "RAID0",
"Span":1,
"PhysicalDrives": ["HA-RAID.0.Disk.0", "HA-RAID.0.Disk.1"],
"UsePercentage":100,
"LogicalDriveCount":1,
"StripSizePerDDF": "256K",
"LdReadPolicy": "NoReadAhead",
"LdWritePolicy": "WriteBack",
"LdIOPolicy": "DirectIO",
"AccessPolicy": "ReadWrite",
"DiskCachePolicy": "Unchanged",
"InitState": "NoInit"
```
Response: 200

12.4 Locating Physical HDD

Method: POST
Payload:
```
"Active":"true"
```
Response: 200

12.5 Locating Logical Volume

URI:
/redfish/v1/Systems/1/Storage/HA-RAID/Volumes/Controller.[controller_num].Volume.[volume_num]/Actions/Oem/SmcVolume.Indicate
Method: POST
Body:
```
"Active":"true"
```
Response: 200
12.6 Deleting Logical Volume

URI: /redfish/v1/Systems/1/Storage/HA-RAID/Volumes/Controller.[controller_num].Volume.[volume_num]/Actions/Oem/SmcVolume
Method: POST
Body: {}
Response: 200

12.7 Clearing All Logical Volumes

URI: /redfish/v1/Systems/1/Storage/HA-RAID/Volumes/Controller.[controller_num].Volume.[volume_num]/Actions/Oem/SmcVolume
Method: POST
Body: {
    "ControllerId":0
}
Response: 200

12.8 Saving HA-Raid Controller Configuration

URI: /redfish/v1/Systems/1/Storage/HA-RAID/Volumes/Controller.[controller_num].Volume.[volume_num]/Actions/Oem/SmcVolume
Method: PATCH
Body: {
    "ControllerId":0,
    "BIOSBootMode":"PauseOnError",
    "JBODMode":"Enable"
}
Response: 200

12.9 Viewing Details of Marvell Controller, Drive and Volume Details

URI: /redfish/v1/Systems/1/Storage/MRVL.HA-RAID
Method: GET
Response: 200
12.10 Creating a Virtual Drive for Marvell

URI: /redfish/v1/Systems/1/Storage/MRVL.HA-RAID/Actions/Oem/SmcStorage.CreateVD
Method: POST
Body:
{
  "PD": ["MRVL.HA-RAID.0.StorageModule/Drives/Disk.Bay.0","MRVL.HA-RAID.0.StorageModule/Drives/Disk.Bay.1"],
  "RaidLevel": "RAID1",
  "StripeBlock": "64K",
  "VDName": "SuperDrive"
}

12.11 Deleting a Virtual Drive for Marvell

Method: POST
Body: {}

12.12 Rebuilding a Virtual Drive for Marvell

Method: POST
Body: {}

12.13 Importing a Virtual Drive for Marvell

Insert or import a VD and register its UUID to Marvell FW. Wait for next system power-on, and this UUID will be registered at Marvell FW.

Method: POST
Body: {}/
12.14 NVME SSD

View NVME storage details.

URI: /redfish/v1/Systems/1/Storage/NVMeSSD
Method: GET
Response: 200

```
{
  @odata.type: "@odata.context",
  @odata.id: "redfish/v1/Systems/1/Storage/NVMeSSD",
  Id: "NVMeSSD",
  Name: "NVMe Storage System",
  StorageControllers: [
    {
      @odata.id: "redfish/v1/Systems/1/Storage/NVMeSSD/StorageControllers/0",
      @odata.type: "redfish.v1.1.StorageController",
      Status: { (State: "Enabled", Health: "OK")},
      Identifiers: [ (Name: "")],
      SupportedControllerProtocols: [ "PCIe"],
      SupportedDeviceProtocols: [ "NVMe"],
      Gen: ()
    }
  ],
  Drives: [
    {
      @odata.id: "redfish/v1/Chassis/NVMeSSD-8/Group-0/StorageBackplane/Drives/Disk:1"
    }
  ],
  Volumes: [
    {
      @odata.id: "redfish/v1/Systems/1/Storage/NVMeSSD/Volumes"
    }
  ],
  Links: {
    Enclosures: [
      {
        @odata.id: "redfish/v1/Chassis/NVMeSSD-8/Group-0/StorageBackplane"
      }
    ],
    Om: ()
  }
}
```

Description: "NVMe SSD",
Status: {
  State: "Enabled",
  Health: "OK"
}
13 Network Management

EthernetInterfaces resources are used to manage BMC network configuration.

### 13.1 Viewing Network Settings

URI: `/redfish/v1/Managers/1/EthernetInterfaces/1`
Method: GET
Response: 200

```
{
  "@odata.type": "redfish.v1EthernetInterface" ,
  "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/1",
  "Id": "1",
  "Name": "Manager Ethernet Interface",
  "Description": "Management network Interface",
  "Status": {
    "State": "OnLine",
    "Health": "OK"
  },
  "MacAddress": "AC:13:30:84:0E:3C",
  "Speed": 1000,
  "Duplex": true,
  "FullDuplex": true,
  "MtuSize": 1500,
  "PortName": "",
  "QTag": "",
  "RealAddress": [0],
  "VLAN": {
    "VLANEnabled": true,
    "VLANId": 0
  },
  "OUIs": {
    "OUIEnabled": true,
    "OUIVendor": "",,
    "OUIModel": "",
    "OUIPhysLayers": false,
    "OUIBlackListed": false,
    "OUIVendorName": "",
    "OUIModelName": "",
    "FurtherAddress": "None"
  },
  "DHCPS": {
    "DHCPSState": "Off",
    "DHCPSEnabled": false,
    "DHCPLeases": [],
    "DHCPSVLAN": 0
  },
  "IPAddrs": {
    "IPv4Address": [0],
    "IPv6Address": [0],
    "IPv6AddressConfigured": true,
    "IPv6Addressjurisdiction": false,
    "IPv4DefaultGateway": "",
    "IPv6DefaultGateway": "",
    "IPv4DNSDomain": "",
    "IPv6DNSDomain": "",
    "IPv4DomainName": "",
    "IPv6DomainName": "",
    "IPv4StaticRoutingEnabled": false,
    "IPv6StaticRoutingEnabled": false
  },
  "IPRoute": {"
    "Address": "172.16.0.123",
    "SubnetMask": "255.255.255.0",
    "Gateway": "172.16.0.1"
  }
}
```

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13.2 IPv6 Configuration

URI: /redfish/v1/Managers/1/EthernetInterfaces/1
Method: PATCH
Payload: ```json
"IPv6StaticAddresses": [{
  "Address": "<IP>",
  "PrefixLength": 64
}]
``` 

13.3 Host Interface

13.3.1 Enabling Host Interface

URI: /redfish/v1/Managers/1/HostInterfaces/1
Method: PATCH
Payload: ```json
"InterfaceEnabled": true
``` 

```
{
  "@odata.type": "#HostInterface.v1_2_1.HostInterface",
  "@odata.id": "/redfish/v1/Managers/1/HostInterfaces/1",
  "Id": "1",
  "Name": "Host Interface",
  "Description": "Management Host Interface",
  "HostInterfaceType": "NetworkHostInterface",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "InterfaceEnabled": true,
  "ExternalAccess": false,
  "Authentication": true,
  "BasicAuth": true,
  "RedfishSessionAuth": true,
  "HostEthernetInterfaces": [
    {
      "@odata.id": "/redfish/v1/Managers/1/HostInterfaces/1/HostEthernetInterfaces"
    }
  ],
  "ManagerEthernetInterfaces": [
    {
      "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/1/ManagerEthernetInterfaces"
    }
  ],
  "NetworkProtocol": {
    "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol"
  },
  "Links": {
    "ComputerSystems": [
      {
        "@odata.id": "/redfish/v1/Systems/1"
      }
    ],
    "Oem": {}
  }
}
```
13.3.2 Editing a Host IP Address
URI: /redfish/v1/Systems/1/EthernetInterfaces/ToManager
Method: PATCH
Payload: {"IPv4StaticAddresses": [{"Address": "169.254.3.<num>"}]}
14 TelemetryService

TelemetryService represents metrics collection and data logs for power consumption on the server. TelemetryService contains the below collected resources.

URI: /redfish/v1/TelemetryService/
Method: GET
Response:

```json
{
   @odata.type: "#TelemetryService.v1_0_0.TelemetryService",
   @odata.id: "/redfish/v1/TelemetryService",
   Id: "TelemetryService",
   Name: "Telemetry Service",
   Status: {
      State: "enabled",
      Health: "OK"
   },
   SupportedCollectionFunctions: ["Average", "Minimum", "Maximum"],
   MetricDefinitions: ["Average", "Minimum", "Maximum"],
   MetricReportDefinitions: ["Average", "Minimum", "Maximum"],
   MetricReports: ["Average", "Minimum", "Maximum"]
}
```
14.1 Metric Definitions

Metric Definitions contain the definition, metadata, or characteristics for a metric.

```json
{
    @odata.type: "#MetricDefinitionCollection.MetricDefinitionCollection",
    @odata.id: "redfish/v1/TelemetryService/MetricDefinitions",
    Name: "Metric Definitions",
    Description: "Metric Definitions view",
    Members@odata.count: 9,
    Members: [
        {
            @odata.id: "redfish/v1/TelemetryService/MetricDefinitions/AvgPowerConsumedHour"
        },
        {
            @odata.id: "redfish/v1/TelemetryService/MetricDefinitions/MinPowerConsumedHour"
        },
        {
            @odata.id: "redfish/v1/TelemetryService/MetricDefinitions/MaxPowerConsumedHour"
        },
        {
            @odata.id: "redfish/v1/TelemetryService/MetricDefinitions/AvgPowerConsumedDay"
        },
        {
            @odata.id: "redfish/v1/TelemetryService/MetricDefinitions/MinPowerConsumedDay"
        },
        {
            @odata.id: "redfish/v1/TelemetryService/MetricDefinitions/MaxPowerConsumedDay"
        },
        {
            @odata.id: "redfish/v1/TelemetryService/MetricDefinitions/AvgPowerConsumedWeek"
        },
        {
            @odata.id: "redfish/v1/TelemetryService/MetricDefinitions/MinPowerConsumedWeek"
        },
        {
            @odata.id: "redfish/v1/TelemetryService/MetricDefinitions/MaxPowerConsumedWeek"
        }
    ]
}
```
**14.2 Metric Report Definitions**

These definitions contain a descriptor of the metric report to be generated.

```json
}
```
14.3 Metric Reports

Metric Reports contain the location for the report generated from a metric report definition.
15 DumpService

DumpService APIs are used to dump and download debug information.

URI: /redfish/v1/Oem/Supermicro/DumpService
Method: GET
Response: 200

```json
{
  @odata.type: "#DumpService.v1_0_0.DumpService",
  @odata.id: "'/redfish/v1/Oem/Supermicro/DumpService",
  Id: "DumpService",
  Name: "Dump Service",
  Description: "Dump Service",
  Dumps:
  {
    @odata.id: "'/redfish/v1/Oem/Supermicro/DumpService/Dumps"
  },
  Actions: "{
    Oem: [{}],
    #SmdDumpService.CreateDump: ({}[
      @Redfish.ActionInfo: "'/redfish/v1/Oem/Supermicro/DumpService/CreateDumpActionInfo"
    ],
    #SmdDumpService.DeleteAll: ({}[
      target: "'/redfish/v1/Oem/Supermicro/DumpService/Actions/SmcDumpService.DeleteAll"
    ])
  }
}
```
15.1 CreateDump

URI:
/redfish/v1/Oem/Supermicro/DumpService/Actions/SmcDumpService.CreateDump

Method: POST

Payload: {"DumpType": "Host Dump"}

Response: 202 Accepted

Task: Task added under TaskService to create dump process and link added in response to navigate to task details.
15.2 HostCrashDumps

When the host crash dump is created, you can download it from HostCrashDumpURI.

URI: /redfish/v1/Oem/Supermicro/DumpService/Dumps/HostCrashDump
Method: GET
Response: 200
15.3 Downloading Crash Dump

URI:
/redfish/v1/Oem/Supermicro/DumpService/Dumps/HostCrashDump/Actions/SmcDump.Download

Method: POST
Payload: {}
Response: 200
Filename: CDump.txt
16 Log Service

This resource represents system health event logs and maintenance event logs.

16.1 System Health Event Log

URI: /redfish/v1/Systems/1/LogServices/<logservice id>
Method: GET
Response: 200

16.1.1 Supported Actions

16.1.1.1 Clearing Logs
Use this API to delete all system health event log entries.

URI: /redfish/v1/Systems/1/LogServices/Log1/Actions/LogService.ClearLog
Method: POST
Response: 200
16.1.1.2 Clearing Acknowledgements
Use this API to clear acknowledgements to all log entries.

URI: /redfish/v1/Systems/1/LogServices/Log1/Actions/Oem/SmcLogService.ClearAcknowledgements
Method: POST
Response: 200

16.1.2 Log Entry Collection
Navigate to view collection of Log Entry resource instances.
/redfish/v1/Systems/1/LogServices/

URI: /redfish/v1/Systems/1/LogServices/<logservice id>/Entries
Method: GET
Response: 200

16.1.2.1 Acknowledging an Event
URI: /redfish/v1/Systems/1/LogServices/Log1/Entries/<num>
Method: PATCH
Payload: { "Oem": { "Supermicro": { "MarkAsAcknowledged": true } } }
Response: 200
16.2 Maintenance Event Log

URI: /redfish/v1/Managers/1/LogServices/<logservice id>
Method: GET
Response: 200

16.2.1 Supported Actions

16.2.1.1 Clearing Logs
Use this API to delete all maintenance event log entries.

URI: /redfish/v1/Managers/1/LogServices/Log1/Actions/LogService.ClearLog
Method: POST
Response: 200
16.2.2 Log Entry Collection

Navigate to view the collection of Log Entry resource instances.

URI: /redfish/v1/Managers/1/LogServices/<logservice id>/Entries
Method: GET
Response: 200

```json
{
   "@odata.type": "#LogEntryCollection.LogEntryCollection",
   "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries",
   "Name": "Maintenance Event Log Service Collection",
   "Description": "Collection of Maintenance Event Logs",
   "Members": [{
      "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/1",
      "Id": "1",
      "Name": "Maintenance Event Log Entry 1",
      "EntryType": "OEM",
      "Severity": "OK",
      "Created": "2020-07-24T05:02:19+00:00",
      "OemRecordFormat": "SMC",
      "Message": "IPMI configuration was restored to default successfully.",
      "MessageId": "Event.v1.0.FactoryDefaultRestored",
      "Oem": {
         "Supermicro": {
            "@odata.type": "#SmcLogEntryExtensions.v1_0_1.LogEntry",
            "Interface": "Redfish",
            "User": "ADMIN(ADMIN)",
            "Source": "10.124.8.168",
            "Category": "other"
         }
      }
   },
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/2", Id: "2"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/3", Id: "3"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/4", Id: "4"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/5", Id: "5"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/6", Id: "6"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/7", Id: "7"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/8", Id: "8"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/9", Id: "9"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/10", Id: "10"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/11", Id: "11"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/12", Id: "12"},
   {"@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/13", Id: "13"}
}
```
17 Jsonschema

The JSON Schema File resource describes the location (URI) of a particular Redfish schema definition being implemented or referenced by a Redfish service.

/redfish/v1/JsonSchemas

18 Registries

Registry defines the base messages for Redfish. It represents properties for the registries themselves. The Message ID is formed per the Redfish specification. It consists of the RegistryPrefix concatenated with the version concatenated with the unique identifier for the message registry entry.

/redfish/v1/Registries/Base.v1_4_0
19 Examples

You can integrate current APIs into their software and applications in order to receive all services provided by Redfish APIs.

19.1 System Reset

URI: /redfish/v1/Systems/1/Actions/ComputerSystem.Reset
Method: POST
ResetType:
Response: 200
19.2 Notifications

19.2.1 SMTP

After applying the configurations, generate any system events to check if an email alert is received.

19.2.1.1 Disabling SMTP SSL Authentication

URI: /redfish/v1/Managers/1/Oem/Supermicro/SMTP
Method: PATCH
Payload:
{"SmtpServer":"mailserver_ip or mailserver_name",
"SmtpPortNumber": "server_port",
"SmtpUserName":"user_name",
"SmtpPassword":"user_password",
"SmtpSenderAddress":"sender_email_address"
}

19.2.1.2 Enabling SMTP SSL Authentication

URI: /redfish/v1/Managers/1/Oem/Supermicro/SMTP
Method: PATCH
Payload:
{"SmtpSSLEnabled": true,
"SmtpServer":"mailserver_ip or mailserver_name",
"SmtpPortNumber": "server_port",
"SmtpUserName":"user_name",
"SmtpPassword": "user_password",
"SmtpSenderAddress":"sender_email_address"
}
19.2.2 SNMP
URI: /redfish/v1/Managers/1/Oem/Supermicro/SNMP
Method: PATCH
Payload: {"SnmpEnabled":true}

19.2.2.1 SNMPv2
URI: /redfish/v1/Managers/1/Oem/Supermicro/SNMP/SNMPv2
Method: PATCH
Payload: {"Snmpv2Enabled":true,"ROCommunity":"rtest","RWCommunity":"wtest"}

19.2.2.2 SNMPv3
URI: /redfish/v1/Managers/1/Oem/Supermicro/SNMP/SNMPv3
Method: PATCH
Payload: {"Snmpv3Enabled":true,"UserName":"administrator","AuthProtocol":"SHA1","PrivateProtocol":"DES","AuthKey":"Test1234","PrivateKey":"Test1234"}

19.2.3 Syslog
URI: /redfish/v1/Managers/1/Oem/Supermicro/Syslog
Method: PATCH
Payload: {"EnableSyslog": true, "SyslogPortNumber": 514, "SyslogServer": "10.136.176.16"}

19.3 FanMode
URI: /redfish/v1/Managers/1/Oem/Supermicro/FanMode
Method: PATCH
Payload: {"Mode": "FullSpeed"}
Mode Allowable Values: {"Standard", "FullSpeed", "PUE2", "HeavyIO"}
19.4 NTP

URI: /redfish/v1/Managers/1/Oem/Supermicro/NTP
Method: PATCH
Payload:
{"NTPEnable": true,
 "PrimaryNTPServer":"127.0.0.1",
 "SecondaryNTPServer":"127.0.0.1",
 "DaylightSavingTime": false
}
Response: 202

Note: Check the task monitor to check the progress for NTP.

19.5 RADIUS

URI: /redfish/v1/Managers/1/Oem/Supermicro/RADIUS
Method: PATCH
Payload:
{"RadiusEnabled":true,
 "RadiusServerIP":"127.0.0.1",
 "RadiusPortNumber":1812,
 "RadiusSecret":"SECRET"}

19.6 Snooping

URI: /redfish/v1/Managers/1/Oem/Supermicro/Snooping
Method: GET

19.7 IP Access Control

URI: /redfish/v1/Managers/1/Oem/Supermicro/IPAccessControl
Method: PATCH
Payload: {"ServiceEnabled": true}
19.7.1 Adding a Rule

URI: /redfish/v1/Managers/1/Oem/Supermicro/IPAccessControl/FilterRules
Method: POST
Payload: \{"Address": ":<IP>\", "PrefixLength": 24, "Policy": "Accept\"
Policy Allowable Values: "Accept", "Drop"

19.7.2 Deleting a Rule

URI: /redfish/v1/Managers/1/Oem/Supermicro/IPAccessControl/FilterRules/<num>
Method: DELETE

19.8 SMCRAKP

URI: /redfish/v1/Managers/1/Oem/Supermicro/SMCRAKP
Method: PATCH
Payload: \{"Mode": "Enabled\"

19.9 IKVM

Launch HTML5 iKVM using Redfish.

URI: /redfish/v1/Managers/1/Oem/Supermicro/IKVM
Method: GET
Response:

```
{
  @odata.type: "#IKVM.v1_0_1.IKVM",
  @odata.id: C"/redfish/v1/Managers/1/Oem/Supermicro/IKVM",
  Id: "IKVM",
  Name: "IKVM",
  Current Interface: "HTML 5",
  URI: C"/redfish/A1MyncGQdQ7LF4g.IKVM"
}
```

Use response property, "URI", above to prepend "https://${BMC_IP}" and paste this complete URL in a browser to render HTML5 iKVM.

Example of launching URL: https://${BMC_IP}/redfish/Kk1D4UVATDja0Jw.IKVM
19.10  iKVM Mouse Mode

URI: /redfish/v1/Managers/1/Oem/Supermicro/MouseMode
Method: PATCH
Payload: {"Mode": "Relative"}
Mode Allowable Values: "Absolute", "Relative", "Single"

19.11  KCS Channel Control

This API allows you to secure their environment by giving appropriate privileges to access the KCS interface.

URI: /redfish/v1/Managers/1/Oem/Supermicro/KCSInterface
Method: PATCH
Payload: {"Privilege": "Administrator"}

Privilege Allowable Values:
- **Administrator**: Users accessing KCS interface will be able to do all the operations that the administrator user can do.
- **Operator**: Users accessing KCS interface will be able to do all the operations that users with Operator privileges can do.
- **User**: Users accessing the KCS interface will be able to do all the operations that users with User privileges can do.
- **Callback**: This may be considered the lowest privilege level. Only commands necessary to support initiating a Callback are allowed.
19.12  Getting MAC Addresses from System NICs

https://{BMC_IP}/redfish/v1/Systems/1/EthernetInterfaces/1

19.13  Python Code for Redfish API Response

```python
base_url = 'https://"IP"/redfish/v1/Managers/1/SerialInterfaces/1'
dict_host = requests.get(base_url).json()
print (json.dumps(dict_host, indent=2))

Output:

```
```
19.14 Chassis Intrusion

**Method:** Get/Patch  
[PATCH]: /redfish/v1/Chassis/1  
**Payload:** 
```
{  
  "PhysicalSecurity": {  
    "IntrusionSensor": "Normal"  
  }  
}
```
20 Available APIs

**Note:** Always check the status code once you get a response from the Redfish URL. You can refer to the status code table mentioned above. Note that all URLs/commands are case-sensitive.

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<thead>
<tr>
<th>API List</th>
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</thead>
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<td>Service root</td>
</tr>
<tr>
<td>/redfish/v1/Chassis</td>
<td></td>
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<td>/redfish/v1/AccountService</td>
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<td>/redfish/v1/JsonSchemas</td>
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<td>/redfish/v1/TaskService</td>
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<tr>
<td>/redfish/v1/CertificateService</td>
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<td>/redfish/v1/TelemetryService</td>
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<td>/redfish/v1/UpdateService/FirmwareInventory/Golden_BMC</td>
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<td>/redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate</td>
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<td>/redfish/v1/UpdateService/Actions/UpdateService.StartUpdate</td>
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<td>/redfish/v1/UpdateService/StartUpdateActionInfo</td>
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<td>/redfish/v1/UpdateService/Actions/Oem/SmcUpdateService.Install</td>
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<td>/redfish/v1/UpdateService/Oem/Supermicro/InstallActionInfo</td>
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<td>/redfish/v1/UpdateService/Oem/Supermicro/IPMIConfig/Actions/SmcIPMIConfig.Upload</td>
<td>Uploads the new IPMI configuration file to set BMC</td>
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<td>/redfish/v1/UpdateService/Oem/Supermicro/IPMIConfig/Actions/SmcIPMIConfig.Download</td>
<td>Downloads IPMI configuration as a file</td>
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<tr>
<td>/redfish/v1/UpdateService/Oem/Supermicro/SSLCert</td>
<td>Views the current SSL certification info</td>
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<tr>
<td>/redfish/v1/UpdateService/Oem/Supermicro/SSLCert/Actions/SmcSSLCert.Upload</td>
<td>Uploads the new SSL certification file</td>
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<td>/redfish/v1/UpdateService/Oem/Supermicro/FirmwareInventory</td>
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<td>/redfish/v1/UpdateService/Oem/Supermicro/FirmwareInventory/BMC/Actions/SmcFirmwareInventory.EnterUpdateMode</td>
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<td>/redfish/v1/UpdateService/Oem/Supermicro/FirmwareInventory/MRVL_HARAIDController.[controller_num]</td>
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<td>/redfish/v1/Oem/Supermicro/DumpService/CreateDumpActionInfo</td>
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21 Reference Links

- **Supermicro Redfish:**
  https://www.supermicro.com/solutions/Redfish.cfm

- **Supermicro YouTube:**
  https://www.youtube.com/SupermicroSoftware

- **DMTF Redfish:**
  http://www.dmtf.org/standards/redfish
  http://redfish.dmtf.org/

- **Mockups:**
  http://redfish.dmtf.org/redfish/v1

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