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Manual Revision 3.4
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<th>Revision</th>
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<td>3.4</td>
<td>1. Added DNS setting</td>
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<td>2. Modified Available APIs</td>
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<td>3. Modified RAID Configuration</td>
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<td>4. Added support platform with Fixed Boot Order</td>
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<td>04/06/2023</td>
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<td>1. Added the FixedBootOrder section</td>
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<td>3. Updated the API URI list</td>
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<td>4. Added the Updated the NIC Firmware chapter</td>
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<td>5. Add support for activating via the Redfish API</td>
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<td>11/01/2023</td>
<td>3.2</td>
<td>1. Fix uri to /redfish/v1/Registries/Base</td>
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<td>2. Added 10.1.1 Check Task State</td>
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<td>3. Deleted Section 6: AuthFailureLoggingThreshold:</td>
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<td>4. Modified Section 8.3: Replacing a Certificate</td>
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<td>5. Modified Section 9.4: SendTestEvent-&gt; SubmitTestEvent</td>
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<td>6. Modified Section17,18: Method, Response of Jsonschema</td>
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<td>7. Delete SMTP section (deprecated in RF 1.9)</td>
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<td></td>
<td></td>
<td>8. Modified SNMP 19.2.1 Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Modified Available APIs</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>/redfish/v1/Registries/BiosAttributeRegistry.v1_0_0</code></td>
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<tr>
<td></td>
<td></td>
<td><code>/redfish/v1/UpdateService/FirmwareInventory/Backup_BIOS</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>/redfish/v1/UpdateService/FirmwareInventory/Backup_BMC</code></td>
</tr>
</tbody>
</table>
Contents

1 Applicable or Supported Platforms ............................................................................................................ 7

2 Introduction .............................................................................................................................................. 8

3 HTTP Request Methods .......................................................................................................................... 9
    3.1 Responses ........................................................................................................................................ 10
    3.2 HTTP Status Code Description ....................................................................................................... 11

4 Using RESTful APIs .................................................................................................................................. 12
    4.1 Authentication ................................................................................................................................. 12
        4.1.1 Basic Authentication .............................................................................................................. 12
        4.1.2 Session Management ............................................................................................................ 12

5 FirmwareInventory and UpdateService ...................................................................................................... 13
    5.1 FirmwareInventory .......................................................................................................................... 13
        5.1.1 Firmware Resiliency Actions .............................................................................................. 14
    5.2 Updating BIOS Firmware .............................................................................................................. 14
    5.3 Updating BMC Firmware .............................................................................................................. 15
    5.4 Updating CPLD Firmware ............................................................................................................ 16
    5.5 Simple Update .................................................................................................................................. 16
    5.6 Updating Broadcom Storage Controller Firmware ......................................................................... 17
    5.7 Updating Marvel Storage Controller Firmware ............................................................................. 17
    5.8 Updating AOC NIC Firmware ...................................................................................................... 17
    5.9 Updating SSL Certificate and Key ................................................................................................. 18

6 Account Service ......................................................................................................................................... 19
    6.1 Creating a User .............................................................................................................................. 20
    6.2 Configuring User Lockout ............................................................................................................ 20
    6.3 Active Directory ............................................................................................................................ 20
    6.4 LDAP ............................................................................................................................................ 20

7 BIOS Configuration .................................................................................................................................... 22
    7.1 Changing a Password ..................................................................................................................... 22
    7.2 Configuring BIOS over Redfish .................................................................................................. 22
        7.2.1 Modifying BIOS Attributes ............................................................................................... 24
        7.2.2 Viewing Pending Settings .................................................................................................. 24
    7.3 Resetting BIOS .............................................................................................................................. 25
    7.4 Boot Options ................................................................................................................................... 25
        7.4.1 Configuring the Boot Order in System BIOS .................................................................... 25
        7.4.2 Configuring UefiBootNext ................................................................................................. 25
    7.5 Secure Boot ..................................................................................................................................... 25
        7.5.1 Enabling Redfish Secure Boot by GET .............................................................................. 25
        7.5.2 Enabling Redfish Secure Boot by PATCH ........................................................................ 26
        7.5.3 Confirming in Pending Settings ........................................................................................... 26
        7.5.4 Enabling Secureboot in BIOS ......................................................................................... 27
    7.6 FixedBootOrder ............................................................................................................................... 29
        7.6.1 Changing the Boot Order Getting the Current Boot Order .................................................... 29
        7.6.2 Changing the Current Boot Order ..................................................................................... 30

8 CertificateService ...................................................................................................................................... 31
    8.1 Generating CSR ............................................................................................................................ 33
        8.1.1 Generating CSR Action Info .............................................................................................. 33
        8.1.2 Generating a CSR Request ................................................................................................ 34
        8.1.3 Viewing Certificate Details ................................................................................................ 35
    8.2 Replacing a Certificate .................................................................................................................. 36
        8.2.1 Replacing Certificate Action Info ...................................................................................... 36
        8.2.2 Renewing a Certificate ....................................................................................................... 37
    8.3 Replacing the Key Certificate .......................................................................................................... 38
1 Applicable or Supported Platforms

The Redfish Reference Guide applies to following platforms.

- X12 and H12 platforms.
- X13, and H13 platforms.
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 centers 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</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>
<tr>
<td>302</td>
<td>Found</td>
</tr>
<tr>
<td>304</td>
<td>Not Modified</td>
</tr>
</tbody>
</table>
4 Using RESTful APIs

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 for 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 protocols 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 several 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>
}
```

The user will receive the “201” message code with the 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 the “SessionTimeout” value if needed

Example: [PATCH] https://BMC_IP/redfish/v1/SessionService Payload: {"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.

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

```json
{
    "@odata.type": "#SoftwareInventoryCollection.SoftwareInventoryCollection",
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory",
    "Id": "UpdateService",
    "Name": "Firmware Inventory Collection",
    "Members@odata.count": 19,
    "Members": [ 
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/BMC" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Backup_BMC" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Golden_BMC" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Staging_BMC" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/BIOS" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Backup_BIOS" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Golden_BIOS" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Staging_BIOS" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Capsule_BIOS" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Capsule_ME" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Capsule_MCU" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/Golden_CPLD_Motherboard" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/CPLD_Motherboard" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/CPLD_Backplane_1" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/BIOS_ME" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/NIC1" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/NVMeController1" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/PowerSupply1" },
        { "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/PowerSupply2" },
    ],
    "Oem": {
```
5.1.1 Firmware Resiliency Actions

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

```json
{
  "Targets": ["/redfish/v1/Managers/1"],
  "InstallOptions": ["UpdateGolden"]
}
```

**Response**: 200

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 the payload.

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

```json
{"Targets": ["/redfish/v1/Systems/1/Bios"],
"@Redfish.OperationApplyTime": "Immediate",
"Oem": {"Supermicro": {"BIOS": {"PreserveME": true, "PreserveNVRAM": true, "PreserveSMBIOS": true,
"BackupBIOS": false }}}}
```

**UpdateFile**: <File>

**Notes**:
- On X12 (Whitley and Tatlow series), X13, and later platforms, only these commands are available for use when using this method: PreserveOA, PreserveSETUPCONF, PreserveSETUPPWD, PreserveSECBOOTKEY, PreserveBOOTCONF, and UpdateRollbackID (note that this only works for RoT).
- With RoT, only these commands are available for use when using this method: PreserveME, PreserveNVRAM, PreserveSMBIOS, and BackupBIOS.

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

**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 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:
  
  ```json
  {"Targets": ["/redfish/v1/UpdateService/FirmwareInventory/CPLD_Motherboard"],
   "@Redfish.OperationApplyTime": "Immediate"}
  UpdateFile: <File>
  ```

  *Note: After Motherboard CPLD update, it will trigger a BMC reset.*

- Use the image file available on the local system to update CPLD backplane firmware:
  
  URI: /redfish/v1/UpdateService/FirmwareInventory
  Method: POST
  Response: 202
  UpdateParameters:
  
  ```json
  {"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/HARAID#/StorageControllers/[num]"],"@Redfish.OperationApplyTime": "OnStartUpdateRequest"}
```

**UpdateFile:** <File>

*Note:* Currently, this is supported to update HA-RAID 3108, 38xxIR, 39xx, and BCOM 3916. After the update, it needs a system reboot for the new firmware to take effect.

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.HARAID#/StorageControllers/[num]"],"@Redfish.OperationApplyTime": "OnStartUpdateRequest"}
```

**UpdateFile:** <File>

5.8 Updating AOC NIC Firmware

“NIC [num]” exists under the Redfish/v1 directory when your AOC NIC controller is supported. To ensure that you can update the AOC NIC controller firmware, check if “NIC [num]” exists in the URI.

/redfish/v1/UpdateService/FirmwareInventory/NIC[num].

To update AOC NIC firmware, use the image file on the local system:

**URI:** /redfish/v1/UpdateService/upload

**Method:** POST

**Response:** 202

**UpdateParameters:**

```
{"Targets": ["/redfish/v1/UpdateService/FirmwareInventory/NIC[num]"],
"@Redfish.OperationApplyTime": "OnStartUpdateRequest"}
```

**UpdateFile:** <File>
5.9 Updating SSL Certificate and Key

Update the SSL certificate and key for a 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, 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 "Administrator", "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:

```
{
  "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=ipmiswqa,dc=satc,dc=com", "cn=pmiswqa,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 BIOS Configuration

Use BIOS APIs to configure properties related to BIOS. The Attribute Registry contains system-specific BIOS attributes and their 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:**

```json
{
    "PasswordName":"AdministratorPassword" or "UserPassword",
    "OldPassword":"",
    "NewPassword":"Password"
}
```

### 7.2 Configuring BIOS over Redfish

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

```json
{
    "@odata.type": "#AttributeRegistry.v1_3_0.AttributeRegistry",
    "Description": "This registry defines a representation of BIOS Attribute instances", "Id":
    "BiosAttributeRegistry.1_0_0",
    "Language": "en",
    "Name": "BIOS Attribute Registry",
    "OwningEntity": "Supermicro",
    "RegistryEntries": {
        "Attributes": [
            
        ]
    }
}
```
Attributes: Contains the attributes and their possible values

```json
{
  "AttributeName": "OptionROMMessages_0028",
  "CurrentValue": "Force BIOS",
  "DefaultValue": "Force BIOS",
  "DisplayName": "Option ROM Messages",
  "GrayOut": false,
  "HelpText": "Set display mode for Option ROM",
  "Hidden": false,
  "MenuPath": ".\Advanced\Boot Feature",
  "ReadOnly": false,
  "Type": "Enum",
  "Value": [
    "Force BIOS",
    "Force ROM",
    "Force ESC"
  ]
}
```
7.2.1 Modifying BIOS Attributes

You can GET the current setting and PATCH desired settings.

**URI:** /redfish/v1/Systems/1/Bios

**Method:** PATCH

**Response:** 202

**Payload:**

```json
{
    "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

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.

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 was 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

```
{
    "@odata.type": "#SecureBoot.v1_0_5.SecureBoot", "@odata.id": "/redfish/v1/Systems/1/SecureBoot", "Id": "Security Boot",
    "Name": "SecureBoot",
    "SecureBootCurrentBoot": "Disabled",
    "SecureBootEnable": false,
    "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
ResetKeyTypes URI: /redfish/v1/Systems/1/SecureBoot/Actions/SecureBoot.ResetKeys
Method: POST
Payload:

```
{
    "ResetKeysType": "DeleteAllKeys"
}
```

ResetKeyTypes 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"
7.6 FixedBootOrder
You can check and change the current boot order.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X13/H13</td>
<td>1.01.x</td>
<td>Ver.3.3</td>
</tr>
</tbody>
</table>

7.6.1 Changing the Boot Order Getting the Current Boot Order

URI: /redfish/v1/Systems/1/Oem/Supermicro/FixedBootOrder
Method: GET
Response: 200

```json
{
  "@odata.type": "#SmcFixedBootOrder.v1_0_0.SmcFixedBootOrder", 
  "@odata.id": "/redfish/v1/Systems/1/Oem/Supermicro/FixedBootOrder", 
  "Id": "FixedBootOrder", 
  "Name": "Fixed Boot Order", 
  "BootModeSelected": "UEFI", 
  "FixedBootOrder": [
    "UEFI USB CD/DVD:UEFI: ATEN Virtual CDROM YS0J", 
    "UEFI Hard Disk", 
    "UEFI AP:UEFI: Built-in EFI Shell", "UEFI Network", 
    "UEFI USB Floppy", "UEFI CD/DVD", 
    "UEFI USB Hard Disk", 
    "UEFI USB Key", 
    "UEFI USB Lan"
  ],
  "FixedBootOrderDisabledItem": [ "Disabled" ],
  "UEFIAP": [ 
    "UEFI: Built-in EFI Shell"
  ],
  "UEFIAPDisabledItem": [ "Disabled" ],
  "UEFIUSBCD/DVD": [ 
    "UEFI: ATEN Virtual CDROM YS0J"
  ],
  "UEFIUSBCD/DVDDisabledItem": [ "Disabled"
  ],
  "@odata.etag": ""506cd45c4c3409c7c1a8e90a53825cb6""
}
```
7.6.2 Changing the Current Boot Order

For the property “FixedBootOrder,” the boot order arrangement is decided by the group.

URI: /redfish/v1/Systems/1/Oem/Supermicro/FixedBootOrder
Method: PATCH

Step 1. Set the boot order of device groups.

Payload:

{
  "FixedBootOrder":["UEFI Hard Disk",
  "UEFI CD/DVD", "UEFI USB Hard Disk", "UEFI USB Key:UEFI OS (USB,Port:9)", "UEFI USB Floppy",
  "UEFI USB Lan", "UEFI Network:(B3/D0/F0) UEFI PXE IPv4 Intel(R) I210 Gigabit Network Connection(MAC:7cc255144d22)", "UEFI AP:UEFI: Built-in EFI Shell"]
}

Step 2. Set the boot order of devices in each device group.

Payload:

{
  "UEFISUSBKey":["UEFI OS (USB,Port:9)", "UEFI OS (USB,Port:6)"
}

It is the same group setting as that in the Supermicro BIOS Setup Menu.

Notes:

• The amount of Device Group of PATCH payload should be equal to that of the current fixed boot order setting.
• The fixed boot order cannot interlace different Device Groups.
• The amount of specific Device Group of PATCH payload should be equal to that of the current specific Device Group.
• For each Device Group, the first boot device in the order cannot be disabled. The disabled boot device must be after another enabled device.
• The Device Group and boot order of each Device Group should be changed if a user prefers to change both the Device Group and the specific Device Group boot order in the fix boot order setting.
• The new setting changes take effect after the system is reset.

Response: 202
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:**

```json
{

}
```

**Response:** 200

```json
{
   "@odata.type": "#CertificateService.v1_0_1.CertificateService",
   "@odata.id": "/redfish/v1/CertificateService",
   "Id": "CertificateService", "Name": "Certificate Service",
   "CertificateLocations": {
      "@odata.id": "/redfish/v1/CertificateService/CertificateLocations"
   },
   "Actions": {
      "Oem": {

      },
      
      "#CertificateService.GenerateCSR": {
         "target": "/redfish/v1/CertificateService/Actions/CertificateService.GenerateCSR",
         "@Redfish.ActionInfo": "/redfish/v1/CertificateService/GenerateCertificateActionInfo"
      },
      
      "#CertificateService.ReplaceCertificate": {
         "@Redfish.ActionInfo": "/redfish/v1/CertificateService/ReplaceCertificateActionInfo"
      }
   }
}
```
"@odata.type": "#ActionInfo.v1_1_2.ActionInfo",
"@odata.id": "/redfish/v1/CertificateService/GenerateCSRActionInfo", "Id": "GenerateCSRActionInfo",
"Name": "Generate CSR Action Info",
"Parameters": [
{
   "Name": "CommonName", "Required": true, "DataType": "String"
},
{
   "Name": "AlternativeNames", "Required": false,
   "DataType": "StringArray"
},
{
   "Name": "Organization", "Required": true, "DataType": "String"
},
{
   "Name": "OrganizationalUnit", "Required": true,
   "DataType": "String"
},
{
   "Name": "City", "Required": true, "DataType": "String"
},
{
   "Name": "State", "Required": true, "DataType": "String"
},
{
   "Name": "Country", "Required": true, "DataType": "String"
},
{
   "Name": "Email", "Required": false, "DataType": "String"
},
"Name": "KeyPairAlgorithm", "Required": false, "DataType": "String", "AllowableValues": [
   "TPM_ALG_RSA"
],
{
   "Name": "KeyBitLength", "Required": false, "DataType": "Number", "MinimumValue": 1024, 
   "MaximumValue": 4096
},
{
   "Name": "CertificateCollection", "Required": true,
   "DataType": "Object"
},
{
   "Name": "KeyUsage", "Required": false, "DataType": 
   "StringArray", "AllowableValues": [ 
   "ServerAuthentication"
]
},
"Oem": "

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:**

```json
{
    "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

```
{
    "@odata.type": "#Certificate.v1_1_0.Certificate",
    "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates/1",
    "Id": "1",
    "Name": "HTTPS Certificate",
    "CertificateString": 
    "-----BEGIN CERTIFICATE-----
    MIIE3TCCA8WgAwIBAgIUcdkJIAr/gSwrinFL4k+XbWBn1R6wOQYJKoZIhvcNAQEL
    nBQAwgZ8xZaAJBqVNZAYTAVMWMwEQYDVQQIEwpD
    Yw0xMmMxMTUwNzA3MDAwMB0nMFAQaAAQABgQIhAfE7
    bQwIbG9jZyBhZGZ3b3JnNjIuY3ZvLmNhLmVudCAiUECMU5WzA1M1Y1MzU5M1Y1
    MQSwCwDQYDVQQEDwUJUE1JMSUwIwYDVQQDEwRJUE1JMSUwIwYJKoZIhvcNAQcD
    UQwJFAEBc3VwcG9ydEBzdXBlcm1pY3JvLmNvbYIUcdkJIAr/gSwrinFL4k+XbWBn1
    "
    "CertificateType": "PEM",
    "Issuer":
    {
        "Country": "US",
        "State": "California",
        "City": "San Jose",
        "Organization": "Super Micro Computer",
        "OrganizationalUnit": "Software",
        "CommonName": "IPMI",
        "Email": "support@supermicro.com"
    },
    "Subject":
    {
        "Country": "US",
        "State": "California",
        "City": "San Jose",
        "Organization": "Super Micro Computer",
        "OrganizationalUnit": "Software",
        "CommonName": "IPMI",
        "Email": "support@supermicro.com"
    },
    "ValidNotBefore": "2023-05-23T00:00:00+00:00",
    "ValidNotAfter": "2033-05-23T00:00:00+00:00",
    "KeyUsage": [ "ServerAuthentication" ],
    "Actions":
    { "#Certificate.Rekey":
        { "target": "/redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates/1/Actions/Certificate.Rekey" },
        { "#Certificate.Renew":
            { "target": "/redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates/1/Actions/Certificate.Renew" } }
    }
}
```

8.2 Replacing a Certificate

You can replace an existing certificate. Note that the new file must be a signed 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:**

```json
{}
```

**Response:**

```json
{
  "@odata.type": "#ActionInfo.v1_1_2.ActionInfo",
  "@odata.id": "/redfish/v1/CertificateService/ReplaceCertificateActionInfo", "Id": "ReplaceCertificateActionInfo", "Name": "Replace Certificate Action Info", "Parameters": [
  {"Name": "CertificateString", "Required": true, "DataType": "String"},
  {"Name": "CertificateType", "Required": true, "DataType": "String", "AllowableValues": ["PEM"]},
  {"Name": "CertificateUri", "Required": true, "DataType": "Object"
  }
],
"Oem": {}
8.2.2 Renewing a Certificate

URI: /redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates/1/Actions/Certificate.Renew
Method: POST
Payload:

```
{ "CertificateString": "-----BEGIN CERTIFICATE REQUEST-----
\nMIICvjCCAgwCAQBkEBML5yH+M9n1y5zGw
\n-----END CERTIFICATE REQUEST-----
",
"CertificateType": "PEM",
"@odata.id": "/redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates/1"
}
```

Response: 200
8.3 Replacing the Key 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 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:**

```json
{
  "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:**

```json
{
  "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 the value to be 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:
  - SNMPv1
  - SMTP
  - Redfish
  - SNMPv3

- **EventTypes:** This property shall contain the types of events you want to receive.

  Allowable values:
  - StatusChange
  - ResourceUpdated
  - ResourceAdded
  - ResourceRemoved
  - Alert"
• **Severity**: This property shall contain the severity of the event that you want to configure.

Allowable values:

- Information
- Warning
- Critical
9.2 Viewing All Subscriptions

To view all subscriptions, follow these steps.

**URI:** /redfish/v1/EventService/Subscriptions  
**Method:** GET

```json
{
    "@odata.type": "#EventDestinationCollection.EventDestinationCollection",  
    "@odata.id": "/redfish/v1/EventService/Subscriptions",  
    "Name": "Event Subscriptions Collection",  
    "Members": [  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/1"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/2"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/3"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/4"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/5"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/6"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/7"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/8"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/9"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/10"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/11"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/12"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/13"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/14"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/15"  
        },  
        {  
            "@odata.id": "/redfish/v1/EventService/Subscriptions/16"  
        }  
    ],  
    "Members@odata.count": 16
}
```
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 the subscriber(s).

**URI:** /redfish/v1/EventService/Actions/EventService.SubmitTestEvent

**Payload:**

```json
{
  "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:**

```json
{@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:**

```json
{@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 00:52:00', '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/VirtualMedia[mounted dev num]/Actions/VirtualMedia.InsertMedia

**Method:** POST

**Payload:**
```
{
  "Image": "<host>/<path>",
  "UserName": "some_username",
  "Password": "some_password"
}
```

**Response:** 202
10.1.1 Checking the Task State
URI: /redfish/v1/TaskService/Tasks/[TASK_NUM]
Method: Get

10.1.2 Verifying the ISO was Mounted by the Redfish Command
URI: /redfish/v1/Managers/1/VirtualMedia/VirtualMedia[mounted_dev_num]
Method: GET
Payload:

```
{}
```

10.2 Unmounting the ISO
URI: /redfish/v1/Managers/1/VirtualMedia/VirtualMedia[mounted_dev_num]/Actions/VirtualMedia.EjectMedia
Method: POST
Payload: {}

10.2.1 Verifying the ISO was Unmounted by the Redfish Command
Verify whether the ISO was unmounted using the Redfish command; the node should be removed.
URI: /redfish/v1/Managers/1/VirtualMedia/VirtualMedia[mounted_dev_num]
Method: GET
Response: 200
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

```json
{
   "@odata.type": "#PCIeDevice.v1_4_0.PCIeDevice",
   "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/NIC1", "Id": "NIC1",
   "Name": "PCIeDevices",
   "Description": "NIC device (riser: RSC-D-6G5)", "Manufacturer": "Supermicro",
   "Model": "",
   "SerialNumber": "",
   "PartNumber": "", "DeviceType": "MultiFunction",
   "FirmwareVersion": "", "Status": {
      "State": "Disabled",
      "Health": "OK",
      "HealthRollup": "OK"
   },
   "PCIeInterface": { "PCIeType": "Gen1", "MaxPCIeType": "Gen5", "LanesInUse": 8,
      "MaxLanes": 8
   },
   "PCIeFunctions": { @odata.id": "/redfish/v1/Chassis/1/PCIeDevices/NIC1/PCIeFunctions"
   },
   "Links": {
      "Chassis": [
         { @odata.id": "/redfish/v1/Chassis/1"
      ]
   },
   "Oem": {}
}
```
11.2 GPU
URI: /redfish/v1/Chassis/1/PCIeDevices/GPU1
Method: GET
Response: 200

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

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 a 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
"@odata.type": "#Storage.v1_9_0.Storage", 
"@odata.id": "redfish/v1/Systems/1/Storage/HA-RAID", "Id": "HA-RAID", 
"Name": "HA Storage System", "StorageControllers": [
  
  { 
  "@odata.id": "redfish/v1/Systems/1/Storage/HA-RAID/StorageControllers/0", "MemberId": "0", 
  "Manufacturer": "Broadcom", "Model": "SAS 3908", 
  "SerialNumber": "FW-00000000", "FirmwareVersion": "5.240.02-3768", 
  "Status": { 
    "State": "Enabled", 
    "Health": "OK" 
  }, 
  "Identifiers": [] 
  }
], 
"Controllers": [ 
  { 
  "@odata.id": "redfish/v1/Systems/1/Storage/HA-RAID/Controllers" },
  
  "Drives": [ 
  { 
  "@odata.id": "redfish/v1/Chassis/HA-RAID.0.StorageEnclosure.0/Drives/Disk.Bay.1" }, 
  { 
  "@odata.id": "redfish/v1/Chassis/HA-RAID.0.StorageEnclosure.0/Drives/Disk.Bay.5" }
], 
"Volumes": [ 
  { 
  "@odata.id": "redfish/v1/Systems/1/Storage/HA-RAID/Volumes" }
], 
"Links": { 
  "Enclosures": [ 
  { 
  "@odata.id": "redfish/v1/Chassis/HA-RAID.0.StorageEnclosure.0" }
  ], 
  "SimpleStorage": { 
  "@odata.id": "redfish/v1/Systems/1/SimpleStorage/1" }
}, 
"Actions": { 
  "Oem": { 
  "#SmcHARAIDController.Save": { 
  "target": "redfish/v1/Systems/1/Storage/HA-RAID/Actions/Oem/SmcHARAIDController.Save", 
  "@Redfish.ActionInfo": 
  "redfish/v1/Systems/1/Storage/HA-RAID/Oem/SmcStorage/SaveActionInfo" 
  }, 
  "#SmcStorage.CreateVolume": { 
  "target": "redfish/v1/Systems/1/Storage/HA-RAID/Actions/Oem/SmcStorage.CreateVolume", 
  "@Redfish.ActionInfo": 
  "redfish/v1/Systems/1/Storage/HA-RAID/Oem/SmcMicro/CreateVolumeActionInfo" 
  }, 
  "#SmcStorage.ClearVolumes": { 
  "target": "redfish/v1/Systems/1/Storage/HA-RAID/Actions/Oem/SmcStorage.ClearVolumes", 
  "@Redfish.ActionInfo": 
  
  "redfish/v1/Systems/1/Storage/HA-RAID/Oem/SmcMicro/ClearVolumesActionInfo" 
  }
  }, 
  "Description": { 
    "External RAID", 
    "Status": { 
      "State": "Enabled", 
      "Health": "OK" 
    } 
  }, 
  "@odata.etag": ""55ae4cf460abfd6b1c5fc50d7e434f83f""
12.2 Viewing Details of HBA Controller, Drive and Volume

URI: /redfish/v1/Systems/1/Storage/HBA
Method: GET
Response: 200
{
    "@odata.type": "#Storage.v1_9_0.Storage",
    "@odata.id": "/redfish/v1/Systems/1/Storage/HBA", "Id": "HBA",
    "Name": "HBA Storage System",
    "StorageControllers": [
        {
            "@odata.id": "/redfish/v1/Systems/1/Storage/HBA#/StorageControllers/0", "MemberId": "0",
            "Manufacturer": "Broadcom",
            "Model": "SAS3808",
            "SerialNumber": "UA20CS003047R101",
            "FirmwareVersion": "23.00.00.00", "Status": {
                "State": "Enabled",
                "Health": "OK"
            },
            "Identifiers": [
                { "DurableName": null }
            ],
            "SupportedControllerProtocols": [ "PCIe" ],
            "SupportedDeviceProtocols": [ "SATA", "SAS" ],
            "Oem": { }
        }
    ],
    "Controllers": {
        "@odata.id": "/redfish/v1/Systems/1/Storage/HBA/Controllers"
    },
    "Controllers": {
        "@odata.id": "/redfish/v1/Systems/1/Storage/HBA/Controllers"
    },
    "Drives": [ ],
    "Volumes": {
        "@odata.id": "/redfish/v1/Systems/1/Storage/HBA/Volumes"
    },
    "Links": {
        "Enclosures": [ ],
        "SimpleStorage": {
            "@odata.id": "/redfish/v1/Systems/1/SimpleStorage/1"
        },
        "Oem": { }
    },
    "Description": "External HBA",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "@odata.etag": ""a1ff5f1e00a725b15fb667521d51b022f"
}
12.3 Creating LSI31XX/38XXIR/39XX Logical Volume

URI: /redfish/v1/Systems/1/Storage/HA-RAID/Actions/Oem/SmcStorage.CreateVolume
Method: POST

Payload:

```
{
  "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", "VdName": "VD"
}
```

Response: 200
12.4 Locating Physical HDD

Method: POST
Payload:

```
{
  "Active": true
}
```

Response: 200

12.5 Locating Logical Volume

Method: POST
Payload:

```
{
  "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
Payload:

```
{
}
```

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

**Payload:**

```json
{
    "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

**Payload:**

```json
{
    "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

**Payload:**

```json
{
    "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

**URI:** /redfish/v1/Systems/1/Storage/MRVL.HA-RAID/Volumes/Controller.[controller_num].Volume.[volume_num]/Actions/Oem/SmcVolume/DeleteVD/
12.12 Rebuilding a Virtual Drive for Marvell

Method: POST
Payload:

12.13 Importing a Virtual Drive for Marvell

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

Method: POST
Payload:

12.14 NVME SSD

View NVME storage details.

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

```json
{
  "@odata.type": "#EthernetInterface.v1_6_3.EthernetInterface",  
  "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/1",  
  "Id": "1",  
  "Name": "Manager Ethernet Interface",  
  "Description": "Management Network Interface",  
  "Status": {  
    "State": "Enabled",  
    "Health": "OK"  
  },  
  "InterfaceEnabled": true,  
  "LinkStatus": "LinkUp",  
  "MACAddress": "3C:EC:EF:3B:FF:FF",  
  "SpeedMbps": 1000,
  "SpeedMbps@Redfish.AllowableValues": ["100", "1000"],  
  "AutoNeg": true,  
  "FullDuplex": true,  
  "MTUSize": 1500,  
  "HostName": "local",  
  "FQDN": "local.supermicro.com",  
  "MaxIPv4StaticAddresses": 5,  
  "VLAN": {  
    "VLANEnable": false,  
    "VLANId": 0  
  },  
  "DHCPv4": {  
    "DHCPEnabled": true,  
    "UseDNSServers": false,  
    ...  
  }
}
```
"UseGateway": true,
"UseNTPServers": false,
"UseStaticRoutes": false,
"UseDomainName": false,
"FallbackAddress": "None"
}

"DHCPv6": {
   "OperatingMode": "Stateless", "UseDNSServers": false, "UseDomainName": false, "UseNTPServers": false, "UseRapidCommit": false
}

"IPv4Addresses": [
   {
      "Address": "10.10.10.221",
      "SubnetMask": "255.255.255.0",
      "AddressOrigin": "DHCP",
      "Gateway": "10.10.10.1"
   }
]

"StatelessAddressAutoConfig": { "IPv4AutoConfigEnabled": false, "IPv6AutoConfigEnabled": true }

"IPv4StaticAddresses": [
   {
      "Address": null, "SubnetMask": null, "Gateway": null
   }
]

"IPv6StaticAddresses": [
   {
      "Address": ":*", "PrefixLength": 64
   },
   {
      "Address": ":*", "PrefixLength": 64
   },
   {
      "Address": ":*", "PrefixLength": 64
   },
   {
      "Address": ":*", "PrefixLength": 64
   },
   {
      "Address": ":*", "PrefixLength": 64
   }
]

"IPv6StaticDefaultGateways": [
]

"IPv6DefaultGateway": 
   "fe80::37a8:5e1:4a0b:cc7c",
"IPv6Addresses": [
   {
      "Address": "2111:1111:3::eedefffe:102f",
      "PrefixLength": 64,
      "AddressOrigin": "SLAAC",
      "AddressState": "Preferred"
   },
   {
      "Address": "fe80::3eedefff:fe3b:e02f",
      "PrefixLength": 64,
      "AddressOrigin": "LinkLocal",
      "AddressState": "Preferred"
   }
]

"NameServers": [
   "2111:1111::f0",
   "10.10.10.205"
]

"StaticNameServers": [
   "10.10.10.205",
   "10.10.10.226",
   "2001:db8::f"
]

"Oem": {
   "Supermicro": {
      "@odata.type": "#SmcEthernetInterfaceExtensions.v1_0_1.EthernetInterfaceExtensions",
      "IPProtocolStatus": "Dual",
      "UDID": "OE:00:00:00:01:00:01:2C:AA:A1:C3:3C:EC:EF:3B:E0:2F",
      "LANInterface": "Failover",
      "LANInterface@Redfish.AllowableValues": ["Dedicated", "Shared", "Failover"
    ],
    "ActiveInterface": "Dedicated"
   }
}
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
}
```

Response:

```json
{
  "@odata.type": "#HostInterface.v1_2_2.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, 
  "ExternallyAccessible": false, 
  "AuthenticationModes": [ 
    "BasicAuth", "RedfishSessionAuth" 
  ], 
  "HostEthernetInterfaces": { 
    "@odata.id": 
      "redfish/v1/Managers/1/HostInterfaces/1/HostEthernetInterfaces" 
  }, 
  "ManagerEthernetInterface": { 
    "@odata.id": 
      "redfish/v1/Managers/1/EthernetInterfaces/ToHost" 
  }, 
  "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:

```json
{
  "IPv4StaticAddresses" : [ { "Address" : "169.254.3.<num>" } ]
}
```
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:** 200

```json
{
    "@odata.type": "#TelemetryService.v1_2_0.TelemetryService",
    "@odata.id": "/redfish/v1/TelemetryService",
    "Id": "TelemetryService",
    "Name": "Telemetry Service",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "SupportedCollectionFunctions": ["Average", "Minimum", "Maximum"],
    "MetricDefinitions": {
        "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions"
    },
    "MetricReportDefinitions": {
        "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions"
    },
    "MetricReports": {
        "@odata.id": "/redfish/v1/TelemetryService/MetricReports"
    }
}
```
14.1 Metric Definitions

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

**URI:** /redfish/v1/TelemetryService/MetricDefinitions

**Method:** GET

**Response:** 200

```json
{
  "@odata.type": "#MetricDefinitionCollection.MetricDefinitionCollection",
  "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions",
  "Id": "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.
URI: /redfish/v1/TelemetryService/MetricReportDefinitions
Method: GET
Response: 200

```
{
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/AvgPowerConsumptionHour"
    },
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/MinPowerConsumptionHour"
    },
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/MaxPowerConsumptionHour"
    },
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/AvgPowerConsumptionDay"
    },
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/MinPowerConsumptionDay"
    },
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/MaxPowerConsumptionDay"
    },
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/AvgPowerConsumptionWeek"
    },
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/MinPowerConsumptionWeek"
    },
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/MaxPowerConsumptionWeek"
    }
  ]
}
```
14.3 Metric Reports

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

URI: /redfish/v1/TelemetryService/MetricReports

Method: GET

Response: 200

```json
{
   "@odata.id": "/redfish/v1/TelemetryService/MetricReports",
   "Id": "MetricReports",
   "Name": "Metric Reports",
   "Description": "Metric Reports view",
   "Members@odata.count": 9,
   "Members": [
      {
         "@odata.id": "/redfish/v1/TelemetryService/MetricReports/AvgPowerConsumptionHour"
      },
      {
         "@odata.id": "/redfish/v1/TelemetryService/MetricReports/MinPowerConsumptionHour"
      },
      {
         "@odata.id": "/redfish/v1/TelemetryService/MetricReports/MaxPowerConsumptionHour"
      },
      {
         "@odata.id": "/redfish/v1/TelemetryService/MetricReports/AvgPowerConsumptionDay"
      },
      {
         "@odata.id": "/redfish/v1/TelemetryService/MetricReports/MinPowerConsumptionDay"
      },
      {
         "@odata.id": "/redfish/v1/TelemetryService/MetricReports/MaxPowerConsumptionDay"
      },
      {
         "@odata.id": "/redfish/v1/TelemetryService/MetricReports/AvgPowerConsumptionWeek"
      },
      {
         "@odata.id": "/redfish/v1/TelemetryService/MetricReports/MinPowerConsumptionWeek"
      },
      {
         "@odata.id": "/redfish/v1/TelemetryService/MetricReports/MaxPowerConsumptionWeek"
      }
   ]
}
```
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_1.DumpService", "@odata.id": "/redfish/v1/Oem/Supermicro/DumpService", "Id": "DumpService", "Name": "Dump Service", "Dumps": {
      "@odata.id": "/redfish/v1/Oem/Supermicro/DumpService/Dumps",
   }
   "Actions": { "Oem": {},
            "#SmcDumpService.CreateDump": {
               "target": "/redfish/v1/Oem/Supermicro/DumpService/Actions/SmcDumpService.CreateDump",
               "@Redfish.ActionInfo": "/redfish/v1/Oem/Supermicro/DumpService/CreateDumpActionInfo"
            },
            "#SmcDumpService.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:

```json
{
  "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

```json
{
  "@odata.type": "#Dump.v1_1_0.Dump",
  "@odata.id": "/redfish/v1/Oem/Supermicro/DumpService/Dumps/HostCrashDump",
  "Id": "HostCrashDump",
  "Description": "Host dump",
  "Size": 49139,
  "Reason": "Host failure",
  "Actions": {
    "Oem": {
    },
    }
  },
  "@odata.etag": "\"ae12d4647e32eb925f33eac0c038604b\""
}
```
15.3 Downloading Crash Dump

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

```json
{
}
```

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:** 20

```json
{
   "@odata.type": "#LogService.v1_1_0.LogService", "@odata.id":
   /redfish/v1/Systems/1/LogServices/Log1", "Id": "Log1",
   "Name": "Health Event Log Service", "MaxNumberOfRecords": 4096, "OverWritePolicy":
   "WrapsWhenFull", "DateTime": "2023-07-03T00:26:24Z",
   "DateTimeLocalOffset": "+00:00", "ServiceEnabled": true, "Status": {
   "State": "Enabled",
   "Health": "OK"
   },
   "LogEntryType": "SEL", "Oem": {
   "Supermicro": {
   "@odata.type": "#SmcLogService.v1_0_0.LogService", "ACPowerOnEventLog": true,
   "FIFOEventLog": true, "SmartPowerEventLog": true
   }
   },
   "Entries": {
   "@odata.id": "/redfish/v1/Systems/1/LogServices/Log1/Entries"
   },
   "Actions": {
   "Oem": {
   "#SmcLogService.ClearAcknowledgements": {
   "@odata.id": "/redfish/v1/Systems/1/LogServices/Log1/Actions/Oem/SmcLogService.ClearAcknowledgements"
   },
   "#LogService.ClearLog": {
   "@odata.id": "/redfish/v1/Systems/1/LogServices/Log1/Actions/LogService.ClearLog"
   }
   }
```

```json
}
```
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 a collection of Log Entry resource instances.

**URI:** /redfish/v1/Systems/1/LogServices  
**Method:** GET
Response: 200

```json
{
  "@odata.type": "#LogEntryCollection.LogEntryCollection",
  "@odata.id": "/redfish/v1/Systems/1/LogServices/Log1/Entries",
  "Name": "Health Event Log Service Collection",
  "Description": "Collection of Health Event Logs", "Members": [
    {
      "@odata.type": "#LogEntry.v1_7_0.LogEntry",
      "@odata.id": "/redfish/v1/Systems/1/LogServices/Log1/Entries/1", "Id": "1",
      "Name": "Health Event Log Entry 1",
      "EntryType": "SEL",
      "Severity": "Critical",
      "Created": "2023-08-14T22:06:39Z",
      "EntryCode": "Assert",
      "SensorType": "Physical Chassis Security",
      "SensorNumber": 170,
      "Message": "[SEC-0000] General chassis intrusion", "MessageId": "0x00FFFF",
      "Oem": {
        "Supermicro": {
          "MarkAsAcknowledged": false,
          "@odata.type": "#SmcLogEntryExtensions.v1_0_1.LogEntry",
          "RawEventData": {
            "EventDirAndType": "0x6F",
            "SensorType": "0x05",
            "SensorName": "Chassis Intruder"
          }
        }
      }
    }
  ],
  "Members@odata.count": 1,
  "@odata.etag": ""37923498b2bd37c38d9c1175d04bd1221"
}
```
16.1.2.1 Acknowledging an Event
URI: /redfish/v1/Systems/1/LogServices/Log1/Entries/[num]
Method: PATCH

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: GET
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.type": "#LogEntry.v1_7_0.LogEntry",
            "@odata.id": "/redfish/v1/Managers/1/LogServices/Log1/Entries/1",
            "Id": "1",
            "Name": "Maintenance Event Log Entry 1",
            "EntryType": "Oem",
            "Severity": "OK",
            "Created": "2023-08-14T22:03:18Z",
            "OemRecordFormat": "SMC",
            "Message": "[MEL-0123] Maintenance event logs were cleared successfully.",
            "MessageId": "Event.1.0.BmcEvtCleared",
            "Oem": {
                "Supermicro": {
                    "@odata.type": "#SmcLogEntryExtensions.v1_0_1.LogEntry",
                    "Interface": "Redfish",
                    "User": "ADMIN",
                    "Source": "10.124.1.193",
                    "Category": "Others"
                }
            }
        }
    ],
    "Members@odata.count": 1,
    "@odata.etag": "\"2dec7e96ae97a2a4208e182938a44753\"
}
```
17 Jsnoschema

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

URI: /redfish/v1/JsonSchemas
Method: GET
Response: 200
Registries define the messages for Redfish. Registries define the messages for Redfish, which in turn represents the registry properties. 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.

URI:
/redfish/v1/Registries/Base
/redfish/v1/Registries/Event
/redfish/v1/Registries/SMC
/redfish/v1/Registries/BiosAttributeRegistry
Method: GET
Response: 200

```json
{
   "@odata.type": "#MessageRegistryFileCollection.MessageRegistryFileCollection",
   "@odata.id": "/redfish/v1/Registries",
   "Name": "Registry Collection",
   "Description": "Registry Repository",
   "Members": [
      {
         "@odata.id": "/redfish/v1/Registries/BiosAttributeRegistry"
      },
      {
         "@odata.id": "/redfish/v1/Registries/Base"
      },
      {
         "@odata.id": "/redfish/v1/Registries/Event"
      },
      {
         "@odata.id": "/redfish/v1/Registries/SMC"
      }
   ],
   "Members@odata.count": 4,
   "@odata.etag": "\"2e96cc1f548b08e443619f326b361321\""
}
```
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

```json
{
   "Success": {
      "code": "Base.v1_10_3.Success",
      "message": "Successfully Completed Request."
   }
}
```
19.2 Notifications

19.2.1 SNMP

URI: /redfish/v1/Managers/1/NetworkProtocol
Method: PATCH
Payload:

```json
{
  "SNMP": {"ProtocolEnabled": true}
}
```

19.2.1.1 SNMPv2

URI: /redfish/v1/Managers/1/NetworkProtocol
Method: PATCH
Payload:

```json
{
  "SNMP": {"EnableSNMPv2c": true}
}
```

19.2.1.2 SNMPv3

URI: /redfish/v1/Managers/1/NetworkProtocol
Method: PATCH
Payload:

```json
{
  "SNMP": {"EnableSNMPv3": true}
}
```

19.2.2 Syslog

URI: /redfish/v1/Managers/1/Oem/Supermicro/Syslog
Method: PATCH
Payload:

```json
{
  "EnableSyslog": true,
  "SyslogPortNumber": 514,
  "SyslogServer": "10.136.176.16"
}
```
19.3 FanMode

URI: /redfish/v1/Managers/1/Oem/Supermicro/FanMode
Method: PATCH
Payload:

```json
{
  "Mode": "FullSpeed"
}
```

Mode Allowable Values: {"Standard", "FullSpeed", "Optimal", "PUE2", "HeavyIO"}

19.4 NTP

URI: /redfish/v1/Managers/1/Oem/Supermicro/NTP
Method: PATCH
Payload:

```json
{
  "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:

```json
{
  "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:

```json
{
  "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

**URI:** /redfish/v1/Managers/1/Oem/Supermicro/iKVM
**Method:** GET

**Response:** {
  "@odata.id": "/redfish/v1/Managers/1/Oem/Supermicro/iKVM",
  "@odata.type": "#IKVM.v1_0_2.IKVM",
  "Id": "IKVM",
  "Name": "IKVM",
  "Current interface": "HTML 5",
  "URI": "/redfish/v1/Managers/1/Oem/Supermicro/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

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

```
{
  "@odata.type": "#EthernetInterface.v1_5_2.EthernetInterface", "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces/1", "Id": "1", "Name": "AOC_NIC1", "Description": "AOC-GTG-i2T #1", "Status": { "State": "Enabled", "Health": "OK" }, "MACAddress": "7c:c2:55:06:00:56", "SpeedMbps": 0, "FQDN": ""}
```

19.14 Chassis Intrusion

URI: /redfish/v1/Chassis/1
Method: GET/PATCH
Payload:

```
{
  "PhysicalSecurity": {"IntrusionSensor": "Normal"}
}
```
### 19.15 Network DNS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X12/H12</td>
<td>1.3.3 or later</td>
<td>Ver.3.4</td>
</tr>
</tbody>
</table>

URI: `/redfish/v1/Managers/1/EthernetInterfaces/1`  
**Method:** GET/PATCH  
**Payload:**

```json
{
  "StaticNameServers": ["10.10.10.1", "10.10.10.2"]
}
```
20 Activating via Redfish API

URI: /redfish/v1/Managers/1/LicenseManager/Actions/LicenseManager.ActivateLicense
Method: POST
Payload:

```
{
  "ProductKey": {"Node": {"LicenseID": "2", "LicenseName": "SFT-DCMSSINGLE", "CreateDate": "20230407"}, "Signature": "Xe2bdYNKGuPjE5wgO5nQG8aFgWrtbZ8KRMngZzwB/gUDKu4drationB3BlgrQ9BnmUbisCFibtMYri9g0/tCdzLEgU/WbeoHTD5AeYnsUW8LGsLyVFe3YpaUAJz0HP5M2mOe99jPB4Cd7dK5oYJx3LpSOCr8ryB9hC2X3/EFubCyCJT12KAiwXLhJ7RCV2P2EDJ0bDim38hLmst1sAiKwK829QtbLEC5W0Oyek+CPZs11rQx0J4mTIBXH+LbKGpdx1bDv9iZqWAlj1qWHkYdszh/FDhmYal12GOJzhj9TDPoHLHYGTpW1ofou+0pzDbAtQ5KLUFzZzoWQA=="}
}
```

Response: 200

```
{
  "Success": {
    "code": "Base.v1_10_3.Success",
    "message": "Successfully Completed Request."
  }
}
```
## 21 Available APIs

<table>
<thead>
<tr>
<th>API List</th>
<th>License</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>/redfish</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1</td>
<td>Standard</td>
<td>Service root</td>
</tr>
<tr>
<td>/redfish/v1/SessionService</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Chassis</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/AccountService</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Managers</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Systems</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/EventService</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/UpdateService</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Registries</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/JsonSchemas</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/TaskService</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/CertificateService</td>
<td>SFT-DCMS-SINGLE</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/TelemetryService</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Oem/SM/Service/ValidityService</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/SessionService/Session</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/SessionService/Session/[session_num]</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/Thermal</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/Power</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/Sensors</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/Sensors/[sensor_num]</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/NetworkAdapters</td>
<td>Standard</td>
<td>BIOS-BMC joint feature</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/NetworkAdapters/[adapter_num]</td>
<td>Standard</td>
<td>BIOS FW update might be required</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/NetworkAdapters/[adapter_num]/Ports</td>
<td>Standard</td>
<td>BIOS-BMC joint feature</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/NetworkAdapters/[adapter_num]/Ports/[np_num]</td>
<td>Standard</td>
<td>BIOS FW update might be required</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/NetworkAdapters/[adapter_num]/NetworkPorts</td>
<td>Standard</td>
<td>BIOS-BMC joint feature</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/NetworkAdapters/[adapter_num]/NetworkPorts/[np_num]</td>
<td>Standard</td>
<td>BIOS FW update might be required</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/NetworkAdapters/[adapter_num]/NetworkDeviceFunctions</td>
<td>Standard</td>
<td>BIOS-BMC joint feature</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/NetworkAdapters/[adapter_num]/NetworkDeviceFunctions/[n df_num]</td>
<td>Standard</td>
<td>BIOS FW update might be required</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeSlots</td>
<td>Standard</td>
<td>BIOS-BMC joint feature</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices</td>
<td>Standard</td>
<td>BIOS FW update might be required</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices/NIC[aoc_card_num]</td>
<td>Standard</td>
<td>Network AOC installation is required; Asset information of each AOC's NIC chip.</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices/NIC[aoc_card_num]/PCIeFunctions</td>
<td>Standard</td>
<td>Network AOC installation is required; Asset information of each AOC's NIC chip.</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices/NIC[aoc_card_num]/PCIeFunctions/[port_num]</td>
<td>Standard</td>
<td>Network AOC installation is required</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices/GPU[gpu_card_num]</td>
<td>Standard</td>
<td>GPU card installation is required, Asset information of GPU cards. (Model, P/N, S/N, FW ver, etc)</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices/GPU[gpu_card_num]/PCIeFunctions</td>
<td>Standard</td>
<td>GPU card installation is required</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices/GPU[gpu_card_num]/PCIeFunctions/[gpu_instance_num]</td>
<td>Standard</td>
<td>GPU card installation is required, Detailed information of GPU cards. (DeviceID, Capacity, location, etc)</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices/NVMeSSD[nvme_ssd_num]</td>
<td>Standard</td>
<td>Asset information of GPU cards. (Model, P/N, S/N, FW ver, etc)</td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices/NVMeSSD[nvme_ssd_num]/PCIeFunctions</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices/NVMeSSD[nvme_ssd_num]/PCIeFunctions/[nv me_ssd_instance_num]</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Chassis/1/PCIeDevices/NVMeSSD[nvme_ssd_num]/PCIeFunctions/[nv me_ssd_instance_num]/PCIeFunctions</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>/redfish/v1/Chassis/HA-</td>
<td>SFT-DCMS-</td>
<td>SAS3108, SAS3408, SAS39xx,</td>
</tr>
</tbody>
</table>
RAID.[controller_num].StorageEnclosure.[enclosure_num]/Drives/Disk.Bay.[disk_num]

- SINGLE
- SFT-DCMS
- Light on physical drive LED indicator
- SAS3108, SAS3408, SAS39xx, SAS38xxIR

- SINGLE
- SFT-DCMS
- For SAS3108, SAS3408, SAS39xx, SAS38xxIR

- SINGLE
- SFT-DCMS
- For SAS3108, SAS3408, SAS39xx, SAS38xxIR

- SINGLE
- SFT-DCMS
- For SAS3108, SAS3408, SAS39xx, SAS38xxIR

- Standard
- For SAS3008, SAS32xx, SAS36xx, SAS38xxIT

/RESTfulV1/Chassis/RAID.[controller_num].StorageEnclosure.[enclosure_num]/Drives/Disk.Bay.[disk_num]/Oem/Supermicro/AssignSpareActionInfo
- Standard
- For SAS3008, SAS32xx, SAS36xx, SAS38xxIT

/RESTfulV1/Chassis/StorageBackplane/

/RESTfulV1/Chassis/NVMeSSD.[pcie_controller_num].Group.[group_num].StorageBackplane/

- SINGLE
- SFT-DCMS
- Light on physical drive LED indicator
- SAS3008, SAS32xx, SAS36xx, SAS38xxIT
- https://www.supermicro.com/zh_tw/products/storage/cards

- Standard
- For SAS3008, SAS32xx, SAS36xx, SAS38xxIT
- https://www.supermicro.com/zh_tw/products/storage/cards

/RESTfulV1/Chassis/MRVL.HA-RAID.[controller_num].StorageModule/

/RESTfulV1/Chassis/MRVL.HA-RAID.[controller_num].StorageModule/Standard

/RESTfulV1/Chassis/MRVL.HA-RAID.[controller_num].StorageModule/Marvell

- SINGLE
- SFT-DCMS
- Light on physical drive LED indicator
- SAS3108, SAS3408, SAS39xx, SAS38xxIR

- Standard
- For SAS3008, SAS32xx, SAS36xx, SAS38xxIT

/RESTfulV1/Chassis/HBA.[controller_num].StorageEnclosure.[enclosure_num]/Drives/Disk.Bay.[disk_num]
/redfish/v1/AccountService/Roles  Standard
/redfish/v1/AccountService/Roles/Administrator  Standard
/redfish/v1/AccountService/Roles/Operator  Standard
/redfish/v1/AccountService/Roles/ReadOnly  Standard
/redfish/v1/AccountService/Accounts  Standard
/redfish/v1/AccountService/Accounts.[account_num]  Standard
/redfish/v1-Managers/1  Standard
/redfish/v1-Managers/1/Actions/Manager.Reset  Standard
/redfish/v1-Managers/1/Actions/Oem/SmcManagerConfig.Reset  Standard
/redfish/v1-Managers/1/Oem/Supermicro/ResetActionInfo  Standard
/redfish/v1-Managers/1/SerialInterfaces  SFT-OOB-LIC, SFT-DCMS-SINGLE
/redfish/v1-Managers/1/SerialInterfaces.[service_num]  SFT-OOB-LIC, SFT-DCMS-SINGLE
/redfish/v1-Managers/1/LogServices  Standard
/redfish/v1-Managers/1/LogServices.Log1  Standard
/redfish/v1-Managers/1/LogServices.Log1/Entries  Standard
(redfish 1.8 supported VM APIs)  Standard
/redfish/v1-Managers/1/VirtualMedia  Standard
/redfish/v1-Managers/1/VirtualMedia.[CDmounted_dev_num]  Standard
/redfish/v1-Managers/1/VirtualMedia.[CDmounted_dev_num]/Actions/VirtualMedia.InsertMedia  Standard for Samba CIFS; SFT-OOB-LIC/SFT-DCMS-SINGLE for HTTP and HTTPS
/redfish/v1-Managers/1/VirtualMedia.[CDmounted_dev_num]/InsertMediaActionInfo  SFT-OOB-LIC, SFT-DCMS-SINGLE
/redfish/v1-Managers/1/VirtualMedia.[CDmounted_dev_num]/Actions/VirtualMedia.EjectMedia  Standard
/redfish/v1-Managers/1/VirtualMedia.Floppy.[mounted_dev_num]  Standard
/redfish/v1-Managers/1/VirtualMedia.[Floppymounted_dev_num]  Standard
/redfish/v1-Managers/1/VirtualMedia.[mounted_dev_num]  Standard
/redfish/v1-Managers/1/VirtualMedia.[VirtualMedia-mounted_dev_num]/Actions/VirtualMedia.InsertMedia  Standard for Samba, CIFS; SFT-OOB-LIC/SFT-DCMS-SINGLE for HTTP and HTTPS
/redfish/v1-Managers/1/VirtualMedia.[VirtualMedia-mounted_dev_num]/InsertMediaActionInfo  SFT-OOB-LIC, SFT-DCMS-SINGLE
/redfish/v1-Managers/1/VirtualMedia.[VirtualMedia-mounted_dev_num]/Actions/VirtualMedia.EjectMedia  Standard
/redfish/v1-Managers/1/EthernetInterfaces  Standard
/redfish/v1-Managers/1/EthernetInterfaces.[eth_num]  Standard
/redfish/v1-Managers/1/EthernetInterfaces.ToHost  Standard
/redfish/v1-Managers/1/HostInterfaces  SFT-OOB-LIC, SFT-DCMS-SINGLE
/redfish/v1-Managers/1/HostInterfaces/1  SFT-OOB-LIC, SFT-DCMS-SINGLE
/redfish/v1-Managers/1/HostInterfaces/1/HostEthernetInterfaces  SFT-OOB-LIC, SFT-DCMS-SINGLE
<table>
<thead>
<tr>
<th>URI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates</code></td>
<td>SFT-DCMS-SINGLE</td>
</tr>
<tr>
<td><code>/redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates/1</code></td>
<td>SFT-DCMS-SINGLE</td>
</tr>
<tr>
<td><code>/redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates/1/Actions/Certificate.Rekey</code></td>
<td>SFT-DCMS-SINGLE</td>
</tr>
<tr>
<td><code>/redfish/v1/Managers/1/NetworkProtocol/HTTPS/Certificates/1/RekeyActionInfo</code></td>
<td>SFT-DCMS-SINGLE</td>
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<tr>
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<td><code>/redfish/v1/Managers/1/Oem/Supermicro/MemoryHealthComp</code></td>
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<td><code>/redfish/v1/Managers/1/Oem/Supermicro/MouseMode</code></td>
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<td>SFT-DCMS-SINGLE for PATCH</td>
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<tr>
<td><code>/redfish/v1/Managers/1/LicenseManager</code></td>
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</tr>
<tr>
<td><code>/redfish/v1/Managers/1/LicenseManager/Actions/LicenseManager.ActivateLicense</code></td>
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<tr>
<td><code>/redfish/v1/Managers/1/Oem/Supermicro/FixedBootOrder</code></td>
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</tr>
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<td><code>/redfish/v1/Systems/1/Actions/ComputerSystem.Reset</code></td>
<td>Standard</td>
</tr>
<tr>
<td><code>/redfish/v1/Systems/1/Processors</code></td>
<td>Standard</td>
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<tr>
<td><code>/redfish/v1/Systems/1/Processors/[processor_num]/ProcessorSummary/ProcessorMetrics</code></td>
<td>SFT-DCMS-SINGLE</td>
</tr>
<tr>
<td><code>/redfish/v1/Systems/1/Memory</code></td>
<td>SFT-DCMS-SINGLE</td>
</tr>
<tr>
<td><code>/redfish/v1/Systems/1/EthernetInterfaces</code></td>
<td>BIOS-BMC joint feature</td>
</tr>
<tr>
<td><code>/redfish/v1/Systems/1/EthernetInterfaces/[eth_num]/VLANs</code></td>
<td>BIOS-FW update might be required</td>
</tr>
<tr>
<td><code>/redfish/v1/Systems/1/EthernetInterfaces/[eth_num]/VLANs/[vlan_instance]</code></td>
<td>BIOS-FW update might be required</td>
</tr>
<tr>
<td><code>/redfish/v1/Systems/1/SimpleStorage</code></td>
<td>SFT-DCMS-SINGLE</td>
</tr>
<tr>
<td><code>/redfish/v1/Systems/1/SimpleStorage/[controller_num]</code></td>
<td>SFT-DCMS-SINGLE</td>
</tr>
<tr>
<td><code>/redfish/v1/Systems/1/Storage</code></td>
<td>SFT-DCMS-SINGLE</td>
</tr>
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<td><code>/redfish/v1/Systems/1/Storage/HA-RAID</code></td>
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- This URI only can be supported on Intel platform
- This feature can be supported on X13 and future platforms
- iKVM over HTML5 can be supported
- BIOS-BMC joint feature
- BIOS FW update might be required
- BIOS-BMC-TAS joint feature
- BIOS FW update might be required
- Storage AOC installation is required
- SAS3108, SAS3408, SAS39xx, SAS38xxiR
<table>
<thead>
<tr>
<th>Path</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/redfish/v1/Systems/1/Storage/HA-RAID/Volumes</td>
<td>Storage AOC installation is required;</td>
</tr>
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<td>[controller_num].Volume.</td>
<td>SAS3108, SAS3408, SAS39xx, SAS38xxIR</td>
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<td>[volume_num]</td>
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<td>[volume_num]</td>
<td>light on virtual drive LED indicator</td>
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<tr>
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<td>create virtual drives</td>
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<tr>
<td>Actions/Oem/SmcVolume.DeleteVD</td>
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<td>To delete specific virtual drive in logical view</td>
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<td>To import specific virtual drive in logical view</td>
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<td>[controller_num].Volume.</td>
<td>For Marvell SE9230, create virtual drives</td>
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<td>Actions/NVMeSSD</td>
<td>Storage AOC installation is required;</td>
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<tr>
<td>BIOS</td>
<td>BIOS current settings</td>
</tr>
<tr>
<td>Actions/Bios.ResetBios</td>
<td>BIOS pending settings</td>
</tr>
<tr>
<td>Actions/Bios/ResetBios</td>
<td>Reset BIOS settings to default</td>
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<td>Resource Path</td>
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<td>/redfish/v1/Bios/Actions/Bios.ChangePassword</td>
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<tr>
<td>/redfish/v1/Bios/ChangePasswordActionInfo</td>
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</tr>
<tr>
<td>/redfish/v1/Bios/LogServices</td>
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</tr>
<tr>
<td>/redfish/v1/Bios/LogServices/Log1</td>
<td>Standard</td>
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<tr>
<td>/redfish/v1/Bios/LogServices/Log1/Actions/LogService.ClearLog</td>
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<td>/redfish/v1/Bios/LogServices/Log1/Actions/Oem/SmcLogService.ClearAcknowledgements</td>
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</tr>
<tr>
<td>/redfish/v1/Bios/LogServices/Log1/Entries</td>
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</tr>
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<td>/redfish/v1/Bios/LogServices/Log1/Entries/[log_num]</td>
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<tr>
<td>/redfish/v1/Bios/SecureBoot</td>
<td>BIOS SecureBoot settings</td>
</tr>
<tr>
<td>/redfish/v1/Bios/SecureBoot/SecureBootDatabases</td>
<td>Supported since X13/H13</td>
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<tr>
<td>/redfish/v1/Bios/SecureBoot/SecureBootDatabases/dbt</td>
<td>Supported since X13/H13</td>
</tr>
<tr>
<td>/redfish/v1/Bios/SecureBoot/SecureBootDatabases/dbr</td>
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</tr>
<tr>
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<td>Supported since X13/H13</td>
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<tr>
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<td>/redfish/v1/UpdateService/Actions/UpdateService.HARAIDController.[controller_num]</td>
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<td>/redfish/v1/UpdateService/Oem/Supercmicro/FirmwareInventory/BMC/Actions/SmcFirmwareInventory.Update</td>
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</tr>
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</tr>
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<td>/redfish/v1/UpdateService/Oem/Supercmicro/FirmwareInventory/HARAIDController.[controller_num]</td>
<td>SFT-DCMS-SINGLE</td>
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<td>/redfish/v1/Registries/BiosAttributeRegistry</td>
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</tr>
<tr>
<td>/redfish/v1/Registries/Event</td>
<td>Standard</td>
</tr>
<tr>
<td>/redfish/v1/Registries/SMC</td>
<td>Standard</td>
</tr>
<tr>
<td>/redfish/v1/JsonSchemas/[variety_of_services]</td>
<td>Standard</td>
</tr>
<tr>
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<td>Standard</td>
</tr>
<tr>
<td>/redfish/v1/TaskService/Tasks/[task_num]</td>
<td>Standard</td>
</tr>
<tr>
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</tr>
<tr>
<td>/redfish/v1/CertificateService/CertificateLocations/</td>
<td>SFT-DCMS-SINGLE</td>
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<td>/redfish/v1/CertificateService/Actions/CertificateService.GenerateCSR</td>
<td>SFT-DCMS-SINGLE</td>
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<tr>
<td>/redfish/v1/CertificateService/GenerateCSRActionInfo</td>
<td>SFT-DCMS-SINGLE</td>
</tr>
<tr>
<td>/redfish/v1/CertificateService/ReplaceCertificateActionInfo</td>
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• This URI can only be supported Intel Platform |
<p>| /redfish/v1/Oem/Supermicro/DumpService/Actions/SmcDumpService.CreateDump | SFT-DCMS-SINGLE   | ROT is required                                                     |
| /redfish/v1/Oem/Supermicro/DumpService/Actions/SmcDumpService.DeleteAll | SFT-DCMS-SINGLE   | ROT is required                                                     |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/HostCrashDump        | SFT-DCMS-SINGLE   | ROT is required                                                     |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/HostCrashDump/Actions/SmcDump.Download | SFT-DCMS-SINGLE   | ROT is required                                                     |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/BIOMEvidenceDump     | Standard          | ROT is required                                                     |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/BIOMEvidenceDump/Actions/SmcBIOMEvidenceDump.Download | Standard          | ROT is required                                                     |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/BIOMEvidenceDump/Actions/SmcBIOMEvidenceDump.Generate | Standard          | ROT is required                                                     |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/BIOSEvidenceDump     | Standard          | ROT is required                                                     |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/BIOSEvidenceDump/Actions/SmcBIOSEvidenceDump.Download | Standard          | ROT is required                                                     |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/BIOSEvidenceDump/Actions/SmcBIOSEvidenceDump.Generate | Standard          | ROT is required                                                     |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/AttestationDump/     | Standard          | ROT2.0 is required and supported since X13/H13                      |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/AttestationDump/Actions/SmcAttestationDump.Download | Standard          | ROT2.0 is required and supported since X13/H13                      |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/AttestationDump/Actions/SmcAttestationDump.Generate | Standard          | ROT2.0 is required and supported since X13/H13                      |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/DriveSmartDump/      | Standard          |                                                                      |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/DriveSmartDump/Actions/SmcDriveSmartDump.Download | Standard          |                                                                      |
| /redfish/v1/Oem/Supermicro/DumpService/Dumps/DriveSmartDump/Actions/SmcDriveSmartDump.Generate | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricDefinitions                    | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricDefinitions/AvgPowerConsumedHour | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricDefinitions/MnPowerConsumedHour | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricDefinitions/MaxPowerConsumedHour | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricDefinitions/AvgPowerConsumedDay | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricDefinitions/MnPowerConsumedDay  | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricDefinitions/MaxPowerConsumedDay | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricDefinitions/AvgPowerConsumedWeek | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricDefinitions/MnPowerConsumedWeek | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricDefinitions/MaxPowerConsumedWeek | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricReportDefinitions              | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricReportDefinitions/AvgPowerConsmptionHour | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricReportDefinitions/MnPowerConsumedHour | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricReportDefinitions/MaxPowerConsumedHour | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricReportDefinitions/AvgPowerConsumedDay | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricReportDefinitions/MnPowerConsumedDay  | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricReportDefinitions/MaxPowerConsumedDay | Standard          |                                                                      |
| /redfish/v1/TelemetryService/MetricReportDefinitions/AvgPowerConsumedWeek | Standard          |                                                                      |</p>
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22 Reference Links

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

- Supermicro on 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

- Contact:
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