



WS300T60L

MS-S429

**AST2600 Firmware
BMC User Guide**

MSI Enterprise Platform Solutions

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Technical Support

If a problem arises with your product and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please visit <https://eps.msi.com/support> for further guidance.

Revision History

Version 1.0, 2026/05, First release.

Chapter 1

1 Introduction

This document describes the operation of AMI's generic MegaRAC OneTree™ firmware. This document, until and unless specified, confirms the functionality on all the SoC platforms listed in this document.

Generic MegaRAC OneTree™ core refers to the new core of AMI's MegaRAC OneTree™ firmware running on the OneTree supported platform.

Chapter 2

2 MegaRAC OneTree™ GUI Overview

The MegaRAC OneTree™ on SoC has an AMI generic, user-friendly Graphics User Interface (GUI) called the MegaRAC OneTree™ GUI. It is designed for easy use. It has a low learning curve because it uses standard Internet browsers.

This chapter allows you to become familiar with the MegaRAC OneTree™ GUI's various functions. Each function is described in detail.

Your MegaRAC OneTree™ GUI may not exactly match this document.

2.1 Username and Password

BMC FW supports a web server based on the bmcweb implementation and webui-vue front end. This can be accessed using the BMC IP address. A sample screenshot of OneTree™ login page is displayed below.

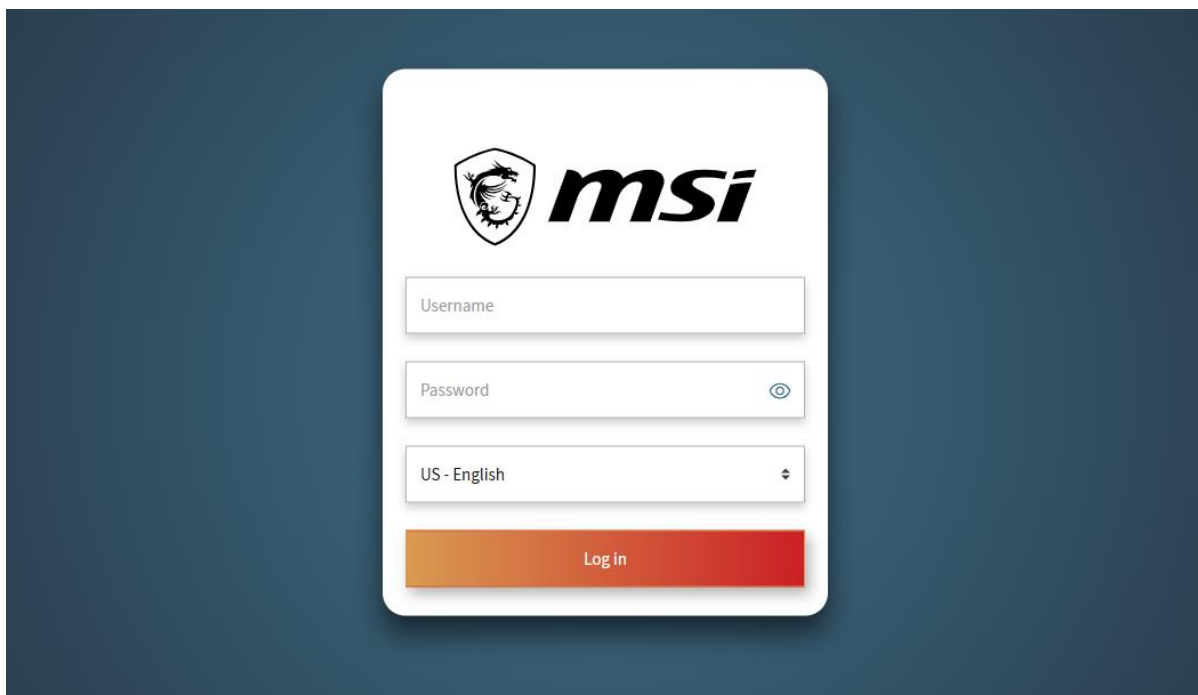


Figure 1 MegaRAC OneTree™ Login

The fields are explained as follows:

Username: Enter your username in this field.

Password: Enter your password in this field.

Language Selection: Language selection drop-down will be populated based on supported languages in Web UI as a part of multi-language support feature. Drop-down option value will be selected based on the browser language. For example, if browser language is configured with Simplified Russian language, then option value will be auto selected as Russian - Русский. Default language will be selected as English if the browser configured language not supported by Web UI. Entire Web UI pages language strings will be displayed based on selected language from drop-down.

The supported languages are given below.

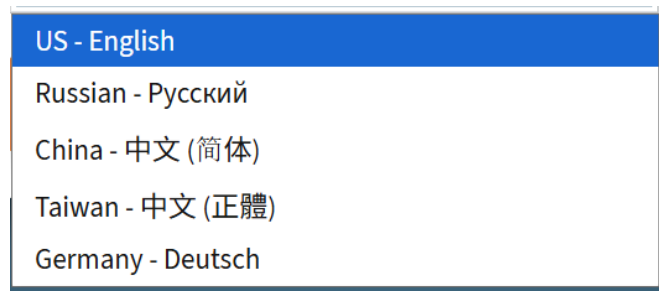


Figure 2 Overview Page

Log in: After entering the required credentials, click Log in to login to MegaRAC One Tree™ GUI. Once login, the Overview page appears as displayed below.

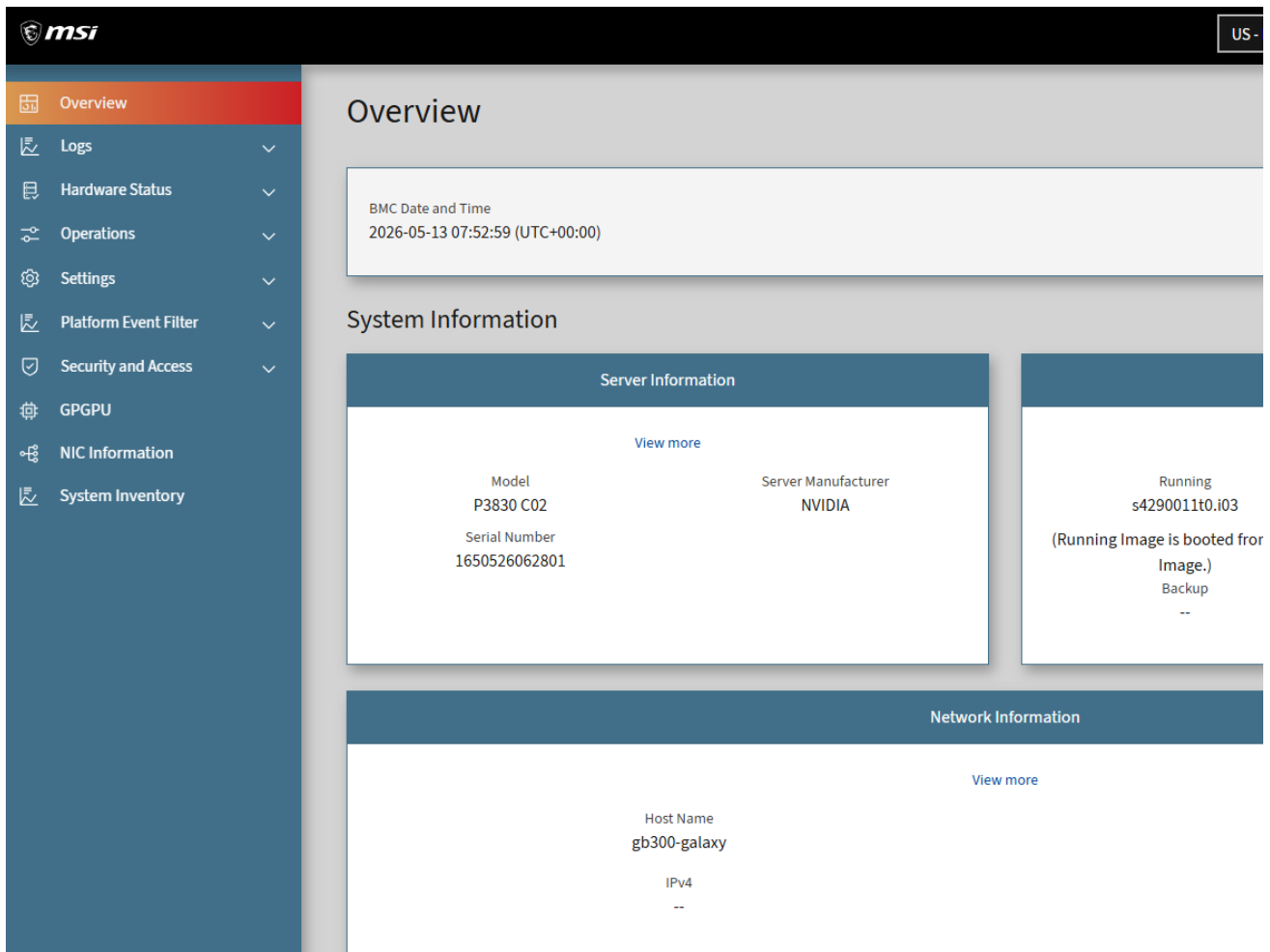


Figure 3: Overview Page

Language Selection: Change the language to view the language strings in different languages to GUI.



Figure 4: Language Selection

Note:

If the user changes Language in GUI, the total template will be changed to corresponding language then the application and calls will be reinitialized based on call response.

WebUI logout on browser refresh is not supported. Since WebUI and Redfish share the same session, both sessions kept alive during browser refresh.

2.1.1 Log-in with Default User & Password – SSH

```
vijaysankarr@MSGIND-9984L:~$ ssh admin@10.0.101.145
admin@10.0.101.145's password:

You are required to change your password immediately (administrator enforced).
Permission denied, please try again.
admin@10.0.101.145's password:
```

Figure 5 Login with default username(admin) and password(OpenBmc123) Ipmitool user

set password 1 ubuntu@123

```
root@ubuntu:/home/ubuntu#
root@ubuntu:/home/ubuntu#
root@ubuntu:/home/ubuntu# ipmitool user set password 1 ubuntu@123
Set User Password command successful (user 1)
root@ubuntu:/home/ubuntu#
root@ubuntu:/home/ubuntu#
root@ubuntu:/home/ubuntu#
root@ubuntu:/home/ubuntu#
```

Figure 6 Reset password for the default user using ipmitool command

```
admin@10.0.101.145's password:
AMIOT-e20b9474ce2c:~$ |
```

Figure 7 After reset password, taking ssh with new password(ubuntu@123)

Note: Even after a password reset user cannot access the console, only SSH access is available.

2.1.2 Log-in with Default User & Password – Redfish

PATCH: `https://<ip>/redfish/v1/AccountService/Accounts/admin`

Request body:

```
{  
  "Password": "superuser1"  
}
```

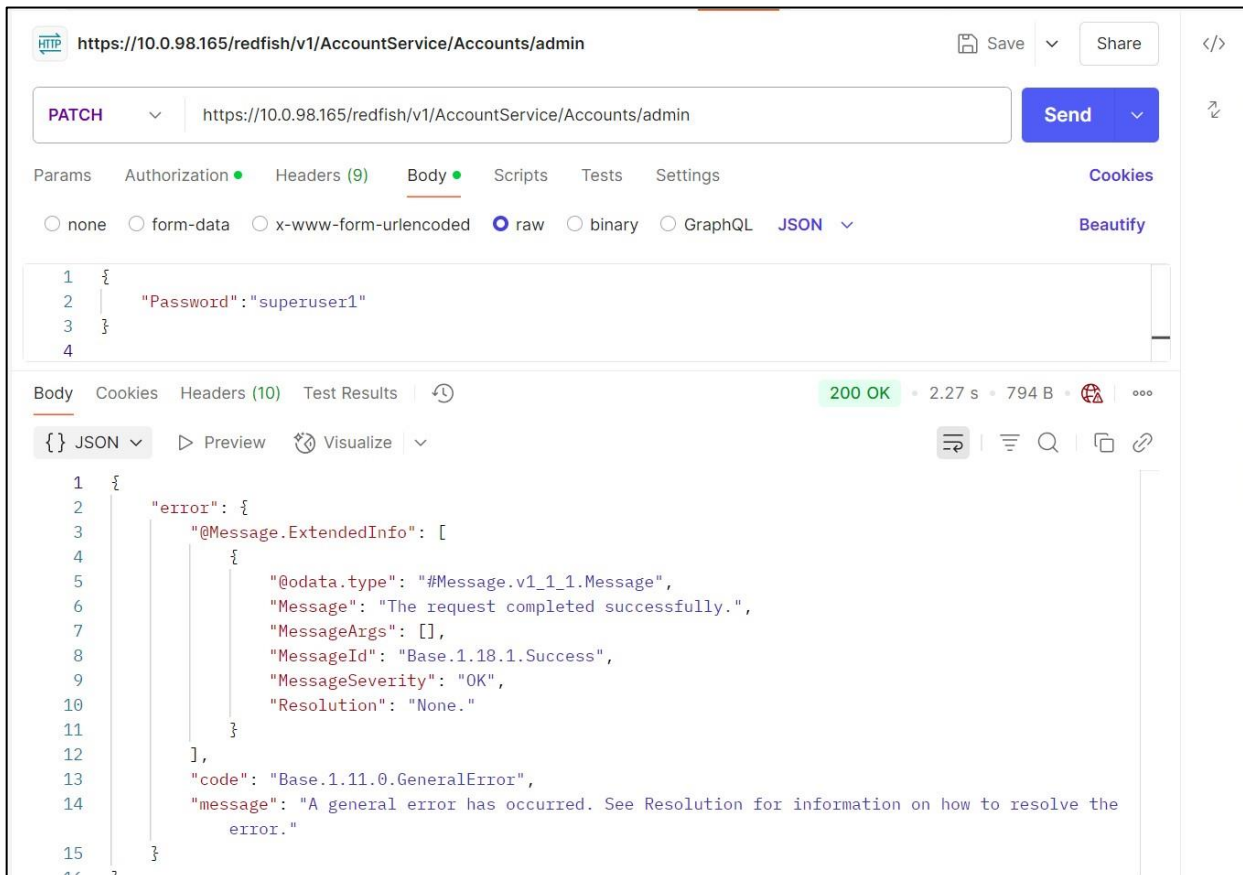


Figure 8 Reset password for the default user using PATCH method

By using updated password as credentials for basic authorization able to successfully get the response for the Redfish URIs that require authentication.

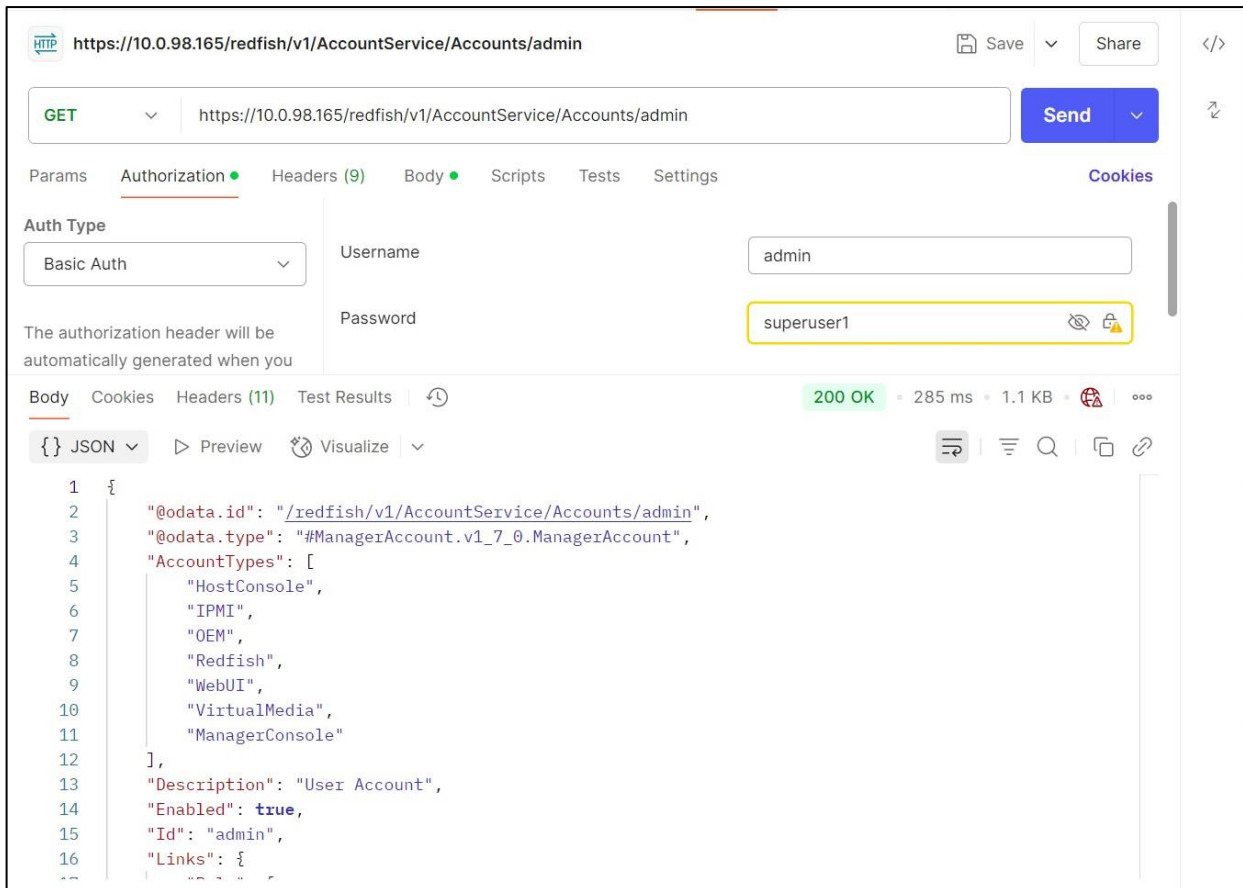


Figure 9 After reset password, launching new session with new password

Note: Duplicate usernames shouldn't exist across various authentication methods like AD, LDAP, RADIUS or IPMI since the privilege of one Authentication method is overwritten by another authentication method when login and hence the correct privilege cannot be returned properly. Duplicate usernames shouldn't be existed across different channels in IPMI.

2.2 WebUI BIOS

Users can access the Bios features in the OneTree WebUI.

In WebUI, BIOS icon appears in the header. Once the bios icon is clicked, it will open a Bios User Interface (UI) in new window.

BIOS feature will support only for the RTP enabled. If the RTP is disabled, the BIOS icon will be hidden.

Note: Dediprog the BIOS image and flash the BMC image (RTP should enable).

- Perform AC power cycle using the PDU.
- Perform Chassis power cycle using the ipmi command (ipmitool chassis power cycle) in BMC console. Launch the Webui using the BMC IP and login the webui, Click the BIOS icon on the header to launch the BIOS interface.

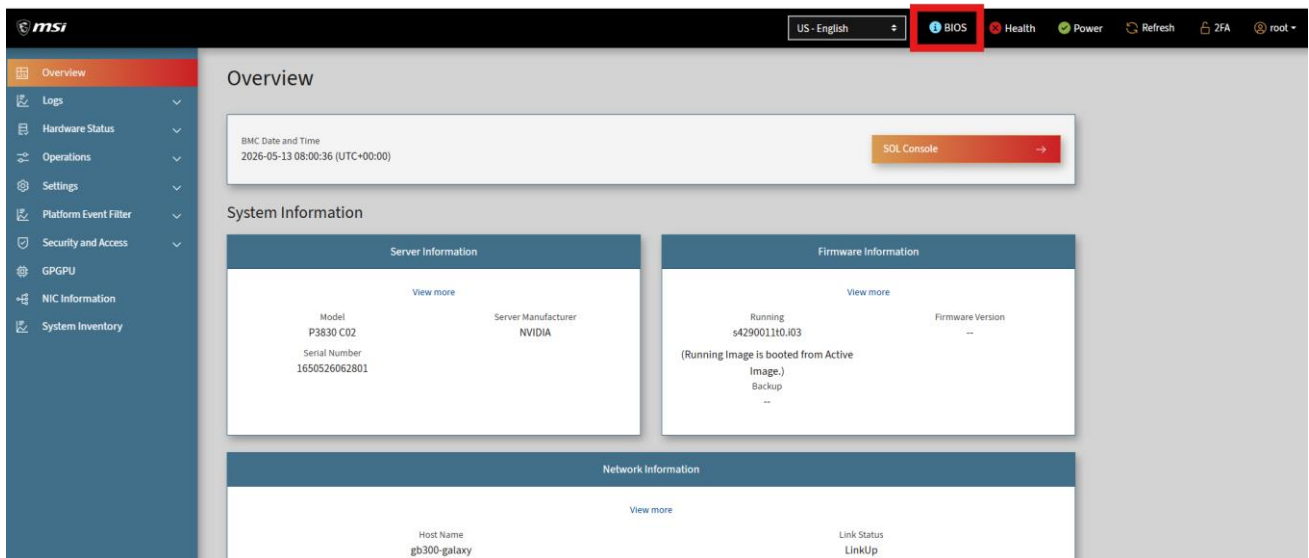


Figure 10 BIOS icon

BIOS User Interface

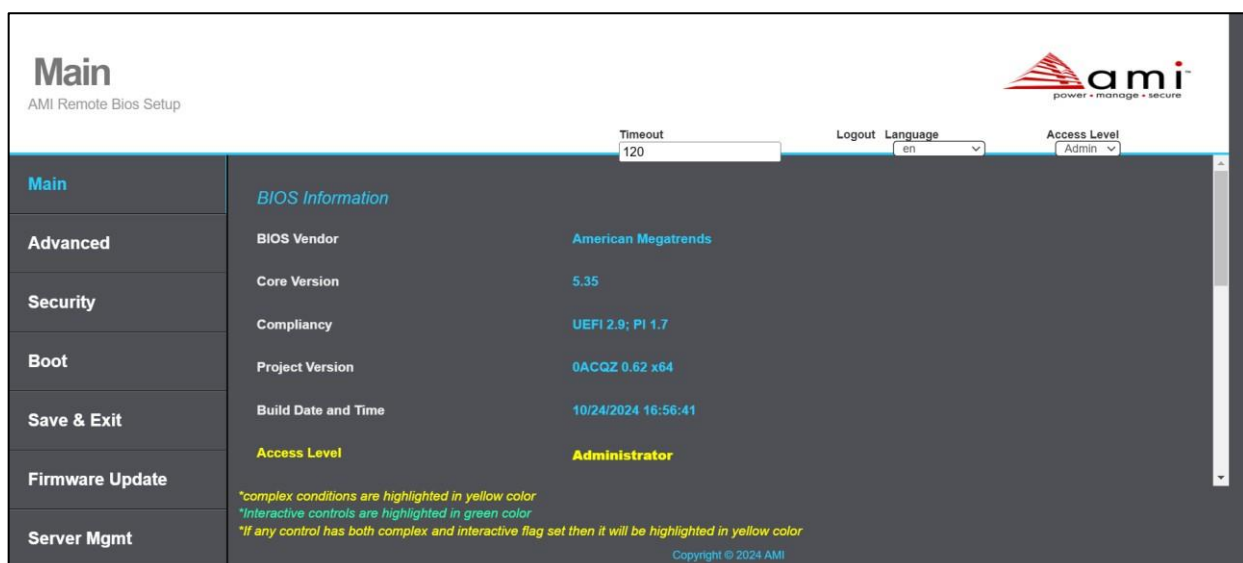


Figure 11 BIOS UI

2.3 WebUI Two Factor Authentication

Two-factor authentication will increase the security of the login process. If users with 2FA enabled can enter a verification code provided by the Two-factor authentication app to log in to the WebUI.

In Webui, the 2FA icon is placed in the header. To enable the 2FA click the icon.

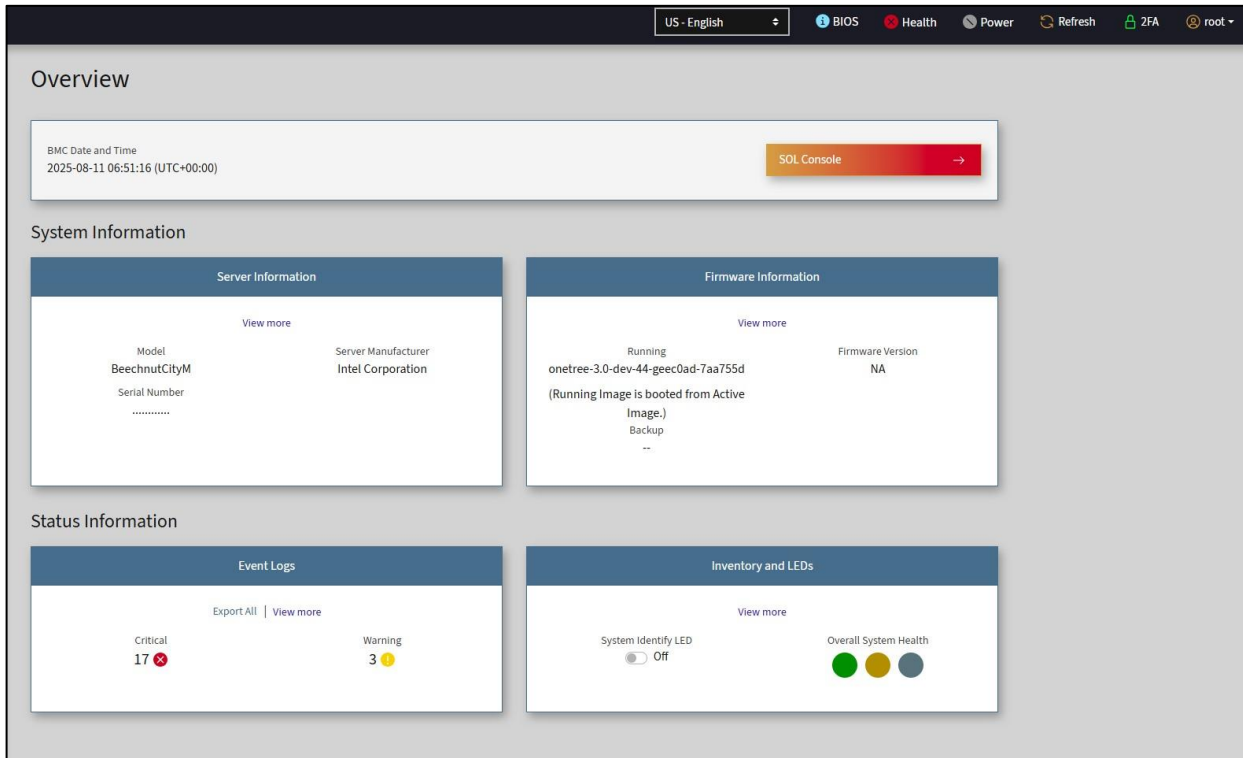


Figure 12 Two factor authentication icon

2.3.1 Enable 2FA

If the user clicks the 2FA icon, the QR code will display with the backup code. Scan the QR code with the Two factor authentication app.

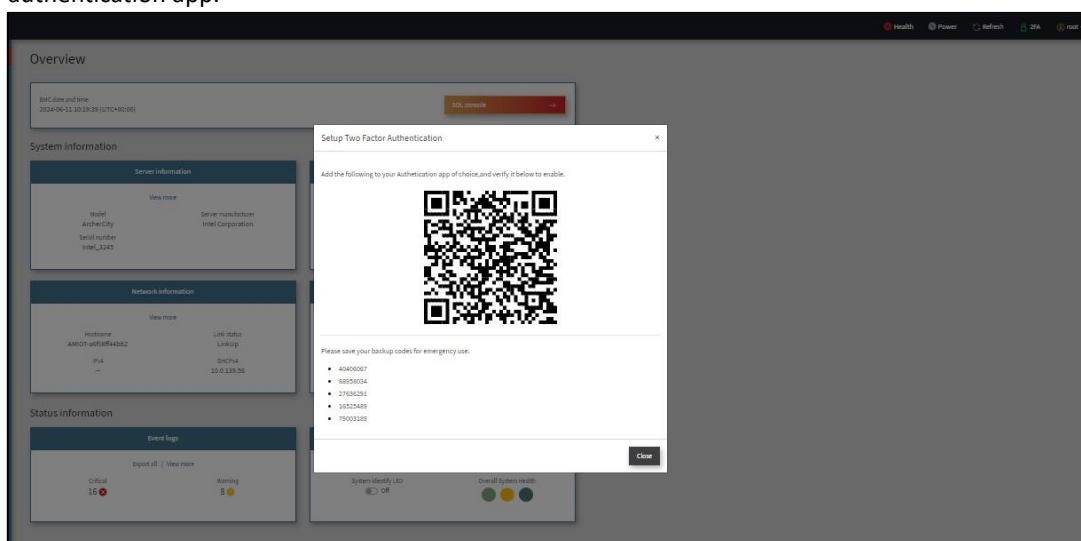


Figure 13 QR Scan

The 2FA icon color will change to green when the user enables the two-factor authentication.

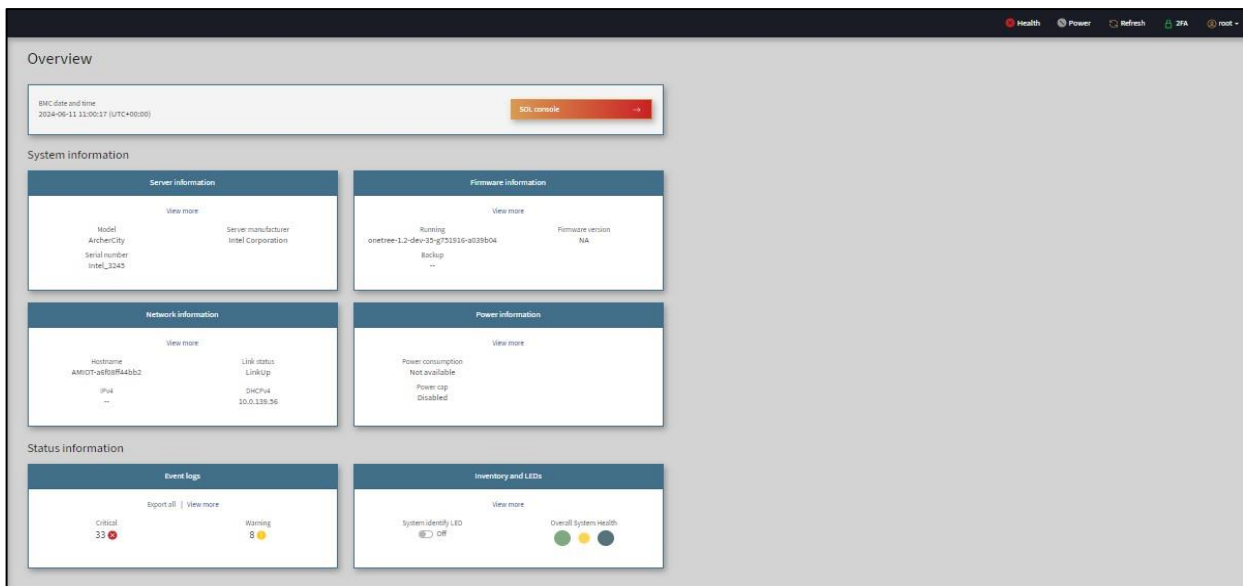


Figure 14 2FA icon after enabled

2.3.2 2FA OTP Verification

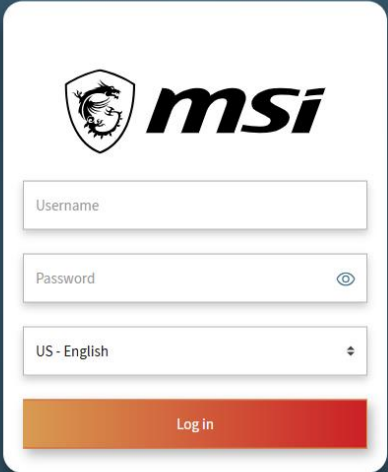
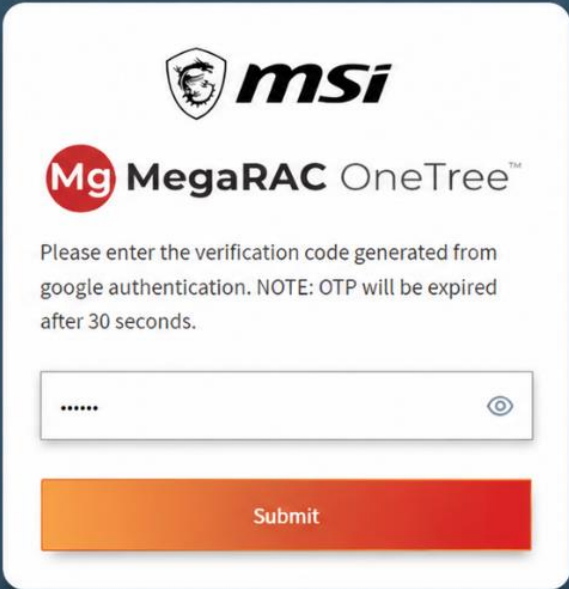
The image shows a login form for MSI. At the top is the MSI logo, which consists of a shield icon with a dragon head and the text "msi" in a bold, italicized font. Below the logo are three input fields: "Username", "Password" (with an eye icon for toggling visibility), and a language selector showing "US - English". At the bottom is a red "Log in" button.

Figure 15 Login

Enter the verification code using the two-factor authentication code.

The image shows a two-factor authentication (2FA) verification form. At the top is the MSI logo. Below it is the "Mg MegaRAC OneTree™" logo, where "Mg" is in a red circle. The text "Please enter the verification code generated from google authentication. NOTE: OTP will be expired after 30 seconds." is displayed. Below this is a text input field with six dots and an eye icon. At the bottom is a red "Submit" button.

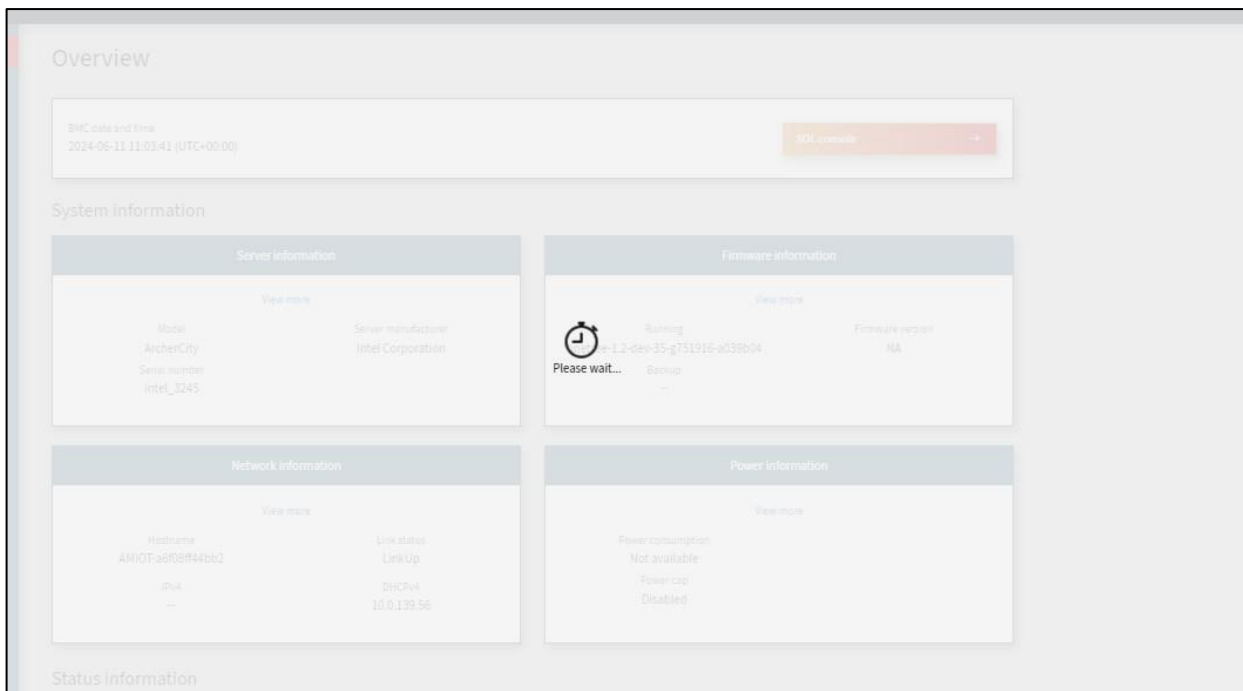


Figure 16 Loading after verification

Once the user enters the correct verification code, the login will be successful and it will navigate to overview page.

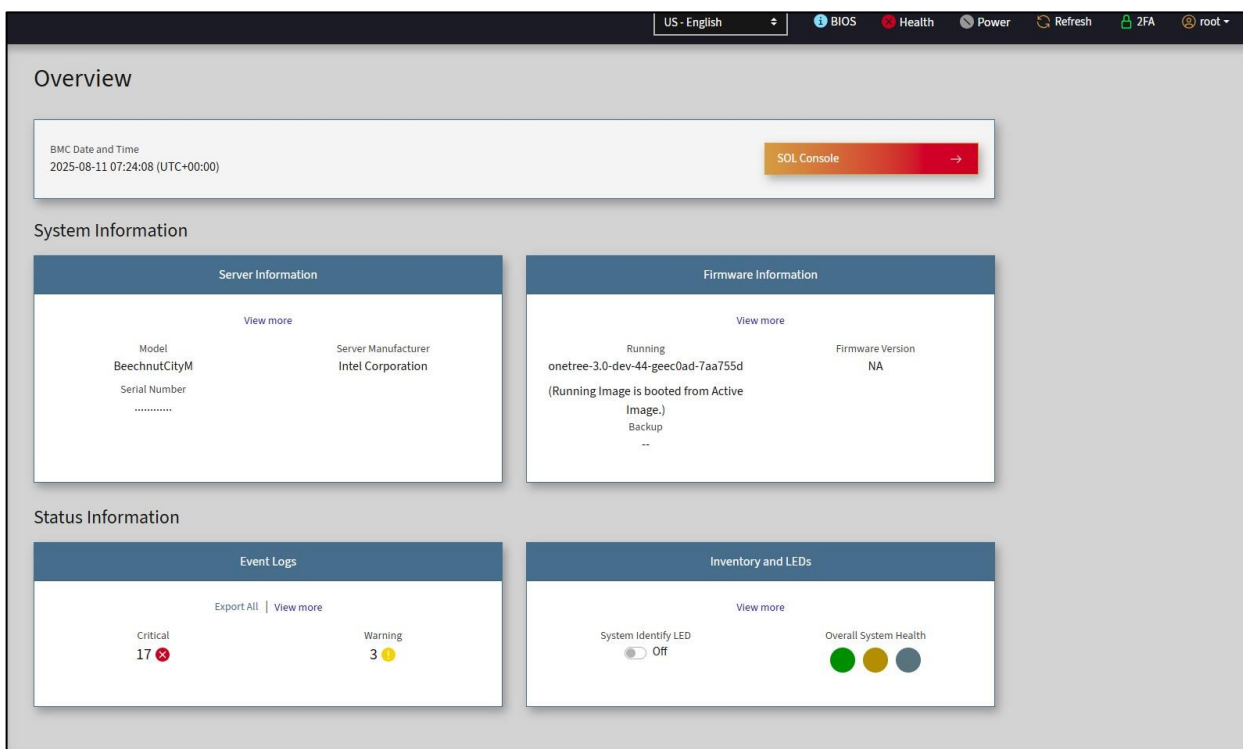


Figure 17 Successfully login after verification

2.3.3 Disable 2FA

If the user needs to disable the two-factor authentication click the 2FA icon. The confirmation popup will display, click Yes to disable the two-factor authentication.

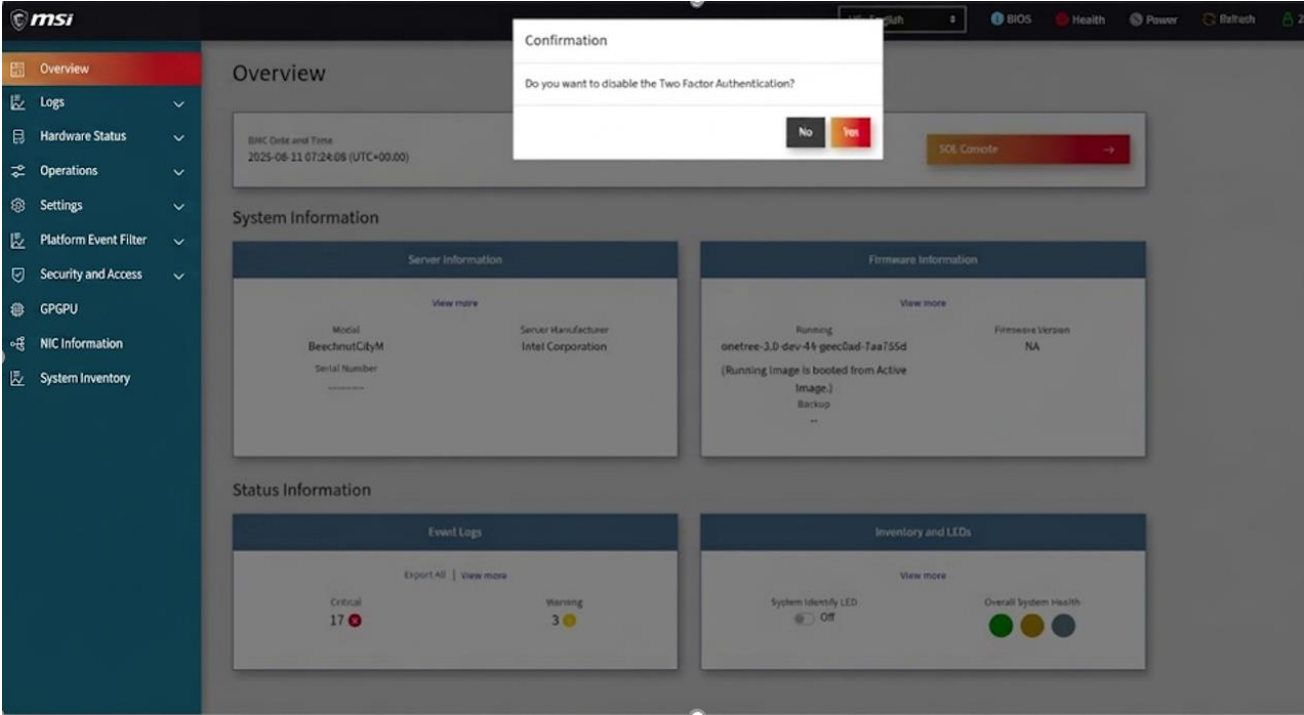


Figure 18 Confirmation popup for disable 2FA

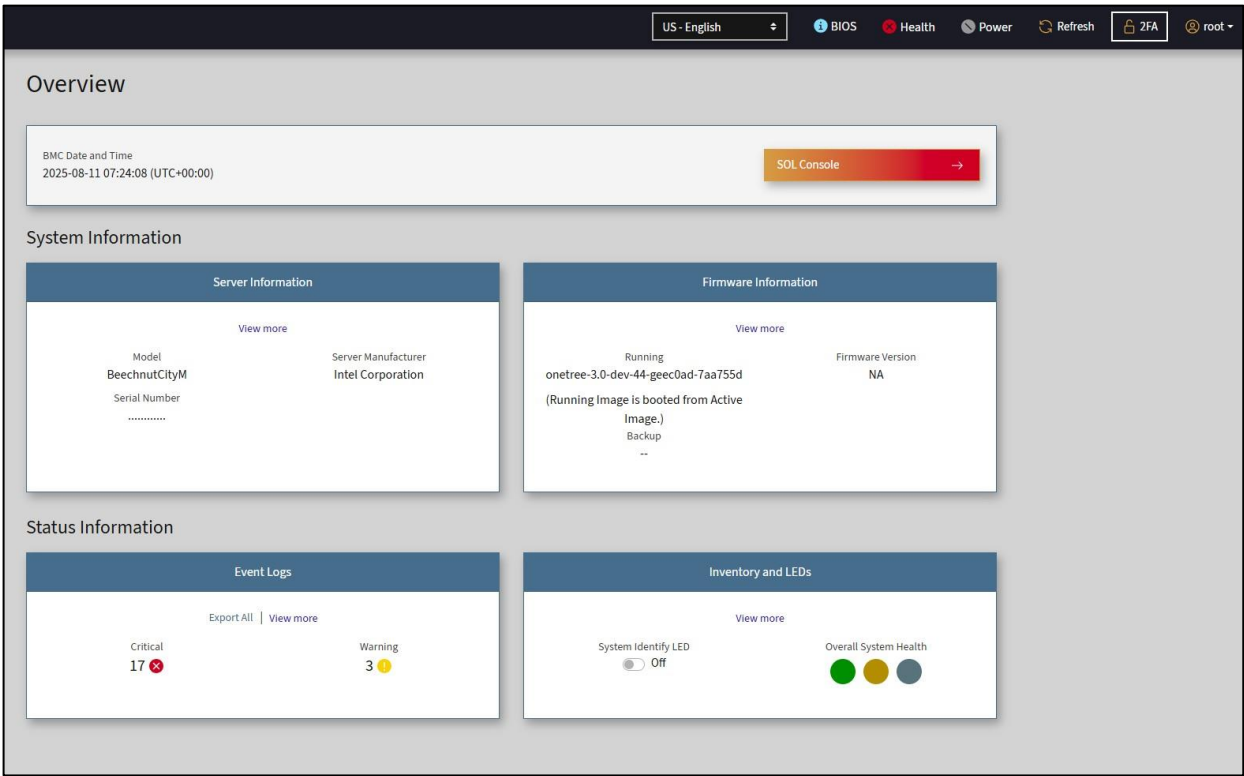


Figure 19 2FA icon after disabled

2.4 Overview Page

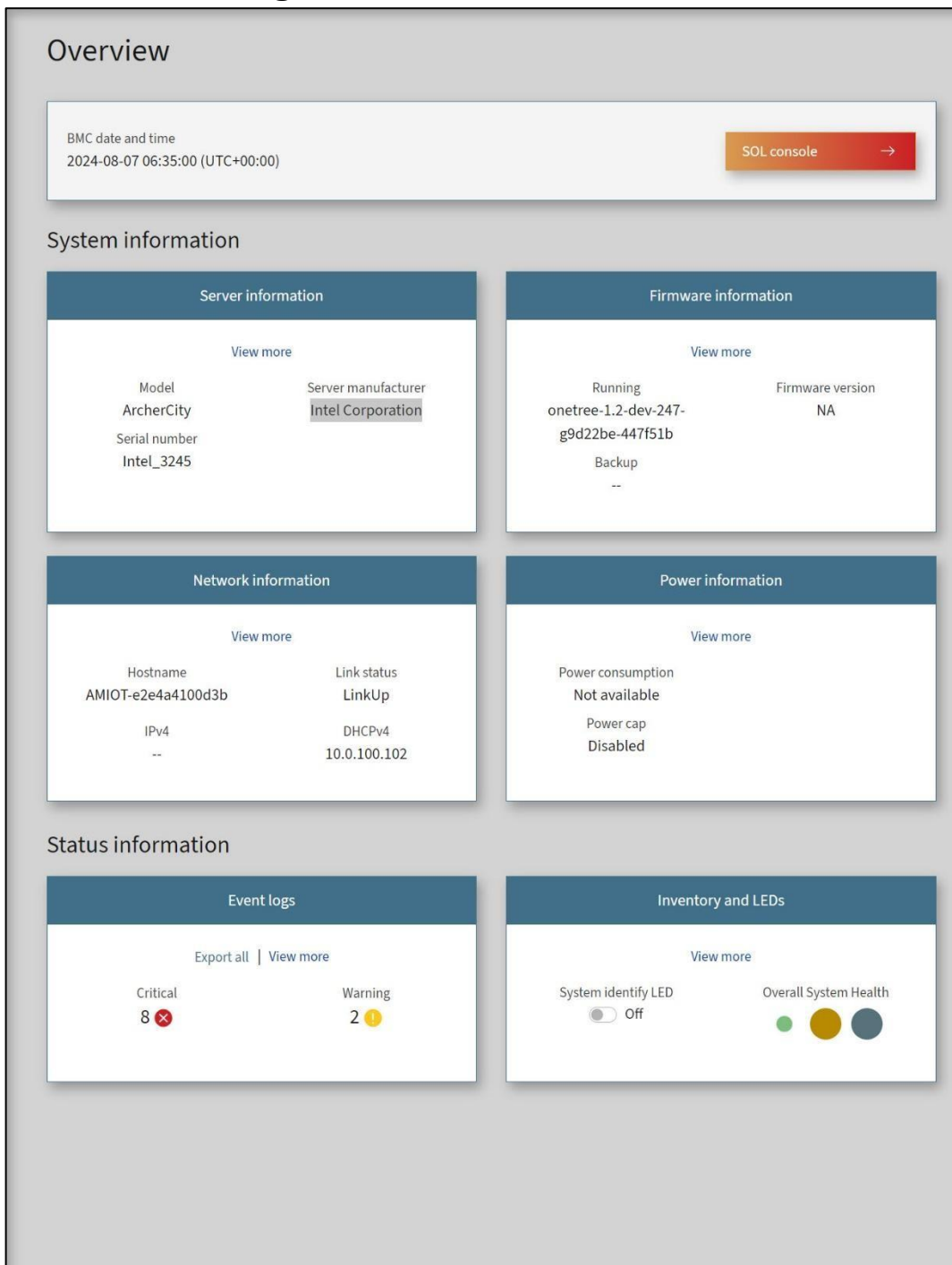


Figure 20 Overview Page

The Overview page displays the information about the following.

1. System Information

- Server information – It contains the information about Model and Serial number.
- Firmware information - It contains information about Running and Backup.
- Network information - It contains information about Hostname, Link status, IPv4 and DHCPv4.
- Power information - It contains information about Power consumption and Power cap.

2. Status Information

- Event logs - It contains the information about severity i.e, Critical and Warning. Export all will download a systemLogs.json file in the download directory of the system containing all event information in json format.
- Inventory and LEDs:
- System Identify LED - which can be selected on/off.
- Overall System Health = Its status will be displayed as mentioned below:
- LED Solid Green - System Health LED
- LED Blinking Green - System Degraded LED
- LED Blinking Amber - Non-critical fault LED
- LED Amber - Critical fault LED
- LED Blue - Identify LED
- Dumps - It contains information about total number of dumps collected. Click Download will download all the dumps collected.

Clicking View more will redirect you to the respective information Page.

2.5 Logs

2.5.1 Video Log

To open the Video Log page, click Logs -> Video Log from the menu bar. A sample screenshot of Video Log page is shown below.

Note:

Video Trigger Settings should be enabled, to display the Video Log page. Video Trigger Settings can be configured under Settings -> Auto Video Settings -> Video Trigger Settings.

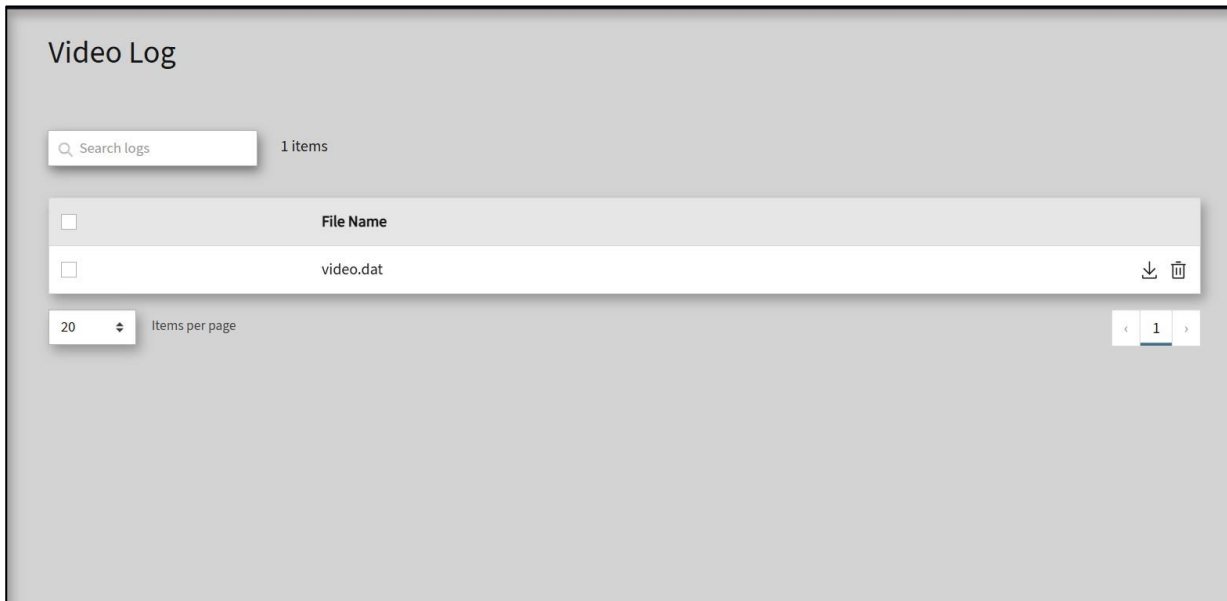


Figure 21 Video Log

Search logs – Search Video Log using search box.

- Users can view Video Logs in the current page by File Name.
- Users can download or delete Video Log by clicking on Download or Delete icon in the right corner.

Note: The “video.dat” file can be compressed using any compression tool like ffmpeg to convert it to output.avi file. Run the following command for getting desired “.avi” video file.

ffmpeg -framerate 15 -vcodec mjpeg -i <Remotepath>/video.dat <DesiredOutputPath>/video.avi

2.5.2 IPMI Event Logs

Users can navigate to Logs -> IPMI Event logs page.

This page contains information about all generated IPMI events. Currently all the IPMI events are supported under IPMI Event Logs category, and all the IPMI event log types are considered as IPMI Event.

Given below is the screenshot for IPMI Event Logs page.

ID	Severity	Date	Description	Status
12	Critical	2025-06-23 12:57:57 (UTC+00:00)	SEL Entry Added:008001300105	Unresolved
11	Warning	2025-06-23 12:57:52 (UTC+00:00)	SEL Entry Added:00800CS36F00	Unresolved
10	Critical	2025-06-23 12:57:39 (UTC+00:00)	SEL Entry Added:008001300109	Unresolved
9	Critical	2025-06-23 12:57:29 (UTC+00:00)	SEL Entry Added:008001300109	Unresolved
8	Critical	2025-06-23 12:57:22 (UTC+00:00)	SEL Entry Added:008002600102	Unresolved
7	Warning	2025-06-23 12:57:17 (UTC+00:00)	SEL Entry Added:00800CS36F00	Unresolved
6	Warning	2025-06-23 12:02:15 (UTC+00:00)	SEL Entry Added:00800CS36F00	Unresolved
5	Critical	2025-06-23 12:02:08 (UTC+00:00)	SEL Entry Added:008002600102	Unresolved
4	Critical	2025-06-23 12:02:01 (UTC+00:00)	SEL Entry Added:008001300108	Unresolved
3	Warning	2025-06-23 12:01:45 (UTC+00:00)	SEL Entry Added:00800CS36F00	Unresolved
2	Critical	2025-06-23 12:01:36 (UTC+00:00)	SEL Entry Added:008002600102	Unresolved
1	Critical	2025-06-23 12:01:25 (UTC+00:00)	SEL Entry Added:008001300109	Unresolved

Figure30 IPMI Event logs Page

The IPMI Event logs page contains information about the following:

Search logs - Search logs using search box.

- Users can filter IPMI events by From date and To date which displays the event by selected date range.
- Delete all – Selected IPMI events will be deleted.
- Export all - A systemLogs.json file will be downloaded in the download directory of the system containing all IPMI event information in json format.
- Users can view IPMI events log in to the current page by ID, Severity, Date, and Description.
- Twenty IPMI events per page are supported.

- The IPMI Event logs can also be deleted using the Delete icon in the right corner.
- The IPMI Event logs can also be exported using the Export icon in the right corner.

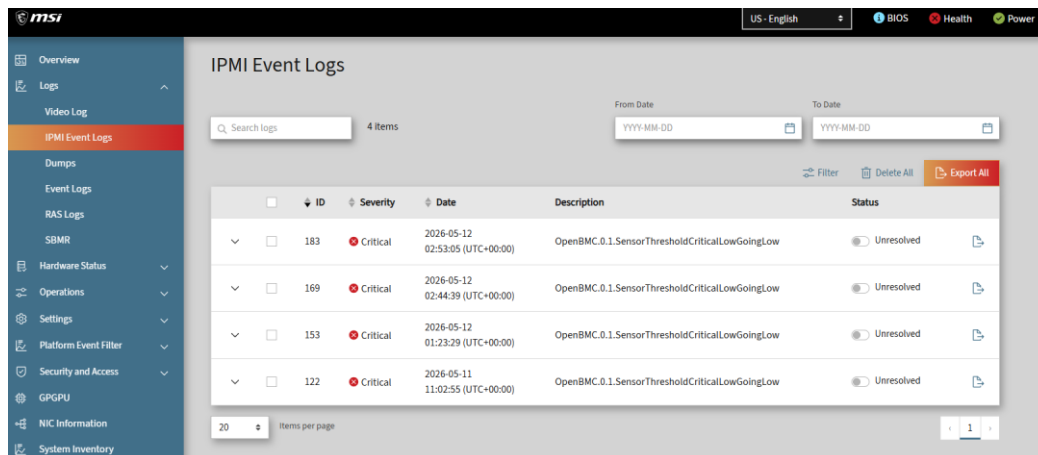


Figure31 IPMI Event logs Page Filter

Filter:

- Users can filter the IPMI Event logs by Severity i.e., OK, Warning and Critical.
- Users can filter IPMI Event logs by Status i.e., Resolved and Unresolved.
- Users can clear all filter selections using the Clear all option.

Additional Data

Identify the specific IPMI event in the log table to download additional data

- Click on the row expand icon located in the respective row of the IPMI event.

Note: This action will reveal more options or details about that IPMI event.

- Once the row is expanded, the user can click the Additional Data button to download a log file with detailed information about the selected IPMI event.

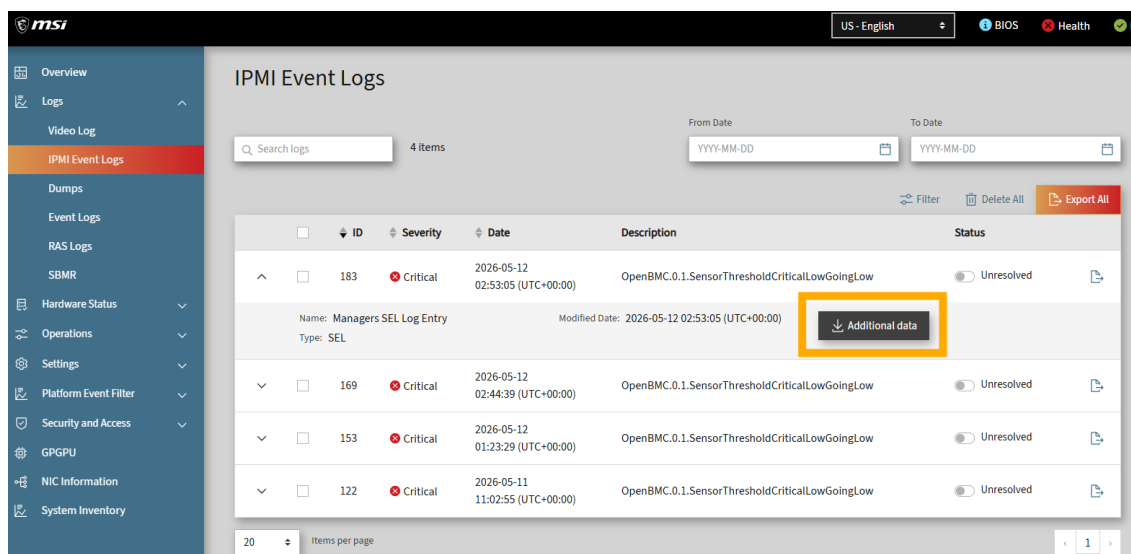


Figure 32 Event Log Row Expand Screenshot

- The message below indicates that the Additional Data for one of the IPMI event logs was successfully downloaded.

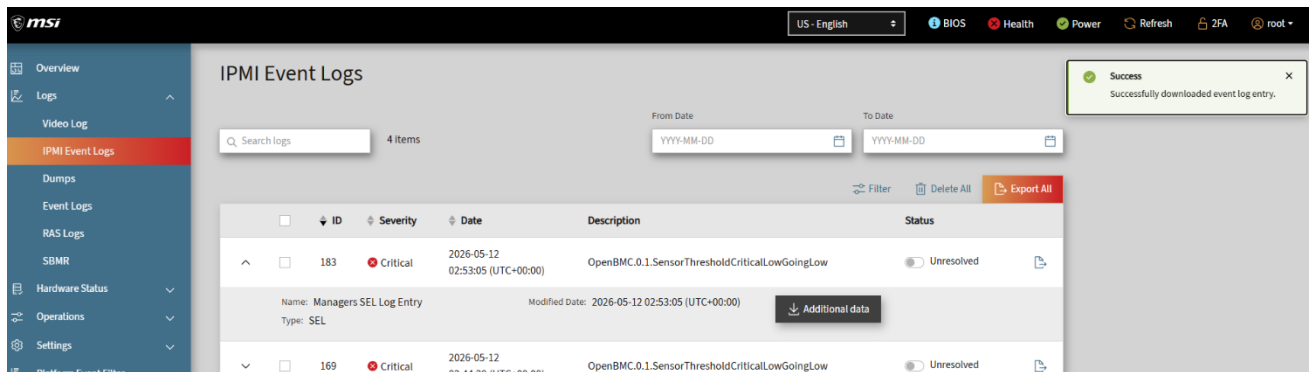


Figure 33 Additional Data Download Success Message

- Open the downloaded file, which contains structured details for analysis.

```
{
  "EVENT_DIR": "1",
  "GENERATOR_ID": "32768",
  "RECORD_TYPE": "2",
  "SENSOR_DATA": "09FFFF",
  "SENSOR_PATH": "",
  "SENSOR_TYPE": "1"
}
```

Figure 34 Additional Data Downloaded File

2.5.3 Dumps

User can navigate to Logs -> Dumps page.

Given below is the screenshot for Dumps page

Dumps

Initiate Dump

Select Dump type

BMC Dump

Initiate Dump

Dumps available on BMC

Search Dumps 59 items From Date YYYY-MM-DD To Date YYYY-MM-DD Filter

☐	Date and Time	Dump Type	ID	Size	
☐	2025-06-26 07:15:38 (UTC+00:00)	BMC Dump Entry	49	0.018 MB	Download Delete
☐	2025-06-26 07:15:16 (UTC+00:00)	BMC Dump Entry	48	0.018 MB	Download Delete
☐	2025-06-26 07:15:06 (UTC+00:00)	BMC Dump Entry	47	0.018 MB	Download Delete
☐	2025-06-26 07:15:29 (UTC+00:00)	BMC Dump Entry	46	0.009 MB	Download Delete
☐	2025-06-26 07:13:07 (UTC+00:00)	BMC Dump Entry	42	0.009 MB	Download Delete
☐	2025-06-26 07:12:56 (UTC+00:00)	BMC Dump Entry	41	0.018 MB	Download Delete
☐	2025-06-26 07:12:33 (UTC+00:00)	BMC Dump Entry	40	0.018 MB	Download Delete

20 Items per page < 1 2 3 >

Figure 35 Dumps

The Dumps page contains the following information:

1. Initiate dump
 - Select dump type - User can select BMC dump as dump type from the drop down.
 - Initiate dump – Click Initiate dump to initiate the process.
2. Dumps available on BMC
 - Search dumps - Search dumps using search box.
 - Users can filter dumps by From date and To date which displays the event by selected date range.
 - Users can view dumps in the current page by Date and time, Dump type, ID, and Size.
 - Users can download or delete dumps by clicking on Download or Delete icon in the right corner.

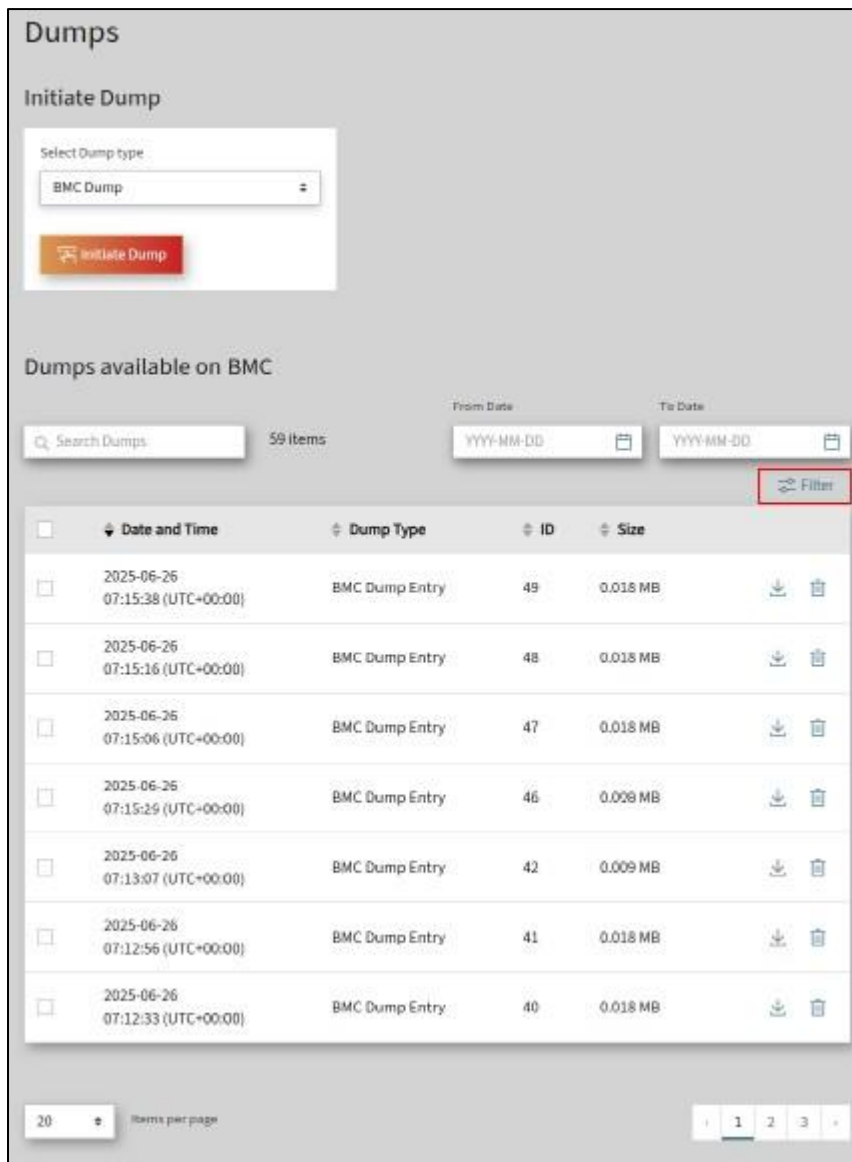


Figure 36 Dumps - Filter

Filter:

- Users can filter the dumps by BMC Dump Entry.
- Users can clear all filter selections using the Clear all option.

Note: The Dump ID displayed refers to a sequential counter that continues from the last assigned ID to ensure uniqueness. This prevents conflicts and maintains data integrity. Even if all previous dumps are removed, the system does not reuse old IDs.

2.5.4 Event Logs

Users can navigate to Logs -> Event logs page.

This page contains information about all generated events. Currently all the events are supported under Event Logs category, and all the event log types are considered as Event.

Given below is the screenshot for Event Logs page.

Event logs

Search logs

17 Items

From date

YYYY-MM-DD

To date

YYYY-MM-DD

Filter

Delete all

Export all

☐	ID	Severity	Date	Description	Status
☒	17	Warning	2024-08-07 06:35:27 UTC	Dimm_Energy_CPU2 warning high threshold assert. Reading=782.863392 Threshold=762.500000.	Unresolved
☒	16	Warning	2024-08-07 06:31:44 UTC	Cpu_Energy_CPU2 warning high threshold assert. Reading=0.000000 Threshold=-582.939648.	Unresolved
☒	15	Warning	2024-08-07 06:31:44 UTC	Cpu_Energy_CPU1 warning high threshold assert. Reading=0.000000 Threshold=-582.939648.	Unresolved
☒	14	OK	2024-08-07 06:31:31 UTC	Status_cpu1 logged a Presence Detected	Unresolved
☒	13	OK	2024-08-07 06:31:31 UTC	ACPI_System_Status logged a S0_G0	Unresolved
☒	12	Critical	2024-08-07 06:31:31 UTC	Service xyz.openbmc_project.GARPCntrol.service has exited unsuccessfully	Unresolved
☒	11	Critical	2024-08-07 06:31:31 UTC	Service nsicd.service has exited unsuccessfully	Unresolved
☒	10	Critical	2024-08-07 06:31:31 UTC	Service init_ssd.service has exited unsuccessfully	Unresolved
☒	9	OK	2024-08-07 06:31:31 UTC	Status_cpu0 logged a Presence Detected	Unresolved
☒	8	OK	2024-08-07 06:31:29 UTC	ACPI_System_Status logged a LEGACY_OFF	Unresolved
☒	7	Critical	2024-08-07 06:31:24 UTC	Service security-registers-check.service has exited unsuccessfully	Unresolved
☒	6	Critical	2024-08-07 06:31:24 UTC	Service system-guid.service has exited unsuccessfully	Unresolved
☒	5	Critical	2024-08-07 06:31:24 UTC	Service nsicd.service has exited unsuccessfully	Unresolved
☒	4	Critical	2024-08-07 06:31:24 UTC	Service host-interface.service has exited unsuccessfully	Unresolved
☒	3	Critical	2024-08-07 06:31:24 UTC	Service ac-boot-check.service has exited unsuccessfully	Unresolved
☒	2	OK	2024-08-07 06:31:00 UTC	SEL Entry Added:2C00218008F1	Unresolved
☒	1	OK	2024-08-07 06:31:00 UTC	SEL Entry Added:2C00218008F0	Unresolved

20

Items per page

1

Figure 37 Event logs Page

The Event logs page contains the information about following:

- Search logs - Search logs using search box.
- Users can filter events by From date and To date which displays the event by selected date range.

- Delete all - Selected events will be deleted.
- Export all - A systemLogs.json file will be downloaded in the download directory of the system containing all event information in json format.
- Users can view events logs in the current page by ID, Severity, Date, and Description.
- Twenty events per page are supported.
- The Event logs can also be deleted using the Delete icon in the right corner.
- The Event logs can also be exported using the Export icon in the right corner.

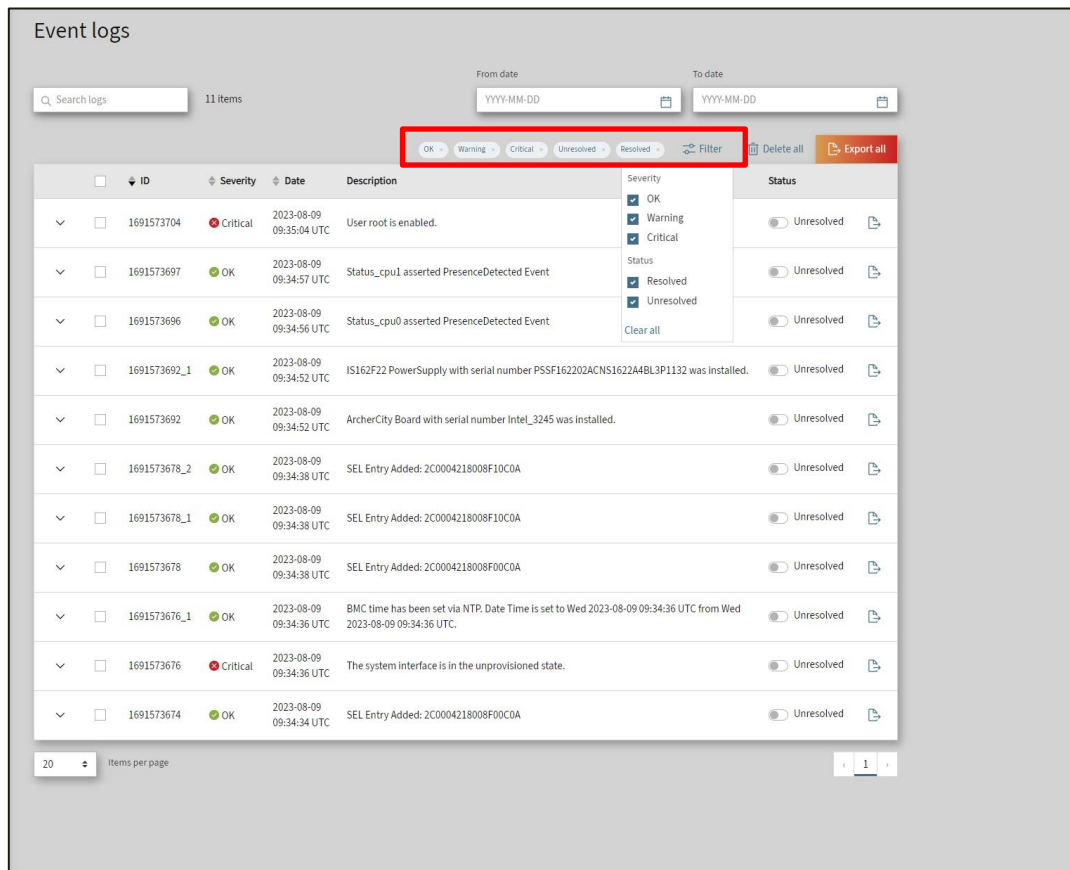


Figure 38 Event logs Page - Filter

Filter:

- Users can filter the Event logs by Severity i.e., OK, Warning and Critical.
- Users can filter Event logs by Status i.e., Resolved and Unresolved.
- Users can clear all filter selections using the Clear all option.

Additional Data

Identify the specific event in the log table to download additional data

- Click on the row expand icon located in the respective row of the event.

Note: This action will reveal more options or details about that event.

- Once the row is expanded, the user can click the Additional Data button to download a log file with detailed information about the selected event.

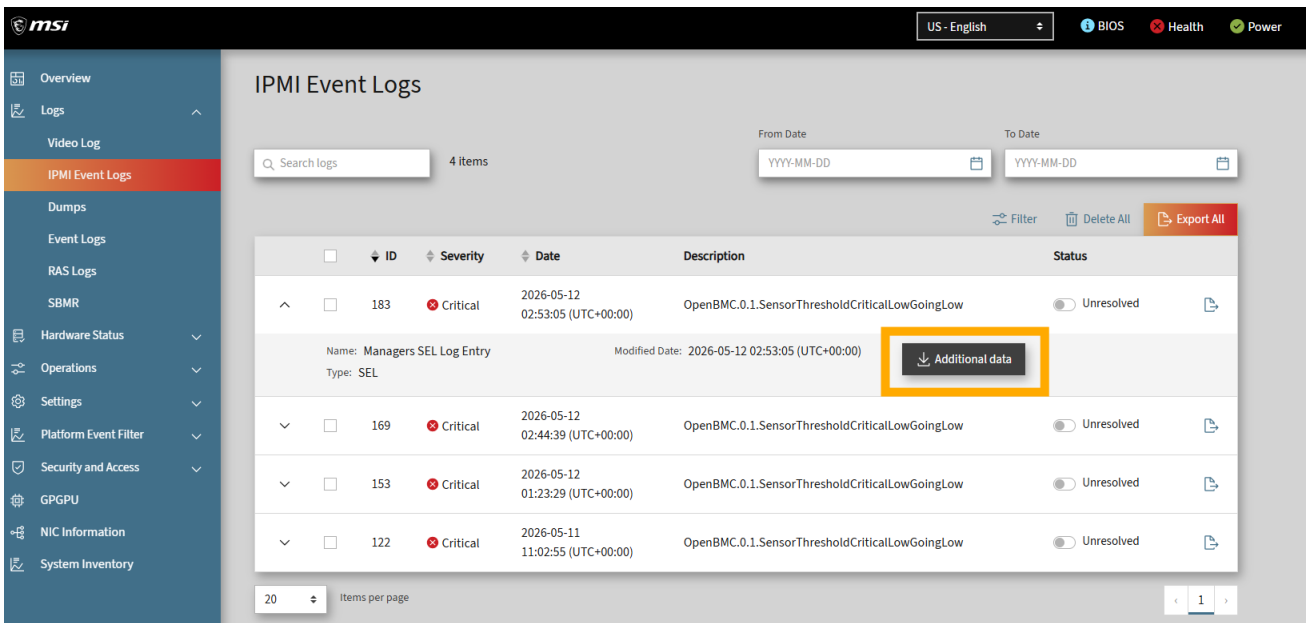


Figure 39 Event Log Row Expand Screenshot

- The message below indicates that the Additional Data for one of the event logs was successfully downloaded.

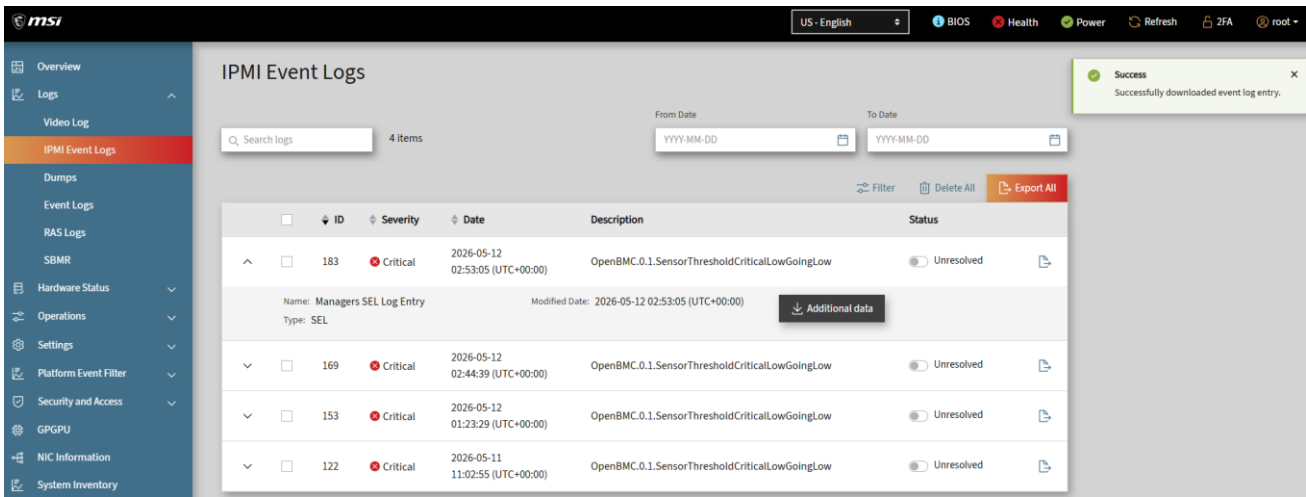


Figure 40 Additional Data Download Success Message

- Open the downloaded file, which contains structured details for analysis.

```
{
  "REDFISH_MESSAGE_ARGS": "PCIe Device Enumeration Service , Discovery Timed Out",
  "REDFISH_MESSAGE_ID": "ResourceEvent.1.0.ResourceErrorsDetected",
  "xyz.openbmc_project.Logging.Entry.Resolution": "Reset the baseboard"
}
```

Figure 41 Additional Data Downloaded File

2.5.5 POST Code Logs

Users can navigate to Logs -> Post code logs page.

Given below is the screenshot for Post Code logs page

The screenshot displays the 'POST code logs' page. At the top, there is a search bar labeled 'Search logs' and a count of '394 items'. To the right, there are date filters for 'From date' and 'To date', both set to 'YYYY-MM-DD'. Below these are buttons for 'Delete all' and 'Export all'. The main content is a table with the following columns: 'Created', 'Time stamp offset', 'Boot count', and 'POST code'. The table lists several log entries, each with a checkbox on the left and an 'Export' icon on the right. At the bottom, there is a pagination control showing '20' items per page and a page number '1'.

	Created	Time stamp offset	Boot count	POST code
☐	2024-08-22 09:40:45 UTC	0.0000	1	0x50
☐	2024-08-22 09:40:45 UTC	0.0012	1	0x10
☐	2024-08-22 09:40:46 UTC	1.0721	1	0x02
☐	2024-08-22 09:40:46 UTC	1.0787	1	0x03
☐	2024-08-22 09:40:48 UTC	3.0962	1	0x00
☐	2024-08-22 09:40:48 UTC	3.0964	1	0x43
☐	2024-08-22 09:40:48 UTC	3.1646	1	0x4a
☐	2024-08-22 09:40:48 UTC	3.1649	1	0x4d

Figure 42 POST code logs Page

The POST code logs page contains the information about following:

- Search logs - Search logs using search box.
- Users can filter POST code logs by From date and To date which displays the event by selected date range.
- Export all - A systemLogs.json file will be downloaded in the download directory of the system containing all event information in json format.
- Users can view POST code logs in the current page by Created, Time stamp offset, Boot count and Post Code.
- Twenty POST code logs per page are supported.
- The Post code logs can also be exported using the Export Log icon in the right corner.

2.6 Hardware Status

2.6.1 Inventory and LEDs

Users can navigate to Hardware Status -> Inventory and LEDs page.

Given below is the screenshot for Inventory and LEDs page.

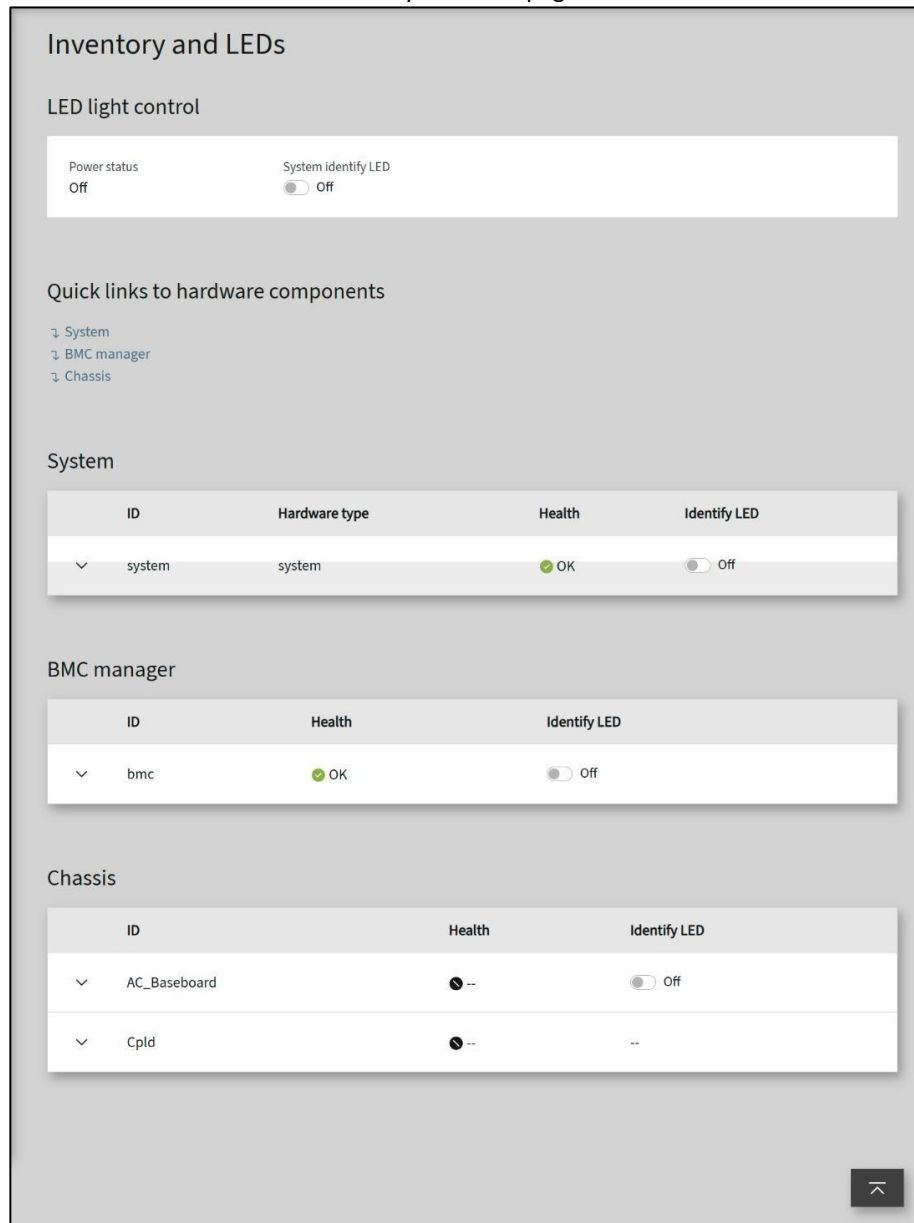
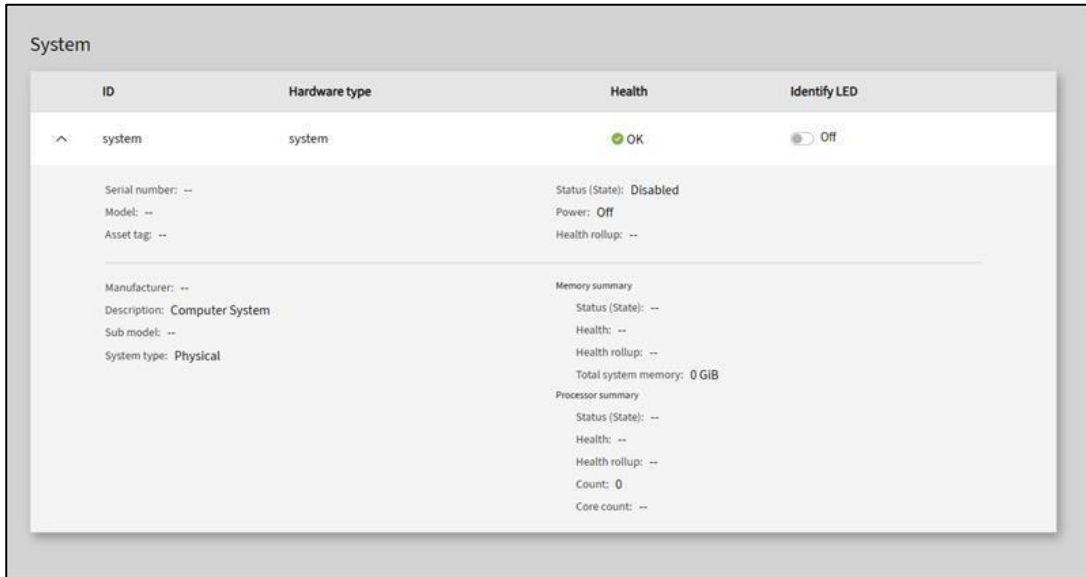


Figure 43 Inventory and LEDs Page

Inventory and LEDs page will show the list of hardware in the system:

1. LED light control – It shows the status of Power status and System identify LED.

3. System - It contains information about ID, Hardware type, Health, Location number and Identify LED.



2. Quick links to hardware components – It provides the quick link to all hardware components.

Figure 44 System Page

- Expand the system row to view detailed hardware information.
- Look for the Serial Number, Model, and Asset Tag fields to identify the system (if available).
- Check the Manufacturer, submodels and Description fields for additional details.
- Confirm whether the system is Physical or a Virtual Machine under the System Type field.
- User can view the Status (State) field to determine if the system is Enabled or Disabled.
- Verify the Power field to see if the system is On or Off.
- Users can also view the details like Status, Health, Health rollup, Total system memory, Count and Core count for both Memory summary and Processor summary.

Note: If a value or data is not available, it will be displayed as "--".

4. BMC manager - It contains information about ID, Health, Location number and Identify LED.

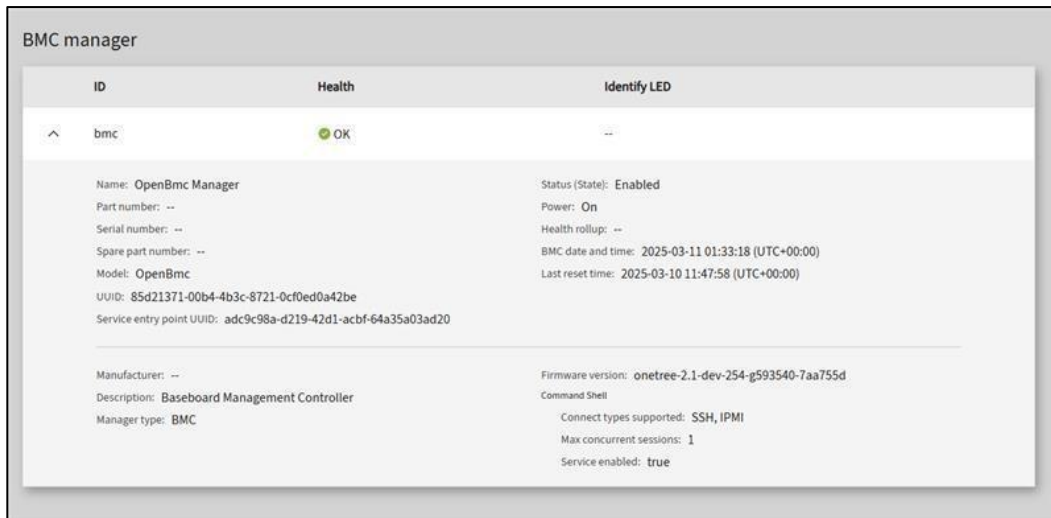


Figure 45 BMC Manager Page

- Expand the system row to view detailed BMC Manager.
 - Ensure health status is ok.
 - Users can verify the status and power.
 - Users can also check the Name, Part number, Serial number, Spare part number, Model, UUID, Service entry point UUID for identification.
 - Users can view the BMC Date & Time and Last Reset Time for recent activity.
 - Users can ensure the firmware version is up to date.
5. Chassis - It contains information about ID, Health, Location number and Identify LED.

Chassis

ID	Identify LED
^ AVC_Baseboard Name: AVC_Baseboard Part Number: Serial Number: Model: AvenueCity Manufacturer: Intel Corporation Chassis Type: RackMount	Off Status (State): Enabled Power: -- Asset Tag: Min Power: 0 W Max Power: 1600 W
^ BNC_Baseboard Name: BNC_Baseboard Part Number: Serial Number: Intel_3245 Model: BeechnutCity Manufacturer: Intel Corporation Chassis Type: RackMount	Off Status (State): Enabled Power: -- Asset Tag: Min Power: 0 W Max Power: 1600 W
^ Cpld Name: Cpld Part Number: -- Serial Number: -- Model: -- Manufacturer: -- Chassis Type: RackMount	-- Status (State): Enabled Power: -- Asset Tag: -- Min Power: 0 W Max Power: 1600 W
^ PLDM_IO_Board Name: PLDM_IO_Board Part Number: -- Serial Number: -- Model: -- Manufacturer: -- Chassis Type: RackMount	-- Status (State): Enabled Power: -- Asset Tag: -- Min Power: 0 W Max Power: 1600 W

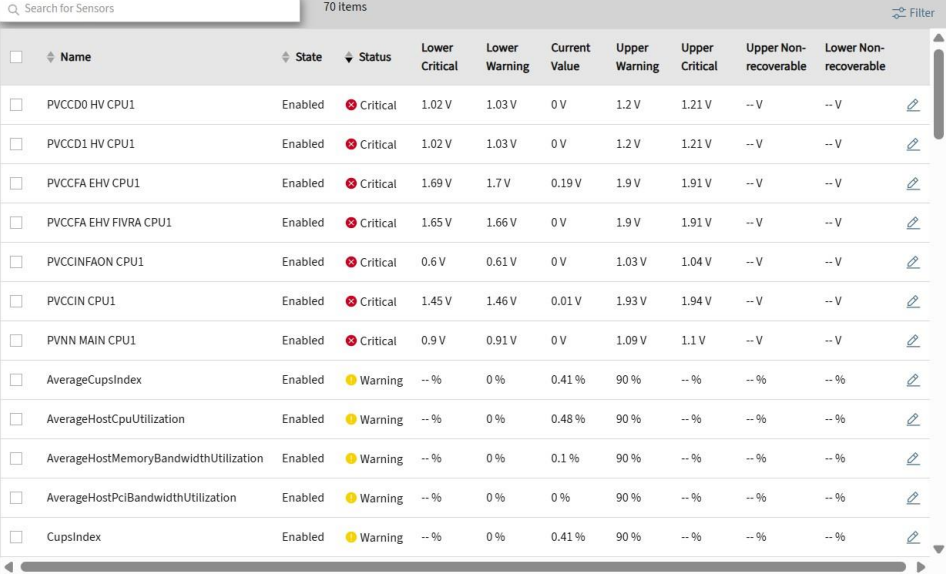
Figure 46 Chassis Page

- Check the Status (State) field to see if the chassis is Active or Inactive mode.
- Users can view the Name, Part Number, Serial Number, Model, and Asset Tag for identification.
- Users can identify the chassis type in the manufacturer field.
- Review the Minimum Power and Maximum Power values to understand power requirements.

2.6.2 Sensors

Users can navigate to Hardware Status -> Sensors page.

Given below is the screenshot for Sensors page.



Sensors

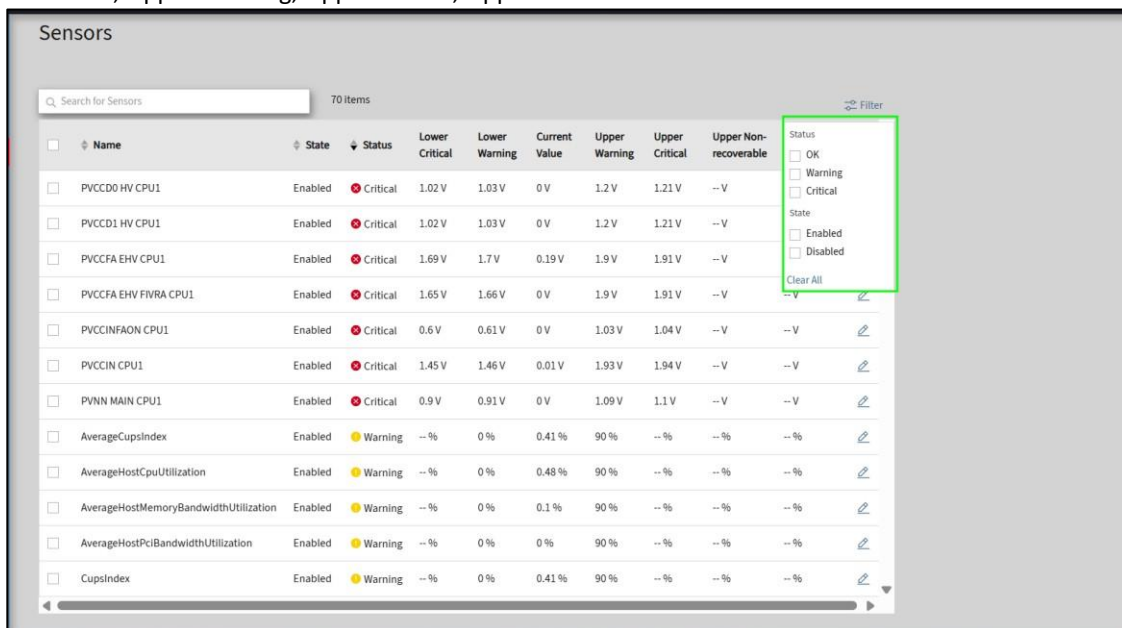
Search for Sensors 70 Items Filter

☐	Name	State	Status	Lower Critical	Lower Warning	Current Value	Upper Warning	Upper Critical	Upper Non-recoverable	Lower Non-recoverable	
☐	PVCCD0 HV CPU1	Enabled	Critical	1.02 V	1.03 V	0 V	1.2 V	1.21 V	-- V	-- V	
☐	PVCCD1 HV CPU1	Enabled	Critical	1.02 V	1.03 V	0 V	1.2 V	1.21 V	-- V	-- V	
☐	PVCCFA EHV CPU1	Enabled	Critical	1.69 V	1.7 V	0.19 V	1.9 V	1.91 V	-- V	-- V	
☐	PVCCFA EHV FIVRA CPU1	Enabled	Critical	1.65 V	1.66 V	0 V	1.9 V	1.91 V	-- V	-- V	
☐	PVCCINFAON CPU1	Enabled	Critical	0.6 V	0.61 V	0 V	1.03 V	1.04 V	-- V	-- V	
☐	PVCCIN CPU1	Enabled	Critical	1.45 V	1.46 V	0.01 V	1.93 V	1.94 V	-- V	-- V	
☐	PVNN MAIN CPU1	Enabled	Critical	0.9 V	0.91 V	0 V	1.09 V	1.1 V	-- V	-- V	
☐	AverageCupsIndex	Enabled	Warning	-- %	0 %	0.41 %	90 %	-- %	-- %	-- %	
☐	AverageHostCpuUtilization	Enabled	Warning	-- %	0 %	0.48 %	90 %	-- %	-- %	-- %	
☐	AverageHostMemoryBandwidthUtilization	Enabled	Warning	-- %	0 %	0.1 %	90 %	-- %	-- %	-- %	
☐	AverageHostPciBandwidthUtilization	Enabled	Warning	-- %	0 %	0 %	90 %	-- %	-- %	-- %	
☐	CupsIndex	Enabled	Warning	-- %	0 %	0.41 %	90 %	-- %	-- %	-- %	

Figure 47 Sensors Page

The sensor page contains the information about the following:

- Search for sensors - Search sensors using search box.
- Users can view Sensors in the current page by Name, Status, Lower Critical, Lower Warning, Current value, Upper Warning, Upper Critical, Upper Non-recoverable and Lower Nonrecoverable.



Sensors

Search for Sensors 70 Items Filter

☐	Name	State	Status	Lower Critical	Lower Warning	Current Value	Upper Warning	Upper Critical	Upper Non-recoverable	
☐	PVCCD0 HV CPU1	Enabled	Critical	1.02 V	1.03 V	0 V	1.2 V	1.21 V	-- V	
☐	PVCCD1 HV CPU1	Enabled	Critical	1.02 V	1.03 V	0 V	1.2 V	1.21 V	-- V	
☐	PVCCFA EHV CPU1	Enabled	Critical	1.69 V	1.7 V	0.19 V	1.9 V	1.91 V	-- V	
☐	PVCCFA EHV FIVRA CPU1	Enabled	Critical	1.65 V	1.66 V	0 V	1.9 V	1.91 V	-- V	
☐	PVCCINFAON CPU1	Enabled	Critical	0.6 V	0.61 V	0 V	1.03 V	1.04 V	-- V	
☐	PVCCIN CPU1	Enabled	Critical	1.45 V	1.46 V	0.01 V	1.93 V	1.94 V	-- V	
☐	PVNN MAIN CPU1	Enabled	Critical	0.9 V	0.91 V	0 V	1.09 V	1.1 V	-- V	
☐	AverageCupsIndex	Enabled	Warning	-- %	0 %	0.41 %	90 %	-- %	-- %	
☐	AverageHostCpuUtilization	Enabled	Warning	-- %	0 %	0.48 %	90 %	-- %	-- %	
☐	AverageHostMemoryBandwidthUtilization	Enabled	Warning	-- %	0 %	0.1 %	90 %	-- %	-- %	
☐	AverageHostPciBandwidthUtilization	Enabled	Warning	-- %	0 %	0 %	90 %	-- %	-- %	
☐	CupsIndex	Enabled	Warning	-- %	0 %	0.41 %	90 %	-- %	-- %	

Status

☐ OK

☐ Warning

☐ Critical

State

☐ Enabled

☐ Disabled

Clear All

Figure 48 Sensors Page - Filter

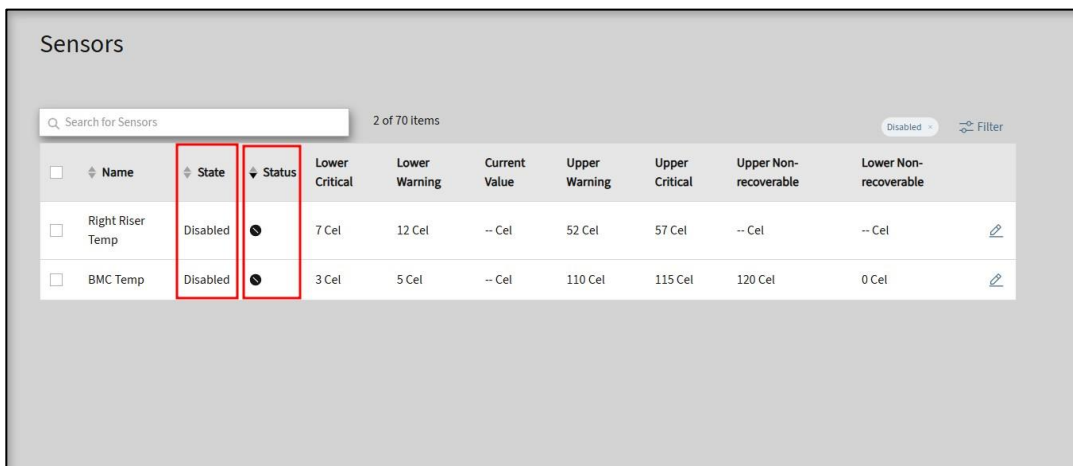
Filter:

- Users can filter the sensors by Status i.e., Critical, Warning, and OK.
- User can filter the sensors by State i.e., Enabled, and Disabled.
- Users can clear all filter selections using the Clear all option.

Disabled Sensor

This feature allows the user to check the sensor is in enabled or disabled state. It allows the user to apply filters for checking the state of sensor. If the sensor is in disabled state, it represents that the sensor is disabled/damaged.

If the Sensor is in Disabled state, the health status does not appear instead looks black as displayed in the below screenshot.



2 of 70 items										
Disabled Filter										
☐	Name	State	Status	Lower Critical	Lower Warning	Current Value	Upper Warning	Upper Critical	Upper Non-recoverable	Lower Non-recoverable
☐	Right Riser Temp	Disabled	●	7 Cel	12 Cel	-- Cel	52 Cel	57 Cel	-- Cel	-- Cel
☐	BMC Temp	Disabled	●	3 Cel	5 Cel	-- Cel	110 Cel	115 Cel	120 Cel	0 Cel

Figure 49 Disabled Sensor

Sensor History

Note: Widgets are little gadgets, which provide real time information about a particular sensor. Users can track a sensor's behavior over a specific amount of time at specific intervals and frame. The result will be displayed as a line graph in the widget.

Users can click on the Sensor Graph icon from the Sensor lists to view its Sensor History. Sensor history values will be updated only after refreshing the WebUI page. A sample screenshot of Sensor with Sensor History is displayed below

Search for Sensors 218 Items Filter										
Name	State	Status	Lower Critical	Lower Warning	Current Value	Upper Warning	Upper Critical	Upper Non-recoverable	Lower Non-recoverable	
PSU2 Output Power	Enabled	Critical	-- W	-- W	242.5 W	212 W	218 W	-- W	-- W	
AverageCupsIndex	Enabled	Warning	-- %	0 %	0.15 %	90 %	-- %	-- %	-- %	
AverageHostCpuUtilization	Enabled	Warning	-- %	0 %	0.18 %	90 %	-- %	-- %	-- %	
AverageHostMemoryBandwidthUtilization	Enabled	Warning	-- %	0 %	0 %	90 %	-- %	-- %	-- %	
AverageHostPciBandwidthUtilization	Enabled	Warning	-- %	0 %	0.04 %	90 %	-- %	-- %	-- %	
CupsIndex	Enabled	Warning	-- %	0 %	0.15 %	90 %	-- %	-- %	-- %	
HostCpuUtilization	Enabled	Warning	-- %	0 %	0.17 %	90 %	-- %	-- %	-- %	
HostMemoryBandwidthUtilization	Enabled	Warning	-- %	0 %	0 %	90 %	-- %	-- %	-- %	
HostPciBandwidthUtilization	Enabled	Warning	-- %	0 %	0.03 %	90 %	-- %	-- %	-- %	
PMT Socket0 0x22806802 ComputeDie0 AGGREGATE CORE CSTATE RESIDENCY C0	Enabled	OK	--	--	235742.83	--	--	--	--	
PMT Socket0 0x22806802 ComputeDie0 DIE CSTATE RESIDENCY C1E	Enabled	OK	--	--	641827639393.33	--	--	--	--	

Figure 50 Sensors Page – Sensor with Sensor History

Note: It is recommended to click the Sensor Graph icon in Web UI to view its own Sensor History.

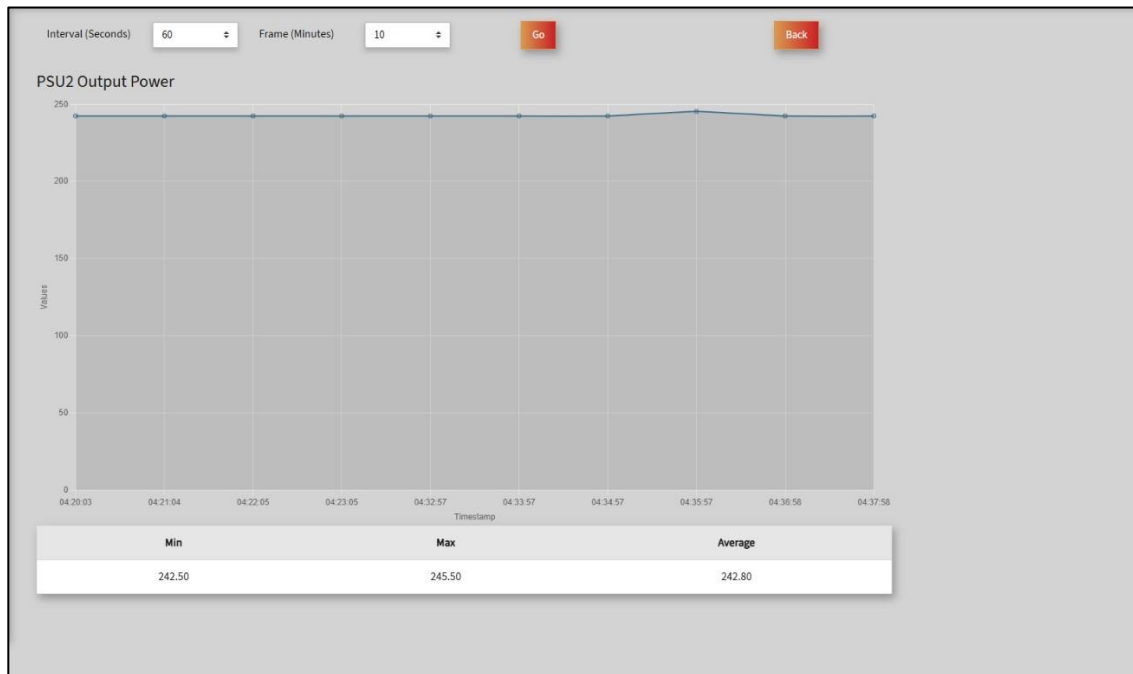


Figure 51 Sensors History

Sensor History Graph:

- Interval (seconds) – Select an option like 10, 20, 30 or 60 from the drop-down list.

- Frame (minutes) – Select an option like 10, 20 or 30 from the drop-down list.
- Click Go to proceed else Back to leave the Page and redirect to Sensor Page.

Note: After WebUI Refresh only sensor history value will get updated.

Power Sensors

Web UI will display the Average power consumption (Average), Maximum power consumption (Max) and Minimum power consumption (Min) values for the following power sensors.

- 'PSU2 Input Power',
- 'PSU2 Output Power',
- 'Cpu Power Average CPU2',
- 'PSU1 Input Power',
- 'PSU1 Output Power',
- 'Platform Power Average CPU1',
- 'Platform Power Average CPU2',
- 'Dimm Power Average CPU1',
- 'Dimm Power Average CPU2',
- 'Cpu Power Average CPU1',



Figure 52 PSU2 Input Power

- Average power consumption -- average value for the sensor reading from the graph
- Maximum power consumption -- maximum value for the sensor reading from the graph
- Minimum power consumption -- minimum value for the sensor reading from the graph

Sensor Threshold

Select a specific sensor from the Sensor lists. The Sensor Information Thresholds for the selected sensor will be displayed as shown below.

Sensors										
Search for Sensors			70 items		Filter					
☐	Name	State	Status	Lower Critical	Lower Warning	Current Value	Upper Warning	Upper Critical	Upper Non-recoverable	Lower Non-recoverable
☐	PCIe 12V Input Voltage	Enabled	OK	-- V	-- V	1.23 V	-- V	-- V	-- V	-- V
☐	PSU1 Input Voltage	Enabled	OK	-- V	-- V	117 V	-- V	-- V	-- V	-- V
☐	PVCCD0 HV CPU0	Enabled	OK	1.02 V	1.03 V	1.12 V	1.2 V	1.21 V	-- V	-- V
☐	PVCCD1 HV CPU0	Enabled	OK	1.02 V	1.03 V	1.12 V	1.2 V	1.21 V	-- V	-- V
☐	PVCCFA EHV CPU0	Enabled	OK	1.69 V	1.7 V	1.82 V	1.9 V	1.91 V	-- V	-- V
☐	PVCCFA EHV FIVRA CPU0	Enabled	OK	1.65 V	1.66 V	1.8 V	1.9 V	1.91 V	-- V	-- V
☐	PVCCFAON CPU0	Enabled	OK	0.6 V	0.61 V	0.72 V	1.03 V	1.04 V	-- V	-- V
☐	PVCCIN CPU0	Enabled	OK	1.45 V	1.46 V	1.84 V	1.93 V	1.94 V	-- V	-- V
☐	PVNN MAIN CPU0	Enabled	OK	0.9 V	0.91 V	1.01 V	1.09 V	1.1 V	-- V	-- V
☐	Watchdog2	Enabled	OK	--	--	--	--	--	--	--
☐	Right Riser Temp	Disabled		7 Cel	12 Cel	-- Cel	52 Cel	57 Cel	-- Cel	-- Cel
☐	BMC Temp	Disabled		3 Cel	5 Cel	-- Cel	110 Cel	115 Cel	120 Cel	0 Cel

Figure 53 Sensor Threshold

2.7 Operations

2.7.1 Factory Default

In MegaRAC OneTree GUI, this option is used to restore the factory defaults of the device firmware.

This section lists the configuration items that will be preserved during factory default configuration.

Warning: Please note that after entering restore factory widgets, other web pages and services will not work. All open widgets will be closed automatically. The device will reset and reboot within few minutes.

To open Factory Defaults page, click Operations > Factory Default from the menu bar. A sample screenshot of Factory Default Page is shown below.

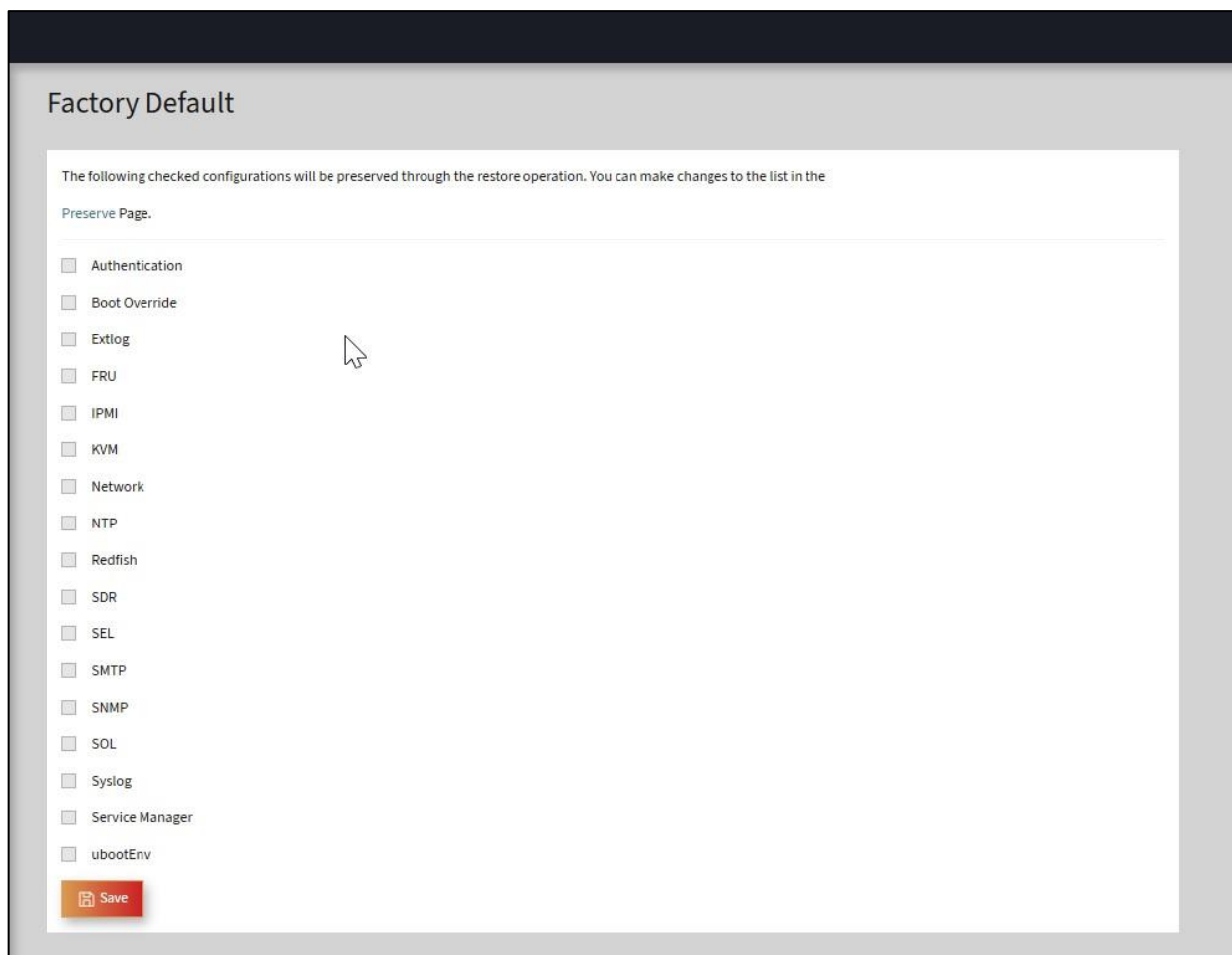


Figure 54 Factory Defaults

Procedure

1. Click Preserve to redirect to Preserve Configuration page, which is used to preserve the particular configuration not to be overwritten by the default configuration.
2. Click Factory Default to restore the factory defaults of the device firmware.

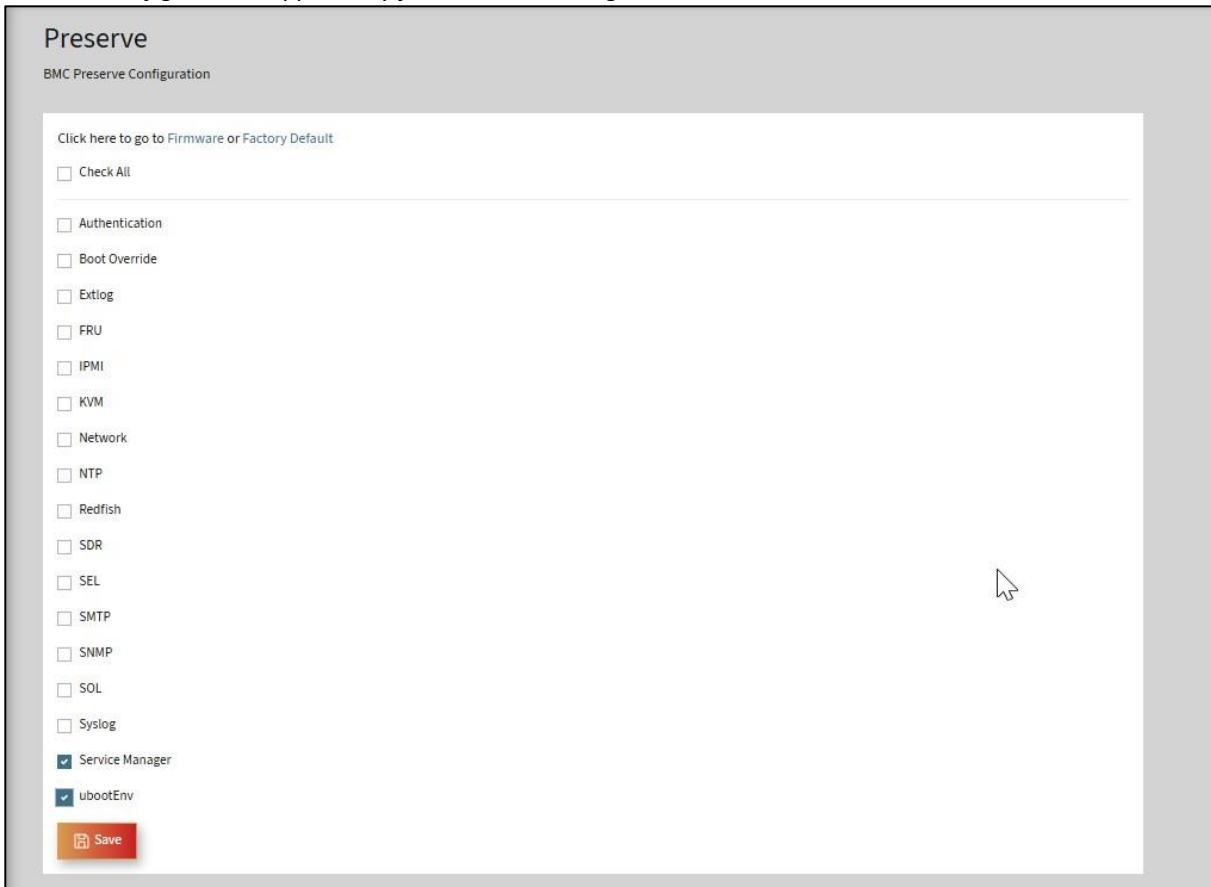
Note: When Factory Defaults action is performed, there might be some log events present after performing restore operation. Those events might be newly generated which can be verified using its timestamp.

2.7.2 Preserve

This page allows the user to configure the preserve configuration items, which will be used by the Restore factory defaults to preserve the existing configuration without overwriting with defaults/ Firmware Upgrade configuration.

To open the Preserve page, click Operations a Preserve from the menu bar. A sample screenshot of Preserve page is shown below.

Note: You can navigate to the Firmware Page and Factory Default Page by clicking the respective links. Preserve configuration support only for BMC active image



Preserve

BMC Preserve Configuration

[Click here to go to Firmware or Factory Default](#)

- ☐ Check All
- ☐ Authentication
- ☐ Boot Override
- ☐ Extlog
- ☐ FRU
- ☐ IPMI
- ☐ KVM
- ☐ Network
- ☐ NTP
- ☐ Redfish
- ☐ SDR
- ☐ SEL
- ☐ SMTP
- ☐ SNMP
- ☐ SOL
- ☐ Syslog
- ☒ Service Manager
- ☒ ubootEnv

Figure 55 Preserve

The various fields of Preserve Configuration are as follows.

Check All: To check the entire configuration list.

Save: To save any changes made.

Note: This configuration is used by Restore Factory Defaults process.

Files Preserved

Authentication

Following file path data will be preserved.

"/etc/pam.d/",
"/etc/nsswitch.conf",
"/etc/nscd.conf",


```

"/etc/group",
"/etc/group-",
"/etc/gshadow",
"/etc/ipmi_pass",
"/etc/login.defs",
"/etc/nslcd.conf",
"/etc/nslcd.conf.default",
"/etc/passwd",
"/etc/shadow",
"/var/lib/phosphor-ldap-conf/",
"/var/lib/radius-configuration.json",
"/var/lib/ipmi/ipmi_user_backup.json",
"/etc/radiusclient-ng/radiusclient.conf",
"/etc/radiusclient-ng/servers",
"/etc/radiusclient-ng/AESIV",
"/etc/radiusclient-ng/AESKey"

```

Boot Override

Following file path data will be preserved.

```

"/var/lib/phosphor-settings-manager/settings/xyz/openbmc_project/control/host0/boot/one_time",
"/var/lib/phosphor-settings-manager/settings/xyz/openbmc_project/control/host0/boot_",
"/var/lib/oob-bios-config-inventory/oob_bios_config.json"

```

EXTLOG

Following file path data will be preserved.

```

"/etc/extlog/extended.log*"

```

FRU

Following file path data will be preserved. The data stored in EEPROM will be persistent across reboot/Firmware update. If platform using EEPROM for fru, by default, it will be preserve. "/etc/fru/"

IPMI

Following file path data will be preserved.

```

"/usr/share/ipmi-providers/channel_access.json",
"/usr/share/ipmi-providers/channel_config.json",

```

```
"/usr/share/ipmi-providers/cipher_list.json",  
"/usr/share/ipmi-providers/cs_privilege_levels.json",  
"/usr/share/ipmi-providers/dcmi_cap.json",  
"/usr/share/ipmi-providers/dcmi_sensors.json",  
"/usr/share/ipmi-providers/dev_id.json",  
"/usr/share/ipmi-providers/master_write_read_white_list.json",  
"/usr/share/ipmi-providers/power_reading.json",  
"/usr/share/ipmi-providers/entity-map.json",  
"/var/lib/ipmi/channel_access_nv.json"
```

KVM

Following file path data will be preserved.

```
"/etc/systemd/system/start-ipkvm.socket.d/override.conf",  
"/etc/virtual-media.json",  
"/etc/tmpfiles.d/virtual-media.conf"
```

NETWORK

Following file path data will be preserved.

```
"/etc/dns.d/dns.conf",  
"/etc/hostname",  
"/etc/systemd/network/",  
"/etc/interface/",  
"/etc/interface/bonding/",  
"/etc/interface/iptables/",  
"/etc/dns.d/"
```

NTP

Following file path data will be preserved.

```
"/etc/systemd/timesyncd.conf",  
"/var/lib/phosphor-settings-manager/settings/xyz/openbmc_project/time/sync_method_",  
"/etc/timezone",  
"/etc/localtime"  
"/etc/systemd/network/"
```

REDFISH

Following file path data will be preserved.

`"/var/lib/redfish/"`

SDR

Following file path data will be preserved.

`"/var/configuration/system.json"`

SEL

Following file path data will be preserved.

`"/etc/extlog/phosphor-logging/errors/",`
`"/etc/extlog/phosphor-logging/ipmi/errors/",`
`"/etc/extlog/phosphor-logging/raid/errors/",`
`"/etc/extlog/phosphor-logging/ipmi_rollover_backup/"`

SMTP

Following file path data will be preserved.

`"/var/lib/alert/primary_smtp_config.json",`
`"/var/lib/alert/secondary_smtp_config.json"`

SNMP

Following file path data will be preserved.

`"/etc/snmp/snmpd.conf.d/snmpd.conf",`
`"/etc/snmp/SnmpTrapStatus",`
`"/var/lib/net-snmp/snmpd.conf",`
`"/var/lib/phosphor-snmp/",`
`"/var/lib/snmp-agent/",`
`"/etc/snmp/snmpd.conf",`
`"/etc/snmp/snmptrapd.conf"`
`"/home/root/bmcweb_persistent_data.json"`

SOL

Following file path data will be preserved.

`"/var/lib/phosphor-settings-manager/settings/xyz/openbmc_project/ipmi/sol/eth0_"`

SYSLOG

Following file path data will be preserved.

```
"/etc/rsyslog.conf",  
"/etc/rsyslog.d/hostconsole.conf",  
"/etc/rsyslog.d/server.conf",  
"/etc/rsyslog.d/syslog.conf",  
"/etc/logrotate.conf",  
"/etc/logrotate.d/logrotate.rsyslog",  
"/etc/logrotate.d/wtmp",  
"/etc/logrotate.d/btmp"
```

Service Manager

Following file path data will be preserved.

```
"/etc/srvcfg-manager/srvcfg.json"
```

U BOOT ENV

This will preserve the configured BMC environmental variables.

Preserve Module	Preserve Configuration file list	Preserve Config data Description
AUTHENTICATION	/etc/pam.d/, /etc/nsswitch.conf, /etc/nscd.conf, /etc/group, /etc/group- /etc/gshadow,/etc/ipmi_pass, /etc/login.defs, /etc/nslcd.conf, /etc/nslcd.conf.default, /etc/passwd, /etc/shadow, /var/lib/phosphor-ldap-conf/ /var/lib/radius-configuration.json	details, authentication User account PAM/NSS/RADIUS/LDAP configuration

Preserve Module	Preserve Configuration file list	Preserve Config data Description
Boot Override	/var/lib/phosphor-settingsmanager/settings/xyz/openbmc_project/control/host0/boot/one_time, /var/lib/phosphor-settingsmanager/settings/xyz/openbmc_project/control/host0/boot_	One-time or persistent boot settings to override default host boot behavior
EXTLOG	/etc/extlog/phosphor-logging/errors/	Extended error logs
FRU	/etc/fru/	FRU data for the baseboard. The data stored in EEPROM will be persistent across reboot/Firmware update. If platform using EEPROM for Fru, by default, it will be preserve.
IPMI	/usr/share/ipmi-providers/channel_access.json, /usr/share/ipmi-providers/channel_config.json, /usr/share/ipmi-providers/cipher_list.json, /usr/share/ipmi-providers/cs_privilege_levels.json, /usr/share/ipmi-providers/dcmi_cap.json, /usr/share/ipmi-providers/dcmi_sensors.json, /usr/share/ipmi-providers/dev_id.json, /usr/share/ipmiproviders/master_write_read_white_list.json, /usr/share/ipmi-providers/power_reading.json, /usr/share/ipmi-providers/entity-map.json, /var/lib/ipmi/channel_access_nv.json	IPMI channel access, user privilege, cipher list, sensor data, and entity maps
NTP	/var/lib/phosphor-settingsmanager/settings/xyz/openbmc_project/time/sync_method_	Time synchronization method (manual or NTP) to ensure accurate system time
SDR	/var/configuration/system.json	system configuration data handled by the Entity Manager.
SEL	/etc/extlog/phosphor-logging/errors/ /etc/extlog/phosphor-logging/ipmi/errors/ /etc/extlog/phosphor-logging/raid/errors/ /etc/extlog/phosphorlogging/ipmi_rollover_backup/	System event log (SEL) entries

Preserve Module	Preserve Configuration file list	Preserve Config data Description
Service Manager	/etc/srvcfg-manager/srvcfg.json	Session timeout, max concurrent sessions, service enable status for KVM, SSH, WEB, Redfish, virtual media
SMTP	/var/lib/alert/primary_smtp_config.json, /var/lib/alert/secondary_smtp_config.json	SMTP server configuration details
SNMP	/etc/snmp/snmpd.conf.d/snmpd.conf, /etc/snmp/SnmpTrapStatus, /var/lib/net-snmp/snmpd.conf, /var/lib/phosphor-snmp/ , /etc/snmp/snmpd.conf, /etc/snmp/snmptrapd.conf	SNMP agent config, users, clients, trap settings
SOL	/var/lib/phosphor-settings-manager/settings/xyz/openbmc_project/ipmi/sol/eth0_	Configuration for Serial Over LAN communication through Ethernet
SYSLOG	/etc/rsyslog.conf, /etc/rsyslog.d/hostconsole /etc/rsyslog.d/server.conf, /etc/rsyslog.d/sy , /etc/logrotate.conf, /etc/logrotate.d/logrotate.rsyslog, /etc/logrotate.d/wtmp , /etc/logrotate.d/btmp	Rsyslog and Log rotate Configuration will preserve
KVM	/etc/systemd/system/startipkvm.socket.d /override.conf	User configurable KVM service listening port
Virtual Media	/etc/virtual-media.json /etc/tmpfiles.d/virtual-media.conf	Retry count and intervals for virtual media reconnect
Redfish	/var/log/redfish	/var/lib/redfish/bios/inventory.json.gz /var/lib/redfish/bios/BiosAttributeRegistry0AC QZ.en-US.0.62.0.json.gz /var/lib/redfish/bios/BiosAttributeRegistry0AC QZ.fr-FR.0.62.0.json.gz /var/lib/redfish/bios/BiosAttributeRegistry0AC QZ.zh-chs.0.62.0.json.gz /var/lib/redfish/bios/static/SetupData.xml Note:

Preserve Module	Preserve Configuration file list	Preserve Config data Description
		The files mentioned above are pushed by BIOS and may vary depending on the BIOS used.
Network	/etc/dns.d/dns.conf /etc/hostname /etc/systemd/network/ /etc/interface/ /etc/interface/bonding/ /etc/interface/iptables/ /etc/dns.d/	/etc/dns.d/dns.conf: DNS configuration /etc/hostname: Current hostname /etc/systemd/network/: Systemd network settings /etc/interface/: Network extra settings /etc/interface/bonding/: bond information /etc/interface/iptables/: firewall settings /etc/dns.d/: All the DNS-related information

2.7.3 Reboot BMC

User can navigate to Operations → Reboot BMC, to reboot the BMC.

Given below is the screenshot for Reboot BMC page.

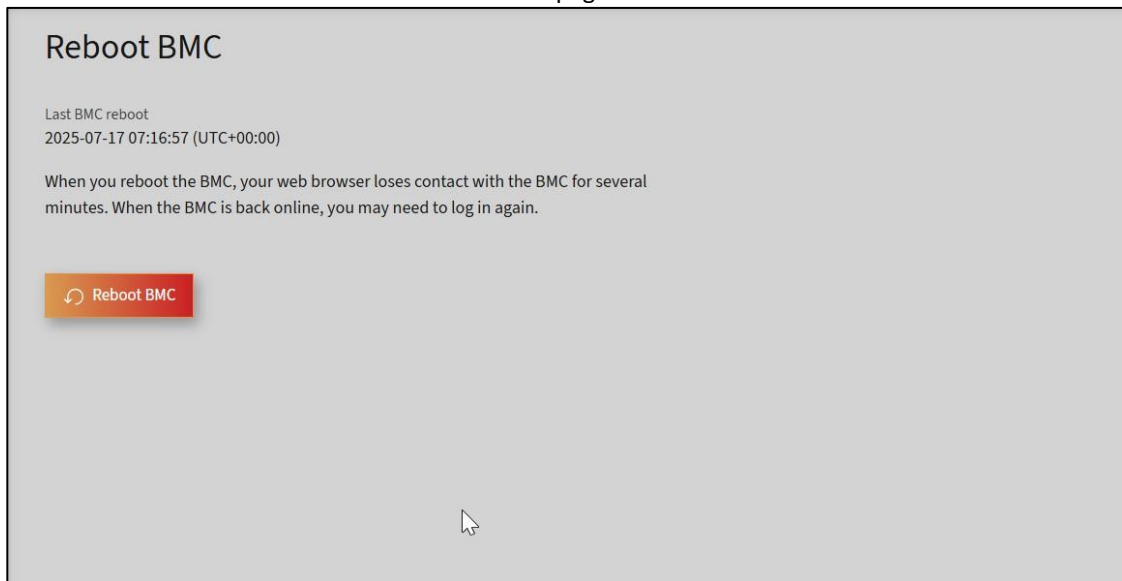


Figure 56 Reboot BMC

The Reboot BMC page contains the information about following:

- Last BMC reboot –It shows the status of Date and time of last reboot.
- Reboot BMC - When you reboot the BMC, your web browser loses contact with the BMC for several minutes. When the BMC is back online, you may need to log in again.

2.7.4 Tasks

Users can navigate to Operations → Tasks page. Given below is the screenshot for Tasks page.

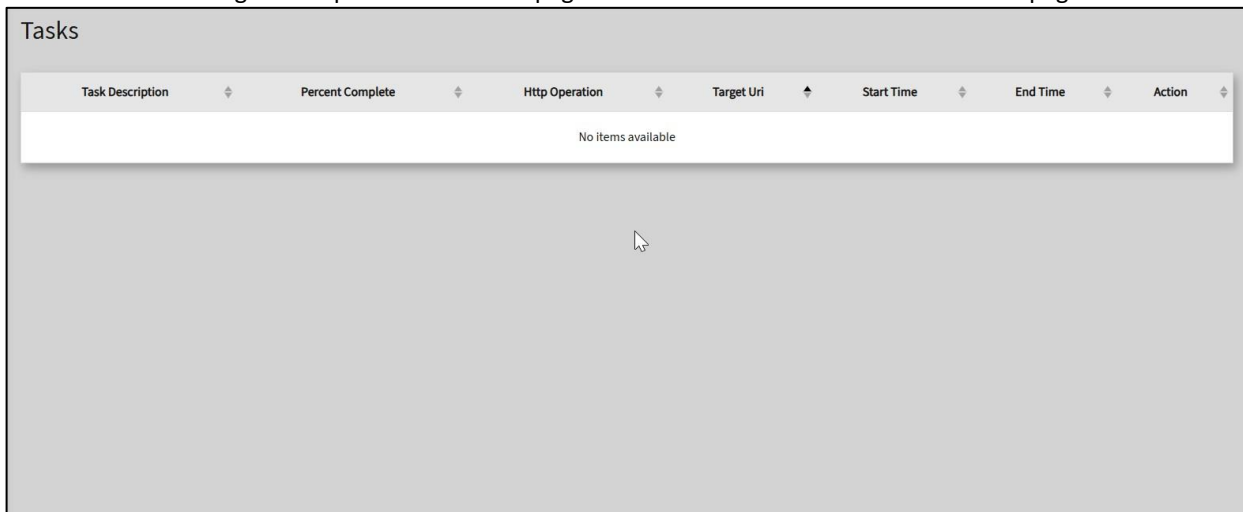


Figure 57 Tasks

Cancel Task: After the Task is initiated, we can cancel the task before completion of the task.

The Tasks page contains the information about the following:

- Task Description: It displays the task description.
- Percent Complete: It displays the percent complete.
- Http Operation: It displays the host operation.
- Target Uri: It displays the Host Uri.
- Start Time: It displays the start time of the task.
- End Time: It displays the end time of the task.
- Action: It displays the action status of the task.

How to Create Tasks:

Step 1: Navigate to Logs menu.

Step 2: Click on Dumps menu.

Step 3: Click on the Initiate Dump button to create a task.

Step 4: Wait for some time.

Step 5: Navigate to Operations.

Step 6: Click on Tasks. If the task is not available, refresh the page and check again. The task should be created.

2.7.5 Firmware

Users can navigate Operations -> Firmware page.

Given below is the screenshot for Firmware page.

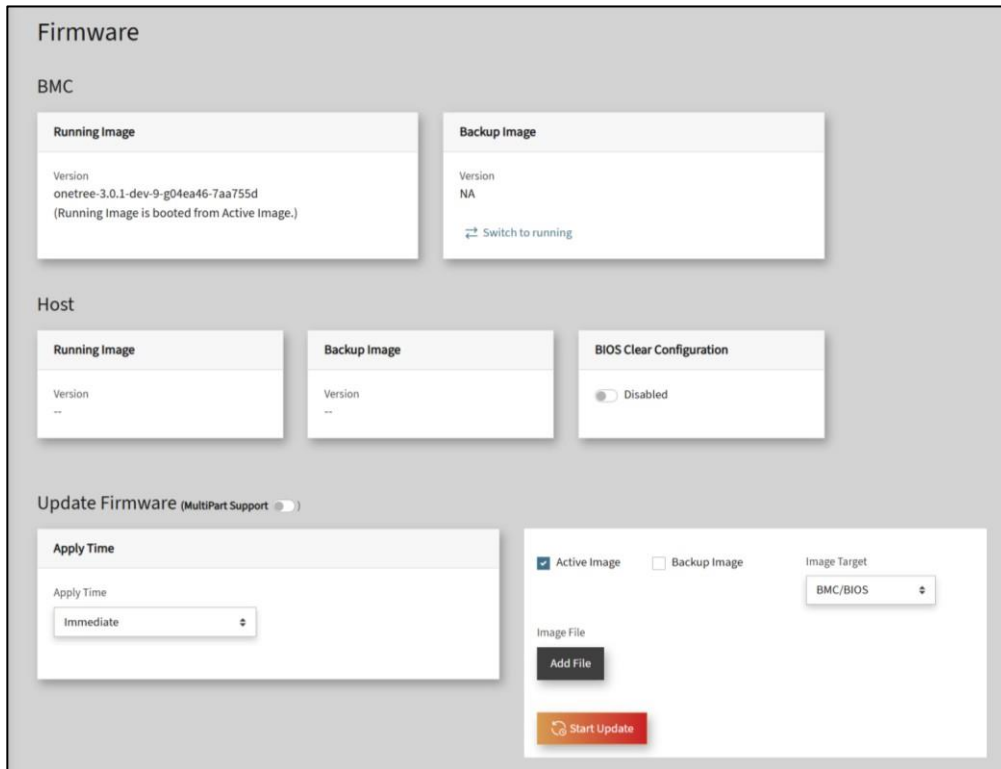


Figure 58 Firmware

The Firmware page contains the information about the following:

- **BMC** - It displays the version of Running image and Backup image.
- **Clear Configuration** – The User data can be preserved when Clear configuration is disabled. If it is enabled, the user data cannot be preserved.
- **Host** - It displays the version of Running image and Backup image.
- **Update Firmware (Multipart Support)**– It allows the user to update the firmware based on the selection and upload of image file.
- **Multipart Support** – User can enable this option to upload the multipart supported. json extension file in which user can add required properties. (Properties should be '@Redfish.OperationApplyTime and Targets should be Immediate or OnReset only'). A sample screenshot is disabled below.

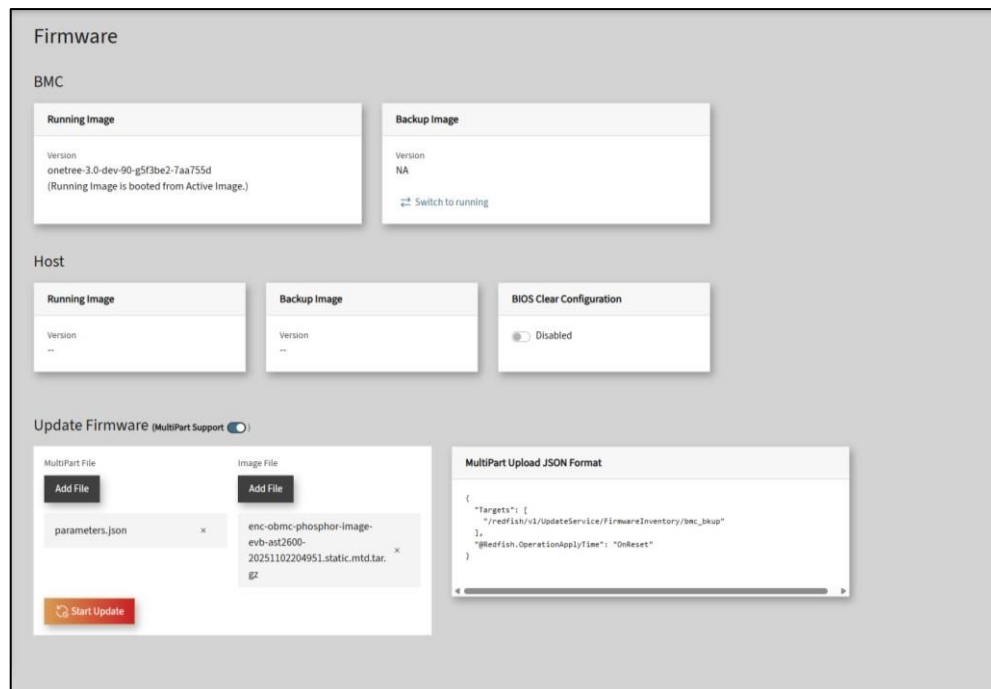


Figure 59 Multipart Support Enabled

Note:

When the multipart support is disabled, the Apply Time and Targets will appear in the Firmware page.

Current Multipart functionality needs JSON file to upload from Web UI as mentioned in above screen shot. To make it more user friendly, we are expecting to avoid uploading the JSON file in the next release, provided it is technically feasible.

- Apply Time – User can select the following Apply time options based on the requirement.
- Immediate:
 - BMC - Firmware update will start immediately Start reboot once BMC updated successfully.
 - BIOS - Firmware update will start immediately, need to reboot Host to update BIOS image.
 - CPLD and other components - Firmware update will start immediately.
- On Reset:
 - BMC, CPLD and other components - Firmware update will start on reset command.
 - BIOS - Firmware update will start on reset command and need to reboot Host to update BIOS image.
- At Maintenance Window Start:
 - BMC - Firmware Update will start within an administrator-specified maintenance window Start date/time. Start reboot once BMC updated successfully
 - BIOS - Firmware Update will start within an administrator-specified maintenance window Start date/time and need to reboot Host to update BIOS image
 - CPLD and other components - Firmware Update will start within an administrator-specified maintenance window Start date/time.
- In Maintenance Window On Reset:

- BMC, CPLD and other components- If reset happens in maintenance period the update will be initiated.
- BIOS - If reset happens in maintenance period the update will be initiated. and need to reboot Host to update BIOS image

Note: If PFR Feature is enabled, Apply Time provides only two options which are Immediate and On Reset. If PFR is disabled, it provides all four options like Immediate, On Reset, At Maintenance Window Start and In Maintenance Window on Reset options.

- Duration in Seconds is applicable for "In Maintenance Window on Reset" and "At Maintenance Window Start" Options: User can provide the duration in seconds. Firmware update will start within an administrator-specified maintenance window start date/time range and User need to give reboot command within specified duration, if the duration provided is not within the time range Firmware update won't happen.
- Start Date: Based on this given date, firmware action will be done.
- Start Time: Based on this given time, firmware action will be done.

Note:

1. *Start Date and Time doesn't appear for Immediate and On Reset options in Apply Time.*
2. *ApplyTime applicable for CPLD, BIOS and Other components, Firmware update will happen upon user selected ApplyTime option. For more details, about ApplyTime option refer Firmware update Extension pack user guide.*

Three types of flashing methods are supported:

1. Dediprog
2. TFTP flash
3. Web UI flash

Update Firmware

Dediprog

Hardware Tool: DediProg* SF600 or similar tool

Software: DediProg Software latest version

Following are the steps to perform using Dediprog Software.

1. Take the BMC EEPROM from the BMC socket and place in DediProg programming socket.
2. Launch the DediProg software and select SPI Device.
3. Upload the firmware image file.
4. Click Batch and then the flash starts.

TFTP Flash on AST2600EVB (v2019 u-boot)

1. Set the environment value:

Set Tftp server ip and ethaddr and get dynamic ip address

Example:

```
setenv serverip <IP
Address> setenv ethact
ftgmac@1e690000 dhcp
```

2. Get image from tftp server:

Example: tftp

0x83000000

<image>

3. Probe and flash the image:

Exam

ple: sf

probe

0

sf update 0x83000000 0x00 <Image

size> reset

Web UI Flash

BMC Firmware Update

The Update Firmware section contains the following fields. A sample screenshot is displayed below.

Firmware

BMC

Running Image

Version
onetree-3.0.1-dev-9-g04ea6-7aa755d
(Running Image is booted from Active Image.)

Backup Image

Version
NA

Switch to running

Host

Running Image

Version
--

Backup Image

Version
--

BIOS Clear Configuration

Disabled

Update Firmware (MultiPart Support ☐)

Apply Time

Apply Time
Immediate

☒ Active Image ☐ Backup Image

Image Target
BMC/BIOS

Image File
Add File

Start Update

Figure 60 Firmware

- Active Image – Enable to update Firmware with Active image.
- Backup Image - Enable to update Firmware with Backup image.
- Recovery Image - Enable to update firmware with Recovery image.

- Image Target - User can select any one of image target from the dropdown if it is selected Active Image, and Backup Image options will be disabled. User needs to select BMC/BIOS target from dropdown if anyone of Active Image, and Backup Image options need to be enabled.

Note:

- The backup image option appears only when the Backup image feature is enabled.
- The Active image option appears only when the Active image feature is enabled.
- The Recovery image option appears only when the PFR feature is enabled.
- The user must select at least one image (Active or Backup) or both to update the firmware. If one SPI is enabled, it remains default-enabled, and the user cannot enable or disable it.
- Click Add file and locate the BMC tar file to upload.
 - a. BMC Full update - Use *.static.mtd.all.tar file for BMC full update , it is used to update all the partition and Configuration files will be preserved based on user selection
 - b. BMC Partial update – Use *.static.mtd.tar file for BMC partial update, it used to update only rootfs partition and all the configuration files will be preserved by default, we won't update rwfs partition

The screenshot displays the 'Firmware' management interface. It is divided into three main sections: BMC, Host, and Update Firmware.

- BMC Section:** Contains two panels. The 'Running Image' panel shows the version 'onetree-2.1-dev-1108-g49b181-7aa755d' and a note that the running image is booted from the Active Image. The 'Backup Image' panel shows the version as '--'.
- Host Section:** Contains three panels. The 'Running Image' and 'Backup Image' panels show the version as '--'. The 'BIOS Clear Configuration' panel has a toggle switch currently set to 'Disabled'.
- Update Firmware Section:** Contains two panels. The 'Apply Time' panel has a text input field for 'Apply Time'. The right panel has a checked checkbox for 'Active Image', an 'Image File' label, an 'Add File' button (highlighted with a red box), and a 'Start Update' button at the bottom.

Figure 61 Update Firmware – Add file

- Once the BMC tar file is added, Click the Start Update button, and then the confirmation popup will display click the Start Update button on the confirmation popup. BMC will start to upload the firmware.
- If you don't want to firmware update, then click Cancel on the confirmation popup.

Firmware

BMC

Running Image

Version
onetree-2.1-dev-1122-g8717d4-7aa755d
(Running Image is booted from Active Image.)

Backup Image

Version
--

Host

Running Image

Version
--

Backup Image

Version
--

BIOS Clear Configuration

☐ Disabled

Update Firmware

Apply Time

Apply Time

Immediate

☒ Active Image

Image File

Add File

intel-platforms-intel-ast2600-20250717204058.tar.gz

Start Update

Figure 62 Update Firmware - Start Update

56

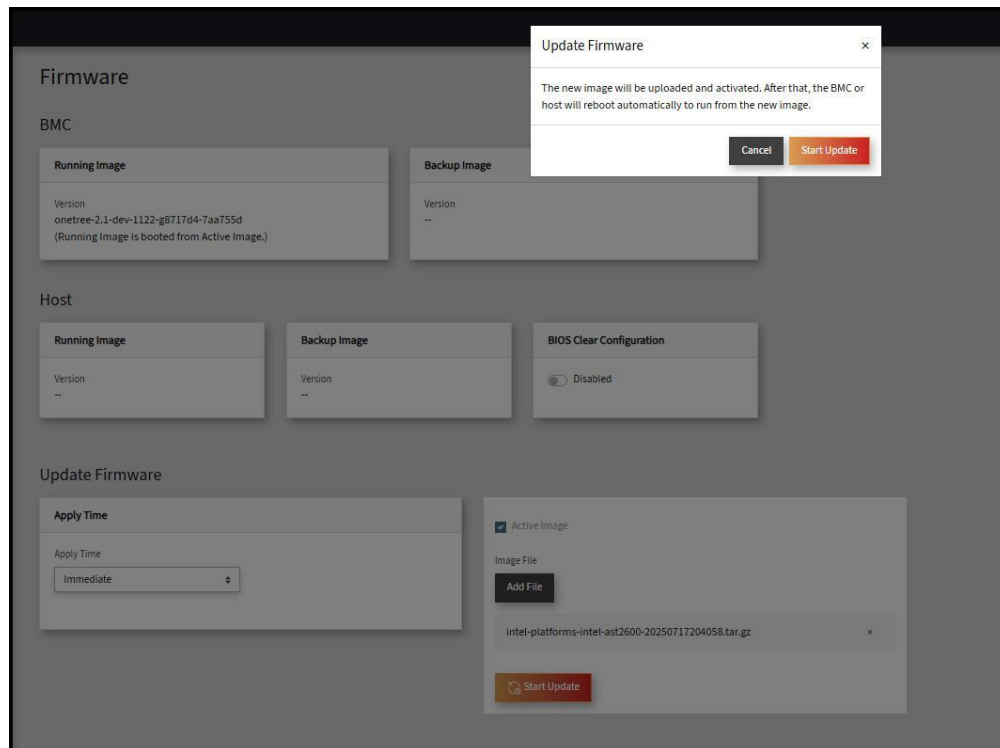
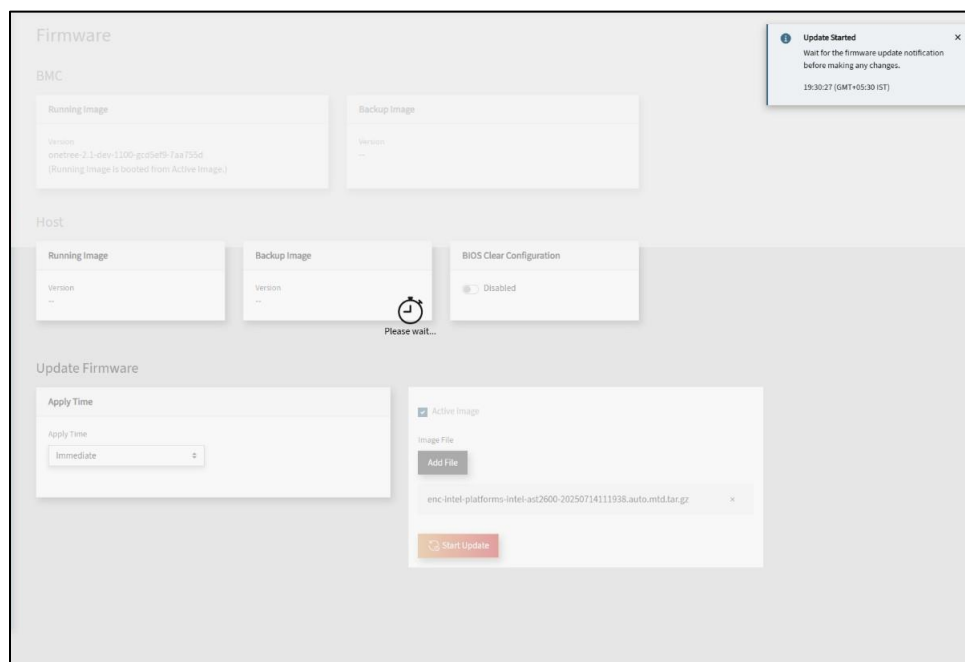


Figure 63 Update Firmware -Upload Firmware

- Wait for the firmware update notification before making any changes.



64 Update Firmware - Update Started

- The progress bar will show the percentage of firmware update

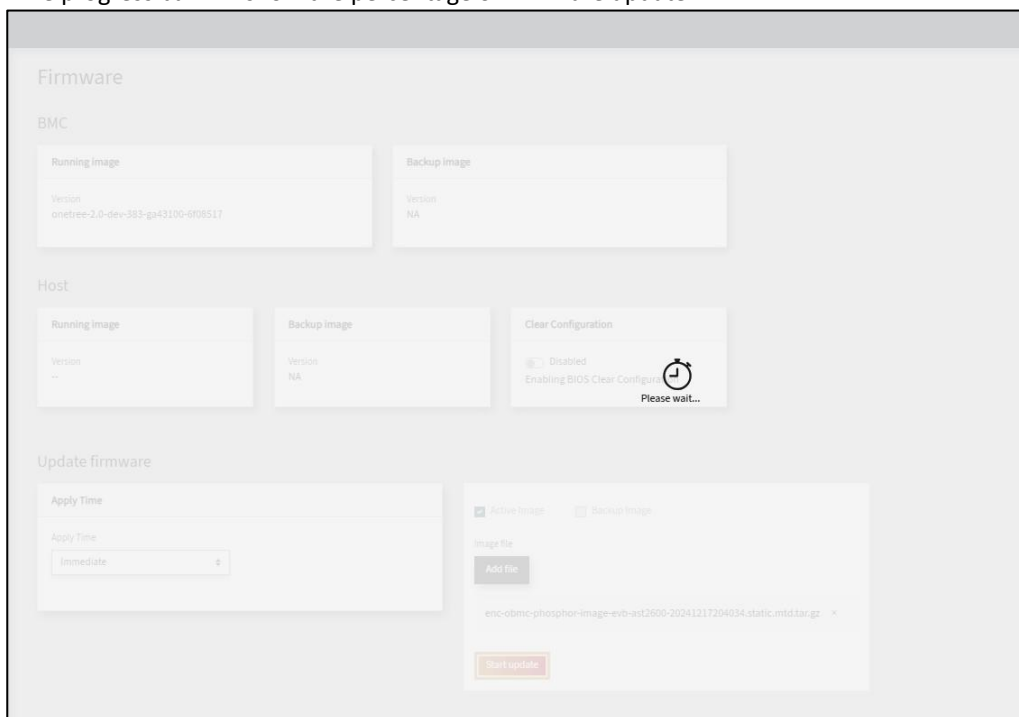


Figure 65 Update Firmware - Progress Bar

- Once the firmware update is successful, the success popup will display.
- Wait for 5-10 minutes then open the new session.

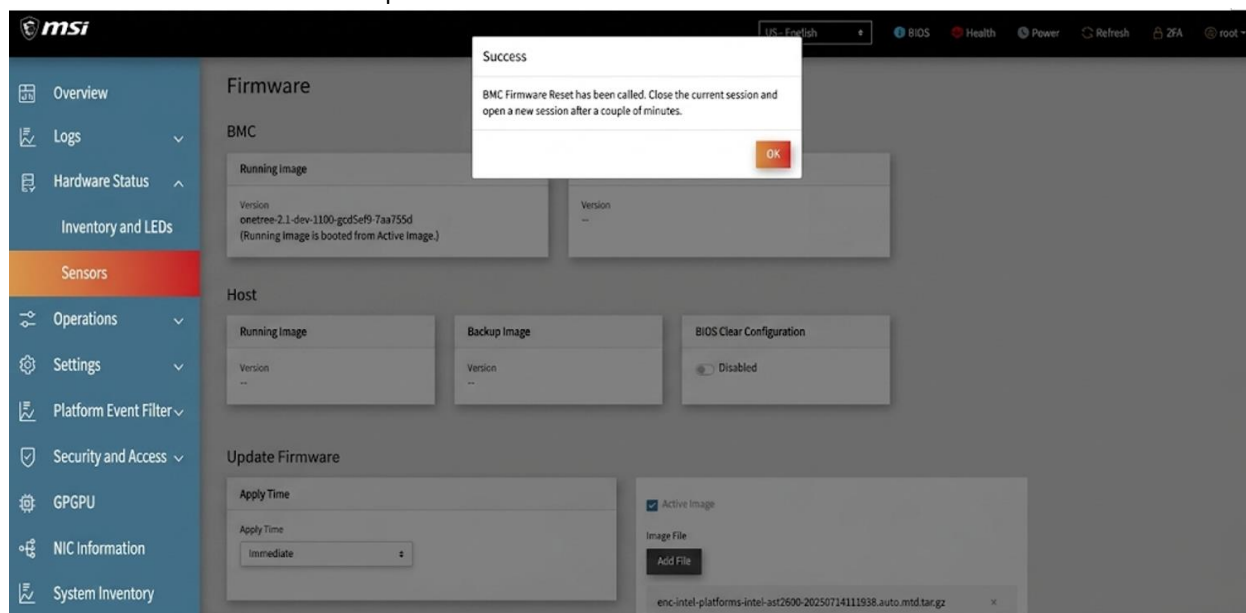


Figure 66 Update Firmware - Success popup

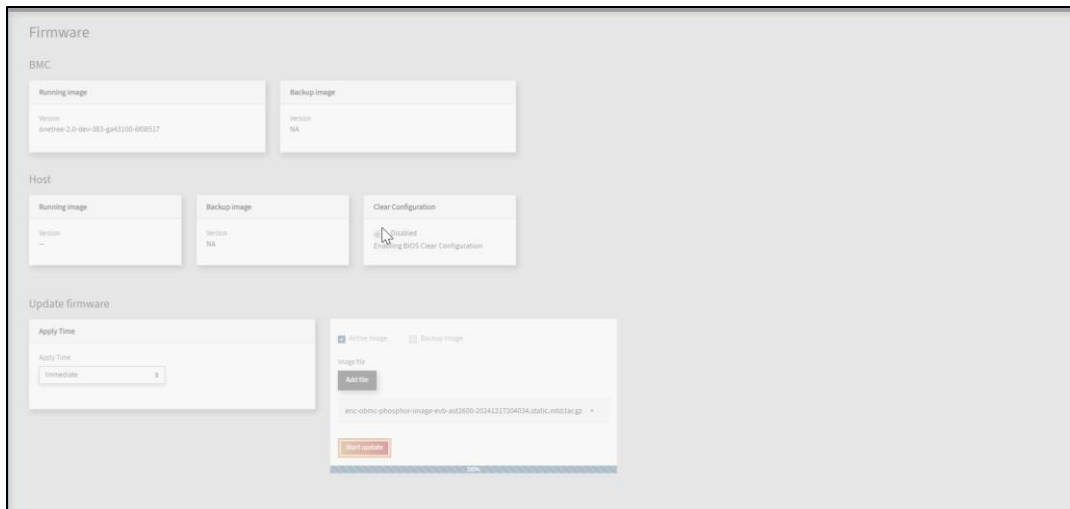


Figure 67 Update Firmware - Updated successfully

BIOS Firmware Update:

- Click Add file and locate the BIOS tar file to upload.

Note: Both the BMC existing image & BIOS image must be signed. NV Chip should be supported in the kernel then only we can proceed, BIOS firmware update

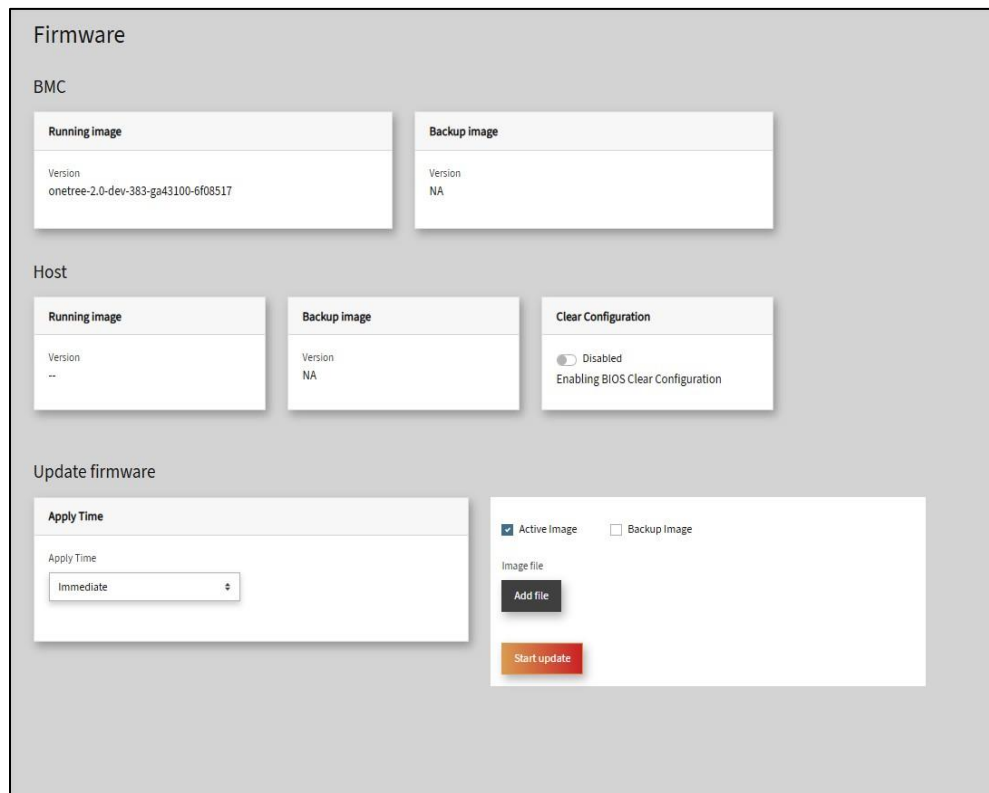


Figure 68 BIOS Firmware Update - Add file

- Once the BIOS tar file is added, Click the Start Update button, and then the confirmation popup will display click the Start Update button on the confirmation popup. BIOS will start to upload the firmware.
- If you don't want to firmware update, then click the cancel button on the confirmation popup.

Firmware

BMC

Running image

Version
onetree-2.0-dev-383-ga43100-6f08517

Backup image

Version
NA

Host

Running image

Version
--

Backup image

Version
NA

Clear Configuration

☐ Disabled
Enabling BIOS Clear Configuration

Update firmware

Apply Time

Apply Time
Immediate

☒ Active Image ☐ Backup Image

Image file

Add file

enc-bios-latest-valid.tar.gz

Start update

Figure 69 BIOS Firmware Update - Start Update

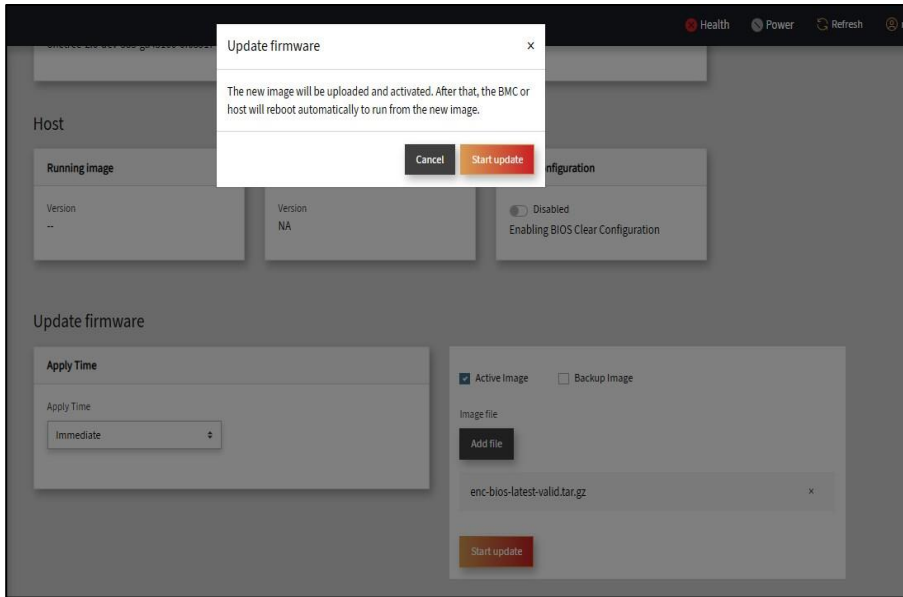


Figure 70 BIOS Firmware Update - Upload Firmware

- Wait for the firmware update notification before making any changes.

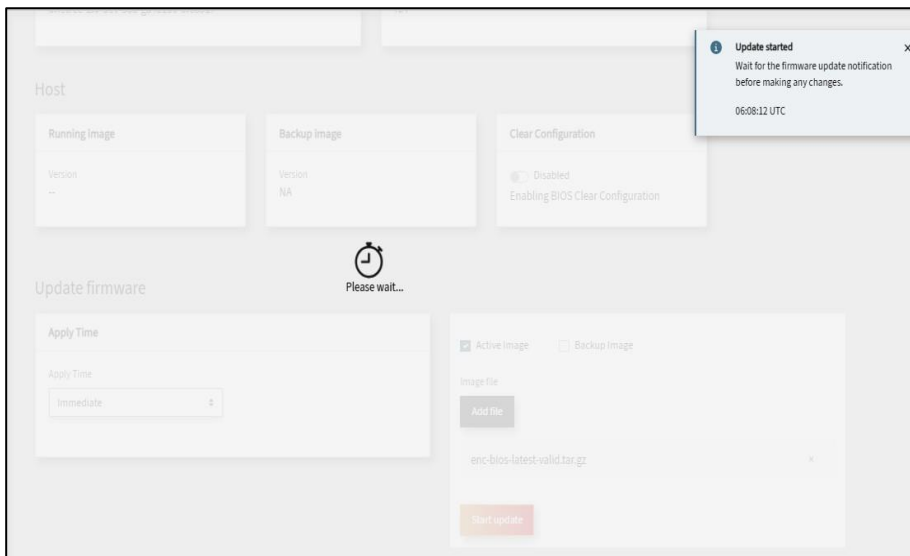


Figure 71 BIOS Firmware Update - Update Started

- The progress bar will show the percentage of firmware update.

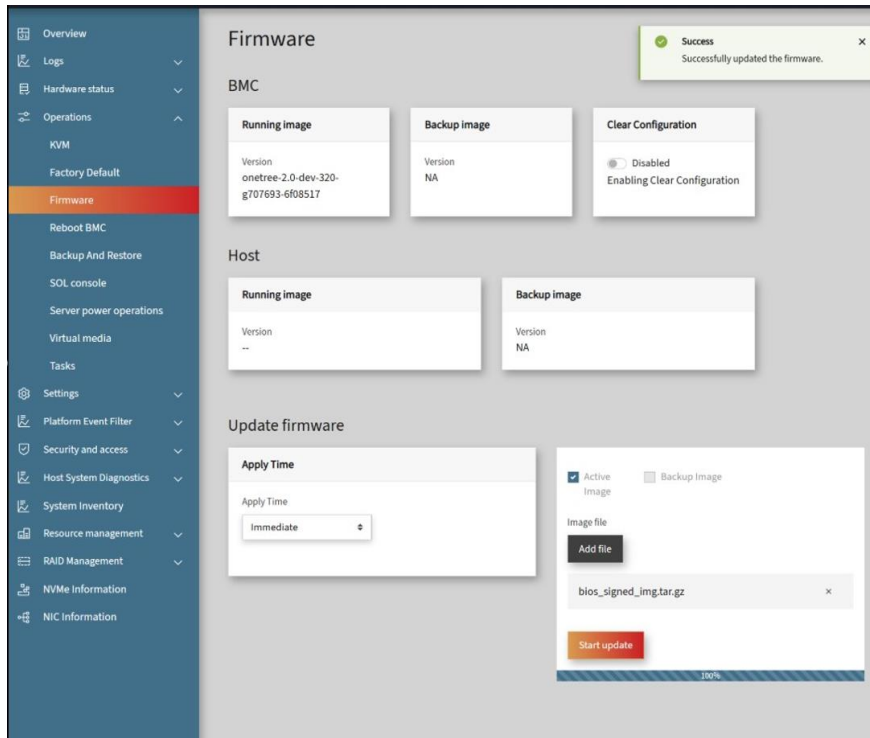


Figure 72 BIOS Firmware Update - Success Message

- Once the firmware update is successful, the success message will appear.

CPLD Firmware Update:

- Click Add file and locate the CPLD tar file to upload.

Note: Both the existing BMC image & CPLD image must be signed. Need to connect CPLD hardware then only we can proceed, CPLD firmware update

Firmware

BMC

Running image

Version
onetree-2.0-dev-383-ga43100-6f08517

Backup image

Version
NA

Host

Running image

Version
--

Backup image

Version
NA

Clear Configuration

Disabled

Enabling BIOS Clear Configuration

Update firmware

Apply Time

Apply Time
Immediate

☒ Active Image

☐ Backup Image

Image file

Add file

Start update

Figure 73 CPLD Firmware Update - Add file

- Once the CPLD tar file is added, Click the Start Update button, and then the confirmation popup will display click the Start Update button on the confirmation popup. CPLD will start to upload the firmware.
- If you don't want to update the firmware, click the Cancel button on the confirmation popup.

Firmware

BMC

Running image

Version
onetree-2.0-dev-383-ga43100-f08517

Backup image

Version
NA

Host

Running image

Version
--

Backup image

Version
NA

Clear Configuration

☐ Disabled
Enabling BIOS Clear Configuration

Update firmware

Apply Time

Apply Time
Immediate

☒ Active Image ☐ Backup Image

Image file
Add file

obmc-cpld-sign-evb_xo3_spi.tar.gz

Start update

Figure 74 CPLD Firmware Update - Start Update

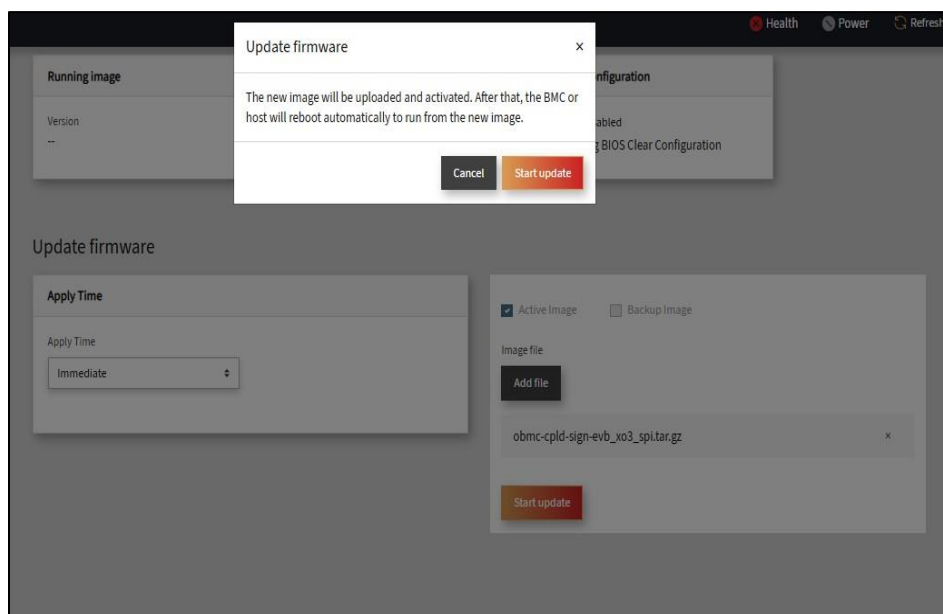


Figure 75 CPLD Firmware Update - Upload Firmware

- Wait for the firmware update notification before making any changes

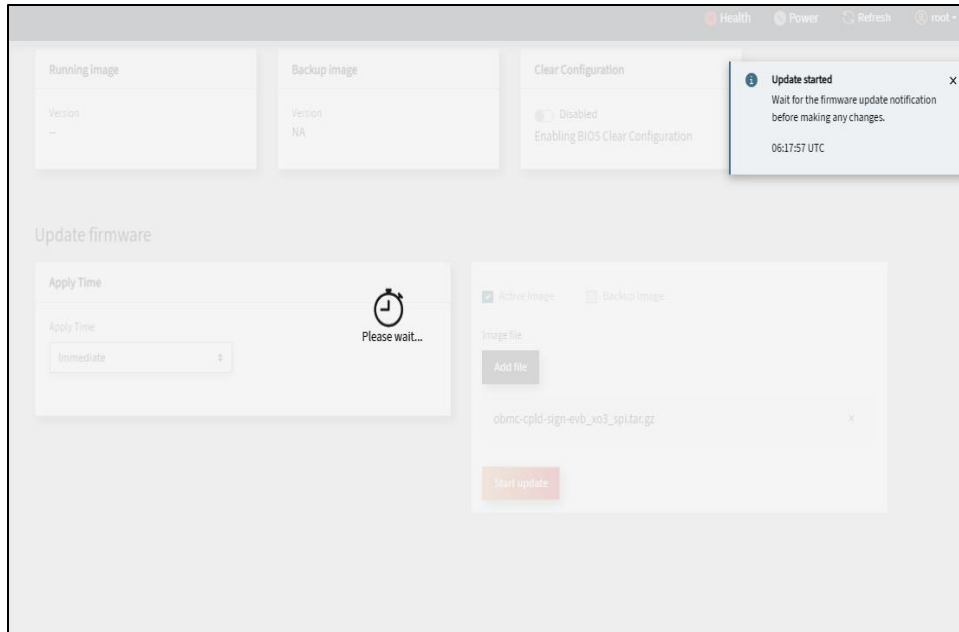


Figure 76 CPLD Firmware Update - Update Started

- The progress bar will show the percentage of firmware update.

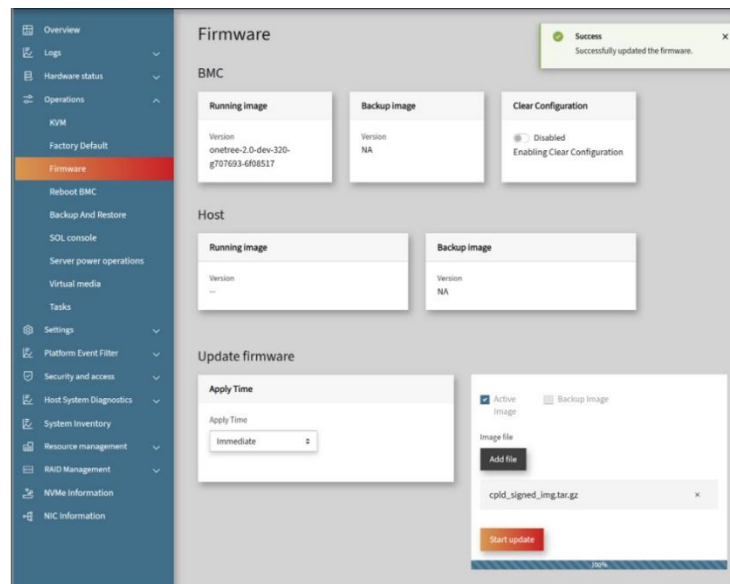


Figure 77 CPLD Firmware Update - Success popup

- Once the firmware update is successful, the success message will appear.

PLDM Firmware Update

- Click Browse and select the PLDM image in .tar format.

Both the BMC existing image & PLDM image must be signed.

Note: *Need to connect PLDM hardware then only we can proceed PLDM firmware update.*

2.7.6 Backup and Restore

User can navigate to Operations à Backup and Restore page.

Given below is the screenshot for Backup and Restore page.

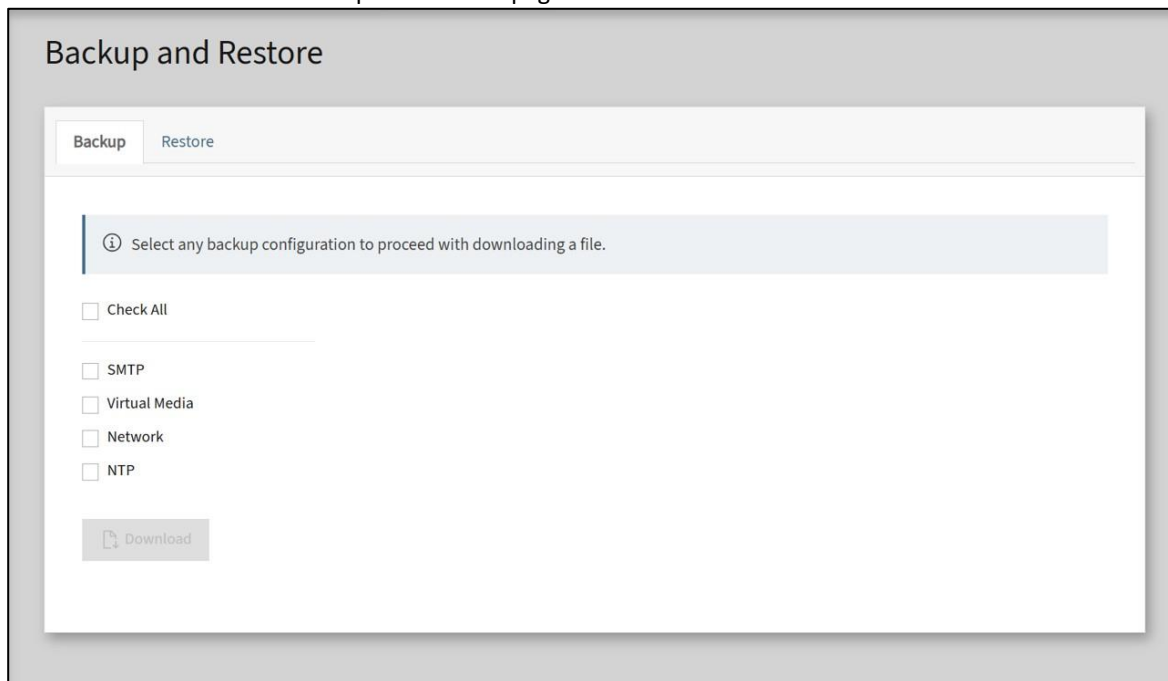


Figure 78 Backup and Restore

The Backup and Restore page contain the information about following:

Backup

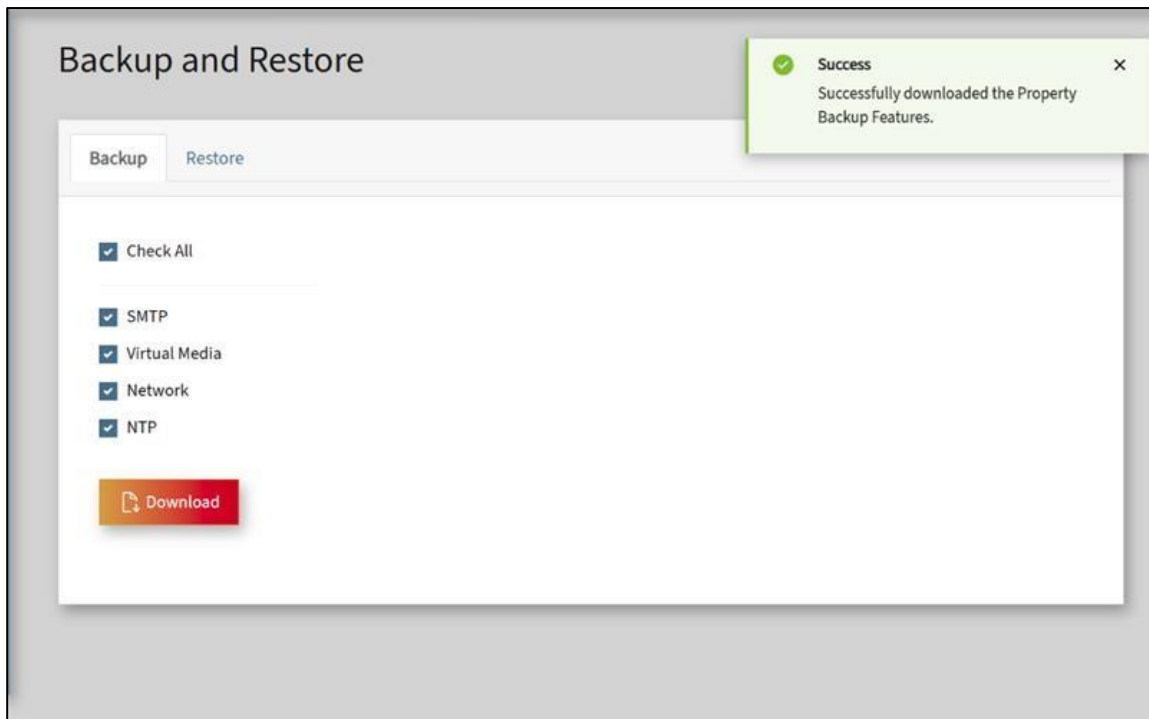


Figure 79 Backup

- SMTP - User can select the checkbox to apply SMTP configuration.
- Virtual Media - User can select the checkbox to apply Virtual Media related internal configuration. Only retry count and retry interval are backed up and can be restored.
- Network - User can select the checkbox to apply Network configuration.
- NTP – User can select the checkbox to apply NTP. Date and Time NTP Configure Settings are backed up and can be restored.
- Download:
- Select the properties needed to backup and click the Download button to download the Backup file in .tar file format.
- To select all Backup Properties, click on Check All checkbox and download all properties.



Figure 80 Download

Restore

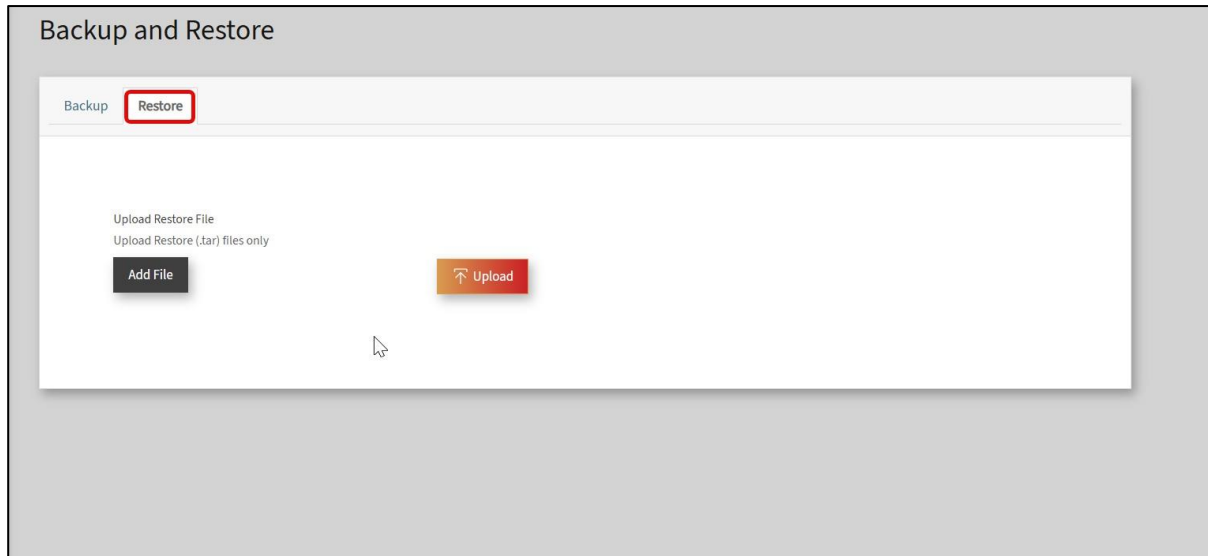


Figure 81 Restore

- Add file – Click Add file to add the downloaded backup file.
- Upload – Click Upload. The Confirmation pop up will display, click OK to restore the downloaded backup file as displayed below.

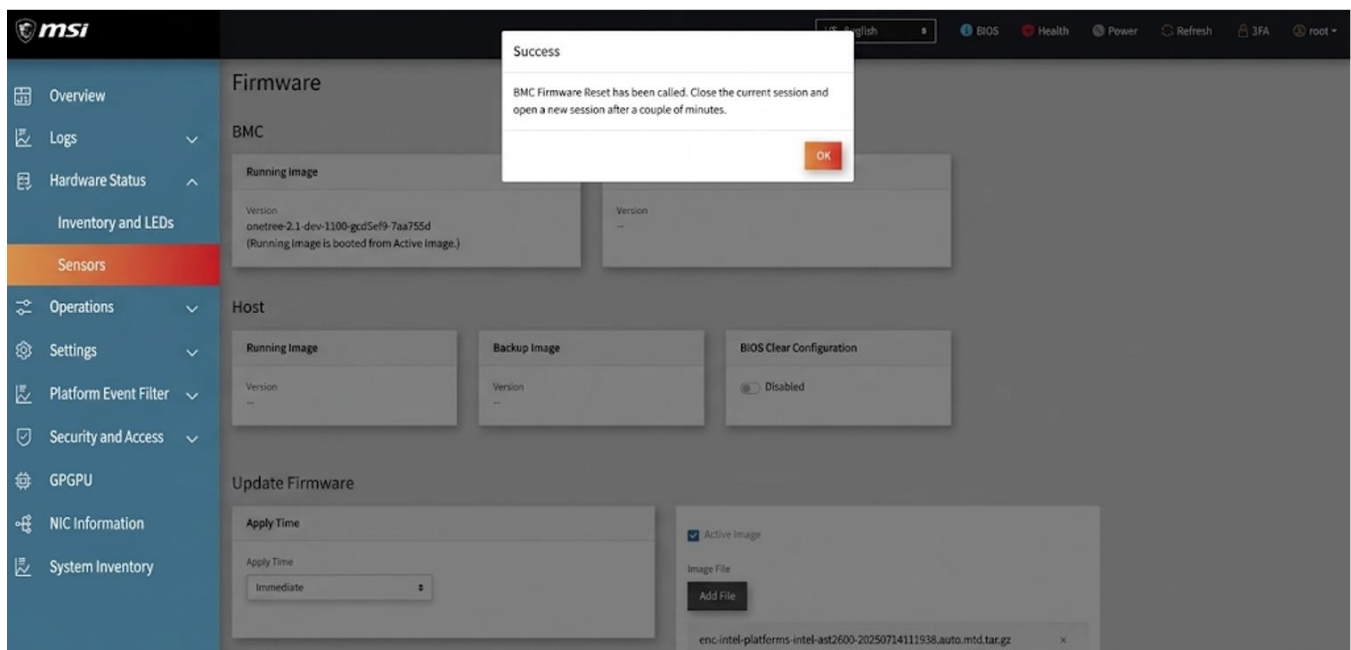


Figure 82 Confirmation Message

- The below success message confirms that the Restore file was successfully uploaded.

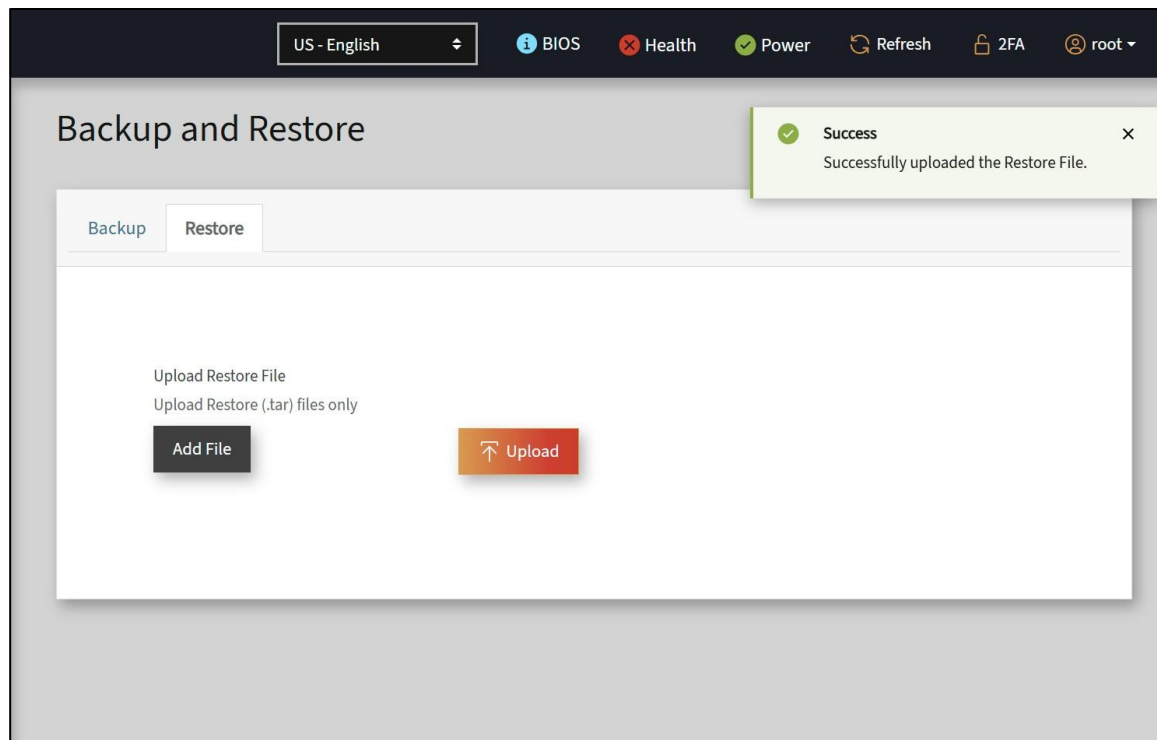


Figure 83 Restore

2.7.7 KVM

BMC FW supports KVM.

Users can navigate Operations -> KVM page. As depicted below, it will show the host desktop where you can do any operations on the host machine.

Given below is the screenshot for KVM page.

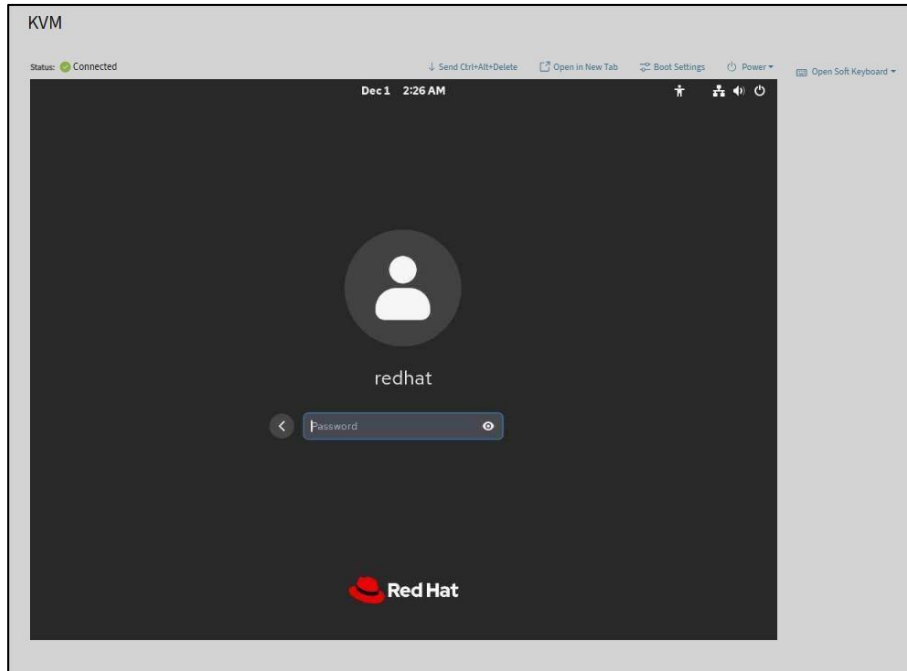


Figure 84 KVM Page

The KVM page contains the information about the following:

- Status - It shows the status as Connected or Disconnected.
- Open in new tab - KVM page will be opened in new window.
- Boot Setting – Override the system default boot sequence.
- Soft Keyboard – Soft Keyboard will be displayed based on the language selection using drop-down.
- Power – Execute Server Power Operations.

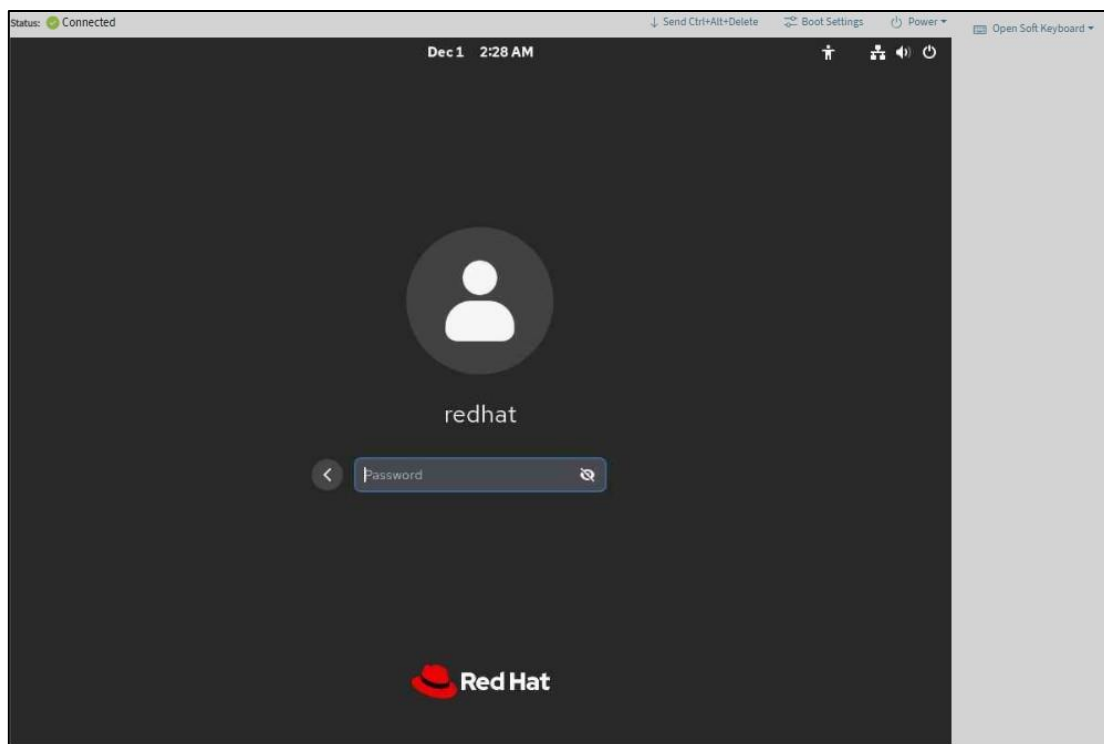
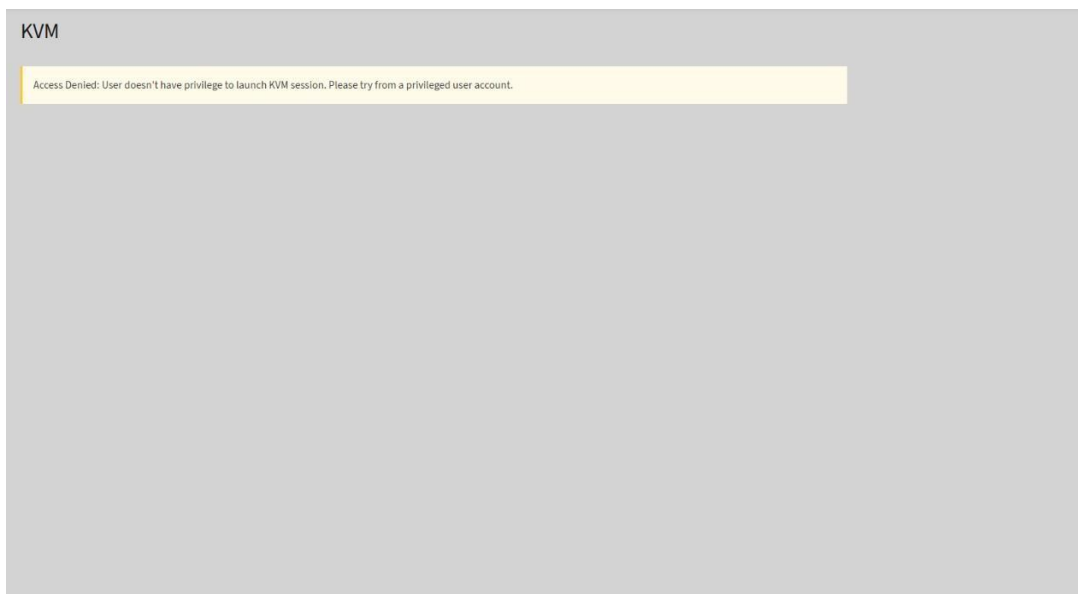


Figure 85 KVM Page – Open in new tab

Note: KVM access cannot be restricted based on user privilege role basis (eg. user with webui group role can access KVM from web).

If the user login with operator or read only, the message popup as:

“Access Denied: User doesn't have privilege to launch KVM session.
Please try from a privileged user account.”



Session Sharing in KVM

KVM session sharing allows for the launch of parallel KVM and VNC sessions with access control.

1. Maximum 2 parallel sessions are supported (Across H5Viewer, JViewer & 3rd Party VNC 2. Full console access (Video and HID) to only first launched session.

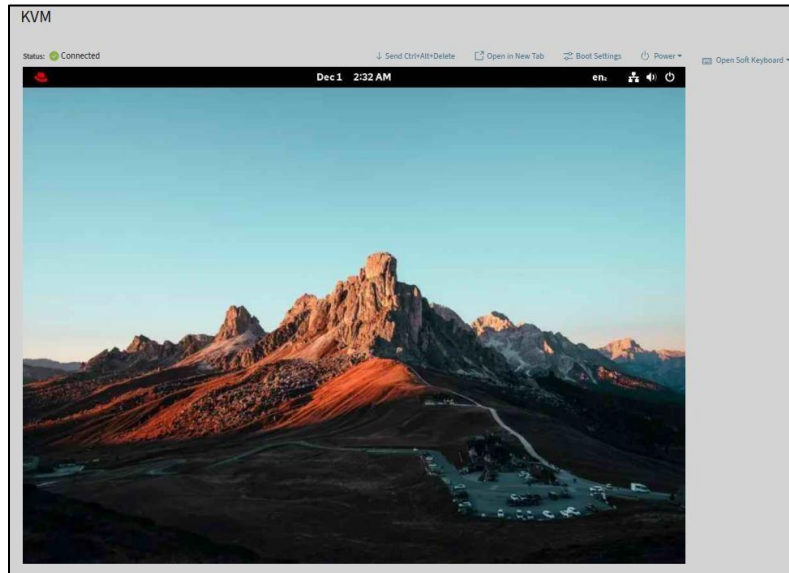


Figure 86 KVM Session with Full Console Access

Second session onwards will receive video only permission (HID access will be disabled)

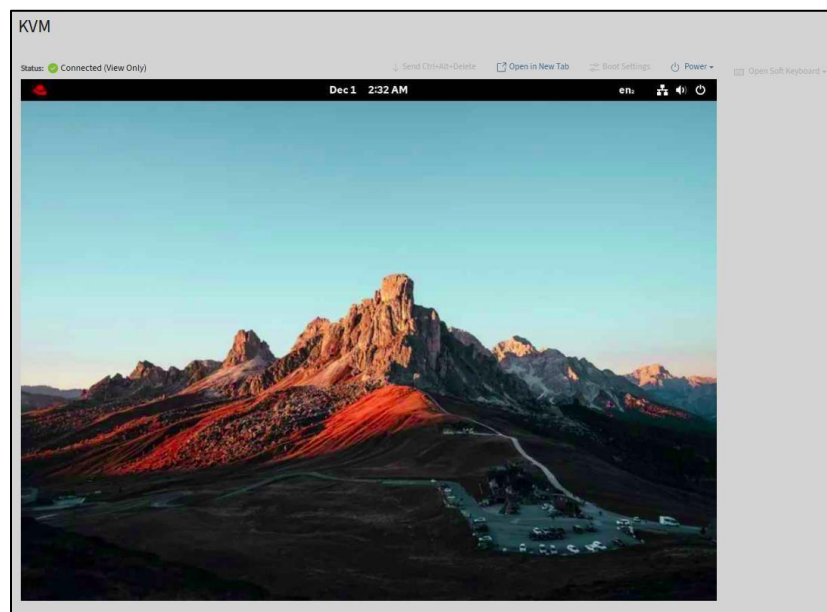


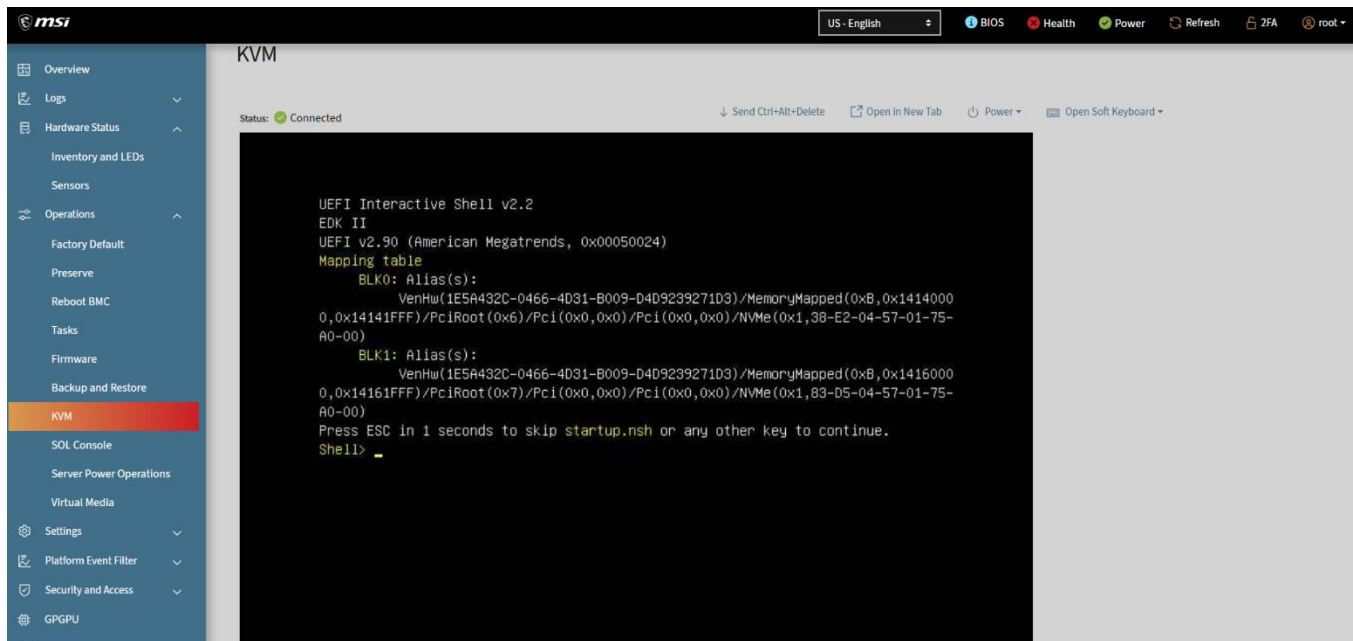
Figure 87 KVM Session with Partial Console Access

Set System Boot Device

The Set System Boot Device (Boot Settings Override) feature enables users to configure and override the default boot sequence of the system. This feature is useful for booting from different sources temporarily or changing the boot order to troubleshoot or deploy specific operating systems.

With the WebUI KVM, users can utilize the Boot Settings configuration Feature by clicking on the BOOT SETTINGS button, which will launch a modal view for configuring the System Boot Device. WebUI → Operations → KVM → Boot Settings

- Click the Boot Setting option to change the boot option.



Server Power Operations in KVM

User can navigate to Operations → KVM page. The Power dropdown will provide the following options to execute server power operations.

- Power ON - Click Power ON to Turn ON the server.
- Graceful Shutdown - Click Graceful Shutdown to shuts down operating system, then shuts down server.
- Graceful Restart - Click Graceful Restart to shuts down operating system, then server reboots
- Forced Shutdown - Click Forced Shutdown to shut down server without operating system shutting down; may cause data corruption.
- Forced Restart - Click Forced Restart to reboot the server without operating system shutting down; may cause data corruption.

The Power dropdown will be displayed based on the server power status.

A sample screenshot of KVM page with power dropdown [server power is OFF]:

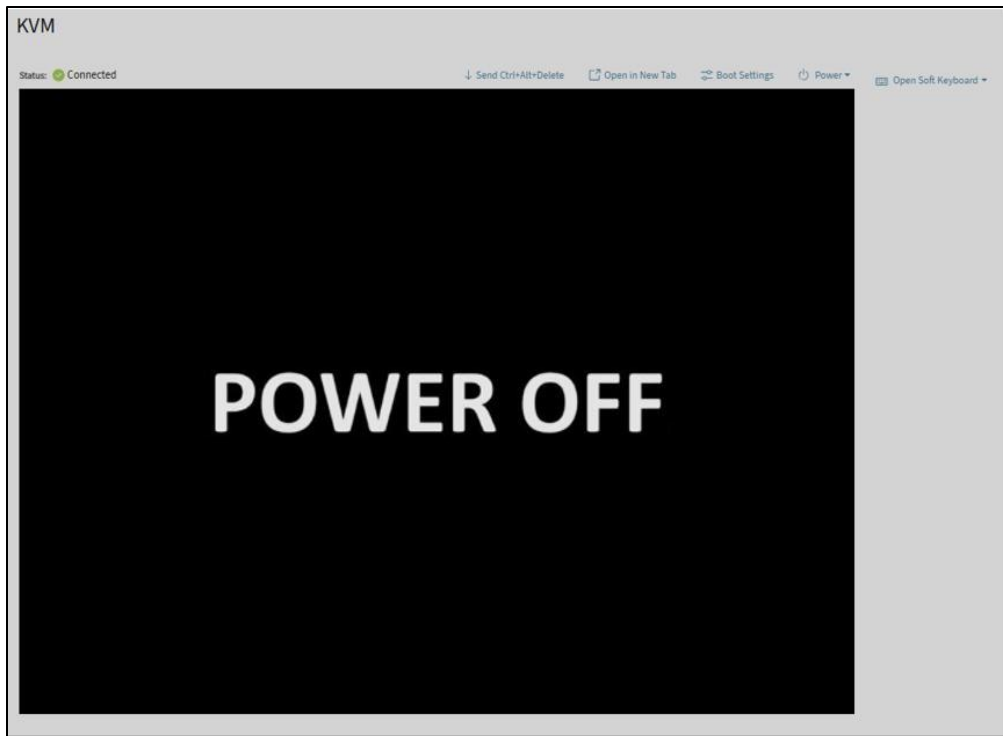


Figure 88 Power OFF

A sample screenshot of KVM page with power dropdown [server power is ON]:

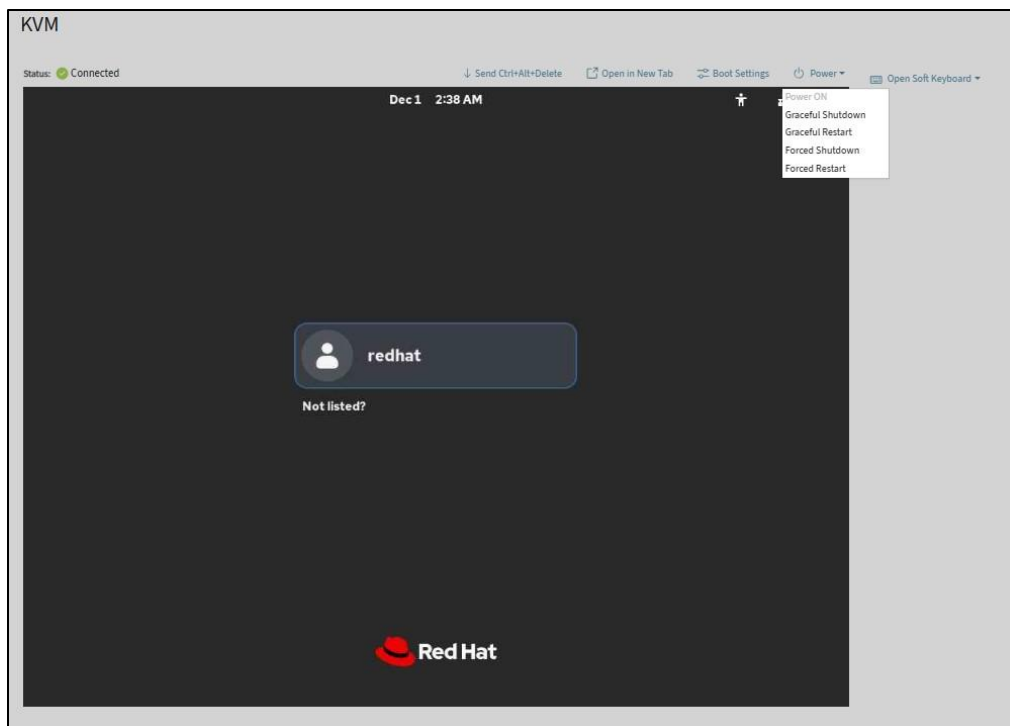


Figure 89 Power ON

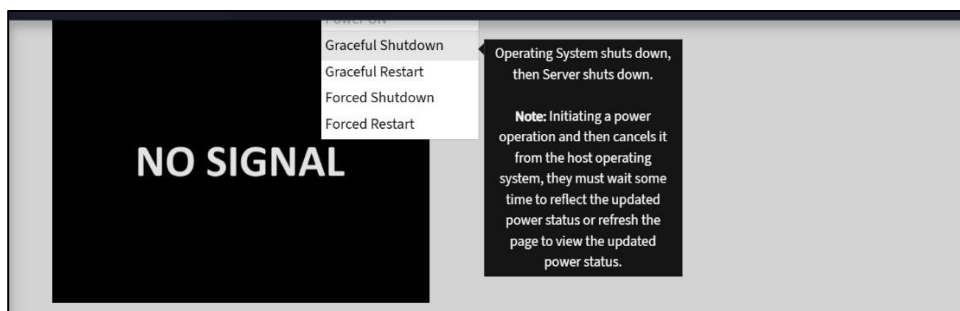


Figure 90 Tooltip Message

Move the cursor to "Forced shutdown" from the Power drop-down user can see the tooltip message before selecting any power operations.

KVM → No Signal

If the host system is powered ON but the KVM is not receiving any video signal, the KVM page will display a "NO SIGNAL" message. This can occur when the host screen is turned off, in sleep mode, etc.



Figure 91 No Signal

Soft Keyboard Support in KVM

User can navigate to Operations → KVM page. This page enables the user to open the Soft Keyboard. Users can select the appropriate language in UI by using the dropdown menu in the top right of the KVM page.

A sample screenshot of KVM page is displayed below.

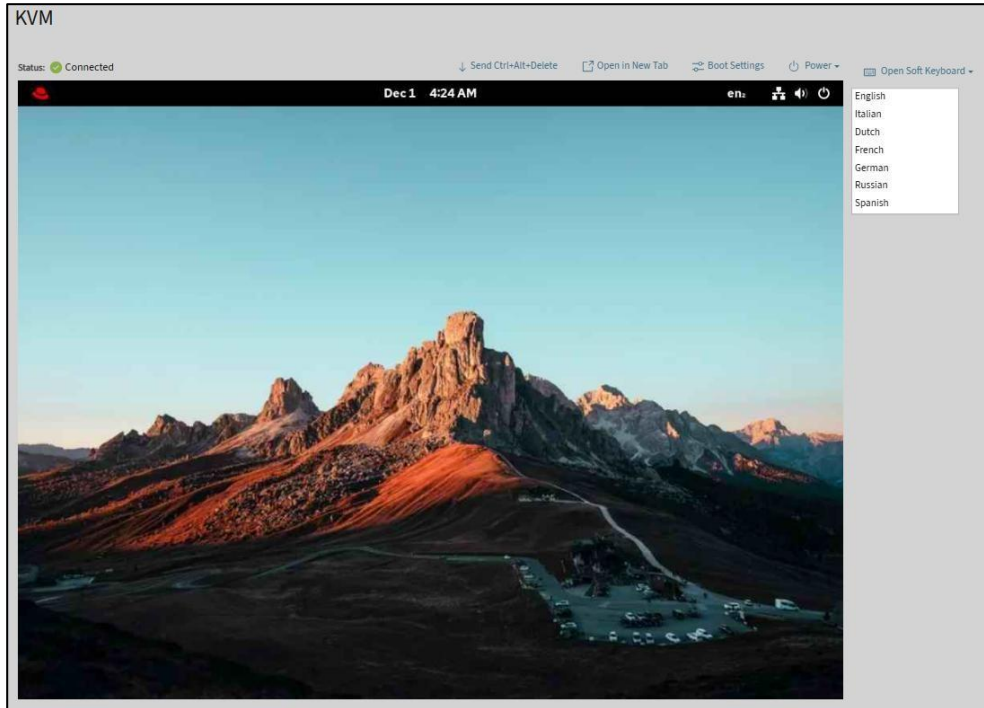


Figure 92 Soft Keyboard KVM Page

The soft keyboard layout will be displayed based on the language selection. The language selected from the soft keyboard and the host input language should be same before start typing using the soft keyboard. Then only the letter pressed from soft keyboard will be rendered properly in the host display.

The Soft Keyboard layout is available in different languages as listed below.

1. English
2. French
3. Dutch
4. German
5. Italian
6. Russian

A sample screenshot of KVM page with soft keyboard is displayed below.

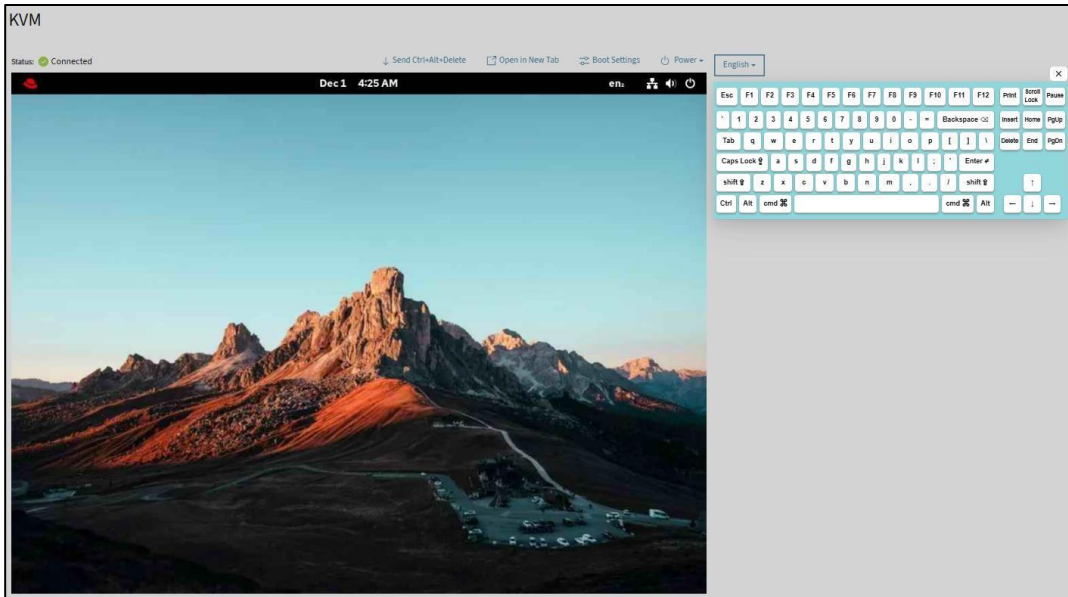


Figure 93 Soft Keyboard Layout

Limitations:

In Web UI, Caps Lock, Shift, Alt, Ctrl and cmd button statuses will be retained within the opened window. Once the window is closed, the button status will be back to the default values. Web UI client is not having any provision to get the key statuses from the host to retain the status of the keys whenever the soft keyboard is getting opened.

This is because the current OneTree KVM implementation will not be aware of host keyboard LED status (e.g., CAPS Lock) during start. So HID communication is one directional (client -> host). So, the user needs to make sure host and client key status are in sync.

Standard VNC Client Support

The VNC server of the BMC can be securely accessed by standard VNC clients using the SSH tunnel. Users can establish ssh tunnel with local port forwarding to BMC by providing following command in Command Prompt.

```
ssh -L <anyport>:localhost:5900 <user_name>@<BMC_IP> eg : ssh -L
```

```
1234:localhost:5900 root@172.16.98.20
```

A sample screenshot of Command Prompt with established ssh tunnel with local port forwarding to BMC displayed below.

```
C:\Users\system32 >ssh -L 1234:localhost:5900 root@172.16.98.20
root@172.16.98.20's password:
root@intel-obmc:~#
```

Figure 94 Command Prompt

Currently supported standard VNC Clients are:

- TightVNC client

Users can Launch TightVNC Viewer application, Provide the forwarded port in the Remote Host section & press Connect to establish connection to VNC Server. Remote Host: localhost:<anyport> eg. localhost:1234

A sample screenshot of Launched TightVNC viewer with Forwarded port information is displayed below.

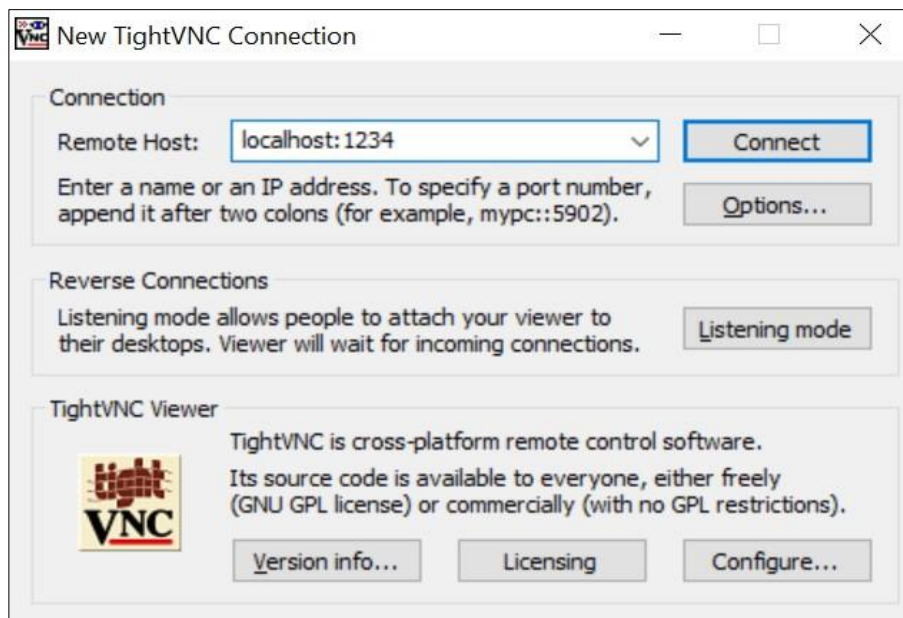


Figure 95 New TightVNC Connection

A sample screenshot of TightVNC viewer connected to VNC server is displayed below.

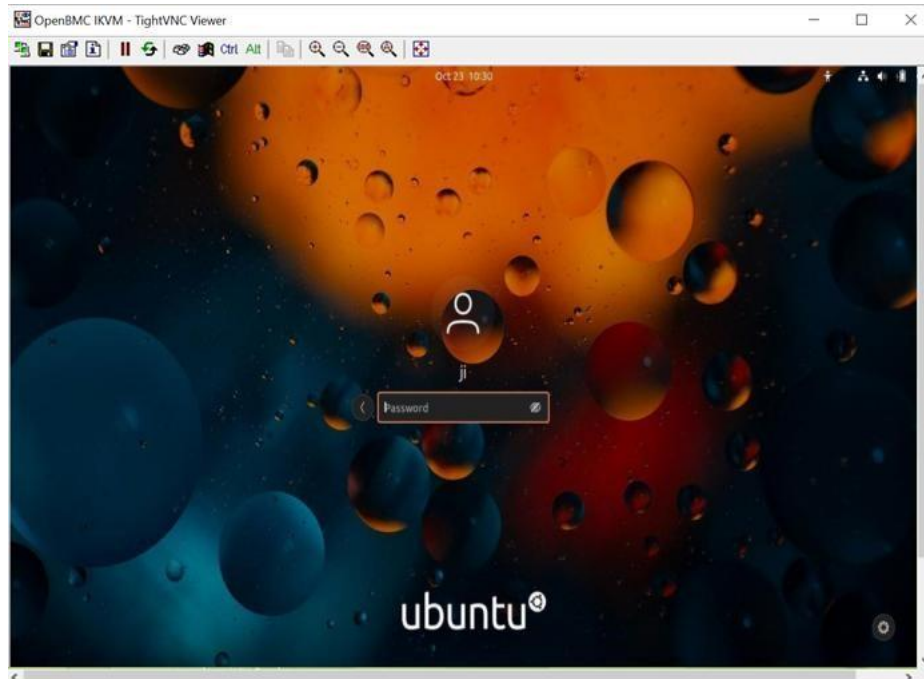


Figure 96 TightVNC Viewer

- RealVNC client

Users can Launch VNC Viewer application, Provide the Forwarded port information to establish connection to VNC Server.

localhost:<anyport> eg.

localhost:1234

A sample screenshot of Launched VNC viewer (realVNC client) with Forwarded port information is displayed below.



Figure 97 Launched VNC Viewer

A sample screenshot of VNC viewer (realVNC client) connected to VNC server is displayed below.

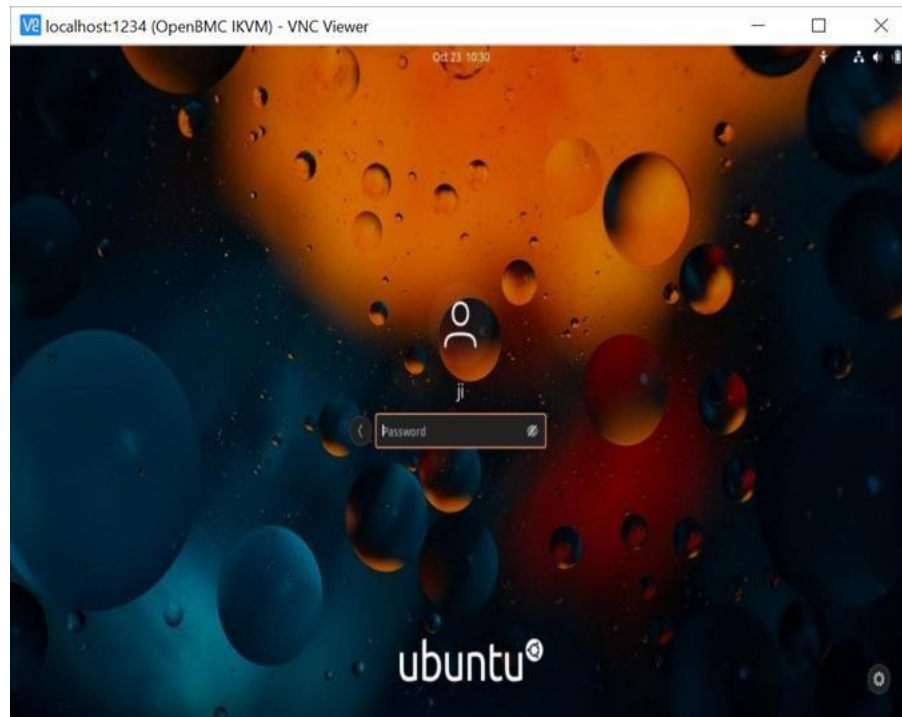


Figure 98 VNC Viewer

2.7.8 SOL console

User can navigate to Operations → SOL console page.

The sample screenshot of the page is shown below.

redirects the server's serial port output to this window.



Figure 99 SOL Console

The SOL console page contains the information about following:

- Status - It shows the status as Connected or Disconnected.
- Open in new tab - SOL Console page will be opened in new window.

Note: The SOL Console may experience difficulties while continuous key presses, potentially leading to input misinterpretation. Therefore, it is advisable to avoid continuous key press.

2.7.9 Server Power Operations

User can navigate to Operations → Server power operations page.

Given below is the screenshot for Server power operations page.

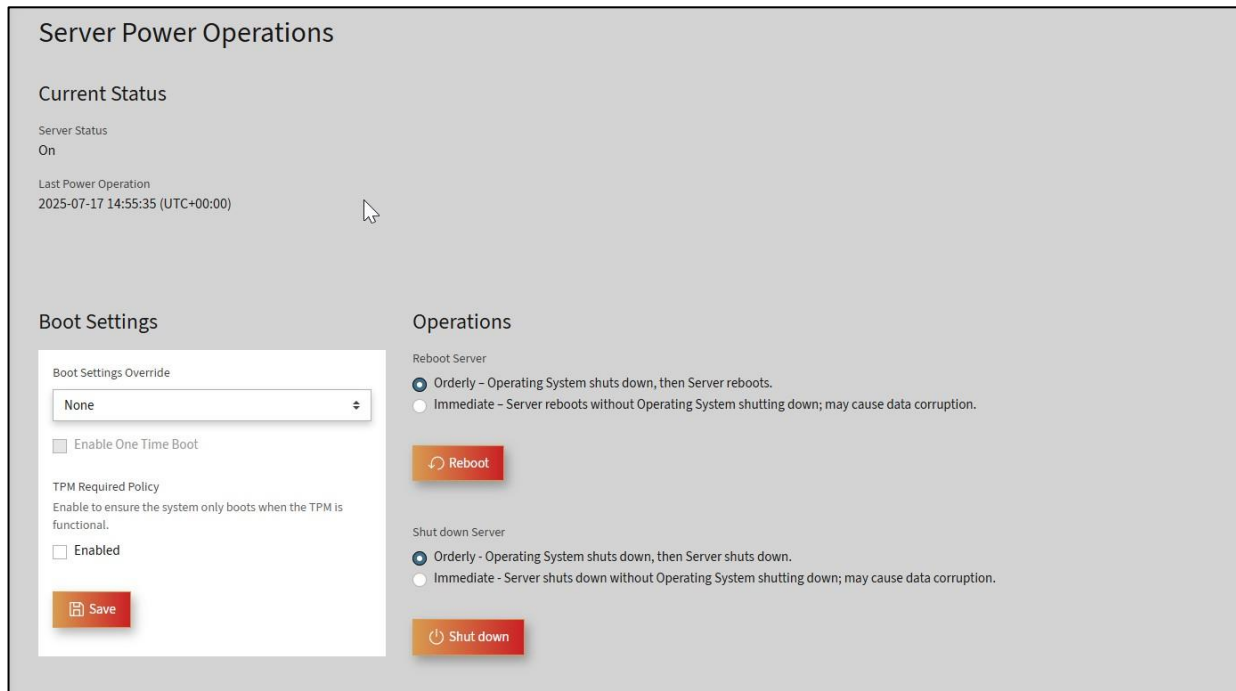


Figure 100 Server power operations

The Server power operations page contains the information about following:

- Current status – It shows the status of Server status and Last power operation.
- Boot Settings

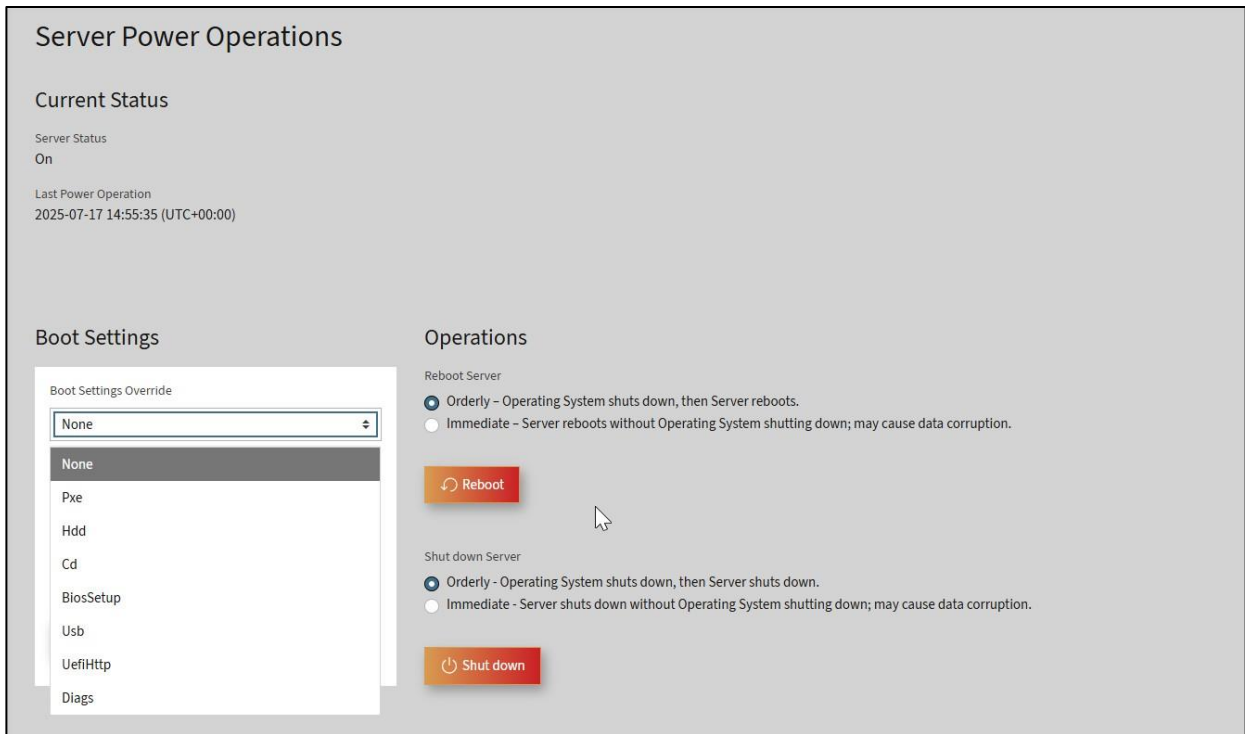


Figure 101 Server power operations – Boot Setting

- Boot settings override – Select PXE or Hdd or Cd or Diags or BiosSetup or Usb using drop down to Enable one time boot.
- TPM required policy - Enable to ensure the system only boots when the TPM is functional.

Note: The TPM required policy can be set through a patch operation and retrieved using a get operation. However, verification during the boot process is currently not supported. This feature will be included in a future release with BIOS support.

- Save - Click Save to successfully save the Boot Settings.

Operations

1. Reboot Server
 - Orderly - Select Orderly. Click Reboot to shut down the operating system and then sever reboots.
 - Immediately - Select Immediately. Click Reboot to reboot server without shutting down operating system. It may cause data corruption.
2. Shutdown Server
 - Orderly - Select Orderly. Click Shut down to shut down the operating system and then sever shut down.
 - Immediately - Select Immediately. Click Shut down to Shut down server without shutting down operating system. It may cause data corruption.

2.7.10 Virtual Media

BMC FW supports virtual media. User can navigate to Operations → Virtual Media page. Given below is the screenshot for Virtual Media page.

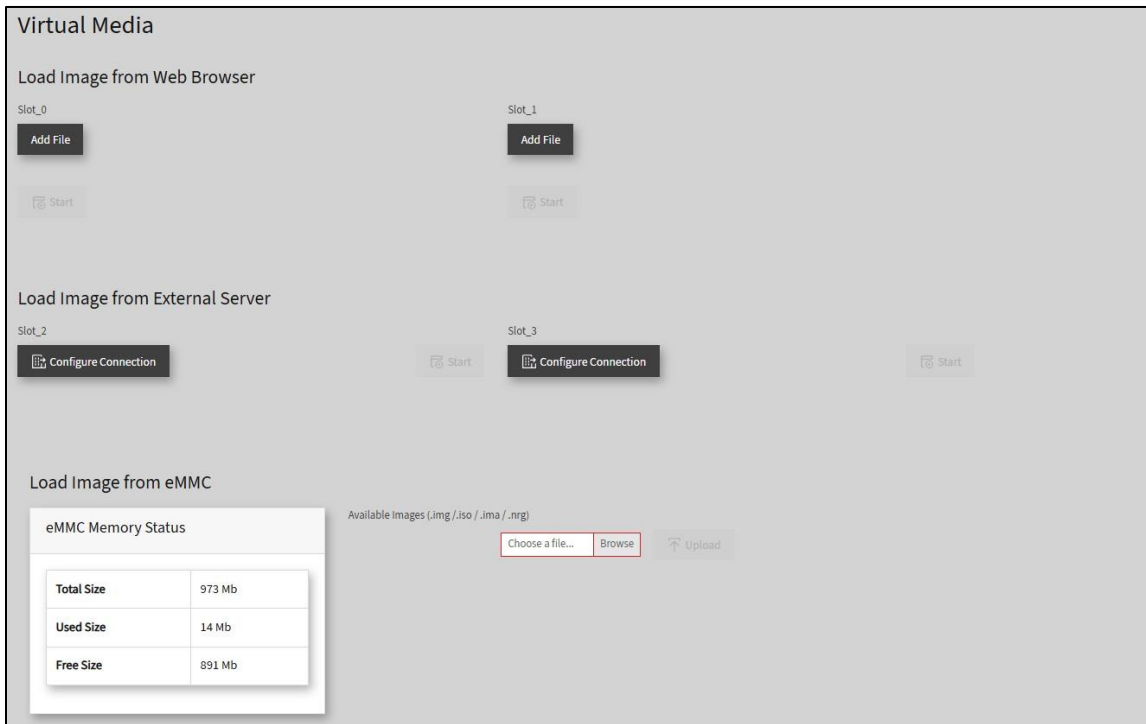


Figure 102 Virtual Media

The Virtual Media page contains information about the following:

1. Load Image from web browser

- Slot_1 - Click Add file and click Start to establish the web socket connection.
- Slot_0 - Click Add file and click Start to establish the web socket connection.

The following types of file formats can be used for redirection (*.iso, *.ima, *.img and *.nrg) .

2. Load Image from external Server

- Slot_3/ Slot_2 - Click Configure Connection to configure the connection. This action opens the Legacy mode configuration dialog as displayed in the below screenshot.

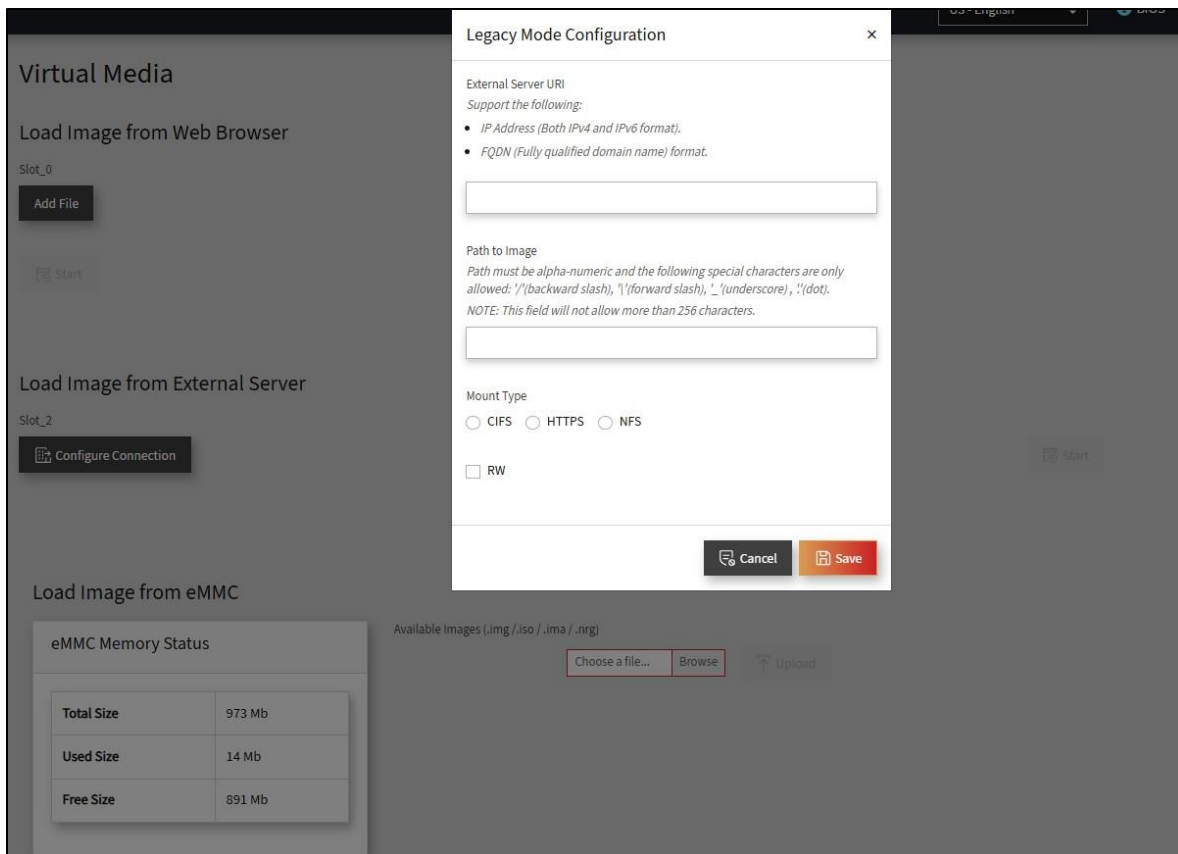


Figure 103 Virtual Media - legacy mode configuration

Legacy mode configuration

- External server URI – Enter the server URI.

Note: Support the following:

- IP Address (Both IPv4 and IPv6 format).
- FQDN (Fully qualified domain name) format. Should not add https in the FQDN, it will append automatically based on the Mount type

- Path to image – Enter the image location.

Note: Path must be alpha-numeric and the following special characters are only allowed: '/'(backward slash), '\'(forward slash), '_'(underscore), '.'(dot).NOTE: This field will not allow more than 256 characters.

Validation:

The screenshot shows a 'Virtual Media' interface in the background with sections for 'Load Image from Web Browser', 'Load Image from External Server', and 'Load Image from eMMC'. An 'eMMC Memory Status' table is visible in the bottom left. Overlaid on this is a 'Legacy Mode Configuration' dialog box. The dialog has fields for 'External Server URI' (containing '10.0.139.25'), 'Path to Image' (containing '/home/sambaserver/A.iso'), 'Mount Type' (with 'CIFS' selected), 'Username' (containing 'root'), and 'Password' (masked with dots). There is also an unchecked 'RW' checkbox with a note: 'Read/Write option is not available for CD images (.iso, .nrg)'. 'Cancel' and 'Save' buttons are at the bottom right of the dialog.

Total Size	973 Mb
Used Size	14 Mb
Free Size	891 Mb

External Server URI	10.0.139.25
Path to Image	/home/sambaserver/A.iso
Mount Type	☒ CIFS ☐ HTTPS ☐ NFS
Username	root
Password	*****
RW	☐ RW Read/Write option is not available for CD images (.iso, .nrg)

Figure 104 Legacy Mode Configuration - Validation

- Mount Type - Select the mount type as CIFS, HTTPS or NFS.

Legacy Mode Configuration

External Server URI

Support the following:

- IP Address (Both IPv4 and IPv6 format).
- FQDN (Fully qualified domain name) format.

Path to Image

Path must be alpha-numeric and the following special characters are only allowed: '/'(backward slash), \"(forward slash), \"(underscore), \"(dot).

NOTE: This field will not allow more than 256 characters.

Mount Type

☒ CIFS ☐ HTTPS ☐ NFS

Username

Password

☐ RW

Cancel

Save

Figure 105 Mount Type –CIFS

- CIFS - Select CIFS, then enter Username and password.
- Check in RW and click Save to save the setting.

Legacy Mode Configuration

External Server URI

Support the following:

• IP Address (Both IPv4 and IPv6 format).

• FQDN (Fully qualified domain name) format.

Path to Image

Path must be alpha-numeric and the following special characters are only allowed: '/'(backward slash), \"(forward slash), \"(underscore) , \"(dot).

NOTE: This field will not allow more than 256 characters.

Mount Type

☐ CIFS

☒ HTTPS

☐ NFS

Username

Password

☐ RW

Cancel

Save

Figure 106 Mount Type HTTPS

- HTTPS - Select HTTPS, then enter Username and password.
- Check in RW and click Save to save the setting.

Legacy Mode Configuration
×

External Server URI

Support the following:

- IP Address (Both IPv4 and IPv6 format).
- FQDN (Fully qualified domain name) format.

Path to Image

Path must be alpha-numeric and the following special characters are only allowed: '/'(backward slash), \"'(forward slash), \"'(underscore), \"'(dot).

NOTE: This field will not allow more than 256 characters.

Mount Type

☐ CIFS
☐ HTTPS
☒ NFS

☐ RW

Cancel

Save

Figure 107 Mount Type NFS

- NFS - Select NFS.
- Check in RW and click Save to save the setting.

Note:

- OpenBMC Virtual Media Design allows all file types to ensure compatibility with different formats. If the Host OS can recognize the redirected medium, it will be mounted.
- Virtual Media redirection will be stopped in case inactivity. (refer virtual-media.json > inactivity Timeout, default – 900 secs).
- Media redirection for CD/DVD ISO images smaller than 600 KB is not supported.

Enhancements

Enhanced USB Gadget Naming for Virtual Media Redirection

Redirected images are uniquely identifiable in the BIOS, allowing users to select the correct boot image based on the slot.

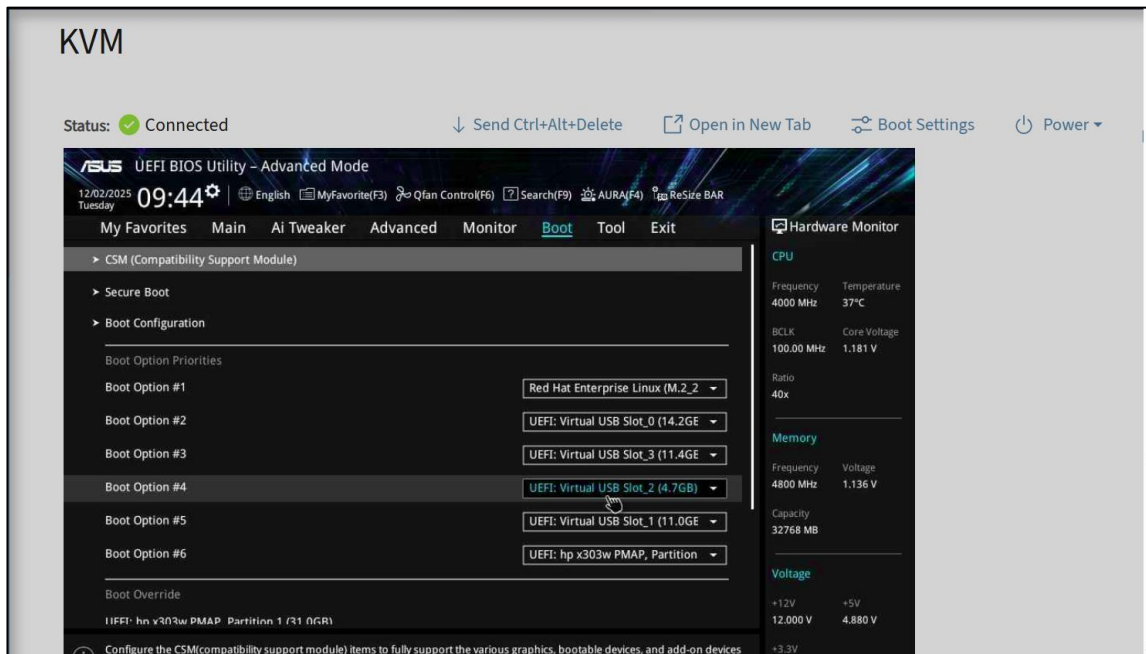


Figure 108 Enhancements

Local Media redirection

This feature extends the Virtual Media service to support mounting local image files stored on the BMC filesystem from eMMC. This enables users to mount ISO, IMG, IMA and NRG files directly from the BMC without requiring external network resources.

Upload the Image:

- Click the Browse button to choose the respective image.

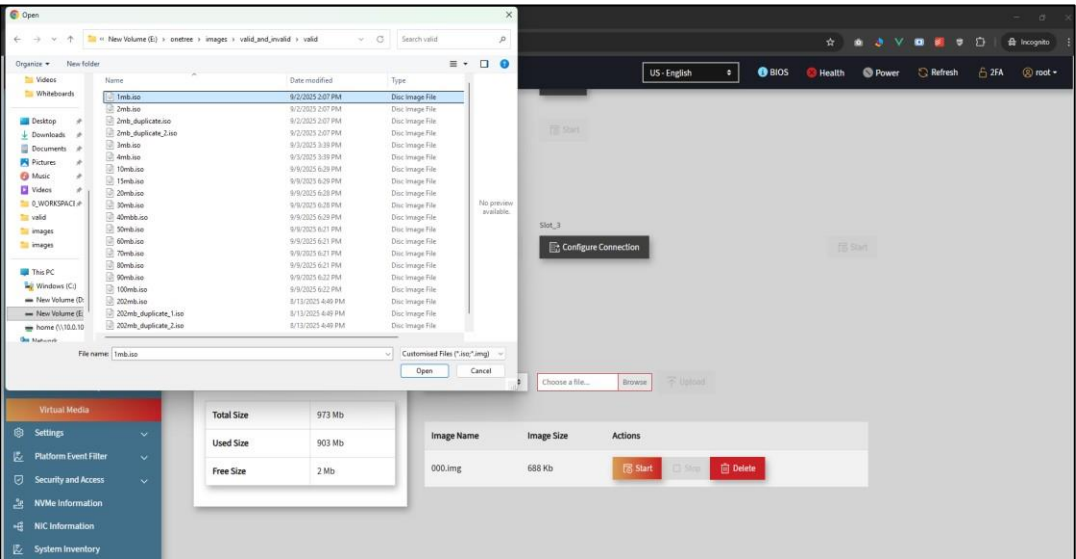


Figure 109 Local Media Redirection

- List of the uploaded images.

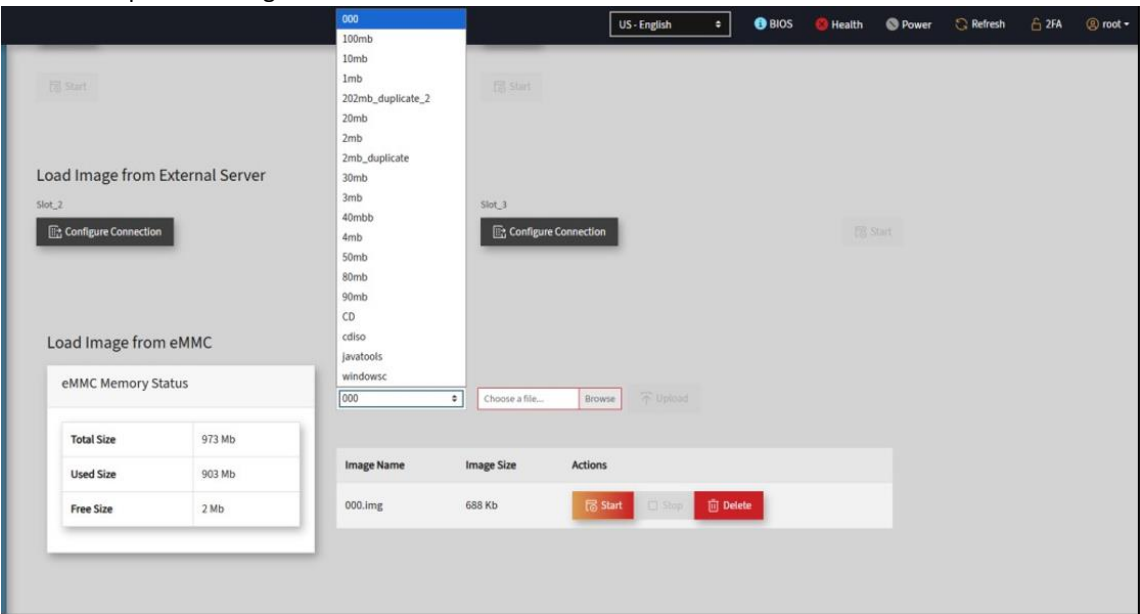


Figure 110 List of Images

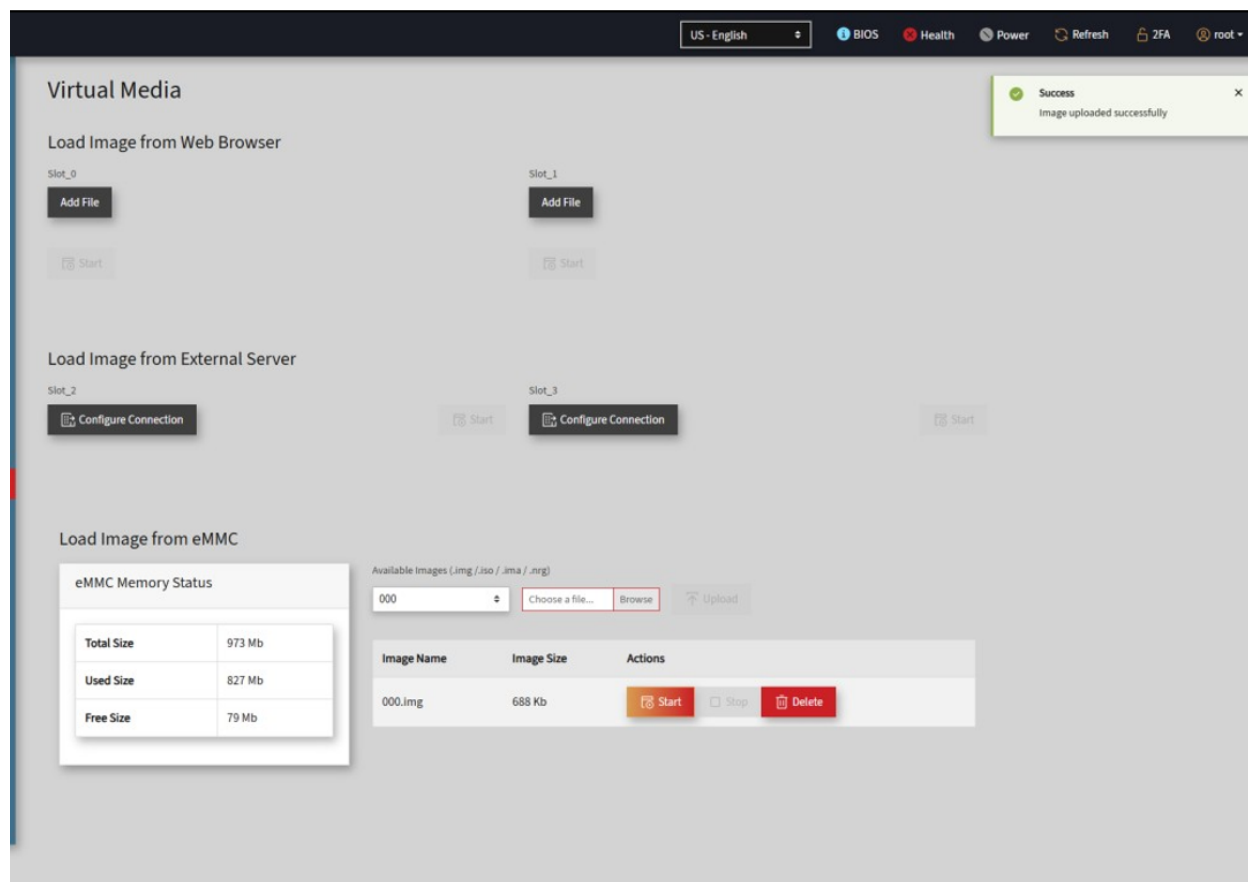


Figure 111 Upload Image

Delete the Image in eMMC

- Click the Delete option to delete the selected image from the eMMC

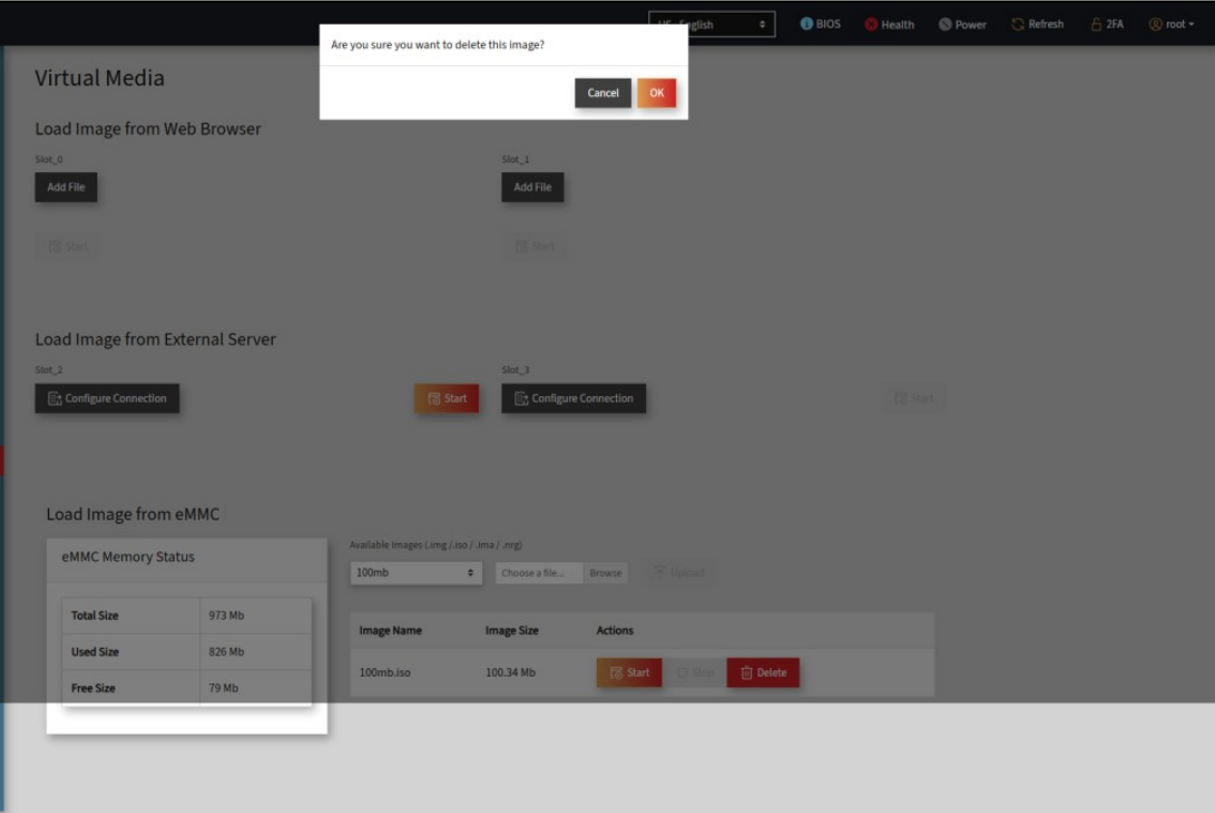


Figure 113 Delete Image

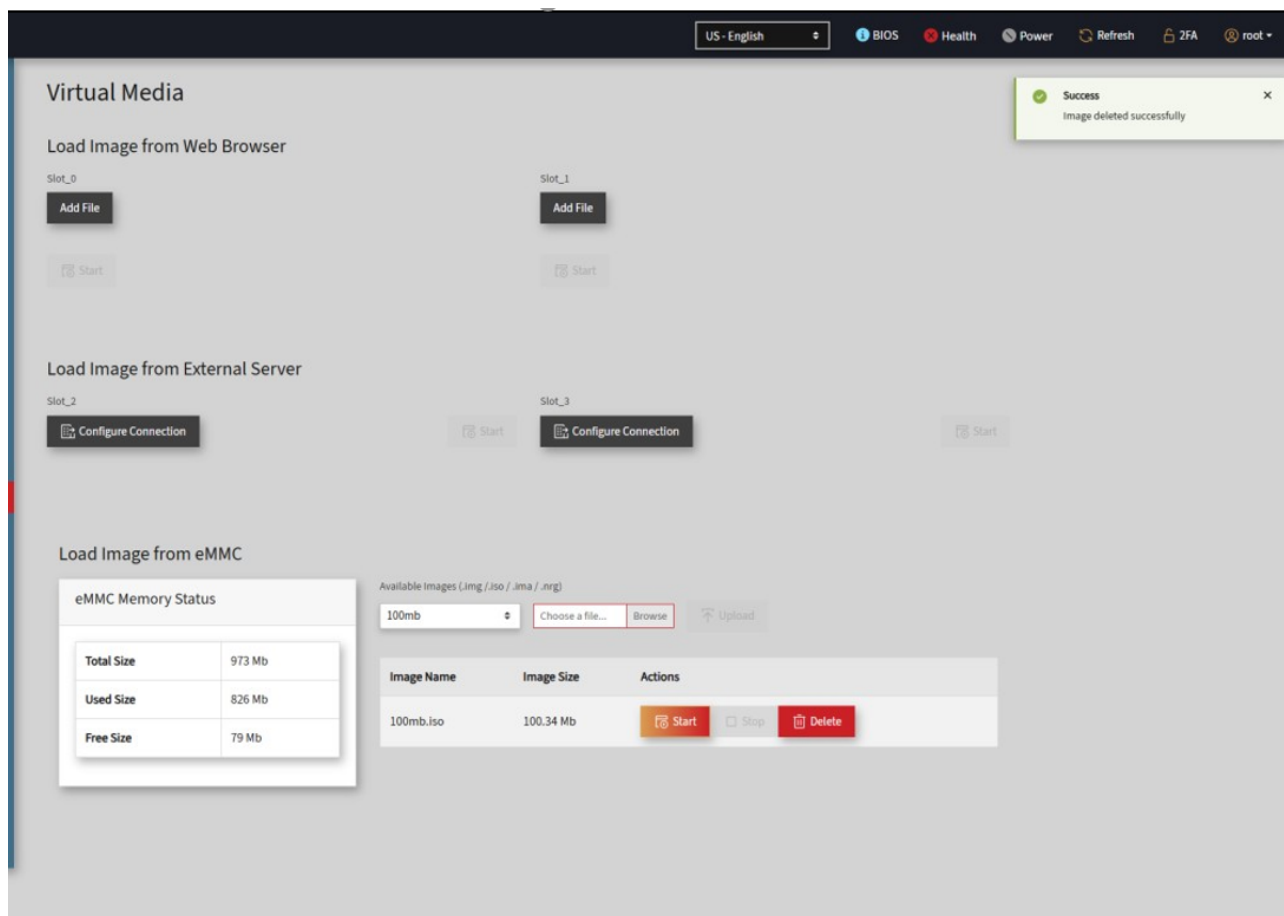


Figure 114 Image Deleted

Start the Image Redirection

- Click the Start option to begin media redirection for the selected image

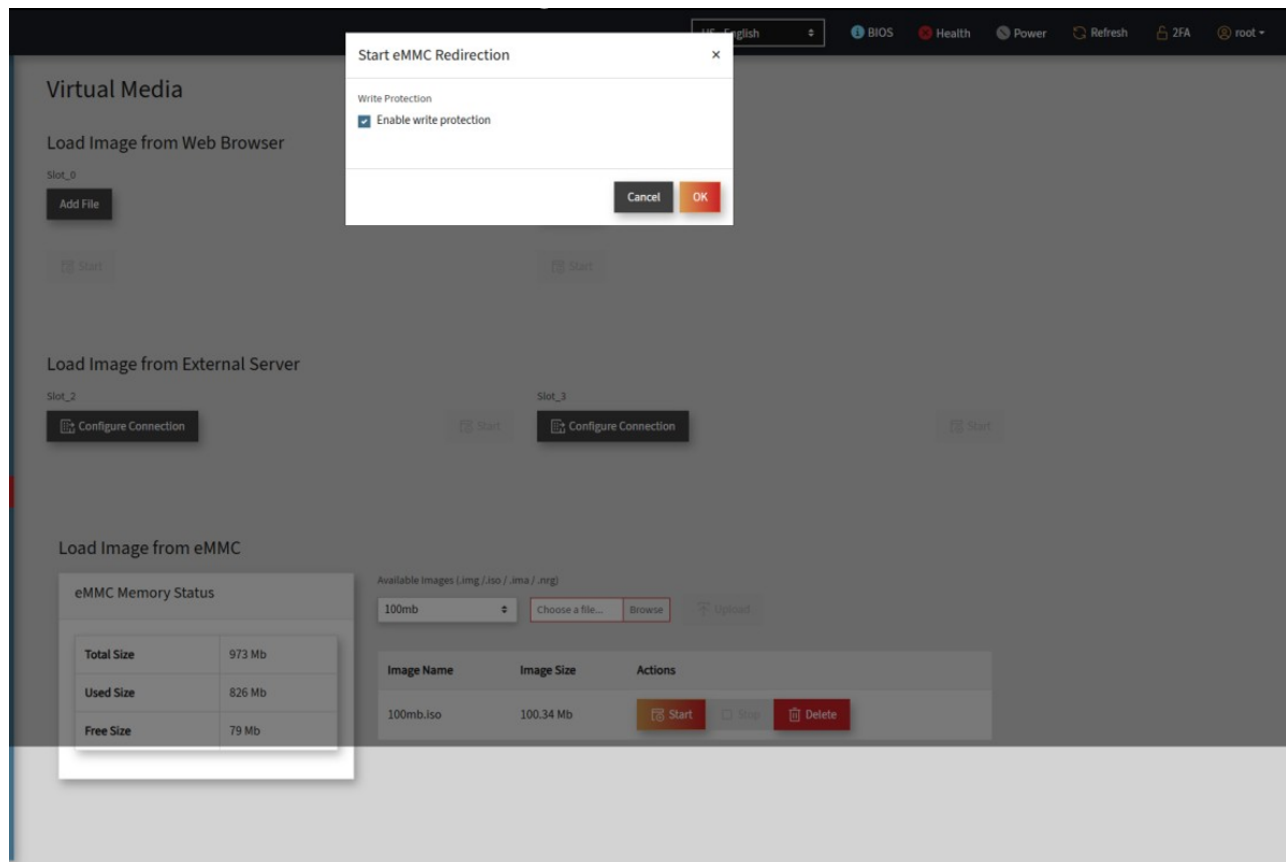


Figure 115 Image Redirection

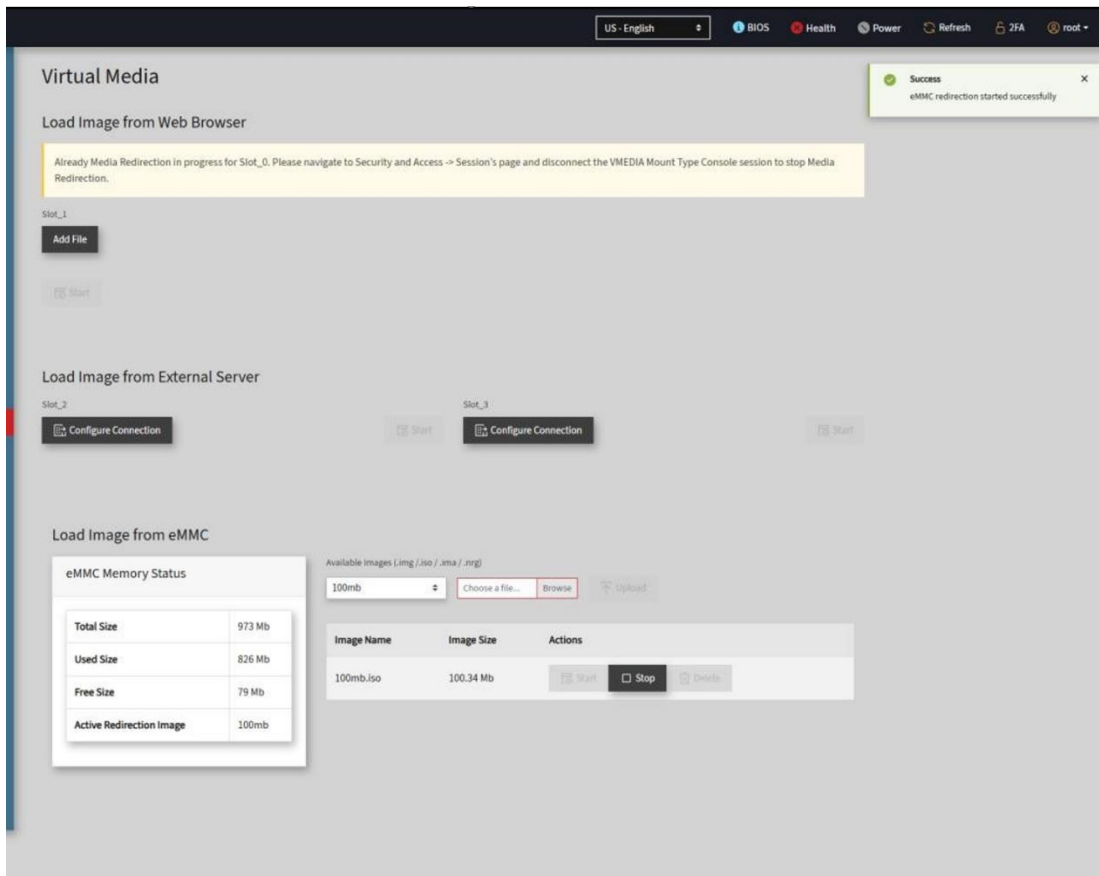


Figure 116 Started Redirection

Stop the Image Redirection

Click the Stop option to stop the media redirection.

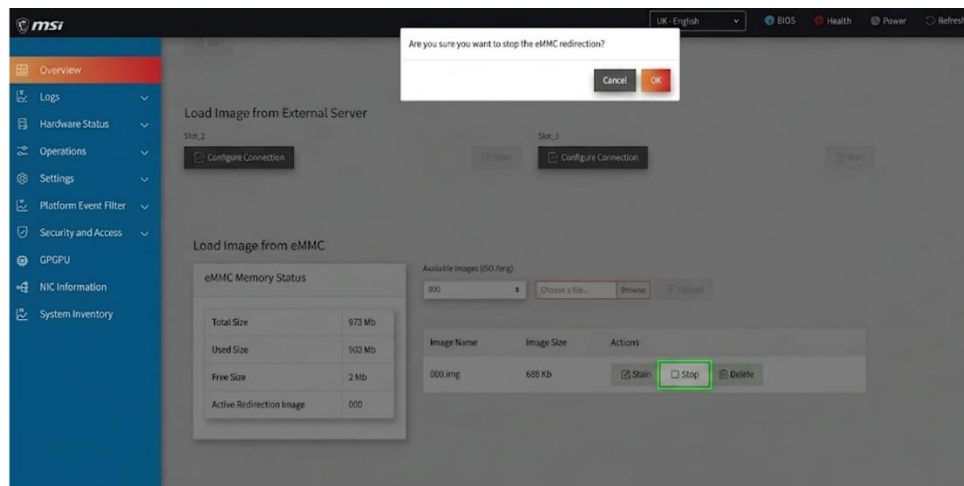


Figure 117 Stop Redirection

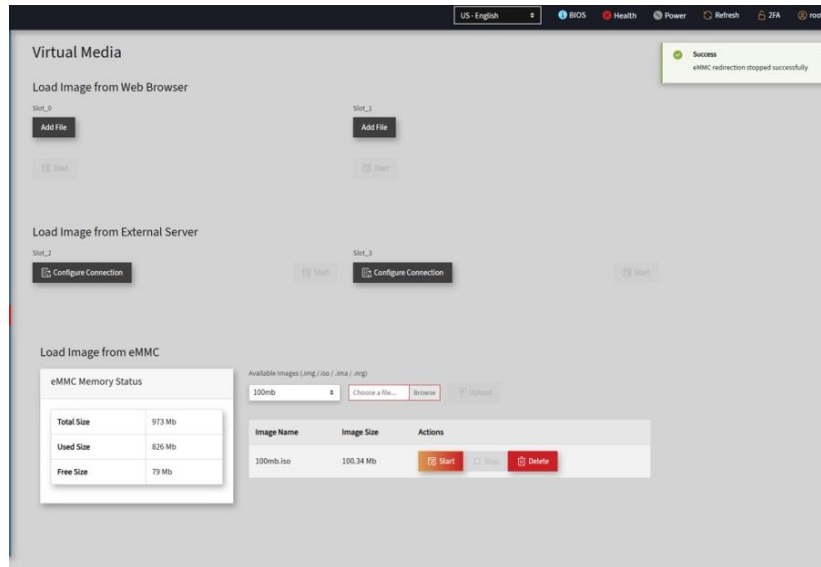


Figure 118 RedirectionStopped

Extended Privilege Support

Users can enable or disable Virtual Media access by selecting the VMedia Access option in User Management page due to this extended privilege support in User Management.

Click and navigate to Security and access -> User management -> Edit User page to enable or disable the VMedia Access option as displayed in the below screenshot.

The 'Edit User' form contains the following fields and options:

- Account Status:** Radio buttons for 'Enabled' (selected) and 'Disabled'.
- Username:** Text field containing 'test12'. Instructions: 'Cannot start with a number', 'No special characters except underscore'.
- Change Password:** Check box (unchecked).
- User Password:** Text field with a visibility toggle (eye icon).
- Password Change Required:** Radio buttons for 'Enabled' and 'Disabled' (selected).
- Privilege:** Dropdown menu set to 'Administrator'.
- Confirm User Password:** Text field with a visibility toggle (eye icon).
- Enable SNMP User:** Radio buttons for 'Enabled' (selected) and 'Disabled'.
- Encryption:** Dropdown menu set to 'AES'.
- Read Write Permission:** Dropdown menu set to 'Read Write'.
- VMedia Access:** Radio buttons for 'Enabled' and 'Disabled' (selected).
- Algorithm:** Dropdown menu set to 'SHA-224'.

At the bottom right are 'Cancel' and 'Save' buttons.

Figure 119 Extended Privilege Support

Note: By default, the root (default admin) user has vMedia access enabled, and this setting cannot be modified. The ability to enable or disable vMedia access is configurable only for additional user accounts.

Enabled = If VMedia Access is enabled, the Virtual Media Redirection page will appear with the required information.

Disabled - If VMedia Access is disabled, the Virtual Media doesn't appear.

Virtual Media page appears with error messages. A sample screenshot is displayed below.

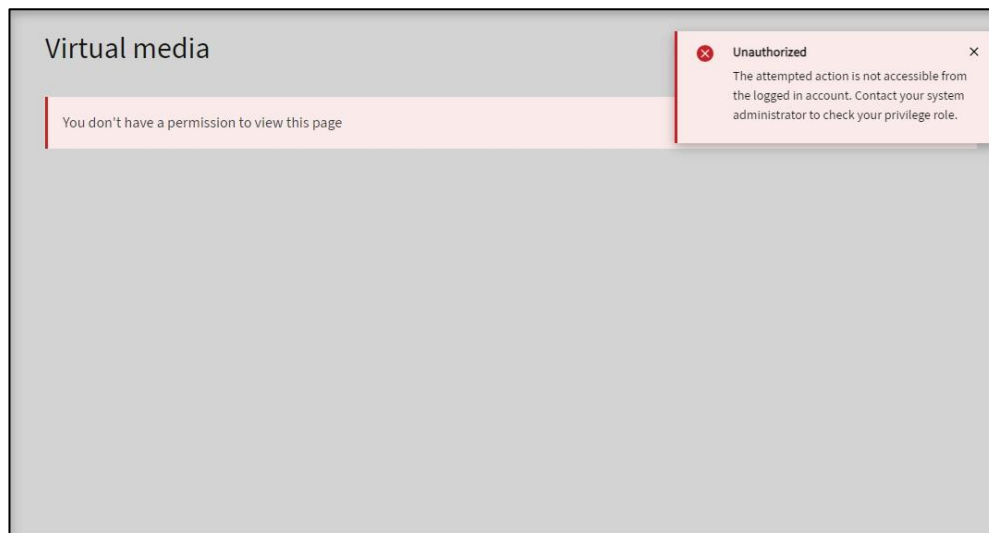


Figure 120 Virtual Media Error

Mounting windows ISO in Virtual Media

Mounting DVD-based ISOs (eg. windows ISO) in Virtual Media are not supported by underlying USB Mass Storage gadget. To mount such iso files it needs to be converted to MBR/FAT32 image format. Refer the following URL for steps to convert DVD-based ISO files to MBR/FAT32 format.

<https://lists.ozlabs.org/pipermail/openbmc/2020-October/023701.html>

Mounted File Modified in the Source Machine while Redirected

Once the media redirection is started, Virtual media will not have control over source files. Therefore, if any modifications are made to the source file in the client filesystem, it is recommended to restart the media redirection for proper functionality.

Remote media Reconnect Support for CIFS and NFS Mount type

Once the media redirection using CIFS and NFS Mount type is started, if any network interruption occurs on RMedia server during media redirection in progress, the mounted medium will be reconnected if network is re-established on Rmedia server within Reconnect Try Time Duration.

Reconnect Try Time Duration can be calculated as follows:

$$\text{Reconnect Try Time Duration} = \text{Retry Count} \times \text{Retry Interval}$$

The Retry Count and Retry interval parameters can be configured by user in Policies page.

Click and navigate to *Security and access* -> *Policies* page and configure retry count and retry interval. A sample screenshot is displayed below.

Policies

Services

Network IPMI (out-of-band IPMI)
Allow Remote Management of the platform via IPMI. Tools such as ipmitool require this Setting to be enabled. ☒ Enabled

KVM
Enabling KVM makes to the guest Operating System. ☒ Enabled

KVM Port Value (in numbers).
5900

Web Port Value (in numbers).
443

Virtual Media
Enabling Virtual Media for Image Redirection. ☒ Enabled

Retry Interval: 15
Retry Count: 3

SOL SSH
Enabling SOL SSH ☒ Enabled

SOL SSH Port Value (in numbers)
2200

SSDP
Enabling SSDP Protocol. ☐ Disabled

SNMP
Enabling SNMP Protocol. ☐ Disabled

Figure 121 Virtual Retry Count and Interval Configuration

- *Retry Interval* = Allowed values ranges between 15 to 30 (in Seconds).
- *Retry Count* = Allowed values ranges between 3 to 6.

Backup and Restore of Virtual Media

This feature ensures that the external server configuration for Virtual Media remains available even after a system reboot. When a user mounts a remote ISO or image via the Virtual Media page, the system stores the external server IP and image path.

Load Image from external Server

- Slot_3/ Slot_2 - Click Configure Connection to configure the connection. This action opens the Legacy mode configuration dialog as displayed in the below screenshot.

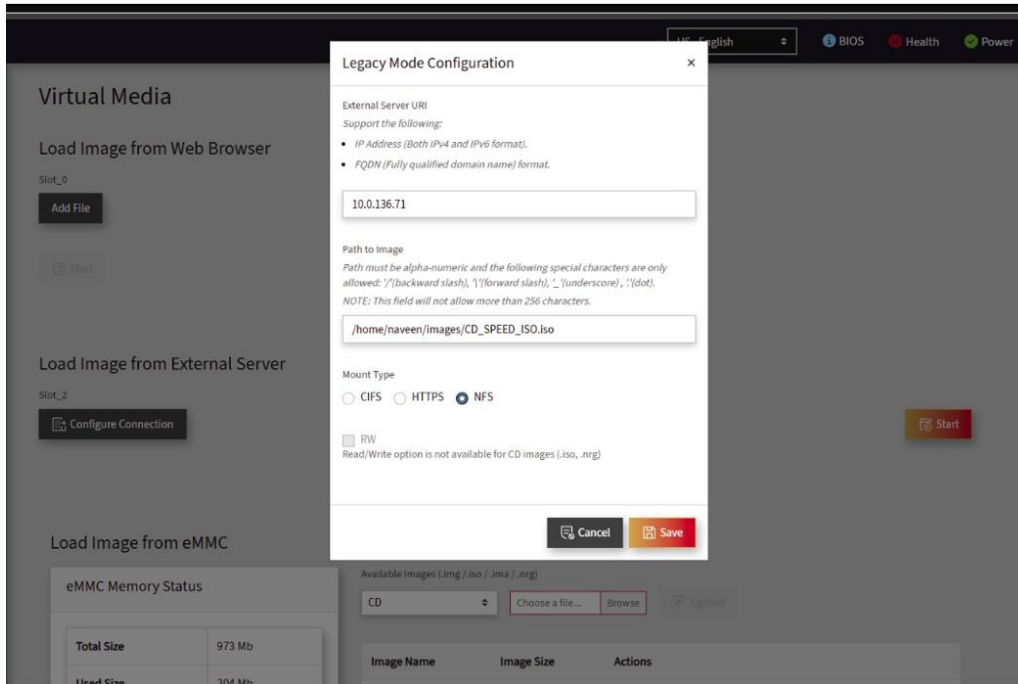


Figure 122 Legacy Mode Configuration

Once the configuration is completed and media redirection is started, the settings are persisted and remain accessible across different browsers

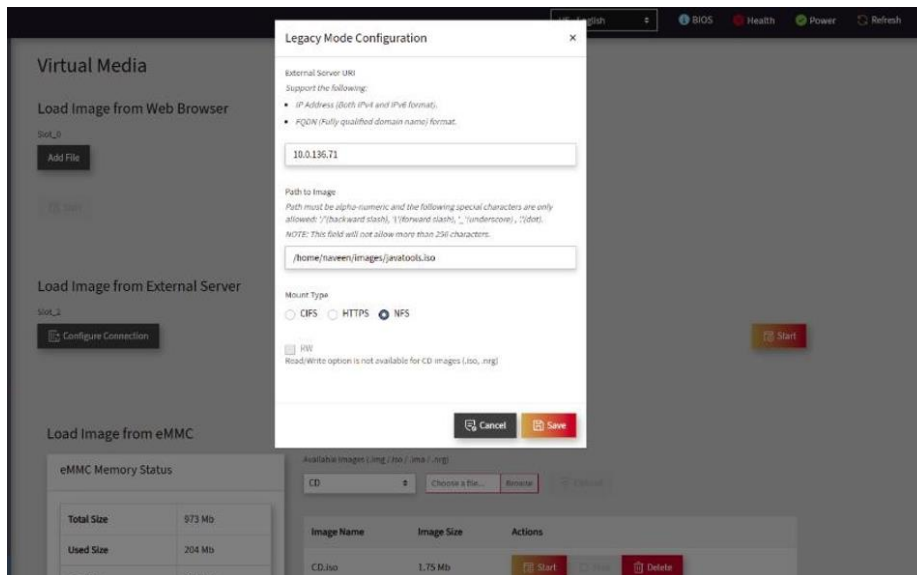


Figure 123 Legacy Mode Configuration 2

Note: Upon BMC reboot, the image path will be unmounted but will still be displayed on the configuration page.

2.8 Settings

2.8.1 PAM Order

User can navigate to Settings and click on PAM Order. Given below the screenshot for PAM Order page.

The PAM Order page contains information about the following:



Figure 124 PAM Order

PAM Order Configuration

- Drag and drop the modules (e.g., Internal Users, LDAP/AD, RADIUS) to change their sequence.
- Click the Save button to apply the new order. If no changes are made, no action is needed as message indicated on the screen.

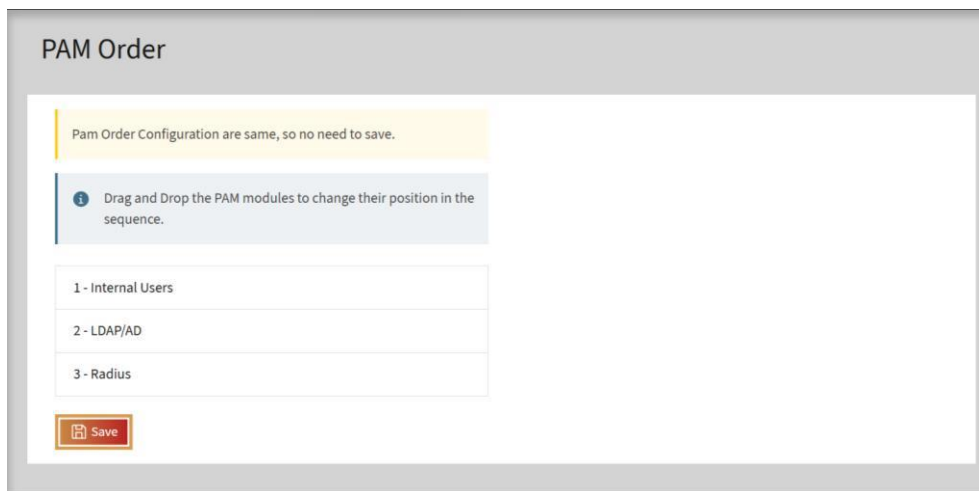


Figure 125 PAM Order Configuration •

The message below confirms that the PAM Order has been updated.

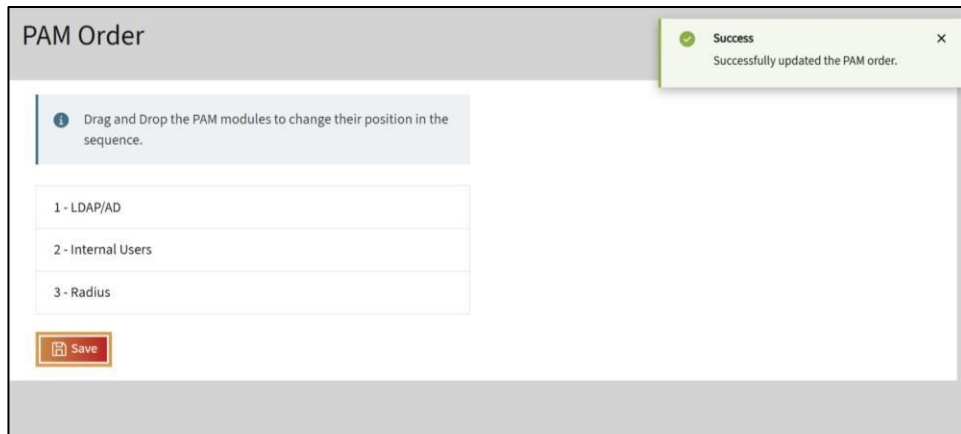


Figure 126 Success Message

2.8.2 Power Restore Policy

The Power Restore Policy determines how a server or device behaves after power is restored following a power loss (such as a power outage or unplugging the system).

- The Power Restore Policy is a configurable setting that tells the BMC what to do when AC power returns

User can navigate to Settings and click on Power Restore Policy. Given below is the screenshot for Power Restore Policy page.

The Power Restore Policy page contains information about the following:

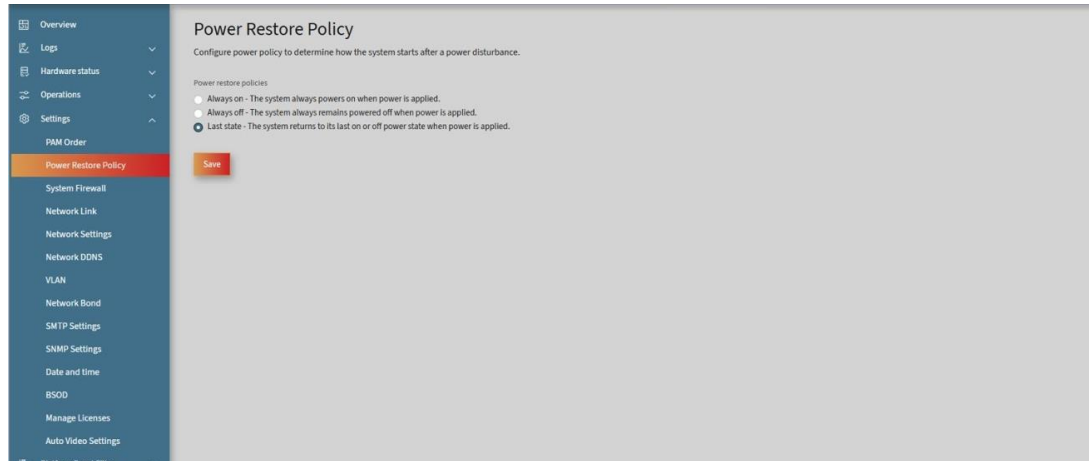


Figure 127 Power Restore Policy

1. Choose one of the available policy options:

Available Policy Options:

- Always Off – The system remains powered off when power is restored, regardless of its state before the outage.
- Always On – The system automatically powers on when power is restored.
- Restore Previous State – The system returns to the power state it was in before the power loss (if it was on, it turns on; if off, it stays off).

2. Click Save to apply the configuration.

Note: The Power Restore Policy page is supported only by AMD and NVIDIA CRB platforms. It is not available on Intel CRB platforms.

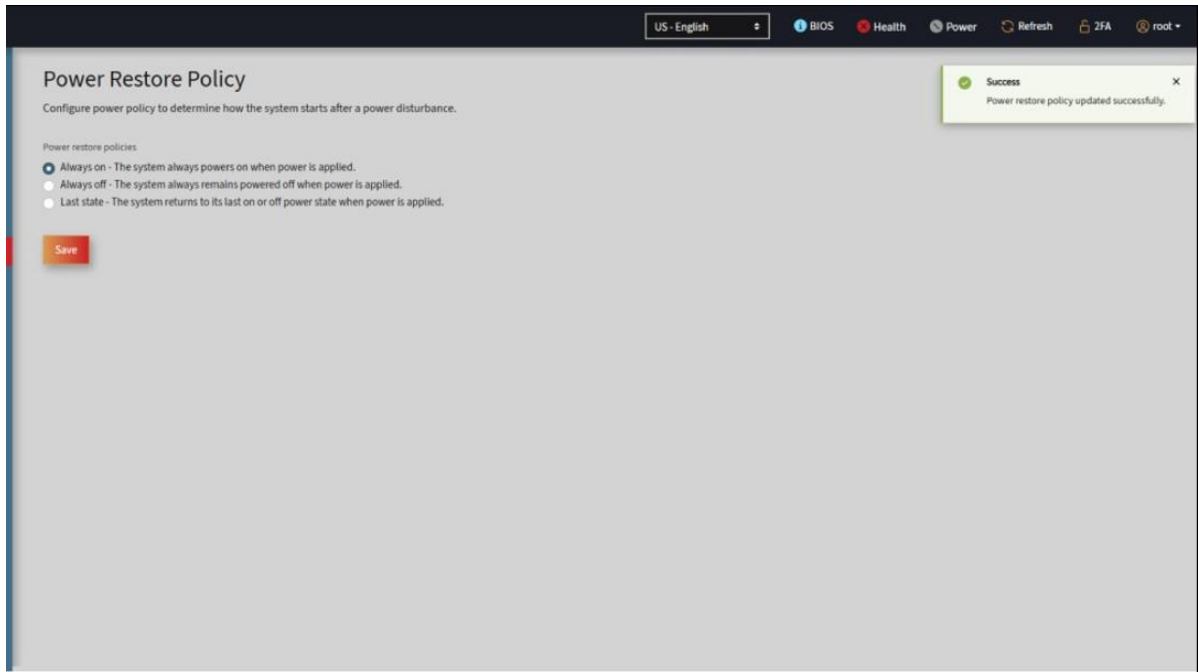


Figure 128 Success Popup for Power Restore Policy Updating

- MAC Address - It displays the configured MAC Address.
- Protocol - It displays the protocols for the configured Port or Port Ranges.
- Start Duration - - The respective firewall rule effect will start from this date and time.
- End Duration - The respective firewall rule effect will start from this date and time.
- PreLoad - It displays the PreLoad for the configured Port or Port Ranges.
- Target – It indicates the current setting of the listed Port or Range of Port rules (Allow or Block) status.
- IP Version - It indicates the current setting IPv4 or IPv6.
- Delete – Click Delete icon to delete the selected slot.

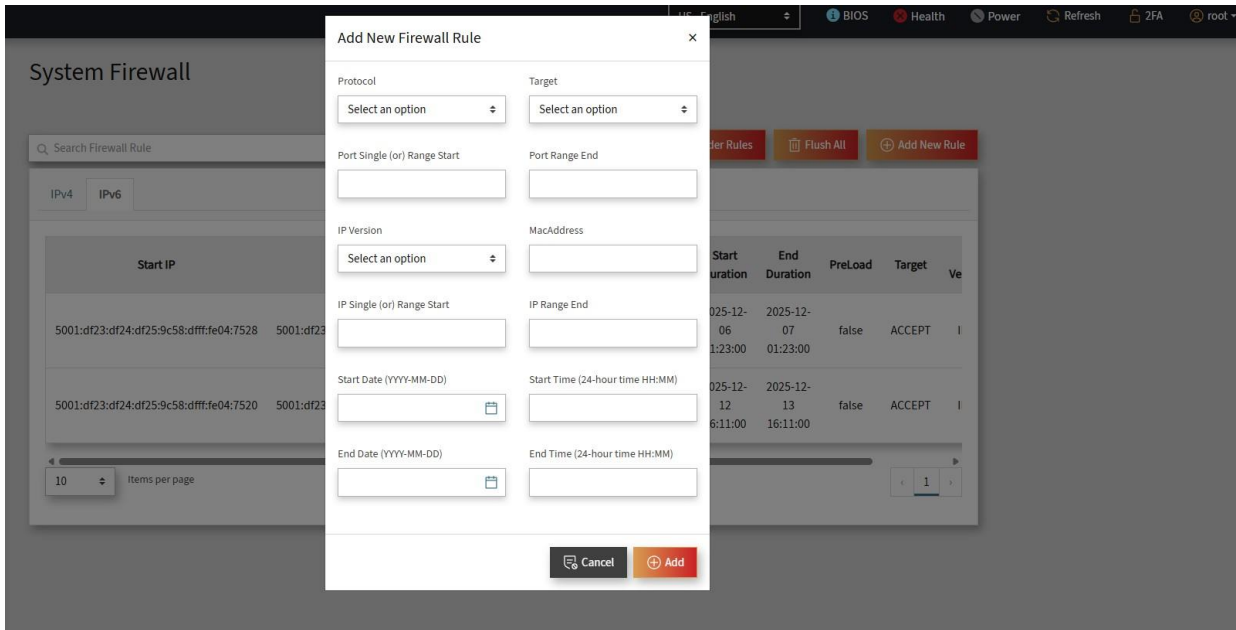


Figure 131 Add New Firewall Rule

Add New Firewall Rule

- Protocol – Select an option like TCP, UDP or ALL from drop-down list.
- Target - To indicate the current setting of the listed Port or Range of Port rules (Allow or Block) status.
- Port Single or Range Start – Enter the port number or a range of port numbers in the Start Port field.
- Port Range End – Enter the end value in the Port Range End field.

Note: Start/ End Port value ranges from 1 to 65535.

- IP Version - To configure IP Address, select IPv4, IPv6, or Both.

Note: When the user selects Both, it will disable the IP Single (or) Range Start and IP Range End fields.

- MAC Address - Enter the MAC Address of the device.
- IP Single or Range Start - To show the configured IP Address or Range of IP. Based on the IPv4 or IPv6 selection in IP Version, the corresponding address should be entered in this field.
- IP Range End - To show the configured IP Address or Range of IP.

Note –

Start/ End IP will support IPv4 and IPv6 Address format only:

IPv4 Address made of 4 numbers separated by dots as in xxx.xxx.xxx.xxx.

Each number ranges from 0 to 255.

First number must not be 0.

IPv6 Address made of 8 groups of 4 Hexadecimal digits separated by colon as in xxx

x:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx

- Start Date (YYYY-MM-DD) - Enter Start date to start the respective firewall rule effect from this date.
- End Date (YYYY-MM-DD) - Enter End date to end the respective firewall rule effect on this date.
- Start Time (24-hour time HH:MM) - Enter start time to start the respective firewall rule effect from this time.
- End Time (24-hour time HH:MM) - Enter end time to end the respective firewall rule effect on this time.
- Click Save to proceed else Cancel to leave the PopUp.

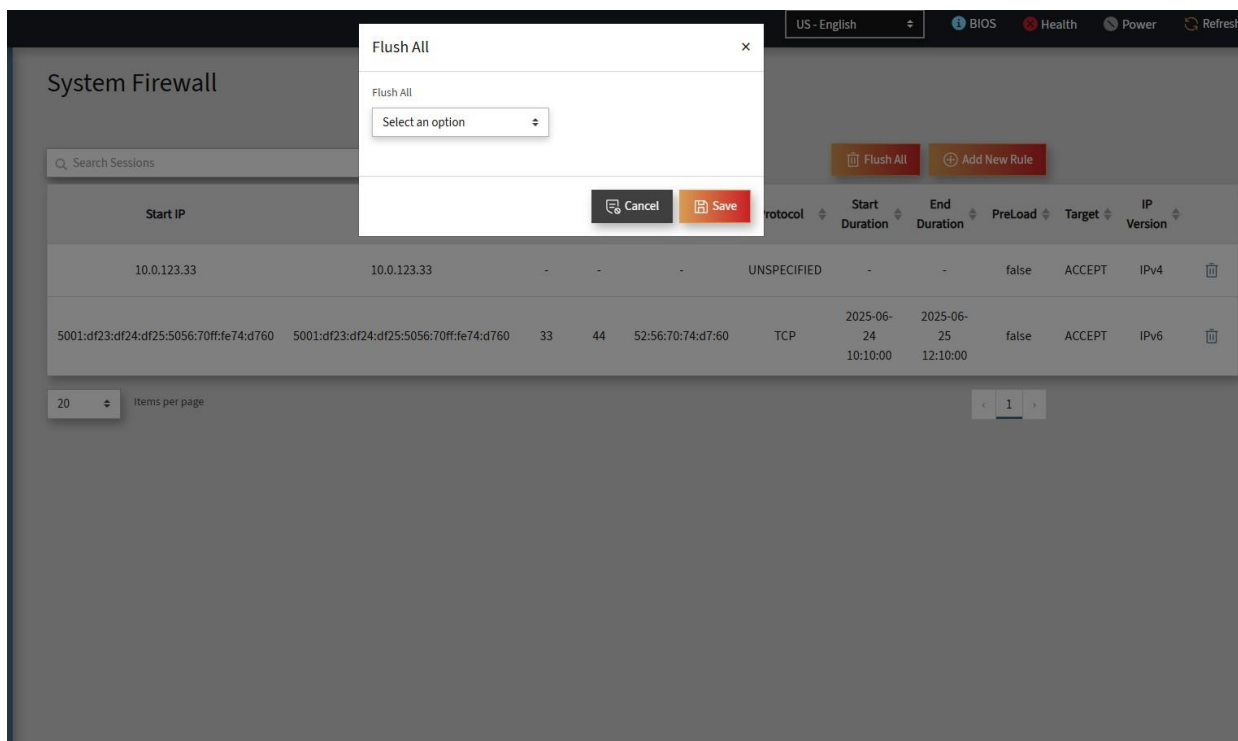


Figure 132 Flush All

Flush All

- Flush All: Select Block All to block all the incoming IP's and Port's.
- Click Save to proceed else Cancel to leave the PopUp.

Reorder Rules

The System Firewall page allows the user to configure reorder firewall rules method which allows to drag and drop all IPv4 Firewall rules or all IPv6 Firewall rules by specifying the preferred order.

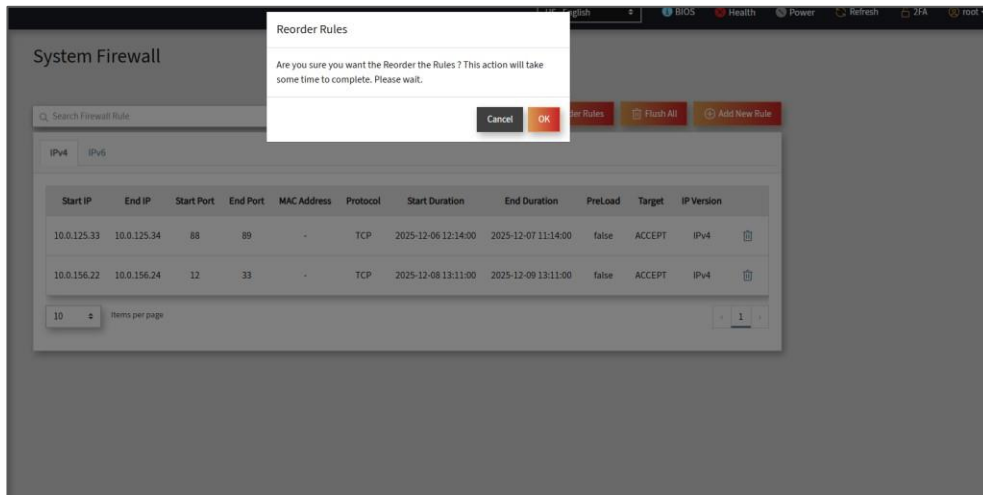


Figure 133 Reorder Rules confirmation

Reorder Rules: Click Reorder Rules button to configure the reorder rules in System Firewall page.

2.8.4 Network Link

This page is used to configure the network link configuration for available network interfaces.

To open Network Link page, click Settings → Network Link from the menu bar. A sample screenshot of Network Link Configuration page is shown below.

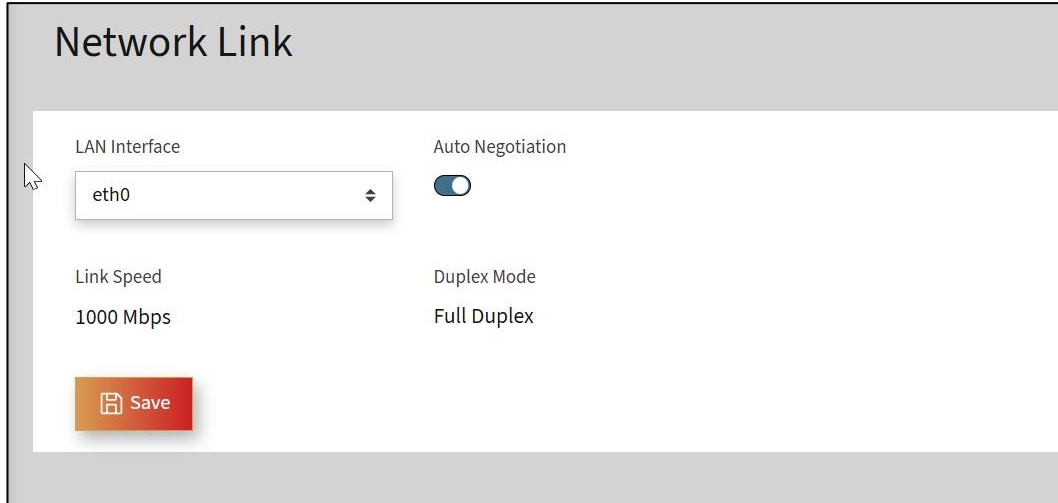


Figure 134 Network Link

The fields of Network Link Configuration are explained below.

LAN Interface: Select the required network interface from the list to which the Link speed and duplex mode to be configured.

Auto Negotiation: This option enables the device to perform automatic configuration to achieve the best possible mode of operation (speed and duplex) over a link.

Link Speed: It lists all the supported capabilities of the network interface. It can be 10/100/1000 Mbps.

Note: Link speed of 1000 Mbps is not applicable, when Auto Negotiation is OFF.

Duplex Mode: Duplex Mode could be either Half Duplex or Full Duplex.

Save: To save the settings.

Procedure:

- Select the LAN Interface from the drop-down list.
- Select either Enable or Disable for Auto Negotiation.

Note: The Link Speed and Duplex Mode will be active only when Auto Negotiation is OFF.

- Select the Link Speed from the drop-down list.
- Select the Duplex Mode either Full duplex or Half duplex.
- Click Save to save the configuration.

2.8.5 Network Settings

Users can navigate to Settings > Network Settings page.

Given below is the screenshot for Network Settings page.

Network Settings

Host Name: AMIOT-469626f23022 [Enable LAN](#)

eth0 hostusb0

Link Status: LinkUp Speed (mbps): 1000

Interface Settings

FQDN: AMIOT-469626f23022.in.megatrends.com MAC Address: 00:07:e9:34:39:b0

IPv4 Settings ☒

Use Domain Name: ☒ Enabled Use DNS Servers: ☒ Enabled Use NTP Servers: ☒ Enabled

IPv4 Addresses: ☒ DHCP

IP Address	Gateway	Subnet Mask	Address origin
10.0.99.171	10.0.96.1	255.255.224.0	DHCP

IPv6 Settings ☒

Use Domain Name: ☒ Enabled Use DNS Servers: ☒ Enabled Use NTP Servers: ☒ Enabled

IPv6 Addresses: ☒ DHCP

[Add static IPv6 Address](#)

IP Address	Prefix Length	Gateway
2001:b021:abcd:0:207:e9ff:fe34:39b0	64	fe80::bdc:d0f8:f0a3:8986
5001:df27:df28:df29:207:e9ff:fe34:39b0	64	fe80::bdc:d0f8:f0a3:8986

Static DNS

[Add IP Address](#)

IP Address

No items available

Figure 135 Network Link

The Network Settings page contains the information about the following:

- Network Settings page helps to configure BMC network settings.

Note: If the reported speed is 65535 and AutoNeg is true, this indicates that the actual link speed is unknown. The network interface is unable to negotiate or retrieve the correct speed from its link partner.

- Network Settings
- Hostname – Click Edit hostname  icon to add Hostname.
- Use domain name - Enable to use domain name from DHCP server.
- Use DNS servers - Enable to use DNS servers from DHCP server.
- Use NTP servers - Enable to use NTP servers.

User can Configure the BMC network setting through interfaces eth0, usb0 and usb1. By clicking the respective interfaces, it allows the user to perform the following operations:

- It shows the Link status and speed (mbps).
- Enable VLAN
- On the Network Settings page, locate the Enable LAN section at the top-right corner.
- Click the edit icon to Enable LAN.
- A pop-up dialog titled Enable LAN will appear.
- Toggle the Enable LAN switch to the ON position.
- From the LAN Interface dropdown, select the desired network interface (e.g., eth0, eth1, etc.).
- Click the Save button to apply the changes. Or click Cancel to close the dialog without saving.

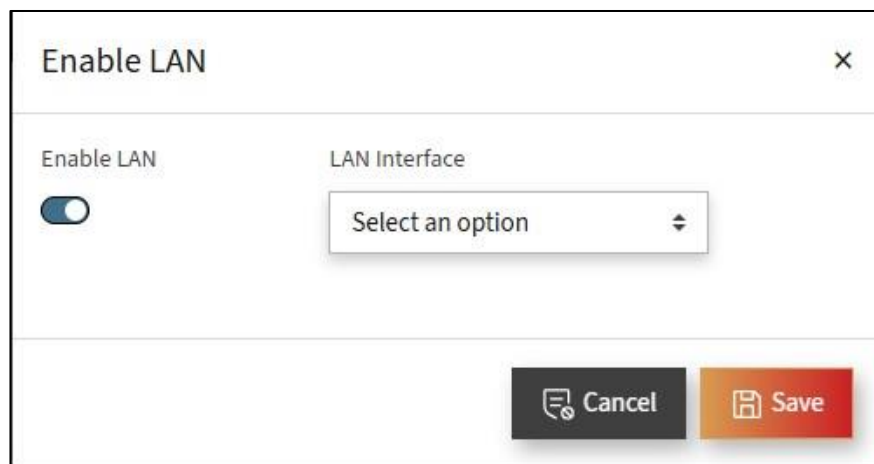


Figure 136 Enable LAN

- Interface settings:
- FQDN – It shows domain name.
- MAC address – Click Edit Mac address icon to add MAC address.
- IPv4
- IPv4 addresses – It displays information like IP address, Gateway, and Subnet mask.

- DHCP – User can enable/disable DHCP using  DHCP toggle button. The static IPv4 address will be manually added when the DHCP is disabled and IPv4 address will be automatically set when DHCP is enabled.
- Enable DHCP – In Network page, user can enable DHCP using toggle button. This configuration may change the ip address of the device by disabling the existing ip. It opens the confirmation message as displayed in the below screenshot. Once it is confirmed, the user can log in with the new ip.
- **Disable DHCP** – User can disable DHCP using toggle button. It opens the Add Static IPv4 address dialog

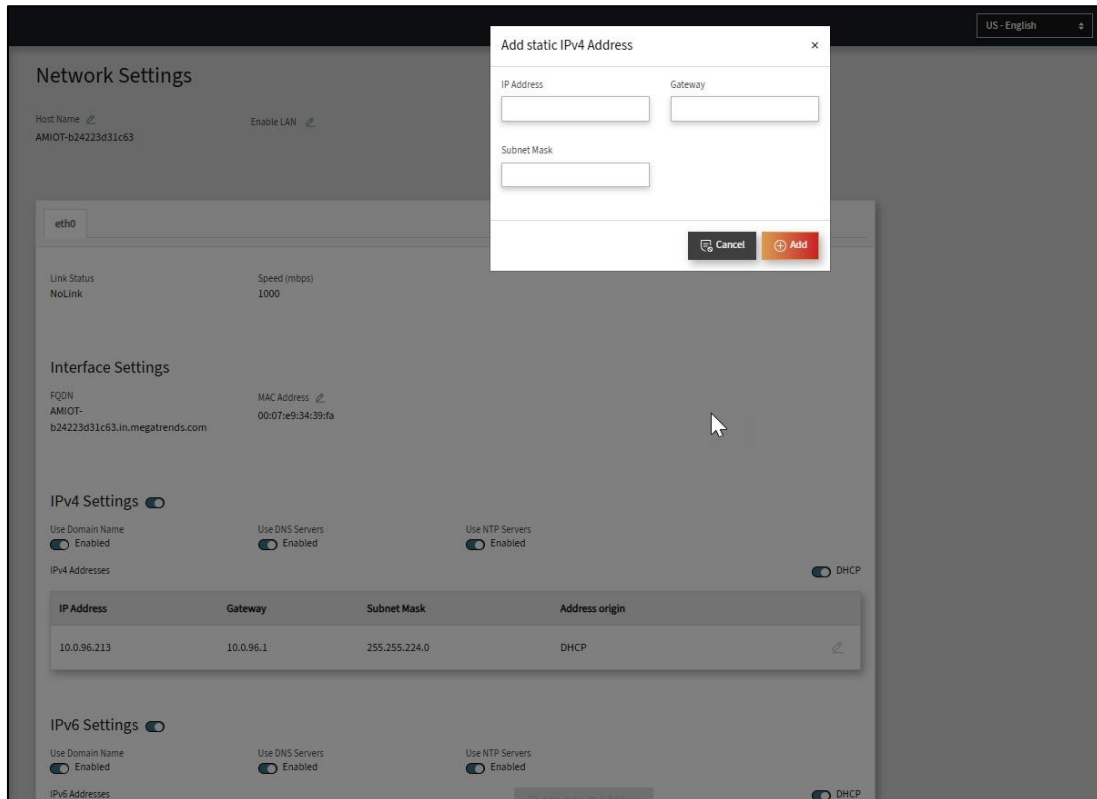


Figure 137 Network - Add static IPv4 Address

- box as displayed in the screenshot below.
- Enter IP address, Gateway, and Subnet mask in Add static IPv4 address dialog box.
- Click Add to add the static IPV4 address. This action opens the following confirmation message to add new ip. A sample screenshot is displayed below.



Figure 138 Confirmation Message

- Click OK to login with the new ip and proceed further.
- The following success message will be displayed once the network configuration has been reset. Hence, the user can close the browser session and open the new browser session to connect the device with the new ip. A sample screenshot is displayed below.

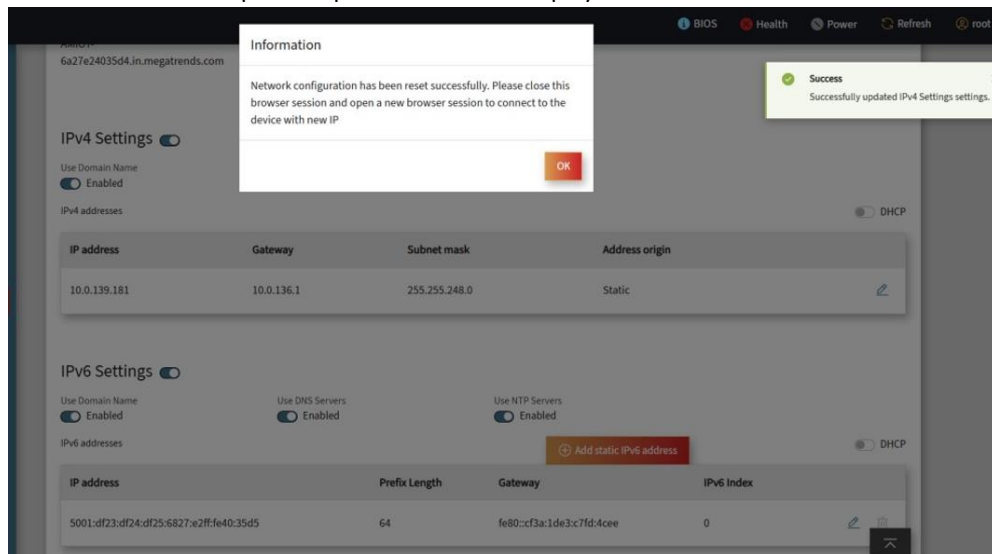


Figure 139 IPV4 Success Message

Note:

The added address can be edited using Edit icon in the right corner of IPv4 address in Network page.

For the selected network interface, either **IPv4 Settings** or **IPv6 Settings** support must be enabled. You cannot disable both IPv4 and IPv6 simultaneously.

- IPv6
- IPv6 addresses – It displays the information like IPV6 Index, IP address, Prefix Length and. Gateway. Toggle DHCP to enable in which static IPv6 address will be added. This action opens the Add static IPv6 address dialog box as displayed in the below screenshot.

Note: For the selected network interface, **IPv4 Settings** or **IPv6 Settings** either support must be enabled. You cannot disable both IPv4 and IPv6 simultaneously.

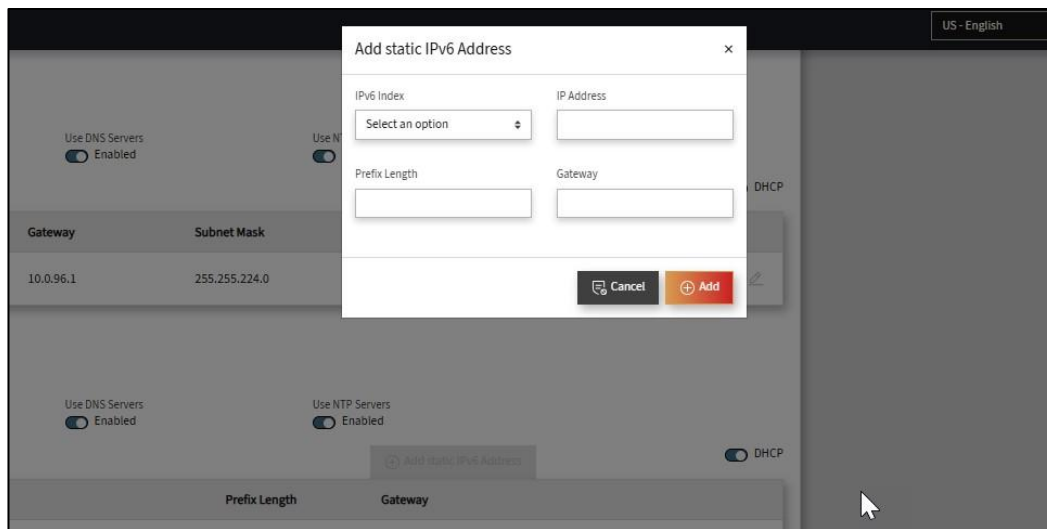


Figure 140 Network - Add static IPv6 Address

- IPv6 Index: Select the network interface index for which the IP will be configured.
- Add static IPv6 address - Toggle DHCP in Network page or click Add static IPv6 address and enter IP address, Prefix Length and Gateway.
- Add - Click Add to add the static IPv6 address.
- Added address can be deleted or edited using Delete or Edit icon in the right corner.
- The following success message will be displayed once the network configuration has been reset. Hence, the user can close the browser session and open the new browser session to connect the device with the new ip. A sample screenshot is displayed below.

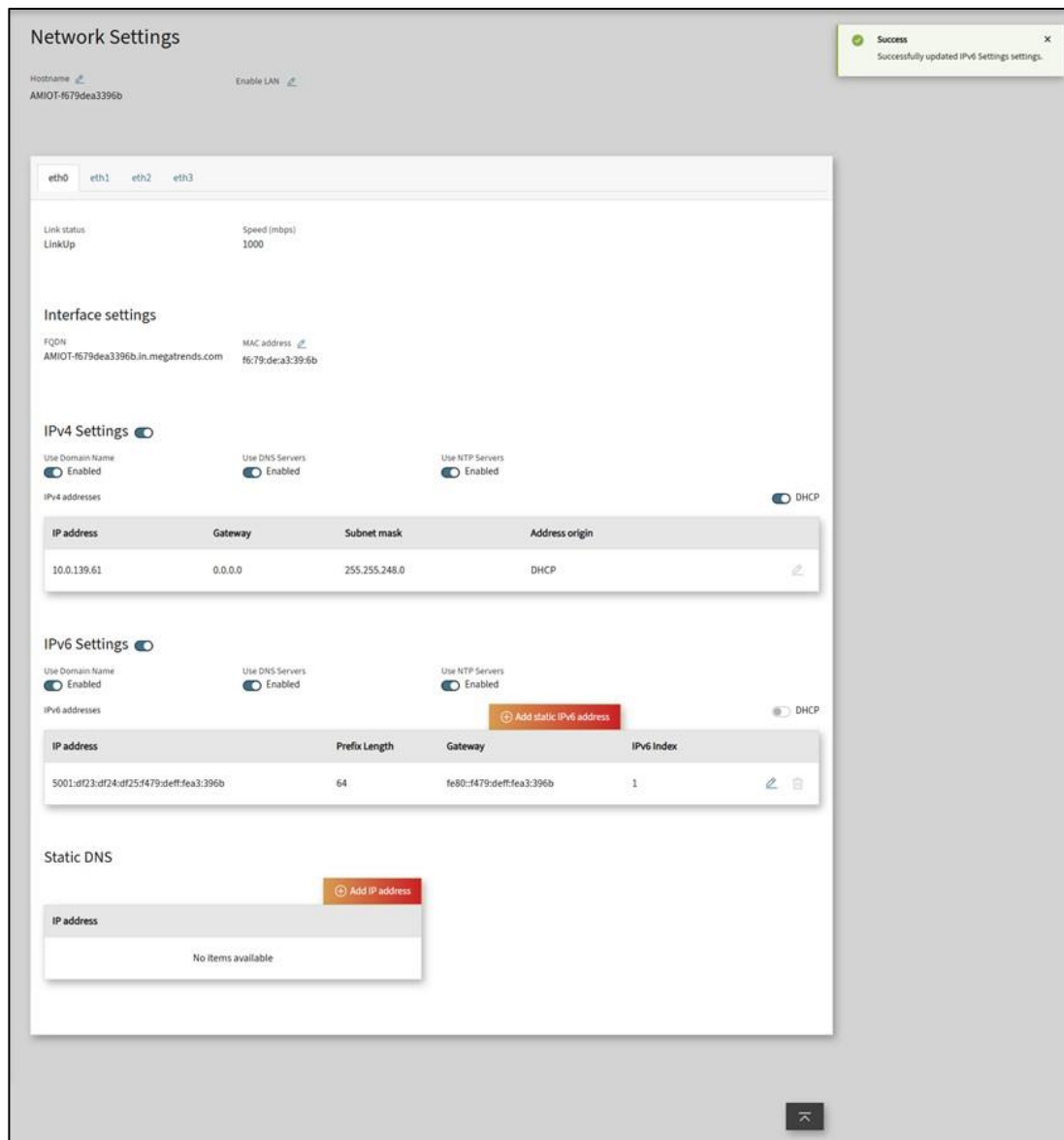


Figure 141 IPV6 Success Message

- Static DNS
- Click Add IP address, enter the Static DNS and click ADD to successfully add the Static DNS.

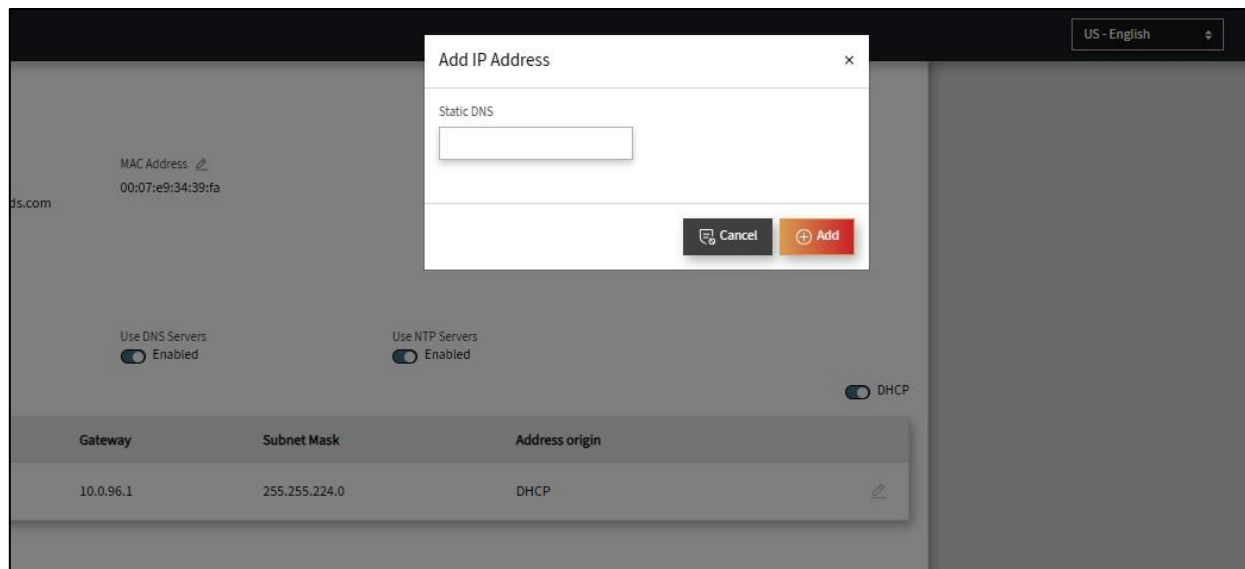


Figure 142 Network - Add IP Address

Note: Cannot set IPv4 static name server address if "Use DNS servers" for IPv4 is not disabled. Besides, cannot set IPv6 static name server address if "Use DNS servers" for IPv6 is not disabled.

2.8.6 Network DDNS

User can navigate to Settings > Network DDNS page.

This page allows the user to perform DDNS configurations which are DHCP, Host, Domain and Interface Configurations. A sample screenshot is displayed below.

The screenshot shows the 'Network DDNS' configuration page. It features four main configuration sections:
1. **DHCP Configuration**: Includes 'Send Host Name' (Enabled) and 'Send NSUpdate' (Enabled) toggle switches.
2. **Host Configuration**: Includes 'Host Name Settings' with 'Manual' and 'Auto' (selected) radio buttons, and a 'Host Name' field with the value 'AMIOT-b67b5ca52348'.
3. **Domain Configuration**: Includes an 'Add Domain Names' link and a 'Domain Name' text field containing 'in.megatrends.com'.
4. **Interfaces**: Includes 'DDNS Method' (Register), 'NSUpdate Enable' (Enabled), and 'Use TSIG' (Disabled) toggle switches.
The page also includes 'Save' buttons for each section, a 'Do NSUpdate' button at the bottom left, and a 'Back' button at the bottom right.

Figure 143 Network DDNS

The Network DDNS page contains the following fields.

DHCP Configuration

- Send Hostname= User can enable/disable the Send Hostname option.
- Send NsUpdate - User can enable/disable the global NsUpdate trigger functionality. If it is enabled only NsUpdate of each interface will be triggered otherwise NsUpdate will not be triggered.

Host Configuration

- Host Name = Select Manual option to mention the static Host name manually. Or select Auto option, it sets the Host name by default.
- Static Host Name –User can mention Static Host name in this field when Manual option is selected.

- Click Save to save the Host configurations.

Auto Option

- The system automatically assigns a host name.
- The host name is usually generated based on a predefined format or unique system identifier (e.g., AMIOT-b67b5ca52348 as shown in image).



Figure 144 Host Configuration

Manual Option

- Allows the user to enter a custom host name manually (e.g., AMIHost as shown in the image).
- The text field becomes editable.
- Useful when you need a specific, meaningful, or recognizable hostname (e.g., for easier network identification).
- Requires the user to ensure the entered name is unique and valid.

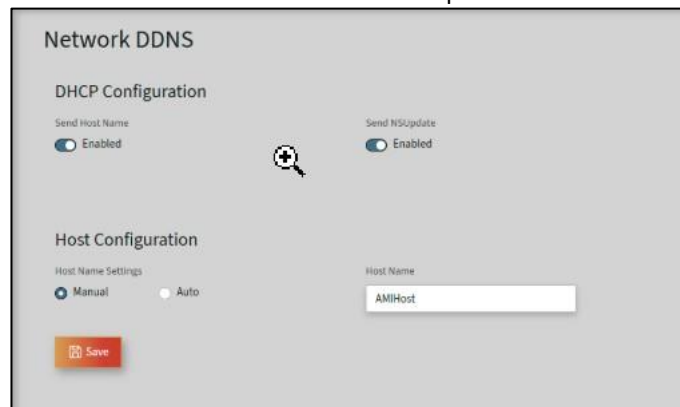
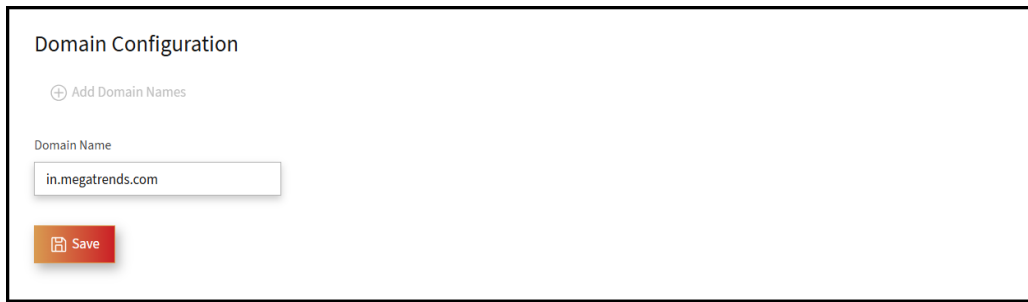


Figure 145 Network DDNS

Domain Configuration



Domain Configuration

+ Add Domain Names

Domain Name

in.megatrends.com

Save

Figure 146 Domain Configuration



Domain Configuration

+ Add Domain Names

Domain Name

in.megatrends.com OneTree Intel AMI

MegaRAC

Save

Figure 147 Domain Configuration - Add Domain Names

- Add Domain Name
- Domain Name →Enter Domain Name
- Click Save to save the Domain configurations.

Note: Domain Name can be set only if "Use Domain" in both IPv4 and IPv6 are disabled.

Interface Configuration

- DDNS Method –Click toggle button to enable the register.
- NSUpdate Enable –This field allows you to enable/disable the NSUpdate trigger functionality for each interface configurations.
- Use TSIG - User can enable/disable Use TSIG option. It requires you to upload the file when Use TSIG is enabled as displayed in the below screenshot.

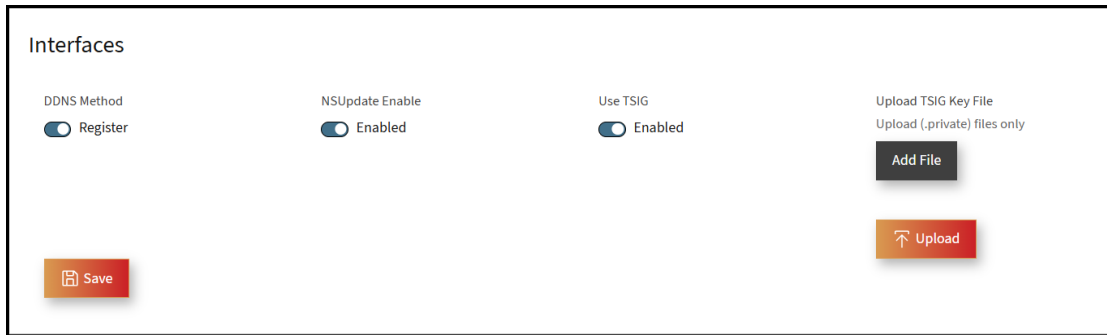


Figure 148 Use TSIG

- Click Save to save the interface configuration.



Figure 149 DoNsUpdate

- After all the configurations are done to register the domain name Click the "DoNsUpdate" button to register the value.
- Once done the system pops up a success toast message.

2.8.7 VLAN

User can navigate to Settings -> VLAN page.

Given below is the screenshot for VLAN page.

VLAN

eth0

Virtual Interface	VLAN ID	VLAN Priority
~	~	~

VLAN ID

VLAN Priority

 Add

Figure 150 VLAN

The VLAN page contains the information about following:

- Users can configure through interfaces eth0, usb0 and usb1.
- VLAN – It contains information about Virtual Interface and VLAN ID.
- VLAN ID - Enter VLAN ID.
- Add - Click Add will open confirmation dialog box.
- Click on Ok may change the IP address, making further access impossible.
- After confirming the device IP, user can log in with the new IP.
- Virtual Interface can also be deleted using the Delete icon in the right corner.

VLAN ID: The Identification for VLAN configuration.

Note:

The value ranges from 2 to 4094. Maximum 2VLAN IDs are supported simultaneously.

The IPMI daemon retrieves the first VLAN interface it finds from the DBus, which organizes objects in ASCII order. Consequently, if you delete a VLAN interface using IPMI human-readable commands, the daemon will remove the first VLAN interface it encounters. To delete a specific VLAN interface, users must issue a raw command with the specified VLAN ID. Alternatively, users can delete VLAN interfaces in ASCII order.

VLAN Priority: The priority for VLAN configuration.

Note: Value ranges from 0 to 7. - 7 is the highest priority for VLAN.

2.8.8 Network Bond

This page is used to configure the network bonding configuration for the network interfaces.

Note: Minimum of two network interfaces required to enable Network bonding for the device.

To open Network Bond page, click Settings -> Network Bond from the menu bar. A sample screenshot of Network Bond Configuration page is shown below.



Figure 151 Network Bond Configuration Page

Enable Bonding: To enable or disable network bonding for network interfaces.

MII Monitor(millisecond): To configure the MII Monitor(millisecond) How much time it should wait before it goes for another active slave.

Note: Enter valid milliseconds between the 1 – 100. The MII Monitor(millisecond) can be entered only if the Enable Bonding option is enabled.

Bond Interface: Select the Bond Interface from the drop-down list.

Note: The Bond Interface can be selected only if the Enable Bonding option is enabled.

Save: To save the current changes.

Network Bonding Enable/Disable Behavior:

Bonding MAC address will be updated based on Active Slave channel

If Bonding is enabled with Active Slave "eth0", then bonding MAC will be updated when setting MAC for "eth0" channel number– 3.

If Bonding is enabled with Active Slave "eth1", then bonding MAC will be updated when setting MAC for "eth1" channel number– 1.

While bonding is enabled, MAC address updated for other channels will be only reflected on dbus objects and interfaces after bond is disabled.

Note: User must refrain from setting duplicate MAC addresses on different channels.

2.8.9 SMTP Settings

User can navigate to Settings -> SMTP Settings page.

The screenshot displays the 'SMTP Settings' configuration page. The left sidebar contains a navigation menu with options like Overview, Logs, Hardware Status, Operations, Settings, PAM Order, Advanced Log Settings, System Firewall, Network Link, Network Settings, Network DNS, VLAN, CLIPS, Node Manager, SMTP Settings (highlighted), SNMP Settings, Date and Time, BIOS, Manage Licenses, Auto Video Settings, Platform Event Filter, Security and Access, RAID Management, HwM Information, NIC Information, System Inventory, and Host System Diagnostics. The main content area is titled 'SMTP Settings' and 'Configure BMC SMTP Settings'. It features two identical configuration sections: 'Primary Configuration' and 'Secondary Configuration'. Each section includes a toggle for 'Enabled', an 'Authentication' dropdown (set to 'Disabled'), input fields for 'Server Address' (10.0.122.89), 'Port' (25), and 'Sender Email Address' (mgubuntu@coreqa.com). There is also a link to 'Add Recipient Email Address' and a field for 'Recipient Email Address 1' (aravindh@ami.com). A 'TLS Enable' toggle is set to 'Enabled'. Below these are three 'Add File' buttons for 'CaCert PEM Certificate', 'Server CRT Certificate', and 'Server Key Certificate', each with a last modified date. The 'Secondary Configuration' section also shows the uploaded files: 'serverCert.pem', 'server.1.crt', and 'server.1.key'. At the bottom of the page are 'Save' and 'Send Test Email' buttons.

Figure 152 SMTP Settings

The SMTP Settings page contains the information about following:

Configure Primary SMTP Settings

- Primary SMTP Configuration - User can enable Primary SMTP Configuration, then enter Server Address. Sever Port number, Sender Email Address and atleast one Recipient Email Address, the Authentication and TLS Enable are optional user can enable and disable both fields. • If enable the Authentication, the username and password is required.
- If enable the TLS Enable the user need to upload the three certificates are Cacert PEM Certificate, Server CRT Certificate, and Server Key Certificate
- Save settings - Click Save settings to successfully configure Primary SMTP Settings.

Configure Secondary SMTP Settings

- Secondary SMTP Configuration - User can enable Secondary SMTP Configuration, then enter Server Address. Sever Port number, Sender Email Address and atleast one Recipient Email Address, the Authentication and TLS Enable are optional user can enable and disable both fields. • If enable the Authentication, the username and password is required.

- If enable the TLS Enable the user need to upload the three certificates are Cacert PEM Certificate, Server CRT Certificate, and Server Key Certificate
- Save settings - Click Save settings to successfully configure Secondary SMTP Settings.

Figure 153: SMTP Configuration

Adding Recipient Email Address

Click Add Recipient Email Address for adding Recipient Email Address as required. This action opens the dialog box as displayed below.

Figure 154: Add Recipient Email Address

Users can add a maximum of four Recipient Email Addresses, after adding the Recipient Email addresses using the Add Recipient Email Address button. Users can remove the Recipient Email Address field using the close icon which is present in the field itself if they don't need the Recipient Email Address field.

Figure 155: Maximum Recipient Email Address

TLS Certificate

When enabling the TLS Enable option in the primary and secondary configuration, the TLS Certificate section will display in both the configuration sections. If disabling the TLS Enable option, the TLS Certificate section won't be displayed.

Before saving the SMTP settings with TLS Enabled user, needs to upload the Cacert PEM Certificate, Server CRT Certificate, and Server Key Certificate. Those three certificates are mandatory for TLS Enabled.

Note: It is recommended to wait 10 to 20 seconds for the service to restart in BMC after adding each certificate.

Figure 156: TLS Certificate

Three certificates are mandatory to enable TLS Enable. Once the user uploads the certificate, Last Modified Date will be displayed for that certificate.

If the Last Modified Date is displayed for those certificates are not a mandated field. So the user can change the certificate by uploading a new certificate.

TLS Enable

Enabled

Cacert PEM Certificate

Last Modified Date: Fri Aug 9 07:21:01 2024

Add file

cacert.pem ×

Server CRT Certificate

Last Modified Date: Fri Aug 9 07:21:31 2024

Add file

server.crt ×

Server Key Certificate

Last Modified Date: Fri Aug 9 07:21:35 2024

Add file

server.key ×

Figure 157 After uploading Certificate

SMTP Settings

Configure BMC SMTP Settings

Primary Configuration

Enabled

Authentication

Disabled

Server Address

10.0.0.5

Port

25

Sender Email Address

aravinths@ami.com

Add Recipient Email Address

Recipient Email Address 1

aravinths@ami.com

TLS Enable

Enabled

Cacert PEM Certificate

Last Modified Date: Fri Aug 9 07:20:32 2024

Add file

Server CRT Certificate

Last Modified Date: Fri Aug 9 07:20:36 2024

Add file

Server Key Certificate

Last Modified Date: Fri Aug 9 07:20:41 2024

Add file

Secondary Configuration

Enabled

Authentication

Disabled

Server Address

10.0.96.152

Port

25

Sender Email Address

aravinths@ami.com

Add Recipient Email Address

Recipient Email Address 1

aravinths@ami.com

TLS Enable

Enabled

Cacert PEM Certificate

Last Modified Date: Fri Aug 9 07:21:01 2024

Add file

Server CRT Certificate

Last Modified Date: Fri Aug 9 07:21:31 2024

Add file

Server Key Certificate

Last Modified Date: Fri Aug 9 07:21:35 2024

Add file

cacert.pem

x

server.crt

x

server.key

x

Save settings

Send Test Alert

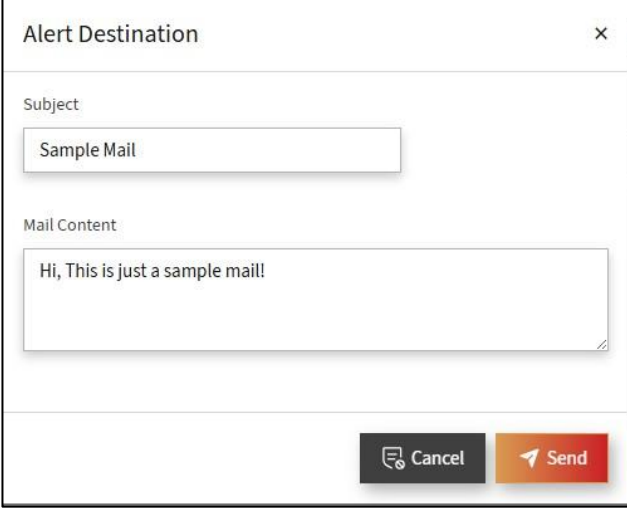
<

Figure 158 Save SMTP Settings

128

Send Test Alert

To send a test alert, click the Send Test Alert button in TLS Certificate dialog, the modal will populate with the default content Sample Mail for Subject and Hi, This is just a sample mail! for Mail Content. Users can change the Subject and Mail Content, then click send to send the test alert to the Recipient configured in SMTP settings.

A modal window titled "Alert Destination" with a close button (X) in the top right corner. It contains two text input fields. The first field is labeled "Subject" and contains the text "Sample Mail". The second field is labeled "Mail Content" and contains the text "Hi, This is just a sample mail!". At the bottom right of the modal, there are two buttons: a "Cancel" button with a speech bubble icon and a "Send" button with a paper plane icon.

Alert Destination

Subject

Sample Mail

Mail Content

Hi, This is just a sample mail!

Cancel Send

Figure 159: Send Test Alert Model

2.8.10 SNMP Settings

Users can navigate to Settings → SNMP Settings.

This page is used to add/delete the Subscription type of SNMP Trap configurations. This feature allows the user to send test trap for SNMP configuration.

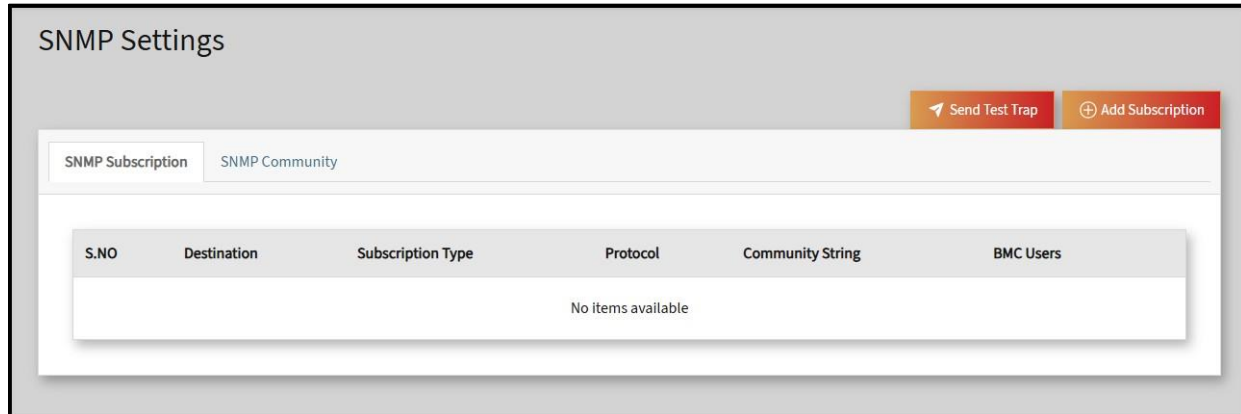


Figure 160 SNMP Settings

The SNMP Settings page contains information about the following:

- Send Test Trap: Click Send Test Trap to send the test trap for SNMP configuration.
- Add Subscription: Click Add Subscription to add the subscriptions for SNMP configuration.

Send Test Trap

Users can send Test Trap only if the SNMP Protocol is enabled in Policies page.

Note: If SNMP configuration is disabled, it does not show any response when user click Send Test Trap.

Go to Policies from the menu, user can see Enabling SNMP Protocol toggle button.

Overview

Logs

Hardware Status

Operations

Settings

Platform Event Filter

Security and Access

NVMe Information

NIC Information

System Inventory

Policies

Services

BMC shell (via SSH)

Allow access to shell sessions via SSH, through port 22 on the BMC.

Enabled

Network IPMI (out-of-band IPMI)

Allow Remote Management of the platform via IPMI Tools such as ipmitool require this Setting to be enabled.

Enabled

KVM

Enabling KVM makes to the guest Operating System.

Enabled

KVM Port Value (in numbers).

5900

Save

Web Port Value (in numbers).

443

Save

Virtual Media

Enabling Virtual Media for image Redirection.

Enabled

Retry Interval

15

Retry Count

3

Save

SOL SSH

Enabling SOL SSH

Disabled

SSDP

Enabling SSDP Protocol.

Disabled

SNMP

Enabling SNMP Protocol.

Disabled

OpenSSL FIPS Mode

Enabling OpenSSL FIPS Mode

Disabled

Configurations

WEB Session Timeout

Change the Web session timeout in between 30 seconds to 86400 seconds time delay.

300

Save

KVM Session Timeout

Change the KVM session timeout in between 30 seconds to 86400 seconds time delay.

900

Save

SOL Non-Volatile Bit Rate

115200

Save

Complexity

Select the Password Complexity dropdown to set the Password complexity (Disabled, Low, Medium, High). Password cannot exceed 20 bytes of length due to IPMI 2.0 restrictions.

Disabled

Password History

Select the Password History dropdown to set the Password History (0 to 5). Saves the last N(0-5) Passwords for each user in order to force Password change history and keep the user from alternating between the same Password too frequently.

0

Max Session Service Information

KVM	Redfish	SSH	Virtual Media	Web
2	20	5	4	20

Figure 161 Policies page Enable the SNMP toggle button.

Once Enabling SNMP Protocol toggle button is enabled and Enabling SNMPv1, v2c, v3 toggle button will be displayed. A sample screenshot is displayed below.



Figure 162 SNMP Configuration

Note: Once SNMP is enabled in Policies page, users need to navigate to SNMP settings page to send test trap. if any Enabling SNMPv1, v2c, v3 toggle button is enabled then disabled (SNMPv1) protocol wont received any trap at destination but enabled (SNMPv2c) protocol received trap at destination and webui returns Test Trap send successfully.

When user clicks Send Test trap in SNMP Settings page without adding any subscription, it will throw error as displayed below.

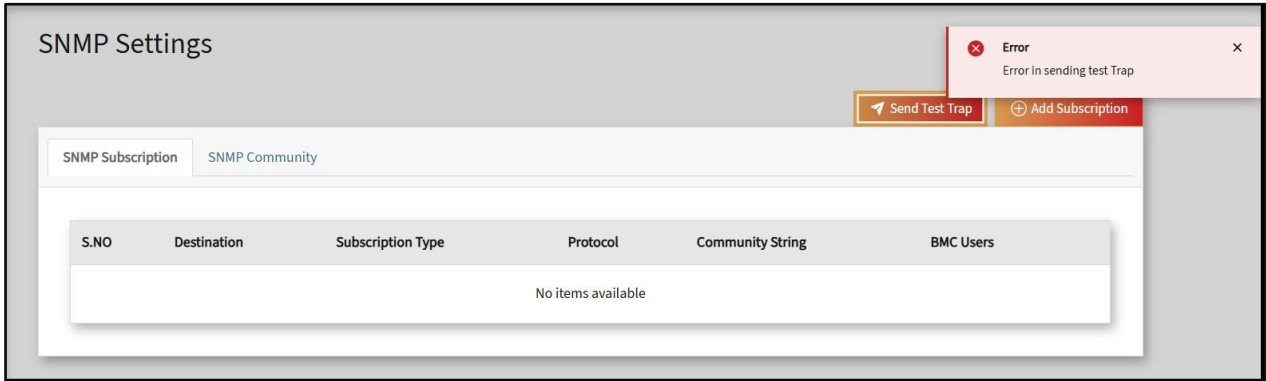


Figure 163 Error Message

After adding subscription, click Send Test Trap, successfully request will be sent. A success message will pop-up as displayed in the screenshot below.

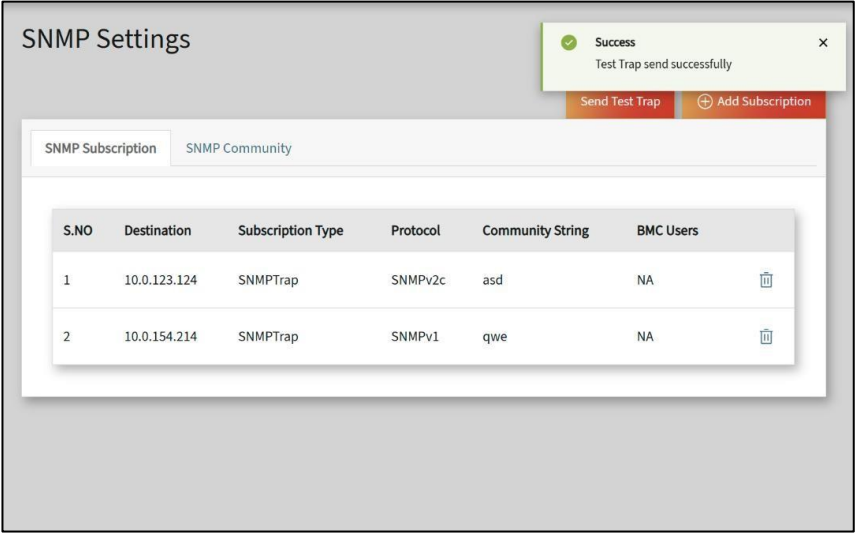


Figure 164 Send Test Trap

Add Community String

Click the Add Community String in the SNMP Community

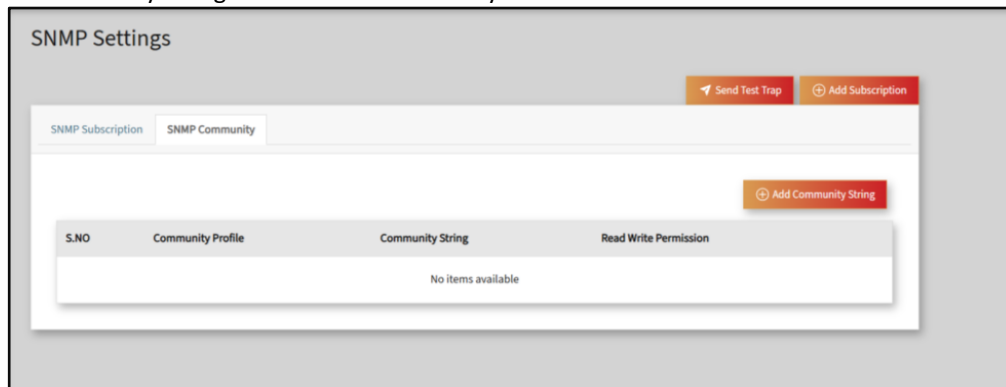


Figure 165 SNMP Community

Clicking Add Community String icon will allow the user to configure the Community Profile, String and Read Write Permission to create a string.

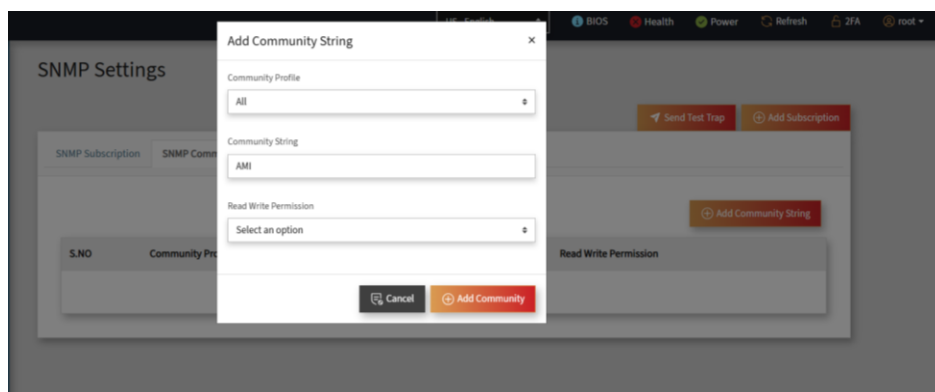


Figure 166 Add Community String

After adding Community String, click Add Community, successful request will be sent. A success message will pop-up as displayed in the screenshot below.

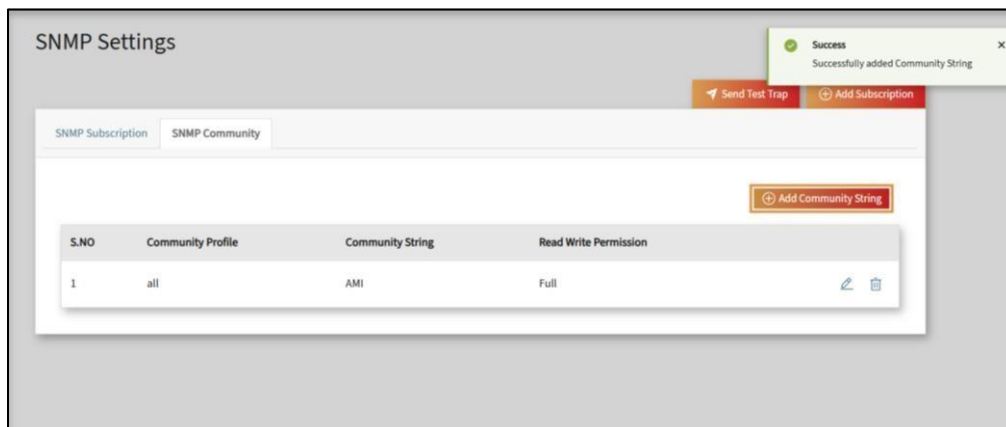


Figure 167 Successfully Added Community String

Edit Community String

Click the Edit icon to edit the Community String details.

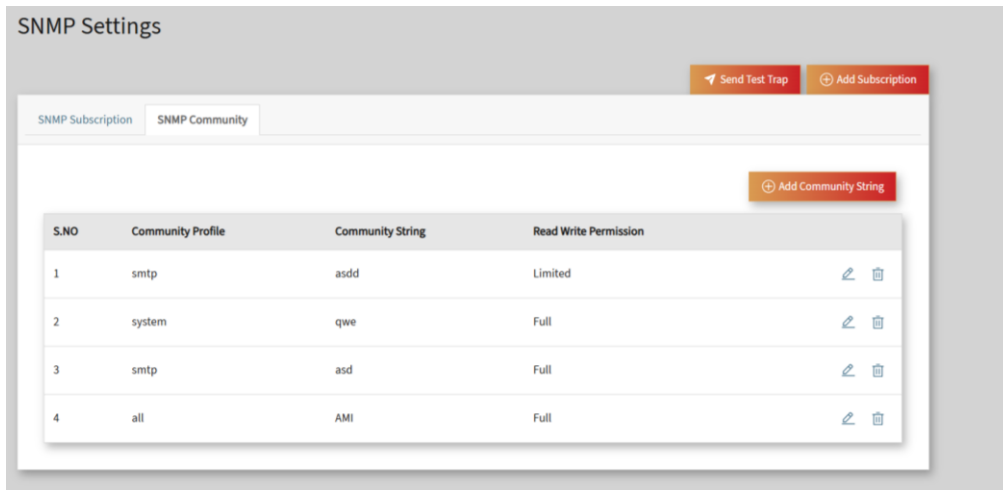


Figure 168 Edit feature in SNMP Community

Users can modify the Community Profile, Community String and permission as needed

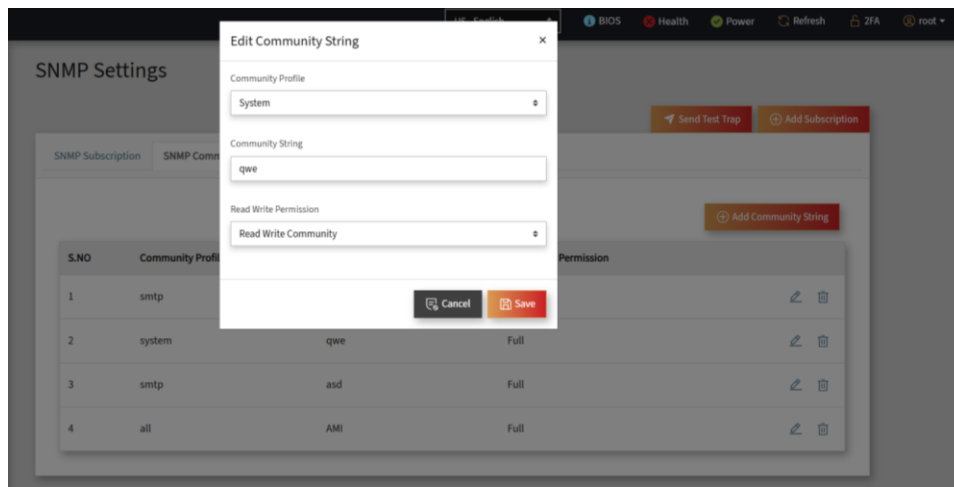


Figure 169 Edit Community String

Click Save to update the edited community string. A success message will pop-up as displayed in the screenshot below.

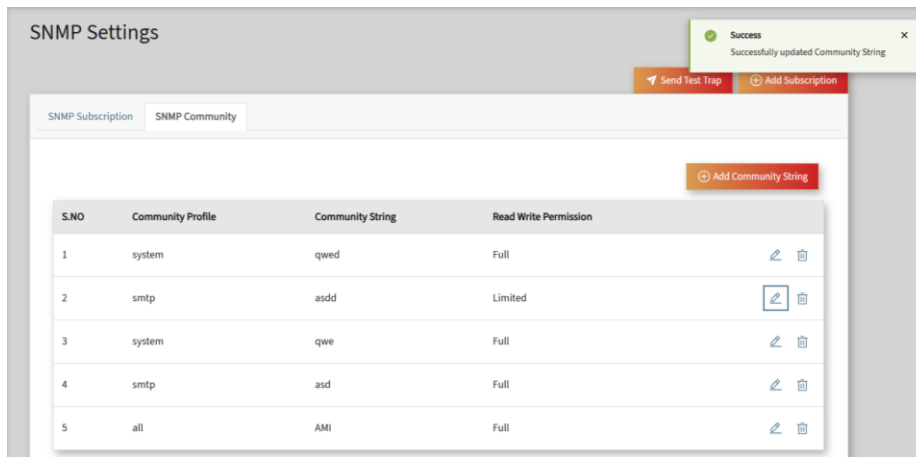


Figure 170 Successfully Updated Community String

Delete Community String

To Delete a Community String, locate it on the SNMP Community page and click its corresponding Delete icon

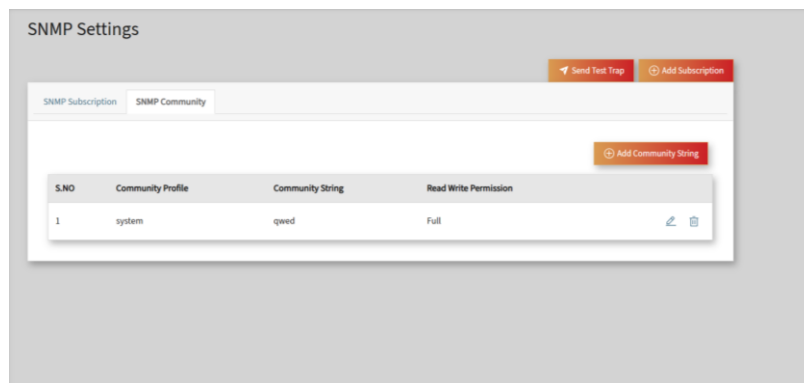


Figure 171 Delete Community String

A success message will pop up after deleting the community string, as shown in the screenshot below.

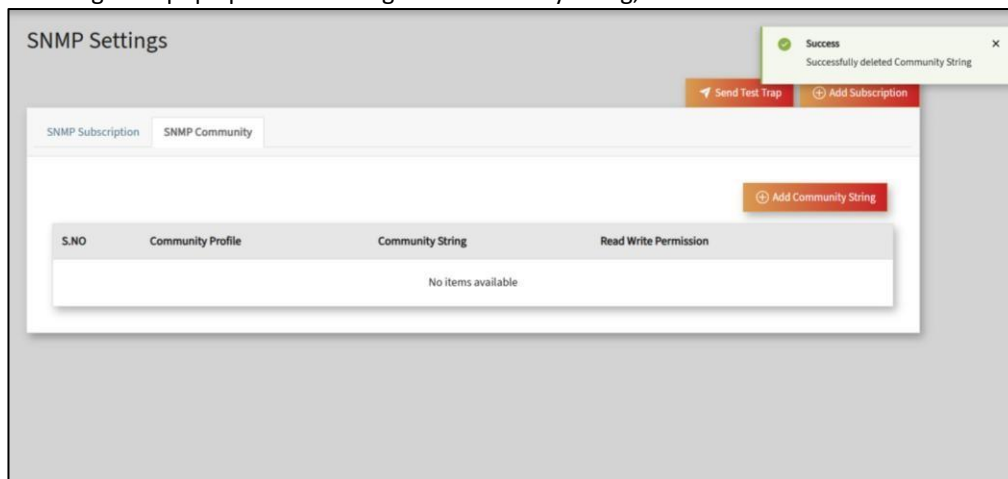


Figure 172 Successfully Deleted Community String

Add/Delete Subscriptions

Clicking Add Subscription icon will allow the user to configure the destination address, Subscription Type, Community String, and Protocol to create a subscription.

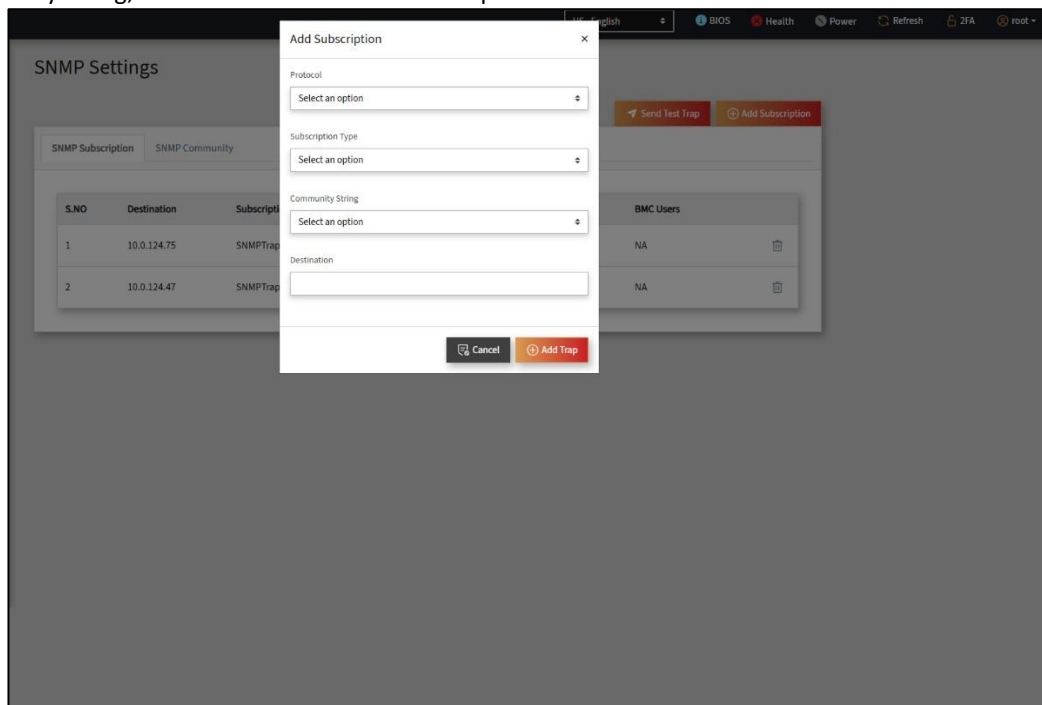


Figure 173 Add Subscription

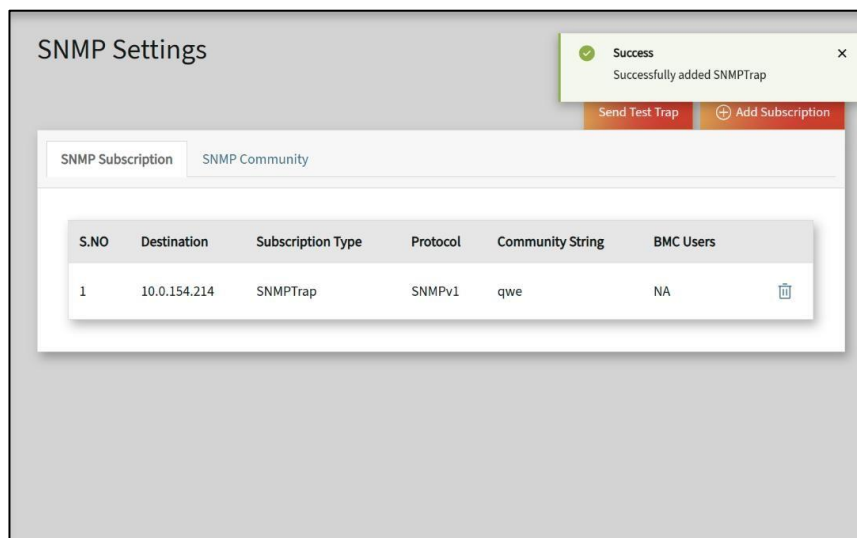


Figure 174 Subscriptions List

Now Add the Subscription with the protocol type as SNMPv3

Users need to select Protocol, Subscription Type, Destination IP and BMC user to create a new subscription.

Add Subscription

Protocol

Select an option

Subscription Type

Select an option

Community String

Select an option

Destination

Cancel

Add Trap

Figure 175 Add Subscription

SNMP Settings

Success

Successfully added SNMPTrap

Send Test Trap

Add Subscription

SNMP Subscription

SNMP Community

S.NO	Destination	Subscription Type	Protocol	Community String	BMC Users
1	10.0.125.122	SNMPTrap	SNMPv3	NA	test

Figure 176 Added SNMPTrap

Click Delete icon of appropriate Subscription in SNMP Settings page, to delete the added subscriptions.

SNMP User Creation

The Add User screen allows administrators to create and configure user accounts with SNMP access.

- Account Status: Enable or disable the user account.
- Username: Must not start with a number; only underscores are allowed.
- Password / Confirm: 8–20 characters; both entries must match.
- Password Change Required: Option to force password update on first login. • Enable SNMP User: Grants SNMP access for monitoring and management.
- Privilege: Select role —*User, Operator, or Administrator*.
- Encryption: Choose SNMP encryption
- Read/Write Permission: Set access level
- VMedia Access: Allows or denies virtual media usage.
- Algorithm: Select SNMP hash algorithm
- Click Add user to save or cancel to discard changes.

The screenshot shows the 'Add User' dialog box. The 'Account Status' section has 'Enabled' selected. The 'Username' field contains 'AMI'. The 'User Password' field contains '*****'. The 'Password Change Required' section has 'Disabled' selected. The 'Privilege' dropdown is set to 'Operator'. The 'Confirm User Password' field contains '*****'. The 'Enable SNMP User' section has 'Disabled' selected. The 'VMedia Access' section has 'Enabled' selected. The 'Add User' button is highlighted in red.

Figure 177 SNMP User Creation

Once the user is successfully created, a confirmation pop-up message will appear as shown in the screenshot below

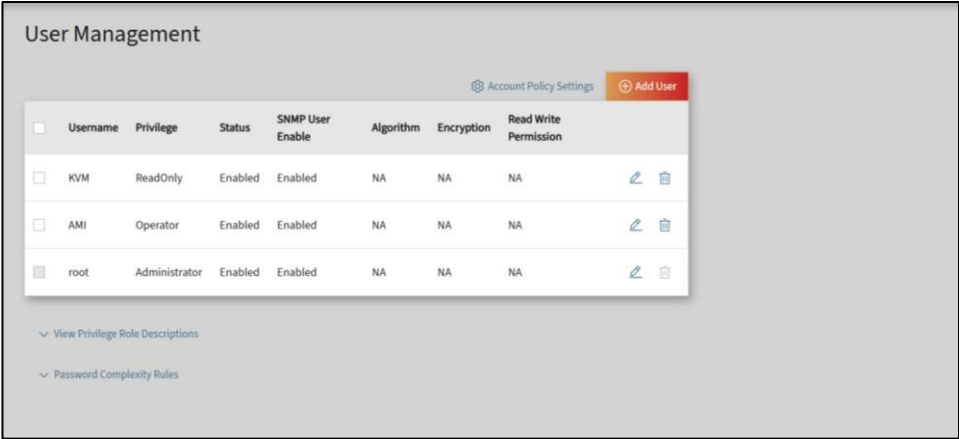


Figure 178 Created SNMP User Successfully

Users can modify the Account Status, Password Change Required, Enable SNMP User, VMedia Access, Encryption, Algorithm, Change Password and Read Write Permission as needed.

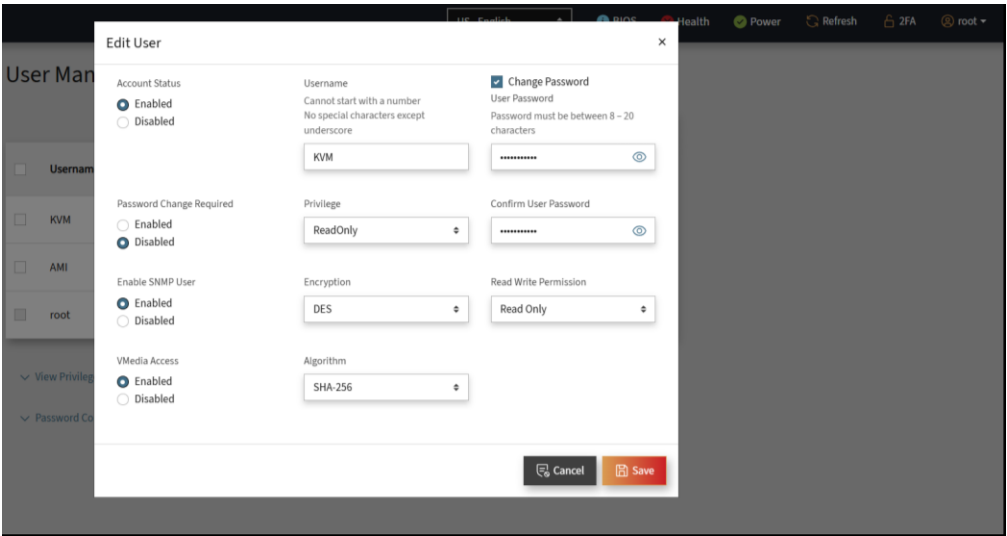


Figure 179 Edit SNMP User

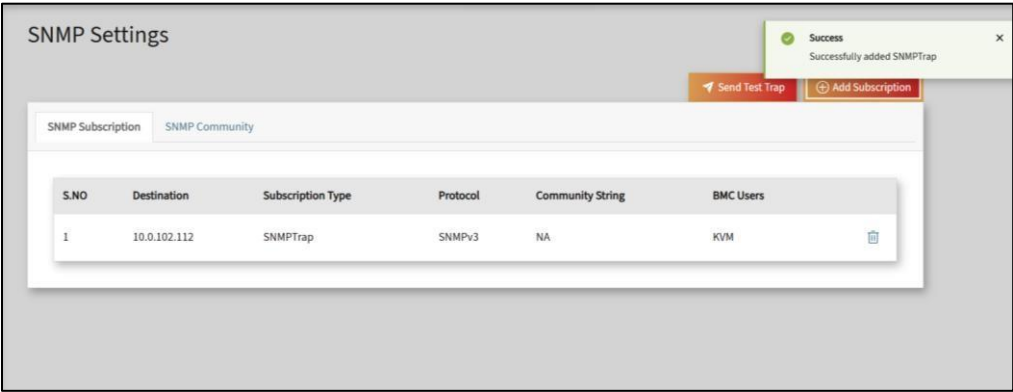


Figure 180 SNMP Subscription

List of the Subscriptions

All added subscriptions will appear as displayed in the screenshot below.

Users can delete the created subscription by clicking the delete icon.

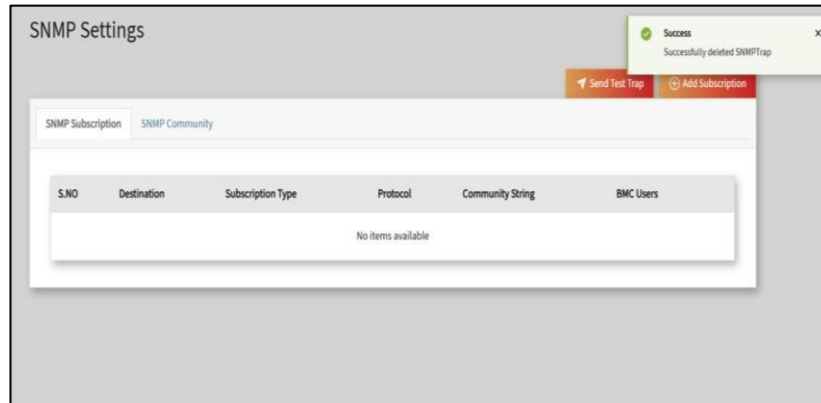


Figure 181 Delete SNMP Subscription User

2.8.11 Date and Time

User can navigate to Settings > Date and Time setting page.

Given below is the screenshot for Date and Time setting page.

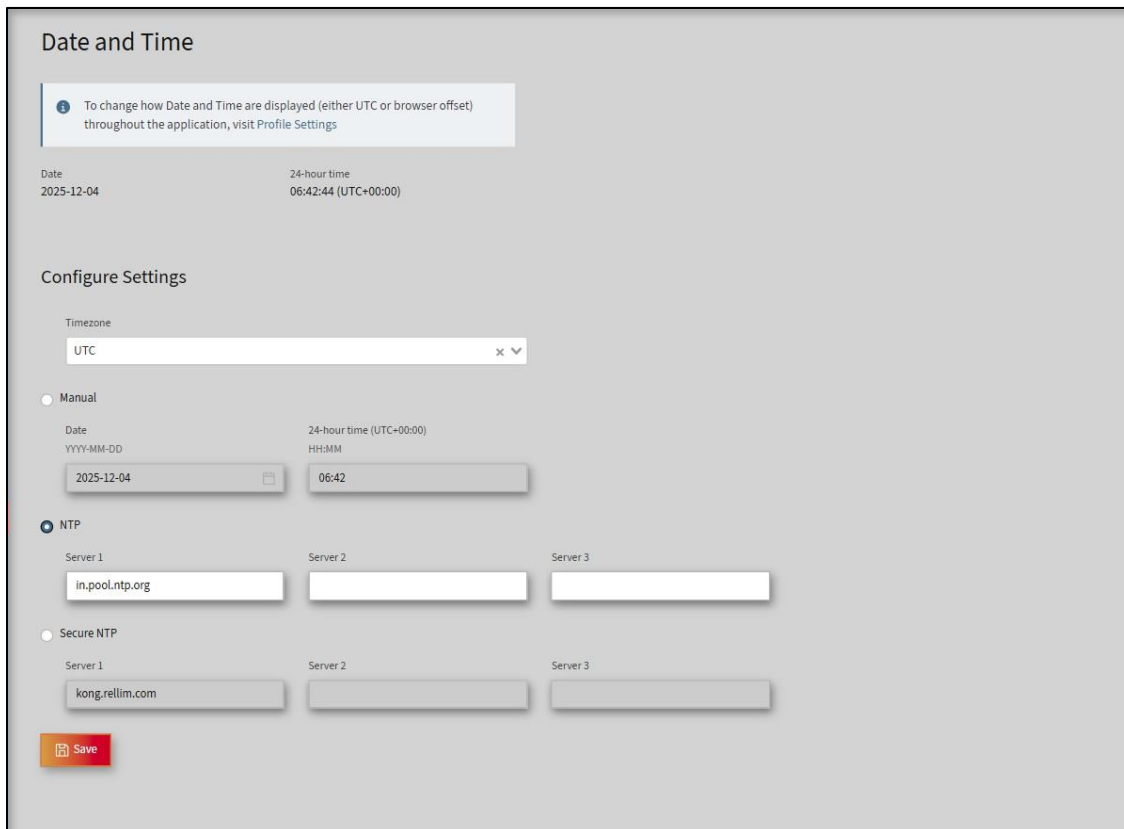
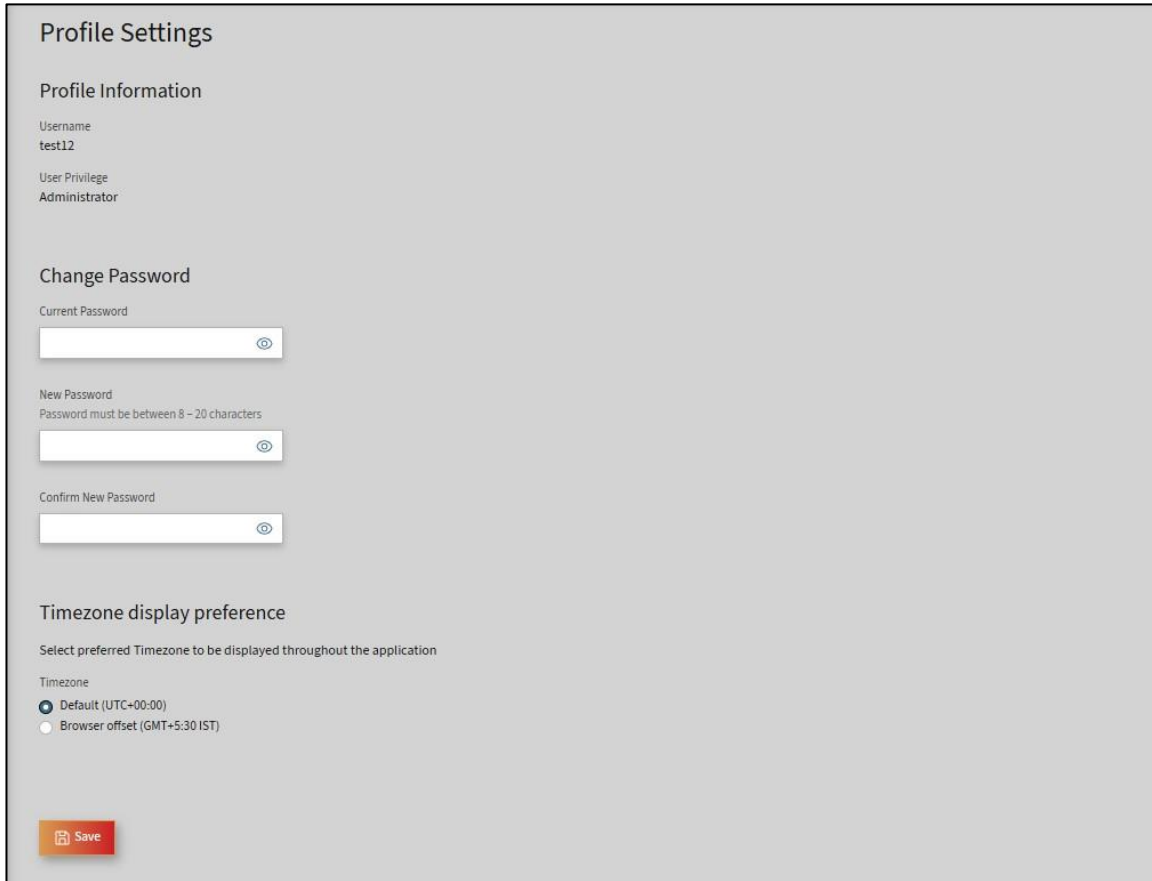


Figure 182 Date and Time

The Date and time page contains the information about the following:

- To change how date and time are displayed (either UTC or browser offset) throughout the application, visit Profile Settings.
- **It shows the status of Date and 24-hour time.**



The screenshot displays the 'Profile Settings' interface. It is divided into three main sections: 'Profile Information', 'Change Password', and 'Timezone display preference'. The 'Profile Information' section shows the 'Username' as 'test12' and the 'User Privilege' as 'Administrator'. The 'Change Password' section contains three input fields: 'Current Password', 'New Password' (with a note that the password must be between 8-20 characters), and 'Confirm New Password'. Each input field has a toggle icon for password visibility. The 'Timezone display preference' section includes a label 'Select preferred Timezone to be displayed throughout the application' and two radio button options: 'Default (UTC+00:00)' (which is selected) and 'Browser offset (GMT+5:30 IST)'. A red 'Save' button is located at the bottom left of the settings area.

Figure 183 Date and Time – Profile Settings

Profile Settings

- Profile information - It shows the Username and User Privilege.
- Change password - Enter New password and confirm new password.

Note: Password must be between 8-20 character

- Timezone display preference - Selects how time is displayed throughout the application.

Note: The browser's offset timezone preference will only be supported in the Web UI.

Configure Settings

- Timezone —Select the desired time zone from the drop-down menu to update the system time accordingly.

Note: Once the timezone is updated, the system time will automatically adjust based on the selected timezone.

Configure Settings

Timezone
UTC

☐ Manual

Date
YYYY-MM-DD
2025-12-04

24-hour time (UTC+00:00)
HH:MM
06:42

☒ NTP

Server 1
in.pool.ntp.org

Server 2

Server 3

☐ Secure NTP

Server 1
kong.rellim.com

Server 2

Server 3

Save

Figure 184 Time Zone

- Manual – User can manually select the Date, 24-hour time (UTC) and select the Timezone location using drop down.

Note: Intel CRB platforms archercity, avenucity and beechnutcity by default has ready only RTC, so we cannot set manual time in these platforms

Note 2: On AST27x0-based SoC platforms, manual date and time settings can be applied at runtime; however, these values are not retained across a BMC reboot. After rebooting, the RTC initializes to the default timestamp 1970-01-01 01:01:01, and as a result, both the Local Time and UTC Time may not reflect the previously configured values. This behavior is observed due to the current RTC initialization and driver handling on the AST27x0 platform.

- NTP - The specified NTP Server 1, Server 2 and Server 3 can be added.
- Secure NTP - The specified Secure NTP Server 1, Server 2 and Server 3 can be added.
- Save settings - Click Save settings to successfully update date and time.

2.8.12 BSOD

Blue Screen of death (BSOD) is an operating system error screen that is displayed to indicate system conflicts and the potential for a crash. This term got its name because these critical messages were displayed on a blue screen.

BSOD errors relate to system hardware, temperature, timing, resources, corrupt registries, or viruses. The BSOD error screen serves as an alert to avert further computer and system damage.

A BSOD freezes Windows and requires that the system be rebooted in order to continue to operate. The blue screen of death is also known as a run-time critical stop error, when this error occurs BIOS will trigger a System Event (OS Stop event run time critical stop) to BMC.

Following table shows the System Event (OS stop event runtime critical stop)

Sensor Type	Sensor Type Code	Sensor Offset	Specific	Event Description
OS Stop/ShutDown	20h	01h		Run-time Critical Stop (a.k.a 'core dump').

A screenshot of BMC console showing OS status is displayed below.

```
root@AMIOT-c208ad8319c9:~# ipmitool sdr elist | grep "OS Stop Status"
OS Stop Status    | 10h | ok   | 35.1 | Run-time critical stop
root@AMIOT-c208ad8319c9:~#
root@AMIOT-c208ad8319c9:~# ipmitool sel list
  5 | 09/11/23 | 06:19:12 UTC | OS Critical Stop #0x10 | Run-time critical stop | Asserted
root@AMIOT-c208ad8319c9:~#
```

Figure 185 BMC Console

User can navigate to Settings → BSOD page. It allows the user to trigger, download, and delete the captured BSOD screen.



Figure 186 BSOD

For Triggering BSOD Image

Click Trigger button to capture the BSOD image.

For Downloading BSOD Image

Click Download button to download the BSOD image.

For Deleting BSOD Image

Click Delete button to delete the BSOD image. Once it is deleted, the BSOD screen will appear as displayed in the screenshot below.

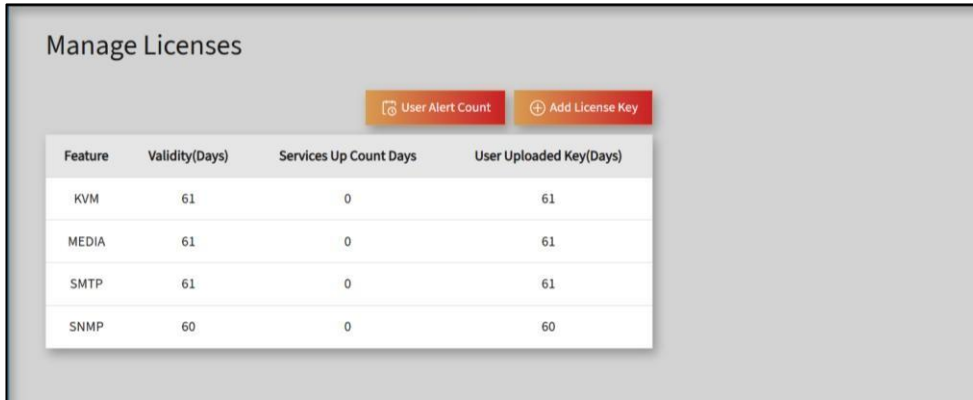


Figure 187 BSOD Success Message

Note: After clicking the BSOD Trigger button, the image will only become visible on the web interface after performing a refresh.

2.8.13 Manage Licenses

This Manage Licenses page displays the available services and its validity period. To open License page, click Settings → Manage Licenses from the menu bar. A sample screenshot of Manage Licenses Page is shown as below.



Feature	Validity(Days)	Services Up Count Days	User Uploaded Key(Days)
KVM	61	0	61
MEDIA	61	0	61
SMTP	61	0	61
SNMP	60	0	60

Figure 188 Manage Licenses

Feature: This field is used to list all the available services.

Validity(days): This field is used to show the validity of the particular service. Validity period mentioned in days.

Services Up Count Days: This field is used to show the Services Up days.

User Uploaded Key(days): This field is used to show the user uploaded feature validity days.

Click User Alert Count button. This action will open User Alert Count dialog box to set User Alert Count Days.

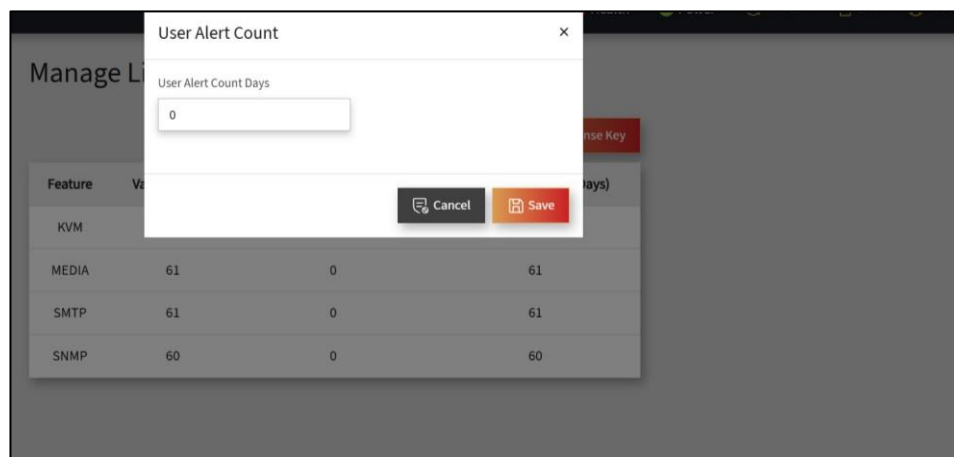


Figure 189 Add user alert count

Add User Alert Count

- User Alert Count Days —Enter the valid count days.

Note: User Alert Count Days validation be like min value will be 0 default and max value will be the minimum days of User Uploaded Key(days) with -1.

- **Example:** From the above manage License table User Uploaded Key(days) min value is 60. So (60 - 1 = 59) 59 will be the max value of the User Alert Count Days field.
- Click Save to proceed else Cancel to leave the page.

Add License Key

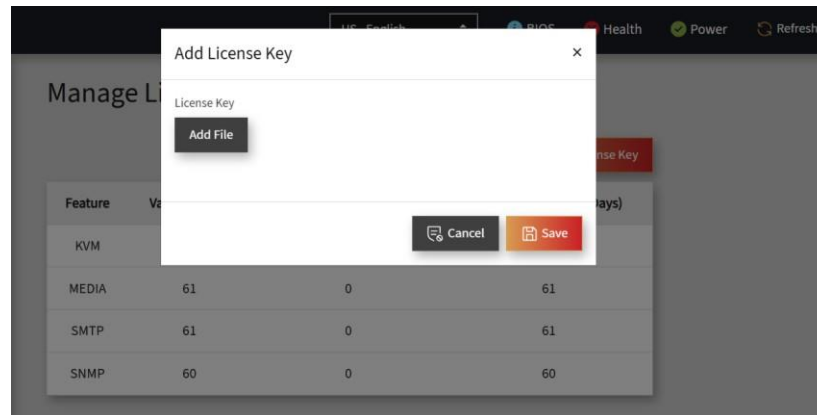


Figure 190 Add License Key

- License Key: This option is used to add a license key to activate the particular service.
- Add File: To add a new license key.

Note: Download the OneTree License Generation Tool from git. Link added below. Git Link:

<https://git.ami.com/tools/megarac/onetree/releases/license-gen>

- Click Save to proceed else Cancel to leave the page.

2.8.14 Auto Video Settings

This page is used to configure the events that will trigger auto video recording function of the KVM server.

- Video Trigger Settings
- Video Remote Storage

A detailed description of the menu items are given below.

To open Auto Video Settings page, click Settings Auto Video Settings from the menu bar. A sample screenshot of Auto Video Settings page is shown below.

Video Trigger Settings

Click Video Trigger Settings Tab. A sample screenshot of Video Trigger Settings is displayed below.

The screenshot displays the 'Auto Video Settings' interface with the 'Video Trigger Settings' tab selected. It features two columns of event categories, each with a toggle switch set to 'Enabled'. The categories include Critical Events (Temperature/Voltage), Non Critical Events (Temperature/Voltage), Chassis Power On Events, Chassis Power Off Events, Chassis Reset Events, LPC Reset Events, and Date and Time Event. Below these, there are input fields for 'Start Date (YYYY-MM-DD)' showing '2025-11-18' and 'Start Time (24-hour time HH:MM)' showing '12:00:00'. A red 'Save' button is located at the bottom left of the settings area.

Figure 191 Video Trigger Settings Page

Event List: It shows the list of available events to be configured. The events are mentioned below.

- Critical Events (Temperature/Voltage)
- Non Critical Events (Temperature/Voltage)
- Chassis Power on Events
- Chassis Power off Events
- Chassis Reset Events
- LPC Reset Events
- Date and Time Event

Save: To save any changes made.

Procedure:

Check the events to be enabled.

To set Date and Time Event, check the option Date and Time Event.

- Enter the year, month and day from the Date field
- Enter/Choose the Time in hh:mm:ss format in the respective fields.

Note:

- *KVM service should be enabled to perform auto-video recording. The date and time should be in advance to the system date and time.*
- *Disable/Enable pre-event recording selection for newly modified configuration to take effect.*

Video Remote Storage

To Video Remote Storage capture host video before critical events like crash or reset occurs, click Video Remote Storage Tab. A sample screenshot of Video Remote Storage page is shown below.

The screenshot shows the 'Auto Video Settings' window with the 'Video Remote Storage' tab selected. The 'Record Video to Remote Server' checkbox is checked. The following fields are visible:

- Maximum Dumps: 1
- Maximum Duration (Sec): 20
- Maximum Size (MB): 10
- Server Address: 10.0.136.53
- Path in Server: /home/ubuntu/laksh/media
- Share Type: NFS (selected), CIFS
- Username: root
- Password: [masked]

A 'Save' button is located at the bottom left of the form.

Figure 192 Video Remote Storage Page

- Check Record Video to Remote Server to enable the Remote Video Support.
- Enter Maximum Duration (Sec) of the video.
- Enter Maximum Size (MB) of the video.
- Enter Maximum Dumps of the video.

Note: The Maximum Duration of the video should be in the range from 1 to 20 seconds. The Maximum Size of the video should be in the range from 1 to 100 mb. The Maximum Dumps should be in the range 1.

- Enter the Server Address.

Note: Server address will support the following:

IP Address (Both IPv4 and IPv6 format).

- Enter the source path in Path in Server field.
- Select the Share Type (NFS/CIFS). If the selected share type is (CIFS), Enter the User Name and Password in the respective fields.
- Click Save to save the setting.

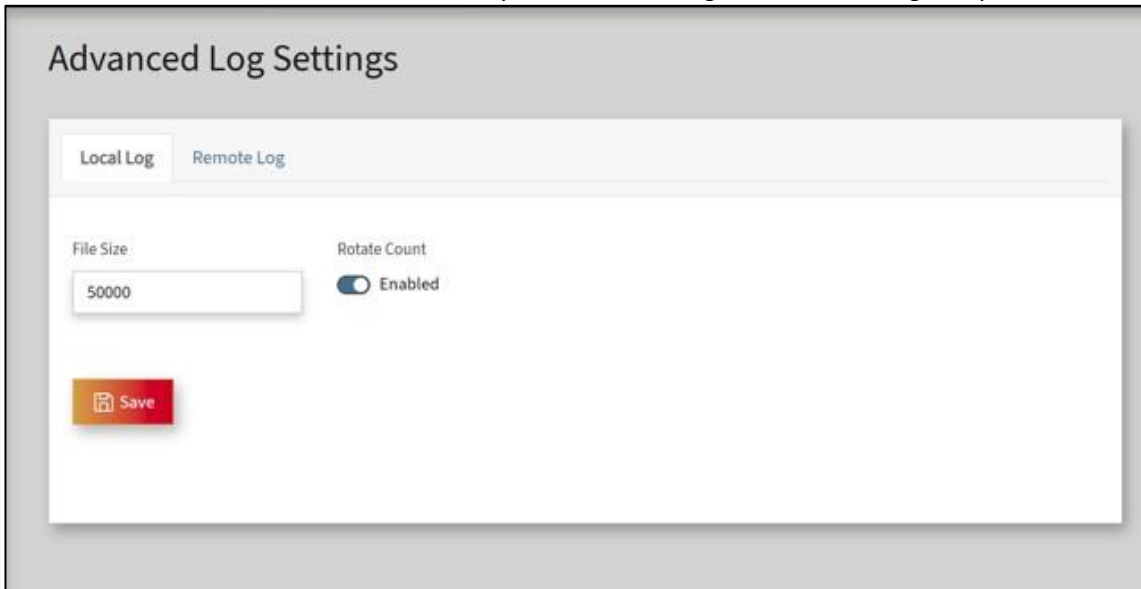
2.8.15 Advanced Log Settings

This Advanced Log Settings feature allows users to configure logging options for both local and remote logging.

Navigate to the "Advanced Log Settings" in settings.

Local Log Settings:

- File Size: Defines the maximum size of the log file before rotation.
- Rotate Count: When enabled, the system will rotate log files after reaching the specified file size.



The screenshot displays the 'Advanced Log Settings' window. At the top, there are two tabs: 'Local Log' (selected) and 'Remote Log'. Below the tabs, the 'File Size' is set to '50000' in a text input field. To the right, the 'Rotate Count' is set to 'Enabled' with a toggle switch. At the bottom left, there is a red 'Save' button with a floppy disk icon.

Figure 193 Advanced Log Settings

Remote Log Settings:

- Remote Log Server: Specifies the IP address of the remote server where logs will be sent.
- Remote Server Port: Defines the port number used for transmitting logs.
- Port Type: Allows selection between UDP (connectionless, faster) and TCP (reliable, connection-based) for log transmission.
- Users can upload cryptographic certificates and private keys for secure logging.
- The uploaded files include:
 - CA Certificate (Certificate Authority validation)
 - Client Certificate (Authentication)
 - Private Key (Used for encryption)
- Click the "Save" button to confirm the configuration changes. Once saved the user will receive the success pop up message

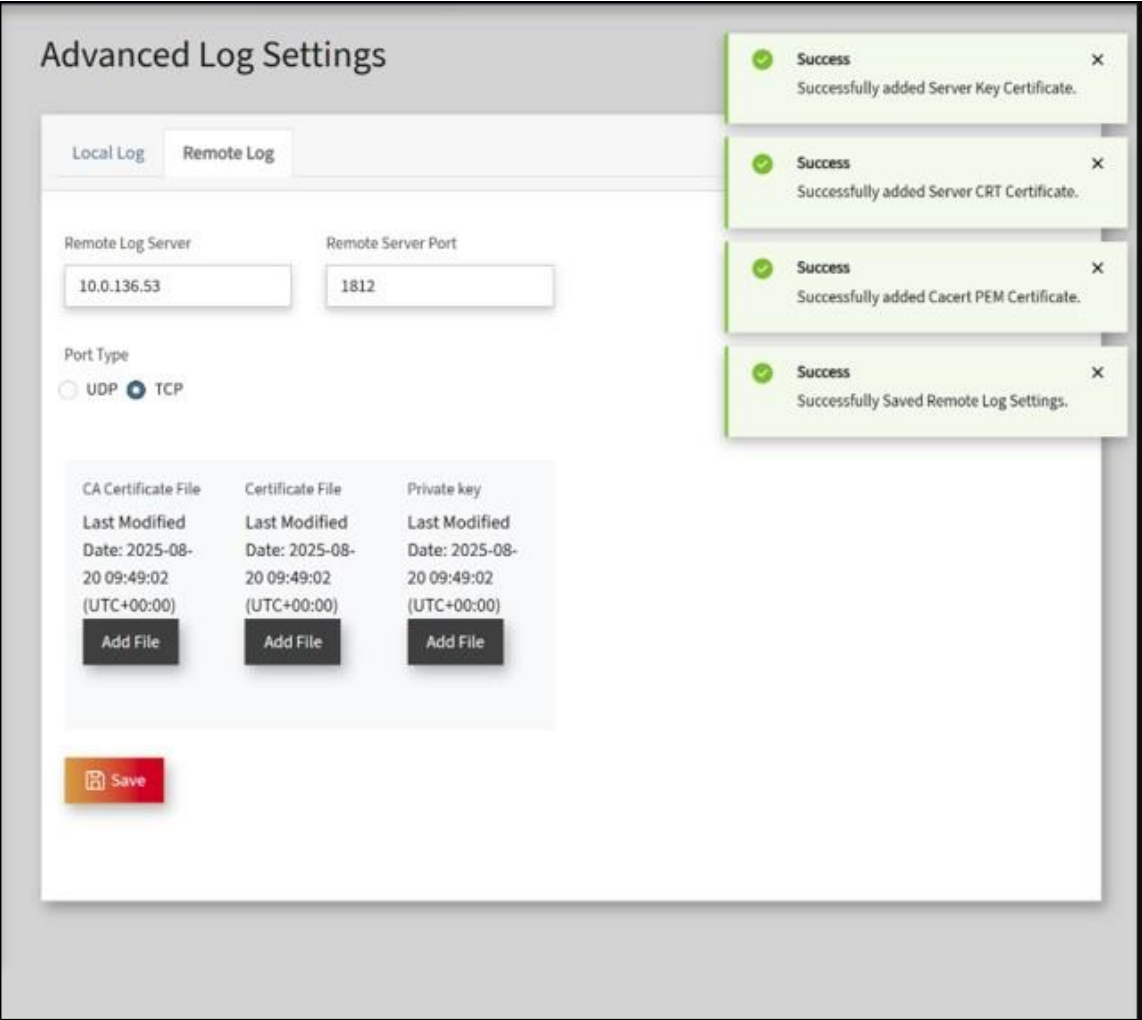


Figure 194 Added Advanced Log Settings

2.8.16 NCSI

To open NCSI page, click Settings → NCSI from the menu bar. A sample screenshot of NCSI Configuration page is shown below.

The NCSI Interface section will be displayed. By default, the first available interface (e.g., eth3) is selected from the dropdown. The associated Package ID and Channel Number fields will auto-populate based on the selected interface.

Note: If a different interface is selected from the NCSI Interface dropdown, the corresponding package and channel information will update automatically.

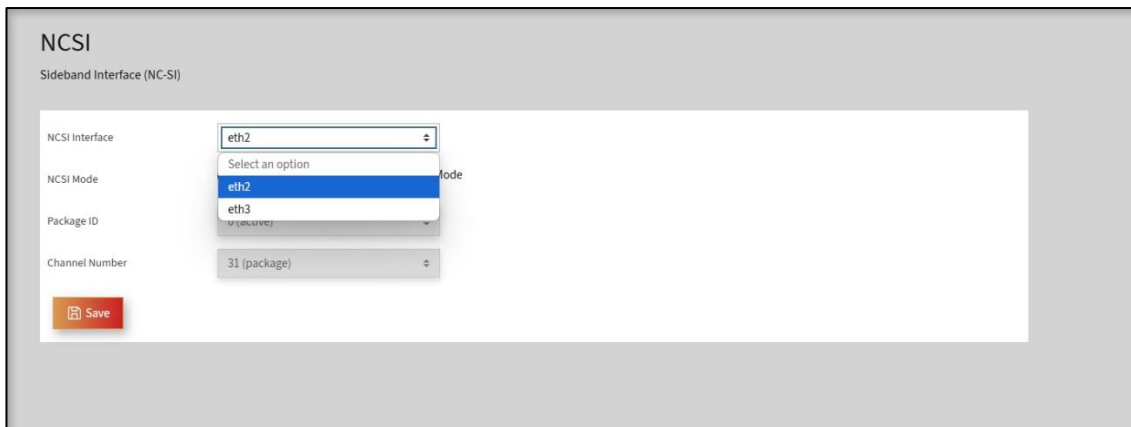
The screenshot shows the 'NCSI' configuration page with the subtitle 'Sideband Interface (NC-SI)'. It features four input fields: 'NCSI Interface' (a dropdown menu with 'eth2' selected and an open list showing 'eth2' and 'eth3'), 'NCSI Mode' (a radio button control), 'Package ID' (a dropdown menu showing '0 (active)'), and 'Channel Number' (a dropdown menu showing '31 (package)'). A red 'Save' button is located at the bottom left of the form area.

Figure 195 NCSI Interface

Choose the desired NCSI Mode by selecting one of the radio buttons:

- **Auto Failover Mode:** Enables automatic switching between interfaces. Only the mode can be saved; other fields are disabled.

Auto Failover Mode:

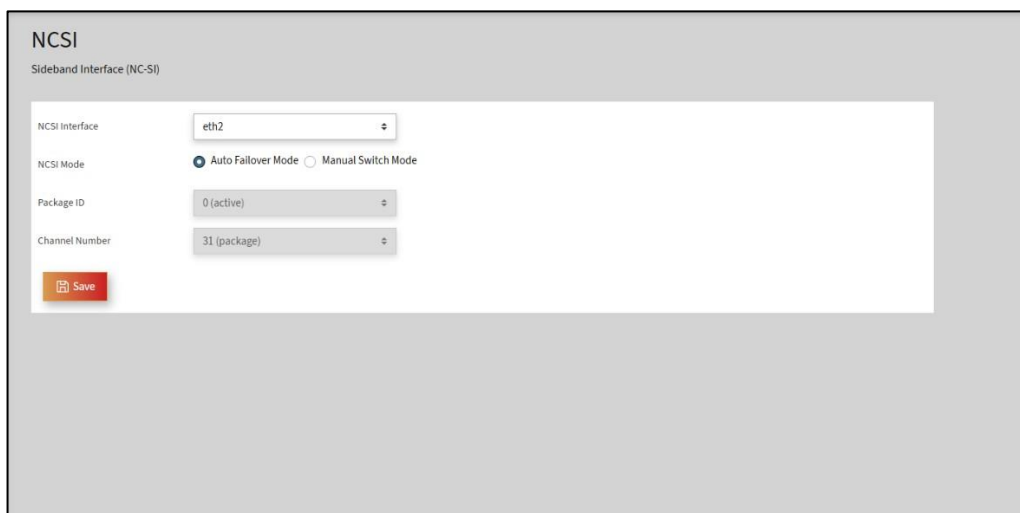
This screenshot shows the 'NCSI' configuration page with 'Auto Failover Mode' selected for the 'NCSI Mode' using a radio button. The 'NCSI Interface' dropdown is set to 'eth2'. The 'Package ID' dropdown is set to '0 (active)' and the 'Channel Number' dropdown is set to '31 (package)'. The 'Save' button is visible at the bottom left.

Figure 196 Auto Failover Mode

- Manual Switch Mode *(default selected as shown in the image)*: Allows manual configuration of the Package ID and Channel Number.



The screenshot shows the 'NCSI' configuration window with the title 'Sideband Interface (NC-SI)'. Inside, the 'NCSI Mode' section has two radio buttons: 'Auto Failover Mode' (unselected) and 'Manual Switch Mode' (selected). Below this, there are three dropdown menus: 'NCSI Interface' set to 'eth3', 'Package ID' set to '0 (active)', and 'Channel Number' set to '3 (package)'. A red 'Save' button is located at the bottom left of the configuration area.

Figure 197 Manual Switch Mode

- Package ID - User can select Package ID using the drop-down list.
- Channel number - User can select Channel number using the drop-down list.
- Click Save to successfully configure NCSI interface settings.



This screenshot shows the same NCSI configuration interface as Figure 197, but with a 'Success' popup in the top right corner that reads 'Successfully saved NCSI Interface Settings.' The configuration values have changed: 'NCSI Interface' is now 'eth2', 'Package ID' is '0 (active)', and 'Channel Number' is '31 (package)'. The 'Save' button now has a checkmark icon next to it.

Figure 198 Success Popup

2.9 Platform Event Filter

2.9.1 Event Filter

Users can navigate to Platform Event Filter → Event Filter page.

Given below is the screenshot for Event Filter page.

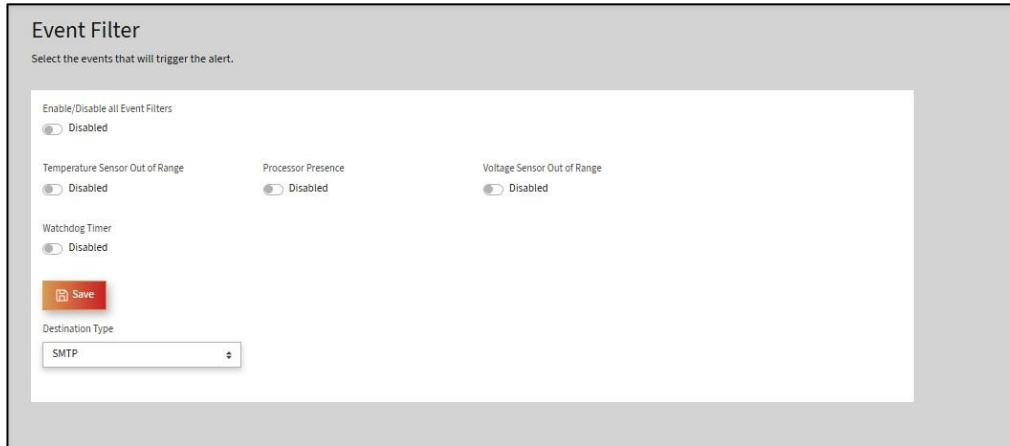


Figure 199 Event Filter

The Event Filter page contains the information about the following:

1. Select the below events that will trigger the alert which has Disable /Enable options.
 - Temperature Sensor Out of Range
 - Processor Presence
 - Voltage Sensor Out of Range
 - Watchdog Timer
2. Click Save settings to successfully trigger the alert.
3. Select the Destination type to determine where alerts are sent when an event is triggered.
4. The available option includes
 - SMTP
 - SNMP Trap
 - Both

2.10 Security and Access

2.10.1 Certificates

User can navigate to Security and access → Certificates page.

Given below is the screenshot for the Certificates page.

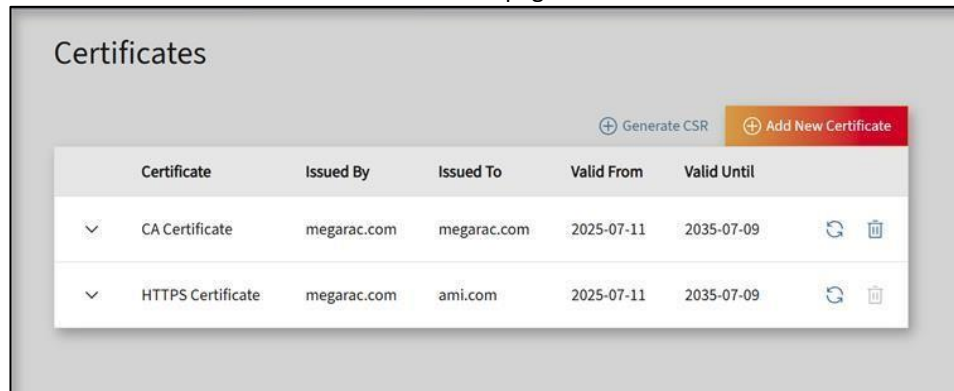


Figure 200 Certificates

The Certificate page contains the information about the following:

- It displays information about Certificate, Issued by, Issued to, Valid from, and Valid until.
- Click on the row expand icon located in the respective row of the certificate.

Once the row is expanded, the user can view the information about the selected certificate. A sample screenshot is displayed below.

					Generate CSR Add New Certificate
Certificate	Issued By	Issued To	Valid From	Valid Until	
^ CA Certificate	megarac.com	megarac.com	2025-07-18	2035-07-16	Refresh Delete
Certificate Version: 3 Serial Number: 5D42B699 Signature Algorithm: sha256WithRSAEncryption Public Key: 2048 Issuer Organization (O): American Megatrends International LLC (AMI) Issuer Common Name (CN): megarac.com Issuer Organization Unit (OU): Service Processors Issuer City or Locality (L): Norcross Issuer State or Province (ST): Georgia Issuer Country(C): US Issuer Email Address: support@ami.com Valid From: 2025-07-18 05:37:33 (UTC+00:00) Valid Until: 2035-07-16 05:37:33 (UTC+00:00) Issued to Organization (O): American Megatrends International LLC (AMI) Issued to Common Name (CN): megarac.com Issued to Organization Unit (OU): Service Processors Issued to City or Locality (L): Norcross Issued to State or Province (ST): Georgia Issued to Country(C): US Issued to Email Address: support@ami.com					
^ HTTPS Certificate	megarac.com	ami.com	2025-07-18	2035-07-16	Refresh Delete
Certificate Version: 3 Serial Number: 3E37E650 Signature Algorithm: sha256WithRSAEncryption Public Key: 2048 Issuer Organization (O): American Megatrends International LLC (AMI) Issuer Common Name (CN): megarac.com Issuer Organization Unit (OU): Service Processors Issuer City or Locality (L): Norcross Issuer State or Province (ST): Georgia Issuer Country(C): US Issuer Email Address: support@ami.com Valid From: 2025-07-18 05:37:33 (UTC+00:00) Valid Until: 2035-07-16 05:37:33 (UTC+00:00) Issued to Organization (O): AMI Issued to Common Name (CN): ami.com Issued to Organization Unit (OU): MEGARAC Issued to City or Locality (L): Duluth Issued to State or Province (ST): Georgia Issued to Country(C): US Issued to Email Address: megarac@ami.com					

Figure 201 Certificates Row Expand

Add New Certificate

- Add new certificate - Click Add new certificate to add new certificate.

Add New Certificate

Certificate Type

LDAP Certificate

Certificate File

Add File

Cancel

Add

Figure 202 Add New Certificate

- Certificate type - Select the LDAP Certificate or CA Certificate using drop down.
- Add file - Click Add file and locate the certificate file to upload.

- Add - Click Add to successfully add the certificate.

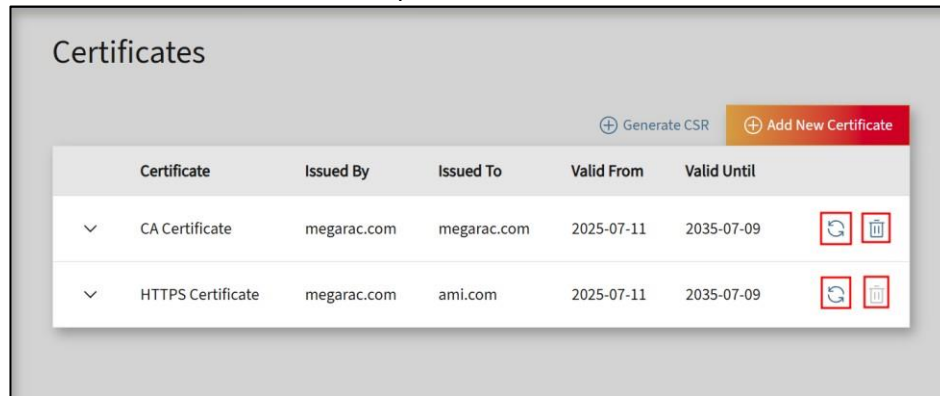


Figure 203 Delete certificate option

- The certificate can also be deleted using the Delete icon in the right corner.
- The certificate can also be replaced using the Replace Certificate icon in the right corner. This action opens the Replace certificate dialog to replace the respective certificate as per the requirement.

Upload HTTPS Certificate

Step 1: Create Own SSL Certificate Authority

Users can create a private key for certificate authority (CA).

```
openssl genrsa -out rootCA.key 2048
```

Step2: Create a root CA Certificate using Private Key

- In Linux machine, create a root CA Certificate using the private key (rootCA.key)

```
openssl req -x509 -new -nodes -key rootCA.key -sha256 -days 1024 -out rootCA.pem
```

Step3: Generate CSR

For common name use (BMC IP/ localhost)

- Users can generate a Certificate Signing Request (CSR) using Web UI. Click Generate CSR at the top right of the page as displayed in the screenshot below.

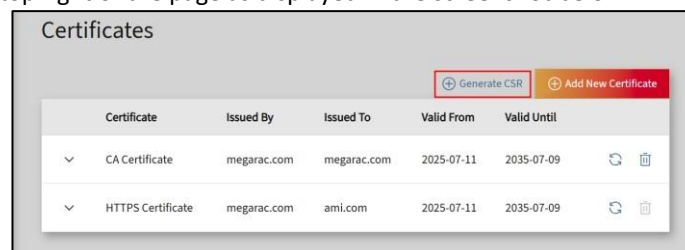


Figure 204 Generate CSR

- Generate a Certificate Signing Request (CSR) dialog appears as displayed in the below screenshot.

Generate a Certificate Signing Request (CSR)

Certificate Type

HTTPS Certificate

Country/Region

India

Private Key

Key Pair Algorithm

RSA

State

TN

City

Chennai

Key Bit Length

2048

Company Name

AMI

Company Unit

MegaRAC

Common Name

10.0.98.18

Challenge Password - Optional

Contact Person - Optional

Email Address - Optional

Alternate Name - Optional
Add multiple alternate names separated by space.

Cancel

Generate CSR

Figure 205 Generate a certificate signing Request

The fields are described below.

- Certificate type - Select HTTPS Certificate using drop down.
- Country/Region - Select Country or Region using drop down.
- Private key:
- Key pair algorithm - Select EC or RSA using drop down.
- State = Enter the state name.
- City =Enter the city name.
- Company name - Enter the Company name.
- Company unit - Enter the Company unit.
- Common name - Enter the common name.
- Challenge password - optional - Enter the challenge password.
- Contact person - optional - Enter the contact person name.
- Email address - optional - Enter email address.

- Alternate name - optional - Add multiple alternate names separated by space.
- Generate CSR - Click Generate CSR to successfully Generate Certificate Signing Request.
- Once the fields are filled, click Generate CSR option. This action generates the Certificate Signing Request (CSR). Click Download to download it and save it as device.csr.

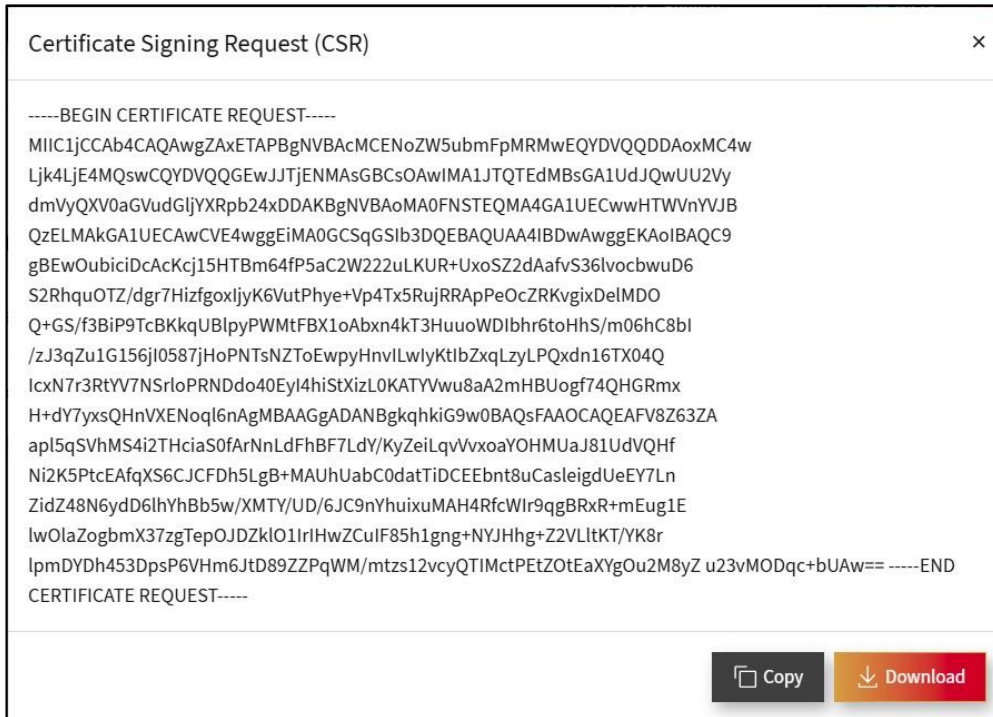


Figure 206 Certificate Signing Request

device.csr rootCA.key rootCA.pem

Step4: Create CA Signed Server Certificate Using CSR Request

- Users can create a CA Signed Server Certificate using CSR request

```
openssl x509 -req -in device.csr -CA rootCA.pem -CAkey rootCA.key -CAcreateserial -out https_certificate.pem -days 500 -sha256
```

Output:

```
Signature ok subject=L = Chennai, CN = 172.31.3.45, C = IN, algorithm = RSA, extendedKeyUsage = ServerAuthentication, O = AMI, OU = Megarac, ST = TN
```

Upload CA signed server certificate (https_certificate.pem) via webui

Replace certificate:

Users can replace the certificate using the Replace Certificate icon in the right corner. This action opens the Replace certificate dialog to replace the respective certificate as per the requirement as displayed in the below screenshot.

Replace Certificate

Certificate Type

CA Certificate

Certificate File

Add File

Cancel

Replace

Figure 207 Replace Certificate

- Add file - Click Add file and locate the certificate file to upload.
 - Replace - Click Replace to successfully Replace the certificate.
- The following screenshot displays that the certificate has successfully replaced.

Certificates

Generate CSR

Add New Certificate

Certificate	Issued By	Issued To	Valid From	Valid Until	
CA Certificate	megarac.com	megarac.com	2025-07-11	2035-07-09	
HTTPS Certificate	megarac.com	ami.com	2025-07-11	2035-07-09	

Success

Successfully replaced HTTPS Certificate.

Figure 208 Certificates

2.10.2 LDAP

User can navigate to Security and access -> LDAP page. Given below is the screenshot for LDAP page.

The screenshot shows the LDAP configuration page. At the top, it says 'LDAP' and 'Configure LDAP Settings and manage Role Groups'. Under the 'Settings' section, 'LDAP Authentication' is checked and 'Enable' is selected. Below this, there are two columns of settings. The left column includes 'Secure LDAP using SSL' (with a note that CA and LDAP certificates are required), 'CA Certificate valid until' (2035-07-16), 'LDAP Certificate valid until' (empty), and 'Manage SSL Certificates'. The right column includes 'Service Type' (OpenLDAP selected, Active Directory unselected), 'Server URI' (ldap://), 'Bind DN' (empty), 'Bind Password' (empty with a toggle icon), 'Base DN' (empty), 'User ID Attribute - Optional' (empty), and 'Group ID Attribute - Optional' (empty). A red 'Save' button is located below the settings. Under the 'Role Groups' section, there is a message: 'LDAP Authentication must be enabled to modify role groups.' Below this is a table with columns 'Group Name' and 'Group Privilege', which is currently empty with the text 'No items available' at the bottom. An 'Add Role Group' button is also present.

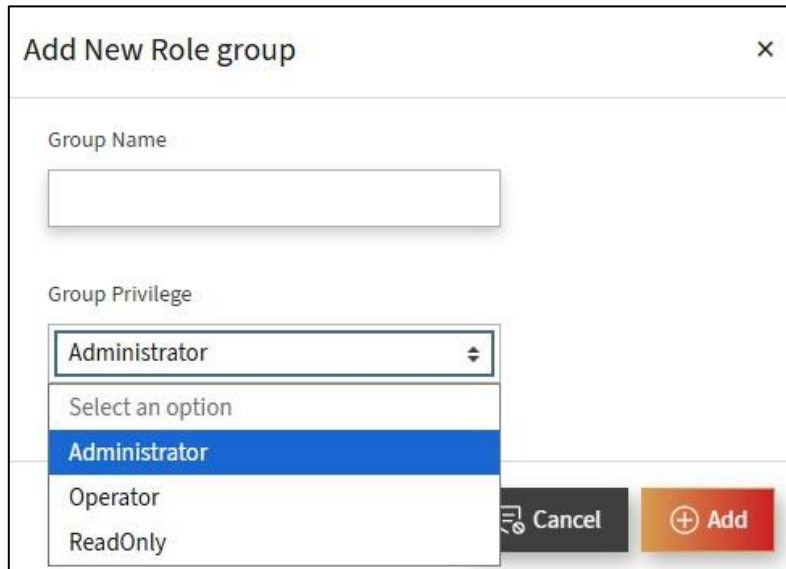
Figure 209 LDAP

Settings

- Click on Enable LDAP authentication to configure LDAP settings.
- Secure LDAP using SSL - CA certificate and LDAP certificate are required to enable secure LDAP.
- CA Certificate valid until – It displays the validity of CA Certificate.
- LDAP Certificate valid until - It displays the validity of LDAP Certificate.
- Manage SSL certificates – It redirects to Certificate page in which user can add, delete, and replace certificate.
- Service type - Select Service type as Open LDAP/Active Directory.
- Server URL – Enter the Server URL
- Bind DN - Specify the Bind DN that is used during bind operation, which authenticates the client to the server.
- Bind PASSWORD - Enter the password in the Password field.
- Base DN - Enter the Base DN.
- UserID attribute - Optional - Enter the UserID attribute.
- Group ID attribute – Optional - Enter the Group ID attribute.

- Save settings - Click Save settings to successfully configure LDAP settings.

Role groups



The screenshot shows a dialog box titled "Add New Role group" with a close button (X) in the top right corner. Inside the dialog, there is a "Group Name" label above a text input field. Below that is a "Group Privilege" label above a dropdown menu. The dropdown menu is open, displaying a list of options: "Administrator" (which is highlighted with a blue background), "Operator", and "ReadOnly". At the bottom right of the dialog, there are two buttons: a "Cancel" button with a trash icon and a red "Add" button with a plus icon.

Figure 210 LDAP – Add new role group

LDAP authentication must be enabled to modify role groups.

- Add role group – Enter Group name and Group privilege.
- After doing these additions, click on Save settings and logout the BMC.
- Now try to Login the BMC through LDAP server.

Note: If there is no mapping for group name to privilege role, default to user privilege role for the session.

2.10.3 User management

Users can navigate to Security and access -> User management page.

Given below is the screenshot for the User management page.

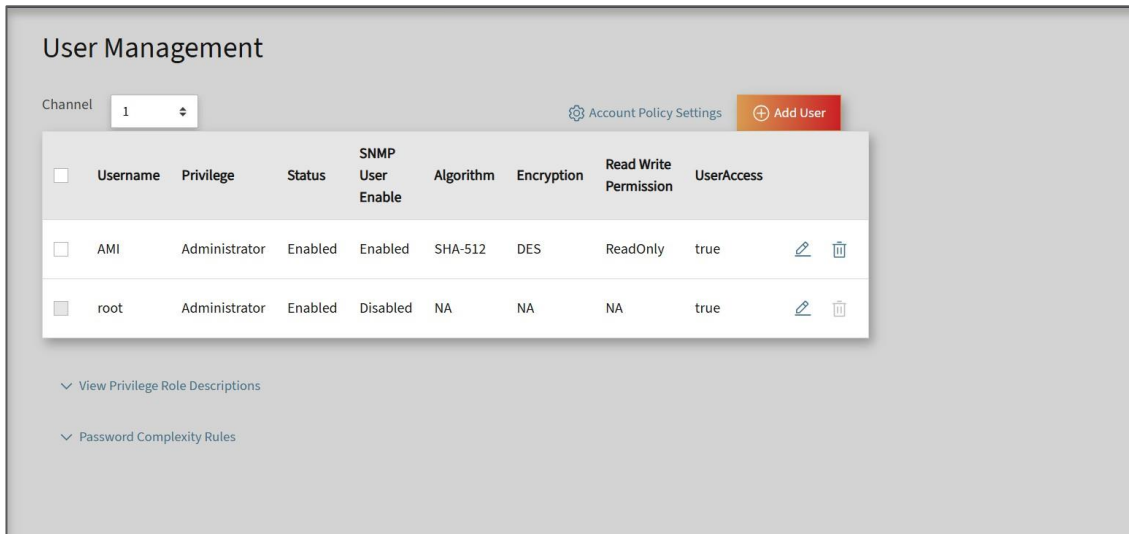


Figure 211 User Management

The User management page contains the information about the following:

Channel: To choose a particular channel from the available channel list.

- It displays information about Username, Privilege, Status, SNMP User Enable, Algorithm, Encryption, Read Write Permission and UserAccess.
- The user management account can also be deleted using the Delete icon in the right corner.
- The user management account can also be edited using the Edit user icon in the right corner.

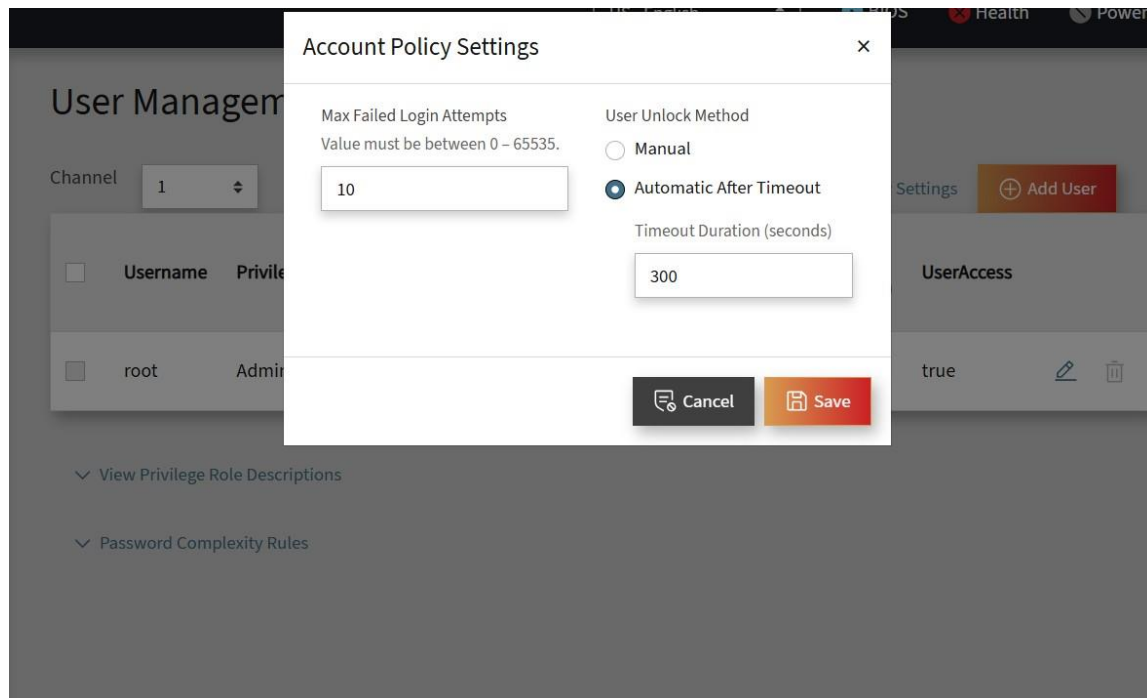


Figure 212 Account policy settings

Account policy settings

- Manual - Select Manual, click Save to manually unlock the account.
- Automatic after timeout – Select Automatic after timeout, select the Timeout duration (seconds) using the drop down and click Save to unlock automatically after timeout.

Max failed login attempts value must be between 0 – 65535.

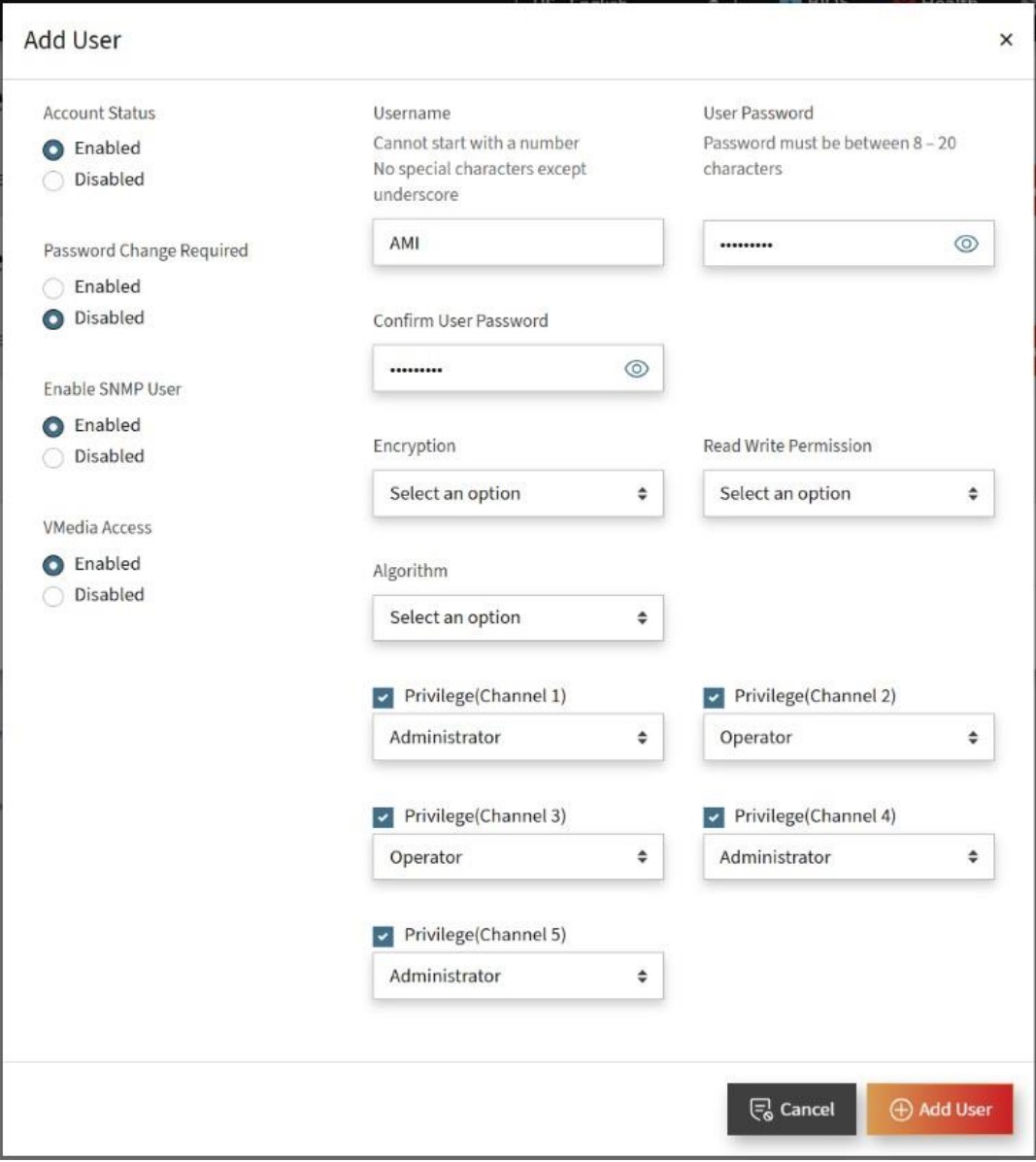
The image shows a 'Add User' dialog box with a close button (X) in the top right corner. The dialog is organized into several sections. On the left, there are four sections of radio buttons: 'Account Status' (Enabled selected), 'Password Change Required' (Disabled selected), 'Enable SNMP User' (Enabled selected), and 'VMedia Access' (Enabled selected). The main area contains fields for 'Username' (AMI), 'User Password' (masked with dots), and 'Confirm User Password' (masked with dots). Below these are dropdown menus for 'Encryption' and 'Algorithm', both currently set to 'Select an option'. At the bottom of the main area, there are five rows of checkboxes and dropdown menus for channel privileges: 'Privilege(Channel 1)' (checked, Administrator), 'Privilege(Channel 2)' (checked, Operator), 'Privilege(Channel 3)' (checked, Operator), 'Privilege(Channel 4)' (checked, Administrator), and 'Privilege(Channel 5)' (checked, Administrator). At the bottom right of the dialog are two buttons: 'Cancel' and 'Add User'.

Figure 213 User Management - Add User (SNMP Enable)

Figure 214 User Management – Add User (SNMP Disable) Add

User

- Account status = Select Enabled or Disabled.
- Username = Enter username.
Note: Cannot start with a number. No special characters except underscore.
- User password = Enter user password.
Note:
 - There must be 8-20 characters.
 - Must have at least a number and an alphabetic character.
 - Can't contain the username.
- Confirm user password = Must match with the user password.
- Privilege (Channel) - Enable Channel Access field, select the channel/channels to enable the network access for the appropriate channels. Select the privilege assigned to the user which could be Administrator or Operator or Read Only.
- Password Change Required = Select Enabled or Disabled to perform Password change.

Enable SNMP User = Select Enabled or Disabled to use SNMP. • When enabled, additional configuration fields become visible:

- Read Write Permission: Defines SNMP access level.
- Encryption: Specifies the encryption method for SNMP.
- Algorithm: Determines the algorithm used for authentication or encryption.
- When disabled, the above three fields are hidden from view.
- VMedia Access - Select Enabled or Disabled to provide VMedia access.

User Management

Channel
1
Account Policy Settings
Add User

	Username	Privilege	Status	SNMP User Enable	Algorithm	Encryption	Read Write Permission	UserAccess	
☐	AMI	Administrator	Enabled	Enabled	SHA-512	DES	ReadOnly	true	
☐	root	Administrator	Enabled	Disabled	NA	NA	NA	true	

^ View Privilege Role Descriptions

Privilege	Administrator	Operator	ReadOnly
Configure components managed by this service	✓	✓	
Configure Manager Resources	✓		
Update Password for Current User Account	✓	✓	✓
Configure Users and their Accounts	✓		
Log in to the service and read resources	✓	✓	✓

v Password Complexity Rules

Figure 215 View privilege role descriptions

Add User – Click Add user to successfully display in the user column.

View Privilege Role Descriptions

- Privilege - Displays the access privilege of the user. Administrator, Operator, and ReadOnly columns show the privilege level for each operation. It displays the operations as mentioned below.
- Configure components managed by this service.
- Configure manager resources.
- Update password for current user account.
- Configure users and their accounts.
- Log in to the service and read resources.

Password Complexity Rules

Password Complexity for High → When creating a password for High complexity need to follow these steps.

- It should contain printable characters only.
 - Password length should not be shorter than 8 characters.
 - Must contain at least 5 unique characters (abcbabcabc not allowed)
 - Meets the following 4 criteria.
 - ✦ Contains the Upper case (e.g. A, G).
 - ✦ Contains Lower case (e.g. a, g).
 - ✦ Contains numbers in digits (e.g. 1,6).
 - ✦ Contains at least one space or symbols (e.g. \$, &).
 - Could not contain username or the username in reverse order (case-insensitive).
 - Could not contain digits in continuous or reverse continuous order longer than or equal to 3 characters (e.g. BMC(123)ste, BMC(654)sfc, BMC(4567)ste, BMC(9876)sfc are not allowed).
 - Could not contain case-sensitive alphabets in continuous or reverse continuous order longer than or equal to 3 characters (e.g. (ABC)347!,57\$(fed)68k, (GHII)347!, 57\$(kji)68k are not allowed).
 - Could not contain symbols longer than 3 characters (e.g. 34Mgs57(?!\$#)68k are not allowed)).
 - Could not contain digits longer than 3 characters (e.g. Fgke(1245)#@, (4390)FGL\$ are not allowed).
 - The Alphabet can contain no longer than 3 characters (case-sensitive) (e.g. Fg1s3as(FDGB), GleOp34!(asbd) are not allowed).
- Password Complexity for Medium – When creating a password for medium complexity need to follow these steps.
 - It should contain printable characters only.
 - Password length should not be shorter than 8 characters.
 - Must contain at least 5 unique characters (abcbabcabc not allowed)
 - Cannot be same as the username or the username in reverse order.
 - Meets the following 4 criteria.
 - ✦ Contains upper case (e.g. A, G)
 - ✦ Contains lower case (e.g. a, g)
 - ✦ Contains digit numbers (e.g. 1, 6)
 - ✦ Contains at least a space or symbols (e.g. \$, &)
 - Could not contains username or the username in reverse order (case insensitive).

- (e.g. username=Hello, Password=th12(oLleH)_78 is not allowed)

Password Complexity for Low →When creating a password for Low complexity need to follow these steps.

- It should contain printable characters only. ○ Password length should not be shorter than 8 characters.

- Must contain at least 5 unique characters (abcbcbcb not allowed) ○ Meets any three out of the following 4 criteria.

- ✦ Contains upper case (e.g. A, G)
- ✦ Contains lower case (e.g. a, g)
- ✦ Contains digit numbers (e.g. 1, 6)
- ✦ Contains at least a space or symbols (e.g. \$, &)

- Could not contain username or username in reverse order (pam_pwquality will check both) (case insensitive) (e.g. username=Hello, both Password =th12 (heLlO)_78 and Password =th12 (oLleH)_78 is not allowed)

- Password Complexity for Disabled – When creating a password for Disabled complexity need to follow these steps.

- It should contain printable characters only. ○ Password length should not be shorter than 8 characters. ○ Cannot be same as the username or the username in reverse order. ○ Must contain at least 5 unique characters (abcbcbcb not allowed) ○ Cannot be simple passwords like 'password'

Note: To change the Password complexity rule, go to Policies page and change the complexity.

A sample screenshot of the User Management page with Password Complexity rules is displayed below.

msi

Overview

Logs

Hardware Status

Operations

Settings

Platform Event Filter

Security and Access

Certificates

LDAP

User Management

Policies

RADIUS

Sessions

GPGPU

NIC Information

System Inventory

View Privilege Role Descriptions

Password Complexity Rules

Password Complexity for high

- It should contain printable characters only.
- Password length should not be shorter than 8 characters.
- Must contain at least 5 unique characters (abcbcabcb not allowed).
- Meets following 4 criteria:
 - Contains Upper Case (e.g. A, G).
 - Contains Lower Case (e.g. a, g).
 - Contains Digit Numbers (e.g. 1, 6).
 - Contains at least a Space or Symbols (e.g. \$, &).
- Could not contain username or the username in reverse order (case-insensitive).
- Could not contain digits in continuous or reverse continuous order longer than or equal to 3 characters (e.g. BMC(123)ste, BMC(654)sfc, BMC(4567)ste, BMC(9876)sfc are not allowed).
- Could not contain case-sensitive alphabets in continuous or reverse continuous order longer than or equal to 3 characters (e.g. (ABC)347!,57\$(fed)68k, (GHIJ)347!, 57\$(kjih)68k are not allowed).
- Could not contain symbols longer than 3 characters (e.g. 34Mgs57(?!\$#)68k are not allowed).
- Could not contain digits longer than 3 characters (e.g. Fgke(1245)#@, (4390)FGL\$ are not allowed).
- The Alphabet can contain no longer than 3 characters (case-sensitive) (e.g. Fg1s3as(FDGB), GleOp34!(asbd) are not allowed).

Password Complexity for Medium

- It should contain printable characters only.
- Password length should not be shorter than 8 characters.
- Must contain at least 5 unique characters (abcbcabcb not allowed)
- Cannot be the same as the username or the username in reverse order.
- Meets following 4 criteria:
 - Contains upper case (e.g. A, G).
 - Contains lower case (e.g. a, g)..
 - Contains Digit Numbers (e.g. 1, 6).
 - Contains at least a space or symbols (e.g. \$, &).
- Could not contain username or the username in reverse order (case insensitive) (eg,username=Hello, Password=th12(oLleHl)_78 is not allowed).

Password Complexity for Low

- It should contain printable characters only.
- Password length should not be shorter than 8 characters.
- Must contain at least 5 unique characters (abcbcabcb not allowed)
- Meets any three out of following 4 criteria:
 - Contains Upper Case (e.g. A, G).
 - Contains Lower Case (e.g. a, g).
 - Contains Digit Numbers (e.g. 1, 6).
 - Contains at least a Space or Symbols (e.g. \$, &).
- Could not contain username or the username in reverse order (pam_cracklib will check both) (case insensitive) (eg. username=Hello, both Password=th12(heLlO)_78 and Password=th12(oLleHl)_78 is not allowed).

Password Complexity for disabled.

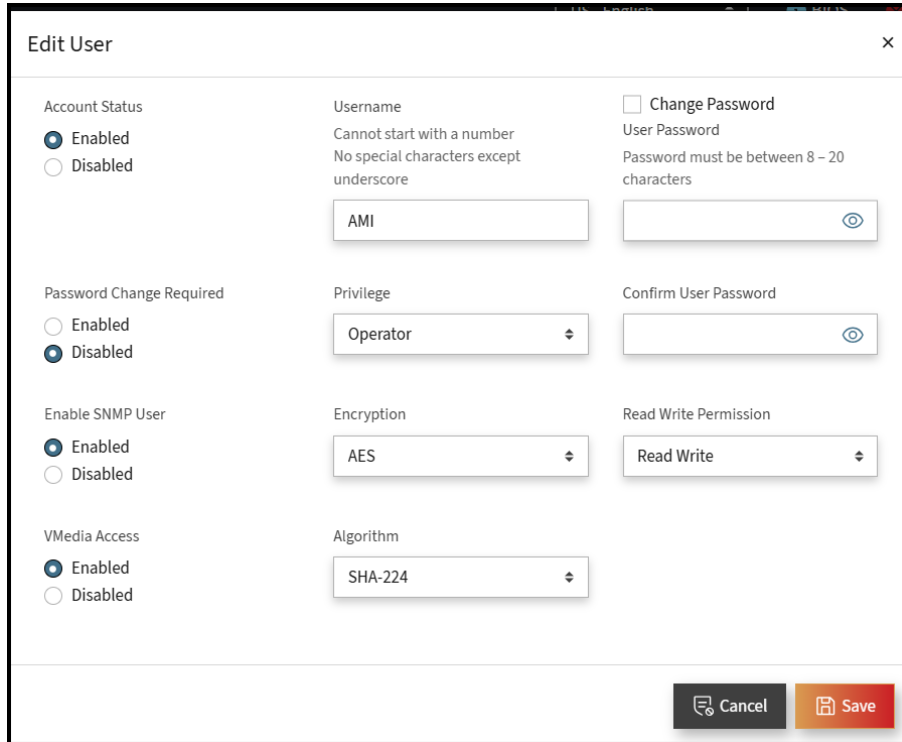
- It should contain Printable Characters only.
- Password length should not be shorter than 8 characters.
- Cannot be the same as the username or the username in reverse order.
- Must contain at least 5 unique characters (abcbcabcb not allowed).
- Cannot be simple Passwords like 'Password'.

Note: To view or modify the Password complexity rule go to Security and Access -> Policies page

Figure 216 User Management with Password Complexity Rules

Edit User

This feature allows the user to edit the given user details. In User Management page, you can select the user and click Edit User  icon to edit. This action opens the Edit User dialog box as displayed in the screenshot below.



Edit User

Account Status

☒ Enabled
☐ Disabled

Username

Cannot start with a number
No special characters except underscore

AMI

☐ Change Password

User Password

Password must be between 8 - 20 characters

Confirm User Password

Read Write Permission

Read Write

Algorithm

SHA-224

Cancel Save

Figure 217 User Management - Edit User (SNMP Enable)

Edit User

Account Status
☒ Enabled
☐ Disabled

Username
 Cannot start with a number
 No special characters except underscore

☐ Change Password
 User Password
 Password must be between 8 – 20 characters

Password Change Required
☐ Enabled
☒ Disabled

Privilege

Confirm User Password

Enable SNMP User
☐ Enabled
☒ Disabled

VMedia Access
☒ Enabled
☐ Disabled

Figure 218 User Management - Edit User (SNMP Disable)

Modify the user details by selecting and mentioning the appropriate details in given fields. These fields are already described in the Add User section. For more information, please see [Add User](#) section.

- VMedia Access – Select Enabled or Disabled option to enable or disable the VMedia access for the selected user.

Note: Virtual media page doesn't appear when Vmedia Access is disabled with this Extended Privilege Support.

Edit User

Account Status
☒ Enabled
☐ Disabled

Username
 Cannot start with a number
 No special characters except underscore

☒ Change Password
 User Password
 Password must be between 8 – 20 characters

Password Change Required
☐ Enabled
☒ Disabled

Privilege

Confirm User Password

Enable SNMP User
☐ Enabled
☒ Disabled

VMedia Access
☒ Enabled
☐ Disabled

- If the user wants to set a new password, check the Change Password checkbox.
- Type a new password in the User Password field (must be 8–20 characters long) and its mandatory.

- Re-enter the same password in the Confirm User Password field to ensure it matches.
- Once both fields are filled correctly, click Save to update your password.

2.10.4 Policies

Users can navigate to Security and access -> Policies page.

Given below is the screenshot for the Policies page

Policies

Services

Network IPMI (out-of-band IPMI)
Allow Remote Management of the platform via IPMI. Tools such as ipmitool require this Setting to be enabled. ☒ Enabled

KVM
Enabling KVM makes to the guest Operating System. ☒ Enabled

KVM Port Value (in numbers):

Web Port Value (in numbers):

Virtual Media
Enabling Virtual Media for Image Redirection. ☒ Enabled

Retry Interval: Retry Count:

SOL SSH
Enabling SOL SSH ☒ Enabled

SOL SSH Port Value (in numbers):

SSCP
Enabling SSCP Protocol. ☐ Disabled

SNMP
Enabling SNMP Protocol. ☒ Enabled

Enabling SNMPv1: ☒ Enabled

Enabling SNMPv2c: ☒ Enabled

Enabling SNMPv3: ☒ Enabled

SNMP Port value:

OpenSSH FIPS Mode
Enabling OpenSSH FIPS Mode ☐ Disabled

Configurations

WEB Session Timeout
Change the Web session timeout in between 30 seconds to 86400 seconds time delay.

KVM Session Timeout
Change the KVM session timeout in between 30 seconds to 86400 seconds time delay.

SOL Non-Volatile Bit Rate:

Complexity
Select the Password Complexity dropdown to set the Password complexity (Disabled, Low, Medium, High). Password cannot exceed 20 bytes of length due to IPMI 2.0 restrictions.

Password History
Select the Password History dropdown to set the Password History (0 to 5). Saves the last N(0-5) Passwords for each user in order to force Password change history and keep the user from alternating between the same Password too frequently.

Max Session Service Information

KVM	Redfish	SSH	Virtual Media	Web
2	20	5	4	20

Figure 219 Policies

The Policies page contains the information about following:

- Network IPMI (out-of-band IPMI) - Allow remote management of the platform via IPMI. Tools such as ipmitool require this setting to be enabled.
- KVM - Enabling KVM makes to the guest operating system.
- Virtual Media - Enabling Virtual Media for image redirection.
- SOL SSH - Enabling SOL SSH. This option will be displayed if the system supports single SOL SSH. A sample screenshot is displayed below.



Figure 220 SOL SSH

- Multi SOL SSH Services - Enabling Multi SOL SSH Services for different TTY interfaces. This option will be displayed if the system supports multi SOL SSH Services. A sample screenshot is displayed below.

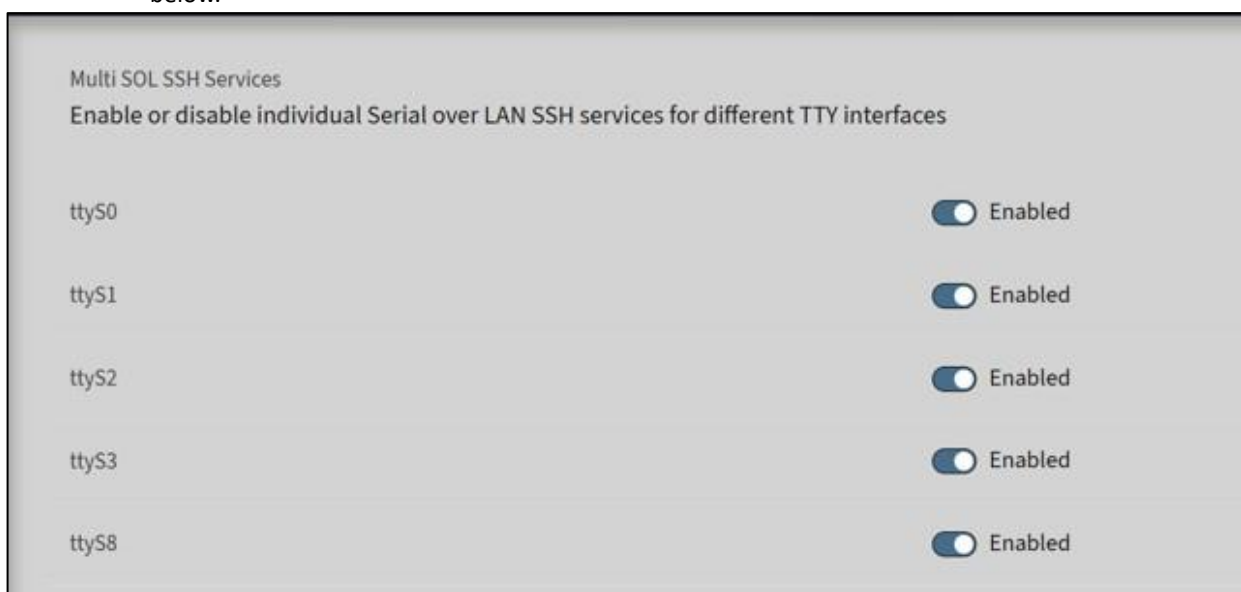


Figure 221 Multi SOL SSH Services

- WEB Session Timeout - Change the Web session timeout in given options using drop down (30 minutes, 1 hour, 2 hours, 4 hours, 8 hours and 1 Day).
- KVM Session Timeout - Change the kvm session timeout in between 30 seconds to 86400 seconds time delay).
 - o The default timeout value is set to 900 seconds.
- SOL Non-Volatile Bit Rate - Select the SOL Non-Volatile Bit Rate drop down to determine which baud rate(9600, 19200, 38400, 57600, 115200) will be used for both IPMI and HTML based SOL.
- Complexity - Select the Password Complexity drop down to set the password complexity (Disabled, Low, Medium, High). Password cannot exceed 20 bytes of length due to IPMI 2.1 restrictions.
- Password History - Select the Password History drop down to set the password History (0 to 5). saves the last N(0~5) passwords for each user in order to force password change history and keep the user from alternating between the same password too frequently.
- SSDP – Enabling SSDP Protocol.

- SSDP Port Value – This SSDP port value will be displayed by default once SSDP protocol is enabled.
- SNMP - Enabling SNMP Protocol.
 - Enabling SNMP v1 - This SNMP v1 protocol will be displayed by default once SNMP protocol is enabled.
 - Enabling SNMP v2c - This SNMP v2c protocol will be displayed by default once SNMP protocol is enabled.
 - Enabling SNMP v3 – This SNMP v3 protocol will be displayed by default once SNMP protocol is enabled.
- OpenSSL FIPS Mode - Enabling OpenSSL FIPS Mode.

Note: On Enabling/Disabling OpenSSL FIPS Mode, the BMC will reboot.

- Max Sessions Service Information

The session limits for each service are as follows:

- o KVM – Maximum of 2 logins
- o Redfish - Maximum of 20 logins
- o SSH - Maximum of 5 logins
- o Virtual Media - Maximum of 4 logins
- o Web - Maximum of 20 logins

If the maximum session limit is exceeded, users will receive an error popup message:

"Maximum number of sessions already in use".

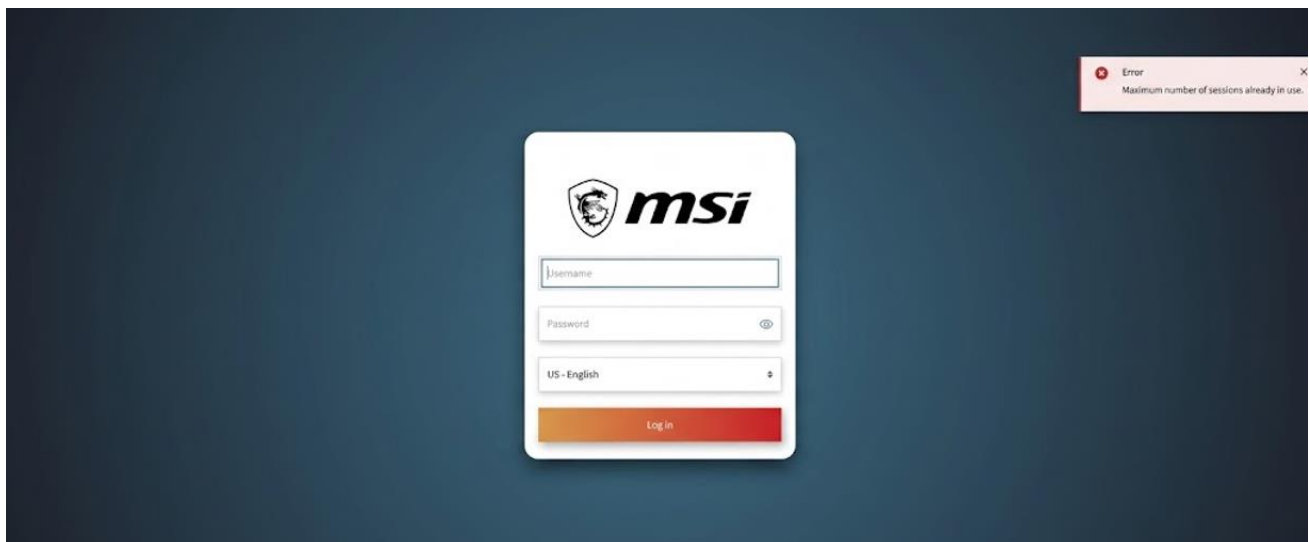


Figure 222 Policies - Error

KVM Port Configuration

Change the KVM port number and click Save. A confirmation popup will show, click the OK button to save the KVM port number.

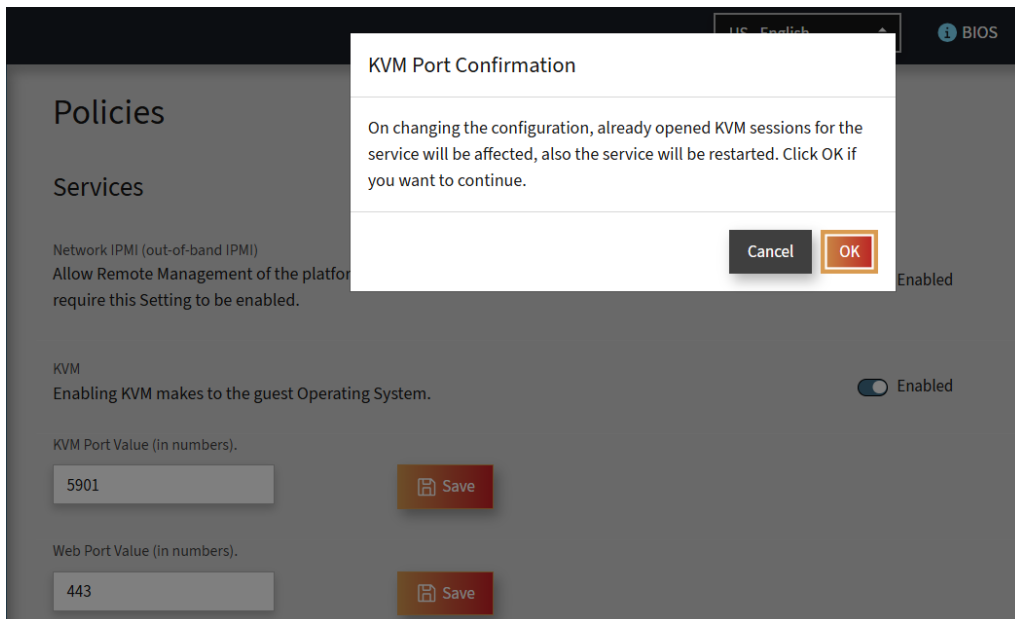


Figure 223 KVM Port Configuration

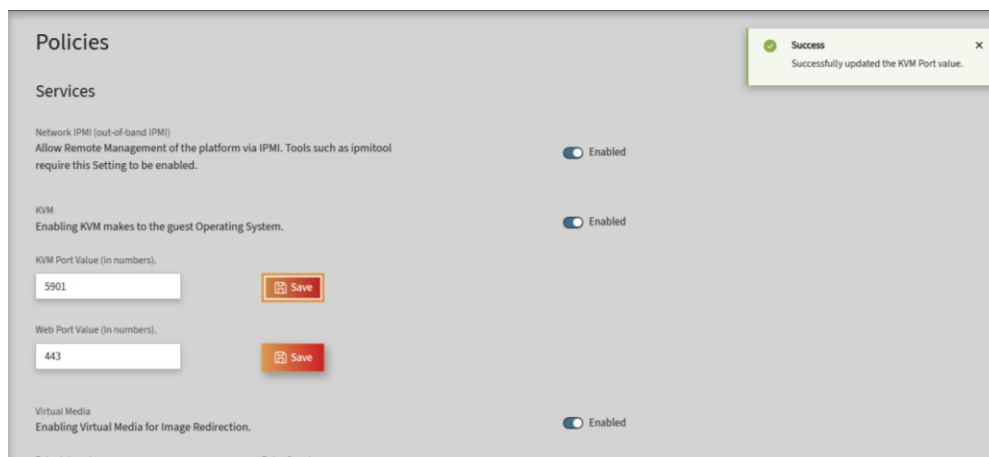


Figure 224 KVM Port Configuration – Policies

The Policies page contains the following fields.

- Network IPMI (Out-Of-Band IPMI) – Enable this option to allow the remote management platform via IPMI.
- KVM – Enable this option for allowing KVM makes to the guest operating system.
- KVM Port Value (in numbers) – Set the KVM port value and click Save.
- Web Port Value (in numbers) - Set the Web port value and click Save.
- Virtual Media = Enable this option to allow virtual media for image redirection.
- SOL SSH
- Enabling SOL SSH – Enable this option to allow SOLSSH.
- SOL SSH Port Value (in numbers) - Set the SOL SSH port value and click Save.
- SSDP – Enable this option to allow SSDP protocol.

Web Port Configuration

Change the web port number and click Save. A confirmation popup will show, click OK button to save the web port number. If click the OK button the WebUI will log out the session.

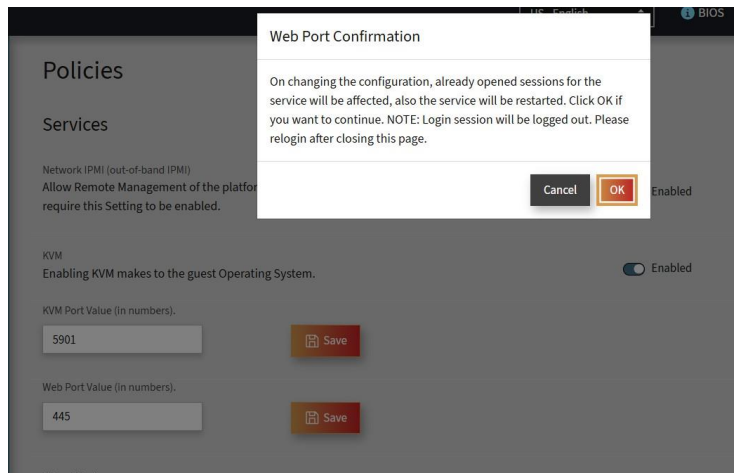


Figure 225 Web Port Configuration

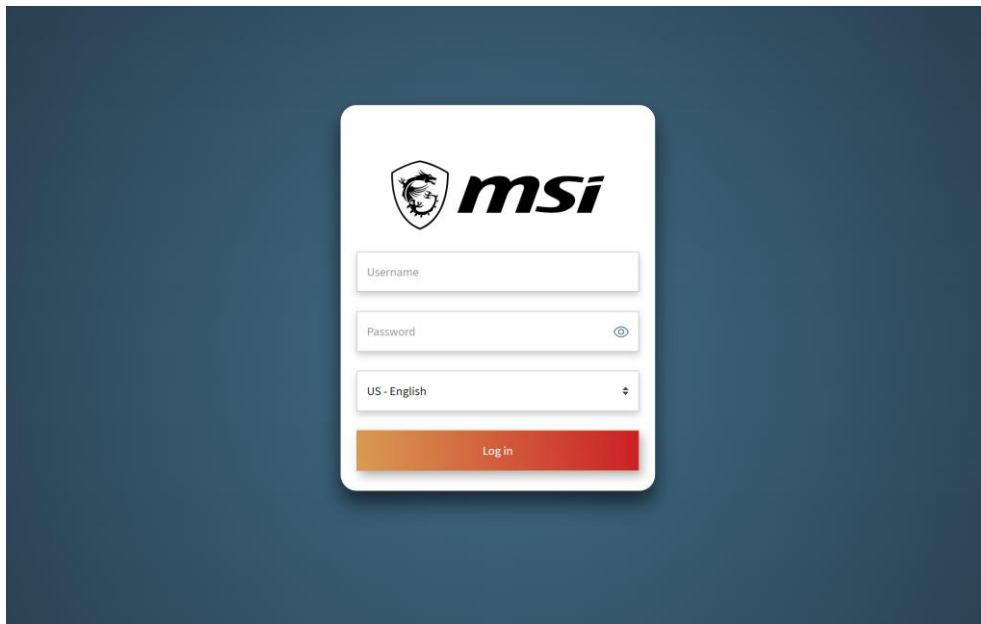


Figure 226 MegaRAC OneTree™ Login page

Rmedia Reconnect Configuration

The screenshot displays the 'Policies' section of a configuration interface. Under the 'Services' heading, several settings are listed:

- Network IPMI (out-of-band IPMI):** Description: 'Allow Remote Management of the platform via IPMI. Tools such as ipmitool require this Setting to be enabled.' Status: Enabled (toggle switch).
- KVM:** Description: 'Enabling KVM makes to the guest Operating System.' Status: Enabled (toggle switch).
- KVM Port Value (in numbers):** Input field contains '5901'. A red 'Save' button is next to it.
- Web Port Value (in numbers):** Input field contains '443'. A red 'Save' button is next to it.
- Virtual Media:** Description: 'Enabling Virtual Media for Image Redirection.' Status: Enabled (toggle switch).
- Retry Interval:** Input field contains '15'.
- Retry Count:** Input field contains '3'. A red 'Save' button is next to it.
- SOL SSH:** Description: 'Enabling SOL SSH'. Status: Enabled (toggle switch).

Figure 227 Retry interval and retry count

- **Retry Interval:** Enter the retry interval to reconnect Virtua Media.
- **Retry Count:** Enter the retry count to reconnect Virtua Media.

Note: Retry count and interval are used only if there is any disruption in the active redirected image. During this case, the media will try to reconnect based on configured retry count and interval values.

- **Save:** To save the settings.

2.10.5 RADIUS

This page allows the user to set the RADIUS Authentication.

To open RADIUS page, the user can navigate to Security and access ->RADIUS page.

A sample screenshot of RADIUS page is shown below.

The various fields of RADIUS page are explained below.

Enable RADIUS Authentication: Option to enable/disable RADIUS authentication.

- Enabled: Uses certificate-based authentication for secure login. Requires uploading RADIUS CA, Client, and Key files. Offers strong security.
- Disabled: Uses simpler methods like username/password (e.g., PAP or CHAP). Easier setup but less secure.

The screenshot shows the RADIUS configuration interface. At the top, there's a navigation bar with 'US - English', 'BIOS', 'Health', 'Power', 'Refresh', '2FA', and 'root'. The main heading is 'RADIUS'. Below it, there's a section for 'Enable RADIUS Authentication' with a checked checkbox. To the right, 'Enable EAP-TLS Authentication' is set to 'Disabled'. The form contains several input fields: 'Server Address' (10.0.98.250), 'Port' (1812), 'Secret' (masked), 'Group Name1' (H=4), 'Group Name2 - Optional' (H=3), 'Group Name3 - Optional' (H=0), 'Privilege 1' (Administrator), 'Privilege 2' (Operator), and 'Privilege 3' (ReadOnly). A red 'Save' button is at the bottom left.

Figure 228 EAP TLS Disabled

This screenshot shows the RADIUS configuration page with 'Enable EAP-TLS Authentication' set to 'Enabled'. The 'Server Address' (10.0.98.250) and 'Port' (1812) fields remain the same. The 'Secret' field is now empty. The group names and privileges are also unchanged. Below the main form, there are three sections for uploading certificates: 'RADIUS CA', 'RADIUS Client', and 'RADIUS Key'. Each section shows a 'Last Modified Date' and an 'Add File' button. A red 'Save' button is located at the bottom left of the form area.

Figure 229 RADIUS

Server Address: The IP address of RADIUS server.

Note: - IP Address (IPv4 format).

Port: The RADIUS Port number.

Note:

- Default Port is 1812.

- Port value ranges from 0 to 65535.

Secret: The Authentication Secret for RADIUS server

Group Name1-Optional: Configure Vendor Specific Attribute

Example: Vendor-Specific="H=4"

Privilege 1: Select Auth Type (Administrator, Operator, ReadOnly) from dropdown.

Group Name2-Optional: Configure Vendor Specific Attribute.

Example: Vendor-Specific="H=3"

Privilege 2: select Auth-Type (Administrator, Operator, ReadOnly) from dropdown

Group Name3-optional: Configure Vendor Specific Attribute.

Example: Vendor-Specific="H=0"

Privilege 3: Select Auth-Type (Administrator, Operator, ReadOnly) from dropdown.

Save settings: To save the settings.

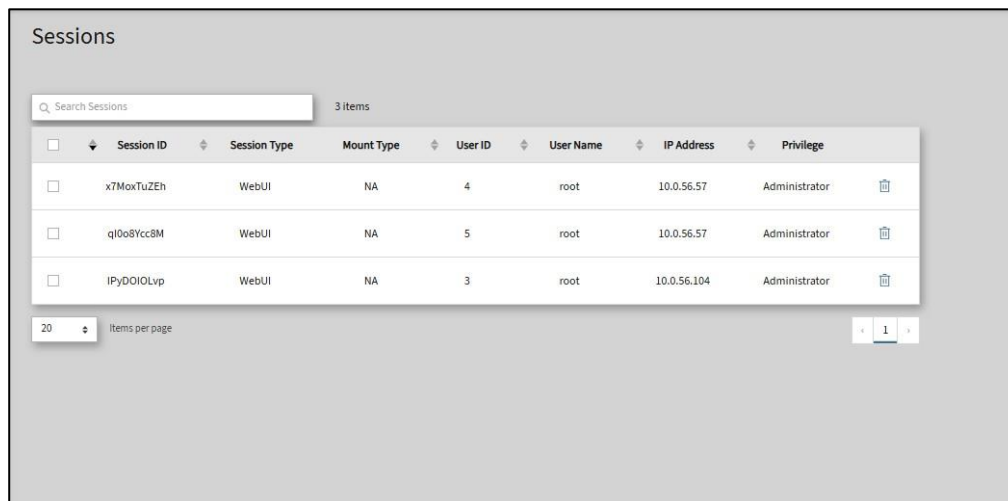
Procedure:

- Enable the RADIUS Authentication check box to authenticate the RADIUS.
- It is recommended to Enable Radius configuration from configure RADIUS page otherwise error message will be showing in page stating that "Radius configuration is not enabled".
- For Authorization Purpose, configure the Radius user with Vendor Specific Attribute in Server side.
- Click Save settings to save the changes made.

2.10.6 Sessions

Users can navigate to Security and access -> Sessions page. This page allows the user to view the Web, KVM, and VMEDIA login session information including Session IP, Session Type, Mount Type, User ID, User name, IP address and User Privilege information.

Given below is the screenshot of Sessions page.



	Session ID	Session Type	Mount Type	User ID	User Name	IP Address	Privilege
☐	x7MoxTuZEh	WebUI	NA	4	root	10.0.56.57	Administrator
☐	q10o8Ycc8M	WebUI	NA	5	root	10.0.56.57	Administrator
☐	IPyDOIOLvp	WebUI	NA	3	root	10.0.56.104	Administrator

Figure 230 Sessions

The Sessions page contains the information about following:

- Search Sessions - User can Search Sessions by search box. It displays information about Session ID, Username, and IP address.
- Session ID -It displays the Session ID.
- Session Type- It displays the type of session. The following list shows the different types of sessions and their description.
- KVMIP – A Keyboard-Video-Mouse over IP session.
- Redfish – A Redfish session.
- ManagerConsole – The manager's console, which could be connected through Telnet, SSH, SM CLP, or another protocol.
- Virtual Media – A Virtual Media session.
- Web – A non-Redfish web user interface session, such as a graphical interface or another webbased protocol.
- Mount Type -It displays the media redirection mount type.
- User ID -It displays the User ID.
- User Name -It displays the Session User name.
- IP Address -It displays the IP address of the session.
- Privilege - It displays the User privilege.
- Delete = Click Delete to delete the selected sessions.

2.11 FRU Information (Field Replaceable Units)

FRU Information page displays the BMC's FRU device information. FRU page shows information like Basic Information, Board Information and Product Information of the FRU device.

To open the FRU Information page, click FRU Information from the menu bar. Select FRU Device ID from the FRU Information section to view the details of the selected device. A sample screenshot of FRU Information page is given below.

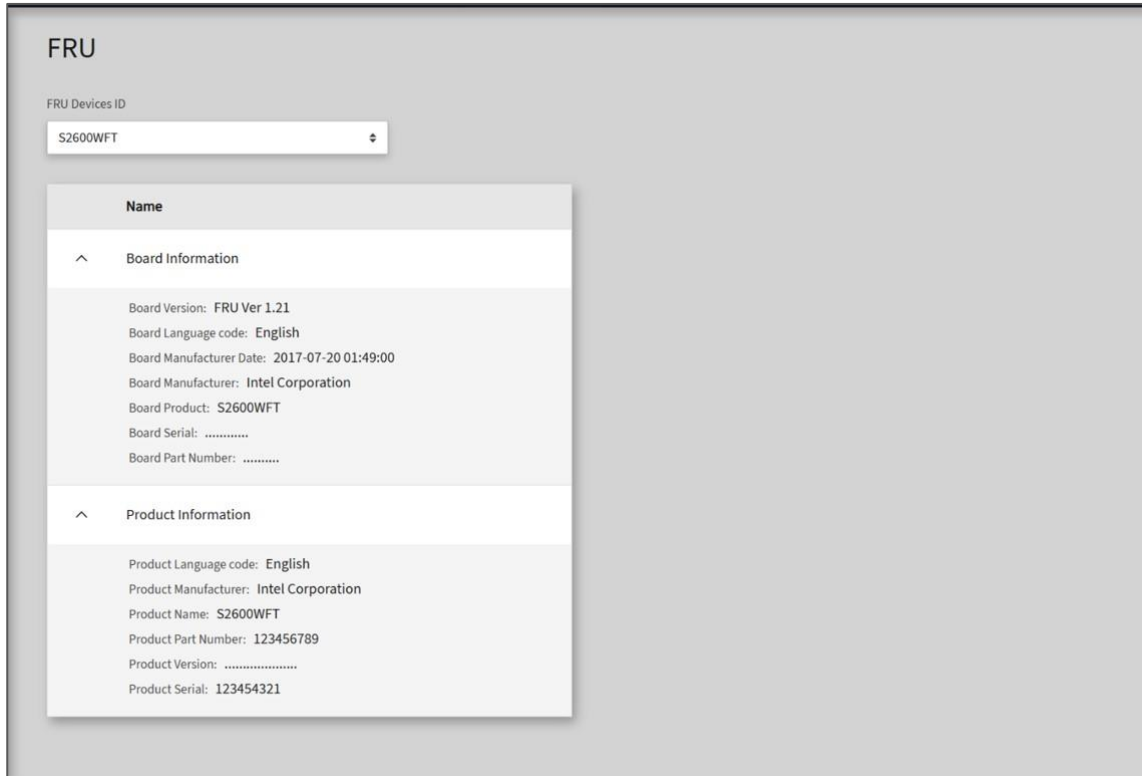


Figure 231 FRU Information

The following fields are displayed here for the selected device.

Available FRU Devices

- FRU device ID - Select the device ID from the drop-down list.

Board Information

- Board Version
- Board Language code
- Board Manufacture Date
- Board Manufacturer
- Board Product
- Board Serial
- Board Part Number

Product Information

- Product Language code
- Product Manufacturer
- Product Name
- Product Part Number

- Product Version
- Product Serial

2.12 System Inventory

Users can navigate to System Inventory page. This page allows the user to view information about System Info, Processor Info, Memory Controller Info, BaseBoard Info, Network Interfaces Info, ipv6 info, Thermal info, Temperature info, Power Controller info, Voltage info, PCIE, Device info, and PCIE Function tabs in appropriate System Inventory pages.

2.12.1 System

This System Info tab displays System information.

System Inventory

System

Processor

Memory Controller

BaseBoard

Power

Thermal

PCIE Device

PCIE Function

Storage

System Info

Name	Description	Indicator LED	Manufacture	Power State	Serial Number	Part Number	System Type	Asset Tag	BIOS Version	State
system	Computer System	false	Intel Corporation	On	Default string	NA	Physical	NA	5.35	Enabled

Figure 232 System Inventory

This field displays the following information such as Name, Description, Indicator LED, Manufacture, Power State, Serial Number, Part Number, System Type, Asset Tag, BIOS version and State.

2.12.2 Processor

This Processor tab displays System Processor Information.

The screenshot shows the 'System Inventory' window with the 'Processor' tab selected. It contains two tables: 'Processor Info' and 'FPGA Info'.

Processor Info

ID	Name	Manufacture	Max Speed MHz	Operating Speed MHz	Model	Processor Architecture	ProcessorType	Socket	Serial Number	Part Number	Instruction Set	Version
DevType1_CPU0	Processor_0	Intel(R) Corporation	0	0	GENUINE INTEL(R) XEON(R)	x86	CPU	CPU0			x86-64	
DevType1_CPU1	Processor_1	Intel(R) Corporation	0	0	GENUINE INTEL(R) XEON(R)	x86	CPU	CPU1			x86-64	

FPGA Info

Id	Name	Firmware ID	Firmware Manufacturer	FPGA Type	Interface Type	Model	PCIe Virtual Functions	Programmable from Host
DevType1_CPU0	Processor_0	NA	NA	NA	NA	NA	0	false
DevType1_CPU1	Processor_1	NA	NA	NA	NA	NA	0	false

Figure 233 Processor Info

Processor Info

This field displays the following information such as Id, Name, Manufacture, MaxSpeed MHz, Operating Speed MHz, Model, Processor Architecture, ProcessorType, Socket, Serial Number, Part Number, Instruction Set, Version, Total Cores, TotalEnabledCores, Total Threads, Health and State.

FPGA Info

This field displays the following information such as Id, Name, Firmware Id, Firmware Manufacture, FPGA Type, Interface Type, Model, PCIe Virtual Functions and Programmable From Host.

2.12.3 Memory Controller

This Memory Controller Info displays System memory controller information.

System Inventory

SystemProcessorMemory ControllerBaseBoardPowerThermalPCIE DevicePCIE FunctionStorage

Memory Controller Info

ID	Name	Capacity MIB	Manufacturer	Serial Number	Part Number	Spare Part Number	Base Module Type	Bus Width Bits	Data Width Bits	Health	State	Operating Speed Mhz	Memory Type	Allowed Speeds MHz	ServiceLabel
DevType2_DIMM1	DevType2_DIMM1	0	NO DIMM	NO DIMM	NO DIMM	NA	RDIMM	0	0	OK	Absent	0	NA	NA	CPU0_DIMM_A
DevType2_DIMM2	DevType2_DIMM2	0	NO DIMM	NO DIMM	NO DIMM	NA	RDIMM	0	0	OK	Absent	0	NA	NA	CPU0_DIMM_B
DevType2_DIMM3	DevType2_DIMM3	0	NO DIMM	NO DIMM	NO DIMM	NA	RDIMM	0	0	OK	Absent	0	NA	NA	CPU0_DIMM_B
DevType2_DIMM4	DevType2_DIMM4	0	NO DIMM	NO DIMM	NO DIMM	NA	RDIMM	0	0	OK	Absent	0	NA	NA	CPU0_DIMM_C

Memory Assembly Info

ID	Name	Binary Data URI	Description	Engineering Change Level	Model	Part Number	SKU	Serial Number	Spare Part Number	Health	State	Vendor	Version
There are no records to show													

Memory Metrics Info

ID	Name	Bandwidth Percent	Block Size Bytes	Blocks Written Read	Blocks Read	Address Parity Error	Correctable ECC Error	Temperature	Data Loss Detected	Last shut down Success	Performance Degraded	Predicted Media Life Left Percent	Remaining Spare Block Percentage	Operating Speed MHz
DevType2_DIMM0	DevType2_DIMM0_Metric	0	0	NA	0	false	false	false	false	false	NA	0	0	0
DevType2_DIMM16	DevType2_DIMM16_Metric	0	0	NA	0	false	false	false	false	false	NA	0	0	0
DevType2_DIMM16	DevType2_DIMM16_Metric	0	0	NA	0	false	false	false	false	false	NA	0	0	0

Figure 234 Memory Controller Info

Memory Controller info

This field displays the following information such as Id, Name, Capacity MIB, Manufacture, Serial Number, Part Number, Spare Part Number, Base Module Type, Bus Width Bits, Data Width Bitz, Health, State, Operating Speed Mhz, Memory Type, Allowed Speeds MHz and Service Label.

Memory Assembly Info

This field displays the following information such as. Id, Name, Binary Data URI, Description, Engineering Change Level, Model, Part Number, SKU, Serial Number, Spare Part Number, State, Vendor and version

Memory Metrics Info

Id, Name, Bandwidth Percent, Block Size Bytes, Blocks Written Read, Blocks Read, Address Parity Error, Correctable ECC Error, Data Loss Detected Last Shutdown Success, Performance Degraded, predictedMediaLifeLeftPercent, remainingSpareBlockPercentage and operatingSpeedMHz

2.12.4 BaseBoard

This Baseboard tab displays with Baseboard Info, Manufacturer Info and IPv6 Addresses Info.

System Inventory

SystemProcessorMemory ControllerBaseBoardPowerThermalPCIE DevicePCIE FunctionStorage

BaseBoard Info

Name	Indicator LED	LocationIndicatorActive	Model	State	Power State	Asset Tag	Manufacturer	Part Number	Serial Number
BNC_Baseboard	NA	false	BeechnutCity	Enabled	On		Intel Corporation		Intel_3245

Network Interfaces Info

ID	MAC Address	Interface enabled	IPv4 Addresses	Host Name	State
eth0	00:07:e9:34:99:f6	true	10.0.98.22	AMIOT-8a640b8a4424	Enabled
hostusb0	9a:8d:56:55:38:18	true	169.254.0.17	AMIOT-8a640b8a4424	Enabled

IPv6 Addresses Info

ID	Address	Prefix Length	Address Origin
eth0	5001:df27:df28:df29:207:e9ff:fe34:99f6	64	Global
eth0	2001:b021:abcd:0:207:e9ff:fe34:99f6	64	Global
eth0	fe80::207:e9ff:fe34:99f6	64	LinkLocal
hostusb0	fe80::988d:56ff:fe55:3818	64	LinkLocal

Figure 235 Baseboard Info

BaseBoard Info: It displays user using baseboard information.

This field displays the following information such as Name, Indicator LED, LocationIndicatorActive, Model, State, Power State, Asset Tag, Manufacturer, Part Number, and Serial Number.

Network interfaces Info: It displays Network interfaces information. This field displays the following information such as ID, MAC Address, Interface Enabled, IPv4 Addresses, HostName and State.

Ipv6 Address Info: It displays ipv6 address information. This field displays the following information such as Id, Address, PrefixLength and AddressOrigin.

2.12.5 Power

This Power tab displays Power Controller Info, and Voltage Info.

System Inventory

System Processor Memory Controller BaseBoard **Power** Thermal PCIe Device PCIe Function Storage

Power Control Info

Name	Manufacturer	Model	Efficiency Percent	Firmware Version	Power Capacity Watts	Power Supply Type	Serial Number	Part Number	Spare Part Number
SOLUM CO IS162F22 PSU1	SOLUM CO., LTD.	IS162F22	100	H/W Rev.:15 F/W Rev:82.9.12	1600	AC	PSSF162202ACNS1622A4BL3P1132	G36234-016	PSSF162202

Voltage Info

Name	State	Reading Units	Reading	MinReadingRange	MaxReadingRange	Reading Type	UF	UC	LC	LF
CPU1 North VR Input Voltage	Enabled	V	1.23	0	300	Voltage	NA	NA	NA	NA
CPU1 PVCCA EHV Input Voltage	Enabled	V	12.07	0	300	Voltage	NA	NA	NA	NA
CPU1 PVCCA EHV Output Voltage	Enabled	V	1.8	0	255	Voltage	NA	NA	NA	NA
CPU1 PVCCD0 Output Voltage	Enabled	V	1.11	0	255	Voltage	NA	NA	NA	NA
CPU1 PVCCD1 Output Voltage	Enabled	V	1.12	0	255	Voltage	NA	NA	NA	NA

Figure 236 Power Info

Power Controller Info: It displays system power information. This field displays the following information such as Name, Manufacturer, Model, Efficiency Percent, Firmware Version, Power Capacity Watts, Power SupplyType, Serial Number, Part Number, Spare Part Number, Health and State.

Voltage Info: It displays system devices and sensors using voltage information. This field displays the following information such as Name, State, Reading Units, Reading, MinReadingRange, MaxReadingRange, Reading Type, UF, UC, LC and LF.

2.12.6 Thermal

This Thermal tab displays the Fan Information and Temperature Information.

System Inventory

System

Processor

Memory Controller

BaseBoard

Power

Thermal

PCIE Device

PCIE Function

Storage

Fan Info

Name	Health	State	Reading RPM	MinReadingRange	MaxReadingRange
Pwm 1 2	✔ OK	Enabled	100	0	100
Pwm 3 4	✔ OK	Enabled	100	0	100
Pwm 5 6	✔ OK	Enabled	100	0	100
Pwm 7 8	✔ OK	Enabled	100	0	100
Pwm 9 10	✔ OK	Enabled	100	0	100

Temperature Info

Name	Physical Context	State	Reading Units	Reading	MinReadingRange	MaxReadingRange	Reading Type	UF	UC	LC	LF
BMC Temp	SystemBoard	Enabled	Cel	26.13	-128	127	Temperature	110	115	3	5
CPU1 DIMM A	CPU	Enabled	Cel	24	-128	127	Temperature	90	100	NA	NA
CPU1 PVCCA Controller Temp	CPU	Enabled	Cel	29	-128	127	Temperature	NA	NA	NA	NA
CPU1 PVCCA EHV Temperature	CPU	Enabled	Cel	29	-128	127	Temperature	110	115	0	5

Figure 237 Thermal Info

Fan Info: It displays system using Fans information. This field displays the following information such as Name, State, ReadingRPM, MinReadingRange, and MaxReadingRange.

Temperature Info: It displays temperature produced by system devices and sensors information. This field displays the following information such as Name, Physical Context, State, Reading Units, reading, MinReadingRange, MaxReadingRange, Reading Type, UF, UC, LC and LF.

2.12.7 PCIe Device

This PCIe Device tab displays a number of PCIe Device information.

System Inventory

System

Processor

Memory Controller

BaseBoard

Power

Thermal

PCIe Device

PCIe Function

Storage

PCIe Device Info

ID	Name	Manufacturer	Asset Tag	State
00_0B_00	PCIe Device	Intel Corporation	NA	Enabled
00_0D_00	PCIe Device	Intel Corporation	NA	Enabled
00_00_1F	PCIe Device	Intel Corporation	NA	Enabled
00_01_00	PCIe Device	Intel Corporation	NA	Enabled
00_2A_00	PCIe Device	Intel Corporation	NA	Enabled

Figure 238 PCIe Device

This field displays the following information such as Id, Name, Manufacturer, AssetTag, and State.

2.12.8 PCIE Function

This PCIE Function tab displays each PCIE Device Functions information.

System Inventory

System	Processor	Memory Controller	BaseBoard	Power	Thermal	PCIE Device	PCIE Function	Storage
--------	-----------	-------------------	-----------	-------	---------	-------------	---------------	---------

PCIE Function Info

ID	Name	Device Class	Class Code	Device ID	Vendor ID	Function ID	Function Type	Revision ID	SubSystem Vendor ID
0	PCIE Function	Processor	0x0B4000	0x4944	0x8086	0	Physical	0x00	0x8086
0	PCIE Function	Processor	0x0B4000	0x2714	0x8086	0	Physical	0x00	0x8086
0	PCIE Function	Bridge	0x060100	0x5795	0x8086	0	Physical	0x00	0x8086
1	PCIE Function	SerialBusController	0x0C0500	0x5796	0x8086	1	Physical	0x00	0x8086
2	PCIE Function	SerialBusController	0x0C8000	0x5794	0x8086	2	Physical	0x09	0x8086

Figure 239 PCIE Function

This field displays the following information such as Id, Name, DeviceClass, ClassCode, DeviceId, VendorId, FunctionId, FunctionType, RevisionId and SubSystemVendorId.

2.12.9 Storage

This Storage Function tab displays each storage information.

System Inventory

System

Processor

Memory Controller

BaseBoard

Power

Thermal

PCIE Device

PCIE Function

Storage

Storage Information

ID	Name	Description	State	Health
StorageUnit_0	StorageUnit_0	Storage0	Enabled	OK
StorageUnit_1	StorageUnit_1	Storage1	Enabled	OK

Storage Controller Information

ID	Name	Asset Tag	Model	Serial Number	Firmware Version	Speed Gbps	Supported Controller Protocols	Supported Device Protocols	State	Health
0	NVMe_Controller_0	(NVMe_Controller_0)	HP SSD EX900 500GB	HASE33271003135	V0714C0	31.51	PCIe, NVMe	NVMe	Enabled	OK
0	USB_Controller0	(USB_Controller_0)	Not Available	Not Available	1.0	38.4	PCIe, USB	USB	Enabled	OK

Storage Drive Information

ID	Name	Manufacturer	Model	Media Type	Serial Number
NVMe_Device0_NSID1	NVMe_Device0_NSID1	N/A	HP SSD EX900 500GB	SSD	HASE33271003135
USB_Device1_Port2	USB_Device1_Port2	USB	SanDisk 3.2Gen1	HDD	0401ece6992d04d46799e183416184ed2f9d4ec82cfc28fe40ca86347aad58f8c26b000000

Storage Volume Information

ID	Name	Block Size Bytes	Capacity Bytes	State	Health
VOL0	Volume_0	4096	1124999168	Enabled	OK
VOL1	Volume_1	16384	685408256	Enabled	OK

Simple Storage Information

ID	Name	UEFI Device Path	State	Health
0	NVMe_Controller_0	PciRoot(0xD)/Pci(0x7,0x0)/Pci(0x0,0x0)	Enabled	OK
1	USB_Controller0	PciRoot(0xD)/Pci(0x9,0x0)/Pci(0x0,0x0)	Enabled	OK

Figure 240 Storage

Storage Information

This table displays the following information such as ID, Name, Description, State, Health.

Storage Controller Information

This table displays the following information such as Id, Name, Asset Tag, Model, Serial Number, Firmware Version, Speed Gbps, Supported Controller Protocols, Supported Device Protocols, State, Health.

Storage Drive Information

This table displays the following information such as ID, Name, Manufacturer, Model, Media Type, Serial Number, Protocol, Block Size Bytes, Capacity Bytes, Encryption Ability, Revision, Ready To Remove, State, Health.

Storage Volume Information

This table displays the following information such as ID, Name, Block Size Bytes, Capacity Bytes, State, Health.

Simple Storage Information

This table displays the following information such as Id, Name, UEFI Device Path, State, Health.

Chapter 3

3 MegaRAC OneTree™ Redfish Configuration

BMCWeb provides an implementation of the Redfish API. BMCWeb application should run in BMC then only redfish will work. OpenBMC will use Redfish Version 1.17.0 with Redfish Schema 2024.4. To login to the BMC/Redfish, use the credentials (root/OpenBmc).

The Redfish Init page can be launched from browser/Postman as displayed in the Service Root URI screenshot.

Please refer MegaRAC OneTree™ - Redfish Expansion Pack API.pdf for resources, attributes and operation supported.

3.1 Service root URI

GET Schema Init - <http://{{ip}}/redfish/v1/>

```
{
  "@odata.id": "/redfish/v1",
  "@odata.type": "#ServiceRoot.v1_17_0.ServiceRoot",
  "AccountService": {
    "@odata.id": "/redfish/v1/AccountService"
  },
  "Cables": {
    "@odata.id": "/redfish/v1/Cables"
  },
  "CertificateService": {
    "@odata.id": "/redfish/v1/CertificateService"
  },
  "Chassis": {
    "@odata.id": "/redfish/v1/Chassis"
  },
  "Description": "Root Service",
  "EventService": {
    "@odata.id": "/redfish/v1/EventService"
  },
  "Id": "RootService",
  "JsonSchemas": {
    "@odata.id": "/redfish/v1/JsonSchemas"
  },
  "Links": {
    "ManagerProvidingService": {
      "@odata.id": "/redfish/v1/Managers/bmc"
    },
    "Sessions": {
      "@odata.id": "/redfish/v1/SessionService/Sessions"
    }
  },
  "Managers": {
    "@odata.id": "/redfish/v1/Managers"
  },
  "Name": "Root Service",
  "Oem": {
    "Ami": {
      "@odata.id": "/redfish/v1/#Oem/Ami",
      "@odata.type": "#OemServiceRoot.v1_0_0.Ami",
      "AtScaleDebug": {
        "@odata.id": "/redfish/v1/Oem/Ami/AtScaleDebug"
      },
      "AutonomousCrashDump": {
        "@odata.id": "/redfish/v1/Oem/Ami/AutonomousCrashDump"
      },
      "LicenseControl": {
        "@odata.id": "/redfish/v1/Oem/Ami/LicenseControl"
      }
    },
    "Intel": {
      "@odata.id": "/redfish/v1/#Oem/Intel",
      "@odata.type": "#OemServiceRoot.v1_0_0.Intel",
      "CupsService": {
        "@odata.id": "/redfish/v1/Oem/Intel/CupsService"
      }
    }
  }
},
```

```

        "OpenBmc": {
            "Pef": {
                "@odata.id": "/redfish/v1/#Oem/OpenBmc",
                "@odata.type": "#OemPefServiceRoot.v1_0_0.OpenBmc",
                "PefService": {
                    "@odata.id": "/redfish/v1/PefService"
                }
            }
        },
        "ProtocolFeaturesSupported": {
            "DeepOperations": {
                "DeepPATCH": false,
                "DeepPOST": false
            },
            "ExcerptQuery": false,
            "ExpandQuery": {
                "ExpandAll": false,
                "Levels": false,
                "Links": false,
                "NoLinks": false
            },
            "FilterQuery": false,
            "OnlyMemberQuery": true,
            "SelectQuery": true
        },
        "RedfishVersion": "1.17.0",
        "Registries": {
            "@odata.id": "/redfish/v1/Registries"
        },
        "SessionService": {
            "@odata.id": "/redfish/v1/SessionService"
        },
        "Systems": {
            "@odata.id": "/redfish/v1/Systems"
        },
        "Tasks": {
            "@odata.id": "/redfish/v1/TaskService"
        },
        "TelemetryService": {
            "@odata.id": "/redfish/v1/TelemetryService"
        },
        "UUID": "dc7413f9-3e60-5e41-abbb-47b899ec2331",
        "UpdateService": {
            "@odata.id": "/redfish/v1/UpdateService"
        }
    }
}

```

3.2 Account Service

GET Account Service - <http://{{ip}}/redfish/v1/AccountService/>

```
{
  "@odata.id": "/redfish/v1/AccountService",
  "@odata.type": "#AccountService.v1_17_0.AccountService",
  "AccountLockoutDuration": 300,
  "AccountLockoutThreshold": 10,
  "Accounts": {
    "@odata.id": "/redfish/v1/AccountService/Accounts"
  },
  "ActiveDirectory": {
    "Authentication": {
      "AuthenticationType": "UsernameAndPassword",
      "Password": null,
      "Username": ""
    },
    "LDAPService": {
      "SearchSettings": {
        "BaseDistinguishedNames": [
          ""
        ],
        "GroupsAttribute": "",
        "UsernameAttribute": ""
      }
    },
    "RemoteRoleMapping": [],
    "ServiceAddresses": [
      ""
    ],
    "ServiceEnabled": false
  },
  "AdditionalExternalAccountProviders": {
    "@odata.id":
      "/redfish/v1/AccountService/ExternalAccountProviders"
  },
  "Description": "Account Service",
  "HTTPBasicAuth": "Enabled",
  "HTTPBasicAuth@Redfish.AllowableValues": [
    "Enabled",
    "Disabled"
  ],
  "Id": "AccountService",
  "LDAP": {
    "Authentication": {
      "AuthenticationType": "UsernameAndPassword",
      "Password": null,
      "Username": ""
    },
    "Certificates": {
      "@odata.id":
        "/redfish/v1/AccountService/LDAP/Certificates"
    }
  },
}
```

```

    "LDAPService": {
      "SearchSettings": {
        "BaseDistinguishedNames": [
          ""
        ],
        "GroupsAttribute": "",
        "UsernameAttribute": ""
      }
    },
    "RemoteRoleMapping": [],
    "ServiceAddresses": [
      ""
    ],
    "ServiceEnabled": false
  },
  "MaxPasswordLength": 20,
  "MinPasswordLength": 8,
  "MultiFactorAuth": {
    "ClientCertificate": {
      "CertificateMappingAttribute": "CommonName",
      "Certificates": {
        "@odata.id":
          "/redfish/v1/AccountService/MultiFactorAuth/ClientCertificate/Certificates",
        "@odata.type":
          "#CertificateCollection.CertificateCollection",
        "Members": [],
        "Members@odata.count": 0
      }
    },
    "Enabled": true,
    "RespondToUnauthenticatedClients": true
  }
},
"Name": "Account Service",
"Oem": {
  "OpenBMC": {
    "@odata.id": "/redfish/v1/AccountService/Oem/OpenBMC",
    "@odata.type":
      "#OpenBMCAccountService.v1_0_0.AccountService",
    "AuthMethods": {
      "BasicAuth": true,
      "Cookie": true,
      "SessionToken": true,
      "TLS": true,
      "XToken": true
    },
    "PasswordPolicyComplexity": "Disabled",
    "RememberOldPasswordTimes": 0
  }
},
"Roles": {
  "@odata.id": "/redfish/v1/AccountService/Roles"
},
"ServiceEnabled": true
}

```


3.3 Account Collection

Get Account Collection - <http://{{ip}}/redfish/v1/AccountService/Accounts/>

```
{
  "@odata.id": "/redfish/v1/AccountService/Accounts",
  "@odata.type":
    "#ManagerAccountCollection.ManagerAccountCollection",
  "Description": "BMC User Accounts",
  "Members": [
    {
      "@odata.id": "/redfish/v1/AccountService/Accounts/root"
    }
  ],
  "Members@odata.count": 1,
  "Name": "Accounts Collection"
}
```

3.4 Manager Account

Get Manager Account - <http://{{ip}}/redfish/v1/AccountService/Accounts/root>

```
{
  "@odata.id": "/redfish/v1/AccountService/Accounts/root",
  "@odata.type": "#ManagerAccount.v1_13_0.ManagerAccount",
  "AccountTypes": [
    "HostConsole",
    "IPMI",
    "VirtualMedia",
    "Redfish",
    "WebUI",
    "ManagerConsole"
  ],
  "Description": "User Account",
  "Enabled": true,
  "Id": "root",
  "Links": {
    "Role": {
      "@odata.id":
        "/redfish/v1/AccountService/Roles/Administrator"
    }
  },
  "Locked": false,
  "Locked@Redfish.AllowableValues": [
    "false"
  ],
  "Name": "User Account",
  "Oem": {
    "Ami": {
      "@odata.type":
        "#AmiManagerAccount.v1_0_0.ManagerAccount",
      "ChannelPrivileges": [
        {
          "ChannelAccess": true,
          "ChannelId": 1,
          "ChannelPrivilege": "Administrator"
        },
        {
          "ChannelAccess": true,
          "ChannelId": 2,
          "ChannelPrivilege": "Administrator"
        },
        {
          "ChannelAccess": true,
          "ChannelId": 3,
          "ChannelPrivilege": "Administrator"
        }
      ],
      "SMTP": {
        "SMTPMailId": ""
      },
      "SNMP": {
        "SNMPAccessEnableStatus": false
      },
      "WebRoleId": "Administrator"
    }
  },
  "Password": null,
  "PasswordChangeRequired": false,
  "RoleId": "Administrator",
  "StrictAccountTypes": true,
  "UserName": "root"
}
```

3.5 Roles Collection

Get Roles Collection - <http://{{ip}}/redfish/v1/AccountService/Roles/>

```
{
  "@odata.id": "/redfish/v1/AccountService/Roles",
  "@odata.type": "#RoleCollection.RoleCollection",
  "Description": "BMC User Roles",
  "Members": [
    {
      "@odata.id":
        "/redfish/v1/AccountService/Roles/Administrator"
    },
    {
      "@odata.id": "/redfish/v1/AccountService/Roles/Operator"
    },
    {
      "@odata.id": "/redfish/v1/AccountService/Roles/ReadOnly"
    }
  ],
  "Members@odata.count": 3,
  "Name": "Roles Collection"
}
```

3.6 Role Instance

GET Role Instance - <http://{{ip}}/redfish/v1/AccountService/Administrator>

```
{
  "@odata.id": "/redfish/v1/AccountService/Roles/Administrator",
  "@odata.type": "#Role.v1_3_3.Role",
  "AssignedPrivileges": [
    "Login",
    "ConfigureManager",
    "ConfigureUsers",
    "ConfigureSelf",
    "ConfigureComponents"
  ],
  "Description": "Administrator User Role",
  "Id": "Administrator",
  "IsPredefined": true,
  "Name": "User Role",
  "OemPrivileges": [],
  "RoleId": "Administrator"
}
```

3.7 Certificate Instance

Get Certificate Service - <http://{{ip}}/redfish/v1/CertificateService>

```
{
  "@odata.id": "/redfish/v1/CertificateService",
  "@odata.type": "#CertificateService.v1_0_6.CertificateService",
  "Actions": {
    "#CertificateService.GenerateCSR": {
      "target": "/redfish/v1/CertificateService/Actions/CertificateService.GenerateCSR"
    },
    "#CertificateService.ReplaceCertificate": {
      "CertificateType@Redfish.AllowableValues": [
        "PEM",
        "PEMchain"
      ],
      "target": "/redfish/v1/CertificateService/Actions/CertificateService.ReplaceCertificate"
    }
  },
  "CertificateLocations": {
    "@odata.id": "/redfish/v1/CertificateService/CertificateLocations"
  },
  "Description": "Actions available to manage certificates",
  "Id": "CertificateService",
  "Name": "Certificate Service"
}
```

3.8 HTTP Certificate

Get HTTP Certificate - <http://{{ip}}/redfish/v1/Managers/bmc/NetworkProtocol/HTTPS/Certificates/1>

```
{
  "@odata.id":
    "/redfish/v1/Managers/bmc/NetworkProtocol/HTTPS/Certificates/1",
  "@odata.type": "#Certificate.v1_0_0.Certificate",
  "CertificateString": "-----BEGIN CERTIFICATE-----
\nMIICVjCCAdygAwIBAgIEcqURATAKBgghkjjOPQQAjA8MQswCQYDVQGEwJVUzEQ\nMA4GA1UECgwHT3B1bk3NQzEBMBKGA1UEAwwsU1J1T1QtZDZlM3MwYyhzQWVjIzMB4X\n-----END CERTIFICATE-----\n",
  "CertificateType": "PEM",
  "Description": "HTTPS Certificate",
  "Id": "1",
  "Issuer": {
    "CommonName": "AMIOT-d671f2340b21",
    "Country": "US",
    "Organization": "OpenBMC"
  },
  "KeyUsage": [
    "KeyEncipherment",
    "ServerAuthentication"
  ],
  "Name": "HTTPS Certificate",
  "Oem": {
    "Ami": {
      "@odata.id":
        "/redfish/v1/Managers/bmc/NetworkProtocol/HTTPS/Certificates/1",
      "@odata.type": "#AMICertificate.v1_0_0.Ami",
      "CertificateVersion": "3",
      "PublicKey": 384
    }
  },
  "SerialNumber": "72:A5:11:01",
  "SignatureAlgorithm": "ecdsa-with-SHA256",
  "Subject": {
    "CommonName": "AMIOT-d671f2340b21",
    "Country": "US",
    "Organization": "OpenBMC"
  },
  "ValidNotAfter": "2035-12-06T06:52:48+00:00",
  "ValidNotBefore": "2025-12-08T06:52:48+00:00"
}
```

3.9 TrustStore Certificate

```
{
  "@odata.id":
    "/redfish/v1/Managers/bmc/Truststore/Certificates/",
  "@odata.type": "#CertificateCollection.CertificateCollection",
  "Description": "A Collection of TrustStore certificate
instances",
  "Members": [],
  "Members@odata.count": 0,
  "Name": "TrustStore Certificates Collection"
}
```

3.10 Chassis collection

GET Chassis Collection- <http://{{ip}}/redfish/v1/Chassis/>

```
{
  "@odata.id": "/redfish/v1/Chassis",
  "@odata.type": "#ChassisCollection.ChassisCollection",
  "Description": "The Collection for Chassis",
  "Members": [
    {
      "@odata.id": "/redfish/v1/Chassis/APISensor"
    },
    {
      "@odata.id": "/redfish/v1/Chassis/BNC_Baseboard"
    },
    {
      "@odata.id": "/redfish/v1/Chassis/Cpld"
    },
    {
      "@odata.id": "/redfish/v1/Chassis/PLDM_IO_Board"
    }
  ],
  "Members@odata.count": 4,
  "Name": "Chassis Collection"
}
```

3.11 Chassis Instance

GET Chassis Instance - http://{{ip}}/redfish/v1/Chassis/BNC_Baseboard

```
{
  "@odata.id": "/redfish/v1/Chassis/BNC_Baseboard",
  "@odata.type": "#Chassis.v1_26_0.Chassis",
  "Actions": {
    "#Chassis.Reset": {
      "@Redfish.ActionInfo":
        "/redfish/v1/Chassis/BNC_Baseboard/ResetActionInfo",
      "target":
        "/redfish/v1/Chassis/BNC_Baseboard/Actions/Chassis.Reset"
    }
  },
  "AssetTag": ".....",
  "ChassisType": "RackMount",
  "Description": "The Collection of Chassis",
  "EnvironmentMetrics": {
    "@odata.id":
      "/redfish/v1/Chassis/BNC_Baseboard/EnvironmentMetrics"
  },
  "Id": "BNC_Baseboard",
  "Links": {
    "ComputerSystems": [
      {
        "@odata.id": "/redfish/v1/Systems/system"
      }
    ],
    "ManagedBy": [
      {
        "@odata.id": "/redfish/v1/Managers/bmc"
      }
    ]
  },
  "LocationIndicatorActive": false,
  "Manufacturer": "Intel Corporation",
  "MaxPowerWatts": 1600.0,
  "MinPowerWatts": 0.0,
  "Model": "BeechnutCity",
  "Name": "BNC_Baseboard",
  "NetworkAdapters": {
    "@odata.id":
      "/redfish/v1/Chassis/BNC_Baseboard/NetworkAdapters"
  },
}
```

```
  "Oem": {
    "AMI": {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard#Oem/AMI",
      "@odata.type": "#OemAMISensor.v1_0_0.OemAMISensor",
      "FRU": {
        "@odata.id": "/redfish/v1/Chassis/BNC_Baseboard/FRU"
      },
      "SensorThreshold": {
        "@odata.id":
          "/redfish/v1/Chassis/BNC_Baseboard/Sensors/Oem/Threshold",
        "@odata.type": "#OemAMISensor.OemAMISensor"
      }
    },
    "PartNumber": ".....",
    "PowerState": "On",
    "PowerSubsystem": {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/PowerSubsystem"
    },
    "Sensors": {
      "@odata.id": "/redfish/v1/Chassis/BNC_Baseboard/Sensors"
    },
    "SerialNumber": ".....",
    "Status": {
      "State": "Enabled"
    },
    "ThermalSubsystem": {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/ThermalSubsystem"
    }
  }
}
```

3.12 Power

GET Power - http://{{ip}}/redfish/v1/Chassis/AC_Baseboard/Power

```
{
  "@odata.id": "/redfish/v1/Chassis/AC_Baseboard/Power",
  "@odata.type": "#Power.v1_5_2.Power",
  "Id": "Power",
  "Name": "Power",
  "PowerControl": [
    {
      "@odata.id":
        "/redfish/v1/Chassis/AC_Baseboard/Power/PowerControl/0",
      "@odata.type": "#Power.v1_1_0.PowerControl",
      "MemberId": "0",
      "Name": "System Power Control",
      "PowerAllocatedWatts": 0,
      "PowerCapacityWatts": 1600.0,
      "PowerConsumedWatts": 0.0,
      "PowerLimit": {
        "CorrectionInMs": null,
        "LimitException": null,
        "LimitInWatts": null
      },
      "PowerMetrics": {
        "AverageConsumedWatts": 0.0,
        "IntervalInMin": 1,
        "MaxConsumedWatts": 0.0,
        "MinConsumedWatts": 0.0
      },
      "PowerRequestedWatts": 0,
      "RelatedItem": [
        {
          "@odata.id":
            "/redfish/v1/Chassis/AC_Baseboard/Power/PowerControl/Accelerators"
        },
        {
          "@odata.id":
            "/redfish/v1/Chassis/AC_Baseboard/Power/PowerControl/Processors"
        },
        {
          "@odata.id":
            "/redfish/v1/Chassis/AC_Baseboard/Power/PowerControl/Memories"
        }
      ]
    }
  ]
}
```



```

    }
  ],
  "RelatedItem@odata.count": 3,
  "Status": {
    "Health": "OK",
    "State": "Disabled"
  }
},
{
  "@odata.id":
  "/redfish/v1/Chassis/AC_Baseboard/Power/PowerControl/Accelerators",
  "@odata.type": "#Power.v1_1_0.PowerControl",
  "MemberId": "Accelerators",
  "Name": "Accelerators Power Control",
  "PowerAllocatedWatts": 0,
  "PowerCapacityWatts": 32767.0,
  "PowerConsumedWatts": null,
  "PowerLimit": {
    "CorrectionInMs": null,
    "LimitException": null,
    "LimitInWatts": null
  },
  "PowerMetrics": {
    "AverageConsumedWatts": null,
    "IntervalInMin": 0,
    "MaxConsumedWatts": null,
    "MinConsumedWatts": null
  },
  "PowerRequestedWatts": 0,
  "RelatedItem": [],
  "RelatedItem@odata.count": 0,
  "Status": {
    "Health": "OK",
    "State": "Disabled"
  }
}
},

```

```

{
  "@odata.id":
  "/redfish/v1/Chassis/AC_Baseboard/Power/PowerControl/Processors",
  "@odata.type": "#Power.v1_1_0.PowerControl",
  "MemberId": "Processors",
  "Name": "Processors Power Control",
  "PowerAllocatedWatts": 0,
  "PowerCapacityWatts": 32767.0,
  "PowerConsumedWatts": null,
  "PowerLimit": {
    "CorrectionInMs": null,
    "LimitException": null,
    "LimitInWatts": null
  },
  "PowerMetrics": {
    "AverageConsumedWatts": null,
    "IntervalInMin": 0,
    "MaxConsumedWatts": null,
    "MinConsumedWatts": null
  },
  "PowerRequestedWatts": 0,
  "RelatedItem": [],
  "RelatedItem@odata.count": 0,
  "Status": {
    "Health": "OK",
    "State": "Disabled"
  }
},
{
  "@odata.id":
  "/redfish/v1/Chassis/AC_Baseboard/Power/PowerControl/Memories",
  "@odata.type": "#Power.v1_1_0.PowerControl",
  "MemberId": "Memories",
  "Name": "Memories Power Control",
  "PowerAllocatedWatts": 0,
  "PowerCapacityWatts": 32767.0,
  "PowerConsumedWatts": null,
  "PowerLimit": {
    "CorrectionInMs": null,

```

```

        "LimitException": null,
        "LimitInWatts": null
    },
    "PowerMetrics": {
        "AverageConsumedWatts": null,
        "IntervalInMin": 0,
        "MaxConsumedWatts": null,
        "MinConsumedWatts": null
    },
    "PowerRequestedWatts": 0,
    "RelatedItem": [],
    "RelatedItem@odata.count": 0,
    "Status": {
        "Health": "OK",
        "State": "Disabled"
    }
}
],
"PowerSupplies": [
    {
        "@odata.id":
"/redfish/v1/Chassis/AC\_Baseboard/Power#/PowerSupplies/0",
        "Manufacturer": "SOLUM CO., LTD. ",
        "MemberId": "SOLUM_CO_IS162F22_PSU1",
        "Model": "IS162F22",
        "Name": "SOLUM CO IS162F22 PSU1",
        "PartNumber": "G36234-016",
        "PowerInputWatts": 0.0,
        "PowerOutputWatts": 19.1875,
        "SerialNumber": "PSSF162202ACNS1622A4BL3P1132",
        "Status": {
            "Health": "OK",
            "State": "Enabled"
        }
    }
],
"Redundancy": [],
"Voltages": [
    {

```

```

"@odata.id":
"/redfish/v1/Chassis/AC_Baseboard/Power#/Voltages/0",
"@odata.type": "#Power.v1_0_0.Voltage",
"LowerThresholdCritical": 10.616,
"LowerThresholdNonCritical": 10.945,
"MaxReadingRange": 16.03592030488215,
"MemberId": "A_P12V_PSU_SCALED",
"MinReadingRange": 0.0,
"Name": "A P12V PSU SCALED",
"ReadingVolts": null,
"Status": {
  "Health": "OK",
  "State": "Enabled"
},
"UpperThresholdCritical": 13.494,
"UpperThresholdNonCritical": 13.101
},
{
"@odata.id":
"/redfish/v1/Chassis/AC_Baseboard/Power#/Voltages/1",
"@odata.type": "#Power.v1_0_0.Voltage",
"LowerThresholdCritical": 0.966,
"LowerThresholdNonCritical": 0.995,
"MaxReadingRange": 2.51357330085861,
"MemberId": "P105_PCH_AUX",
"MinReadingRange": 0.0,
"Name": "P105 PCH AUX",
"ReadingVolts": 1.0497,
"Status": {
  "Health": "OK",
  "State": "Enabled"
},
"UpperThresholdCritical": 1.139,
"UpperThresholdNonCritical": 1.106
},
{
"@odata.id":
"/redfish/v1/Chassis/AC_Baseboard/Power#/Voltages/2",
"@odata.type": "#Power.v1_0_0.Voltage",

```

```

    "LowerThresholdCritical": 10.616,
    "LowerThresholdNonCritical": 10.945,
    "MaxReadingRange": 16.03592030488215,
    "MemberId": "P12V_AUX",
    "MinReadingRange": 0.0,
    "Name": "P12V AUX",
    "ReadingVolts": 11.6164,
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "UpperThresholdCritical": 13.494,
    "UpperThresholdNonCritical": 13.101
},
{
    "@odata.id":
    "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/3",
    "@odata.type": "#Power.v1_0_0.Voltage",
    "LowerThresholdCritical": 1.648,
    "LowerThresholdNonCritical": 1.699,
    "MaxReadingRange": 2.5422005618134844,
    "MemberId": "P1V8_PCH",
    "MinReadingRange": 0.0,
    "Name": "P1V8 PCH",
    "ReadingVolts": 1.8212,
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "UpperThresholdCritical": 1.961,
    "UpperThresholdNonCritical": 1.904
},
{
    "@odata.id":
    "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/4",
    "@odata.type": "#Power.v1_0_0.Voltage",
    "LowerThresholdCritical": 2.974,
    "LowerThresholdNonCritical": 3.066,
    "MaxReadingRange": 4.382120822007058,

```

```

    "MemberId": "P3V3",
    "MinReadingRange": 0.0,
    "Name": "P3V3",
    "ReadingVolts": null,
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "UpperThresholdCritical": 3.647,
    "UpperThresholdNonCritical": 3.541
},
{
    "@odata.id":
    "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/5",
    "@odata.type": "#Power.v1_0_0.Voltage",
    "LowerThresholdCritical": 2.138,
    "LowerThresholdNonCritical": 2.457,
    "MaxReadingRange": 7.173600872947189,
    "MemberId": "P3VBAT",
    "MinReadingRange": 0.0,
    "Name": "P3VBAT",
    "ReadingVolts": 3.0674,
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "UpperThresholdCritical": 3.296,
    "UpperThresholdNonCritical": 3.263
},
{
    "@odata.id":
    "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/6",
    "@odata.type": "#Power.v1_0_0.Voltage",
    "LowerThresholdCritical": 4.506,
    "LowerThresholdNonCritical": 4.645,
    "MaxReadingRange": 6.672004095174633,
    "MemberId": "P5V",
    "MinReadingRange": 0.0,
    "Name": "P5V",

```

```

    "ReadingVolts": null,
    "Status": {
      "Health": "OK",
      "State": "Enabled"
    },
    "UpperThresholdCritical": 5.525,
    "UpperThresholdNonCritical": 5.365
  },
  {
    "@odata.id":
    "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/7",
    "@odata.type": "#Power.v1_0_0.Voltage",
    "MaxReadingRange": 300.0,
    "MemberId": "PSU1_Input_Voltage",
    "MinReadingRange": 0.0,
    "Name": "PSU1 Input Voltage",
    "ReadingVolts": 226.0,
    "Status": {
      "Health": "OK",
      "State": "Enabled"
    }
  },
  {
    "@odata.id":
    "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/8",
    "@odata.type": "#Power.v1_0_0.Voltage",
    "LowerThresholdCritical": 1.012,
    "LowerThresholdNonCritical": 1.045,
    "MaxReadingRange": 2.5224497695108683,
    "MemberId": "PVCCD_HV_CPU2",
    "MinReadingRange": 0.0,
    "Name": "PVCCD HV CPU2",
    "ReadingVolts": null,
    "Status": {
      "Health": "OK",
      "State": "Enabled"
    }
  },
  "UpperThresholdCritical": 1.231,
  "UpperThresholdNonCritical": 1.197

```



```

{
  "@odata.id":
  "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/9",
  "@odata.type": "#Power.v1_0_0.Voltage",
  "LowerThresholdCritical": 1.104,
  "LowerThresholdNonCritical": 1.138,
  "MaxReadingRange": 1.6320668157236722,
  "MemberId": "PVCCFA_EHV_FIVRA_CPU2",
  "MinReadingRange": 0.0,
  "Name": "PVCCFA EHV FIVRA CPU2",
  "ReadingVolts": null,
  "Status": {
    "Health": "OK",
    "State": "Enabled"
  },
  "UpperThresholdCritical": 1.301,
  "UpperThresholdNonCritical": 1.263
},
{
  "@odata.id":
  "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/10",
  "@odata.type": "#Power.v1_0_0.Voltage",
  "LowerThresholdCritical": 1.376,
  "LowerThresholdNonCritical": 1.418,
  "MaxReadingRange": 2.356045599490942,
  "MemberId": "PVCCIN_CPU2",
  "MinReadingRange": 0.0,
  "Name": "PVCCIN CPU2",
  "ReadingVolts": null,
  "Status": {
    "Health": "OK",
    "State": "Enabled"
  },
  "UpperThresholdCritical": 2.151,
  "UpperThresholdNonCritical": 2.088
},
{
  "@odata.id":
  "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/11",

```

```

    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/11",
      "@odata.type": "#Power.v1_0_0.Voltage",
      "LowerThresholdCritical": 0.729,
      "LowerThresholdNonCritical": 0.752,
      "MaxReadingRange": 2.4140596060291633,
      "MemberId": "PVCCINFAON_CPU2",
      "MinReadingRange": 0.0,
      "Name": "PVCCINFAON CPU2",
      "ReadingVolts": null,
      "Status": {
        "Health": "OK",
        "State": "Enabled"
      },
      "UpperThresholdCritical": 1.29,
      "UpperThresholdNonCritical": 1.255
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/AC\_Baseboard/Power#/Voltages/12",
      "@odata.type": "#Power.v1_0_0.Voltage",
      "LowerThresholdCritical": 0.893,
      "LowerThresholdNonCritical": 0.977,
      "MaxReadingRange": 2.450740129474307,
      "MemberId": "PVNN_PCH_AUX",
      "MinReadingRange": 0.0,
      "Name": "PVNN PCH AUX",
      "ReadingVolts": 1.0264,
      "Status": {
        "Health": "OK",
        "State": "Enabled"
      },
      "UpperThresholdCritical": 1.208,
      "UpperThresholdNonCritical": 1.113
    }
  ]
}

```


3.13 Sensors Collection

GET Sensors Collection - http://{{ip}}/redfish/v1/Chassis/BNC_Baseboard/Sensors

```
{
  "@odata.id": "/redfish/v1/Chassis/BNC_Baseboard/Sensors",
  "@odata.type": "#SensorCollection.SensorCollection",
  "Description": "Collection of Sensors for this Chassis",
  "Members": [
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/acpidevice_ACPI_PSU1"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/acpidevice_ACPI_PSU2"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/acpisystem_ACPI_System_Status"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/airflow_System_Airflow"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/battery_CMOS_Battery"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/bmcfirmwarehealth_BMC_Firmware_Health"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/count_PMT_Socket0_0x22806802_ComputeDie0_AGGREGATE_CORE_CSTATE_RESIDENCY_C0"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/count_PMT_Socket0_0x22806802_ComputeDie0_DIE_CSTATE_RESIDENCY_C1E"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/count_PMT_Socket0_0x22806802_Core0_CSTATE_RESIDENCY_C0"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/count_PMT_Socket0_0x22806802_Core0_CSTATE_RESIDENCY_C1"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/count_PMT_Socket0_0x22806802_Core10_CSTATE_RESIDENCY_C0"
    }
  ],
}
```

```
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/voltage_PVCCFA_EHV_FIVRA_CPU0"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/voltage_PVCCINFAON_CPU0"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/voltage_PVCCIN_CPU0"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/voltage_PVNN_MAIN_CPU0"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/watchdog_Watchdog2"
    }
  ],
  "Members@odata.count": 309,
  "Name": "Sensors",
  "Oem": {
    "Ami": {
      "Threshold": {
        "@odata.id":
          "/redfish/v1/Chassis/BNC_Baseboard/Sensors/Oem/Threshold"
      }
    }
  }
}
```

3.14 Sensor Instance

GET Sensor Instance - http://{{ip}}/redfish/v1/Chassis/BNC_Baseboard/Sensors/airflow_System_Airflows

```
{
  "@odata.id":
    "/redfish/v1/Chassis/BNC_Baseboard/Sensors/voltage_PVCCFA_EHV_FIVRA_CPU0",
},
{
  "@odata.id":
    "/redfish/v1/Chassis/BNC_Baseboard/Sensors/voltage_PVCCINFAON_CPU0",
},
{
  "@odata.id":
    "/redfish/v1/Chassis/BNC_Baseboard/Sensors/voltage_PVCCIN_CPU0",
},
{
  "@odata.id":
    "/redfish/v1/Chassis/BNC_Baseboard/Sensors/voltage_PVNN_MAIN_CPU0",
},
{
  "@odata.id":
    "/redfish/v1/Chassis/BNC_Baseboard/Sensors/watchdog_Watchdog2",
}
],
"Members@odata.count": 309,
"Name": "Sensors",
"Oem": {
  "Ami": {
    "Threshold": {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/Oem/Threshold"
    }
  }
}
}
```

3.15 Thermal Subsystem

GETThermal - http://{{ip}}/redfish/v1/Chassis/BNC_Baseboard/ThermalSubsystem

```
{
  "@odata.id":
  "/redfish/v1/Chassis/BNC_Baseboard/ThermalSubsystem",
  "@odata.type": "#ThermalSubsystem.v1_3_3.ThermalSubsystem",
  "Description": "The Collection of Thermal Subsystem",
  "FanRedundancy": [
    {
      "MaxSupportedInGroup": 12,
      "MinNeededInGroup": 1,
      "RedundancyGroup": [
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_1"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_2"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_3"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_4"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_5"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_6"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_7"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_8"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_9"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_10"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_11"
        },
        {
          "@odata.id":
          "/redfish/v1/Chassis/BNC\_Baseboard/ThermalSubsystem/Fans/Fan\_12"
        }
      ]
    }
  ]
}
```

```
{
  "@odata.id":
    "redfish/v1/Chassis/BNC_Baseboard/ThermalSubsystem/Fans/Fan_11"
},
{
  "@odata.id":
    "redfish/v1/Chassis/BNC_Baseboard/ThermalSubsystem/Fans/Fan_12"
}
],
"RedundancyType": "NPlusM",
"Status": {
  "Health": "OK",
  "State": "Enabled"
}
}
},
"Fans": {
  "@odata.id":
    "redfish/v1/Chassis/BNC_Baseboard/ThermalSubsystem/Fans"
},
"Id": "ThermalSubsystem",
"Name": "Thermal Subsystem",
"Status": {
  "Health": "OK",
  "State": "Enabled"
}
},
"ThermalMetrics": {
  "@odata.id":
    "redfish/v1/Chassis/BNC_Baseboard/ThermalSubsystem/ThermalMetrics"
}
}
```

3.16 Event Service

GET Event Service - <http://{{ip}}/redfish/v1/EventService/>

```
{
  "@odata.id": "/redfish/v1/EventService",
  "@odata.type": "#EventService.v1_10_3.EventService",
  "Actions": {
    "#EventService.SubmitTestEvent": {
      "@Redfish.ActionInfo": {
        "/redfish/v1/EventService/SubmitTestEventActionInfo",
        "target":
          "/redfish/v1/EventService/Actions/EventService.SubmitTestEvent"
      }
    }
  },
  "DeliveryRetryAttempts": 3,
  "DeliveryRetryIntervalSeconds": 60,
  "Description": "Event Service",
  "EventFormatTypes": [
    "Event",
    "MetricReport"
  ],
  "Id": "EventService",
  "Name": "Event Service",
  "Oem": {
    "OpenBmc": {
      "SMTP": {
        "@odata.type": "#AMIEventService.SMTP",
        "PrimaryConfiguration": {
          "@odata.type":
            "#AMIEventService.PrimaryConfiguration",
          "Actions": {
            "#AMIEventService.PrimaryConfiguration": {
              "target":
                "/redfish/v1/EventService/Actions/Oem/Ami/SMTP.PrimarySSLCertificateUpload"
            }
          }
        },
        "Authentication": false,
        "Enable": false,
        "Host": "",
        "Password": "",
        "Port": 25,
        "Recipient": [
          "",
          "",
          "",
          ""
        ],
        "Sender": "",
        "TLSEnable": false,
        "UserName": "",
        "isCACERTEExist": false,
        "isServerCRTEExist": false,
        "isServerKeyExist": false
      }
    }
  }
},
```

```

        "SecondaryConfiguration": {
            "@odata.type":
            "#AMIEventService.SecondaryConfiguration",
            "Actions": {
                "#AMIEventService.SecondaryConfiguration": {
                    "target":
                    "/redfish/v1/EventService/Actions/Oem/Ami/SMTP.SecondarySSLCertificateUpload"
                }
            },
            "Authentication": false,
            "Enable": false,
            "Host": "",
            "Password": "",
            "Port": 25,
            "Recipient": [
                "",
                "",
                "",
                ""
            ],
            "Sender": "",
            "TLSEnable": false,
            "UserName": "",
            "isCACERTExist": false,
            "isServerCRTExist": false,
            "isServerKeyExist": false
        }
    },
    "RegistryPrefixes": [
        "Base",
        "OpenBMC",
        "TaskEvent",
        "HeartbeatEvent"
    ],
    "ResourceTypes": [
        "Task",
        "Heartbeat"
    ],
    "SSEFilterPropertiesSupported": {
        "EventFormatType": true,
        "MessageId": true,
        "MetricReportDefinition": true,
        "OriginResource": false,
        "RegistryPrefix": true,
        "ResourceType": false
    },

```

```

        "ServerSentEventUri": "/redfish/v1/EventService/SSE",
        "ServiceEnabled": true,
        "Status": {
            "State": "Enabled"
        },
        "Subscriptions": {
            "@odata.id": "/redfish/v1/EventService/Subscriptions"
        }
    }
}

```

3.17 Json Schemas

GET Json Schemas - <http://{{ip}}/redfish/v1/JsonSchemas/>

```
{
  "@odata.id": "/redfish/v1/JsonSchemas",
  "@odata.type":
  "#JsonSchemaFileCollection.JsonSchemaFileCollection",
  "Description": "Collection of JsonSchemaFiles",
  "Members": [
    {
      "@odata.id": "/redfish/v1/JsonSchemas/AMIAccountService"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/AMIAAtScaleDebug"
    },
    {
      "@odata.id":
      "/redfish/v1/JsonSchemas/AMIAutonomousCrashDump"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/AMICertificate"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/AMICHassisFRU"
    },
    {
      "@odata.id":
      "/redfish/v1/JsonSchemas/AMICHassisFRUCollection"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/AMIEventService"
    },
    {
      "@odata.id":
      "/redfish/v1/JsonSchemas/AMIEExternalAccountProvider"
    },
    {
      "@odata.id":
      "/redfish/v1/JsonSchemas/AMINVMemIController"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/AMINVMemIDrive"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/AMINVMemIPort"
    },
    {
      "@odata.id":
      "/redfish/v1/JsonSchemas/AMIResetToDefaults"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/AMISensor"
    }
  ],
}
```

```

    {
      "@odata.id":
        "/redfish/v1/JsonSchemas/TriggersCollection"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/USBController"
    },
    {
      "@odata.id":
        "/redfish/v1/JsonSchemas/USBControllerCollection"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/UpdateService"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/VirtualMedia"
    },
    {
      "@odata.id":
        "/redfish/v1/JsonSchemas/VirtualMediaCollection"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/Volume"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/VolumeCollection"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/odata-v4"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/odata"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/redfish-error"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/redfish-payload-
        annotations"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/redfish-schema-v1"
    },
    {
      "@odata.id": "/redfish/v1/JsonSchemas/redfish-schema"
    }
  ],
  "Members@odata.count": 214,
  "Name": "JsonSchemaFile Collection"
}

```


3.18 Manager Collection

GET Manager Collection - <http://{{ip}}/redfish/v1/Managers/>

```
{
  "@odata.context": "/redfish/v1/$metadata#ManagerCollection.ManagerCollection",
  "@odata.id": "/redfish/v1/Managers",
  "@odata.type": "#ManagerCollection.ManagerCollection",
  "Members": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "Members@odata.count": 1,
  "Name": "Manager Collection"
}
```


3.19 Manager Instance

GET Manager Instance - <http://{{ip}}/redfish/v1/Managers/bmc/>

```
{
  "@odata.id": "/redfish/v1/Managers/bmc",
  "@odata.type": "#Manager.v1_20_0.Manager",
  "Actions": {
    "#Manager.Reset": {
      "@Redfish.ActionInfo":
        "/redfish/v1/Managers/bmc/ResetActionInfo",
      "target":
        "/redfish/v1/Managers/bmc/Actions/Manager.Reset"
    },
    "#Manager.ResetToDefaults": {
      "@Redfish.ActionInfo":
        "/redfish/v1/Managers/bmc/ResetActionInfo",
      "target":
        "/redfish/v1/Managers/bmc/Actions/Manager.ResetToDefaults"
    }
  },
  "CommandShell": {
    "ConnectTypesSupported": [
      "SSH",
      "IPMI"
    ],
    "MaxConcurrentSessions": 1,
    "ServiceEnabled": true
  },
  "DateTime": "2025-12-08T09:40:33Z",
  "Description": "Baseboard Management Controller",
  "EthernetInterfaces": {
    "@odata.id": "/redfish/v1/Managers/bmc/EthernetInterfaces"
  },
  "FirmwareVersion": "onetree-3.0-251121-105-g78362d-7aa755d",
  "Id": "bmc",
  "LastResetTime": "2025-12-08T08:37:17+00:00",
  "Links": {
    "ActiveSoftwareImage": {
      "@odata.id":
        "/redfish/v1/UpdateService/FirmwareInventory/bmc_active"
    },
    "ManagerForChassis": [
      {
        "@odata.id": "/redfish/v1/Chassis/BNC_Baseboard"
      }
    ],
    "ManagerForChassis@odata.count": 1,
    "ManagerForServers": [
      {
        "@odata.id": "/redfish/v1/Systems/system"
      }
    ],
    "ManagerForServers@odata.count": 1,
    "ManagerInChassis": {
      "@odata.id": "/redfish/v1/Chassis/BNC_Baseboard"
    }
  },
}
```

```

    "SoftwareImages": [
      {
        "@odata.id":
          "/redfish/v1/UpdateService/FirmwareInventory/bmc\_active"
      }
    ],
    "SoftwareImages@odata.count": 1
  },
  "LocationIndicatorActive": false,
  "LogServices": {
    "@odata.id": "/redfish/v1/Managers/bmc/LogServices"
  },
  "ManagerDiagnosticData": {
    "@odata.id":
      "/redfish/v1/Managers/bmc/ManagerDiagnosticData"
  },
  "ManagerType": "BMC",
  "Model": "OpenBmc",
  "Name": "OpenBmc Manager",
  "NetworkProtocol": {
    "@odata.id": "/redfish/v1/Managers/bmc/NetworkProtocol"
  },
  "Oem": {
    "@odata.id": "/redfish/v1/Managers/bmc#/Oem",
    "Intel": {
      "@odata.id": "/redfish/v1/Managers/bmc#/Oem/Intel",
      "@odata.type": "#OpenBMCManager.v1_0_0.Intel",
      "NodeManager": {
        "@odata.id":
          "/redfish/v1/Managers/bmc/Oem/Intel/NodeManager"
      }
    },
    "OpenBmc": {
      "@odata.id": "/redfish/v1/Managers/bmc#/Oem/OpenBmc/",
      "@odata.type": "#OpenBMCManager.v1_0_0.Manager",
      "Certificates": {
        "@odata.id":
          "/redfish/v1/Managers/bmc/Truststore/Certificates"
      },
      "Fan": {
        "@odata.id":
          "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan",
        "@odata.type": "#OpenBMCManager.v1_0_0.Manager.Fan",
        "FanControllers": {
          "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers",
          "@odata.type":
            "#OpenBMCManager.v1_0_0.Manager.FanControllers",
          "Fan_11_12": {
            "@odata.id":
              "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers/Fan\_11\_12",
            "@odata.type":
              "#OpenBMCManager.v1_0_0.Manager.FanController",
            "FFGainCoefficient": 1.0,

```

```

        "FFOffCoefficient": 0.0,
        "ICoefficient": 0.0,
        "ILimitMax": 0.0,
        "ILimitMin": 0.0,
        "Inputs": [
            "Fan 11",
            "Fan 12"
        ],
        "NegativeHysteresis": 2.0,
        "OutLimitMax": 100.0,
        "OutLimitMin": 30.0,
        "Outputs": [
            "Pwm_11_12"
        ],
        "PCoefficient": 0.0,
        "PositiveHysteresis": 0.0,
        "SlewNeg": 0.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
                "@odata.type":
                    "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    },
    "Fan_1_2": {
        "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers/Fan\_1\_2",
        "@odata.type":
            "#OpenBMCManager.v1_0_0.Manager.FanController",
        "FFGainCoefficient": 1.0,
        "FFOffCoefficient": 0.0,
        "ICoefficient": 0.0,
        "ILimitMax": 0.0,
        "ILimitMin": 0.0,
        "Inputs": [
            "Fan 1",
            "Fan 2"
        ],
        "NegativeHysteresis": 2.0,
        "OutLimitMax": 100.0,
        "OutLimitMin": 30.0,
        "Outputs": [
            "Pwm_1_2"
        ],
        "PCoefficient": 0.0,
        "PositiveHysteresis": 0.0,
        "SlewNeg": 0.0,
        "SlewPos": 0.0,

```

```

    "Zones": [
      {
        "@odata.id":
          "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
        "@odata.type":
          "#OpenBMCManager.v1_0_0.FanZone"
      }
    ]
  },
  "Fan_3_4": {
    "@odata.id":
      "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers/Fan\_3\_4",
    "@odata.type":
      "#OpenBMCManager.v1_0_0.Manager.FanController",
    "FFGainCoefficient": 1.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": 0.0,
    "ILimitMax": 0.0,
    "ILimitMin": 0.0,
    "Inputs": [
      "Fan 3",
      "Fan 4"
    ],
    "NegativeHysteresis": 2.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 30.0,
    "Outputs": [
      "Pwm_3_4"
    ],
    "PCoefficient": 0.0,
    "PositiveHysteresis": 0.0,
    "SlewNeg": 0.0,
    "SlewPos": 0.0,
    "Zones": [
      {
        "@odata.id":
          "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
        "@odata.type":
          "#OpenBMCManager.v1_0_0.FanZone"
      }
    ]
  },
  "Fan_5_6": {
    "@odata.id":
      "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers/Fan\_5\_6",
    "@odata.type":
      "#OpenBMCManager.v1_0_0.Manager.FanController",
    "FFGainCoefficient": 1.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": 0.0,
    "ILimitMax": 0.0,
    "ILimitMin": 0.0,
    "Inputs": [
      "Fan 5",
      "Fan 6"
    ],
  },

```

```

        "NegativeHysteresis": 2.0,
        "OutLimitMax": 100.0,
        "OutLimitMin": 30.0,
        "Outputs": [
            "Pwm_5_6"
        ],
        "PCoefficient": 0.0,
        "PositiveHysteresis": 0.0,
        "SlewNeg": 0.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
                "@odata.type":
                    "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    },
    "Fan_7_8": {
        "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers/Fan\_7\_8",
        "@odata.type":
            "#OpenBMCManager.v1_0_0.Manager.FanController",
        "FFGainCoefficient": 1.0,
        "FFOffCoefficient": 0.0,
        "ICoefficient": 0.0,
        "ILimitMax": 0.0,
        "ILimitMin": 0.0,
        "Inputs": [
            "Fan 7",
            "Fan 8"
        ],
        "NegativeHysteresis": 2.0,
        "OutLimitMax": 100.0,
        "OutLimitMin": 30.0,
        "Outputs": [
            "Pwm_7_8"
        ],
        "PCoefficient": 0.0,
        "PositiveHysteresis": 0.0,
        "SlewNeg": 0.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
                "@odata.type":
                    "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    },
},

```

```

"Fan_9_10": {
  "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers/Fan_9_10",
  "@odata.type":
    "#OpenBMCManager.v1_0_0.Manager.FanController",
  "FFGainCoefficient": 1.0,
  "FFOffCoefficient": 0.0,
  "ICoefficient": 0.0,
  "ILimitMax": 0.0,
  "ILimitMin": 0.0,
  "Inputs": [
    "Fan 9",
    "Fan 10"
  ],
  "NegativeHysteresis": 2.0,
  "OutLimitMax": 100.0,
  "OutLimitMin": 30.0,
  "Outputs": [
    "Pwm_9_10"
  ],
  "PCoefficient": 0.0,
  "PositiveHysteresis": 0.0,
  "SlewNeg": 0.0,
  "SlewPos": 0.0,
  "Zones": [
    {
      "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
      "@odata.type":
        "#OpenBMCManager.v1_0_0.FanZone"
    }
  ]
},
"PSU1_Fan_1": {
  "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers/PSU1_Fan_1",
  "@odata.type":
    "#OpenBMCManager.v1_0_0.Manager.FanController",
  "FFGainCoefficient": 1.0,
  "FFOffCoefficient": 0.0,
  "ICoefficient": 0.0,
  "ILimitMax": 0.0,
  "ILimitMin": 0.0,
  "Inputs": [
    "PSU1 Fan Speed 1"
  ],
  "NegativeHysteresis": 2.0,
  "OutLimitMax": 100.0,
  "OutLimitMin": 40.0,
  "Outputs": [
    "Pwm PSU1 Fan 1"
  ],
  "PCoefficient": 0.0,
  "PositiveHysteresis": 0.0,
  "SlewNeg": 0.0,
  "SlewPos": 0.0,

```



```

    "Zones": [
      {
        "@odata.id":
          "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/PSU",
        "@odata.type":
          "#OpenBMCManager.v1_0_0.FanZone"
      }
    ]
  },
  "PSU1_Fan_2": {
    "@odata.id":
      "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers/PSU1\_Fan\_2",
    "@odata.type":
      "#OpenBMCManager.v1_0_0.Manager.FanController",
    "FFGainCoefficient": 1.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": 0.0,
    "ILimitMax": 0.0,
    "ILimitMin": 0.0,
    "Inputs": [
      "PSU1 Fan Speed 2"
    ],
    "NegativeHysteresis": 2.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 40.0,
    "Outputs": [
      "Pwm PSU1 Fan 2"
    ],
    "PCoefficient": 0.0,
    "PositiveHysteresis": 0.0,
    "SlewNeg": 0.0,
    "SlewPos": 0.0,
    "Zones": [
      {
        "@odata.id":
          "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/PSU",
        "@odata.type":
          "#OpenBMCManager.v1_0_0.FanZone"
      }
    ]
  },
  "PSU2_Fan_1": {
    "@odata.id":
      "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers/PSU2\_Fan\_1",
    "@odata.type":
      "#OpenBMCManager.v1_0_0.Manager.FanController",
    "FFGainCoefficient": 1.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": 0.0,
    "ILimitMax": 0.0,
    "ILimitMin": 0.0,
    "Inputs": [
      "PSU2 Fan Speed 1"
    ],
    "NegativeHysteresis": 2.0,
    "OutLimitMax": 100.0,

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        "OutLimitMin": 40.0,
        "Outputs": [
            "Pwm PSU2 Fan 1"
        ],
        "PCoefficient": 0.0,
        "PositiveHysteresis": 0.0,
        "SlewNeg": 0.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/PSU",
                "@odata.type":
                "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    },
    "PSU2_Fan_2": {
        "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanControllers/PSU2\_Fan\_2",
        "@odata.type":
        "#OpenBMCManager.v1_0_0.Manager.FanController",
        "FFGainCoefficient": 1.0,
        "FFOffCoefficient": 0.0,
        "ICoefficient": 0.0,
        "ILimitMax": 0.0,
        "ILimitMin": 0.0,
        "Inputs": [
            "PSU2 Fan Speed 2"
        ],
        "NegativeHysteresis": 2.0,
        "OutLimitMax": 100.0,
        "OutLimitMin": 40.0,
        "Outputs": [
            "Pwm PSU2 Fan 2"
        ],
        "PCoefficient": 0.0,
        "PositiveHysteresis": 0.0,
        "SlewNeg": 0.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/PSU",
                "@odata.type":
                "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    }
},
"FanZones": {
    "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones",
    "@odata.type":
    "#OpenBMCManager.v1_0_0.Manager.FanZones",

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"Left": {
  "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
  "@odata.type":
    "#OpenBMCManager.v1_0_0.FanZone",
  "Chassis": {
    "@odata.id":
      "/redfish/v1/Chassis/APISensor"
  },
  "FailSafePercent": 100.0,
  "MinThermalOutput": 40.0
},
"PSU": {
  "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/PSU",
  "@odata.type":
    "#OpenBMCManager.v1_0_0.FanZone",
  "FailSafePercent": 100.0,
  "MinThermalOutput": 40.0
},
"Right": {
  "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
  "@odata.type":
    "#OpenBMCManager.v1_0_0.FanZone",
  "Chassis": {
    "@odata.id":
      "/redfish/v1/Chassis/APISensor"
  },
  "FailSafePercent": 100.0,
  "MinThermalOutput": 40.0
}
},
"PidControllers": {
  "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers",
  "@odata.type":
    "#OpenBMCManager.v1_0_0.Manager.PidControllers",
  "BMC_Temp": {
    "@odata.id":
      "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/BMC_Temp",
    "@odata.type":
      "#OpenBMCManager.v1_0_0.Manager.PidController",
    "FFGainCoefficient": 0.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": -1.0,
    "ILimitMax": 100.0,
    "ILimitMin": 30.0,
    "Inputs": [
      "BMC Temp"
    ],
    "NegativeHysteresis": 5.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 30.0,
    "PCoefficient": -0.15,
    "PositiveHysteresis": 0.0,

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    "SetPoint": 80.0,
    "SlewNeg": -1.0,
    "SlewPos": 0.0,
    "Zones": [
      {
        "@odata.id":
          "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
        "@odata.type":
          "#OpenBMCManager.v1_0_0.FanZone"
      }
    ]
  },
  "CPU1_DIMM_AF": {
    "@odata.id":
      "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/CPU1\_DIMM\_AF",
    "@odata.type":
      "#OpenBMCManager.v1_0_0.Manager.PidController",
    "FFGainCoefficient": 0.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": -1.0,
    "ILimitMax": 100.0,
    "ILimitMin": 30.0,
    "Inputs": [
      "DIMM [ABCDEFGH]\d+ CPU1"
    ],
    "NegativeHysteresis": 5.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 30.0,
    "PCoefficient": -0.15,
    "PositiveHysteresis": 0.0,
    "SetPoint": 60.0,
    "SlewNeg": -1.0,
    "SlewPos": 0.0,
    "Zones": [
      {
        "@odata.id":
          "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
        "@odata.type":
          "#OpenBMCManager.v1_0_0.FanZone"
      }
    ]
  },
  "CPU1_DIMM_GL": {
    "@odata.id":
      "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/CPU1\_DIMM\_GL",
    "@odata.type":
      "#OpenBMCManager.v1_0_0.Manager.PidController",
    "FFGainCoefficient": 0.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": -1.0,
    "ILimitMax": 100.0,
    "ILimitMin": 30.0,
    "Inputs": [
      "DIMM [GHIJKL]\d+ CPU1"
    ],
    "NegativeHysteresis": 5.0,

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        "OutLimitMax": 100.0,
        "OutLimitMin": 30.0,
        "PCoefficient": -0.15,
        "PositiveHysteresis": 0.0,
        "SetPoint": 60.0,
        "SlewNeg": -1.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
                "@odata.type":
                "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    },
    "CPU1_VR": {
        "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/CPU1\_VR",
        "@odata.type":
        "#OpenBMCManager.v1_0_0.Manager.PidController",
        "FFGainCoefficient": 0.0,
        "FFOffCoefficient": 0.0,
        "ICoefficient": -1.0,
        "ILimitMax": 100.0,
        "ILimitMin": 30.0,
        "Inputs": [
            "CPU1 PVCCA EHV Temperature",
            "CPU1 PVCCD0 Temperature",
            "CPU1 VCCIN Temperature",
            "CPU1 PVCCFA EHV FIVRA Temperature"
        ],
        "NegativeHysteresis": 5.0,
        "OutLimitMax": 100.0,
        "OutLimitMin": 30.0,
        "PCoefficient": -0.15,
        "PositiveHysteresis": 0.0,
        "SetPoint": 80.0,
        "SlewNeg": -1.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
                "@odata.type":
                "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    },
    "CPU2_DIMM_AF": {
        "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/CPU2\_DIMM\_AF",
        "@odata.type":
        "#OpenBMCManager.v1_0_0.Manager.PidController",
        "FFGainCoefficient": 0.0,
        "FFOffCoefficient": 0.0,

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        "ICoefficient": -1.0,
        "ILimitMax": 100.0,
        "ILimitMin": 30.0,
        "Inputs": [
            "DIMM [ABCDEF]\d+ CPU2"
        ],
        "NegativeHysteresis": 5.0,
        "OutLimitMax": 100.0,
        "OutLimitMin": 30.0,
        "PCoefficient": -0.15,
        "PositiveHysteresis": 0.0,
        "SetPoint": 60.0,
        "SlewNeg": -1.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
                "@odata.type":
                    "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    },
    "CPU2_DIMM_GL": {
        "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/CPU2\_DIMM\_GL",
        "@odata.type":
            "#OpenBMCManager.v1_0_0.Manager.PidController",
        "FFGainCoefficient": 0.0,
        "FFOffCoefficient": 0.0,
        "ICoefficient": -1.0,
        "ILimitMax": 100.0,
        "ILimitMin": 30.0,
        "Inputs": [
            "DIMM [GHIJKL]\d+ CPU2"
        ],
        "NegativeHysteresis": 5.0,
        "OutLimitMax": 100.0,
        "OutLimitMin": 30.0,
        "PCoefficient": -0.15,
        "PositiveHysteresis": 0.0,
        "SetPoint": 60.0,
        "SlewNeg": -1.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
                "@odata.type":
                    "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    },
    "CPU2_VR": {
        "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/CPU2\_VR",

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"@odata.type":
"#OpenBMCManager.v1_0_0.Manager.PidController",
"FFGainCoefficient": 0.0,
"FFOffCoefficient": 0.0,
"ICoefficient": -1.0,
"ILimitMax": 100.0,
"ILimitMin": 30.0,
"Inputs": [
    "CPU2 PVCCA EHV Temperature",
    "CPU2 PVCCD0 Temperature",
    "CPU2 VCCIN Temperature",
    "CPU2 PVCCFA EHV FIVRA Temperature"
],
"NegativeHysteresis": 5.0,
"OutLimitMax": 100.0,
"OutLimitMin": 30.0,
"PCoefficient": -0.15,
"PositiveHysteresis": 0.0,
"SetPoint": 80.0,
"SlewNeg": -1.0,
"SlewPos": 0.0,
"Zones": [
    {
        "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
        "@odata.type":
        "#OpenBMCManager.v1_0_0.FanZone"
    }
]
},
"DTS_CPU1": {
    "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/DTS\_CPU1",
    "@odata.type":
    "#OpenBMCManager.v1_0_0.Manager.PidController",
    "FFGainCoefficient": 0.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": -0.2,
    "ILimitMax": 100.0,
    "ILimitMin": 30.0,
    "Inputs": [
        "DTS CPU1"
    ],
    "NegativeHysteresis": 5.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 30.0,
    "PCoefficient": -0.1,
    "PositiveHysteresis": 0.0,
    "SetPoint": -15.0,
    "SetPointOffset":
    "UpperThresholdNonCritical",
    "SlewNeg": -1.0,
    "SlewPos": 0.0,

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    "Zones": [
      {
        "@odata.id":
          "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
        "@odata.type":
          "#OpenBMCManager.v1_0_0.FanZone"
      }
    ]
  },
  "DTS_CPU2": {
    "@odata.id":
      "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/DTS\_CPU2",
    "@odata.type":
      "#OpenBMCManager.v1_0_0.Manager.PidController",
    "FFGainCoefficient": 0.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": -0.4,
    "ILimitMax": 100.0,
    "ILimitMin": 30.0,
    "Inputs": [
      "DTS_CPU2"
    ],
    "NegativeHysteresis": 5.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 30.0,
    "PCoefficient": -0.15,
    "PositiveHysteresis": 0.0,
    "SetPoint": -15.0,
    "SetPointOffset":
      "UpperThresholdNonCritical",
    "SlewNeg": -1.0,
    "SlewPos": 0.0,
    "Zones": [
      {
        "@odata.id":
          "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
        "@odata.type":
          "#OpenBMCManager.v1_0_0.FanZone"
      }
    ]
  },
  "Left_DIMM_Bank_Temp": {
    "@odata.id":
      "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/Left\_DIMM\_Bank\_Temp",
    "@odata.type":
      "#OpenBMCManager.v1_0_0.Manager.PidController",
    "FFGainCoefficient": 0.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": -1.0,
    "ILimitMax": 100.0,
    "ILimitMin": 30.0,
    "Inputs": [
      "Left DIMM Bank Temp"
    ],
    "NegativeHysteresis": 5.0,
    "OutLimitMax": 100.0,

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        "OutLimitMin": 30.0,
        "PCoefficient": -0.15,
        "PositiveHysteresis": 0.0,
        "SetPoint": 80.0,
        "SlewNeg": -1.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
                "@odata.type":
                    "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    },
    "Left_Mid_Board_Temp": {
        "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/Left\_Mid\_Board\_Temp",
        "@odata.type":
            "#OpenBMCManager.v1_0_0.Manager.PidController",
        "FFGainCoefficient": 0.0,
        "FFOffCoefficient": 0.0,
        "ICoefficient": -1.0,
        "ILimitMax": 100.0,
        "ILimitMin": 30.0,
        "Inputs": [
            "Left Mid Board Temp"
        ],
        "NegativeHysteresis": 5.0,
        "OutLimitMax": 100.0,
        "OutLimitMin": 30.0,
        "PCoefficient": -0.15,
        "PositiveHysteresis": 0.0,
        "SetPoint": 55.0,
        "SlewNeg": -1.0,
        "SlewPos": 0.0,
        "Zones": [
            {
                "@odata.id":
                    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
                "@odata.type":
                    "#OpenBMCManager.v1_0_0.FanZone"
            }
        ]
    },
    "Left_Rear_Board_Temp": {
        "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/Left\_Rear\_Board\_Temp",
        "@odata.type":
            "#OpenBMCManager.v1_0_0.Manager.PidController",
        "FFGainCoefficient": 0.0,
        "FFOffCoefficient": 0.0,
        "ICoefficient": -1.0,
        "ILimitMax": 100.0,
        "ILimitMin": 30.0,
        "Inputs": [

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        "Left Rear Board Temp"
    ],
    "NegativeHysteresis": 5.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 30.0,
    "PCoefficient": -0.15,
    "PositiveHysteresis": 0.0,
    "SetPoint": 60.0,
    "SlewNeg": -1.0,
    "SlewPos": 0.0,
    "Zones": [
        {
            "@odata.id":
                "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
            "@odata.type":
                "#OpenBMCMManager.v1_0_0.FanZone"
        }
    ]
},
"PSU1_Temperature": {
    "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/PSU1\_Temperature",
    "@odata.type":
        "#OpenBMCMManager.v1_0_0.Manager.PidController",
    "FFGainCoefficient": 0.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": -4.64,
    "ILimitMax": 100.0,
    "ILimitMin": 30.0,
    "Inputs": [
        "PSU1 Temperature"
    ],
    "NegativeHysteresis": 5.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 40.0,
    "PCoefficient": -0.15,
    "PositiveHysteresis": 0.0,
    "SetPoint": 50.0,
    "SlewNeg": -1.0,
    "SlewPos": 0.0,
    "Zones": [
        {
            "@odata.id":
                "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/PSU",
            "@odata.type":
                "#OpenBMCMManager.v1_0_0.FanZone"
        }
    ]
},
"PSU2_Temperature": {
    "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/PSU2\_Temperature",
    "@odata.type":
        "#OpenBMCMManager.v1_0_0.Manager.PidController",
    "FFGainCoefficient": 0.0,
    "FFOffCoefficient": 0.0,

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    "ICoefficient": -4.64,
    "ILimitMax": 100.0,
    "ILimitMin": 30.0,
    "Inputs": [
        "PSU2 Temperature"
    ],
    "NegativeHysteresis": 5.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 40.0,
    "PCoefficient": -0.15,
    "PositiveHysteresis": 0.0,
    "SetPoint": 50.0,
    "SlewNeg": -1.0,
    "SlewPos": 0.0,
    "Zones": [
        {
            "@odata.id":
                "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/PSU",
            "@odata.type":
                "#OpenBMCManager.v1_0_0.FanZone"
        }
    ]
},
"Right_DIMM_Bank_Temp": {
    "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/Right\_DIMM\_Bank\_Temp",
    "@odata.type":
        "#OpenBMCManager.v1_0_0.Manager.PidController",
    "FFGainCoefficient": 0.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": -1.0,
    "ILimitMax": 100.0,
    "ILimitMin": 30.0,
    "Inputs": [
        "Right DIMM Bank Temp"
    ],
    "NegativeHysteresis": 5.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 30.0,
    "PCoefficient": -0.15,
    "PositiveHysteresis": 0.0,
    "SetPoint": 80.0,
    "SlewNeg": -1.0,
    "SlewPos": 0.0,
    "Zones": [
        {
            "@odata.id":
                "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
            "@odata.type":
                "#OpenBMCManager.v1_0_0.FanZone"
        }
    ]
},
"Right_Mid_Board_Temp": {
    "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/Right\_Mid\_Board\_Temp",

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"@odata.type":
"#OpenBMCManager.v1_0_0.Manager.PidController",
"FFGainCoefficient": 0.0,
"FFOffCoefficient": 0.0,
"ICoefficient": -1.0,
"ILimitMax": 100.0,
"ILimitMin": 30.0,
"Inputs": [
    "Right Mid Board Temp"
],
"NegativeHysteresis": 5.0,
"OutLimitMax": 100.0,
"OutLimitMin": 30.0,
"PCoefficient": -0.15,
"PositiveHysteresis": 0.0,
"SetPoint": 55.0,
"SlewNeg": -1.0,
"SlewPos": 0.0,
"Zones": [
    {
        "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
        "@odata.type":
        "#OpenBMCManager.v1_0_0.FanZone"
    }
]
},
"Right_Rear_Board_Temp": {
    "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/PidControllers/Right\_Rear\_Board\_Temp",
    "@odata.type":
    "#OpenBMCManager.v1_0_0.Manager.PidController",
    "FFGainCoefficient": 0.0,
    "FFOffCoefficient": 0.0,
    "ICoefficient": -1.0,
    "ILimitMax": 100.0,
    "ILimitMin": 30.0,
    "Inputs": [
        "Right Rear Board Temp"
    ],
    "NegativeHysteresis": 5.0,
    "OutLimitMax": 100.0,
    "OutLimitMin": 30.0,
    "PCoefficient": -0.15,
    "PositiveHysteresis": 0.0,
    "SetPoint": 60.0,
    "SlewNeg": -1.0,
    "SlewPos": 0.0,
    "Zones": [
        {
            "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
            "@odata.type":
            "#OpenBMCManager.v1_0_0.FanZone"
        }
    ]
}
]

```

```

    },
    "Profile": "Performance",
    "Profile@Redfish.AllowableValues": [
        "Acoustic",
        "Performance",
        "LiquidColdPlate"
    ],
    "StepwiseControllers": {
        "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/StepwiseControllers",
        "@odata.type":
            "#OpenBMCManager.v1_0_0.Manager.StepwiseControllers",
        "Front_Panel_LCC": {
            "@odata.id":
                "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/StepwiseControllers/Front_Panel_LCC",
            "@odata.type":
                "#OpenBMCManager.v1_0_0.Manager.StepwiseController",
            "Direction": "Floor",
            "Inputs": [
                "Inlet BRD Temp"
            ],
            "NegativeHysteresis": 2.0,
            "PositiveHysteresis": 0.0,
            "Steps": [
                {
                    "Output": 30.0,
                    "Target": 20.0
                },
                {
                    "Output": 38.0,
                    "Target": 22.0
                },
                {
                    "Output": 48.0,
                    "Target": 25.0
                },
                {
                    "Output": 55.0,
                    "Target": 27.0
                },
                {
                    "Output": 60.0,
                    "Target": 30.0
                },
                {
                    "Output": 90.0,
                    "Target": 35.0
                },
                {
                    "Output": 100.0,
                    "Target": 40.0
                }
            ],
            "Zones": [
                {

```

```

        "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
        "@odata.type":
        "#OpenBMCManager.v1_0_0.FanZone"
    },
    {
        "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
        "@odata.type":
        "#OpenBMCManager.v1_0_0.FanZone"
    }
]
},
"Left_Riser_LCC": {
    "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/StepwiseControllers/Left\_Riser\_LCC",
    "@odata.type":
    "#OpenBMCManager.v1_0_0.Manager.StepwiseController",
    "Direction": "Floor",
    "Inputs": [
        "Left Riser Temp"
    ],
    "NegativeHysteresis": 2.0,
    "PositiveHysteresis": 0.0,
    "Steps": [
        {
            "Output": 40.0,
            "Target": 40.0
        },
        {
            "Output": 55.0,
            "Target": 45.0
        },
        {
            "Output": 68.0,
            "Target": 50.0
        },
        {
            "Output": 80.0,
            "Target": 55.0
        },
        {
            "Output": 90.0,
            "Target": 60.0
        },
        {
            "Output": 100.0,
            "Target": 65.0
        }
    ],
    "Zones": [
        {
            "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Left",
            "@odata.type":
            "#OpenBMCManager.v1_0_0.FanZone"
        }
    ]
}

```

```

    }
  ]
},
"PSU2_LCC": {
  "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/StepwiseControllers/PSU2\_LCC",
  "@odata.type":
    "#OpenBMCManager.v1_0_0.Manager.StepwiseController",
  "Direction": "Floor",
  "Inputs": [
    "PSU2 Temperature"
  ],
  "NegativeHysteresis": 2.0,
  "PositiveHysteresis": 0.0,
  "Steps": [
    {
      "Output": 40.0,
      "Target": 30.0
    },
    {
      "Output": 100.0,
      "Target": 65.0
    }
  ],
  "Zones": [
    {
      "@odata.id":
        "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/PSU",
      "@odata.type":
        "#OpenBMCManager.v1_0_0.FanZone"
    }
  ]
},
"Right_Riser_LCC": {
  "@odata.id":
    "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/StepwiseControllers/Right\_Riser\_LCC",
  "@odata.type":
    "#OpenBMCManager.v1_0_0.Manager.StepwiseController",
  "Direction": "Floor",
  "Inputs": [
    "Right Riser Temp"
  ],
  "NegativeHysteresis": 2.0,
  "PositiveHysteresis": 0.0,
  "Steps": [
    {
      "Output": 40.0,
      "Target": 40.0
    },
    {
      "Output": 55.0,
      "Target": 45.0
    },
    {
      "Output": 68.0,
      "Target": 50.0
    }
  ]
}

```

```

    },
    {
        "Output": 80.0,
        "Target": 55.0
    },
    {
        "Output": 90.0,
        "Target": 60.0
    },
    {
        "Output": 100.0,
        "Target": 65.0
    }
],
"Zones": [
    {
        "@odata.id":
            "/redfish/v1/Managers/bmc#/Oem/OpenBmc/Fan/FanZones/Right",
        "@odata.type":
            "#OpenBMCManager.v1_0_0.FanZone"
    }
]
}
},
"Jpeg": {
    "@odata.id":
        "/redfish/v1/Managers/bmc/Oem/OpenBmc/Jpeg_"
}
},
"PowerState": "On",
"SecurityPolicy": {
    "@odata.id": "/redfish/v1/Managers/bmc/SecurityPolicy"
},
"SerialInterfaces": {
    "@odata.id": "/redfish/v1/Managers/bmc/SerialInterfaces"
},
"ServiceEntryPointUUID": "dc7413f9-3e60-5e41-abb-47b899ec2331",
"Status": {
    "Health": "OK",
    "State": "Enabled"
},
"TimeZoneName": "UTC",
"UUID": "30f80299-f9a0-41d0-aa8c-d4a62701516b",
"VirtualMedia": {
    "@odata.id": "/redfish/v1/Managers/bmc/VirtualMedia"
}
}
}

```

Note: Fixed time zone configuration patch operation <https://git.ami.com/megarac/osp-team/oe2.3/-/issues/1135>

3.20 Ethernet Interfaces Collection

GET Ethernet Interfaces Collection - <http://{{ip}}/redfish/v1/Managers/bmc/EthernetInterfaces/>

```
{
  "@odata.id": "/redfish/v1/Managers/bmc/EthernetInterfaces",
  "@odata.type":
    "#EthernetInterfaceCollection.EthernetInterfaceCollection",
  "Description": "Collection of EthernetInterfaces for this
Manager",
  "Members": [
    {
      "@odata.id":
        "/redfish/v1/Managers/bmc/EthernetInterfaces/eth0"
    },
    {
      "@odata.id":
        "/redfish/v1/Managers/bmc/EthernetInterfaces/hostusb0"
    }
  ],
  "Members@odata.count": 2,
  "Name": "Ethernet Network Interface Collection"
}
```

3.21 Ethernet Interface Instance

GET Ethernet Interface - <http://{{ip}}/redfish/v1/Managers/bmc/EthernetInterfaces/eth0/>

```
{
  "@odata.id":
  "/redfish/v1/Managers/bmc/EthernetInterfaces/eth0",
  "@odata.type": "#EthernetInterface.v1_12_3.EthernetInterface",
  "DHCPv4": {
    "DHCPEnabled": true,
    "UseDNSServers": true,
    "UseDomainName": true,
    "UseNTPServers": true
  },
  "DHCPv6": {
    "OperatingMode": "Enabled",
    "UseDNSServers": true,
    "UseDomainName": true,
    "UseNTPServers": true
  },
  "Description": "Management Network Interface",
  "EthernetInterfaceType": "Physical",
  "FQDN": "AMIOT-d671f2340b21.in.megatrends.com",
  "HostName": "AMIOT-d671f2340b21",
  "IPv4Addresses": [
    {
      "Address": "10.0.97.38",
      "AddressOrigin": "DHCP",
      "Gateway": "10.0.96.1",
      "SubnetMask": "255.255.224.0"
    }
  ],
  "IPv4StaticAddresses": [],
  "IPv6AddressPolicyTable": [],
  "IPv6Addresses": [
    {
      "Address": "fe80::207:e9ff:fe34:a1f0",
      "AddressOrigin": "LinkLocal",
      "PrefixLength": 64
    },
    {
      "Address": "2001:b021:abcd:0:207:e9ff:fe34:a1f0",
      "AddressOrigin": "SLAAC",
      "PrefixLength": 64
    },
    {
      "Address": "5001:df27:df28:df29:207:e9ff:fe34:a1f0",
      "AddressOrigin": "SLAAC",
      "PrefixLength": 64
    }
  ]
},
```



```
"IPv6DefaultGateway": "fe80::849:43b0:2a2f:dc3e",
"IPv6StaticAddresses": [],
"IPv6StaticDefaultGateways": [],
"Id": "eth0",
"InterfaceEnabled": true,
"LinkStatus": "LinkUp",
"MACAddress": "00:07:e9:34:a1:f0",
"MTUSize": 1500,
"Name": "Manager Ethernet Interface",
"NameServers": [
  "10.0.0.31",
  "10.0.0.32"
],
"SpeedMbps": 1000,
"StatelessAddressAutoConfig": {
  "IPv6AutoConfigEnabled": true
},
"StaticNameServers": [],
"Status": {
  "State": "Enabled"
}
}
```

3.22 Log Services Collection

GET Log Service Collection - <http://{{ip}}/redfish/v1/Managers/bmc/LogServices/>

```
{
  "@odata.id": "/redfish/v1/Managers/bmc/LogServices",
  "@odata.type": "#LogServiceCollection.LogServiceCollection",
  "Description": "Collection of LogServices for this Manager",
  "Members": [
    {
      "@odata.id":
        "/redfish/v1/Managers/bmc/LogServices/Journal"
    },
    {
      "@odata.id": "/redfish/v1/Managers/bmc/LogServices/SEL"
    },
    {
      "@odata.id": "/redfish/v1/Managers/bmc/LogServices/Dump"
    },
    {
      "@odata.id":
        "/redfish/v1/Managers/bmc/LogServices/FaultLog_"
    }
  ],
  "Members@odata.count": 4,
  "Name": "Open BMC Log Services Collection"
}
```

3.23 Network Protocol

GET Network Protocol - <http://{{ip}}/redfish/v1/Managers/bmc/NetworkProtocol/>

```
{
  "@odata.id": "/redfish/v1/Managers/bmc/NetworkProtocol",
  "@odata.type":
    "#ManagerNetworkProtocol.v1_10_1.ManagerNetworkProtocol",
  "Description": "Manager Network Service",
  "FQDN": "AMIOT-d671f2340b21.in.megatrends.com",
  "HTTP": {
    "Port": null,
    "ProtocolEnabled": false
  },
  "HTTPS": {
    "Certificates": {
      "@odata.id":
        "/redfish/v1/Managers/bmc/NetworkProtocol/HTTPS/Certificates"
    },
    "Port": 443,
    "ProtocolEnabled": true
  },
  "HostName": "AMIOT-d671f2340b21",
  "IPMI": {
    "Port": 623,
    "ProtocolEnabled": true
  },
  "Id": "NetworkProtocol",
  "NTP": {
    "NTPServers": [
      "in.pool.ntp.org"
    ],
    "NetworkSuppliedServers": [],
    "ProtocolEnabled": true
  },
  "Name": "Manager Network Protocol",
  "Oem": {
    "Ami": {
      "@odata.type":
        "#AmiManagerNetworkProtocol.v1_0_0.ManagerNetworkProtocol",
      "AvailableChannelList": [
        {
          "ChannelId": 1,
          "ChannelName": "eth1"
        },
        {
          "ChannelId": 2,
          "ChannelName": "hostusb0"
        },
        {
          "ChannelId": 3,
          "ChannelName": "eth0"
        }
      ],
      "DefaultChannel": {
        "ChannelId": 1,
        "ChannelName": "eth1"
      }
    }
  }
}
```

```

        "HTTPS": {
            "Masked": false,
            "Running": true
        },
        "IPMB": {
            "Masked": false,
            "ProtocolEnabled": true,
            "Running": true
        },
        "IPMI": {
            "Masked": false,
            "Running": true
        },
        "SNMP": {
            "CommunityStrings": [
                null
            ]
        },
        "SSH": {
            "Masked": false,
            "Running": true
        }
    },
    "SNMP": {
        "CommunityStrings": [
            null
        ],
        "EnableSNMPv1": true,
        "EnableSNMPv2c": true,
        "EnableSNMPv3": true,
        "Port": 161,
        "ProtocolEnabled": true
    },
    "SSH": {
        "Port": 22,
        "ProtocolEnabled": true
    },
    "Status": {
        "Health": "OK",
        "HealthRollup": "OK",
        "State": "Enabled"
    }
}

```

3.24 VirtualMedia Collection

GET VirtualMedia Collection - <http://{{ip}}/redfish/v1/Managers/bmc/VirtualMedia>

```
{
  "@odata.id": "/redfish/v1/Managers/bmc/VirtualMedia",
  "@odata.type":
    "#VirtualMediaCollection.VirtualMediaCollection",
  "Members": [
    {
      "@odata.id":
        "/redfish/v1/Managers/bmc/VirtualMedia/Slot_3"
    },
    {
      "@odata.id":
        "/redfish/v1/Managers/bmc/VirtualMedia/Slot_2"
    },
    {
      "@odata.id":
        "/redfish/v1/Managers/bmc/VirtualMedia/Slot_1"
    },
    {
      "@odata.id":
        "/redfish/v1/Managers/bmc/VirtualMedia/Slot_0"
    }
  ],
  "Members@odata.count": 4,
  "Name": "Virtual Media Services"
}
```

3.25 VirtualMedia Instance

GET VirtualMedia Instance - http://{{ip}}/redfish/v1/Managers/bmc/VirtualMedia/Slot_0

```
{
  "@odata.id": "/redfish/v1/Managers/bmc/VirtualMedia/Slot_0",
  "@odata.type": "#VirtualMedia.v1_6_4.VirtualMedia",
  "Actions": {
    "#VirtualMedia.EjectMedia": {
      "target":
        "/redfish/v1/Managers/bmc/VirtualMedia/Slot_0/Actions/VirtualMedia.EjectMedia"
    }
  },
  "ConnectedVia": "NotConnected",
  "Description": "Virtual Removable Media",
  "Id": "Slot_0",
  "Inserted": false,
  "MediaTypes": [
    "CD",
    "USBStick"
  ],
  "Name": "Virtual Removable Media",
  "Oem": {
    "Ami": {
      "@odata.id":
        "/redfish/v1/Managers/bmc/VirtualMedia/Slot_0/Oem/Ami",
      "@odata.type": "#AmiVirtualMedia.v1_0_0.AmiVirtualMedia"
    },
    "OpenBMC": {
      "@odata.id":
        "/redfish/v1/Managers/bmc/VirtualMedia/Slot_0/Oem/OpenBMC",
      "@odata.type":
        "#OpenBMCVirtualMedia.v1_0_0.VirtualMedia",
      "WebSocketEndpoint": "/nbd/0"
    }
  },
  "TransferMethod": "Stream",
  "TransferProtocolType": "OEM",
  "WriteProtected": true
}
```

3.26 CUPS Service

GET CupsService Collection - <http://{{ip}}/redfish/v1/Oem/Intel/CupsService>

```
{
  "@odata.id": "/redfish/v1/Oem/Intel/CupsService",
  "@odata.type": "#CupsService.v1_0_0.CupsService",
  "AveragingPeriod": "PT3.000S",
  "CupsSensors": {
    "@odata.id": "/redfish/v1/Oem/Intel/CupsService/Sensors"
  },
  "Description": "Cups Service",
  "DynamicLoadFactors": {
    "CoreLoadFactor": 5.936417381024637,
    "IioLoadFactor": 53.344474966880696,
    "MemoryLoadFactor": 40.719107652094664
  },
  "Id": "CupsService",
  "Interval": "PT1.000S",
  "LoadFactorConfiguration": "Dynamic",
  "Name": "Cups Service",
  "StaticLoadFactors": {
    "CoreLoadFactor": 33.3,
    "IioLoadFactor": 33.3,
    "MemoryLoadFactor": 33.4
  },
  "Status": {
    "State": "Enabled"
  }
}
```

3.27 CUPS Service Instance

GET Virtual Media Instance - [http:// {{ip}} /redfish/v1/Oem/Intel/CupsService/Sensors](http://{{ip}}/redfish/v1/Oem/Intel/CupsService/Sensors)

```
{
  "@odata.id": "/redfish/v1/Oem/Intel/CupsService/Sensors",
  "@odata.type": "#CupsSensorCollection.CupsSensorCollection",
  "Description": "Cups Sensor Collection",
  "Members": [
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/utilization_AverageCupsIndex"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/utilization_AverageHostMemoryBandwidthUtilization"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/utilization_AverageHostPciBandwidthUtilization"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/utilization_AverageHostCpuUtilization"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/utilization_CupsIndex"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/utilization_HostMemoryBandwidthUtilization"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/utilization_HostPciBandwidthUtilization"
    },
    {
      "@odata.id":
        "/redfish/v1/Chassis/BNC_Baseboard/Sensors/utilization_HostCpuUtilization"
    }
  ],
  "Members@odata.count": 8,
  "Name": "Cups Sensor Collection"
}
```


3.28 PefService Collection

```
{
  "@odata.id": "/redfish/v1/PefService",
  "@odata.type": "#PefService.v1_0_0.PefService",
  "Actions": {
    "#PefService.SendAlertMail": {
      "target":
        "/redfish/v1/PefService/Actions/PefService.SendAlertMail"
    },
    "#PefService.SendAlertSNMPTrap": {
      "target":
        "/redfish/v1/PefService/Actions/PefService.SendAlertSNMPTrap"
    }
  },
  "Description": "Pef Service Collections",
  "DestinationType": "SMTP",
  "DestinationType@Redfish.AllowableValues": [
    "SnmpTrap",
    "SMTP",
    "Both"
  ],
  "FilterEnable": [
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0
  ],
  "Id": "Pef Service",
  "Members": [
    {
      "@odata.id": "/redfish/v1/PefService/Entry1"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry10"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry11"
    }
  ]
}
```

```

    {
      "@odata.id": "/redfish/v1/PefService/Entry34"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry35"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry36"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry37"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry38"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry39"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry4"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry40"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry5"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry6"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry7"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry8"
    },
    {
      "@odata.id": "/redfish/v1/PefService/Entry9"
    }
  ],
  "Members@odata.count": 40,
  "Name": "Pef Service",
  "PEFActionGblControl": 1
}

```

3.29 Message Registry Collection

GET Message Registry Collection - [http:// {{ip}} /redfish/v1/Registries/](http://{{ip}}/redfish/v1/Registries/)

```
{
  "@odata.id": "/redfish/v1/Registries",
  "@odata.type": "#MessageRegistryFileCollection.MessageRegistryFileCollection",
  "Description": "Collection of MessageRegistryFiles",
  "Members": [
    {
      "@odata.id": "/redfish/v1/Registries/Base"
    },
    {
      "@odata.id": "/redfish/v1/Registries/TaskEvent"
    },
    {
      "@odata.id": "/redfish/v1/Registries/License"
    },
    {
      "@odata.id": "/redfish/v1/Registries/NodeManager"
    },
    {
      "@odata.id": "/redfish/v1/Registries/ResourceEvent"
    },
    {
      "@odata.id": "/redfish/v1/Registries/OpenBMC"
    },
    {
      "@odata.id": "/redfish/v1/Registries/Telemetry"
    },
    {
      "@odata.id": "/redfish/v1/Registries/PrivilegeRegistry"
    },
    {
      "@odata.id": "/redfish/v1/Registries/HeartbeatEvent"
    },
    {
      "@odata.id": "/redfish/v1/Registries/CertificateService"
    }
  ],
  "Members@odata.count": 10,
  "Name": "MessageRegistryFile Collection"
}
```

3.30 Message Registry Instance

GET Message Registry Instance - [http:// {{ip}} /redfish/v1/Registries/TaskEvent](http://{{ip}}/redfish/v1/Registries/TaskEvent)

```
{
  "@odata.id": "/redfish/v1/Registries/TaskEvent",
  "@odata.type": "#MessageRegistryFile.v1_1_5.MessageRegistryFile",
  "Description": "DMTF TaskEvent Message Registry File Location",
  "Id": "TaskEvent",
  "Languages": [
    "en"
  ],
  "Languages@odata.count": 1,
  "Location": [
    {
      "Language": "en",
      "Uri": "/redfish/v1/Registries/TaskEvent.1.0.3.json"
    }
  ],
  "Location@odata.count": 1,
  "Name": "TaskEvent Message Registry File",
  "Registry": "TaskEvent.1.0"
}
```

3.31 Message Registry

GET Message Registry - [http:// {{ip}} /redfish/v1/Registries/TaskEvent 1.0.3.json](http://{{ip}}/redfish/v1/Registries/TaskEvent 1.0.3.json)

```
{
  "@Redfish.Copyright": "Copyright 2014-2020 DMTF in cooperation
with the Storage Networking Industry Association (SNIA). All
rights reserved.",
  "@odata.type": "#MessageRegistry.v1_6_3.MessageRegistry",
  "Description": "This registry defines the messages for task
related events.",
  "Id": "TaskEvent.1.0.3",
  "Language": "en",
  "Messages": {
    "TaskAborted": {
      "Description": "A task has completed with errors.",
      "Message": "The task with Id '%1' has completed with
errors.",
      "MessageSeverity": "Critical",
      "NumberOfArgs": 1,
      "ParamTypes": [
        "string"
      ],
      "Resolution": "None.",
      "Severity": "Critical"
    },
    "TaskCancelled": {
      "Description": "A task has been cancelled.",
      "Message": "Work on the task with Id '%1' has been
halted prior to completion due to an explicit request.",
      "MessageSeverity": "Warning",
      "NumberOfArgs": 1,
      "ParamTypes": [
        "string"
      ],
      "Resolution": "None.",
      "Severity": "Warning"
    },
    "TaskCompletedOK": {
      "Description": "A task has completed.",
      "Message": "The task with Id '%1' has completed.",
      "MessageSeverity": "OK",
      "NumberOfArgs": 1,
      "ParamTypes": [
        "string"
      ],
      "Resolution": "None.",
      "Severity": "OK"
    }
  }
}
```

3.32 Session Service Collection

GET Session Service Collection - <http://{{ip}}/redfish/v1/SessionService/>

```
{
  "@odata.id": "/redfish/v1/SessionService",
  "@odata.type": "#SessionService.v1_2_0.SessionService",
  "Description": "Session Service",
  "Id": "SessionService",
  "Name": "Session Service",
  "Oem": {
    "Ami": {
      "@odata.id": "/redfish/v1/SessionService#/Oem/Ami",
      "@odata.type": "#AMISessionService.v1_0_0.Ami",
      "BMCwebPort": 443,
      "KVMPort": 5900,
      "KVMSessionTimeout": 900,
      "KvmMaxSession": 2,
      "RedfishMaxSession": 20,
      "SshMaxSession": 5,
      "VmMaxSession": 4,
      "WebMaxSession": 20
    }
  },
  "ServiceEnabled": true,
  "SessionTimeout": 300,
  "Sessions": {
    "@odata.id": "/redfish/v1/SessionService/Sessions"
  }
}
```

3.33 Sessions Instance

GET Sessions Instance - <http://{{ip}}/redfish/v1/SessionService/Sessions/seyJ7kVLiz>

```
{
  "@odata.id": "/redfish/v1/SessionService/Sessions",
  "@odata.type": "#SessionCollection.SessionCollection",
  "Description": "Session Collection",
  "Members": [
    {
      "@odata.id":
        "/redfish/v1/SessionService/Sessions/session_16"
    },
    {
      "@odata.id":
        "/redfish/v1/SessionService/Sessions/session_13"
    }
  ],
  "Members@odata.count": 2,
  "Name": "Session Collection"
}
```

3.34 Systems Collection

GET System Collection - <http://{{i}}/redfish/v1/Systems>

```
{
  "@odata.id": "/redfish/v1/Systems",
  "@odata.type":
    "#ComputerSystemCollection.ComputerSystemCollection",
  "Members": [
    {
      "@odata.id": "/redfish/v1/Systems/system"
    }
  ],
  "Members@odata.count": 1,
  "Name": "Computer System Collection"
}
```


3.35 System Instance

GET System Instance - [http:// {{ip}} /redfish/v1/Systems/system](http://{{ip}}/redfish/v1/Systems/system)

```
{
  "@odata.id": "/redfish/v1/Systems/system",
  "@odata.type": "#ComputerSystem.v1_23_1.ComputerSystem",
  "Actions": {
    "#ComputerSystem.Reset": {
      "@Redfish.ActionInfo":
        "/redfish/v1/Systems/system/ResetActionInfo",
      "target":
        "/redfish/v1/Systems/system/Actions/ComputerSystem.Reset"
    }
  },
  "AssetTag": ".....",
  "Bios": {
    "@odata.id": "/redfish/v1/Systems/system/Bios"
  },
  "BiosVersion": "NA",
  "Boot": {
    "AutomaticRetryConfig": "Disabled",
    "AutomaticRetryConfig@Redfish.AllowableValues": [
      "Disabled",
      "RetryAttempts"
    ],
    "BootSourceOverrideEnabled": "Disabled",
    "BootSourceOverrideMode": "UEFI",
    "BootSourceOverrideMode@Redfish.AllowableValues": [
      "Legacy",
      "UEFI"
    ],
    "BootSourceOverrideTarget": "None",
    "BootSourceOverrideTarget@Redfish.AllowableValues": [
      "None",
      "Pxe",
      "Hdd",
      "Cd",
      "BiosSetup",
      "Usb",
      "UefiHttp",
      "Diags"
    ],
    "StopBootOnFault": "Never",
    "TrustedModuleRequiredToBoot": "Disabled",
    "TrustedModuleRequiredToBoot@Redfish.AllowableValues": [
      "Required",
      "Disabled"
    ]
  },
  "BootProgress": {
    "Oem": {
      "Intel": {
        "@odata.type":
          "#OpenBMCComputerSystem.v1_0_0.Intel",
        "CpldErr": "No error",
        "CpldLastState": "ST_PLT_ON"
      }
    }
  }
}
```

```

    },
    "Description": "Computer System",
    "FabricAdapters": {
      "@odata.id": "/redfish/v1/Systems/system/FabricAdapters"
    },
    "GraphicalConsole": {
      "ConnectTypesSupported": [
        "KVMIP"
      ],
      "MaxConcurrentSessions": 1,
      "ServiceEnabled": true
    },
    "HostWatchdogTimer": {
      "FunctionEnabled": false,
      "Status": {
        "State": "Enabled"
      },
      "TimeoutAction": "ResetSystem",
      "TimeoutAction@Redfish.AllowableValues": [
        "None",
        "ResetSystem",
        "PowerCycle",
        "PowerDown",
        "OEM"
      ]
    },
    "Id": "system",
    "LastResetTime": "2025-12-08T08:38:40+00:00",
    "Links": {
      "Chassis": [
        {
          "@odata.id": "/redfish/v1/Chassis/BNC\_Baseboard"
        }
      ],
      "ManagedBy": [
        {
          "@odata.id": "/redfish/v1/Managers/bmc"
        }
      ]
    },
    "LocationIndicatorActive": false,
    "LogServices": {
      "@odata.id": "/redfish/v1/Systems/system/LogServices"
    },
    "Manufacturer": "Intel Corporation",
    "Memory": {
      "@odata.id": "/redfish/v1/Systems/system/Memory"
    },
    "MemorySummary": {
      "TotalSystemMemoryGiB": 0.0
    },
    "Model": "BeechnutCity",
    "Name": "system",
    "NetworkInterfaces": {
      "@odata.id": "/redfish/v1/Systems/system/NetworkInterfaces"
    },

```

```

"Oem": {
  "Ami": {
    "@odata.type":
      "#AmiManagerNetworkProtocol.v1_0_0.AmiManagerNetworkProtocol",
    "GraphicalConsole": {
      "Masked": false
    },
    "PhysicalLED": {
      "@odata.type":
        "#OpenBMCComputerSystem.v1_0_0.PhysicalLED",
      "AmberLED": "Blinking",
      "BlueLED": "Off",
      "GreenLED": "Off"
    },
    "SerialConsole": {
      "IPMI": {
        "Masked": false
      },
      "SSH": {
        "Masked": false,
        "Running": true
      }
    },
    "VirtualMediaConfig": {
      "Masked": false
    }
  },
  "OpenBmc": {
    "@odata.type": "#OpenBMCComputerSystem.v1_0_0.OpenBmc",
    "FirmwareProvisioning": {
      "@odata.type":
        "#OpenBMCComputerSystem.FirmwareProvisioning",
      "ProvisioningStatus": "NotProvisioned"
    }
  }
},
"PCIeDevices": [],
"PCIeDevices@odata.count": 0,
"PartNumber": ".....",
"PowerRestorePolicy": "AlwaysOff",
"PowerState": "On",
"ProcessorSummary": {
  "Count": 0
},
"Processors": {
  "@odata.id": "/redfish/v1/Systems/system/Processors"
},
"SerialConsole": {
  "IPMI": {
    "ServiceEnabled": true
  },
  "MaxConcurrentSessions": 1,
  "SSH": {
    "HotKeySequenceDisplay": "Press ~. to exit console",
    "Port": 2200,
    "ServiceEnabled": true
  }
}

```

```
    }  
  },  
  "SerialNumber": ".....",  
  "Status": {  
    "Health": "OK",  
    "State": "Enabled"  
  },  
  "Storage": {  
    "@odata.id": "/redfish/v1/Systems/system/Storage"  
  },  
  "SystemType": "Physical",  
  "VirtualMediaConfig": {  
    "ServiceEnabled": true  
  }  
}
```

Note: Fixed Set BootSourceOverrideTarget as 'Diags' and In ipmi get bootparam returns error.
<https://git.ami.com/megarac/osp-team/oe2.3/-/issues/98>

3.36 Storage Collection

GET Storage Collection - <http://{{ip}}/redfish/v1/Systems/System/Storage/>

```
{
  "@odata.id": "/redfish/v1/Systems/system/Storage",
  "@odata.type": "#StorageCollection.StorageCollection",
  "Members": [
    {
      "@odata.id": "/redfish/v1/Systems/system/Storage/1"
    }
  ],
  "Members@odata.count": 1,
  "Name": "Storage Collection"
}
```

3.37 Storage Instance

GET Storage Instance - <http://{{ip}}/redfish/v1/Systems/System/Storage/1/>

```
{
  "@odata.id": "/redfish/v1/Systems/system/Storage/1",
  "@odata.type": "#Storage.v1_18_0.Storage",
  "Controllers": {
    "@odata.id":
      "/redfish/v1/Systems/system/Storage/1/Controllers"
  },
  "Drives": [],
  "Drives@odata.count": 0,
  "Id": "1",
  "Name": "Storage",
  "Status": {
    "State": "Enabled"
  }
}
```

3.38 Task Service

GET Task Service - <http://{{ip}}/redfish/v1/TaskService/>

```
{
  "@odata.id": "/redfish/v1/TaskService",
  "@odata.type": "#TaskService.v1_2_1.TaskService",
  "CompletedTaskOverWritePolicy": "Oldest",
  "DateTime": "2025-12-08T11:07:52+00:00",
  "Description": "Task Collection",
  "Id": "TaskService",
  "LifecycleEventOnTaskStateChange": true,
  "Name": "Task Service",
  "ServiceEnabled": true,
  "Status": {
    "State": "Enabled"
  },
  "Tasks": {
    "@odata.id": "/redfish/v1/TaskService/Tasks"
  }
}
```

1. Task will be kept with task status as completed. And it will be erased once bmc is rebooted.
2. If Task status is not completed (e.g. aborted, internal process failed), task will be kept by providing respective task status and will be erased once bmc is rebooted.
3. After generation of a task irrespective of its progress, if the bmc got rebooted all the tasks will be erased from task collection. And not able to show in collection once bmc is up.

3.39 Update Service

GET Update Service - <http://{{ip}}/redfish/v1/UpdateService/>

```
{
  "@odata.id": "/redfish/v1/UpdateService",
  "@odata.type": "#UpdateService.v1_15_0.UpdateService",
  "Description": "Service for Software Update",
  "FirmwareInventory": {
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
  },
  "HttpPushUri": "/redfish/v1/UpdateService/update",
  "HttpPushUriOptions": {
    "HttpPushUriApplyTime": {
      "ApplyTime": "Immediate",
      "ApplyTime@Redfish.AllowableValues": [
        "Immediate",
        "OnReset",
        "AtMaintenanceWindowStart",
        "InMaintenanceWindowOnReset"
      ],
      "MaintenanceWindowDurationInSeconds": 0,
      "MaintenanceWindowStartTime": "1970-01-01T00:00:00+00:00"
    }
  },
  "HttpPushUriTargets": [],
  "HttpPushUriTargetsBusy": false,
  "Id": "UpdateService",
  "MaxImageSizeBytes": 135266304,
  "MultipartHttpPushUri": "/redfish/v1/UpdateService/update",
  "Name": "Update Service",
```

```
    "Oem": {
      "Ami": {
        "@odata.type": "#AMiUpdateService.v1_0_0.Ami",
        "PreserveConfiguration": {
          "AUTHENTICATION": false,
          "Boot_Override": false,
          "EXTLOG": false,
          "FRU": false,
          "IPMI": false,
          "KVM": false,
          "NETWORK": false,
          "NTP": false,
          "REDFISH": false,
          "SDR": false,
          "SEL": false,
          "SMTP": false,
          "SNMP": false,
          "SOL": false,
          "SYSLOG": false,
          "ServiceManager": false,
          "U_BOOT_ENV": true
        }
      },
      "ApplyOptions": {
        "@odata.type": "#OemUpdateService.ApplyOptions",
        "ClearConfig": false
      }
    },
    "ServiceEnabled": true
  }
```


3.40 Firmware Inventory Collection

GET Firmware Inventory Collection - <http://{{ip}}/redfish/v1/UpdateService/FirmwareInventory/>

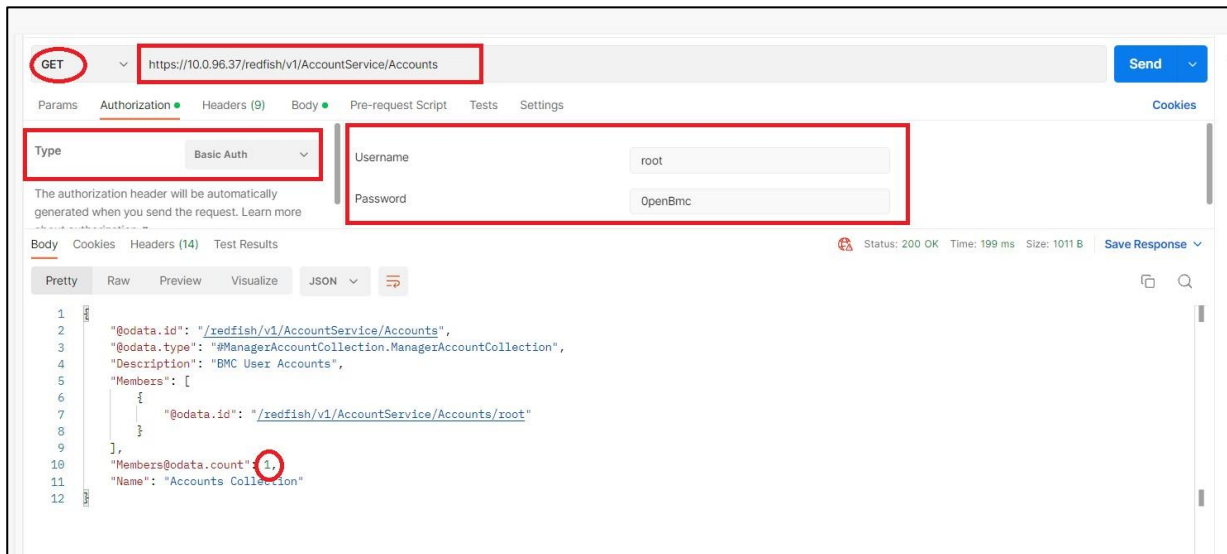
```
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory",
  "@odata.type": "#SoftwareInventoryCollection.SoftwareInventoryCollection",
  "Description": "Software Inventory Collection",
  "Members": [
    {
      "@odata.id":
        "/redfish/v1/UpdateService/FirmwareInventory/CPU_cpId"
    },
    {
      "@odata.id":
        "/redfish/v1/UpdateService/FirmwareInventory/DEBUG_cpId"
    },
    {
      "@odata.id":
        "/redfish/v1/UpdateService/FirmwareInventory/SCM_cpId"
    },
    {
      "@odata.id":
        "/redfish/v1/UpdateService/FirmwareInventory/bios_active"
    },
    {
      "@odata.id":
        "/redfish/v1/UpdateService/FirmwareInventory/bmc_active"
    },
    {
      "@odata.id":
        "/redfish/v1/UpdateService/FirmwareInventory/rot_fw_active"
    }
  ],
  "Members@odata.count": 6,
  "Name": "Software Inventory Collection"
}
```

3.41 TelemetryService Collection

```
{
  "@odata.id": "/redfish/v1/TelemetryService",
  "@odata.type": "#TelemetryService.v1_3_4.TelemetryService",
  "Description": "TelemetryService",
  "Id": "TelemetryService",
  "LogService": {
    "@odata.id": "/redfish/v1/Managers/bmc/LogServices/Journal"
  },
  "MaxReports": 10,
  "MetricReportDefinitions": {
    "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions"
  },
  "MetricReports": {
    "@odata.id": "/redfish/v1/TelemetryService/MetricReports"
  },
  "MinCollectionInterval": "PT1.000S",
  "Name": "Telemetry Service",
  "Status": {
    "State": "Enabled"
  },
  "SupportedCollectionFunctions": [
    "Maximum",
    "Minimum",
    "Average",
    "Summation"
  ],
  "Triggers": {
    "@odata.id": "/redfish/v1/TelemetryService/Triggers"
  }
}
```

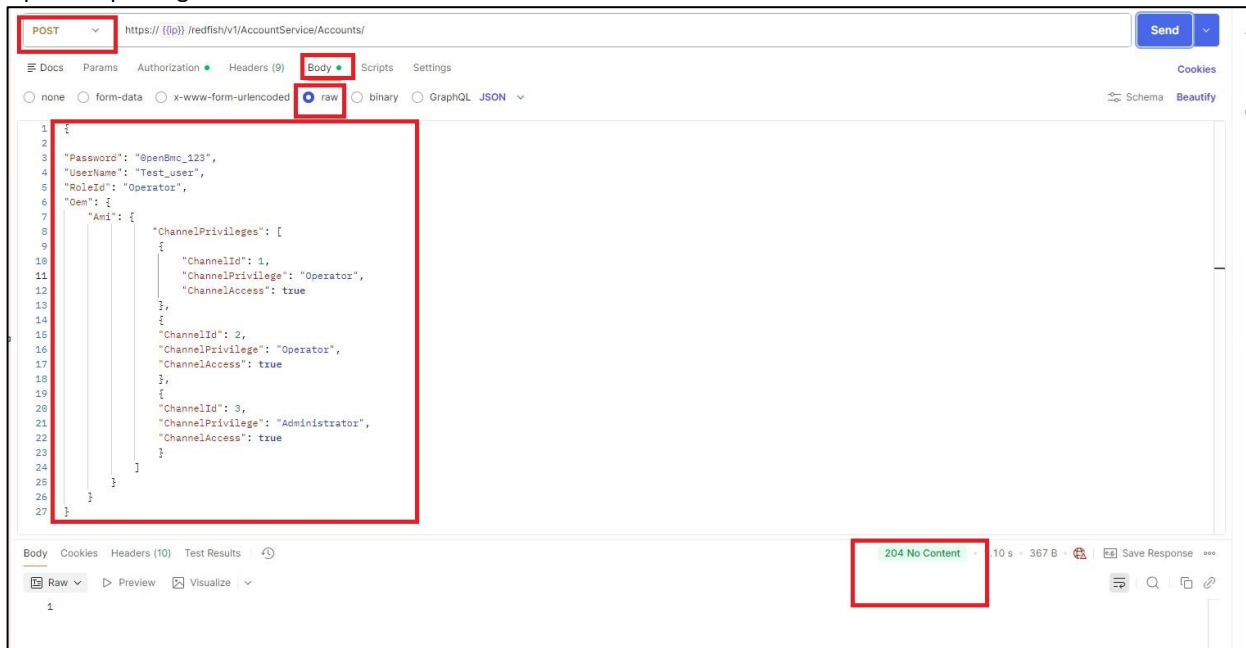
3.42 User Management through Redfish

Local users can be list out by GET call using POSTMAN.

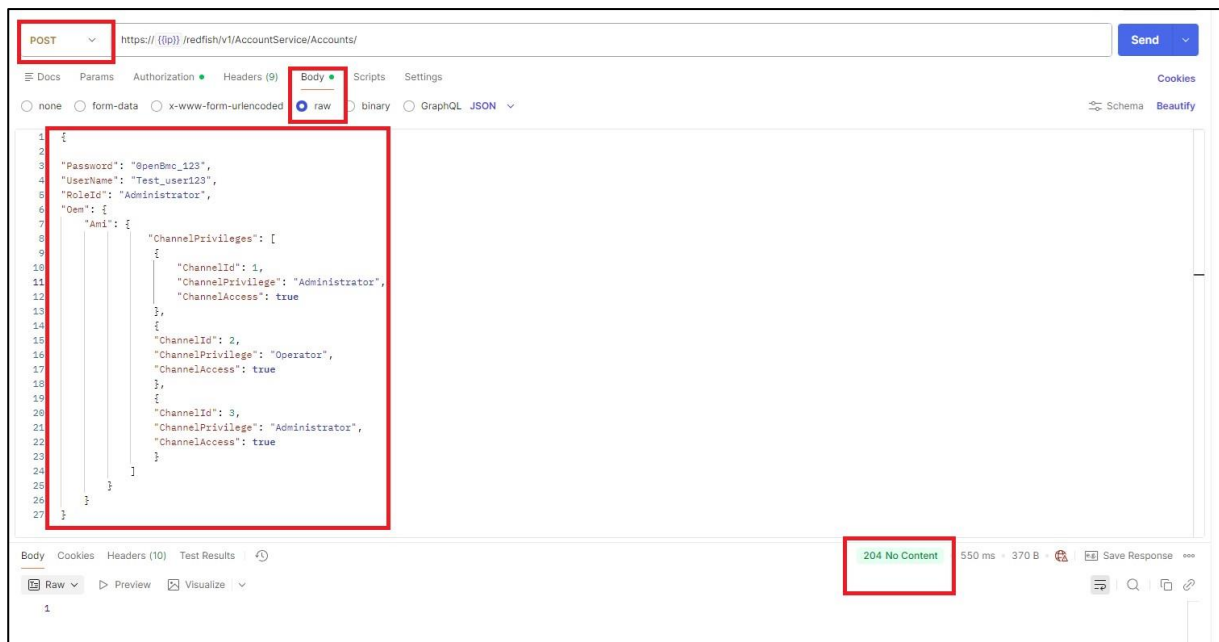


Local user can be created via redfish by POST call using POSTMAN.

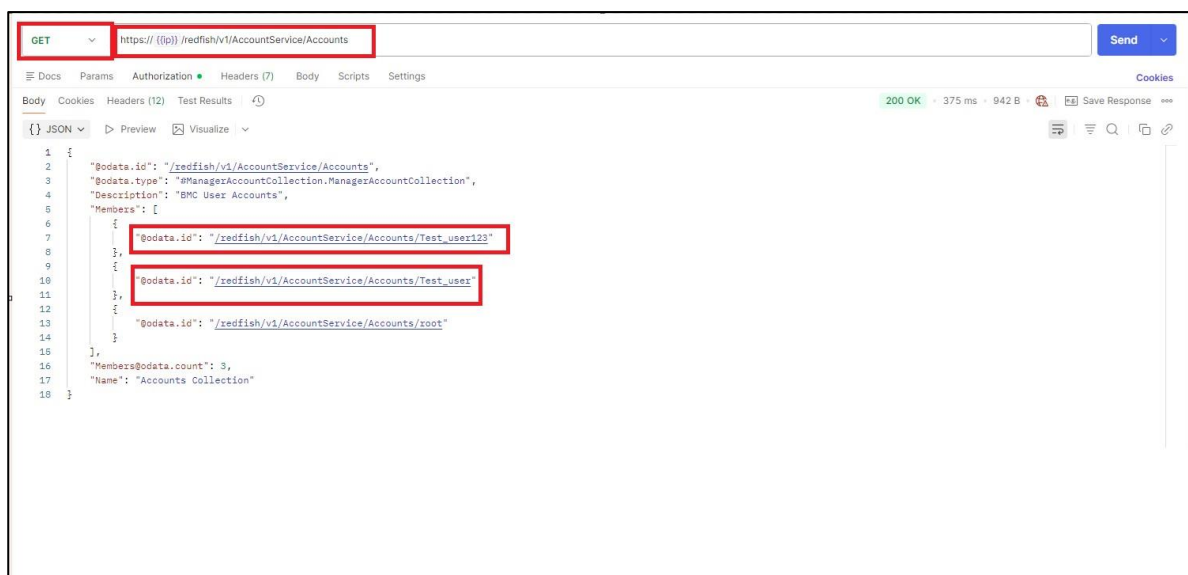
Operator privilege user creation:



Administrator privilege user creation:

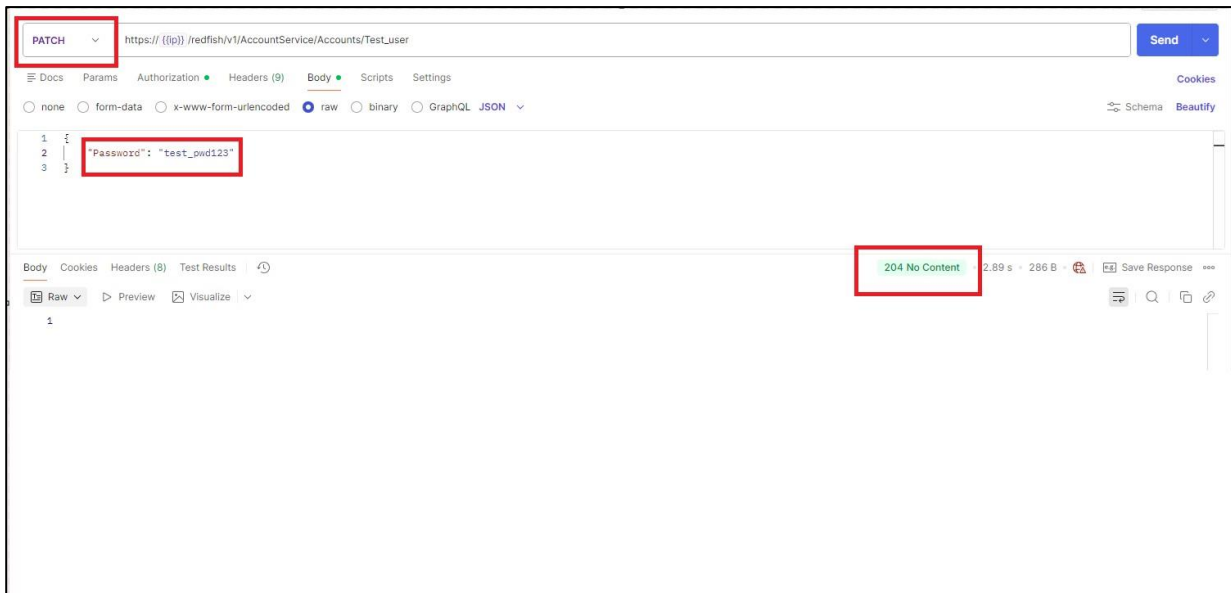


Created users can be able to see in local user list:

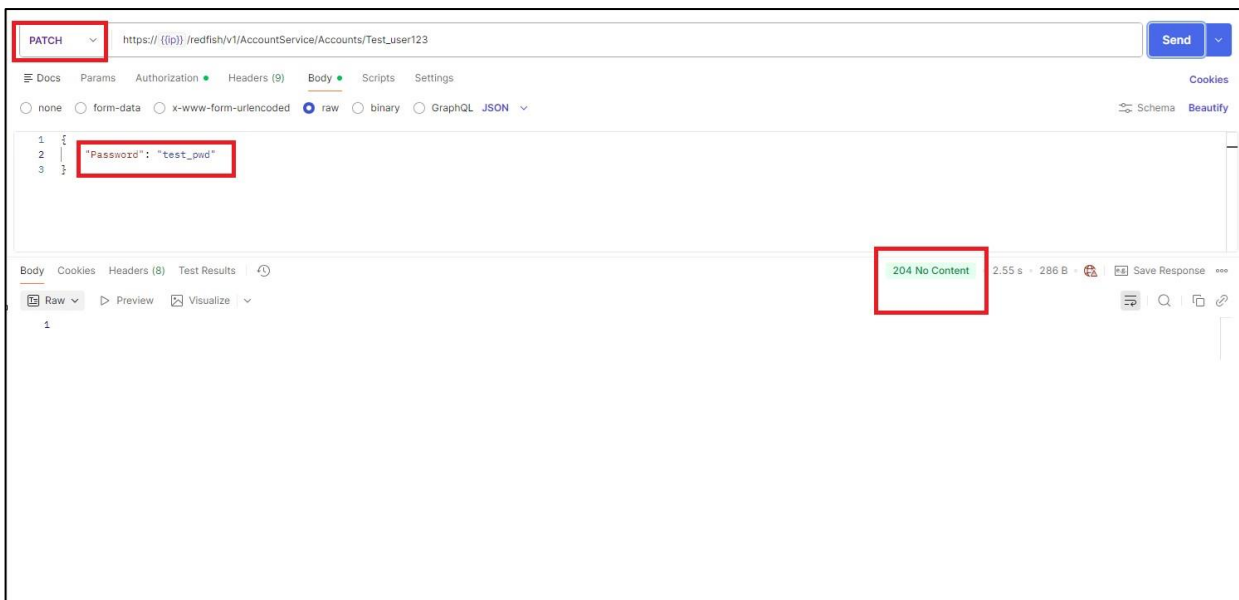


Setting (Modify) the local user's password via Redfish by PATCH call using POSTMAN.

Operator user's password modify:



Administrator user's password modify:

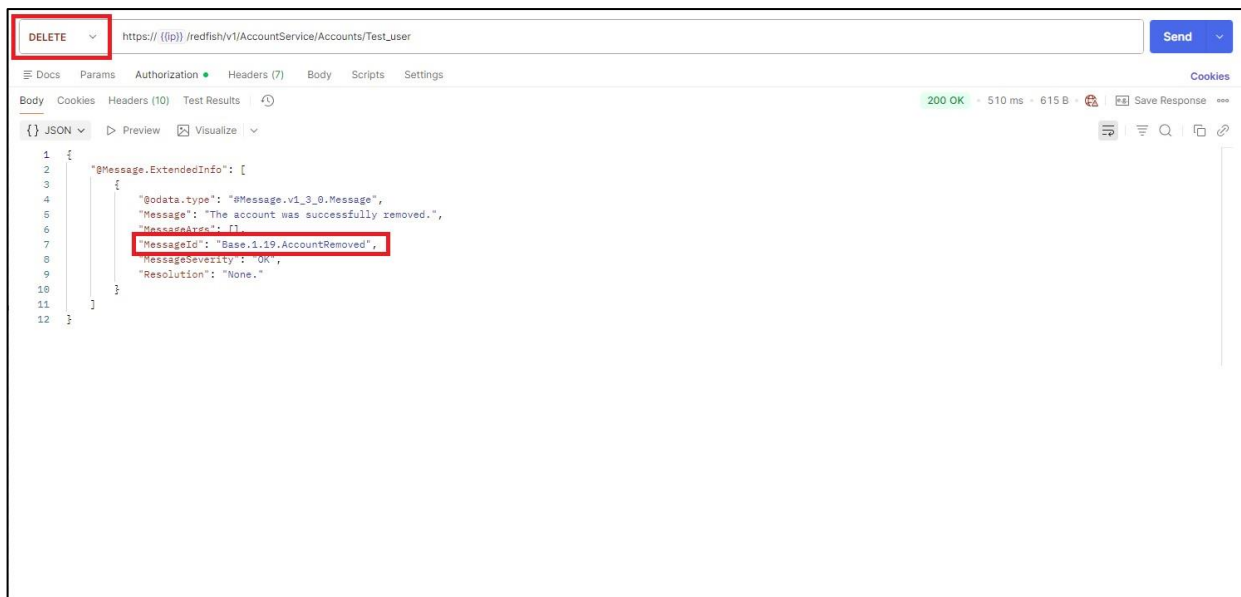


Note:

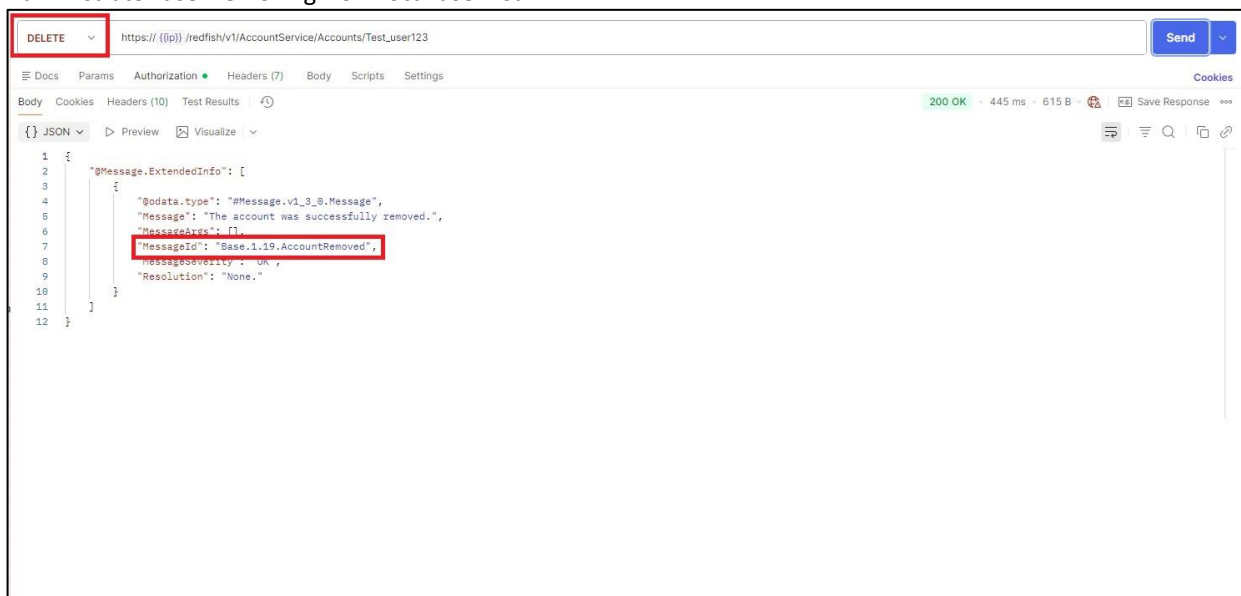
Newly updated local user's password confirmed by webui login. RoleID (privilege), UserName also can be modified to local users using patch call.

Created local users can be delete via Redfish by DELETE call using POSTMAN.

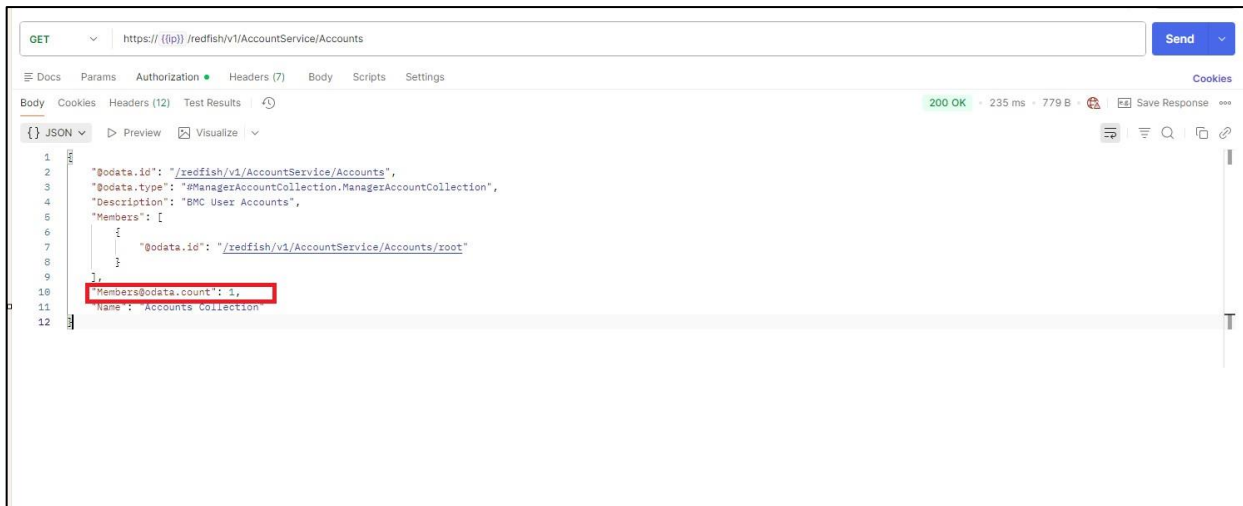
Operator user removing from local user list:



Administrator user removing from local user list.

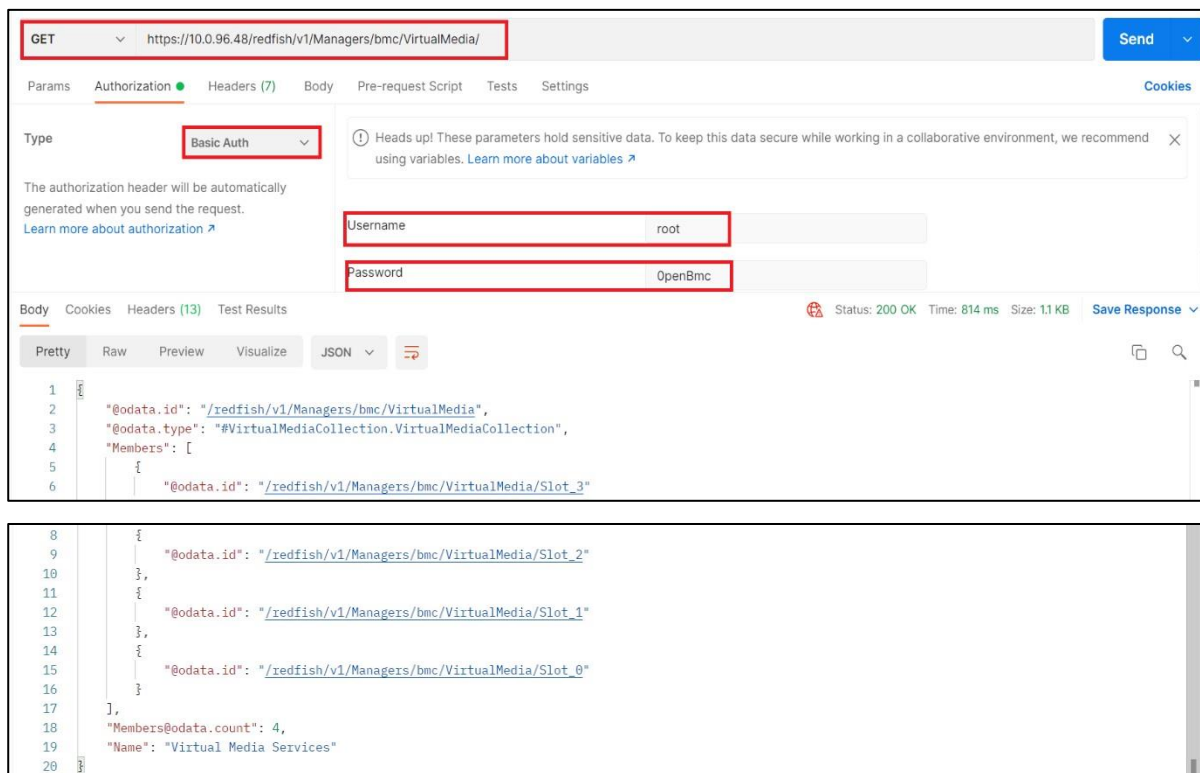


Can be confirmed, created users removed from local user list.



3.43 VM Transfer Protocol via NFS, CIFS and HTTPS through Redfish

Get Virtual Media Action Info using redfish “GET” call via postman.



- Inset VM via NFS , CIFS and HTTPS using redfish “POST” call through postman.

- **VirtualMedia via “NFS”**

The screenshot shows a REST client interface with the following details:

- URL:** `https://10.0.102.213/redfish/v1/Managers/bmc/VirtualMedia/Slot_2/Actions/VirtualMedia.InsertMedia`
- Method:** POST
- Body (JSON):**

```
{
  "Image": "nfs://172.31.2.234:/home/nibin/ubuntu20.iso",
  "UserName": "megarac",
  "Password": "megarac",
  "Inserted": true,
  "TransferProtocolType": "NFS"
}
```
- Status:** 200 OK
- Response (JSON):**

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

- **VirtualMedia via “CIFS”**

The screenshot shows a REST client interface with the following details:

- URL:** `https://10.0.102.213/redfish/v1/Managers/bmc/VirtualMedia/Slot_2/Actions/VirtualMedia.InsertMedia`
- Method:** POST
- Body (JSON):**

```
{
  "Image": "smb://10.0.102.130/sambashare/ubuntu-18.04.6-live-server-amd64.iso",
  "UserName": "amiindia",
  "Password": "amiindia",
  "Inserted": true,
  "TransferProtocolType": "CIFS"
}
```
- Status:** 200 OK
- Response (JSON):**

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

- **VirtualMedia via “HTTPS”**

The screenshot shows a REST client interface with the following details:

- URL:** `https://10.0.102.213/redfish/v1/Managers/bmc/VirtualMedia/Slot_2/Actions/VirtualMedia.InsertMedia`
- Method:** POST
- Body (JSON):**

```
{
  "Image": "https://10.0.102.130/ubuntu-18.04.6-live-server-amd64.iso",
  "UserName": "amiindia",
  "Password": "amiindia",
  "Inserted": true,
  "TransferProtocolType": "HTTPS"
}
```
- Status:** 200 OK
- Response (JSON):**

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


- Below is log in bmc side and host side (Device is mounted)

```
Nov 29 08:03:15 intel-obmc kernel: Mass Storage Function, version: 2009/09/11
Nov 29 08:03:15 intel-obmc kernel: LUN: removable file: (no medium)
```

```
NAME                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0                7:0      0  55.6M 1 loop /snap/core18/2620
loop1                7:1      0  55.6M 1 loop /snap/core18/2632
loop2                7:2      0  67.8M 1 loop /snap/lxd/22753
loop3                7:3      0  63.2M 1 loop /snap/core20/1695
loop4                7:4      0  70.3M 1 loop /snap/lxd/21029
loop5                7:5      0  49.7M 1 loop /snap/snapd/17576
loop6                7:6      0   48M 1 loop /snap/snapd/17336
loop7                7:7      0  63.2M 1 loop /snap/core20/1634
sda                  8:0      0   2.7T 0 disk
├─sda1                8:1      0   512M 0 part /boot/efi
├─sda2                8:2      0    1G 0 part /boot
├─sda3                8:3      0   2.7T 0 part
└─ubuntu--vg-ubuntu--lv 253:0    0  200G 0 lvm  /
root@msgubuntuarch:~# lsblk
NAME                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0                7:0      0  55.6M 1 loop /snap/core18/2620
loop1                7:1      0  55.6M 1 loop /snap/core18/2632
loop2                7:2      0  67.8M 1 loop /snap/lxd/22753
loop3                7:3      0  63.2M 1 loop /snap/core20/1695
loop4                7:4      0  70.3M 1 loop /snap/lxd/21029
loop5                7:5      0  49.7M 1 loop /snap/snapd/17576
loop6                7:6      0   48M 1 loop /snap/snapd/17336
loop7                7:7      0  63.2M 1 loop /snap/core20/1634
sda                  8:0      0   2.7T 0 disk
├─sda1                8:1      0   512M 0 part /boot/efi
├─sda2                8:2      0    1G 0 part /boot
├─sda3                8:3      0   2.7T 0 part
└─ubuntu--vg-ubuntu--lv 253:0    0  200G 0 lvm  /
sdb                  8:16     1   969M 1 disk
├─sdb1                8:17     1   969M 1 part
└─sdb2                8:18     1   2.4M 1 part
root@msgubuntuarch:~#
```

- If we try to reinsert VM again, while already VM is running in backend then below error will be displayed.

POST https://{{ip}}/redfish/v1/Managers/bmc/VirtualMedia/Slot_2/Actions/VirtualMedia.InsertMedia

Body: raw

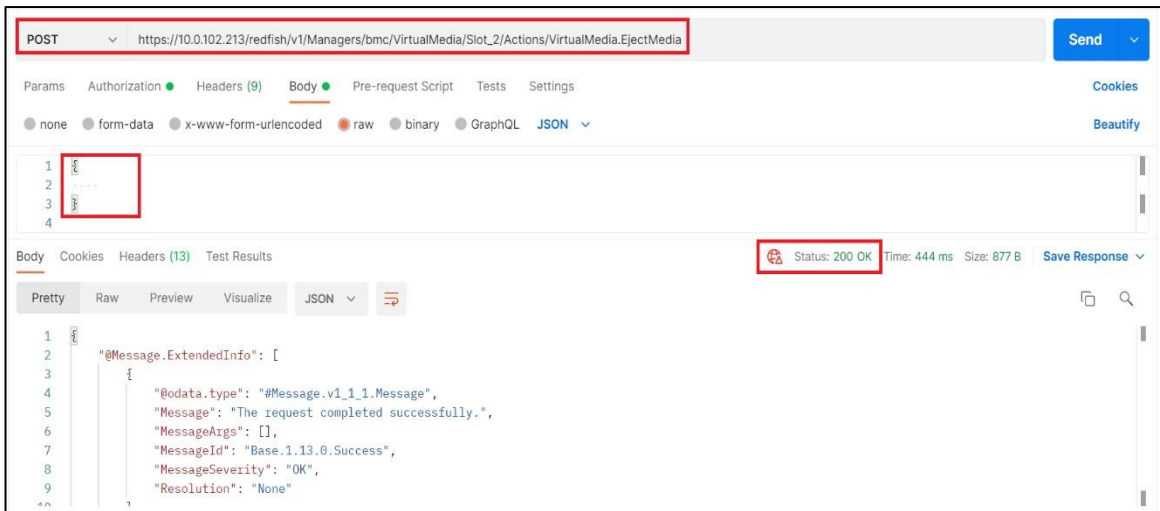
```
1 {
2   "Image": "nfs://172.31.100.100:/home/nfsserver/ubuntu.iso",
3   "UserName": "",
4   "Password": "",
5   "WriteProtected": true,
6   "TransferProtocolType": "NFS",
7   "Inserted": true
8 }
```

400 Bad Request • 210 ms • 1.03 KB

Body: JSON

```
1 {
2   "error": {
3     "@Message.ExtendedInfo": [
4       {
5         "@odata.type": "#Message.v1_3_0.Message",
6         "Message": "The requested resource of type Slot with the property Slot_2 with the value 'can't insert' already exists.",
7         "MessageArgs": [
8           "Slot ",
9           "Slot_2",
10          "can't insert"
11        ],
12        "MessageId": "Base.1.19.ResourceAlreadyExists",
13        "MessageSeverity": "Critical",
14        "Resolution": "Do not repeat the create operation as the resource was already created."
15      }
16    ]
17  }
```

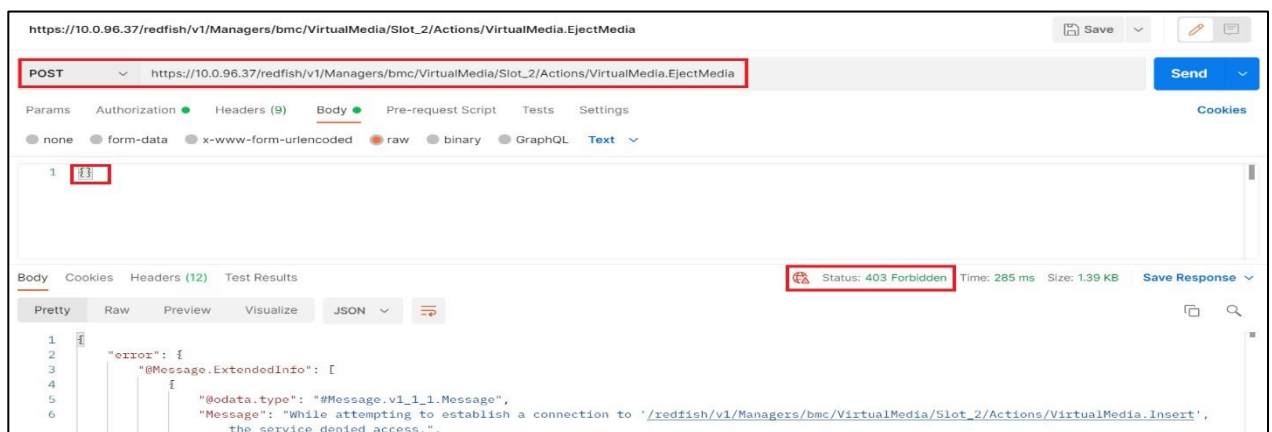
➤ Eject VM using redfish POST call through postman for both NFS, CIFS and HTTPS.



Below is log in host side

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPPOINT
loop0	7:0	0	55.6M	1	loop	/snap/core18/2620
loop1	7:1	0	55.6M	1	loop	/snap/core18/2632
loop2	7:2	0	67.8M	1	loop	/snap/lxd/22753
loop3	7:3	0	63.2M	1	loop	/snap/core20/1695
loop4	7:4	0	70.3M	1	loop	/snap/lxd/21029
loop5	7:5	0	49.7M	1	loop	/snap/snapd/17576
loop6	7:6	0	48M	1	loop	/snap/snapd/17336
loop7	7:7	0	63.2M	1	loop	/snap/core20/1634
sda	8:0	0	2.7T	0	disk	
├─sda1	8:1	0	512M	0	part	/boot/efi
├─sda2	8:2	0	1G	0	part	/boot
├─sda3	8:3	0	2.7T	0	part	
└─ubuntu--vg-ubuntu--lv	253:0	0	200G	0	lvm	/

- If we try to Eject VM, when VM is not running in backend then below error will display, for both NFS, CIFS and HTTPS



Note: All these transfer methods are works through "Stream based transfer" as per VM design document provided by OpenBMC.

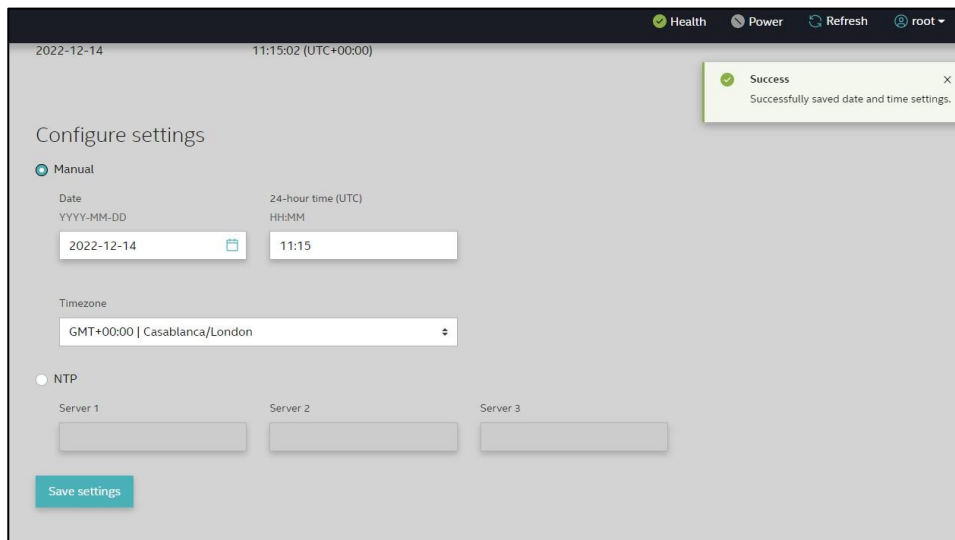
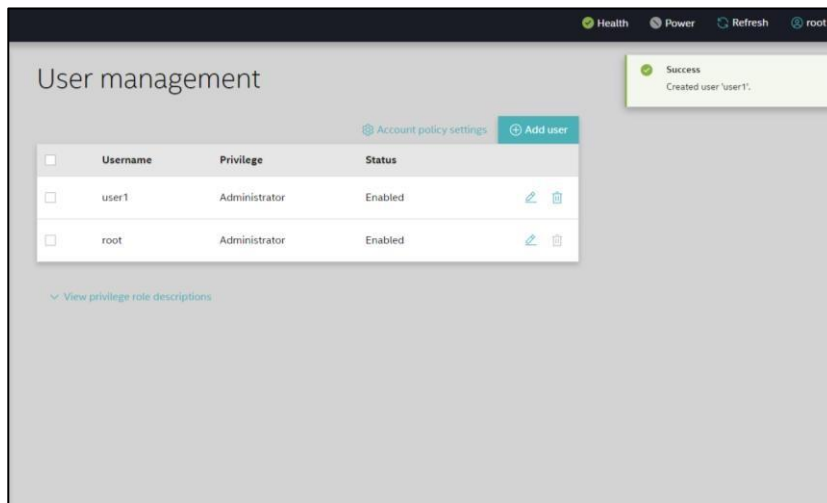
For reference check below URL

<https://github.com/openbmc/docs/blob/fb532ca714ea87f84372e89a16202eb1fb8577ed/designs/virtualmedia.md#legacy-mode>

[https://github.com/openbmc/docs/blob/fb532ca714ea87f84372e89a16202eb1fb8577ed/designs/virtualmedia.md#r
edfish-support](https://github.com/openbmc/docs/blob/fb532ca714ea87f84372e89a16202eb1fb8577ed/designs/virtualmedia.md#r
edfish-support)

3.44 Restore factory default settings through Redfish

- Initially change some settings, for example create new users, change the date and time etc.

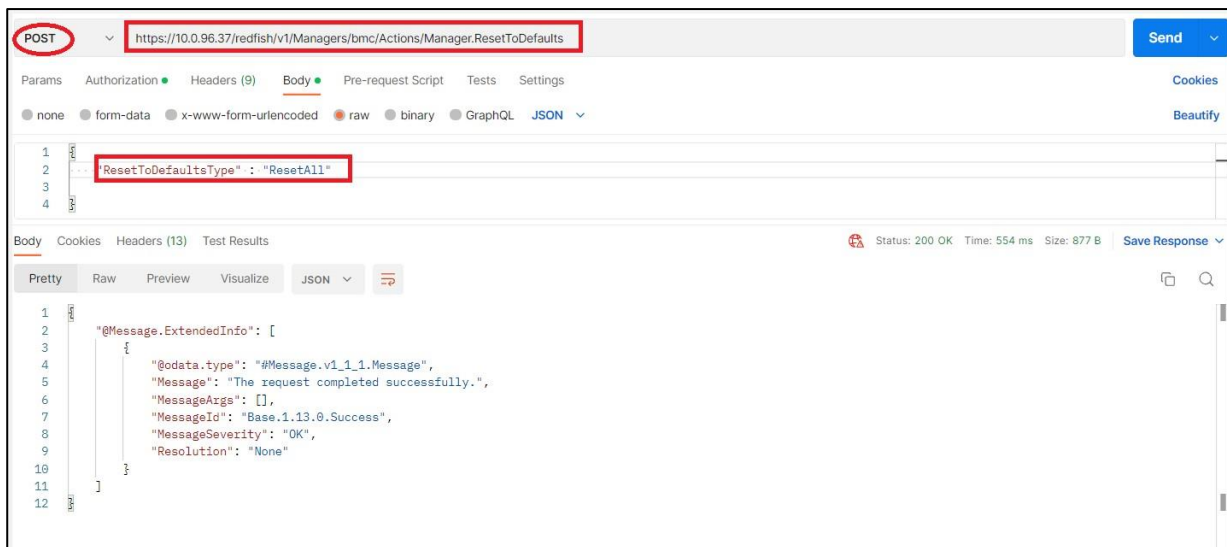


```
root@intel-obmc:~# date
Wed Dec 14 11:15:58 UTC 2022
root@intel-obmc:~#
```

>> BMC log

From above screenshot we can find time has changed and users are created.

- Reset all default settings using redfish "POST" call via postman

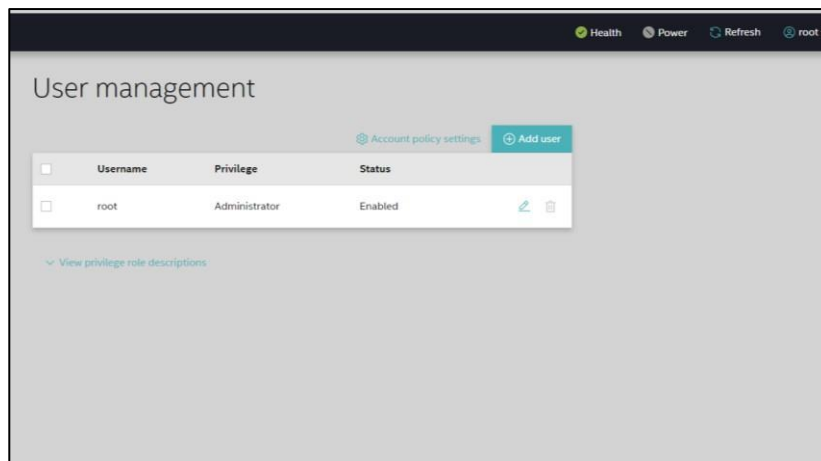


Below is log data from BMC side.

```
Stopping Virtual Media Service...
Stopping CPU Sensor...
Stopping Event Sensor...
Stopping Exit Air Temp Sensor...
Stopping Gpio Sensor...
Stopping Hwmon Temp Sensor...
Stopping Intrusion Sensor...
Stopping IPMB Sensor...
Stopping Phosphor sysfs LED controller...
Stopping Phosphor sysfs LED controller...
Stopping MCU Temp Sensor...
Stopping PSU Sensor...
[ OK ] Stopped NFS status monitor for NFSv2/3 locking..
[ OK ] Stopped Start bmcweb server.
[ OK ] Stopped Phosphor Dump core monitor..
[ OK ] Stopped Phosphor certificate manager for authority.
[ OK ] Stopped Phosphor certificate manager for bmcweb.
[ OK ] Stopped Phosphor certificate manager for nslcd.
[ OK ] Stopped Phosphor Dbus Monitor.
[ OK ] Stopped Phosphor Watchdog.
[ OK ] Stopped Rotate the event logs.
[ OK ] Stopped Lightweight SLP Server.
[ OK ] Stopped Intel Power Control.
[ OK ] Stopped Fru Device.
[ OK ] Stopped Phosphor Inventory Manager.
[ OK ] Stopped Phosphor LDAP privilege mapper.
[ OK ] Stopped Phosphor Log Manager.
[ OK ] Stopped Phosphor SNMP conf Manager.
[ OK ] Stopped Phosphor Download Manager.
[ OK ] Stopped Rsyslog config updater.
[ OK ] Stopped Phosphor User Manager.
[ OK ] Stopped Virtual Media Service.
[ OK ] Stopped Event Sensor.
[ OK ] Stopped Gpio Sensor.
[ OK ] Stopped Phosphor sysfs LED controller.
[ OK ] Stopped Phosphor sysfs LED controller.
[ OK ] Stopped OpenBMC ipKVM daemon.
[ OK ] Stopped Phosphor Dump Manager.
[ OK ] Stopped Avahi mDNS/DNS-SD Stack.
```

- After rebooted bmc we can see the default settings.

```
root@evb-ast2600:~# date [ 290.
Thu Apr 1 12:45:08 UTC 2021
root@evb-ast2600:~#
```



3.45 Redfish Schema

Redfish Specification Reference	V1.17.0
Redfish Schema Reference	2024.2
BIOS Redfish Version	1.21.1 (Verified with Intel Beechnut City)
HI Specification Reference	1.3.0 (Partially Supported)

3.46 Host Interface Support

Redfish Server in OneTree presents the details about redfish main resources like Systems, Chassis and Managers and services like Event service, session service, account service, task service through a Web Server that responds to the URL requests from the user. This section discusses all the possible Host Interface requests including GET operations that can be issued to the Redfish Server and its response that can be validated against the reactive results from BMC and Redfish Specification.

We have connected Archercity board with Host via USB type B to A cable as Host Interface.

3.46.1 Hardware Setup Details and Initial Configuration

- Host Interface should be supported and connection between the host and bmc must be established.
- GET, SET, PATCH BIOS Attributes are supported through Host – BMC Communication.
- USB Info & Host Interface Info can be obtained through ipmitool commands.
- Ping / Transfer of bytes between the host and bmc should work fine.

Pre-requisite:

- Host should be connected to Archercity bmc.
- Should be able to access Host.

Connectivity:

Set usb1 interface IP in BMC

- `ifconfig usb1 169.254.0.17 netmask 255.255.0.0 up`

Set the mapped ethernet interface IP in Host

- `ifconfig example_iface 169.254.0.18 netmask 255.255.0.0 up`

After this ping should work

ping from host to bmc -> ping 169.254.0.17

3.46.2 Host Interface URI'S

Command: GET ATTRIBUTES

The screenshot shows a REST client interface with a GET request to `https://10.0.96.6/redfish/v1/Systems/system/Bios`. The response is a 200 OK status with a response time of 15.44 s and a body size of 9.48 KB. The response is displayed in JSON format, showing the BIOS settings and attributes.

```
{
  "@Redfish.Settings": {
    "@odata.type": "#Settings.v1_4_0.Settings",
    "SettingsObject": {
      "@odata.id": "/redfish/v1/Systems/system/Bios/Settings"
    }
  },
  "@odata.id": "/redfish/v1/Systems/system/Bios",
  "@odata.type": "#Bios.v1_2_3.Bios",
  "Actions": {
    "#Bios.ChangePassword": {
      "target": "/redfish/v1/Systems/system/Bios/Actions/Bios.ChangePassword"
    },
    "#Bios.ResetBios": {
      "target": "/redfish/v1/Systems/system/Bios/Actions/Bios.ResetBios"
    }
  },
  "AttributeRegistry": "BiosAttributeRegistry0ACQZ.0.72.0",
  "Attributes": {
    "ACPI002": "Enabled",
    "ACPI004": "Disabled",
    "AHCI000": "Disabled",
    "GSI0020": "Disabled",
    "TDMT000": "TDMT000Enabled"
  }
}
```

System / New Request

GET https://10.0.96.6/redfish/v1/Systems/system/Bios

200 OK • 15.44 s • 9.48 KB

Body Cookies Headers (12) Test Results

JSON Preview Visualize

```
80 "IPMI811": 0,  
81 "IPMI812": "IPMI812NoAccess",  
82 "IPMI813": "",  
83 "MAPIDS": "TCG003:0,TCG001:1,TCG006:1,TCG004:1,TCG002:1,TCG016:1,TCG017:1,TCG018:1,TCG019:1,  
TCG020:1,TCG021:1,TCG007:1,TCG011:1,TCG012:1,TCG013:1,TCG022:1,TCG010:1,TCG014:1,ACPI004:0,  
ACPI002:0,REDF000:0,REDF001:0,REDF010:0,REDF006:0,REDF007:1,NVLCK002:0,TER000:1,TER001:1,  
TER010:0,TER06B:1,TER011:0,TER0020:0,TER05C:0,TER02F:0,TER03E:0,TER04D:0,TER012:0,  
TER0021:0,TER030:0,TER03F:0,TER04E:0,TER05D:0,TER07B:0,TER089:0,TER06c:0,TER098:0,  
GSI0020:0,PCIS001:1,PCIS002:1,PCIS003:1,PCIS004:1,PCIS005:1,PCIS006:1,PCIS007:1,PCIS032:1,  
PCIS033:1,PCIS008:0,PCIS009:0,PCIS010:0,PCIS011:0,PCIS012:0,PCIS013:0,PCIS014:0,PCIS015:0,  
PCIS016:0,PCIS017:0,PCIS020:0,PCIS021:0,PCIS022:0,PCIS023:0,PCIS024:0,PCIS025:0,PCIS026:0,  
PCIS027:0,PCIS028:0,PCIS029:0,PCIS030:0,PCIS031:0,USB000:1,USB002:0,USB00E:1,USB001:1,  
USB003:1,USB004:1,USB00F:1,USB00A:1,USB009:1,USB00B:1,USB00C:1,USB011:1,USB012:1,USB013:1,  
USB014:1,USB015:1,USB016:1,USB017:1,USB018:1,USB019:1,USB01A:1,USB01B:1,USB01C:1,USB01D:1,  
USB01E:1,USB01F:1,USB020:1,USB021:1,USB022:1,USB023:1,USB024:1,USB025:1,USB026:1,USB027:1,  
USB028:1,USB029:1,USB02A:1,USB02B:1,USB02C:1,USB02D:1,USB02E:1,USB02F:1,USB030:1,NWSK000:0,  
NWSK001:0,NWSK006:0,NWSK002:0,NWSK007:0,NWSK004:0,NWSK005:0,SETUP001:0,SETUP002:0,  
AHCIO00:1,SECB001:0,SECB002:0,SECB008:0,SETUP003:0,SETUP004:0,SETUP005:0,SETUP006:0,  
RFWCS030:1,OROM003:1,OROM004:1,OROM005:1,OROM006:1,OROM007:1,OROM002:0,OROM001:0,OROM999:0,  
OROM998:0,OROM997:0,OROM996:0,OROM995:0,OROM994:0,OROM993:0,OROM992:0,RECV000:1,RECV001:1,  
IPMI606:0,IPMI600:0,IPMI605:0,IPMI601:0,IPMI100:0,IPMI101:0,IPMI102:0,IPMI103:0,IPMI104:0,  
IPMI105:0,IPMI400:0,IPMI004:0,IPMI000:0,IPMI001:0,IPMI002:0,IPMI003:0,IPMI200:0,IPMI201:0,  
IPMI565:1,IPMI500:0,IPMI501:1,IPMI502:1,IPMI503:1,IPMI504:1,IPMI505:0,IPMI506:1,IPMI507:1,  
TPMT508:1,TPMT509:1,TPMT510:0,TPMT511:1,TPMT512:1,TPMT513:1,TPMT522:1,TPMT514:1,TPMT520:1.
```

GET https://10.0.96.6/redfish/v1/Systems/system/Bios

200 OK • 15.44 s • 9.48 KB

Body Cookies Headers (12) Test Results

JSON Preview Visualize

```
223 "USB02A": "USB02AAuto",  
224 "USB02B": "USB02BAuto",  
225 "USB02C": "USB02CAuto",  
226 "USB02D": "USB02DAuto",  
227 "USB02E": "USB02EAuto",  
228 "USB02F": "USB02FAuto",  
229 "USB030": "USB030Auto",  
230 },  
231 "Description": "BIOS Configuration Service",  
232 "Id": "BIOS",  
233 "Links": {  
234   "ActiveSoftwareImage": {  
235     "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bios_active"  
236   },  
237   "SoftwareImages": [  
238     {  
239       "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bios_active"  
240     },  
241   ],  
242   "SoftwareImages@odata.count": 1  
243 },  
244 "Name": "BIOS Configuration",  
245 "ResetBiosToDefaultsPending": false  
246 }
```

Command: PATCH ATTRIBUTES

The screenshot shows a REST client interface with the following details:

- Method:** PATCH
- URL:** `https://10.0.96.6/redfish/v1/Systems/system/Bios/Settings`
- Body:** A JSON object with the following structure:

```
1 {
2   "Attributes": {
3     "SETUP003": 4,
4     "SETUP004": "SETUP0040ff"
5   }
6 }
```
- Status:** 200 OK, 9.29 s, 749 B
- Response Body (JSON):**

```
1 {
2   "error": {
3     "@Message.ExtendedInfo": [
4       {
5         "@odata.type": "#Message.v1_3_0.Message",
6         "Message": "The request completed successfully.",
7         "MessageArgs": [],
8         "MessageId": "Base.1.19.Success",
9         "MessageSeverity": "OK",
10        "Resolution": "None."
11      }
12    ],
13    "code": "Base.1.19.Success",
14    "message": "The request completed successfully."
15  }
16 }
```

Command: GET BIOS SETTINGS ATTRIBUTES

The screenshot shows a REST client interface with the following details:

- Method:** GET
- URL:** `https://10.0.96.6/redfish/v1/Systems/system/Bios/Settings`
- Status:** 200 OK, 3.93 s, 683 B
- Response Body (JSON):**

```
1 {
2   "@odata.id": "/redfish/v1/Systems/system/Bios/Settings",
3   "@odata.type": "#Bios.v1_2_3.Bios",
4   "Attributes": {
5     "SETUP003": 4,
6     "SETUP004": "SETUP0040ff"
7   },
8   "Description": "BIOS Settings",
9   "Id": "BIOS_Settings",
10  "Name": "BIOS Configuration"
11 }
```

Command: GET BIOS ATTRIBUTE REGISTRY

```
GET https://10.0.96.6/redfish/v1/Registries/BiosAttributeRegistry0ACQZ.en-US.0.72.0.json Send

Docs Params Authorization Headers (9) Body Scripts Settings Cookies

Body Cookies Headers (12) Test Results 200 OK 1.32 s 190.9 KB Save Response

JSON Preview Visualize

1 {
2   "@odata.context": "/redfish/v1/$metadata#AttributeRegistry.AttributeRegistry",
3   "@odata.etag": "Dummyetag",
4   "@odata.id": "/redfish/v1/Registries/BiosAttributeRegistry0ACQZ.en-US.0.72.0.json",
5   "@odata.type": "#AttributeRegistry.v1_3_9.AttributeRegistry",
6   "Description": "This registry defines a representation of BIOS Attribute instances",
7   "Id": "BiosAttributeRegistry0ACQZ.en-US.0.72.0",
8   "Language": "en-US",
9   "Name": "0ACQZ BIOS Attribute Registry",
10  "OwningEntity": "AMI",
11  "RegistryEntries": {
12    "Attributes": [
13      {
14        "AttributeName": "TCG003",
15        "DefaultValue": "Enabled",
16        "DisplayName": "Security Device Support",
17        "HelpText": "Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.",
18        "MenuPath": "./Advanced/Trusted Computing",
19        "ReadOnly": false,
20        "ResetRequired": true,
21        "Type": "Enumeration",
22        "UefiNamespaceId": "x-UEFI-AMI",
```

```
GET https://10.0.96.6/redfish/v1/Registries/BiosAttributeRegistry0ACQZ.en-US.0.72.0.json Send

Docs Params Authorization Headers (9) Body Scripts Settings Cookies

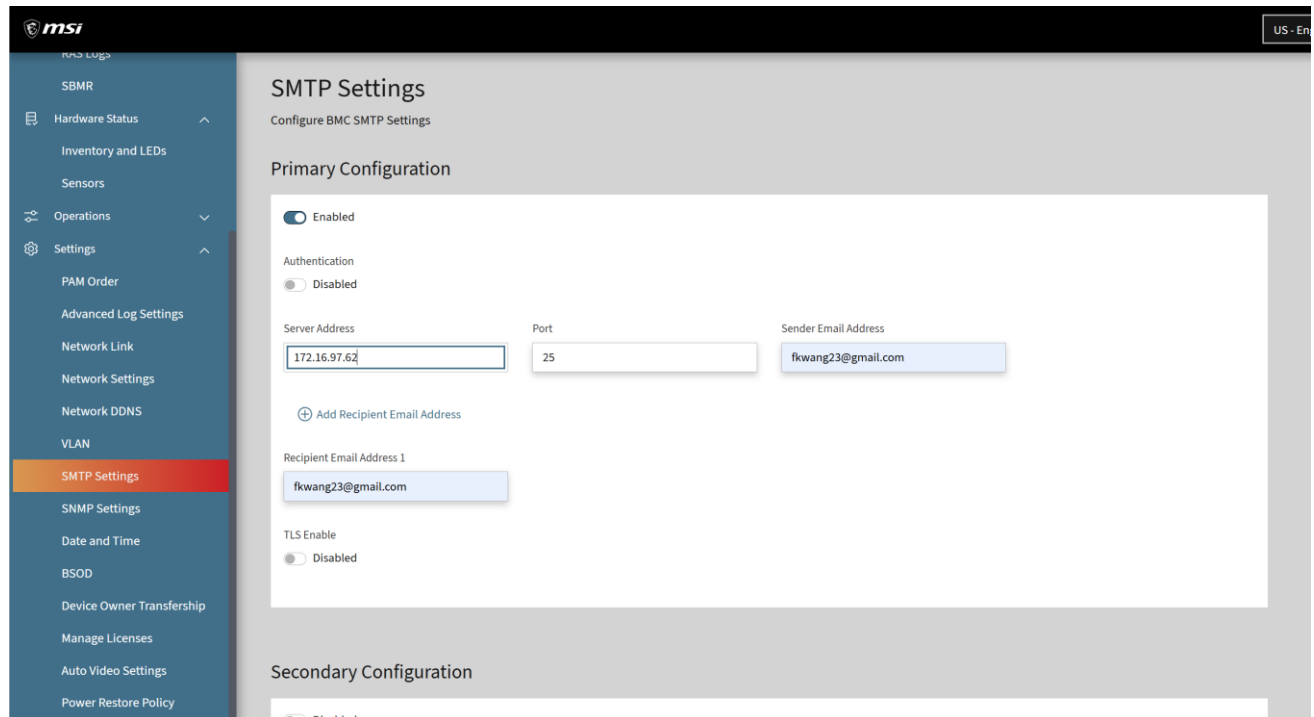
Body Cookies Headers (12) Test Results 200 OK 1.32 s 190.9 KB Save Response

JSON Preview Visualize

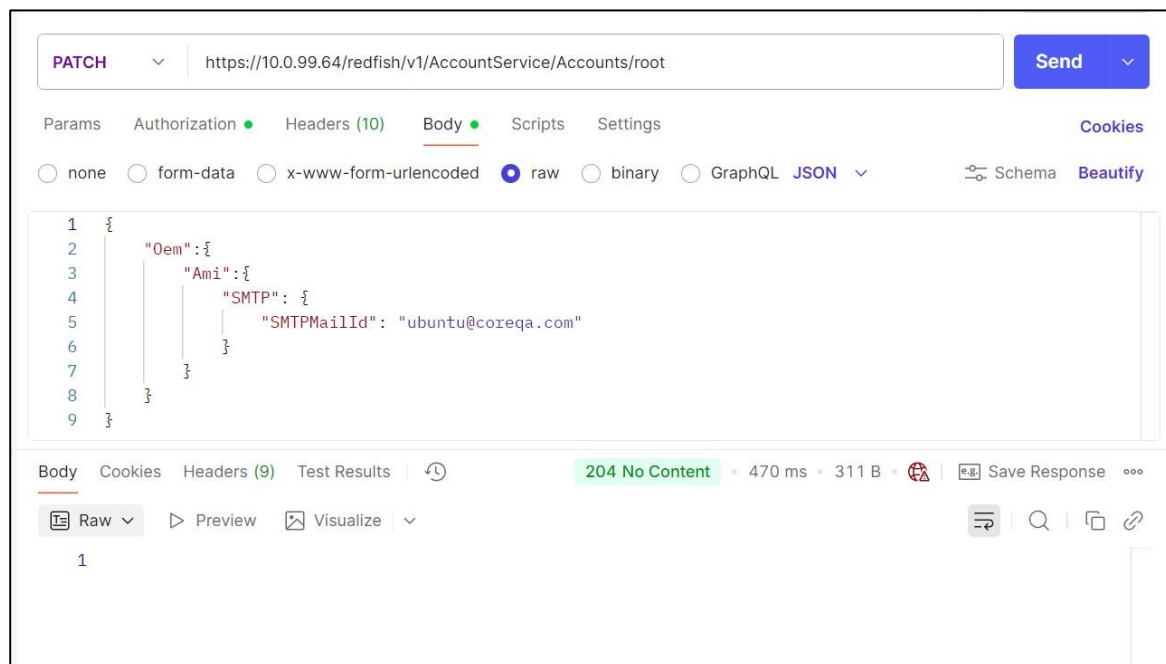
6170     "DependencyFor": "IPMI510",
6171     "Type": "Map"
6172   },
6173   {
6174     "Dependency": {
6175       "MapFrom": [
6176         {
6177           "MapFromAttribute": "IPMI515",
6178           "MapFromCondition": "EQU",
6179           "MapFromProperty": "CurrentValue"
6180         }
6181       ],
6182       "MapToAttribute": "IPMI515",
6183       "MapToProperty": "Hidden",
6184       "MapToValue": "true"
6185     },
6186     "DependencyFor": "IPMI515",
6187     "Type": "Map"
6188   }
6189 ],
6190 "RegistryVersion": "0.72.0"
6191 }
6192 }
```

3.47 Forgot Password

3.47.1 Prerequisites



- **Configure SMTP MailID**



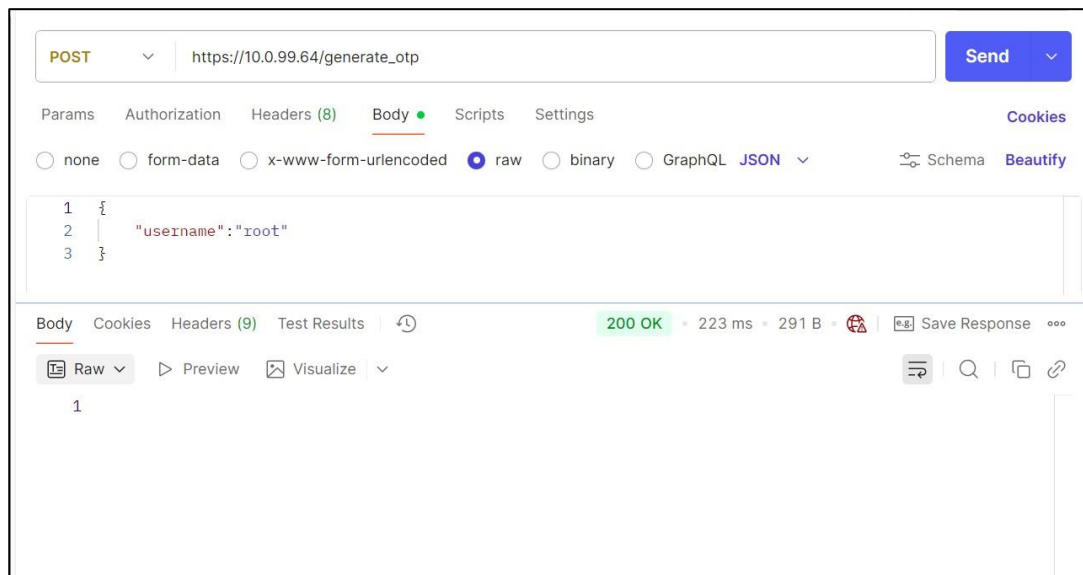
Note: To receive the OTP, both the SMTP server and the SMTP email ID must be configured.

3.47.2 OTP Generation

POST `https://{BMCIP}/generate_otp`

Request Body:

```
{  
  "username": "root"  
}
```



- OTP has been received in configured SMTP server

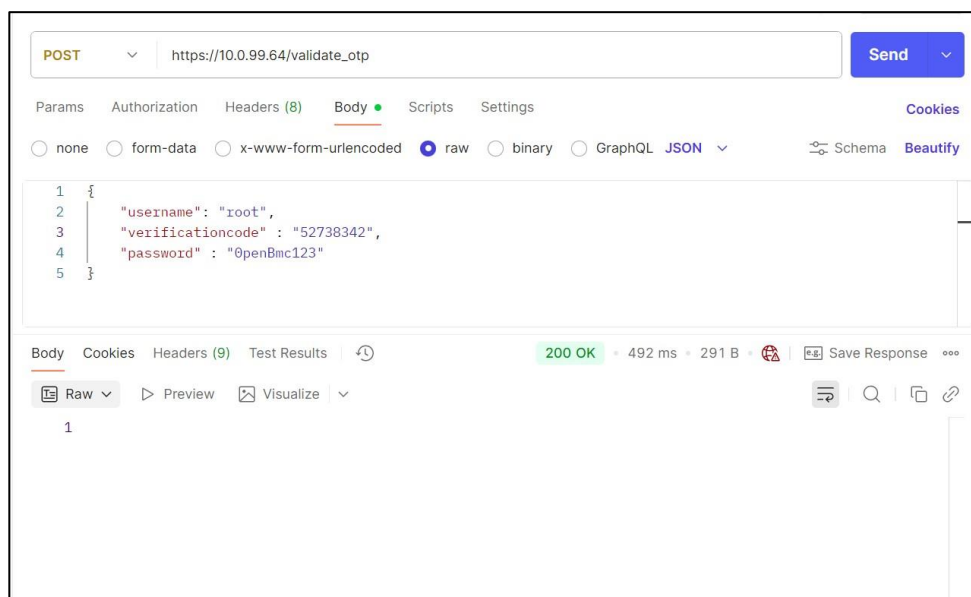
```
ubuntu@smtp:~/Maildir/new$  
ubuntu@smtp:~/Maildir/new$ ls  
1761544054.V802I29a0025M30005.smtp  
ubuntu@smtp:~/Maildir/new$  
ubuntu@smtp:~/Maildir/new$ cat 1761544054.V802I29a0025M30005.smtp  
Return-Path: <aishwaryam@ami.com>  
X-Original-To: ubuntu@coreqa.com  
Delivered-To: ubuntu@coreqa.com  
Received: from AMIOT-baf8ac97ef10 (unknown [10.0.99.64])  
  by smtp.coreqa.com (Postfix) with ESMTP id 04AA439A17AE  
  for <ubuntu@coreqa.com>; Mon, 27 Oct 2025 11:17:34 +0530 (IST)  
Date: Mon, 27 Oct 2025 05:47:33 +0000  
From: aishwaryam@ami.com  
Message-Id: <1761544054.535.373@AMIOT-baf8ac97ef10>  
To: ubuntu@coreqa.com  
Subject: The OTP for root  
  
The OTP has been sent for UserName : root52738342  
ubuntu@smtp:~/Maildir/new$
```


3.47.3 OTP Validation

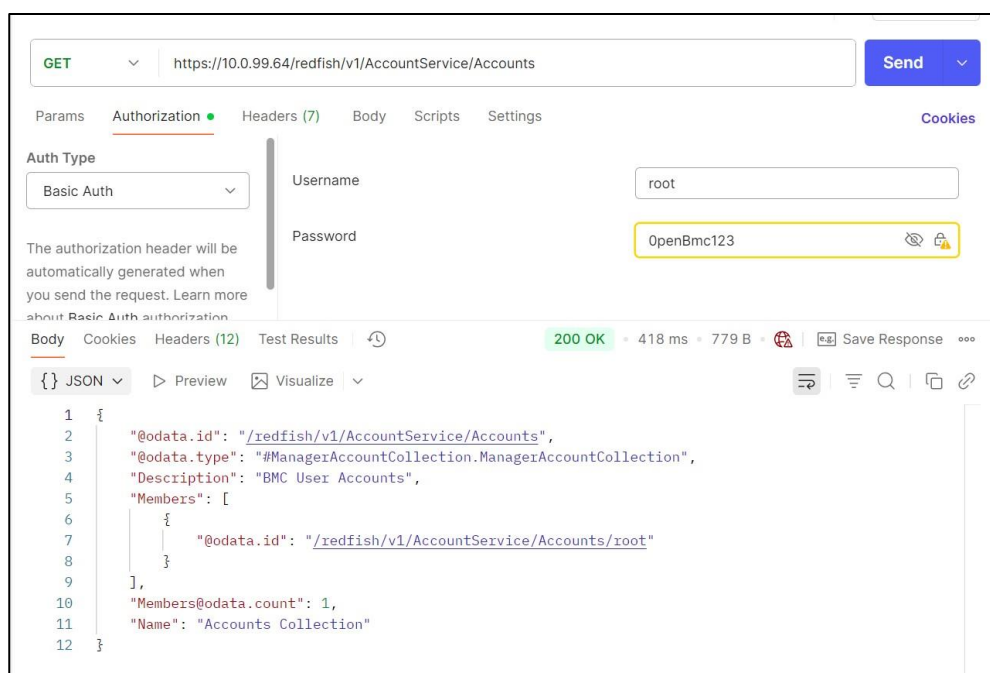
Post `https://{BMCIIP}/validate_otp`

Request Body:

```
{  
  "username": "root",  
  "verificationcode": "27817506",  
  "password": "OpenBmc"  
}
```



Able to successfully log in with updated password:



Chapter 4

4 MegaRAC OneTree™ Thermal Configuration

BMC FW supports Thermal management.

The thermal management module by default provides efficient “Thermal algorithm” to achieve desired temperature/heat level in the system.

The `swampd` is a daemon running within the OpenBMC environment. It uses a well-defined configuration file to control the temperature of the tray components to keep them within operating conditions. Entity manager is used for configuration of sensor.

This chapter allows you to become familiar with Thermal management. Each Type is described in detail.

Thermal Management

Two Types of controllers supported PID and Stepwise Controller.

1. PID Controller
2. Stepwise Controller

PID controller

A proportional-integral-derivative (PID) controller tracks the error between the process variable (Current Reading) and the Setpoint, the integral of recent errors, and the derivative of the error signal. It computes its next corrective effort from a weighted sum of those three terms, then applies the results to the process.

A PID controller uses the ideal or International Society of Automation (ISA) standard form of the PID algorithm to compute its output.

The key parameter for PID Controller is Setpoint.

Example:

If the current reading of sensor is 25, and the setpoint is 20, then the fan speed is increased which reduces the temperature below the setpoint.

Stepwise controller

The Stepwise use the mapping of reading and output value instead of set RPM setpoint. The reading and output value should be in pair .

Example:

```
{  
    "Reading": {25, 26},  
    "Output": {10, 20}  
}
```

If the temperature reading is below 26, the return value will be 10. And if the reading value is above 26, the Stepwise controller will set PWM value as 20% RPM. Through busctl command we can set the properties

xyz.openbmc_project.Configuration.Pid (PID configuration interface)

property- SetPoint

xyz.openbmc_project.Configuration.StepWise(stepwise configuration interface)

properties- Reading &Outputs

Example: busctl set-property xyz.openbmc_project.EntityManager
/xyz/openbmc_project/inventory/system/board/AC_Baseboard/BMC_Temp
xyz.openbmc_project.Configuration.Pid SetPoint d 20

```
root@intel-obmc:~# busctl introspect xyz.openbmc_project.EntityManager /xyz/openbmc_project/inventory/system/board/AC_Baseboard/BMC_T
NAME                                TYPE      SIGNATURE RESULT/VALUE  FLAGS
org.freedesktop.DBus.Introspectable interface -          -          -
org.freedesktop.DBus.Peer          interface -          -          -
org.freedesktop.DBus.Properties    interface -          -          -
xyz.openbmc_project.Configuration.Pid interface -          -          -
xyz.openbmc_project.Configuration.StepWise interface -          -          -
org.freedesktop.DBus.Properties    interface -          -          -
org.freedesktop.DBus.Properties    method ss      v          -
org.freedesktop.DBus.Properties    method s      a{sv}      -
org.freedesktop.DBus.Properties    method ssv     -          -
org.freedesktop.DBus.Properties    signal sa{sv}as -          -
xyz.openbmc_project.Configuration.Pid interface -          -          -
xyz.openbmc_project.Configuration.Pid method -          -          -
xyz.openbmc_project.Configuration.Pid property s      "temp"     emits-change writable
xyz.openbmc_project.Configuration.Pid property d      0          emits-change writable
xyz.openbmc_project.Configuration.Pid property d      0          emits-change writable
xyz.openbmc_project.Configuration.Pid property d     -1         emits-change writable
xyz.openbmc_project.Configuration.Pid property d     100        emits-change writable
xyz.openbmc_project.Configuration.Pid property d      30         emits-change writable
xyz.openbmc_project.Configuration.Pid property as     1 "BMC Temp" emits-change writable
xyz.openbmc_project.Configuration.Pid property s      "BMC Temp" emits-change writable
xyz.openbmc_project.Configuration.Pid property d      5          emits-change writable
xyz.openbmc_project.Configuration.Pid property d     100        emits-change writable
xyz.openbmc_project.Configuration.Pid property d      30         emits-change writable
xyz.openbmc_project.Configuration.Pid property d     -0.15      emits-change writable
xyz.openbmc_project.Configuration.Pid property d      0          emits-change writable
xyz.openbmc_project.Configuration.Pid property d     20         emits-change writable
xyz.openbmc_project.Configuration.Pid property d     -1         emits-change writable
xyz.openbmc_project.Configuration.Pid property d      0          emits-change writable
xyz.openbmc_project.Configuration.Pid property s      "Pid"      emits-change writable
xyz.openbmc_project.Configuration.Pid property as     1 "Left"     emits-change writable
```

4.1 Memory Thermal Management

"DIMM sensors are controlled memory management, A PID algorithm is used for controlling fan speed based on DIMM temperatures. DIMM temperature sensors are used as the control input to the PID algorithm".

4.2 PECI Thermal management

"CPU sensors comes under PECI thermal management, Processor thermal management utilizes PID algorithms for which the Processor DTS (Digital Thermal Sensor) sensor is a controlling input".

4.3 Power Supply Fan sensors

A fan located inside a power supply. The BMC supports one Power Supply Temperature sensor for each system power supply module, PSU1 temperature sensor configured PID type.

4.4 System Airflow Monitoring

"Airflow management planning is the process of clearing paths for hot and cold air, Inlet and Outlet temp sensors manages the airflow" and also based on fans reading the system airflow is calculated.

System airflow sensor is varying, based on fans speed(reading).

4.5 Hot Swap Fan support

Hot-swapping allows the removal or insertion of components to the computer without shutting down or rebooting the system. It is also called "hot insertion". Plug/unplug the fan in power on time.

4.6 Multiple Fan Profiles Control Support

If we add a "Profiles" vector into the PID and Stepwise entity-manager configurations the logic becomes much simpler. We default to all profiles and can limit the scope of some configurations to the selected profile.

```
{
  "Class": "temp",
  "FFGainCoefficient": 0.0,
  "FFOffCoefficient": 0.0,
  "ICoefficient": -1.0,
  "ILimitMax": 100,
  "ILimitMin": 30,
  "Inputs": [
    "BMC Temp"
  ],
  "Name": "BMC Temp",
  "NegativeHysteresis": 5.0,
  "OutLimitMax": 100,
  "OutLimitMin": 30,
  "Outputs": [],
  "PCoefficient": -0.15,
  "PositiveHysteresis": 0.0,
  "SetPoint": 80.0,
  "Profiles": [
    "Performance"
  ],
  "SlewNeg": -1,
  "SlewPos": 0.0,
  "Type": "Pid",
  "Zones": [
    "Left"
  ]
},
```

OpenBMC supports Acoustic and performance profiles only

if no profiles are fully supported across all configured fan domains, the BMC defaults to profile 7

i.e..default profile

Default mode is Performance mode.

Performance:

In performance mode, a server uses fans aggressively to cool the overall system. Servers should use performance mode while processing demanding workloads, but most servers select performance mode as the default. This drives the fans harder than may be needed, and it's noisy.

Acoustic:

By using acoustic mode, the user has some control over the fan speeds and airflow (and noise) that is produced by the system fans. This mode can be used for noise or airflow concerns in the user environment.

When the option is set to Off, the fan speeds change as required for optimal cooling.

Acoustic mode can degrade server performance, so disable it while processing critical workloads.

4.7 Fan Redundancy

When fan failure, the redundancy fan will work in the place of failure fan.

One of more fans have failed or have been removed or a configuration change occurred which requires additional fans.

Example: The eight fan modules (FMs) provide airflow for chassis cooling zones 1-4. For redundancy, each zone has two dedicated FMs. Replace a failed fan module immediately.

i.e., Each zone has 2-fans, 2 fans under working, reading is getting for 2 fans. If one fan is failed then other fan will take care of that zone

Description

A system fan is not working, or it is very slow and there are critical fan alerts:

Degraded state

Redundancy Lost state

Lower Critical - going low

Service and Object paths for Fan redundancy

Service :- xyz.openbmc_project.FanSensor

Objpath:- /xyz/openbmc_project/control/FanRedundancy/Tach

Interface : - xyz.openbmc_project.Control.FanRedundancy

DbusPassiveRedundancy monitors the fan redundancy interface via dbus match for changes. When the "Status" property changes to Failed, all sensors in the interface's "Collection" property are added to the failed member. This set can then be queried by a sensor to see if they are part of a failed redundancy collection. When this happens, they get marked as failed.

Check fan redundancy status (busctl introspect and check the state of the redundancy (status property))

Collection property will give list of fans and there objpaths

Status property: will show the current redundancy state

FULL state: System is in a fully redundant state.

Failed state: System has lost redundancy.

Degraded state: Redundancy is in a degraded state.

AllowedFailures : -Number of fans in error state before redundancy is lost.

```
root@intel-obmc:~# busctl introspect xyz.openbmc_project.FanSensor /xyz/openbmc_project/control/FanRedundancy/Tach
NAME                                TYPE      SIGNATURE RESULT/VALUE  FLAGS
org.freedesktop.DBus.Introspectable interface -          -          -
.Introspect                        method    -          s              -
org.freedesktop.DBus.Peer         interface -          -          -
.GetMachineId                      method    -          s              -
.Ping                             method    -          -              -
org.freedesktop.DBus.Properties   interface -          -          -
.Get                              method    ss         v              -
.GetAll                           method    s          a{sv}         -
.Set                              method    ssv        -              -
.PropertiesChanged                signal    sa{sv}as   -              -
xyz.openbmc_project.Association.Definitions interface -          -          -
.Associations                     property  a(sss)    1 "chassis" "all_sensors" "/xyz/openb... emits-change
xyz.openbmc_project.Control.FanRedundancy interface -          -          -
.AllowedFailures                  property  y          1              emits-change
.Collection                       property  as         10 "/xyz/openbmc_project/sensors/fan_... emits-change
.Status                           property  s          "Full"        emits-change
```

Degraded:1 fan in critical, respective Zone pwm Duty is 99%

Failed: 2 fans in critical(redundancy lost), all pwm duty is 99%

Full: pwm dutycycle is minimum 40%(set to default)

By default it is in full state (full redundancy state)

Chapter 5

5 MegaRAC OneTree™ IPMI Configuration

5.1 Supported IPMI Commands

Net Function	Command	Command Name	Comments	
Application				
0x06	0x01	Get Device ID		
0x06	0x02	Cold Reset		
0x06	0x03	Warm Reset		
0x06	0x08	Get Device GUID		
0x06	0x06	Set ACPI Power state		
0x06	0x07	Get ACPI Power State		
0x06	0x45	Set User Name		
0x06	0x46	Get User Name		
0x06	0x47	Set User Password		
0x06	0x37	Get System Guide		
0x06	0x58	Set System Info Parameter	Supported: Set In Progress, System firmware Version, System name, Operating System name Non-volatile, Operating System name	
			Volatile, Present OS Version number.	
0x06	0x59	Get System Info Parameter		
0x06	0x4c	Set User Payload Access	Supported: Standard 1(SOL).	Payload
0x06	0x4d	Get User Payload Access		
0x06	0x4e	Get Channel Pay Load Support		
0x06	0x4f	Get Channel Pay Load Version		
0x06	0x52	Master Write Read		

Net Function	Command	Command Name	Comments	
0x06	0x54	Get Channel Cipher Suites		
0x06	0x24	Set Watchdog Timer	Events logging Supported.	Not
0x06	0x22	Reset Watchdog Timer		
0x06	0x25	Get Watchdog Timer		
0x06	0x2e	Set BMC Global Enable		
0x06	0x2f	Get BMC Global Enable		
0x06	0x35	Read Event Message Buffer		
0x06	0x31	Get Message Flag		
0x06	0x30	Clear Message Flag		
0x06	0x34	Send Message	Supported: IPMB, Other Lan	
0x06	0x36	Get Interface Capabilities		
0x06	0x40	Set Channel Access	Supported: PEF Alerting, Per Message authentication, User level Authentication, Access Mode, Channel Privledge Limit.	
0x06	0x41	Get Channel Access		
0x06	0x30	Set Sensor Reading and Event Status		
0x06	0x42	Get Channel Info		
0x06	0x38	Get Channel Authentication Capabilities		
CHASSIS				
0x00	0x00	Get Chassis Capabilities		
0x00	0x01	Get Chassis Status		
0x00	0x02	Chassis Control		
0x00	0x0F	Get POH Counter		
0x00	0x04	Chassis Identity		

Net Function	Command	Command Name	Comments
0x00	0x07	Get System Restart Cause	
0x00	0x0a	Set Front Panel Enables	
0x00	0x08	Set SystemBoot Options	Supported: Set In Progress, Bmc boot flag Valid bit Clearing, Boot Info Acknowledge, Boot flags.
0x00	0x09	Get SystemBoot Options	Supported: Set In Progress, Bmc boot flag Valid bit Clearing, Boot Info Acknowledge, Boot flags
Sensor Event			
0x04	0x20	Get Device SDR Info	
0x04	0x21	Get Device SDR	
0x04	0x27	Get Sensor Threshold	
0x04	0x2D	Get Sensor Reading	
0x04	0x22	Reserve Device SDR Repository	
0x04	0x2f	Get Sensor Type	
0x04	0x29	Get Sensor Event Enable	
0x04	0x2b	Get Sensor Event Status	
0x04	0x26	Set Sensor Threshold	
0x04	0x02	Platform Event	Partially Supported [Events generated via ipmi are updated in ipmi & redfish logs]
PEF& Alerting Commands			
0x04	0x10	Get PEF Capabilities	
0x04	0x11	Arm PEF Postpone Timer	
0x04	0x12	Set PEF Configuration Parameters	

Net Function	Command	Command Name	Comments
0x04	0x13	Get PEF Configuration Parameters	
Storage			
0x0a	0x10	Get FRU Inventory Area Info	
0x0a	0x11	Read FRU Data	
0x0a	0x12	Write FRU Data	
0x0a	0x20	Get SDR Repository Info	
0x0a	0x22	Reserve SDR Repository	
0x0a	0x23	Get SDR	
0x0a	0x40	Get SEL Info	
0x0a	0x42	Reserve SEL	
0x0a	0x43	Get Sel Entry	
0x0a	0x28	Get SDR	
0x0a	0x44	Repository Time	
0x0a	0x47	Add SEL Entry	
0x0a	0x48	Clear SEL	
0x0a	0x49	Get SEL Time	
0x0a	0x46	Set SEL Time	
Transport			
0x0c	0x01	Set LAN Configuration Parameters	
0x0c	0x02	Get LAN Configuration Parameters	
0x0c	0x21	Set SOL Configuration Parameters	Supported: Set in Progress, SOL Enable, SOL Authentication, Accumulate, Retry, Port.
0x0c	0x22	Get SOL Configuration Parameters	Supported: Set in Progress, SOL Enable, SOL Authentication, Accumulate, Retry,

Net Function	Command	Command Name	Comments
			Non-Volatile bitrate, Payload channel, Port.
DCMI			
0x2c	0x01	Get DCMI Capability Info	parameter 3,4,5 is not supported
0x2c	0x06	Get Asset Tag	
0x2c	0x08	Set Asset Tag	
0x2c	0x09	Get Management Controller Identifier string	
0x2c	0x09	Set management Controller Identifier string.	
0x2c	0x02	Get Power Reading	Enhanced System Power Statistics mode not supported Required node manager support.
0x2c	0x03	Get Power Limit	Required node manager support.
0x2c	0x04	Set Power Limit	Required node manager support
0x2c	0x05	Activate/Deactivate Power Limit	Required node manager support
0x2c	0x10	Get Temperature Reading	
0x2c	0x07	Get DCMI Sensor Info	
0x2c	0x12	Set DCMI Configuration Parameters	SUPPORTED [Activate DHCP] [Discovery configuration (option 12)]
0x2c	0x13	Get DCMI Configuration Parameters	SUPPORTED [Activate DHCP]

Note: Device ID IPMI Command Each data field can be modified, but it needs to be modified according to the format.
 PATH - /usr/share/ipmi-providers/dev_id.json

5.1.1 Auxiliary Value User Modification for IPMI

The AUX values from both Get Device ID and mc info IPMI commands are determined based on the version ID set in the Version property of the D-Bus interface xyz.openbmc_project.Software.Version. To modify these values, users can update the version-vars.inc file located in meta-ami/meta-common/recipes-core/os-release or create a corresponding file in their own meta layer to override the AUX value during the build process. By setting a specific version ID, the system ensures that both IPMI commands reflect the intended auxiliary information consistently.

```
meta_hash = irun_git(d, mibase, 'rev-parse HEAD')
# If no hash, provide default
if meta_hash.startswith('fatal:'):
    meta_hash = obmc_hash[0:7]
#version_id = '{}-{}'.format(meta_vers, obmc_hash[0:7])
version_id = "onetree-2.1-Dev-1-g2bc15b-7aa755d"
if version_id:
    d.setVar('VERSION_ID', version_id)
    versionList = version_id.split('-')
    versionList = re.split(r'[-|.]', version_id)
    version = '{}.{}.{}'.format(versionList[0], versionList[1], versionList[2])
    d.setVar('VERSION', version)
    d.setVar('IPMI_MAJOR', versionList[1])
    d.setVar('IPMI_MINOR', versionList[2])
    if versionList[3] == "Dev":
        d.setVar('IPMI_AUX13', hex(min(int(versionList[4]), 0xff)))
    else:
        d.setVar('IPMI_AUX13', hex(min(int(versionList[3]), 0xff)))
    d.setVar('IPMI_AUX14', '0x{}'.format(meta_hash[0:2]))
    d.setVar('IPMI_AUX15', '0x{}'.format(meta_hash[2:4]))
    d.setVar('IPMI_AUX16', '0x{}'.format(meta_hash[4:6]))
```

```
root@AMIOT-2aa73391daa8:~# busctl introspect xyz.openbmc_project.Software.BMC.Updater /xyz/openbmc_project/software/bmc_active
```

NAME	TYPE	SIGNATURE	RESULT/VALUE	FLAGS
org.freedesktop.DBus.Introspectable	interface	-	-	-
.Introspect	method	-	s	-
org.freedesktop.DBus.Peer	interface	-	-	-
.GetMachineId	method	-	s	-
.Ping	method	-	-	-
org.freedesktop.DBus.Properties	interface	-	-	-
.Get	method	ss	v	-
.GetAll	method	s	a{sv}	-
.Set	method	ssv	-	-
.PropertiesChanged	signal	sa{sv}as	-	-
xyz.openbmc_project.Association.Definitions	interface	-	-	-
.Associations	property	a(sss)	1 "inventory" "activation" ""	emits-change writable
xyz.openbmc_project.Common.FilePath	interface	-	-	-
.Path	property	s	"bmc_active"	emits-change writable
xyz.openbmc_project.Inventory.Decorator.Compatible	interface	-	-	-
.Names	property	as	0	emits-change writable
xyz.openbmc_project.Software.Activation	interface	-	-	-
.Activation	property	s	"xyz.openbmc_project.Software.Activat..."	emits-change writable
.RequestedActivation	property	s	"xyz.openbmc_project.Software.Activat..."	emits-change writable
xyz.openbmc_project.Software.ExtendedVersion	interface	-	-	-
.ExtendedVersion	property	s	""	emits-change writable
xyz.openbmc_project.Software.RedundancyPriority	interface	-	-	-
.Priority	property	y	0	emits-change writable
xyz.openbmc_project.Software.Version	interface	-	-	-
.Version	property	s	"onetree-2.1-dev-1-g2bc15b-7aa755d"	emits-change writable

Get Device ID

S.No	Response Data Field	Response Data Source
2	Device ID	Data will be retrieved from dev_id.json file
3	Device Revision	Data will be retrieved from dev_id.json file
4	Firmware Revision (Major)	Data will be retrieved from version_ID over D-Bus
5	Firmware Revision (Minor)	Data will be retrieved from version_ID over D-Bus
6	IPMI Version	Hardcoded (02h)
7	Additional Device Support	Data will be retrieved from dev_id.json file
8:10	Manufacturer ID	Data will be retrieved from dev_id.json file
11:12	Product ID	Data will be retrieved from /var/cache/private/prodID file
13:16	Auxiliary Firmware Revision	Data will be retrieved from version_ID over D-Bus from version-vars.inc file

5.2 Cipher Suite Privileges

IPMI allows configuring the maximum privilege level permitted for each cipher suite to enforce security rules.

If a session is established using a cipher suite, it cannot exceed that suite's maximum privilege level.

Example:

- Cipher Suite 17 → Privilege OPERATOR
- Session with USER privilege → Allowed
- Session with ADMINISTRATOR privilege → Blocked (Too high)

In OneTree currently supports only one cipher suite (17). The cipher suite privilege should be set to 1st Cipher Suite Priv Max.

```
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 lan print 3
Set in Progress      : Set Complete
Auth Type Support    :
Auth Type Enable     : Callback :
                    : User      :
                    : Operator :
                    : Admin    :
                    : OEM      :
IP Address Source    : DHCP Address
IP Address           : 10.0.98.119
Subnet Mask          : 255.255.224.0
MAC Address          : 9e:9d:81:a6:2f:7e
IP Header            : TTL=0x40 Flags=0x40 Precedence=0x00 TOS=0x10
BMC ARP Control      : ARP Responses Enabled, Gratuitous ARP Disabled
Gratuitous ARP Intrvl : 2.0 seconds
Default Gateway IP    : 10.0.96.1
Default Gateway MAC   : 00:09:0f:09:00:12
Backup Gateway IP     : 0.0.0.0
Backup Gateway MAC    : 00:00:00:00:00:00
802.1q VLAN ID       : Disabled
802.1q VLAN Priority  : 0
RMCP+ Cipher Suites  : 17
Cipher Suite Priv Max : aaaaaaaaaaaaaa
                    : X=Cipher Suite Unused
                    : c=CALLBACK
                    : u=USER
                    : o=OPERATOR
                    : a=ADMIN
                    : O=OEM
```

Example:

If cipher suite 3 and 17 supported means, Cipher suite privilege should be set to first 2 Cipher Suite Priv Max.

First privilege for 3 and Second privilege for 17.

```
802.1q VLAN Priority : 0
RMCP+ Cipher Suites : 3,17
Cipher Suite Priv Max : aaXXXXXXXXXXXXX
                    : X=Cipher Suite Unused
                    : c=CALLBACK
                    : u=USER
                    : o=OPERATOR
                    : a=ADMIN
                    : O=OEM
Bad Password Threshold : 0
```

Test case Example:

Cipher Suite Unused Privilege:

Session cannot be established with unused cipher suite privilege.


```

msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 lan set 3 cipher_privs Xaaaaaaaaaaaaa
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1
Error in open session response message : insufficient resources for role

Error: Unable to establish IPMI v2 / RMCP+ session
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L USER
Error in open session response message : insufficient resources for role

Error: Unable to establish IPMI v2 / RMCP+ session
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L OPERATOR
Error in open session response message : insufficient resources for role

Error: Unable to establish IPMI v2 / RMCP+ session
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L ADMINISTRATOR
Error in open session response message : insufficient resources for role

Error: Unable to establish IPMI v2 / RMCP+ session
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$

```

USER Privilege:

Session can be established up to Maximum USER privilege only.

```

msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 lan set 3 cipher_privs uaaaaaaaaaaaaa
7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1
Set Session Privilege Level to ADMINISTRATOR failed: Unknown (0x81)
Error: Unable to establish IPMI v2 / RMCP+ session
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L USER
23 00 02 01 02 bf 57 01 00 00 00 42 d9 11 14
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L OPERATOR
Error in open session response message : unauthorized role requested

Error: Unable to establish IPMI v2 / RMCP+ session
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L ADMINISTRATOR
Set Session Privilege Level to ADMINISTRATOR failed: Unknown (0x81)
Error: Unable to establish IPMI v2 / RMCP+ session
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$

```

Operator Privilege:

Session can be established up to Maximum OPERATOR privilege only.

```

msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 lan set 3 cipher_privs oaaaaaaaaaaaaa
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1
Set Session Privilege Level to ADMINISTRATOR failed: Unknown (0x81)
Error: Unable to establish IPMI v2 / RMCP+ session
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L USER
23 00 02 01 02 bf 57 01 00 00 00 42 d9 11 14
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L OPERATOR
23 00 02 01 02 bf 57 01 00 00 00 42 d9 11 14
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L ADMINISTRATOR
Set Session Privilege Level to ADMINISTRATOR failed: Unknown (0x81)
Error: Unable to establish IPMI v2 / RMCP+ session
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$

```

Administrator Privilege:

Session can be established with all supported privileges.

```

msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 lan set 3 cipher_privs aaaaaaaaaaaaaa
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1
23 00 02 01 02 bf 57 01 00 00 00 42 d9 11 14
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L USER
23 00 02 01 02 bf 57 01 00 00 00 42 d9 11 14
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L OPERATOR
23 00 02 01 02 bf 57 01 00 00 00 42 d9 11 14
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L ADMINISTRATOR
23 00 02 01 02 bf 57 01 00 00 00 42 d9 11 14
msgsubuntu@msgsubuntu-OptiPlex-Tower-7020:~$

```

Note:

If cipher suite privilege set to USER, can't be able to execute admin privilege commands (Set Channel Access) and operator privilege commands (Reset Watchdog Timer) due to insufficient privilege level.

```

msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 lan set 3 cipher_privs uaaaaaaaaaaaaa
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1
Set Session Privilege Level to ADMINISTRATOR failed: Unknown (0x81)
Error: Unable to establish IPMI v2 / RMCP+ session
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 6 1 -L USER
23 00 02 01 02 bf 57 01 00 00 00 42 d9 11 14
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 0x06 0x40 0x03 0x52 0x82 -L USER
Unable to send RAW command (channel=0x0 netfn=0x6 lun=0x0 cmd=0x40 rsp=0xd4): Insufficient privilege level
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$ ipmitool -I lanplus -H 10.0.98.119 -U root -P OpenBmc -C 17 raw 0x06 0x22 -L USER
Unable to send RAW command (channel=0x0 netfn=0x6 lun=0x0 cmd=0x22 rsp=0xd4): Insufficient privilege level
msgubuntu@msgubuntu-OptiPlex-Tower-7020:~$

```


5.3 LAN Interface

Supports dedicated and shared LAN interface for Out-of-Band access to the Service Processor.

By default, MAC will be auto generated and configured if it is not configured by the user. Supported IPMI commands are listed here.

Example:

```
ipmitool -H <BMC IP> -U root -I lanplus -P OpenBmc raw 0x6 0x1 → Get Device ID
```

```
ipmitool -H <BMC IP> -U root -I lanplus -P OpenBmc lan print 3 → Get Lan Info ipmitool
```

```
-H <BMC IP> -U root -I lanplus -P OpenBmc chassis power <on/off/cycle/reset/status>
```

```
ipmitool -H <BMC IP> -U root -I lanplus -P OpenBmc sensor list ipmitool -H <BMC IP> -U
```

```
root -I lanplus -P OpenBmc sdr list
```

5.4 KCS Interface

KCS interface is supported in the firmware for In-band interface for Host to BMC communication.

Firmware supports only the SMS interface and SMM interface host supported.

Example: `ipmitool raw 6 1`

Note: *Recommended to use ipmitool version 1.8.18 to avoid abnormal response.*

5.5 FRU Device Support

BMC FW supports the IPMI FRU devices support. FRU device configuration can be done through entity manager, read and write FRU data to EEPROM are supported.

```
root@intel-obmc:~# ipmitool fru list
FRU Device Description : Builtin FRU Device (ID 0)
Chassis Type          : Rack Mount Chassis
Chassis Part Number   : .....
Chassis Serial        : .....
Chassis Extra         : .....
Chassis Extra         : .....
Board Mfg Date        : Unspecified
Board Mfg             : Intel Corporation
Board Product         : ArcherCity
Board Serial          : Intel_3245
Board Part Number     : .....
Product Manufacturer  : Intel Corporation
Product Name          : ArcherCity
Product Part Number   : .....
Product Version       : .....
Product Serial        : Intel_3245
Product Asset Tag     : .....

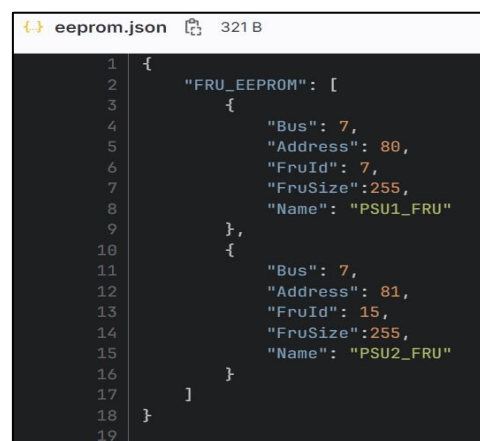
FRU Device Description : IS162F22 (ID 84)
Product Manufacturer   : SOLUM CO., LTD.
Product Name           : IS162F22
Product Part Number    : G36234-016
Product Version        : 11A
Product Serial         : PSSF162202ACNS1622A4BL3P1132

root@intel-obmc:~#
```

5.5.1 Empty FRU Support

To enable empty FRU device support “configurable.fru” Flag should be enable for intel-**ipmi-oem recipe**.

Configurable_{fru} allows listing the FRU even when the eeprom is having empty, when it's configured with the i2c Bus & Address in eeprom.json file



```
1  {
2    "FRU_EEPROM": [
3      {
4        "Bus": 7,
5        "Address": 80,
6        "FruId": 7,
7        "FruSize": 255,
8        "Name": "PSU1_FRU"
9      },
10     {
11       "Bus": 7,
12       "Address": 81,
13       "FruId": 15,
14       "FruSize": 255,
15       "Name": "PSU2_FRU"
16     }
17   ]
18 }
19
```

File path : meta-<platform>/recipes-phosphor/configuration/entity-manager/eeprom.json

When the feature is enabled, entity-manager & ipmi ensure even when the eeprom is having empty FRU date, it will get listed if its configured in eeprom.json file.

This configuration file allows to configure the FRU id by mapping the location of device and to configure the FRUSize when eeprom is having empty data, such that Empty FRU can be upated using ipmitool

```
FRU Device Description : IS162F22 (ID 7)
Product Manufacturer  : SOLUM CO., LTD.
Product Name         : IS162F22
Product Part Number  : G36234-016
Product Version      : 11A
Product Serial       : PSSF162202ACNS1622A4BL3P1132
Product Area Checksum : OK

FRU Device Description : UNKNOWN (ID 15)
Unknown FRU header version 0xff
```

Note:

When “configurable-fru” feature is not enabled, FRU ID will get randomly generated and the FRU with empty eeprom data won’t get listing in IPMI.

5.6 Sensors Support

Sensor configuration and monitoring will be done through entity manager.

```
root@AMIOT-8ecbab1cea84:~# ipmitool sensor list
```

ACPI PSU1	0x0	discrete	0x0100	na	na	na	na	na	na
ACPI PSU2	0x0	discrete	0x0100	na	na	na	na	na	na
ACPI System Stat	0x0	discrete	0x0110	na	na	na	na	na	na
System Airflow	23.000	unspecified	ok	na	na	na	na	na	na
CMOS Battery	0x0	discrete	0x0400	na	na	na	na	na	na
BMC Firmware Hea	0x0	discrete	0x1100	na	na	na	na	na	na
Chassis on	0x0	discrete	0x0000	na	na	na	na	na	na
Status cpu0	0x0	discrete	0x8000	na	na	na	na	na	na
Status cpu1	0x0	discrete	0x8000	na	na	na	na	na	na
PSU1 In Current	0.624	Amps	ok	na	na	na	na	na	na
PSU1 Out Current	10.000	Amps	ok	na	na	na	164.000	180.000	na
PSU2 In Current	0.702	Amps	ok	na	na	na	na	na	na
PSU2 Out Current	11.000	Amps	ok	na	na	na	164.000	180.000	na
Cpu Energy CPU1	1864.800	unspecified	nc	na	na	na	0.000	na	na
Cpu Energy CPU2	2083.200	unspecified	nc	na	na	na	0.000	na	na
Dimm Energy CPU1	1394.400	unspecified	nc	na	na	na	756.000	na	na
Dimm Energy CPU2	2049.600	unspecified	nc	na	na	na	756.000	na	na
Platform Energy	0.000	unspecified	ok	na	na	na	2100.000	na	na
Platform Energy	0.000	unspecified	ok	na	na	na	2100.000	na	na
Pwm 0	39.984	unspecified	ok	na	na	na	na	na	na
Pwm 1	39.984	unspecified	ok	na	na	na	na	na	na
Pwm 2	39.984	unspecified	ok	na	na	na	na	na	na
Pwm 3	39.984	unspecified	ok	na	na	na	na	na	na
Pwm 4	39.984	unspecified	ok	na	na	na	na	na	na
Pwm 5	39.984	unspecified	ok	na	na	na	na	na	na
Pwm 12	39.984	unspecified	ok	na	na	na	na	na	na
Pwm 13	39.984	unspecified	ok	na	na	na	na	na	na
Pwm 14	39.984	unspecified	ok	na	na	na	na	na	na
Pwm 15	39.984	unspecified	ok	na	na	na	na	na	na
Pwm PSU1 Fan 1	39.984	unspecified	ok	na	na	na	na	na	na
Pwm PSU1 Fan 2	39.984	unspecified	ok	na	na	na	na	na	na
Pwm PSU2 Fan 1	39.984	unspecified	ok	na	na	na	na	na	na
Pwm PSU2 Fan 2	39.984	unspecified	ok	na	na	na	na	na	na
Fan 0	0.000	RPM	ok	na	1078.000	1274.000	na	na	na
Fan 1	0.000	RPM	ok	na	1078.000	1274.000	na	na	na
Fan 2	4214.000	RPM	ok	na	1078.000	1274.000	na	na	na
Fan 3	4214.000	RPM	ok	na	1078.000	1274.000	na	na	na
Fan 4	4214.000	RPM	ok	na	1078.000	1274.000	na	na	na
Fan 5	4214.000	RPM	ok	na	1078.000	1274.000	na	na	na
Fan 6	0.000	RPM	ok	na	1078.000	1274.000	na	na	na
Fan 7	0.000	RPM	ok	na	1078.000	1274.000	na	na	na
Fan 8	8722.000	RPM	ok	na	1078.000	1274.000	na	na	na
Fan 9	9408.000	RPM	ok	na	1078.000	1274.000	na	na	na
PSU1 Fan Speed 1	8260.000	RPM	ok	na	na	na	na	na	na
PSU1 Fan Speed 2	6962.000	RPM	ok	na	na	na	na	na	na
PSU2 Fan Speed 1	8260.000	RPM	ok	na	na	na	na	na	na
PSU2 Fan Speed 2	6962.000	RPM	ok	na	na	na	na	na	na
OS Stop Status	0x0	discrete	0x0000	na	na	na	na	na	na
Cpu Power Averag	105.600	Watts	ok	na	na	na	264.000	na	na
Cpu Power Averag	88.000	Watts	ok	na	na	na	264.000	na	na
Cpu Power Cap CP	0.000	Watts	ok	na	na	na	270.300	na	na

Cpu Power Cap CP	0.000	Watts	ok	na	na	na	270.300	na	na
Cpu Power Cap CP	0.000	Watts	ok	na	na	na	270.300	na	na
Dimm Power Avera	0.000	Watts	ok	na	na	na	0.000	na	na
Dimm Power Avera	0.000	Watts	ok	na	na	na	0.000	na	na
Dimm Power Cap C	0.000	Watts	ok	na	na	na	7.625	na	na
Dimm Power Cap C	0.000	Watts	ok	na	na	na	7.625	na	na
PSU1 Input Power	141.600	Watts	ok	na	na	na	1947.000	2147.600	na
PSU1 Out Power	118.000	Watts	ok	na	na	na	na	na	na
PSU2 Input Power	141.600	Watts	ok	na	na	na	1947.000	2147.600	na
PSU2 Out Power	129.800	Watts	ok	na	na	na	na	na	na
Platform Power A	na	Watts	na	na	na	na	404.800	na	na
Platform Power A	na	Watts	na	na	na	na	404.800	na	na
Platform Power C	0.000	Watts	ok	na	na	na	400.350	na	na
Platform Power C	0.000	Watts	ok	na	na	na	400.350	na	na
Power Unit	0x0	discrete	0x0000	na	na	na	na	na	na
BMC Temp	29.000	degrees C	ok	na	0.000	5.000	110.000	115.000	na
CPU1 North VR Te	28.000	degrees C	ok	na	0.000	5.000	110.000	115.000	na
CPU1 PVCCD VR Te	na	degrees C	na	na	0.000	5.000	110.000	115.000	na
CPU1 PVCCFA EHV	na	degrees C	na	na	0.000	5.000	110.000	115.000	na
CPU1 South VR Te	28.000	degrees C	ok	na	0.000	5.000	110.000	115.000	na
CPU1 VCCIN VR Te	na	degrees C	na	na	0.000	5.000	110.000	115.000	na
CPU2 North VR Te	30.000	degrees C	ok	na	0.000	5.000	110.000	115.000	na
CPU2 PVCCD VR Te	na	degrees C	na	na	0.000	5.000	110.000	115.000	na
CPU2 PVCCFA EHV	na	degrees C	na	na	0.000	5.000	110.000	115.000	na
CPU2 South VR Te	27.000	degrees C	ok	na	0.000	5.000	110.000	115.000	na
CPU2 VCCIN VR Te	na	degrees C	na	na	0.000	5.000	110.000	115.000	na
Core 0 CPU1	34.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 0 CPU2	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 1 CPU1	32.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 1 CPU2	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 2 CPU1	34.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 2 CPU2	32.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 3 CPU2	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 4 CPU1	30.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 4 CPU2	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 5 CPU1	32.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 5 CPU2	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 6 CPU1	32.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 6 CPU2	32.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 7 CPU1	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 7 CPU2	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 10 CPU1	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 10 CPU2	32.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 11 CPU1	29.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 11 CPU2	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 12 CPU1	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 12 CPU2	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 13 CPU1	30.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 14 CPU1	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 14 CPU2	30.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 15 CPU1	32.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 15 CPU2	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 16 CPU1	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 16 CPU2	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 18 CPU2	32.000	degrees C	ok	na	na	na	79.000	87.000	na

Core 51 CPU1	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 51 CPU2	34.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 52 CPU1	35.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 52 CPU2	35.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 53 CPU1	32.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 53 CPU2	36.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 54 CPU1	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 55 CPU2	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 56 CPU1	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 57 CPU1	31.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 57 CPU2	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 58 CPU1	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 59 CPU1	33.000	degrees C	ok	na	na	na	79.000	87.000	na
Core 59 CPU2	35.000	degrees C	ok	na	na	na	79.000	87.000	na
DIMM A1 CPU1	29.000	degrees C	ok	na	na	na	93.000	95.000	na
DIMM A1 CPU2	28.000	degrees C	ok	na	na	na	93.000	95.000	na
DTS CPU1	36.000	degrees C	ok	na	na	na	79.000	87.000	na
DTS CPU2	39.000	degrees C	ok	na	na	na	79.000	87.000	na
Die CPU1	36.000	degrees C	ok	na	na	na	79.000	87.000	na
Die CPU2	39.000	degrees C	ok	na	na	na	79.000	87.000	na
Inlet BRD Temp	26.000	degrees C	ok	na	0.000	5.000	110.000	115.000	na
Left Rear Board	27.000	degrees C	ok	na	0.000	5.000	110.000	115.000	na
PSU1 Temperature	22.000	degrees C	ok	na	na	na	73.000	78.000	na
PSU2 Temperature	22.000	degrees C	ok	na	na	na	73.000	78.000	na
Right Rear Board	28.000	degrees C	ok	na	0.000	5.000	110.000	115.000	na
SSB Temp	30.000	degrees C	ok	na	0.000	5.000	98.000	103.000	na
AverageCupsIndex	na	unspecified	na	na	0.000	0.000	94.864	99.960	na
AverageHostCpuUt	0.000	unspecified	ok	na	0.000	0.000	94.864	99.960	na
AverageHostMemor	0.000	unspecified	ok	na	0.000	0.000	94.864	99.960	na
AverageHostPciBa	na	unspecified	na	na	0.000	0.000	94.864	99.960	na
CupsIndex	na	unspecified	na	na	0.000	0.000	94.864	99.960	na
HostCpuUtilizati	0.000	unspecified	ok	na	0.000	0.000	94.864	99.960	na
HostMemoryBandwi	0.000	unspecified	ok	na	0.000	0.000	94.864	99.960	na
HostPciBandwidth	na	unspecified	na	na	0.000	0.000	94.864	99.960	na
A P12V PSU SCALE	12.096	Volts	ok	na	10.647	10.962	13.104	13.482	na
P1V8 PCH	1.820	Volts	ok	na	1.650	1.700	1.900	1.960	na
P3V3	3.320	Volts	ok	na	2.976	3.062	3.543	3.646	na
P3VBAT	3.063	Volts	ok	na	2.136	2.445	3.260	3.288	na
P5V	5.004	Volts	ok	na	4.506	4.637	5.371	5.528	na
P12V AUX	12.096	Volts	ok	na	10.647	10.962	13.104	13.482	na
P105 PCH AUX	1.049	Volts	ok	na	0.970	1.000	1.109	1.139	na
PSU1 In Voltage	228.920	Volts	ok	na	na	na	na	na	na
PSU2 In Voltage	228.920	Volts	ok	na	na	na	na	na	na
PVCCD HV CPU2	1.168	Volts	ok	na	1.010	1.049	1.198	1.228	na
PVCCFA EHV FIVRA	1.197	Volts	ok	na	1.107	1.139	1.261	1.299	na
PVCCINFA0N CPU2	1.064	Volts	ok	na	0.732	0.751	1.254	1.292	na
PVCCIN CPU2	1.730	Volts	ok	na	1.380	1.417	2.088	2.153	na
PVNN PCH AUX	1.027	Volts	ok	na	0.893	0.979	1.114	1.210	na
Watchdog2	0x0	discrete	0x0000	na	na	na	na	na	na
root@AMIOT-8ecbab1cea84:~# ipmitool sensor list wc -l									
207									
root@AMIOT-8ecbab1cea84:~#									

The following table provides information about the sensors of Beechnutcity platform.


```

root@AMIOT-be763de82e10:~# ipmitool sensor list
ACPI PSU1      0x0      discrete 0x0100    na      na      na      na      na      na
ACPI PSU2      0x0      discrete 0x0200    na      na      na      na      na      na
ACPI System Stat 0x0      discrete 0x4010    na      na      na      na      na      na
System Airflow  na      unspecified na      na      na      na      na      na      na
Status cpu0    0x0      discrete 0x8000    na      na      na      na      na      na
Status cpu1    0x0      discrete 0x8000    na      na      na      na      na      na
PSU1 In Current 0.156    Amps      ok      na      na      na      na      na      na
PSU1 Out Current 1.000    Amps      ok      na      na      na      164.000  180.000  na
PSU2 In Current 0.000    Amps      ok      na      na      na      na      na      na
PSU2 Out Current 0.000    Amps      ok      na      na      na      82.000   90.000   na
Pwm 1 2       99.960    unspecified ok      na      na      na      na      na      na
Pwm 3 4       99.960    unspecified ok      na      na      na      na      na      na
Pwm 5 6       99.960    unspecified ok      na      na      na      na      na      na
Pwm 7 8       99.960    unspecified ok      na      na      na      na      na      na
Pwm 9 10      99.960    unspecified ok      na      na      na      na      na      na
Pwm 11 12     99.960    unspecified ok      na      na      na      na      na      na
Pwm PSU1 Fan 1 39.984    unspecified ok      na      na      na      na      na      na
Pwm PSU1 Fan 2 39.984    unspecified ok      na      na      na      na      na      na
Pwm PSU2 Fan 1 39.984    unspecified ok      na      na      na      na      na      na
Pwm PSU2 Fan 2 39.984    unspecified ok      na      na      na      na      na      na
Fan 1         na      RPM      na      na      na      na      na      na      na
Fan 2         na      RPM      na      na      na      na      na      na      na
Fan 3         na      RPM      na      na      na      na      na      na      na
Fan 4         na      RPM      na      na      na      na      na      na      na
Fan 5         na      RPM      na      na      na      na      na      na      na
Fan 6         na      RPM      na      na      na      na      na      na      na
Fan 7         na      RPM      na      na      na      na      na      na      na
Fan 8         na      RPM      na      na      na      na      na      na      na
Fan 9         na      RPM      na      na      na      na      na      na      na
Fan 10        na      RPM      na      na      na      na      na      na      na
Fan 11        na      RPM      na      na      na      na      na      na      na
Fan 12        na      RPM      na      na      na      na      na      na      na
PSU1 Fan Speed 1 8142.000  RPM      ok      na      na      na      na      na      na
PSU1 Fan Speed 2 6962.000  RPM      ok      na      na      na      na      na      na
PSU2 Fan Speed 1 0.000     RPM      ok      na      na      na      na      na      na
PSU2 Fan Speed 2 0.000     RPM      ok      na      na      na      na      na      na
System Event Log 0x0      discrete 0x0000    na      na      na      na      na      na
OS Stop Status 0x0      discrete 0x0000    na      na      na      na      na      na
PSU1 Input Power 23.600    Watts     ok      na      na      na      1947.000  2147.600  na
PSU1 Out Power 0.000     Watts     ok      na      na      na      na      na      na
PSU2 Input Power 0.000     Watts     ok      na      na      na      1947.000  2147.600  na
PSU2 Out Power 0.000     Watts     ok      na      na      na      na      na      na
Status PSU1    0x0      discrete 0x0100    na      na      na      na      na      na
Status PSU2    0x0      discrete 0x0d00    na      na      na      na      na      na
Power Unit     0x0      discrete 0x0000    na      na      na      na      na      na
BMC Temp      39.000    degrees C ok      0.000    3.000    5.000    110.000  115.000  120.000
DTS CPU2      na      degrees C na      na      na      na      na      na      na
Inlet BRD Temp 27.000    degrees C ok      na      0.000    5.000    110.000  115.000  na
Left DIMM Bank T 26.000    degrees C ok      na      0.000    5.000    90.000   100.000  na
Left Mid Board T 26.000    degrees C ok      na      0.000    5.000    110.000  115.000  na
Left Rear Board 25.000    degrees C ok      na      0.000    5.000    110.000  115.000  na
PSU1 Temperature 35.000    degrees C ok      na      na      na      73.000   78.000   na
PSU2 Temperature 35.000    degrees C ok      na      na      na      73.000   78.000   na
Right DIMM Bank 28.000    degrees C ok      na      0.000    5.000    90.000   100.000  na
Right Mid Board 30.000    degrees C ok      na      0.000    5.000    90.000   100.000  na
Right Rear Board 27.000    degrees C ok      na      0.000    5.000    110.000  115.000  na
AverageCupsIndex na      unspecified na      na      na      0.000    90.160  na      na
AverageHostCpuUtl na      unspecified na      na      na      0.000    90.160  na      na
AverageHostMemor na      unspecified na      na      na      0.000    90.160  na      na
AverageHostPciBa na      unspecified na      na      na      0.000    90.160  na      na
CupsIndex      na      unspecified na      na      na      0.000    90.160  na      na
HostCpuUtilizati na      unspecified na      na      na      0.000    90.160  na      na
HostMemoryBandwi na      unspecified na      na      na      0.000    90.160  na      na
HostPciBandwidth na      unspecified na      na      na      0.000    90.160  na      na
P1V8 AUX      1.813    Volts     ok      na      na      na      na      na      na
P3V3 AUX      3.199    Volts     ok      na      1.548    1.651    3.492    3.595    na
P12V AUX      12.028   Volts     ok      na      11.408   11.470   12.524   12.586   na
PSU1 In Voltage 227.740  Volts     ok      na      na      na      na      na      na
PSU2 In Voltage 0.000     Volts     ok      na      na      na      na      na      na
PVCCD0 HV CPU1 na      Volts     na      na      1.019    1.029    1.196    1.205    na
PVCCD1 HV CPU1 na      Volts     na      na      1.019    1.029    1.196    1.205    na
PVCCFA EHV CPU1 na      Volts     na      na      1.686    1.695    1.901    1.911    na
PVCCFA EHV FIVRA na      Volts     na      na      1.646    1.656    1.901    1.911    na
PVCCINFAON CPU1 na      Volts     na      na      0.598    0.608    1.029    1.039    na
PVCCIN CPU1    na      Volts     na      na      1.450    1.460    1.931    1.940    na
PVNN MAIN CPU1 na      Volts     na      na      0.902    0.911    1.088    1.098    na
Watchdog2     0x0      discrete 0x0000    na      na      na      na      na      na

```

Note:

- 1 Based on the Beechnutcity platform, the sensor list can vary. Discrete sensors do not have threshold values.

2 The sensors listed below do not have a single threshold value for these platforms: EGS, AVC, BNC, AST2700 AVC DCSCM.

- PSU1&2 Fan Speed 1
- PSU1&2 Fan Speed 2
- PSU1&2 Input Voltage
- System Airflow
- CPU1&2 North VR Output Current
- CPU1&2 PVCCA EHV Output Current
- CPU1&2 PVCCD0 Output Current
- CPU1&2 PVCCD1 Output Current
- CPU1&2 PVCCFA EHV FIVRA Output Current
- CPU1&2 PVCCINFAON Output Current
- CPU1&2 PVNN Output Current
- CPU1&2 South VR Output Current
- CPU1&2 VNN EHV Output Current
- DCSCM OCP 12V Output Current
- PCIe 12V Output Current
- P1V8 AUX
- PCIe 12V In Voltage
- PSU1 & 2 Input Current
- PWM Related sensor
- CPU2 North VR Input Power
- CPU2 PVCCA EHV Output Power
- CPU2 PVCCD0 Output Power
- CPU2 PVCCD1 Output Power
- CPU2 PVCCFA EHV FIVRA Output Power
- CPU2 PVCCINFAON Output Power
- CPU2 PVNN Output Power
- CPU2 South VR Input Power
- CPU2 VNN EHV Input Power
- CPU2 North VR Input Voltage
- CPU2 PVCCA EHV Input Voltage
- CPU2 PVCCA EHV Output Voltage
- CPU2 PVCCD0 Output Voltage
- CPU2 PVCCD1 Output Voltage
- CPU2 PVCCD Input Voltage

- CPU2 PVCCFA EHV FIVRA Input Voltage
- CPU2 PVCCFA EHV FIVRA Output Voltage
- CPU2 PVCCINFAON Output Voltage
- CPU2 PVNN Output Voltage
- CPU2 South VR Input Voltage
- CPU2 VNN EHV Input Voltage
- DCSCM OCP 12V Input Voltage

- 3 When attempting to set the sensor threshold values above the sensor's maximum limit, the threshold value will rotate around.
- 4 Unlike threshold-based sensors, energy sensors measure accumulated consumption and do not have threshold value Threshold mismatch is expected because the values are rounded during conversion The table shows the threshold differences for each sensor type.

SI.NO	Sensor Type	Maximum difference(+/-)
1.	Voltage	0.06
2.	Temperature	0.01
3.	Current	0.01
4.	Power(other)	6

5.7 SMTP OEM Commands

The following commands use to configure smtp data.

Set SMTP Command:

Net Function = 0x30 Command = 0xE3

	Byte	Data field
Request Data	1	Server Selector Primary = 00 Secondary = 01
	2	Parameter Selector
	3: N	Configuration parameter data. (Refer SMTP Configuration Parameter Table)
Response Data	1	Completion Code

Get SMTP Command:

Net Function = 0x30 Command = 0xE4

	Byte	Data field
Request Data	1	Sever Selector Primary = 00 Secondary = 01
	2	Parameter Selector
Response Data	1	Completion Code
	3: N	Configuration parameter data. (Refer SMTP Configuration Parameter Table)

SMTP Configuration Parameter:

Parameter	#	Parameter Data
Enable/Disable Authentication	1	Data1 - This parameter is used to Enable or Disable the Authentication 01b = Enable Authentication 00b = Disable Authentication
Enable/Disable SMTP	2	Data1 - This parameter is used to Enable or Disable the SMTP setup. 01b = Enable SMTP 00b = Disable SMTP
Host Server IP Address	3	Data1:4 = IP address MS-byte first
Password	4	Data1:64 - Used to configure Password. Maximum allowed size for Email ID is 64
Port Number	5	Data1:2 = Port Number MS-byte first
Receiver Mail Address	6	Data1: Select Receiver 01h = First Recv. Mail 02h = Second Recv. Mail Data2:64: -Used to configure Receiver Mail Address. Maximum allowed size for Email ID is 64 (including username and domain name).
Sender Mail Address	7	Data1:64 - Used to configure Sender Mail Address. Maximum allowed size for Email ID is 64 (including username and domain name).
Enable/Disable TLS	8	Data1 - This parameter is used to Enable or Disable the TLS 01b = Enable TLS 00b = Disable TLS
Username	9	Data1:64 - Used to configure Username. Maximum allowed size for Email ID is 64
Host server IPv6 Address	10	Data1:16 IPv6 Address MS-byte first

5.8 Circular and Linear SEL Configuration

An Event can be differentiated based on the Severity of the Entry. Based on the severity only the Capping limit is defined. Maximum of 1250 entries will be supported (including both information and error entries).

Information cap: 900 Error cap: 350

“Create” D-Bus method needs to be used. This D-Bus method accepts below mentioned Parameters.

Parameters	Type	Comments
Message	string	Event description for redfish
Severity	enum[xyz.openbmc_project.Logging.Entry.Level]	xyz.openbmc_project.Logging.Entry.Level.Informational xyz.openbmc_project.Logging.Entry.Level.Warning xyz.openbmc_project.Logging.Entry.Level.Error
Additional Data	Dictionary [string, string]	This parameter can be populated with details required for IPMI SEL. Eg: "SENSOR_DATA", "SENSOR_PATH", "EVENT_DIR", "GENERATOR_ID", "SENSOR_TYPE", "RECORD_TYPE"

Linear and Circular policy can be configured using the busctl/IPMI commands.

OEM Command	NetFun	Command
Get SEL Policy	0x32	0x7E
Set SEL Policy	0x32	0x7F

SEL Policy	Data
Linear SEL	00h
Circular SEL	01h

Linear and Circular policy can be configured using the busctl commands.

Circular Policy:

```
busctl set-property xyz.openbmc_project.Settings /xyz/openbmc_project/logging/settings
xyz.openbmc_project.Logging.Settings SelPolicy s
"xyz.openbmc_project.Logging.Settings.Policy.Circular"
```

```
root@intel-obmc:~# busctl set-property xyz.openbmc_project.Settings /xyz/openbmc_project/logging/settings xyz.openbmc_project.Logging.Settings Sel
Policy s "xyz.openbmc_project.Logging.Settings.Policy.Circular"
root@intel-obmc:~#
root@intel-obmc:~# busctl get-property xyz.openbmc_project.Settings /xyz/openbmc_project/logging/settings xyz.openbmc_project.Logging.Settings Sel
Policy
s "xyz.openbmc_project.Logging.Settings.Policy.Circular"
root@intel-obmc:~#
```

Linear Policy:

```
busctl set-property xyz.openbmc_project.Settings /xyz/openbmc_project/logging/settings
xyz.openbmc_project.Logging.Settings SelPolicy s
"xyz.openbmc_project.Logging.Settings.Policy.Linear"
```

```
root@intel-obmc:~# busctl get-property xyz.openbmc_project.Settings /xyz/openbmc_project/logging/settings xyz.openbmc_project.Logging.Settings Sel
Policy
s "xyz.openbmc_project.Logging.Settings.Policy.Circular"
root@intel-obmc:~# busctl set-property xyz.openbmc_project.Settings /xyz/openbmc_project/logging/settings xyz.openbmc_project.Logging.Settings Sel
Policy s "xyz.openbmc_project.Logging.Settings.Policy.Linear"
root@intel-obmc:~#
root@intel-obmc:~# busctl get-property xyz.openbmc_project.Settings /xyz/openbmc_project/logging/settings xyz.openbmc_project.Logging.Settings Sel
Policy
s "xyz.openbmc_project.Logging.Settings.Policy.Linear"
root@intel-obmc:~#
```

Activate Windows
Go to Settings to activate Windows.

5.9 Service Manager IPMI OEM command

5.9.1 Set BMC Service Status

Description

This command sets the enabled/disabled state of specified BMC services.

NetFn	0x32
Command	0xE1

Request Data:

Byte	Data field
1	<i>state</i> : The state to set for the services. 00h = Disabled 01h = Enabled
2 : 3	<i>serviceMask</i> : A bitmask indicating which services to update with LS Byte first.

Response Data:

Byte	Data field
1	Completion Code

5.9.2 Get BMC Service Status

Description

This command retrieves the status of specified BMC services. If no specific service is requested, it returns the status of all services.

NetFn	0x32
Command	0xE2

Request Data:

Byte	Data field
1 : 2	<i>serviceMask (optional)</i> : A bitmask indicating which services statuses to retrieve. If 0, retrieves the status of all services with LS Byte first.

Response Data:

Byte	Data field
1 : 2	<i>serviceStatus</i> : A bitmask representing the status of the requested services.

5.9.3 Set BMC Service Port Value

Description

This command is used to set the port value for specified BMC services.

NetFn	0x32
Command	0xE3

Request Data:

Byte	Data field
1 : 2	<i>serviceMask</i> : A bitmask indicating which services port number to be updated with LSB first.
3 : 4	<i>portValue</i> : Bitmask indicating port value to be set, with LS Byte first.

Response Data:

Byte	Data field
1	Completion Code

5.9.4 Get Bmc Service Port Value

Description

This command retrieves the port value for specified BMC services.

NetFn	0x32
Command	0xE4

Request Data

Byte	Data field
1 : 2	<i>serviceMask</i> : A bitmask indicating which service's port value to retrieve, with LS Byte first.

Response Data

Byte	Data field
1 : 2	<i>portValue</i> : The port number associated with the specified service.

Bit Mask for corresponding services.

Bit positions for the current available services in the stack:

Bit 0: Web Service (bmcweb)

Bit 1: SSH Service (dropbear)

Bit 2: IPMB Service (ipmb)

Bit 3: SOL Service for Instance 1 (obmc_2dconsole_40ttyS0)

Bit 4: SOL Service for Instance 2 (obmc_2dconsole_40ttyS1)

Bit 5: SOL Service for Instance 3 (obmc_2dconsole_40ttyS2)

Bit 6: SOL Service for Instance 4 (obmc_2dconsole_40ttyS3)

Bit 7: KCS Service using bridge 3 (phosphor_2dipmi_2dkcs_40ipmi_kcs3)

Bit 8: KCS Service using bridge 4 (phosphor_2dipmi_2dkcs_40ipmi_kcs4)

Bit 9: RMCP Service with Bond0 interface (phosphor_2dipmi_2dnet_40bond0)

Bit 10: RMCP Service with eth0 interface (phosphor_2dipmi_2dnet_40eth0)

Bit 11: RMCP Service with eth1 interface (phosphor_2dipmi_2dnet_40eth1)

Bit 12: RMCP Service with eth2 interface (phosphor_2dipmi_2dnet_40usb0)

Bit 13: KVM Service (start_2dipkvm)

Bit 14: vMedia service (xyz_2eopenbmc_project_2eVirtualMedia)

Chapter 6

6 MegaRAC OneTree™ BMC Internal Tool Usage

6.1 I2C TOOLS

6.1.1 I2cdetect: (which will detect and print all available bus in the system)

- Usage: i2cdetect [-y] [-a] [-q] [-r] I2CBUS [FIRST LAST]
- i2cdetect -F I2CBUS
- i2cdetect -l
- Example: i2cdetect -l

```
root@intel-obmc:~# i2cdetect -l
i2c-0 i2c 1e78a080.i2c-bus I2C adapter
i2c-4 i2c 1e78a280.i2c-bus I2C adapter
i2c-5 i2c 1e78a300.i2c-bus I2C adapter
i2c-6 i2c 1e78a380.i2c-bus I2C adapter
i2c-7 i2c 1e78a400.i2c-bus I2C adapter
i2c-8 i2c 1e78a480.i2c-bus I2C adapter
i2c-9 i2c 1e78a500.i2c-bus I2C adapter
i2c-12 i2c 1e78a680.i2c-bus I2C adapter
i2c-13 i2c 1e78a700.i2c-bus I2C adapter
i2c-16 i2c i2c-8-mux (chan_id 0) I2C adapter
i2c-17 i2c i2c-8-mux (chan_id 1) I2C adapter
i2c-18 i2c i2c-8-mux (chan_id 0) I2C adapter
i2c-19 i2c i2c-8-mux (chan_id 1) I2C adapter
i2c-20 i2c i2c-8-mux (chan_id 2) I2C adapter
i2c-21 i2c i2c-8-mux (chan_id 3) I2C adapter
i2c-22 i2c i2c-8-mux (chan_id 0) I2C adapter
i2c-23 i2c i2c-8-mux (chan_id 1) I2C adapter
i2c-24 i2c i2c-8-mux (chan_id 2) I2C adapter
i2c-25 i2c i2c-8-mux (chan_id 3) I2C adapter
i2c-26 i2c i2c-8-mux (chan_id 0) I2C adapter
i2c-27 i2c i2c-8-mux (chan_id 1) I2C adapter
i2c-28 i2c i2c-8-mux (chan_id 2) I2C adapter
i2c-29 i2c i2c-8-mux (chan_id 3) I2C adapter
root@intel-obmc:~#
```

6.1.2 I2cdump:

I2cdump command will print all the data from specific i2c device.

- Example: i2cdump -y 1e78a800.i2c-bus 0x4c

```
root@AMI5abe89f3f5d1:~# i2cdump -y 1e78a800.i2c-bus 0x4c
No size specified (using byte-data access)
 0 1 2 3 4 5 6 7 8 9 a b c d e f 0123456789abcdef
00: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
10: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
20: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
30: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
40: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
50: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
60: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
70: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
80: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
90: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
a0: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
b0: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
c0: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
d0: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
e0: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
f0: XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XXXXXXXXXXXXXXXX
root@AMI5abe89f3f5d1:~#
```

6.1.3 I2cget:

I2cget is a helper command to read registers on devices connected through the I2C bus.

```
root@intel-obmc:~# i2cget -f -y 7 0x50 0x05 0x0d
```

6.1.4 I2cset:

I2cset is a helper program to set registers on devices connected through the I2C bus.

```
root@intel-obmc:~# i2cset -f -y 7 0x50 0x05 0x01
root@intel-obmc:~# i2cget -f -y 7 0x50 0x05
0x01
root@intel-obmc:~# i2cdump -f -y 7 0x50
No size specified (using byte-data access)
  0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f  0123456789abcdef
00: 01 00 00 00 01 01 00 f1 01 0c 19 e1 53 4f 4c 55  ?...??.????SOLU
10: 4d 20 43 4f 2e 2c 20 4c 54 44 2e 20 20 20 20 20  M CO., LTD.
20: 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20  ?IS
30: 31 36 32 46 32 32 ca 47 33 36 32 33 34 2d 30 31  162F22?G36234-01
40: 38 c3 31 33 41 dc 50 53 53 46 31 36 32 32 30 32  8?13A?PSSF162202
50: 41 43 4e 53 31 36 32 32 41 34 42 4c 43 4d 30 36  ACNS1622A4BLCM06
60: 35 39 00 00 c1 00 00 a6 00 02 18 43 a3 40 06 34  59...?..??.?C?@?4
70: 08 41 02 28 23 b0 36 50 46 20 67 2f 3f 0c 0e 34  ?A?(#?6PF g/???4
80: a8 00 40 06 00 01 02 0d e6 0a 01 b0 04 74 04 ec  ?.@?.???????t??
90: 04 78 00 00 00 85 00 01 82 0d 31 3f 82 b0 04 74  ?x...?..?1????t
a0: 04 ec 04 78 00 00 00 ac 0d ff ff ff ff ff ff ff  ???x...??.
b0: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  .....
c0: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  .....
d0: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  .....
e0: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  .....
f0: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  .....
root@intel-obmc:~#
```

6.2 GPIO TOOLS

6.2.1 GPIO utilities

There are a few GPIO utilities supported on the BMC FW. They can be used to set / get state on the GPIO lines, set /get direction of a GPIO line etc.

6.2.2 gpiodetect:

Usage: gpiodetect

List all GPIO chips; print their labels and number of GPIO lines.

```
root@intel-obmc:~# gpiodetect
gpiochip0 [1e780000.gpio] (208 lines)
gpiochip1 [1e780800.gpio] (36 lines)
gpiochip2 [1e780500.sgpiom] (160 lines)
```

6.2.3 gpioset:

Usage: gpioset [OPTIONS] <chip name/number> <offset1>=<value1>

<offset2>=<value2> ... Set GPIO line values of a GPIO chip and maintain the state until the process exits Options:

-v, --version: display the version and exit

-l, --active-low: set the line active state to low

-m, --mode=[exit|wait|time|signal] (defaults to 'exit'):

tell the program what to do after

setting values

-s, --sec=SEC: specify the number of seconds to wait (only valid for --mode=time)

-u, --usec=USEC: specify the number of microseconds to wait (only valid for --

mode=time) -b, --background: after setting values: detach from the controlling

terminal Modes:

exit: set values and exit immediately

wait: set values and wait for user to press ENTER

time: set values and sleep for a specified amount

of time signal: set values and wait for SIGINT or

SIGTERM

Example: gpioset gpiochip0 11=0

```
root@AMiB2ee8ffa0a99:~# gpioget gpiochip0 11
0
root@AMiB2ee8ffa0a99:~# gpioset gpiochip0 11=1
root@AMiB2ee8ffa0a99:~# gpioget gpiochip0 11
1
root@AMiB2ee8ffa0a99:~# █
```

Note: The state of a GPIO line controlled over the character device reverts to default when the last process referencing the file descriptor representing the device file exits. This means that it's wrong to run `gpioset`, have it exit and expect the line to continue being driven high or low. It may happen if given pin is floating but it must be interpreted as undefined behavior.

6.2.4 `gpioget`:

Usage: `gpioget` [OPTIONS] <chip name/number> <offset 1> <offset 2> ...

Read line value(s) from a GPIO chip Options:

- v, --version: display the version and exit
- l, --active-low: set the line active state to low

Example: `gpioget gpiochip0 11`

```
root@AMiB2ee8ffa0a99:~# gpioget gpiochip0 11
0
root@AMiB2ee8ffa0a99:~# gpioset gpiochip0 11=1
root@AMiB2ee8ffa0a99:~# gpioget gpiochip0 11
1
root@AMiB2ee8ffa0a99:~# █
```

6.2.5 `gpiofind`:

Usage: `gpiofind`

- Find the gpiochip name and line offset given the line name

```
root@intel-obmc:~# gpiofind "LED_CPU2_CH4_DIMM2_FAULT"
gpiochip2 71
root@intel-obmc:~# █
```

6.2.6 `gpioinfo`:

Usage:

`gpioinfo`

- List all lines of specified gpiochips, their names, consumers, Direction, active state and additional flags.

```

root@intel-obmc:~# gpioinfo
gpiochip0 - 208 lines:
line 0:      unnamed      kernel  input  active-high [used]
line 1:      unnamed      kernel  input  active-high [used]
line 2:      unnamed      unused   input  active-high
line 3:      unnamed      unused   input  active-high
line 4:      "SMB_CPU_PIO_M_SCL" kernel input active-high [used]
line 5:      "SMB_CPU_PIO_M_SDA" kernel input active-high [used]
line 6:      "SMB_IPMB_STBY_LVC3_R_SCL" kernel input active-high [used]
line 7:      "SMB_IPMB_STBY_LVC3_R_SDA" kernel input active-high [used]
line 8:      "FM_I200VA_OC" unused input active-high
line 9:      "NMI_OUT" "power-control" output active-high [used]
line 10:     "IRQ_SMB3_M2_ALERT_N" unused input active-high
line 11:     unnamed      unused   input  active-high
line 12:     "RGMII_BMC_RMM4_LVC3_R_MDC" kernel input active-high [used]
line 13:     "RGMII_BMC_RMM4_LVC3_R_MDIO" kernel input active-high [used]
line 14:     "FM_BMC_BMCINIT_R" unused input active-high
line 15:     "FP_ID_LED_N" "Identify" output active-low [used]
line 16:     "FM_FORCE_BMC_UPDATE_N" unused input active-high
line 17:     "RST_RGMII_PHYRST_N" unused input active-high
line 18:     "FM_TPM_EN_PULSE" unused output active-high
line 19:     "FM_BMC_CRASHLOG_TRIG_N" "crashdump" output active-high [used]
line 20:     "IRQ_BMC_PCH_NMI_R" unused input active-high
line 21:     "FM_CPU1_DISABLE_COD_N" unused input active-high
line 22:     "FM_4S_8S_N_MODE" unused input active-high
line 23:     "FM_STANDALONE_MODE_N" unused input active-high
line 24:     "CPU_ERR0" "host-error-monitor" input active-high [used]
line 25:     "CPU_ERR1" "host-error-monitor" input active-high [used]
line 26:     "CPU_ERR2" "host-error-monitor" input active-high [used]
line 27:     "PRDY_N"      unused   input  active-high
line 28:     "FM_SPD_SWITCH_CTRL_N" "CLTT" output active-high [used]
line 29:     unnamed      unused   input  active-high

```

6.2.7 gpiomon:

Usage: gpiomon [OPTIONS] <chip name/number> <offset 1> <offset 2>

Wait for events on GPIO lines and print them to standard output.

Options:

- v, --version: display the version and exit
- l, --active-low: set the line active state to low
- n, --num-events=NUM: exit after processing NUM events
- s, --silent: don't print event info
- r, --rising-edge: only process rising edge events
- f, --falling-edge: only process falling edge events
- b, --line-buffered: set standard output as line buffered
- F, --format=FMT specify custom output format

Format Specifiers:

- %o: GPIO line offset
- %e: event type (0 - falling edge, 1 rising edge)
- %s: seconds part of the event timestamp
- %n: nanoseconds part of the event timestamp.

6.3 ADC Test Tool

6.3.1 adcapp

This is a test tool used to get the ADC values for all the ADC channels.

sage : addapp <NumOfMaxChannels> <option>

option:

read-adc-channel Get ADC value for all the ADC

```
channels root@evb-ast2600:~# adcapp 16 --read-
```

```
adc-channel ADC Channel Value = 778mv for channel
```

```
0
```

```
ADC Channel Value = 775mv for channel 1
```

```
ADC Channel Value = 782mv for channel 2
```

```
ADC Channel Value = 770mv for channel 3
```

```
ADC Channel Value = 434mv for channel 4
```

```
ADC Channel Value = 434mv for channel 5
```

```
ADC Channel Value = 741mv for channel 6
```

```
ADC Channel Value = 9mv for channel 7
```

```
ADC Channel Value = 665mv for channel 8
```

```
ADC Channel Value = 667mv for channel 9
```

```
ADC Channel Value = 442mv for channel 10
```

```
ADC Channel Value = 440mv for channel 11
```

```
ADC Channel Value = 741mv for channel 12
```

```
ADC Channel Value = 739mv for channel 13
```

```
ADC Channel Value = 469mv for channel 14
```

```
ADC Channel Value = 466mv for channel 15
```

Example: adcapp 16==read-adc-channel

```
root:~#adcapp 16 --read-adc-channel
ADC Channel Value = 778mv for channel 0
ADC Channel Value = 775mv for channel 1
ADC Channel Value = 782mv for channel 2
ADC Channel Value = 770mv for channel 3
ADC Channel Value = 434mv for channel 4
ADC Channel Value = 434mv for channel 5
ADC Channel Value = 741mv for channel 6
ADC Channel Value = 9mv for channel 7
ADC Channel Value = 665mv for channel 8
ADC Channel Value = 667mv for channel 9
ADC Channel Value = 442mv for channel 10
ADC Channel Value = 440mv for channel 11
ADC Channel Value = 741mv for channel 12
ADC Channel Value = 739mv for channel 13
ADC Channel Value = 469mv for channel 14
ADC Channel Value = 466mv for channel 15
```

6.4 PWMTACH TOOL

pwmtachtool is used to set and get fan speed, dutycycle values as shown below:

```
root@evb-ast2600:~# pwmtachtool
```

Usage : pwmtachtool <device_id> <command-option> <fanum>

--set-fan-speed:Set Fan's speed. Takes the RPM value as the last argument

parameters:<Fan_Number> <Fan_Speed>

--set-pwm-dutycycle:Set Fan's dutycycle. dutycycle_percentage value should be between 1 to

100 --set-pwm-dutycycle-value: Set Fan's dutycycle. dutycycle_value should be between 0 to

255. parameters:<pwm_number> <dutycycle value>

--get-pwm-dutycycle:Get Fan's dutycycle

--get-fan-speed:Get Fan's speed

--verbose:Enable Debug messages

PWM NUMBER	FAN NUMBER
0	0
1	1
2	2
3	3
4	4
5	5
12	6
13	7
14	8
15	9

6.4.1 GET PWM DUTY:

```
root@intel-obmc:~# pwmtachtool 0 --get-pwm-dutycycle 2
GET_PWM_DUTYCYCLE:dutycycle value 76 to pwm 2
PWM 2 Dutycycle is 76
root@intel-obmc:~# pwmtachtool 0 --get-fan-speed 2
GET_TACH_SPEED:rpm value 5940
```

6.4.2 Set Pwm Dutycycle Value:

```
root@intel-obmc:~# pwmtachtool 0 --set-pwm-dutycycle-value 2 100
Fan PWM set dutycycle value Successfully
root@intel-obmc:~# pwmtachtool 0 --get-pwm-dutycycle 2
GET_PWM_DUTYCYCLE:dutycycle value 100 to pwm 2
PWM 2 Dutycycle is 100
root@intel-obmc:~# pwmtachtool 0 --get-fan-speed 2
GET_TACH_SPEED:rpm value 6480
Fan 2 speed is 6480
```

6.4.3 Set Fan Speed:

```
root@intel-obmc:~# pwmtachtool 0 --set-fan-speed 2 8000
GET_PWM_NUMBER:fan 2, pwm 2, val 0x2000000
/sys/class/hwmon/hwmon0/of_node/fan@2/reg
GET_PWM_DUTYCYCLE:dutycycle value 72 to pwm 2
GET_TACH_SPEED:rpm value 7800
After update: dutycycle=76, rpmvalue=7800
retry 19 : dt=76, ps=0, cr=100
GET_TACH_SPEED:rpm value 8520
After update: dutycycle=70, rpmvalue=8520

Fan Speed set Successfully
root@intel-obmc:~# pwmtachtool 0 --get-fan-speed 2
GET_TACH_SPEED:rpm value 8100
Fan 2 speed is 8100
root@intel-obmc:~# █
```

6.4.4 Set PWM Dutycycle:

```
root@intel-obmc:~# pwmtachtool 0 --set-pwm-dutycycle 2 50
Fan PWM set dutycycle Successfully
root@intel-obmc:~# pwmtachtool 0 --get-fan-speed 2
GET_TACH_SPEED:rpm value 5340
Fan 2 speed is 5340
root@intel-obmc:~#
root@intel-obmc:~# pwmtachtool 0 --set-pwm-dutycycle 2 30
Fan PWM set dutycycle Successfully
root@intel-obmc:~# pwmtachtool 0 --get-fan-speed 2
GET_TACH_SPEED:rpm value 3600
Fan 2 speed is 3600
root@intel-obmc:~# █
```

6.4.5 Get fan speed:

```
root@intel-obmc:~# pwmtachtool 0 --get-fan-speed 2
GET_TACH_SPEED:rpm value 6480
Fan 2 speed is 6480
```

Note: The driver provides functionality to read or set the PWM duty cycle, which regulates the fan's speed (on a scale of 0–255). However, it is not possible to determine from the driver's side whether a fan is physically connected to the system.

6.5 SPDM Requester Tool

spdm_requester is used to launch a SPDM requester with specific arguments and communicate given tasks with other SPDM endpoints which play the role of SPDM responder through SPDM commands over MCTP protocol. Usage: spdm_requester [OPTIONS] Options:

-h, --help Print this help message and exit.

-m, --medium Transport binding. {pcie, smbus, spi, usb} [default medium is smbus]

-e, --eid MCTP Endpoint ID on SPDM responder. {1 – 254} [0xFF: check all detected devices]

-i, --index Measurement operation. {0 – 255} [0xFF: request all measurement blocks]

-s, --slot Slot ID. {0 – 7} [0x00: manufacturing provisioned slot]

-S, --SkipCertCheck Skip certificate verification [No]

-P, --preSharedKey Use pre-shared key exchange to run secure session [No]

-d, --data Application data bytes [default payload is {0x01, 0x80, 0x00, 0x02}]

-c, --command Testing command. [default command is basic_test]

Commands:

basic_test

get_measurements

get_component_integrity

run_secure_session

certificate_provision

```
root@AMIOT-5236c123145c:~# spdm_requester -h
spdm_requester, version: 1.0.0
Usage: spdm_requester [OPTIONS]

Options:
  -h, --help                    Print this help message and exit
  -m, --medium TEXT:value in {pcie->PCIe,smbus->SMBus,spi->SPI,usb->USB} OR {PCIe,SMBus,SPI,USB} [smbus]
                                Transport binding
  -e, --eid UINT:INT in [1 - 254] [0xFF: check all detected devices]
                                MCTP Endpoint ID on SPDM responder
  -i, --index UINT:INT in [0 - 255] [0xFF: request all measurement blocks]
                                Measurement operation
  -s, --slot UINT:INT in [0 - 7] [0x00: manufacturing provisioned slot]
                                Slot ID
  -c, --command TEXT:value in {basic_test->basic_test,certificate_provision->certificate_provision,get_component_integrity->get_component_integrity,get_measurements->get_measurements,run_secure_session->run_secure_session} OR {basic_test,certificate_provision,get_component_integrity,get_measurements,run_secure_session} [basic_test]
                                Testing command
  -S, --SkipCertCheck [No]      Skip certificate verification
  -P, --preSharedKey [No]      Use pre-shared key exchange to run secure session
  -d, --data UINT [{}] ...      Application data bytes
```

6.5.1 Basic test

- The basic test will try to do certificate chain and measurements retrieval on your specific SPDm device.
- The default slot is 0, known as a provisioned factory-default certificate chain.
- Default measurement operation is querying all blocks.
- Please backup the whole logs of SPDm certificate chain if need to recover overwritten slot accidentally.

```
root@AMIOT-5236c123145c:~# spd_m_requester -c basic_test -m smbus -e 111
SPDM certificate chain:
37 06 00 00 71 0b a5 94 61 1d 3a 37 c9 10 a1 44
38 f6 d9 2e 7d b9 bb aa 6b ab 66 de bc ea b1 cf
23 a3 38 90 73 24 2e 5f 6c e9 f6 7b c9 8a 7f a2
fa 38 46 e2 30 82 01 d4 30 82 01 5a a0 03 02 01
02 02 14 21 41 dd 4e ec f8 19 62 24 2e 7e d6 ae
64 cb 29 5d c4 90 51 30 0a 06 08 2a 86 48 ce 3d
04 03 03 30 21 31 1f 30 1d 06 03 55 04 03 0c 16
44 4d 54 46 20 6c 69 62 73 70 64 6d 20 45 43 50
33 38 34 20 43 41 30 1e 17 0d 32 33 30 34 32 30
30 31 31 33 35 34 5a 17 0d 33 33 30 34 31 37 30
31 31 33 35 34 5a 30 21 31 1f 30 1d 06 03 55 04
03 0c 16 44 4d 54 46 20 6c 69 62 73 70 64 6d 20
45 43 50 33 38 34 20 43 41 30 76 30 10 06 07 2a
86 48 ce 3d 02 01 06 05 2b 81 04 00 22 03 62 00
04 15 1c 0b 41 fb 87 d5 20 e0 7a f8 58 67 ef c0
ed 61 af 58 bf 92 52 33 ae 87 a9 7f 46 8b d4 b6
ef aa 2c 5b 0f 84 19 a0 8c 10 9b 81 4c d7 64 7e
SPDM measurements:
12 e0 01 ff 1d 21 51 fa 52 72 af 08 44 7d 58 92
8d 6e 15 39 c5 c6 b6 41 40 de 15 f4 e5 da 37 92
a0 57 cf 73 00 12 60 00 20 07 c9 01 00 01 01 43
00 00 40 00 8d 53 1d 77 d8 21 e1 67 11 4d 1e b0
7e 0a e1 9c fb 56 51 52 40 88 43 c7 68 f1 13 5b
54 8f df a1 3a 20 3e 5c 7f 12 9c ea cc 01 7d f2
6c 99 9f 62 da 26 db f2 e1 12 83 45 ec 0f 65 d3
7f 87 ca 41 02 01 43 00 01 40 00 9e ff d8 a6 68
f7 6d 3f ce 35 45 1a 13 6f 8e f6 71 02 60 e9 ca
28 be ef 89 7f 55 9f cd ba 48 a4 c0 66 56 0f b4
90 01 95 ca e4 d4 fa b1 f7 d1 12 43 42 10 08 af
86 14 d9 2a 3f ca bb bf 75 24 8f 03 01 43 00 02
40 00 ff de 42 48 3a 68 7d d4 7d 05 f9 56 a2 d6
20 07 b7 1a 29 88 08 4d a1 09 5e c2 e4 3b ca 15
66 80 ca e0 7d 0b 84 cb c7 fc 9b 1d 4e 80 cd 86
69 aa 95 6a ed 8b b1 7b 0a 20 a5 03 1c 28 8d fa
8b 9f 04 01 43 00 03 40 00 3a 0b d5 b0 84 36 b1
d3 86 12 20 90 cf a0 44 6c f2 57 1b 74 f2 a1 5f
44 df 73 56 95 da b8 4b bb 1b eb b3 ae f3 9a f6
a0 50 73 70 b5 fb 00 d5 13 a5 2d d1 65 07 f6 88
```

6.5.2 Get measurements

- The command only fetches measurements from SPDm responder; it will help a lot when the SPDm responder only supports raw-bit stream measurements without signing certificate and authentication by challenge capability. This command will request raw-bit streams or attached signature measurements according to the result of SPDm VCA negotiation.
- The result below is from requesting an SPDm responder that does not have certificate or challenge capabilities.

```
root@AMIOT-5236c123145c:~# spd_m_requester -c get_measurements -m smbus -e 111
```

6.5.3 Get component integrity

- The command is designed for platform attestation via Redfish according to the DMTF specification.
- The command will go through the negotiation process of versions, capabilities, algorithms, and then retrievals of certificate chain and measurements, finally generating readable structure of component integrity.

```
root@AMIOT-5236c123145c:~# spdman_requester -c get_component_integrity -e 111 -m smb
```

```
SPDM Version: 1.2
Hash algorithm: TPM_ALG_SHA_384
Signing algorithm: TPM_ALG_ECDSA_ECC_NIST_P384
Certificate chain:
-----BEGIN CERTIFICATE-----
MIIB1DCCAVqgAwIBAgIUUhdtuz4GWikLn7WrmTLKV3EkFEwCgYIKoZIzj0EAwMw
ITEFMB0GA1UEAwWRE1URiBsaWJzcGRtIEVDUDM4NCBDQTAEFw0yMzA0MjAwMTEz
NTRaFw0yMzA0MTcwMTEzNTRaMCEwH2AdBgNVBAMMFkRNVFVYbGlic3BkbS8FQ1Az
ODQgQ0EwdjAQBgcqhkJOPQIBBgUrgQQAIGNiAAQVHAtB+4fVIOB6+Fhn78DtYa9Y
v5JSM66HqX9G19S276osWw+EGaCMEJuBTNdKfjJuAsX8PSV8o7y1yqb0BBGNvboZ
c5KYVsyZJEGX77L7VD/wMR20owTq3CLKyJot/fyJuzBRMB0GA1UdDgQWBBERK4qQK
wF2uoJcQ0Fdw0FFYX1yJyUjAfbGnVHSMEGDAWgBRK4qQKwF2uoJcQ0Fdw0FFYX1yJ
UjAPBgNVHRMBAf8EBTADAQH/MAoGCCqGSM49BAMDA2gAMGUCMCoYLsz/qh8zUm9s
/UBj/xeJbgNFu0IDxG4XhqqYqMEgEtKEfBbqH66K74URQVff/AlxAKhMuZBL2pP
wo7YI62B3kxRUAsnF49GJok7n/nOS0DuKP0/BuGzTY9sSBwqLKnQ3g==
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIB3DCCAWGgAwIBAgIBATAKBggqhkJOPQDDAzAhMR8wHQYDVQDDZETVRGIGxp
YnNwZG0gRUNQMzg0IENBMB4XDTEzMDQyMDAxMTQwNV0XDTMzMDQxNzAxMTQwNVow
MDEuMCwGA1UEAwWRE1URiBsaWJzcGRtIEVDUDM4NCBpbmRlcm1lZGhldGUyY2Yy
dDB2MBAGByqGSM49AgEGBSuBBAAiA2IABDF9AUEa9+nqXDkeN20WjSxu2X7qGSXF
l0DczjL/kkBL+0tE2Pc920emRL9VdwI10TcnaKToBE6HdY9ZV6mAULQ8l8r6Gx0o
UNwNer4TPTfb/diFlvyqJz04klxbuAwkyqNeMFwwDAYDVR0TBAlUwAwEB/zALBgNV
HQ8EBAMCAf4wHQYDVIR0BBYEFAPb6drHzQDDl0hxzjr8aVX1VfNMCAGA1UdJQEB
/wQWMBQGCSGAQUFBwMBBggrBgEFBQcDAjAKBgqhkJOPQDDAwNpADBmAJEAMQNK
R2ZsMGq3ndNamSForglQb+u0/e9pC8+yVl+2jx9DEQze9v13/ak0JYF+l2RMAjEA
+cdcVD1DkpowPWEaHvhLUdTVIJDShfBE3kCF6jRh3Wv+YL0KwNs9Qyyt1Mtp+iIz
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIICRzCCAcygAwIBAgIBAZAKBggqhkJOPQDDAzAwMS4wLAYDVQDDCVETVRGIGxp
YnNwZG0gRUNQMzg0IGludGVybWVkaWZ0ZSBjZXJ0MB4XDTEzMDQxMjAwMTEzMDQx
DTMzMDkxOTA3MTEzM1owLTERMCKGA1UEAwWRE1URiBsaWJzcGRtIEVDUDM4NCBp
ZXNwb25kZXIyY2YyY2YyY2YyY2YyY2YyY2YyY2YyY2YyY2YyY2YyY2YyY2YyY2Yy
o2IS2tT+WZTOva7X0pTk4xGIElW01b4UfK3yjbSQ84gVJotUxqEQYsZz8TUdB
FB9t1leso5/RuWTeBxHoMXjedTq3LBVW6vUgY5MPM6Lxo354GaOBvDCBuTAMBgNV
HRMBAf8EAjAAMAsGA1UdDwQEAwIF4DAdBgNVHQ4EFgQUFDxPZsfxYEB/Z8GVaLOH
KD7FI4MwHQYDVIR0RBCowKKAmbgorBgEEAYMCGhIBoBgMFkFDTUU6V0LER0VU0jEy
MzQ1Njc4OTAwKgYDVROLAQH/BCAwHgYIKwYBBQUHAWEGCCsGAQUFBwMCAggrBgEF
BQcDCTAEbgorBgEEAYMCGhIGBBAwDjAMBgorBgEEAYMCGhICMAoGCCqGSM49BAMD
A2kAMGYCMQCvdQKps6ZHSm70DLCFB/w8U50psAnCubPzLrmZvsV1nKxPw4p6JH0X
98sqcRRXPpICMQDTV6+Ua0ECTlFQDEp0L3I3tQP/WIDg9euuHoHY1YQ9GIng/gfN
Qy0nvfwkprL/XQk=
-----END CERTIFICATE-----
```

6.5.4 Run secure session

- The command demonstrated the lifecycle of secure session over SPDm protocol and will construct the secure session, send heartbeat to keep the session alive, update the session key, try to send PLDM payload within secure session, and finally terminate the secure session.
- You can use -d, =data option to overwrite the application data to send within a secure session.
- Secure session establishment by pre-shared key is only supported with SPDm responder emulation.

```
root@AMIIOT-5236c123145c:~# spdm_requester -c run_secure_session -m smbus -e 111
```

6.5.5 Do Certificate Provision

- The command demonstrated the flow of certificate provision over SPDm protocol and will construct the secure session, get CSR from given SPDm endpoint within secure session, generate root certificate, sign CSR with created root certificate, and finally set generated SPDm certificate chain back to SPDm endpoint, then terminate the secure session.
- Warning: please specify slot 1 to 7 instead of slot 0 to avoid overwriting the factory-default provisioned certificate chain.

```
root@AMIIOT-5236c123145c:~# spdm_requester -c certificate_provision -m smbus -e 111 -s 2
```


6.6 PLDMTOOLS

pldmtool is a client tool that acts as a PLDM requester which runs on the BMC. pldmtool sends the request message and displays the response message also provides flexibility to parse the response message and display it in readable format.

pldmtool supports the subcommands for PLDM types such as base, platform, bios, fru, oem-ibm. Using --help, you can understand which commands are supported and what parameters need to be entered.

```
$ pldmtool -h
PLDM requester tool for OpenBMC
Usage: pldmtool [OPTIONS] SUBCOMMAND

Options:
  -h, --help          Print this help message and exit

Subcommands:
  raw                send a raw request and print response
  base               base type command
  bios               bios type command
  platform            platform type command
  fru                 FRU type command
  oem-ibm             oem type command
```

6.6.1 pldmtool command usage

We need to first confirm whether the device responds normally after using the base command. If it responds normally, we can proceed to use different types of commands. As for the different types, we can use the GetPLDMTypes command to get them.

6.6.2 pldmtool base command

pldmtool base GetPLDMTypes

We will first use the GetPLDMTypes command to determine which types of this EID supports. For example, we can see that EID 15 supports types 0, 2, 4, and 5.

```

root@chalupa:~# pldmtool base GetPLDMTypes -m 16
{
  "CompletionCode": "SUCCESS",
  "PLDMTypes": [
    {
      "PLDM Type": "base",
      "PLDM Type Code": 0
    },
    {
      "PLDM Type": "platform",
      "PLDM Type Code": 2
    },
    {
      "PLDM Type": "fru",
      "PLDM Type Code": 4
    },
    {
      "PLDM Type": "fw_update",
      "PLDM Type Code": 5
    }
  ]
}

```

pldmtool base GetTID

It is also possible to determine which endpoint corresponds to which Terminus ID.

```

root@chalupa:~# pldmtool base GetTID -m 16
{
  "CompletionCode": "SUCCESS",
  "TID": 15
}

```

6.6.3 pldmtool platform command

pldmtool platform GetPDR

GetPDR command is used to retrieve Platform Descriptor Records (PDRs) from a PLDM-enabled device. From the returned PDR, we can use the sensor ID to read the sensor data.

```
root@chalupa:~# pldmtool platform GetPDR -m 16 -a
[
{
  "nextRecordHandle": 1,
  "responseCount": 19,
  "recordHandle": 0,
  "PDRHeaderVersion": 1,
  "PDRType": "Terminus Locator PDR",
  "recordChangeNumber": 0,
  "dataLength": 9,
  "PLDMTerminusHandle": 0,
  "validity": "valid",
  "TID": 15,
  "containerID": 33049,
  "terminusLocatorType": "MCTP_EID",
  "terminusLocatorValueSize": 1,
  "EID": 16
},
{
  "nextRecordHandle": 2,
  "responseCount": 28,
  "recordHandle": 1,
  "PDRHeaderVersion": 1,
  "PDRType": "State Sensor PDR",
  "recordChangeNumber": 0,
  "dataLength": 18,
  "PLDMTerminusHandle": 0,
  "sensorID": 3,
  "entityType": "[Physical] I/O Module",
  "entityInstanceNumber": 0,
  "containerID": 33049,
  "sensorInit": "noInit",
  "sensorAuxiliaryNamesPDR": false,
  "compositeSensorCount": 1,
  "stateSetID[0]": "Health State(1)",
  "possibleStatesSize[0]": 2,
  "possibleStates[0]": [
    "Normal(1)",
    "Non-Critical(2)",
    "Critical(3)"
  ]
},
{
  "nextRecordHandle": 3,
  "responseCount": 27,
  "recordHandle": 2,
  "PDRHeaderVersion": 1,
  "PDRType": "State Sensor PDR",
  "recordChangeNumber": 0,
  "dataLength": 17,
  "PLDMTerminusHandle": 0,
  "sensorID": 4,
  "entityType": "[Physical] Communication Channel",
  "entityInstanceNumber": 1,
  "containerID": 33049,

```

pldmtool platform GetStateSensorReadings

Using the sensor ID obtained from the GetPDR command as the parameter for -i, we can use GetStateSensorReadings to check the state of this sensor.

```
root@chalupa:~# pldmtool platform GetStateSensorReadings -m 16 -i 5 -r 1
{
  "compositeSensorCount": 1,
  "sensorOpState[0]": "Sensor Enabled",
  "presentState[0]": "Sensor Warning",
  "previousState[0]": "Sensor Normal",
  "eventState[0]": "Sensor Warning"
}
```

6.6.4 pldmtool fru command

pldmtool fru command GetFruRecordTable

The GetFruRecordTable command is used to retrieve the Field Replaceable Unit (FRU) record table from a PLDM-enabled device.

```
root@chalupa:~# pldmtool fru GetFruRecordTable -m 16
-----
FRU Record Set Identifier : 1
FRU Record Type          : "General(1)"
Number of FRU fields     : 7
Encoding Type            : "ASCII(1)"
-----
FRU Field Type           : "Part Number(3)"
FRU Field Length         : 21
FRU Field Value          : "MCX4121A-ACAT"
FRU Field Type           : "Serial Number(4)"
FRU Field Length         : 24
FRU Field Value          : "MT1926J07355"
FRU Field Type           : "Manufacture Date(6)"
FRU Field Length         : 13
FRU Field Value          : "\u0006 !\u0001' 5W\u0000\u0000\u0000\u0000\u0000\u0000"
FRU Field Type           : "Name(8)"
FRU Field Length         : 29
FRU Field Value          : "CX4121A - ConnectX-4 LX SFP28"
FRU Field Type           : "Version(10)"
FRU Field Length         : 10
FRU Field Value          : "14.29.2002"
FRU Field Type           : "Engineering Change Level(13)"
FRU Field Length         : 2
FRU Field Value          : "AH"
FRU Field Type           : "Vendor IANA(15)"
FRU Field Length         : 4
FRU Field Value          : "UTF-8 display error: [json.exception.type_error.316] invalid UTF-8 byte at index 1: 0x81"
FRU Field Value          : 19810000 (hex fallback)
-----
FRU Record Set Identifier : 2
FRU Record Type          : "OEM(254)"
Number of FRU fields     : 3
Encoding Type            : "ASCII(1)"
-----
{
  "Encoding Type for FRU fields": "ASCII(1)",
  "FRU Record Set Identifier": 2,
  "FRU Record Type": "OEM(254)",
  "Number of FRU fields": 3
}
```

pldmtool fru GetFruRecordTableMetadata

The pldmtool fru GetFruRecordTableMetadata command provides metadata about the FRU record table, including version information, the number of entries, and the total length of the table.

```
root@chalupa:~# pldmtool fru GetFruRecordTableMetadata -m 16
{"FRUDATAMajorVersion":1,"FRUDATAMinorVersion":0,"FRUTableMaximumSize":0,"FRUTableLength":151,"Total number of Record Set Identifiers in table":2,"Total number of records in table":2,"FRU DATAstructureTableIntegrityChecksum":2900645973}
{
  "FRU DATAstructureTableIntegrityChecksum": 2900645973,
  "FRUDATAMajorVersion": 1,
  "FRUDATAMinorVersion": 0,
  "FRUTableLength": 151,
  "FRUTableMaximumSize": 0,
  "Total number of Record Set Identifiers in table": 2,
  "Total number of records in table": 2
}
{"FRUDATAMajorVersion":1,"FRUDATAMinorVersion":0,"FRUTableMaximumSize":0,"FRUTableLength":151,"Total number of Record Set Identifiers in table":2,"Total number of records in table":2,"FRU DATAstructureTableIntegrityChecksum":2900645973}
{
  "FRUDATAMajorVersion": 1,
  "FRUDATAMinorVersion": 0,
  "FRUTableMaximumSize": 0,
  "FRUTableLength": 151,
  "Total number of Record Set Identifiers in table": 2,
  "Total number of records in table": 2,
  "FRU DATAstructureTableIntegrityChecksum": 2900645973
}
```

6.6.5 pldmtool fw_update command

pldmtool fw_update command

The pldmtool fw_update GetFwParams command returns firmware update parameters, including update capabilities, component details, and version information.

```
root@chalupa:~# pldmtool fw_update GetFwParams -m 16
{
  "CompletionCode": "SUCCESS",
  "CapabilitiesDuringUpdate": {
    "Component Update Failure Recovery Capability": "Device will revert to previous component image upon failure, timeout or cancellation of the transfer.",
    "Component Update Failure Retry Capability": "Device will not be able to update component again unless it exits update mode and the UA sends a new Request Update command.",
    "Firmware Device Partial Updates": "Firmware Device cannot accept a partial update and all components present on the FD shall be updated.",
    "Firmware Device Host Functionality during Firmware Update": "Device will revert to previous component image upon failure, timeout or cancellation of the transfer.",
    "Firmware Device Update Mode Restrictions": "No host OS environment restriction for update mode"
  },
  "ComponentCount": 1,
  "ActiveComponentImageSetVersionString": "14.29.2002",
  "PendingComponentImageSetVersionString": "",
  "ComponentParameterEntries": [
    {
      "ComponentClassification": "Software Bundle",
      "ComponentIdentifier": 1,
      "ComponentClassificationIndex": 0,
      "ActiveComponentComparisonStamp": 236783570,
      "ActiveComponentReleaseDate": "20210127",
      "PendingComponentComparisonStamp": 0,
      "PendingComponentReleaseDate": "",
      "ComponentActivationMethods": [
        "System reboot",
        "DC power cycle",
        "AC power cycle"
      ]
    }
  ],
  "CapabilitiesDuringUpdate": {
    "Firmware Device apply state functionality": "Firmware Device performs an auto-apply during transfer phase and apply step will be completed immediately."
  },
  "ActiveComponentVersionString": "14.29.2002",
  "PendingComponentVersionString": ""
}
```

pldmtool fw_update GetStatus

The pldmtool fw_update GetStatus command returns the current status of the firmware update process.

```
root@chalupa:~# pldmtool fw_update GetStatus -m 16
{
  "CompletionCode": "SUCCESS",
  "CurrentState": "IDLE",
  "PreviousState": "IDLE",
  "AuxState": "Operation in progress",
  "AuxStateStatus": "AuxState is In Progress or Success",
  "ProgressPercent": 101,
  "ReasonCode": "Initialization of firmware device has occurred",
  "UpdateOptionFlagsEnabled": 0
}
```

6.6.6 pldmtool raw command

The pldmtool raw command allows users to send custom or unsupported PLDM commands directly to a device. It is primarily used for testing or debugging PLDM commands that are not yet implemented in the standard pldmtool interface, including OEM-specific or newly defined commands. Before using raw command, it is recommended to first verify the supported PLDM types and commands using GetPLDMTypes and GetPLDMCommands.

```
root@chalupa:~# pldmtool raw -m 17 --data 0x81 0x05 0x1B
pldmtool: <6> Tx: 11 01 81 05 1b
Success in creating the socket : RC = 5
Success in connecting to socket : RC = 0
Success in sending message type as pldm to mctp demux daemon : RC = 1
pldmtool: <6> Rx: 01 05 1b 00 00 00 03 00 00 00 00 00 00 00
```


6.7 MCTP

6.7.1 MCTP-REQ TOOL

mctp-req is a client tool that acts as an MCTP requester and runs on the BMC. It is specifically designed for use with the MCTP over I3C transport binding. The tool sends request messages and displays response messages with flexibility to parse and present the response in a readable format.

mctp-req tool command

net id

Included the network ID as a D-Bus property for registered endpoints. Retrieve the NetID by performing introspect for endpoints.

```
root@AMIOT-763e1f471e18:~# busctl introspect xyz.openbmc_project.MCTP.Control.I3C /xyz/openbmc_project/mctp/2/29 -l
NAME                                TYPE      SIGNATURE RESULT/VALUE                                FLAGS
org.freedesktop.DBus.Introspectable interface -      -
org.freedesktop.DBus.Introspectable method    -      s
org.freedesktop.DBus.Peer           interface -      -
org.freedesktop.DBus.Peer           method    -      s
org.freedesktop.DBus.Ping           method    -      -
org.freedesktop.DBus.Properties     interface -      -
org.freedesktop.DBus.Properties     method    ss      v
org.freedesktop.DBus.Properties     method    s       a{sv}
org.freedesktop.DBus.Properties     method    ssv      -
org.freedesktop.DBus.Properties     signal    sa(sv)as -
xyz.openbmc_project.Common.UUID     interface -      -
xyz.openbmc_project.Common.UUID     property  s       "80008600-0400-0040-8000-010000000000" emits-change
xyz.openbmc_project.Common.UnixSocket interface -      -
xyz.openbmc_project.Common.UnixSocket property  ay      21 47 116 109 112 47 109 99 116 112 45 99 108 105 101 110 116 45 115 111 99 107 emits-change
xyz.openbmc_project.Common.UnixSocket property  u       0 emits-change
xyz.openbmc_project.Common.UnixSocket property  u       5 emits-change
xyz.openbmc_project.Inventory.Decorator.I3CDevice interface -      -
xyz.openbmc_project.Inventory.Decorator.I3CDevice property  y       30 emits-change
xyz.openbmc_project.Inventory.Decorator.I3CDevice property  i       2 emits-change
xyz.openbmc_project.MCTP.Binding     interface -      -
xyz.openbmc_project.MCTP.Binding     property  s       "xyz.openbmc_project.MCTP.Endpoint.MediaTypees.I3C" emits-change
xyz.openbmc_project.MCTP.Endpoint   interface -      -
xyz.openbmc_project.MCTP.Endpoint   property  u       29 emits-change
xyz.openbmc_project.MCTP.Endpoint   property  s       "xyz.openbmc_project.MCTP.Endpoint.MediaType.I3C" emits-change
xyz.openbmc_project.MCTP.Endpoint   property  i       3 emits-change
xyz.openbmc_project.MCTP.Endpoint   property  ay      3 5 126 0 emits-change
xyz.openbmc_project.MCTP.PCIVendorDefined interface -      -
xyz.openbmc_project.MCTP.PCIVendorDefined property  aq      4 256 2 3 5 emits-change
xyz.openbmc_project.MCTP.PCIVendorDefined property  s       "0x8086" emits-change
```

Command:

mctp-req net {netId} eid {eid} type {mctp type} data {data}

Example: mctp control message get endpoint Eid(0x02)

These mctp-req command will get the response data from endpoint based on the request.

```
root@AMIOT-e67113360429:~# mctp-req net 3 eid 29 type 0 data 82:02
Sending to (net 3, eid 29), type 0, len 2
Response from (net 3, eid 29) type 0 len 6
Data:
0x02 0x02 0x00 0x1d 0x11 0x00
```

```
root@AMIOT-e67113360429:~# mctp-req net 3 eid 23 type 0 data 82:02
Sending to (net 3, eid 23), type 0, len 2
[ 4633.336249] i3c-target-mctp 0-target: MCTP packet length invalid
[ 4633.344039] i3c-target-mctp 0-target: MCTP packet length invalid
Response from (net 3, eid 23) type 0 len 6
Data:
0x02 0x02 0x00 0x17 0x01 0x00
```


6.7.2 mctp-ctrl (For mctp/i2c and mctp/pcie use)

There is a command-line mode for sending commands via mctp-ctrl. It creates a separate process for each command, which stops once it receives a response or the retry attempts are exhausted. This section introduces the usage of MCTP Control Command and provides examples of sending PLDM and SPDMM commands.

MCTP Ctrl Command Usage

- -v Verbose level
- -e Target Endpoint Id
- -m Mode: (0 - Commandline mode)
- -t Binding Type (1 - I2C, 2 - PCIe)
- -b Binding data (pvt)
- -d Delay in seconds (for MCTP enumeration)
- -s Tx data (MCTP packet payload: [Req-dgram]-[cmd-code]--)
- -f Absolute path to configuration json file
- -n Bus number for the selected interface, eg. PCIe 1, PCIe 2, I2C 3, ...");

Sending PLDM Msg Command Example

- Ensure there are no SPDMM services running. If there are, stop them first
Example command for checking : `systemctl | grep pldm`
- PLDM get type command
- Mctp over I2C example : `mctp-ctrl -v -m 0 -d 0 -t 1 -n {I2CBus} -e {eid} -s "01 80 00 04" -f /usr/share/mctp/mctp_cfg_smbus{eid}.json`
- Mctp over PCIe example : `mctp-ctrl -v -m 0 -d 0 -t 2 -e {eid} -s "01 80 00 04"`
- Output

```
root@AMIOT-5658d950a87b:~# mctp-ctrl -v -m 0 -d 0 -t 1 -n 8 -e 16 -s "01 80 00 04" -f /usr/share/mctp/mctp_cfg_smbus8.json
parse_command_line: Verbose level:1
[parse_smbus_json_config] Use arp endpointsexec_command_line_mode: Run mode: Commandline mode
exec_command_line_mode: Setting up SMBus socket
exec_command_line_mode: socket init for Message Type:0x1
1709055211-603 mctp_req_msg > 80 00 04
1709055211-607 mctp_prefix_msg > 00 10
1709055211-607 mctp_resp_msg > 01 00 00 04 00 75 00 00 00 00 00 00 00
1709055211-607 mctp-socket: mctp_rcv: resp_msg_len: 13, mctp_len: 13
do_mctp_cmdline: Successfully received message
Command Done in [4] ms
```

Sending SPDMM Msg Command Example

- Ensure there are no SPDMM services running. If there are, stop them first.
Example command for checking : `systemctl | grep spdm`
- SPDMM get type command
- Mctp over I2C example : `mctp-ctrl -v -m 0 -d 0 -t 1 -n {I2CBus} -e {eid} -s "05 10 84 00 00" -f /usr/share/mctp/mctp_cfg_smbus{eid}.json`
- Mctp over PCIe example : `mctp-ctrl -v -m 0 -d 0 -t 2 -e {eid} -s "05 10 84 00 00"`
- Output

```

root@AMIOT-4602b7f9025f:~# mctp-ctrl -v -m 0 -d 0 -t 1 -n 9 -e 16 -s "05 10 84 00 00" -f /usr/share/mctp/mctp_cfg_smbus9.json
parse_command_line: Verbose level:1
[parse_smbus_json_config] Use arp endpointexec_command_line_mode: Run mode: Commandline mode
exec_command_line_mode: Setting up SMBus socket
exec_command_line_mode: socket init for Message Type:0x5
1709056906-301 mctp_req_msg > 10 84 00 00
1709056906-418 mctp_prefix_msg > 00 10
1709056906-418 mctp_resp_msg > 05 10 04 00 00 00 02 00 10 00 11
1709056906-418 mctp-socket: mctp_rcv: resp_msg_len: 11, mctp_len: 11

do_mctp_cmdline: Successfully received message
Command Done in [117] ms

```

6.7.3 mctp-req (For mctp/i3c use)

mctp-req is a client tool that acts as a Mctp requester which runs on the BMC. Mctp-req sends the request message and displays the response message also provides flexibility to parse the response message and display it in readable format.

mctp-req command

Command : mctp-req eid {eid} type {control message type} data {instance Id}:{control command}

Ex: mctp-req eid 29 type 0 data 82:01

These mctp-req command will get the response data from particular endpoint based on the request.

```

root@AMIOT-0658e8576eda:~# mctp-req eid 29 type 0 data 82:02
req: sending to (net 1, eid 29), type 0, len 2
req: message from (net 1, eid 29) type 0 len 6
data:
0x02 0x02 0x00 0x1d 0x11 0x00
root@AMIOT-0658e8576eda:~# mctp-req eid 29 type 0 data 82:01
req: sending to (net 1, eid 29), type 0, len 2
req: message from (net 1, eid 29) type 0 len 3
data:
0x02 0x01 0x05
root@AMIOT-0658e8576eda:~# mctp-req eid 29 type 0 data 82:08
req: sending to (net 1, eid 29), type 0, len 2
req: message from (net 1, eid 29) type 0 len 3
data:
0x02 0x08 0x05
root@AMIOT-0658e8576eda:~# mctp-req eid 29 type 0 data 82:03
req: sending to (net 1, eid 29), type 0, len 2
req: message from (net 1, eid 29) type 0 len 19
data:
0x02 0x03 0x00 0x80 0x00 0x86 0x00 0x04 0x00 0x00 0x40 0x80 0x00 0x01 0x00 0x00 0x00 0x00 0x00
root@AMIOT-0658e8576eda:~# mctp-req eid 29 type 0 data 82:06
req: sending to (net 1, eid 29), type 0, len 2
req: message from (net 1, eid 29) type 0 len 3
data:
0x02 0x06 0x03

```

Chapter 7

7 MegaRAC OneTree™ Event Filter Configuration

Event Filtering provides a regular mechanism for configuring the BMC to take selected action on event messages that it generates. The BMC maintains an event filter table that is used to select which events triggers the action (Alert). Each time the BMC receives an event message it compares the event data against the entries in the event filter table. The BMC scans all entries in the table and generates alert for the entries that is matched. The alert can be either SMTP Mail Alert or SNMP Trap Alert.

7.1 Event Filter Table Configuration

- The `pef-alert-manager.json` stores the persistent Event Filter table Configuration. The file will be available in `/var/lib/pef-alert-manager/pef-alert-manager.json` within the BMC.
- Event Filter table can configured From WebUI , or directly modifying `pef-alert-manager.json` file , using `busctl` call

```
busctl set-property xyz.openbmc_project.pef.alert.manager  
/xyz/openbmc_project/PefAlertManager/EventFilterTable/Entry<table-number>  
xyz.openbmc_project.pef.EventFilterTable <property>
```

```
root@intel-obmc:~# busctl set-property xyz.openbmc_project.pef.alert.manager  
/xyz/openbmc_project/PefAlertManager/EventFilterTable/Entry9  
xyz.openbmc_project.pef.EventFilterTable SensorType y 7
```

Event filter table configuration determines which events should trigger an alert. The alert can be sent as either an SNMP Trap alert or an SMTP Mail alert. The Destination Type D-Bus property can be used to configure the type of alert.

Destination Type	Value
SNMP Trap Alert	0
SMTP Mail Alert	1

7.2 SMTP Configuration

The following should be configured to send an alert through SMTP.

- Enable/Disable smtp
- Host IP Address
- Port Number
- Sender Mail address
- Receiver Mail address

SMTP Configuration

We can configure SMTP in BMC through busctl command. Below are the test cases which describe the SMTP configuration in BMC. When “DestinationType” value is “1” then only SMTP mail alert will be sent

- Set DestinationType as SMTP Mail alert

```
busctl set-property xyz.openbmc_project.pef.alert.manager  
/xyz/openbmc_project/PefAlertManager/DestinationSelector/Entry1  
xyz.openbmc_project.pef.DestinationSelectorTable DestinationType y 1
```

- Set SMTP configuration data.

```
busctl call xyz.openbmc_project.mail /xyz/openbmc_project/mail/alert xyz.openbmc_project.mail.alert  
SetSmtplibConfig bsqs "true" <Server-IP> <Port-Number> <Sender-Mail-Address>
```

- Get SMTP configuration data.

```
busctl call xyz.openbmc_project.mail /xyz/openbmc_project/mail/alert xyz.openbmc_project.mail.alert  
GetSmtplibConfig
```

- Configure the receiver's address:

```
busctl set-property xyz.openbmc_project.pef.alert.manager /xyz/openbmc_project/PefAlertManager  
xyz.openbmc_project.pef.PEFConfInfo Recipient as 1 <Receiver-Email-Address>
```

- Send Sample mail for checking SMTP.

```
busctl call xyz.openbmc_project.mail /xyz/openbmc_project/mail/alert xyz.openbmc_project.mail.alert  
SendMail sss "msgubuntu@coreqa.com" "Test alert" "Fan11 threshold going high"
```

7.3 SNMP Trap Configuration

For PEF Alert to be sent as SNMP Trap the Destination Client details should be configured and the DestinationType should be configured for SNMP Trap Alert. When "DestinationType" D-Bus property value is "0" SNMP Trap alert will be sent.

- Set DestinationType as SNMP Trap Alert

```
busctl set-property xyz.openbmc_project.pef.alert.manager  
/xyz/openbmc_project/PefAlertManager/DestinationSelector/Entry1  
xyz.openbmc_project.pef.DestinationSelectorTable DestinationType y 0
```

- Configure the destination client .

For V2c:

```
busctl call xyz.openbmc_project.Snmp.Conf /xyz/openbmc_project/snmp/CommunityStrManager  
xyz.openbmc_project.Snmp.CommunityStrManager.Create Client sss "COMMUNITY STRING"  
"READ WRITE PERMISSION" "COMMUNITY PROFILE"
```

```
busctl call xyz.openbmc_project.Network.SNMP /xyz/openbmc_project/network/snmp/manager  
xyz.openbmc_project.Network.Client.Create Client sqss " IP- ADDRESS " 162 "v2c" "COMMUNITY STRING"
```

For v1:

```
busctl call xyz.openbmc_project.Snmp.Conf /xyz/openbmc_project/snmp/CommunityStrManager  
xyz.openbmc_project.Snmp.CommunityStrManager.Create Client sss "COMMUNITY STRING" "READ WRITE  
PERMISSION" "COMMUNITY PROFILE"
```

```
busctl call xyz.openbmc_project.Network.SNMP /xyz/openbmc_project/network/snmp/manager  
xyz.openbmc_project.Network.Client.Create Client sqss " IP- ADDRESS " 162 "v1" "COMMUNITY  
STRING"
```

For v3:

Snmp user create command

```
busctl call xyz.openbmc_project.Snmp.Conf /xyz/openbmc_project/snmp/UserManager  
xyz.openbmc_project.Snmp.UserManager.Create Client sssss "USERNAME" "PASSWORD"  
"ENCRYPTION" "ALGORITHM" "READ WRITE PERMISSION"
```

```
busctl call xyz.openbmc_project.Network.SNMP /xyz/openbmc_project/network/snmp/manager  
xyz.openbmc_project.Network.Client.Create Client sqss "IP- ADDRESS " 162 "v3" "USERNAME"
```

7.4 SNMP-agent

SNMP Agent —Software client preinstalled on network devices. SNMP Agents will store information about device status and relay this to the SNMP Manager when polled.

- Configure the destination client IP address and Port Number etc,.

```
busctl                                call                                xyz.openbmc_project.Snmp.Conf
/xyz/openbmc_project/snmp/CommunityStrManager
xyz.openbmc_project.Snmp.CommunityStrManager.Create      Client      sss
"COMMUNITYSTRING" "READ WRITE PERMISSION" "COMMUNITY PROFILE"
```

Execute command from external client `snmpwalk -v2c -c`

COMMUNITY STRING <BMC IP> .1.3.6.1.4.1.8072.2.

7.5 Add Community String

1. For SNMP Agent

Service: busctl call xyz.openbmc_project.Snmp.Conf

Object Path: /xyz/openbmc_project/snmp/CommunityStrManager

Interface Name:

xyz.openbmc_project.Snmp.CommunityStrManager.Create

Method:

Client

```
busctl call xyz.openbmc_project.Snmp.Conf /xyz/openbmc_project/snmp/CommunityStrManager
xyz.openbmc_project.Snmp.CommunityStrManager.Create Client sss "COMMUNITYSTRING" "READ
WRITE PERMISSION" "COMMUNITY PROFILE"
```

Note: The SNMP community string should not be set to default values such as 'public' or 'private' due to security concerns. It is strongly recommended to configure a unique, complex string to prevent unauthorized access.

2. For SNMP Trap:

Service: busctl call xyz.openbmc_project.Snmp.Conf

Object Path: /xyz/openbmc_project/snmp/snmpUtils

Interface Name: xyz.openbmc_project.Snmp.SnmpUtils

Method: SendSNMPTrap

```
root@AMIOT-327f58a9172f:~# busctl introspect xyz.openbmc_project.Snmp.Conf /xyz/openbmc_project/snmp/SnmpUtils xyz.openbmc_project.Snmp.SnmpUtils
NAME                                TYPE      SIGNATURE RESULT/VALUE  FLAGS
.ListSNMPCommunityProfile          method    -            as             -
.SendSNMPTrap                      method    -            b             -
.EnableSNMPV1                      property  b           true          emits-change writable
.EnableSNMPV2                      property  b           true          emits-change writable
.EnableSNMPV3                      property  b           true          emits-change writable
.SnmpTrapStatus                   property  b           true          emits-change writable
root@AMIOT-327f58a9172f:~#
```

Enable/Disable SNMP version:

Service : busctl call xyz.openbmc_project.Snmp.Conf

Object Path : /xyz/openbmc_project/snmp/snmpUtils

Interface Name : xyz.openbmc_project.Snmp.SnmpUtils

```

root@AMIOT-327f58a9172f:~# busctl introspect xyz.openbmc_project.Snmp.Conf /xyz/openbmc_project/snmp/SnmpUtils xyz.openbmc_project.Snmp.SnmpUtils
NAME                                     TYPE      SIGNATURE RESULT/VALUE FLAGS
.ListSNMPCommunityProfile              method    -         as         -
.SendSNMPTrap                          method    -         b          -
.EnableSNMPV1                          property  b         true       emits-change writable
.EnableSNMPV2                          property  b         true       emits-change writable
.EnableSNMPV3                          property  b         true       emits-change writable
.SnmpTrapStatus                        property  b         true       emits-change writable
root@AMIOT-327f58a9172f:~#

```

Note: If the property value is true the corresponding SNMP version will enable and vice versa.

7.6 ListViewAccess method:

List the View Access from SNMP configuration file located at (/etc/snmp/snmpd.conf)

```

####
# Third, create a view for us to let the groups have rights to:

#          incl/excl subtree          mask
view all   included .1                80
#view system included .iso.org.dod.internet.mgmt.mib-2.system
view system included .1.3.6
view smtp   included .1.3.6.1.4.1.8072.3

```

```

root@AMIOT-327f58a9172f:~#
root@AMIOT-327f58a9172f:~# busctl call xyz.openbmc_project.Snmp.Conf /xyz/openbmc_project/snmp/SnmpUtils xyz.openbmc_project.Snmp.SnmpUtils ListSNMPComm
unityProfile
as 3 "all" "system" "smtp"
root@AMIOT-327f58a9172f:~#
root@AMIOT-327f58a9172f:~#
root@AMIOT-327f58a9172f:~#

```


7.7 ListNewlyCreatedCommunityString method:

Newly created community strings are listed here:

busctl tree xyz.openbmc_project.Snmp.Conf

```
root@AMIOT-327f58a9172f:~# busctl tree xyz.openbmc_project.Snmp.Conf
`- /xyz
   `-- /xyz/openbmc_project
        `-- /xyz/openbmc_project/snmp
             | - /xyz/openbmc_project/snmp/CommunityStrManager
             |   `-- /xyz/openbmc_project/snmp/CommunityStrManager/COMMUNITYSTRING
             | - /xyz/openbmc_project/snmp/SnmpUtils
             `-- /xyz/openbmc_project/snmp/UserManager
root@AMIOT-327f58a9172f:~#
```

Chapter 8

8 BHS Power ON

OneTree™ stack has validated with AVC system + GNR processor. The below features are validated.

1. BMC booted to linux.
2. All the drivers are loaded properly.
3. Host booted to BIOS and UEFI.
4. BMC and BIOS serial console is working.
5. BMC firmware is stable with warm, cold reset, AC and DC cycle.
6. Power operation is working which means all the eSPI handshaking through virtual wire channel is good.
7. Halt BMC in u-boot and check host is still alive.
8. SPI read and write is working.
9. Memory read and write is working.
10. Validated gpio pins through tool and kernel sub system.
11. BMC got IP in u-boot and Linux,
12. TFTP is working,
13. I2C buses are configured as per dts in linux, few validations using i2c tool like scan and read i2c devices
14. Basic core manageability features like IPMI, sensor, SOL, redfish and Web UI etc. are working.
15. Basic network functionality,
16. PECI
17. BMC vGPIO
18. Node Manager
19. CUPS
20. Tools like ipmitool, i2c, gpio, adc and PWM are working.

Chapter 9

9 DC -MHS (Mustang) Supported Feature

In early 2022, six companies, Intel, Dell, HPE, Google, Meta, and Microsoft (and recent addition AMD) kicked off a collaboration in the Open Compute Project (OCP) called Data Center Modular Hardware System (DC-MHS). Through six base specifications, DC-MHS documents several types of Host Processor Modules (HPMs) and how they interface with building blocks needed to configure a full server. Host Processor Modules (with CPU and memory) and other modular, standardized elements allow customers to offer a wider range of systems for Enterprise, Hyperscale, Cloud, Telecom and Edge sooner and with reduced engineering investment. The same module is deployed in multiple configurations at higher scale.

<https://www.opencompute.org/wiki/Server/DC-MHS>

<https://community.intel.com/t5/Blogs/Thought-Leadership/Big-Ideas/Modularity-and-StandardizationTransforming-Server-Architecture/post/1428908>

Supported Features

1. Sensor (Temp, FAN, ADC and Discrete)
2. FRU
3. Thermal Management
4. IPMI
5. DCMi
6. User Management
7. Chassis power control
8. SEL

Chapter 10

10 Aspeed SOC Secure Boot

This explains hardware secure boot and software verified boot to prevent BMC from attackers tampering the BMC image.

- AST2600 based root of trust.
- U-Boot verified boot based on software

10.1 ASPEED Secure Boot

- SOC supports hardware boot image measurement and decryption.
- RSA Key mode is supported by ASPEED.
- Support up to 8 OEM DSS public keys.
- Programmable options to select SHA224, SHA256, SHA384 or SHA512 Hash algorithms supported.
- Programmable options to select RSA1024, RSA2048, RSA3072, RSA4096 for image digest decryption.
- Supports AES256 for secure boot mode 2 firmware image encryption.

Crypto engine which is available in ASPEED SOC used to authenticate the security of the SPL Image. The signature which is available in secure image header is decrypted by public key available in OTP memory and compared with the hash generated from the SPL image.

If the hash matches, the ARM controller starts executing SPL image.

10.2 U-Boot Verified Boot

A verified boot is the verification of all software loaded into a machine during the boot process to ensure that it is authorized and correct for that specific machine. The scope of verified boot can extend from the moment of system reset till the boot process. For instance, it can involve loading U-Boot from read-only memory, followed by loading a signed kernel and then utilizing a kernel's dm-verity driver to mount a signed root file system.

Flattened Image Tree

- The FIT format is already widely used in U-Boot. It is a flattened device tree (FDT) in a particular format, with images contained within.
- FITs include hashes to verify images, so it is relatively straightforward to add signatures as well.
- The public key can be stored in U-Boot's device tree in a standard place. Then when a FIT is loaded it can be verified using that public key.

Signing

Verified boot uses cryptographic algorithms to 'sign' software images. Images are signed using a private key known only to the signer but can be verified using a public key. As its name suggests the public key can be made available without risk to the verification process. The private and

public keys are mathematically related. For more information on how this works look up "public key cryptography" and "RSA" (a particular algorithm).

- "mkimage" tool used to sign the image.
- Tool gets input from ".its" file. Provide private key and DTB file.
- ITS file provides the image file, encryption algorithm, load and entry, compression.
- Tool generates digest and encrypts, for the image configured in ITS using private key.
- The DTB updated with respective public key in it.

Chapter 11

11 KVM & Media OS Compatibility

Host OS (Server Edition 64-bit)	• Ubuntu Server 22.04.4, 24.04.2
	• RHEL Server/Rocky Linux/CentOS - 9.6 , 10.0
	• SLES 15SP6
	• Windows Server 2022, 2025
Client OS (64-bit)	• Ubuntu 22.04, 24.04
	• Windows 10, 11
	• Fedora 42
	• MACOS 15 Sequoia
Web Browser (Official Build) (64-bit)	• Firefox 144
	• MS Edge 142
	• Chrome 142
	• Safari 18

Chapter 12

12 Virtual Media Performance

SoC Platform	Media redirection from web browser	Media redirection from external server			
		NFS	CIFS	HTTPS	JViewer
Beechnut City (GNR SP A2 NVMe M.2 PCI4 CPU platform)	3.7MB/s (3m6s)	11Mb/s (1m2s)	5.8MB/s (1m58s)	4.1MB/s (2m46s)	3.1MB/s (3m21s)
BMC Firmware	OneTree-2.1				
Test Note	Redirect 655 MB file to HOST and copy the file to different location in host. Average Speed = (File Size) / (Time taken to copy the file) Client - Ubuntu 22.04.4 Host - Ubuntu Server 22.04.5				

Chapter 13

13 SOL

One of the powerful tools in IPMI is Serial Over LAN (SOL) which provides serial line access over the management LAN. The baseboard management controller (BMC) microcontroller embedded on the server motherboard does this by redirecting information destined for the serial port over to the LAN. With SOL console redirection system administrators can remotely view the text-based console on their remote servers from anywhere and perform any task that doesn't require a GUI.

Transporting serial data over IP networks using telnet, serial over IP, SOL and the likes is the way forward for server serial communications. Just as the KVM functions in embedded service processors is displacing the need for external KVM appliances, so the SOL capability of BMCs and console redirection in service processors is reducing the need for serial console servers for server console management.

13.1 SOL Logging

BMC will log the sol data into a file for user's future reference.

By default, SOL log file will be stored in `/var/log/obmc-console.log` and each file size will be 256k, In case if the log file reaches the size limit, next log file will be created with name as `obmc-console1.log`.

Downloading the SOL log file support will be included in Redfish and WEBUI

13.2 Multi SOL Support

The integration of MultiSOL with "obmc-console" enhances openBMC's remote management. As data centers evolve, efficient solutions are crucial. MultiSOL and "obmc-console" allow admins to manage multiple systems' consoles concurrently over a network. While SOL accessed one system's console, MultiSOL addresses managing many. It merges MultiSOL with "obmc-console" for centralized control, simplifying tasks across servers, enhancing efficiency, and minimizing downtime. This integration aids issue resolution, provisioning, updates, and monitoring. It empowers admins with a versatile toolset that enhances modern server management and remote operation within openBMC.

- In remote OS like Ubuntu, open a terminal and activate sol by executing the following request in command line.

```
ssh root@<BMC IP> -p 220x
```

```
password: OpenBmc
```

- After activating the sol, boot into Host A Linux OS [say Ubuntu20.04 (64 bit) here]. Enter Linux shell, then run strace command as below
Enter Host Linux shell, then run strace command as below.

```
strace /sbin/agetty ttyS0 115200 vt100 (for ast2600 baudrate must be 115200)
```

```
(or) strace /sbin/agetty ttyUSB0 115200 vt100 (For using USB to Serial Converter)
```

- By executing the above command, host machine will be redirected to the console where sol session is activated, command would show lots of messages, you should be able to see login prompt at the end of the messages and it will wait in read state. (It means the strace command works correctly)

```
pandiaraj@smtp:~$ ssh root@10.0.96.202 -p 2203
The authenticity of host '10.0.96.202:2203 ([10.0.96.202]:2203)' can't be established.
RSA key fingerprint is SHA256:TU/1keyx2ao9S09bOmV1hCY0e7G+zBh+B6wM7/f0d1M.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Failed to add the host to the list of known hosts (/home/pandiaraj/.ssh/known_hosts).
root@10.0.96.202's password:
Permission denied, please try again.
root@10.0.96.202's password:

Ubuntu 20.04.1 LTS ami-B365M-D3H ttyS0

ami-B365M-D3H login: ami
Password:
Welcome to Ubuntu 20.04.1 LTS (GNU/Linux 5.15.0-79-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

264 updates can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable

New release '22.04.3 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Tue Aug 22 10:58:27 IST 2023 from 10.0.56.113 on pts/0
-bash: cannot set terminal process group (14847): Inappropriate ioctl for device
-bash: no job control in this shell
ami@ami-B365M-D3H:~$
```

Note:

** Port numbers for Uart 1 = 2200, Uart 2 = 2201, Uart 3 = 2202, Uart 4 = 2203*

- Then SOL can be activated with Host B. The host connected to UART4 got launched and UBUNTU login screen had occurred as shown below.

Now, boot into Host B Linux OS [say Ubuntu20.04 (64 bit) here]. Enter Linux shell, then run strace command as below.

```
strace /sbin/agetty ttyS0 115200 vt100 (or)
```

```
strace /sbin/agetty ttyUSB0 115200 vt100 (For using USB to Serial Converter)
```

- Then, activate SOL command with ssh in client side Linux terminal.

```
ssh root@<BMC IP> -p 2200
```

```
password: OpenBmc
```

```
pandiaraj@smtp:~$ ssh root@10.0.96.202 -p 2200
The authenticity of host '[10.0.96.202]:2200 ([10.0.96.202]:2200)' can't be established.
RSA key fingerprint is SHA256:Tu/1keyx2ao9S09bCmv1hCY0e7G+zBh+B6wM7/f0d1M.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Failed to add the host to the list of known hosts (/home/pandiaraj/.ssh/known_hosts).
root@10.0.96.202's password:

Ubuntu 20.04.1 LTS ami1-B365M-D3H ttyS0
ami1-B365M-D3H login: ami1
Password:
Welcome to Ubuntu 20.04.1 LTS (GNU/Linux 5.4.0-42-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

276 updates can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable

Your Hardware Enablement Stack (HWE) is supported until April 2025.
*** System restart required ***
Last login: Tue Aug 22 10:49:32 IST 2023 from 10.0.56.113 on pts/0
-bash: cannot set terminal process group (253990): Inappropriate ioctl for device
-bash: no job control in this shell
ami1@ami1-B365M-D3H:~$
ami1@ami1-B365M-D3H:~$
ami1@ami1-B365M-D3H:~$
```

- To close the SOL session, issue exit command and then type (~.) to terminate or issue SOL deactivate command.

Chapter 14

14 JViewer

JViewer is a standalone utility that provides remote console access for OpenBMC based firmware. It utilizes the RFB (Remote Frame Buffer) Protocol via secure websockets (WSS) to provide KVM (Keyboard video and mouse) access. NBD (Network Block Device) over secure websockets to provide VMedia (Virtual Media) access.

Virtual Media Slot_0 and Slot_1 is shared between JViewer and WebUI virtual media page. (i.e., Any one client can have access for media redirection)

14.1 Requirements

Following are the requirements to build/run JViewer utility.

- OpenJDK 11 LTS 64-bit

Following client platforms are supported.

- Windows 64-bit
- Linux 64-bit
- Mac 64-bit

Note: Only x86 CPU architecture is supported.

14.2 Usage

JViewer utilizes the JAR package format to offer a portable executable binary that can be executed across multiple platforms. The JAR file enables launching through the command line or simply by double clicking.

To launch directly from the command line, JViewer supports various parameters.

```
java -jar JViewer.jar -hostname <BMC_IP> -webport <BMC_HTTPS_PORT> -u <BMC_USERNAME> -p <BMC_PASSWORD> -launch jviewer
```

eg.

```
java -jar JViewer.jar -hostname 192.168.1.1 -webport 443 -u testuser -p testpswd -launch jviewer
```

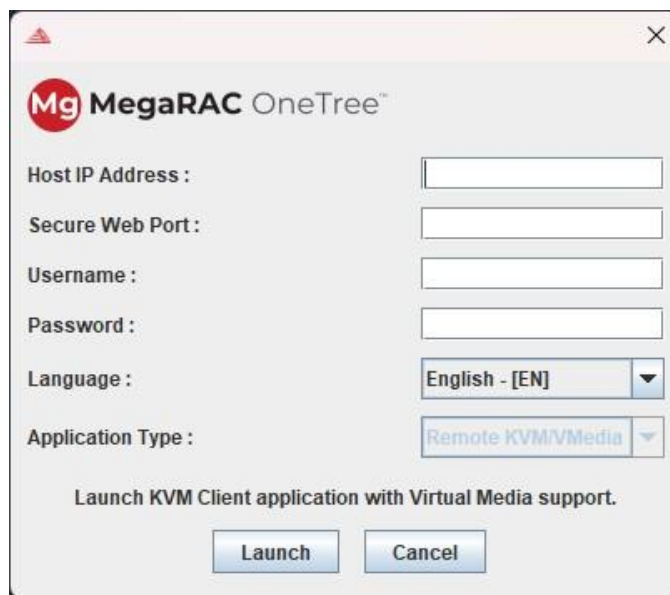
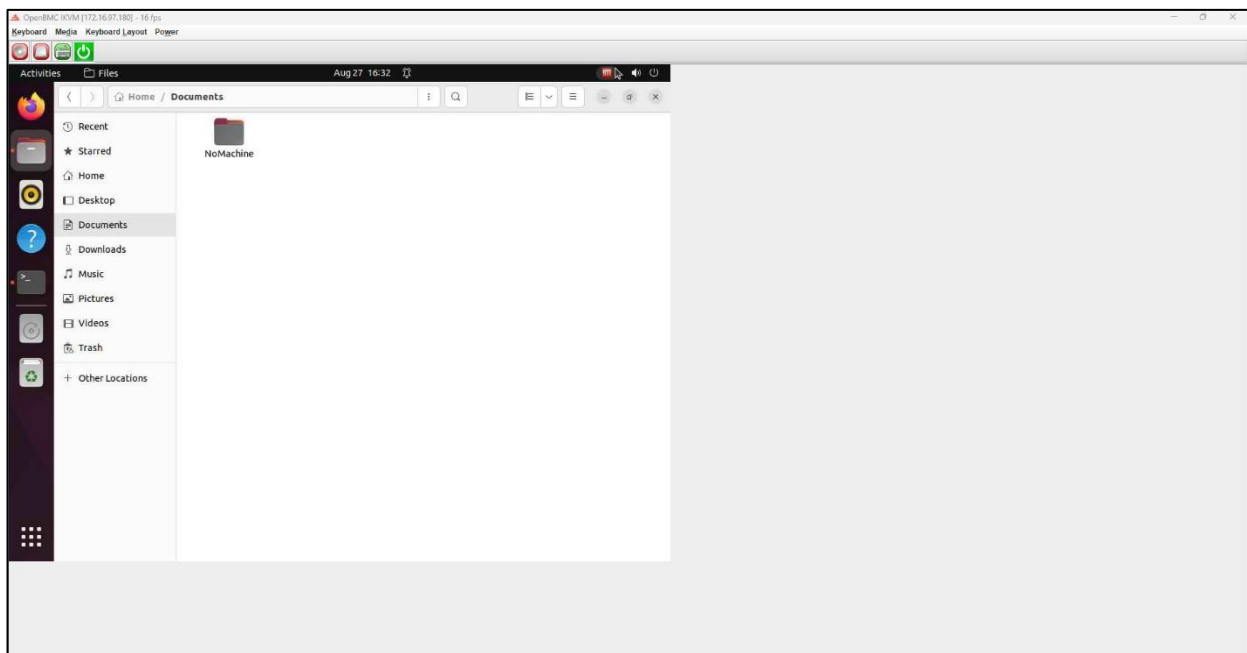


Figure 241 JViewer Standalone Input Dialog



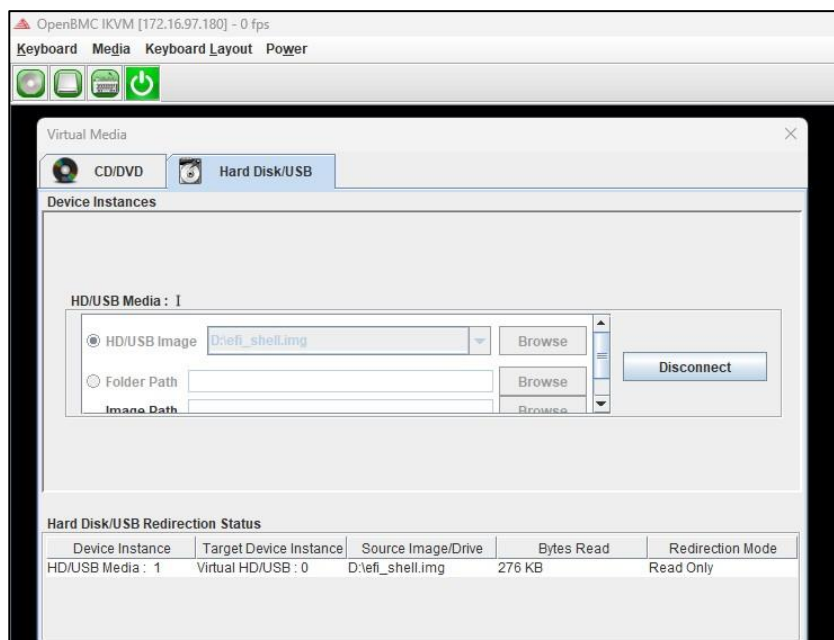
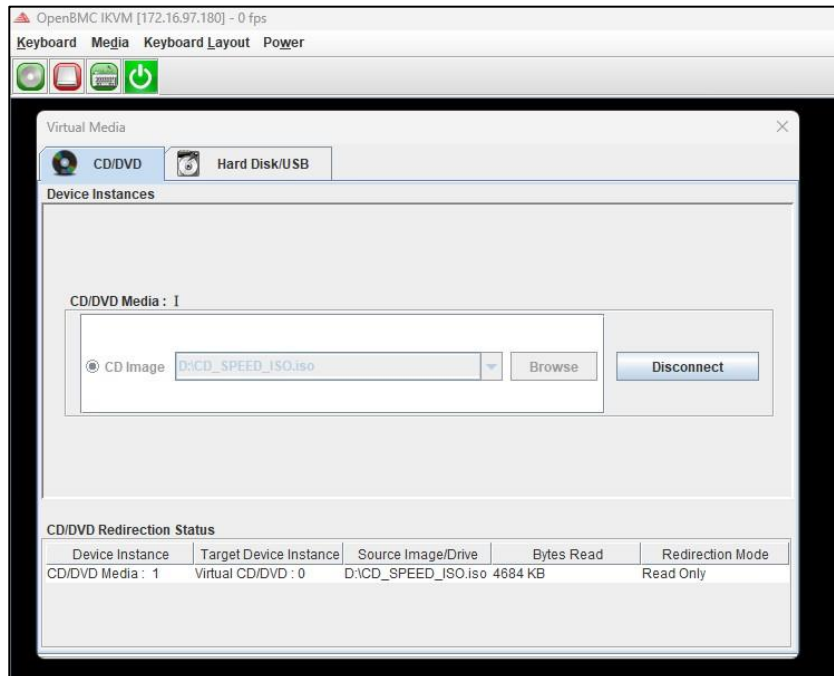
14.3 Quick Button

The lower left of Console Redirection windows displays all the quick buttons. These quick buttons help you to perform these functions by just clicking them.

Quick Button	Explanation
	These quick buttons will pop up a virtual media where you can configure the media
	This quick button is used to show or hide the soft keyboard.
	This quick button will work like toggle button if icon is in green color server status is power on by clicking the button immediate shutdown action will be triggered in host If the icon is in red color server status is power off . Click the button to power on the host.

14.4 Media

The virtual media wizard will allow you to redirect different media to the host system. This wizard recommends Hard Disk/USB image files (*.ima, .img), CD/DVD image files (.iso, *.nrg) by default for better compatibility. A sample screenshot of Virtual Media Application is given below.

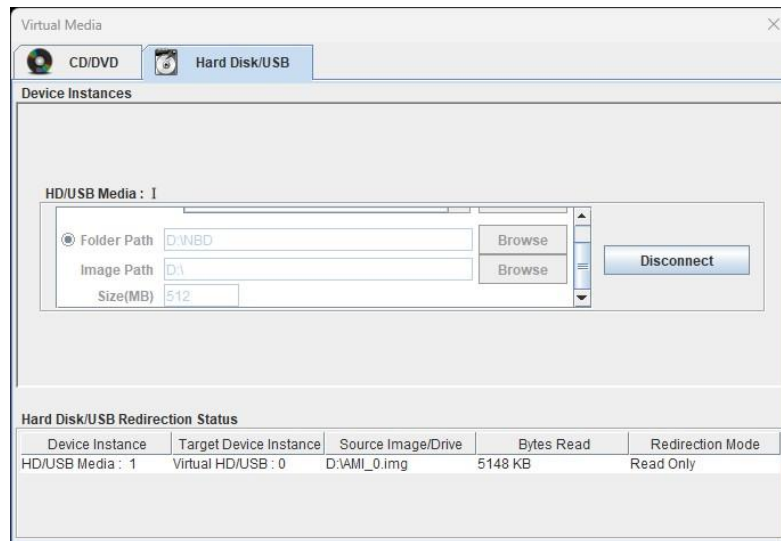


Folder Redirection Support

JViewer supports redirecting local file system folder to remote host as storage medium. Configuration option is available under Hard Disk/USB tab in Virtual Media wizard.

- Folder Path =Folder to be redirected. Use the Browse button to select the folder.

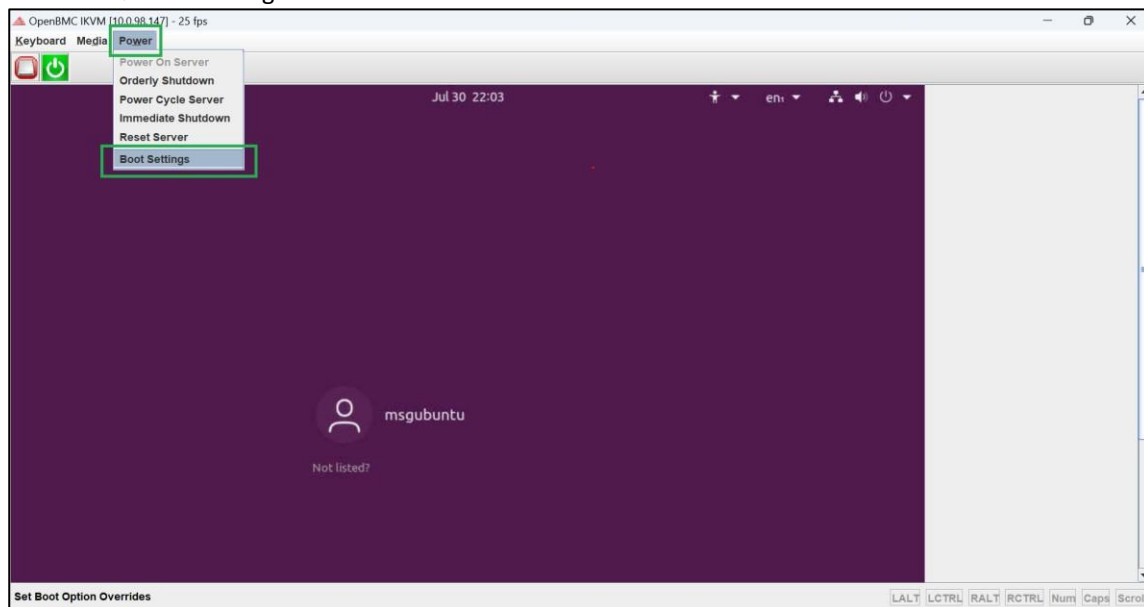
- Image Path = Temporary file to be used for redirection. Use the Browse button to configure a path with write permission. This file will be removed when redirection is stopped.
- Size(MB) = Temporary file size limit. Configure the size relative to the folder to be redirected. Supported values are minimum 16MB and maximum 2048MB.

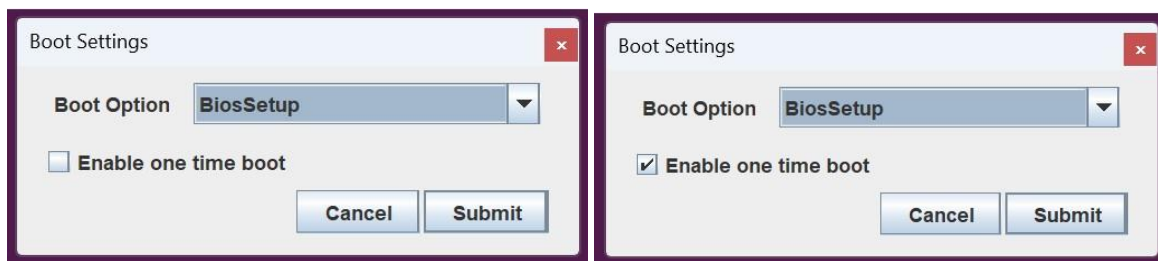
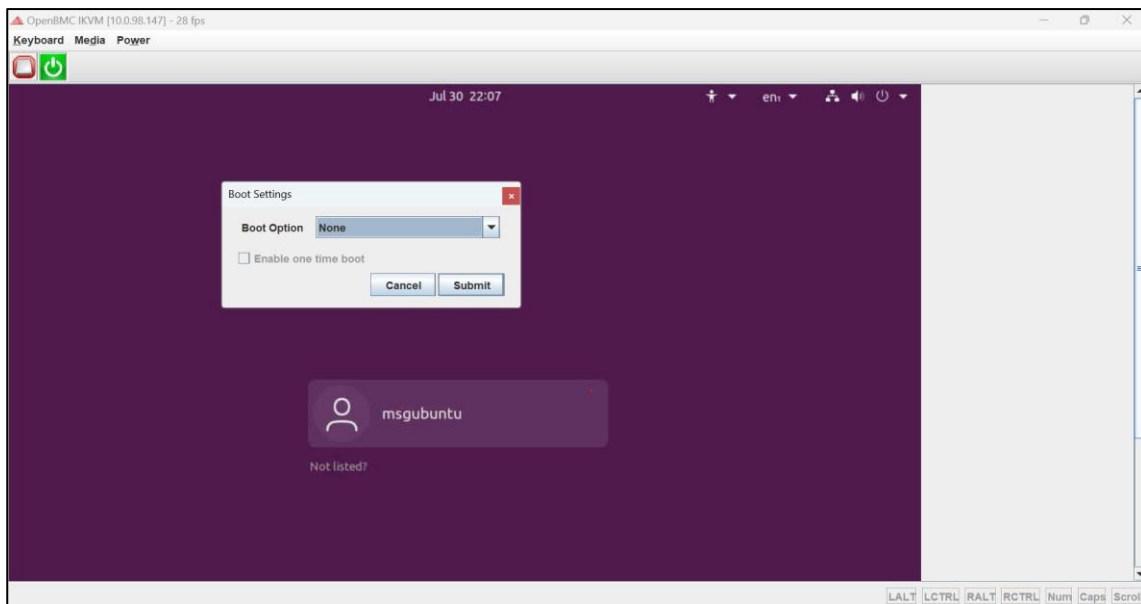


14.4.1 Accessing Boot Settings in Jviewer

With the JViewer, users can utilize the Boot Settings configuration Feature by clicking on the Boot Settings button, which will launch a modal view for configuring the System Boot Device.

Click Power → Boot Settings





Boot Settings Override: Select one of the Option from the option list

Options - [None, Pxe, Hdd, Cd, Safe, Diags, BiosSetup, Usb]

Enable one time boot: Check the box for enabling one time boot Settings

Cancel: Clicking the “Cancel” button will reset the current changes and close the modal view.

Submit: Clicking the “Submit” button will save the Configuration & close the modal View.

Note:

To stop the host OS in BIOS during boot, the ‘Enable-One Time Boot’ option must be enabled.

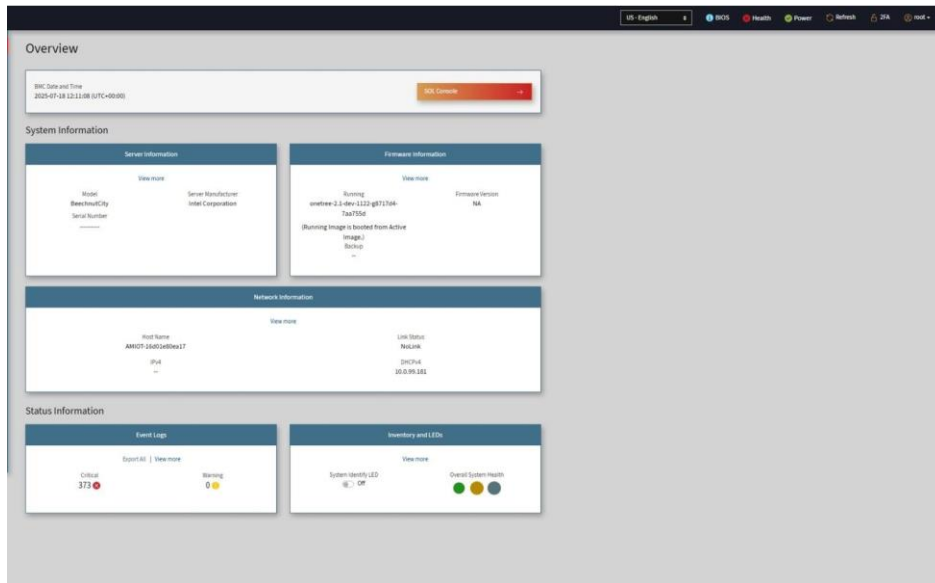
Check the Power Operation section for more information about boot options.

Chapter 15

15 WebUI Two Factor Authentication

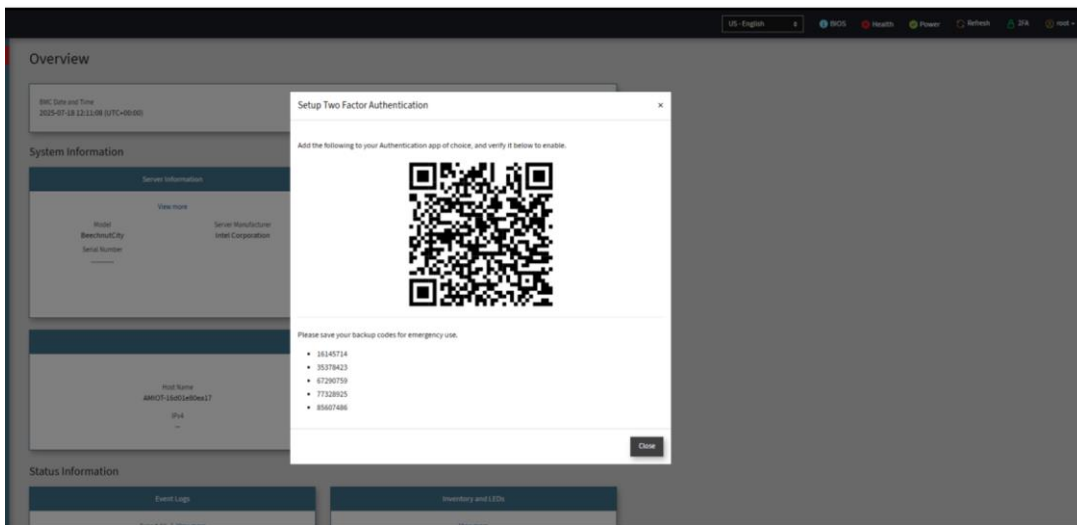
Two-factor authentication will increase the security of the login process. If users with 2FA enabled can enter a verification code provided by the Two-factor authentication app to log in to the WebUI.

In Webui, the 2FA icon is placed in the header. To enable the 2FA click the icon.

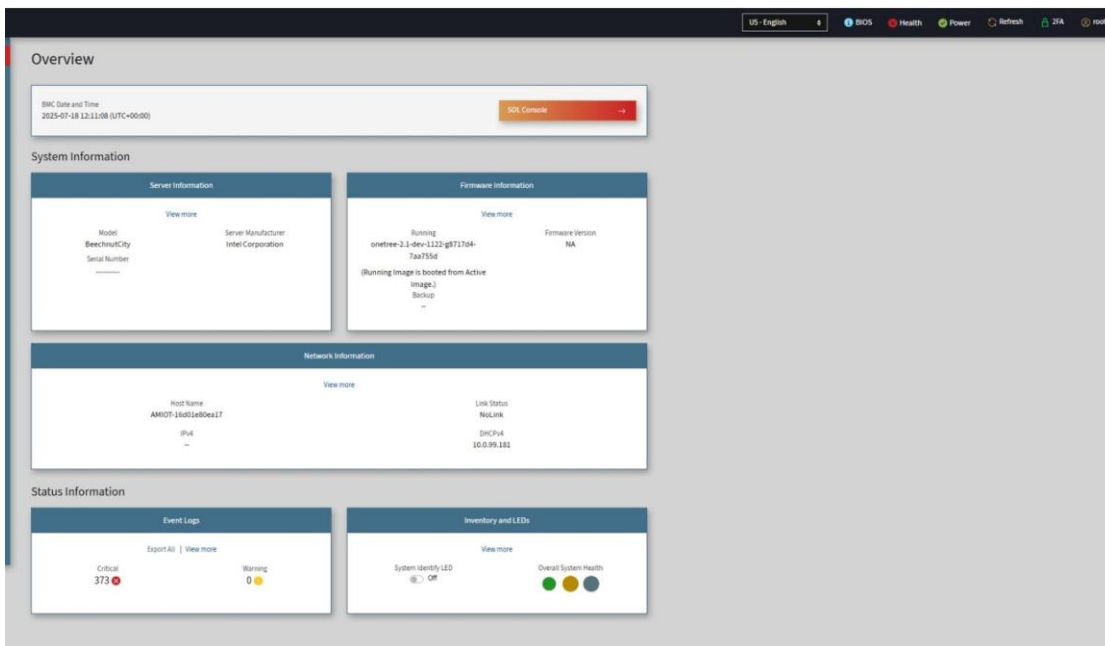


15.1 Enable 2FA

If the user clicks the 2FA icon the QR code will display with the backup code. Scan the QR code with the Two factor authentication app.

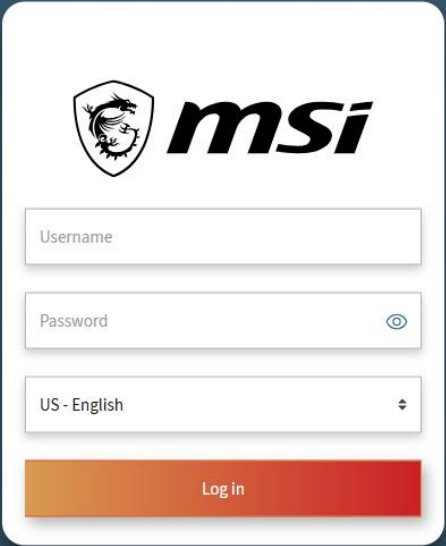


The 2FA icon color will change to green when the user enables the two-factor authentication.



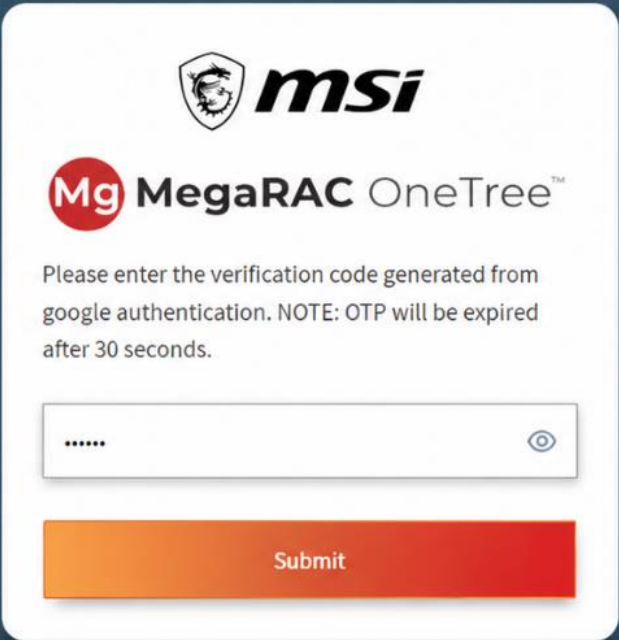
15.2 2FA OTP Verification

Login using the username and password.

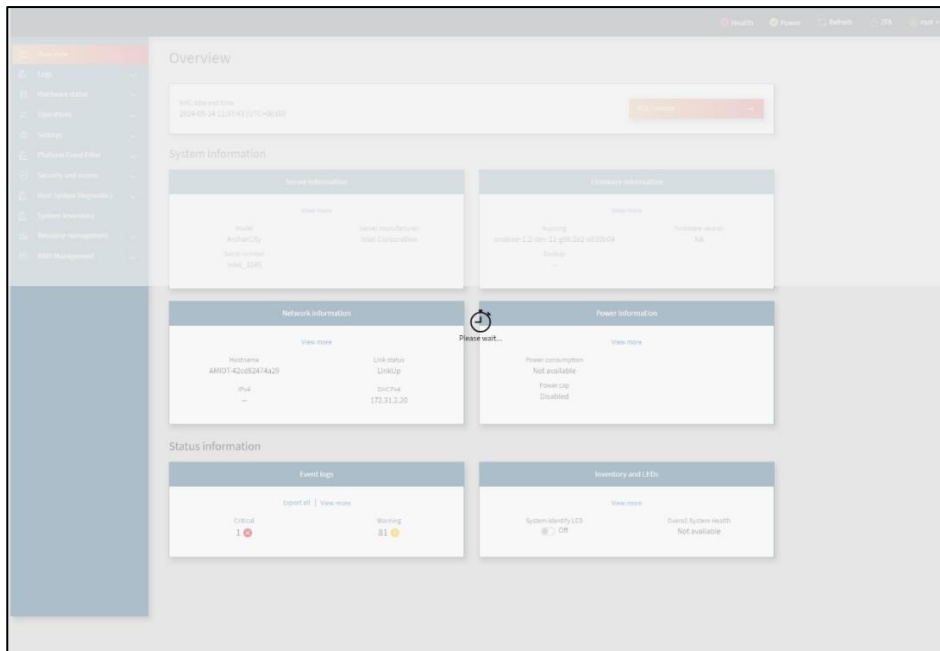


The login form is centered on a dark blue background. It features the MSI logo at the top, which consists of a shield icon with a dragon and the text "msi". Below the logo are three input fields: "Username", "Password" (with an eye icon for toggling visibility), and "US - English" (with a dropdown arrow). At the bottom is a red "Log in" button.

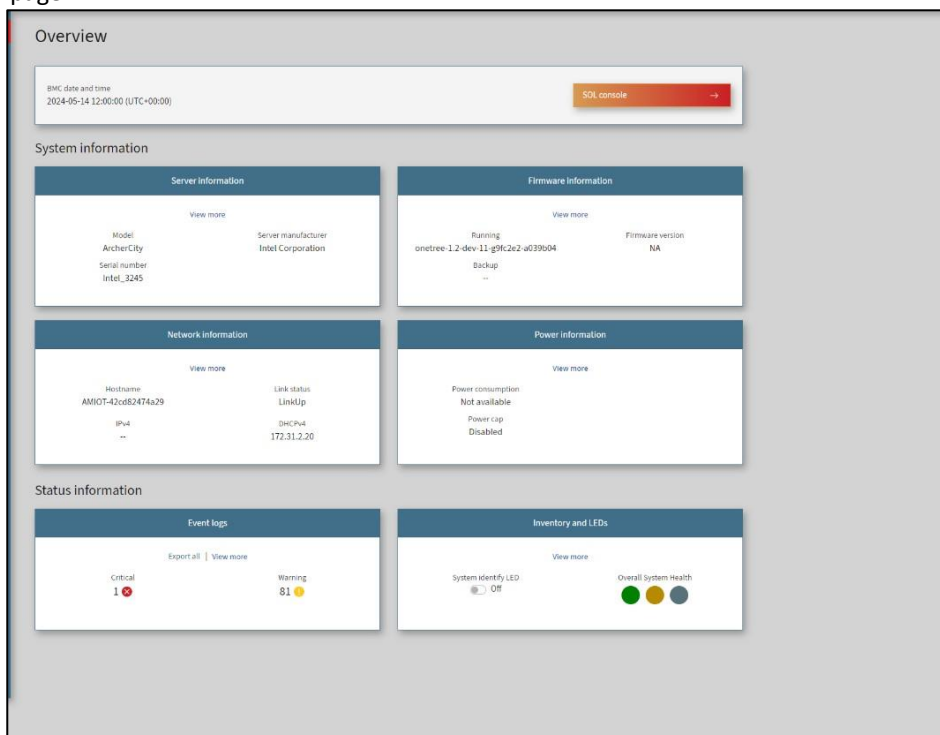
Enter the verification code using the two-factor authentication code.



The verification form is centered on a dark blue background. It features the MSI logo at the top. Below it is the "Mg MegaRAC OneTree™" logo, where "Mg" is in a red circle. The text "Please enter the verification code generated from google authentication. NOTE: OTP will be expired after 30 seconds." is displayed. Below this is a text input field with a masked "*****" and an eye icon. At the bottom is a red "Submit" button.

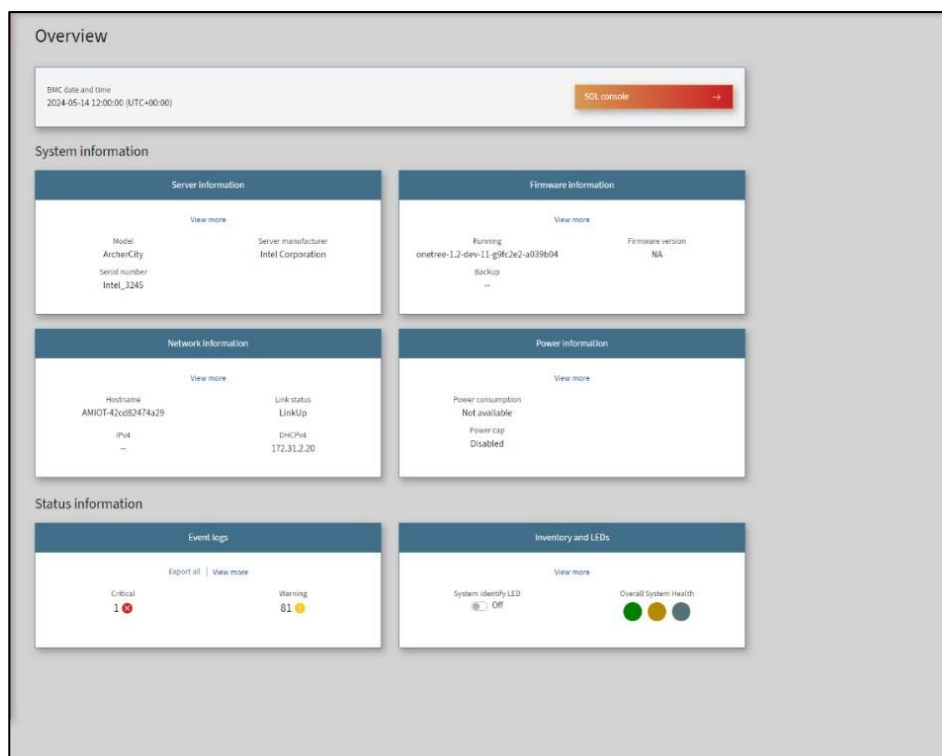
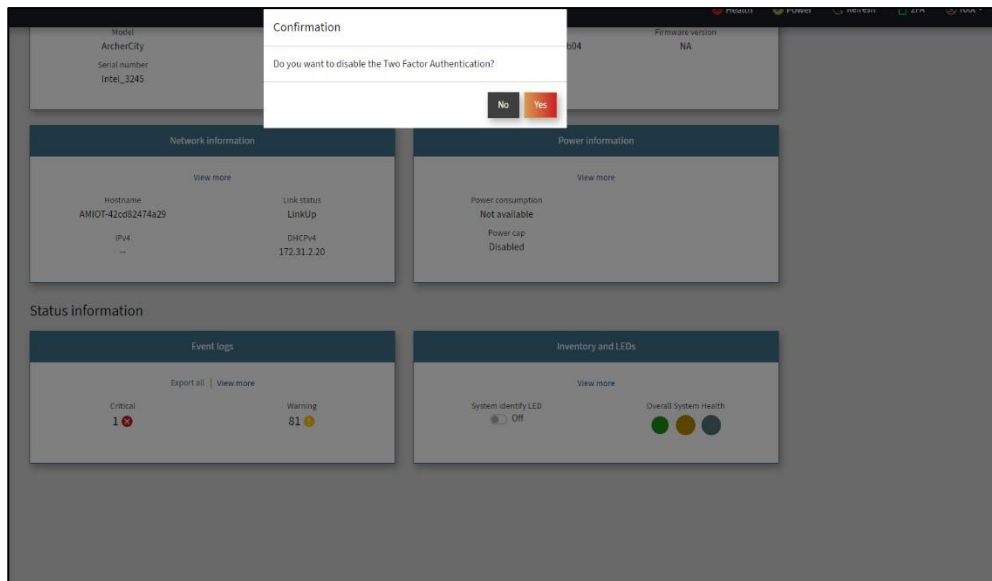


Once the user enters the correct verification code, the login will be successful and it will navigate to Overview page.



15.3 Disable 2FA

If the user needs to disable the two-factor authentication click the 2FA icon. The confirmation popup will display, click Yes to disable the two-factor authentication.



15.4 Dbus Methods

Enable 2FA for a created user

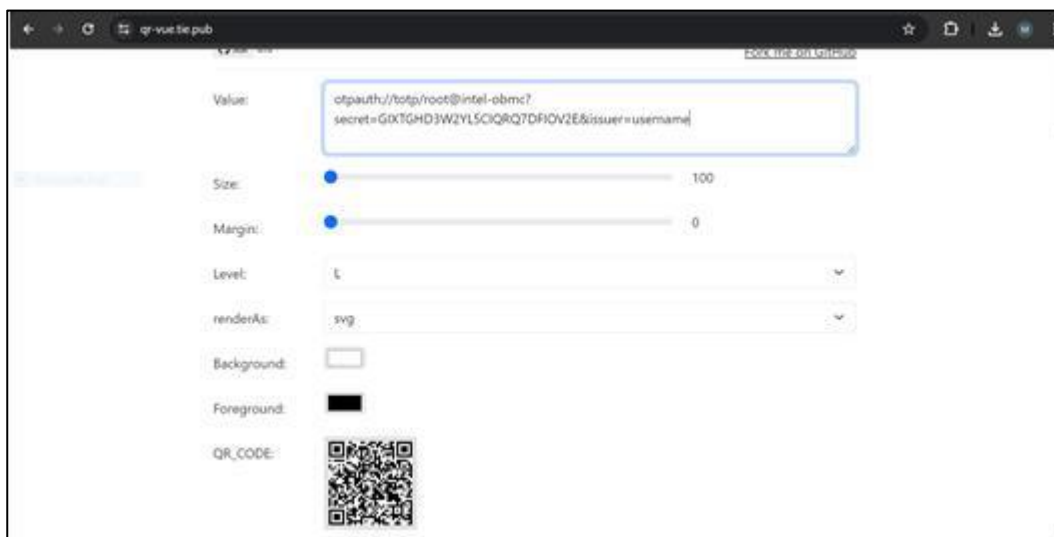
```
busctl call xyz.openbmc_project.TwoFactorAuthentication
/xyz/openbmc_project/TwoFactorAuthentication
xyz.openbmc_project.TwoFactorAuthentication.WebTwoFactorAuthentication
EnableTwoFactorAuthentication syb "username" 3 <0/1>
```

Note: 0 -> disable and 1 -> Enable.

```
root@intel-obmc:~# busctl call xyz.openbmc_project.TwoFactorAuthentication /xyz/openbmc_project/TwoFactorAuthentication xyz.op
enbmc_project.TwoFactorAuthentication.WebTwoFactorAuthentication EnableTwoFactorAuthentication syb "username" 3 1
s "otpauth://totp/root@intel-obmc?secret=RFVEUXP7IIEXJDHX5KX274QB7E&issuer=username"
root@intel-obmc:~#
```

Response: returns URL.

Using the above URL in below link, there we can generate QA Code and scan that QR with Authenticator. Link: <https://qr-vue.tie.pub/>



Using busctl introspect can able to view the set values,

```
busctl introspect xyz.openbmc_project.TwoFactorAuthentication
/xyz/openbmc_project/TwoFactorAuthentication
```

```
root@intel-obmc:~# busctl introspect xyz.openbmc_project.TwoFactorAuthentication /xyz/openbmc_project/TwoFactorAuthentication
NAME                                TYPE      SIGNATURE RESULT/VALUE FLAGS
org.freedesktop.DBus.Introspectable Interface -      -          -
org.freedesktop.DBus.Introspectable.Introspect Method    -      s          -
org.freedesktop.DBus.Peer           Interface -      -          -
org.freedesktop.DBus.Peer.GetMachineId Method    -      s          -
org.freedesktop.DBus.Peer.Ping      Method    -      -          -
org.freedesktop.DBus.Properties     Interface -      -          -
org.freedesktop.DBus.Properties.Get Method    ss      v          -
org.freedesktop.DBus.Properties.GetAll Method    s       a(sv)     -
org.freedesktop.DBus.Properties.Set Method    ssv     -          -
org.freedesktop.DBus.Properties.PropertiesChanged Signal    sa(sv)as -          -
xyz.openbmc_project.TwoFactorAuthentication.WebTwoFactorAuthentication.EnableTwoFactorAuthentication Interface -      -          -
xyz.openbmc_project.TwoFactorAuthentication.WebTwoFactorAuthentication.VerifyOTP Method    sib     s          -
xyz.openbmc_project.TwoFactorAuthentication.WebTwoFactorAuthentication.VerifyOTP Method    ss      b          -
root@intel-obmc:~#
```

```
busctl introspect xyz.openbmc_project.User.Manager /xyz/openbmc_project/user/username
```

```

root@intel-obmc:~# busctl introspect xyz.openbmc_project.User.Manager /xyz/openbmc_project/user/username
NAME                                TYPE      SIGNATURE RESULT/VALUE  FLAGS
org.freedesktop.DBus.Introspectable interface -          -          -
org.freedesktop.DBus.Introspect    method   -          s              -
org.freedesktop.DBus.Peer           interface -          -          -
org.freedesktop.DBus.Ping           method   -          s              -
org.freedesktop.DBus.Properties     interface -          -          -
org.freedesktop.DBus.Properties     method   ss         v              -
org.freedesktop.DBus.GetAll         method   s          a(sv)         -
org.freedesktop.DBus.Set            method   ssv        -              -
org.freedesktop.DBus.PropertiesChanged signal    aa(sv)as    -              -
xyz.openbmc_project.Object.Delete   interface -          -          -
xyz.openbmc_project.Object.Delete   method   -          -              -
xyz.openbmc_project.User.Attributes interface -          -          -
xyz.openbmc_project.User.Attributes property  b          false         const
xyz.openbmc_project.User.Attributes property  b          true          emits-change writable
xyz.openbmc_project.User.Attributes property  b          7 "bootconsole" "ipmi" "media" "redfi... emits-change writable
xyz.openbmc_project.User.Attributes property  as         -              emits-change writable
xyz.openbmc_project.User.Attributes property  b          false         const
xyz.openbmc_project.User.Attributes property  b          false         const
xyz.openbmc_project.User.Attributes property  s          "priv-admin" emits-change writable

```

Verify the OTP `busctl call xyz.openbmc_project.TwoFactorAuthentication /xyz/openbmc_project/TwoFactorAuthentication xyz.openbmc_project.TwoFactorAuthentication.WebTwoFactorAuthentication VerifyOTP ss "<username>" "<OTP>"`

```

root@intel-obmc:~# busctl call xyz.openbmc_project.TwoFactorAuthentication.WebTwoFactorAuthentication VerifyOTP ss "username" "332243"woFactorAuthentication xyz.op
b true
root@intel-obmc:~#

```

Recovery Code Usage

```

root@intel-obmc:~# cat /etc/google_otp/ch3/username/.google_authenticator
GIXTGH03M2YL5C1Q7DF10V2E
" TOTP_AUTH
" WINDOW_SIZE 3
31749215
22797951
26147132
27286272
12498268
root@intel-obmc:~#

```

Use Verify the OTP command,

```

root@intel-obmc:~# cat /etc/google_otp/ch3/username/.google_authenticator
GIXTGH03M2YL5C1Q7DF10V2E
" TOTP_AUTH
" WINDOW_SIZE 3
22797951
26147132
27286272
12498268
root@intel-obmc:~#

```

Note: Used recovery code will be removed in available recovery codes (refer below image)

```

root@intel-obmc:~# cat /etc/google_otp/ch3/username/.google_authenticator
GIXTGH03M2YL5C1Q7DF10V2E
" TOTP_AUTH
" WINDOW_SIZE 3
22797951
26147132
27286272
12498268
root@intel-obmc:~#

```


Chapter 16

16 PAM Reorder

16.1 Dbus Methods

Service : xyz.openbmc_project.User.Manager
Object Path : /xyz/openbmc_project/user
InterfaceName : xyz.openbmc_project.User.AccountPolicy

GetPamOrder

busctl call xyz.openbmc_project.User.Manager /xyz/openbmc_project/user
xyz.openbmc_project.User.AccountPolicy GetPamOrder

Note: If the return vector contains any zero values, the call failed due to an inability to open the file or invalid data in the configuration.

SetPamOrder

busctl call xyz.openbmc_project.User.Manager /xyz/openbmc_project/user
xyz.openbmc_project.User.AccountPolicy SetPamOrder ay 3 3 2 1

Note: Currently supported PAM module and their sequence number.

* pam_unix - 1

* pam_ldap - 2

*pam_radius -3

Chapter 17

17 I2C Bus Fault

I2C bus fault alarm will help to notify the user to know about the I2c issue which is identified by Linux kernel. I2c bus failure or fault will cause due to slave not working properly or any other hardware issue on I2c bus. In a single i2c bus there could be multiple slaves, when bus fault occurs all slaves won't work properly it is important to solve that bus fault.

Linux kernels have this capability to identify what kind of issue bus on I2c, when error occurs interrupt will be generated, from that will get 32-bit value, the 32bit value will represents 32 different statuses such as bus error, bus recovery, timeout etc.,

In this application the status of I2c bus fault will be logged to phosphor-sel-logger, messages will be available on SEL entries.

```
root@intel-obmc:~#  
root@intel-obmc:~# busctl get-property xyz.openbmc_project.Logging /xyz/openbmc_project/logging/entry/255 xyz.openbmc_project.Logging.Entry Message  
s "I2c Busfault due to I2cBusFault due to Arbitration LossOn I2C-8"  
root@intel-obmc:~#
```

Chapter 18

18 License Control

18.1 Step to Generate License Key

1. Need to clone the License-gen to tool to generate the Key.
<https://git.ami.com/tools/megarac/onetree/releases/license-gen>
2. License Key configuration "config.ini"

```
[LICENSE_SUPPORT]
privatekey = private.pem
output = License.key
licensableservices = kvm,media,web
licensevalidity = 10,30,40
globallicensevalidity = 100
hardwareid = DE:FA:12:E3:F1:45
```

Note:

- For config modification refer License-gen tool user guide.
<https://git.ami.com/tools/megarac/onetree/releases/license-gen#getting-started>
- Need to use same key pair as used in image signing tool to sign the BMC image
- Example: `openssl genrsa -out private_key.pem 1024; openssl rsa -pubout -in private_key.pem -out public_key.pem`

3. Command to generate License Key.

./license-gen config.ini

```
pandiaraj@smtp:/home/pandiaraj/tools/license-gen$ ls -al
total 24984
drwxrwxr-x 3 pandiaraj pandiaraj 4096 Apr 16 15:08 .
drwxrwxr-x 12 pandiaraj pandiaraj 4096 Apr 16 15:04 ..
-rw-rw-r-- 1 pandiaraj pandiaraj 210 Apr 16 15:07 config.ini
-rw-rw-r-- 1 pandiaraj pandiaraj 429 Apr 16 15:04 COPYING.AMI
drwxrwxr-x 8 pandiaraj pandiaraj 4096 Apr 16 15:04 .git
-rwxrwxr-x 1 pandiaraj pandiaraj 25552744 Apr 16 15:04 license-gen
-rwxrwxr-x 1 pandiaraj pandiaraj 887 Apr 16 15:07 private.pem
-rw-rw-r-- 1 pandiaraj pandiaraj 680 Apr 16 15:04 README.md
pandiaraj@smtp:/home/pandiaraj/tools/license-gen$ ./license-gen config.ini
2024-04-11 15:08:44 | SUCCESS | License file Generated successfully at 'License.key'
pandiaraj@smtp:/home/pandiaraj/tools/license-gen$ ls -al
total 24988
drwxrwxr-x 3 pandiaraj pandiaraj 4096 Apr 16 15:08 .
drwxrwxr-x 12 pandiaraj pandiaraj 4096 Apr 16 15:04 ..
-rw-rw-r-- 1 pandiaraj pandiaraj 210 Apr 16 15:07 config.ini
-rw-rw-r-- 1 pandiaraj pandiaraj 429 Apr 16 15:04 COPYING.AMI
drwxrwxr-x 8 pandiaraj pandiaraj 4096 Apr 16 15:04 .git
-rwxrwxr-x 1 pandiaraj pandiaraj 25552744 Apr 16 15:04 license-gen
-rw-rw-r-- 1 pandiaraj pandiaraj 402 Apr 16 15:08 License.key
-rwxrwxr-x 1 pandiaraj pandiaraj 887 Apr 16 15:07 private.pem
-rw-rw-r-- 1 pandiaraj pandiaraj 680 Apr 16 15:04 README.md
pandiaraj@smtp:/home/pandiaraj/tools/license-gen$
```

18.2 Dbus Operations

18.2.1 Dbus command to add license Key

1. Create directory “/tmp/license-control/” and upload the License key with extension .key in the same path.
2. And run below dbus command to AddLicenseKey

```
busctl call xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl AddLicenseKey
```

```
root@intel-obmc:~# cat /etc/license-control/license.json
{
  "licenseableServices": [
    {
      "LicenseValidity": 1,
      "serviceControlCmd": "start-lpkvm",
      "serviceName": "KVM"
    },
    {
      "LicenseValidity": 1,
      "serviceControlCmd": [],
      "serviceName": "WEB"
    },
    {
      "LicenseValidity": 1,
      "serviceControlCmd": "xyz.openbmc_project.VirtualMedia.service",
      "serviceName": "MEDIA"
    },
    {
      "LicenseValidity": 1,
      "serviceControlCmd": "mail-alert-manager.service",
      "serviceName": "SMTP"
    }
  ],
  "licenseconfig": [
    {
      "MACid": "FF:FF:FF:FF:FF:FF",
      "effectiveTimeStamp": "2024:04:01 12:40:29",
      "globalLicenseValidity": 5,
      "servicesUpCountDays": 6,
      "userAlertCount": 0
    }
  ]
}
root@intel-obmc:~# busctl call xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl AddLicenseKey
b true
root@intel-obmc:~#
root@intel-obmc:~# cat /etc/license-control/license.json
{
  "licenseableServices": [
    {
      "LicenseValidity": 10,
      "serviceControlCmd": "start-lpkvm",
      "serviceName": "KVM"
    },
    {
      "LicenseValidity": 10,
      "serviceControlCmd": [],
      "serviceName": "WEB"
    },
    {
      "LicenseValidity": 10,
      "serviceControlCmd": "xyz.openbmc_project.VirtualMedia.service",
      "serviceName": "MEDIA"
    },
    {
      "LicenseValidity": 0,
      "serviceControlCmd": "mail-alert-manager.service",
      "serviceName": "SMTP"
    }
  ],
  "licenseconfig": [
    {
      "MACid": "7A:9A:C2:E3:D0:EA",
      "effectiveTimeStamp": "2024:04:01 12:40:29",
      "globalLicenseValidity": 0,
      "servicesUpCountDays": 0,
      "userAlertCount": 0
    }
  ]
}
root@intel-obmc:~#
root@intel-obmc:~# systemctl status start-lpkvm.service
* start-lpkvm.service - OpenBMC lpkvm daemon
Loaded: loaded (/lib/systemd/system/start-lpkvm.service; enabled; preset: enabled)
Active: active (running) since Mon 2024-04-01 12:53:31 UTC; 6s ago
Process: 1115 ExecStartPre=/usr/bin/create_usbhid.sh disconnect (code=exited, status=0/SUCCESS)
Main PID: 1118 (obmc-lkvm)
CPU: 76ms
CGroup: /system.slice/start-lpkvm.service
        └─1118 /usr/bin/obmc-lkvm -v /dev/video0 -k /dev/hidg0 -p /dev/hidg1

Apr 01 12:53:31 intel-obmc systemd[1]: Starting OpenBMC lpkvm daemon ...
Apr 01 12:53:31 intel-obmc systemd[1]: Started OpenBMC lpkvm daemon.
Apr 01 12:53:31 intel-obmc obmc-lkvm[1118]: 01/04/2024 12:53:31 Listening for VNC connections on TCP port 5900
root@intel-obmc:~#
```

Note:

- AddLicenseKey will fail, if unsigned image has flashed. And need to use same private/public key pairs for image signing and license gen tools.
- AddLicenseKey will fail with invalid time respect to below table.

18.2.2 Get licesenc Key

```
busctl call xyz.openbmc_project.License /xyz/openbmc_project/License
xyz.openbmc_project.License.LicenseControl GetLicenseKeys
```

```
root@intel-obmc:~# busctl call xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl GetLicenseKey
s "KVM:61;MEDIA:61;SMTP:61;SNMP:60;TMP:60;"
root@intel-obmc:~#
```

18.2.3 Add user alert count

1. Set AlertUserCount

```
busctl set-property xyz.openbmc_project.License /xyz/openbmc_project/License
xyz.openbmc_project.License.LicenseControl UserAlertCount u 50
```

2. Get AlertUserCount

```
busctl get-property xyz.openbmc_project.License /xyz/openbmc_project/License
xyz.openbmc_project.License.LicenseControl UserAlertCount
```

```
root@intel-obmc:~# busctl get-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount
u 0
root@intel-obmc:~# busctl call xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl GetLicenseKey
s "KVM:61;MEDIA:61;SMTP:61;SNMP:60;TMP:60;"
root@intel-obmc:~# busctl set-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount u 59
root@intel-obmc:~# busctl get-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount
u 59
root@intel-obmc:~# busctl set-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount u 0
root@intel-obmc:~# busctl get-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount
u 0
root@intel-obmc:~# busctl set-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount u -1
busctl: invalid option -- '1'
root@intel-obmc:~# busctl set-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount u 60
Failed to set property UserAlertCount on interface xyz.openbmc_project.License.LicenseControl: Invalid argument was given.
root@intel-obmc:~# busctl get-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount
u 0
root@intel-obmc:~# busctl set-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount u 70
Failed to set property UserAlertCount on interface xyz.openbmc_project.License.LicenseControl: Invalid argument was given.
root@intel-obmc:~# busctl get-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount
u 0
root@intel-obmc:~# busctl set-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount u A
Failed to parse 'A' as unsigned 32-bit integer: Invalid argument
root@intel-obmc:~# busctl set-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount u 40
root@intel-obmc:~# busctl get-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl UserAlertCount
u 40
root@intel-obmc:~#
```

Note:

- 1 If the lowest licensable service validity is greater than 60, then the AlertUserCount can be set to a maximum of 60.
- 2 If the lowest licensable service validity is less than 60, then the AlertUserCount will be set to a value that is lower than the lowest license validity service.

Example:

1. If lowest licensable service validity is 70, then maximum of AlertUserCount is 60.
2. If lowest licensable service validity is 30, then maximum of AlertUserCount is 29.

18.2.4 Get Alert Message.

```
busctl get-property xyz.openbmc_project.License /xyz/openbmc_project/License
xyz.openbmc_project.License.LicenseControl AlertMessage
```

```
root@intel-obmc:~#
root@intel-obmc:~# busctl get-property xyz.openbmc_project.License /xyz/openbmc_project/License xyz.openbmc_project.License.LicenseControl AlertMessage
s "GLOBAL:0;KVM:1;MEDIA:1;SMTP:1;WEB:1;"
root@intel-obmc:~#
```


Chapter 19

19 Host Console Logging Support

There are two modes in Host Logger (Uart Logging)

19.1 Buffer mode

Host logs are stored in a temporary buffer and flushed to a file according to the policy that can be defined with service parameters. It gives the ability to save the startup logs and shutdown logs in separate files.

Note:

- Log store Path: `/var/log/obmc-console/hostlog_*/`
- Log will generate only after BMC reboot or sending SIGUSR1 to the specific hostlogger process

Step 1: Launch SOL session and closed the session after used.

Step 2. Send SIGUSR1 to hostlogger to trigger Uart log and log will store as gzip file.

Step 3. Unzip the file with the command “ `gzip -d *.log.gz`”.

```
root@ast2700-default:/var/log/obmc-console/hostlog_ttyS3#
root@ast2700-default:/var/log/obmc-console/hostlog_ttyS3# ps | grep logger
 465 root      7780 S      hostlogger
 468 root      7780 S      hostlogger
 470 root      7780 S      hostlogger
 472 root      7780 S      hostlogger
 524 root      7932 S      /usr/bin/sel-logger
1098 root      3504 S      grep logger
root@ast2700-default:/var/log/obmc-console/hostlog_ttyS3#
root@ast2700-default:/var/log/obmc-console/hostlog_ttyS3# kill SIGUSR1 465 468 470 472
-sh: kill: SIGUSR1: arguments must be process or job IDs
root@ast2700-default:/var/log/obmc-console/hostlog_ttyS3# ls
ttyS3_20240820_131933.log.gz
root@ast2700-default:/var/log/obmc-console/hostlog_ttyS3# gzip -d ttyS3_20240820_131933.log.gz
root@ast2700-default:/var/log/obmc-console/hostlog_ttyS3# ls
ttyS3_20240820_131933.log
root@ast2700-default:/var/log/obmc-console/hostlog_ttyS3# cat ttyS3_20240820_131933.log
[ 2024-08-20T13:18:37+00:00 ] >>> Log collection started at 2024-08-20 13:18:37
[ 2024-08-20T13:18:37+00:545460846592 ]
[ 2024-08-20T13:18:37+00:545460846592 ] ami@ami-B365M-D3H:~$
[ 2024-08-20T13:18:37+00:545460846592 ] ami@ami-B365M-D3H:~$
[ 2024-08-20T13:18:37+00:545460846592 ] ami@ami-B365M-D3H:~$ ls
[ 2024-08-20T13:18:40+00:545460846592 ] Desktop      Downloads      Music           Pictures        Templates
[ 2024-08-20T13:18:40+00:545460846592 ] Documents  enable_linux_ast_7-10  new_enable_linux_ast  Public          Videos
[ 2024-08-20T13:18:40+00:545460846592 ] ami@ami-B365M-D3H:~$ date
[ 2024-08-20T13:18:41+00:545460846592 ] Tuesday 20 August 2024 06:48:41 PM IST
[ 2024-08-20T13:18:41+00:545460846592 ] ami@ami-B365M-D3H:~$ ls -la
[ 2024-08-20T13:18:45+00:545460846592 ] total 112
[ 2024-08-20T13:18:45+00:545460846592 ] drwxr-xr-x 15 ami  ami  4096 Aug 20 18:45 .
[ 2024-08-20T13:18:45+00:545460846592 ] drwxr-xr-x  3 root root  4096 Jul 30 15:36 ..
[ 2024-08-20T13:18:45+00:545460846592 ] -rw-r----- 1 ami  ami  1500 Aug 20 18:45 .bash_history
[ 2024-08-20T13:18:45+00:545460846592 ] -rw-r--r--  1 ami  ami   220 Jul 30 15:36 .bash_logout
[ 2024-08-20T13:18:45+00:545460846592 ] -rw-r--r--  1 ami  ami  3771 Jul 30 15:36 .bashrc
[ 2024-08-20T13:18:45+00:545460846592 ] drwxrwxr-x 11 ami  ami  4096 Aug  7 12:44 .cache
[ 2024-08-20T13:18:45+00:545460846592 ] drwx----- 11 ami  ami  4096 Aug  7 12:44 .config
[ 2024-08-20T13:18:45+00:545460846592 ] drwxr-xr-x  2 ami  ami  4096 Jul 30 15:40 Desktop
```


19.2 Stream mode

host logs are forwarded into a server socket (e.g. a socket created by the rsyslog imuxsock module). It gives the ability to stream logs in almost realtime.

Note: Log store Path: /var/log/obmc-console/hostlog_/*

Step 1: Launch SQL session and closed the session after used.

Step 2: Log will store in the path /var/log/obmc-consol/hostlog_*.log.

```
root@ast2700-default:~#
root@ast2700-default:~# cat /var/log/obmc-console/hostlog_ttyS
hostlog_ttyS0.log hostlog_ttyS2/      hostlog_ttyS3/
root@ast2700-default:~# cat /var/log/obmc-console/hostlog_ttyS0.log

Ubuntu 20.04.1 LTS ami-B365M-D3H ttyS0

ami-B365M-D3H login: ami
Password:
Welcome to Ubuntu 20.04.1 LTS (GNU/Linux 5.15.0-117-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

229 updates can be installed immediately.
1 of these updates is a security update.
To see these additional updates run: apt list --upgradable

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Tue Aug 20 18:45:28 IST 2024 from 10.0.56.15 on pts/0
-bash: cannot set terminal process group (1428): Inappropriate ioctl for device
-bash: no job control in this shell
ami@ami-B365M-D3H:~$ ls -la
total 112
drwxr-xr-x 15 ami  ami   4096 Aug 20 18:45 .
drwxr-xr-x  3 root root  4096 Jul 30 15:36 ..
-rw-r----- 1 ami  ami   1488 Aug 13 21:15 .bash_history
-rw-r--r--  1 ami  ami    220 Jul 30 15:36 .bash_logout
-rw-r--r--  1 ami  ami   3771 Jul 30 15:36 .bashrc
```

For More details refer: [phosphor-hostlogger/README.md at master · openbmc/phosphor-hostlogger \(github.com\)](https://github.com/openbmc/phosphor-hostlogger/blob/master/README.md).

Chapter 20

20 Backup Restore

20.1 Test Case for Supported Modules

Get List of supported Modules for backup & restore

```
busctl get-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup  
xyz.openbmc_project.Backup.BackupRestore ModuleSupported -j
```

```
root@AMIOT-2a2a1aa36af5:~# busctl get-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore ModuleSupported -j  
{  
  "type" : "a(ss)",  
  "data" : [  
    [  
      "A",  
      "Network"  
    ],  
    [  
      "B",  
      "Virtual-media"  
    ],  
    [  
      "C",  
      "SMTP"  
    ],  
    [  
      "D",  
      "NTP"  
    ]  
  ]  
}  
root@AMIOT-2a2a1aa36af5:~#
```

A = Network

B = Virtual-media

C = SMTP

D = NTP

20.2 Creating Backup Configuration

1. Login to BMC console
2. Setup SMTP on the WebUI and Save. Doesn't need to connect to a real server, just save the settings.

3. Introspect the Backup Dbus

a. `busctl introspect xyz.openbmc_project.Backup /xyz/openbmc_project/Backup`

```
root@AMIOT-3e2ff39554da:~# busctl introspect xyz.openbmc_project.Backup /xyz/openbmc_project/Backup
NAME                                TYPE      SIGNATURE RESULT/VALUE  FLAGS
org.freedesktop.DBus.Introspectable interface -          -          -
org.freedesktop.DBus.ObjectManager interface -          -          -
org.freedesktop.DBus.ObjectManager .GetManagedObjects method -          a{oa{sa{sv}}}-
org.freedesktop.DBus.ObjectManager .InterfacesAdded signal oa{sa{sv}} -          -
org.freedesktop.DBus.ObjectManager .InterfacesRemoved signal oas -          -
org.freedesktop.DBus.Peer interface -          -          -
org.freedesktop.DBus.Peer .GetMachineId method -          s          -
org.freedesktop.DBus.Peer .Ping method -          -          -
org.freedesktop.DBus.Properties interface -          -          -
org.freedesktop.DBus.Properties .Get method ss v          -
org.freedesktop.DBus.Properties .GetAll method s a{sv} -
org.freedesktop.DBus.Properties .Set method ssv -          -
org.freedesktop.DBus.Properties .PropertiesChanged signal sa{sv}as -          -
xyz.openbmc_project.Backup.BackupRestore interface -          -          -
xyz.openbmc_project.Backup.BackupRestore .CreateBackup method s s          -
xyz.openbmc_project.Backup.BackupRestore .RestoreBackup method s b          -
xyz.openbmc_project.Backup.BackupRestore .BackupFlags property s "S" emits-change writable
root@AMIOT-3e2ff39554da:~#
```

4. Set the BackupFlags Property

- a. `busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s "ABCD"`
- b. `busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s "C"`
- c. `busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s "AD"` *Note: An empty flag "" will not create any backup file.*

5. Run the Create Backup

- a. `busctl call xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore CreateBackup s "test"`
6. Status of Create Backup Operation
 - a. `busctl get-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupRestoreStatus -j`
7. test.tar will be generated in path /tmp/backup.
8. Download / Save the test.tar file to local PC for Restoring.

```

root@AMIOT-2a2a1aa36af5:~#
root@AMIOT-2a2a1aa36af5:~# busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s "ABCD"
root@AMIOT-2a2a1aa36af5:~# busctl get-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags
s "ABCD"
root@AMIOT-2a2a1aa36af5:~#
root@AMIOT-2a2a1aa36af5:~# busctl call xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore CreateBackup s "test"
s "/tmp/backup/test.tar"
root@AMIOT-2a2a1aa36af5:~#
root@AMIOT-2a2a1aa36af5:~# busctl get-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupRestoreStatus -j
{
  "type" : "(sbsas)",
  "data" : [
    "Create Backup",
    true,
    ""
  ]
}
root@AMIOT-2a2a1aa36af5:~# ls -al /tmp/backup/test.tar
-rw-r--r-- 1 root root 13840 May 14 05:09 /tmp/backup/test.tar
root@AMIOT-2a2a1aa36af5:~#
root@AMIOT-2a2a1aa36af5:~#

```

20.3 Restoring Backup Configuration

1. Create the restore folder “/tmp/restore”
2. Copy the tar file created by CreateBackup into the restore folder
3. Set the BackupFlags Property
 - a. `busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s "ABCD"`
 - b. `busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s "C"`
 - c. `busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s "AD"`
 - d. `busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s ""` NOTE: An empty flag will restore all configs available
4. Run the Restore method
 - a. `busctl call xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore RestoreBackup s "test"`
5. Status of Restore Backup Operation
 - a. `busctl get-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupRestoreStatus -j`
6. Wait a few minutes for the restoration process to finish, then check that the settings have been restored correctly.

```
root@AM10T-2a2a1aa36af5:~#
root@AM10T-2a2a1aa36af5:~# busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s ""
root@AM10T-2a2a1aa36af5:~#
root@AM10T-2a2a1aa36af5:~# busctl call xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore RestoreBackup s "test"
b true
root@AM10T-2a2a1aa36af5:~#
root@AM10T-2a2a1aa36af5:~#
root@AM10T-2a2a1aa36af5:~# busctl get-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupRestoreStatus -j
{
  "type" : "(sbsas)",
  "data" : [
    "Restore",
    true,
    "",
    [
      "Network",
      "Virtual-media",
      "SMTP",
      "NTP"
    ]
  ]
}
root@AM10T-2a2a1aa36af5:~#
```

SMTP

SMTP Configuration

☒ Enabled

Server Address	Port	Sender Email Address
127.0.0.1	24	ami@ami.com

Note:

1. Ensure that the image is signed with `BACKUP_AND_RESTORE_SUPPORT` option enabled in the `ImageSigningTool`, when creating or restoring a backup configuration. Unsigned images or images signed without this support will lead to failure.
2. Also, make sure the Backup and Restore Key is the same when performing backup and restore operations across different firmware updates or BMCs.

```
root@AMIOT-b67b5ca52348:~# ls -al /tmp/restore
drwxr-xr-x  2 root  root   60 Sep 26 05:31 .
drwxrwxrwt 13 root  root  320 Sep 26 05:30 ..
-rw-r--r--  1 root  root  115 Sep 26 05:31 test.tar
root@AMIOT-b67b5ca52348:~# busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s ""
root@AMIOT-b67b5ca52348:~# busctl call xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore RestoreBackup s "test"
b false
root@AMIOT-b67b5ca52348:~# busctl get-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupRestoreStatus -j
{
  "type": "(sbsas)",
  "data": [
    "Restore",
    false,
    "Failed to Decrypt the Backup Config File",
    []
  ]
}
```

```
root@AMIOT-b67b5ca52348:~# busctl set-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupFlags s "ABC"
root@AMIOT-b67b5ca52348:~# busctl call xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore CreateBackup s "test"
s "/dev/null"
root@AMIOT-b67b5ca52348:~# busctl get-property xyz.openbmc_project.Backup /xyz/openbmc_project/Backup xyz.openbmc_project.Backup.BackupRestore BackupRestoreStatus -j
{
  "type": "(sbsas)",
  "data": [
    "Create Backup",
    false,
    "Failed to encrypt the backupconfig file",
    [
      "Network",
      "Virtual-media",
      "SMTP"
    ]
  ]
}
```

Chapter 21

21 Service Manager

21.1 Overview

Service Name and Object Path:

The Service Manager Daemon dynamically creates D-Bus objects for each configurable service instance under the service name “xyz.openbmc_project.Control.Service.Manager” and object path “/xyz/openbmc_project/control/service”
service name “xyz.openbmc_project.Control.Service.Manager” and object path

“/xyz/openbmc_project/control/service” Object Naming Convention:

Each service instance corresponds to a D-Bus object using the pattern /xyz/openbmc_project/control/service/<servicename>.

Interface: xyz.openbmc_project.Control.Service.Attributes

1. Enabled: Indicates if the service is set to start automatically on boot.
2. Masked: Shows if the service is permanently disabled and cannot be started.
3. MaxSession: Sets the maximum number of allowed concurrent sessions for the service.
4. Running: Tells if the service is currently active and running.
5. SessionTimeout : Configures how long a session can remain inactive before being terminated.

Note:

- 1 *MaxSession and SessionTimeout are added for specific services via svcfg.json file.*
- 2 *Services manager will only hold the parameters value and corresponding action will be taken care by respective modules*

Interface: xyz.openbmc_project.Control.Service.SocketAttributes

1. Port: Specifies the number identifying where the service is listening for connections.

Note: The interface will appear only if the service has a socket associated with it.

21.2 Dbus Operations

1. List the Supported Service.

“busctl tree xyz.openbmc_project.Control.Service.Manager”

```
root@intel-obmc:~# busctl tree xyz.openbmc_project.Control.Service.Manager
- /xyz
  - /xyz/openbmc_project
    - /xyz/openbmc_project/control
      - /xyz/openbmc_project/control/service
        - /xyz/openbmc_project/control/service/bmcweb
        - /xyz/openbmc_project/control/service/dropbear
        - /xyz/openbmc_project/control/service/obmc_2dconsole_40ttyS0
        - /xyz/openbmc_project/control/service/obmc_2dconsole_40ttyS1
        - /xyz/openbmc_project/control/service/obmc_2dconsole_40ttyS2
        - /xyz/openbmc_project/control/service/obmc_2dconsole_40ttyS3
        - /xyz/openbmc_project/control/service/phosphor_2dipmi_2dkcs_40ipmi_kcs3
        - /xyz/openbmc_project/control/service/phosphor_2dipmi_2dkcs_40ipmi_kcs4
        - /xyz/openbmc_project/control/service/phosphor_2dipmi_2dnet_40eth0
        - /xyz/openbmc_project/control/service/phosphor_2dipmi_2dnet_40eth1
        - /xyz/openbmc_project/control/service/phosphor_2dipmi_2dnet_40usb0
        - /xyz/openbmc_project/control/service/start_2dipkvm
        - /xyz/openbmc_project/control/service/xyz_2eopenbmc_project_2eVirtualMedia
```

2. List of supported property for specific service

“busctl introspect xyz.openbmc_project.Control.Service.Manager

/xyz/openbmc_project/control/service/bmcweb”

```
root@intel-obmc:~# busctl introspect xyz.openbmc_project.Control.Service.Manager /xyz/openbmc_project/control/service/bmcweb
NAME                                TYPE      SIGNATURE RESULT/VALUE  FLAGS
org.freedesktop.DBus.Introspectable interface -          -          -
.Introspect                        method    s          -          -
org.freedesktop.DBus.Peer         interface -          -          -
.GetMachineId                     method    s          -          -
.Ping                             method    -          -          -
org.freedesktop.DBus.Properties   interface -          -          -
.Get                              method    ss         v          -
.GetAll                           method    s          a{sv}      -
.Set                              method    ssv        -          -
.PropertiesChanged                signal    sa{sv}as   -          -
xyz.openbmc_project.Control.Service.Attributes interface -          -          -
.Enabled                          property  b          true        emits-change writable
.Masked                           property  b          false       emits-change writable
.MaxSession                       property  q          20          emits-change
.Running                          property  b          true        emits-change writable
.SessionTimeout                   property  q          300        emits-change writable
xyz.openbmc_project.Control.Service.SocketAttributes interface -          -          -
.Port                             property  q          443        emits-change writable
```

3. Dbus command to change Enabled status for the specific service.

“busctl set-property xyz.openbmc_project.Control.Service.Manager

/xyz/openbmc_project/control/service/bmcweb xyz.openbmc_project.Control.Service.Attributes Enable b 1”

```
root@intel-obmc:~# busctl set-property xyz.openbmc_project.Control.Service.Manager /xyz/openbmc_project/control/service/bmcweb xyz.openbmc_project.Control.Service.Attributes Enable b 0
root@intel-obmc:~# busctl introspect xyz.openbmc_project.Control.Service.Manager /xyz/openbmc_project/control/service/bmcweb
NAME                                TYPE      SIGNATURE RESULT/VALUE  FLAGS
org.freedesktop.DBus.Introspectable interface -          -          -
.Introspect                        method    s          -          -
org.freedesktop.DBus.Peer         interface -          -          -
.GetMachineId                     method    s          -          -
.Ping                             method    -          -          -
org.freedesktop.DBus.Properties   interface -          -          -
.Get                              method    ss         v          -
.GetAll                           method    s          a{sv}      -
.Set                              method    ssv        -          -
.PropertiesChanged                signal    sa{sv}as   -          -
xyz.openbmc_project.Control.Service.Attributes interface -          -          -
.Enabled                          property  b          false       emits-change writable
.Masked                           property  b          false       emits-change writable
.MaxSession                       property  q          20          emits-change
.Running                          property  b          true        emits-change writable
.SessionTimeout                   property  q          300        emits-change writable
xyz.openbmc_project.Control.Service.SocketAttributes interface -          -          -
.Port                             property  q          443        emits-change writable
```

4. Dbus command to change Running and SessionTimeout status for the specific service. “busctl set-property xyz.openbmc_project.Control.Service.Manager

/xyz/openbmc_project/control/service/bmcweb

xyz.openbmc_project.Control.Service.Attributes running b 1”


```
“busctl set-property xyz.openbmc_project.Control.Service.Manager
/xyz/openbmc_project/control/service/bmcweb
xyz.openbmc_project.Control.Service.Attributes SessionTimeout t 60”
```

```
root@intel-obmc:~# busctl set-property xyz.openbmc_project.Control.Service.Manager /xyz/openbmc_project/control/service/bmcweb xyz.openbmc_project.Control.Service.Attributes SessionTimeout q 600
root@intel-obmc:~#
root@intel-obmc:~# busctl set-property xyz.openbmc_project.Control.Service.Manager /xyz/openbmc_project/control/service/bmcweb xyz.openbmc_project.Control.Service.Attributes Running b 0
root@intel-obmc:~#
root@intel-obmc:~# busctl introspect xyz.openbmc_project.Control.Service.Manager /xyz/openbmc_project/control/service/bmcweb
NAME                                TYPE      SIGNATURE RESULT/VALUE FLAGS
org.freedesktop.DBus.Introspectable interface -          -
.Introspect                         method    -          -
org.freedesktop.DBus.Peer          interface -          -
.GetMachineId                       method    -          -
.Ping                               method    -          -
org.freedesktop.DBus.Properties    interface -          -
.Get                                method    ss         v          -
.GetAll                             method    s          a{sv}      -
.Set                                method    ssv        -          -
.PropertiesChanged                  signal    sa{sv}as   -          -
xyz.openbmc_project.Control.Service.Attributes interface -          -
.Enabled                            property  b          false      emits-change writable
.Masked                             property  b          false      emits-change writable
.MaxSession                         property  q          20         emits-change
.Running                            property  b          false      emits-change writable
.SessionTimeout                     property  q          600        emits-change writable
xyz.openbmc_project.Control.Service.SocketAttributes interface -          -
.Port                               property  q          443        emits-change writable
root@intel-obmc:~#
root@intel-obmc:~# systemctl status bmcweb*
x bmcweb.service - Start bmcweb server
   Loaded: loaded (/usr/lib/systemd/system/bmcweb.service; disabled; preset: enabled)
   Active: failed (Result: exit-code) since Tue 2024-04-02 11:27:31 UTC; 58s ago
 Duration: 4min 20.518s
   Main PID: 1141 (code=exited, status=0/SUCCESS)
    CPU: 600ms

Apr 02 11:23:10 intel-obmc systemd[1]: Started Start bmcweb server.
Apr 02 11:27:31 intel-obmc systemd[1]: Stopping Start bmcweb server...
Apr 02 11:27:31 intel-obmc bash[1262]: /bin/bash: /usr/bin/delete-hi-user.sh: No such file or directory
Apr 02 11:27:31 intel-obmc systemd[1]: bmcweb.service: Control process exited, code=exited, status=127/n/a
Apr 02 11:27:31 intel-obmc bmcweb[1141]: Checking certs in file /etc/ssl/certs/https/server.pem
Apr 02 11:27:31 intel-obmc systemd[1]: bmcweb.service: Failed with result 'exit-code'.
Apr 02 11:27:31 intel-obmc systemd[1]: Stopped Start bmcweb server.
root@intel-obmc:~#
```

Note: The SessionTimeout should be set between 30 and 86400 seconds.

5. Dbus command to change port no for the specific service.

```
“busctl set-property xyz.openbmc_project.Control.Service.Manager
/xyz/openbmc_project/control/service/bmcweb xyz.openbmc_project.Control.Service.Attributes Port q 400”
```

```
root@intel-obmc:~#
root@intel-obmc:~# busctl set-property xyz.openbmc_project.Control.Service.Manager /xyz/openbmc_project/control/service/bmcweb xyz.openbmc_project.Control.Service.SocketAttributes Port q 440
root@intel-obmc:~# busctl introspect xyz.openbmc_project.Control.Service.Manager /xyz/openbmc_project/control/service/bmcweb
NAME                                TYPE      SIGNATURE RESULT/VALUE FLAGS
org.freedesktop.DBus.Introspectable interface -          -
.Introspect                         method    -          -
org.freedesktop.DBus.Peer          interface -          -
.GetMachineId                       method    -          -
.Ping                               method    -          -
org.freedesktop.DBus.Properties    interface -          -
.Get                                method    ss         v          -
.GetAll                             method    s          a{sv}      -
.Set                                method    ssv        -          -
.PropertiesChanged                  signal    sa{sv}as   -          -
xyz.openbmc_project.Control.Service.Attributes interface -          -
.Enabled                            property  b          false      emits-change writable
.Masked                             property  b          false      emits-change writable
.MaxSession                         property  q          20         emits-change
.Running                            property  b          false      emits-change writable
.SessionTimeout                     property  q          600        emits-change writable
xyz.openbmc_project.Control.Service.SocketAttributes interface -          -
.Port                               property  q          440        emits-change writable
root@intel-obmc:~#
```

Note: Enabled, Running, Masked, Port will take 15s to refelect changes in BMC and will restart the specific service.

Chapter 22

22 BootLogo

22.1 Overview

Added boot logo support for ast2600 platform, psplash will splash the image on display using the framebuffer. psplash writes the boot logo directly to the framebuffer device (/dev/fb0). The framebuffer is a memory-mapped region that represents the screen's pixel data, and writing to it allows immediate control over the display.

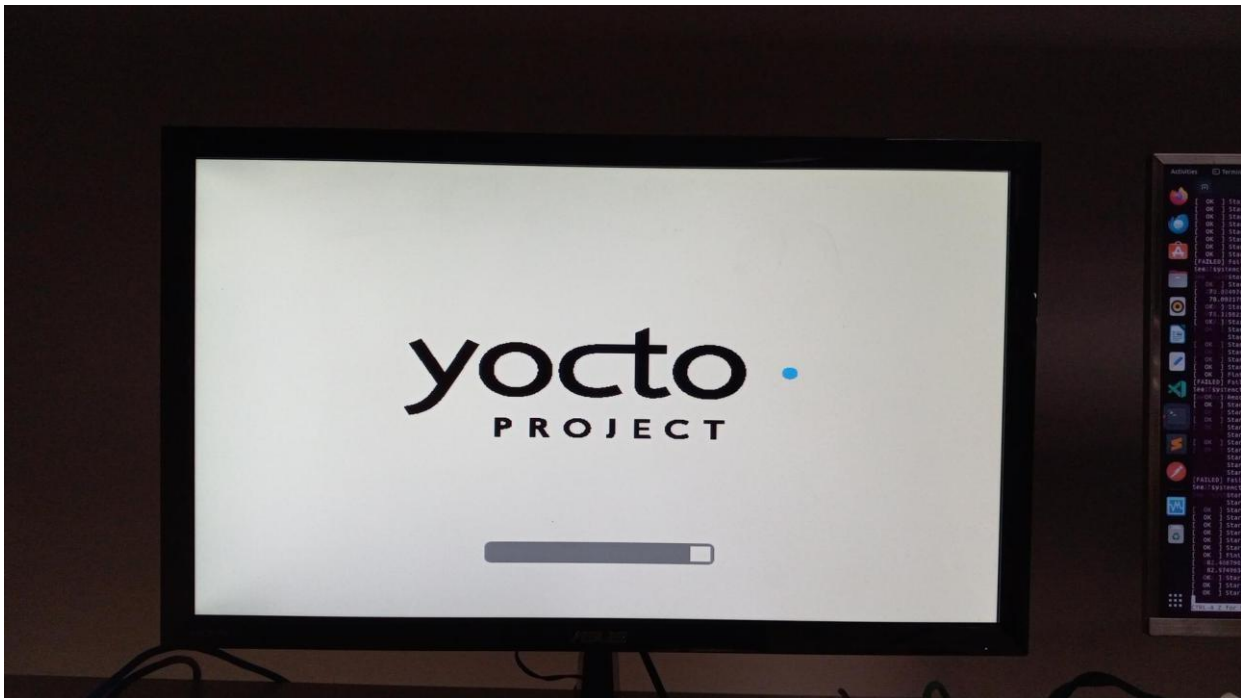
22.2 Customization of boot logo

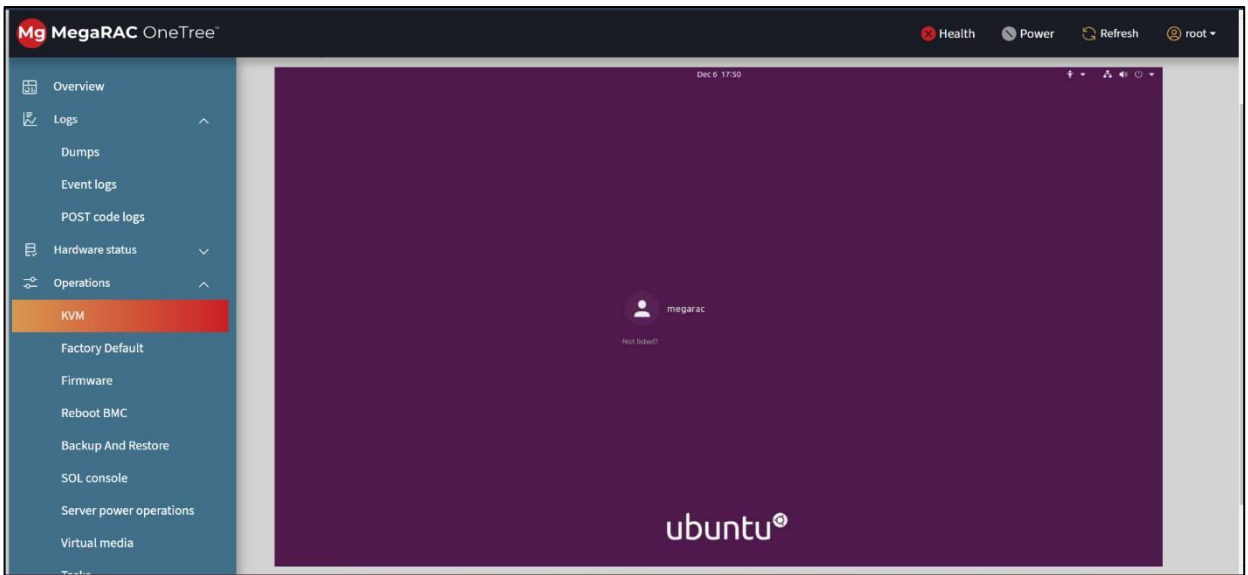
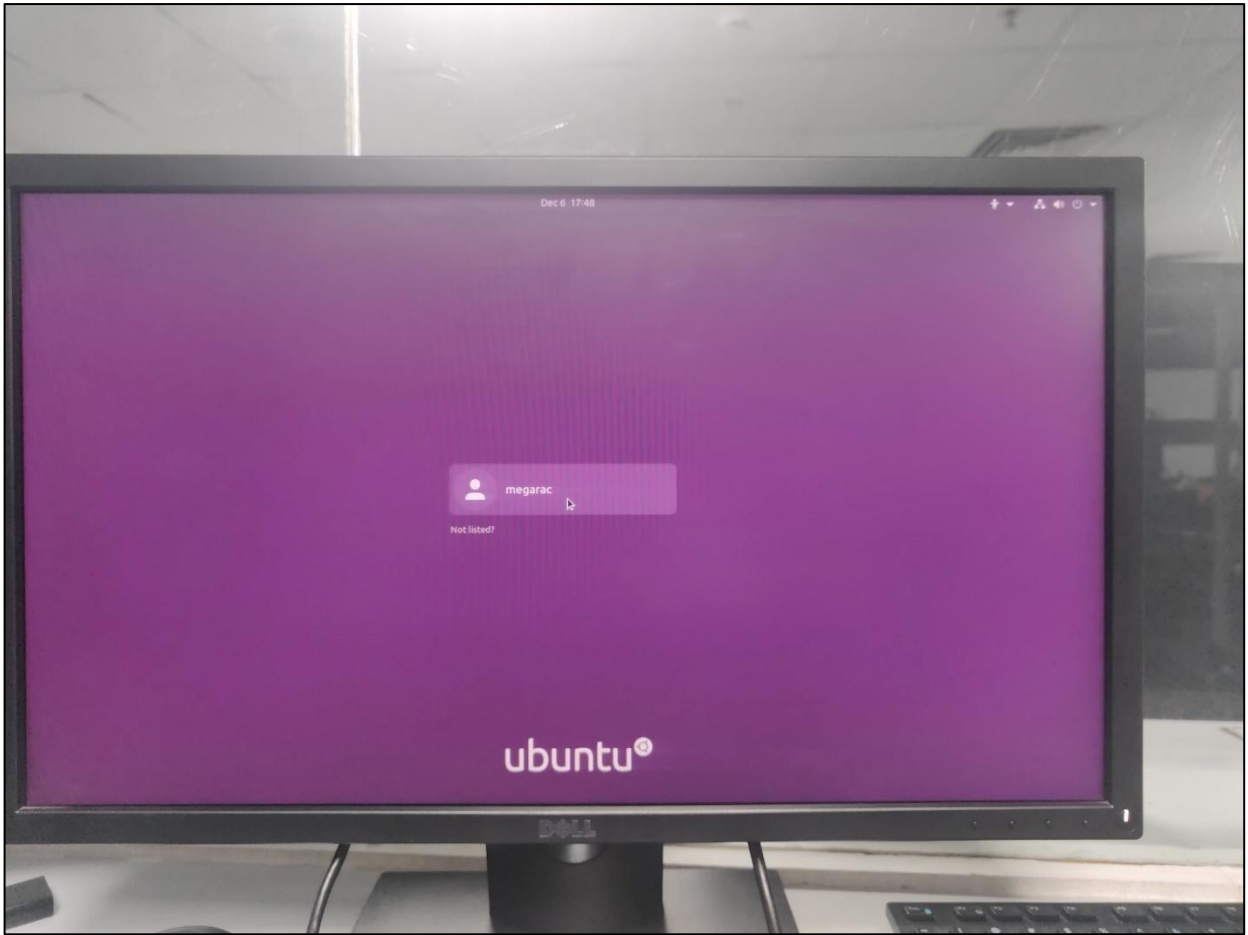
Bootlogo can only be customize during build time.

Add the customized image to psplash during build time and it will update that image to

Framebuffer which can be displayed on screen when bmc boots up.

The bootlogo will be seen during bmc boot, once boot process completes host os screen will be visible to the display connected via vga port.





Chapter 23

23 LINUX OS Installation with nomodeset

23.1 LINUX OS Installation Post CVE 2019-6260 Mitigation Fix on AST SOC

After the CVE 2019-6260 fix in Aspeed SOC, Linux OS installation fails frequently. While booting into the installation when the kernel tries to load the video driver module, the video driver crashes leading to kernel dump. Thus, the installation process fails.

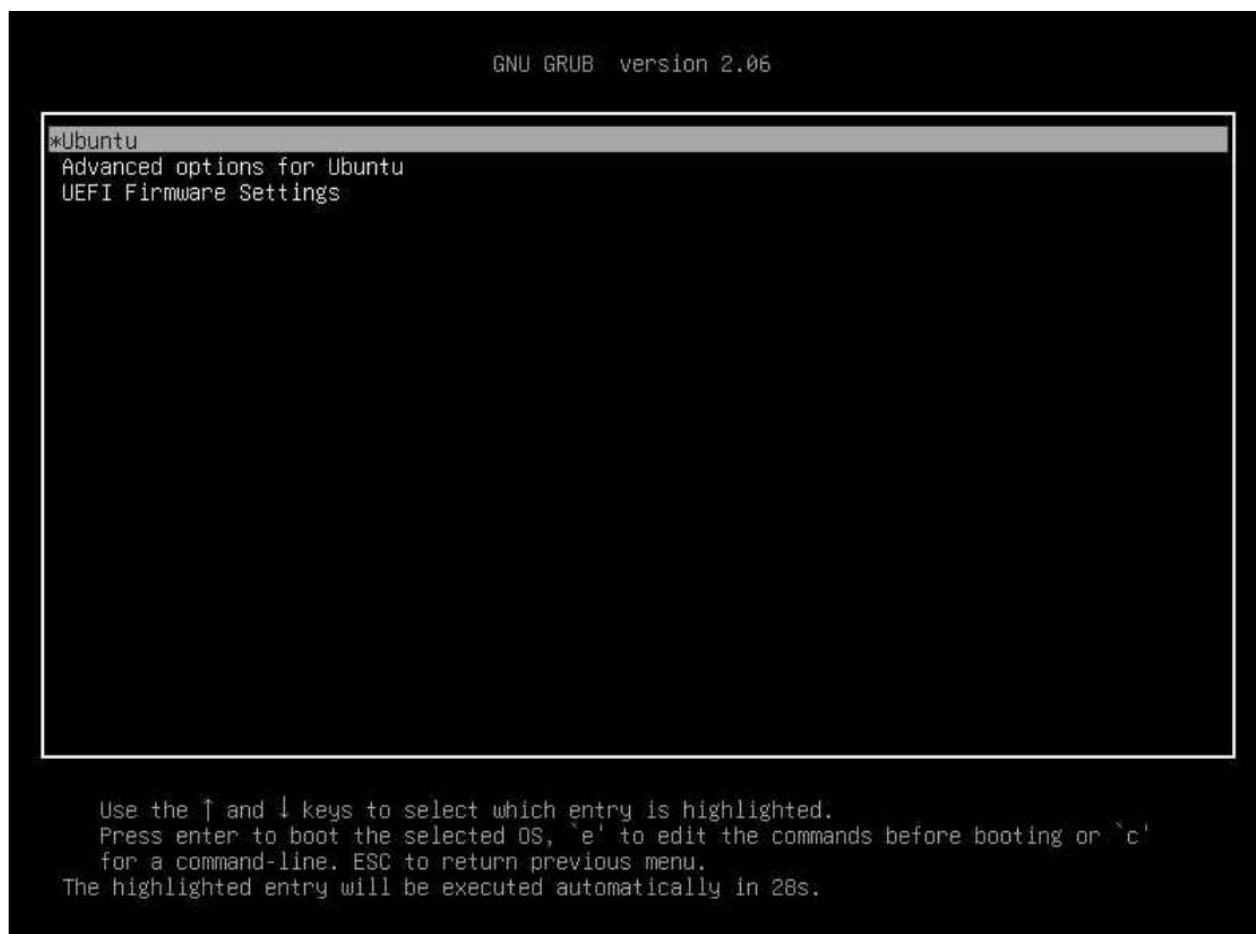
As a work around for this issue, Aspeed suggested using the nomodeset option in the GRUB, before booting into the installation medium for the new installation.

A few of the supported Linux operating systems for which we tried this option, and the procedure is explained in this document.

23.1.1 UBUNTU

Here are the steps to include the nomodeset parameter in the boot configuration.

1. On the BIOS page, select the boot option for Ubuntu and wait until the following GRUB screen appears.



Ubuntu GRUB screen

2. Adding the nomodeset parameter instructs the kernel to not load video drivers and use BIOS modes instead until X is loaded.
3. Click “E” while booting to the installation. This action displays the setparams option in the screen to edit bootparams. A sample screenshot is displayed below. Find the line that starts with linux and add nomodeset to it.
4. This change is only temporary — it will just be used once, and GRUB won’t remember it in the future.

```
GNU GRUB version 2.06

setparams 'Ubuntu'

    recordfail
    load_video
    gfxmode $linux_gfx_mode
    insmod gzio
    if [ x$grub_platform = xxen ]; then insmod xzio; insmod lzopio; fi
    insmod part_gpt
    insmod ext2
    search --no-floppo --fs-uuid --set=root e00fcf9f-8f85-44f3-8481-679a46f1297b
    linux      /boot/vmlinuz-6.8.0-51-generic root=UUID=e00fcf9f-8f85-44f3-8481-679a46f1297b ro quiet splash nomodeset $vt_handoff
    initrd     /boot/initrd.img-6.8.0-51-generic

Minimum Emacs-like screen editing is supported. TAB lists completions. Press Ctrl-x
or F10 to boot, Ctrl-c or F2 for a command-line or ESC to discard edits and return
to the GRUB menu.
```

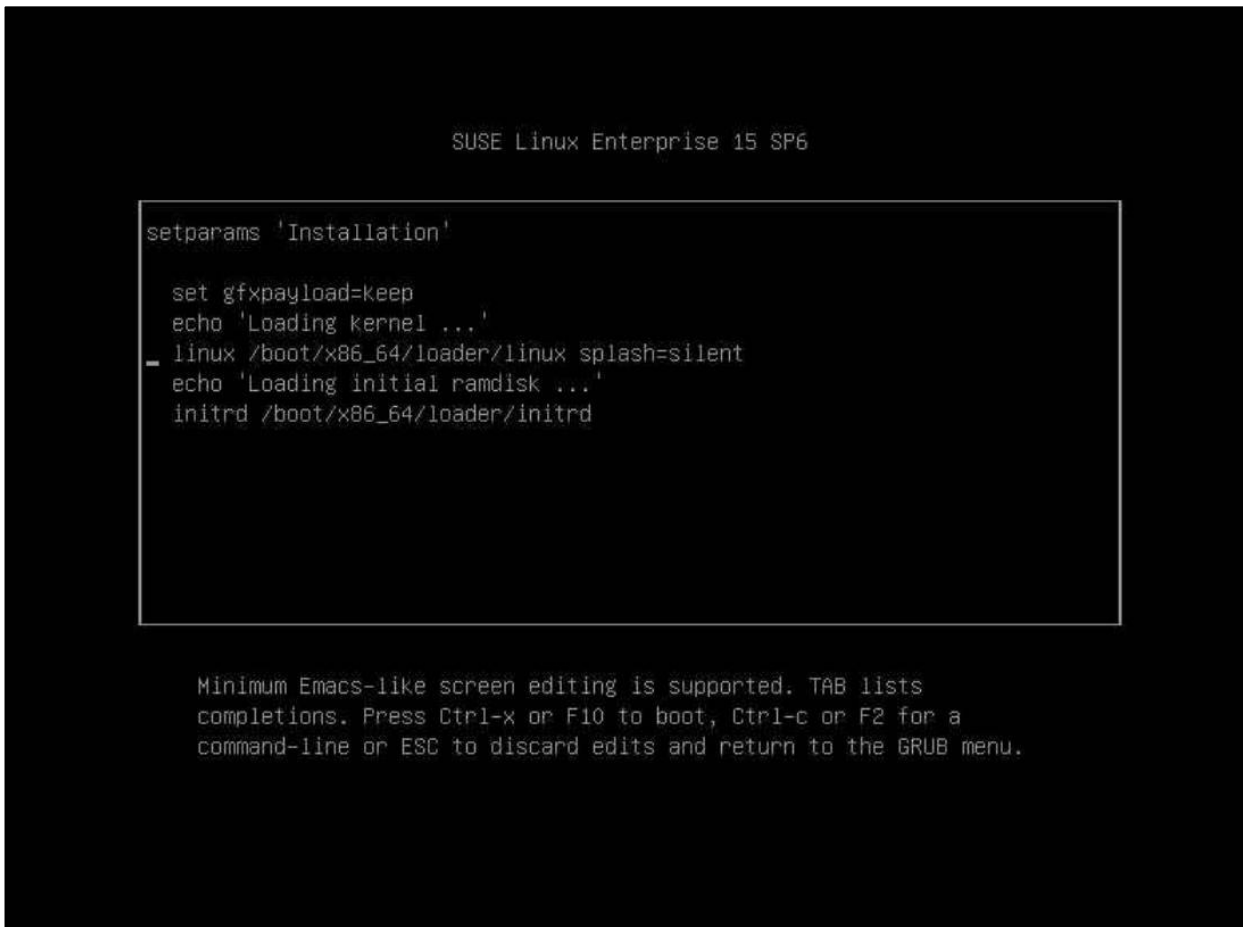
Ubuntu with nomodeset

5. Press Ctrl+X or F10 to boot with the nomodeset option which was added. If you make a mistake, press Esc to go back to the previous screen.
6. And then it continues with the installation.

23.1.2 SLES

Here are the steps to include the nomodeset parameter in the boot configuration.

1. On the Installation screen, click “e” to enter GRUB mode.



SLES GRUB screen

2. Add “nomodeset” before “splash=silent” in the line that starts with linuxefi. Adding the nomodeset parameter instructs the kernel to not load video drivers and use BIOS modes instead until X is loaded.
3. Clicking “e” key enables the user to edit a menu entry. Navigate to the line on this screen that starts with linuxefi.
4. Replace splash=silent by nomodeset splash=silent. This change is only temporary—it will just be used once, and GRUB won’t remember it in the future.

SUSE Linux Enterprise 15 SP6

```
setparams 'Installation'

set gfxpayload=keep
echo 'Loading kernel ...'
linux /boot/x86_64/loader/linux nomodeset splash=silent
echo 'Loading initial ramdisk ...'
initrd /boot/x86_64/loader/initrd
```

Minimum Emacs-like screen editing is supported. TAB lists completions. Press Ctrl-x or F10 to boot, Ctrl-c or F2 for a command-line or ESC to discard edits and return to the GRUB menu.

SLES with nomodeset

5. Press Ctrl+X or F10 to boot with the nomodeset option which was added. If you make a mistake, press Esc to go back to the previous screen.
6. And then it continues with the installation.

23.1.3 RHEL

Here are the steps to include the nomodeset parameter in the boot configuration.

1. Click “E” while booting to the installation.
2. This action displays the setparams option in the screen to edit bootparams. A sample screenshot is displayed below.



RHEL GRUB Screen

3. Include nomodeset in the first line of the screen as shown in the below screenshot.



RHEL with nomodeset

4. Press Ctrl+X or F10 to boot with the nomodeset option which was added. If you make a mistake, press Esc to go back to the previous screen.

And then it continues with the installation.

Chapter 24

24 Ports Usage

Port	Owner Module	Usage
53	DNS/Dynamic DNS	This is the port used by DNS servers to receive queries and updates
68	DHCP Client	This port is used by DHCP clients to receive responses from the server, such as IP address offers and acknowledgments.
546	DHCPv6 Client	This port is for listening to DHCPv6 messages on UDP port.
5353	Multicast Domain Name System (mDNS)	This port is used for both queries and responses in the mDNS protocol
5900	Video Server(obmc-ikvm)	To accept video connection requests
111	rpcbind	Portmapper for RPC services
22	dropbear	SSH access for remote login applicable only with debug-tweaks feature.
2200:2203	obmc-console-server	Serial console over LAN
5355	lldpd.service	Link-local Multicast Name Resolution
5900	Video Server(obmc-ikvm)	To accept video connection requests
161	snmpd	SNMP agent
162	snmptrapd	SNMP trap receiver
427	slpd-lite.service	Service Location Protocol
199	smux or SNMP	SNMP management
123	systemd-timesyncd	NTP
623	Netipmid/phosphor-ipmi-net	LAN Interface
443	BMCWeb server	Listening for secured network connections on HTTPS:/

Chapter 25

25 User Privilege Table

According to the Redfish URL privilege specification, some pages require elevated privileges to modify their contents. If a user does not have sufficient privileges, those pages will appear read-only. So, the following table has been captured with the applicability of these privilege levels in each page as per requirements.

R is Read-only user privilege

O is Operator user privilege

A is Administrator use privilege

SI.No	Menu	Sub Menu	View	Action
1	BIOS	BIOS		A/O/R
2	2FA	2FA		A/O/R
3	Overview	Overview	R	A/O
4	Logs	Logs -> Dumps	R/O	A
3	Logs	Logs -> Event Logs	R/O	A
4	Logs	Logs -> Ipmi Event Logs	R/O	A
5	Logs	Logs -> Post code Log	R/O	A
6	Logs	Logs -> Video logs	R/O	A
7	Hardware Status	Hardware Status -> Inventory and LEDs	R	A/O
8	Hardware Status	Hardware Status -> Sensors	R	A/O
9	Operations	Operations -> Factory Default	R/O	A
10	Operations	Operations -> Preserve	R	A/O
11	Operations	Operations -> Reboot BMC	R/O	A

Sl.No	Menu	Sub Menu	View	Action
12	Operations	Operations -> Tasks	R/O	A
13	Operations	Operations -> Firmware	R/O	A
14	Operations	Operations -> Backup and Restore	R/O	A
15	Operations	Operations -> KVM	R	A/O
16	Operations	Operations -> SOL Console	R/O	A
17	Operations	Operations -> Server Power Operations	R/O	A
18	Operations	Operations -> Virtual Media	R/O	A
19	Settings	Settings -> PAM Order	R/O	A
20	Settings	Settings -> Log Settings Advanced	R/O	A
21	Settings	Settings Firewall -> System	R	A/O
22	Settings	Settings Link -> Network	R/O	A
23	Settings	Settings Settings -> Network	R/O	A
24	Settings	Settings DDNS -> Network	R/O	A
25	Settings	Settings Bond -> Network	R	A/O
26	Settings	Settings -> NCSI	R/O	A
27	Settings	Settings -> VLAN	R	A/O
28	Settings	Settings -> CUPs	R	A/O
29	Settings	Settings -> Node Manager	R/O	A

Sl.No	Menu	Sub Menu	View	Action
30	Settings	Settings -> SMTP	R/O	A
31	Settings	Settings -> SNMP	R	A/O
32	Settings	Settings -> Date and Time	R/O	A
33	Settings	Settings -> BSOD	R	A/O
34	Settings	Settings -> Manage Licnses	R/O	A
35	Settings	Settings -> Auto Video Settings		A/O/R
36	Settings	Settings -> Device Ownership Transfer		A/O/R
37	Settings	Settings -> SPDM	R/O	A
38	Platform Event Filter	Platform Event Filter -> Event Filter		A/O/R
39	Security and Access	Security and Access -> Certificates	R/O	A
40	Security and Access	Security and Access -> LDAP	R/O	A
41	Security and Access	Security and Access -> User Management	R/O	A
42	Security and Access	Security and Access -> Policies	R	A/O
43	Security and Access	Security and Access -> RADIUS		A/O/R
44	Security and Access	Security and Access -> Sessions	R/O	A
45	GPGPU	GPGPU	A/O/R	
46	RAID Management	RAID Management -> Adapter	R	A/O
47	RAID Management	RAID Management -> Physical Device	R	A/O
48	RAID Management	RAID Management -> Logical Device	R	A/O
49	RAID Management	RAID Management -> Topology Information	R	A/O
50	RAID Management	RAID Management -> Event Log	R/O	A
51	NVME Information	NVME Information	R/O	A
52	NIC Information	NIC Information	R/O	A

Sl.No	Menu	Sub Menu	View	Action
53	System Inventory	System Inventory	R/O	A
54	Resource Management	Resource Management - > Power	R/O	A
55	Host System Diagnostics	Host System Diagnostics -> ADDC	R	A/O
56	Host System Diagnostics	Host System Diagnostics -> ACD	R	A/O
57	Host System Diagnostics	Host System Diagnostics -> ASD	R	A/O
58	Host System Diagnostics	Host System Diagnostics -> Remote Debug	R	A/O

Chapter 26

26 MegaRAC OneTree™ Firmware Update

26.1 BMC Firmware Update

Non PFR BMC Firmware Update

26.1.1 BMC Firmware Update via Redfish

1. Create an OpenBmc Tar format BMC Image:
2. BMC run time tar image will be created under image dir `build/tmp/deploy/images/intel-ast2600` as with below format `intel-platforms-image-update-intel-ast2600-<date\_time>.tar`
3. If signed image feature is enabled the image will be replaced with signed image with same name format `intelplatforms-image-update-intel-ast2600-<date\_time>.tar`

```
tejas@tejas-patil:~/kiruba/onetree/build/tmp/deploy/images/intel-ast2600$ ls -la image-update*
lrwxrwxrwx 1 tejas tejas 26 Jun 26 13:09 image-update -> image-update-intel-ast2600
lrwxrwxrwx 1 tejas tejas 31 Jun 26 13:09 image-update-full -> image-update-full-intel-ast2600
lrwxrwxrwx 1 tejas tejas 66 Jun 26 13:09 image-update-full-intel-ast2600 -> intel-platforms-image-update-full-intel-ast2600-20230626073733.tar
lrwxrwxrwx 1 tejas tejas 61 Jun 26 13:09 image-update-intel-ast2600 -> intel-platforms-image-update-intel-ast2600-20230626073733.tar
tejas@tejas-patil:~/kiruba/onetree/build/tmp/deploy/images/intel-ast2600$
```

4. This runtime image will only update the image-a partition of the SPI. i.e it will only update kernel and ramdisk components of the image.

FIT description: U-Boot fitImage for Phosphor OpenBMC (Phosphor OpenBMC Project Reference Distro)/1.0/intel-ast2600

Created: Tue Apr 5 23:00:00 2011

Image 0 (kernel-1)

Description: Linux kernel

Created: Tue Apr 5 23:00:00 2011

Type: Kernel Image

Compression: uncompressed

Data Size: 4303624 Bytes = 4202.76 KiB = 4.10 MiB

Architecture: ARM

OS: Linux

Load Address: 0x80001000

Entry Point: 0x80001000

Image 1 (fdt-aspeed-bmc-intel-ast2600.dtb)

Description: Flattened Device Tree blob

Created: Tue Apr 5 23:00:00 2011

Type: Flat Device Tree

Compression: uncompressed

Data Size: 90395 Bytes = 88.28 KiB = 0.09 MiB

Architecture: ARM

Image 2 (fdt-aspeed-bmc-intel-ast2600-acm.dtb)

Description: Flattened Device Tree blob

Created: Tue Apr 5 23:00:00 2011

Type: Flat Device Tree

Compression: uncompressed

Data Size: 90532 Bytes = 88.41 KiB = 0.09 MiB

Architecture: ARM

Image 3 (ramdisk-1)

Description:

Created: Tue Apr 5 23:00:00 2011

Type: RAMDisk Image

Compression: uncompressed

Data Size: 23040000 Bytes = 22500.00 KiB = 21.97 MiB

Architecture: ARM

OS: Linux

Load Address: unavailable

Entry Point: unavailable

Default Configuration: 'conf-aspeed-bmc-intel-ast2600.dtb'

Configuration 0 (conf-aspeed-bmc-intel-ast2600.dtb)

Description: 1 Linux kernel, FDT blob, ramdisk

Kernel: kernel-1

Init Ramdisk: ramdisk-1

FDT: fdt-aspeed-bmc-intel-ast2600.dtb

Sign algo: ,rsa2048:rsa_oem_fitimage_key

Sign value: unavailable

Timestamp: unavailable

Configuration 1 (conf-aspeed-bmc-intel-ast2600-acm.dtb)

Description: 0 Linux kernel, FDT blob, ramdisk

Kernel: kernel-1

Init Ramdisk: ramdisk-1

FDT: fdt-aspeed-bmc-intel-ast2600-acm.dtb

Sign algo: ,rsa2048:rsa_oem_fitimage_key

Sign value: unavailable

Timestamp: unavailable

5. BMC FULL signed/unsigned Update image will be created in deploy folder `intel-platforms-image-update-fullintel-ast2600-<date\_time>.tar`
6. This image is used to update entire SPI chip.
7. Update BMC using redfish update service call:
8. Issue POST call to update service to initiate the update.

```
tejas@tejas-patil:~/kiruba/onetree/build/tmp/deploy/images/intel-ast2600$ export bmc=172.16.56.124
tejas@tejas-patil:~/kiruba/onetree/build/tmp/deploy/images/intel-ast2600$ export token=$(curl -k -H "Content-Type: application/json" -X POST https://$bmc/login -d '{"username": "root", "password": "OpenBmc"}' | grep token | awk '{print $2}'; | tr -d '\n')
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
100 82 100 37 100 45 29 36 0:00:01 0:00:01 --:--:-- 65
tejas@tejas-patil:~/kiruba/onetree/build/tmp/deploy/images/intel-ast2600$ curl -k -H "X-Auth-Token: $token" -H "Content-Type: application/octet-stream" -X POST -T image-update https://$bmc/redfish/v1/UpdateService
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/0",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "0",
  "TaskState": "Running",
  "TaskStatus": "OK"
}
tejas@tejas-patil:~/kiruba/onetree/build/tmp/deploy/images/intel-ast2600$
```

9. Monitor update status using redfish Task service call:

- Issue GET call on TaskService in order to monitor update status tejas@tejas-patil:~/kiruba\$

```
curl -k https://root:OpenBmc@$bmc/redfish/v1/TaskService/Tasks/0
```

```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/0",
  "@odata.type": "#Task.v1_4_3.Task",
  "EndTime": "2023-06-27T11:50:06+00:00",
  "Id": "0",
  "Messages": [
    {
      "@odata.type": "#Message.v1_0_0.Message",
      "Message": "The task with id 0 has started.",
      "MessageArgs": [
        "0"
      ],
      "MessageId": "TaskEvent.1.0.1.TaskStarted",
      "Resolution": "None.",
      "Severity": "OK"
    },
    {
      "@odata.type": "#Message.v1_0_0.Message",
      "Message": "The task with id 0 has changed to progress 10 percent complete.",
      "MessageArgs": [
        "0",
        "10"
      ]
    }
  ]
}
```

```

    ],
    "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
    "Resolution": "None.",
    "Severity": "OK"
  },
  {
    "@odata.type": "#Message.v1_0_0.Message",
    "Message": "The task with id 0 has changed to progress 30 percent complete.",
    "MessageArgs": [
      "0",
      "30"
    ],
    "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
    "Resolution": "None.",
    "Severity": "OK"
  },
  {
    "@odata.type": "#Message.v1_0_0.Message",
    "Message": "The task with id 0 has changed to progress 40 percent complete.",
    "MessageArgs": [
      "0",
      "40"
    ],
    "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
    "Resolution": "None.",
    "Severity": "OK"
  },
  {
    "@odata.type": "#Message.v1_0_0.Message",
    "Message": "The task with id 0 has changed to progress 60 percent complete.",
    "MessageArgs": [
      "0",
      "60"
    ],
    "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
    "Resolution": "None.",

```

```

    "Severity": "OK"
  },
  {
    "@odata.type": "#Message.v1_0_0.Message",
    "Message": "The task with id 0 has changed to progress 95 percent complete.",
    "MessageArgs": [
      "0",
      "95"
    ],
    "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
    "Resolution": "None.",
    "Severity": "OK"
  },
  {
    "@odata.type": "#Message.v1_0_0.Message",
    "Message": "The task with id 0 has changed to progress 100 percent complete.",
    "MessageArgs": [
      "0",
      "100"
    ],
    "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
    "Resolution": "None.",
    "Severity": "OK"
  },
  {
    "@odata.type": "#Message.v1_0_0.Message",
    "Message": "The task with id 0 has Completed.",
    "MessageArgs": [
      "0"
    ],
    "MessageId": "TaskEvent.1.0.1.TaskCompletedOK",
    "Resolution": "None.",
    "Severity": "OK"
  }
],
"Name": "Task 0",

```

```

    "Payload": {
      "HttpHeaders": [
        "Host: 172.16.56.124",
        "User-Agent: curl/7.58.0",
        "Accept: */*",
        "Content-Length: 8971"
      ],
      "HttpOperation": "POST",
      "JsonBody": "null",
      "TargetUri": "/redfish/v1/UpdateService"
    },
    "PercentComplete": 100,
    "StartTime": "2023-06-27T11:49:28+00:00",
    "TaskMonitor": "/redfish/v1/TaskService/Tasks/0/Monitor",
    "TaskState": "Completed",
    "TaskStatus": "OK"
  }
}

```

10. Check the BMC Inventory to find updated version:

11. Issue GET Inventory call to check the updated Version.

```

tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr$ curl -k -H "X-Auth-Token:$token" -H "Content-
Type:application/octet-stream" -X GET https://$bmc/redfish/v1/UpdateService/FirmwareInventory/bmc_active
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_active",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC image",
  "Id": "bmc_active",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "RelatedItem@odata.count": 1,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",

```

```
"State": "Enabled"  
},  
"Updateable": true,  
    "Version": "ot-0.1-114-ga61984-da5e164"  
}
```

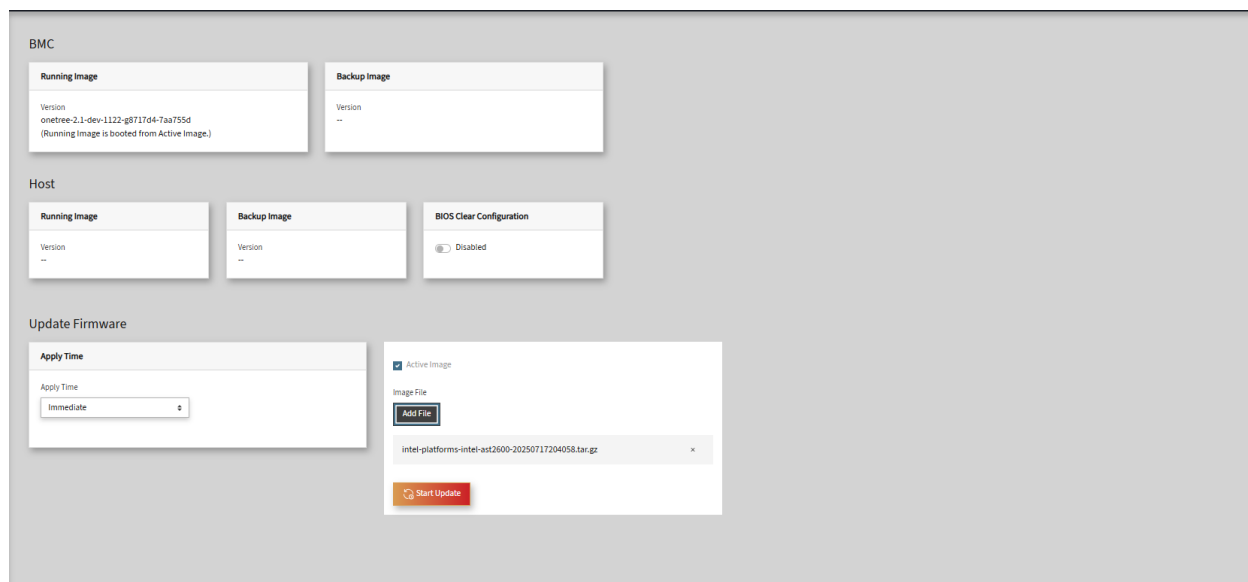
26.1.2 BMC Firmware update via Web UI

User can navigate to Operations -> Firmware page.

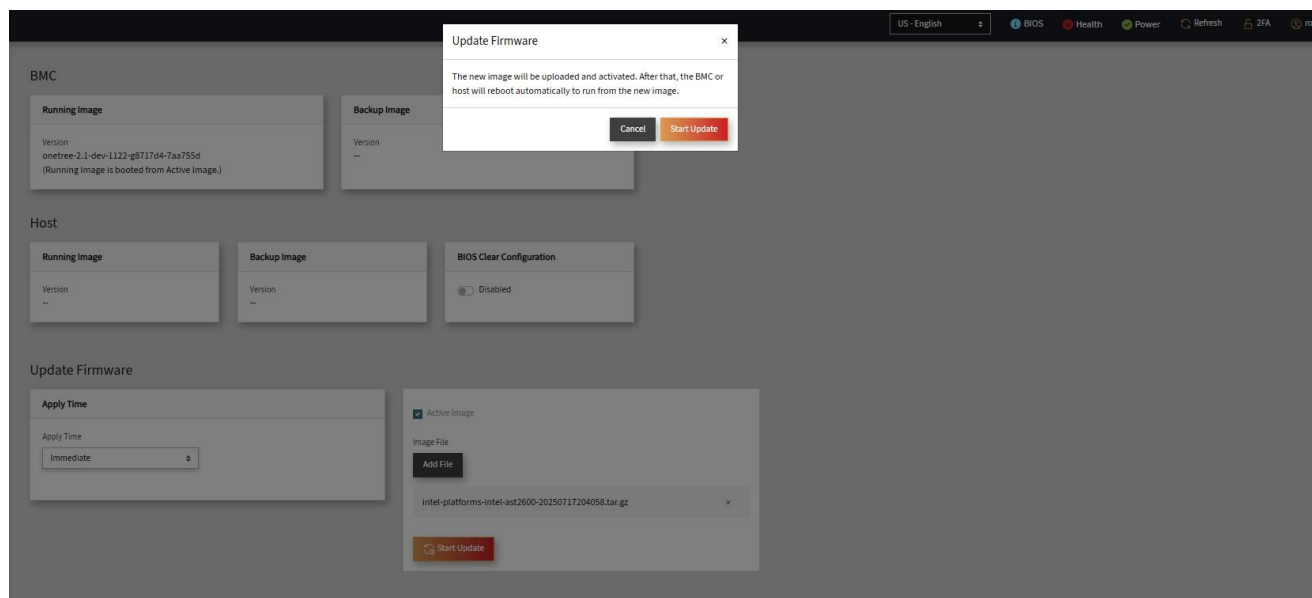
Given below is the screenshot for Firmware page.

Update Firmware

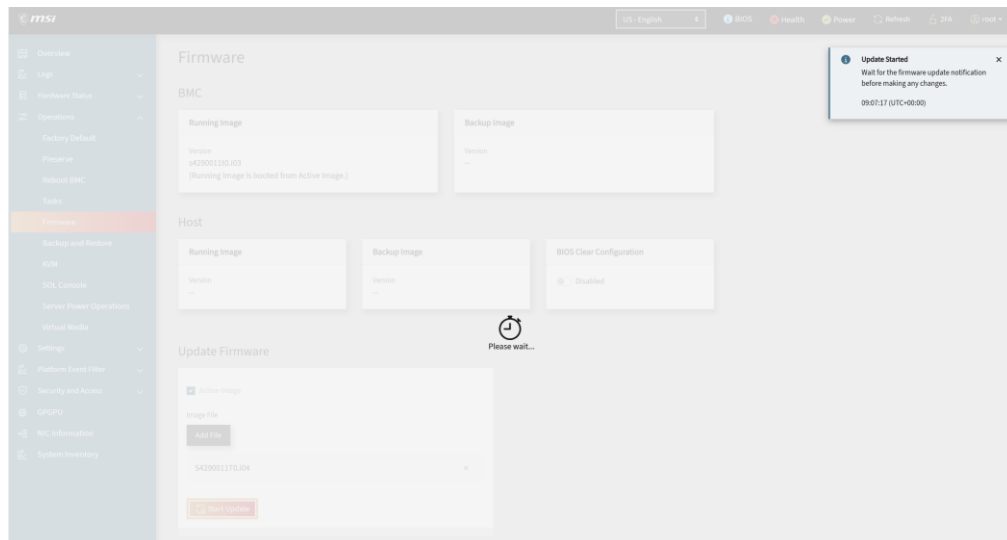
- Click Add file and locate the tar file to upload.



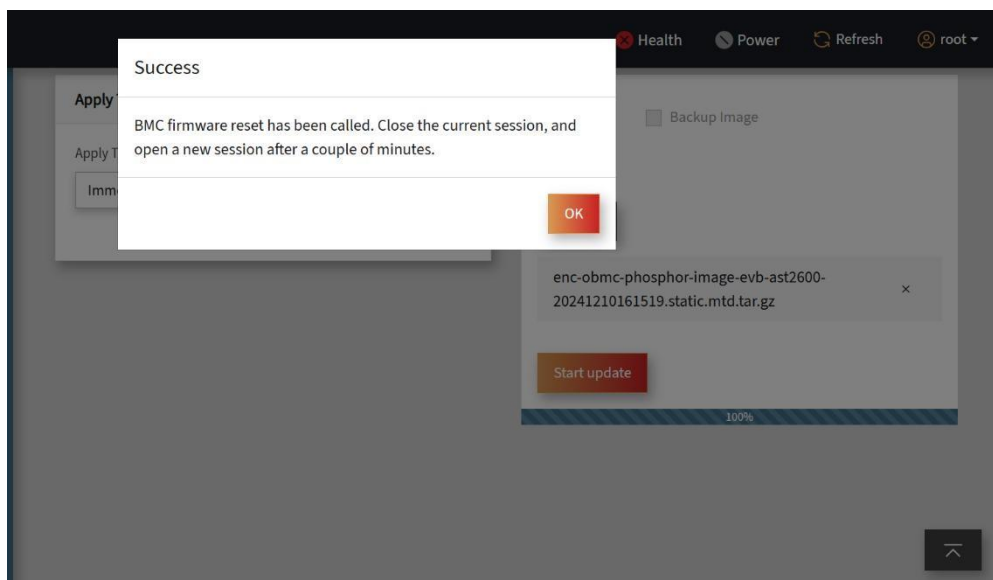
- Click Start Update and bmc will start to upload the firmware and after some time UI gets logout and BMC will reboot it.



- The progress bar will show the percentage of firmware update.



- Once the BMC Firmware update is successful, the success popup will display. It will take 5-10 minutes for the BMC to flash and reset.



26.2 Dual Image Support

OneTree™ allows you to maintain two separate firmware images, commonly referred to as the primary and secondary images. One of these images is designated as the active image, while the other serves as a backup. OneTree™ can install the updated firmware into the bkup image slot while the active image remains untouched. This feature can be enabled by enabling "dual-image" in ./build/conf/local.conf.

For Dual SPI ABR enable dual image, Hardware fails safe:

```
EXTRA_IMAGE_FEATURES:append = " onetree-dual-image"
```

```
EXTRA_IMAGE_FEATURES:append = " onetree-hw-failsafe-boot" EXTRA_IMAGE_FEATURES:append = " onetree-sync-conf"
```

For Single SPI ABR enable single spi abr

```
EXTRA_IMAGE_FEATURES:append = " onetree-single-spi-abr"
```

26.2.1 BMC Active image

Note: By default, when you issue an update request with bmc image it will be updated on Active spi i.e CS0.

26.2.2 Check Existing BMC Version

- Check existing version of the active image using redfish GET call

tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr\$ curl -k -H "X-Auth-Token:\$token" -H

"ContentType:application/octet-stream" -X GET

https://{bmc}/redfish/v1/UpdateService/FirmwareInventory/

```
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory",
  "@odata.type": "#SoftwareInventoryCollection.SoftwareInventoryCollection",
  "Members": [
    {
      "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bios_active"
    },
    {
      "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_active"
    },
    {
      "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_bkup"
    },
    {
      "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/cpld_active"
    },
    {
      "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/me"
    }
  ],
  "Members@odata.count": 5,
  "Name": "Software Inventory Collection"
}
```

tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr\$ curl -k -H "X-Auth-Token:\$token" -H "Content-Type:application/octet-stream" -X GET

https://{bmc}/redfish/v1/UpdateService/FirmwareInventory/bmc_active

```
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_active",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC image",
  "Id": "bmc_active",
}
```

```
"Name": "Software Inventory",
"RelatedItem": [
  {
    "@odata.id": "/redfish/v1/Managers/bmc"
  }
],
"RelatedItem@odata.count": 1,
"Status": {
  "Health": "OK",
  "HealthRollup": "OK",
  "State": "Enabled"
},
"Updateable": true,
"Version": "ot-0.1-114-ga61984-da5e164"
tejas@tejas-
patil:~/hemu/Onetree/jun21/onetree/nonpfr$
```

26.2.3 Issue Update Call

- Issue redfish update call with tar image or image-update-full present in deploy folder

```
tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr$ curl -k -H "X-Auth-Token: $token" -H "Content-Type: application/octet-stream" -X POST -T tmp/deploy/images/intel-ast2600/image-update-full https://${bmc}/redfish/v1/UpdateService
```

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

26.2.4 Check Update Progress

- Monitor the update progress using task service. Once the update is done, the bmc will be rebooted.

```
tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr$ curl -k -H "X-Auth-Token:$token" -H "Content-Type:application/json" -X GET https://${bmc}/red
```

```
fish/v1/TaskService/Tasks/0
```

```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/0",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "0",
  "Messages": [
    {
      "@odata.type": "#Message.v1_0_0.Message",
      "Message": "The task with id 0 has started.",
      "MessageArgs": [
        "0"
      ],
      "MessageId": "TaskEvent.1.0.1.TaskStarted",
      "Resolution": "None.",
      "Severity": "OK"
    },
    {
      "@odata.type": "#Message.v1_0_0.Message",
      "Message": "The task with id 0 has changed to progress 10 percent complete.",
      "MessageArgs": [
        "0",
        "10"
      ],
      "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
      "Resolution": "None.",
      "Severity": "OK"
    },
    {
      "@odata.type": "#Message.v1_0_0.Message",
      "Message": "The task with id 0 has changed to progress 30 percent complete.",
      "MessageArgs": [
```

```

    "0",
    "30"
  ],
  "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
  "Resolution": "None.",
  "Severity": "OK"
},
{
  "@odata.type": "#Message.v1_0_0.Message",
  "Message": "The task with id 0 has changed to progress 40 percent complete.",
  "MessageArgs": [
    "0",
    "40"
  ],
  "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
  "Resolution": "None.",
  "Severity": "OK"
},
{
  "@odata.type": "#Message.v1_0_0.Message",
  "Message": "The task with id 0 has changed to progress 60 percent complete.",
  "MessageArgs": [
    "0",
    "60"
  ],
  "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
  "Resolution": "None.",
  "Severity": "OK"
}
],
"Name": "Task 0",
"Payload": {
  "HttpHeaders": [
    "Host: 10.0.97.197",
    "User-Agent: curl/7.58.0",
    "Accept: */*",

```

```
"Content-Length: 67123200"
],
"HttpOperation": "POST",
"JsonBody": "null",
"TargetUri": "/redfish/v1/UpdateService"
},
"PercentComplete": 60,
"StartTime": "2023-06-28T08:20:32+00:00",
"TaskMonitor": "/redfish/v1/TaskService/Tasks/0/Monitor",
"TaskState": "Running",
"TaskStatus": "OK"
```

26.2.5 Check Updated BMC Version

- Once bmc is booted back up issue get call on bmc_active inventory to see the updated version.

```
tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpr$ curl -k -H "X-Auth-Token:$token" -H
"ContentType:application/octet-stream" -X GET
https://$bmc/redfish/v1/UpdateService/FirmwareInventory/bmc_active

{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_active",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC image",
  "Id": "bmc_active",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "RelatedItem@odata.count": 1,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Updateable": true,
  "Version": "ot-0.1-114-ga61984-test"
}
```


26.2.6 BMC Backup Image

- Update BMC backup firmware image

26.2.7 Check Existing BMC Version

- Check existing version of the active image using redfish GET call `tejas@tejas-`

`patil:~/hemu/Onetree/jun21/onetree/nonpfr$ curl -k -H "X-Auth-Token:$token" -H`

`"ContentType:application/octet-stream" -X GET`

`https://{bmc}/redfish/v1/UpdateService/FirmwareInventory/bmc_bkup`

```
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_bkup",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC image",
  "Id": "bmc_bkup",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "RelatedItem@odata.count": 1,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Updateable": true,
  "Version": "ot-0.1-114-ga61984-da5e164"
```

26.2.8 Issue PATCH Call

- Issue PATCH call to set "HttpPushUriTargets" as "bmc_bkup" to select backup image for update

```
tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr$ curl -k -H "X-Auth-Token:$token" -H "Content-Type:application/json" -X PATCH https://{bmc}/redfish/v1/UpdateService -d '{"HttpPushUriTargets":["bmc_bkup"], "HttpPushUriTargetsBusy": true}'
```

```
tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr$ curl -k -H "X-Auth-Token:$token" -H "ContentType:application/json" -X GET https://{bmc}/redfish/v1/UpdateService
```

```
{
  "@odata.id": "/redfish/v1/UpdateService",
  "@odata.type": "#UpdateService.v1_5_0.UpdateService",
  "Description": "Service for Software Update",
  "FirmwareInventory": {
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
  },
  "HttpPushUri": "/redfish/v1/UpdateService/update",
  "HttpPushUriOptions": {
    "HttpPushUriApplyTime": {
      "ApplyTime": "Immediate"
    }
  },
  "HttpPushUriTargets": [
    "bmc_bkup"
  ],
  "HttpPushUriTargetsBusy": false,
  "Id": "UpdateService",
  "MaxImageSizeBytes": 71303168,
  "Name": "Update Service",
  "Oem": {
    "ApplyOptions": {
      "@odata.type": "#OemUpdateService.ApplyOptions",
      "ClearConfig": false
    }
  },
  "ServiceEnabled": true
}
```

26.2.9 Issue Update Call

- Issue redfish update call with tar image or image-update-full present in deploy folder
tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr\$ curl -k -H "X-Auth-Token: \$token" -H
"Content-Type: application/octet-stream" -X POST -T tmp/deploy/images/intel-
ast2600/image-update-full https://{bmc}/redfish/v1/UpdateService

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

26.2.10 Check Update Progress

- Monitor the update progress using task service. Once the update is done, the BMC will be rebooted.

```
tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr$ curl -k -H "X-Auth-Token:$token" -H "Content-Type:application/json" -X GET https://${bmc}/red
```

```
fish/v1/TaskService/Tasks/0
```

```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/0",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "0",
  "Messages": [
    {
      "@odata.type": "#Message.v1_0_0.Message",
      "Message": "The task with id 0 has started.",
      "MessageArgs": [
        "0"
      ],
      "MessageId": "TaskEvent.1.0.1.TaskStarted",
      "Resolution": "None.",
      "Severity": "OK"
    },
    {
      "@odata.type": "#Message.v1_0_0.Message",
      "Message": "The task with id 0 has changed to progress 10 percent complete.",
      "MessageArgs": [
        "0",
        "10"
      ],
      "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
      "Resolution": "None.",
      "Severity": "OK"
    },
    {
      "@odata.type": "#Message.v1_0_0.Message",
      "Message": "The task with id 0 has changed to progress 30 percent complete.",
      "MessageArgs": [
        "0",
```

```

    "30"
  ],
  "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
  "Resolution": "None.",
  "Severity": "OK"
},
{
  "@odata.type": "#Message.v1_0_0.Message",
  "Message": "The task with id 0 has changed to progress 40 percent complete.",
  "MessageArgs": [
    "0",
    "40"
  ],
  "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
  "Resolution": "None.",
  "Severity": "OK"
},
{
  "@odata.type": "#Message.v1_0_0.Message",
  "Message": "The task with id 0 has changed to progress 60 percent complete.",
  "MessageArgs": [
    "0",
    "60"
  ],
  "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
  "Resolution": "None.",
  "Severity": "OK"
}
],
"Name": "Task 0",
"Payload": {
  "HttpHeaders": [
    "Host: 10.0.97.197",
    "User-Agent: curl/7.58.0",
    "Accept: */*",
    "Content-Length: 67123200"
  ]
}

```

```
],  
  "HttpOperation": "POST",  
  "JsonBody": "null",  
  "TargetUri": "/redfish/v1/UpdateService"  
},  
  "PercentComplete": 60,  
  "StartTime": "2023-06-28T08:20:32+00:00",  
  "TaskMonitor": "/redfish/v1/TaskService/Tasks/0/Monitor",  
  "TaskState": "Running",  
  "TaskStatus": "OK"
```

26.2.11 Check Updated BMC Version

- Once BMC booted back up issue get call on bmc_bkup inventory to see the updated version

```
tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr$ curl -k -H "X-Auth-Token:$token" -H
"ContentType:application/octet-stream" -X GET
https://$bmc/redfish/v1/UpdateService/FirmwareInventory/bmc_bkup
```

```
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_bkup",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC image",
  "Id": "bmc_bkup",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "RelatedItem@odata.count": 1,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Updateable": true,
  "Version": "ot-0.1-114-ga61984-test"
```

```
tejas@tejas-patil:~/hemu/Onetree/jun21/onetree/nonpfr$
```


26.2.12 Switch BMC Image

- Switch BMC image from current active image to backup image
- Check Version of Both the images

```
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/image-signing-tool/output_dual$ curl -k https://root:OpenBmc@${bmc}/redfish/v1/UpdateService/FirmwareInventory/bmc_bkup
```

```
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_bkup",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC image",
  "Id": "bmc_bkup",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "RelatedItem@odata.count": 1,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Updateable": true,
  "Version": "ot-1.0-dev-48-g4eeb58-2e5cac2"
```

```
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/image-signing-tool/output_dual$ curl -k https://root:OpenBmc@${bmc}/redfish/v1UpdateService/FirmwareInventory/bmc_active
```

```
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_active",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC image",
  "Id": "bmc_active",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
```

```
}  
],  
"RelatedItem@odata.count": 1,  
"Status": {  
  "Health": "OK",  
  "HealthRollup": "OK",  
  "State": "Enabled"  
},  
"Updateable": true,  
"Version": "ot-1.0-dev-51-ge6ed3e-2e5cac2"  
}
```

26.2.13 Check Current BMC Image

```
root@AMIOT-5af0b58e3cb1:~# cat /etc/os-release | grep VERSION
VERSION="OT.1-0"
VERSION_ID=ot-1.0-dev-51-ge6ed3e-2e5cac2
VERSION_CODENAME="mickledore" OPENBMC_VERSION="OT-1.0-Dev-0-
g2e5cac" root@AMIOT-5af0b58e3cb1:~
```

26.2.14 Switch BMC to Backup Image

```
root@AMIOT-5af0b58e3cb1:~# ls -la /sys/class/spi_master/spi0/device/access_backup
-rw-r--r--      1 root      root           4096 Dec  20  08:20
/sys/class/spi_master/spi0/device/access_backup root@AMIOT-5af0b58e3cb1:~# echo 1
> /sys/class/spi_master/spi0/device/access_backup root@AMIOT-5af0b58e3cb1:~# BP1
```

U-Boot 2019.04 (Mar 21 2022 - 23:02:47 +0000)

SOC: AST2600-A1

```
root@AMIOT-5af0b58e3cb1:~# cat /etc/os-release | grep VERSION
VERSION="OT.1-0"
VERSION_ID=ot-1.0-dev-51-ge6ed3e-2e5cac2
VERSION_CODENAME="mickledore" OPENBMC_VERSION="OT-1.0-Dev-0-
g2e5cac" root@AMIOT-5af0b58e3cb1:~
```

26.2.15 Update Firmware for both BMC

- Update Firmware for both BMC active and Backup image at a same time

26.2.16 Check Existing BMC Version

- Check exist BMC active and Backup image version

```
task@ubuntu:~$ cat
}msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ export bmc=10.0.99.105
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ export token=$(curl -k -H "Content-Type: applicat
ton/json" -X POST https://$bmc/login -d '{"username": "root", "password": "OpenBmc"}' | grep token | awk '{print $2;}' | tr -d ' ')
% Total    % Received % Xferd  Average Speed   Time    Time     Time
Dload  Upload   Total    Spent    Left   Speed
100    82    100    37    100    45    136    166  --:--:-- --:--:-- --:--:--    302
```

```
Version: "ot-1.1-dev-49-g328922-de623ba"
}msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ curl -k https://root:OpenBmc@$bmc/redfish/v1/
pdateService/FirmwareInventory/bmc_active
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_active",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC image",
  "Id": "bmc_active",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "RelatedItem@odata.count": 1,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Updateable": true,
  "Version": "ot-1.1-dev-49-g328922-23baf18"
}msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ curl -k https://root:OpenBmc@$bmc/redfish/v1/
pdateService/FirmwareInventory/bmc_bkup
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_bkup",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC image",
  "Id": "bmc_bkup",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "RelatedItem@odata.count": 1,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Updateable": true,
  "Version": "ot-1.1-dev-49-g328922-de623ba"
```

26.2.17 Issue PATCH Call

- Issue PATCH call to set "HttpPushUriTargets" as "bmc_active", "bmc_bkup" to select backup image for update

```
mgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$
```

```
curl -k -H "X-Auth-Token:$token" -H "Content-Type: application/json" -X PATCH https://$bmc/redfish/v1/UpdateService -d '{"HttpPushUriTargets":["bmc_active","bmc_bkup"], "HttpPushUriTargetsBusy": true}'
```

```
mgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ curl -k -H "X-Auth-Token: $token" -H "Content-Type: application/octet-stream" -X GET https://$bmc/redfish/v1/UpdateService
```

```
{
  "@odata.id": "/redfish/v1/UpdateService",
  "@odata.type": "#UpdateService.v1_11_1.UpdateService",
  "Description": "Service for Software Update",
  "FirmwareInventory": {
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
  },
  "HttpPushUri": "/redfish/v1/UpdateService/update",
  "HttpPushUriOptions": {
    "HttpPushUriApplyTime": {
      "ApplyTime": "Immediate"
    }
  },
  "HttpPushUriTargets": [
    "bmc_active",
    "bmc_bkup"
  ],
  "HttpPushUriTargetsBusy": true,
  "Id": "UpdateService",
  "MaxImageSizeBytes": 134217728,
  "MultipartHttpPushUri": "/redfish/v1/UpdateService/update",
  "Name": "Update Service",
  "Oem": {
    "ApplyOptions": {
      "@odata.type": "#OemUpdateService.ApplyOptions",
      "ClearConfig": false
    }
  }
}
```

},

"ServiceEnabled": true

```
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ curl -k -H "X-Auth-Token:$token" -H "Content-Type:application/json" -X PATCH https://${bmc}/redfish/v1/UpdateService -d '{"HttpPushUriTargets":["bmc_active","bmc_bkup"],"HttpPushUriTargetsBusy":true}'
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ curl -k -H "X-Auth-Token: $token" -H "Content-Type: application/octet-stream" -X GET https://${bmc}/redfish/v1/UpdateService
{
  "@odata.id": "/redfish/v1/UpdateService",
  "@odata.type": "#UpdateService.v1_11_1.UpdateService",
  "Description": "Service for Software Update",
  "FirmwareInventory": {
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
  },
  "HttpPushUri": "/redfish/v1/UpdateService/update",
  "HttpPushUriOptions": {
    "HttpPushUriApplyTime": {
      "ApplyTime": "Immediate"
    }
  },
  "HttpPushUriTargets": [
    "bmc_active",
    "bmc_bkup"
  ],
  "HttpPushUriTargetsBusy": true,
  "Id": "UpdateService",
  "MaxImageSizeBytes": 134217728,
  "MultipartHttpPushUri": "/redfish/v1/UpdateService/update",
  "Name": "Update Service",
  "Oem": {
    "ApplyOptions": {
      "@odata.type": "#OemUpdateService.ApplyOptions",
      "ClearConfig": false
    }
  },
  "ServiceEnabled": true
}
```


26.2.18 Issue Redfish Update Call

- Issue redfish update call to update BMC active and backup image

```
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ curl -k -H "X-Auth-Token: $token" -H "Content-Type: application/octet-stream" -X POST -T obmc-image-feb-6.tar.gz https://$bmc/redfish/v1/UpdateService/update
```

```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "1",
  "TaskState": "New",
  "TaskStatus": "OK"
}
```

26.2.19 BMC Log

Feb 02 08:12:22 AMIOT-764f2f2b5cc6 phosphor-version-software-manager[831]: Untaring /tmp/images/1b0679633d25-4cee-88b0-fba3494c9f38 to /tmp/images/imaqlt

Feb 02 08:12:25 AMIOT-764f2f2b5cc6 phosphor-version-software-manager[831]: No values found in MANIFEST file for key: ExtendedVersion=

Feb 02 08:12:25 AMIOT-764f2f2b5cc6 phosphor-version-software-manager[831]: No values found in MANIFEST file for key: CompatibleName=

Feb 02 08:12:25 AMIOT-764f2f2b5cc6 mapperx[429]: Found invalid association on path /xyz/openbmc_project/software/7119b27d_1400921130

Feb 02 08:12:25 AMIOT-764f2f2b5cc6 mapperx[429]: Found invalid association on path /xyz/openbmc_project/software/7119b27d_1400921130

Feb 02 08:12:25 AMIOT-764f2f2b5cc6 phosphor-image-updater[774]: Version (bmc_active) is currently running on the BMC; unable to remove.

Feb 02 08:12:34 AMIOT-764f2f2b5cc6 systemd[1]: Created slice Slice /system/fwupd.

Feb 02 08:12:34 AMIOT-764f2f2b5cc6 systemd[1]: Starting Latest Flash BMC with fwupd script : 7119b27d_1400921130...

Feb 02 08:12:34 AMIOT-764f2f2b5cc6 fwupd[1102]: path=7119b27d_1400921130

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: PROTO=file

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: REMOTE=/tmp/images/7119b27d_1400921130/MANIFEST

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: REMOTE_HOST=

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: REMOTE_PATH=tmp/images/7119b27d_1400921130/MANIFEST

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: Download 'tmp/images/7119b27d_1400921130/MANIFEST' from file tmp/images/7119b27d_1400921130/MANIFEST

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: METAFILE_PATH=/tmp/images/7119b27d_1400921130/MANIFEST

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: Updating image /tmp/images/7119b27d_1400921130/imagebmc

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: BMC Full Flash - full SPI update request

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 intelcpusensor[636]: PECI set dev name to /dev/peci-default

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: BMC Full Flash - Booted from CS0

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: Start Update Both BMC Active and Backup images. It will take ~20 minutes....

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 fwupd[1102]: BMC Full Flash - Starting the SPI write on active CS0 spi. It will take ~8 minutes....

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 nv-syncd[351]: Terminated

Feb 02 08:12:39 AMIOT-764f2f2b5cc6 systemd[1]: Stopping Overlay sync to NV storage...

Feb 02 08:12:40 AMIOT-764f2f2b5cc6 systemd[1]: nv-sync.service: Deactivated successfully.

Feb 02 08:12:40 AMIOT-764f2f2b5cc6 systemd[1]: Stopped Overlay sync to NV storage.

Feb 02 08:12:40 AMIOT-764f2f2b5cc6 systemd[1]: nv-sync.service: Consumed 3.038s CPU time.

Feb 02 08:12:40 AMIOT-764f2f2b5cc6 systemd[1]: tmp-.rwfs.mount: Deactivated successfully.

Feb 02 08:19:20 AMIOT-764f2f2b5cc6 fwupd[1102]: BMC Full Flash - Image update successful

Feb 02 08:19:25 AMIOT-764f2f2b5cc6 fwupd[1102]: BMC Full Flash - Starting the SPI write on bkup CS1 spi.
It will take ~8 minu.

Feb 02 08:19:25 AMIOT-764f2f2b5cc6 fwupd[1102]: mtdPart=mtd6

Feb 02 08:26:02 AMIOT-764f2f2b5cc6 systemd[1]: Stopped Overlay sync to NV storage.

Feb 02 08:26:02 AMIOT-764f2f2b5cc6 systemd[1]: nv-sync.service: Consumed 1.609s CPU time.

Feb 02 08:26:02 AMIOT-764f2f2b5cc6 fwupd[1102]: BMC Full Flash - Preserve Config Done

Feb 02 08:26:02 AMIOT-764f2f2b5cc6 fwupd[1102]: BMC Full Flash - Restore u-boot-env partition

Feb 02 08:26:02 AMIOT-764f2f2b5cc6 intelcpusensor[636]: PECI set dev name to /dev/peci-default

Feb 02 08:26:02 AMIOT-764f2f2b5cc6 fwupd[1244]: /tmp/uboot_env_data.bin does not exist

Feb 02 08:26:02 AMIOT-764f2f2b5cc6 fwupd[1102]: BMC Full Flash - Image updated successful on bkup spi

Feb 02 08:26:02 AMIOT-764f2f2b5cc6 logger-systemd[1246]: BMC firmware update to version NA completed successfully.

[1134.950975] reboot: Restarting system

BP0c00

U-Boot 2019.04 (Mar 21 2022 - 23:02:47 +0000)

SOC: AST2600-A3

RST: WDT1 SOC

PCI RST: #2

FMC 2nd Boot (ABR): Enable, Dual flashes, Source: Primary

26.2.20 Check BMC version

- Check BMC active and backup image version, both images updated with same image.

```
msgsubuntu@msgsubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ export bmc=10.0.99.114
msgsubuntu@msgsubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ export token=$(curl -k -H "Content-Type: applicat
ion/json" -X POST https://$bmc/login -d '{"username": "root", "password": "OpenBmc"}' | grep token | awk '{print $2;}' | tr -d ' ')
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total     Spent    Left  Speed
100    82    100    37    100    45    132    160  --:--:-- --:--:-- --:--:--    291
msgsubuntu@msgsubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ curl -k https://root:OpenBmc@$bmc/redfish/v1/U
pdateService/FirmwareInventory/bmc_active
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_active",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC Image",
  "Id": "bmc_active",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "RelatedItem@odata.count": 1,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Updateable": true,
  "Version": "ot-1.1-dev-49-g328922-dc2d1c7"
}
msgsubuntu@msgsubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$ curl -k https://root:OpenBmc@$bmc/redfish/v1/U
pdateService/FirmwareInventory/bmc_bkup
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/bmc_bkup",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC Image",
  "Id": "bmc_bkup",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "RelatedItem@odata.count": 1,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Updateable": true,
  "Version": "ot-1.1-dev-49-g328922-dc2d1c7"
}
msgsubuntu@msgsubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-common/recipes-ami/image-tar-tool$
```

26.2.21 Hardware Failsafe Boot Support

Hardware Setup

Stop at uboot prompt.

For Dual SPI ABR case:

1. Enable ABR mode.
`otp pb strap 2B 1`
2. Check otp info strap command.

`otp info strap`

```
ast# otp info strap
```

BIT(hex)	Value	Description
0x2B	0x1	Enable boot SPI or eMMC ABR
0x2C	0x0	Boot SPI ABR Mode : dual

For Single SPI ABR case:

1. Enable ABR mode.
`otp pb strap 2B 1`
2. Enable Single SPI ABR mode.
`otp pb strap 2C 1`
3. Set SPI flash size.

For 64MB Images, 128MB flash size is required.

`otp pb strap 2F 1` `otp pb`

`strap 2E 1` `otp pb strap 2D 1`

4. Check otp info strap command.

`otp info strap`

```
ast# otp info strap
```

BIT(hex)	Value	Description
0x2B	0x1	Enable boot SPI or eMMC ABR
0x2C	0x1	Boot SPI ABR Mode : single
0x2F:0x2D	0x7	Boot SPI flash size : 128MB

26.2.22 Hardware Failsafe Boot, Dual SPI Flash

Primary image is corrupted, inactive, boot from secondary image.

Check logs from console.

BP0c00

BP1c00

U-Boot 2019.04 (Mar 21 2022 - 23:02:47 +0000)

SOC: AST2600-A3

RST: Power On

FMC 2nd Boot (ABR): Enable, Dual flashes, Source: Alternate

eSPI Mode: SIO:Enable : SuperIO-2e

Eth: MAC0: RGMII, MAC1: RGMII, MAC2: RGMII, MAC3: RGMII

Model: Intel server board with AST2600 as the BMC

Watchdog enabled

DRAM: Reserving 32768 Bytes for IRQ stack at: b9f373a0

959.9 MiB (capacity:1024 MiB, VGA:64 MiB, ECC:off)

Loading Environment from SPI Flash... SF: Detected w25q512jv with page size 256 Bytes, erase size 64 KiB, total 64 MiB

OK

In: serial@1e784000

Out: serial@1e784000

Err: serial@1e784000

Model: Intel server board with AST2600 as the BMC

Saving Environment to SPI Flash... SF: Detected w25q512jv with page size 256 Bytes, erase size 4 KiB, total 64 MiB

Erasing SPI flash...Writing to SPI flash...done

Valid environment: 2

Primary image is broken, cannot be detected, boot from secondary image.

Check logs from console.

BP0c00

BP1c00

U-Boot 2019.04 (Mar 21 2022 - 23:02:47 +0000)

SOC: AST2600-A3

RST: Power On

FMC 2nd Boot (ABR): Enable, Dual flashes, Source: Alternate

eSPI Mode: SIO:Enable : SuperIO-2e

Eth: MAC0: RGMII, MAC1: RGMII, MAC2: RGMII, MAC3: RGMII

Model: Intel server board with AST2600 as the BMC

Watchdog enabled

DRAM: Reserving 32768 Bytes for IRQ stack at: b9f373a0

959.9 MiB (capacity:1024 MiB, VGA:64 MiB, ECC:off)

Loading Environment from SPI Flash... SF: Detected w25q512jv with page size 256 Bytes, erase size 64 KiB, total 64 MiB

OK

In: serial@1e784000

Out: serial@1e784000

Err: serial@1e784000

Model: Intel server board with AST2600 as the BMC

Saving Environment to SPI Flash... SF: Detected w25q512jv with page size 256 Bytes, erase size 4 KiB, total 64 MiB

Erasing SPI flash...Writing to SPI flash...done

Valid environment: 1

Primary image can be normal boot.

Secondary image can be normal booting, or can be corrupted, or can be broken. Check logs from console.

BP0c00

U-Boot 2019.04 (Mar 21 2022 - 23:02:47 +0000)

SOC: AST2600-A3

RST: Power On

FMC 2nd Boot (ABR): Enable, Dual flashes, Source: Primary

eSPI Mode: SIO:Enable : SuperIO-2e

Eth: MAC0: RGMII, MAC1: RGMII, MAC2: RGMII, MAC3: RGMII

Model: Intel server board with AST2600 as the BMC

Watchdog enabled

DRAM: Reserving 32768 Bytes for IRQ stack at: b9f373a0

959.9 MiB (capacity:1024 MiB, VGA:64 MiB, ECC:off)

Loading Environment from SPI Flash... SF: Detected w25q512jv with page size 256 Bytes, erase size 64 KiB, total 64 MiB

OK

In: serial@1e784000

Out: serial@1e784000

Err: serial@1e784000

Model: Intel server board with AST2600 as the BMC

Saving Environment to SPI Flash... SF: Detected w25q512jv with page size 256 Bytes, erase size 4 KiB, total 64 MiB

Erasing SPI flash...Writing to SPI flash...done

Valid environment: 2

26.2.23 Hardware failsafe boot, single SPI flash

Primary image is corrupted, inactive, boot from secondary image.

Check logs from console.

BP0c00

BP1c00

U-Boot 2019.04 (Mar 21 2022 - 23:02:47 +0000)

SOC: AST2600-A3

RST: Power On

FMC 2nd Boot (ABR): Enable, Single flash, Source: Alternate, bspi_size: 128 MB

eSPI Mode: SIO:Enable : SuperIO-2e

Eth: MAC0: RGMII, MAC1: RGMII, MAC2: RGMII, MAC3: RGMII

Model: Intel server board with AST2600 as the BMC

Watchdog enabled

DRAM: Reserving 32768 Bytes for IRQ stack at: b9f373a0

959.9 MiB (capacity:1024 MiB, VGA:64 MiB, ECC:off)

Loading Environment from SPI Flash... SF: Detected mx66l1g45g with page size 256 Bytes, erase size 4 KiB, total 128 MiB

*** Warning - bad CRC, using default environment

In: serial@1e784000

Out: serial@1e784000

Err: serial@1e784000

Model: Intel server board with AST2600 as the BMC

Saving Environment to SPI Flash... SF: Detected mx66l1g45g with page size 256 Bytes, erase size 4 KiB, total 128 MiB

Erasing SPI flash...Writing to SPI flash...done

Valid environment: 2

Primary image can be normal booting.

For single spi abr case, it does not have broken spi flash test case, for that it has one spi flash and secondary image is boot from same spi flash but different address. Secondary image can be normal booting or can be corrupted. Check logs from console.

BP0c00

U-Boot 2019.04 (Mar 21 2022 - 23:02:47 +0000)

SOC: AST2600-A3

RST: Power On

FMC 2nd Boot (ABR): Enable, Single flash, Source: Primary, bspi_size: 128 MB

eSPI Mode: SIO:Enable : SuperIO-2e

Eth: MAC0: RGMII, MAC1: RGMII, MAC2: RGMII, MAC3: RGMII

Model: Intel server board with AST2600 as the BMC

Watchdog enabled

DRAM: Reserving 32768 Bytes for IRQ stack at: b9f373a0

959.9 MiB (capacity:1024 MiB, VGA:64 MiB, ECC:off)

Loading Environment from SPI Flash... SF: Detected mx66l1g45g with page size 256 Bytes, erase size 4 KiB, total 128 MiB

OK

In: serial@1e784000

Out: serial@1e784000

Err: serial@1e784000

Model: Intel server board with AST2600 as the BMC

Saving Environment to SPI Flash... SF: Detected mx66l1g45g with page size 256 Bytes, erase size 4 KiB, total 128 MiB

Erasing SPI flash...Writing to SPI flash...done

Valid environment: 1

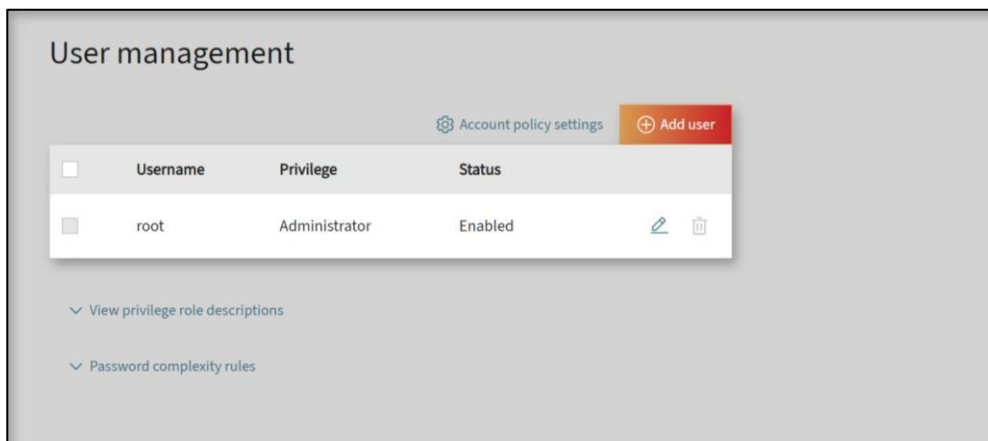
26.2.24 Firmware Update Matrix

Dedicated means two spi flashes for hw failsafe boot, continuous means one spi flash for single spi ABR. The corrupted/inactive refers to image firmware is not able to boot. The broken refers to spi flash is broken not able to be detected. Okay refers to firmware and spi flash can be boot and detected.

SNO	FAIL SAFE	SPI	Primary Image		Secondary Image		COMMENTS
1	HW FAILSAFE	DEDICATED	OK		OK		
2	HW FAILSAFE	DEDICATED	Corrupted Inactive	or	OK		
3	HW FAILSAFE	DEDICATED	Broken		OK		
4	HW FAILSAFE	DEDICATED	OK		Corrupted Inactive	or	
5	HW FAILSAFE	DEDICATED	OK		Broken		
6	HW FAILSAFE	CONTIGIOUS	OK		OK		
7	HW FAILSAFE	CONTIGIOUS	Corrupted Inactive	or	OK		
8	HW FAILSAFE	CONTIGIOUS	OK		Corrupted Inactive	or	

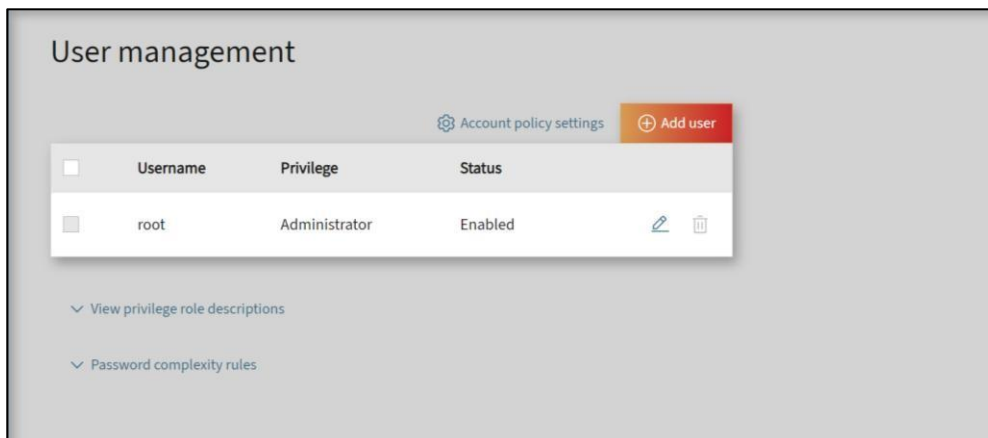
26.2.25 Sync Configuration

- Sync Configuration between both BMC active and BMC backup image.
- Flash Dual enabled image and add new configuration using Web UI.



- Switch from primary to secondary image with below command

```
echo 1 > /sys/class/spi_master/spi0/device/access_backup
```
- After Boot with backup image check configuration exists in Web UI



26.3 BIOS Update Support

Note: We don't have server with bios chip access so validated on AST2600 card.

26.3.1 Create bios openbmc tar image

Use image-signing-tool to create bios sign tar file

```
kiruba@msgubuntu-OptiPlex-7070:~/ot/image-signing-tool$ ./image-signer config_bios.ini
2025-12-11 20:05:09 - Signed hashed image creating ...
2025-12-11 20:05:10 - Signed hashed image created success ...
kiruba@msgubuntu-OptiPlex-7070:~/ot/image-signing-tool$
```

26.3.2 Update using the update service call

```
root@tejas-patil:/home/tejas/hemu/images# export bmc=172.16.56.140
root@tejas-patil:/home/tejas/hemu/images# export token=$(curl -k -H "Content-Type: application/json" -X POST https://${bmc}/login -d '{"username": "root", "password": "OpenBmc"}' | grep token | awk '{print $2;}' | tr -d '"')
% Total    % Received % Xferd  Average Speed   Time    Time     Current
                                 Dload  Upload   Total   Spent    Left     Speed
100    82    100    37    100    45      34      41  0:00:01  0:00:01 --:--:--   76
root@tejas-patil:/home/tejas/hemu/images# curl -k -H "X-Auth-Token: $token" -H "Content-Type: application/octet-stream" -X POST -T ./obmc-bios-32m.tar.gz https://${bmc}/redfish/v1/UpdateService
{"@odata.id": "/redfish/v1/TaskService/Tasks/0",
"@odata.type": "#Task.v1_4_3.Task",
"Id": "0",
"TaskState": "Running",
"TaskStatus": "OK"}
```

26.3.3 Monitor status using task service

```
root@tejas-patil:/home/tejas/hemu/images# curl -k -H "X-Auth-Token: $token" -H "Content-Type: application/octetstream" -X GET https://${bmc}/redfish/v1/TaskService/Tasks/0
```

```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/0",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "0",
  "Messages": [
    {
      "@odata.type": "#Message.v1_0_0.Message",
      "Message": "The task with id 0 has started.",
      "MessageArgs": [
        "0"
      ],
      "MessageId": "TaskEvent.1.0.1.TaskStarted",
      "Resolution": "None.",
      "Severity": "OK"
    },
    {
      "@odata.type": "#Message.v1_0_0.Message",
      "Message": "The task with id 0 has changed to progress 10 percent complete.",

```

```

"MessageArgs": [
  "0",
  "10"
],
"MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
"Resolution": "None.",
"Severity": "OK"
},
{
"@odata.type": "#Message.v1_0_0.Message",
"Message": "The task with id 0 has changed to progress 30 percent complete.",
"MessageArgs": [
  "0",
  "30"
],
"MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
"Resolution": "None.",
"Severity": "OK"
},
{
"@odata.type": "#Message.v1_0_0.Message",
"Message": "The task with id 0 has changed to progress 40 percent complete.",
"MessageArgs": [
  "0",
  "40"
],
"MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
"Resolution": "None.",
"Severity": "OK"
},
{
"@odata.type": "#Message.v1_0_0.Message",
"Message": "The task with id 0 has changed to progress 50 percent complete.",
"MessageArgs": [
  "0",
  "50"

```

```

    ],
    "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
    "Resolution": "None.",
    "Severity": "OK"
  },
  {
    "@odata.type": "#Message.v1_0_0.Message",
    "Message": "The task with id 0 has changed to progress 60 percent complete.",
    "MessageArgs": [
      "0",
      "60"
    ],
    "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
    "Resolution": "None.",
    "Severity": "OK"
  },
  {
    "@odata.type": "#Message.v1_0_0.Message",
    "Message": "The task with id 0 has changed to progress 95 percent complete.",
    "MessageArgs": [
      "0",
      "95"
    ],
    "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
    "Resolution": "None.",
    "Severity": "OK"
  },
  {
    "@odata.type": "#Message.v1_0_0.Message",
    "Message": "The task with id 0 has changed to progress 100 percent complete.",
    "MessageArgs": [
      "0",
      "100"
    ],
    "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
    "Resolution": "None.",

```

```
    "Severity": "OK"
  }
],
"Name": "Task 0",
"Payload": {
  "HttpHeaders": [
    "Host: 172.16.56.140",
    "User-Agent: curl/7.58.0",
    "Accept: */*",
    "Content-Length: 10236060"
  ],
  "HttpOperation": "POST",
  "JsonBody": "null",
  "TargetUri": "/redfish/v1/UpdateService"
},
"PercentComplete": 100,
"StartTime": "2023-05-19T11:55:45+00:00",
"TaskMonitor": "/redfish/v1/TaskService/Tasks/0/Monitor",
"TaskState": "Running",
"TaskStatus": "OK"
```


26.3.4 BMC Log

```
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] Software object: /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] Manifest purpose: HOST
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] Detected component: bios
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] Image selected: /tmp/images/f0f469d5_1254420400/image-bios
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9609]: [INFO] Push-URI targets (raw): <none>
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] Push-URI targets (received): <none>
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9619]: [INFO] Valid targets (Purpose=HOST): <none>
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] No valid targets for Purpose=HOST; will run once without target
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] ==== BIOS update ====
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] set_task_status(Starting): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] set_progress(40): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] set_progress(50): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] set_task_status(Running): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] set_progress(60): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] SCRIPT: /usr/libexec/fwupd/flash-bios.sh /tmp/images/f0f469d5_1254420400 /tmp/images/f0f469d5_1254420400/image-bios
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] ==== BIOS FLASH ====
Nov 17 12:27:42 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] TARGET=bios IMAGE_DIR=/tmp/images/f0f469d5_1254420400 IMAGE_PATH=/tmp/images/f0f469d5_1254420400/image-bios
Nov 17 12:27:43 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] set_progress(40): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:27:43 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] set_progress(50): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:27:43 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] set_progress(60): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:27:43 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] mtdPart=mtd7
Nov 17 12:27:43 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] BIOS Full Flash - Preserve Configuration JSON not present
Nov 17 12:27:43 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] IFWI Full Flash - Starting the SPI write. It will take ~5 minutes....
Nov 17 12:29:03 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] set_progress(95): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:29:03 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] IFWI Full Flash - Image update successful
Nov 17 12:29:03 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] BIOS Full Flash - Preserve Configuration JSON not present
Nov 17 12:29:03 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] set_progress(100): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:29:03 AMIOT-b67b5ca52348 fwupd[9635]: [INFO] set_progress(100): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:29:03 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] set_progress(60): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:29:03 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] set_progress(95): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:29:03 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] set_task_status(Completed): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:29:03 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] set_progress(100): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:29:03 AMIOT-b67b5ca52348 fwupd[9595]: [INFO] set_progress(100): /xyz/openbmc_project/software/f0f469d5_1254420400
Nov 17 12:29:03 AMIOT-b67b5ca52348 systemd[1]: fwupd@f0f469d5_1254420400.service: Deactivated successfully.
Nov 17 12:29:03 AMIOT-b67b5ca52348 systemd[1]: Finished Latest Flash BMC with fwupd script : f0f469d5_1254420400.
```

26.3.5 BIOS Firmware Update via Web UI

Note: Both the BMC existing image and the BIOS image must be signed.

Users can navigate Operations -> Firmware page. Given below is the screenshot for Firmware page.

Update Firmware:

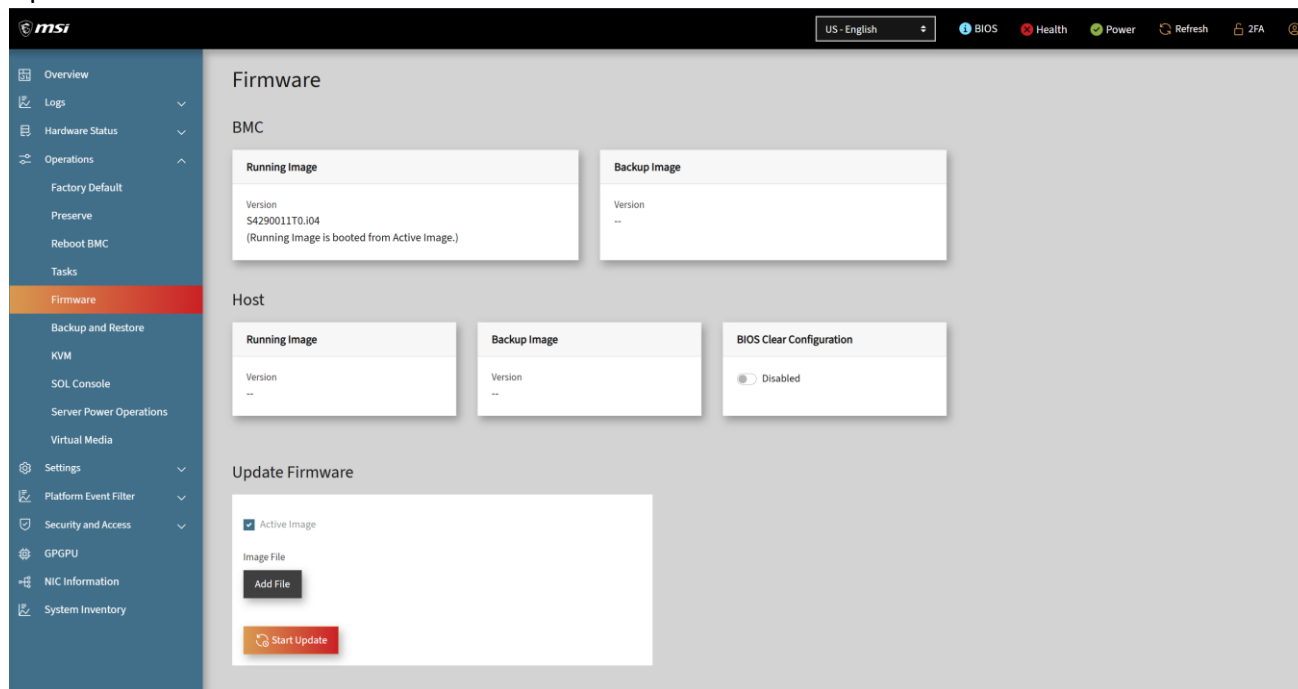


Figure 242 Update Firmware

- Click Add file and locate the BIOS Signed tar file to upload.

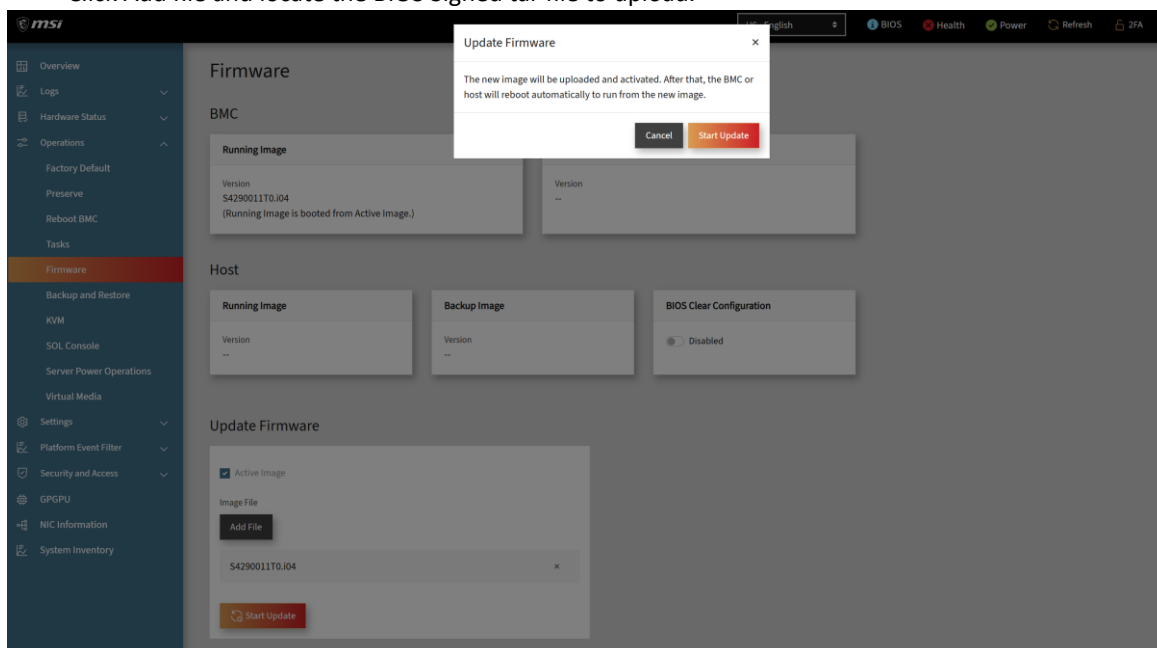


Figure 243 Confirm Message

- Click Start Update and BIOS will start to upload the firmware. It takes 5-10 minutes to complete BIOS FW update.

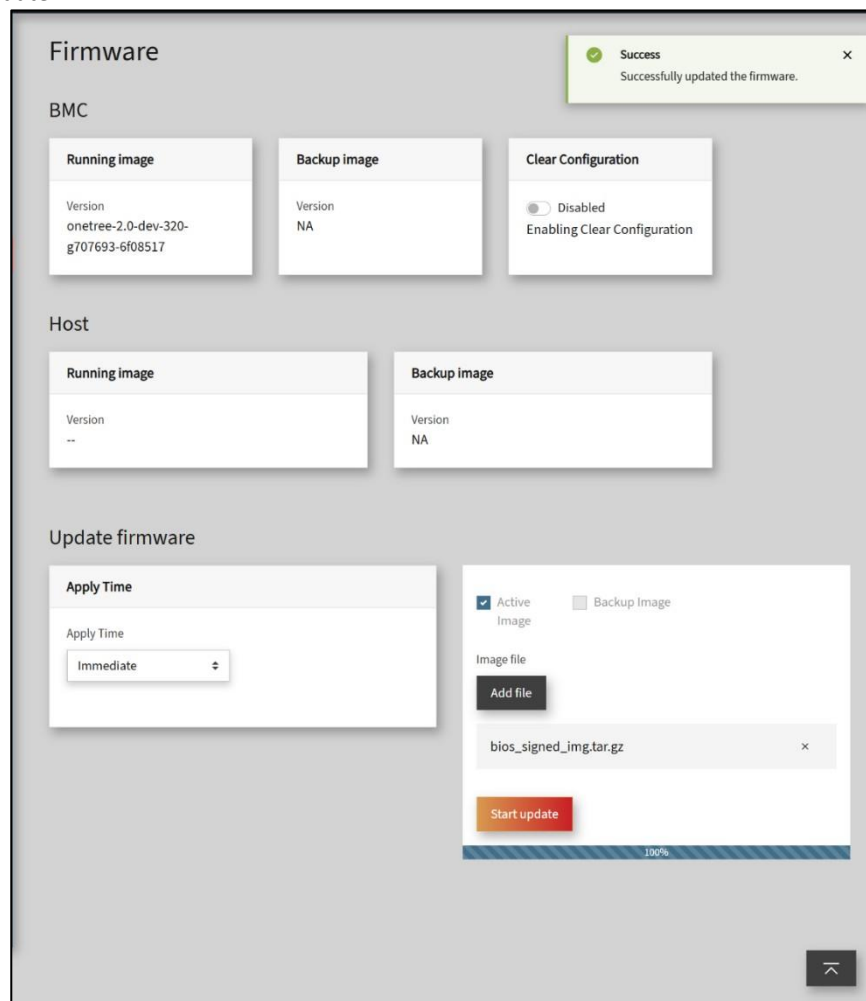


Figure 244 Success Message

- BIOS Firmware updated successfully, and success message will be popup.

26.3.6 BIOS FW Update with Preserve Configuration

1. Add JSON file based on configuration start address and length with the filename as `/tmp/preserveBIOS.json`
2. To check whether the configuration is preserved properly, manually have to update particular address binary and validate the preserved configuration *Note:*

We have created a ticket in IPS (Intel technical support) to access BIOS SPI from BMC to check preserve configuration.

We have validated in `ast2600evb` it has `pnor` mtd partition

In some EVB boards pnor partition has different data, so try to update pnor partition with BIOS binary and try below test steps to validate feature.

```
root@intel-obmc:/tmp# nanddump -a -s 0x01800000 -l 40 /dev/mtd6
```

ECC failed: 0

ECC corrected: 0

Number of bad blocks: 0

Number of bbt blocks: 0

Block size 65536, page size 1, OOB size 0

Dumping data starting at 0x01800000 and ending at

0x01800028... root@intel-obmc:/tmp# nandwrite -s

0x01800000 /dev/mtd6 test.bin Writing data to block 384 at

offset 0x1800000

```
root@intel-obmc:/tmp# nanddump -a -s 0x01800000 -l 40 /dev/mtd6
```

ECC failed: 0

ECC corrected: 0

Number of bad blocks: 0

Number of bbt blocks: 0

Block size 65536, page size 1, OOB size 0

Dumping data starting at 0x01800000 and ending at 0x01800028...

```
! !# !11#0013" 10#31 root@intel-obmc:/tmp# root@intel-
```

```
obmc:/tmp#
```

26.3.7 Update BIOS FW via Redfish

```
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/image-signing-tool/image-signing-tool$ export
bmc=10.0.97.205 msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/image-signing-tool/image-signing-tool$
export imgpt=enc-biosvalid.tar.gz msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/image-signing-
tool/image-signing-tool$ curl -k -H "Content-Type: application/octet-stream" -T ${imgpt} -X
POST
```

https://root:OpenBmc@\${bmc}/redfish/v1/UpdateService/update

```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/4",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "4",
  "TaskState": "New",
  "error": {
    "@Message.ExtendedInfo": [
      {
        "@odata.type": "#Message.v1_1_1.Message",
        "Message": "The request completed successfully.",
        "MessageArgs": [],
        "MessageId": "Base.1.16.0.Success",
        "MessageSeverity": "OK",
        "Resolution": "None"
      }
    ],
    "code": "Base.1.16.0.Success",
    "message": "The request completed successfully."
  }
}
```

```
}msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/image-signing-tool/image-signing-tool$ curl -k
https://root:OpenBmc@${bmc}/redfish/v1/TaskService/Tasks/4
```

```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/4",
  "@odata.type": "#Task.v1_4_3.Task",
  "HidePayload": false,
  "Id": "4",
  "Messages": [
    {
      "@odata.type": "#Message.v1_1_1.Message",
```

```

"Message": "The task with Id '4' has started.",
"MessageArgs": [
  "4"
],
"MessageId": "TaskEvent.1.0.3.TaskStarted",
"MessageSeverity": "OK",
"Resolution": "None."
},
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The task with Id '4' has changed to progress 10 percent complete.",
"MessageArgs": [
  "4",
  "10"
],
"MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
"MessageSeverity": "OK",
"Resolution": "None."
},
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The task with Id '4' has changed to progress 30 percent complete.",
"MessageArgs": [
  "4",
  "30"
],
"MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
"MessageSeverity": "OK",
"Resolution": "None."
},
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The task with Id '4' has changed to progress 40 percent complete.",
"MessageArgs": [
  "4",
  "40"

```

```

    ],
    "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
    "MessageSeverity": "OK",
    "Resolution": "None."
  },
  {
    "@odata.type": "#Message.v1_1_1.Message",
    "Message": "The task with Id '4' has changed to progress 50 percent complete.",
    "MessageArgs": [
      "4",
      "50"
    ],
    "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
    "MessageSeverity": "OK",
    "Resolution": "None."
  },
  {
    "@odata.type": "#Message.v1_1_1.Message",
    "Message": "The task with Id '4' has changed to progress 60 percent complete.",
    "MessageArgs": [
      "4",
      "60"
    ],
    "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
    "MessageSeverity": "OK",
    "Resolution": "None."
  }
],
"Name": "Task 4",
"Payload": {
  "HttpHeaders": [],
  "HttpOperation": "POST",
  "JsonBody": "null",
  "TargetUri": "/redfish/v1/UpdateService/update"
},
"PercentComplete": 60,

```

```
"StartTime": "2024-07-18T14:46:36+00:00",  
"TaskMonitor": "/redfish/v1/TaskService/Tasks/4/Monitor",  
"TaskState": "New"  
}
```

BMC Log:

```
root@intel-obmc:/tmp# journalctl -f | grep -e fwupd -e phosphor-image-updater  
Jul 18 14:35:20 intel-obmc phosphor-image-updater[494]: BMC image activating - BMC reboots are disabled.  
Jul 18 14:35:20 intel-obmc systemd[1]: Starting Latest Flash BMC with fwupd script : bd2a8171_216277563...  
Jul 18 14:35:20 intel-obmc fwupd[2405]: path=bd2a8171_216277563  
Jul 18 14:35:25 intel-obmc fwupd[2405]: PROTO=file  
Jul 18 14:35:25 intel-obmc fwupd[2405]: REMOTE=/tmp/images/bd2a8171_216277563/MANIFEST  
Jul 18 14:35:25 intel-obmc fwupd[2405]: REMOTE_HOST=  
Jul 18 14:35:25 intel-obmc fwupd[2405]: REMOTE_PATH=tmp/images/bd2a8171_216277563/MANIFEST  
Jul 18 14:35:25 intel-obmc fwupd[2405]: Download 'tmp/images/bd2a8171_216277563/MANIFEST' from file  
tmp/images/bd2a8171_216277563/MANIFEST  
Jul 18 14:35:25 intel-obmc fwupd[2405]: METAFILE_PATH=/tmp/images/bd2a8171_216277563/MANIFEST  
Jul 18 14:35:25 intel-obmc fwupd[2405]: Check firmware update priority  
Jul 18 14:35:25 intel-obmc fwupd[2405]: Updating image /tmp/images/bd2a8171_216277563/image-bios  
Jul 18 14:35:25 intel-obmc fwupd[2405]: IFWI Full Flash - 64MB full SPI update request  
Jul 18 14:35:25 intel-obmc fwupd[2405]: mtdPart=mtd6  
Jul 18 14:35:25 intel-obmc fwupd[2405]: BIOS Full Flash - Start Preserve Config  
Jul 18 14:35:25 intel-obmc fwupd[2480]: ECC failed: 0  
Jul 18 14:35:25 intel-obmc fwupd[2480]: ECC corrected: 0  
Jul 18 14:35:25 intel-obmc fwupd[2480]: Number of bad blocks: 0  
Jul 18 14:35:25 intel-obmc fwupd[2480]: Number of bbt blocks: 0  
Jul 18 14:35:25 intel-obmc fwupd[2480]: Block size 65536, page size 1, OOB size 0  
Jul 18 14:35:25 intel-obmc fwupd[2480]: Dumping data starting at 0x01800000 and ending at 0x01880000...  
Jul 18 14:35:30 intel-obmc fwupd[2405]: BIOS NVRAM Configs Preserved successfully  
Jul 18 14:35:30 intel-obmc fwupd[2492]: ECC failed: 0  
Jul 18 14:35:30 intel-obmc fwupd[2492]: ECC corrected: 0  
Jul 18 14:35:30 intel-obmc fwupd[2492]: Number of bad blocks: 0  
Jul 18 14:35:30 intel-obmc fwupd[2492]: Number of bbt blocks: 0  
Jul 18 14:35:30 intel-obmc fwupd[2492]: Block size 65536, page size 1, OOB size 0  
Jul 18 14:35:30 intel-obmc fwupd[2492]: Dumping data starting at 0x01880000 and ending at 0x01900000...  
Jul 18 14:35:35 intel-obmc fwupd[2405]: BIOS NVRAM_BACKUP Configs Preserved successfully  
Jul 18 14:35:35 intel-obmc fwupd[2405]: IFWI Full Flash - Starting the SPI write. It will take ~5 minutes....
```


Jul 18 14:36:58 intel-obmc fwupd[2493]: File does not seem to match flash data. First mismatch at 0x00000000x00010000

Jul 18 14:36:58 intel-obmc fwupd[2405]: IFWI Full Flash - Image update successful

Jul 18 14:37:13 intel-obmc fwupd[2514]: Writing data to block 384 at offset 0x1800000

Jul 18 14:37:13 intel-obmc fwupd[2514]: Writing data to block 385 at offset 0x1810000

Jul 18 14:37:13 intel-obmc fwupd[2514]: Writing data to block 386 at offset 0x1820000

Jul 18 14:37:13 intel-obmc fwupd[2514]: Writing data to block 387 at offset 0x1830000

Jul 18 14:37:13 intel-obmc fwupd[2514]: Writing data to block 388 at offset 0x1840000

Jul 18 14:37:13 intel-obmc fwupd[2514]: Writing data to block 389 at offset 0x1850000

Jul 18 14:37:13 intel-obmc fwupd[2514]: Writing data to block 390 at offset 0x1860000

Jul 18 14:37:13 intel-obmc fwupd[2514]: Writing data to block 391 at offset 0x1870000

Jul 18 14:37:13 intel-obmc fwupd[2405]: BIOS Full Flash - restore NVRAM Configs Preserved successfully

Jul 18 14:37:29 intel-obmc fwupd[2524]: Writing data to block 392 at offset 0x1880000

Jul 18 14:37:29 intel-obmc fwupd[2524]: Writing data to block 393 at offset 0x1890000 Jul 18 14:37:29 intel-obmc fwupd[2524]: Writing data to block 394 at offset 0x18a0000

Jul 18 14:37:29 intel-obmc fwupd[2524]: Writing data to block 395 at offset 0x18b0000 Jul 18 14:37:29 intel-obmc fwupd[2524]: Writing data to block 396 at offset 0x18c0000

Jul 18 14:37:29 intel-obmc fwupd[2524]: Writing data to block 397 at offset 0x18d0000

Jul 18 14:37:29 intel-obmc fwupd[2524]: Writing data to block 398 at offset 0x18e0000

Jul 18 14:37:29 intel-obmc fwupd[2524]: Writing data to block 399 at offset 0x18f0000

Jul 18 14:37:29 intel-obmc fwupd[2405]: BIOS Full Flash - restore NVRAM_BACKUP Configs Preserved successfully

Jul 18 14:37:29 intel-obmc fwupd[2529]: /usr/bin/fwupd.sh: line 259: logger-systemd: command not found

Jul 18 14:37:29 intel-obmc fwupd[2405]: remove called

Jul 18 14:37:29 intel-obmc systemd[1]: fwupd@bd2a8171_216277563.service: Deactivated successfully.

Jul 18 14:37:29 intel-obmc systemd[1]: Finished Latest Flash BMC with fwupd script : bd2a8171_216277563.

Jul 18 14:37:29 intel-obmc systemd[1]: fwupd@bd2a8171_216277563.service: Consumed 2min 8.031s CPU time.

Jul 18 14:37:29 intel-obmc phosphor-image-updater[494]: BMC activation has ended - BMC reboots are re-enabled.

26.3.8 Check the Preserved Configuration

- Check the Updated address it preserved the configuration

Jul 18 15:11:48 intel-obmc systemd[1]: Finished Latest Flash BMC with fwupd script : 36f75e22_1966131285.

Jul 18 15:11:48 intel-obmc systemd[1]: fwupd@36f75e22_1966131285.service: Consumed 1min 26.040s CPU time.

Jul 18 15:11:48 intel-obmc phosphor-image-updater[494]: BMC activation has ended - BMC reboots are re-enabled.

^C

root@intel-obmc:/tmp# nanddump -a -s 0x01800000 -l 40 /dev/mtd6

ECC failed: 0

ECC corrected: 0

Number of bad blocks: 0

Number of bbt blocks: 0

Block size 65536, page size 1, OOB size 0

Dumping data starting at 0x01800000 and ending at 0x01800028...

! !# !13#0013" 10#31 root@intel-obmc:/tmp#

26.3.9 ClearConfig for BIOS FW update

- Set ClearConfig as true to clear the configuration for BIOS FW update

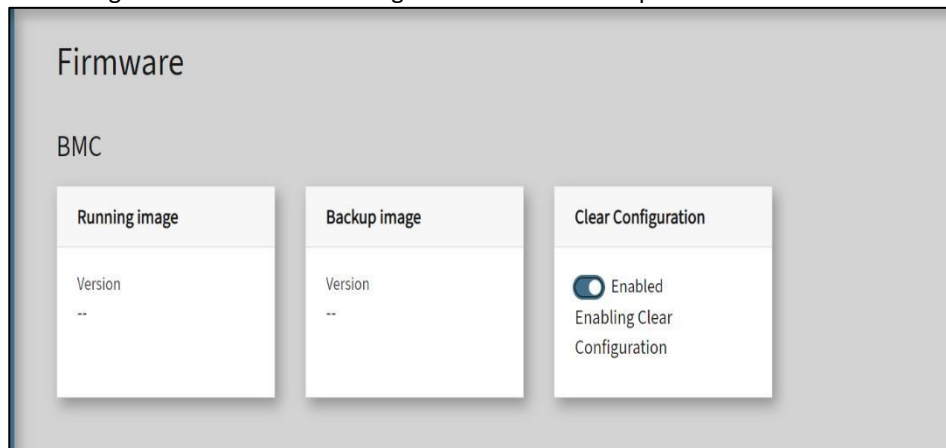


Figure 245 Clear Config

26.3.10 Check the update service call

- Check the update service call to check that ClearConfig is set to be true

```
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/image-signing-tool/image-signing-tool$ curl -k https://root:OpenBmc@${bmc}/redfish/v1/UpdateService
```

```
{
  "@odata.id": "/redfish/v1/UpdateService",
  "@odata.type": "#UpdateService.v1_11_1.UpdateService",
  "Actions": {
    "#UpdateService.SimpleUpdate": {
      "TransferProtocol@Redfish.AllowableValues": [
        "HTTPS"
      ],
      "target": "/redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate"
    }
  },
  "Description": "Service for Software Update",
  "FirmwareInventory": {
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
  },
  "HttpPushUri": "/redfish/v1/UpdateService/update",
  "HttpPushUriOptions": {
    "HttpPushUriApplyTime": {
      "ApplyTime": "Immediate",
      "ApplyTime@Redfish.AllowableValues": [
        "Immediate",
        "OnReset",
        "AtMaintenanceWindowStart",
        "InMaintenanceWindowOnReset"
      ],
    },
    "MaintenanceWindowDurationInSeconds": 0,
    "MaintenanceWindowStartTime": "1970-01-01T00:00:00+00:00"
  },
  "HttpPushUriTargets": [],
}
```

```
"HttpPushUriTargetsBusy": false,
"Id": "UpdateService",
"MaxImageSizeBytes": 134217728,
"MultipartHttpPushUri": "/redfish/v1/UpdateService/update",
"Name": "Update Service",
"Oem": {
  "ApplyOptions": {
    "@odata.type": "#OemUpdateService.ApplyOptions",
    "ClearConfig": true
  }
},
"ServiceEnabled": true
}
```

26.3.11 Update BIOS FW via redfish

```
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/image-signing-tool/image-signing-tool$ curl -k -H  
"Content-Type: application/octet-stream" -T ${imgpt} -X POST
```

[https://root:OpenBmc@\\${bmc}/redfish/v1/UpdateService/update](https://root:OpenBmc@${bmc}/redfish/v1/UpdateService/update)

```
{  
  "@odata.id": "/redfish/v1/TaskService/Tasks/7",  
  "@odata.type": "#Task.v1_4_3.Task",  
  "Id": "7",  
  "TaskState": "New",  
  "error": {  
    "@Message.ExtendedInfo": [  
      {  
        "@odata.type": "#Message.v1_1_1.Message",  
        "Message": "The request completed successfully.",  
        "MessageArgs": [],  
        "MessageId": "Base.1.16.0.Success",  
        "MessageSeverity": "OK",  
        "Resolution": "None"  
      }  
    ],  
    "code": "Base.1.16.0.Success",  
    "message": "The request completed successfully."  
  }  
}
```

BMC Log:

```
root@intel-obmc:/tmp# nanddump -a -s 0x01800000 -l 40 /dev/mtd6  
ECC failed: 0  
ECC corrected: 0  
Number of bad blocks: 0  
Number of bbt blocks: 0  
Block size 65536, page size 1, OOB size 0  
Dumping data starting at 0x01800000 and ending at 0x01800028...  
! # !11#0013" 10#31 root@intel-obmc:/tmp#  
root@intel-obmc:/tmp# journalctl -f | grep -e fwupd -e phosphor-image-updater
```

Jul 18 15:10:22 intel-obmc phosphor-image-updater[494]: Unable to find publickey in existing image
Jul 18 15:10:22 intel-obmc phosphor-image-updater[494]: Missing Signature configuration data in system
Jul 18 15:10:22 intel-obmc phosphor-image-updater[494]: The operation failed internally.
Jul 18 15:10:22 intel-obmc phosphor-image-updater[494]: Signature Validation failed for image version.
Jul 18 15:10:22 intel-obmc phosphor-image-updater[494]: BMC image activating - BMC reboots are disabled.
Jul 18 15:10:22 intel-obmc systemd[1]: Starting Latest Flash BMC with fwupd script : 36f75e22_1966131285...
Jul 18 15:10:22 intel-obmc fwupd[3137]: path=36f75e22_1966131285
Jul 18 15:10:26 intel-obmc fwupd[3137]: PROTO=file
Jul 18 15:10:26 intel-obmc fwupd[3137]: REMOTE=/tmp/images/36f75e22_1966131285/MANIFEST
Jul 18 15:10:26 intel-obmc fwupd[3137]: REMOTE_HOST=
Jul 18 15:10:26 intel-obmc fwupd[3137]: REMOTE_PATH=tmp/images/36f75e22_1966131285/MANIFEST
Jul 18 15:10:26 intel-obmc fwupd[3137]: Download 'tmp/images/36f75e22_1966131285/MANIFEST' from file tmp/images/36f75e22_1966131285/MANIFEST
Jul 18 15:10:26 intel-obmc fwupd[3137]: METAFILE_PATH=/tmp/images/36f75e22_1966131285/MANIFEST
Jul 18 15:10:27 intel-obmc fwupd[3137]: Check firmware update priority
Jul 18 15:10:27 intel-obmc fwupd[3137]: Updating image /tmp/images/36f75e22_1966131285/image-bios
Jul 18 15:10:27 intel-obmc fwupd[3137]: IFWI Full Flash - 64MB full SPI update request
Jul 18 15:10:27 intel-obmc fwupd[3137]: mtdPart=mtd6
Jul 18 15:10:27 intel-obmc fwupd[3137]: BIOS Full Flash - Not Preserved the Config
Jul 18 15:10:27 intel-obmc fwupd[3137]: IFWI Full Flash - Starting the SPI write. It will take ~5 minutes....
Jul 18 15:11:48 intel-obmc fwupd[3199]: File does not seem to match flash data. First mismatch at 0x000000000x00010000
Jul 18 15:11:48 intel-obmc fwupd[3137]: IFWI Full Flash - Image update successful
Jul 18 15:11:48 intel-obmc fwupd[3209]: /usr/bin/fwupd.sh: line 274: logger-systemd: command not found
Jul 18 15:11:48 intel-obmc fwupd[3137]: remove called
Jul 18 15:11:48 intel-obmc systemd[1]: fwupd@36f75e22_1966131285.service: Deactivated successfully.
Jul 18 15:11:48 intel-obmc systemd[1]: Finished Latest Flash BMC with fwupd script : 36f75e22_1966131285.
Jul 18 15:11:48 intel-obmc systemd[1]: fwupd@36f75e22_1966131285.service: Consumed 1min 26.040s CPU time.
Jul 18 15:11:48 intel-obmc phosphor-image-updater[494]: BMC activation has ended - BMC reboots are re-enabled.
^C
root@intel-obmc:/tmp# nanddump -a -s 0x01800000 -l 40 /dev/mtd6
ECC failed: 0
ECC corrected: 0
Number of bad blocks: 0

Number of bbt blocks: 0

Block size 65536, page size 1, OOB size 0

Dumping data starting at 0x01800000 and ending at 0x01800028...

!	!#	!13#0013"	10#31	root@intel-obmc:/tmp#
---	----	-----------	-------	-----------------------

26.3.12 Check Configuration

- Check Same address binary will be changed to old state root@intel-

```
obmc:/tmp# nanddump -a -s 0x01800000 -l 40 /dev/mtd6
```

ECC failed: 0

ECC corrected: 0

Number of bad blocks: 0

Number of bbt blocks: 0

Block size 65536, page size 1, OOB size 0

Dumping data starting at 0x01800000 and ending at 0x01800028...

```
! !# !13#0013" 10#31 root@intel-obmc:/tmp#
```

26.4 Inband IPMI Firmware Update Support

26.4.1 Building and using the Host tool

Clone the needed open-source repositories and build the host tool to initiate the IPMI inband flashing.

Refer the below link to build the host tool.

<https://github.com/openbmc/phosphor-ipmi-flash#building-and-using-the-host-tool>

Once the build tool gets installed successfully, we will get the following `burn_my_bmc` binary in the `phosphor-ipmiflash/tools` location. Which is the binary we are going to use for IPMI inband BMC firmware update.

```
msgubuntu@MSG-3:~/dinesh/ipmiTool/phosphor-ipmi-flash/tools$  
msgubuntu@MSG-3:~/dinesh/ipmiTool/phosphor-ipmi-flash/tools$  
msgubuntu@MSG-3:~/dinesh/ipmiTool/phosphor-ipmi-flash/tools$ ls  
bt.cpp          handler.hpp     io.hpp          libup  
bt.hpp          helper.cpp      libupdater_la  libup  
burn_my_bmc     helper.hpp      libupdater_la-bt.lo  libup  
burn_my_bmc-main.o  interface.hpp  libupdater_la-bt.o   libup  
handler.cpp      io.cpp         libupdater_la-handler.lo  libup  
msgubuntu@MSG-3:~/dinesh/ipmiTool/phosphor-ipmi-flash/tools$  
msgubuntu@MSG-3:~/dinesh/ipmiTool/phosphor-ipmi-flash/tools$
```

26.4.2 Testing – BMC Flash

Step 1: Copy the BMC image to the host machine (ex. *intel-platforms-image-update-full-intel-ast260020230830104228.tar*)

Step 2: Untar the image and we will have below files.

```
ac-osp@acosp-ArcherCityM:/home/ddd$ ls -lh imageFiles
total 65M
-rw-r--r-- 1 ac-osp ac-osp 64M Aug 30 06:44 image-bmc
-rw-r--r-- 1 ac-osp ac-osp 128 Aug 30 06:44 image-bmc.sig
-rw-r--r-- 1 ac-osp ac-osp 128 Aug 30 06:44 image-full.sig
-rw-r--r-- 1 ac-osp ac-osp 169 Aug 30 06:44 MANIFEST
-rw-r--r-- 1 ac-osp ac-osp 128 Aug 30 06:44 MANIFEST.sig
-rw-r--r-- 1 ac-osp ac-osp 272 Aug 30 06:44 publickey
-rw-r--r-- 1 ac-osp ac-osp 128 Aug 30 06:44 publickey.sig
ac-osp@acosp-ArcherCityM:/home/ddd$
```

Step 3: Execute the following command to Initiate the BMC firmware update via IPMI inband

```
./burn_my_bmc --command update --interface ipminet --image <bmc_image_to_update> --sig <image-bmc.sig file from untar> --type tarball --host <host_ip> --ignore-update
```

Note:

- Type tarball for EGS and BHS bmc firmware update
- Type image for AST2600 bmc firmware update Example:

```
sudo ./burn_my_bmc --command update --interface ipminet --image intel-platforms-image-update-fullintel-ast2600-20230830104228.tar --sig image-bmc.sig --type tarball --host 172.31.4.160 --ignore-update
```

Step 4: After executing the burn_my_bmc command, the firmware update will be start.

```
[root@ami16e2a26c66c3 egs]# ./burn_my_bmc --command update --interface ipminet --host 172.31.4.23 --image intel-pla
tforms-image-update-full-intel-ast2600-20230913061053.tar --sig image-bmc.sig --type tarball --ignore-update
Sending over the firmware image.
Progress: 100.00%
Sending over the hash file.
Progress: 100.00%
Opening the verification file
Committing to /flash/verify to trigger service
Calling stat on /flash/verify session to check status
success
Returned success
succeeded
Opening the update file
Committing to /flash/update to trigger service
succeeded
[root@ami16e2a26c66c3 egs]#
```

Step 5: After the burn_my_bmc command success, we can be able to see the firmware update started in the BMC by journalctl prints.

And after that, the BMC will reboot automatically.

26.4.3 Test Results – BMC Flash

BMC firmware version before firmware update.

BMC firmware version after firmware update

26.4.4 Testing – CPLD Flash

Step 1: Connect the CPLD device to the inband enabled BMC

Step 2: Copy the CPLD image to the host machine.

```
msgubuntu@MSG-3:~/dinesh/gitTool/images$ ls -ltr
total 52
-rw-rw-r-- 1 msgubuntu msgubuntu 13770 Dec 22 18:16 obmc-cpld-sign-87654321_xo3.tar.gz
-rw-rw-r-- 1 msgubuntu msgubuntu 13761 Dec 22 18:16 obmc-cpld-sign-12345678_xo3.tar.gz
drwxrwxr-x 2 msgubuntu msgubuntu 4096 Dec 22 18:20 image1
```

Step 3: Untar the CPLD image and we will have following files.

```
images/image1$ ls -ltr
128 Nov 30 21:59 publickey.sig
272 Nov 30 21:59 publickey
128 Nov 30 21:59 MANIFEST.sig
147 Nov 30 21:59 MANIFEST
128 Nov 30 21:59 image-cpld.sig
2097666 Nov 30 21:59 image-cpld
```

Step 4: Execute the firmware update command using the tool “burn_my_bmc”

Example:

```
sudo ./burn_my_bmc --command update --interface ipminet --image obmc-cpld-sign-12345678_xo3.tar.gz -
sig image-cpld.sig --type tarball --ignore-update --host xx.x.xx.xxx
```

Step 5: The BMC will start updating the CPLD firmware.

26.4.5 Test Results – CPLD Flash

After the `burn_my_bmc` command success, we can check the BMC log prints related to the CPLD firmware update.

```
msgubuntu@MSG-3:~/dinesh/gitTool/ipmi-flash-tools$ sudo ./burn_my_bmc --command update --interface ipminet --image ../images/obmc-cpld-sign-12345678_xo3.tar.gz --sig ../images/image1/image-cpld.sig --type tarball --ignore-update --host 10.0.97.208
[sudo] password for msgubuntu:
Sending over the firmware image.
Progress: 100.00%
Sending over the hash file.
Progress: 100.00%
Opening the verification file
Committing to /flash/verify to trigger service
Calling stat on /flash/verify session to check status
success
Returned success
succeeded
Opening the update file
Committing to /flash/update to trigger service
succeeded
msgubuntu@MSG-3:~/dinesh/gitTool/ipmi-flash-tools$
```

```
Dec 22 14:58:47 intel-obmc ipmid[442]: Triggered phosphor-ipmi-flash-bmc-prepare.target mode replace: /org/freedesktop/systemd1/job/1450
Dec 22 14:58:47 intel-obmc systemd[1]: Reached target Phosphor-ipmi-flash Prepare BMC to receive update.
Dec 22 14:58:47 intel-obmc ipmid[442]: Job Finished phosphor-ipmi-flash-bmc-prepare.target /org/freedesktop/systemd1/job/1450: done
Dec 22 14:58:47 intel-obmc ipmid[442]: Triggered phosphor-ipmi-flash-bmc-verify.target mode replace: /org/freedesktop/systemd1/job/1452
Dec 22 14:58:47 intel-obmc systemd[1]: Reached target Phosphor-ipmi-flash verify the image contents.
Dec 22 14:58:47 intel-obmc ipmid[442]: Job Finished phosphor-ipmi-flash-bmc-verify.target /org/freedesktop/systemd1/job/1452: done
Dec 22 14:58:47 intel-obmc ipmid[442]: Triggered fwupd@-tmp-image.tar.service mode replace: /org/freedesktop/systemd1/job/1454
Dec 22 14:58:47 intel-obmc systemd[1]: Created slice Slice /system/fwupd.
Dec 22 14:58:47 intel-obmc systemd[1]: Starting Latest Flash BMC with fwupd script : /tmp/image.tar...
Dec 22 14:58:47 intel-obmc ipmid[442]: Canceled fwupd@-tmp-image.tar.service: /org/freedesktop/systemd1/job/1454
Dec 22 14:58:47 intel-obmc ipmid[442]: Job Finished fwupd@-tmp-image.tar.service /org/freedesktop/systemd1/job/1454: canceled
Dec 22 14:58:47 intel-obmc fwupd[729]: path=/tmp/image.tar
Dec 22 14:58:47 intel-obmc fwupd[734]: MANIFEST
Dec 22 14:58:47 intel-obmc fwupd[734]: publicKey
Dec 22 14:58:47 intel-obmc fwupd[734]: image-cpld
Dec 22 14:58:47 intel-obmc fwupd[734]: image-cpld.sig
Dec 22 14:58:47 intel-obmc fwupd[734]: MANIFEST.sig
Dec 22 14:58:47 intel-obmc fwupd[734]: publicKey.sig
Dec 22 14:58:47 intel-obmc fwupd[729]: PROTO=file
Dec 22 14:58:47 intel-obmc fwupd[729]: REMOTE=/tmp/updateImage/MANIFEST
Dec 22 14:58:47 intel-obmc fwupd[729]: REMOTE_HOST=
Dec 22 14:58:47 intel-obmc fwupd[729]: REMOTE_PATH=/tmp/updateImage/MANIFEST
Dec 22 14:58:47 intel-obmc fwupd[729]: Download 'tmp/updateImage/MANIFEST' from file tmp/updateImage/MANIFEST
Dec 22 14:58:47 intel-obmc fwupd[729]: METAFILE_PATH=/tmp/updateImage/MANIFEST
Dec 22 14:58:47 intel-obmc fwupd[729]: Updating image /tmp/updateImage/image-cpld
Dec 22 14:58:47 intel-obmc fwupd[729]: BMC CPLD Flash update request
Dec 22 14:58:47 intel-obmc fwupd[729]: cpld full flash called
Dec 22 14:58:47 intel-obmc fwupd[729]: CPLD Flash - Starting the cpld write....
Dec 22 14:58:47 intel-obmc fwupd[729]: issuing... cpld-tool -n /dev/jtag0 -p /tmp/updateImage/image-cpld
Dec 22 14:58:50 intel-obmc systemd-timesyncd[300]: Timed out waiting for reply from [2001:4860:4806::]:123 (time1.google.com).
Dec 22 14:58:50 intel-obmc systemd-timesyncd[300]: BMC time updated via NTP: New time=Fri 2023-12-22 14:58:50 UTC, Old time=Fri 2023-12-22 14:58:50 UTC
Dec 22 14:58:50 intel-obmc systemd-timesyncd[300]: Contacted time server 216.239.35.0:123 (time1.google.com).
Dec 22 14:58:50 intel-obmc systemd-timesyncd[300]: Initial clock synchronization to Fri 2023-12-22 14:58:50.649197 UTC.
Dec 22 15:00:05 intel-obmc fwupd[729]: CPLD Flash - Image update successful
Dec 22 15:00:05 intel-obmc fwupd[729]: cpld-tool -n /dev/jtag0 -u
Dec 22 15:00:05 intel-obmc fwupd[729]: CPLD Flash - USERCODE = 0x87654321
Dec 22 15:00:05 intel-obmc systemd[1]: fwupd@-tmp-image.tar.service: Deactivated successfully.
Dec 22 15:00:05 intel-obmc systemd[1]: fwupd@-tmp-image.tar.service: Consumed 21.584s CPU time.
^C
root@intel-obmc:~#
```

Able to update the CPLD firmware successfully using the IPMI inband flashing tool.

26.5 Preserve Configuration by Modules

Note: Below are Supported modules to preserve/clear configuration during firmware update

- SMTP
- SNMP
- SEL
- REDFISH
- AUTHENTICATION
- NETWORK
- U_Boot_Env
- SDR
- FRU
- KVM
- ServiceManager
- IPMI
- NTP
- SOL
- SYSLOG
- Boot_Override
- EXTLOG

Other than the above listed modules can be added dynamically by the respective module owners in the future, refer Design document to create/update entity manager json file For FRU:

The data stored in EEPROM will be persistent across reboot/Firmware update. eg: FRU in BHS platforms. In EGS, baseboard doesn't have EEPROM to store base board FRU, hence will be stored in binary file.

26.5.1 Add New Configuration

- Add new configuration and check preserve settings in Web UI.
- Add new user in User Management page.

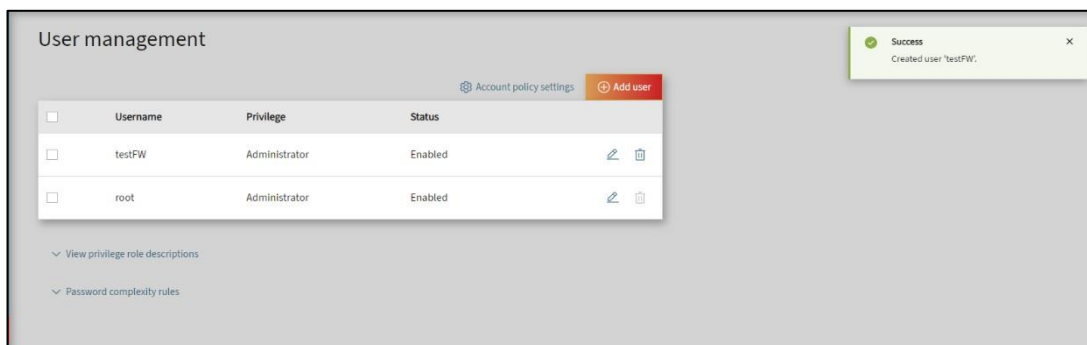


Figure 246 Add New Config

- Go to Preserve Configuration tab and select all check boxes or select required check box to preserve Configuration by modules.

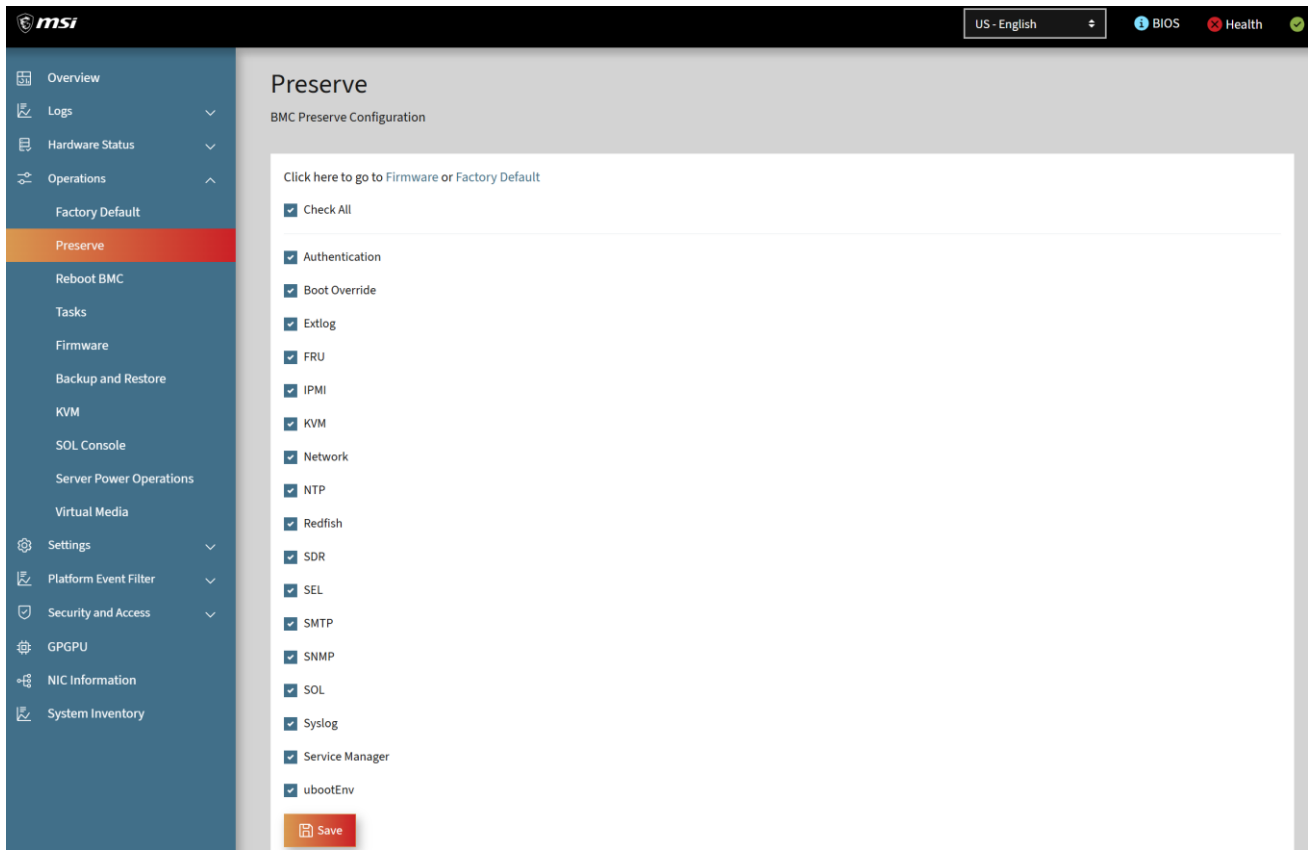


Figure 247 Preserve

26.5.2 Update BMC Image

- Update BMC FW image via redfish call.
- Use curl command to update BMC Firmware update. msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/metacommon/recipes-ami/image-tar-tool\$ export bmc=10.0.98.132 msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/metacommon/recipes-ami/image-tar-tool\$ export token=`curl -k -H "Content-Type: application/json" -X POST https://\$bmc/login -d '{"username": "root", "password": "OpenBmc"}' | grep token | awk '{print \$2;}' | tr -d '``

% Total % Received % Xferd Average Speed Time Time Time Current

Dload Upload Total Spent Left Speed

100 82 100 37 100 45 156 190 --:--:-- --:--:-- --:--:-- 347

```
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/metacommon/recipes-ami/image-tar-tool$ curl -k -H "X-Auth-Token: $token" -H "Content-Type: application/octet-stream" -X POST -T obmc-image-fb-2.tar.gz https://$bmc/redfish/v1/UpdateService/update
```

```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "1",
  "TaskState": "New",
  "TaskStatus": "OK"
}
```


BMC Log

```
Dec 09 06:07:23 AMIOT-b67b5ca52348 phosphor-image-updater[794]: BMC activation - BMC reboots are disabled.
Dec 09 06:07:26 AMIOT-b67b5ca52348 systemd[1]: Starting Latest Flash BMC with fwupd script: 075b12ba_1569402969...
Dec 09 06:07:26 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] Software object: /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] Manifest purpose: BMC
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] Detected component: bmc
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] Image selected: /tmp/images/075b12ba_1569402969/image-bmc
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] Check firmware update priority
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] ALLowed: No conflicting firmware updates in progress
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5162]: [INFO] Push-URI targets (raw): bmc_active
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] Push-URI targets (received): bmc_active
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5171]: [INFO] Valid targets (Purpose=BMC): bmc_active
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] Invalid targets (Purpose=BMC): bmc_active
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] === BMC prepare ===
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] SCRIPT: /usr/libexec/fwupd/prepare-bmc.sh
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] set_task_status(Starting): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] set_progress(40): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: BootOverride (paths=3)
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: EXTLOG (paths=1)
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: IPMI (paths=1)
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: NETWORK (paths=7)
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: NTP (paths=5)
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: SDR (paths=1)
Dec 09 06:07:27 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: SYSLOG (paths=8)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: U_BOOT_ENV (requested=0, kept=0)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] BMC Full Flash - Backup u-boot-env partition
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] U-Boot env backed up to /tmp/u-boot-env.bin (mtd2, size=131072B)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: AUTHENTICATION (paths=19)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: FRU (paths=1)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: KVM (paths=3)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve ENABLED: LicenseControl (requested=4, kept=4)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: REDFISH (paths=1)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: SDR (paths=1)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: SEL (paths=4)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: SMT (paths=2)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: SNMP (paths=8)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve DISABLED: ServiceManager (paths=1)
Dec 09 06:07:28 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] Preserve summary: DISABLED => BootOverride EXTLOG IPMI NETWORK NTP SOL SYSLOG AUTHENTICATION FRU KVM REDFISH SDR SEL SMT SNMP ServiceManager
Dec 09 06:07:29 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] set_progress(50): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] set_progress(50): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMIOT-b67b5ca52348 fwupd[5185]: [INFO] prepare stage complete.
Dec 09 06:07:29 AMIOT-b67b5ca52348 fwupd[5498]: [INFO] === BMC update ===
Dec 09 06:07:29 AMIOT-b67b5ca52348 fwupd[5498]: [INFO] set_task_status(Starting): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMIOT-b67b5ca52348 fwupd[5498]: [INFO] set_progress(40): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMIOT-b67b5ca52348 fwupd[5498]: [INFO] SCRIPT: /usr/libexec/fwupd/flash-bmc.sh /tmp/images/075b12ba_1569402969 /tmp/images/075b12ba_1569402969/image-bmc_bmc_active
Dec 09 06:08:35 AMIOT-b67b5ca52348 fwupd[5540]: [INFO] diff blocks: 145
Dec 09 06:08:36 AMIOT-b67b5ca52348 fwupd[5517]: [INFO] Image update successful
Dec 09 06:08:36 AMIOT-b67b5ca52348 fwupd[5517]: [INFO] set_progress(100): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:36 AMIOT-b67b5ca52348 fwupd[5517]: [INFO] set_progress(100): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMIOT-b67b5ca52348 fwupd[5517]: [INFO] flash stage complete.
Dec 09 06:08:38 AMIOT-b67b5ca52348 fwupd[5498]: [INFO] set_progress(60): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMIOT-b67b5ca52348 fwupd[5498]: [INFO] set_progress(65): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMIOT-b67b5ca52348 fwupd[5498]: [INFO] set_task_status(Completed): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMIOT-b67b5ca52348 fwupd[5498]: [INFO] set_progress(100): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMIOT-b67b5ca52348 fwupd[5498]: [INFO] set_progress(100): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] === BMC cleanup ===
Dec 09 06:08:38 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] SCRIPT: /usr/libexec/fwupd/cleanup-bmc.sh
Dec 09 06:08:38 AMIOT-b67b5ca52348 fwupd[5561]: [INFO] IS UBOOT_ENABLED is true: restoring U-Boot env
Dec 09 06:08:38 AMIOT-b67b5ca52348 fwupd[5561]: [INFO] Restoring U-Boot env to /dev/mtd2 from /tmp/u-boot-env.bin
Dec 09 06:08:40 AMIOT-b67b5ca52348 fwupd[5561]: [INFO] subsystem: complete building xattr subsystem, 0 of xdatum (0 unchecked, 0 orphan) and 0 of xref (0 dead, 0 orphan) found.
Dec 09 06:08:40 AMIOT-b67b5ca52348 fwupd[5561]: [INFO] U-Boot env restore successful with flashcp (/dev/mtd2)
Dec 09 06:08:40 AMIOT-b67b5ca52348 fwupd[5561]: [INFO] nfs mount /run/initialramfs/rw has unknown backing device:
Dec 09 06:08:40 AMIOT-b67b5ca52348 fwupd[5561]: [INFO] Found mtd partition: 5, attempting to mount as jffs2 to /tmp/.rwfs
Dec 09 06:08:40 AMIOT-b67b5ca52348 fwupd[5561]: [INFO] Calling cleanup_overlay with blacklist_and_sync with:
Dec 09 06:09:30 AMIOT-b67b5ca52348 fwupd[5561]: [INFO] Volatile overlay /sync completes: /run/initialramfs/rw/cow -> /tmp/.rwfs/cow
Dec 09 06:09:30 AMIOT-b67b5ca52348 fwupd[5561]: [INFO] Deleting files from blacklist: /tmp/blacklist
Dec 09 06:09:30 AMIOT-b67b5ca52348 fwupd[5561]: [INFO] Overlay cleanup complete (/sync + blacklist applied)
Dec 09 06:09:35 AMIOT-b67b5ca52348 fwupd[5138]: [INFO] clearing Push-URI targets and busy status
Dec 09 06:09:35 AMIOT-b67b5ca52348 systemd[1]: fwupd@075b12ba_1569402969.service: Deactivated successfully.
Dec 09 06:09:36 AMIOT-b67b5ca52348 systemd[1]: Finished Latest Flash BMC with fwupd script: 075b12ba_1569402969.
Dec 09 06:09:36 AMIOT-b67b5ca52348 systemd[1]: fwupd@075b12ba_1569402969.service: Consumed 1min 15.746s CPU time.
Dec 09 06:09:36 AMIOT-b67b5ca52348 phosphor-image-updater[794]: BMC activation has ended - BMC reboots are re-enabled.
[ OK ] Stopped Force reboot of the BMC.
[ OK ] Removed slice Slice/usr-systemd
```

26.5.3 Check Configuration are Preserved

- After BMC updated successfully Check BMC web UI to check configuration are preserved

```
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/meta-
common/recipes-ami/image-tar-tool$ curl -k
https://root:OpenBmc@${bmc}/redfish/v1/UpdateService/FirmwareInventory/bmc_active {
  "@odata.id":
  "/redfish/v1/UpdateService/FirmwareInventory/bmc_active",
  "@odata.type": "#SoftwareInventory.v1_1_0.SoftwareInventory",
  "Description": "BMC image",
  "Id": "bmc_active",
  "Name": "Software Inventory",
  "RelatedItem": [
    {
      "@odata.id": "/redfish/v1/Managers/bmc"
    }
  ],
  "RelatedItem@odata.count": 1,
  "Status": {
    "Health": "OK",
    "HealthRollup": "OK",
    "State": "Enabled"
  },
  "Updateable": true,
  "Version": "ot-1.1-dev-49-g328922-23baf18"
}
```

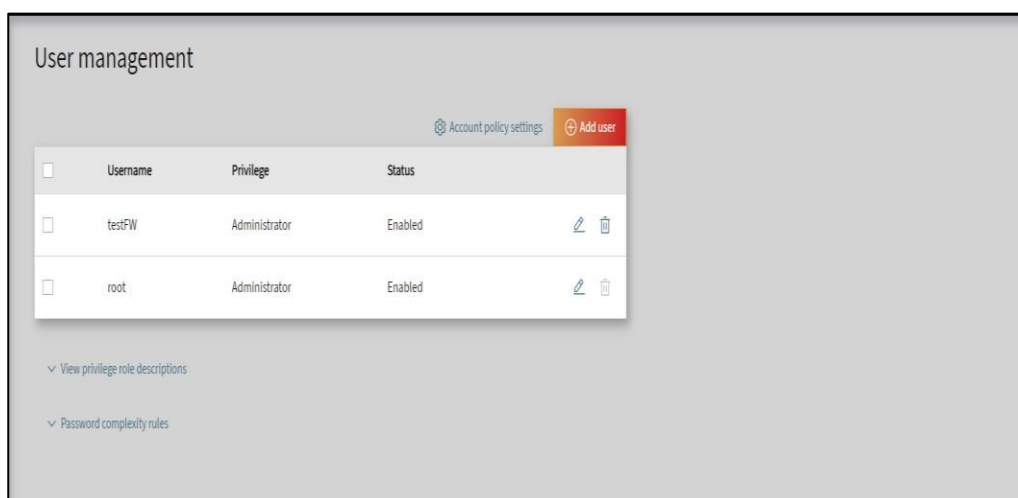


Figure 248 User Management

26.6 Clear Configuration

- Add new configuration in Web UI.

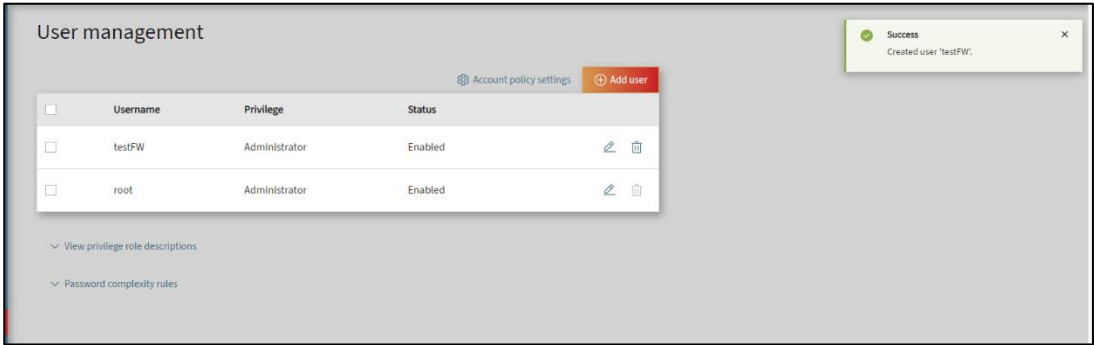


Figure 249 Clear Configuration

- Go to Clear Configuration tab and uncheck all check boxes or uncheck required check boxes to clear Configuration by modules.
- Selected/checked configuration will be preserved, and other configurations will be cleared during firmware update.

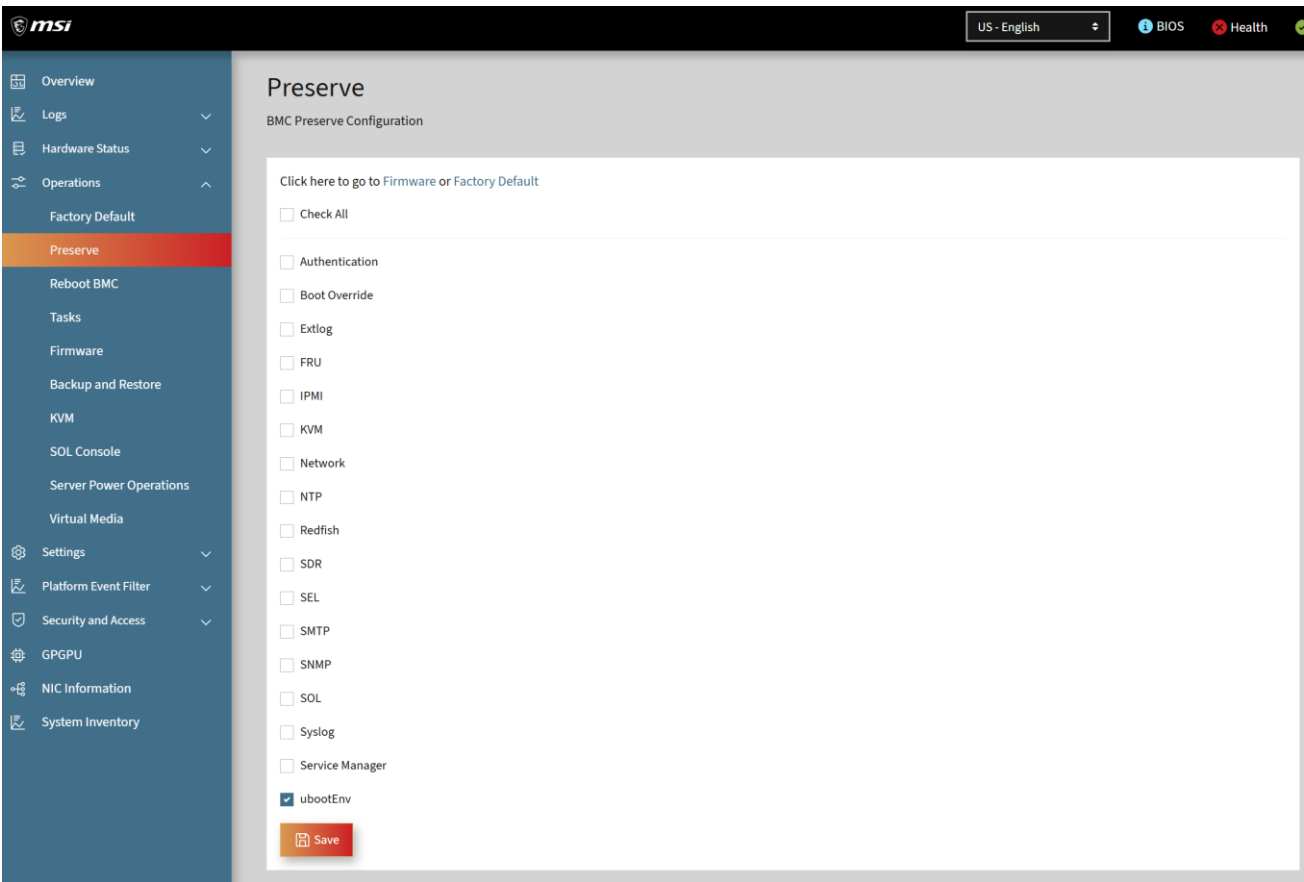


Figure 250 Preserve

26.6.1 Update BMC Firmware

- Update BMC firmware using redfish update service call

- Pass BMC tar image to update BMC Firmware service

```
msgubuntu@msgubuntu-OptiPlex-7000:~/kiruba/egs/onetree/meta-ami/metacommon/recipes-ami/image-tar-tool$ curl -k -H "X-Auth-Token: $token" -H "Content-Type: application/octet-stream" -X POST -T obmc-image-feb-1.tar.gz https://$bmc/redfish/v1/UpdateService/update
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "1",
  "TaskState": "New",
  "TaskStatus": "OK" }
```

BMC Log

```
Dec 09 06:07:25 AMI0T-b67b5ca52348 phosphor-image-updater[794]: BMC activation has ended - BMC reboots are re-enabled.
Dec 09 06:07:25 AMI0T-b67b5ca52348 phosphor-image-updater[794]: BMC image activating - BMC reboots are disabled.
Dec 09 06:07:26 AMI0T-b67b5ca52348 systemd[1]: Starting Latest Flash BMC with fwupd script: 075b12ba_1569402969...
Dec 09 06:07:26 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Software object: /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Has (test purpose): BMC
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Detected component: bmc
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Image selected: /tmp/images/075b12ba_1569402969/image-bmc
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Check firmware update priority
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Valid targets (Purpose=BMC): bmc_active
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Push-URI targets (raw): bmc_active
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Push-URI targets (received): bmc_active
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Validated targets (Purpose=BMC): bmc_active
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] ===== BMC prepare =====
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] SCRIPT: /usr/libexec/fwupd/prepare-bmc.sh
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] set_task_status(Starting): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] set_progress(40): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: Boot Override (paths=3)
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: EXTLOG (paths=1)
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: IPMI (paths=11)
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: NETWORK (paths=7)
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: NTP (paths=3)
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: SOL (paths=1)
Dec 09 06:07:27 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: SYSLOG (paths=8)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve ENABLED: U-BOOT_ENV (requested=0, kept=0)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] BMC Full Flash - Backup u-boot-env partition
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] U-Boot env backed up to /tmp/u-boot-env.bin (mtd2, size=131072B)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: AUTHENTICATION (paths=19)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: FRU (paths=1)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: KVM (paths=3)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve ENABLED: LicenseControl (requested=4, kept=4)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: REDFISH (paths=1)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: SDR (paths=1)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: SEL (paths=1)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: SMTP (paths=2)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: SNMP (paths=8)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve DISABLED: ServiceManager (paths=1)
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve summary: ENABLED => U-BOOT_ENV LicenseControl
Dec 09 06:07:28 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve summary: DISABLED => Boot Override EXTLOG IPMI NETWORK NTP SOL SYSLOG AUTHENTICATION FRU KVM REDFISH SDR SEL SMTP SNMP ServiceManager
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Preserve policy decided: IS_UBOOT_ENABLED=true
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] set_progress(50): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] set_progress(50): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] prepare stage complete.
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] ===== BMC update =====
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] set_task_status(Starting): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] set_progress(40): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] set_progress(50): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] set_progress(50): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] [ 776.48105] ABR Boot Mode: 0 (Dual SPI ABR)
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] [SCU510-0-00000945, bit 12]
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] set_task_status(Running): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] set_progress(60): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:07:29 AMI0T-b67b5ca52348 fwupd 5138: [INFO] SCRIPT: /usr/libexec/fwupd/flash-bmc.sh /tmp/images/075b12ba_1569402969/image-bmc_bmc_active
Dec 09 06:08:36 AMI0T-b67b5ca52348 fwupd 5540: [33.8K blob data]
Dec 09 06:08:36 AMI0T-b67b5ca52348 fwupd 5540: diff blocks: 145
Dec 09 06:08:36 AMI0T-b67b5ca52348 fwupd 5517: [INFO] Image update successful
Dec 09 06:08:36 AMI0T-b67b5ca52348 fwupd 5517: [INFO] set_progress(100): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:36 AMI0T-b67b5ca52348 fwupd 5517: [INFO] set_progress(100): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5498: [INFO] set_progress(60): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5498: [INFO] set_progress(95): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5498: [INFO] set_task_status(Completed): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5498: [INFO] set_progress(100): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5498: [INFO] set_progress(100): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5498: [INFO] set_progress(100): /xyz/openbmc_project/software/075b12ba_1569402969
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5138: [INFO] BMC Cleanup
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5138: [INFO] SCRIPT: /usr/libexec/fwupd/cleanup-bmc.sh
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5561: [INFO] IS_UBOOT_ENABLED is true; restoring U-Boot env
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5561: [INFO] Restoring U-Boot env to /dev/mtd2 from /tmp/u-boot-env.bin
Dec 09 06:08:38 AMI0T-b67b5ca52348 fwupd 5561: [INFO] subsystem, complete building xattr subsystem, 0 of xdatum (0 unchecked, 0 orphan) and 0 of xref (0 dead, 0 orphan) found.
Dec 09 06:08:40 AMI0T-b67b5ca52348 fwupd 5561: [INFO] U-Boot env restore successful with flashcp (/dev/mtd2)
Dec 09 06:08:40 AMI0T-b67b5ca52348 fwupd 5561: [INFO] rvfs mount /run/initramfs/rw has unknown backing device:
Dec 09 06:08:40 AMI0T-b67b5ca52348 fwupd 5561: [INFO] Found mtd partition: 5, attempting to mount as jffs2 to /tmp/.rvfs
Dec 09 06:08:40 AMI0T-b67b5ca52348 fwupd 5561: [INFO] Calling cleanup_overlay_with_blacklist and rsync with:
Dec 09 06:08:40 AMI0T-b67b5ca52348 fwupd 5561: [INFO] Volatile overlay rsync complete: /run/initramfs/rw/cow -> /tmp/.rvfs/cow
Dec 09 06:08:40 AMI0T-b67b5ca52348 fwupd 5561: [INFO] Deleting files from blacklist: /tmp/blacklist
Dec 09 06:08:40 AMI0T-b67b5ca52348 fwupd 5561: [INFO] Overlay cleanup complete (rsync + blacklist applied)
Dec 09 06:08:40 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Clearing Push-URI targets and busy status
Dec 09 06:09:36 AMI0T-b67b5ca52348 systemd[1]: fwupd075b12ba_1569402969.service: Deactivated successfully.
Dec 09 06:09:36 AMI0T-b67b5ca52348 systemd[1]: Finished Latest Flash BMC with fwupd script: 075b12ba_1569402969.
Dec 09 06:09:36 AMI0T-b67b5ca52348 systemd[1]: fwupd075b12ba_1569402969.service: Consumed 1min 15.746s CPU time.
Dec 09 06:09:36 AMI0T-b67b5ca52348 phosphor-image-updater[794]: BMC activation has ended - BMC reboots are re-enabled.
Dec 09 06:09:36 AMI0T-b67b5ca52348 fwupd 5138: [INFO] Stopped Force reboot of the BMC.
```

26.6.2 Check Configuration

- After BMC Firmware Updated check newly added configuration in BMC Web UI.

User management

Account policy settings

Add user

☐	Username	Privilege	Status	
☐	root	Administrator	Enabled	 

View privilege role descriptions

Password complexity rules

26.7 ApplyTime Property

Applytime Modes "Immediate", "OnReset", "AtMaintenanceWindowStart" and "InMaintenanceWindowOnReset" support is added.

- "Immediate" -> the update will happen immediately, and this is default mode.
- "OnReset" -> In this mode the update will happen when bmc reboot is issued.
- "AtMaintenanceWindowStart" -> In this mode the the update will happen when bmc time reaches the maintenance winodow scheduled.
- "InMaintenanceWindowOnReset" -> In this mode the the update will happen when reboot is issued in maintenance window.

26.7.1 ApplyTime: Immediate(default)

- check the apply time attribute of the update service URL by default it will be "Immediate".
- issue Update service POST call. Result: Update should start immediately. you can monitor the status using Task service URL

check the apply time attribute of the update service URL by default it will be "Immediate"

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService
```

```
{
  "@odata.id": "/redfish/v1/UpdateService",
  "@odata.type": "#UpdateService.v1_11_1.UpdateService",
  "Description": "Service for Software Update",
  "FirmwareInventory": {
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
  },
  "HttpPushUri": "/redfish/v1/UpdateService/update",
  "HttpPushUriOptions": {
    "HttpPushUriApplyTime": {
      "ApplyTime": "Immediate",
      "ApplyTime@Redfish.AllowableValues": [
        "Immediate",
```

```
    "OnReset",

    "AtMaintenanceWindowStart",

    "InMaintenanceWindowOnReset"

  ],

  "MaintenanceWindowDurationInSeconds": 0,

  "MaintenanceWindowStartTime": "1970-01-01T00:00:00+00:00"

}

},

"HttpPushUriTargets": [],

"HttpPushUriTargetsBusy": false,

"Id": "UpdateService",

"MaxImageSizeBytes": 134217728,

"MultipartHttpPushUri": "/redfish/v1/UpdateService/update",

"Name": "Update Service",

"Oem": {

  "ApplyOptions": {

    "@odata.type": "#OemUpdateService.ApplyOptions",

    "ClearConfig": false

  }

},

"ServiceEnabled": true
```

Issue Update Service POST Call

```
$ curl -k -H "Content-Type: application/octet-stream" -X POST -T ./obmc-image.tar.gz https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService/update
```

```
{
"@Message.ExtendedInfo": [
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The request completed successfully.",
"MessageArgs": [],
"MessageId": "Base.1.16.0.Success",
"MessageSeverity": "OK",
"Resolution": "None"
}
],
"@odata.id": "/redfish/v1/TaskService/Tasks/1",
"@odata.type": "#Task.v1_4_3.Task",
"Id": "1",
"TaskState": "New"
}
```

Update should start immediately. You can monitor the status using Task service URL

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/redfish/v1/TaskService/Tasks/1
{
"@odata.id": "/redfish/v1/TaskService/Tasks/1",
"@odata.type": "#Task.v1_4_3.Task",
"HidePayload": false,
"Id": "1",
"Messages": [
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The task with Id '1' has started.",
"MessageArgs": [
"1"
],
"MessageId": "TaskEvent.1.0.3.TaskStarted",
}
```



```

    "MessageSeverity": "OK",
    "Resolution": "None."
  },
  {
    "@odata.type": "#Message.v1_1_1.Message",
    "Message": "The task with Id '1' has changed to progress 10 perce
complete.",
    "MessageArgs": [
      "1",
      "10"
    ],
    "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
    "MessageSeverity": "OK",
    "Resolution": "None."
  },
  {
    "@odata.type": "#Message.v1_1_1.Message",
    "Message": "The task with Id '1' has changed to progress 30 perce
complete.",
    "MessageArgs": [
      "1",
      "30"
    ],
    "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
    "MessageSeverity": "OK",
    "Resolution": "None."
  },
  {
    "@odata.type": "#Message.v1_1_1.Message",
    "Message": "The task with Id '1' has changed to progress 40 perce
complete.",
    "MessageArgs": [
      "1",
      "40"
    ],
    "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
    "MessageSeverity": "OK",

```

```

    "Resolution": "None."
  },
  {
    "@odata.type": "#Message.v1_1_1.Message",
    "Message": "The task with Id '1' has changed to progress 60 perce
complete.",
    "MessageArgs": [
      "1",
      "60"
    ],
    "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
    "MessageSeverity": "OK",
    "Resolution": "None."
  },
  {
    "@odata.type": "#Message.v1_1_1.Message",
    "Message": "The task with Id '1' has changed to progress 95 perce
complete.",
    "MessageArgs": [
      "1",
      "95"
    ],
    "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
    "MessageSeverity": "OK",
    "Resolution": "None."
  }
],
"Name": "Task 1",
"Payload": {
  "HttpHeaders": [],
  "HttpOperation": "POST",
  "JsonBody": "null",
  "TargetUri": "/redfish/v1/UpdateService/update"
},
"PercentComplete": 95,
"StartTime": "2024-04-07T16:05:48+00:00",

```

```
"TaskMonitor": "/redfish/v1/TaskService/Tasks/1/Monitor",  
"TaskState": "New"  
}
```

26.7.2 ApplyTime : OnReset

- Set the applytime attribute to "OnReset".
- Check the apply time option set correctly to "OnReset".
- Issue update call using POST call on Update Service URI.
- The Update should not happen until reboot is issued.the task will be paused.
- Issue Reboot to initiate update. Result: Update is resumed.

Set the applytime attribute to "OnReset"

```
$ curl -k -H "Content-Type: application/json" -X PATCH -d
'{"HttpPushOptions":{"HttpPushUriApplyTime":{"ApplyTime":"OnReset"},"MaintenanceWindowDurationInSec
ond s":0,"MaintenanceWindowStartTime":""}}' https://rooenBmc@10.0.96.175/redfish/v1/UpdateService
{
  "@Message.ExtendedInfo": [
    {
      "@odata.type": "#Message.v1_1_1.Message",
      "Message": "The request completed successfully.",
      "MessageArgs": [],
      "MessageId": "Base.1.16.0.Success",
      "MessageSeverity": "OK",
      "Resolution": "None"
    }
  ]
}
```

Check the apply time option set correctly to "OnReset"

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService
{
  "@odata.id": "/redfish/v1/UpdateService",
  "@odata.type": "#UpdateService.v1_11_1.UpdateService",
  "Description": "Service for Software Update",
  "FirmwareInventory": {
    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
  },
  "HttpPushUri": "/redfish/v1/UpdateService/update",
  "HttpPushUriOptions": {
    "HttpPushUriApplyTime": {
      "ApplyTime": "OnReset",
      "ApplyTime@Redfish.AllowableValues": [
```

```

    "Immediate",
    "OnReset",
    "AtMaintenanceWindowStart",
    "InMaintenanceWindowOnReset"
  ],
  "MaintenanceWindowDurationInSeconds": 0,
  "MaintenanceWindowStartTime": "1970-01-01T00:00:00+00:00"
}
},
"HttpPushUriTargets": [],
"HttpPushUriTargetsBusy": false,
"Id": "UpdateService",
"MaxImageSizeBytes": 134217728,
"MultipartHttpPushUri": "/redfish/v1/UpdateService/update",
"Name": "Update Service",
"Oem": {
  "ApplyOptions": {
    "@odata.type": "#OemUpdateService.ApplyOptions",
    "ClearConfig": false
  }
},
"ServiceEnabled": true

```

Issue update call using POST call on Update Service URI.

```

$ curl -k -H "Content-Type: application/octet-stream" -X POST -T ./obmc-image.tar.gz
https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService/update

```

```

{
"@Message.ExtendedInfo": [
  {
    "@odata.type": "#Message.v1_1_1.Message",
    "Message": "The request completed successfully.",
    "MessageArgs": [],
    "MessageId": "Base.1.16.0.Success",
    "MessageSeverity": "OK",
    "Resolution": "None"
  }
]
}

```

```

    }
  ],
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "1",
  "TaskState": "New"
}

```

Update should not happen until reboot is issued. The task will be paused.

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/redfish/v1/TaskService/Tasks/1
```

```

{
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_3.Task",
  "HidePayload": false,
  "Id": "1",
  "Messages": [
    {
      "@odata.type": "#Message.v1_1_1.Message",
      "Message": "The task with Id '1' has started.",
      "MessageArgs": [
        "1"
      ],
      "MessageId": "TaskEvent.1.0.3.TaskStarted",
      "MessageSeverity": "OK",
      "Resolution": "None."
    },
    {
      "@odata.type": "#Message.v1_1_1.Message",
      "Message": "The task with Id '1' has been paused.",
      "MessageArgs": [
        "1"
      ],
      "MessageId": "TaskEvent.1.0.3.TaskPaused",
      "MessageSeverity": "Warning",
      "Resolution": "None."
    }
  ]
}

```

```

    }
  ],
  "Name": "Task 1",
  "Payload": {
    "HttpHeaders": [],
    "HttpOperation": "POST",
    "JsonBody": "null",
    "TargetUri": "/redfish/v1/UpdateService/update"
  },
  "PercentComplete": 0,
  "StartTime": "2024-04-07T16:28:09+00:00",
  "TaskMonitor": "/redfish/v1/TaskService/Tasks/1/Monitor",
  "TaskState": "Stopping"
}

```

Issue Reboot to Initiate Update

```
$ ipmitool -H 10.0.96.175 -I lanplus -U root -P OpenBmc -C 17 raw 6 2
```

Result:

Update is resumed.

```
msgubuntu@msgubuntu-OptiPlex-7000:~/hemu/OTnov24/workspace_20240323_223046$ curl -k -X GET https://root:OpenBmc@10.0.96.175/redfish/v1/TaskService/Tasks/1
```

```

{
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_3.Task",
  "HidePayload": false,
  "Id": "1",
  "Messages": [
    {
      "@odata.type": "#Message.v1_1_1.Message",
      "Message": "The task with Id '1' has started.",
      "MessageArgs": [
        "1"
      ],
      "MessageId": "TaskEvent.1.0.3.TaskStarted",
      "MessageSeverity": "OK",

```

```

"Resolution": "None."
},
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The task with Id '1' has been paused.",
"MessageArgs": [
    "1"
],
"MessageId": "TaskEvent.1.0.3.TaskPaused",
"MessageSeverity": "Warning",
"Resolution": "None."
},
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The task with Id '1' has changed to progress 10 percent complete.",
"MessageArgs": [
    "1",
    "10"
],
"MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
"MessageSeverity": "OK",
"Resolution": "None."
},
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The task with Id '1' has changed to progress 30 percent complete.",
"MessageArgs": [
    "1",
    "30"
],
"MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
"MessageSeverity": "OK",
"Resolution": "None."
},
{
"@odata.type": "#Message.v1_1_1.Message",

```



```

"Message": "The task with Id '1' has changed to progress 40 percent complete.",
"MessageArgs": [
    "1",
    "40"
],
"MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
"MessageSeverity": "OK",
"Resolution": "None."
},
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The task with Id '1' has changed to progress 60 percent complete.",
"MessageArgs": [
    "1",
    "60"
],
"MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
"MessageSeverity": "OK",
"Resolution": "None."
}
],
"Name": "Task 1",
"Payload": {
    "HttpHeaders": [],
    "HttpOperation": "POST",
    "JsonBody": "null",
    "TargetUri": "/redfish/v1/UpdateService/update"
},
"PercentComplete": 60,
"StartTime": "2024-04-07T16:28:09+00:00",
"TaskMonitor": "/redfish/v1/TaskService/Tasks/1/Monitor",
"TaskState": "Stopping"
}

```

26.7.3 ApplyTime : AtMaintenanceWindowStart

- set applytime as "AtMaintenanceWindowStart" and set MaintenanceWindowStartTime and MaintenanceWindowDurationInSeconds.
- check the apply time and maintenance window attributes option set correctly to "AtMaintenanceWindowStart".
- Issue update call using POST call on Update Service URI.
- the Update should not happen until timer reaches "MaintenanceWindowStartTime". The task will be paused.. Result: The update will be initiated once BMC reaches the scheduled maintenance window start time.
- set applytime as "AtMaintenanceWindowStart" and set MaintenanceWindowStartTime and MaintenanceWindowDurationInSeconds

```
$ curl -k -H "Content-Type: application/json" -X PATCH -d '{"HttpPuhUriOptions":{"HttpPushUriApplyTime":{"ApplyTime":"AtMaintenanceWindowStart","MaintenanceWindowDurationInSeconds":120,"MaintenanceWindowStartTime":"2024-04-07T17:05:00+00:00"}}}' https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService
```

```
{
  "@Message.ExtendedInfo": [
    {
      "@odata.type": "#Message.v1_1_1.Message",
      "Message": "The request completed successfully.",
      "MessageArgs": [],
      "MessageId": "Base.1.16.0.Success",
      "MessageSeverity": "OK",
      "Resolution": "None"
    },
    {
      "@odata.type": "#Message.v1_1_1.Message",
      "Message": "The request completed successfully.",
      "MessageArgs": [],
      "MessageId": "Base.1.16.0.Success",
```

```

    "MessageSeverity": "OK",

    "Resolution": "None"

  },

  {

    "@odata.type": "#Message.v1_1_1.Message",
    "Message": "The request completed successfully.",

    "MessageArgs": [],

    "MessageId": "Base.1.16.0.Success",

    "MessageSeverity": "OK",

    "Resolution": "None"

  }

]

```

check the apply time and maintenance window attributes option set correctly to "AtMaintenanceWindowStart"

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/redfish/v1/Update
```

Service

```

{

  "@odata.id": "/redfish/v1/UpdateService",

  "@odata.type": "#UpdateService.v1_11_1.UpdateService",

  "Description": "Service for Software Update",

  "FirmwareInventory": {

    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"

  },

  "HttpPushUri": "/redfish/v1/UpdateService/update",

  "HttpPushUriOptions": {

    "HttpPushUriApplyTime": {

```

```
"ApplyTime": "AtMaintenanceWindowStart",

"ApplyTime@Redfish.AllowableValues": [

    "Immediate",

    "OnReset",

    "AtMaintenanceWindowStart",

    "InMaintenanceWindowOnReset"

],

"MaintenanceWindowDurationInSeconds": 120,

"MaintenanceWindowStartTime": "2024-04-07T17:05:00+00:00"

}

},

"HttpPushUriTargets": [],

"HttpPushUriTargetsBusy": false,

"Id": "UpdateService",

"MaxImageSizeBytes": 134217728,

"MultipartHttpPushUri": "/redfish/v1/UpdateService/update",

"Name": "Update Service",

"Oem": {

    "ApplyOptions": {

        "@odata.type": "#OemUpdateService.ApplyOptions",

        "ClearConfig": false

    }

},
```

Issue update call using POST call on Update Service URI

```
$ curl -k -H "Content-Type: application/octet-stream" -X POST -T ./obmc-image.tar.gz https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService/update
```

```
{
  "@Message.ExtendedInfo": [
    {
      "@odata.type": "#Message.v1_1_1.Message",
      "Message": "The request completed successfully.",
      "MessageArgs": [],
      "MessageId": "Base.1.16.0.Success",
      "MessageSeverity": "OK",
      "Resolution": "None"
    }
  ],
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "1",
  "TaskState": "New"

  "ServiceEnabled": true
}
```

The Update should not happen until timer reaches "MaintenanceWindowStartTime": "2024-04-07T17:05:00+00:00".the task will be paused.

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/redfish/v1/TaskService/Tasks/1
```

```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
```

```

"@odata.type": "#Task.v1_4_3.Task",
"HidePayload": false,
"Id": "1",

"Messages": [

{

"@odata.type": "#Message.v1_1_1.Message",
"Message": "The task with Id '1' has started.",
"MessageArgs": [

"1"

],

"MessageId": "TaskEvent.1.0.3.TaskStarted",
"MessageSeverity": "OK",
"Resolution": "None."

},

{

"@odata.type": "#Message.v1_1_1.Message",
"Message": "The task with Id '1' has been paused.",
"MessageArgs": [

"1"

],

"MessageId": "TaskEvent.1.0.3.TaskPaused",
"MessageSeverity": "Warning",
"Resolution": "None."

}

],

"Name": "Task 1",

```

```

"Payload": {

  "HttpHeaders": [],

  "HttpOperation": "POST",

  "JsonBody": "null",

  "TargetUri": "/redfish/v1/UpdateService/update"

},

"PercentComplete": 0,

"StartTime": "2024-04-07T17:01:40+00:00",

"TaskMonitor": "/redfish/v1/TaskService/Tasks/1/Monitor",

"TaskState": "Pending"

}

```

Result:

The update will initiate once BMC reaches the scheduled maintenance window start time.

BMC Log:

Apr 07 17:05:09 AMIOT-7e17bb854a4d fwupd[12290]: path=49ee8919_985575890

Apr 07 17:05:13 AMIOT-7e17bb854a4d fwupd[12296]: find: /proc/12156: No such file or directory

Apr 07 17:05:14 AMIOT-7e17bb854a4d fwupd[12290]: PROTO=file

```

Apr           07           17:05:14           AMIOT-7e17bb854a4d           fwupd[12290]:
REMOTE=/tmp/images/49ee8919_985575890/MANIFEST

```

Apr 07 17:05:14 AMIOT-7e17bb854a4d fwupd[12290]: REMOTE_HOST=

```

Apr           07           17:05:14           AMIOT-7e17bb854a4d           fwupd[12290]:
REMOTE_PATH=tmp/images/49ee8919_985575890/MANIFEST

```

```

Apr           07           17:05:14           AMIOT-7e17bb854a4d           fwupd[12290]:           Download
'tmp/images/49ee8919_985575890/MANIFEST' from file tmp/images/49ee8919_985575890/MAN
IFEST

```

```

Apr           07           17:05:15           AMIOT-7e17bb854a4d           fwupd[12290]:
METAFILE_PATH=/tmp/images/49ee8919_985575890/MANIFEST

```

Apr 07 17:05:15 AMIOT-7e17bb854a4d fwupd[12290]: Updating image
/tmp/images/49ee8919_985575890/image-bmc

Apr 07 17:05:15 AMIOT-7e17bb854a4d fwupd[12290]: BMC Full Flash - full SPI update request

Apr 07 17:05:15 AMIOT-7e17bb854a4d fwupd[12290]: BMC Full Flash - Booted from CS0

Apr 07 17:05:15 AMIOT-7e17bb854a4d fwupd[12290]: BMC Full Flash - Starting the SPI write on active CS0
spi. It will take ~8 minutes....

Apr 07 17:05:15 AMIOT-7e17bb854a4d fwupd[12290]: BMC Full Flash - Backup u-boot-env partition

[996.393452] jffs2: notice: (20360) jffs2_build_xattr_subsystem: complete building xattr subsystem, 0 of
xdatum
(0 unchecked, 0 orphan) and

0 of xref (0 dead, 0 orphan)

found.

Apr 07 17:11:57 AMIOT-7e17bb854a4d fwupd[12290]: BMC Full Flash - Image update successful

Apr 07 17:11:57 AMIOT-7e17bb854a4d fwupd[12290]: BMC Full Flash - Start Preserve Config

Apr 07 17:12:22 AMIOT-7e17bb854a4d fwupd[12290]: BMC Full Flash - Preserve Config Done

Apr 07 17:12:22 AMIOT-7e17bb854a4d fwupd[12290]: BMC Full Flash - Restore u-boot-env partition

Task status:

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/redfish/v1/TaskSrvce/Tasks/1
```

```
{  
  
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",  
  
  "@odata.type": "#Task.v1_4_3.Task",  
  
  "HidePayload": false,  
  
  "Id": "1",  
  
  "Messages": [  
  
    {  
  
      "@odata.type": "#Message.v1_1_1.Message",  
  
      "Message": "The task with Id '1' has started.",  
  
      "MessageArgs": [  

```



```

    "1"

  ],

  "MessageId": "TaskEvent.1.0.3.TaskStarted",

  "MessageSeverity": "OK",

  "Resolution": "None."

},

{

  "@odata.type": "#Message.v1_1_1.Message",

  "Message": "The task with Id '1' has been paused.",

  "MessageArgs": [

    "1"

  ],

  "MessageId": "TaskEvent.1.0.3.TaskPaused",

  "MessageSeverity": "Warning",

  "Resolution": "None."

},

{

  "@odata.type": "#Message.v1_1_1.Message",

  "Message": "The task with Id '1' has changed to progress 10 percent complete.",

  "MessageArgs": [

    "1",

    "10"

  ],

  "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",

  "MessageSeverity": "OK",

  "Resolution": "None."

```

```

},

{
  "@odata.type": "#Message.v1_1_1.Message",
  "Message": "The task with Id '1' has changed to progress 30 percent complete.",
  "MessageArgs": [
    "1",
    "30"
  ],
  "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
  "MessageSeverity": "OK",
  "Resolution": "None."
},

{
  "@odata.type": "#Message.v1_1_1.Message",
  "Message": "The task with Id '1' has changed to progress 40 percent complete.",
  "MessageArgs": [
    "1",
    "40"
  ],
  "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
  "MessageSeverity": "OK",
  "Resolution": "None."
},

{
  "@odata.type": "#Message.v1_1_1.Message",
  "Message": "The task with Id '1' has changed to progress 60 percent complete.",

```

```
"MessageArgs": [  
  "1",  
  "60"  
],  
"MessageId": "TaskEvent.1.0.3.TaskProgressChanged",  
"MessageSeverity": "OK",  
"Resolution": "None."  
}  
],  
"Name": "Task 1",  
"Payload": {  
  "HttpHeaders": [],  
  "HttpOperation": "POST",  
  "JsonBody": "null",  
  "TargetUri": "/redfish/v1/UpdateService/update"  
},  
"PercentComplete": 60,  
"StartTime": "2024-04-07T17:01:40+00:00",  
"TaskMonitor": "/redfish/v1/TaskService/Tasks/1/Monitor",  
"TaskState": "Pending"  
}
```

26.7.4 ApplyTime : AtMaintenanceWindowStart - (Cancel Task Scenario)

5. Set applytime as "AtMaintenanceWindowStart" and set MaintenanceWindowStartTime and MaintenanceWindowDurationInSeconds.
6. Check the apply time and maintenance window attributes option set correctly to "AtMaintenanceWindowStart".
7. Issue update call using POST call on Update Service URI.
8. The Update should not happen until timer reaches "MaintenanceWindowStartTime". The task will be paused.
9. Issue cancel Task OEM command. and pass the task to be cancelled.
Result: Task 1 should be cancelled. and update should not happen.

Set applytime as "AtMaintenanceWindowStart" and set MaintenanceWindowStartTime and MaintenanceWindowDurationInSeconds

```
$ curl -k -H "Content-Type: application/json" -X PATCH -d
'{"HttpPushUriOptions":{"HttpPushUriApplyTime":{"ApplyTime":"AtMaintenanceWindowStart","MaintenanceWindowDurationInSeconds":120,"MaintenanceWindowStartTime":"2024-04-07T17:34:00+00:00"}}}'
https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService
```

```
{

"@Message.ExtendedInfo": [

{

"@odata.type": "#Message.v1_1_1.Message",

"Message": "The request completed successfully.",

"MessageArgs": [],

"MessageId": "Base.1.16.0.Success",

"MessageSeverity": "OK",

"Resolution": "None"

},

{

"@odata.type": "#Message.v1_1_1.Message",

"Message": "The request completed successfully.",

"MessageArgs": [],
```

```

"MessageId": "Base.1.16.0.Success",

"MessageSeverity": "OK",

"Resolution": "None"

},

{

"@odata.type": "#Message.v1_1_1.Message",

"Message": "The request completed successfully.",

"MessageArgs": [],

"MessageId": "Base.1.16.0.Success",

"MessageSeverity": "OK",

"Resolution": "None"

}

]

```

Check the apply time and maintenance window attributes option set correctly to "AtMaintenanceWindowStart"

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService
```

```

{

"@odata.id": "/redfish/v1/UpdateService",

"@odata.type": "#UpdateService.v1_11_1.UpdateService",

"Description": "Service for Software Update",

"FirmwareInventory": {

"@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"

},

"HttpPushUri": "/redfish/v1/UpdateService/update",

"HttpPushUriOptions": {

"HttpPushUriApplyTime": {

```

```
"ApplyTime": "AtMaintenanceWindowStart",

"ApplyTime@Redfish.AllowableValues": [

    "Immediate",

    "OnReset",

    "AtMaintenanceWindowStart",

    "InMaintenanceWindowOnReset"

],

"MaintenanceWindowDurationInSeconds": 120,

"MaintenanceWindowStartTime": "2024-04-07T17:34:00+00:00"

}

},

"HttpPushUriTargets": [],

"HttpPushUriTargetsBusy": false,

"Id": "UpdateService",

"MaxImageSizeBytes": 134217728,

"MultipartHttpPushUri": "/redfish/v1/UpdateService/update",

"Name": "Update Service",

"Oem": {

    "ApplyOptions": {

        "@odata.type": "#OemUpdateService.ApplyOptions",

        "ClearConfig": false

    }

},

"ServiceEnabled": true

}
```

Issue update call using POST call on Update Service URL

```
$ curl -k -H "Content-Type: application/octet-stream" -X POST -T ./obmc-image.tar.gz https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService/update
```

```
{
  "@Message.ExtendedInfo": [
    {
      "@odata.type": "#Message.v1_1_1.Message",
      "Message": "The request completed successfully.",
      "MessageArgs": [],
      "MessageId": "Base.1.16.0.Success",
      "MessageSeverity": "OK",
      "Resolution": "None"
    }
  ],
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_3.Task",
  "Id": "1",
  "TaskState": "New"
}
```

The Update should not happen until timer reaches "MaintenanceWindowStartTime": "2024-0407T17:34:00+00:00""2024-04-07T17:05:00+00:00".the task will be paused.

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/red
```

```
fish/v1/TaskService/Tasks/1
```

```
{
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_3.Task",
  "HidePayload": false,
}
```

```
"Id": "1",

"Messages": [

  {

    "@odata.type": "#Message.v1_1_1.Message",

    "Message": "The task with Id '1' has started.",

    "MessageArgs": [

      "1"

    ],

    "MessageId": "TaskEvent.1.0.3.TaskStarted",

    "MessageSeverity": "OK",

    "Resolution": "None."

  },

  {

    "@odata.type": "#Message.v1_1_1.Message",

    "Message": "The task with Id '1' has been paused.",

    "MessageArgs": [

      "1"

    ],

    "MessageId": "TaskEvent.1.0.3.TaskPaused",

    "MessageSeverity": "Warning",

    "Resolution": "None."

  }

],

"Name": "Task 1",

"Payload": {

  "HttpHeaders": [],
```



```
"HttpOperation": "POST",  
  
"JsonBody": "null",  
  
"TargetUri": "/redfish/v1/UpdateService/update"  
  
},  
  
"PercentComplete": 0,  
  
"StartTime": "2024-04-07T17:30:54+00:00",  
  
"TaskMonitor": "/redfish/v1/TaskService/Tasks/1/Monitor",  
  
"TaskState": "Pending"
```

Issue Delete call to cancel the Task. and pass the task to be cancelled in this case it is 1

```
$ curl -k -H "Content-Type: application/octet-stream" -X DELETE  
https://root:OpenBmc@10.0.96.175redfish/v1/TaskService/Tasks/1
```

Result: The task 1 should be cancelled and update should not be happened; the task will be removed.

26.7.5 ApplyTime: InMaintenanceWindowOnReset

- Set applytime as "InMaintenanceWindowOnReset" and set MaintenanceWindowStartTime and MaintenanceWindowDurationInSeconds.
- Check the apply time and maintenance window attributes option set correctly to "InMaintenanceWindowOnReset".
- Issue update call using POST call on Update Service URI.
- The Update should not happen until if reboot happens between "MaintenanceWindowStartTime" and "MaintenanceWindowDurationInSeconds".the task will be paused.

Result: Issue a reboot within the maintenance reboot then only the update will happen and task will be resumed.

Set applytime as "InMaintenanceWindowOnReset" and set MaintenanceWindowStartTime and MaintenanceWindowDurationInSeconds

```
$ curl -k -H "Content-Type: application/json" -X PATCH -d '{"HttpPushUriOptions":{"HttpPushUriApplyTime":{"ApplyTime":"InMaintenanceWindowOnReset"},"MaintenanceWindowDurationInSeconds":120,"MaintenanceWindowStartTime": "2024-04-07T17:42:00+00:00"}}' https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService
```

```
{
"@Message.ExtendedInfo": [
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The request completed successfully.",
"MessageArgs": [],
"MessageId": "Base.1.16.0.Success",
"MessageSeverity": "OK",
"Resolution": "None"
},
{
"@odata.type": "#Message.v1_1_1.Message",
"Message": "The request completed successfully.",
"MessageArgs": [],
```

```

    "MessageId": "Base.1.16.0.Success",

    "MessageSeverity": "OK",

    "Resolution": "None"

  },

  {

    "@odata.type": "#Message.v1_1_1.Message",

    "Message": "The request completed successfully.",

    "MessageArgs": [],

    "MessageId": "Base.1.16.0.Success",

    "MessageSeverity": "OK",

    "Resolution": "None"

  }

]

```

Check the apply time and maintenance window attributes option set correctly to "InMaintenanceWindowOnReset"

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/red
```

```
fish/v1/UpdateService
```

```

{

  "@odata.id": "/redfish/v1/UpdateService",
  "@odata.type": "#UpdateService.v1_11_1.UpdateService",

  "Description": "Service for Software Update",

  "FirmwareInventory": {

    "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"

  },

  "HttpPushUri": "/redfish/v1/UpdateService/update",

```

```

"HttpPushUriOptions": {
  "HttpPushUriApplyTime": {
    "ApplyTime": "InMaintenanceWindowOnReset",
    "ApplyTime@Redfish.AllowableValues": [
      "Immediate",
      "OnReset",
      "AtMaintenanceWindowStart",
      "InMaintenanceWindowOnReset"
    ],
    "MaintenanceWindowDurationInSeconds": 120,
    "MaintenanceWindowStartTime": "2024-04-07T17:42:00+00:00"
  }
},
"HttpPushUriTargets": [],
"HttpPushUriTargetsBusy": false,
"Id": "UpdateService",
"MaxImageSizeBytes": 134217728,
"MultipartHttpPushUri": "/redfish/v1/UpdateService/update", "Name": "Update Service",
"Oem": {
  "ApplyOptions": {
    "@odata.type": "#OemUpdateService.ApplyOptions",
    "ClearConfig": false
  }
},
"ServiceEnabled": true

```

Issue update call using POST call on Update Service URI.

```
$ curl -k -H "Content-Type: application/octet-stream" -X POST -T ./obmc-  
image.tar.gz https://root:OpenBmc@10.0.96.175/redfish/v1/UpdateService/update
```

```
{  
  
  "@Message.ExtendedInfo": [  
  
    {  
  
      "@odata.type": "#Message.v1_1_1.Message",  
  
      "Message": "The request completed successfully.",  
  
      "MessageArgs": [],  
  
      "MessageId": "Base.1.16.0.Success",  
  
      "MessageSeverity": "OK",  
  
      "Resolution": "None"  
  
    }  
  
  ],  
  
  "@odata.id": "/redfish/v1/TaskService/Tasks/2",  
  "@odata.type": "#Task.v1_4_3.Task",  
  
  "Id": "2",  
  
  "TaskState": "New"
```

*The Update should not happen until if reboot happens between
"MaintenanceWindowStartTime":
"2024-04-07T17:34:00+00:00""2024-04-07T17:05:00+00:00" and
"MaintenanceWindowDurationInSeconds": 120.the task will be paused.*

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/red  
fish/v1/TaskService/Tasks/2
```

```
{  
  
  "@odata.id": "/redfish/v1/TaskService/Tasks/2",
```

```
"@odata.type": "#Task.v1_4_3.Task",

"HidePayload": false,

"Id": "2",

"Messages": [

  {

    "@odata.type": "#Message.v1_1_1.Message",

    "Message": "The task with Id '2' has started.",

    "MessageArgs": [

      "2"

    ],

    "MessageId": "TaskEvent.1.0.3.TaskStarted",

    "MessageSeverity": "OK",

    "Resolution": "None."

  },

  {

    "@odata.type": "#Message.v1_1_1.Message",

    "Message": "The task with Id '2' has been paused.",

    "MessageArgs": [

      "2"

    ],

    "MessageId": "TaskEvent.1.0.3.TaskPaused",

    "MessageSeverity": "Warning",

    "Resolution": "None."

  }

],

"Name": "Task 2",
```

```
"Payload": {  
  "HttpHeaders": [],  
  "HttpOperation": "POST",  
  "JsonBody": "null",  
  "TargetUri": "/redfish/v1/UpdateService/update"  
},  
"PercentComplete": 0,  
"StartTime": "2024-04-07T17:41:21+00:00",  
"TaskMonitor": "/redfish/v1/TaskService/Tasks/2/Monitor",  
"TaskState": "Pending"  
}
```

Result:

Issue a reboot within the maintenance reboot then only the update will happen and task will be resumed.

BMCLog:

```
root@AMIOT-7e17bb854a4d:~# date   Sun Apr 7 17:42:06 UTC 2024
```

```
root@AMIOT-7e17bb854a4d:~#   reboot                root@AMIOT-
```

```
7e17bb854a4d:~# [ OK ] Removed slice Slice /system/getty.
```

```
[ OK ] Removed slice Slice /system/modprobe.
```

```
[ OK ] Removed slice Slice /system/obmc-flash-bmc-setenv.
```

```
[ OK ] Removed slice Slice /system/systemd-coredump.
```

```
[ OK ] Stopped target BMC Quiesce Target.
```

```
[ OK ] Stopped target RPC Port Mapper.
```

```
[ OK ] Stopped target Timer Units.
```

[OK] Stopped Daily rotation of log files.

[OK] Stopped Daily Cleanup of Temporary Directories.

[OK] Stopped target System Time Set.

[OK] Stopped target Hardware activated USB gadget.

Stopping my update script ...

Stopping Lightweight UPnP IGD daemon...

Stopping NFS status monitor for NFSv2/3 locking....

Stopping ttyS2 Console Server...

[OK] Stopped Assert bmc_booted LED.

[OK] Removed slice Slice /system/obmc-led-group-start.

[OK] Stopped Wait for /xyz/openbmc_project/led/groups/bmc_booted.

Stopping Phosphor-Pid-Control Margin-based Fan Control Daemon...

Stopping Phosphor Watchdog...

Stopping BMC Hardware Watchdog Daemon...

7de6ee42_1634435547

Stopping Load/Save OS Random Seed...

Stopping Time & Date Service...

Stopping Intel Power Control for the Host 0...

Stopping Restriction mode manager...

Stopping Phosphor U-Boot environment manager...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping Phosphor sysfs LED controller...

Stopping MCTP Daemon...

Stopping MCTP Daemon...

Stopping MCTP Daemon...

[OK] Stopped Phosphor Watchdog.

[OK] Stopped BMC Hardware Watchdog Daemon.

[OK] Stopped Intel Power Control for the Host 0.

[OK] Stopped Phosphor U-Boot environment manager.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Phosphor sysfs LED controller.

[OK] Stopped Restriction mode manager.

[OK] Stopped Phosphor-Pid-Control Margin-based Fan Control Daemon.

[OK] Stopped NFS status monitor for NFSv2/3 locking..

[OK] Stopped MCTP Daemon.

[OK] Stopped MCTP Daemon.

[OK] Stopped MCTP Daemon.

[OK] Stopped Time & Date Service.

[OK] Stopped Load/Save OS Random Seed.

[OK] Stopped ttyS2 Console Server.

[OK] Stopped Lightweight UPnP IGD daemon.

[OK] Removed slice Slice /system/obmc-console.

[OK] Removed slice Slice /system/xyz.openbmc_project.Chassis.Control.Power.

[OK] Removed slice Slice /system/xyz.openbmc_project.led.controller.

[OK] Removed slice Slice /system/xyz.openbmc_project.mctpd.

[OK] Stopped target Host and Network Name Lookups.

[OK] Stopped Wait for /xyz/openbmc_project/u_boot/environment/mgr. applytime =

xyz.openbmc_project.Software.ApplyTime.RequestedApplyTimes.InMaintenanceWindowOnReset

Maintenance Window Start Time: 2024-04-07 17:42:00

Maintenance Window End Time: 2024-04-07 17:44:00

Current time is within maintenance window.

path=7de6ee42_1634435547 find:

/proc/748/task/29460: No such file or directory

PROTO=file

REMOTE=/tmp/images/7de6ee42_1634435547/MANIFEST

REMOTE_HOST=

REMOTE_PATH=tmp/images/7de6ee42_1634435547/MANIFEST

Download 'tmp/images/7de6ee42_1634435547/MANIFEST' from file
tmp/images/7de6ee42_1634435547/MANIFEST

METAFILE_PATH=/tmp/images/7de6ee42_1634435547/MANIFEST

Updating image /tmp/images/7de6ee42_1634435547/image-bmc

BMC Full Flash - full SPI update request

BMC Full Flash - Booted from CS0

BMC Full Flash - Starting the SPI write on active CS0 spi. It will take ~8 minutes....

BMC Full Flash - Backup u-boot-env partition

BMC Full Flash - Image update successful

BMC Full Flash - Start Preserve Config

BMC Full Flash - Preserve Config Done

BMC Full Flash - Restore u-boot-env partition

Call failed: Could not activate remote peer: activation request failed: unit is invalid.

Rebooting.

[1720.623912] reboot: Restarting system

Task status

```
$ curl -k -X GET https://root:OpenBmc@10.0.96.175/redfish/v1/TaskService/Tasks/2
```

```
{
```

```
"@odata.id": "/redfish/v1/TaskService/Tasks/2",
```

```
"@odata.type": "#Task.v1_4_3.Task",
```

```
"HidePayload": false,
```

```
"Id": "2",
```

```
"Messages": [
```

```
{
```

```
"@odata.type": "#Message.v1_1_1.Message",
  "Message": "The task with Id '2' has
              started.",

  "MessageArgs": [

    "2"

  ],

  "MessageId": "TaskEvent.1.0.3.TaskStarted",

  "MessageSeverity": "OK",

  "Resolution": "None."

},

{

  "@odata.type": "#Message.v1_1_1.Message",

  "Message": "The task with Id '2' has been paused.",

  "MessageArgs": [

    "2"

  ],

  "MessageId": "TaskEvent.1.0.3.TaskPaused",

  "MessageSeverity": "Warning",

  "Resolution": "None."

},

{

  "@odata.type": "#Message.v1_1_1.Message",

  "Message": "The task with Id '2' has been paused.",

  "MessageArgs": [

    "2"

  ],
```

```
"MessageId": "TaskEvent.1.0.3.TaskPaused",

"MessageSeverity": "Warning",

"Resolution": "None."

},

{

"@odata.type": "#Message.v1_1_1.Message",

"Message": "The task with Id '2' has changed to progress 10 percent complete.",

"MessageArgs": [

    "2",

    "10"

],

"MessageId": "TaskEvent.1.0.3.TaskProgressChanged",

"MessageSeverity": "OK",

"Resolution": "None."

},

{

"@odata.type": "#Message.v1_1_1.Message",

"Message": "The task with Id '2' has changed to progress 30 percent complete.",

"MessageArgs": [

    "2",

    "30"

],

"MessageId": "TaskEvent.1.0.3.TaskProgressChanged",

"MessageSeverity": "OK",

"Resolution": "None."

},

}
```

```

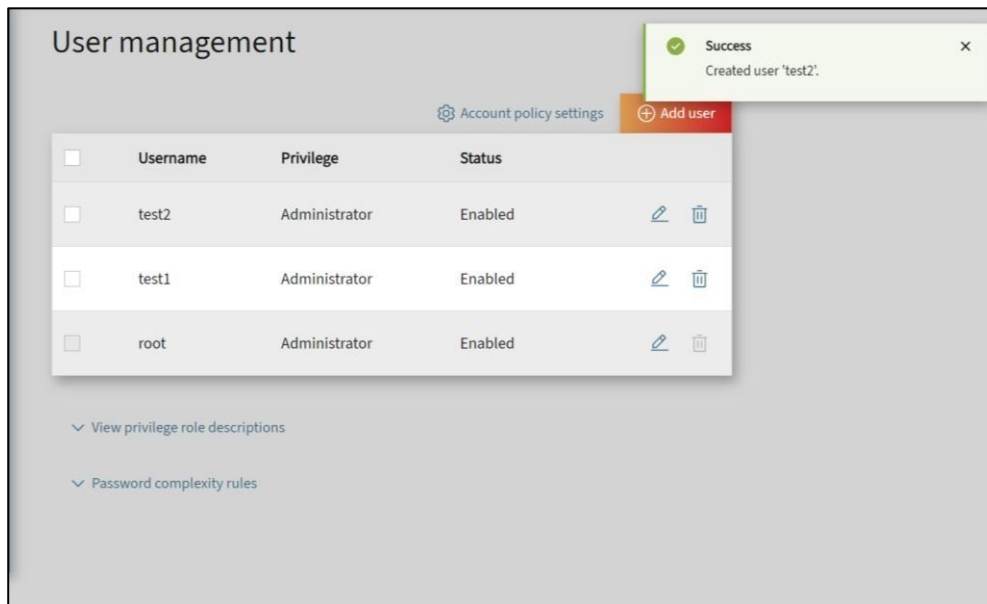
{
  "@odata.type": "#Message.v1_1_1.Message",
  "Message": "The task with Id '2' has changed to progress 40 percent complete.",
  "MessageArgs": [
    "2",
    "40"
  ],
  "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
  "MessageSeverity": "OK",
  "Resolution": "None."
},
{
  "@odata.type": "#Message.v1_1_1.Message",
  "Message": "The task with Id '2' has changed to progress 60 percent complete.",
  "MessageArgs": [
    "2",
    "60"
  ],
  "MessageId": "TaskEvent.1.0.3.TaskProgressChanged",
  "MessageSeverity": "OK",
  "Resolution": "None."
}
],
"Name": "Task 2",
"Payload": {
  "HttpHeaders": [],

```

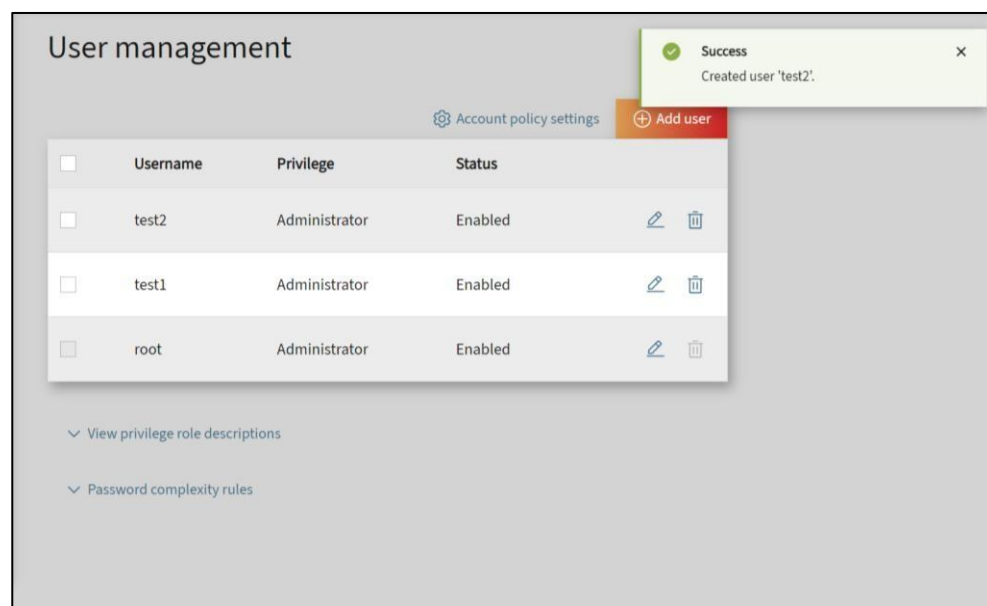
```
"HttpOperation": "POST",  
  
"JsonBody": "null",  
  
"TargetUri": "/redfish/v1/UpdateService/update"  
  
},  
  
"PercentComplete": 60,  
  
"StartTime": "2024-04-07T17:41:21+00:00",  
  
"TaskMonitor": "/redfish/v1/TaskService/Tasks/2/Monitor",  
  
"TaskState": "Stopping"  
  
}
```

26.8 Partial Restore Factory Default

- Preserve configuration by modules during Restore Factory default
- Add new configuration and check preserve settings in Web UI.
- Add two new users under user management.



- **Update SNMP Configuration**



- Update configuration in preserve configuration tab.
- Select/check modules need to be preserved during restore factory default.

Preserve

BMC Preserve Configuration

[Click here to go to Firmware or Factory Default](#)

- ☒ Check All
- ☒ Authentication
- ☒ Boot Override
- ☒ Extlog
- ☒ FRU
- ☒ IPMI
- ☒ KVM
- ☒ Network
- ☒ NTP
- ☒ Redfish
- ☒ SDR
- ☒ SEL
- ☒ SMTP
- ☒ SNMP
- ☒ SOL
- ☒ Syslog
- ☒ Service Manager
- ☒ ubootEnv

 Save

- Go to Factory Default page, click Save button to trigger Restore factory default.

Factory Default

The following checked configurations will be preserved through the restore operation. You can make changes to the list in the Preserve Page.

- ☒ Authentication
- ☒ Boot Override
- ☒ Extlog
- ☒ FRU
- ☒ IPMI
- ☒ KVM
- ☒ Network
- ☒ NTP
- ☒ Redfish
- ☒ SDR
- ☒ SEL
- ☒ SMTP
- ☒ SNMP
- ☒ SOL
- ☒ Syslog
- ☒ Service Manager
- ☒ ubootEnv

 Save

- After click Save button, click okay to trigger Restore factory default.
- Once BMC boots up, selected modules configuration files/folders will be preserved.

Update Configuration in Preserve Configuration Tab

- Deselect / uncheck all configuration or specific modules to clear during restore factory default and click Save button to update the changes.

Preserve

BMC Preserve Configuration

[Click here to go to Firmware or Factory Default](#)

☐ Check All

☐ Authentication

☐ Boot Override

☐ Extlog

☐ FRU

☐ IPMI

☐ KVM

☐ Network

☐ NTP

☐ Redfish

☐ SDR

☐ SEL

☐ SMTP

☐ SNMP

☐ SOL

☐ Syslog

☐ Service Manager

☒ ubootEnv

- Go to Factory Default page, click Save to trigger Restore factory default.

Factory Default

The following checked configurations will be preserved through the restore operation. You can make changes to the list in the Preserve Page.

☐ Authentication

☐ Boot Override

☐ Extlog

☐ FRU

☐ IPMI

☐ KVM

☐ Network

☐ NTP

☐ Redfish

☐ SDR

☐ SEL

☐ SMTP

☐ SNMP

☐ SOL

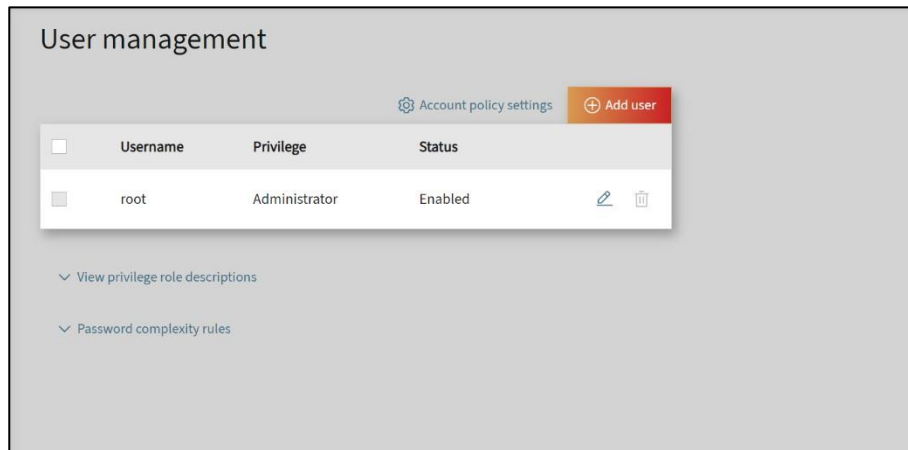
☐ Syslog

☐ Service Manager

☒ ubootEnv

- Click Save and okay to trigger factory default and BMC will be reboot.

- Once BMC boots up check the modified configuration will be cleared.



26.9 Phosphor Log Event for Update

We log into three events for all updates.

- Started
 - Staged
 - Successful
- The logs can be viewed in `/redfish/v1/Systems/system/LogServices/EventLog/Entries` Redfish URI

```

hemanth@MSGIND-9030L:~$ curl -k https://root:OpenBmc@10.0.98.0/redfish/v1/Systems/system/LogServices/EventLog/Entries | grep update -A 6 -B 7
% Total    % Received % Xferd Average Speed   Time    Time     Current
                                 Dload  Upload   Total   Spent    Left     Speed

  0      0     0      0      0 --:--:-- --:--:-- --:--:--    0 {
"@odata.id": "/redfish/v1/Systems/system/LogServices/EventLog/Entries/13",
"@odata.type": "#LogEntry.v1_9_0.LogEntry",
"AdditionalDataURI": "/redfish/v1/Systems/system/LogServices/EventLog/Entries/13/attachment",
"Created": "2025-04-29T18:19:41.451+00:00",
"EntryPoint": "Event",
"Id": "13",
"Message": "bmc firmware update to version onetree-2.1-dev-341-ge3e402-7aa755d started.",
"Modified": "2025-04-29T18:19:41.451+00:00",
"Name": "System Event Log Entry",
"Resolved": false,
"Severity": "OK"
},
{
"@odata.id": "/redfish/v1/Systems/system/LogServices/EventLog/Entries/14",
"@odata.type": "#LogEntry.v1_9_0.LogEntry",
"AdditionalDataURI": "/redfish/v1/Systems/system/LogServices/EventLog/Entries/14/attachment",
"Created": "2025-04-29T18:19:41.523+00:00",
"EntryPoint": "Event",
"Id": "14",
"Message": "bmc firmware update to version onetree-2.1-dev-341-ge3e402-7aa755d staged successfully.",
"Modified": "2025-04-29T18:19:41.523+00:00",
"Name": "System Event Log Entry",
"Resolved": false,
"Severity": "OK"
},
{
"@odata.id": "/redfish/v1/Systems/system/LogServices/EventLog/Entries/21",
"@odata.type": "#LogEntry.v1_9_0.LogEntry",
"AdditionalDataURI": "/redfish/v1/Systems/system/LogServices/EventLog/Entries/21/attachment",
"Created": "2025-04-29T18:25:00.494+00:00",
"EntryPoint": "Event",
"Id": "21",
"Message": "bmc firmware update to version onetree-2.1-dev-341-ge3e402-7aa755d completed successfully.",
"Modified": "2025-04-29T18:25:00.494+00:00",
"Name": "System Event Log Entry",
"Resolved": false,
"Severity": "OK"
},
{
100 34338 100 34338    0     0 70321    0 --:--:-- --:--:-- --:--:--  70364

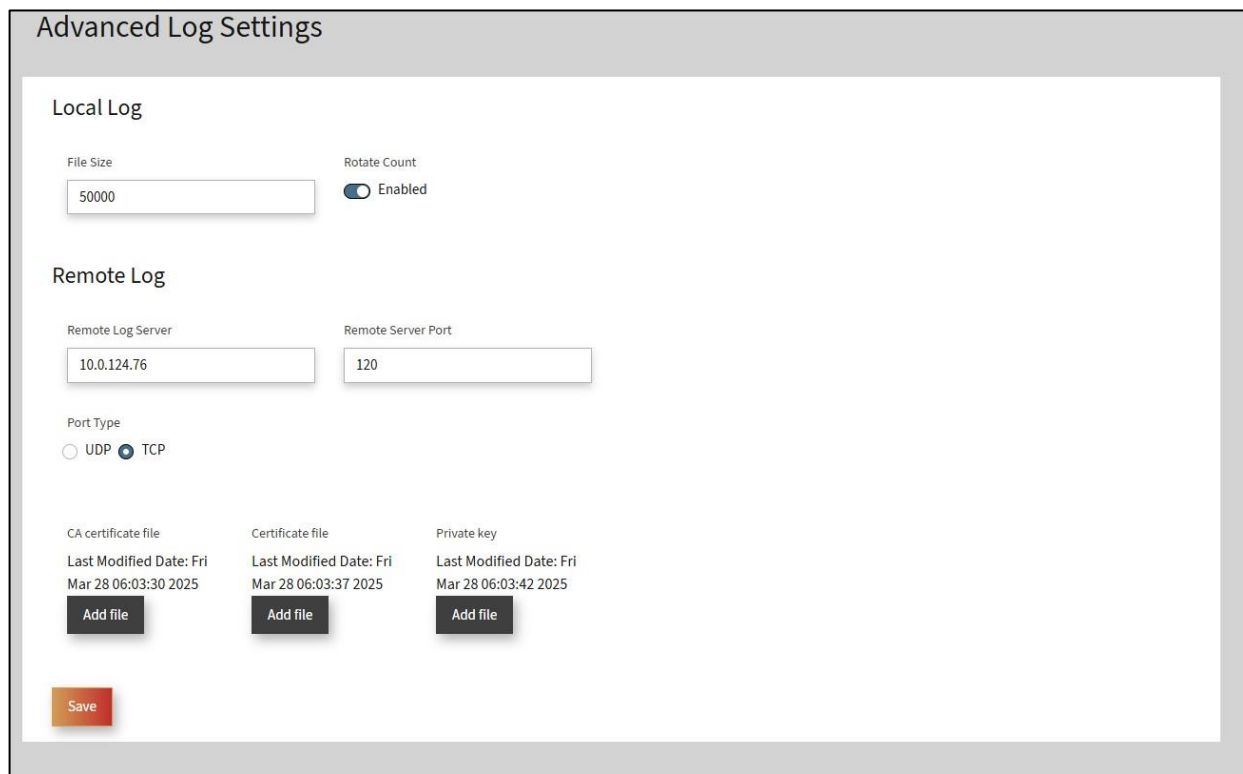
```

Chapter 27

27 Remote Syslog [TLS]

27.1 WEBUI Configuration

Navigate to Settings -> Advance Log Settings able to view the page.



The screenshot displays the 'Advanced Log Settings' web interface. It is divided into two main sections: 'Local Log' and 'Remote Log'. In the 'Local Log' section, there is a 'File Size' input field set to '50000' and a 'Rotate Count' toggle switch that is currently 'Enabled'. The 'Remote Log' section contains a 'Remote Log Server' input field with the value '10.0.124.76' and a 'Remote Server Port' input field with the value '120'. Below these, the 'Port Type' is set to 'TCP' (selected with a radio button) over 'UDP'. At the bottom of the 'Remote Log' section, there are three columns for certificate and key management: 'CA certificate file', 'Certificate file', and 'Private key'. Each column shows a 'Last Modified Date' (all are 'Fri Mar 28 06:03:30 2025', 'Fri Mar 28 06:03:37 2025', and 'Fri Mar 28 06:03:42 2025' respectively) and an 'Add file' button. A 'Save' button is located at the bottom left of the interface.

Figure 251 Advanced Log Settings

This Advanced Log Settings feature allows users to configure logging options for both local and remote logging.

27.2 Local Log Settings

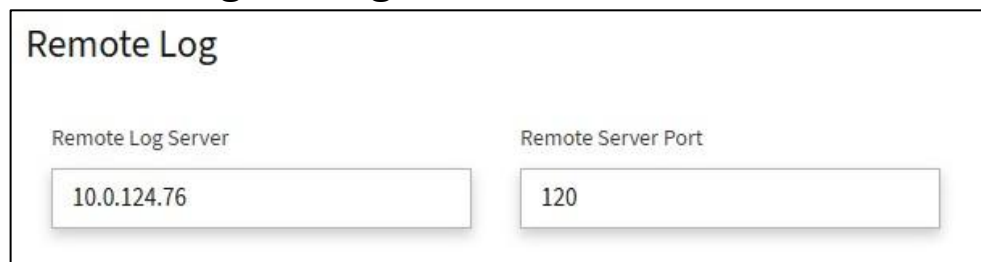
- File Size: Defines the maximum size of the log file before rotation.
- Rotate Count: When enabled, the system will rotate log files after reaching the specified file size.



The 'Local Log' settings interface is enclosed in a rectangular box. At the top left, the title 'Local Log' is displayed. Below it, there are two main sections. The first section, labeled 'File Size', contains a text input field with the value '50000'. The second section, labeled 'Rotate Count', features a toggle switch that is currently turned on, followed by the text 'Enabled'.

Figure 252 Local Log

27.3 Remote Log Settings

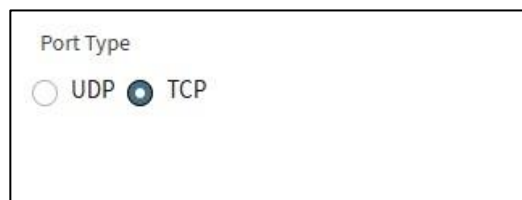


The 'Remote Log' settings interface is enclosed in a rectangular box. At the top left, the title 'Remote Log' is displayed. Below it, there are two main sections. The first section, labeled 'Remote Log Server', contains a text input field with the value '10.0.124.76'. The second section, labeled 'Remote Server Port', contains a text input field with the value '120'.

Figure 253 Remote Log Settings

- Remote Log Server: Specifies the IP address of the remote server where logs will be sent.
- Remote Server Port: Defines the port number used for transmitting logs.

27.4 Port Types



The 'Port Type' settings interface is enclosed in a rectangular box. At the top left, the title 'Port Type' is displayed. Below it, there are two radio button options: 'UDP' and 'TCP'. The 'TCP' option is selected, indicated by a filled circle next to it.

Figure 254 Port Type

Port Type: Allows selection between UDP (connectionless, faster) and TCP (reliable, connection-based) for log transmission.

27.5 Security Certificates and Save

CA certificate file	Certificate file	Private key
Last Modified Date: Fri Mar 28 06:03:30 2025	Last Modified Date: Fri Mar 28 06:03:37 2025	Last Modified Date: Fri Mar 28 06:03:42 2025
Add file	Add file	Add file

Figure 255 Security Certificates

- Users can upload cryptographic certificates and private keys for secure logging.
- The uploaded files include:
- CA Certificate (Certificate Authority Validation)
- Client Certificate (Authentication)
- Private Key (Used for Encryption)

Save Button:

Clicking "Save" applies and stores the configured log settings.

This feature is likely designed for logging server diagnostics, security logs, or system events while allowing remote monitoring and secure transmission.

27.6 Rsyslog TLS Setting [Host]

Do the below configuration in ubuntu host and add same certificates [uploaded via webui]

In the host machine, configure the certificate locations in rsyslog.conf.

- Install Rsyslog TLS Library

Use the following command to install the required TLS module for Rsyslog: `$apt-get install rsyslog-openssl`

- Rsyslog Configuration on the Server

Ensure the required certificates are placed in the configured location:

- CA Certificate: `/conf/ca.crt`
- Server Certificate: `/conf/server.crt`
- Server Key: `/conf/server.key`

TLS Support Configuration

```
$DefaultNetstreamDriver      openssl
$DefaultNetstreamDriverCAFile /conf/ca.crt
$DefaultNetstreamDriverCertFile /conf/server.crt
$DefaultNetstreamDriverKeyFile /conf/server.key
```

Load TCP Input Module with TLS Configuration

```
module(    load="imtcp"
streamDriver.name="openssl"
streamDriver.mode="3"
    streamDriver.authMode="x509/certvalid"
)
```

Enable Secure Syslog Input on Port 6514

```
input(type="imtcp" port="6514")
```


27.6.1 Server TLS configuration:

```
#TLS support

$DefaultNetstreamDriver      openssl
$DefaultNetstreamDriverCAFile /conf/ca.crt
$DefaultNetstreamDriverCertFile /conf/server.crt
$DefaultNetstreamDriverKeyFile /conf/server.key

module(
    load="imtcp"
    streamDriver.name="openssl"
    streamDriver.mode="3"
    streamDriver.authMode="x509/certvalid"
)
input(type="imtcp" port="6514")
```

Note: Restart rsyslog service on server after configuration:

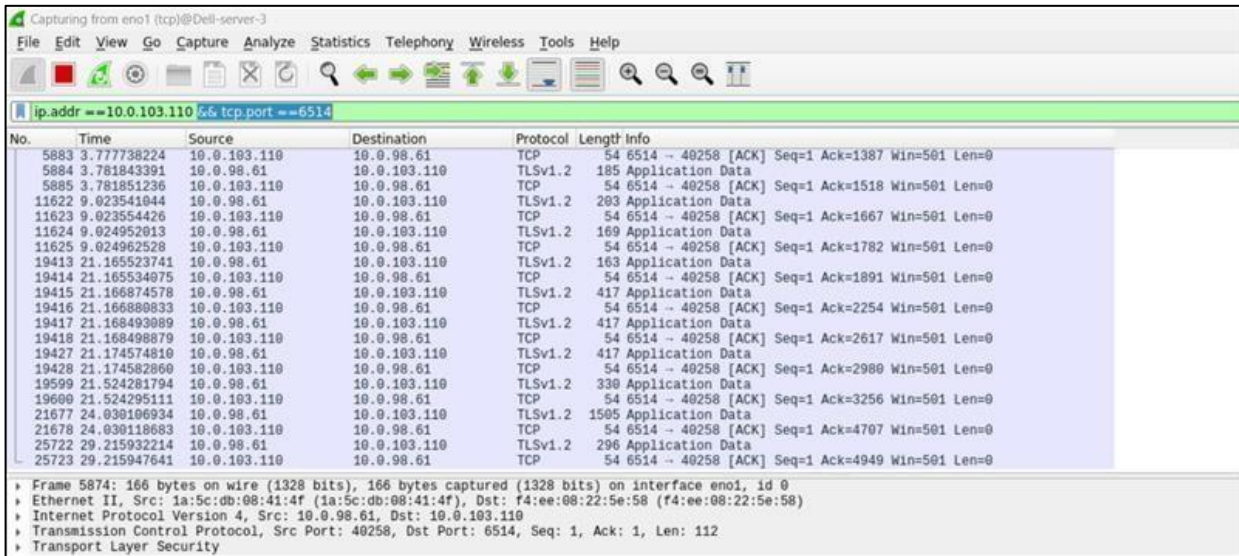
- Systemctl restart rsyslog

Redirecting logs to remote server: cat /var/log/syslog

```
Mar 12 11:40:48 AMIOT-9e72b0907e94 rsyslogd[893]: [origin software="rsyslogd" swVersion="8.2402.0" x-pid="893" x-info="https://www.rsyslog.com"] rsyslogd was HUPed
Mar 12 11:40:58 AMIOT-9e72b0907e94 systemd[1]: Started Phosphor Power Supply Monitor.
Mar 12 11:40:58 AMIOT-9e72b0907e94 phosphor-psu-monitor[24177]: Failed to find device driver /sys/bus/i2c/devices/7-0058/driver, error filesystem error: read_symlink: No such file or
rectory [/sys/bus/i2c/devices/7-0058/driver]
Mar 12 11:40:58 AMIOT-9e72b0907e94 phosphor-psu-monitor[24177]: Unable to find hmon directory in device base path DEVICE_PATH=/sys/bus/i2c/devices/7-0058
Mar 12 11:40:58 AMIOT-9e72b0907e94 phosphor-psu-monitor[24177]: Failed to request GPIO line
Mar 12 11:40:58 AMIOT-9e72b0907e94 phosphor-psu-monitor[24177]: presenceGPIO read fail: error requesting GPIO lines: Device or resource busy
Mar 12 11:40:58 AMIOT-9e72b0907e94 phosphor-psu-monitor[24177]: D-Bus property /xyz/openbmc_project/inventory/system/powersupply2 access failure exception
Mar 12 11:40:58 AMIOT-9e72b0907e94 phosphor-psu-monitor[24177]: Failed to read sysfs file errno=2 FILENAME=/sys/kernel/debug/pmbus/mfr_revision
Mar 12 11:40:58 AMIOT-9e72b0907e94 systemd[1]: phos-psu-monitor.service: Main process exited, code=exited, status=254/n/a
Mar 12 11:40:58 AMIOT-9e72b0907e94 systemd[1]: phos-psu-monitor.service: Failed with result 'exit-code'.
Mar 12 11:41:03 AMIOT-9e72b0907e94 systemd[1]: phos-psu-monitor.service: Scheduled restart job, restart counter is at 2987.
Mar 12 11:41:03 AMIOT-9e72b0907e94 systemd[1]: Starting Phosphor Power Supply Monitor...
Mar 12 11:41:18 AMIOT-9e72b0907e94 systemd[1]: Started Phosphor Power Supply Monitor.
Mar 12 11:41:18 AMIOT-9e72b0907e94 phosphor-psu-monitor[24181]: Failed to find device driver /sys/bus/i2c/devices/7-0058/driver, error filesystem error: read_symlink: No such file or
rectory [/sys/bus/i2c/devices/7-0058/driver]
Mar 12 11:41:18 AMIOT-9e72b0907e94 phosphor-psu-monitor[24181]: Unable to find hmon directory in device base path DEVICE_PATH=/sys/bus/i2c/devices/7-0058
Mar 12 11:41:18 AMIOT-9e72b0907e94 phosphor-psu-monitor[24181]: Failed to request GPIO line
Mar 12 11:41:18 AMIOT-9e72b0907e94 phosphor-psu-monitor[24181]: presenceGPIO read fail: error requesting GPIO lines: Device or resource busy
Mar 12 11:41:18 AMIOT-9e72b0907e94 phosphor-psu-monitor[24181]: D-Bus property /xyz/openbmc_project/inventory/system/powersupply2 access failure exception
Mar 12 11:41:18 AMIOT-9e72b0907e94 phosphor-psu-monitor[24181]: Failed to read sysfs file errno=2 FILENAME=/sys/kernel/debug/pmbus/mfr_revision
Mar 12 11:41:18 AMIOT-9e72b0907e94 phosphor-psu-monitor[24181]: filesystem error: cannot make canonical path: No such file or directory [/sys/bus/i2c/devices/7-0058]
Mar 12 11:41:18 AMIOT-9e72b0907e94 systemd[1]: phos-psu-monitor.service: Main process exited, code=exited, status=254/n/a
Mar 12 11:41:18 AMIOT-9e72b0907e94 systemd[1]: phos-psu-monitor.service: Failed with result 'exit-code'.
Mar 12 11:41:23 AMIOT-9e72b0907e94 systemd[1]: phos-psu-monitor.service: Scheduled restart job, restart counter is at 2988.
Mar 12 11:41:23 AMIOT-9e72b0907e94 systemd[1]: Starting Phosphor Power Supply Monitor...
Mar 12 17:11:29 msgubuntu-9703 kernel: [8903242.299627] e1000e 0000:00:1f.6 eno1: left promiscuous mode
msgubuntu@msgubuntu-9703:~$
```

27.7 Open WireShark For TCP/UDP Verification

TCP capture:

A screenshot of the Wireshark network protocol analyzer interface. The top menu bar includes File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, and Help. Below the menu is a toolbar with various icons for packet capture and analysis. The packet list pane shows a series of captured packets, with the first packet selected. The packet details pane on the right shows the structure of the selected packet, including Ethernet II, Internet Protocol Version 4, and Transmission Control Protocol. The packet bytes pane at the bottom shows the raw data of the selected packet.

No.	Time	Source	Destination	Protocol	Length	Info
5883	3.777738224	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=1387 Win=501 Len=0
5884	3.781843391	10.0.98.61	10.0.103.110	TLSv1.2	185	Application Data
5885	3.781851236	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=1518 Win=501 Len=0
11622	9.023541044	10.0.98.61	10.0.103.110	TLSv1.2	203	Application Data
11623	9.023554426	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=1667 Win=501 Len=0
11624	9.024952013	10.0.98.61	10.0.103.110	TLSv1.2	169	Application Data
11625	9.024962528	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=1782 Win=501 Len=0
19413	21.165523741	10.0.98.61	10.0.103.110	TLSv1.2	163	Application Data
19414	21.165534075	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=1891 Win=501 Len=0
19415	21.166874578	10.0.98.61	10.0.103.110	TLSv1.2	417	Application Data
19416	21.166880833	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=2254 Win=501 Len=0
19417	21.168493089	10.0.98.61	10.0.103.110	TLSv1.2	417	Application Data
19418	21.168498879	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=2617 Win=501 Len=0
19427	21.174574810	10.0.98.61	10.0.103.110	TLSv1.2	417	Application Data
19428	21.174582860	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=2980 Win=501 Len=0
19599	21.524281794	10.0.98.61	10.0.103.110	TLSv1.2	330	Application Data
19600	21.524295111	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=3256 Win=501 Len=0
21677	24.030106934	10.0.98.61	10.0.103.110	TLSv1.2	1505	Application Data
21678	24.030118683	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=4707 Win=501 Len=0
25722	29.215932214	10.0.98.61	10.0.103.110	TLSv1.2	296	Application Data
25723	29.215947641	10.0.103.110	10.0.98.61	TCP	54	6514 → 40258 [ACK] Seq=1 Ack=4949 Win=501 Len=0

Frame 5874: 166 bytes on wire (1328 bits), 166 bytes captured (1328 bits) on interface eno1, id 0
Ethernet II, Src: 1a:5c:db:08:41:4f (1a:5c:db:08:41:4f), Dst: f4:ee:08:22:5e:58 (f4:ee:08:22:5e:58)
Internet Protocol Version 4, Src: 10.0.98.61, Dst: 10.0.103.110
Transmission Control Protocol, Src Port: 40258, Dst Port: 6514, Seq: 1, Ack: 1, Len: 112
Transport Layer Security

Figure 256 TCP Capture

Chapter 28

28 Power

D-BUS properties of the power operations:

Power State	Property	Changing to Value
By Default, (After AC cycle)	RequestedHostTransition	"xyz.openbmc_project.State.Host.Transition.Off"
	RequestedPowerTransition	"xyz.openbmc_project.State.Chassis.Transition.Off"
Power Off (IPMI)	RequestedPowerTransition	"xyz.openbmc_project.State.Chassis.Transition.Off"
Power On (IPMI)	RequestedHostTransition	"xyz.openbmc_project.State.Host.Transition.On"
Power Cycle (IPMI)	RequestedHostTransition	"xyz.openbmc_project.State.Host.Transition.Reboot"
Power Reset (IPMI)	RequestedHostTransition	"xyz.openbmc_project.State.Host.Transition.ForceWarmReboot"
Graceful Shutdown (Web UI)	RequestedHostTransition	"xyz.openbmc_project.State.Host.Transition.Off"
Forced Shutdown (Web UI)	RequestedPowerTransition	"xyz.openbmc_project.State.Chassis.Transition.Off"
Graceful Restart (Web UI)	RequestedHostTransition	"xyz.openbmc_project.State.Host.Transition.GracefulWarmReboot"
Forced Restart (Web UI)	RequestedHostTransition	"xyz.openbmc_project.State.Host.Transition.ForceWarmReboot"
Power ON (Web UI)	RequestedHostTransition	"xyz.openbmc_project.State.Host.Transition.On"



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