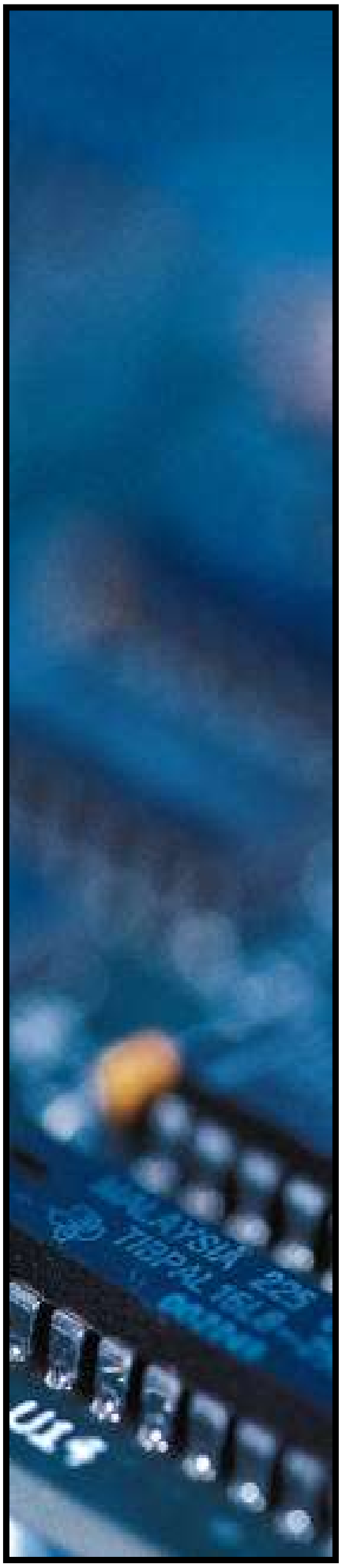

AMI MegaRAC® OpenEdition Ampere Altra User Guide

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Document Change History

Date	Doc Version	Author	Description
11-01-2021	0.1	Ryon Heichelbech	Initial Draft
11-08-2021	0.2	Hongwei Zhang	Updated for OCP repo

Contents

1. Introduction

This document describes features supported by MegaRAC OpenEdition firmware on the Ampere Altra platform.

2. Building

The platform is compiled with the following steps:

- git clone -b 'oe2.2_ampere_update' https://github.com/opencomputeproject/HWMgmt-MegaRAC-OpenEdition.git ami_oe_ampere && cd ami_oe_ampere
- TEMPLATECONF=meta-ami/meta-jade/conf . openbmc-env
- bitbake obmc-phosphor-image

3. Supported Features in MegaRAC OpenEdition

3.1. BMC Firmware Update Flash

3.1.1. TFTP Flash

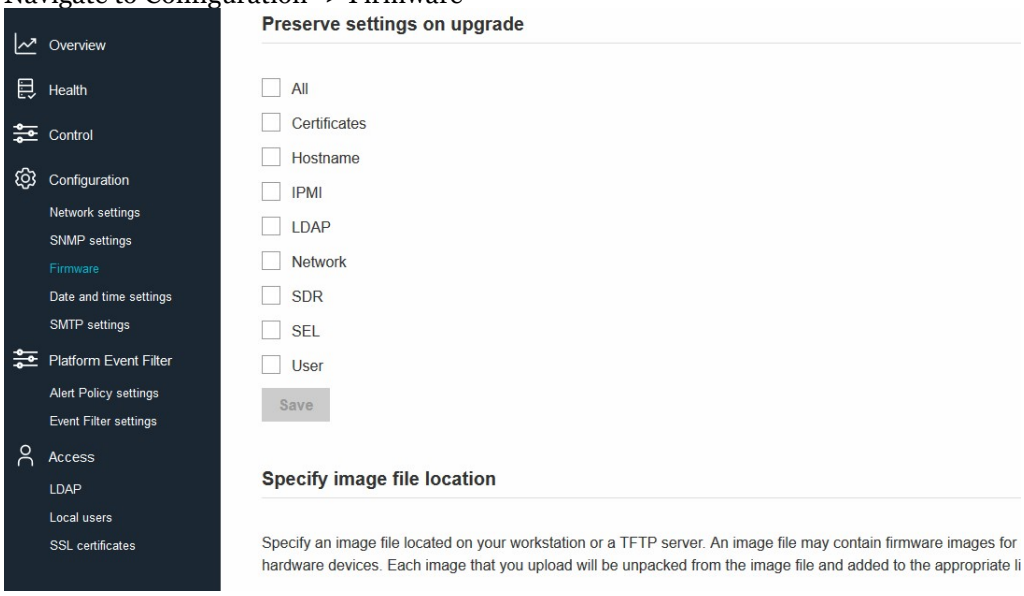
The BMC firmware can be updated by tftp in u-boot by the following set of commands:

- `setenv ethact FTGMAC100#1; setenv eth1addr <MACADDR>; setenv serverip <SERVERIP>; dhcp`
- `tftp <FILENAME>`
- `protect off all; erase all; cp.b 0x83000000 0x20000000 0x4000000`
- `reset`

3.1.2. WebUI Flash

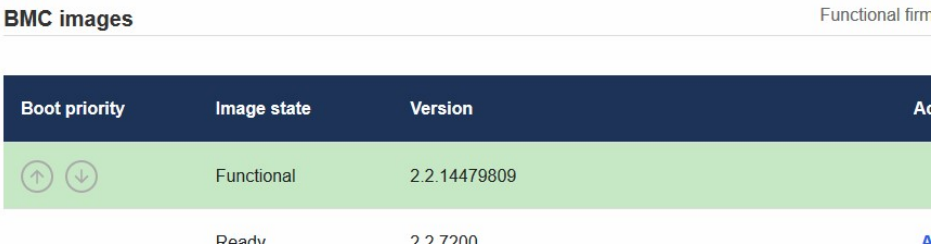
The BMC is updatable via WebUI as follows:

- Navigate to Configuration -> Firmware

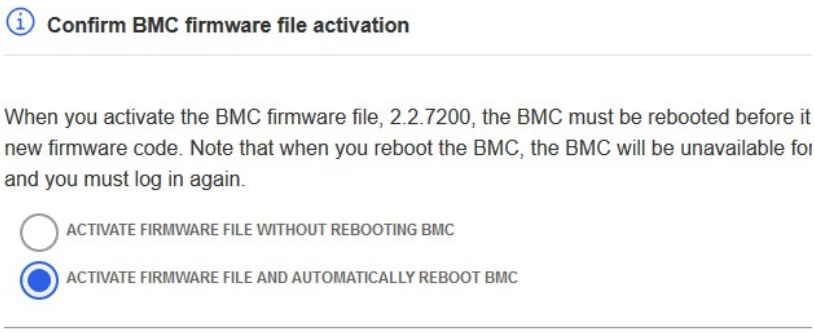


- Select settings to preserve and select “Save” (if applicable and flashing full image)
- Select “Choose a file”
- Select a valid OpenBMC firmware package for upload

- Select “Upload firmware” and wait for firmware to upload
- Select “Activate” to activate the image



- Select “Continue” in the popup modal to flash the BMC



3.1.3. Redfish Flash

The BMC can be flashed via Redfish with the following command:

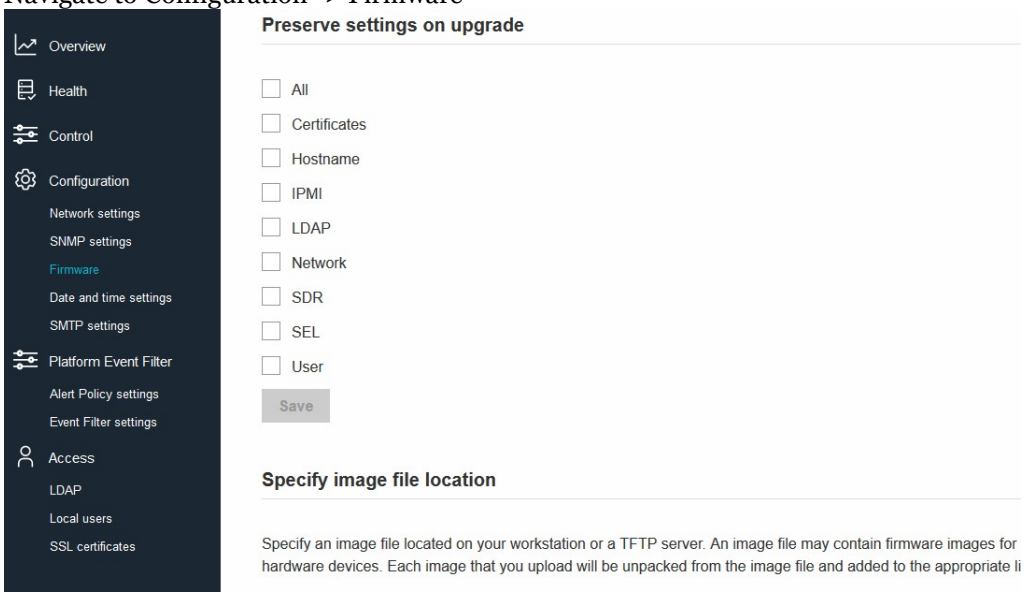
- `curl -k https://root:0penBmc@{target_ip}/redfish/v1/UpdateService -H "Content-Type: application/octet-stream" -X POST -T obmc-phosphor-image-mtjade.static.mtd.all.tar`

3.2. BIOS Update Flash

3.2.1. WebUI Flash

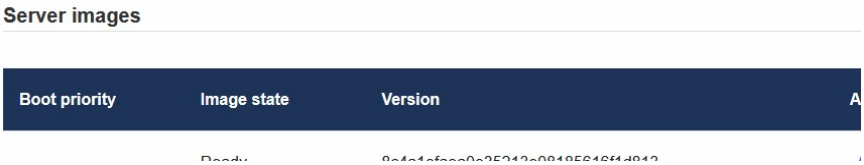
The BIOS is updatable via WebUI as follows:

- Navigate to Configuration -> Firmware

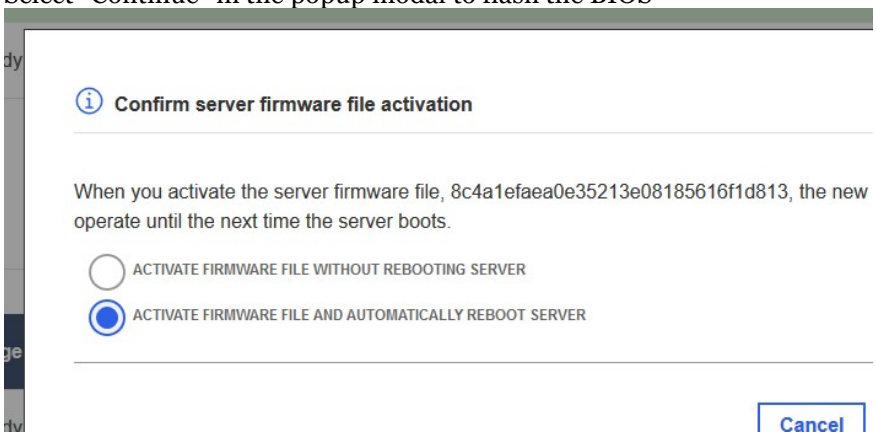


- Select “Choose a file”
- Select a valid BIOS package for upload

- Select “Upload firmware” and wait for firmware to upload
- Select “Activate” to activate the image



- Select “Continue” in the popup modal to flash the BIOS



3.2.2. Redfish Flash

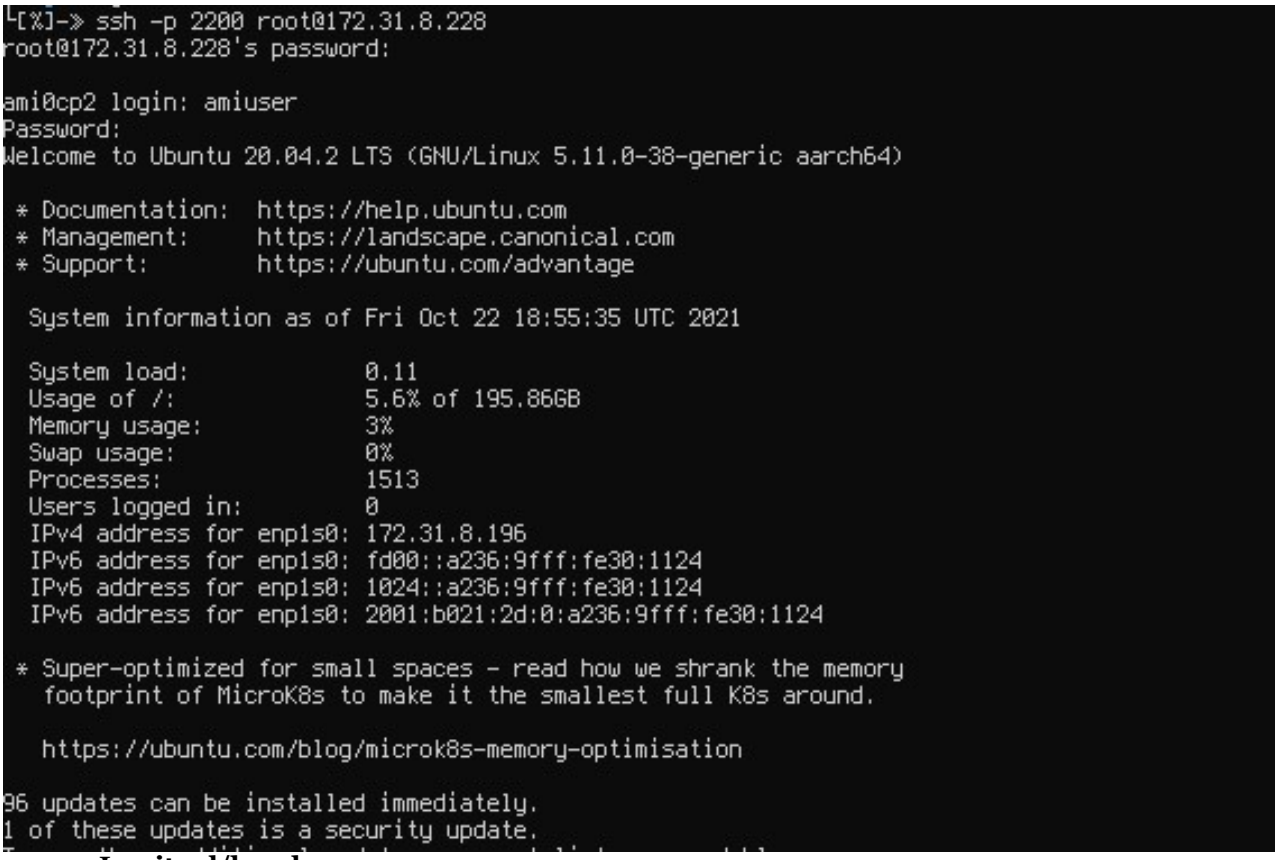
The BIOS can be flashed via Redfish with the following command:

- `curl -k https://root:0penBmc@{target_ip}/redfish/v1/UpdateService -H "Content-Type: application/octet-stream" -X POST -T jade_tianocore_atf_1.07.20210909.tar`

3.3. Serial-over-Lan

3.3.1. SOL over SSH

SOL over SSH can be used by accessing the BMC via ssh on port 2200



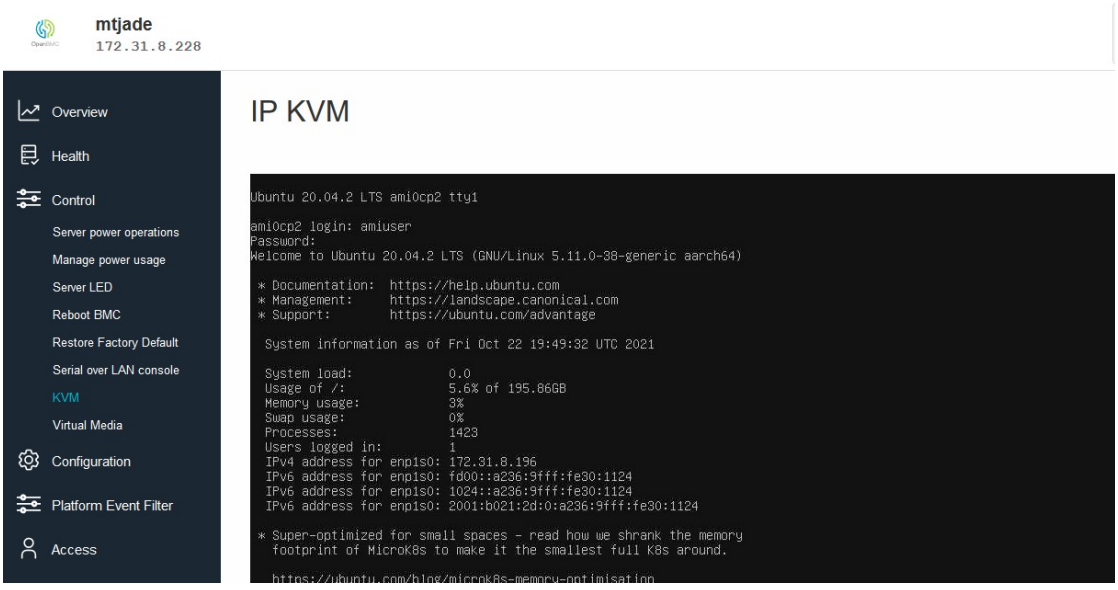
3.3.2. Ipmitool/lanplus

SOL can be used with ipmitool with the “ipmitool -H {target_ip} -U root -P openBmc -I lanplus -C 17 sol activate” command as shown:

```
└[%]-» ipmitool -H 172.31.8.228 -U root -P 0penBmc -I lanplus -C 17 sol activate
[SOL Session operational.  Use ~? for help]

ami0cp2 login: amiuser
Password:
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.11.0-38-generic aarch64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Fri Oct 22 19:02:16 UTC 2021

  System load:             0.0
  Usage of /:              5.6% of 195.86GB
  Memory usage:            3%
  Swap usage:              0%
  Processes:               1461
  Users logged in:         0
  IPv4 address for enp1s0: 172.31.8.196
  IPv6 address for enp1s0: fd00::a236:9fff:fe30:1124
  IPv6 address for enp1s0: 1024::a236:9fff:fe30:1124
  IPv6 address for enp1s0: 2001:b021:2d:0:a236:9fff:fe30:1124

 * Super-optimized for small spaces - read how we shrank the memory
   footprint of MicroK8s to make it the smallest full K8s around.

   https://ubuntu.com/blog/microk8s-memory-optimisation

96 updates can be installed immediately.
1 of these updates is a security update.
```

3.4. KVM

KVM can be accessed via “Control -> KVM” to control the host via the web UI.



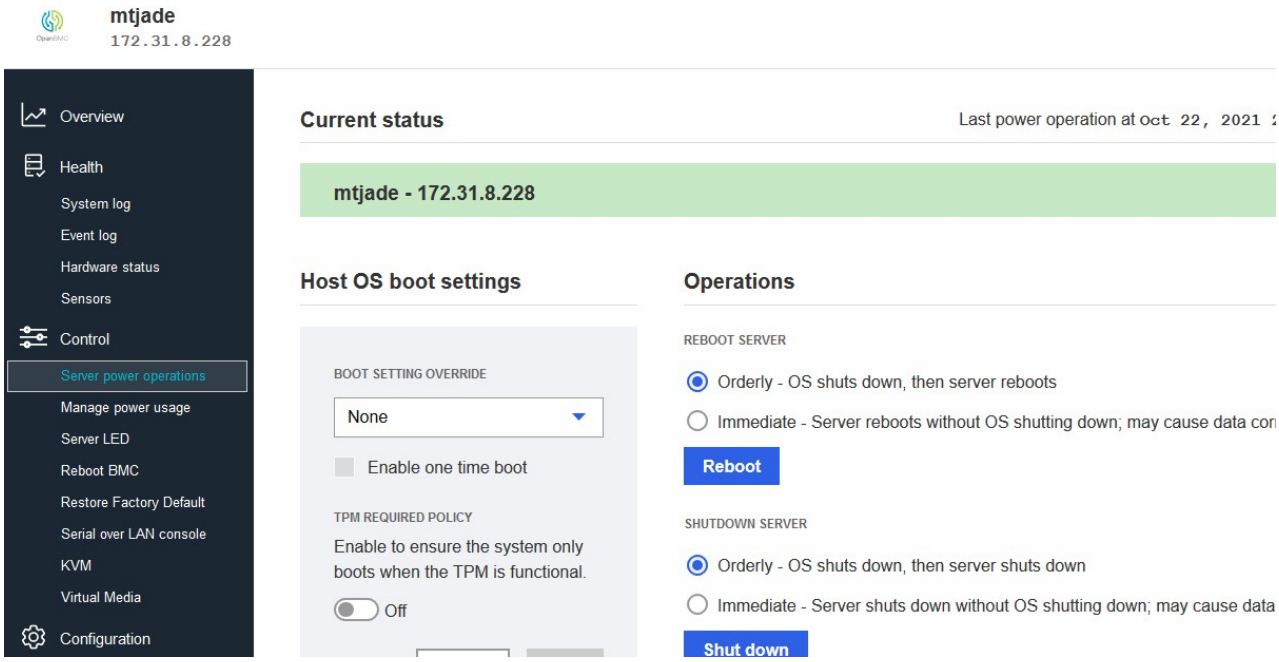
3.5. Chassis Power

3.5.1. Ipmitool

Chassis power can be controlled with the “ipmitool chassis power {on,off,cycle,reset}” commands.

3.5.2. WebUI

Chassis power can be controlled via the web UI in the Control -> Server Power Operations tab:



3.6. Ipmitool interfaces

Ipmitool can be used via many different interfaces:

3.6.1. Lanplus

Lanplus allows communicating with the BMC over a network connection (only cipher suite 17 supported):

```
ryon@megaRAC-Test2:~$ ipmitool -H 172.31.8.194 -U root -P 0penBmc -C 17 -
Device ID                 : 32
Device Revision           : 1
Firmware Revision         : 2.02
IPMI Version              : 2.0
Manufacturer ID           : 20974
Manufacturer Name         : AMI
Product ID                : 0 (0x0000)
Product Name              : Unknown (0x0)
Device Available          : yes
Provides Device SDRs      : yes
Additional Device Support :
    Sensor Device
    SDR Repository Device
    SEL Device
    FRU Inventory Device
    IPMB Event Receiver
    IPMB Event Generator
    Chassis Device
```

3.6.2. DBus

The DBus interface allows the usage of IPMI from the BMC's internal console:

```
root@mtjade:~# ipmitool bmc info
Device ID                 : 32
Device Revision           : 1
Firmware Revision         : 2.02
IPMI Version              : 2.0
Manufacturer ID           : 20974
Manufacturer Name         : American Megatrends,
Product ID                : 0 (0x0000)
Product Name              : Unknown (0x00)
Device Available          : yes
Provides Device SDRs      : yes
Additional Device Support :
    Sensor Device
    SDR Repository Device
    SEL Device
    FRU Inventory Device
    IPMB Event Receiver
    IPMB Event Generator
    Chassis Device
```

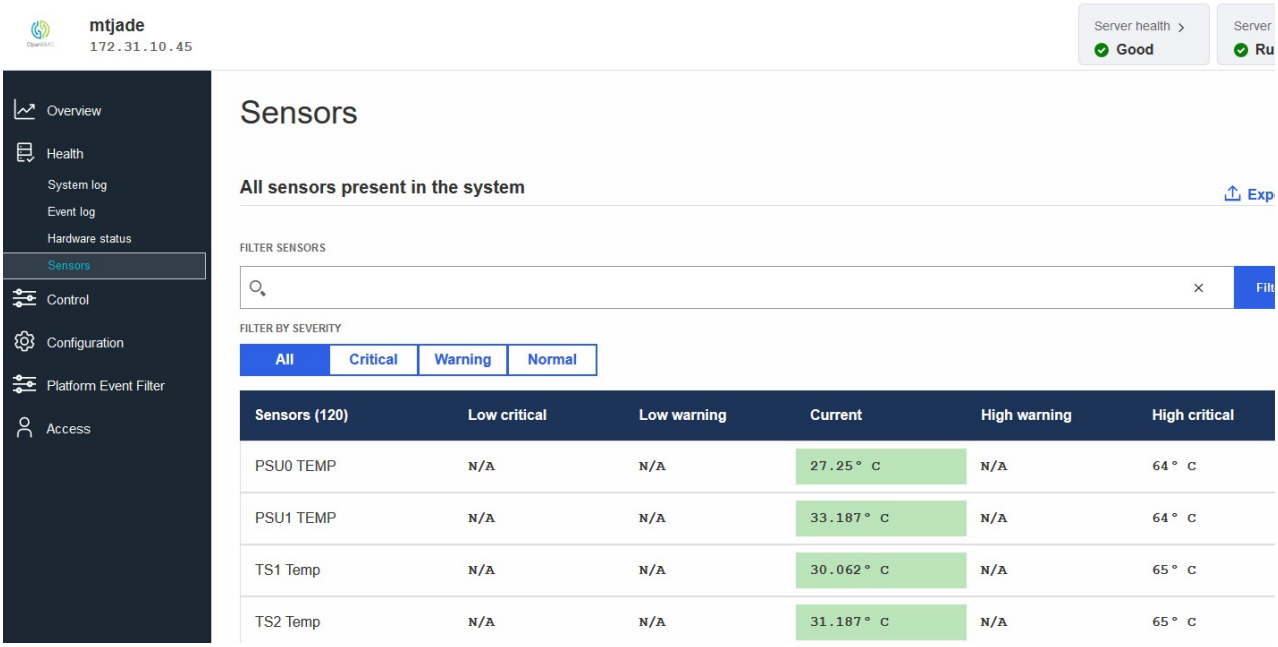
3.6.3. SSIF

SSIF is the host interface used to communicate with the BMC via IPMI from the host machine, provided the host has the appropriate drivers:

```
amiuser@ami0cp2:~$ sudo ipmitool bmc info
[sudo] password for amiuser:
Device ID                 : 32
Device Revision           : 1
Firmware Revision         : 2.02
IPMI Version              : 2.0
Manufacturer ID           : 20974
Manufacturer Name         : AMI
Product ID                : 0 (0x0000)
Product Name              : Unknown (0x0)
Device Available          : yes
Provides Device SDRs      : yes
Additional Device Support :
    Sensor Device
    SDR Repository Device
    SEL Device
    FRU Inventory Device
    IPMB Event Receiver
    IPMB Event Generator
    Chassis Device
```

3.7. Sensor Support

BMC FW supports several system chassis sensors, both through web ui and ipmitool.



```
root@mtjade:~# ipmitool sensor
PSU0 IINPUT      | 5.664      | Amps       | ok    | na        | na        | na        | na
PSU0 IOUTPUT     | 46.800     | Amps       | ok    | na        | na        | na        | na
PSU1 IINPUT      | 0.000      | Amps       | ok    | na        | na        | na        | na
PSU1 IOUTPUT     | 0.000      | Amps       | ok    | na        | na        | na        | na
S0 Core VRD Curr | 0.000      | Amps       | ok    | na        | na        | na        | na
S0 DIMM VR1 Curr | 0.000      | Amps       | ok    | na        | na        | na        | na
S0 DIMM VR2 Curr | 0.000      | Amps       | ok    | na        | na        | na        | na
S0 RCA VRD Curr  | 0.000      | Amps       | ok    | na        | na        | na        | na
S0 SOC VRD Curr  | 0.000      | Amps       | ok    | na        | na        | na        | na
S1 Core VRD Curr | 0.000      | Amps       | ok    | na        | na        | na        | na
S1 DIMM VR1 Curr | 0.000      | Amps       | ok    | na        | na        | na        | na
S1 DIMM VR2 Curr | 0.000      | Amps       | ok    | na        | na        | na        | na
S1 RCA VRD Curr  | 0.000      | Amps       | ok    | na        | na        | na        | na
S1 SOC VRD Curr  | 0.000      | Amps       | ok    | na        | na        | na        | na
FAN3 1           | 11739.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN3 2           | 11193.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN4 1           | 19929.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN4 2           | 18473.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN5 1           | 19838.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN5 2           | 18473.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN6 1           | 19929.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN6 2           | 18382.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN7 1           | 19110.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN7 2           | 18291.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN8 1           | 19656.000  | RPM        | ok    | na        | 455.000   | na        | na
FAN8 2           | 18473.000  | RPM        | ok    | na        | 455.000   | na        | na
PSU0 fan1        | 3540.000   | RPM        | ok    | na        | na        | na        | na
PSU1 fan1        | 2714.000   | RPM        | ok    | na        | na        | na        | na
PSU0 PINPUT      | 616.200    | Watts      | ok    | na        | na        | na        | na
PSU0 POUTPUT     | 566.500    | Watts      | ok    | na        | na        | na        | na
PSU1 PINPUT      | 0.000      | Watts      | ok    | na        | na        | na        | na
```

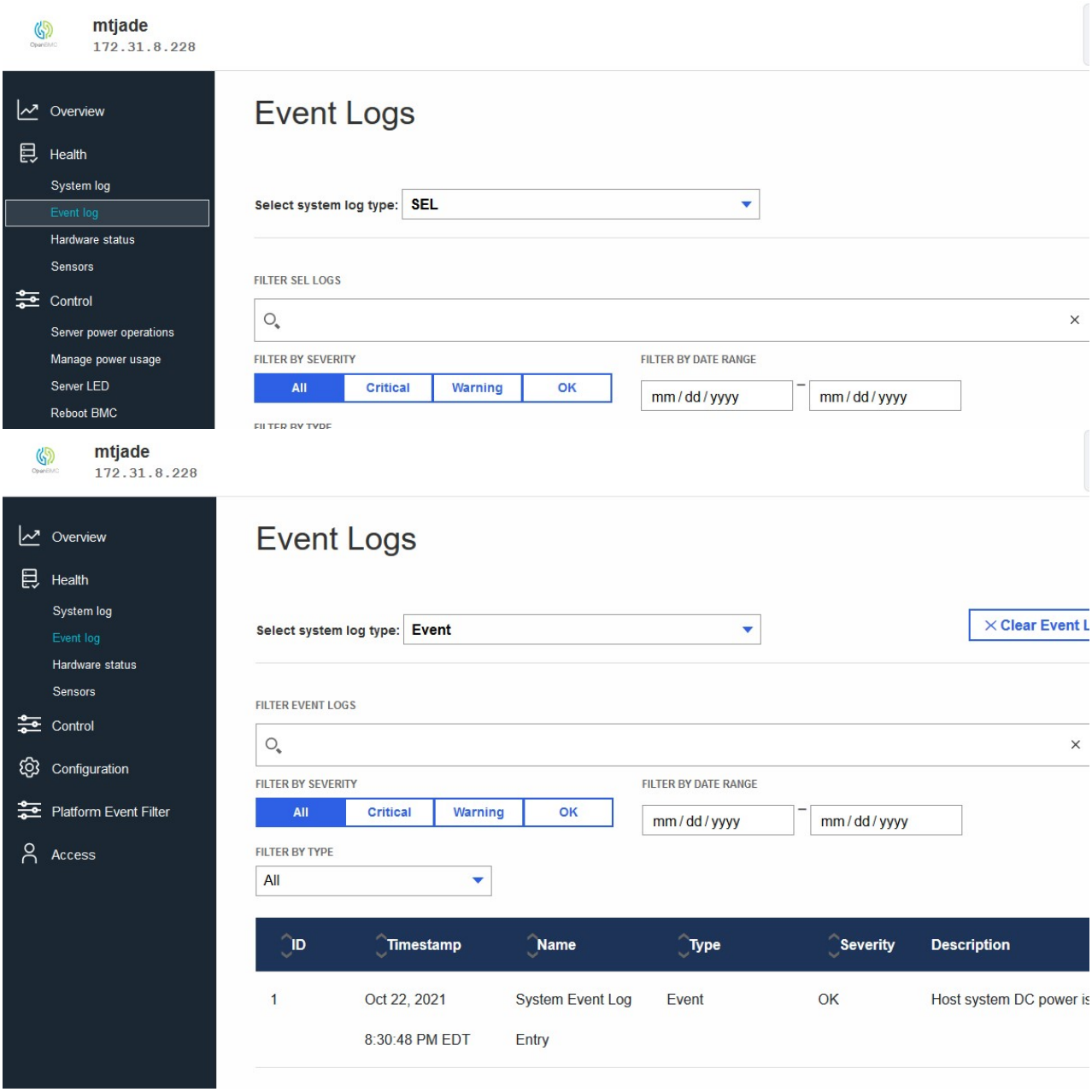
3.8. System Event Log Support

BMC FW supports system event logging. IPMI SEL log can be managed through the standard commands.

For example: ipmitool -U root -P openBmc -I lanplus -H <BMC IP> sel list

```
root@mtjade:~# ipmitool sel
SEL Information
Version          : 1.5 (v1.5, v2 compliant)
Entries          : 77
Free Space       : 65535 bytes or more
Percent Used     : unknown
Last Add Time    : 10/23/21 00:38:46 UTC
Last Del Time    : Not Available
Overflow         : false
Supported Cmds   : 'Delete' 'Reserve'
root@mtjade:~# ipmitool sel list
   1 | 10/23/21 | 00:30:48 UTC | reserved |
   2 | 10/23/21 | 00:30:55 UTC | reserved |
   3 | 10/23/21 | 00:31:12 UTC | reserved |
   4 | 10/23/21 | 00:31:34 UTC | reserved |
   5 | 10/23/21 | 00:31:37 UTC | reserved |
   6 | 10/23/21 | 00:31:44 UTC | reserved |
   7 | 10/23/21 | 00:31:45 UTC | reserved |
   8 | 10/23/21 | 00:31:45 UTC | reserved |
   9 | 10/23/21 | 00:31:45 UTC | reserved |
   a | 10/23/21 | 00:31:56 UTC | reserved |
   b | 10/23/21 | 00:31:57 UTC | reserved |
   c | 10/23/21 | 00:31:57 UTC | reserved |
   d | 10/23/21 | 00:32:07 UTC | reserved |
   e | 10/23/21 | 00:32:15 UTC | reserved |
   f | 10/23/21 | 00:32:18 UTC | reserved |
  10 | 10/23/21 | 00:32:29 UTC | reserved |
  11 | 10/23/21 | 00:32:30 UTC | reserved |
  12 | 10/23/21 | 00:34:55 UTC | reserved |
  13 | 10/23/21 | 00:35:01 UTC | reserved |
  14 | 10/23/21 | 00:35:04 UTC | reserved |
  15 | 10/23/21 | 00:35:11 UTC | reserved |
  16 | 10/23/21 | 00:35:13 UTC | reserved |
  17 | 10/23/21 | 00:35:21 UTC | reserved |
  18 | 10/23/21 | 00:35:22 UTC | reserved |
  19 | 10/23/21 | 00:35:23 UTC | reserved |
  1a | 10/23/21 | 00:35:24 UTC | reserved |
  1b | 10/23/21 | 00:35:30 UTC | reserved |
```

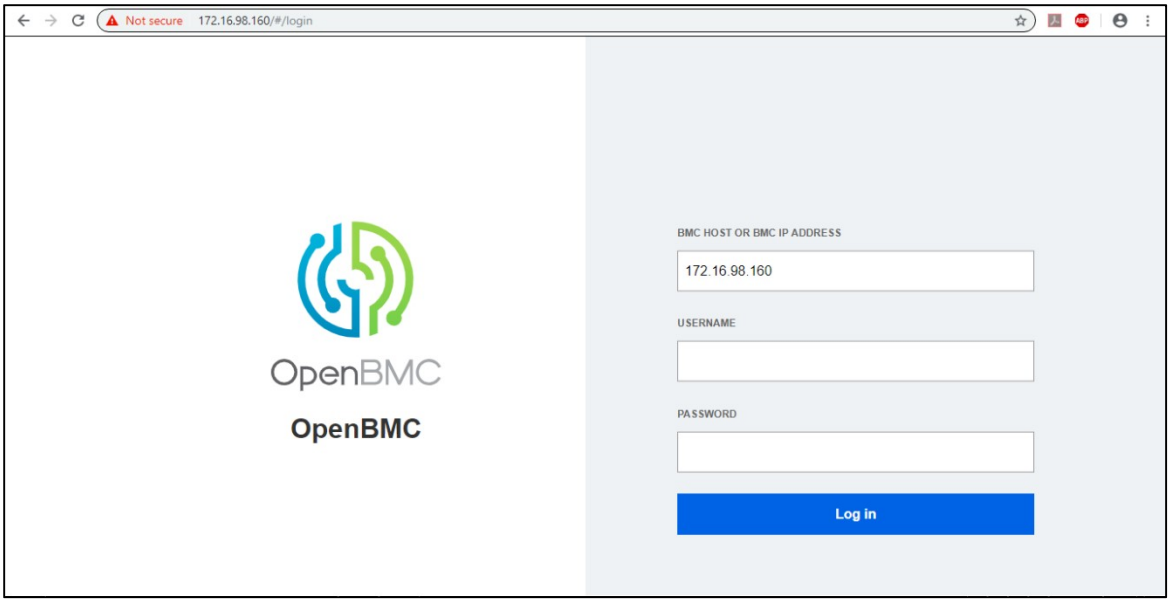
In the **Server Health** option, click **System log** tab where SEL can be viewed on web UI as shown below.



3.9. WebUI Support

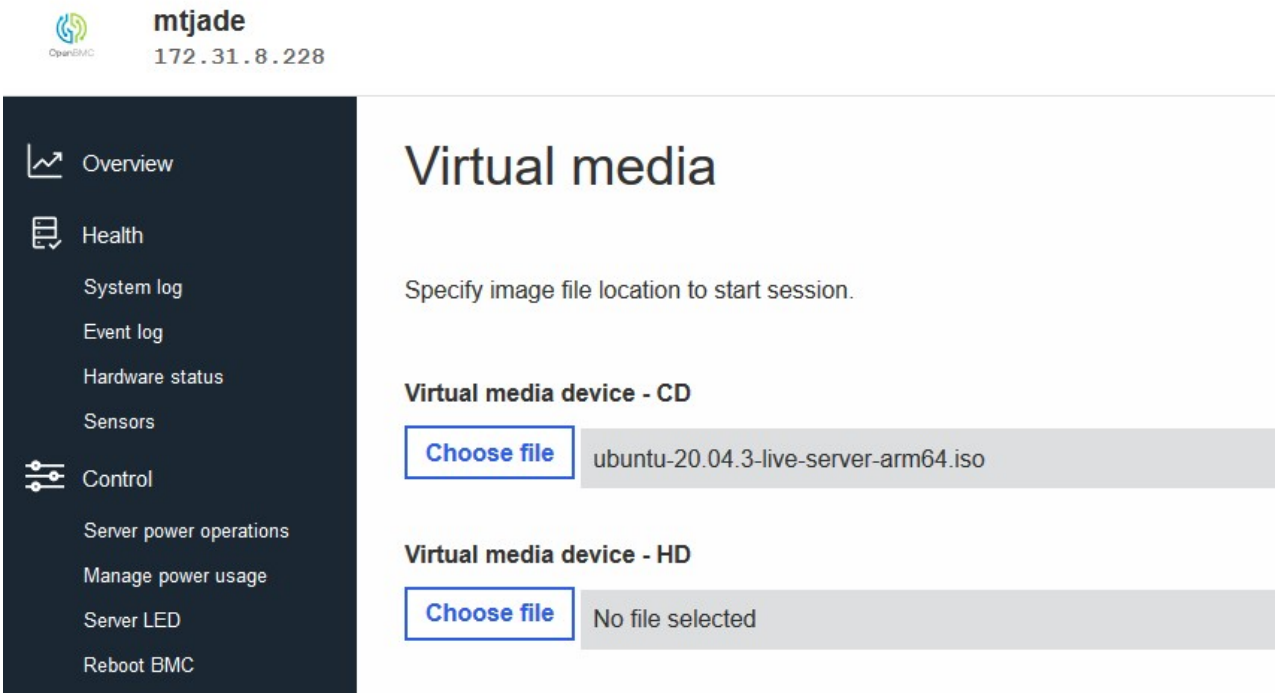
BMC FW supports a web server based on the bmcweb implementation and phosphor web UI front end. This can be accessed using the BMC IP address. A sample screenshot of the login page is given below.

1. Use valid user credentials (default are root/openBmc, note it's not O, it's zero :) to login.

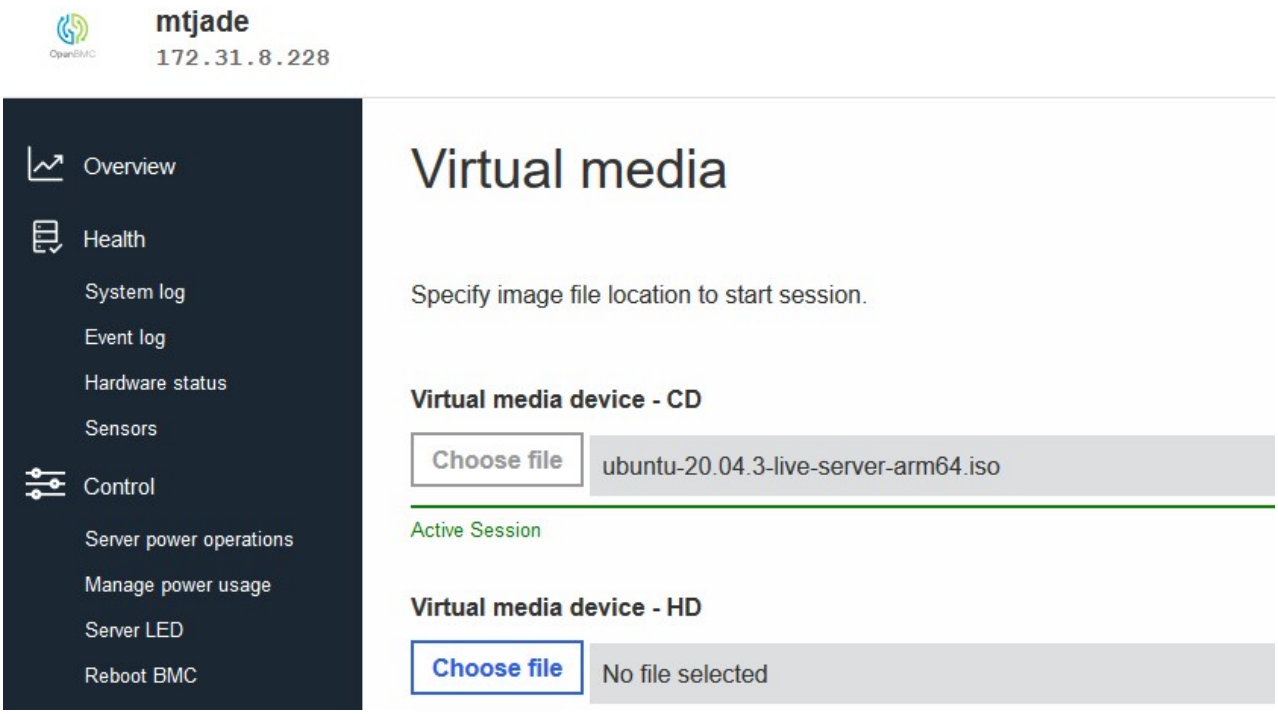


3.10. Virtual Media Support

BMC FW supports virtual media. User navigates to "Server control → Virtual Media" page, after logging in on the webUI. As shown below there will be option to choose a file.



User selects file and pushes 'start' button to establish the connection. An indicator appears to alert the user that there is an active session.

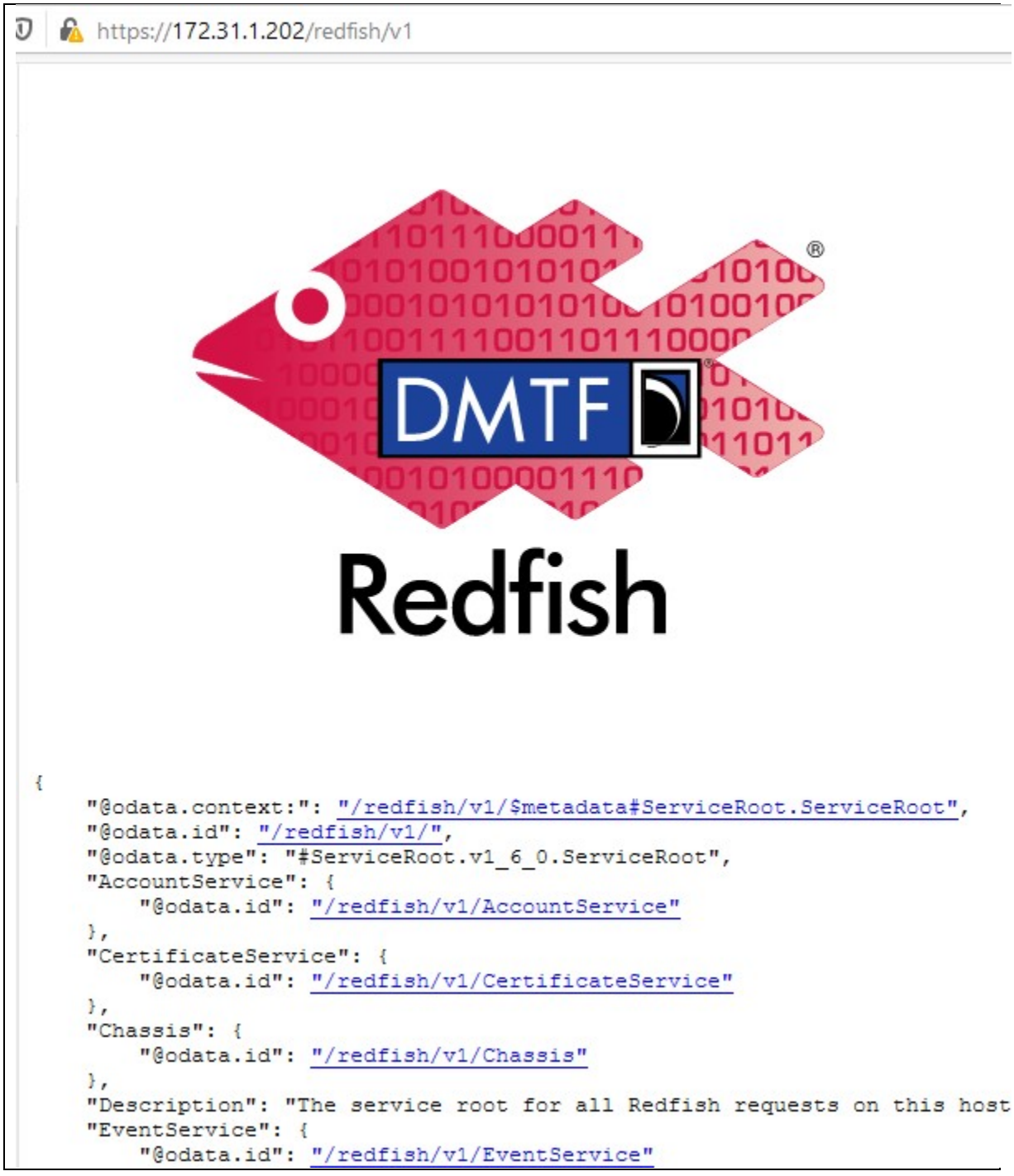


The mounted virtual media image can then be accessed from the host.

3.11. Redfish Support

BMC FW supports Redfish, here are some examples:

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



System Collection - http://{{ip}}/redfish/v1/Systems/

4. Features Implemented but Not Validated

- Network settings
- SNMP settings
- SMTP settings
- LDAP
- Certificate management
- User management