# Fan and Power Control Module User's Guide

**Note**

Before using this information and the product it supports, be sure to read and understand the safety information and the safety instructions, which are available at:
https://pubs.lenovo.com/safety_documentation/
http://systemx.lenovofiles.com/help/topic/com.lenovo.sysx.safety.doc/safety_pdf.pdf

The server is intended for use in a system/rack always installed on the load side of Power Distribution Unit (PDU) or Uninterruptible Power Supply (UPS) supplying a maximum 20 A branch circuit protection. The overall system/rack connection to mains power is to be a Pluggable Type B connector.

In addition, be sure that you are familiar with the terms and conditions of the Lenovo warranty for your solution, which can be found at:
http://datacentersupport.lenovo.com/warrantylookup

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# Contents



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# Chapter 1. Introduction

Use Fan and power control module (FPC) web interface to perform chassis management functions within a web browser.

It performs the following tasks:

1. Node status report
2. Chassis power and fan status report
3. Chassis power and fan configuration management
4. Chassis VPD information report
5. Chassis event log display, backup, and restore
6. FPC management and settings backup/restore

**Notes:** The FPC web interface supports the following browsers:

- Internet Explorer 8 (Windows 7/64-bit Windows Server 2008 R2 Standard/64-bit Windows Server 2008 R2 Enterprise only) or later
- Firefox 27.0 or later
- Google Chrome 30.0 or later

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# Chapter 2. Web interface access

FPC web interface can be accessed through Ethernet connection (10/100Mbit) by establishing a session with FPC.

Connecting to the FPC for the first time might require a change of the Internet protocol properties on the client computer. See "Network Configuration" on page 27 section for more information.

**Note:** For enhanced security FPC firmware that complies with NIST800-131A, please enable at least TLS1.2 on web browser to use FPC Web interface.

To log in to the FPC web interface, complete the following steps :

1. Point your browser to the FPC web interface URL that your system administrator defined during initial configuration.
2. Following out-of-factory default network settings is applied at first use of FPC:
   - IPv4 enabled with static IP = 192.168.0.100)
   - IPv6 enabled with local link address (LLA) IP.

     **Notes:** To calculate LLA IP, follow procedures below:

     a. Split the MAC address of FPC (39-A7-94-07-CB-D0)into two parts and insert FF-FE in the middle. For example, 39-A7-94-FF-FE-07-CB-D0
     b. Convert the two hexadecimal digits at the left end of the string to binary. For example, 00111001-A7-94-FF-FE-07-CB-D0
     c. Invert the value for bit 7 of the binary string. For example, 00111011-A7-94-FF-FE-07-CB-D0
     d. Convert the binary digits at the left end of the string back to hexadecimal.
     e. Combine the hexadecimal digit pairs into 4-digit groups. For example, 3BA7-94FF-FE07-CBD0
     f. Replace dash (-) separators with colon (:) separators. For example, 3BA7:94FF:FE07:CBD0
     g. Add Fe80:: to the left of the string. For example, FE80::3BA7:94FF:FE07:CBD0
3. Type your user ID and password assigned by a system administrator.
   - Default ID: USERID
   - Password: PASSW0RD

     **Note:** The sixth character of PASSW0RD is number zero.
4. Click **Log in**.

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# Chapter 3. Overview

The section introduces detailed functions for FPC web interface.

There are overall six function tabs:

- **Summary**
- **Power**
- **Cooling**
- **System Information**
- **Event Log**
- **Configuration**

Mouse cursor over the function tab buttons reveals the subcategories of the function. Click on the tab or subcategories taking user directly to the function.

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*Figure 1. Overview*

**Note:** Pages with **Refresh** button does not refresh periodically, except voltage overview and cooling overview. Auto-refresh interval is every 1 or 5 minutes on these two pages. For the other pages, click **Refresh** button to get the latest readings and status.

## Summary

Summary page displays overall chassis status and information.


*Figure 2. Chassis*

## Chassis Front Overview

Individual tab is used introduce status of chassis front view and rear view components. Under **Chassis Front Overview** section, the following illustration indicates the node status:

| Node | Width | Height | Status | Reset / Reseat | Node | Width | Height | Status | Reset / Reseat |
|---|---|---|---|---|---|---|---|---|---|
| 11 | N/A | 0 U | No Present | Reset Reseat | 12 | N/A | 0 U | No Present | Reset Reseat |
| 09 | N/A | 0 U | No Present | Reset Reseat | 10 | N/A | 0 U | No Present | Reset Reseat |
| 07 | N/A | 0 U | No Present | Reset Reseat | 08 | N/A | 0 U | No Present | Reset Reseat |
| 05 | N/A | 0 U | No Present | Reset Reseat | 06 | Half | 1 U | Power On | Reset Reseat |
| 03 | Half | 1 U | Power Off | Reset Reseat | 04 | N/A | 0 U | No Present | Reset Reseat |
| 01 | N/A | 0 U | No Present | Reset Reseat | 02 | Half | 1 U | Power Off | Reset Reseat |

*Figure 3. Chassis Front Overview*

- **Node**: Indicates node numbering.
- **Width**: Half/full is used to represent half-wide or full-wide node.
- **Height**: Node height can be 1 to 6U.
- **Status**:
  - **Not Present**: No node is installed.
  - **No Permission**: The node has not granted power permission and cannot be powered on.
  - **Fault**: The node has power fault and cannot be powered on.
  - **Power On**: The node is powered on.
  - **Power Off**: The node is powered off.
- **Reset/Reseat**: Used to perform virtual reset/virtual reseat.
  - **Reset**: Remotely reset node XCC through FPC.
  - **Reseat**: Remotely power cycle the entire node.
  - After virtual **Reset/Reseat**, the node XCC takes at least two minutes to be ready.

  **Note: Chassis Front Overview** needs to be manually updated 5 minutes after FPC or node XCC is reset to maintain latest node status.

## Chassis Rear Overview

Under **Chassis Rear Overview** section, there are three major sections to show the rear chassis status:

- **Management Module**
- **Current PSU**

- **Fan**

## Management Module

**Management Module**: Indicates the status of FPC

| Node | Width | Height | Status | Reset / Reseat | Node | Width | Height | Status | Reset / Reseat |
|---|---|---|---|---|---|---|---|---|---|
| 11 | N/A | 0 U | No Present | Reset Reseat | 12 | N/A | 0 U | No Present | Reset Reseat |
| 09 | N/A | 0 U | No Present | Reset Reseat | 10 | N/A | 0 U | No Present | Reset Reseat |
| 07 | N/A | 0 U | No Present | Reset Reseat | 08 | N/A | 0 U | No Present | Reset Reseat |
| 05 | N/A | 0 U | No Present | Reset Reseat | 06 | Half | 1 U | Power On | Reset Reseat |
| 03 | Half | 1 U | Power Off | Reset Reseat | 04 | N/A | 0 U | No Present | Reset Reseat |
| 01 | N/A | 0 U | No Present | Reset Reseat | 02 | Half | 1 U | Power Off | Reset Reseat |

*Figure 4. Management Module*

- **Status**: Indicates the FPC operating status.
  - **FPC Reboot**: Warm reboot the FPC
  - **Reset to Default**: Restored the FPC settings to out-of-factory default
- **Firmware version**: The current firmware version
- **PSoC version**: When user performs FPC firmware update, PSoC firmware is automatically updated to the latest version.
- **Boot-up Flash**: Indicates FPC current boot up bank. In normal operation, **Boot-up flash** should always be **First**. Only when the first flash has a hardware or firmware failure, FPC will switch to 2nd flash.
- **Identify LED**: Identify LED (ID LED) is a blue LED to assist user in locating chassis in rack. User can choose to turn the blue LED solid on or make the LED blink once every second. Click **Apply** to activate the option.
- **Error LED**: Error LED is on when critical event occurs. User can choose to turn it off and allow the LED to be turned on when the next event comes.

## PSU

**PSU**: Indicates the status of power supplies

| Node | Width | Height | Status | Reset / Reseat | Node | Width | Height | Status | Reset / Reseat |
|---|---|---|---|---|---|---|---|---|---|
| 11 | N/A | 0 U | No Present | Reset Reseat | 12 | N/A | 0 U | No Present | Reset Reseat |
| 09 | N/A | 0 U | No Present | Reset Reseat | 10 | N/A | 0 U | No Present | Reset Reseat |
| 07 | N/A | 0 U | No Present | Reset Reseat | 08 | N/A | 0 U | No Present | Reset Reseat |
| 05 | N/A | 0 U | No Present | Reset Reseat | 06 | Half | 1 U | Power On | Reset Reseat |
| 03 | Half | 1 U | Power Off | Reset Reseat | 04 | N/A | 0 U | No Present | Reset Reseat |
| 01 | N/A | 0 U | No Present | Reset Reseat | 02 | Half | 1 U | Power Off | Reset Reseat |

*Figure 5. PSU*

- **Status**
  - **Present**: The power supply is installed.
  - **Not Present**: No power supply is installed.
  - **Fault**: The power supply is in faulty condition.

- **Ratings**: Displays the power rating such as 900 W, 1300 W and 2000 W power supplies.
- **AC-IN**: AC input power
- **EPOW (Early power off warning)**
  - **Assert**: The power supply is in AC lost condition.
  - **Normal**: The power supply AC is in normal operating condition.
- **DC-PG (Direct current - power good)**: The DC power status of the power supply.
  - **No**: The power supply is not providing the required DC power.
  - **Yes**: The power supply is providing required DC power.

### Fan

**Fan**: Indicates the status of fans.

Fan

| Bay | Status | Type | Bay | Status | Type |
|---|---|---|---|---|---|
| 1 | Present | Standard | 6 | Present | Standard |
| 2 | Present | Standard | 7 | Present | Standard |
| 3 | Present | Standard | 8 | Present | Standard |
| 4 | Present | Standard | 9 | Present | Standard |
| 5 | Present | Standard | 10 | Present | Standard |

*Figure 6. Fan*

- **Status**
  - **Present**: The fan is in normal operating condition.
  - **Not present**: No fan installed.
  - **Fault**: The fan is in faulty condition.
- **Type**: Supports only one type of fan (Standard).

## Power

There are five major sections under **Power** tab.


*Figure 7. Power tab*

- **Power Overview**: Displays the chassis level power consumption, the node level power consumption, and power consumption of subsystems, which includes power subsystem (PSUs), and thermal subsystem (System fans).
- **PSU Configuration**: Allows users to set the redundancy mode for power supplies.
- **Power Cap**: Allows users to set power capping/saving.
- **Voltage Overview**: Monitors the voltage rail on FPC.
- **Power Restore Policy**: Allows user to enable power restore policy.

## Power Overview

**Power Overview** displays the chassis level power consumption, the node level power consumption, and power consumption of subsystems, which includes power subsystem (PSUs), and thermal subsystem (System fans).

Chassis and node level power consumption reports minimum, average, and maximum value

Power Overview

**Total Chassis Power Consumption**

| Min. (W) | Avg. (W) | Max. (W) |
|---|---|---|
| 337 | 337 | 338 |

**Total Fans Power Consumption**

| |
|---|
| 53.45 W |

**Node Power Consumption**

| Node | Min. (W) | Avg. (W) | Max. (W) | Node | Min. (W) | Avg. (W) | Max. (W) |
|---|---|---|---|---|---|---|---|
| 11 | 0 | 0 | 0 | 12 | 41 | 44 | 59 |
| 09 | 0 | 0 | 0 | 10 | 0 | 0 | 0 |
| 07 | 0 | 0 | 0 | 08 | 0 | 0 | 0 |
| 05 | 0 | 0 | 0 | 06 | 110 | 111 | 111 |
| 03 | 0 | 0 | 0 | 04 | 0 | 0 | 0 |
| 01 | 0 | 0 | 0 | 02 | 0 | 0 | 0 |

*Figure 8. Power Overview*

The chassis and PSU power consumption sampled every 1 second over 30 seconds period.

## PSU Configuration

**PSU Configuration** allows users to set the redundancy mode for power supplies.

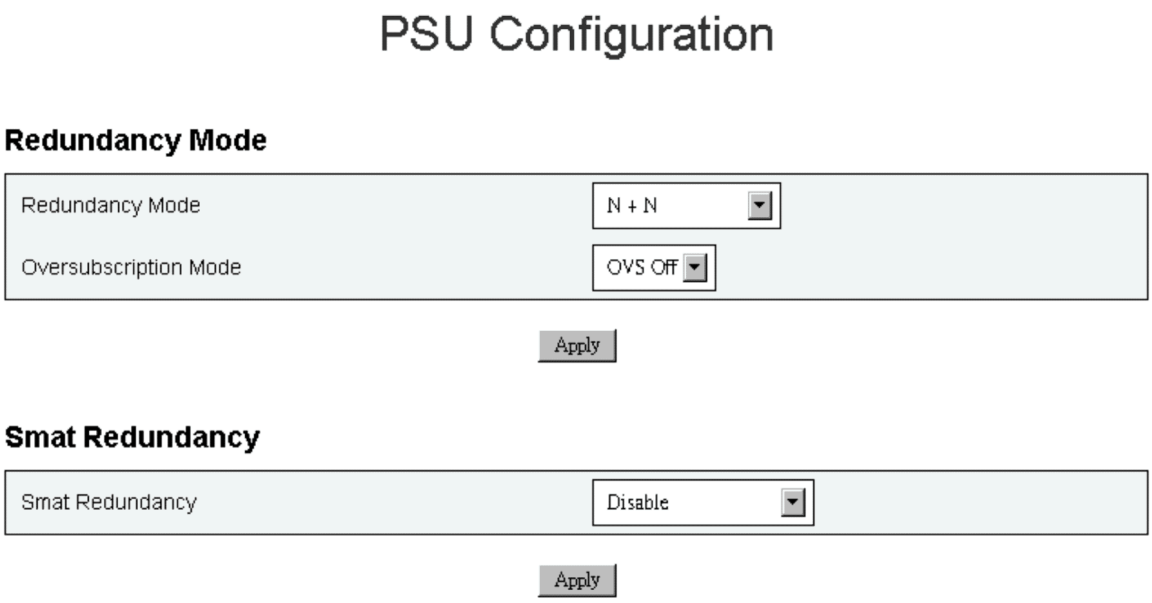



*Figure 9. PSU Configuration*

1. **Redundancy Mode**: Offer two modes for user to choose.
   - **Redundancy Mode**
     - **No Redundancy**: System could be throttled or shut down if one or more power supplies are in faulty condition.
     - **N+1**: There is one properly installed PSU as redundant power supply, so there is no impact to system operation or performance if any one of the PSUs is in faulty condition, given that Oversubscription mode is not enabled.
     - **N+N**: Have half of the properly installed PSUs as redundant power supplies, therefore, there is no impact to system operation or performance if any half number of the PSUs has failed, given that Over-subscription mode is not enabled. For example, 6 PSUs properly installed, 3 PSUs could fail without any impact when N+N and no Over-subscription is applied.
   - **Over-subscription Mode**: **Oversubscription Mode** allows user to take advantage of the extra power from the redundant power supply when the power supplies are in healthy condition. When the redundancy fails, PSU will shut down within 1 second if system power loading is not corrected after the time limit. FPC takes the action of node throttling at such power emergency. Chassis performance could be impacted even in redundancy mode if oversubscription is also enabled.
     - Oversubscription is applied only with N+1 or N+N redundancy modes.
     - When enabled with N+1, the total power available is equivalent to **No Redundancy** mode.
   - Click on **Apply** after choosing the redundancy and oversubscription mode from drop-down menu to activate.
2. **Smart Redundancy**: Three scanning period are offered: 10/30/60 minutes. The shorter the scanning period, the faster FPC adjusts number of hibernate PSUs to optimize PSU efficiency when system load changes. With shorter scanning period, PSU are also turned on and off more frequently when system loading fluctuates, which could reduce PSU life. Disable smart Redundancy will keep all PSU always active. Click on **Apply** after choosing the scanning period from drop-down menu to apply selections.

   **Note:** CFFv1 PSU (900w) does not support this feature. **Smart Redundancy** will always be in **Disable** state and the **Apply** button will be greyed out when 900w PSU is installed

## Power Capping

You can choose the following two cap types through power cap configuration.

1. **Chassis Capping**
2. **Nodes Capping**

Power cap allows user to set a wattage limit on power consumption. When applied on individual node, the node power consumption is capped at assigned level and when applied on chassis, the whole chassis power consumption is capped. When power saving is enabled, individual node or all nodes (chassis level) runs in modes of different throttling level, depending on the modes chosen.

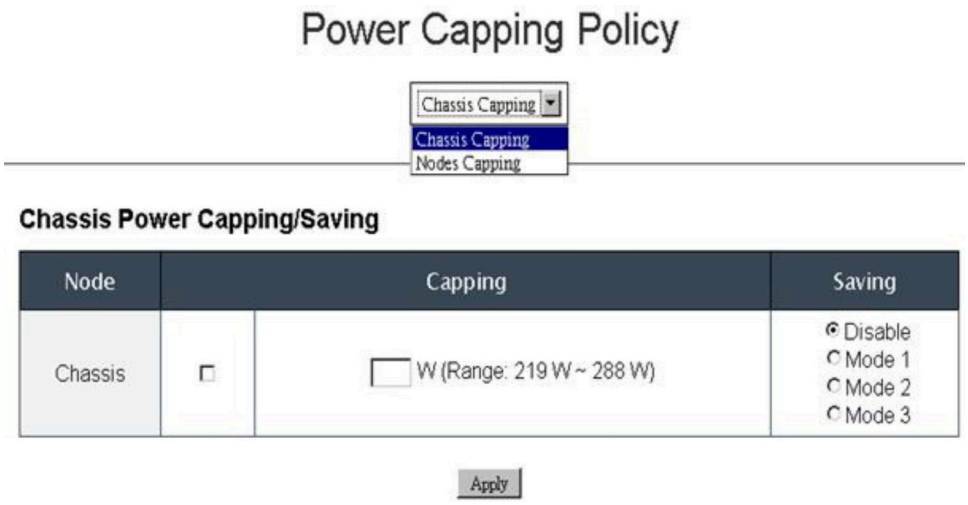



*Figure 10. Chassis Capping*

1. Select **Chassis Capping** or **Nodes Capping** from the drop-down menu.
2. Enter a power cap value, check the box, and click on **Apply** to enable power capping.
3. Capping enabled (checked) or disabled (unchecked) can be applied independent of capping value. However, if capping is enabled without any input value, FPC display **0w** as default value to represents that no user capping value is specified and no capping is enforced. If a value is entered and applied without enable ticked, the value will be saved but not enforced.
4. Capping range is suggested to user based on the minimum and maximum possible power consumption of the node/chassis. Any value between 1~ 32767W is still allowed even if the value is not set within the suggested range. A capping value of ‘0w’ is not accepted as user input value since it represents no user value specified.
5. User entered capping value might not be met if capping value entered is lower than the lower bound of suggested range.
6. Select enable in the **Power Save** section and click on **Apply** to activate power save.
7. Power save can be applied with power cap simultaneously.
8. The system runs in a throttled state (defined by the implementation) regardless of the workload.

   There are three types of power saving modes and the following table provides details about saving modes.

*Table 1. Saving Mode*

| Mode | Title | Description | Supportability |
|---|---|---|---|
| Disable | Static maximum perform-ance | The system runs at full speed (no throttling) regardless of the workload | Support |
| Mode 1 | Static minimum power | The system runs in a throttled state (defined by the implementation) regardless of the workload | Support |
| Mode 2 | Dynamic favor perform-ance | The system adjusts throttling levels based on workload, attempting to favor performance over power savings | Not Supported |
| Mode 3 | Dynamic favor power | The system adjusts throttling levels based on workload, attempting to favor power savings over performance | Not Supported |

## Voltage Overview

**Voltage Overview** table provides the status of FPC board (12V, 5V, 3.3V) and battery voltage. Error log is asserted if critical threshold is reached.

**Probe List**

| Status | Probe Name | Reading | Lower Non-Critical | Upper Non-Critical | Lower Critical | Upper Critical | Lower Non-Recoverable | Upper Non-Recoverable |
|---|---|---|---|---|---|---|---|---|
| ✔ | 12V_SENSE | 11.904 V | N/A | N/A | 10.816 V | 13.248 V | N/A | N/A |
| ✔ | 3V3_SENSE | 3.2900 V | N/A | N/A | 2.9750 V | 3.6225 V | N/A | N/A |
| ✔ | 5V_SENSE | 4.995 V | N/A | N/A | 4.563 V | 5.589 V | N/A | N/A |
| ✔ | VBAT_SENSE | 2.9040 V | N/A | N/A | 1.7952 V | N/A | N/A | N/A |
| ✔ | HW_RESET_DEFAULT | 2.4735 V | N/A | N/A | 0.8051 V | N/A | N/A | N/A |

*Figure 11. Voltage Overview*

## Power Restore Policy

When **Power Restore Policy** is enabled as **Restore**, FPC remembers the latest node power status and recovery the node to the power status it was before AC is abruptly lost.

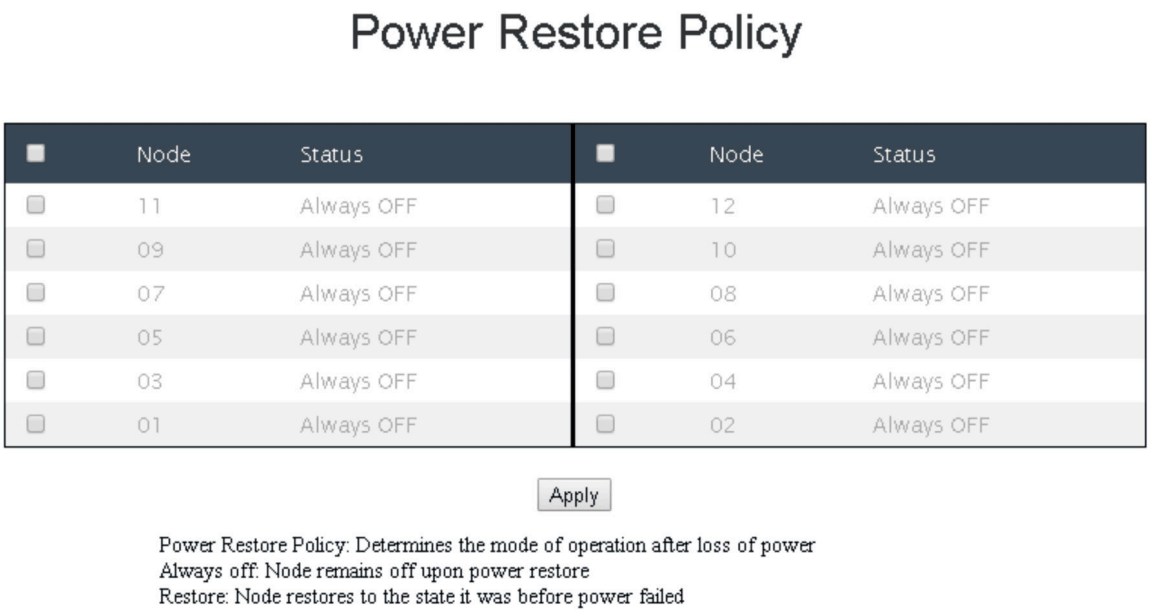



*Figure 12. Power Restore Policy*

**Power Restore Policy**: Determines the mode of operation after loss of power.

- **Always off**: Node remains off upon power restore.
- **Restore**; Node restores to the previous state that was before power failed.

1. Check the boxes of the nodes that needed to enable power restore policy or uncheck the boxes to set policy to always off after power recovery.
2. Click **Apply** to activate the setting.

   **Notes:**

   - Power restore policy changed within 1 minute before AC lost might not be recovered due to design limitation.
   - Nodes ON/OFF state change within 1 minute before AC lost might not be recovered due to design limitation.

## Cooling

There are three major sections under **Cooling** tab.

- **Cooling Overview**: System fan speed
- **PSU Fan Speed**: Power supply fan speed
- **Acoustic Mode**: Allow users to choose acoustic mode

## Cooling Overview

Fan speed is displayed in RPM. Error log is asserted when fan speed is below lower critical threshold.

**Note:** This page will automatically refresh every 30 seconds.

## Cooling Overview

**Probe List**

Refresh

| Status | Probe Name | Reading | LowerNon-Critical | UpperNon-Critical | LowerCritical | UpperCritical | LowerNon-Recoverable | UpperNon-Recoverable |
|---|---|---|---|---|---|---|---|---|
| | FAN_Tach_1A | 2752 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_1B | 2112 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_2A | 2816 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_2B | 2176 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_3A | 2816 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_3B | 2176 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_4A | 2752 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_4B | 2176 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_5A | 2816 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_5B | 2112 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_6A | 2688 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_6B | 2240 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_7A | 2752 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_7B | 2176 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_8A | 2816 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_8B | 2112 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_9A | 2752 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |
| | FAN_Tach_9B | 2176 RPM | N/A | N/A | 1472 RPM | N/A | N/A | N/A |

*Figure 13. Cooling Overview*

- **Status** (two status):
  - Healthy condition: 
  - Fault condition: 
- **Fan_Tach_#A(B)**: System fan speed normally operates at 2000~13000 rpm.

  DW612 Enclosure system fan is equipped with dual motor. Tach A displays the primary fan motor speed and tach B displays the redundant fan motor speed.
- **Lower Critical**: 1472 rpm is set to be the lower critical fan speed threshold.

## PSU Fan Speed

PSU Fan Speed

| Fan | Speed (RPM) | Speed (% of Max.) | Status |
|---|---|---|---|
| Fan1 | 0 | 0% | No Present |
| Fan2 | 0 | 0% | No Present |
| Fan3 | 0 | 0% | No Present |
| **Fan4** | **5528** | **10%** | **Normal** |
| Fan5 | 0 | 0% | No Present |
| Fan6 | 0 | 0% | No Present |

*Figure 14. PSU Fan Speed*

- **Speed**: PSU fan speed normally operates at 5500~23000 rpm. PSU fan speed is displayed in RPM.
- **Duty (% of Max.)** : Out of 25000 rpm.
- **Status**:
  - **Normal**: PSU fan is running in healthy condition
  - **Not Present**: No power supply is installed
  - **Fault**: Fan speed is lower than the threshold (3000 rpm)

## Acoustic Mode

To reduce the noise level of the chassis during run-time, you can configure the chassis to five different acoustic modes.

Acoustic Mode Selection

Select an Acoustic Mode : None

Apply

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. As a result, Mode1,2,3 increase the possibility that the node might have to be throttled to maintain cooling within the fan speed limitation.

None: Fan speeds change as required for optimal cooling.
Mode1: Highest acoustics attenuation (lowest cooling).
Mode2: Intermediate acoustics attenuation.
Mode3: Low acoustics attenuation (higher cooling).

NOTE:If there is power or thermal demanding PCI card installed in the chassis, acoustic mode is automatically disabled.

*Figure 15. Acoustic Mode Selection*

1. Select the mode from the drop-down menu according to your preference.
   - **None**: Fan speeds change as required for optimal cooling
   - **Mode 1**: Highest acoustics attenuation (lowest cooling). System fan speed is capped at 28% duty (7.5 bels)

- **Mode 2**: Higher acoustics attenuation. System fan speed is capped at 34% duty (7.8 bels)
- **Mode 3**: Low acoustics attenuation (higher cooling). System fan speed is capped at 40% duty (8.1 bels)

2. Click on **Apply** after choosing the acoustic mode from the drop-down menu to activate the setting.

   **Notes:**

   - Acoustic modes can only apply to the entire chassis as a whole
   - When acoustic modes are applied, nodes workload is also capped to avoid over-heating
   - If there is power or thermal demanding configuration in the chassis, acoustic mode is automatically disabled

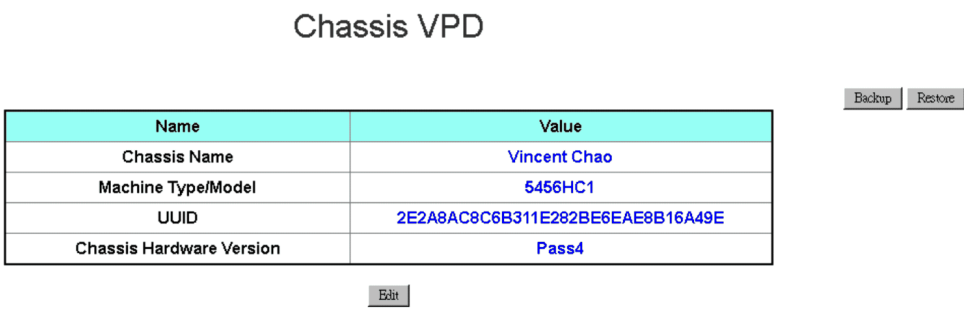
## System Information

There are four sections under **System information** tab and provide the fixed VPD data.

- **Chassis VPD**
- **Midplane VPD**
- **FPC VPD**
- **PSU VPD**

**Note:** Information displayed with IPMI standard FRU command is limited to FPC Board VPD data only.

## Chassis VPD




| Name | Value |
|---|---|
| Chassis Name | Vincent Chao |
| Machine Type/Model | 5456HC1 |
| UUID | 2E2A8AC8C6B311E282BE6EAE8B16A49E |
| Chassis Hardware Version | Pass4 |

*Figure 16. Chassis VPD*

- **Backup**: Save current chassis name onto USB storage device for future migration
- **Restore**: Load the chassis name from previously saved data on the USB storage device
- **Edit**: Modify the chassis name based on following rule
  - Chassis Name can be up to 64 characters using alphanumeric characters a-z, A-Z and 0-9, - (hyphen), _ (underscore), and space
- **Default Chassis Name**: For example, “DW612 Enclosure” (offset 0x02FF of VPD).
- **Machine Type**: For example, “545611Z” (offset 0x01FA of VPD).
- **UUID**: Randomly generated ID number of the chassis (offset 0x0219 of VPD).
- **Chassis Hardware Version**: Hardware version (offset 0x0206 of VPD).

## Midplane VPD

Midplane VPD

Backup Restore

| Name | Value |
|---|---|
| Card Serial Number | Y031UN41901N |
| Card UUID | 49EB643C7A4D11E384CBE65D41AC854E |
| Card Hardware Version | Pass5 |
| Card FRU Part Number | 46W2907 |

Edit

*Figure 17. Midplane VPD*

- **Backup**: Save the current card serial number, card UUID, hardware version, and FRU part number onto the USB storage device for future migration.
- **Restore**: Load the previously saved card serial number, card UUID, hardware version, and FRU part number data from the USB storage device.
- **Edit**: Modify the card serial number, UUID and FRU part number as user preference based on following rule:
  - Card Serial Number: Card serial number must be filled in with all 12 alphanumeric characters (A-Z, 0-9). No space and no other characters allowed.
  - UUID: Card UUID must be filled in with all 32 alphanumeric characters (A-Z, 0-9). No space and no other characters allowed.
  - FRU Part Number: FRU part number must be filled in with all 7 alphanumeric characters (A-Z, 0-9). No space and no other characters allowed.
- **Card Serial Number**: Should be the last 12 characters of 11S bar code label on midplane (offset 0x00FC, 0x0106 of VPD). For example, 11S00J6184Y03UN28W02X
- **Card UUID**: Randomly generated ID number of the chassis.
- **Card Hardware Version**: Hardware version.
- **Card FRU Part Number**: “46W2907” (offset 0x0126 of VPD).

## FPC VPD

FPC VPD

| Name | Value |
|---|---|
| Card Serial Number | Y031UN41901N |
| Card UUID | 49EB643C7A4D11E384CBE65D41AC854E |
| Card Hardware Version | Pass6 |
| Card FRU Serial Number | 00Y8605 |

*Figure 18. FPC VPD*

- **Card Serial Number**: Should be the last 12 characters of 11S bar code label on FPC (offset 0x0053, 0x005D of VPD). For example, 11S00J6184**Y03UN28W02X**
- **Card UUID**: Randomly generated at manufacturing site (offset 0x0083 of VPD).
- **Card Hardware Version**: hardware version (offset 0x0037 of VPD).

- **Card FRU Serial Number**: “00Y8605” (offset 0x0076 of VPD).

## PSU VPD

PSU VPD

| PSU # | FRU Part Number | PSU # | FRU Part Number |
|---|---|---|---|
| 6 | N/A | 5 | N/A |
| 4 | 69Y5925 | 3 | N/A |
| 2 | 69Y5925 | 1 | N/A |

*Figure 19. PSU VPD*

- **FRU Part Number:** It indicates the fan needs to be replaced.

## Event Log

Event log tab allow users to view SEL (System Event Log) and perform backup/restore/restore to default operations.

There are three major sections under **Event Log** tab:

- **Event Log**: A record of chassis level events
- **USB Recovery**: Users can perform data migration of event logs and chassis settings between FPC modules. Settings can also be restored to default in this page.

SEL logs chassis level info/warning/critical events so that user can get some clues of what is going on in the chassis. A maximum number of 511 event entries can be logged.

By default, the latest entry is at the last page as events are sorted by occurring order from earliest in time to the latest. Click on **Date/Time** can reorder the sorting from latest to earliest event.

**Note:** Currently, new event cannot be written into the log when it is full. User needs to manually clear log before latest event can be logged.

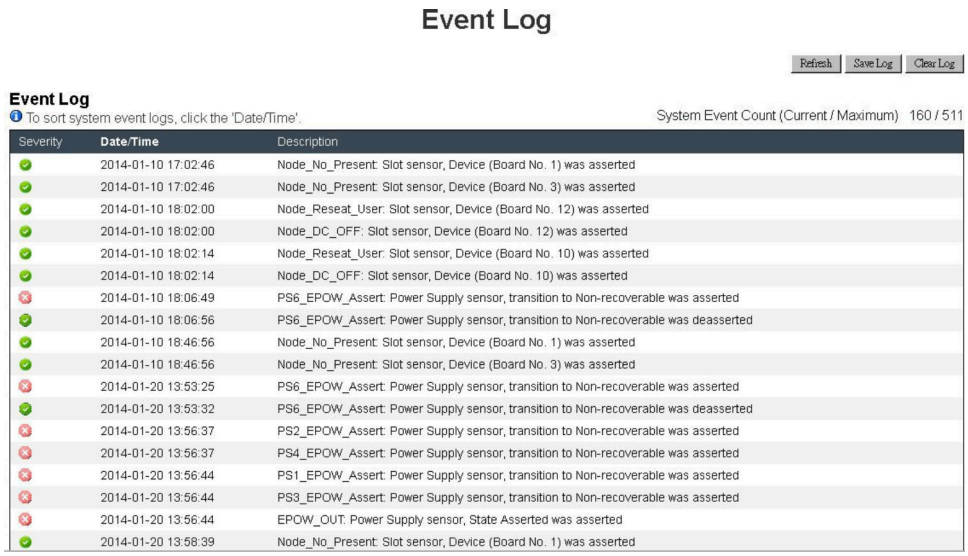



*Figure 20. Event Log*

- **Refresh**: SEL does not automatic refresh. User needs to manually click **Refresh** to get the latest entries.
- **Save Log**: Exports SEL data and save as .csv file
- **Clear Log**: Clears SEL data
- **Severity**: From low severity to high severity
  -  : Indicates **Information** type of events
  -  : Indicates **Warning** type of event
  -  : Indicates **Critical** type of events. Critical event lits ‘Error’ LED.

For detailed event log messages, please see *Messages and Codes Reference* at http://thinksystem.lenovofiles.com/help/index.jsp.

## USB Recovery

**USB Recovery** page allows you to backup and restore your data.

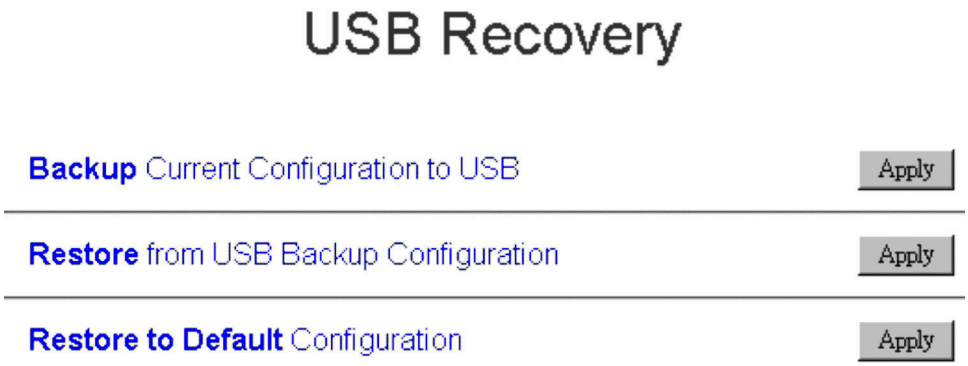
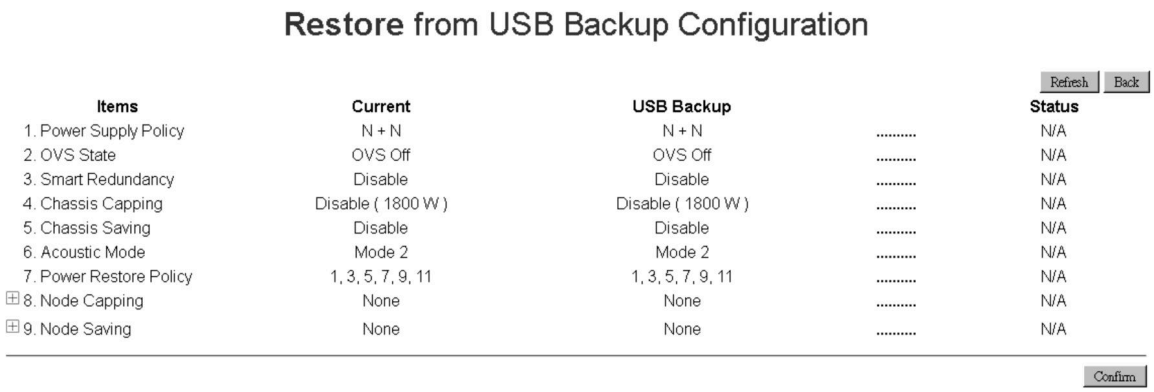



*Figure 21. FPC Recovery*

One USB storage device is used for FPC to preserve or to migrate SEL and user configurations. This USB key must be mounted on FPC board for FPC to function correctly. When there is no data stored in the USB key, factory default settings are applied for all configurations. User configurations are automatically backed up to USB key when they are set or modified. There are three functions on the USB recovery page.

**Note:** The size of the USB storage device should be larger than 1GB. The support file system is VFAT16/32 , ext2 ,ext3…etc (Linux accessible file system).

- **Backup**: Backup SEL and below chassis configurations to local device or USB storage device.
  - Power supply redundancy policy
  - Oversubscription mode
  - Smart Redundancy
  - Chassis capping/saving or node capping/saving
  - Acoustic Mode setting
  - Power restore policy



**Restore** from USB Backup Configuration

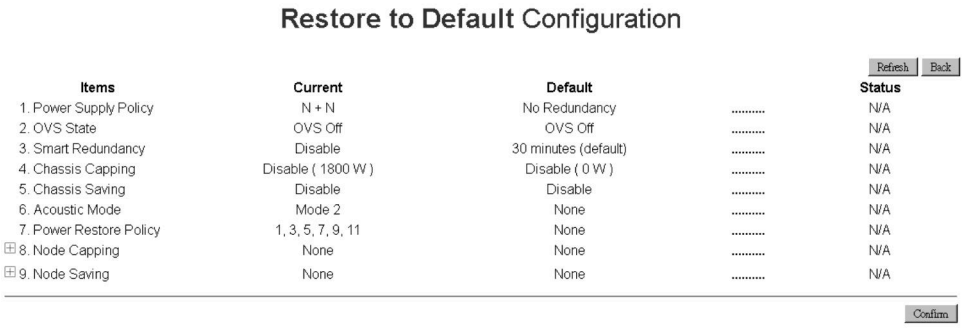
Refresh Back

| Items | Current | USB Backup | | Status |
|---|---|---|---|---|
| 1. Power Supply Policy | N + N | N + N | ..... | N/A |
| 2. OVS State | OVS Off | OVS Off | ..... | N/A |
| 3. Smart Redundancy | Disable | Disable | ..... | N/A |
| 4. Chassis Capping | Disable ( 1800 W ) | Disable ( 1800 W ) | ..... | N/A |
| 5. Chassis Saving | Disable | Disable | ..... | N/A |
| 6. Acoustic Mode | Mode 2 | Mode 2 | ..... | N/A |
| 7. Power Restore Policy | 1, 3, 5, 7, 9, 11 | 1, 3, 5, 7, 9, 11 | ..... | N/A |
| ⊞ 8. Node Capping | None | None | ..... | N/A |
| ⊞ 9. Node Saving | None | None | ..... | N/A |

Confirm

*Figure 22. FPC Restore*

- **Restore**: Restore and apply the configurations stored in USB storage device to FPC.
- **Restore to Default**: Restore the following settings to out-of-factory values.
  - Power supply redundancy policy default = No redundancy
  - Oversubscription mode default = No oversubscription
  - Smart Redundancy = 30 minutes
  - Chassis capping/saving or node capping/saving default = No chassis/node capping/saving
  - Acoustic Mode setting default = Acoustic mode disabled
  - Power restore policy default = All disabled



**Restore to Default** Configuration

Refresh Back

| Items | Current | Default | | Status |
|---|---|---|---|---|
| 1. Power Supply Policy | N + N | No Redundancy | ..... | N/A |
| 2. OVS State | OVS Off | OVS Off | ..... | N/A |
| 3. Smart Redundancy | Disable | 30 minutes (default) | ..... | N/A |
| 4. Chassis Capping | Disable ( 1800 W ) | Disable ( 0 W ) | ..... | N/A |
| 5. Chassis Saving | Disable | Disable | ..... | N/A |
| 6. Acoustic Mode | Mode 2 | None | ..... | N/A |
| 7. Power Restore Policy | 1, 3, 5, 7, 9, 11 | None | ..... | N/A |
| ⊞ 8. Node Capping | None | None | ..... | N/A |
| ⊞ 9. Node Saving | None | None | ..... | N/A |

Confirm

*Figure 23. FPC Restore to Default Configuration*

## Configuration

Configuration tabs settings are used to manage FPC module.


*Figure 24. Configuration*

There are eight sections:

- **Firmware Update**
- **SMTP**
- **SNMP**

- **PEF**
- **Network Configuration**
- **Time Setting**
- **User Account**
- **Account Security**
- **Web Certificate**

**Note:** By pressing hardware reset button for more than 4 seconds, all settings (except **Time Setting**) can be restored to out-of-factory default settings.

All settings, except time setting, in the configuration tab can be restored to out-of-factory default settings through coin battery removal or by pressing hardware reset button for more than 4s.

Complete the following steps to remove the coin battery:

1. Pull FPC module out of the chassis.
2. Remove coin battery from FPC module.
3. Insert FPC module without battery back to chassis, boot up, and wait for FPC to reboot.
4. The following sings can be observed during FPC boot up and reboot.
   a. Power LED lit on.
   b. Heartbeat LED blinks for 0.3 seconds on and 3.8 seconds off.
   c. Checklog LED lit on due to lack of battery
   d. FPC then reboot and have fan spin up, Power LED lit, Heartbeat LED blinks and Checklog LED on again.
5. After observing Checklog LED lit up again after FPC reboot, pull FPC module out of the chassis.
6. Install the battery back to FPC module.
7. Insert FPC module with battery back to chassis.

## Firmware Update

There are two phases to the firmware update process. During firmware upload stage, you can choose path to fetch the firmware image. FPC checks the image header information for validation.

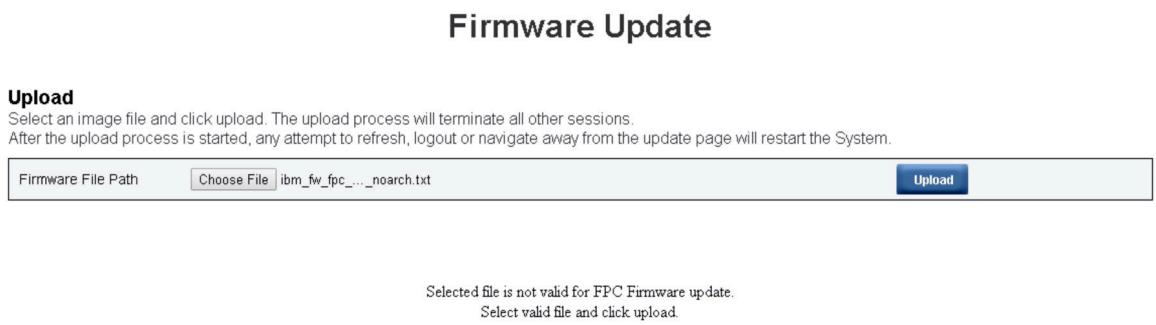



*Figure 25. Firmware Update*

**Upload**
Select an image file and click upload. The upload process will terminate all other sessions. After the upload process is started, any attempt to refresh, logout or navigate away from the update page will restart the system.

Once a valid firmware image is uploaded, a firmware image confirmation table appears with **Preserve Settings** check box. If **Preserve Settings** is checked, FPC configurations are kept and applied after the firmware update. The preserved settings include:

- SMTP
- SNMP
- PEF
- Network Configuration
- Time Setting (Time is always kept no matter **Preserve Settings** is checked or not)
- User Account
- Account Security
- Web Services

**Notes:**

1. A **Recover Primary Bank Firmware** check box is present in the firmware update page, but non-functional when FPC is boot up from the primary bank. If FPC starts on secondary bank, which indicates that the primary bank image might be corrupted and need recovery, this check box is open for selection. Check it to perform the recovery measure and update image onto the primary bank, and uncheck to upgrade firmware onto the secondary bank.
2. Secondary bank needs to be pre-installed with firmware up to a certain level for 'Recover Primary Bank Firmware' to be available.
3. FPC will automatically restart if you choose to cancel firmware update process after uploading the firmware image.

During updating, the system will direct you to a loading page where all FPC functions are locked.

Once the progress reaches 100%, FPC automatically restarts and you need to log in again to access FPC Web interface.

## SMTP/SNMP/PEF

Configured SMTP and SNMP traps allow user to monitor the chassis for selected events. SMTP/SNMP trap event types can be set in the PEF (Platform Event Filter) page.

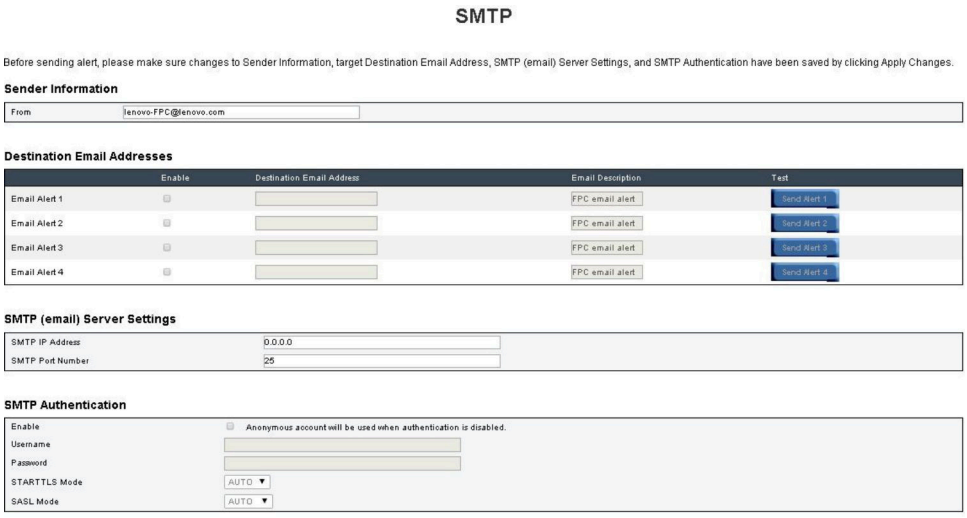



*Figure 26. SMTP*

- **SMTP**: You can enable, configure and test SMTP email alert at this page.
  - Click **Send Alert #** to test the email alert
  - Please check **Global Alerting Enable** in PEF page to enable email alerts
  - The following information provides the default values:
    - All email alert disabled
    - Email server address = 0.0.0.0
    - Authentication disabled

  **Notes:**

  1. Before sending alert, make sure changes to **Sender Information**, **Destination Email Address**, **SMTP (email) Server Setting**, and **SMTP Authentication** have been saved by clicking **Apply**.
  2. When FPC SEL is full, no new event entry can be added to SEL. SMTP event email will not be generated until the log is cleared.

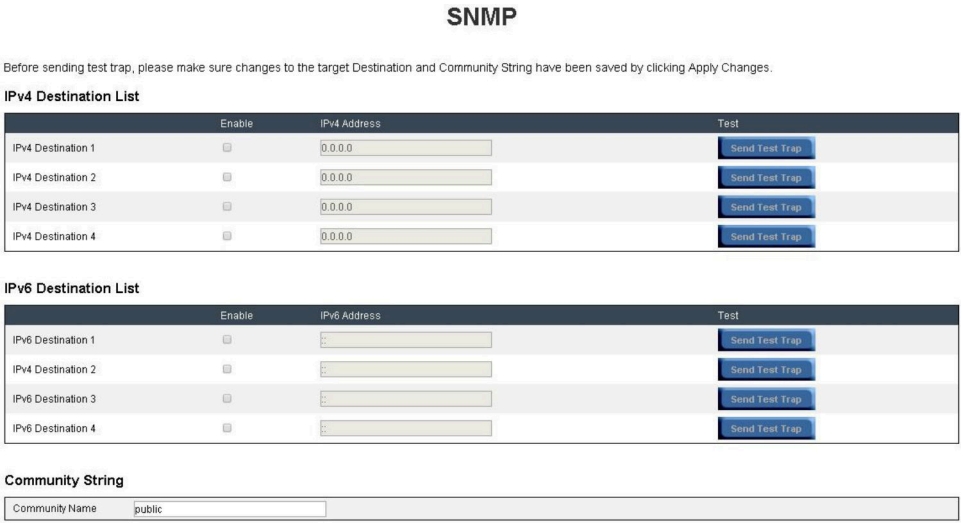



*Figure 27. SNMP*

- **SNMP**: You can enable, configure and test SNMP trap at this page.
  - Click **Send Test Trap** to test the event trap
  - **Community Name** displays/configures the SNMP community name using only alphabet and numerical values. The value must not be empty.
  - All the events would be sent to destination IP address when **Global Alerting Enable** in PEF page is checked.
  - For SNMP trap type, check the **Generate PEF** box for targeted type of events.

    **Notes:**

    1. Before sending test trap, make sure changes to the target **Destination** and **Community String** have been saved by clicking **Apply**.
    2. When FPC SEL is full, some PEF alerts might be missing or be sent repeatedly.
  - The following information provides the default values:
    - All traps disabled
    - Community Name = public

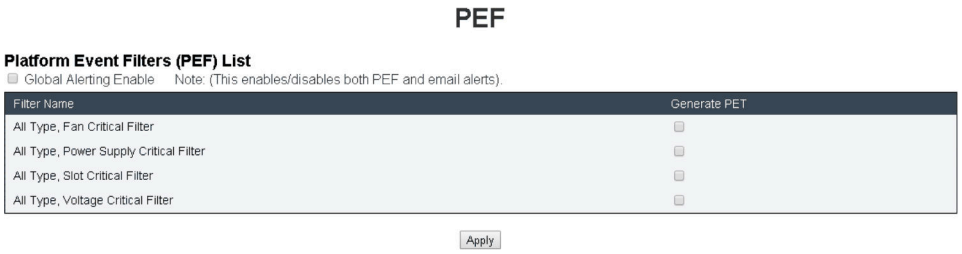



*Figure 28. PEF*

- **PEF**: You can set SMTP/SNMP trap event types at this page.
  - The following information provides the default values:
    - None of the filter selected
    - Global Alerting unchecked

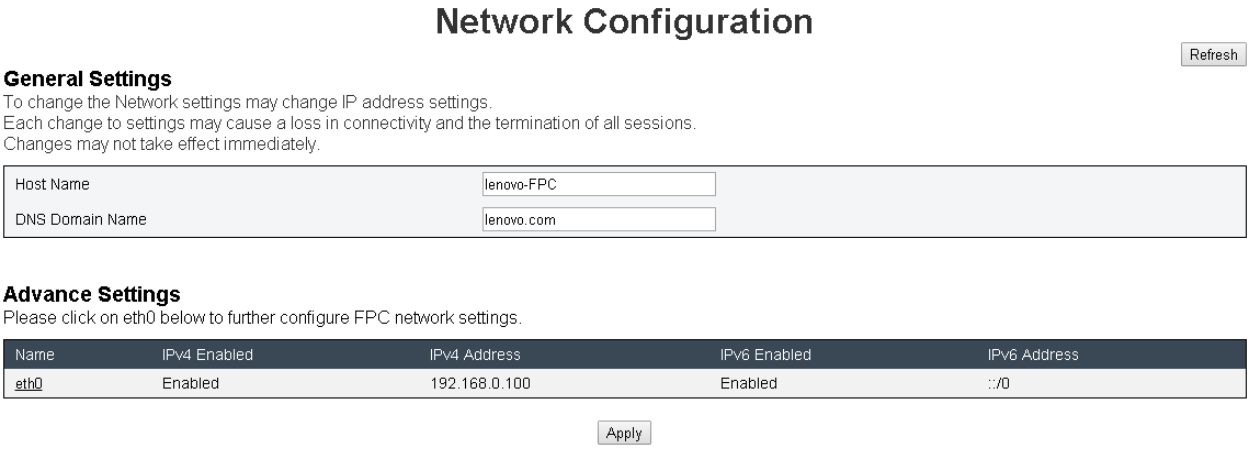
## Network Configuration

You can modify networking parameters in **Network configuration**.

You can modify following networking parameters in **Network configuration** section:

- Host Name
- DNS Domain Name
- Auto Negotiation Mode
- Network Speed
- Duplex Mode
- IP Version (IPv4, IPv6) Enable/Disable
- IP Address
- IP Source (Static and DHCP)
- Gateway
- Subnet Mask
- DNS Server
- VLAN

*Figure 29. Network Configuration*



### General Settings

To change the Network settings may change IP address settings. Each change to settings may cause a loss in connectivity and the termination of all sessions. Changes may not take effect immediately.

Default settings for **Network configuration**:

- Host Name: lenovo-FPC
- DNS Domain Name: lenovo.com

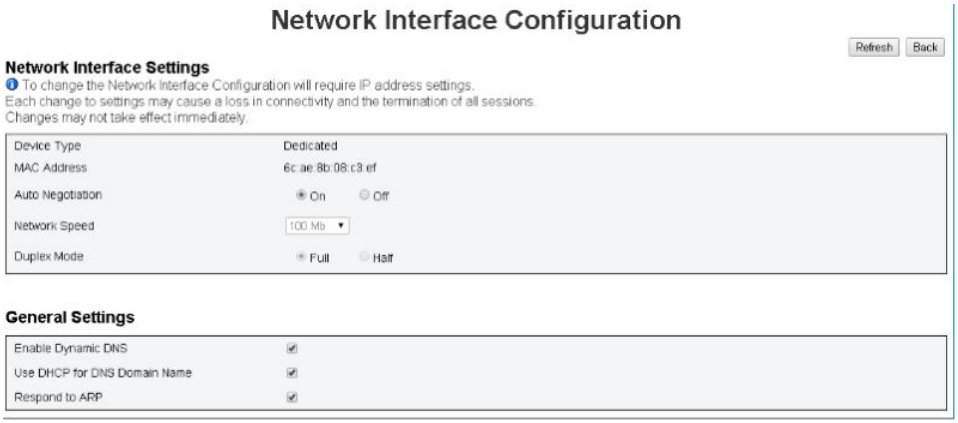



*Figure 30. Network Interface configuration*

Click on the item of **Network Interface Configuration** leads to the detail network settings.

Default settings for **Network Interface Configuration**:

- Auto Negotiation: On
- Dynamic DNS: Unchecked
- Use DHCP for DNS Domain Name: Unchecked
- Respond to ARP: Checked

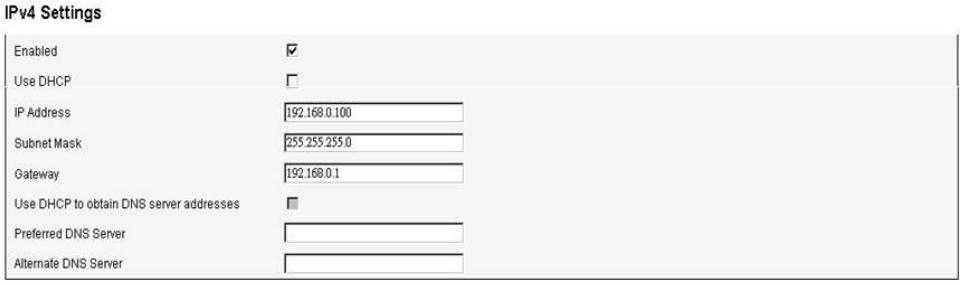



*Figure 31. IPv4 Settings*

Default settings for **IPv4 Settings**:

- IPv4: Enabled
- Use DHCP: Unchecked
- IP Address: 192.168.0.100
- Subnet Mask: 255.255.255.0

- Gateway: 192.168.0.1
- Preferred/Alternate DNS Server: Blank

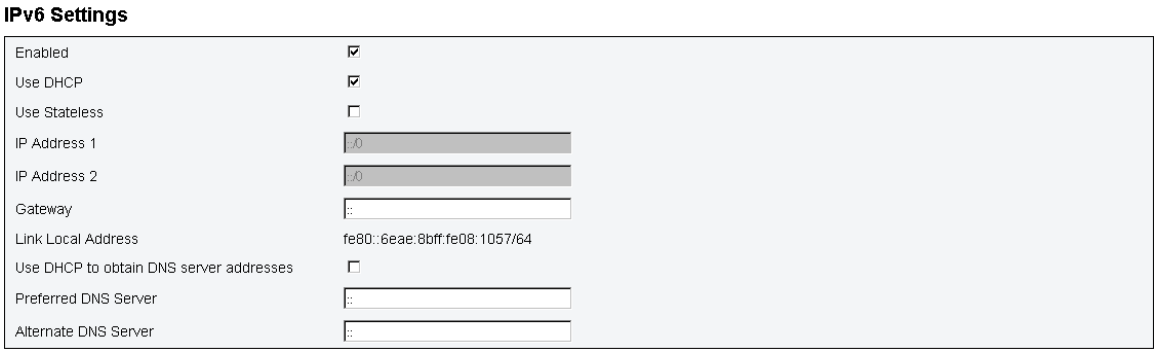



*Figure 32. IPv6 Settings*

Default settings for **IPv6 Settings**:

- IPv6: Enabled
- Auto configuration = Checked (IP = LLA)
- Use DHCP to obtain DNS server addresses = Unchecked
- Preferred/Alternate DNS Server = Blank

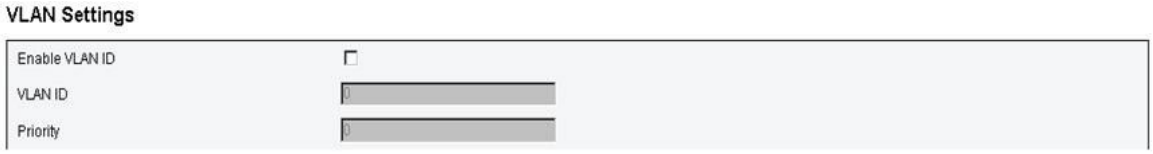



*Figure 33. VLAN Settings*

Default settings for **VLAN Settings**:

- VLAN: Disabled

## Time Setting

This page is used to configure system time.

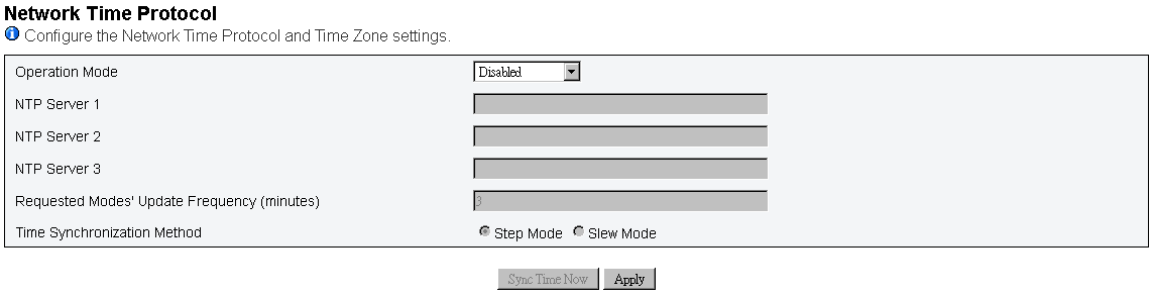



*Figure 34. Time Settings*

Select date and time and apply. Once set, time is always kept even if user restores settings to default or uncheck **Preserve Setting** during the firmware update.

# User Account

**User Account** page allows you to manage user roles.

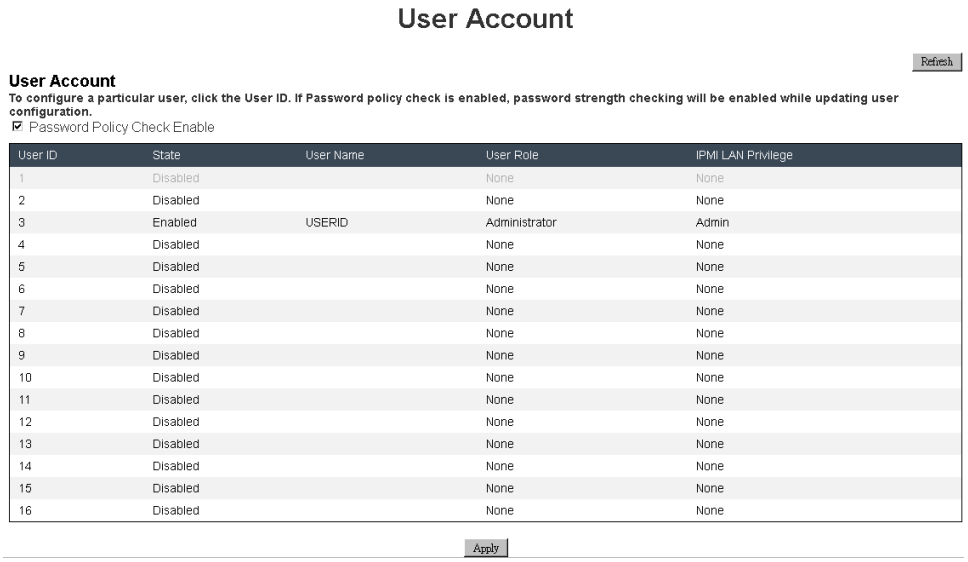
There are three types of user roles:

- Administrator: Full access to all the web pages and can modify all the settings and configurations
- Operator: Full access to all the web pages except **User Account** page. Operator can only see its own account at the **User Account** page and no modification at the account page is allowed
- User: Full access and modification rights to all the pages except the following pages in **Configuration** tab: **SMTP/SNMP/PEF/Network Configuration/User Account/Web Service**. Only viewing right is allowed on these pages. Any modification is not allowed.

n,233.4mm,sfx)=″graphics:graphic96AF5DAB9EB8CCD2266A2E554C0BD9F6″

*Figure 35. User Account page for User and Operator*

Password Policy Check Enabled by default. User Privileges = admin, User name= USERID, Password = PASSW0RD




| User ID | State | User Name | User Role | IPMI LAN Privilege |
|---|---|---|---|---|
| 1 | Disabled | | None | None |
| 2 | Disabled | | None | None |
| 3 | Enabled | USERID | Administrator | Admin |
| 4 | Disabled | | None | None |
| 5 | Disabled | | None | None |
| 6 | Disabled | | None | None |
| 7 | Disabled | | None | None |
| 8 | Disabled | | None | None |
| 9 | Disabled | | None | None |
| 10 | Disabled | | None | None |
| 11 | Disabled | | None | None |
| 12 | Disabled | | None | None |
| 13 | Disabled | | None | None |
| 14 | Disabled | | None | None |
| 15 | Disabled | | None | None |
| 16 | Disabled | | None | None |

*Figure 36. User Account - Administrator*

The image shows **User Account** page for Administrator

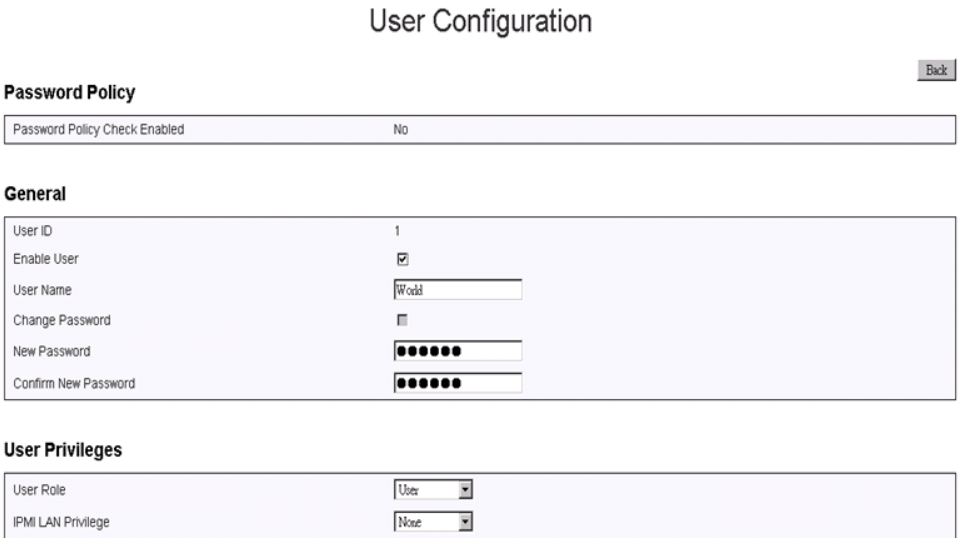



*Figure 37. Password Policy*

Click on one of the listed account leads to **User Configuration**. User can enable/disable/delete account, set user name, set/change password, and select user privileges here. When **Password Policy Check Enable** box is checked, account password needs to follow the password policy rule (at least 8 characters with numbers, letters, and a character)

**Notes:**

1. User assigns account user name in **User Name** field with up to 16 characters using alphanumeric characters a-z, A-Z and 0-9, - (hyphen) and _ (underscore). Click the **Apply Changes** button. If validation fails, the GUI displays an error message. Creating new user account with existing user name is not allowed.
2. User can set/change password in **New Password** field using up to 20 printable US-ASCII (Code: 33-126) characters. Password must contains characters from three of the following four categories:
   - English uppercase characters (A through Z)
   - English lowercase characters (a through z)
   - Base 10 digits (0 through 9)
   - Non-alphabetic characters (for example, !, $, #, %)

   If validation fails, the GUI displays an error message.

## Web Service

You can configure different HTTPS ports for connection and enable/disable IPMI service state at **Services** page.

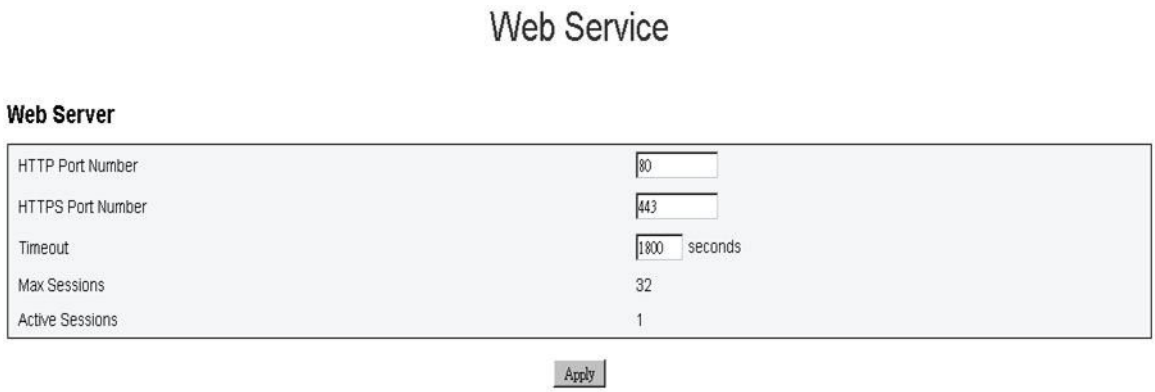



*Figure 38. Web services*

Default settings for **Services**:

- HTTP Port Number = 80
- HTTPS Port Number = 443
- Timeout = 1800s

## Web Certificate

The web certificate page displays current certificate information.

A web server might require that a valid certificate and corresponding private encryption key be installed for the communication between FPC web and the server to be secure. Two methods are available for generating the private key and required web certificate: using a self-signed certificate and using a certificate that is signed by a certificate authority. FPC by default is equipped with a self-signed web certificate with RSA-2048 key encryption. If user would like to provide a self-signed certificate or would like to use a certificate-authority-signed certificate for the FPC web, web certificate provides the option.

To generate a new private encryption key and certificate-signing request (CSR), complete the following steps:

1. In the left navigation pane, click **Configuration** and click **Web Certificate** tab on the right.
2. Click on **Generate CSR**.

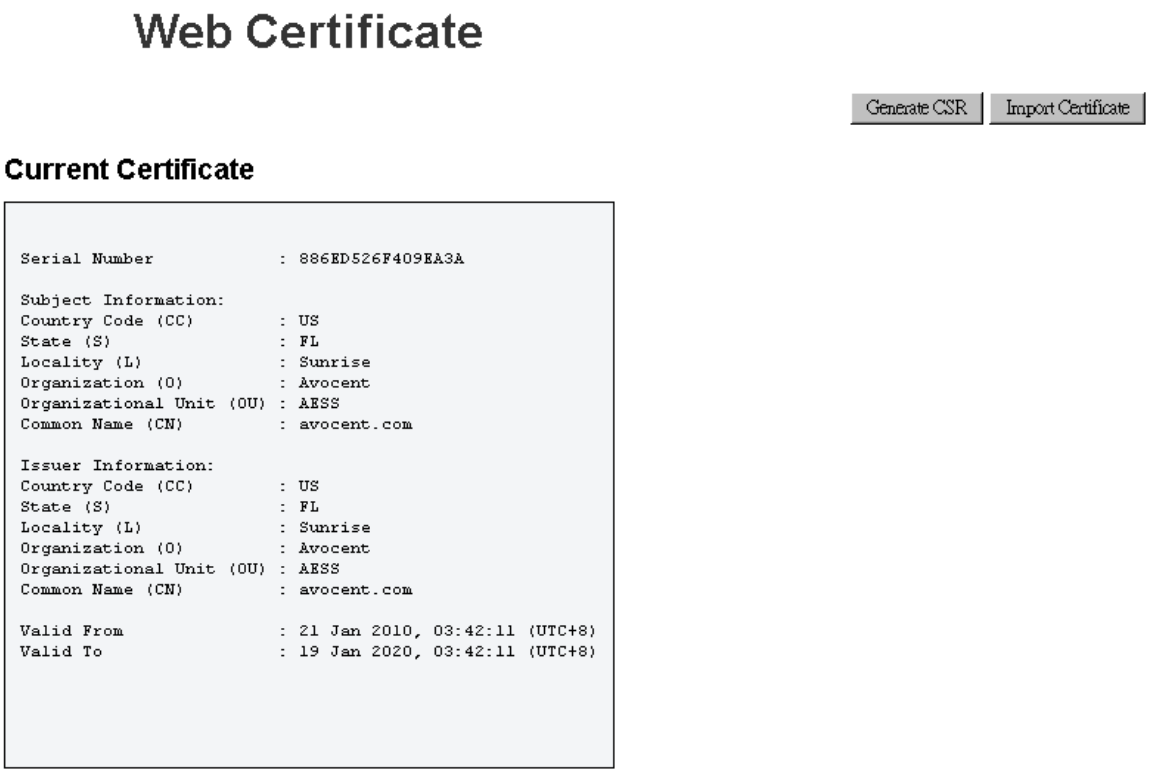



*Figure 39. Web Certificate*

3. A generate certificate page is displayed..

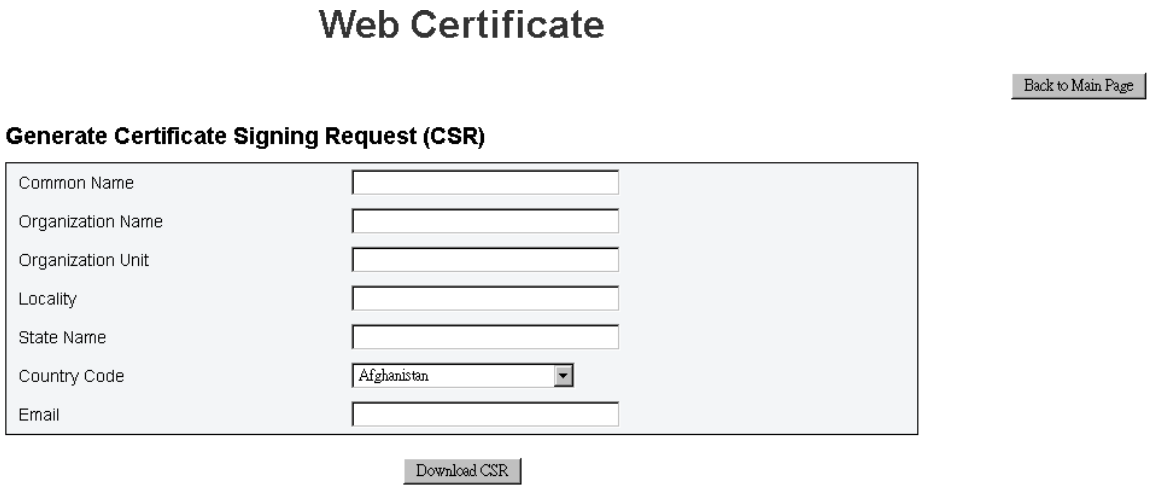



*Figure 40. Web Certificate*

4. Fill in the information.
   - **Common Name (required)**

     Use this field to indicate the FPC host name that currently appears in the browser Web address bar. Make sure that the value that you typed in this field exactly matches the host name as it is known by the Web browser. The browser compares the host name in the resolved Web address to the name that appears in the certificate. To prevent certificate warnings from the browser, the value that is used in this field must match the host name that is used by the browser to connect to the FPC. For

example, if the address in the Web address bar is http://mm11.xyz.com/private/main.ssi, the value that is used for the XCC Host Name field must be mm11.xyz.com. This field can contain a maximum of 60 characters.

- **Organization Name (required)**

  Use this field to indicate the company or organization that owns the FPC. When this is used to generate a certificate-signing request, the issuing certificate authority can verify that the organization that is requesting the certificate is legally entitled to claim ownership of the given company or organization name. This field can contain a maximum of 60 characters.

- **Organization Unit (optional)**Use this field to indicate the unit within the company or organization that owns the FPC. This field can contain a maximum of 60 characters.
- **Locality (required)**

  Use this field to indicate the city or locality where the FPC is physically located. This field can contain a maximum of 50 characters.

- **State Name (required)**

  Use this field to indicate the state or province where the FPC is physically located. This field can contain a maximum of 30 characters.

- **Country Code (required)**

  Use this field to indicate the country where the FPC is physically located. This field must contain the 2-character country code.

- **Email (required)**

  Use this field to indicate the e-mail address of a contact person who is responsible for the FPC. This field can contain a maximum of 60 characters.

5. Once the required information are completed. Click on **Download CSR** to save the CSR file.
6. Send the CSR to your certificate authority. When the certificate authority returns your signed certificate, upload the signed CSR by click on **Import Certificate**.
7. A file selection page is displayed.

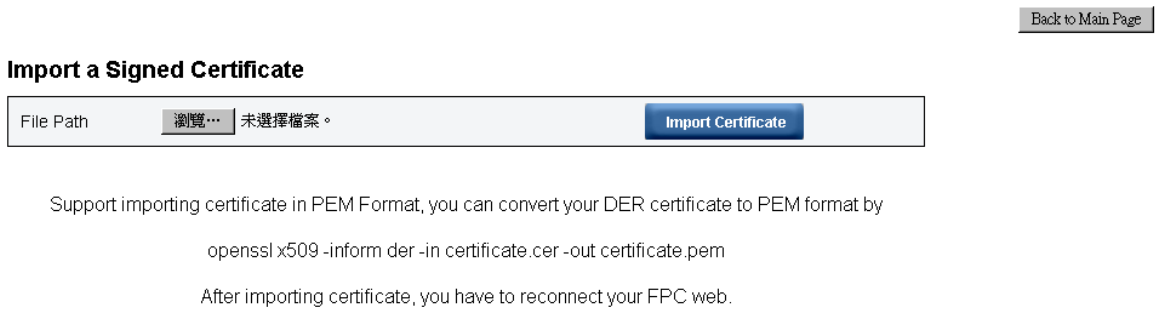



*Figure 41. Signed Certificate*

8. Select the signed certificate file and click on the blue **Import Certificate** button.

**Notes:**

- FPC only support importing certificate file in PEM format.
- CSR generated will be encrypted with RSA-2048 cryptography.

# Chapter 4. IPMI Command

The section provides detailed IPMI commands.

- **Name**

  GetPSUCollectedData (Sum)

  **NetFn**

  0x32

  **CMD**

  0x90

  **Request data / Response data**

  **Request:**

  - Byte 1: Input type 1: AC-IN

  2: DC-OUT

  3: PSU fan power

  **Response:**

  **(when AC-IN, DC-OUT)**

  Byte 1 – completion code (0x00)

  Byte 2 – Sum of MIN AC-IN /(DC- OUT) LSB

  Byte 3 – Sum of MIN AC-IN /(DC- OUT) MSB

  Byte 4 – Sum of average AC-IN/(DC-OUT) LSB

  Byte 5 – Sum of average AC-IN/(DC-OUT) MSB

  Byte 6 – Sum of MAX AC-IN /(DC- OUT) LSB

  Byte 7 – Sum of MAX AC-IN /(DC- OUT) MSB

  **(when Fan power)**

  Byte 1 – completion code (0x00)

  Byte 2 - Sum of FAN_Power LSB

  Byte 3 - Sum of FAN_Power Byte 2

  Byte 4 - Sum of FAN_Power MSB

  **Comments**

  This command is used to show regularly collected data from PMBUS.

  1 Unit = 1 W

  **Note:** Only FAN power unit using 10 mW = 0.0.1 W FAN total power = (MSB * 256* 256 ) + Byte2 (256) + LSB (10 mW)

- **Name**

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GetPSUStatus

**NetFn**

0x32

**CMD**

0x91

**Request data / Response data**

**Request:**

- None

**Response:**

Byte 1 – completion code (0x00)

Byte 2 – PS_EPOW

Byte 3 – PS_THROTTLE

Byte 4 – PS_PRESENT

Byte 5 – PS_PWR_GOOD

Byte 6 – EPOW_OUT

Byte 7 – THROTTLE

**Comments**

This command is used to show the PSU related register or Status (From PSOC)

Bit: 0-5 = PSU1-6

0: not trigger , 1: trigger

- **Name**

GetSySLED

**NetFn**

0x32

**CMD**

0x96

**Request data / Response data**

**Request:**

- None

**Response:**

Byte 1 – completion code (0x00)

Byte 2 – SysLocater LED

Byte 3 – CheckLog LED

**Comments**

This command is used to get the FPC LED status.

0: Off

1: On

2: Blink (Locater only)

- **Name**

  SetSySLED

  **NetFn**

  0x32

  **CMD**

  0x97

  **Request data / Response data**

  **Request:**

  Byte 1: Input type

  – 1: SysLocater LED
  – 2: CheckLog LED

  Byte 2:

  – 0: Disable
  – 1: Enable
  – 2 blink (SysLocater only)

  **Response:**

  Byte 1 – completion code (0x00) PARAM_OUT_OF_RANGE (0xC9)

  **Comments**

  This command is used to get the FPC LED status.

  0: Off

  1: On

  2: Blink (Locater only)

- **Name**

  ShowNodePowerConsume

  **NetFn**

  0x32

  **CMD**

  0x98

  **Request data / Response data**

  **Request:**

  Byte 1 –Node number (0x1~0x0d Node 1-12 , Chassis 13)

  **Response:**

Byte 1 – completion code

Byte 2 – Power minimum (LSB)

Byte 3 – Power minimum (MSB)

Byte 4 – Power average (LSB)

Byte 5 – Power average (MSB)

Byte 6 – Power maximum (LSB)

Byte 7 – Power maximum (MSB)

**Comments**

This is used to show the Node power consume by MSG_POWER_READING command. Unit = 1 W

- **Name**

  ShowInfoNodeSize

  **NetFn**

  0x32

  **CMD**

  0x99

  **Request data / Response data**

  **Request:**

  Byte 1 –Node number (0x1~0x0c Node 1-12)

  **Response:**

  Byte 1 – completion code

  Byte 2 – Node Phyical Width

  Byte 3 – Node Phyical Hight

  Byte 4 – AddOn Vaild

  Byte 5 – AddOn Width

  Byte 6 – AddOn Hight

  **Comments**

  This is used to show Node size info by MSG_GET_NODE_SIZE command got from XCC.

- **Name**

  SetPSUFFS

  **NetFn**

  0x32

  **CMD**

  0x9a

  **Request data / Response data**

**Request:**

Byte 1: FFS number(1-2)

Byte 2: input value (0/1)

**Response:**

Byte 1 – completion code OUT_OF_RANGE (0xC9)

**Comments**

This is used to set PSU FFS 0: not triggered

1: triggered

- **Name**

  SetAcousticMode

  **NetFn**

  0x32

  **CMD**

  0x9b

  **Request data / Response data**

  **Request:**

  Byte 1 – Acoustic mode

  **Response:**

  Byte 1 – completion code (0x0) OUT_OF_RANGE (0xC9) PCIe priority high(0x01)

  **Comments**

  0x00 = Disable

  0x01 = Mode1 Enable

  System fan cannot exceed 20 duty.

  0x02 = Mode2 Enable

  System fan cannot exceed 50 duty.

  0x03 = Mode3 Enable

  System fan cannot exceed 80 duty.

- **Name**

  SetOverSubMode

  **NetFn**

  0x32

  **CMD**

  0x9c

  **Request data / Response data**

  **Request:**

Byte 1 – Over Subscription mode

**Response:**

Byte 1 – completion code (0x00) CUR_NOT_SUPPORT(0xd5) PARAM_OUT_OF_RANGE(0xc9)

**Comments**

0x0 = Disable

0x1 = Enable

**Note:** The OVS enable.

Total power bank would become TP *1.20. Only exception is TP * 1.20 > current available power (number of PWRGD * power type). The power bank would be current available power.

- **Name**

  GetCappingCapity

  **NetFn**

  0x32

  **CMD**

  0x9d

  **Request data / Response data**

  **Request:**

  Byte 1 –Node number (0x1~0x0d : Node 0x1~0xc , Chassis 0x0d)

  **Response:**

  Byte1 – completion code (0x00) Out of Range (0xc9)

  Byte2 – Min. capping value LSB

  Byte3 – Min. capping value MSB

  Byte4 – Max. capping value LSB

  Byte5 – Max. capping value MSB

  **Comments**

  **Node Capping Range:**

  (Node min power capacity ) < Cap < (Node max power capacity)

  **Chassis Capping Range:** (Sum of Node min power capacity ) < Cap ) The Min power should consider the permission pass nodes.

  **Note:** Capping will only be applied in OS-runtime. The configuration of chassis level current capping is not the same behavior with sum of node level.

- **Name**

  SetCappingValue

  **NetFn**

  0x32

  **CMD**

0x9e

**Request data / Response data**

**Request:**

Byte 1 –Node number (0x1~0x0d : Node 0x1~0xc , Chassis 0x0d)

Byte 2 – Capping Value LSB Byte 3 – Capping Value MSB **Response:**

Byte 1 – completion code (0x00) OUT_OF_RANGE (0xC9) CUR_NOT_SUPPORT(0xD5)

**Comments**

**Note:** Capping / Saving not support when node with no permission

Capping value range ( 1~32767)

- **Name**

  SetCappingSavingState

  **NetFn**

  0x32

  **CMD**

  0x9f

  **Request data / Response data**

  **Request:**

  Byte 1 –Node number (0x1~0x0d : Node 0x1~0xc , Chassis 0x0d)

  Byte 2 – Capping disable /enable Byte 3 – Saving mode **Response:**

  Byte 1 – completion code (0x00) OUT_OF_RANGE (0xC9

  **Comments**

  Note: Capping / Saving not support when node with no permission

  Byte 3 : Saving mode 0x00 = Disable

  0x01 = Saving mode1

  0x02 = Saving mode2

  0x03 = Saving mode3

- **Name**

  GetCappingSavingState

  **NetFn**

  0x32

  **CMD**

  0Xa0

  **Request data / Response data**

  **Request:**

  Byte 1 –Node number (0x1~0x0d : Node 0x1~0xc , Chassis 0x0d)

**Response:**

Byte 1 – completion code (0x00) OUT_OF_RANGE (0xC9)

Byte 2 – Capping disable /enable

Byte 3 – Capping Value LSB

Byte 4 – Capping Value MSB

Byte 5 – Saving mode

**Comments**

Capping mode: 0x00 = Disable 0x01 = Enable Saving mode: 0x00 = Disable

0x01 = Saving mode1 0x02 = Saving mode2 0x03 = Saving mode3

- **Name**

  SetSysTime

  **NetFn**

  0x32

  **CMD**

  0xa1

  **Request data / Response data**

  **Request:**

  Byte 1 – Year_MSB(1970 ~2037)

  Byte 2 – Year_LSB (1970 ~2037)

  Byte 3 – Month (0x01~0x12)

  Byte 4 – Date (0x01~0x31)

  Byte 5 – Hour (0x00~0x23)

  Byte 6 – Minute (0x00~0x59)

  Byte 7 – Second (0x00~0x59)

  **Response:**

  Byte 1 – completion code (0x00)

  **Comments**

  For user input convenient, the input data is decimal format.

  Example: Year 2010 byte1 : 0x20

- **Name**

  GetPSUPolicyBank

  **NetFn**

  0x32

  **CMD**

  0xa2

**Request data / Response data**

**Request:**

- None

**Response:**

Byte 1 – completion code (0x00) Byte 2 – PSU_Policy

Byte 2 – PSU_Policy

– 0: No-Redundant
– 1: N+1 Policy
– 2: N+N Policy

Byte 3 – Oversubscription Mode

– 0: disable
– 1: enable

Byte 4 – PowerBankLSB

Byte 5 – PowerBankMSB

**Comments**

This command is used for get PSU policy and total power bank. (Unit :1W)

- **Name**

SetPSUPolicy

**NetFn**

0x32

**CMD**

0xa3

**Request data / Response data**

**Request:**

Byte 1 – PSU_Policy: 0: No-Redundant

– 1: N+1 Policy
– 2: N+N Policy

**Response:**

Byte 1 – completion code (0x00) Out of Range (0xC9) PSU_CONFIG_NOT_ALLOW(0x01) PSU_BANK_LACK(0x02)

**Comments**

This command is used for set PSU policy.

We may not set the PSU policy successful because configuration invalid.

- **Name**

ResetNodeByUser

**NetFn**

0x32

**CMD**

0xa4

**Request data / Response data**

**Request:**

Byte 1 – Node number (0x1~0x0c Node 1-12 )

Byte 2 – Reset Action

- 1: reset (imm-reset)
- 2: reseat (aux-off -> aux-on)

**Response:**

Byte 1 – completion code (0x00) CUR_NOT_SUPPORT (0xd5)

**Comments**

This command is used for Reset/Reseat node by user If node not present, it would response 0xd5

- **Name**

  OEMGetPSUFanStatus

  **NetFn**

  0x32

  **CMD**

  0xa5

  **Request data / Response data**

  **Request:**

  Byte 1 – PSU FAN number (0x1~0x06 FAN 1-6 )

  **Response:**

  Byte 1 – FAN_Speed_LSB (rpm)

  Byte 2 – FAN_Speed_MSB (rpm)

  Byte 3 – FAN speed (0~100%)

  Byte 4 – FAN health

  - 0 : Not Present 1 : Ab-Normal
  - 2 : Normal

  **Comments**

  This command is used for get PSU fan status

  **Note:** Ab-Normal means PSU rpm is lower than3000 rpms

- **Name**

  OEMSetStorage

  **NetFn**

0x32

**CMD**

0xa6

**Request data / Response data**

**Request:**

Byte 1 – Actions

- 1: USB Back Up
- 2: USB Restore config
- 3: Get USB restore status
- 4: Restore to default config

**Response:**

Byte 1 – 0x00 (Action activated)

- 0x01 (Device busy)
- 0x02 (Device not installed)
- 0x03 (BackUp config invalid) Only when Get USB restore status :
  - Byte 1 - Restore status
  - Byte 2 - Node Capping fail LSB
  - Byte 3 - Node Capping fail MSB
  - Byte 4 - Node Saving fail LSB
  - Byte 5 - Node Saving fail MSB

**Comments**

**Note:** The input “Get USB restore status” show the Restore action status.

The restore action must take at least 5 seconds.

USB restore status: 0x00: Restore success

Bitmask when bit is on:

- Bit-0: Set PSU_Policy_fail
- Bit-1: Set PSU_OVS_fail
- Bit-2: Chassis Capping fail
- Bit-3: Chassis Saving fail
- Bit-4: Acoustic fail
- Bit-5: Node power restore policy fail
- Bit-6: Smart Redundant fail

- **Name**

  OEMGetNodeStatus

  **NetFn**

  0x32

  **CMD**

0xa7

**Request data / Response data**

**Request:**

Byte 1 – Node number (0x1~0x0C )

**Response:**

Byte 1 – completion code (0x00) Out of Range (0xC9)

Byte 2 – Node Power State Byte 3 – Width

Byte 4 – Height

Byte 5 – Permission state

**Comments**

Bit-Mask of Node Power State :

- 0x00 = Power OFF
- 0x10 = S3
- 0x20 = No Permission
- 0x40 = Fault
- 0x80 = Power ON

Permission state :

- 0x00 = Not present
- 0x01 = Standby
- 0x02 = First_permission_fail
- 0x03 = Second_permission_fail
- 0x04 = Permission pass (Secondary boot pass)

- **Name**

  GetFPCStatus

  **NetFn**

  0x32

  **CMD**

  0xa8

  **Request data / Response data**

  **Request:**

  - None

  **Response:**

  Byte 1 – completion code (0x00)

  Byte 2 – FPC major version

  Byte 3 – FPC minor version

  Byte 4 – PSOC major version

Byte 5 – PSOC minor version

Byte 6 – Boot Flash number (0x1- 0x2)

Byte 7 – Build major number

Byte 8 – Build minor number

**Comments**

The build minor is using ASCII value

ex: 0x41 = ‘A’

- **Name**

  SetRestorePolicy

  **NetFn**

  0x32

  **CMD**

  0xa9

  **Request data / Response data**

  **Request:**

  Byte 1 – Node number LSB (BIT_MASK : 0x0~0x3F )

  Byte 2 – Node number MSB (BIT_MASK : 0x0~0x3F )

  **Response:**

  Byte 1 – completion code (0x00) Out of Range (0xC9)

  **Comments**

  Example:

  If set node 1-3 enable, then Byte 1 = 0x7 (0000 0111)

- **Name**

  GetRestorePolicy

  **NetFn**

  0x32

  **CMD**

  0xaa

  **Request data / Response data**

  **Request:**

  - None

  **Response:**

  Byte 1 – completion code (0x00)

  Byte 2 – Node number LSB

  Byte 3 – Node number MSB

**Comments**

- **Name**

  SetSmartRedundant

  **NetFn**

  0x32

  **CMD**

  0xab

  **Request data / Response data**

  **Request:**

  Byte 1 – mode:

  **Response:**

  Byte 1 – completion code (0x00) Out of Range (0xC9) Not Support (0x01)

  **Comments**

  Mode (0-3):

  0 : disable

  1: per 10 minutes update

  2: per 30 minutes update

  3: per 60 minutes update (If PSU in “not support” or “mismatch “stage, the PSU smart-redundant also not support.

- **Name**

  GetSmartRedundantStauts

  **NetFn**

  0x32

  **CMD**

  0xac

  **Request data / Response data**

  **Request:**

  - None

  **Response:**

  Byte 1 – completion code (0x00)

  Byte 2 – mode

  Byte 3 – Status

  **Comments**

  Status:

  0x00: Normal

0x01: Not support

- **Name**

  SetFPCResetDefault

  **NetFn**

  0x32

  **CMD**

  0xad

  **Request data / Response data**

  **Request:**

  - None

  **Response:**

  Byte 1 – completion code (0x00)

  **Comments**

  This command is used for reset FPC to default value by user

- **Name**

  CmdCipherSuiteChange

  **NetFn**

  0x32

  **CMD**

  0xb1

  **Request data / Response data**

  **Request:**

  Byte 1 – cipher suite level 0x0: get current cipher suite

  – 0x1: set cipher suite to level 1
  – 0x2: set cipher suite to level 2

  **Response:**

  Byte 1 – completion code (0x00)

  **Comments**

  This command is used for get/set current cipher suite level.

- **Name**

  Failsafe Logging

  **NetFn**

  0x32

  **CMD**

  0xD2

**Request data / Response data**

**Request:**

Byte 1 – Status

– 0x00: Disable (default setting)

– 0x01: Enable

**Response:**

Byte 00 – Completion code

Byte 01 – Last status

Byte 02 – Set status

**Comments**

While enabled, FPC will assert a SELwhen the node enter failsafe state for over 3 seconds;then, FPC will log chassis status in USB dongle when the node enter failsafe state for over 7 minutes.

**Note:** This command is only available for the 1.08, FHET30M or later versions.

- **Name**

  Failsafe Virtual Reseat

  **NetFn**

  0x32

  **CMD**

  0xD3

  **Request data / Response data**

  **Request:**

  Byte 1 – Status

  – 0x00: Disable (default setting)

  – 0x01: Enable

  **Response:**

  Byte 00 – Completion code

  Byte 01 – Last status

  Byte 02 – Set status

  **Comments**

  When enabled, FPC will proceed a virtual reseat for the node which enters failsafe state for over 7 minutes.

  **Note:** This command is only available for the 1.08, FHET30M or later versions.

# Index



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