Environmental Monitoring and PoE Management

The Cisco Catalyst 8300 Series Edge Platform have hardware and software features that periodically monitor the router's environment. This chapter provides information on the environmental monitoring features on your router that allow you to monitor critical events and generate statistical reports on the status of various router components. This chapter includes the following sections:

Environmental Monitoring

The router provides a robust environment-monitoring system with several sensors that monitor the system temperatures. Microprocessors generate interrupts to the HOST CPU for critical events and generate a periodic status and statistics report. The following are some of the key functions of the environmental monitoring system:

- Monitoring temperature of CPUs, motherboard, and midplane
- Monitoring fan speed
- Recording abnormal events and generating notifications
- Monitoring Simple Network Management Protocol (SNMP) traps
- Generating and collecting Onboard Failure Logging (OBFL) data
- Sending call home event notifications
- Logging system error messages
- Displaying present settings and status

Environmental Monitoring and Reporting Functions

Monitoring and reporting functions allow you to maintain normal system operation by identifying and resolving adverse conditions prior to loss of operation.

• Environmental Reporting Functions, on page 4

Environmental Monitoring Functions

Environmental monitoring functions use sensors to monitor the temperature of the cooling air as it moves through the chassis.

The local power supplies provide the ability to monitor:

- Input and output current
- Output voltage
- Input and output power
- Temperature
- Fan speed

The device is expected to meet the following environmental operating conditions:

- Operating Temperature Nominal—32°F to 104°F (0°C to 40°C)
- Operating Humidity Nominal—10% to 85% RH noncondensing
- Operating Humidity Short Term—10% to 85% RH noncondensing
- Operating Altitude—Sea level 0 ft to 10,000 ft (0 to 3000 m)
- AC Input Range—85 to 264 VAC

In addition, each power supply monitors its internal temperature and voltage. A power supply is either within tolerance (normal) or out of tolerance (critical). If an internal power supply's temperature or voltage reaches a critical level, the power supply shuts down without any interaction with the system processor.

The following table displays the levels of status conditions used by the environmental monitoring system.

Table 1: Levels of Status Conditions Used by the Environmental Monitoring System

Status Level	Description
Normal	All monitored parameters are within normal tolerance.
Warning	The system has exceeded a specified threshold. The system continues to operate, but operator action is recommended to bring the system back to a normal state.
Critical	An out-of-tolerance temperature or voltage condition exists. Although the system continues to operate, it is approaching shutdown. Immediate operator action is required.

The environmental monitoring system sends system messages to the console, for example, when the conditions described here are met:

Fan Failure

When the system power is on, all the fans should be operational. Although the system continues to operate if a fan fails, the system displays the following message:

```
%IOSXE_PEM-3-FANFAIL: The fan in slot 2/0 is encountering a failure condition
```

Sensors Out of Range

When sensors are out of range, the system displays the following message:

```
%ENVIRONMENTAL-1-ALERT: V: 1.0v PCH, Location: R0, State: Warning, Reading: 1102 mV

%ENVIRONMENTAL-1-ALERT: V: PEM Out, Location: P1, State: Warning, Reading: 0 mV

%ENVIRONMENTAL-1-ALERT: Temp: Temp 3, Location R0, State : Warning, Reading : 90C
```

Fan Tray (Slot P2) Removed

When the fan tray for slot P2 is removed, the system displays the following message:

```
%IOSXE_PEM-6-REMPEM_FM: PEM/FM slot P2 removed
```

Fan Tray (Slot P2) Reinserted

When the fan tray for slot P2 is reinserted, the system displays the following message:

```
%IOSXE_PEM-6-INSPEM_FM: PEM/FM slot P2 inserted
```

Fan Tray (Slot 2) is Working Properly

When the fan tray for slot 2 is functioning properly, the system displays the following message:

```
%IOSXE_PEM-6-PEMOK: The PEM in slot P2 is functioning properly
```

Fan 0 in Slot 2 (Fan Tray) is Not Working

When Fan 0 in the fan tray of slot 2 is not functioning properly, the system displays the following message:

```
%IOSXE_PEM-3-FANFAIL: The fan in slot 2/0 is encountering a failure condition
```

Fan 0 in Slot 2 (Fan Tray) is Working Properly

When Fan 0 in the fan tray of slot 2 is functioning properly, the system displays the following message:

```
%IOSXE_PEM-6-FANOK: The fan in slot 2/0 is functioning properly
```

Main Power Supply in Slot 1 is Powered Off

When the main power supply in slot 1 is powered off, the system displays the following message:

```
%IOSXE_PEM-3-PEMFAIL: The PEM in slot 1 is switched off or encountering a
failure condition.
```

Main Power Supply is Inserted in Slot 1

When the main power supply is inserted in slot 1, the system displays the following messages:

```
%IOSXE_PEM-6-INSPEM_FM: PEM/FM slot P1 inserted
%IOSXE_PEM-6-PEMOK: The PEM in slot 1 is functioning properly
```

Temperature and Voltage Exceed Max/Min Thresholds

The following example shows the warning messages indicating the maximum and minimum thresholds of the temperature or voltage:

```
Warnings :
--------
For all the temperature sensors (name starting with “Temp:”) above,
the critical warning threshold is 100C (100C and higher)
the warning threshold is 80C (range from 80C to 99C)
the low warning threshold is 1C (range from -inf to 1C).

For all voltage sensors (names starting with "V:"),
the high warning threshold starts at that voltage +10%. (voltage + 10% is warning)
the low warning threshold starts at the voltage -10%. (voltage - 10% is warning)
```

Environmental Reporting Functions

You can retrieve and display environmental status reports using the following commands:

- **debug environment**
- **debug platform software cman env monitor polling**
- **debug ilpower**
- **debug power** [**inline** | **main**]
- **show diag all eeprom**
- **show diag slot R0 eeprom detail**
- **show environment**
- **show environment all**
- **show inventory**
- **show platform all**
- **show platform diag**
- **show platform software status control-processor**
- **show version**
- **show power**
- **show power inline**

These commands show the current values of parameters such as temperature and voltage.

The environmental monitoring system updates the values of these parameters every 60 seconds. Brief examples of these commands are shown below:

debug environment: Example

```
Router# debug environment location P0
Environmental sensor Temp: Temp 1 P0 debugging is on
Environmental sensor Temp: Temp 2 P0 debugging is on
```

```
Environmental sensor Temp: Temp 3 P0 debugging is on
Environmental sensor V: PEM Out P0 debugging is on
Environmental sensor I: PEM In P0 debugging is on
Environmental sensor I: PEM Out P0 debugging is on
Environmental sensor W: In pwr P0 debugging is on
Environmental sensor W: Out pwr P0 debugging is on
Environmental sensor RPM: fan0 P0 debugging is on

*Jul  8 21:49:23.292 PDT:     Sensor: Temp: Temp 1 P0, In queue 1
*Jul  8 21:49:23.292 PDT:     State=Normal  Reading=35
*Jul  8 21:49:23.292 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:23.292 PDT:     Sensor: Temp: Temp 1 P0  State=Normal Reading=35
*Jul  8 21:49:23.292 PDT:     Inserting into queue 1 on spoke 189.
*Jul  8 21:49:23.292 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:23.292 PDT:     Sensor: Temp: Temp 2 P0, In queue 1
*Jul  8 21:49:23.292 PDT:     State=Normal  Reading=40
*Jul  8 21:49:23.292 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:23.292 PDT:     Sensor: Temp: Temp 2 P0  State=Normal Reading=40
*Jul  8 21:49:23.292 PDT:     Inserting into queue 1 on spoke 189.
*Jul  8 21:49:23.292 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:23.292 PDT:     Sensor: Temp: Temp 3 P0, In queue 1
*Jul  8 21:49:23.292 PDT:     State=Normal  Reading=44
*Jul  8 21:49:23.292 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:23.292 PDT:     Sensor: Temp: Temp 3 P0  State=Normal Reading=44
*Jul  8 21:49:23.292 PDT:     Inserting into queue 1 on spoke 189.
*Jul  8 21:49:23.292 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:23.292 PDT:     Sensor: V: PEM In P0, In queue 1
*Jul  8 21:49:23.292 PDT:     State=Normal  Reading=118501
*Jul  8 21:49:23.292 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:23.293 PDT:     Sensor: V: PEM In P0  State=Normal Reading=118501
*Jul  8 21:49:23.293 PDT:     Inserting into queue 1 on spoke 189.
*Jul  8 21:49:23.293 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:23.293 PDT:     Sensor: V: PEM Out P0, In queue 1
*Jul  8 21:49:23.293 PDT:     State=Normal  Reading=12000
*Jul  8 21:49:23.293 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:23.293 PDT:     Sensor: V: PEM Out P0  State=Normal Reading=12000
*Jul  8 21:49:23.293 PDT:     Inserting into queue 1 on spoke 189.
*Jul  8 21:49:23.293 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:23.293 PDT:     Sensor: I: PEM In P0, In queue 1
*Jul  8 21:49:23.293 PDT:     State=Normal  Reading=820
*Jul  8 21:49:23.293 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:23.293 PDT:     Sensor: I: PEM In P0  State=Normal Reading=828
*Jul  8 21:49:23.293 PDT:     Inserting into queue 1 on spoke 189.
*Jul  8 21:49:23.293 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:23.293 PDT:     Sensor: I: PEM Out P0, In queue 1
*Jul  8 21:49:23.293 PDT:     State=Normal  Reading=7200
*Jul  8 21:49:23.293 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:23.293 PDT:     Sensor: I: PEM Out P0  State=Normal Reading=7100
*Jul  8 21:49:23.293 PDT:     Inserting into queue 1 on spoke 189.
*Jul  8 21:49:23.293 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:23.293 PDT:     Sensor: P: In pwr P0, In queue 1
*Jul  8 21:49:23.293 PDT:     State=Normal  Reading=97
*Jul  8 21:49:23.293 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:23.293 PDT:     Sensor: P: In pwr P0  State=Normal Reading=98
*Jul  8 21:49:23.293 PDT:     Inserting into queue 1 on spoke 189.
*Jul  8 21:49:23.293 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:23.293 PDT:     Sensor: P: Out pwr P0, In queue 1
*Jul  8 21:49:23.293 PDT:     State=Normal  Reading=87
*Jul  8 21:49:23.293 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:23.293 PDT:     Sensor: P: Out pwr P0  State=Normal Reading=89
*Jul  8 21:49:23.293 PDT:     Inserting into queue 1 on spoke 189.
*Jul  8 21:49:23.293 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:23.293 PDT:     Sensor: RPM: fan0 P0, In queue 1
*Jul  8 21:49:23.293 PDT:     State=Normal  Reading=5824
```

```
*Jul  8 21:49:23.293 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:23.293 PDT:     Sensor: RPM: fan0 P0  State=Normal Reading=5824
*Jul  8 21:49:23.293 PDT:     Inserting into queue 1 on spoke 189.
*Jul  8 21:49:23.293 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:43.296 PDT:     Sensor: Temp: Temp 1 P0, In queue 1
*Jul  8 21:49:43.296 PDT:     State=Normal  Reading=35
*Jul  8 21:49:43.296 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:43.296 PDT:     Sensor: Temp: Temp 1 P0  State=Normal Reading=35
*Jul  8 21:49:43.296 PDT:     Inserting into queue 1 on spoke 209.
*Jul  8 21:49:43.296 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:43.296 PDT:     Sensor: Temp: Temp 2 P0, In queue 1
*Jul  8 21:49:43.296 PDT:     State=Normal  Reading=40
*Jul  8 21:49:43.296 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:49:43.296 PDT:     Sensor: Temp: Temp 2 P0  State=Normal Reading=40
*Jul  8 21:49:43.296 PDT:     Inserting into queue 1 on spoke 209.
*Jul  8 21:49:43.296 PDT:     Rotation count=20 Displacement=0
*Jul  8 21:49:43.296 PDT:     Sensor: Temp: Temp 3 P0, In queue 1
*Jul  8 21:49:43.296 PDT:     State=Normal  Reading=44
*Jul  8 21:49:43.296 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:53:43.329 PDT:     State=Normal  Reading=5824
*Jul  8 21:53:43.329 PDT:     Rotation count=0  Poll period=20000
*Jul  8 21:53:43.329 PDT:     Sensor: RPM: fan0 P0  State=Normal Reading=5824
*Jul  8 21:53:43.329 PDT:     Inserting into queue 1 on spoke 149.
*Jul  8 21:53:43.329 PDT:     Rotation count=20 Displacement=0
```

debug platform software cman env monitor polling: Example

```
Router# debug platform software cman env monitor polling
platform software cman env monitor polling debugging is on
Router#
*Jul  8 21:56:23.351 PDT: Sensor: Temp: Temp 1 P0, In queue 1
*Jul  8 21:56:23.351 PDT: State=Normal  Reading=35
*Jul  8 21:56:23.351 PDT: Rotation count=0  Poll period=20000
*Jul  8 21:56:23.351 PDT: IOS-RP-ENVMON: sensor READ callback Temp: Temp 1, P0, 35
*Jul  8 21:56:23.351 PDT: Sensor: Temp: Temp 1 P0  State=Normal Reading=35
*Jul  8 21:56:23.351 PDT: Inserting into queue 1 on spoke 9.
*Jul  8 21:56:23.351 PDT: Rotation count=20 Displacement=0
*Jul  8 21:56:23.351 PDT: Sensor: Temp: Temp 2 P0, In queue 1
*Jul  8 21:56:23.351 PDT: State=Normal  Reading=40
*Jul  8 21:56:23.351 PDT: Rotation count=0  Poll period=20000
*Jul  8 21:56:23.351 PDT: IOS-RP-ENVMON: sensor READ callback Temp: Temp 2, P0, 40
*Jul  8 21:56:23.351 PDT: Sensor: Temp: Temp 2 P0  State=Normal Reading=40
*Jul  8 21:56:23.351 PDT: Inserting into queue 1 on spoke 9.
*Jul  8 21:56:23.351 PDT: Rotation count=20 Displacement=0
*Jul  8 21:56:23.351 PDT: Sensor: Temp: Temp 3 P0, In queue 1
*Jul  8 21:56:23.351 PDT: State=Normal  Reading=44
*Jul  8 21:56:23.351 PDT: Rotation count=0  Poll period=20000
*Jul  8 21:56:23.351 PDT: IOS-RP-ENVMON: sensor READ callback Temp: Temp 3, P0, 44
*Jul  8 21:56:23.351 PDT: Sensor: Temp: Temp 3 P0  State=Normal Reading=44
*Jul  8 21:56:23.351 PDT: Inserting into queue 1 on spoke 9.
*Jul  8 21:56:23.351 PDT: Rotation count=20 Displacement=0
*Jul  8 21:56:23.351 PDT: Sensor: V: PEM In P0, In queue 1
*Jul  8 21:56:23.351 PDT: State=Normal  Reading=118501
*Jul  8 21:56:23.351 PDT: Rotation count=0  Poll period=20000
*Jul  8 21:56:23.351 PDT: IOS-RP-ENVMON: sensor READ callback V: PEM In, P0, 118501
*Jul  8 21:56:23.351 PDT: Sensor: V: PEM In P0  State=Normal Reading=118501
*Jul  8 21:56:23.351 PDT: Inserting into queue 1 on spoke 9.
*Jul  8 21:56:23.351 PDT: Rotation count=20 Displacement=0
*Jul  8 21:56:23.351 PDT: Sensor: V: PEM Out P0, In queue 1
*Jul  8 21:56:23.351 PDT: State=Normal  Reading=12100
*Jul  8 21:56:23.351 PDT: Rotation count=0  Poll period=20000
*Jul  8 21:56:23.351 PDT: IOS-RP-ENVMON: sensor READ callback V: PEM Out, P0, 12000
```

```
*Jul  8 21:56:23.351 PDT: Sensor: V: PEM Out P0  State=Normal Reading=12000
*Jul  8 21:56:23.351 PDT: Inserting into queue 1 on spoke 9.
*Jul  8 21:56:23.351 PDT: Rotation count=20 Displacement=0
*Jul  8 21:56:23.351 PDT: Sensor: I: PEM In P0, In queue 1
*Jul  8 21:56:23.351 PDT: State=Normal  Reading=820
*Jul  8 21:56:23.351 PDT: Rotation count=0  Poll period=20000
*Jul  8 21:56:23.351 PDT: IOS-RP-ENVMON: sensor READ callback I: PEM In, P0, 828
*Jul  8 21:56:23.351 PDT: Sensor: I: PEM In P0  State=Normal Reading=828
*Jul  8 21:56:23.351 PDT: Inserting into queue 1 on spoke 9.
*Jul  8 21:56:23.351 PDT: Rotation count=20 Displacement=0
*Jul  8 21:56:23.351 PDT: Sensor: I: PEM Out P0, In queue 1
*Jul  8 21:56:23.351 PDT: State=Normal  Reading=7200
*Jul  8 21:56:23.351 PDT: Rotation count=0  Poll period=20000
*Jul  8 21:56:23.351 PDT: IOS-RP-ENVMON: sensor READ callback I: PEM Out, P0, 7100
*Jul  8 21:56:23.352 PDT: Sensor: I: PEM Out P0  State=Normal Reading=7100
*Jul  8 21:56:23.352 PDT: Inserting into queue 1 on spoke 9.
*Jul  8 21:56:23.352 PDT: Rotation count=20 Displacement=0
*Jul  8 21:56:23.352 PDT: Sensor: P: In pwr P0, In queue 1
*Jul  8 21:56:23.352 PDT: State=Normal  Reading=97
*Jul  8 21:56:23.352 PDT: Rotation count=0  Poll period=20000
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback P: In pwr, P0, 98
*Jul  8 21:56:23.352 PDT: Sensor: P: In pwr P0  State=Normal Reading=98
*Jul  8 21:56:23.352 PDT: Inserting into queue 1 on spoke 9.
*Jul  8 21:56:23.352 PDT: Rotation count=20 Displacement=0
*Jul  8 21:56:23.352 PDT: Sensor: P: Out pwr P0, In queue 1
*Jul  8 21:56:23.352 PDT: State=Normal  Reading=88
*Jul  8 21:56:23.352 PDT: Rotation count=0  Poll period=20000
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback P: Out pwr, P0, 88
*Jul  8 21:56:23.352 PDT: Sensor: P: Out pwr P0  State=Normal Reading=88
*Jul  8 21:56:23.352 PDT: Inserting into queue 1 on spoke 9.
*Jul  8 21:56:23.352 PDT: Rotation count=20 Displacement=0
*Jul  8 21:56:23.352 PDT: Sensor: RPM: fan0 P0, In queue 1
*Jul  8 21:56:23.352 PDT: State=Normal  Reading=5888
*Jul  8 21:56:23.352 PDT: Rotation count=0  Poll period=20000
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback RPM: fan0, P0, 5888
*Jul  8 21:56:23.352 PDT: Sensor: RPM: fan0 P0  State=Normal Reading=5888
*Jul  8 21:56:23.352 PDT: Inserting into queue 1 on spoke 9.
*Jul  8 21:56:23.352 PDT: Rotation count=20 Displacement=0
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback RPM: fan0, P2, 12600
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback RPM: fan1, P2, 12840
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback RPM: fan2, P2, 12900
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback P: pwr, P2, 8
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback Temp: Inlet 1, R0, 29
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback Temp: Inlet 2, R0, 30
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback Temp: Outlet 1, R0, 35
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback Temp: Outlet 2, R0, 36
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback Temp: CP-CPU, R0, 42
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 12v, R0, 12127
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 5v, R0, 5022
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 3.3v, R0, 3308
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 3.0v, R0, 3023
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 2.5v, R0, 2490
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 1.8v, R0, 1798
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 1.2v, R0, 1203
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 1.2v_CPU, R0, 1201
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 1.05v_CPU, R0, 1052
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 1.05v, R0, 1062
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 1.0v, R0, 1002
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback V: 0.6v, R0, 593
*Jul  8 21:56:23.352 PDT: IOS-RP-ENVMON: sensor READ callback P: pwr, R0, 86
*Jul  8 21:56:25.352 PDT: IOS-RP-ENVMON: sensor READ callback P: pwr: Pwr, 0/1, 5
*Jul  8 21:56:32.354 PDT: IOS-RP-ENVMON: sensor READ callback P: pwr: Pwr, 1/0, 27
```

debug ilpower: Example

```
Router# debug ilpower ?
  cdp         ILPOWER CDP messages
  controller  ILPOWER controller
  event       ILPOWER event
  ha          ILPOWER High-Availability
  port        ILPOWER port management
  powerman    ILPOWER powerman
  registries  ILPOWER registries
  scp         ILPOWER SCP messages
  upoe        ILPOWER upoe
```

debug power [inline|main]: Example

In this example, there is one 1000W power supply and one 450W power supply. Inline and main power output is shown.

```
Router# debug power ?
  inline  ILPM inline power related
  main    Main power related
  <cr>    <cr>
Router# debug power
POWER all debug debugging is on

Router# show debugging | include POWER
POWER:
POWER main debugging is on
POWER inline debugging is on
Router#
..

*Jul  8 21:56:23.351: %ENVIRONMENTAL-6-NOTICE: V: PEM Out, Location: P1, State: Warning,
Reading: 0 mV
*Jul  8 21:56:23.351: %IOSXE_PEM-6-PEMOK: The PEM in slot P1 is functioning properly
*Jul  8 21:56:23.351: %PLATFORM_POWER-6-MODEMATCH: Main power is in Boost mode
*Jul  8 21:56:23.351: Power M: Received Msg for 12V/Main, total power 1450, Run same as cfg
 Yes
*Jul  8 21:56:23.351: Power M: Received Msg for POE/ILPM, total power 500, Run same as cfg
 No
*Jul  8 21:56:23.351: Power I: Updating pool power is 500 watts
*Jul  8 21:56:23.351: Power I: Intimating modules of total power 500 watts
*Jul  8 21:56:23.351: Power M: Received Msg for 12V/Main, total power 1450, Run same as cfg
 Yes
*Jul  8 21:56:23.351: Power M: Received Msg for POE/ILPM, total power 500, Run same as cfg
 No
*Jul  8 21:56:23.351: Power I: Updating pool power is 500 watts
*Jul  8 21:56:23.351: Power I: Intimating modules of total power 500 watts
Router#
```

show diag all eeprom: Example

```
Router# show diag all eeprom
MIDPLANE EEPROM data:

        Product Identifier (PID) : C8300-1N1S-6T
        Version Identifier (VID) : V00
        PCB Serial Number        : FDO231403QE
        Hardware Revision        : 1.0
```

```
        CLEI Code                : TBDTBDTBDT
Power/Fan Module P0 EEPROM data:

        Product Identifier (PID) : PWR-4430-AC
        Version Identifier (VID) : V02
        PCB Serial Number        : LIT23032XFS
        CLEI Code                : IPUPAMFAAB
Power/Fan Module P1 EEPROM data is not initialized

External PoE Module POE0 EEPROM data is not initialized

External PoE Module POE1 EEPROM data is not initialized

Internal PoE is not present

Slot R0 EEPROM data:

        Product Identifier (PID) : C8300-1N1S-6T
        Version Identifier (VID) : V00
        PCB Serial Number        : FDO231403QE
        Hardware Revision        : 1.0
        CLEI Code                : TBDTBDTBDT
Slot F0 EEPROM data:

        Product Identifier (PID) : C8300-1N1S-6T
        Version Identifier (VID) : V00
        PCB Serial Number        : FDO231403QE
        Hardware Revision        : 1.0
        CLEI Code                : TBDTBDTBDT
Slot 0 EEPROM data:

        Product Identifier (PID) : C8300-1N1S-6T
        Version Identifier (VID) : V00
        PCB Serial Number        : FDO231403QE
        Hardware Revision        : 1.0
        CLEI Code                : TBDTBDTBDT
Slot 1 EEPROM data:

        Product Identifier (PID) : C8300-1N1S-6T
        Version Identifier (VID) : V00
        PCB Serial Number        : FDO231403QE
        Hardware Revision        : 1.0
        CLEI Code                : TBDTBDTBDT
SPA EEPROM data for subslot 0/0:

        Product Identifier (PID) : 4x1G-2xSFP
        Version Identifier (VID) : V01
        PCB Serial Number        :
        Top Assy. Part Number    : 68-2236-01
        Top Assy. Revision       : A0
        Hardware Revision        : 2.2
        CLEI Code                : CNUIAHSAAA
SPA EEPROM data for subslot 0/1 is not available

SPA EEPROM data for subslot 0/2 is not available

SPA EEPROM data for subslot 0/3 is not available

SPA EEPROM data for subslot 0/4 is not available

SPA EEPROM data for subslot 0/5 is not available

SPA EEPROM data for subslot 1/0 is not available
```

```
SPA EEPROM data for subslot 1/1 is not available

SPA EEPROM data for subslot 1/2 is not available

SPA EEPROM data for subslot 1/3 is not available

SPA EEPROM data for subslot 1/4 is not available

SPA EEPROM data for subslot 1/5 is not available
```

show environment: Example

In this example, note the output for the slots POE0 and POE1.

```
Router# show environment
 Number of Critical alarms:  0
Number of Major alarms:     0
Number of Minor alarms:     0

 Slot        Sensor          Current State   Reading
Threshold(Minor,Major,Critical,Shutdown)
 ----------  --------------  --------------- ------------
---------------------------------------
 P0          Temp: Temp 1    Normal          34   Celsius       (na ,na ,na ,na )(Celsius)
 P0          Temp: Temp 2    Normal          39   Celsius       (na ,na ,na ,na )(Celsius)
 P0          Temp: Temp 3    Normal          43   Celsius       (na ,na ,na ,na )(Celsius)
 P0          V: PEM In       Normal          119001mV           na
 P0          V: PEM Out      Normal          12100mV            na
 P0          I: PEM In       Normal          820  mA            na
 P0          I: PEM Out      Normal          7200 mA            na
 P0          P: In pwr       Normal          97   Watts         na
 P0          P: Out pwr      Normal          88   Watts         na
 P0          RPM: fan0       Normal          5760 RPM           na
 P2          RPM: fan0       Normal          12600RPM           na
 P2          RPM: fan1       Normal          12900RPM           na
 P2          RPM: fan2       Normal          12840RPM           na
 P2          P: pwr          Normal          8    Watts         na
 R0          Temp: Inlet 1   Normal          29   Celsius       (na ,na ,48 ,na )(Celsius)
 R0          Temp: Inlet 2   Normal          30   Celsius       (na ,na ,na ,na )(Celsius)
 R0          Temp: Outlet 1  Normal          34   Celsius       (na ,na ,81 ,na )(Celsius)
 R0          Temp: Outlet 2  Normal          35   Celsius       (na ,na ,81 ,na )(Celsius)
 R0          Temp: CP-CPU    Normal          42   Celsius       (na ,na ,97 ,na )(Celsius)
 R0          V: 12v          Normal          12119mV            na
 R0          V: 5v           Normal          5022 mV            na
 R0          V: 3.3v         Normal          3308 mV            na
 R0          V: 3.0v         Normal          3023 mV            na
 R0          V: 2.5v         Normal          2490 mV            na
 R0          V: 1.8v         Normal          1798 mV            na
 R0          V: 1.2v         Normal          1203 mV            na
 R0          V: 1.2v_CPU     Normal          1201 mV            na
 R0          V: 1.05v_CPU    Normal          1054 mV            na
 R0          V: 1.05v        Normal          1060 mV            na
 R0          V: 1.0v         Normal          1002 mV            na
 R0          V: 0.6v         Normal          592  mV            na
 R0          P: pwr          Normal          85   Watts         na
 0/1         P: pwr: Pwr     Normal          5    Watts         na
 1/0         P: pwr: Pwr     Normal          28   Watts         na
```

show environment all: Example

```
Router# show environment all
Sensor List:  Environmental Monitoring
 Sensor           Location          State             Reading
 Temp: Temp 1     P0                Normal            36 Celsius
 Temp: Temp 2     P0                Normal            38 Celsius
 Temp: Temp 3     P0                Normal            38 Celsius
 V: PEM In        P0                Normal            206502 mV
 V: PEM Out       P0                Normal            12000 mV
 I: PEM In        P0                Normal            281 mA
 I: PEM Out       P0                Normal            3500 mA
 P: In pwr        P0                Normal            53 Watts
 P: Out pwr       P0                Normal            43 Watts
 RPM: fan0        P0                Normal            3712 RPM
 RPM: fan0        P2                Normal            7260 RPM
 RPM: fan1        P2                Normal            7260 RPM
 RPM: fan2        P2                Normal            7200 RPM
 P: pwr           P2                Normal            3 Watts
 Temp: Inlet 1    R0                Normal            19 Celsius
 Temp: Inlet 2    R0                Normal            21 Celsius
 Temp: Outlet 1   R0                Normal            25 Celsius
 Temp: Outlet 2   R0                Normal            23 Celsius
 Temp: CP-CPU     R0                Normal            29 Celsius
 V: 12v           R0                Normal            11984 mV
 V: 5v            R0                Normal            5018 mV
 V: 3.3v          R0                Normal            3311 mV
 V: 3.0v          R0                Normal            2992 mV
 V: 2.5v          R0                Normal            2488 mV
 V: 1.8v          R0                Normal            1785 mV
 V: 1.2v          R0                Normal            1201 mV
 V: 1.2v_CPU      R0                Normal            1200 mV
 V: 1.05v_CPU     R0                Normal            1051 mV
 V: 1.05v         R0                Normal            1058 mV
 V: 1.0v          R0                Normal            1001 mV
 V: 0.6v          R0                Normal            595 mV
 P: pwr           R0                Normal            45 Watts
```

show inventory: Example

```
Router# show inventory


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
INFO: Please use "show license UDI" to get serial number for licensing.
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

NAME: "Chassis", DESCR: "Cisco C8300-1N1S-6T Chassis"
PID: C8300-1N1S-6T     , VID: V00  , SN: FDO2320A0C

NAME: "Fan Tray", DESCR: "Cisco C8300 1RU Fan Assembly"
PID: C8300-FAN-1R      , VID:      , SN:

NAME: "module 0", DESCR: "Cisco C8300-1N1S-6T Built-In NIM controller"
PID: C8300-1N1S-6T     , VID:      , SN:

NAME: "NIM subslot 0/0", DESCR: "Front Panel 6 ports Gigabitethernet Module"
PID: 4x1G-2xSFP        , VID: V01  , SN:

NAME: "module 1", DESCR: "Cisco C8300-1N1S-6T Built-In SM controller"
```

```
PID: C8300-1N1S-6T     , VID:      , SN:

NAME: "module R0", DESCR: "Cisco C8300-1N1S-6T Route Processor"
PID: C8300-1N1S-6T     , VID: V00  , SN: FDO231403QE

NAME: "module F0", DESCR: "Cisco C8300-1N1S-6T Forwarding Processor"
PID: C8300-1N1S-6T     , VID:      , SN:
```

show platform: Example

```
Router# show platform
 Chassis type: C8300-1N1S-6T

Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
0         C8300-1N1S-6T       ok                    2d03h
 0/0      4x1G-2xSFP          ok                    2d03h
1         C8300-1N1S-6T       ok                    2d03h
R0        C8300-1N1S-6T       ok, active            2d03h
F0        C8300-1N1S-6T       ok, active            2d03h
P0        PWR-4430-AC         ok                    2d03h
P1        Unknown             empty                 never
P2        C8300-FAN-1R        ok                    2d03h

Slot      CPLD Version        Firmware Version
--------- ------------------- ----------------------------------------
0         19121329            1RU-20191104
1         19121329            1RU-20191104
R0        19121329            1RU-20191104
F0        19121329            1RU-20191104
```

show platform diag: Example

```
Router# show platform diag
Chassis type: C8300-1N1S-6T

Slot: 0, C8300-1N1S-6T
  Running state               : ok
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:00:29 (2d03h ago)
  Software declared up time   : 00:01:05 (2d03h ago)
  CPLD version                : 19121329
  Firmware version            : 1RU-20191104

Sub-slot: 0/0, 4x1G-2xSFP
  Operational status          : ok
  Internal state              : inserted
  Physical insert detect time : 00:01:27 (2d03h ago)
  Logical insert detect time  : 00:01:27 (2d03h ago)

Slot: 1, C8300-1N1S-6T
  Running state               : ok
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:00:29 (2d03h ago)
  Software declared up time   : 00:01:06 (2d03h ago)
  CPLD version                : 19121329
```

```
  Firmware version            : 1RU-20191104

Slot: R0, C8300-1N1S-6T
  Running state               : ok, active
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:00:29 (2d03h ago)
  Software declared up time   : 00:00:29 (2d03h ago)
  CPLD version                : 19121329
  Firmware version            : 1RU-20191104

Slot: F0, C8300-1N1S-6T
  Running state               : ok, active
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:00:29 (2d03h ago)
  Software declared up time   : 00:01:00 (2d03h ago)
  Hardware ready signal time  : 00:00:58 (2d03h ago)
  Packet ready signal time    : 00:01:05 (2d03h ago)
  CPLD version                : 19121329
  Firmware version            : 1RU-20191104

Slot: P0, PWR-4430-AC
  State                       : ok
  Physical insert detect time : 00:00:52 (2d03h ago)

Slot: P1, Unknown
  State                       : empty
  Physical insert detect time : 00:00:00 (never ago)

Slot: P2, C8300-FAN-1R
  State                       : ok
  Physical insert detect time : 00:00:52 (2d03h ago)

Slot: POE0, Unknown
  State                       : empty
  Physical insert detect time : 00:00:00 (never ago)

Slot: POE1, Unknown
  State                       : empty
  Physical insert detect time : 00:00:00 (never ago)

Slot: GE-POE, Unknown
  State                       : NA
  Physical insert detect time : 00:00:00 (never ago)
```

show platform software status control-processor: Example

```
Router# show platform software status control-processor
RP0: online, statistics updated 10 seconds ago
Load Average: healthy
  1-Min: 0.53, status: healthy, under 5.00
  5-Min: 0.90, status: healthy, under 5.00
  15-Min: 0.87, status: healthy, under 5.00
Memory (kb): healthy
  Total: 3884836
  Used: 1976928 (51%), status: healthy
  Free: 1907908 (49%)
  Committed: 3165956 (81%), under 90%
Per-core Statistics
CPU0: CPU Utilization (percentage of time spent)
```

```
  User:  2.10, System:  2.20, Nice:  0.00, Idle: 95.69
  IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU1: CPU Utilization (percentage of time spent)
  User:  2.80, System:  2.60, Nice:  0.00, Idle: 94.50
  IRQ:  0.00, SIRQ:  0.10, IOwait:  0.00
CPU2: CPU Utilization (percentage of time spent)
  User:  1.90, System:  2.10, Nice:  0.00, Idle: 96.00
  IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU3: CPU Utilization (percentage of time spent)
  User: 10.12, System:  0.60, Nice:  0.00, Idle: 89.27
  IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
```

show diag slot R0 eeprom detail: Example

```
Router# show diag slot R0 eeprom detail
Slot R0 EEPROM data:

        EEPROM version           : 4
        Compatible Type          : 0xFF
        PCB Serial Number        : FDO23470DHV
        Controller Type          : 4268
        Hardware Revision        : 1.0
        PCB Part Number          : 73-19423-07
        Board Revision           : A0
        Top Assy. Part Number    : 800-105842-02
        Deviation Number         : 551831
        Fab Version              : 07
        Product Identifier (PID) : C8300-1N1S-4T2X
        Version Identifier (VID) : V01
        CLEI Code                : CMM6J00ARA
        Processor type           : D0
        Chassis Serial Number    : FDO2401A038
        Chassis MAC Address      : c4b2.399e.b6c0
        MAC Address block size   : 144
        Manufacturing Test Data  : 00 00 00 00 00 00 00 00
        Asset ID                 :
```

show version: Example

```
Router# show version

Cisco IOS XE Software, Version 17.03.01prd8
Cisco IOS Software [Amsterdam], c8000be Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Version
 17.3.1prd8, RELEASE SOFTWARE
 (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Tue 19-May-20 12:00 by mcpre


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documentation or "License Notice" file accompanying the IOS-XE software,
or the applicable URL provided on the flyer accompanying the IOS-XE
software.
```

```
ROM: (c)

Router uptime is 2 days, 3 hours, 26 minutes
Uptime for this control processor is 2 days, 3 hours, 27 minutes
System returned to ROM by Reload Command
System image file is "bootflash:c8000be-universalk9.17.03.01prd8.SPA.bin"
Last reload reason: Reload Command



This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and
use. Delivery of Cisco cryptographic products does not imply
third-party authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.


Technology Package License Information:

------------------------------------------------------------------
Technology     Type         Technology-package Technology-package
                            Current           Next Reboot
------------------------------------------------------------------
Smart License  Perpetual    network-essentials network-essentials
Smart License  Subscription None              None

The current crypto throughput level is 1000000 kbps


Smart Licensing Status: UNREGISTERED/EVAL MODE

cisco C8300-1N1S-6T (1RU) processor with 3763047K/6147K bytes of memory.
Processor board ID FDO2320A0CF
Router operating mode: Autonomous
6 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
8388608K bytes of physical memory.
7090175K bytes of flash memory at bootflash:.
28884992K bytes of M.2 USB at harddisk:.

Configuration register is 0x2102
```

Configuring Power Supply Mode

You can configure the power supplies of both the device and a connected Power over Ethernet (PoE) module.

- Configuring the Edge Platforms Power Supply Mode, on page 16
- Configuring the External PoE Service Module Power Supply Mode, on page 16

For more information on the Power Supply Mode, See the Overview of the Power Options section.

- Hardware Installation Guide for Cisco Catalyst 8300 Series Edge Platform
- Hardware Installation Guide for Cisco Catalyst 8200 Series Edge Platforms

Configuring the Edge Platforms Power Supply Mode

Configure the main power supply on the Edge Platforms using the **power main redundant** command:

- **power main redundant**—Sets the main power supply in redundant mode.
- **no power main redundant**—Sets the main power supply in boost mode.

  The boost mode is supported only on C8300-2N2S-4T2X and C8300-2N2S-6T platforms.

Note The default mode for the device power supply is redundant mode.

Configuring the External PoE Service Module Power Supply Mode

Configure the power supply of an external PoE service module using the **power inline redundant** command:

- **power inline redundant**—Sets the external PoE service module power supply in redundant mode.
- **no power inline redundant**—Sets the external PoE service module power supply in boost mode. The boost mode is supported only on C8300-2N2S-4T2X and C8300-2N2S-6T platforms.

Note The default mode for the external PoE service module power supply is redundant mode.

The **show power** command shows whether boost or redundant mode is configured and whether this mode is currently running on the system.

Examples for Configuring Power Supply Mode

Example—Configured Mode of Boost for Main PSU and PoE Module

The Boost mode is supported only on C8300-2N2S-4T2X and C8300-2N2S-6T platforms. In this example, the **show power** command shows the configured mode as `Boost`, which is also the current runtime state. The `Main PSU` shows information about the main power supply. The `POE Module` shows information about the inline/PoE power. In this example, the current run-time state for the main power supply is the same as the configured state (`Boost` mode).

```
Router# show power
Main PSU :
```

```
    Configured Mode : Boost
    Current runtime state same : Yes
    Total power available : 2000 Watts
POE Module :
    Configured Mode : Boost
    Current runtime state same : Yes
    Total power available : 1000 Watts
Router#
```

Example—Configured Mode of Boost for Main PSU and PoE Module

In this example, the **show power** command shows the power supplies that are present in the device. The Main PSU and POE Module are configured to the `Boost` mode, which differs from the current runtime state. The current runtime state is the `Redundant` mode. A likely explanation for this is that there is only one main power supply present in the router. See mode example 4 in the table titled "Modes of Operation" in Available PoE Power, on page 18.

You can enter the **show platform** command to show the power supplies that are present in the device.

```
Router# show power
Main PSU :
    Configured Mode : Boost
    Current runtime state same : No
    Total power available : 1000 Watts
POE Module :
    Configured Mode : Boost
    Current runtime state same : No
    Total power available : 500 Watts
Router#
```

Example—Configured Mode of Redundant for Main PSU and PoE Module

In this example, the **show power** command shows the configured mode is `Redundant` for both the main and inline power. The system has one 450 W and one 100 W power supply.

```
Router# show powerMain PSU :
    Configured Mode : Redundant
    Current runtime state same : No
    Total power available : 250 Watts
POE Module :
    Configured Mode : Redundant
    Current runtime state same : No
    Total power available : 0 Watts

Router#
```

Example—Configured Mode of Boost for Main Power

In this example, the main power is configured to be in `boost` mode by using the **no** form of the **power main redundant** command. This sets the main power to `boost` mode with 1450 W and inline power to `redundant` mode with 500 W.

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# no power main redundant
Router(config)#
*Jan 31 03:35:22.284: %PLATFORM_POWER-6-MODEMATCH: Inline power is in Redundant mode
```

```
Router(config)#
Router(config)# exit
Router#
*Jan 31 03:36:13.111: %SYS-5-CONFIG_I: Configured from console by console
Router# show power
Main PSU :
    Configured Mode : Boost
    Current runtime state same : Yes
    Total power available : 1450 Watts
POE Module :
    Configured Mode : Redundant
    Current runtime state same : Yes
    Total power available : 500 Watts
Router#
```

Example—Configured Mode of Boost for PoE Power

In this example, an attempt is made to configure the inline power in boost mode by using the **no** form of the **power inline redundant** command. The inline power mode is **not** changed to boost mode because that would require a total power available in redundant mode of 1000 W. The inline power mode is redundant and is shown by the following values for the PoE Module:

- `Configured Mode : Boost`
- `Current runtime state same : No`

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# no power inline redundant
Router(config)#
*Jan 31 03:42:40.947: %PLATFORM_POWER-6-MODEMISMATCH: Inline power not in Boost mode
Router(config)#
Router(config)# exit
Router#
*Jan 31 03:36:13.111: %SYS-5-CONFIG_I: Configured from console by console
Router# show power
Main PSU :
    Configured Mode : Boost
    Current runtime state same : Yes
    Total power available : 1450 Watts
POE Module :
    Configured Mode : Boost
    Current runtime state same : No
    Total power available : 500 Watts
Router#
```

Available PoE Power

For the PoE feature to be available on the external PoE module, the total power from the power supplies must be 500 W or higher.

Note To ensure the PoE feature is functional on the external PoE module, verify the availability of PoE power on your router using the **show platform** and **show power** commands.

To determine there is enough PoE power for use by an external PoE service module, use the **show platform** and **show power** commands to calculate the available PoE power based on the wattage values of the main power supplies and PoE inverters.

Take the values of your main P0 and P1 power supplies to give the Total Power (for main power supplies.) Then take the values of your PoE1 and PoE2 power inverters to calculate the Total PoE Power.

The following table shows example modes of operation, which may be similar to your configuration.

The Total PoE Power value, in the final column of the table needs to be 500 W or higher for the PoE feature to be functional on a connected PoE service module.

Note Add power inverters to the router before inserting an external PoE module. Otherwise, even if the Total PoE Power is sufficient, the PoE power will not be used by the external PoE module and the module will need to be re-booted for the PoE feature to be functional.

Configuring a power mode of boost or redundant on the main power supplies, or PoE inverters, may affect the value for Total PoE Power.

The following table shows all power values in Watts. The wattage ratings of the main power supplies are shown in columns Main P0 and Main P1. The wattage ratings of the PoE inverters are shown in columns PoE0 and PoE1.

Table 2: Modes of Operation

Mode Example	Main P0	Main P1	Config Mode	Total Power (Main)	PoE0	PoE1	Config Mode	Total PoE Power
1	450	None	Redundant or Boost	450	None	500	Redundant or Boost	0 (None)
2	450	450	Boost	900	None	500	Redundant or Boost	0 (None)
3	450	450	Redundant	450	500	None	Redundant or Boost	0 (None)
4	1000	None	Redundant or Boost	1000	500	None	Redundant or Boost	500
5	1000	450	Redundant	450	500	500	Redundant or Boost	0 (None)
6	1000	450	Boost	1450	500	500	Boost	500
7	1000	1000	Redundant	1000	500	500	Boost	500
8	1000	1000	Boost	2000	500	500	Boost	1000

Note In the table above, for 500 W or higher Total PoE Power to be available, the "Total Power" (of the main power supplies) must be 1000 W or higher.

For 1000 W Total PoE Power (see Mode Example 8 above), there must be two 1000 W main power supplies (in `Boost` mode) and two PoE inverters (also in `Boost` mode).

Caution Care should be taken while removing the power supplies and power inverters (especially in `Boost` mode of operation). If the total power consumption is higher than can be supported by one power supply alone and in this condition a power supply is removed, the hardware can be damaged. This may then result in the system being unstable or unusable.

Similarly, in the case where there is only one PoE inverter providing PoE power to a service module, and in this condition the PoE inverter is removed, the hardware may be damaged, and may result in the system being unstable or unusable.