



# Environmental Monitoring

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## Note

- For complete syntax and usage information for the commands used in this chapter, see these publications:  
[http://www.cisco.com/en/US/products/ps11846/prod\\_command\\_reference\\_list.html](http://www.cisco.com/en/US/products/ps11846/prod_command_reference_list.html)
- Cisco IOS Release 15.4SY supports only Ethernet interfaces. Cisco IOS Release 15.4SY does not support any WAN features or commands.



## Tip

For additional information about Cisco Catalyst 6500 Series Switches (including configuration examples and troubleshooting information), see the documents listed on this page:

[http://www.cisco.com/en/US/products/hw/switches/ps708/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html)

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## Environmental Monitoring Overview

Environmental monitoring of chassis components provides early-warning indications of possible component failures, which ensures a safe and reliable system operation and avoids network interruptions. This section describes the monitoring of these critical system components, which allows you to identify and rapidly correct hardware-related problems in your system.

# How to Determine Sensor Temperature Thresholds

The system sensors set off alarms based on different temperature threshold settings. Use the **show environment alarm threshold** command to display the sensor temperature thresholds:

```
Router> show environment alarm threshold
environmental alarm thresholds:

power-supply 1 fan-fail: OK
  threshold #1 for power-supply 1 fan-fail:
  (sensor value != FALSE ) is system minor alarm
power-supply 1 power-output-fail: OK
  threshold #1 for power-supply 1 power-output-fail:
  (sensor value != FALSE ) is system minor alarm
power-supply 1 power-output-mode: high
  threshold #1 for power-supply 1 power-output-mode:
  (sensor value < 1 ) is system minor alarm
power-supply 1 incompatible with fan: OK
  threshold #1 for power-supply 1 incompatible with fan:
  (sensor value != FALSE ) is system minor alarm
power-supply 2 fan-fail: OK
  threshold #1 for power-supply 2 fan-fail:
  (sensor value != FALSE ) is system minor alarm
power-supply 2 power-output-fail: OK
  threshold #1 for power-supply 2 power-output-fail:
  (sensor value != FALSE ) is system minor alarm
power-supply 2 power-output-mode: high
  threshold #1 for power-supply 2 power-output-mode:
  (sensor value < 1 ) is system minor alarm
power-supply 2 incompatible with fan: OK
  threshold #1 for power-supply 2 incompatible with fan:
  (sensor value != FALSE ) is system minor alarm
fan-tray 1 fan-fail: OK
  threshold #1 for fan-tray 1 fan-fail:
  (sensor value == 1 ) is system minor alarm
operating clock count: 2
  threshold #1 for operating clock count:
  (sensor value < 2 ) is system minor alarm
  threshold #2 for operating clock count:
  (sensor value < 1 ) is system major alarm
operating VTT count: 3
  threshold #1 for operating VTT count:
  (sensor value < 3 ) is system minor alarm
  threshold #2 for operating VTT count:
  (sensor value < 2 ) is system major alarm
operating fan count: 1
  threshold #1 for operating fan count:
  (sensor value < 1 ) is system minor alarm
VTT 1 outlet temperature: 37C
  threshold #1 for VTT 1 outlet temperature:
  (sensor value >= 100C) is system minor alarm
  threshold #2 for VTT 1 outlet temperature:
  (sensor value >= 115C) is system major alarm
VTT 1 OK: OK
  threshold #1 for VTT 1 OK:
  (sensor value != FALSE ) is system minor alarm
VTT 2 outlet temperature: 39C
  threshold #1 for VTT 2 outlet temperature:
  (sensor value >= 100C) is system minor alarm
  threshold #2 for VTT 2 outlet temperature:
  (sensor value >= 115C) is system major alarm
VTT 2 OK: OK
  threshold #1 for VTT 2 OK:
```

```
(sensor value != FALSE ) is system minor alarm
VTT 3 outlet temperature: 42C
threshold #1 for VTT 3 outlet temperature:
(sensor value >= 100C) is system minor alarm
threshold #2 for VTT 3 outlet temperature:
(sensor value >= 115C) is system major alarm
VTT 3 OK: OK
threshold #1 for VTT 3 OK:
(sensor value != FALSE ) is system minor alarm
clock 1 OK: OK
threshold #1 for clock 1 OK:
(sensor value != FALSE ) is system minor alarm
clock 2 OK: OK
threshold #1 for clock 2 OK:
(sensor value != FALSE ) is system minor alarm
module 1 power-output-fail: OK
threshold #1 for module 1 power-output-fail:
(sensor value != FALSE ) is system minor alarm
module 1 outlet temperature: 56C
threshold #1 for module 1 outlet temperature:
(sensor value >= 75C) is system minor alarm
threshold #2 for module 1 outlet temperature:
(sensor value >= 90C) is system major alarm
module 1 inlet temperature: 41C
threshold #1 for module 1 inlet temperature:
(sensor value >= 50C) is system minor alarm
threshold #2 for module 1 inlet temperature:
(sensor value >= 75C) is system major alarm
module 1 device-1 temperature: 63C
threshold #1 for module 1 device-1 temperature:
(sensor value >= 75C) is system minor alarm
threshold #2 for module 1 device-1 temperature:
(sensor value >= 90C) is system major alarm
module 1 device-2 temperature: 45C
threshold #1 for module 1 device-2 temperature:
(sensor value >= 50C) is system minor alarm
threshold #2 for module 1 device-2 temperature:
(sensor value >= 75C) is system major alarm
module 1 aux-1 temperature: 57C
threshold #1 for module 1 aux-1 temperature:
(sensor value >= 75C) is system minor alarm
threshold #2 for module 1 aux-1 temperature:
(sensor value >= 90C) is system major alarm
module 1 aux-2 temperature: 46C
threshold #1 for module 1 aux-2 temperature:
(sensor value >= 50C) is system minor alarm
threshold #2 for module 1 aux-2 temperature:
(sensor value >= 75C) is system major alarm
module 1 insufficient cooling: OK
threshold #1 for module 1 insufficient cooling:
(sensor value != FALSE ) is system major alarm
module 1 asic-1 temperature: 61C
threshold #1 for module 1 asic-1 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 1 asic-1 temperature:
(sensor value >= 125C) is system major alarm
module 1 asic-2 temperature: 61C
threshold #1 for module 1 asic-2 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 1 asic-2 temperature:
(sensor value >= 125C) is system major alarm
module 1 asic-3 temperature: 61C
threshold #1 for module 1 asic-3 temperature:
(sensor value >= 110C) is system minor alarm
```

```

threshold #2 for module 1 asic-3 temperature:
(sensor value >= 125C) is system major alarm
module 1 asic-4 temperature: 63C
threshold #1 for module 1 asic-4 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 1 asic-4 temperature:
(sensor value >= 125C) is system major alarm
module 3 power-output-fail: OK
threshold #1 for module 3 power-output-fail:
(sensor value != FALSE ) is system minor alarm
module 3 module outlet-1 temperature: 39C
threshold #1 for module 3 module outlet-1 temperature:
(sensor value >= 70C) is system minor alarm
threshold #2 for module 3 module outlet-1 temperature:
(sensor value >= 85C) is system major alarm
module 3 module inlet-1 temperature: 37C
threshold #1 for module 3 module inlet-1 temperature:
(sensor value >= 55C) is system minor alarm
threshold #2 for module 3 module inlet-1 temperature:
(sensor value >= 70C) is system major alarm
module 3 module outlet-2 temperature: 50C
threshold #1 for module 3 module outlet-2 temperature:
(sensor value >= 70C) is system minor alarm
threshold #2 for module 3 module outlet-2 temperature:
(sensor value >= 85C) is system major alarm
module 3 module inlet-2 temperature: 43C
threshold #1 for module 3 module inlet-2 temperature:
(sensor value >= 55C) is system minor alarm
threshold #2 for module 3 module inlet-2 temperature:
(sensor value >= 70C) is system major alarm
module 3 insufficient cooling: OK
threshold #1 for module 3 insufficient cooling:
(sensor value != FALSE ) is system major alarm
module 3 fan-upgrade required: OK
threshold #1 for module 3 fan-upgrade required:
(sensor value != FALSE ) is system major alarm
module 3 asic-1 temperature: 58C
threshold #1 for module 3 asic-1 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 3 asic-1 temperature:
(sensor value >= 125C) is system major alarm
module 3 asic-2 temperature: 56C
threshold #1 for module 3 asic-2 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 3 asic-2 temperature:
(sensor value >= 125C) is system major alarm
module 3 asic-3 temperature: 55C
threshold #1 for module 3 asic-3 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 3 asic-3 temperature:
(sensor value >= 125C) is system major alarm
module 1 EARL 1 device-1 temperature: 82C
threshold #1 for module 1 EARL 1 device-1 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 1 EARL 1 device-1 temperature:
(sensor value >= 125C) is system major alarm
module 1 EARL 1 device-2 temperature: 81C
threshold #1 for module 1 EARL 1 device-2 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 1 EARL 1 device-2 temperature:
(sensor value >= 125C) is system major alarm
module 1 EARL 2 device-1 temperature: 81C
threshold #1 for module 1 EARL 2 device-1 temperature:
(sensor value >= 110C) is system minor alarm

```

```

threshold #2 for module 1 EARL 2 device-1 temperature:
(sensor value >= 125C) is system major alarm
module 1 EARL 2 device-2 temperature: 80C
threshold #1 for module 1 EARL 2 device-2 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 1 EARL 2 device-2 temperature:
(sensor value >= 125C) is system major alarm
module 3 EARL outlet-1 temperature: 73C
threshold #1 for module 3 EARL outlet-1 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 3 EARL outlet-1 temperature:
(sensor value >= 125C) is system major alarm
module 3 EARL inlet-1 temperature: 73C
threshold #1 for module 3 EARL inlet-1 temperature:
(sensor value >= 110C) is system minor alarm
threshold #2 for module 3 EARL inlet-1 temperature:
(sensor value >= 125C) is system major alarm
power-converter 1 : 3.3V Output: OK
threshold #1 for power-converter 1 : 3.3V Output:
(sensor value != 1 ) is system minor alarm
power-converter 2 : 3.3V Output: OK
threshold #1 for power-converter 2 : 3.3V Output:
(sensor value != 1 ) is system minor alarm

```

## How to Monitor the System Environmental Status

To display system status information, enter the **show environment [alarm | cooling | status | temperature]** command. The keywords display the following information:

- **alarm**—Displays environmental alarms.
  - **status**—Displays alarm status.
  - **thresholds**—Displays alarm thresholds.
- **cooling**—Displays fan tray status, chassis cooling capacity, ambient temperature, and per-slot cooling capacity.
- **status**—Displays field-replaceable unit (FRU) operational status and power and temperature information.
- **temperature**—Displays FRU temperature information.

To view the system status information, enter the **show environment** command:

```

Router# show environment
environmental alarms:
no alarms

Router# show environment alarm
environmental alarms:
no alarms

Router# show environment cooling
fan-tray 1:
fan-tray 1 type: C6807-XL-FAN
fan-tray 1 mode: High-power
fan-tray 1 fan-fail: OK
chassis per slot cooling capacity: 97 cfm
module 1 cooling requirement: 84 cfm
module 3 cooling requirement: 84 cfm

Router# show environment status

```

```

switch 1 backplane:
  operating clock count: 2
  operating VTT count: 3
  operating fan count: 1

switch 1 fan-tray 1:
  switch 1 fan-tray 1 type: C6807-XL-FAN
  switch 1 fan-tray 1 mode: High-power
  switch 1 fan-tray 1 fan-fail: OK
switch 1 VTT 1:
  switch 1 VTT 1 OK: OK
  switch 1 VTT 1 outlet temperature: 36C
switch 1 VTT 2:
  switch 1 VTT 2 OK: OK
  switch 1 VTT 2 outlet temperature: 38C
switch 1 VTT 3:
  switch 1 VTT 3 OK: OK
  switch 1 VTT 3 outlet temperature: 41C
switch 1 clock 1:
  switch 1 clock 1 OK: OK, switch 1 clock 1 clock-inuse: in-use
switch 1 clock 2:
  switch 1 clock 2 OK: OK, switch 1 clock 2 clock-inuse: not-in-use
switch 1 power-supply 1:
  switch 1 power-supply 1 fan-fail: OK
  switch 1 power-supply 1 power-input: AC high
  switch 1 power-supply 1 power-output-mode: high
  switch 1 power-supply 1 incompatible with fan: OK
  switch 1 power-supply 1 power-output-fail: OK

switch 1 power-supply 2:
  switch 1 power-supply 2 fan-fail: OK
  switch 1 power-supply 2 power-input: AC high
  switch 1 power-supply 2 power-output-mode: high
  switch 1 power-supply 2 incompatible with fan: OK
  switch 1 power-supply 2 power-output-fail: OK

switch 1 power-converter 1:
  switch 1 power-converter 1 : 3.3V Output: OK
switch 1 power-converter 2:
  switch 1 power-converter 2 : 3.3V Output: OK
switch 1 module 1:
  switch 1 module 1 power-output-fail: OK
  switch 1 module 1 outlet temperature: 53C
  switch 1 module 1 inlet temperature: 40C
  switch 1 module 1 device-1 temperature: 60C
  switch 1 module 1 device-2 temperature: 45C
  switch 1 module 1 aux-1 temperature: 55C
  switch 1 module 1 aux-2 temperature: 45C
  switch 1 module 1 asic-1 temperature: 58C
  switch 1 module 1 asic-2 temperature: 59C
  switch 1 module 1 asic-3 temperature: 60C
  switch 1 module 1 asic-4 temperature: 61C
  switch 1 module 1 EARL 1 device-1 temperature: 78C
  switch 1 module 1 EARL 1 device-2 temperature: 77C
  switch 1 module 1 EARL 2 device-1 temperature: 77C
  switch 1 module 1 EARL 2 device-2 temperature: 77C
switch 1 module 3:
  switch 1 module 3 power-output-fail: OK
  switch 1 module 3 module outlet-1 temperature: 38C
  switch 1 module 3 module inlet-1 temperature: 36C
  switch 1 module 3 module outlet-2 temperature: 49C
  switch 1 module 3 module inlet-2 temperature: 43C
  switch 1 module 3 asic-1 temperature: 56C
  switch 1 module 3 asic-2 temperature: 56C

```

```
switch 1 module 3 asic-3 temperature: 54C
switch 1 module 3 EARL outlet-1 temperature: 72C
switch 1 module 3 EARL inlet-1 temperature: 71C
```

## Information About LED Environmental Indications

The LEDs can indicate two alarm types: major and minor. Major alarms indicate a critical problem that could lead to the system being shut down. Minor alarms are for informational purposes only, giving you notice of a problem that could turn critical if corrective action is not taken.

When the system has an alarm (major or minor), that indicates an overtemperature condition, the alarm is not canceled nor is any action taken (such as module reset or shutdown) for 5 minutes. If the temperature falls 5°C (41°F) below the alarm threshold during this period, the alarm is canceled.

[Table 15-1](#) lists the environmental indicators for the supervisor engine and switching modules.



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**Note**

See the *Catalyst 6500 Series Switch Module Installation Guide* for additional information on LEDs, including the supervisor engine SYSTEM LED.

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Table 15-1 Environmental Monitoring for Supervisor Engine and Switching Modules

Component	Alarm Type	LED Indication	Action
Supervisor engine temperature sensor exceeds major threshold	Major	STATUS LED red	Generates syslog message and an SNMP trap. If there is a redundancy situation, the system switches to a redundant supervisor engine and the active supervisor engine shuts down. If there is no redundancy situation and the overtemperature condition is not corrected, the system shuts down after 5 minutes.
<b>Note</b> <ul style="list-style-type: none"> <li>Temperature sensors monitor key supervisor engine components including daughter cards.</li> <li>A STATUS LED is located on the supervisor engine front panel and all module front panels.</li> <li>The STATUS LED is red on the failed supervisor engine. If there is no redundant supervisor, the SYSTEM LED is red also.</li> </ul>			
Supervisor engine temperature sensor exceeds minor threshold	Minor	STATUS LED orange	Generates syslog message and an SNMP trap. Monitors the condition.
Redundant supervisor engine temperature sensor exceeds major or minor threshold	Major	STATUS LED red	Generates syslog message and an SNMP trap. If a major alarm is generated and the overtemperature condition is not corrected, the system shuts down after 5 minutes.
	Minor	STATUS LED orange	Monitors the condition if a minor alarm is generated.
Switching module temperature sensor exceeds major threshold	Major	STATUS LED red	Generates syslog message and SNMP. Powers down the module (see the “ <a href="#">How to Power Modules Off and On</a> ” section on page 14-3 for instructions).
Switching module temperature sensor exceeds minor threshold	Minor	STATUS LED orange	Generates syslog message and an SNMP trap. Monitors the condition.

**Tip**

For additional information about Cisco Catalyst 6500 Series Switches (including configuration examples and troubleshooting information), see the documents listed on this page:

[http://www.cisco.com/en/US/products/hw/switches/ps708/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html)

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