14
Power Management

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
- 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

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Power Management Overview

In systems with redundant power supplies, both power supplies must be of the same wattage. The Catalyst 6500 series switches allow you to use both AC-input and DC-input power supplies in the same chassis. For detailed information on supported power supply configurations, see the *Catalyst 6500 Series Switch Installation Guide*.

The modules have different power requirements, and some configurations require more power than a single power supply can provide. The power management feature allows you to power all installed modules with two power supplies. However, redundancy is not supported in this configuration because the total power drawn from both power supplies is at no time greater than the capability of one supply. Redundant and nonredundant power configurations are described in the following sections.

How to Enable or Disable Power Redundancy

To disable or enable redundancy (redundancy is enabled by default) from global configuration mode, enter the **power redundancy-mode combined | redundant** commands. You can change the configuration of the power supplies to redundant or nonredundant at any time.

To disable redundancy, use the **combined** keyword. In a nonredundant configuration, the power available to the system is the combined power capability of both power supplies. The system powers up as many modules as the combined capacity allows. However, if one power supply fails and there is not enough power for all of the previously powered-up modules, the system powers down those modules.

To enable redundancy, use the **redundant** keyword. In a redundant configuration, the total power drawn from both power supplies is not greater than the capability of one power supply. If one supply malfunctions, the other supply can take over the entire system load. When you install and power up two power supplies, each concurrently provides approximately half of the required power to the system. Load sharing and redundancy are enabled automatically; no software configuration is required.

To view the current state of modules and the total power available for modules, enter the **show power** command (see the "How to Display System Power Status" section on page 14-3).

Table 14-1 describes how the system responds to changes in the power supply configuration.

Table 14-1 Effects of Power Supply Configuration Changes

Configuration Change	Effect
Redundant to nonredundant	• System log and syslog messages are generated. • System power is increased to the combined power capability of both power supplies. • Modules marked *power-deny* in the **show power** oper state field are brought up if there is sufficient power.
Nonredundant to redundant (both power supplies must be of equal wattage)	• System log and syslog messages are generated. • System power is decreased to the power capability of one supply. • If there is not enough power for all previously powered-up modules, some modules are powered down and marked as *power-deny* in the **show power** oper state field.
Equal wattage power supply is inserted with redundancy enabled	• System log and syslog messages are generated. • System power equals the power capability of one supply. • No change in module status because the power capability is unchanged.
Equal wattage power supply is inserted with redundancy disabled	• System log and syslog messages are generated. • System power is increased to the combined power capability of both power supplies. • Modules marked *power-deny* in the **show power** oper state field are brought up if there is sufficient power.
Higher or lower wattage power supply is inserted with redundancy enabled	• System log and syslog messages are generated. • The system will operate in a non-redundant combined mode.
Higher or lower wattage power supply is inserted with redundancy disabled	• System log and syslog messages are generated. • System power is increased to the combined power capability of both power supplies. • Modules marked *power-deny* in the **show power** oper state field are brought up if there is sufficient power.

Table 14-1 Effects of Power Supply Configuration Changes (continued)

Configuration Change	Effect
Power supply is removed with redundancy enabled	• System log and syslog messages are generated. • No change in module status because the power capability is unchanged.
Power supply is removed with redundancy disabled	• System log and syslog messages are generated. • System power is decreased to the power capability of one supply. • If there is not enough power for all previously powered-up modules, some modules are powered down and marked as *power-deny* in the **show power** oper state field.
System is booted with power supplies of different wattage installed and redundancy enabled	• System log and syslog messages are generated. • The system does not allow you to have power supplies of different wattage installed in a redundant configuration. The lower wattage supply shuts down.
System is booted with power supplies of equal or different wattage installed and redundancy disabled	• System log and syslog messages are generated. • System power equals the combined power capability of both power supplies. • The system powers up as many modules as the combined capacity allows.

How to Power Modules Off and On

To power modules off and on from the CLI, perform this task:

	Command	Purpose
Step 1	`Router# configure terminal`	Enters global configuration mode.
Step 2	`Router(config)# power enable module slot_number`	Powers a module on.
Step 3	`Router(config)# no power enable module slot_number`	Powers a module off.

Note When you enter the **no power enable module** *slot* command to power down a module, the module's configuration is not saved.

This example shows how to power on the module in slot 3:

```
Router# configure terminal
Router(config)# power enable module 3
```

How to Display System Power Status

The **show power** command displays the current power status of system components:

```
Router# show power
system power redundancy mode = combined
system power redundancy operationally = combined(2+0)
system power total = 5699.72 Watts (109.61 Amps @ 52V)
system power used = 3930.16 Watts (75.58 Amps @ 52V)
system power available = 1769.56 Watts (34.03 Amps @ 52V)
 Power-Capacity PS-Fan Output Oper
```

```
PS Type Watts A @52V Status Status State
---- ------------------ ------- ------ ------ ------ -----
1 C6800-XL-3KW-AC 2999.88 57.69 OK OK on
2 C6800-XL-3KW-AC 2999.88 57.69 OK OK on
3 none
4 none
 Pwr-Allocated Oper
Fan Type Watts A @52V State
---- ------------------ ------- ------ -----
1 C6807-XL-FAN 260.00 5.00 OK
 Pwr-Allocated Oper
PwrCon Type Watts A @52V State
------ ---------------- ------- ------ -----
1 C6800-XL-PS-CONV 12.48 0.24 OK
2 C6800-XL-PS-CONV 12.48 0.24 OK

 Pwr-Requested Pwr-Allocated Admin Oper
Slot Card-Type Watts A @52V Watts A @52V State State
---- ------------------ ------- ------ ------- ------ ----- -----
1 C6800-32P10G-XL 587.60 11.30 587.60 11.30 on on
2 C6800-32P10G 587.60 11.30 587.60 11.30 on on
3 C6800-SUP6T-XL 353.60 6.80 353.60 6.80 on on
4 C6800-SUP6T-XL 353.60 6.80 353.60 6.80 on on
5 C6800-32P10G-XL 587.60 11.30 587.60 11.30 on on
6 C6800-32P10G 587.60 11.30 587.60 11.30 on on
7 C6800-32P10G-XL 587.60 11.30 587.60 11.30 on on
system auxiliary power mode = off
system auxiliary power redundancy operationally = non-redundant
system primary connector power limit = 9100.00 Watts (175.00 Amps @ 52V)
system auxiliary connector power limit = 13000.00 Watts (250.00 Amps @ 52V)
system primary power used = 3930.16 Watts (75.58 Amps @ 52V)
system auxiliary power used = 0 Watt

Router#
```

The **show power** command displays the current power status of a specific power supply:

```
Router# show power status power-supply 1
Power-Capacity PS-Fan Output Oper
PS   Type               Watts   A @52V Status Status State
---- ------------------ ------- ------ ------ ------ -----
1 C6800-XL-3KW-AC 2999.88 57.69 OK     OK     on
Router#
```

You can display power supply input fields by specifying the power supply number in the command. A new power-output field with operating mode is displayed for power supplies with more than one output mode. Enter the **show environment status power-supply** command as follows:

```
Router# show environment status power-supply 1
switch 1 power-supply 1:
 power-supply 1 fan-fail: OK
 power-supply 1 power-input: AC high
 power-supply 1 power-output-mode: high
 power-supply 1 incompatible with fan: OK
 power-supply 1 power-output-fail: OK
Router# show environment status power-supply 2
switch 1 power-supply 2:
 power-supply 2 fan-fail: OK
 power-supply 2 power-input: AC high
 power-supply 2 power-output-mode: high
 power-supply 2 incompatible with fan: OK
 power-supply 2 power-output-fail: OK
```

How to Power Cycle Modules

You can power cycle (reset) a line card module by entering the **hw-module module {mod #} reset** command. The module powers off for 5 seconds, and then powers on.

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