



Managing System Hardware

This chapter provides details on monitoring the health of the switch.

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Configuring Power Supplies

Switches in the MDS 9000 Family have two redundant power supply slots. The power supplies can be configured in either redundant or combined mode.

- Redundant mode—Uses the capacity of one power supply only. This is the default mode. In case of power supply failure, the entire switch has sufficient power available in the system.
- Combined mode—Uses the combined capacity of both power supplies. In case of power supply failure, the entire switch can be shut down (depends on the power used) causing traffic disruption. This mode is seldom used, except in cases where the switch has two low power supply capacities but a higher power usage.



Note

The chassis in the Cisco MDS 9000 Family uses 1200 Watts when powered at 110 volts, and 2500 Watts when powered at 220 volts.

Guidelines for Power Supplies with Different Capacities

When power supplies with different capacities are installed in the switch, the total power available differs based on the configured mode.

- In redundant mode, the total power is the lesser of the two power supply capacities. For example, if you have the following usage figures configured:

Power supply 1 = 2500 Watts

Additional Power supply 2 = not used

Current usage = 2000 Watts

Current capacity = 2500 Watts

Then the following three scenarios differ as specified:

- Scenario 1**—If 1800 Watts is added as power supply 2, then power supply 2 is shut down.
Reason: 1800 Watts is less than the usage of 2000 Watts.
- Scenario 2**—If 2200 Watts is added as power supply 2, then the current capacity decreases to 2200 Watts.
Reason: 2200 Watts is the lesser of the two power supplies.
- Scenario 3**—If 3000 Watts is added as power supply 2, then the current capacity value remains at 2500 Watts.
Reason: 2500 Watts is the lesser of the two power supplies.

Table 10-1 lists redundant mode power supply scenarios.

Table 10-1 Redundant Mode Power Supply Scenarios

Scenario	Power Supply 1 (Watts)	Current Usage (Watts)	Insertion of Power Supply 2 (Watts)	New Capacity (Watts)	Action Taken by Switch
1	2500	2000	1800	2500	Power supply 2 is shut down.
2	2500	2000	2200	2200	Capacity becomes 2200Watts.
3	2500	2000	3300	2500	Capacity remains the same.

- In combined mode, the total power is twice the lesser of the two power supply capacities. For example, if you have the following usage figures configured:
Power supply 1 = 2500 Watts
Additional Power supply 2 = not used
Current Usage = 2000 Watts
Current capacity = 2500 Watts
Then, the following three scenarios differ as specified:
 - Scenario 1**—If 1800 Watts is added as power supply 2, then the capacity increases to 3600 Watts.
Reason: 3600 Watts is twice the minimum (1800 Watts).
 - Scenario 2**—If 2200 Watts is added as power supply 2, then the current capacity increases to 4400 Watts.

Reason: 4400 Watts is twice the minimum (2200 Watts).

- **Scenario 3**—If 3000 Watts is added as power supply 2, then the current capacity increases to 5000 Watts.

Reason: 5000 Watts is twice the minimum (2500 Watts).

Table 10-2 lists combined mode power supply scenarios.

Table 10-2 Combined Mode Power Supply Scenarios

Scenario	Power Supply 1 (Watts)	Current Usage (Watts)	Insertion of Power Supply 2 (Watts)	New Capacity (Watts)	Action Taken by Switch
1	2500	2000	1800	3600	Power is never shut down. The new capacity is changed.
2	2500	2000	2200	4400	
3	2500	2000	3300	5000	

Guidelines for Power Supplies with Different Capacities

When you change the configuration from combined to redundant mode and the system detects a power supply that has a capacity lower than the current usage, the power supply is shut down. If both power supplies have a lower capacity than the current system usage, the configuration is not allowed. Various configuration scenarios are displayed and summarized in Table 10-3.

- **Scenario 1**—You have the following usage figures configured:
 Power supply 1 = 2500 Watts
 Additional Power supply 2 = 1800 Watts
 Current Usage = 2000 Watts
 Current mode = **combined** mode (so current capacity is 3600Watts)
 You decide to change the switch to **redundant** mode. Then power supply 2 is shut down.
 Reason: 1800Watts is the lesser of the two power supplies and it is less than the system usage.
- **Scenario 2**—You have the following usage figures configured:
 Power supply 1 = 2500 Watts
 Additional Power supply 2 = 2200 Watts
 Current Usage = 2000 Watts
 Current mode = **combined** mode (so current capacity is 4400Watts).
 You decide to change the switch to **redundant** mode. Then the current capacity decreases to 2200Watts.
 Reason: 2200Watts is the lesser of the two power supplies.
- **Scenario 3**—You have the following usage figures configured:
 Power supply 1 = 2500 Watts
 Additional Power supply 2 = 1800 Watts
 Current Usage = 3000 Watts
 Current mode = **combined** mode (so current capacity is 3600 Watts).

You decide to change the switch to **redundant** mode. Then the current capacity decreases to 2500Watts and the configuration is rejected.

Reason: 2500Watts is less than the system usage (3000Watts).

Table 10-3 Summary of Configuration Scenarios for Power Supplies with Different Capacities

Scenario	Power Supply 1 (W)	Current Mode	Current Usage (W)	Power Supply 2 (W)	New Mode	New Capacity (W)	Action Taken by Switch
1	2500	combined	2000	1800	N/A	3600	Existing configuration.
	2500	N/A	2000	1800	redundant	2500	Power supply 2 is shut down
2	2500	combined	2000	2200	N/A	4400	Existing configuration.
	2500	N/A	2000	2200	redundant	2200	The new capacity is changed.
3	2500	combined	3000	1800	N/A	3600	Existing configuration.
	2500	N/A	3000	1800	redundant	N/A	Rejected, so the mode reverts to combined mode.

Managing Power Supplies

To manage power supply power attributes, perform the following steps.

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- Step 1** From the Fabric Manager menu tree, choose **Switches > Modules** and then click the **Power Supplies** tab, or from the Device Manager, choose **Physical > Power Supplies**. The Information pane from the Fabric Manager displays power supply power attributes for multiple switches. The dialog box from the Device Manager displays power supply power attributes for a single switch.
- Step 2** Configure the power attributes for the power supply.
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Displaying Module Temperature

Each module (switching and supervisor) has four sensors: 1 (outlet sensor), 2 (intake sensor), 3 (onboard sensor), and 4 (onboard sensor). Each sensor has two thresholds (in Celsius), minor and major.



Note

A threshold value of -127 indicates that no thresholds are configured or applicable.

When a minor threshold is exceeded, a minor alarm occurs and the following action is taken for all four sensors:

- Syslog messages are displayed.
- Call Home alerts are sent (if configured).
- SNMP notifications are sent (if configured).

When a major threshold is exceeded, a major alarm occurs and the following action is taken as follows:

- For sensors 1, 3, and 4 (outlet and onboard sensors):
 - Syslog messages are displayed.
 - Call Home alerts are sent (if configured).
 - SNMP notifications are sent (if configured).
- For sensor 2 (intake sensor):
 - If the threshold is exceeded in a switching module, the module is shut down.
 - If the threshold is exceeded in a supervisor module with HA-standby or standby present, the supervisor module is shut down.
 - If the standby supervisor is not present, the entire switch is shut down.



Note

Switch shut down only happens after a two-minute interval. During this interval the software monitors the temperature every five (5) seconds and continuously sends syslog messages as configured. If the required action is not taken (for example, a new fan module is inserted to decrease temperature) and if the temperature does not come down, the system is shut down at the end of two minutes.

To monitor sensor temperature attributes, perform the following steps.

- Step 1** From the Fabric Manager menu tree, choose **Switches > Modules** and then click the **Temperature Sensors** tab, or from Device Manager, choose **Physical > Temperature Sensors**.
- The Information pane from the Fabric Manager displays sensor temperature attributes for multiple switches. The Sensors dialog box from the Device Manager displays sensor temperature attributes for a single switch.
- Step 2** Configure the sensor attributes.

Monitoring Fan Modules

The fan status is continuously monitored. In case of a fan module failure, the following action is taken:

- Syslog messages are displayed.
- Call Home alerts are sent (if configured).
- SNMP notifications are sent (if configured).

**Caution**

A fan failure could lead to temperature alarms if not corrected immediately.

When a fan module is removed, the Fan module removed message is displayed every 10 seconds for three minutes after the fan removal. After the three-minute interval, a system shutdown message is displayed every 5 seconds for two additional minutes. At the end of this 5-minute sequence, the system is shutdown. If the fan module is re-inserted at any point within this 5-minute period, the remaining sequence is stopped.

To monitor a fan module from Device Manager, choose **Physical > Fans**. The dialog box displays the fan status.

Monitoring Clock Modules

Each switch has two clock modules for redundancy: Clock A (primary) and Clock B. The redundant clock module (Clock B) takes over if the primary clock module fails. If Clock A is available at startup, the switch uses Clock A, otherwise it uses Clock B.

If Clock A fails, the switch is reset and Clock B automatically takes over. Clock modules cannot be configured. If both modules fail, the switch shuts down. The probability of a clock failure is low given that the mean time between failures (MTBF) is 3660316 hours.

Viewing System Attributes

To manage system attributes, perform the following steps.

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- Step 1** From the Fabric Manager menu tree, choose **Switches**, or from Device Manager, choose **Admin > System**. You can also double-click on the chassis in Device Manager.
- The Fabric Manager Information pane shows system attributes for multiple switches. The dialog box from the Device Manager shows system attributes for a single switch.
- Step 2** Configure the system attributes for the chassis.
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Viewing Running Processes

You can view information about the processes that are currently running on a switch from Device Manager. Choose **Admin > Running processes** to see the process information listed in the Running Processes dialog box.

Viewing Flash File Information

You can view information about the files that are currently stored in flash memory on the switch from Device Manager. Choose **Admin > Flash Files** to see the stored files information listed in the Flash Files dialog box.

Managing Inventory Information

To manage inventory attributes, perform the following steps.

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- Step 1** From the Fabric Manager menu tree, choose **Switches > Modules**, and then click the **Inventory** tab, or from Device Manager, choose **Physical > Inventory**.
- The Fabric Manager Information pane displays system attributes for multiple switches. The dialog box from the Device Manager displays system attributes for a single switch.
- Step 2** Configure the inventory attributes for the module.
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Managing Module Attributes

To manage module status attributes, perform the following steps.

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- Step 1** From the Fabric Manager menu tree, choose **Switches > Modules** and then click the **Card Status** tab, or from Device Manager, choose **Physical > Modules**.
- The Information pane from the Fabric Manager displays card attributes for multiple switches. The dialog box from the Device Manager view displays attributes for a single switch.
- Step 2** Configure the status attributes for the module.
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