Managing Modules

This chapter describes how to manage switching modules (also known as line cards) and provides information on monitoring module states.

This chapter contains the following topics:

About Modules

Table 9-1 describes the supervisor module options for switches in the Cisco MDS 9000 Family.

Table 9-1 Supervisor Module Options

Product	No. of Supervisor Modules	Supervisor Module Slot	Switching Module Features
Cisco MDS 9216	One module (includes 16 Fibre Channel ports)	1	2-slot chassis allows one optional switching module in the other slot.
Cisco MDS 9509	Two modules	5 and 6	9-slot chassis allows any switching module in the other seven slots.
Cisco MDS 9506	Two modules	5 and 6	6-slot chassis allows any switching module in the other four slots.

Supervisor Modules

Supervisor modules are automatically powered up and started with the switch.

Cisco MDS 9200 Series switches have one supervisor module that includes an integrated 16-port switching module.

Cisco MDS 9500 Series switches have two supervisor modules--one in slot 5 (sup-1) and one in slot 6 (sup-2). When the switch powers up and both supervisor modules come up together, the module that enters the active mode is dependent on which of the two modules comes up first. The standby module constantly monitors the active module. If the active module fails, the standby module takes over without any impact to user traffic.

Switching Modules

Cisco MDS 9000 Family switches support any switching module in any non-supervisor slot. The switching module obtains its image from the supervisor module.

The interfaces in each module are ready to be configured when the module displays an ok status.

Viewing the State of a Module

The switching module goes through a testing and an initializing stage before displaying an ok status. Table 9-2 describes the possible states in which a module can exist.

Table 9-2 Module States

show module Output	Description
`powered up`	The hardware has electrical power. When the hardware is powered up, the software begins booting.
`testing`	The module has established connection with the supervisor and the switching module is performing bootup diagnostics.
`initializing`	The diagnostics have completed successfully and the configuration is being downloaded.
`failure`	The switch detects a switching module failure upon initialization and automatically attempts to power-cycle the module three times. After the third attempt it continues to display a failed state.
`ok`	The switch is ready to be configured.
`power-denied`	The switch detects insufficient power for a switching module to power up.
`active`	This module is the active supervisor module and the switch is ready to be configured.
`HA-standby`	This module is the standby supervisor module and that the HA switchover mechanism is enabled.
`standby`	This module is the standby supervisor module and the warm switchover mechanism is enabled.

To view the state of a module from Device Manager, choose **Physical > Modules**. The dialog box displays the status of every module.

Identifying Module LEDs

Table 9-3 describe the LED location, type, and status for supervisor and switching modules used in Cisco MDS 9000 Family switches.

Table 9-3 Module LEDs on a Cisco MDS 9200 Series Switch

Module	LED Type	Status	Description
Fixed switching module	Status	Green	• All chassis environmental monitors (power supply, fan, temperature sensor, clock, and chassis) are reporting OK. • Sufficient power is available for all modules
		Orange	• Any one of the chassis environmental monitors (power supply, fan, temperature sensor, clock, and chassis) failed. • Sufficient power is not available for all modules. • Incompatible power supplies are installed. • The redundant clock failed.
		Red	• The diagnostic test failed. • The module is not operational because a fault occurred during the initialization sequence. • A temperature condition occurred. (A major threshold was exceeded during environmental monitoring.)
Optional switching module	System	Green	All diagnostics pass. The module is operational (normal initialization sequence).
		Orange	• The module is booting or running diagnostics (normal initialization sequence). • An over temperature condition occurred. (A minor threshold was exceeded during environmental monitoring.)
		Red	• The diagnostic test failed. The module is not operational because a fault occurred during the initialization sequence. • An over temperature condition occurred. (A major threshold was exceeded during environmental monitoring.)

Table 9-4 lists the system and power management LEDs on a redundant supervisor module that are synchronized to the active supervisor module.

Table 9-4 Supervisor Module LEDs on a Cisco MDS 9500 Series Switch

LED	Status	Description
Status	Green	All diagnostics pass. The module is online.
	Orange	• The module is booting or running diagnostics (normal initialization sequence). • The module is not online. • An over temperature condition has occurred. (A minor threshold has been exceeded during environmental monitoring.)
	Red	• The diagnostic test failed. The module is not operational because a fault occurred during the initialization sequence. • An over temperature condition has occurred. (A major threshold has been exceeded during environmental monitoring.)
System	Green	All chassis environmental monitors (power supply, fan, temperature sensor, clock, and chassis) are reporting OK.
	Orange	• Any one of the environmental monitors (power supply, fan, temperature sensor, clock, and chassis) has failed. • Incompatible power supplies are installed. • The redundant clock has failed.
	Red	The temperature of the supervisor module major threshold has been exceeded.
Active	Green	The supervisor module is operational and active.
	Orange	The supervisor module is in standby mode.
Pwr Mgmt1	Green	Sufficient power is available for all modules.
	Orange	Sufficient power is not available for all modules.

Table 9-5 lists the Ethernet interface LEDs on a Cisco MDS 9200 Series Switch.

Table 9-5 Ethernet Interface LEDs on a Cisco MDS 9200 Series Switch

Module	LED Type	Status	Description
Ethernet (mgmt 0)	Activity	Flashing green	Traffic is passing through the interface.
	Link	Solid green	The link is functioning.
		Off	The link is down.

Table 9-6 lists the switching module LEDs.

Table 9-6 Switching Module LEDs

LED Type	Status	Description
Status	Green	All diagnostics pass. The module is operational (normal initialization sequence).
	Orange	• The module is booting or running diagnostics (normal initialization sequence). • An over temperature condition occurred. (A minor threshold was exceeded during environmental monitoring.)
	Red	• The diagnostic test failed. The module is not operational because a fault occurred during the initialization sequence. • An over temperature condition occurred. (A major threshold was exceeded during environmental monitoring.)
Speed	On	2 Gbps mode.
	Off	1 Gbps mode.
Link	Solid green	Link is up.
	Flashing green	Link is up (beacon used to identify port).
	Solid yellow	Disabled by software.
	Flashing yellow	Fault is detected.
	Off	Link is down.

Configuring EPLDs

Switches and directors in the Cisco MDS 9000 Family contain several electrically programmable logical devices (EPLDs) that provide hardware functionalities in all modules. Starting with Cisco MDS SAN-OS Release 1.2, EPLD image upgrades are periodically provided to include enhanced hardware functionality or to resolve known issues.

Tip Refer to the *Cisco MDS SAN-OS Release Notes* to verify if the EPLD has changed for the SAN-OS image version being used.

EPLDs can be upgraded or downgraded. When EPLDs are being upgraded or downgraded, the following guidelines and observations apply:

- You can individually update each module that is online. The EPLD update is only disruptive to the module being upgraded.
- If you interrupt an upgrade, the module must be upgraded again.
- The upgrade or downgrade can only be executed from the active supervisor module. While the active supervisor module cannot be updated, you can update the other modules individually.
- In Cisco MDS 9100 Series Fabric switches, be sure to specify 1 as the module number.
- Cisco MDS 9216 Switches do not support EPLD upgrades.

Caution Do not insert or remove any modules while an EPLD upgrade or downgrade is in progress.

Note Switches in the Cisco MDS 9100 Series do not support a forced EPLD upgrade. When you upgrade the EPLD module on these switches, you receive the following message:

```
Data traffic on the switch will stop now!! Do you want to continue (y/n)?
```

Refer to the *Cisco MDS 9000 Family Configuration Guide* for information on upgrading EPLDs.

Default Supervisor Module Settings

Table 9-7 lists the default settings for the supervisor module.

Table 9-7 Default Supervisor Module Settings

Parameters	Default
Administrative connection	Serial connection.
Global switch information	• No value for system name. • No value for system contact. • No value for location.
System clock	No value for system clock time.
In-band (VSAN 1) interface	IP address, subnet mask, and broadcast address assigned to the VSAN is set to 0.0.0.0.