



Configuring the Supervisor Engine 2 and the Switch Fabric Module

This chapter describes how to configure the Supervisor Engine 2 and the Switch Fabric Module (SFM) for the Cisco 7600 series routers.



Note

- Release 12.2(18)SXE and rebuilds of Release 12.2(18)SXE do not support Supervisor Engine 2.
- For complete syntax and usage information for the commands used in this chapter, refer to the *Cisco IOS Master Command List*, Release 12.2SX at this URL:

http://www.cisco.com/en/US/docs/ios/mcl/122sxmcl/12_2sx_mcl_book.html

This chapter consists of these sections:

- [Using the Slots on a Supervisor Engine 2, page 6-1](#)
- [Understanding How the Switch Fabric Module Works, page 6-2](#)
- [Configuring the Switch Fabric Module, page 6-3](#)
- [Monitoring the Switch Fabric Module, page 6-5](#)



Tip

For additional information (including configuration examples and troubleshooting information), see the documents listed on this page:

http://www.cisco.com/en/US/products/hw/routers/ps368/tsd_products_support_series_home.html

Using the Slots on a Supervisor Engine 2

The Supervisor Engine 2 has one Flash PC card (PCMCIA) slot.

With PCMCIA Advanced Technology Attachment (ATA) FlashDisk devices, the keyword for the slot on the active Supervisor Engine 2 is **disk0:** and the keyword for the slot on a redundant Supervisor Engine 2 is **slavedisk0:**.

With non-ATA Flash PC cards, the keyword for the slot on the active Supervisor Engine 2 is **slot0:** and the keyword for the slot on a redundant Supervisor Engine 2 is **slot0:**.

Understanding How the Switch Fabric Module Works

These sections describe how the Switch Fabric Module works:

- [Switch Fabric Module Overview, page 6-2](#)
- [Switch Fabric Module Slots, page 6-2](#)
- [Switch Fabric Redundancy, page 6-2](#)
- [Forwarding Decisions for Layer 3-Switched Traffic, page 6-2](#)
- [Switching Modes, page 6-3](#)

Switch Fabric Module Overview

The Switch Fabric Module creates a dedicated connection between fabric-enabled modules and provides uninterrupted transmission of frames between these modules. In addition to the direct connection between fabric-enabled modules provided by the Switch Fabric Module, fabric-enabled modules also have a direct connection to the 32-Gbps forwarding bus.

The Switch Fabric Module does not have a console. A two-line LCD display on the front panel shows fabric utilization, software revision, and basic system information.

Switch Fabric Module Slots

With a 13-slot chassis, install the Switch Fabric Modules in either slot 7 or 8.



Note

In a 13-slot chassis, only slots 9 through 13 support dual switch fabric interface switching modules (for example, WS-X6816-GBIC).

With all other chassis, install the Switch Fabric Modules in either slot 5 or 6.

Switch Fabric Redundancy

The Switch Fabric Module first installed functions as the primary module. For redundancy, you can install a redundant Switch Fabric Module. When two Switch Fabric Modules are installed at the same time, the module in the upper slot functions as the primary module, and the one in the lower slot functions as the backup. If you reset the module installed in the upper slot, the one in the lower slot becomes active.

No configuration is required for Switch Fabric Module redundancy. The module in the upper slot functions as the primary module and a redundant Switch Fabric Module in the lower slot automatically takes over if the primary module fails.

Forwarding Decisions for Layer 3-Switched Traffic

Either a PFC2 or a Distributed Feature Card (DFC) makes the forwarding decision for Layer 3-switched traffic as follows:

- A PFC2 makes all forwarding decisions for each packet that enter the router through a module without a DFC.
- A DFC makes all forwarding decisions for each packet that enters the router on a DFC-enabled module in these situations:
 - If the egress port is on the same module as the ingress port, the DFC forwards the packet locally (the packet never leaves the module).
 - If the egress port is on a different fabric-enabled module, the DFC sends the packet across the SFM to the egress module, which sends it out the egress port.
 - If the egress port is on a different nonfabric-enabled module, the DFC sends the packet across the SFM to the Supervisor Engine 2. The Supervisor Engine 2 fabric interface transfers the packet to the 32-Gbps switching bus where it is received by the egress module and is sent out the egress port.

Switching Modes

When you install a Switch Fabric Module, the traffic is forwarded to and from modules in one of the following modes:

- Compact mode—The router uses this mode for all traffic when only fabric-enabled modules are installed. In this mode, a compact version of the DBus header is forwarded over the switch fabric channel, which provides the best possible performance.
- Truncated mode—The router uses this mode for traffic between fabric-enabled modules when there are both fabric-enabled and nonfabric-enabled modules installed. In this mode, the router sends a truncated version of the traffic (the first 64 bytes of the frame) over the switch fabric channel.
- Bus mode (also called flow-through mode)—The router uses this mode for traffic between nonfabric-enabled modules and for traffic between a nonfabric-enabled module and a fabric-enabled module. In this mode, all traffic passes between the local bus and the supervisor engine bus.

Table 6-1 shows the switching modes used with fabric-enabled and nonfabric-enabled modules installed.

Table 6-1 Switching Modes with Switch Fabric Module Installed

Modules	Switching Modes
Between fabric-enabled modules (when no nonfabric-enabled modules are installed)	Compact ¹
Between fabric-enabled modules (when nonfabric-enabled modules are also installed)	Truncated ²
Between fabric-enabled and nonfabric-enabled modules	Bus
Between non-fabric-enabled modules	Bus

1. In **show** commands, displayed as dcef mode for fabric-enabled modules with DFC installed; displayed as fabric mode for other fabric-enabled modules.
2. Displayed as fabric mode in **show** commands.

Configuring the Switch Fabric Module

These section describe configuring the Switch Fabric Module:

- [Configuring the Switching Mode, page 6-4](#)

- [Configuring Fabric-Required Mode, page 6-4](#)
- [Configuring an LCD Message, page 6-5](#)

**Note**

When you are in configuration mode you can enter EXEC mode-level commands by entering the **do** keyword before the EXEC mode-level command.

Configuring the Switching Mode

To configure the switching mode, perform this task:

Command	Purpose
Router(config)# [no] fabric switching-mode allow {bus-mode {truncated [{threshold [number]}]}}	Configures the switching mode.

When configuring the switching mode, note the following information:

- To allow use of nonfabric-enabled modules or to allow fabric-enabled modules to use bus mode, enter the **fabric switching-mode allow bus-mode** command.
- To prevent use of nonfabric-enabled modules or to prevent fabric-enabled modules from using bus mode, enter the **no fabric switching-mode allow bus-mode** command.

**Caution**

When you enter the **no fabric switching-mode allow bus-mode** command, power is removed from any nonfabric-enabled modules installed in the router.

- To allow fabric-enabled modules to use truncated mode, enter the **fabric switching-mode allow truncated** command.
- To prevent fabric-enabled modules from using truncated mode, enter the **no fabric switching-mode allow truncated** command.
- To configure how many fabric-enabled modules must be installed before they use truncated mode instead of bus mode, enter the **fabric switching-mode allow truncated threshold *number*** command.
- To return to the default truncated-mode threshold, enter the **no fabric switching-mode allow truncated threshold** command.

Configuring Fabric-Required Mode

To configure fabric-required mode, which prevents all switching modules from operating unless there is a Switch Fabric Module installed, perform this task:

Command	Purpose
Router(config)# fabric required	Configures fabric-required mode, which prevents switching modules from operating without a switch fabric module.
Router(config)# no fabric required	Clears fabric-required mode.

**Caution**

If you enter the **fabric required** command on a router that does not have a Switch Fabric Module installed, all modules except the supervisor engine turn off.

When configuring fabric-required mode, note the following information:

- If you boot the router with fabric-required mode configured but without a Switch Fabric Module installed, only the supervisor engine receives power; no switching modules power up.
- When the router is operating with fabric-required mode configured and a Switch Fabric Module installed, if you remove the switch fabric module or if it fails, the router removes power from all switching modules; only the supervisor engine remains active.
- When the router is operating with fabric-required mode configured and with redundant Switch Fabric Modules installed, if you remove both switch fabric modules or if both fail, the router removes power from all switching modules; only the supervisor engine remains active.

Configuring an LCD Message

To configure a message for display on the LCD, perform this task:

Command	Purpose
Router(config)# fabric lcd-banner <i>d message d</i>	Configures a message for display on the LCD.
Router(config)# no fabric lcd-banner	Clears the message displayed on the LCD.

When configuring a message for display on the LCD, note the following information:

- The *d* parameter is a delimiting character. You cannot use the delimiting character in the message. The delimiter is a character of your choice—a pound sign (#), for example.
- You can use the following tokens, in the form \$(token), in the message text:
 - \$(hostname)—Displays the router's host name.
 - \$(domain)—Displays the router's domain name.

Monitoring the Switch Fabric Module

The Switch Fabric Module supports a number of **show** commands for monitoring purposes. A fully automated startup sequence brings the module online and runs the connectivity diagnostics on the ports.

These sections describe how to monitor the Switch Fabric Module:

- [Displaying the Module Information, page 6-7](#)
- [Displaying the Switch Fabric Module Redundancy Status, page 6-7](#)
- [Displaying Fabric Channel Switching Modes, page 6-7](#)
- [Displaying the Fabric Status, page 6-8](#)
- [Displaying the Fabric Utilization, page 6-8](#)
- [Displaying Fabric Errors, page 6-8](#)

**Note**

The Switch Fabric Module does not require any user configuration.

Displaying the Module Information

To display the module information, perform this task:

Command	Purpose
Router# show module {5 6 7 8}	Displays module information.

This example shows how to display module information:

```
Router# show module 5
Mod Ports Card Type                               Model                Serial No.
-----
  5      0 Switching Fabric Module                WS-C6500-SFM         SAD04420JR5

Mod MAC addresses                               Hw   Fw           Sw           Status
-----
  5  0001.0002.0003 to 0001.0002.0003  1.0  6.1(3)       6.2(0.97)    Ok
```

Displaying the Switch Fabric Module Redundancy Status

To display the switch fabric module redundancy status, perform this task:

Command	Purpose
Router# show fabric active	Displays switch fabric module redundancy status.

This example shows how to display the switch fabric module redundancy status:

```
Router# show fabric active
Active fabric card in slot 5
No backup fabric card in the system
Router#
```

Displaying Fabric Channel Switching Modes

To display the fabric channel switching mode of one or all modules, perform this task:

Command	Purpose
Router# show fabric switching-mode [module {slot_number all}]	Displays fabric channel switching mode of one or all modules.

This example shows how to display the fabric channel switching mode of all modules:

```
Router# show fabric switching-mode all
bus-only mode is allowed
Module Slot      Switching Mode
1               Bus
2               Bus
3               DCEF
4               DCEF
5               No Interfaces
6               DCEF
```

Displaying the Fabric Status

To display the fabric status of one or all switching modules, perform this task:

Command	Purpose
Router# show fabric status [<i>slot_number</i> all]	Displays fabric status.

This example shows how to display the fabric status of all modules:

```
Router# show fabric status all
  slot      channel      module      fabric
  status
  1          0          OK          OK
  3          0          OK          OK
  3          1          OK          OK
  4          0          OK          OK
Router#
```

Displaying the Fabric Utilization

To display the fabric utilization of one or all modules, perform this task:

Command	Purpose
Router# show fabric utilization [<i>slot_number</i> all]	Displays fabric utilization.

This example shows how to display the fabric utilization of all modules:

```
Router# show fabric utilization all
  slot      channel  Ingress %  Egress %
  1          0         0         0
  3          0         0         0
  3          1         0         0
  4          0         0         0
  4          1         0         0
  6          0         0         0
  6          1         0         0
  7          0         0         0
  7          1         0         0
Router#
```

Displaying Fabric Errors

To display fabric errors of one or all modules, perform this task:

Command	Purpose
Router# show fabric errors [<i>slot_number</i> all]	Displays fabric errors.

This example shows how to display fabric errors on all modules:

```
Router# show fabric errors
      slot    channel  module  module  module  fabric
              crc      hbeat    sync    sync
      1         0        0         0         0
      3         0        0         0         0
      3         1        0         0         0
      4         0        0         0         0
      4         1        0         0         0
      6         0        0         0         0
      6         1        0         0         0
      7         0        0         0         0
      7         1        0         0         0
Router#
```

**Tip**

For additional information (including configuration examples and troubleshooting information), see the documents listed on this page:

http://www.cisco.com/en/US/products/hw/routers/ps368/tsd_products_support_series_home.html

