Configuring and Monitoring the Switch Fabric Functionality

This chapter describes how to configure the switching mode and monitor the switch fabric functionality that is included on the Supervisor Engine 720-10GE and the Supervisor Engine 720:

Note For complete syntax and usage information for the commands used in this chapter, see the Cisco IOS Master Command List, at this URL:

http://www.cisco.com/en/US/docs/ios/mcl/allreleasemcl/all_book.html

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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Understanding the Switch Fabric Functionality

These sections describe how the switch fabric functionality works:

Switch Fabric Functionality Overview

The switch fabric functionality is built into the supervisor engine and 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 funtionality, fabric-enabled modules also have a direct connection to the 32-Gbps forwarding bus.

Forwarding Decisions for Layer 3-Switched Traffic

Either a PFC3 or a Distributed Feature Card 3 (DFC3) makes the forwarding decision for Layer 3-switched traffic as follows:

- A PFC3 makes all forwarding decisions for each packet that enters the switch through a module without a DFC3.
- A DFC3 makes all forwarding decisions for each packet that enters the switch on a DFC3-enabled module in these situations:
  - If the egress port is on the same module as the ingress port, the DFC3 forwards the packet locally (the packet never leaves the module).
  - If the egress port is on a different fabric-enabled module, the DFC3 sends the packet to the egress module, which sends it out the egress port.
  - If the egress port is on a different nonfabric-enabled module, the DFC3 sends the packet to the supervisor engine. The supervisor engine 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

With a Supervisor Engine 720-10GE or a Supervisor Engine 720, traffic is forwarded to and from modules in one of the following modes:

- Compact mode—The switch 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 switch uses this mode for traffic between fabric-enabled modules when there are both fabric-enabled and nonfabric-enabled modules installed. In this mode, the switch 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 switch 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 14-1 shows the switching modes used with fabric-enabled and nonfabric-enabled modules installed.

Table 14-1 Switch Fabric Functionality Switching Modes

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 DFC3 installed; displayed as fabric mode for other fabric-enabled modules.
2. Displayed as fabric mode in **show** commands.

Configuring the Switch Fabric Functionality

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 switch.

- 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.

Monitoring the Switch Fabric Functionality

The switch fabric functionality 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 functionality:

Displaying the Switch Fabric Redundancy Status

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

Command	Purpose
`Router# show fabric active`	Displays switch fabric 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 module all
Module Slot     Switching Mode
    3                    Bus
    5                    Bus
Router#
```

Displaying the Fabric Status

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

Command	Purpose
Router# **show fabric status** [*slot_number* | **all**]	Displays fabric status.

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

```
Router# show fabric status
slot  channel speed module   fabric   hotStandby  Standby  Standby
                    status   status      support  module   fabric
    1        0   20G     OK       OK          N/A
    1        1   20G     OK       OK          N/A
    2        0   20G     OK       OK   Y(not-hot)
    2        1   20G     OK       OK   Y(not-hot)
    3        0   20G     OK       OK   Y(not-hot)
    4        0   20G     OK       OK   Y(not-hot)
    4        1   20G     OK       OK   Y(not-hot)
Router#
```

Displaying the Fabric Utilization

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

Command	Purpose
Router# **show fabric utilization** [*slot_number* | **all**]	Displays fabric utilization.

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

```
Router# show fabric utilization all
slot    channel      speed    Ingress %     Egress %
    1          0        20G            0            0
    1          1        20G            0            0
    2          0        20G            0           24
    2          1        20G            0           24
    3          0        20G           48            0
    4          0        20G            0            0
    4          1        20G            0            0
Router#
```

Displaying Fabric Errors

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

Command	Purpose
`Router# show fabric errors [slot_number | all]`	Displays fabric errors.

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

```
Router# show fabric errors

Module errors:
 slot    channel        crc      hbeat       sync   DDR sync
    1          0          0          0          0          0
    8          0          0          0          0          0
    8          1          0          0          0          0
    9          0          0          0          0          0

Fabric errors:
 slot    channel       sync     buffer    timeout
    1          0          0          0          0
    8          0          0          0          0
    8          1          0          0          0
    9          0          0          0          0
Router#
```

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http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html

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