



Configuring the Switch Fabric Modules

This chapter describes how to configure the Switch Fabric Module (WS-C6500-SFM) and Switch Fabric Module 2 (WS-X6500-SFM 2) for the Catalyst 6500 series switches.



Note

For complete syntax and usage information for the commands used in this chapter, refer to the *Catalyst 6000 Family Command Reference* publication.

This chapter consists of these sections:

- [Understanding How the Switch Fabric Module Works, page 43-1](#)
- [Configuring and Monitoring the Switch Fabric Module, page 43-2](#)



Note

The WS-C6500-SFM is supported in the Catalyst 6500 6-and 9-slot chassis only. The WS-X6500-SFM 2 is supported in the Catalyst 6500 6-slot, 9-slot, 13-slot, and 6509-NEB chassis.

Understanding How the Switch Fabric Module Works



Note

The Switch Fabric Module is supported only with Supervisor Engine 2 in the Catalyst 6500 series switch.

The Switch Fabric Module creates a dedicated connection between fabric-enabled modules and provides uninterrupted transmission of frames between these modules. The Switch Fabric Module also provides fabric-enabled modules with a direct connection to the Catalyst 6500 32-Gbps forwarding bus.

You can use the **set system crossbar-fallback bus-mode | none** command to specify how packets are handled if the Switch Fabric Module is removed or fails. If you specify **bus-mode**, the switching is done in flow-through mode. If you specify **none**, the switch ports are disabled and switching stops.

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.

Install the WS-C6500-SFM in either slot 5 or 6 in the 6-slot and 9-slot Catalyst 6500 series switches. Install the WS-X6500-SFM 2 in slots 7 or 8 in the 13-slot Catalyst 6500 switches. The Switch Fabric Module first installed functions as the primary module. For redundancy, you can install a standby Switch Fabric Module.

When you install two Switch Fabric Modules at the same time in a 6- or 9-slot chassis, the primary module is in slot 5 and the backup is in slot 6. If you reset the module in slot 5, the module in slot 6 becomes active.

When you install two Switch Fabric Modules at the same time in a 13-slot chassis, the primary module is in slot 7 and the backup is in slot 8. If you reset the module in slot 7, the module in slot 8 becomes active.

When you install a Switch Fabric Module in a Catalyst 6500 series switch, the traffic is forwarded to and from modules in one of these modes:

- Flow-through mode—Data passes between the local bus and the supervisor engine bus. This mode is used for traffic to or from nonfabric-enabled modules.
- Truncated mode—If there are at least two fabric-enabled modules installed in a system with both fabric-enabled and nonfabric-enabled modules, traffic between the fabric-enabled modules is forwarded in truncated mode. In this mode, only the truncated data (the first 64 bytes of the frame) is sent over the switch fabric channel if both the destination and the source are fabric-enabled modules. If either the source or destination is a nonfabric-enabled module, the data goes through the switch fabric channel and the data bus. The Switch Fabric Module does not get involved when traffic is forwarded between nonfabric-enabled modules.
- Compact mode—A compact version of the DBus header is forwarded over the switch fabric channel, delivering the best possible switching rate. Nonfabric-enabled modules do not support the compact mode and generate cyclic redundancy check (CRC) errors if they receive frames in compact mode. This mode is used only when no nonfabric-enabled modules are installed in the chassis.

Table 43-1 shows the switch modes used with fabric-enabled and nonfabric-enabled modules installed.

Table 43-1 Switching Modes with Switch Fabric Module Installed

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

Configuring and Monitoring the Switch Fabric Module

The Switch Fabric Module does not require any user configuration but 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.

From the supervisor engine, you can reset the module using the **reset module** command, disable and enable the module using the **set module enable | disable** command, and power it down using the **set module powerdown module** command.

These sections describe how to configure the Switch Fabric Module:

- [Configuring a Fallback Option, page 43-3](#)
- [Configuring the Switching Mode, page 43-3](#)
- [Switch Fabric Redundancy, page 43-4](#)
- [Monitoring the Switch Fabric Module, page 43-4](#)
- [Configuring the LCD Banner, page 43-8](#)

Configuring a Fallback Option

The `set system crossbar-fallback {bus-mode | none}` command allows you to configure a fallback option if the Switch Fabric Module connection fails.

To configure a fallback option for the Switch Fabric Module, perform this task in privileged mode:

Task	Command
Configure a fallback option for the Switch Fabric Module.	<code>set system crossbar-fallback {bus-mode none}</code>

This example shows how to configure a fallback option to bus-mode:

```
Console> (enable) set system crossbar-fallback bus-mode
System crossbar-fallback set to bus-mode.
Console> (enable)
```

Configuring the Switching Mode

To improve performance, you can manually specify which switching mode the system uses. If you have one or more nonfabric-enabled modules installed in the chassis, configure the switch to use flow-through mode. If you have only fabric-enabled modules installed, configure the switch to use compact mode.



Note

Nonfabric-enabled modules do not support compact mode.

To configure the switch to use flow-through mode if you have non-fabric enabled modules installed, perform this task:

Task	Command
Configure the switch to use flow-through mode.	<code>set system switchmode allow bus-only</code>

This example shows how to configure the switch to use flow-through mode:

```
Console> (enable) set system switchmode allow bus-only
Console> (enable)
```

To configure the switch to use compact mode if you have only fabric-enabled modules installed, perform this task:

Task	Command
Configure the switch to use compact mode.	set system switchmode allow truncated

This example shows how to configure the switch to use compact mode:

```
Console> (enable) set system switchmode allow truncated
```

```
Console> (enable)
```

Switch Fabric Redundancy

No configuration is required for Switch Fabric Module redundancy. The module in slot 5 functions as the primary module and a redundant Switch Fabric Module in slot 6 automatically takes over if the primary module fails. A mixed redundant configuration with a WS-C6500-SFM and a WS-X6500-SFM 2 is not supported.

Monitoring the Switch Fabric Module

This section describes how to monitor the Switch Fabric Module:

- [Displaying the Module Information, page 43-4](#)
- [Displaying the Fabric Channel Counters, page 43-5](#)
- [Displaying the Fabric Channel Switching Mode and Channel Status, page 43-5](#)
- [Displaying the Fabric Channel Utilization, page 43-6](#)
- [Displaying the Backplane Traffic and Fabric Channel Input and Output, page 43-7](#)
- [Displaying Switching Mode Configuration, page 43-8](#)



Note

Enter all **show** commands supported by the Switch Fabric Module from the supervisor engine.

Displaying the Module Information

To display the module information, perform this task in privileged mode:

Task	Command
Display the module information.	show module mod

This example shows how to display module information:

```
Console> (enable) show module
Mod Slot Ports Module-Type          Model                Sub Status
-----
1   1     2     1000BaseX Supervisor    WS-X6K-SUP2-2GE     yes ok
4   4     24     100BaseFX MM Ethernet    WS-X6224-MM-MT      no  ok
```

```

5 5 0 Switch Fabric Module WS-C6500-SFM no ok

Mod Module-Name Serial-Num
-----
1 Munish
4 SAD02390156
5 SAD042818BR

Mod MAC-Address(es) Hw Fw Sw
-----
1 00-40-0b-ff-00-00 to 00-40-0b-ff-00-01 0.219 6.1(0.146) 6.2(0.33-Eng) KEY
  00-50-3e-7e-71-56 to 00-50-3e-7e-71-57
  00-01-64-f8-ca-00 to 00-01-64-f8-cd-ff
4 00-10-7b-c2-3a-c0 to 00-10-7b-c2-3a-d7 0.204 4.2(0.24)V 6.2(0.14)KEY
5 00-40-0b-ff-00-00 0.204 6.1(0.133) 6.2(0.14)KEY

Mod Sub-Type Sub-Model Sub-Serial Sub-Hw
-----
1 L3 Switching Engine II WS-F6K-PFC2 SAD04110B5S 0.305
Console> (enable)

```

Displaying the Fabric Channel Counters

To display the fabric channel counters, perform this task in privileged mode:

Task	Command
Display the fabric channel counters.	show fabric channel counters <i>module</i>

This example shows how to display the fabric channel counters:

```

Console> show fabric channel counters 5
Channel 0 counters:
0 rxTotalPkts = 0
1 txTotalPkts = 0
2 rxGoodPkts = 0
3 rxErrors = 0
4 txErrors = 0
5 txDropped = 0

```

Displaying the Fabric Channel Switching Mode and Channel Status

To display the fabric channel switching mode and channel status, perform this task in privileged mode:

Task	Command
Display the fabric channel switching mode and channel status.	show fabric channel switchmode

This example shows how to display the fabric channel switching mode and channel status:

```

Console> (enable) show fabric channel switchmode
Global switching mode:truncated

Module Num Fab Chan Fab Chan Switch Mode Channel Status
-----
1 1 0, 0 flow through ok

```

4	0	n/a	n/a	n/a
5	18	0, 0	n/a	ok
5	18	1, 1	n/a	unused
5	18	2, 2	n/a	unused
5	18	3, 3	n/a	unused
5	18	4, 4	n/a	unused
5	18	5, 5	n/a	unused
5	18	6, 6	n/a	unused
5	18	7, 7	n/a	unused
5	18	8, 8	n/a	unused
5	18	9, 9	n/a	unused
5	18	10, 10	n/a	unused
5	18	11, 11	n/a	unused
5	18	12, 12	n/a	unused
5	18	13, 13	n/a	unused
5	18	14, 14	n/a	unused
5	18	15, 15	n/a	unused
5	18	16, 16	n/a	unused
5	18	17, 17	n/a	unused

In the **show fabric channel switchmode** command output, the Switch Mode field displays one of the following modes:

- Flow-through mode
- Truncated mode
- Compact mode



Note

See the [“Understanding How the Switch Fabric Module Works”](#) section on page 43-1 for definitions for the different modes.

Displaying the Fabric Channel Utilization

To display the fabric channel utilization, perform this task in privileged mode:

Task	Command
Display the fabric channel utilization.	show fabric channel utilization

This example shows how to display the fabric channel utilization:

```
Console> show fabric channel utilization
```

```
Fab Chan Input Output
-----
      0      0%      0%
      1      0%      0%
      2      0%      0%
      3      0%      0%
      4      0%      0%
      5      0%      0%
      6      0%      0%
      7      0%      0%
      8      0%      0%
      9      0%      0%
     10      0%      0%
     11      0%      0%
     12      0%      0%
     13      0%      0%
```

```

14    0%    0%
15    0%    0%
16    0%    0%
17    0%    0%

```

Displaying the Backplane Traffic and Fabric Channel Input and Output

To display the backplane traffic and fabric channel input and output, perform either of these tasks:

Task	Command
Display system status including the backplane traffic and fabric channel input and output.	show system
Display the backplane traffic and fabric channel input and output.	show traffic

This example shows how to display the system status including backplane traffic and fabric channel input and output:

```

Console> (enable) show system

PS1-Status PS2-Status
-----
ok          none

Fan-Status Temp-Alarm Sys-Status Uptime d,h:m:s Logout
-----
ok          off          ok          0,00:02:52    20 min

PS1-Type     PS2-Type
-----
WS-CAC-1000W none

Modem  Baud  Backplane-Traffic Peak Peak-Time
-----
disable 9600  0%                0% Thu Jul 27 2000, 14:03:27

PS1 Capacity:852.60 Watts (20.30 Amps @42V)

System Name          System Location          System Contact          CC
-----
Fab Chan Input Output
-----
0    0%    0%
1    0%    0%
2    0%    0%
3    0%    0%
4    0%    0%
5    0%    0%
6    0%    0%
7    0%    0%
8    0%    0%
9    0%    0%
10   0%    0%
11   0%    0%
12   0%    0%

```

```

13 0% 0%
14 0% 0%
15 0% 0%
16 0% 0%
17 0% 0%
Console> (enable)

```

This example shows how to display backplane traffic and fabric channel input and output:

```

Console> (enable) show traffic

Threshold:100%
Backplane-Traffic Peak Peak-Time
-----
0% 0% Thu Jul 27 2000, 14:03:27

Fab Chan Input Output
-----
0 0% 0%
1 0% 0%
2 0% 0%
3 0% 0%
4 0% 0%
.
.
.
14 0% 0%
15 0% 0%
16 0% 0%
17 0% 0%
Console> (enable)

```

Displaying Switching Mode Configuration

To display the switching mode configuration, perform this task in privileged mode:

Task	Command
Display the switching mode configuration.	show system switchmode

This example shows how to display the switching mode configuration:

```

Console> (enable) show system switchmode
Switchmode allow:truncated
Switchmode threshold:2
Console> (enable)

```

Configuring the LCD Banner

You can modify the LCD banner from the supervisor engine by entering the **set banner lcd** command to include the following information:

- Chassis serial number
- Switch IP address
- System Name
- Supervisor engine version

- Multilayer Switch Feature Card (MSFC) version on active and standby supervisor engine
- System contact

After the LCD banner content is modified, this information is sent to the Switch Fabric Modules installed in the chassis and displayed in the LCDs.

To modify the LCD banner content, perform this task in privileged mode:

	Task	Command
Step 1	Modify the LCD banner content.	set banner lcd <i>c</i> [<i>text</i>] <i>c</i>
Step 2	Verify the LCD banner change.	show banner

This example shows how to modify the LCD banner for the Switch Fabric Module:

```

Console> (enable) set banner lcd &HelloWorld!&
LCD banner set
Console> (enable) show banner
MOTD banner:

LCD config:
Hello
World!

```

