Switch Fabric Functionality

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**Note**

- For complete syntax and usage information for the commands used in this chapter, see these publications:
  
- Cisco IOS Release 12.2SY supports only Ethernet interfaces. Cisco IOS Release 12.2SY does not support any WAN features or commands.

**Tip**

For additional information about Cisco Catalyst 6500 Series Switches (including configuration examples and troubleshooting information), see the documents listed on this page:


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**Prerequisites for Switch Fabric Functionality**

None.

**Restrictions for Switch Fabric Functionality**

None.
Information About the Switch Fabric Functionality

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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 functionality, fabric-enabled modules also have a direct connection to the forwarding bus.

Forwarding Decisions for Layer 3-Switched Traffic

Either a PFC or a Distributed Feature Card makes the forwarding decision for Layer 3-switched traffic as follows:

- A PFC makes all forwarding decisions for each packet that enters the switch through a module without a DFC.
- A DFC makes all forwarding decisions for each packet that enters the switch on a DFC-equipped 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 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 to the supervisor engine. The supervisor engine fabric interface transfers the packet to the switching bus where it is received by the egress module and is sent out the egress port.

Default Settings for Switch Fabric Functionality

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 9-1 shows the switching modes used with fabric-enabled and nonfabric-enabled modules installed.
How to Configure the Switch Fabric Functionality

To configure the switching mode, perform this task:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Router(config)# [no] fabric switching-mode allow {bus-mode</td>
<td>{truncated [{threshold [number]}]}]</td>
</tr>
</tbody>
</table>

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.

### Table 9-1  Switch Fabric Functionality Switching Modes

<table>
<thead>
<tr>
<th>Modules</th>
<th>Switching Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between fabric-enabled modules (when no nonfabric-enabled modules are installed)</td>
<td>Compact</td>
</tr>
<tr>
<td><strong>Note</strong> In <code>show</code> commands, displayed as dcef mode for fabric-enabled modules with a DFC installed; displayed as fabric mode for other fabric-enabled modules.</td>
<td></td>
</tr>
<tr>
<td>Between fabric-enabled modules (when nonfabric-enabled modules are also installed)</td>
<td>Truncated</td>
</tr>
<tr>
<td><strong>Note</strong> Displayed as fabric mode in <code>show</code> commands.</td>
<td></td>
</tr>
<tr>
<td>Between fabric-enabled and nonfabric-enabled modules</td>
<td>Bus</td>
</tr>
<tr>
<td>Between non-fabric-enabled modules</td>
<td>Bus</td>
</tr>
</tbody>
</table>
Monitoring the Switch Fabric Functionality

- Displaying the Switch Fabric Redundancy Status, page 9-4
- Displaying Fabric Channel Switching Modes, page 9-4
- Displaying the Fabric Status, page 9-4
- Displaying the Fabric Utilization, page 9-5
- Displaying Fabric Errors, page 9-5

Displaying the Switch Fabric Redundancy Status

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Router# show fabric active</td>
<td>Displays switch fabric redundancy status.</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Router# show fabric switching-mode {module</td>
<td>Displays fabric channel switching mode of one or all modules.</td>
</tr>
</tbody>
</table>
{slot_number | all}                               |

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

Router# show fabric switching-mode module all
%Truncated mode is allowed
%System is allowed to operate in legacy mode

<table>
<thead>
<tr>
<th>Module Slot</th>
<th>Switching Mode</th>
<th>Bus Mode</th>
<th>Bus Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>DCEF</td>
<td>Compact</td>
<td>Compact</td>
</tr>
<tr>
<td>9</td>
<td>Crossbar</td>
<td>Compact</td>
<td></td>
</tr>
</tbody>
</table>

Router#

Displaying the Fabric Status

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Router# show fabric status {slot_number</td>
<td>all}</td>
</tr>
</tbody>
</table>
This example shows how to display the fabric status of all modules:

```
Router# show fabric status
slot  channel  speed  module  fabric
      status     status
 1   0       8G      OK       OK
 5   0       8G      OK      Up- Timeout
 6   0      20G      OK      Up- BufError
 8   0       8G      OK       OK
 8   1       8G      OK       OK
 9   0       8G      Down- DDRsync  OK
```

Displaying the Fabric Utilization

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
</table>

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

```
Router# show fabric utilization all
Lo% Percentage of Low-priority traffic.
Hi% Percentage of High-priority traffic.
  slot  channel  speed  Ingress Lo%  Egress Lo%  Ingress Hi%  Egress Hi%
  5   0      20G    0        0     0          0      0
  9   0       8G    0        0     0          0      0
```

Displaying Fabric Errors

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
</table>

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
```
Tip

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