Information About Switching Modes

The switching mode determines whether the switch begins forwarding the frame as soon as the switch has read the destination details in the packet header or waits until the entire frame has been received and checked for cyclic redundancy check (CRC) errors before forwarding them to the network.

The switching mode is applicable to all packets being switched or routed through the hardware and can be saved persistently through reboots and restarts.

The switch operates in either of the following switching modes:

**Cut-Through Switching Mode**

Cut-through switching mode is enabled by default. Switches operating in cut-through switching mode start forwarding the frame as soon as the switch has read the destination details in the packet header. A switch in cut-through mode forwards the data before it has completed receiving the entire frame.

The switching speed in cut-through mode is faster than the switching speed in store-and-forward switching mode.

**Store-and-Forward Switching Mode**

When store-and-forward switching is enabled, the switch checks each frame for cyclic redundancy check (CRC) errors before forwarding them to the network. Each frame is stored until the entire frame has been received and checked.

Because it waits to forward the frame until the entire frame has been received and checked, the switching speed in store-and-forward switching mode is slower than the switching speed in cut-through switching mode.
Guidelines and Limitations for Switching Modes

Consider the following guidelines and limitations for each of the switching modes:

**Cut-Through Switching Mode Guidelines and Limitations**

- *show* commands with the `internal` keyword are not supported.
- When an FCS error is discovered, FCS error packets are not immediately dropped. (The packet transmission may have already been in progress.) For this situation, the packet is truncated and marked with error marking in EOF. The packet is then dropped at the next node.
- Packets with FCS errors are not mirrored if SPAN is configured.
- By default, all HiGig™ links operate at 42G to compensate for the HiGig™ header over fabric and to support the full line rate of 40G from the front-panel ports. However, the speed mismatch could result in packets being forwarded in store-and-forward mode. To make sure that the traffic is cut through, you can use the `switching-mode fabric-speed 40g` command to change the HiGig™ links on the 42G ports to operate at 40G and use the `show switching-mode fabric-speed` command to verify the configuration. This feature is supported only for the Cisco Nexus 9500 Series switches with the 9636PQ line card. It is not supported for the Cisco Nexus 9300 Series switches. Operating at 40G improves latency but prevents the fabric from supporting the full line rate. See the [Cisco Nexus 9000 Series NX-OS Layer 2 Configuration Guide](#) for more information.
- Beginning in 7.0(3)I1(2), cut-through switching is supported on the Cisco Nexus 9500 Series switch with the 9636PQ line card.
- Cut-through switching is supported on Cisco Nexus 9300 Series switches for traffic from 40G ports (ALE ASIC) to 10G ports (NFE ASIC). It is also supported for traffic between 10G ports (NFE ASIC) to 10G ports (NFE ASIC) only when buffer-boot is not enabled. Traffic going from 10G ports (NFE ASIC) to 40G (ALE ASIC) ports will always be store and forward.
- The Cisco Nexus 31128PQ switch operates in over-subscribed mode only and therefore is unable to support cut-through switching mode.

**Store-and-Forward Switching Mode Guidelines and Limitations**

- *show* commands with the `internal` keyword are not supported.
- The store-and-forward switching mode is supported on the following Cisco Nexus platforms:
  - Cisco Nexus 9200 Platform Switches.
  - Cisco Nexus 9500 Platform Switches.
  - Cisco Nexus 9300-EX and 9300-FX Platform Switches.
  - Cisco Nexus 3164Q, 31128PQ, 3232C, and 3264Q switches.
- Packets with FCS errors are dropped.
- Packets with FCS errors are not mirrored if SPAN is configured.
- The CPU port always operates in store-and-forward mode. Any packets forwarded to the CPU with FCS errors are dropped.
• Store-and-forward mode activates automatically for a port when the switch identifies that the port is oversubscribed and the ingress rate is greater than the switching capacity of the egress port. For example, when the port ingress rate is 10 gigabit and the switching capacity of the egress port is 1 gigabit.

**Note**
The global configuration does not change, even if store-and-forward mode is activated for an oversubscribed port.

### Licensing Requirements for Switching Modes

Cut-through switching mode and store-and-forward switching modes do not require licenses. Any feature not included in a license package is bundled with the Cisco NX-OS system images and is provided at no extra charge to you. For a complete explanation of the Cisco NX-OS licensing scheme, see the *Cisco NX-OS Licensing Guide*.

### Default Settings for Switching Modes

Cut-through switching is enabled by default.

### Configuring Switching Modes

#### Enabling Store-and-Forward Switching

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>switch# configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>switch(config) # switching-mode store-forward</td>
<td>Enables store-and-forward switching mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>(Optional) switch(config)# copy running-config startup-config</td>
<td>Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.</td>
</tr>
</tbody>
</table>

**Example**

This example shows how to enable store-and-forward switching:
Reenabling Cut-Through Switching

Cut-through switching is enabled by default. To reenable cut-through switching, use the no form of the 
switching-mode store-forward command.

Procedure

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<tr>
<td>Step 1</td>
<td>switch# configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>switch(config) # no switching-mode store-forward</td>
<td>Disables store-and-forward switching mode. Enables cut-through switching mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>(Optional) switch(config)# copy running-config startup-config</td>
<td>Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.</td>
</tr>
</tbody>
</table>

Example

This example shows how to reenable cut-through switching:

```bash
switch# configure terminal
switch(config) # no switching-mode store-forward
switch(config) #
```