

# 10

## Interface Configuration

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- [Information About Interface Configuration](#), page 10-2
- [How to Configure a Range of Interfaces](#), page 10-2
- [How to Define and Use Interface-Range Macros](#), page 10-2
- [How to Configure Optional Interface Features](#), page 10-3
- [Information About Online Insertion and Removal](#), page 10-11
- [How to Monitor and Maintain Interfaces](#), page 10-11
- [How to Check Cable Status with the TDR](#), page 10-14
- [How to Convert Line Card to Operate in 40G Mode](#), page 10-14

**Note**

- For complete syntax and usage information for the commands used in this chapter, see these publications:  
[http://www.cisco.com/en/US/products/ps11846/prod\\_command\\_reference\\_list.html](http://www.cisco.com/en/US/products/ps11846/prod_command_reference_list.html)
- Cisco IOS Release 15.4SY supports only Ethernet interfaces. Cisco IOS Release 15.4SY 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:

[http://www.cisco.com/en/US/products/hw/switches/ps708/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html)

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## Information About Interface Configuration

Many features in the software are enabled on a per-interface basis. When you enter the **interface** command, you must specify the following information:

- Interface type:
  - Fast Ethernet (use the **fastethernet** keyword)
  - Gigabit Ethernet (use the **gigabitethernet** keyword)
  - 10-Gigabit Ethernet (use the **tengigabitethernet** keyword)
  - 40-Gigabit Ethernet (use the **fortygigabitethernet** keyword)
- Slot number—The slot in which the module is installed. On switches supported by Cisco IOS Release 15.4SY, slots are numbered starting with 1 from top to bottom.
- Port number—The physical port number on the module. On switches supported by Cisco IOS Release 15.4SY, the port numbers always begin with 1. When facing the rear of the switch, ports are numbered from the left to the right.

You can identify ports from the physical location. You also can use **show** commands to display information about a specific port, or all the ports.

See this document for information about the **interface** command:

<http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-i1.html#GUID-0D6BDFCD-3FBB-4D26-A274-C1221F8592DF>

## How to Configure a Range of Interfaces

The interface-range configuration mode allows you to configure multiple interfaces with the same configuration parameters. After you enter the interface-range configuration mode, all command parameters you enter are attributed to all interfaces within that range until you exit out of the interface-range configuration mode. See this document for information about the **interface range** command:

<http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-i1.html#GUID-8EC4EF91-F929-45F8-95CA-E4C9A9724FFF>

## How to Define and Use Interface-Range Macros

You can define an interface-range macro to automatically select a range of interfaces for configuration. Before you can use the **macro** keyword in the **interface range macro** command string, you must define the macro.

To define an interface-range macro, perform this task:

Command	Purpose
<pre>Router(config)# <b>define interface-range</b> macro_name {vlan vlan_ID - vlan_ID}   {type slot/port - port} [, {type slot/port - port}]</pre>	Defines the interface-range macro and save it in NVRAM.

This example shows how to define an interface-range macro named `enet_list` to select Gigabit Ethernet ports 1/1 through 1/4:

```
Router(config)# define interface-range enet_list gigabitethernet 1/1 - 4
```

To show the defined interface-range macro configuration, perform this task:

Command	Purpose
Router# <b>show running-config</b>	Shows the defined interface-range macro configuration.

This example shows how to display the defined interface-range macro named `enet_list`:

```
Router# show running-config | include define  
define interface-range enet_list GigabitEthernet1/1 - 4  
Router#
```

To use an interface-range macro in the **interface range** command, perform this task:

Command	Purpose
Router(config)# <b>interface range macro</b> <i>macro_name</i>	Selects the interface range to be configured using the values saved in a named interface-range macro.

This example shows how to change to the interface-range configuration mode using the interface-range macro `enet_list`:

```
Router(config)# interface range macro enet_list  
Router(config-if)#
```

## How to Configure Optional Interface Features

- [Configuring Ethernet Interface Speed and Duplex Mode, page 10-3](#)
- [Configuring Jumbo Frame Support, page 10-6](#)
- [Configuring IEEE 802.3x Flow Control, page 10-9](#)
- [Configuring the Port Debounce Timer, page 10-10](#)

## Configuring Ethernet Interface Speed and Duplex Mode

- [Speed and Duplex Mode Configuration Guidelines, page 10-4](#)
- [Configuring the Ethernet Interface Speed, page 10-4](#)
- [Setting the Interface Duplex Mode, page 10-5](#)
- [Configuring Link Negotiation on Gigabit Ethernet Ports, page 10-5](#)
- [Displaying the Speed and Duplex Mode Configuration, page 10-6](#)

### Speed and Duplex Mode Configuration Guidelines

You usually configure Ethernet port speed and duplex mode parameters to auto and allow ports to negotiate the speed and duplex mode. If you decide to configure the port speed and duplex modes manually, consider the following information:

- You cannot set the Ethernet port speed to auto (the **no speed** command) if the duplex mode is not set to auto (the **no duplex** command).
- If you configure an Ethernet port speed to a value other than auto (for example, 10, 100, or 1000 Mbps), configure the connecting port to match. Do not configure the connecting port to negotiate the speed.
- If you manually configure the Ethernet port speed to either 10 Mbps or 100 Mbps, the switch prompts you to also configure the duplex mode on the port.



**Note**

A LAN port cannot automatically negotiate Ethernet port speed and duplex mode if the connecting port is configured to a value other than auto.



**Caution**

Changing the Ethernet port speed and duplex mode configuration might shut down and reenables the interface during the reconfiguration.

### Configuring the Ethernet Interface Speed



**Note**

If you configure the Ethernet port speed to **auto** on a 10/100/1000-Mbps Ethernet port, both speed and duplex are autonegotiated. 10-Gigabit Ethernet ports do not support autonegotiation.

To configure the port speed for a 10/100/1000-Mbps Ethernet port, perform this task:

	Command	Purpose
Step 1	Router(config)# <b>interface gigabitethernet slot/port</b>	Selects the Ethernet port to be configured.
Step 2	Router(config-if)# <b>speed {10   100   1000   {auto [10 100 [1000]]}}</b>	Configures the speed of the Ethernet interface.

When configuring the port speed for a 10/100/1000-Mbps Ethernet port, note the following:

- Enter the **auto 10 100** keywords to restrict the negotiated speed to 10-Mbps or 100-Mbps.
- The **auto 10 100 1000** keywords have the same effect as the **auto** keyword by itself.

This example shows how to configure the speed to 100 Mbps on the Gigabit Ethernet port 1/4:

```
Router(config)# interface gigabitethernet 1/4
Router(config-if)# speed 100
```

## Setting the Interface Duplex Mode



### Note

- 10-Gigabit Ethernet and Gigabit Ethernet are full duplex only. You cannot change the duplex mode on 10-Gigabit Ethernet or Gigabit Ethernet ports or on a 10/100/1000-Mbps port configured for Gigabit Ethernet.
- If you set the port speed to auto on a 10/100/1000-Mbps Ethernet port, both speed and duplex are autonegotiated. You cannot change the duplex mode of autonegotiation ports.

To set the duplex mode of an Ethernet or Gigabit Ethernet port, perform this task:

	Command	Purpose
Step 1	Router(config)# <b>interface gigabitethernet</b> <i>slot/port</i>	Selects the Ethernet port to be configured.
Step 2	Router(config-if)# <b>duplex</b> [auto   full   half]	Sets the duplex mode of the Ethernet port.

This example shows how to set the duplex mode to full on Gigabit Ethernet port 1/4:

```
Router(config)# interface gigabitethernet 1/4
Router(config-if)# duplex full
```

## Configuring Link Negotiation on Gigabit Ethernet Ports



### Note

Link negotiation does not negotiate port speed.

On Gigabit Ethernet ports, link negotiation exchanges flow-control parameters, remote fault information, and duplex information. Link negotiation is enabled by default.

The ports on both ends of a link must have the same setting. The link will not come up if the ports at each end of the link are set inconsistently (link negotiation enabled on one port and disabled on the other port).

[Table 10-1](#) shows the four possible link negotiation configurations and the resulting link status for each configuration.

**Table 10-1** Link Negotiation Configuration and Possible Link Status

Link Negotiation State		Link Status	
Local Port	Remote Port	Local Port	Remote Port
Off	Off	Up	Up
On	On	Up	Up
Off	On	Up	Down
On	Off	Down	Up

To configure link negotiation on a port, perform this task:

	Command	Purpose
Step 1	Router(config)# <b>interface gigabitethernet</b> <i>slot/port</i>	Selects the port to be configured.
Step 2	Router(config-if)# <b>speed nonegotiate</b>	Disables link negotiation.

This example shows how to enable link negotiation on Gigabit Ethernet port 1/4:

```
Router(config)# interface gigabitethernet 1/4
Router(config-if)# no speed nonegotiate
```

## Displaying the Speed and Duplex Mode Configuration

To display the speed and duplex mode configuration for a port, perform this task:

Command	Purpose
Router# <b>show interfaces</b> <i>type slot/port</i> [ <b>transceiver properties</b> ]	Displays the speed and duplex mode configuration. To display autonegotiation status for speed and duplex, add the <b>transceiver properties</b> option.

## Configuring Jumbo Frame Support

- [Information about Jumbo Frame Support, page 10-6](#)
- [Configuring MTU Sizes, page 10-8](#)

### Information about Jumbo Frame Support

- [Jumbo Frame Support Overview, page 10-6](#)
- [Nondefault MTU Sizes on Ethernet Ports, page 10-7](#)
- [VLAN Interfaces, page 10-8](#)

### Jumbo Frame Support Overview

A jumbo frame is a frame larger than the default Ethernet size. You enable jumbo frame support by configuring a larger-than-default maximum transmission unit (MTU) size on a port or VLAN interface and configuring the global LAN port MTU size.



#### Note

- Jumbo frame support fragments routed traffic in software on the route processor (RP).
- Jumbo frame support does not fragment bridged traffic.

#### Bridged and Routed Traffic Size Check at Ingress 10/100, and 100 Mbps Ethernet and 10-Gigabit Ethernet Ports

Jumbo frame support compares ingress traffic size with the global LAN port MTU size at ingress 10/100, and 100 Mbps Ethernet and 10-Gigabit Ethernet LAN ports that have a nondefault MTU size configured. The port drops traffic that is oversized. You can configure the global LAN port MTU size (see the

[“Configuring the Global Egress LAN Port MTU Size” section on page 10-9](#)).

#### **Bridged and Routed Traffic Size Check at Ingress Gigabit Ethernet Ports**

Gigabit Ethernet LAN ports configured with a nondefault MTU size accept frames containing packets of any size larger than 64 bytes. With a nondefault MTU size configured, Gigabit Ethernet LAN ports do not check for oversize ingress frames.

#### **Routed Traffic Size Check on the PFC**

For traffic that needs to be routed, Jumbo frame support on the PFC compares traffic sizes to the configured MTU sizes and provides Layer 3 switching for jumbo traffic between interfaces configured with MTU sizes large enough to accommodate the traffic. Between interfaces that are not configured with large enough MTU sizes, if the “do not fragment bit” is not set, the PFC sends the traffic to the RP to be fragmented and routed in software. If the “do not fragment bit” is set, the PFC drops the traffic.

#### **Bridged and Routed Traffic Size Check at Egress 10, 10/100, and 100 Mbps Ethernet Ports**

10, 10/100, and 100 Mbps Ethernet LAN ports configured with a nondefault MTU size transmit frames containing packets of any size larger than 64 bytes. With a nondefault MTU size configured, 10, 10/100, and 100 Mbps Ethernet LAN ports do not check for oversize egress frames.

#### **Bridged and Routed Traffic Size Check at Egress Gigabit Ethernet and 10-Gigabit Ethernet Ports**

Jumbo frame support compares egress traffic size with the global egress LAN port MTU size at egress Gigabit Ethernet and 10-Gigabit Ethernet LAN ports that have a nondefault MTU size configured. The port drops traffic that is oversized. You can configure the global LAN port MTU size (see the [“Configuring the Global Egress LAN Port MTU Size” section on page 10-9](#)).

### **Nondefault MTU Sizes on Ethernet Ports**

- [Ethernet Port Overview, page 10-7](#)
- [Layer 3 Ethernet Ports, page 10-7](#)
- [Layer 2 Ethernet Ports, page 10-8](#)

#### **Ethernet Port Overview**

Configuring a nondefault MTU size on a 10, 10/100, or 100 Mbps Ethernet port limits ingress packets to the global LAN port MTU size and permits egress traffic of any size larger than 64 bytes.

Configuring a nondefault MTU size on a Gigabit Ethernet port permits ingress packets of any size larger than 64 bytes and limits egress traffic to the global LAN port MTU size.

Configuring a nondefault MTU size on a 10-Gigabit Ethernet port limits ingress and egress packets to the global LAN port MTU size.

You can configure the MTU size on any Ethernet port.

#### **Layer 3 Ethernet Ports**

On a Layer 3 port, you can configure an MTU size on each Layer 3 Ethernet port that is different than the global LAN port MTU size.



**Note**

Traffic through a Layer 3 Ethernet LAN port that is configured with a nondefault MTU size is also subject to the global LAN port MTU size (see the [“Configuring the Global Egress LAN Port MTU Size” section on page 10-9](#)).

### Layer 2 Ethernet Ports

On a Layer 2 port, you can only configure an MTU size that matches the global LAN port MTU size (see the “Configuring the Global Egress LAN Port MTU Size” section on page 10-9).

### VLAN Interfaces

You can configure a different MTU size on each Layer 3 VLAN interface. Configuring a nondefault MTU size on a VLAN interface limits traffic to the nondefault MTU size. You can configure the MTU size on VLAN interfaces to support jumbo frames.

## Configuring MTU Sizes

- [Configuring the MTU Size, page 10-8](#)
- [Configuring the Global Egress LAN Port MTU Size, page 10-9](#)

### Configuring the MTU Size

To configure the MTU size, perform this task:

	Command	Purpose
Step 1	Router(config)# <b>interface</b> {{vlan vlan_ID}   {{type slot/port}   {port-channel port_channel_number} slot/port}}	Selects the interface to configure.
Step 2	Router(config-if)# <b>mtu</b> mtu_size	Configures the MTU size.
Step 3	Router(config-if)# <b>end</b>	Exits configuration mode.

When configuring the MTU size, note the following information:

- For VLAN interfaces and Layer 3 Ethernet ports, supported MTU values are from 64 to 9216 bytes.



#### Note

For Cisco Catalyst C6840 Series switches the supported MTU values are from 64 to 9154 bytes.

- For Layer 2 Ethernet ports, you can configure only the global egress LAN port MTU size (see the “Configuring the Global Egress LAN Port MTU Size” section on page 10-9).
- MTU size on a Layer 2 interface is always set to maximum. If you reconfigure the MTU size to enable jumbo frame support, MTU size does not get updated in the MTU hardware table for L2 interface at the egress. The interface (L2) MTU size check happens only at the ingress port.

This example shows how to configure the MTU size on Gigabit Ethernet port 1/2:

```
Router# configure terminal
Router(config)# interface gigabitethernet 1/2
Router(config-if)# mtu 9216
Router(config-if)# end
```

This example shows how to verify the configuration:

```
Router# show interface gigabitethernet 1/2
GigabitEthernet1/2 is administratively down, line protocol is down
  Hardware is C6k 1000Mb 802.3, address is 0030.9629.9f88 (bia 0030.9629.9f88)
  MTU 9216 bytes, BW 1000000 Kbit, DLY 10 usec,
  <...Output Truncated...>
Router#
```

## Configuring the Global Egress LAN Port MTU Size

To configure the global egress LAN port MTU size, perform this task:

	Command	Purpose
Step 1	Router(config)# <b>system jumbomtu</b> <i>mtu_size</i>	Configures the global egress LAN port MTU size. <b>Note</b> Because it would change all the interface MTU sizes to the default (1500), rather than to any configured nondefault interface MTU size, do not use the <code>system jumbomtu</code> command to set the MTU size to 1500. (CSCtq52016)
Step 2	Router(config)# <b>end</b>	Exits configuration mode.

## Configuring IEEE 802.3x Flow Control

Gigabit Ethernet and 10-Gigabit Ethernet ports use flow control to stop the transmission of frames to the port for a specified time; other Ethernet ports use flow control to respond to flow-control requests.

If a Gigabit Ethernet or 10-Gigabit Ethernet port receive buffer becomes full, the port can be configured to transmit an IEEE 802.3x pause frame that requests the remote port to delay sending frames for a specified time. All Ethernet ports can be configured to respond to IEEE 802.3x pause frames from other devices.

To configure flow control on an Ethernet port, perform this task:

	Command	Purpose
Step 1	Router(config)# <b>interface</b> <i>type slot/port</i>	Selects the port to configure.
Step 2	Router(config-if)# <b>flowcontrol</b> { <b>receive</b>   <b>send</b> } { <b>desired</b>   <b>off</b>   <b>on</b> }	Configures a port to send or respond to pause frames.

When configuring flow control, note the following information:

- Because auto negotiation does not work on 10 Gigabit Ethernet fiber optic ports, they respond to pause frames by default. On 10 Gigabit Ethernet fiber optic ports, the flow-control operational mode is always the same as administrative mode.
- When configuring how a port responds to pause frames, note the following information:
  - For a Gigabit Ethernet port, when the configuration of a remote port is unknown, you can use the **receive desired** keywords to configure the Gigabit Ethernet port to respond to received pause frames. (Supported only on Gigabit Ethernet ports.)
  - Use the **receive on** keywords to configure a port to respond to received pause frames.
  - Use the **receive off** keywords to configure a port to ignore received pause frames.
- When configuring transmission of pause frames on a port, note the following information:
  - For a Gigabit Ethernet port, when the configuration of the remote ports is unknown, you can use the **send desired** keywords to configure the Gigabit Ethernet port to send pause frames. (Supported only on Gigabit Ethernet ports.)
  - Use the **send on** keywords to configure a port to send pause frames.
  - Use the **send off** keywords to configure a port not to send pause frames.

This example shows how to turn on receive flow control and how to verify the flow-control configuration:

```
Router# configure terminal
Router(config)# interface gigabitethernet 1/2
Router(config-if)# flowcontrol receive on
Router(config-if)# end
Router# show interfaces flowcontrol

Interface Send      Receive
Gi1/1      Desired    OFF
Gi1/2      Desired    ON
<output truncated>
```

## Configuring the Port Debounce Timer

The port debounce timer delays notification of a link change, which can decrease traffic loss due to network reconfiguration. You can configure the port debounce timer separately on each LAN port.



### Caution

Enabling the port debounce timer causes link down detections to be delayed, resulting in loss of traffic during the debouncing period. This situation might affect the convergence and reconvergence of some Layer 2 and Layer 3 protocols.

To configure the debounce timer on a port, perform this task:

	Command	Purpose
Step 1	Router(config)# <b>interface</b> <i>type slot/port</i>	Selects the port to configure.
Step 2	Router(config-if)# <b>link debounce</b> [ <b>time</b> <i>debounce_time</i> ]	Configures the debounce timer.

When configuring the debounce timer on a port, note the following information:

- The **time** keyword is supported only on fiber 1000 Mbps or faster Ethernet ports.
- You can increase the port debounce timer value in increments of 100 milliseconds up to 5000 milliseconds on ports operating at 1000 Mbps over copper media.
- The debounce timer recognizes 10-Gbps copper media and detects media-only changes.

[Table 10-2](#) lists the time delay that occurs before notification of a link change.

**Table 10-2** Default Port Debounce Timer Delay Times

Port Type	Debounce Timer Disabled	Debounce Timer Enabled
Ports operating at 10 Mbps or 100 Mbps:	300 milliseconds	3100 milliseconds
Ports operating at 1000 Mbps or 10 Gbps over copper media:	300 milliseconds	3100 milliseconds
Ports operating at 1000 Mbps or 10 Gbps over fiber media:	10 milliseconds	100 milliseconds

**Note** The show interfaces debounce command does not display the default value for 10-GigabitEthernet ports when the port debounce timer is disabled.

**Note**

On all 10-Gigabit Ethernet ports, the Debounce Timer Disabled value is 10 milliseconds and the Debounce Timer Enabled value is 100 milliseconds.

This example shows how to enable the port debounce timer on Gigabit Ethernet port 1/12:

```
Router(config)# interface gigabitethernet 1/12  
Router(config-if)# link debounce  
Router(config-if)# end
```

This example shows how to display the port debounce timer settings:

```
Router# show interfaces debounce | include enable  
Gi1/12  enable          3100
```

## Information About Online Insertion and Removal

The online insertion and removal (OIR) feature allows you to remove and replace modules while the system is online. You can shut down the modules before removal and restart it after insertion without causing other software or interfaces to shut down.

**Note**

Do not remove or install more than one module at a time. After you remove or install a module, check the LEDs before continuing. For module LED descriptions, see the *Catalyst 6500 Series Switch Installation Guide*.

When a module has been removed or installed, the switch stops processing traffic for the module and scans the system for a configuration change. Each interface type is verified against the system configuration, and then the system runs diagnostics on the new module. There is no disruption to normal operation during module insertion or removal.

The switch can bring only an identical replacement module online. To support OIR of an identical module, the module configuration is not removed from the running-config file when you remove a module.

If the replacement module is different from the removed module, you must configure it before the switch can bring it online.

Layer 2 MAC addresses are stored in an EEPROM, which allows modules to be replaced online without requiring the system to update switching tables and data structures. Regardless of the types of modules installed, the Layer 2 MAC addresses do not change unless you replace the supervisor engine. If you do replace the supervisor engine, the Layer 2 MAC addresses of *all* ports change to those specified in the address allocator on the new supervisor engine.

## How to Monitor and Maintain Interfaces

- [Monitoring Interface Status, page 10-12](#)
- [Clearing Counters on an Interface, page 10-12](#)
- [Resetting an Interface, page 10-13](#)
- [Shutting Down and Restarting an Interface, page 10-13](#)

## Monitoring Interface Status

The software contains commands that you can enter at the EXEC prompt to display information about the interface including the version of the software and the hardware and statistics about interfaces. The following table lists some of the interface monitoring commands. (You can display the complete list of **show** commands by using the **show ?** command at the EXEC prompt.) These commands are described in the *Cisco IOS Interface Command Reference* publication.

To display information about the interface, perform these tasks:

Command	Purpose
Router# <b>show ibc</b>	Displays current internal status information.
Router# <b>show eobc</b>	Displays current internal out-of-band information.
Router# <b>show interfaces</b> [ <i>type slot/port</i> ]	Displays the status and configuration of all or a specific interface.
Router# <b>show running-config</b>	Displays the currently running configuration.
Router# <b>show rif</b>	Displays the current contents of the routing information field (RIF) cache.
Router# <b>show protocols</b> [ <i>type slot/port</i> ]	Displays the global (system-wide) and interface-specific status of any configured protocol.
Router# <b>show version</b>	Displays the hardware configuration, software version, the names and sources of configuration files, and the boot images.

## Clearing Counters on an Interface

To clear the interface counters shown with the **show interfaces** command, perform this task:

Command	Purpose
Router# <b>clear counters</b> {{ <b>vlan</b> <i>vlan_ID</i> }   { <i>type slot/port</i> }   { <b>port-channel</b> <i>channel_ID</i> }}	Clears interface counters.

This example shows how to clear and reset the counters on Gigabit Ethernet port 1/5:

```
Router# clear counters gigabitethernet 1/5
Clear "show interface" counters on this interface [confirm] y
*Sep 30 08:42:55: %CLEAR-5-COUNTERS: Clear counter on interface GigabitEthernet1/5
```

The **clear counters** command clears all the current counters from the interface unless the optional arguments specify a specific interface.



### Note

The **clear counters** command clears counters displayed with the EXEC **show interfaces** command, not counters retrieved using SNMP.

## Resetting an Interface

To reset an interface, perform this task:

Command	Purpose
Router# <b>clear interface</b> <i>type slot/port</i>	Resets an interface.

This example shows how to reset Gigabit Ethernet port 1/5:

```
Router# clear interface gigabitethernet 1/5
```

## Shutting Down and Restarting an Interface

You can shut down an interface, which disables all functions on the specified interface and shows the interface as unavailable on all monitoring command displays. This information is communicated to other network servers through all dynamic routing protocols. The interface is not included in any routing updates.

To shut down an interface and then restart it, perform this task:

	Command	Purpose
<b>Step 1</b>	Router(config)# <b>interface</b> {{ <b>vlan</b> <i>vlan_ID</i> }   { <i>type slot/port</i> }   { <b>port-channel</b> <i>channel_ID</i> }}	Selects the interface to be configured.
<b>Step 2</b>	Router(config-if)# <b>shutdown</b>	Shuts down the interface.
<b>Step 3</b>	Router(config-if)# <b>no shutdown</b>	Reenables the interface.

This example shows how to shut down Gigabit Ethernet port 1/5:

```
Router(config)# interface gigabitethernet 1/5
Router(config-if)# shutdown
Router(config-if)#
```



### Note

The link state messages (LINK-3-UPDOWN and LINEPROTO-5-UPDOWN) are disabled by default. Enter the **logging event link status** command on each interface where you want the messages enabled.

This example shows how to reenables Gigabit Ethernet port 1/5:

```
Router(config-if)# no shutdown
Router(config-if)#
```

To check if an interface is disabled, enter the EXEC **show interfaces** command. An interface that has been shut down is shown as administratively down in the **show interfaces** command display.

## How to Check Cable Status with the TDR

You can check the status of copper cables using the time domain reflectometer (TDR). The TDR detects a cable fault by sending a signal through the cable and reading the signal that is reflected back to it. All or part of the signal can be reflected back by any number of cable defects or by the end of the cable itself.

Use the TDR to determine if the cabling is at fault if you cannot establish a link. This test is especially important when replacing an existing switch, upgrading to Gigabit Ethernet, or installing new cables.



### Note

- TDR can test cables up to a maximum length of 115 meters.
- TDR results are not meaningful for a link that is operating successfully.
- The port must be up before running the TDR test. If the port is down, you cannot enter the **test cable-diagnostics tdr** command successfully, and the following message is displayed:

```
Router# test cable-diagnostics tdr interface gigabitethernet2/12
% Interface Gi2/12 is administratively down
% Use 'no shutdown' to enable interface before TDR test start.
```

To start or stop the TDR test, perform this task:

Command	Purpose
<code>test cable-diagnostics tdr interface {interface interface_number}</code>	Starts or stops the TDR test.

This example shows how to run the TDR-cable diagnostics:

```
Router # test cable-diagnostics tdr interface gigabitethernet2/1
TDR test started on interface Gi2/1
A TDR test can take a few seconds to run on an interface
Use 'show cable-diagnostics tdr' to read the TDR results.
Router #
```



### 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](http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html)

[Participate in the Technical Documentation Ideas forum](#)

## How to Convert Line Card to Operate in 40G Mode

You can configure C6800-x10G cards to operate in 10G mode and 40G mode. The ports are natively 10G but can support 40G by adding a CVR-4SFP10G-QSFP adapter. These cards need to be converted to 40G mode to support 40G interfaces. The cards can support both 10G and 40G interfaces on different port-groups.



### Note

Converting the line card to 40G mode will reset the module.

To configure a module to operate in 40G mode, perform the following task:

Command	Purpose
<pre>Router(config)# hw-module {slot - slot-no } operation-mode {port-group - port-group } fortyGigabitEthernet</pre>	Configures the slot port-group to 40G Mode.

To show the module operation mode, run the following command:

Command	Purpose
<pre>Router# show hw-module {slot - slot-no } operation-mode</pre>	Shows the operation mode on slot per port-group.

## Overview of Cisco CVR-4SFP10G-QSFP Adapter

The Cisco CVR-4SFP10G-QSFP Adapter converts four SFP+ ports into a QSFP+ port. With this adapter, you have the flexibility to use a QSFP+ module to connect to a 40 Gigabit Ethernet port on the other end of the link. This flexibility allows a cost-effective transition to 40 Gigabit Ethernet by maximizing the use of existing or new 10 Gigabit Ethernet SFP+ platforms.

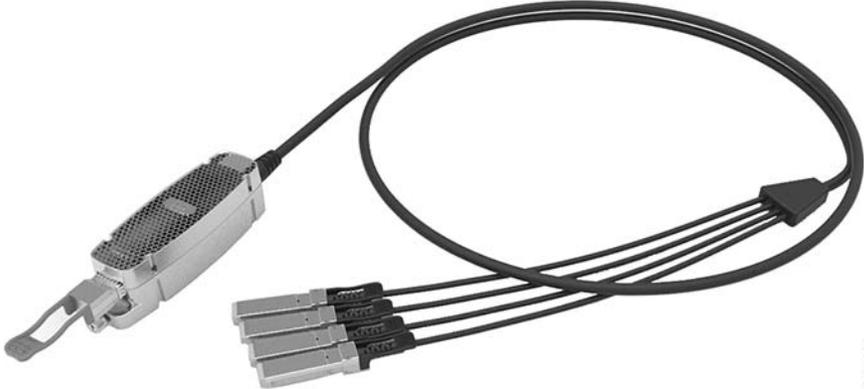
For more information, see the Cisco 4 x SFP10G to QSFP Reverse Adapter Data Sheet.

**Figure 10-1** Cisco CVR-4SFP10G-QSFP Adapter and QSFP+ Module



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Figure 10-2 Cisco CVR-4SFP10G-QSFP Adapter with QSFP+ Module Plugged In



### Compatible Line Cards

All Catalyst 6800 series line cards support CVR-4SFP10G-QSFP Adapter. Due to power limitations on line card, one port per port-group can be operated on 40G and connected to CVR-4SFP10G-QSFP Adapter.

Table 10-3 40G Ports supported on port groups

Line Card	Port-group Mapping	40G Ports – Physical Port Mapping	Supported 40G Ports per Port-Group
C6800-32P10G	PG1 – 1,3,5,7,9,11,13,15	Port 33 – 1,3,5,7 & Port 35 – 9,11,13,15	PG1 – Port 33
	PG2 – 2,4,6,8,10,12,14,16	Port 34 – 2,4,6,8 & Port 36 – 10,12,14,16	PG2 – Port 34
	PG3 – 17,19,21,23,25,27,29,31	Port 37 – 17,19,21,23 & Port 39 – 25,27,29,31	PG3 – Port 37
	PG4 – 18,20,22,24,26,28,30,32	Port 38 – 18,20,22,24 & Port 40 – 26,28,30,32	PG4 – Port 38
C6800-16P10G	PG1 – 1,2,3,4,5,6,7,8	Port 17 – 1,2,3,4 & Port 18 – 5,6,7,8	PG1 – Port 17
	PG2 – 9,10,11,12,13,14,15,16	Port 19 – 9,10,11,12 & Port 20 – 13,14,15,16	PG2 – Port 19
C6800-8P10G	PG1 – 1,2,3,4	Port 9 – 1,2,3,4	PG1 – Port 9
	PG2 – 5,6,7,8	Port 10 – 5,6,7,8	PG2 – Port 10

**Note**

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40G mode conversion on line card is per port-group, ports in the non-converted port-groups will continue to operate in 10G mode and no ports are disabled.

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