Configuring Interfaces

This chapter describes how to configure interfaces on the Cisco 7600 series routers. It contains these sections:

Note

- For complete syntax and usage information for the commands used in this chapter, refer to the Cisco 7600 Series Routers Command References at this URL:

  http://www.cisco.com/en/US/products/hw/routers/ps368/prod_command_reference_list.html

Understanding Interface Configuration

Many features in the software are enabled on a per-interface basis. Each interface corresponds to a port on a module installed in a particular slot on the router:

- Slot number—The slot in which the module is installed. On the Cisco 7600 series router, slots are numbered starting with 1, from top to bottom or right to left.
- Port number—The physical port number on the module. On the Cisco 7600 series router, the port numbers always begin with 1. When facing the rear of the router, ports are numbered from the left to the right or top to bottom.

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.

Several LAN and WAN protocols (such as ATM and Frame Relay) support subinterfaces. Subinterfaces are virtual interfaces that are associated with a physical hardware interface. Each subinterface can be configured to support a different network. Thus, subinterfaces enable a single physical interface to support several networks.

For additional information on configuring interfaces on Cisco routers, see the *Cisco IOS Interface Configuration Guide* at this URL:

http://www.cisco.com/en/US/docs/ios/12_2/interface/configuration/guide/finter_c.html

Using the Interface Command

Note You use the commands described in this section to configure both physical ports and logical interfaces.

These procedures apply to all interface configuration processes. Begin the interface configuration process in global configuration mode. To use the **interface** command, follow these steps:

Step 1 Enter the **configure terminal** command at the privileged EXEC prompt to enter global configuration mode:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
```

Step 2 Enter the **interface** command. Specify interface type, along with the slot number/port number to identify the interface to configure. For example, to configure the interface for port 5 on the Fast Ethernet card installed in slot 5 (that is, FastEthernet port 5/5), enter:

```
Router(config)# interface fastethernet 5/5
Router(config-if)#
```

Note You do not need to add a space between the interface type and interface number. For example, in the preceding line you can specify either *fastethernet 5/5* or *fastethernet5/5*.

Step 3 After each **interface** command, enter the appropriate interface configuration commands to configure the interface. These interface configuration commands define the protocols and applications that will run on the interface. The commands are collected and applied to the **interface** command until you enter another **interface** command or press **Ctrl-Z** to exit interface configuration mode.

Note You can use **show interfaces** EXEC command to see a list of the interfaces on the router.

You can use the **show hardware** EXEC command to see a list of system software and hardware.

Step 4 After you configure an interface, you can check its status by using the EXEC **show** commands listed in "Monitoring and Maintaining Interfaces" section on page 8-15.

Configuring 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.

To configure a range of interfaces with the same configuration, perform this task:

Command	Purpose
`Router(config)# [no] interface range {{vlan vlan_ID - vlan_ID [, vlan vlan_ID - vlan_ID]} | {type[1] slot/port - port [, type[1] slot/port - port]} | {macro_name [, macro_name]}}`	Selects the range of interfaces to be configured.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

When configuring a range of interfaces, note the following:

- For information about macros, see the "Defining and Using Interface-Range Macros" section on page 8-4.
- You can enter up to five comma-separated ranges.
- You need not enter spaces before or after the comma.
- You need not add a space between the interface numbers and the dash when using the **interface range** command.
- The **no interface range** command supports VLAN interfaces.

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 reenable all Fast Ethernet ports 5/1 to 5/5:

```
Router(config)# interface range fastethernet 5/1 - 5
Router(config-if)# no shutdown
Router(config-if)#
*Oct  6 08:24:35: %LINK-3-UPDOWN: Interface FastEthernet5/1, changed state to up
*Oct  6 08:24:35: %LINK-3-UPDOWN: Interface FastEthernet5/2, changed state to up
*Oct  6 08:24:35: %LINK-3-UPDOWN: Interface FastEthernet5/3, changed state to up
*Oct  6 08:24:35: %LINK-3-UPDOWN: Interface FastEthernet5/4, changed state to up
*Oct  6 08:24:35: %LINK-3-UPDOWN: Interface FastEthernet5/5, changed state to up
*Oct  6 08:24:36: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet5/
5, changed state to up
*Oct  6 08:24:36: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet5/
3, changed state to up
*Oct  6 08:24:36: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet5/
4, changed state to up
Router(config-if)#
```

This example shows how to use a comma to add different interface type strings to the range to reenable all Fast Ethernet ports in the range 5/1 to 5/5 and both Gigabit Ethernet ports (1/1 and 1/2):

```
Router(config-if)# interface range fastethernet 5/1 - 5, gigabitethernet 1/1 - 2
Router(config-if)# no shutdown
Router(config-if)#
*Oct  6 08:29:28: %LINK-3-UPDOWN: Interface FastEthernet5/1, changed state to up
```

```
*Oct  6 08:29:28: %LINK-3-UPDOWN: Interface FastEthernet5/2, changed state to up
*Oct  6 08:29:28: %LINK-3-UPDOWN: Interface FastEthernet5/3, changed state to up
*Oct  6 08:29:28: %LINK-3-UPDOWN: Interface FastEthernet5/4, changed state to up
*Oct  6 08:29:28: %LINK-3-UPDOWN: Interface FastEthernet5/5, changed state to up
*Oct  6 08:29:28: %LINK-3-UPDOWN: Interface GigabitEthernet1/1, changed state to
 up
*Oct  6 08:29:28: %LINK-3-UPDOWN: Interface GigabitEthernet1/2, changed state to
 up
*Oct  6 08:29:29: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet5/
5, changed state to up
*Oct  6 08:29:29: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet5/
3, changed state to up
*Oct  6 08:29:29: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet5/
4, changed state to up
Router(config-if)#
```

If you enter multiple configuration commands while you are in interface-range configuration mode, each command is executed as it is entered (they are not batched together and executed after you exit interface-range configuration mode).

If you exit interface-range configuration mode while the commands are being executed, some commands may not be executed on all interfaces in the range. Wait until the command prompt reappears before exiting interface-range configuration mode.

Defining and Using 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
Router(config)# **define interface-range** *macro_name* {**vlan** *vlan_ID - vlan_ID*} | {*type*[1] *slot/port - port*} [, {*type*[1] *slot/port - port*}]	Defines the interface-range macro and save it in NVRAM.
Router(config)# **no define interface-range** *macro_name*	Deletes a macro.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

This example shows how to define an interface-range macro named enet_list to select Fast Ethernet ports 5/1 through 5/4:

```
Router(config)# define interface-range enet_list fastethernet 5/1 - 4
```

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

Command	Purpose
Router# **show running-config**	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 FastEthernet5/1 - 4
```

```
Router#
```

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

Command	Purpose
`Router(config)# interface range macro macro_name`	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)#
```

Configuring Optional Interface Features

These sections describe optional interface features:

Configuring Ethernet Interface Speed and Duplex Mode

These sections describe how to configure Ethernet port speed and duplex mode:

Speed and Duplex Mode Configuration Guidelines

You usually configure Ethernet port speed and duplex mode parameters to auto and allow the Cisco 7600 series router to negotiate the speed and duplex mode between ports. If you decide to configure the port speed and duplex modes manually, consider the following information:

- If you set the Ethernet port speed to auto, the router automatically sets the duplex mode to auto.
- If you enter the **no speed** command, the router automatically configures both speed and duplex to auto.
- 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 router prompts you to also configure the duplex mode on the port.

Note Cisco 7600 series routers 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 reenable the interface during the reconfiguration.

Configuring the Ethernet Interface Speed

Note If you configure the Ethernet port speed to **auto** on a 10/100-Mbps or 10/100/1000-Mbps Ethernet port, both speed and duplex are autonegotiated.

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

	Command	Purpose
Step 1	`Router(config)# interface fastethernet slot/port`	Selects the Ethernet port to be configured.
Step 2	`Router(config-if)# speed {10 | 100 | 1000 | {auto [10 100 [1000]]}}`	Configures the speed of the Ethernet interface.
	`Router(config-if)# no speed`	Reverts to the default configuration (speed auto).

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 Fast Ethernet port 5/4:

```
Router(config)# interface fastethernet 5/4
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-Mps port configured for Gigabit Ethernet.
- If you set the port speed to auto on a 10/100-Mbps or 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 Fast Ethernet port, perform this task:

	Command	Purpose
Step 1	`Router(config)# interface fastethernet slot/port`	Selects the Ethernet port to be configured.
Step 2	`Router(config-if)# duplex [auto | full | half]` `Router(config-if)# no duplex`	Sets the duplex mode of the Ethernet port. Reverts to the default configuration (duplex auto).

This example shows how to set the duplex mode to full on Fast Ethernet port 5/4:

```
Router(config)# interface fastethernet 5/4
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 8-1 shows the four possible link negotiation configurations and the resulting link status for each configuration.

Table 8-1 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)# interface gigabitethernet slot/port`	Selects the port to be configured.
Step 2	`Router(config-if)# speed nonegotiate` `Router(config-if)# no speed nonegotiate`	Disables link negotiation. Reverts to the default configuration (link negotiation enabled).

This example shows how to enable link negotiation on Gigabit Ethernet port 5/4:

```
Router(config)# interface gigabitethernet 5/4
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# **show interfaces** *type*[1] *slot/port*	Displays the speed and duplex mode configuration.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

This example shows how to display the speed and duplex mode of Fast Ethernet port 5/4:

```
Router# show interfaces fastethernet 5/4
FastEthernet5/4 is up, line protocol is up
  Hardware is Cat6K 100Mb Ethernet, address is 0050.f0ac.3058 (bia 0050.f0ac.3058)
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:33, output never, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     1238 packets input, 273598 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     1380 packets output, 514382 bytes, 0 underruns
     0 output errors, 0 collisions, 2 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
Router#
```

Configuring Jumbo Frame Support

These sections describe jumbo frame support:

- Understanding Jumbo Frame Support, page 8-9
- Configuring MTU Sizes, page 8-10

Caution The following switching modules support a maximum ingress frame size of 8092 bytes:

- WS-X6516-GE-TX when operating at 100 Mbps
- WS-X6148-RJ-45, WS-X6148-RJ-45V and WS-X6148-RJ21, WS-X6148-RJ21V
- WS-X6248-RJ-45 and WS-X6248-TEL
- WS-X6248A-RJ-45 and WS-X6248A-TEL
- WS-X6348-RJ-45, WS-X6348-RJ45V and WS-X6348-RJ-21, WX-X6348-RJ21V

When jumbo frame support is configured, these modules drop ingress frames larger than 8092 bytes.

Note The WS-X6548-GE-TX, WS-X6548V-GE-TX, WS-X6148-GE-TX, and WS-X6148V-GE-TX do not support jumbo frames.

Understanding Jumbo Frame Support

These sections describe jumbo frame support:

- Jumbo Frame Support Overview, page 8-9
- Ethernet Ports, page 8-10
- VLAN Interfaces, page 8-10

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 MSFC.
- Jumbo frame support does not fragment bridged traffic.

Bridged and Routed Traffic Size Check at Ingress 10, 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, 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 8-11).

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 MSFC 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 8-11).

Ethernet Ports

These sections describe configuring nondefault MTU sizes on Ethernet ports:

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.

Configuring a nondefault MTU size on an Ethernet port limits routed traffic to the configured 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 8-11).

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 8-11).

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

These sections describe how to configure MTU sizes:

Configuring the MTU Size

To configure the MTU size, perform this task:

	Command	Purpose
Step 1	`Router(config)# interface {{vlan vlan_ID} | {{type[1] slot/port} | {port-channel port_channel_number} slot/port}}`	Selects the interface to configure.
Step 2	`Router(config-if)# mtu mtu_size` `Router(config-if)# no mtu`	Configures the MTU size. Reverts to the default MTU size (1500 bytes).
Step 3	`Router(config-if)# end`	Exits configuration mode.
Step 4	`Router# show running-config interface [{gigabitethernet | tengigabitethernet} slot/port]`	Displays the running configuration.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, or **ge-wan**

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.
- 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 8-11).

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)# system jumbomtu mtu_size` `Router(config)# no system jumbomtu`	Configures the global egress LAN port MTU size. Reverts to the default global egress LAN port MTU size (9216 bytes).
Step 2	`Router(config)# end`	Exits configuration mode.

Configuring IEEE 802.3X Flow Control

Gigabit Ethernet and 10-Gigabit Ethernet ports on the Cisco 7600 series routers 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 transmits an IEEE 802.3X pause frame that requests remote ports to delay sending frames for a specified time. All Ethernet ports (10 Gbps, 1 Gbps, 100 Mbps, and 10 Mbps) can receive and 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)# interface` *type*[1] *slot/port*	Selects the port to configure.
Step 2	`Router(config-if)# flowcontrol {receive | send} {desired | off | on}`	Configures a port to send or respond to pause frames.
	`Router(config-if)# no flowcontrol {receive | send}`	Reverts to the default flow control settings.
Step 3	`Router# show interfaces [`*type*[1] *slot/port*`] flowcontrol`	Displays the flow-control configuration for all ports.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

When configuring flow control, note the following information:

- 10-Gigabit Ethernet ports are permanently configured to respond to pause frames.
- When the configuration of the remote ports is unknown, use the **receive desired** keywords to configure a Gigabit Ethernet port to respond to received pause frames.
- Use the **receive on** keywords to configure a Gigabit Ethernet port to respond to received pause frames.
- Use the **receive off** keywords to configure a Gigabit Ethernet port to ignore received pause frames.
- When configuring transmission of pause frames, note the following information:
  - When the configuration of the remote ports is unknown, use the **send desired** keywords to configure a port to send pause frames.
  - 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
Fa5/1     Not capable  OFF
<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 up and 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)# interface type[1] slot/port`	Selects the port to configure.
Step 2	`Router(config-if)# link debounce [time debounce_time]`	Configures the debounce timer.
	`Router(config-if)# no link debounce`	Reverts to the default setting.
Step 3	`Router# show interfaces debounce`	Verifies the configuration.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

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

- The **time** keyword is supported only on fiber Gigabit Ethernet ports.
- You can increase the port debounce timer value in increments of 100 milliseconds up to 5000 milliseconds on ports operating at 1000 Mpbs over copper media.
- WS-X6502-10GE is not supported.
- Both fiber and copper media are supported for 10 Gbps ports.
- Media-only changes are detected.

Table 8-2 lists the time delay that occurs before notification of a link change.

Table 8-2 Port Debounce Timer Delay Time

Port Type	Debounce Timer Disabled	Debounce Timer Enabled
Ports operating at 10 Mpbs or 100 Mbps	300 milliseconds	3100 milliseconds
Ports operating at 1000 Mpbs or 10 Gbps over copper media	300 milliseconds	3100 milliseconds
Ports operating at 1000 Mpbs or 10 Gbps over fiber media except WS-X6502-10GE	10 milliseconds	100 milliseconds
WS-X6502-10GE 10-Gigabit ports	1000 milliseconds	3100 milliseconds

This example shows how to enable the port debounce timer on Fast Ethernet port 5/12:

```
Router(config)# interface fastethernet 5/12
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
Fa5/12  enable          3100
```

Adding a Description for an Interface

You can add a description about an interface to help you remember its function. The description appears in the output of the following commands: **show configuration**, **show running-config**, and **show interfaces**.

To add a description for an interface, perform this task:

Command	Purpose
`Router(config-if)# description string`	Adds a description for an interface.
`Router(config-if)# no description`	Deletes a description from an interface.

This example shows how to add a description on Fast Ethernet port 5/5:

```
Router(config)# interface fastethernet 5/5
Router(config-if)# description Channel-group to "Marketing"
```

Understanding Online Insertion and Removal

The online insertion and removal (OIR) feature supported on the Cisco 7600 series routers 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, refer to the *Cisco 7600 Series Router Installation Guide*.

When a module has been removed or installed, the Cisco 7600 series router 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 router 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 router 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.

Monitoring and Maintaining Interfaces

Following is a list of several of the commands that you can use to monitor and maintain interfaces on the Cisco 7600 series router.

Command	Purpose
`Router# show ibc`	Displays current internal status information.
`Router# show eobc`	Displays current internal out-of-band information.
`Router# show interfaces [type slot/port]`	Displays the status and configuration of all or a specific interface.
`Router# show running-config`	Displays the currently running configuration.
`Router# show rif`	Displays the current contents of the routing information field (RIF) cache.
`Router# show protocols [type slot/port]`	Displays the global (system-wide) and interface-specific status of any configured protocol.
`Router# show version`	Displays the hardware configuration, software version, the names and sources of configuration files, and the boot images.
`Router(config)# interface type slot/port` `Router(config-if)# shutdown`	Shuts down the specified interface, which disables all functions on the interface and shows the interface as unavailable. In addition, the interface is not included in any routing updates.
`Router(config)# interface type slot/port` `Router(config-if)# no shutdown`	Enables an interface that is shut down.
`Router# clear counters [{type[1] slot/port} | {vlan vlan_ID} | {port-channel channel_ID}]`	Clears interface counters. If you do not specify an optional interface type, the command clears all current counters for the specified interface. **Note** This command clears counters displayed with the EXEC **show interfaces** command, not counters retrieved using SNMP.
`Router# clear interface type1 slot/port`	Resets an interface.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

Note

- For detailed command syntax and usage information, see the *Cisco 7600 Series Cisco IOS Command Reference* at this URL:

  http://www.cisco.com/en/US/products/hw/routers/ps368/prod_command_reference_list.html

- For additional information on monitoring and maintaining interfaces on Cisco routers, see the Release 12.2 *Cisco IOS Interface Configuration Guide* at this URL:

  http://www.cisco.com/en/US/docs/ios/12_2/interface/configuration/guide/finter_c.html

Checking the Cable Status Using 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 router, upgrading to Gigabit Ethernet, or installing new cables.

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.
```

Note

- TDR can test cables up to a maximum length of 115 meters.
- See the *Release Notes for Cisco IOS Release 12.2SX on the Supervisor Engine 720, Supervisor Engine 32, and Supervisor Engine 2* for information about which modules support the TDR.

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

Command	Purpose
test cable-diagnostics tdr interface {*interface interface-number*}	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 #
```