

Configuring Interfaces

This chapter describes how to configure interfaces for the Catalyst 4500 series switches. It also provides guidelines, procedures, and configuration examples.

This chapter includes the following major sections:

- [Overview of Interface Configuration, page 6-1](#)
- [Using the interface Command, page 6-2](#)
- [Configuring a Range of Interfaces, page 6-4](#)
- [Defining and Using Interface-Range Macros, page 6-5](#)
- [Deploying 10-Gigabit Ethernet and a Gigabit Ethernet SFP Ports, page 6-6](#)
- [Digital Optical Monitoring Transceiver Support, page 6-7](#)
- [Configuring Optional Interface Features, page 6-7](#)
- [Understanding Online Insertion and Removal, page 6-18](#)
- [Monitoring and Maintaining the Interface, page 6-18](#)

**Note**

For complete syntax and usage information for the switch commands used in this chapter, refer to the *Catalyst 4500 Series Switch Cisco IOS Command Reference* and related publications at this location:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios124/124cr/index.htm>.

Overview of Interface Configuration

By default, all interfaces are enabled. The 10/100-Mbps Ethernet interfaces autonegotiate connection speed and duplex. The 10/100/1000-Mbps Ethernet interfaces negotiate speed, duplex, and flow control. The 1000-Mbps Ethernet interfaces negotiate flow control only. Autonegotiation automatically selects the fastest speed possible on that port for the given pair. If a speed is explicitly stated for an interface, that interface will default to half duplex unless it is explicitly set for full duplex.

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

- Interface type:
 - Fast Ethernet (use the **fastethernet** keyword)
 - Gigabit Ethernet (use the **gigabitethernet** keyword)

- 10-Gigabit Ethernet (use the **tengigabitethernet** keyword)
- Slot number—The slot in which the interface module is installed. Slots are numbered starting with 1, from top to bottom.
- Interface number—The interface number on the module. The interface numbers always begin with 1. When you are facing the front of the switch, the interfaces are numbered from left to right.

You can identify interfaces by physically checking the slot/interface location on the switch. You can also use the Cisco IOS **show** commands to display information about a specific interface or all the interfaces.

Using the interface Command

These general instructions apply to all interface configuration processes:

- Step 1** At the privileged EXEC prompt, enter the **configure terminal** command to enter global configuration mode:

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

- Step 2** In global configuration mode, enter the **interface** command. Identify the interface type and the number of the connector on the interface card. The following example shows how to select Fast Ethernet, slot 5, interface 1:

```
Switch(config)# interface fastethernet 5/1
Switch(config-if)#
```

- Step 3** Interface numbers are assigned at the factory at the time of installation or when modules are added to a system. Enter the **show interfaces** EXEC command to see a list of all interfaces installed on your switch. A report is provided for each interface that your switch supports, as shown in this display:

```
Switch(config-if)#Ctrl-Z
Switch#show interfaces
Vlan1 is up, line protocol is down
  Hardware is Ethernet SVI, address is 0004.dd46.7aff (bia 0004.dd46.7aff)
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 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 packets output, 0 bytes, 0 underruns
    0 output errors, 0 interface resets
    0 output buffer failures, 0 output buffers swapped out
GigabitEthernet1/1 is up, line protocol is down
  Hardware is Gigabit Ethernet Port, address is 0004.dd46.7700 (bia 0004.dd46.7700)
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
```

```

Auto-duplex, Auto-speed
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/2000/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
  0 packets input, 0 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
  0 packets output, 0 bytes, 0 underruns
  0 output errors, 0 collisions, 0 interface resets
  0 babbles, 0 late collision, 0 deferred
  0 lost carrier, 0 no carrier
  0 output buffer failures, 0 output buffers swapped out
GigabitEthernet1/2 is up, line protocol is down
  Hardware is Gigabit Ethernet Port, address is 0004.dd46.7701 (bia 0004.dd46.7701)
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Auto-duplex, Auto-speed
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/2000/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 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
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out
--More--
<...output truncated...>

```

Step 4 To begin configuring Fast Ethernet interface 5/5, as shown in the following example, enter the keyword, interface type, slot number, and interface number in global configuration mode:

```

Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface fastethernet 5/5
Switch(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 5** Follow each **interface** command with the interface configuration commands your particular interface requires. The commands you enter 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 and return to privileged EXEC mode.
- Step 6** After you configure an interface, check its status by using the EXEC **show** commands listed in [“Monitoring and Maintaining the Interface” section on page 6-18](#).

Configuring a Range of Interfaces

The interface-range configuration mode allows you to configure multiple interfaces with the same configuration parameters. When you enter the interface-range configuration mode, all command parameters you enter are attributed to all interfaces within that range until you exit interface-range configuration mode.

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

Command	Purpose
Switch(config)# interface range { vlan <i>vlan_ID</i> - <i>vlan_ID</i> } {{ fastethernet gigabitethernet tengigabitethernet macro <i>macro_name</i> } <i>slot/interface</i> - <i>interface</i> } [, { vlan <i>vlan_ID</i> - <i>vlan_ID</i> } {{ fastethernet gigabitethernet tengigabitethernet macro <i>macro_name</i> } <i>slot/interface</i> - <i>interface</i> }]	Selects the range of interfaces to be configured. Note the following: • You are required to enter a space before the dash. • You can enter up to five comma-separated ranges. • You are not required to enter spaces before or after the comma.



Note

When you use the **interface range** command, you must add a space between the **vlan**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, or **macro** keyword and the dash. For example, the command **interface range fastethernet 5/1 - 5** specifies a valid range; the command **interface range fastethernet 1-5** does not contain a valid range command.



Note

The **interface range** command works only with VLAN interfaces that have been configured with the **interface vlan** command (the **show running-configuration** command displays the configured VLAN interfaces). VLAN interfaces that are not displayed by the **show running-configuration** command cannot be used with the **interface range** command.

```
Switch(config)# interface range fastethernet 5/1 - 5
Switch(config-if-range)# no shutdown
Switch(config-if-range)#
*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
Switch(config-if)#
```

```
Switch(config-if)# interface range fastethernet 5/1 - 5, gigabitethernet 1/1 - 2
Switch(config-if)# no shutdown
Switch(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
Switch(config-if)#
```

Defining and Using Interface-Range Macros

Command	Purpose
Switch(config)# define interface-range <i>macro_name</i> { vlan <i>vlan_ID</i> - <i>vlan_ID</i> } {{ fastethernet gigabitethernet } <i>slot/interface</i> - <i>interface</i> } [, { vlan <i>vlan_ID</i> - <i>vlan_ID</i> } {{ fastethernet gigabitethernet } <i>slot/interface</i> - <i>interface</i> }]	Defines the interface-range macro and saves it in the running configuration file.

enet_list

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

Command	Purpose
Switch# show running-config	Shows the defined interface-range macro configuration.

enet_list

```
Switch# show running-config | include define  
define interface-range enet_list FastEthernet5/1 - 4  
Switch#
```

interface range

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

enet_list

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

Deploying 10-Gigabit Ethernet and a Gigabit Ethernet SFP Ports

**Note**

uplink ports, you must re-boot the switch. On the Catalyst 4503, 4506, and 4507R series switches, this capability is automatically enabled.

Prior to Cisco Release 12.2(25)SG, the Cisco Catalyst 4500 Supervisor Engine V-10GE allowed you to enable either the dual wire-speed 10-Gigabit Ethernet ports, or four alternatively wired Gigabit Ethernet SFP uplink ports. With Cisco Release 12.2(25)SG, you can simultaneously deploy the dual 10 Gigabit Ethernet ports and the four Gigabit Ethernet SFP ports. This capability is supported on the Catalyst 4503, Catalyst 4506, and Catalyst 4507R chassis.

When deploying a Catalyst 4510R chassis, one of three configurations is supported:

- Enable the dual 10 -Gigabit Ethernet ports (X2 optics) only.
- Enable the four Gigabit Ethernet ports (SFP optics) only.
- Enable both the dual 10 Gigabit Ethernet and the four Gigabit Ethernet ports, with the understanding that the tenth slot (Flex-Slot) will only support a 2-port gigabit interface converter (GBIC) line card (WS-X4302-GB) when in this mode.

To select the 10-Gigabit Ethernet and/or the Gigabit Ethernet SFP uplink ports, perform this task:

	Command	Purpose
Step 1	<code>configure terminal</code>	Establishes global configuration mode.
Step 2	<code>hw-module uplink select all</code> <code>gigabitethernet tengigabitethernet</code>	Selects the port type to enable.

The following example shows how to enable both 10-Gigabit Ethernet and Gigabit Ethernet SFP uplink ports on a Catalyst 4510R series switch:

```
configure terminal
hw-module uplink select all
```

Digital Optical Monitoring Transceiver Support

Command line interface (CLI) commands (show inventory, show idprom interface) are used on transceivers to obtain serial number, model name, inventory information.

The following commands are specific to the transceivers that support the DOM capability:

- Display current values and thresholds for all sensor on a particular interface transceiver:
- Enable/Disable the entSensorThresholdNotification for all sensors in all the transceivers:
- Enable/Disable transceiver monitoring:



Note

This feature is only available when a DOM capable transceiver is present and configured for monitoring. The frequency at which the sensor information is refreshed depends on default values configured in the transceiver EEPROM (Serial Electrically Erasable Programmable Read Only Memory).

Configuring Optional Interface Features

The following subsections describe optional procedures:

- [Configuring Ethernet Interface Speed and Duplex Mode, page 6-8](#)
- [Configuring Flow Control, page 6-11](#)
- [Configuring Jumbo Frame Support, page 6-13](#)

- ## Configuring Ethernet Interface Speed and Duplex Mode

- ## Speed and Duplex Mode Configuration Guidelines



Caution

Setting the Interface Speed

6-8

speed 100

interface fastethernet 5/4
speed auto



interface gigabitethernet 1/1
speed auto 10 100

interface gigabitethernet 1/1
speed auto 100



interface gigabitethernet1/1	
speed nonegotiate	



interface fastethernet	
duplex auto full half	

Displaying the Interface Speed and Duplex Mode Configuration

<code>show interfaces fastethernet gigabitethernet tengigabitethernet</code>	

`show interface fastethernet 6/1`

Adding a Description for an Interface

, , and

To add a description for an interface, enter the following command:

<code>description <i>string</i></code>	

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

`description Channel-group to "Marketing"`

Configuring Flow Control

pause frame



configure terminal	
interface interface-id	
	Configures a Gigabit Ethernet port to send or receive pause frames.

```
interface g7/5
  flowcontrol send on
end
show inmterfaces gigabitEthernet 7/5 capabilities
```

Model: WS-X4548-GB-RJ45-RJ-45
Type: 10/100/1000-TX
Speed: 10,100,1000,auto
Duplex: half,full,auto
Trunk encap. type: 802.1Q,ISL
Trunk mode: on,off,desirable,nonegotiate
Channel: yes
Broadcast suppression: percentage(0-100), hw
Flowcontrol: rx-(off,on,desired),tx-(off,on,desired)

```
show flowcontrol interface GigabitEthernet 7/5
```

```
on          desired
```

```
show interfaces gigabitEthernet 5/5 capabilities
```

```
Flowcontrol:          rx-(off,on,desired),tx-(off,on,desired)
```

```
show flowcontrol interface gigabitEthernet 5/5
```

```
off          off
```

```
show interfaces fa3/5 capabilities
```

Flowcontrol: rx-(none),tx-(none)

show flowcontrol interface fa3/5

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Configuring Jumbo Frame Support

-
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- [Configuring MTU Sizes, page 6-15](#)

Ports and Modules that Support Jumbo Frames

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Understanding Jumbo Frame Support

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Jumbo Frame Support Overview


Note


Note

Ethernet Ports

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-

Ethernet Port Overview

Layer 3 and Layer 2 EtherChannels

VLAN Interfaces

and support the same MTU size, or configure none of them. However, such uniformity of MTU size in the same VLAN is not enforced.

When a VLAN has switch ports with different MTU size, packets received from a port with a larger MTU might be dropped when they are forwarded to a port with a smaller MTU.

If the switch ports in a VLAN have jumbo frames enabled, the corresponding SVI can have jumbo frames enabled. The MTU of an SVI should always be smaller than the smallest MTU among all the switch ports in the VLAN, but this condition is not enforced.

The MTU of a packet is not checked on the ingress side for an SVI; it is checked on the egress side of an SVI. If the MTU of a packet is larger than the MTU of the egress SVI, the packet will be sent to the CPU for fragmentation processing. If the “do not fragment” bit is not set, the packet is fragmented. Otherwise, the packet is dropped.

Configuring MTU Sizes

<code>type¹ } { port_channel_number slot/port mtu_size</code>	Selects the interface to configure.
<code>slot/port</code>	

1. `type` = fastethernet, gigabitethernet, or



Note

Interacting with the Baby Giants Feature

`system mtu <size>`

system mtu 1540

Configuring Auto-MDIX on a Port


Note


Note


Note

Table 6-1 Link Conditions and auto-MDIX Settings

Local Side auto-MDIX	Remote Side auto-MDIX	With Correct Cabling	With Incorrect Cabling

	Command	Purpose
Step 1		
Step 2	<i>interface-id</i>	
Step 3		
Step 4		
Step 5		
Step 6	<i>interface-id</i>	
Step 7		

Displaying the Interface auto-MDIX Configuration

	Command or Action	Purpose
Step 1		•
Step 2	<code>type /</code>	

Table 6-2 Auto-MDIX and Operational State

Auto-MDIX Setting And Operational State on an Interface	Description

Auto-MDIX on (operational: on)

show ?

	Command	Purpose
Step 1		
Step 2		
Step 3		
Step 4		

show protocols fastethernet 5/5

Clearing and Resetting the Interface

Command	Purpose
Switch# clear counters { }	



	Command	Purpose
Step 1	Switch(config)# interface {vlan } { { fastethernet gigabitethernet tengigabitethernet } / } { port-channel }	
Step 2	Switch(config-if)# shutdown	
Step 3	Switch(config-if)# no shutdown	

```
Switch(config)# interface fastethernet 5/5
Switch(config-if)# shutdown
Switch(config-if)#
*Sep 30 08:33:47: %LINK-5-CHANGED: Interface FastEthernet5/5, changed state to a
administratively down
Switch(config-if)#
```

```
Switch(config-if)# no shutdown
Switch(config-if)#
*Sep 30 08:36:00: %LINK-3-UPDOWN: Interface FastEthernet5/5, changed state to up
Switch(config-if)#
```

Configuring Interface Link Status and Trunk Status Events

-
-

```
[no] logging event link-status [use-global]
[no] logging event trunk-status [use-global]
```

- logging event link-status
- no logging event link-status
- logging event link-status use-global

Configuring Link Status Event Notification for an Interface

Command	Purpose
Switch(config-if) # logging event link-status	
Switch(config-if) # no logging event link-status	
Switch(config-if) # logging event link-status use-global	

Global Settings

[no] logging event link-status global
[no] logging event

trunk-status global

- logging event link-status global
- no logging event link-status global

Configuring a Switch Global Link Status Logging Event

Command	Purpose
Switch(config-if) # logging event link-status global	
Switch(config-if) # no logging event link-status global	

Result

global setting	interface setting	actual logging state
-----	-----	-----
on	on	on
off	on	on
on	off	off
off	off	off
on	default(use-global)	on
off	default(use-global)	off

```
//
// The global link status and trunk status logging events are enabled.
//
Switch# show running | include logging
show running | include logging
logging event link-status global
logging event trunk-status global
Switch#

//
// The interface link status and trunk status logging settings
// are set to default values, which follow regardless of the global
// setting.
//
Switch# show running interface g1/4
Building configuration...

Current configuration: 97 bytes
!
interface GigabitEthernet1/4
 switchport trunk encapsulation dot1q
 switchport mode trunk
end
Switch#

//
// The trunk status logging messages for the interface are
// displayed whenever the interface trunking status is changed.
// Here we change the other end node's trunking encapsulation
// from dot1q to isl.
//
3d00h: %DTP-5-ILGLCFG: Illegal config(on,isl--on,dot1q) on Gi1/4
3d00h: %DTP-5-ILGLCFG: Illegal config(on,isl--on,dot1q) on Gi1/4
3d00h: %DTP-5-ILGLCFG: Illegal config(on,isl--on,dot1q) on Gi1/4

//
// The link and trunk status logging message for the interface
// are displayed whenever the interface link status is changed.
// Here we do a "shut" and "no shut" on the other end link node.
//
3d00h: %DTP-5-NONTRUNKPORTON: Port Gi1/4 has become non-trunk
3d00h: %LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet1/4, changed state to down
```

```
3d00h: %LINK-3-UPDOWN: Interface GigabitEthernet1/4, changed state to
down
3d00h: %LINK-3-UPDOWN: Interface GigabitEthernet1/4, changed state to up
3d00h: %DTP-5-TRUNKPORTON: Port Gi1/4 has become dot1q trunk
3d00h: %LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet1/4, changed state to up
```

Resetting the Interface to the Default Configuration

default interface

```
Switch(config)# default interface fastEthernet 3/5
Interface FastEthernet3/5 set to default configuration
```

```
Switch# show run interface fastethernet 3/5
Building configuration...
```

```
Current configuration : 58 bytes
!
interface FastEthernet3/5
  no ip address
  shutdown
end
```

