



Configuring Ethernet Interfaces

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Information About Ethernet Interfaces

The Ethernet ports can operate as standard Ethernet interfaces connected to servers or to a LAN.

The Ethernet interfaces also support Fibre Channel over Ethernet (FCoE). FCoE allows the physical Ethernet link to carry both Ethernet and Fibre Channel traffic.

The Ethernet interfaces are enabled by default.

Interface Command

You can enable the various capabilities of the Ethernet interfaces on a per-interface basis using the **interface** command. When you enter the **interface** command, you specify the following information:

- Interface type—All physical Ethernet interfaces use the **ethernet** keyword.
- Slot number:
 - Slot 1 includes all the fixed ports.
 - Slot 2 includes the ports on the upper expansion module (if populated).
 - Slot 3 includes the ports on the lower expansion module (if populated).
 - Slot 4 includes the ports on the lower expansion module (if populated).
- Port number— Port number within the group.

The interface numbering convention is extended to support use with a Cisco Nexus Fabric Extender as follows:

```
switch(config)# interface ethernet [chassis]/slot/port
```

- The chassis ID is an optional entry that you can use to address the ports of a connected Fabric Extender. The chassis ID is configured on a physical Ethernet or EtherChannel interface on the switch to identify the Fabric Extender discovered through the interface. The chassis ID ranges from 100 to 199.

Information About Unified Ports

Cisco Nexus unified ports allow you to configure a physical port on a Cisco Nexus device switch as a 1/10-Gigabit Ethernet, Fibre Channel over Ethernet (FCoE), or 2-, 4-, 8-Gigabit native Fibre Channel port.

Currently, most networks have two types of switches for different types of networks. For example, LAN switches carry Ethernet traffic up to Catalyst or Nexus switches carry FC traffic from servers to MDS switches. With unified port technology, you can deploy a unified platform, unified device, and unified wire approach. Unified ports allow you to move from an existing segregated platform approach where you choose LAN and SAN port options to transition to a single, unified fabric that is transparent and consistent with existing practices and management software. A unified fabric includes the following:

- Unified platform—Uses the same hardware platform and the same software code level and certifies it once for your LAN and SAN environments.
- Unified device—Runs LAN and SAN services on the same platform switch. The unified device allows you to connect your Ethernet and Fibre Channel cables to the same device.
- Unified wire—Converges LAN and SAN networks on a single converged network adapter (CNA) and connects them to your server.

A unified fabric allows you to manage Ethernet and FCoE features independently with existing Cisco tools.

Guidelines and Limitations for Unified Ports

- Ethernet ports and Fibre Channel ports must be configured in the following order:
 - Fibre Channel ports must be configured from the last port of the module.
 - Ethernet ports must be configured from the first port of the module.

If the order is not followed, the following errors are displayed:

```
ERROR: Ethernet range starts from first port of the module
ERROR: FC range should end on last port of the module
```

Unidirectional Link Detection Parameter

The Cisco-proprietary Unidirectional Link Detection (UDLD) protocol allows ports that are connected through fiber optics or copper (for example, Category 5 cabling) Ethernet cables to monitor the physical configuration of the cables and detect when a unidirectional link exists. When the switch detects a unidirectional link, UDLD shuts down the affected LAN port and alerts the user. Unidirectional links can cause a variety of problems, including spanning tree topology loops.

UDLD is a Layer 2 protocol that works with the Layer 1 protocols to determine the physical status of a link. At Layer 1, autonegotiation takes care of physical signaling and fault detection. UDLD performs tasks that

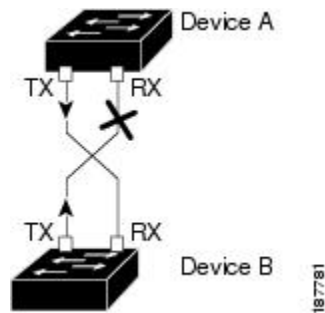
autonegotiation cannot perform, such as detecting the identities of neighbors and shutting down misconnected LAN ports. When you enable both autonegotiation and UDLD, Layer 1 and Layer 2 detections work together to prevent physical and logical unidirectional connections and the malfunctioning of other protocols.

A unidirectional link occurs whenever traffic transmitted by the local device over a link is received by the neighbor but traffic transmitted from the neighbor is not received by the local device. If one of the fiber strands in a pair is disconnected, and if autonegotiation is active, the link does not stay up. In this case, the logical link is undetermined, and UDLD does not take any action. If both fibers are working normally at Layer 1, then UDLD at Layer 2 determines whether those fibers are connected correctly and whether traffic is flowing bidirectionally between the correct neighbors. This check cannot be performed by autonegotiation, because autonegotiation operates at Layer 1.

A Cisco Nexus device periodically transmits UDLD frames to neighbor devices on LAN ports with UDLD enabled. If the frames are echoed back within a specific time frame and they lack a specific acknowledgment (echo), the link is flagged as unidirectional and the LAN port is shut down. Devices on both ends of the link must support UDLD in order for the protocol to successfully identify and disable unidirectional links.

The following figure shows an example of a unidirectional link condition. Device B successfully receives traffic from Device A on the port. However, Device A does not receive traffic from Device B on the same port. UDLD detects the problem and disables the port.

Figure 1: Unidirectional Link



Default UDLD Configuration

The following table shows the default UDLD configuration.

Table 1: UDLD Default Configuration

Feature	Default Value
UDLD global enable state	Globally disabled
UDLD aggressive mode	Disabled
UDLD per-port enable state for fiber-optic media	Enabled on all Ethernet fiber-optic LAN ports
UDLD per-port enable state for twisted-pair (copper) media	Enabled

UDLD Aggressive and Nonaggressive Modes

UDLD aggressive mode is disabled by default. You can configure UDLD aggressive mode only on point-to-point links between network devices that support UDLD aggressive mode. If UDLD aggressive mode is enabled, when a port on a bidirectional link that has a UDLD neighbor relationship established stops receiving UDLD frames, UDLD tries to reestablish the connection with the neighbor. After eight failed retries, the port is disabled.

To prevent spanning tree loops, nonaggressive UDLD with the default interval of 15 seconds is fast enough to shut down a unidirectional link before a blocking port transitions to the forwarding state (with default spanning tree parameters).

When you enable the UDLD aggressive mode, the following occurs:

- One side of a link has a port stuck (both transmission and receive)
- One side of a link remains up while the other side of the link is down

In these cases, the UDLD aggressive mode disables one of the ports on the link, which prevents traffic from being discarded.

Interface Speed

Cisco Discovery Protocol

The Cisco Discovery Protocol (CDP) is a device discovery protocol that runs over Layer 2 (the data link layer) on all Cisco-manufactured devices (routers, bridges, access servers, and switches) and allows network management applications to discover Cisco devices that are neighbors of already known devices. With CDP, network management applications can learn the device type and the Simple Network Management Protocol (SNMP) agent address of neighboring devices that are running lower-layer, transparent protocols. This feature enables applications to send SNMP queries to neighboring devices.

CDP runs on all media that support Subnetwork Access Protocol (SNAP). Because CDP runs over the data-link layer only, two systems that support different network-layer protocols can learn about each other.

Each CDP-configured device sends periodic messages to a multicast address, advertising at least one address at which it can receive SNMP messages. The advertisements also contain time-to-live, or holdtime information, which is the length of time a receiving device holds CDP information before discarding it. Each device also listens to the messages sent by other devices to learn about neighboring devices.

The switch supports both CDP Version 1 and Version 2.

Default CDP Configuration

The following table shows the default CDP configuration.

Table 2: Default CDP Configuration

Feature	Default Setting
CDP interface state	Enabled

Feature	Default Setting
CDP timer (packet update frequency)	60 seconds
CDP holdtime (before discarding)	180 seconds
CDP Version-2 advertisements	Enabled

Error-Disabled State

An interface is in the error-disabled (err-disabled) state when the interface is enabled administratively (using the **no shutdown** command) but disabled at runtime by any process. For example, if UDLD detects a unidirectional link, the interface is shut down at runtime. However, because the interface is administratively enabled, the interface status displays as err-disabled. Once an interface goes into the err-disabled state, you must manually reenabling it or you can configure an automatic timeout recovery value. The err-disabled detection is enabled by default for all causes. The automatic recovery is not configured by default.

When an interface is in the err-disabled state, use the **errdisable detect cause** command to find information about the error.

You can configure the automatic err-disabled recovery timeout for a particular err-disabled cause by changing the time variable.

The **errdisable recovery cause** command provides automatic recovery after 300 seconds. To change the recovery period, use the **errdisable recovery interval** command to specify the timeout period. You can specify 30 to 65535 seconds.

If you do not enable the err-disabled recovery for the cause, the interface stays in the err-disabled state until you enter the **shutdown** and **no shutdown** commands. If the recovery is enabled for a cause, the interface is brought out of the err-disabled state and allowed to retry operation once all the causes have timed out. Use the **show interface status err-disabled** command to display the reason behind the error.

About Port Profiles

You can create a port profile that contains many interface commands and apply that port profile to a range of interfaces on the Cisco Nexus device. Port profiles can be applied to the following interface types:

- Ethernet
- VLAN network interface
- Port channel

A command that is included in a port profile can be configured outside of the port profile. If the new configuration in the port profile conflicts with the configurations that exist outside the port profile, the commands configured for an interface in configuration terminal mode have higher priority than the commands in the port profile. If changes are made to the interface configuration after a port profile is attached to it, and the configuration conflicts with that in the port profile, the configurations in the interface will be given priority.

You inherit the port profile when you attach the port profile to an interface or range of interfaces. When you attach, or inherit, a port profile to an interface or range of interfaces, the switch applies all the commands in that port profile to the interfaces.

You can have one port profile inherit the settings from another port profile. Inheriting another port profile allows the initial port profile to assume all of the commands of the second, inherited, port profile that do not conflict with the initial port profile. Four levels of inheritance are supported. The same port profile can be inherited by any number of port profiles.

To apply the port profile configurations to the interfaces, you must enable the specific port profile. You can configure and inherit a port profile onto a range of interfaces prior to enabling the port profile; you then enable that port profile for the configurations to take effect on the specified interfaces.

When you remove a port profile from a range of interfaces, the switch undoes the configuration from the interfaces first and then removes the port profile link itself. When you remove a port profile, the switch checks the interface configuration and either skips the port profile commands that have been overridden by directly entered interface commands or returns the command to the default value.

If you want to delete a port profile that has been inherited by other port profiles, you must remove the inheritance before you can delete the port profile.

You can choose a subset of interfaces from which to remove a port profile from among that group of interfaces that you originally applied the profile. For example, if you configured a port profile and configured ten interfaces to inherit that port profile, you can remove the port profile from just some of the specified ten interfaces. The port profile continues to operate on the remaining interfaces to which it is applied.

If you delete a specific configuration for a specified range of interfaces using the interface configuration mode, that configuration is also deleted from the port profile for that range of interfaces only. For example, if you have a channel group inside a port profile and you are in the interface configuration mode and you delete that port channel, the specified port channel is also deleted from the port profile as well.

After you inherit a port profile on an interface or range of interfaces and you delete a specific configuration value, that port profile configuration will not operate on the specified interfaces.

If you attempt to apply a port profile to the wrong type of interface, the switch returns an error.

When you attempt to enable, inherit, or modify a port profile, the switch creates a checkpoint. If the port profile configuration fails, the switch rolls back to the prior configuration and returns an error. A port profile is never only partially applied.

Guidelines and Limitations for Port Profiles

Port profiles have the following configuration guidelines and limitations:

- Each port profile must have a unique name across interface types and the network.
- Commands that you enter under the interface mode take precedence over the port profile's commands if there is a conflict. However, the port profile retains that command in the port profile.
- The port profile's commands take precedence over the default commands on the interface, unless the default command explicitly overrides the port profile command.
- After you inherit a port profile onto an interface or range of interfaces, you can override individual configuration values by entering the new value at the interface configuration level. If you remove the individual configuration values at the interface configuration level, the interface uses the values in the port profile again.
- There are no default configurations associated with a port profile.
- A subset of commands are available under the port profile configuration mode, depending on which interface type that you specify.

- You cannot use port profiles with Session Manager.

Debounce Timer Parameters

The port debounce time is the amount of time that an interface waits to notify the supervisor of a link going down. During this time, the interface waits to see if the link comes back up. The wait period is a time when traffic is stopped.

You can enable the debounce timer for each interface and specify the delay time in milliseconds.



Caution

When you enable the port debounce timer the link up and link down detections are delayed, resulting in a loss of traffic during the debounce period. This situation might affect the convergence and reconvergence of some protocols.

MTU Configuration

The Cisco Nexus device switch does not fragment frames. As a result, the switch cannot have two ports in the same Layer 2 domain with different maximum transmission units (MTUs). A per-physical Ethernet interface MTU is not supported. Instead, the MTU is set according to the QoS classes. You modify the MTU by setting class and policy maps.



Note

When you show the interface settings, a default MTU of 1500 is displayed for physical Ethernet interfaces and a receive data field size of 2112 is displayed for Fibre Channel interfaces.

Configuring Ethernet Interfaces

The section includes the following topics:

Configuring a Layer 3 Interface on a Cisco Nexus Device

On Cisco Nexus devices, you can configure a Layer 3 interface.

You can change a Layer 3 interface into a Layer 2 interface by using the **switchport** command. You can change a Layer 2 interface into a Layer 3 interface by using the **no switchport** command.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters configuration mode.
Step 2	switch(config)# interface ethernet slot/port	Enters configuration mode for the specified interface.

	Command or Action	Purpose
		Note If this is a QSFP+ GEM, the <i>slot/port</i> syntax is <i>slot/QSFP-module/port</i> .
Step 3	switch(config-if)# no switchport	Selects the Layer 3 interface.
Step 4	switch(config-if)# no shutdown	Restarts the interface.

This example shows how to configure a Layer 3 interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# no shutdown
```

Configuring Unified Ports

Before You Begin

Confirm that you have a supported Cisco Nexus switch. Unified Ports are available on the following Cisco Nexus switches:

If you're configuring a unified port as Fibre Channel or FCoE, confirm that you have enabled the **feature fcoe** command.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config) # slot slot number	Identifies the slot on the switch.
Step 3	switch(config-slot) # port port number type {ethernet fc}	Configures a unified port as a native Fibre Channel port and an Ethernet port. <ul style="list-style-type: none"> • type—Specifies the type of port to configure on a slot in a chassis. • ethernet—Specifies an Ethernet port. • fc—Specifies a Fibre Channel (FC) port. Note Changing unified ports on an expansion module (GEM) requires that you power cycle the GEM card. You do not have to reboot the entire switch for changes to take effect.
Step 4	switch(config-slot) # copy running-config startup-config	Copies the running configuration to the startup configuration.

	Command or Action	Purpose
Step 5	switch(config-slot) # reload	Reboots the switch.
Step 6	switch(config) # slot slot number	Identifies the slot on the switch.
Step 7	switch(config-slot) # no port port number type fc	Removes the unified port.

This example shows how to configure 20 ports as Ethernet ports and 12 as FC ports:

```
switch# configure terminal
switch(config)# slot 1
switch(config-slot)# port 21-32 type fc
switch(config-slot)# copy running-config startup-config
switch(config-slot)# reload
```

Configuring the UDLD Mode

You can configure normal or aggressive unidirectional link detection (UDLD) modes for Ethernet interfaces on devices configured to run UDLD. Before you can enable a UDLD mode for an interface, you must make sure that UDLD is already enabled on the device that includes the interface. UDLD must also be enabled on the other linked interface and its device.

To use the normal UDLD mode, you must configure one of the ports for normal mode and configure the other port for the normal or aggressive mode. To use the aggressive UDLD mode, you must configure both ports for the aggressive mode.



Note

Before you begin, UDLD must be enabled for the other linked port and its device.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# feature udld	Enables UDLD for the device.
Step 3	switch(config)# no feature udld	Disables UDLD for the device.
Step 4	switch(config)# show udld global	Displays the UDLD status for the device.
Step 5	switch(config)# interface type slot/port	Specifies an interface to configure, and enters interface configuration mode.
Step 6	switch(config-if)# udld {enable disable aggressive}	Enables the normal UDLD mode, disables UDLD, or enables the aggressive UDLD mode.
Step 7	switch(config-if)# show udld interface	Displays the UDLD status for the interface.

This example shows how to enable UDLD for the switch:

```
switch# configure terminal
switch(config)# feature udld
```

This example shows how to enable the normal UDLD mode for an Ethernet port:

```
switch# configure terminal
switch(config)# interface ethernet 1/4
switch(config-if)# udld enable
```

This example shows how to enable the aggressive UDLD mode for an Ethernet port:

```
switch# configure terminal
switch(config)# interface ethernet 1/4
switch(config-if)# udld aggressive
```

This example shows how to disable UDLD for an Ethernet port:

```
switch# configure terminal
switch(config)# interface ethernet 1/4
switch(config-if)# udld disable
```

This example shows how to disable UDLD for the switch:

```
switch# configure terminal
switch(config)# no feature udld
```

Configuring Interface Speed



Note

If the interface and transceiver speed is mismatched, the SFP validation failed message is displayed when you enter the **show interface ethernet slot/port** command. For example, if you insert a 1-Gigabit SFP transceiver into a port without configuring the speed 1000 command, you will get this error. By default, all ports are 10 Gigabits.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# interface type slot/port	Enters interface configuration mode for the specified interface. This interface must have a 1-Gigabit Ethernet SFP transceiver inserted into it.
Step 3	switch(config-if)# speed speed	Sets the speed for a physical Ethernet interface.

The following example shows how to set the speed for a 1-Gigabit Ethernet port:

```
switch# configure terminal
switch(config)# interface ethernet 1/4
switch(config-if)# speed 1000
```

Disabling Link Negotiation

You can disable link negotiation using the **no negotiate auto** command. By default, auto-negotiation is enabled on 1-Gigabit ports and disabled on 10-Gigabit ports.

This command is equivalent to the Cisco IOS **speed non-negotiate** command.



Note

The auto-negotiation configuration is not applicable on 10-Gigabit Ethernet ports. When auto-negotiation is configured on a 10-Gigabit port, the following error message is displayed:

```
ERROR: Ethernet1/40: Configuration does not match the port capability
```

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# interface ethernet slot/port	Selects the interface and enters interface mode.
Step 3	switch(config-if)# no negotiate auto	Disables link negotiation on the selected Ethernet interface (1-Gigabit port).
Step 4	switch(config-if)# negotiate auto	(Optional) Enables link negotiation on the selected Ethernet interface. The default for 1-Gigabit Ethernet ports is enabled. Note This command is not applicable for 10GBASE-T ports. It should not be used on 10-GBASE-T ports.

This example shows how to disable auto-negotiation on a specified Ethernet interface (1-Gigabit port):

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# no negotiate auto
switch(config-if)#
```

This example shows how to enable auto-negotiation on a specified Ethernet interface (1-Gigabit port):

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# negotiate auto
switch(config-if)#
```

Configuring the CDP Characteristics

You can configure the frequency of Cisco Discovery Protocol (CDP) updates, the amount of time to hold the information before discarding it, and whether or not to send Version-2 advertisements.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# [no] cdp advertise {v1 v2 }	(Optional) Configures the version to use to send CDP advertisements. Version-2 is the default state. Use the no form of the command to return to its default setting.
Step 3	switch(config)# [no] cdp format device-id {mac-address serial-number system-name}	(Optional) Configures the format of the CDP device ID. The default is the system name, which can be expressed as a fully qualified domain name. Use the no form of the command to return to its default setting.
Step 4	switch(config)# [no] cdp holdtime seconds	(Optional) Specifies the amount of time a receiving device should hold the information sent by your device before discarding it. The range is 10 to 255 seconds; the default is 180 seconds. Use the no form of the command to return to its default setting.
Step 5	switch(config)# [no] cdp timer seconds	(Optional) Sets the transmission frequency of CDP updates in seconds. The range is 5 to 254; the default is 60 seconds. Use the no form of the command to return to its default setting.

This example shows how to configure CDP characteristics:

```
switch# configure terminal
switch(config)# cdp timer 50
switch(config)# cdp holdtime 120
switch(config)# cdp advertise v2
```

Enabling or Disabling CDP

You can enable or disable CDP for Ethernet interfaces. This protocol works only when you have it enabled on both interfaces on the same link.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# interface <i>type slot/port</i>	Enters interface configuration mode for the specified interface.
Step 3	switch(config-if)# cdp enable	Enables CDP for the interface. To work correctly, this parameter must be enabled for both interfaces on the same link.
Step 4	switch(config-if)# no cdp enable	Disables CDP for the interface.

This example shows how to enable CDP for an Ethernet port:

```
switch# configure terminal
switch(config)# interface ethernet 1/4
switch(config-if)# cdp enable
```

This command can only be applied to a physical Ethernet interface.

Enabling the Error-Disabled Detection

You can enable error-disable (err-disabled) detection in an application. As a result, when a cause is detected on an interface, the interface is placed in an err-disabled state, which is an operational state that is similar to the link-down state.

**Note**

Base ports in Cisco Nexus 5500 never get error disabled due to pause rate-limit like in the Cisco Nexus 5020 or 5010 switch.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# errdisable detect cause { <i>all</i> <i>link-flap</i> <i>loopback</i> }	Specifies a condition under which to place the interface in an err-disabled state. The default is enabled.
Step 3	switch(config)# shutdown	Brings the interface down administratively. To manually recover the interface from the err-disabled state, enter this command first.
Step 4	switch(config)# no shutdown	Brings the interface up administratively and enables the interface to recover manually from the err-disabled state.

	Command or Action	Purpose
Step 5	switch(config)# show interface status err-disabled	Displays information about err-disabled interfaces.
Step 6	switch(config)# copy running-config startup-config	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

This example shows how to enable the err-disabled detection in all cases:

```
switch# configure terminal
switch(config)# errdisable detect cause all
switch(config)# shutdown
switch(config)# no shutdown
switch(config)# show interface status err-disabled
switch(config)# copy running-config startup-config
```

Enabling the Error-Disabled Recovery

You can specify the application to bring the interface out of the error-disabled (err-disabled) state and retry coming up. It retries after 300 seconds, unless you configure the recovery timer (see the **errdisable recovery interval** command).

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# errdisable recovery cause {all udd bpduguard link-flap failed-port-state pause-rate-limit}	Specifies a condition under which the interface automatically recovers from the err-disabled state, and the device retries bringing the interface up. The device waits 300 seconds to retry. The default is disabled.
Step 3	switch(config)# show interface status err-disabled	Displays information about err-disabled interfaces.
Step 4	switch(config)# copy running-config startup-config	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

This example shows how to enable err-disabled recovery under all conditions:

```
switch# configure terminal
switch(config)# errdisable recovery cause all
switch(config)# show interface status err-disabled
switch(config)# copy running-config startup-config
```

Configuring the Error-Disabled Recovery Interval

You can use this procedure to configure the err-disabled recovery timer value. The range is from 30 to 65535 seconds. The default is 300 seconds.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# errdisable recovery interval interval	Specifies the interval for the interface to recover from the err-disabled state. The range is from 30 to 65535 seconds. The default is 300 seconds.
Step 3	switch(config)# show interface status err-disabled	Displays information about err-disabled interfaces.
Step 4	switch(config)# copy running-config startup-config	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

This example shows how to enable err-disabled recovery under all conditions:

```
switch# configure terminal
switch(config)# errdisable recovery interval 32
switch(config)# show interface status err-disabled
switch(config)# copy running-config startup-config
```

Port Profiles

Creating a Port Profile

You can create a port profile on the switch. Each port profile must have a unique name across interface types and the network.

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: switch# configure terminal switch(config)#	Enters configuration mode.

	Command or Action	Purpose
Step 2	port-profile [type { ethernet interface-vlan port channel }] <i>name</i> Example: <pre>switch(config)# port-profile type ethernet test switch(config-port-prof) #</pre>	Creates and names a port profile for the specified type of interface and enters the port profile configuration mode.
Step 3	exit Example: <pre>switch(config-port-prof) # exit switch(config) #</pre>	Exits port profile configuration mode.
Step 4	show port-profile Example: <pre>switch(config)# show port-profile name</pre>	(Optional) Displays the port profile configuration.
Step 5	copy running-config startup-config Example: <pre>switch(config)# copy running-config startup-config</pre>	(Optional) Copies the running configuration to the startup configuration.

This example shows how to create a port profile named test for Ethernet interfaces:

```
switch# configure terminal
switch(config)# port-profile type ethernet test
switch(config-port-prof) #
```

This example shows how to add the interface commands to a port profile named ppEth configured for Ethernet interfaces:

```
switch# configure terminal
switch(config)# port-profile ppEth
switch(config-port-prof) # switchport mode trunk
switch(config-port-prof) # switchport trunk allowed vlan 300-400
switch(config-port-prof) # flowcontrol receive on
switch(config-port-prof) # speed 10000
switch(config-port-prof) #
```

Modifying a Port Profile

You can modify a port profile in port-profile configuration mode.

You can remove commands from a port profile using the **no** form of the command. When you remove a command from the port profile, the corresponding command is removed from the interface that is attached to the port profile.

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: switch# configure terminal switch(config)#	Enters configuration mode.
Step 2	port-profile [type {ethernet interface-vlan port channel}] name Example: switch(config)# port-profile type ethernet test switch(config-port-prof)#	Enters the port profile configuration mode for the specified port profile and allows you to add or remove configurations to the profile.
Step 3	exit Example: switch(config-port-prof)# exit switch(config)#	Exits the port profile configuration mode.
Step 4	show port-profile Example: switch(config)# show port-profile name	(Optional) Displays the port profile configuration.
Step 5	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Copies the running configuration to the startup configuration.

This example shows how to remove commands from the port profile named ppEth configured for an Ethernet interface:

```
switch# configure terminal
switch(config)# port-profile ppEth
switch(config-port-prof)# switchport mode trunk
switch(config-port-prof)# switchport trunk allowed vlan 300-400
switch(config-port-prof)# flowcontrol receive on
switch(config-port-prof)# no speed 10000
switch(config-port-prof)#
```

Enabling a Specific Port Profile

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: switch# configure terminal switch(config)#	Enters configuration mode.
Step 2	port-profile [type {ethernet interface-vlan port channel}] name Example: switch(config)# port-profile type ethernet test switch(config-port-prof)# no shutdown switch(config-port-prof)#	Enters the port profile configuration mode for the specified port profile.
Step 3	state enabled name Example: switch(config-port-prof)# state enabled switch(config-port-prof)#	Enables the port profile.
Step 4	exit Example: switch(config-port-prof)# exit switch(config)#	Exits the port profile configuration mode.
Step 5	show port-profile Example: switch(config)# show port-profile name	(Optional) Displays the port profile configuration.
Step 6	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Copies the running configuration to the startup configuration.

This example shows how to enter port profile configuration mode and enable the port profile:

```
switch# configure terminal
switch(config)# port-profile type ethernet test
switch(config-port-prof)# state enabled
switch(config-port-prof)#
```

Inheriting a Port Profile

You can inherit a port profile onto an existing port profile. The switch supports four levels of inheritance.

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: switch# configure terminal switch(config)#	Enters configuration mode.
Step 2	port-profile <i>name</i> Example: switch(config)# port-profile test switch(config-port-prof)#	Enters port profile configuration mode for the specified port profile.
Step 3	inherit port-profile <i>name</i> Example: switch(config-port-prof)# inherit port-profile adam switch(config-port-prof)#	Inherits another port profile onto the existing one. The original port profile assumes all the configurations of the inherited port profile.
Step 4	exit Example: switch(config-port-prof)# exit switch(config)#	Exits the port profile configuration mode.
Step 5	show port-profile Example: switch(config)# show port-profile <i>name</i>	(Optional) Displays the port profile configuration.
Step 6	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Copies the running configuration to the startup configuration.

This example shows how to inherit the port profile named adam onto the port profile named test:

```
switch# configure terminal
switch(config)# port-profile test
switch(config-ppm)# inherit port-profile adam
switch(config-ppm)#
```

This example shows how to add the interface commands to a port profile named ppEth configured for Ethernet interfaces:

```
switch# configure terminal
switch(config)# port-profile ppEth
switch(config-port-prof)# switchport mode trunk
switch(config-port-prof)# switchport trunk allowed vlan 300-400
switch(config-port-prof)# flowcontrol receive on
switch(config-port-prof)# speed 10000
switch(config-port-prof)#
```

This example shows how to inherit a port profile named ppEth configured for Ethernet interfaces into an existing port profile named test:

```
switch# configure terminal
switch(config)# port-profile test
switch(config-port-prof)# inherit port-profile ppEth
switch(config-port-prof)#
```

This example shows how to assign a port profile named ppEth configured for Ethernet interfaces to a range of Ethernet interfaces:

```
switch# configure terminal
switch(config)# interface ethernet 1/2-5
switch(config-if)# inherit port-profile ppEth
switch(config-if)#
```

This example shows how to remove an inherited port profile named ppEth from an existing port profile named test:

```
switch# configure terminal
switch(config)# port-profile test
switch(config-port-prof)# no inherit port-profile ppEth
switch(config-port-prof)#
```

Removing an Inherited Port Profile

You can remove an inherited port profile.

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: switch# configure terminal switch(config)#	Enters configuration mode.
Step 2	port-profile name Example: switch(config)# port-profile test switch(config-port-prof)#	Enters port profile configuration mode for the specified port profile.
Step 3	no inherit port-profile name Example: switch(config-port-prof)# no inherit port-profile adam switch(config-port-prof)#	Removes an inherited port profile from this port profile.
Step 4	exit Example: switch(config-port-prof)# exit switch(config)#	Exits the port profile configuration mode.
Step 5	show port-profile Example: switch(config)# show port-profile name	(Optional) Displays the port profile configuration.

	Command or Action	Purpose
Step 6	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Copies the running configuration to the startup configuration.

This example shows how to remove the inherited port profile named adam from the port profile named test:

```
switch# configure terminal
switch(config)# port-profile test
switch(config-ppm)# no inherit port-profile adam
switch(config-ppm)#
```

Assigning a Port Profile to a Range of Interfaces

You can assign a port profile to an interface or to a range of interfaces. All of the interfaces must be the same type.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	interface [ethernet <i>slot/port</i> interface-vlan <i>vlan-id</i> port-channel <i>number</i>]	Selects the range of interfaces.
Step 3	inherit port-profile <i>name</i>	Assigns the specified port profile to the selected interfaces.
Step 4	exit	Exits port profile configuration mode.
Step 5	show port-profile <i>name</i>	(Optional) Displays the port profile configuration.
Step 6	switch(config)# copy running-config startup-config	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

This example shows how to assign the port profile named adam to Ethernet interfaces 2/3 to 2/5, 3/2, and 1/20 to 1/25:

```
switch# configure terminal
switch(config)# interface ethernet 2/3 to 2/5, 3/2, and 1/20 to 1/25
switch(config-if)# inherit port-profile adam
switch(config-if)# exit
switch(config)# show port-profile adam
switch(config)# copy running-config startup-config
```

Removing a Port Profile from a Range of Interfaces

You can remove a port profile from some or all of the interfaces to which you have applied the profile.

Procedure

	Command or Action	Purpose
Step 1	<code>switch# configure terminal</code>	Enters global configuration mode.
Step 2	<code>interface [ethernet slot/port interface-vlan vlan-id port-channel number]</code>	Selects the range of interfaces.
Step 3	<code>no inherit port-profile name</code>	Removes the specified port profile from the selected interfaces.
Step 4	<code>exit</code>	Exits port profile configuration mode.
Step 5	<code>show port-profile</code>	(Optional) Displays the port profile configuration.
Step 6	<code>switch(config)# copy running-config startup-config</code>	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

This example shows how to remove the port profile named adam from Ethernet interfaces 1/3-5:

```
switch# configure terminal
switch(config)# interface ethernet 1/3-5
switch(config-if)# no inherit port-profile adam
switch(config-if)# exit
switch(config)# show port-profile
switch(config)# copy running-config startup-config
```

Configuration Examples for Port Profiles

The following example shows how to configure a port profile, inherit the port profile on an Ethernet interface, and enabling the port profile.

```
switch(config)#
switch(config)# show running-config interface Ethernet1/14

!Command: show running-config interface Ethernet1/14
!Time: Thu Aug 26 07:01:32 2010

version 5.0(2)N1(1)

interface Ethernet1/14

switch(config)# port-profile type ethernet alpha
switch(config-port-prof)# switchport mode trunk
switch(config-port-prof)# switchport trunk allowed vlan 10-15
switch(config-port-prof)#
switch(config-port-prof)# show running-config port-profile alpha

!Command: show running-config port-profile alpha
```

```

!Time: Thu Aug 26 07:02:29 2010

version 5.0(2)N1(1)
port-profile type ethernet alpha
  switchport mode trunk
  switchport trunk allowed vlan 10-15

switch(config-port-prof)# int eth 1/14
switch(config-if)# inherit port-profile alpha
switch(config-if)#
switch(config-if)# port-profile type ethernet alpha
switch(config-port-prof)# state enabled
switch(config-port-prof)#
switch(config-port-prof)# sh running-config interface ethernet 1/14

!Command: show running-config interface Ethernet1/14
!Time: Thu Aug 26 07:03:17 2010

version 5.0(2)N1(1)

interface Ethernet1/14
  inherit port-profile alpha

switch(config-port-prof)# sh running-config interface ethernet 1/14 expand-port-profile

!Command: show running-config interface Ethernet1/14 expand-port-profile
!Time: Thu Aug 26 07:03:21 2010

version 5.0(2)N1(1)

interface Ethernet1/14
  switchport mode trunk
  switchport trunk allowed vlan 10-15

switch(config-port-prof)#

```

Configuring the Debounce Timer

You can enable the debounce timer for Ethernet ports by specifying a debounce time (in milliseconds) or disable the timer by specifying a debounce time of 0.

You can show the debounce times for all of the Ethernet ports by using the **show interface debounce** command.

To enable or disable the debounce timer, perform this task:

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# interface <i>type slot/port</i>	Enters interface configuration mode for the specified interface.
Step 3	switch(config-if)# link debounce time <i>milliseconds</i>	Enables the debounce timer for the amount of time (1 to 5000 milliseconds) specified. Disables the debounce timer if you specify 0 milliseconds.

This example shows how to enable the debounce timer and set the debounce time to 1000 milliseconds for an Ethernet interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/4
switch(config-if)# link debounce time 1000
```

This example shows how to disable the debounce timer for an Ethernet interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/4
switch(config-if)# link debounce time 0
```

Configuring the Description Parameter

You can provide textual interface descriptions for the Ethernet ports.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# interface <i>type slot/port</i>	Enters interface configuration mode for the specified interface.
Step 3	switch(config-if)# description <i>test</i>	Specifies the description for the interface.

This example shows how to set the interface description to Server 3 interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/3
switch(config-if)# description Server 3 Interface
```

Disabling and Restarting Ethernet Interfaces

You can shut down and restart an Ethernet interface. This action disables all of the interface functions and marks the interface as being down on all monitoring displays. This information is communicated to other network servers through all dynamic routing protocols. When shut down, the interface is not included in any routing updates.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# interface <i>type slot/port</i>	Enters interface configuration mode for the specified interface.
Step 3	switch(config-if)# shutdown	Disables the interface.
Step 4	switch(config-if)# no shutdown	Restarts the interface.

This example shows how to disable an Ethernet port:

```
switch# configure terminal
switch(config)# interface ethernet 1/4
switch(config-if)# shutdown
```

This example shows how to restart an Ethernet interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/4
switch(config-if)# no shutdown
```

Displaying Interface Information

To view configuration information about the defined interfaces, perform one of these tasks:

Command	Purpose
switch# show interface <i>type slot/port</i>	Displays the detailed configuration of the specified interface.
switch# show interface <i>type slot/port capabilities</i>	Displays detailed information about the capabilities of the specified interface. This option is available only for physical interfaces.
switch# show interface <i>type slot/port transceiver</i>	Displays detailed information about the transceiver connected to the specified interface. This option is available only for physical interfaces.
switch# show interface brief	Displays the status of all interfaces.
switch# show interface flowcontrol	Displays the detailed listing of the flow control settings on all interfaces.
switch# show interface debounce	Displays the debounce status of all interfaces.
show port--profile	Displays information about the port profiles.

The **show interface** command is invoked from EXEC mode and displays the interface configurations. Without any arguments, this command displays the information for all the configured interfaces in the switch.

This example shows how to display the physical Ethernet interface:

```
switch# show interface ethernet 1/1
Ethernet1/1 is up
Hardware is 1000/10000 Ethernet, address is 000d.eca3.5f08 (bia 000d.eca3.5f08)
MTU 1500 bytes, BW 10000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 190/255, rxload 192/255
Encapsulation ARPA
Port mode is trunk
full-duplex, 10 Gb/s, media type is 1/10g
Input flow-control is off, output flow-control is off
```

```

Auto-mdix is turned on
Rate mode is dedicated
Switchport monitor is off
Last clearing of "show interface" counters never
5 minute input rate 942201806 bytes/sec, 14721892 packets/sec
5 minute output rate 935840313 bytes/sec, 14622492 packets/sec
Rx
 129141483840 input packets 0 unicast packets 129141483847 multicast packets
 0 broadcast packets 0 jumbo packets 0 storm suppression packets
 8265054965824 bytes
 0 No buffer 0 runt 0 Overrun
 0 crc 0 Ignored 0 Bad etype drop
 0 Bad proto drop
Tx
 119038487241 output packets 119038487245 multicast packets
 0 broadcast packets 0 jumbo packets
 7618463256471 bytes
 0 output CRC 0 ecc
 0 underrun 0 if down drop 0 output error 0 collision 0 deferred
 0 late collision 0 lost carrier 0 no carrier
 0 babble
 0 Rx pause 8031547972 Tx pause 0 reset

```

This example shows how to display the physical Ethernet capabilities:

```

switch# show interface ethernet 1/1 capabilities
Ethernet1/1
 Model:                734510033
 Type:                 10Gbase-(unknown)
 Speed:                1000,10000
 Duplex:                full
 Trunk encap. type:    802.1Q
 Channel:              yes
 Broadcast suppression: percentage(0-100)
 Flowcontrol:          rx-(off/on),tx-(off/on)
 Rate mode:            none
 QOS scheduling:        rx-(6q1t),tx-(1p6q0t)
 CoS rewrite:          no
 ToS rewrite:          no
 SPAN:                 yes
 UDL:                  yes
 Link Debounce:        yes
 Link Debounce Time:   yes
 MDIX:                 no
 FEX Fabric:           yes

```

This example shows how to display the physical Ethernet transceiver:

```

switch# show interface ethernet 1/1 transceiver
Ethernet1/1
 sfp is present
 name is CISCO-EXCELIGHT
 part number is SPP5101SR-C1
 revision is A
 serial number is ECL120901AV
 nominal bitrate is 10300 Mbits/sec
 Link length supported for 50/125mm fiber is 82 m(s)
 Link length supported for 62.5/125mm fiber is 26 m(s)
 cisco id is --
 cisco extended id number is 4

```

This example shows how to display a brief interface status (some of the output has been removed for brevity):

```
switch# show interface brief
```

```

-----
Ethernet      VLAN   Type Mode   Status Reason          Speed   Port
Interface                                           Ch #
-----
Eth1/1        200   eth trunk up      none          10G(D) --
Eth1/2        1     eth trunk up      none          10G(D) --
Eth1/3        300   eth access down   SFP not inserted 10G(D) --
Eth1/4        300   eth access down   SFP not inserted 10G(D) --

```

```
Eth1/5      300   eth  access down   Link not connected   1000 (D)  --
Eth1/6      20    eth  access down   Link not connected   10G (D)   --
Eth1/7      300   eth  access down   SFP not inserted    10G (D)   --
...
```

This example shows how to display the link debounce status (some of the output has been removed for brevity):

```
switch# show interface debounce
```

```
-----
Port          Debounce time  Value(ms)
-----
...
Eth1/1        enable         100
Eth1/2        enable         100
Eth1/3        enable         100
...
```

This example shows how to display the CDP neighbors:



Note

The default device ID field for CDP advertisement is the hostname and serial number, as in the example above.

```
switch# show cdp neighbors
Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute
Device ID         Local Intrfce  Hldtme  Capability  Platform  Port ID
d13-dist-1       mgmt0         148     S I         WS-C2960-24TC  Fas0/9
n5k (FLC12080012) Eth1/5        8       S I s       N5K-C5020P-BA  Eth1/5
```

Default Physical Ethernet Settings

The following table lists the default settings for all physical Ethernet interfaces:

Parameter	Default Setting
Debounce	Enable, 100 milliseconds
Duplex	Auto (full-duplex)
Encapsulation	ARPA
MTU ¹	1500 bytes
Port Mode	Access
Speed	Auto (10000)

¹ MTU cannot be changed per-physical Ethernet interface. You modify MTU by selecting maps of QoS classes.

