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CHAPTER 1

Configuring Ethernet Interfaces

This section describes the configuration of the Ethernet interfaces on a Cisco Nexus 5000 Series switch. It includes the following sections:

- [Information About Ethernet Interfaces, page 1-1](#)
- [Configuring Ethernet Interfaces, page 1-4](#)
- [Displaying Interface Information, page 1-9](#)

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. For additional information, see [Chapter 1, “Configuring FCoE”](#) and [Chapter 1, “Configuring Virtual Interfaces.”](#)

On a Cisco Nexus 5000 Series switch, the Ethernet interfaces are enabled by default.

This section includes the following topics:

- [About the Interface Command, page 1-1](#)
- [Unidirectional Link Detection Parameter, page 1-2](#)
- [Interface Speed, page 1-4](#)
- [About the Debounce Timer Parameters, page 1-4](#)
- [About MTU Configuration, page 1-4](#)

About the 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),

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- Port number
 - Port number within the group.

Unidirectional Link Detection Parameter

This section includes the following topics:

- [UDLD Overview, page 1-2](#)
- [Default UDLD Configuration, page 1-3](#)
- [UDLD Aggressive and Nonaggressive Modes, page 1-3](#)

UDLD Overview

The Cisco-proprietary Unidirectional Link Detection (UDLD) protocol allows ports that are connected through fiber-optic 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, as long as 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 5000 Series switch 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.



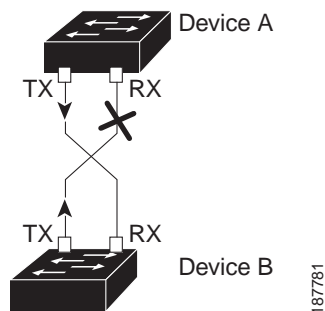
Note

By default, UDLD is locally disabled on copper LAN ports to avoid sending unnecessary control traffic on this type of media.

Figure 1-1 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.

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Figure 1-1 Unidirectional Link



Default UDLD Configuration

Table 1-1 shows the default UDLD configuration.

Table 1-1 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	Disabled on all Ethernet 10/100 and 1000BASE-TX LAN ports

For information on configuring the UDLD for the device and its port, see the [“Configuring the UDLD Mode” section on page 1-4](#).

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 frame, 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.

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Interface Speed

A Cisco Nexus 5000 Series switch has a number of fixed 10-Gigabit ports, each equipped with SFP+ interface adapters. The Nexus 5010 switch has 20 fixed ports, the first eight of which are switchable 1-Gigabit/10-Gigabit ports. The Nexus 5020 switch has 40 fixed ports, the first 16 of which are switchable 1-Gigabit/10-Gigabit ports.

About the 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.

About MTU Configuration

A per-physical Ethernet interface maximum transmission unit (MTU) is not supported. Instead, MTU is set according to the QoS classes. You modify MTU by setting Policy and Class maps. See [Chapter 1, “Configuring QoS”](#) for more details.

When you show the interface settings, an 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

This section shows how to configure Ethernet interfaces. It includes the following topics:

- [Configuring the UDLD Mode, page 1-4](#)
- [Configuring Interface Speed, page 1-5](#)
- [Configuring the CDP Parameter, page 1-6](#)
- [Configuring the Debounce Timer, page 1-7](#)
- [Configuring the Description Parameter, page 1-7](#)
- [Disabling and Restarting Ethernet Interfaces, page 1-8](#)

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.

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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.

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

This example shows how to enable the 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

The first eight ports of a Nexus 5010 switch and the first 16 ports of a Nexus 5020 switch are switchable 1-Gigabit/10-Gigabit ports. The default interface speed is 10-Gigabit. To configure these ports for 1-Gigabit Ethernet, insert a 1-Gigabit Ethernet SFP transceiver into the applicable port then set its speed with the **speed** command.

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To configure a 1-Gigabit Ethernet port, perform this task:

	Command	Purpose
Step 1	switch# configure terminal	Enters 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 on the 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
```

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



Note

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

Configuring the CDP Parameter

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

To enable or disable CDP for an interface, perform this task:

	Command	Purpose
Step 1	switch# configure terminal	Enters configuration mode.
Step 2	switch(config)# interface type slot/port	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.
	switch(config-if)# cdp disable	Disables CDP for the interface.

The following 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.

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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:

	Command	Purpose
Step 1	switch# configure terminal	Enters 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
```

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

Configuring the Description Parameter

To provide textual interface descriptions for the Ethernet ports, perform this task:

	Command	Purpose
Step 1	switch# configure terminal	Enters 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
```

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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.

To disable an interface, perform this task:

	Command	Purpose
Step 1	switch# configure terminal	Enters 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.

The following example shows how to disable an Ethernet port:

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

To restart an interface, perform this task:

	Command	Purpose
	switch(config-if)# no shutdown	Restarts the interface.

The following example shows how to restart an Ethernet interface:

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


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

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.

The following example shows how to display the physical Ethernet interface:

```
switch# show interface ethernet 1/4
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
```

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```
0 babble
0 Rx pause 8031547972 Tx pause 0 reset
```

The following example shows how to display the physical Ethernet capabilities:

```
switch# show interface ethernet 1/3 capabilities
Ethernet1/1
  Model:                AGD11342302
  Type:                 10Gbase-SR
  Speed:                1000,10000
  Duplex:               full
  Trunk encap. type:    802.1Q
  Channel:              no
  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
  UDLD:                 yes
  Link Debounce:        yes
  Link Debounce Time:   yes
  MDIX:                 no
```

The following example shows how to display the physical Ethernet transceiver:

```
switch# show interface ethernet 1/3 transceiver
Ethernet1/3
  sfp is present
  name is CISCO-AVAGO
  part number is SFBR-7700SDZ   B4 R
  revision is B4 R
  serial number is AGD1134229V   070823
  nominal bitrate is 0 Mbits/sec
  Link length supported for 50/125mm fiber is 0 m(s)
  Link length supported for 62.5/125mm fiber is 0 m(s)
  cisco id is --
  cisco extended id number is 4
```

The following 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
-----
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) --
...

```

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

```
switch# show interface debounce

-----
```

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

The following example shows how to display the CDP neighbors:

```
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
d5-switch-9.qa.    Eth1/40        148     R S I       WS-C6506-E  Ten4/2
dist-row-d         mgmt0          147     R S I       WS-C3560G-48T Gig0/34
```

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. See [Chapter 1, "Configuring QoS,"](#) for additional information.

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