



CHAPTER 26

Configuring UDLD

This chapter describes how to configure the UniDirectional Link Detection (UDLD) protocol on the Cisco ME 3400E Ethernet Access switch.



Note

For complete syntax and usage information for the commands used in this chapter, see the command reference for this release.

- [Understanding UDLD, page 26-1](#)
[Configuring UDLD, page 26-3](#)
[Displaying UDLD Status, page 26-6](#)

Understanding UDLD

UDLD is a Layer 2 protocol that enables devices connected through fiber-optic or twisted-pair Ethernet cables to monitor the physical configuration of the cables and detect when a unidirectional link exists. All connected devices must support UDLD for the protocol to successfully identify and disable unidirectional links. When UDLD detects a unidirectional link, it disables the affected port and alerts you. Unidirectional links can cause a variety of problems, including spanning-tree topology loops.

Modes of Operation

UDLD supports two modes of operation: normal (the default) and aggressive. In normal mode, UDLD can detect unidirectional links due to misconnected ports on fiber-optic connections. In aggressive mode, UDLD can also detect unidirectional links due to one-way traffic on fiber-optic and twisted-pair links and to misconnected ports on fiber-optic links.

In normal and aggressive modes, UDLD works with the Layer 1 mechanisms to learn 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 ports. When you enable both autonegotiation and UDLD, the 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 sent by a local device is received by its neighbor but traffic from the neighbor is not received by the local device.

- On fiber-optic or twisted-pair links, one of the ports cannot send or receive traffic.
- On fiber-optic or twisted-pair links, one of the ports is down while the other is up.
- One of the fiber strands in the cable is disconnected.

In these cases, UDLD disables the affected port.

In a point-to-point link, UDLD hello packets can be considered as a heart beat whose presence guarantees the health of the link. Conversely, the loss of the heart beat means that the link must be shut down if it is not possible to re-establish a bidirectional link.

If both fiber strands in a cable are working normally from a Layer 1 perspective, UDLD in aggressive mode detects whether those fiber strands 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.

Methods to Detect Unidirectional Links

- Neighbor database maintenance

UDLD learns about other UDLD-capable neighbors by periodically sending a hello packet (also called an advertisement or probe) on every active port to keep each device informed about its neighbors.

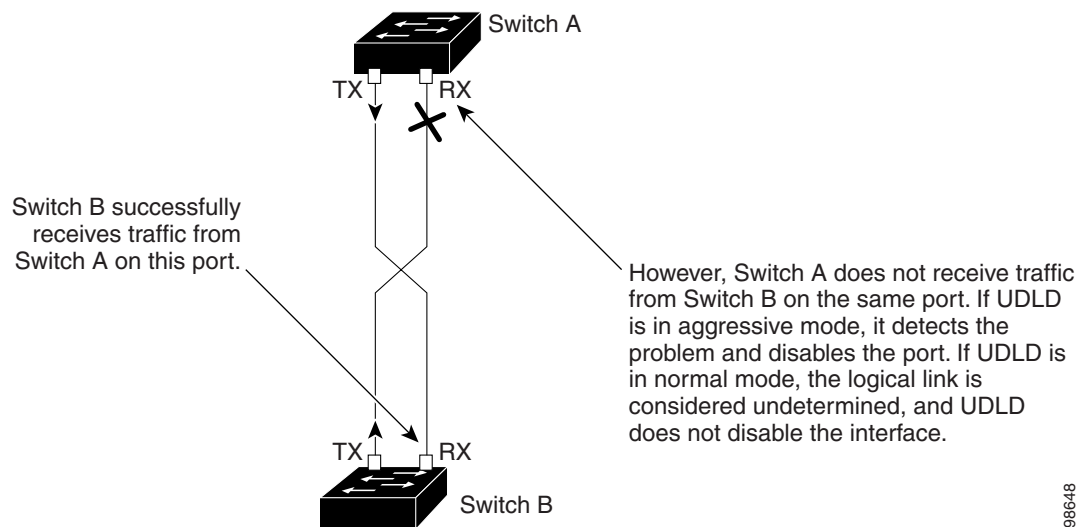
When the switch receives a hello message, it caches the information until the age time (hold time or time-to-live) expires. If the switch receives a new hello message before an older cache entry ages, the switch replaces the older entry with the new one.

Whenever a port is disabled and UDLD is running, whenever UDLD is disabled on a port, or whenever the switch is reset, UDLD clears all existing cache entries for the ports affected by the configuration change. UDLD sends at least one message to inform the neighbors to flush the part of their caches affected by the status change. The message is intended to keep the caches synchronized.

Event-driven detection and echoing

UDLD relies on echoing as its detection mechanism. Whenever a UDLD device learns about a new neighbor or receives a resynchronization request from an out-of-sync neighbor, it restarts the detection window on its side of the connection and sends echo messages in reply. Because this behavior is the same on all UDLD neighbors, the sender of the echoes expects to receive an echo in reply.

Figure 26-1 *UDLD Detection of a Unidirectional Link*



Configuring UDLD

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- [Configuration Guidelines, page 26-4](#)
- [Enabling UDLD Globally, page 26-5](#)
 - [Enabling UDLD on an Interface, page 26-5](#)
 - [Resetting an Interface Disabled by UDLD, page 26-6](#)

Default UDLD Configuration

Table 26-1 Default UDLD Configuration

Feature	Default Setting
	Disabled on all Ethernet 10/100 and 1000BASE-TX ports
UDLD aggressive mode	Disabled

Configuration Guidelines

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Caution

connected device that is running STP.

Enabling UDLD Globally

	Command	Purpose
Step 1	configure terminal	
Step 2	udld { enable message time message-timer-interval}	<p>Specify the UDLD mode of operation:</p> <ul style="list-style-type: none"> —Enables UDLD in aggressive mode on all fiber-optic ports. —Enables UDLD in normal mode on all fiber-optic ports on the switch. UDLD is disabled by default. <p>An individual interface configuration overrides the setting of the global configuration command.</p> <p>For more information about aggressive and normal modes, see the “Modes of Operation” section on page 26-1.</p> <ul style="list-style-type: none"> —Configures the period of time between UDLD probe messages on ports that are in the advertisement phase and are detected to be bidirectional. The range is from 7 to 90 seconds. <p>This command affects fiber-optic ports only. Use the interface configuration command to enable UDLD on other port types. For more information, see the “Enabling UDLD on an Interface” section on page 26-5.</p>
Step 3		Return to privileged EXEC mode.
Step 4	show udd	Verify your entries.
Step 5	copy running-config startup-config	

no udd enable
no udd aggressive

Enabling UDLD on an Interface

configure terminal	
interface <i>interface-id</i>	

	Command	Purpose
Step 4		<ul style="list-style-type: none"> • • <p>Note</p>
Step 5		
Step 6		
Step 7		

Resetting an Interface Disabled by UDLD

	Command	Purpose
Step 1		
Step 2		

You can also bring up the port by using these commands:

- **The shutdown** `no shutdown` interface configuration command re-enables the disabled fiber-optic port.
- **The aggressive timer** `no udd aggressive | enable` global configuration command enables the timer to automatically recover from the UDLD error-disabled state, and the `udd aggressive | enable` global configuration command re-enables the disabled fiber-optic port.
- **The recovery timer** `no udd port` interface configuration command re-enables the disabled fiber-optic port.
- **The recovery timer** `udd port [aggressive]` interface configuration command re-enables the disabled fiber-optic port.

The `no udd aggressive | enable` global configuration command enables the timer to automatically recover from the UDLD error-disabled state, and the `udd aggressive | enable` global configuration command re-enables the disabled fiber-optic port. The `no udd port` interface configuration command re-enables the disabled fiber-optic port. The `udd port [aggressive]` interface configuration command re-enables the disabled fiber-optic port.

Displaying UDLD Status

