



Configuring LLDP

This chapter describes how to configure the Link Layer Discovery Protocol (LLDP) in order to discover other devices on the local network.

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Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at <https://tools.cisco.com/bugsearch/> and the release notes for your software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the "New and Changed Information" chapter or the Feature History table in this chapter.

About LLDP

The Cisco Discovery Protocol (CDP) is a device discovery protocol that allows network management applications to automatically discover and learn about other Cisco devices that are connected to the network.

To permit the discovery of non-Cisco devices, the switch also supports the Link Layer Discovery Protocol (LLDP), a vendor-neutral device discovery protocol that is defined in the IEEE 802.1ab standard. LLDP allows network devices to advertise information about themselves to other devices on the network. This protocol runs over the data-link layer, which allows two systems running different network layer protocols to learn about each other.

LLDP is a one-way protocol that transmits information about the capabilities and status of a device and its interfaces. LLDP devices use the protocol to solicit information only from other LLDP devices.

LLDP supports a set of attributes that it uses to discover other devices. These attributes contain type, length, and value (TLV) descriptions. LLDP devices can use TLVs to send and receive information to other devices on the network. Details such as configuration information, device capabilities, and device identity can be advertised using this protocol.

LLDP advertises the following TLVs by default:

- DCBXP
- Management address
- Port description
- Port VLAN
- System capabilities
- System description
- System name

About DCBXP

The Data Center Bridging Exchange Protocol (DCBXP) is an extension of LLDP. It is used to announce, exchange, and negotiate node parameters between peers. DCBXP parameters are packaged into a specific DCBXP TLV. This TLV is designed to provide an acknowledgement to the received LLDP packet. In this way, DCBXP adds a lightweight acknowledgement mechanism on top of LLDP so that any application that needs a request-response semantic from a link-level protocol can make use of DCBXP.

Other applications that need to exchange and negotiate parameters with peer nodes using DCBXP are as follows:

- Priority-based Flow Control (PFC)—PFC is an enhancement to the existing Pause mechanism in Ethernet. It enables Pause based on user priorities or classes of service. A physical link divided into eight virtual links with PFC provides the capability to use Pause on a single virtual link without affecting traffic on the other virtual links. Enabling Pause on a per-user-priority basis allows administrators to create lossless links for traffic requiring no-drop service while retaining packet-drop congestion management for IP traffic.
- Enhanced Transmission Selection (ETS)—ETS enables optimal bandwidth management of virtual links. ETS is also called priority grouping. It enables differentiated treatments within the same priority classes of PFC. ETS provides prioritized processing based on bandwidth allocation, low latency, or best effort, resulting in per-group traffic class allocation. For example, an Ethernet class of traffic may have a high-priority designation and a best effort within that same class. ETS allows differentiation between traffic of the same priority class, thus creating priority groups.
- Application Priority Configuration TLV—Carries information about which VLANs will be used by specific protocols.



Note For information on the quality of service (QoS) features, see the *Cisco Nexus 7000 Series NX-OS Quality of Service Configuration Guide*.

DCBXP is enabled by default, provided LLDP is enabled. When LLDP is enabled, DCBXP can be enabled or disabled using the **[no] lldp tlv-select dcbxp** command. DCBXP is disabled on ports where LLDP transmit or receive is disabled.

High Availability

The LLDP feature supports stateless and stateful restarts. After a reboot or supervisor switchover, the running configuration is applied.

For more information on high availability, see the *Cisco Nexus 7000 Series NX-OS High Availability and Redundancy Guide*.

Virtualization Support

One instance of LLDP is supported.

Guidelines and Limitations for LLDP

LLDP has the following configuration guidelines and limitations:

- LLDP must be enabled on the device before you can enable or disable it on any interfaces.
- LLDP is supported only on physical interfaces.
- LLDP can discover up to one device per port.
- LLDP can discover Linux servers, provided they are not using a converged network adapter (CNA). LLDP cannot discover other types of servers.
- DCBXP incompatibility messages might appear when you change the network QoS policy if a physical loopback connection is in the device. The incompatibility exists for only a short time and then clears.
- DCBXP is not supported for the Cisco Nexus 2000 Series Fabric Extender.
- Beginning with Cisco NX-OS Release 5.2, LLDP is supported for the Cisco Nexus 2000 Series Fabric Extender. LLDP packets can now be sent and received through the Fabric Extender ports for neighbor discovery.
 - All LLDP configuration on Fabric Extender ports occurs on the supervisor. LLDP configuration and **show** commands are not visible on the Fabric Extender console.
 - LLDP is not supported for a Fabric Extender-virtual port channel (vPC) connection.

Default Settings for LLDP

This table lists the LLDP default settings.

Parameters	Default
Global LLDP	Disabled

Parameters	Default
LLDP on interfaces	Enabled, after LLDP is enabled globally
LLDP hold time (before discarding)	120 seconds
LLDP reinitialization delay	2 seconds
LLDP timer (packet update frequency)	30 seconds
LLDP TLVs	Enabled
LLDP receive	Enabled, after LLDP is enabled globally
LLDP transmit	Enabled, after LLDP is enabled globally
DCBXP	Enabled, provided LLDP is enabled

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Note Cisco NX-OS commands for this feature may differ from Cisco IOS commands for a similar feature.

Enabling or Disabling LLDP Globally

You can enable or disable LLDP globally on a device. You must enable LLDP globally to allow a device to send and receive LLDP packets.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# [no] feature lldp	Enables or disables LLDP on the device. LLDP is disabled by default.
Step 3	(Optional) switch(config)# show running-config lldp	Displays the global LLDP configuration. If LLDP is enabled, it shows "feature lldp." If LLDP is disabled, it shows an "Invalid command" error.
Step 4	(Optional) switch(config)# copy running-config startup-config	Copies the running configuration to the startup configuration.

Enabling or Disabling LLDP on an Interface

After you globally enable LLDP, it is enabled on all supported interfaces by default. However, you can enable or disable LLDP on individual interfaces or selectively configure an interface to only send or only receive LLDP packets.

Before you begin

Make sure that you have globally enabled LLDP on the device.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# interface <i>interface slot/port</i>	Specifies the interface on which you are enabling LLDP and enters the interface configuration mode.
Step 3	switch(config-if)# [no] lldp transmit	Enables or disables the transmission of LLDP packets on an interface. After you globally enable LLDP, it is enabled on all supported interfaces by default.
Step 4	switch(config-if)# [no] lldp receive	Enables or disables the reception of LLDP packets on an interface. After you globally enable LLDP, it is enabled on all supported interfaces by default.
Step 5	(Optional) switch(config-if)# show lldp interface <i>interface slot/port</i>	Displays the LLDP configuration on the interface.
Step 6	(Optional) switch(config)# copy running-config startup-config	Copies the running configuration to the startup configuration.

Configuring Optional LLDP Parameters

You can configure the frequency of LLDP updates, the amount of time for a receiving device to hold the information before discarding it, and the initialization delay time. You can also select the TLVs to include in LLDP packets.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	(Optional) switch(config)# [no] lldp holdtime <i>seconds</i>	Specifies the amount of time in seconds that a receiving device should hold the information sent by your device before discarding it. The range is 10 to 255 seconds; the default is 120 seconds.
Step 3	(Optional) switch(config)# [no] lldp reinit <i>seconds</i>	Specifies the delay time in seconds for LLDP to initialize on any interface. The range is 1 to 10 seconds; the default is 2 seconds.

	Command or Action	Purpose
Step 4	(Optional) switch(config)# [no] lldp timer <i>seconds</i>	Specifies the transmission frequency of LLDP updates in seconds. The range is 5 to 254 seconds; the default is 30 seconds.
Step 5	(Optional) switch(config)# show lldp timers	Displays the LLDP hold time, delay time, and update frequency configuration.
Step 6	(Optional) switch(config)# [no] lldp tlv-select <i>tlv</i>	Specifies the TLVs to send and receive in LLDP packets. The available TLVs are dcbxp, management-address, port-description, port-vlan, system-capabilities, system-description, and system-name. All available TLVs are enabled by default.
Step 7	(Optional) switch(config)# show lldp tlv-select	Displays the LLDP TLV configuration.
Step 8	(Optional) switch(config)# copy running-config startup-config	Copies the running configuration to the startup configuration.

Verifying the LLDP Configuration

To display the LLDP configuration, perform one of the following tasks:

Command	Purpose
show running-config lldp	Displays the global LLDP configuration.
show lldp interface <i>interface slot/port</i>	Displays the LLDP interface configuration.
show lldp timers	Displays the LLDP hold time, delay time, and update frequency configuration.
show lldp tlv-select	Displays the LLDP TLV configuration.
show lldp dcbx interface <i>interface slot/port</i>	Displays the local DCBX control status.
show lldp neighbors { detail interface <i>interface slot/port</i> }	Displays the LLDP neighbor device status.
show lldp traffic	Displays the LLDP counters, including the number of LLDP packets sent and received by the device, the number of discarded packets, and the number of unrecognized TLVs.
show lldp traffic interface <i>interface slot/port</i>	Displays the number of LLDP packets sent and received on the interface.

Use the **clear lldp counters** command to clear the LLDP statistics.

Configuration Example for LLDP

This example shows how to enable LLDP on a device; disable LLDP on some interfaces; configure optional parameters such as hold time, delay time, and update frequency; and disable several LLDP TLVs:

```
switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# feature lldp
switch(config)# interface ethernet 7/9
switch(config-if)# no lldp transmit
switch(config-if)# no lldp receive
switch(config-if)# exit
switch(config)# interface ethernet 7/10
switch(config-if)# no lldp transmit
switch(config-if)# no lldp receive
switch(config-if)# exit
switch(config)# lldp holdtime 200
switch(config)# lldp reinit 5
switch(config)# lldp timer 50
switch(config)# no lldp tlv-select port-vlan
switch(config)# no lldp tlv-select system-name
```

Related Documents

Related Topic	Related Topic
LLDP commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	<i>Cisco Nexus 7000 Series NX-OS System Management Command Reference</i>
VDCs	<i>Cisco Nexus 2000 Series Fabric Extender Software Configuration Guide</i>
Fabric Extender	<i>Cisco Network Analysis Module (NAM) for Nexus 7000 Quick Start Guide</i>

Feature History for LLDP

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Table 1: Feature History for LLDP

Feature Name	Releases	Feature Information
LLDP	5.2(1)	Added LLDP support for the Cisco Nexus 2000 Series Fabric Extender.
DCBXP	5.1(1)	This feature was introduced.

LLDP	5.0(2)	This feature was introduced.
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