Configuring Link Layer Discovery Protocol

This feature module describes how to configure Link Layer Discovery Protocol (LLDP) on the Cisco ASR 901 Aggregation Series Router. The Cisco Discovery Protocol (CDP) is a device discovery protocol that runs over the data-link layer (Layer 2) on all Cisco-manufactured devices (routers, bridges, access servers, and switches). CDP 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, Cisco ASR 901supports 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.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and 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 Feature Information for LLDP, on page 6.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn . An account on Cisco.com is not required.

Restrictions for LLDP

The following are the restrictions for LLDP:

- The memory available on a given end network device dictates the number of neighbor entries recorded. However, under most operating conditions, end devices such as printers, IP phones, workstations and so on, are typically operated in the receive mode only.
- If Entity MIB are used for LLDP broadcast, such as to create a sender ID. LLDP can be configured only when these MIBs are available.

Overview of LLDP

It is an optional element of a protocol stack in the 802 LAN station. LLDP uses the logical link control (LLC) services to transmit and receive information to and from other LLDP agents. LLC provides a Link Service Access Point (LSAP) for access to LLDP. Each LLDP frame is transmitted as a single MAC service request. Each incoming LLDP frame is received at the MAC Service Access Point (MSAP) by the LLC entity as a MAC service indication.

The LLDP protocol operates through the LLDP agent. The tasks of the LLDP agent are to:

- Collect information from the LLDP local system MIB and transmit it periodically.
- Receive LLDP frames from neighbors and populate LLDP remote devices MIBs.

LLDP supports a set of attributes used to find the neighbor devices. These attributes are type, length, and value descriptions of devices, and are referred to as Type Length Value (TLV). LLDP supported devices use TLVs to send and receive information from their neighbors. Details such as configuration information, device capabilities, and device identity are also advertised using this protocol.

How to Configure LLDP

This section contains the following procedures:

Configuring LLDP

Complete the following steps to configure LLDP on the Cisco ASR 901 platform:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	Do one of the following: • **lldp run**	• The **lldp run** command enables LLDP globally on all the interfaces on the router.

	Command or Action	Purpose

	• **lldp holdtime** *seconds*
	• **lldp reinit** *seconds*
	• **lldp timer** *rate*
	• **lldp lldp tlv-select**
	Example:
	`Router(config)# lldp run`
	Example:
	`Router(config)# lldp holdtime 100`
	Example:
	`Router(config)# lldp reinit 2`
	Example:
	`Router(config)# lldp timer 75`
	Example:
	`Router(config-if)# lldp tlv-select system-description`
		• The **lldp holdtime** command specifies the hold time. The value ranges from 0 to 65535 seconds. The default value is 120 seconds.
		• The **lldp reinit** command specifies the delay time in seconds for LLDP to initialize on any interface. The value ranges from 2 to 5 seconds. The default value is 2 seconds.
		• The **lldp timer** command specifies the rate at which LLDP packets are sent. The value ranges from 5 to 65534 seconds. The default value is 30 seconds.
		• The **lldp tlv-select** command enables a specific LLDP TLV on a supported interface. Cisco ASR 901 LLDP supports the following TLVs:
		  • Port Description—Information about the interface that includes the name of the manufacturer, product name, and the version of the interface.
		  • System Description—Textual description of the device.
		  • System Name—Assigned name of the device.
		  • System Capabilities—Capability of the device and its primary function.
		  • Management Address—IP or MAC address of the device.

Step 4	**end** **Example:** `Router(config-if)# end`	Returns the CLI to privileged EXEC mode.

Verifying LLDP

To verify LLDP on the Cisco ASR 901 router, use the show command as shown in the following example.

```
Router# show lldp ?

entry      Information for specific neighbor entry
```

```
errors     LLDP computational errors and overflows
interface  LLDP interface status and configuration
neighbors  LLDP neighbor entries
traffic    LLDP statistics
|          Output modifiers
<cr>
```

```
Router# show lldp entry *

Capability codes:
(R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
(W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other
```

Configuration Example for LLDP

This section provides the following configuration examples:

Example: Enabling LLDP Globally

```
Router> enable
Router# configure terminal
Router(config)# lldp run
Router(config)# end
```

Example: Configuring Hold Time

```
Router> enable
Router# configure terminal
Router(config)# lldp holdtime 100
Router(config)# end
```

Example: Configuring Delay Time

```
Router> enable
Router# configure terminal
Router(config)# lldp reinit 2
Router(config)# end
```

Example: Configuring Intervals

```
Router> enable
Router# configure terminal
Router(config)# lldp timer 75
Router(config)# end
```

This is an example to enable an LLDP TLV on a supported interface:

```
Router> enable
Router# configure terminal
Router(config)# interface ethernet 0/1
Router(config-if)# lldp tlv-select system-description
Router(config-if)# end
```

Where to go Next

For additional information on configuring Multihop BFD, see the documentation listed in the Additional References section.

Additional References

The following sections provide references related to LLDP feature.

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
Cisco ASR 901 Command Reference	Cisco ASR 901 Series Aggregation Services Router Command Reference
Cisco IOS Interface and Hardware Component Commands	Cisco IOS Interface and Hardware Component Command Reference

Standards

Standard	Title
None	—

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/c/en/us/td/docs/wireless/asr_901/mib/reference/asr_mib.html

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for LLDP

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

Table 1: Feature Information for LLDP, on page 6 lists the release history for this feature and provides links to specific configuration information.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn . An account on Cisco.com is not required.

Note Table 1: Feature Information for LLDP, on page 6 lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 1: Feature Information for LLDP

Feature Name	Releases	Feature Information
LLDP	12.2(2)SNG	See Overview of LLDP, on page 2 for more information about this feature.