Provisioning Link Layer 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). CDP allows network management applications to automatically discover and learn about other Cisco devices connected to the network.

To support non-Cisco devices and to allow for interoperability between other devices, the switch supports the IEEE 802.1AB Link Layer Discovery Protocol (LLDP). LLDP is a neighbor discovery protocol that is used for 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 supports a set of attributes that it uses to discover neighbor devices. These attributes contain type, length, and value descriptions and are referred to as TLVs. LLDP supported devices can use TLVs to receive and send information to their neighbors. Details such as configuration information, device capabilities, and device identity can be advertised using this protocol.

By default, LLDP is disabled globally and on interfaces.

The switch supports these basic management TLVs. These are mandatory LLDP TLVs.

- Port description TLV

- System name TLV

- System description

- System capabilities TLV

- Management address TLV

These organizationally-specific LLDP TLVs are also advertised to support LLDP-MED.

- Port VLAN ID TLV (IEEE 802.1 organizationally specific TLVs)

- MAC/PHY configuration/status TLV (IEEE 802.3 organizationally specific TLVs)

How To Configure LLDP

Setting LLDP Global Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLldpPortType** **Example:** `Switch# ProvisionLldpPortType`	Enters the ProvisionLldpPortType mode.

Step 2	**setLldpConfig lldpGlobalConfiguration {global-state {enable	disable}	hold-time** *lldp-hold-time*	**lldp-transmission-delay** *value* |**reinit-delay** *tx-reinit-value* **timer** *tx-value*	**tlv-selecttlv-select {mgmt-address	port-description	system-capabilities	system-description	system-name}**
									
									Example:
									`Switch(ProvisionLldpPortType)# setLldpConfig`
									`lldpGlobalConfiguration global-state enable`
									`Switch(ProvisionLldpPortType)# setLldpConfig`
									`lldpGlobalConfiguration hold-time 5`
									`Switch(ProvisionLldpPortType)# setLldpConfig`
									`lldpGlobalConfiguration lldp-transmission-delay 10`
									`Switch(ProvisionLldpPortType)# setLldpConfig`
									`lldpGlobalConfiguration timer 10`
									`Switch(ProvisionLldpPortType)# setLldpConfig`
									`lldpGlobalConfiguration reinit-delay 10`
									`Switch(ProvisionLldpPortType)# setLldpConfig`
									`lldpGlobalConfiguration tlv-select system-description`
									`enable`
									`Switch(ProvisionLldpPortType)# setLldpConfig`
									`lldpGlobalConfiguration tlv-select port-description enable`
									`Switch(ProvisionLldpPortType)# setLldpConfig`
									`lldpGlobalConfiguration tlv-select management-address`
									`enable`
									`Switch(ProvisionLldpPortType)# setLldpConfig`
									`lldpGlobalConfiguration tlv-select system-capabilities`
									`enable`
									`Switch(ProvisionLldpPortType)# setLldpConfig`
									`lldpGlobalConfiguration tlv-select system-name enable`
										Sets the LLDP global configuration.
										
										• **global-state**—LLDP global state. This state is either *enabled* or *disabled*.
										
										• **hold-time**—LLDP hold time before discarding the configuration. The valid values are from 2 to 10 seconds. The default value is 4 seconds.
										
										• **lldp-transmission-delay**—LLD Transmission delay value. The valid values are from 1 to 8192. The default value is 2 seconds.
										
										• **reinit-delay**—LLDP transmission re-initialization delay. The valid values are from 1 to 10 seconds. The default value is 2 seconds.
										
										• **timer**—Time between each LLDP frame transmitted in seconds. The valid values are from 5 to 32768. The default value is 30 seconds.
										
										• **tlv-select**—Transmission TLV.

Step 3	**setLldpConfig review** **Example:** `Switch(ProvisionLldpPortType)# setLldpConfig review`	Reviews the setLldpConfig.
Step 4	**setLldpConfig commit** **Example:** `Switch(ProvisionLldpPortType)# setLldpConfig commit`	Sends the setLldpConfig configuration to the Cisco ME 1200 NID.

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	Command or Action	Purpose

Step 5	**exit**
	
	Example:
	
	`Switch(ProvisionLldpPortType)# exit`
	`Switch#`
		Exits the provisionLldpPortType mode.

What to Do Next

After the configuration is sent to the Cisco ME 1200 NID, use the following **get** command to view the setLldpConfig configuration.

```
Switch(ProvisionLldpPortType)# getLldpConfig getLldpConfigRequest
Switch(ProvisionLldpPortType)# getLldpConfig review

Commands in queue:
            getLldpConfig getLldpConfigRequest

Switch(ProvisionLldpPortType)# getLldpConfig commit

GetLldpConfig_Output.lldpGlobalConfiguration.global_state = true
GetLldpConfig_Output.lldpGlobalConfiguration.hold_time = 5
GetLldpConfig_Output.lldpGlobalConfiguration.timer = 10
GetLldpConfig_Output.lldpGlobalConfiguration.tlv_select.system_name =
true
GetLldpConfig_Output.lldpGlobalConfiguration.tlv_select.system_description
 = true
GetLldpConfig_Output.lldpGlobalConfiguration.tlv_select.port_description
 = true
GetLldpConfig_Output.lldpGlobalConfiguration.tlv_select.management_address
 = true
GetLldpConfig_Output.lldpGlobalConfiguration.tlv_select.system_capabilities
 = true
GetLldpConfig_Output.lldpGlobalConfiguration.reinit_delay = 10
GetLldpConfig_Output.lldpGlobalConfiguration.lldp_transmission_delay =
10

GetLldpConfig Commit Success!!!
```

Setting LLDP Configuration to Default

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLldpPortType** **Example:** `Switch# ProvisionLldpPortType`	Enters the ProvisionLldpPortType mode.

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	Command or Action	Purpose
Step 2	**setLldpDefaults setLldpDefaultsRequest** **Example:** `Switch(ProvisionLldpPortType)# setLldpDefaults setLldpDefaultsRequest`	Sets the LLDP configuration to default values.
Step 3	**setLldpDefaults commit** **Example:** `Switch(ProvisionLldpPortType)# setLldpDefaults commit`	Sends the setLldpDefaults configuration to the Cisco ME 1200 NID.

Step 4	**exit**
	
	Example:
	
	`Switch(ProvisionLldpPortType)# exit`
	`Switch#`
		Exits the ProvisionLldpPortType mode.

What to Do Next

After the configuration is sent to the Cisco ME 1200 NID, use the following **get** command to view the setLldpDefaults configuration.

```
Switch(ProvisionLldpPortType)# getLldpDefaults getLldpDefaultsRequest
Switch(ProvisionLldpPortType)# getLldpDefaults review

Commands in queue:
                 getLldpDefaults getLldpDefaultsRequest

Switch(ProvisionLldpPortType)# getLldpDefaults commit

GetLldpDefaults_Output.lldpGlobalConfiguration.global_state = true
GetLldpDefaults_Output.lldpGlobalConfiguration.hold_time = 5
GetLldpDefaults_Output.lldpGlobalConfiguration.timer = 30
GetLldpDefaults_Output.lldpGlobalConfiguration.tlv_select.system_name =
true
GetLldpDefaults_Output.lldpGlobalConfiguration.tlv_select.system_description
 = true
GetLldpDefaults_Output.lldpGlobalConfiguration.tlv_select.port_description
 = true
GetLldpDefaults_Output.lldpGlobalConfiguration.tlv_select.management_address
 = true
GetLldpDefaults_Output.lldpGlobalConfiguration.tlv_select.system_capabilities
 = true
GetLldpDefaults_Output.lldpGlobalConfiguration.reinit_delay = 2
GetLldpDefaults_Output.lldpGlobalConfiguration.lldp_transmission_delay =
 10

GetLldpDefaults Commit Success!!!
```

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Setting LLDP Port Configuration

DETAILED STEPS

	Command or Action	**Purpose**
Step 1	**ProvisionLldpPortType** **Example:** `Switch# ProvisionLldpPortType`	Enters the ProvisionLldpPortType mode.

Step 2	**setLldpportconfig lldpPortConfiguration {lldp-receive-enable {disable | enable} |lldp-transmit-enable {disable | enable} | port-number** *port-number*}
	
	Example:
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration port-number 3`
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-receive-enable disable`
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-transmit-enable disable`
		Sets the LLDP port configuration.
		
		• **lldp-receive-enable**—Whether LLDP receive is enabled or disabled.
		
		• **lldp-transmit-enable**—Whether LLDP transmit is enabled or disabled.
		
		• **port-number**—The target interface number. The valid values are from 1 to 6.

Step 3	**setLldpPortConfig review** **Example:** `Switch(ProvisionLldpPortType)# setLldpPortConfig review`	Reviews the setLldpPortConfig.
Step 4	**setLldpPortConfig commit** **Example:** `Switch(ProvisionLldpPortType)# setLldpConfig commit`	Sends the setLldpConfig configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionLldpPortType)# exit`
	`Switch#`
		Exits the ProvisionLldpPortType mode.

What to Do Next

After the configuration is sent to the Cisco ME 1200 NID, use the following **get** command to view the setLldpPortConfig configuration.

```
Switch(ProvisionLldpPortType)# getLldpportConfig physicalPortNum 3
Switch(ProvisionLldpPortType)# getLldpportConfig review

Commands in queue:
            getLldpConfig physicalPortNum 3

Switch(ProvisionLldpPortType)# getLldpportConfig commit
```

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```
GetLldpPortConfig_Output.lldpPortConfiguration.port_number = 3
GetLldpPortConfig_Output.lldpPortConfiguration.lldp_transmit_enable =
false
GetLldpPortConfig_Output.lldpPortConfiguration.lldp_receive_enable = false


GetLldpPortConfig Commit Success!!!
```

Setting LLDP Port Configuration to Default

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLldpPortType** **Example:** `Switch# ProvisionLldpPortType`	Enters the ProvisionLldpPortType mode.

Step 2	**setlldpportdefaults physicalPortNum***port-number*
	
	Example:
	
	`Switch(ProvisionLldpPortType)#`
	`setlldpportdefaults physicalPortNum 3`
		Sets the LLDP port configuration to default values.
		
		• **physicalPortNum**—Port number for which the LLDP configuration is set to default. The valid values are from 1 to 6.

Step 3	**setlldpportdefaults commit**
	
	Example:
	`Switch(ProvisionLldpPortType)#`
	`setlldpportdefaults commit`
		Sends the setlldpportdefaults configuration to the Cisco ME 1200 NID.

Step 4	**exit**
	
	Example:
	`Switch(ProvisionLldpPortType)# exit`
	`Switch#`
		Exits the ProvisionLldpPortType mode.

What to Do Next

After the configuration is sent to the Cisco ME 1200 NID, use the following **get** command to view the setlldpportdefaults configuration.

```
Switch(ProvisionLldpPortType)# getLldpportdefaults physicalPortNum 3
Switch(ProvisionLldpPortType)# getLldpportdefaults review

Commands in queue:
            getLldpportdefaults physicalPortNum 3

Switch(ProvisionLldpPortType)# getLldpportdefaults commit

GetLldpPortDefaults_Output.lldpPortConfiguration.port_number = 3
GetLldpPortDefaults_Output.lldpPortConfiguration.lldp_transmit_enable =
true
```

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```
GetLldpPortDefaults_Output.lldpPortConfiguration.lldp_receive_enable =
true

GetLldpPortDefaults Commit Success!!!
```

Other Commands For LLDP Configuration

Clearing LLDP Counters

clearLldpCounters
```
Switch(ProvisionLldpPortType)# clearLldpCounters physicalPortNum 3
```

Displaying LLDP Neighbors

showlldpneighbors physicalPortNum *physical-port-number*
```
Switch(ProvisionLldpPortType)# showlldpneighbors physicalPortNum 3
Switch(ProvisionLldpPortType)# showlldpneighbors commit
```

```
ShowLldpNeighbors_Output.lldpNeighborInformation.local_port_id = 3
ShowLldpNeighbors_Output.lldpNeighborInformation.chassis_id =
'18-9C-5D-A7-F4-1C'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_port_id = 'Gi0/3'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_port_description
 = 'GigabitEthernet0/3'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_system_name =
'IRF-Whales-1'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_system_capabilities
 = 'Bridge(+), Router(+)'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_system_description
 = 'Cisco IOS Software, ME360x Software (ME360x-UNIVERSAL-M), Version
15.4(2)SN, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2014 by Cisco Systems, Inc.
Compiled Fri 21-Mar-14 09:12 by prod_rel_team'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_management_IP =
'7.3.9.13 (IPv4)'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_management_IPv6
= ''

ShowLldpNeighbors Commit Success!!!
```

Displaying LLDP Statistics

showlldpstatistics physicalPortNum *physical-port-number*
```
Switch(ProvisionLldpPortType)# showlldpstatistics physicalPortNum 3
Switch(ProvisionLldpPortType)# showlldpstatistics commit
```

```
ShowLldpStatistics_Output.lldpPortStatistics.global_counters.total_neighbor_entries_added
 = 1
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Tx_Frames =
17
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Rx_Frames =
0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Rx_Errors =
0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Rx_Frames_Discarded
```

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```
 = 0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.TLVs_Discarded
 = 0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.TLVs_Unrecognized
 = 0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Org_Discarded
 = 0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Age_Outs = 0

ShowLldpStatistics Commit Success!!!
```

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