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## Chapter20: LLDP Configuration



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# Chapter 1 Link Layer-2 Discovery Protocol (LLDP)

## 1.1 LLDP Overview

802.1AB The link layer discovery protocol (LLDP) at 802.1AB helps to detect network troubles easily and maintain the network topology. It enables the neighboring device to send out notice of its own state information to other devices and each port of all devices stores information of defining themselves. If necessary, they can also send update information to the neighboring devices and the neighboring devices will store the information in standard SNMP MIBs. The network management system can inquire the connection of current layer-2 from MIB. LLDP can neither configure nor control the network element or traffic. It only reports configuration of layer-2.

Simply, LLDP is a neighbor discovery protocol. It sets a standard method for the Ethernet network device, such as switches, routers and WAPs. It enables the Ethernet device to notify its existence to other nodes and save the discovery information of neighboring devices. For instance, all information including the device configuration and the device identification can be notified through the protocol. Specifically, LLDP defines a universal notification information set, a transmission notification protocol and a method of storing all notification information. The device needs to notify the notification information can transmit many notifications in a LAN data packet. The transmission type is TLV.

TLV has three compulsory types: Chassis ID TLV, Port ID TLV and Time To Live TLV; five optional types: Port Description, System Name, System Description, System Capabilities and Management Address; and three extension TLVs: DOT1 (Port Vlan ID, Protocol Vlan ID, Vlan Name, Protocol Identity); DOT3 (MAC/PHY Configuration/Status, Power Via MDI, Link Aggregation, Max Frame Size); MED (MED Capability, Network Policy, Location Identification, Extended Power-via-MDI, Inventory (Hardware Revision, Firmware Revision, Software Revision, Serial Number, Manufacturer Name, Mode Name, Assert ID)).

LLDP is a unidirectional protocol. One LLDP agent transmits its state information and functions through its connected MSAP, or receives the current state information or function information about the neighbor. However, the LLDP agent cannot request any information from the peer through the protocol. During message exchange, message transmission and reception do not affect each other. You can configure only message transmission or reception or both.

### 1.1.1 Initializing the Protocol

LLDP can work under three modes: transmit-only, receive-only and transmit-and-receive. The default mode is transmit-and-receive.

### 1.1.2 Initializing LLDP Transmit Mode

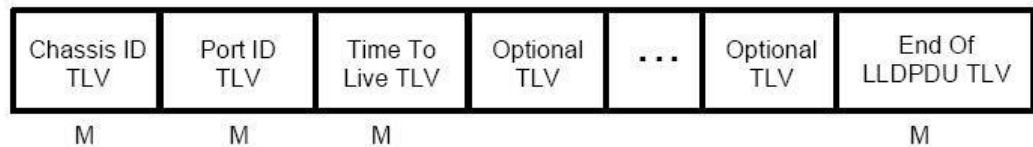
Set LLDP to transmit-only in the interface mode. In transmit-only mode, the interface transmits LLDP packets when the state or value of one or more information elements (management object) of the local system change or the transmission timer is timeout. The interface will not transmit LLDP packets when disabling the function.

### 1.1.3 Initializing LLDP Reception Mode

Set LLDP to receive-only in the interface mode. In receive-only mode, the interface can receive LLDP packets from the neighbors and save tlv into the remote MIB. The interface will drop LLDP packets when disabling the function.

### 1.1.4 LLDP PDU Packet Structure Description

In accordance with the order, LLDP PDU includes three compulsory TLVs in the front, one or more optional TLV in the middle and LLDPUD TLV in the end. As shown in figure 1:



M must include TLV.

Figure 1 LLDP PDU Format

(1) Three compulsory TLVs should be listed in sequence at the beginning of LLDP PDU:

1. Chassis ID TLV
2. Port ID TLV
3. Time To Live TLV

(2) Optional TLV selected by the network management can be listed randomly.

4. Port Description
5. System Name
6. System Description
7. System Capabilities
8. Management Address

Three extensions (including DOT1):

9. Port Vlan ID
10. Protocol Vlan ID
11. Vlan Name
12. Protocol Identity

DOT3:

13. MAC/PHY Configuration/Status
14. Power Via MDI
15. Link Aggregation
16. Max Frame Size

MED (TLV of MED is not transmitted by default. LLDP packets with MED TLV will be transmitted only when LLDP packets with MED TLV are received.)

17. MED Capability (TLV is compulsory if MED TLV is added.)
18. Network Policy
19. Location Identification
20. Extended Power-via-MDI
21. Inventory (包含 Hardware Revision、Firmware Revision、Software Revision、Serial Number、Manufacturer Name、Mode Name、Assert ID)

(3) The end TLV should be the last one in LLDP PDU.

## 1.2 LLDP Configuration Task List

- Disabling/enabling LLDP
- Configuring holdtime
- Configuring Timer
- Configuring Reinit
- Configuring the To-Be-Sent TLV
- Configuring the Transmission or Reception Mode
- Specifying the Management IP Address of a Port
- Sending Trap Notification to mib Database
- Configuring Show-Relative Commands
- Configuring the Deletion Commands

## 1.3 LLDP Configuration Tasks

### 1.3.1 Disabling/enablingLLDP

LLDP is disabled by default. You need start up LLDP before it runs. After enabling LLDP, the local port regularly forwards lldp frame to notify the information of the opposite local port.

Run the following command in global configuration mode to enable LLDP:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	lldp run	Runs LLDP.

Run the following command to disable LLDP:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	no lldp run	Disables LLDP.

Caution: Only lldp function is enabled can the system process lldp packets. Otherwise, lldp frame will be directly forwarded.

### 1.3.2 Configuringholdtime

In normal condition, the remote information stored in MIB will update before aging. But the frame may loss in sending and causes the information ages. For avoiding this, you need to set the value of TTL and ensure the update LLDP frame is forwarded time after time. You can control the timeout time of transmitting the LLDP message through modifying holdtime:

Run the following command in global configuration mode to configure holdtime of LLDP:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	lldp holdtime time	Configures the timeout time of LLDP. The value range from 0 to 65535. The default value is 120s.

Resumes the timeout time to the default value:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.

Step2	no lldp holdtime	Resumes the timeout time to the default value, 120 seconds.
-------	------------------	---

Caution: To ensure the former neighbor information is not lost owing to aging when receiving next LLDP frame, the timeout time should be longer than the LLDP packet transmit interval.

### 1.3.3 Configuring Timer

You can control the interval of the switch to transmit message by configuring the timer of LLDP.

Run the following command in global configuration mode to configure timer of LLDP:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	lldp timer time	Configures the interval of message transmission of LLDP. The value ranges from 5 to 65534. The default time is 30 seconds.

Resumes the default interval, that is, 30 seconds.

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	no lldp timer	Resumes the default interval, that is, 30 seconds.

### 1.3.4 Configuring Reinit

LLDP information will be forwarded automatically in two conditions: first, the status or value of one or more information elements (management objects) change; second, the sending timer timeouts. A single information change cause the LLDP packet is forwarded and a series of information change may cause many LLDP frames forwarded, but a frame can only report one change. For avoiding this, the web management defines the interval of two continuous LLDP frames. You can control the interval of the switch to continuously transmit two messages by configuring reinit of LLDP.

Run the following command in global configuration mode to configure reinit of LLDP:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	lldp reinit time	Configures the interval of LLDP to continuously transmit message. The value ranges from 2 to 5. The default time is 2 seconds.

Resumes the default value of reinit.

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	no lldp reinit	Resumes the default interval of continuously transmitting message; the default interval value is two seconds.

### 1.3.5 Configuring the To-Be-Sent TLV

You can choose TLV which requires to be sent by configuring tlv-select of LLDP. By default, all TLVs are transmitted.

Run the following commands in global configuration mode to add or delete tlv of LLDP:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	lldp tlv-select management-address	This step is optional. Transmits the management address tlv. The management address is usually layer-3 IP address which should be easy to use.
Step3	lldp tlv-select port-description	This step is optional. Transmits the port description tlv. The port description uses number or letters for description.
Step4	lldp tlv-select system-capabilities	This step is optional. Transmits the system performance tlv. The system performance refers to the system of transmitting packets such as the switch or router.
Step5	lldp tlv-select system-description	This step is optional. Transmits system description tlv. The system description is consist of texts including numbers and letters. The system description should include the full name of the system, the hardware version, the software system and the network software.
Step6	lldp tlv-select system-name	This step is optional. Transmits system name tlv. The system name domain is a specified name consisted of numbers and letters. The name of the system should be the name of the system manager. That is the name of the switch.

Run the following commands in global configuration mode to delete to-be-sent TLV:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.



Step2	no lldp tlv-select management-address	This step is optional. Transmits the management address tlv. The management address is usually layer-3 IP address which should be easy to use.
Step3	no lldp tlv-select port-description	This step is optional. Transmits the port description tlv. The port description uses number or letters for description.
Step4	no lldp tlv-select system-capabilities	This step is optional. Transmits the system performance tlv. The system performance refers to the system of transmitting packets such as the switch or router.
Step5	no lldp tlv-select system-description	This step is optional. Transmits system description tlv. The system description is consist of texts including numbers and letters. The system description should include the full name of the system, the hardware version, the software system and the network software.
Step6	no lldp tlv-select system-name	This step is optional. Transmits system name tlv. The system name domain is a specified name consisted of numbers and letters. The name of the system should be the name of the system manager. That is the name of the switch.

### 1.3.6 Specifying the Port's Configuration and Selecting the To-Be-Sent Expanded TLV

Through the configuration of dot1-tlv-select/ dot3-tlv-select/ med-tlv-select of LLDP on a port, you can select expanded TLV to be sent. By default, TLV of both DOT1 and DOT3 will be transmitted while TLV of MED will not be transmitted.

Run the following commands in port configuration mode to add the to-be-sent TLV:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	interface intf-type intf-id	Enters the interface configuration mode.
Step3	lldp dot1-tlv-select port-vlan-id	(Optional) Sends the 802.1-defined TLV and notifies the PVID of a port.
Step4	lldp dot1-tlv-select protocol-vlan-id	(Optional) Sends the 802.1-defined TLV and notifies the PPVID of a port.
Step5	lldp dot1-tlv-select vlan-name	(Optional) Sends the 802.1-defined TLV and notifies the VLAN name of a port.

Step6	lldp dot3-tlv-select macphy-confg	(Optional) Sends the 802.3-defined TLV. The following contents are contained: a) The bit rate and the communication mode (duplex) on the physical layer;
		b) Current duplex and the set bit rate; c) Showing whether the setting is the results of auto-negotiation in the initial connection phase or is a compulsory manual behavior;
Step7	lldp dot3-tlv-select power	(Optional) Sends the 802.3-defined TLV and shows the interface allows the power supply connecting to the non-power system through the link.
Step8	lldp dot3-tlv-select link-aggregation	(Optional) Sends the 802.3-defined TLV and specifies a port to identify the aggregation if the link can be aggregated.
Step9	lldp dot3-tlv-select max-frame-size	(Optional) Sends the 802.3-defined TLV and specifies the size of the maximum frame on a port(byte) .
Step10	lldp med-tlv-select network-policy	(Optional) Sends the MED-defined TLV and the interface can effectively discover and diagnose VLAN configured error-matching flow and the attribute of layer-2 and layer-3
Step11	lldp med-tlv-select location	(Optional) Sends the MED-defined TLV and specifies the address. a) coordinate-based LCI, which is defined in IETF 3825[6]; b) city's address LCI, which is defined in IETF (refer to Annex B); c) ELIN code of the urgency call service;
Step12	lldp med-tlv-select power-management	(Optional) Sends the MED-defined TLV and shows the information of power supply.
Step13	lldp med-tlv-select inventory	(Optional) Sends the MED-defined TLV and shows the attribute of detailed inventory.

Run the following commands in global configuration mode to delete to-be-sent TLV:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	interface intf-type intf-id	Enters the interface configuration mode.

Step3	no lldp dot1-tlv-select port-vlan-id	(Optional) Sends the 802.1-defined TLV and notifies the PVID of a port.
Step4	no lldp dot1-tlv-select protocol-vlan-id	(Optional) Sends the 802.1-defined TLV and notifies the PPVID of a port.
Step5	no lldp dot1-tlv-select vlan-name	(Optional) Sends the 802.1-defined TLV and notifies the VLAN name of a port.
Step6	no lldp dot3-tlv-select macphy-config	(Optional) Sends the 802.3-defined TLV. The following contents are contained:
		<ul style="list-style-type: none"> <li>a) The bit rate and the communication mode (duplex) on the physical layer;</li> <li>b) Current duplex and the set bit rate;</li> <li>c) Showing whether the setting is the results of auto-negotiation in the initial connection phase or is a compulsory manual behavior;</li> </ul>
Step7	no lldp dot3-tlv-select power	(Optional) Sends the 802.3-defined TLV and shows the interface allows the power supply connecting to the non-power system through the link.
Step8	no lldp dot3-tlv-select link-aggregation	(Optional) Sends the 802.3-defined TLV and specifies a port to identify the aggregation if the link can be aggregated.
Step9	no lldp dot3-tlv-select max-frame-size	(Optional) Sends the 802.3-defined TLV and specifies the size of the maximum frame on a port(byte) .
Step10	no lldp med-tlv-select network-policy	(Optional) Sends the MED-defined TLV and the interface can effectively discover and diagnose VLAN configured error-matching flow and the attribute of layer-2 and layer-3.
Step11	no lldp med-tlv-select location	<p>(Optional) Sends the MED-defined TLV and specifies the address.</p> <ul style="list-style-type: none"> <li>a) coordinate-based LCI, which is defined in IETF 3825[6];</li> <li>b) city's address LCI, which is defined in IETF (refer to Annex B);</li> <li>c) ELIN code of the urgency call service;</li> </ul>
Step12	no lldp med-tlv-select power-management	(Optional) Sends the MED-defined TLV and shows the information of power supply.
Step13	no lldp med-tlv-select inventory	(Optional) Sends the MED-defined TLV and shows the attribute of detailed inventory.

### 1.3.7 Configuring the Transmission or Reception Mode

LLDP can work under three modes: transmit-only, receive-only and transmit-and-receive. By default, LLDP works under the transmit-and-receive mode. You can modify the working mode of LLDP through the following commands.

Run the following commands in the interface configuration mode and set lldp to the transmit-and-receive mode.

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	interface intf-type intf-id	Enters the interface configuration mode.
Step3	no lldp transmit	Disables the transmit-only mode of the port.
Step4	no lldp receive	Disables the receive-only mode of the port.

Run the following commands in the interface configuration mode and set lldp to the transmit-and-receive mode.

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	interface intf-type intf-id	Enters the interface configuration mode.
Step3	lldp transmit	Enables the transmit mode of the port.
Step4	lldp receive	Enables the receive mode of the port.

Note: Except the above mode, the interface can also be configured to the transmit-only mode or the receive-only mode.

### 1.3.8 Specifying the Management IP Address of a Port

In port configuration state, you can randomly configure the management address of the port, from which the LLDP packets are transmitted. This management address should be an IP address related with this port, and only in this way the normal communication of this port can be guaranteed.

Run the following commands in port configuration mode to set the management IP address:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	interface intf-type intf-id	Enters the interface configuration mode.
Step3	lldp management-ip A.B.C.D	Sets the management IP address of a port.

Note: Both the `no lldp` command and the `management-ip` command can be used to resume the default management address of the port and the default management address is the IP address of the VLAN interface that corresponds to the PVID port. When the corresponding VLAN interface does not exist, the management address is 0.0.0.0.

### 1.3.9 Sending Trap Notification to mib Database

Sending Trap Notification to lldp mib database or ptopo mib database.

Run the following commands in the global configuration mode to sending trap notification to lldp mib database or ptopo mib database.

Procedure	Command	Purpose
Step1	<code>config</code>	Enters the global configuration mode.
Step2	<code>lldp trap-send lldp-mib</code>	Sends trap notification to lldp mib database.
Step3	<code>lldp trap-send ptopo-mib</code>	Sends trap notification to ptopo mib database.

Note: Both the `no lldp` command and the `management-ip` command can be used to resume the default management address of the port and the default management address is the IP address of the VLAN interface that corresponds to the PVID port.

When the corresponding VLAN interface does not exist, the management address is 0.0.0.0.

### 1.3.10 Configuring the Location Information

The location configuration is used to determine the address of the local machine.

Run the following commands in global configuration mode to configure the location information:

Procedure	Command	Purpose
Step1	<code>config</code>	Enters the global configuration mode.
Step2	<code>location elin identifier id WORD</code>	Sets the location elin information, in which id is the elin identifier number and WORD stands for the elin information, which ranges from 10 to 25 bytes.
Step3	<code>location civic identifier id</code>	Enters the location configuration mode.
Step4	<code>language WORD</code>	Sets the language.
Step5	<code>state WORD</code>	Sets the state's (provincial) name, such as shanghai.

Step6	county WORD	Sets the name of a county.
Step7	city WORD	Sets the name of a city.
Step8	division WORD	Sets the name of a division.
Step9	neighborhood WORD	Sets the name of neighborhood.
Step10	street WORD	Sets the name of a street.
Step11	leading-street-dir WORD	Sets the direction of a main street, such as N (north).
Step12	trailing-street-suffix WORD	Sets the suffix of a small street, such as SW.
Step13	street-suffix WORD	Sets the suffix of a street, such as platz.
Step14	number WORD	Sets the street number, such as number 123.
Step15	street-number-suffix WORD	Sets the suffix of the street number, such as number 1/2 of A road.
Step16	landmark WORD	Sets the landmark, such as Colombia University.
Step17	additional-location WORD	Sets the additional location.
Step18	name WORD	Sets the information about a resident, such as Joe's haircut shop.
Step19	postal-code WORD	Sets the postal code.
Step20	building WORD	Sets the information about a building.
Step21	unit WORD	Sets the information about a unit.
Step22	floor WORD	Sets the information about a floor.
Step23	room WORD	Sets the information about a room.
Step24	type-of-place WORD	Sets the type of a place, such as office.
Step25	postal-community WORD	Sets the name of a postal office.
Step26	post-office-box WORD	Sets the name of a postal box, such as 12345.

Step27	additional-code WORD	Sets the additional code.
Step28	country WORD	Sets the name of a country.
Step29	script WORD	Sets the script.

Run the following commands in global configuration mode to delete the location information:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	no location elin identifier id	Deletes the location elin information of elin identifier.
Step3	no location civic identifier id	Deletes the location elin information of id, which is the number of civic identifier.
Step4	location civic identifier id	Enters the location configuration mode.
Step5	no language	Deletes the language.
Step6	no state	Deletes the state's (provincial) name, such as shanghai.
Step7	no county	Deletes the name of a county.
Step8	no city	Deletes the name of a city.
Step9	no division	Deletes the name of a division.
Step10	no neighborhood	Deletes the name of neighborhood.
Step11	no street	Deletes the name of a street.
Step12	no leading-street-dir	Deletes the direction of a main street, such as N (north).
Step13	no trailing-street-suffix	Deletes the suffix of a small street, such as SW.
Step14	no street-suffix	Deletes the suffix of a street, such as platz.
Step15	no number	Deletes the street number, such as number 123.

Step16	no street-number-suffix	Deletes the suffix of the street number, such as number 1/2 of A road.
Step17	no landmark	Deletes the landmark, such as Colombia University.
Step18	no additional-location	Deletes the additional location.
Step19	no name	Deletes the information about a resident, such as Joe's haircut shop.
Step20	no postal-code	Deletes the name of a postal office.
Step21	no building	Deletes the information about a building.
Step22	no unit	Deletes the information about a unit.
Step23	no floor	Deletes the information about a floor.
Step24	no room	Deletes the information about a room.
Step25	no type-of-place	Deletes the type of a place, such as office.
Step26	no postal-community	Deletes the name of a postal office.
Step27	no post-office-box	Deletes the name of a postal box, such as 12345.
Step28	no additional-code	Deletes the additional code.
Step29	no country	Deletes the name of a country.
Step30	no script	Deletes the script.

### 1.3.11 Specifying a Port to Set the Location Information

The following commands can be used to set the location information for a port and bear the location information in TLV.

Run the following commands in port configuration mode to set the location information:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	interface intf-type intf-id	Enters the interface configuration mode.
Step3	location civic id	Sets the location information of civic id.



Step4	location elin id	Sets the location information of elin id.
-------	------------------	---

Run the following commands in port configuration mode to delete the location information:

Procedure	Command	Purpose
Step1	config	Enters the global configuration mode.
Step2	interface intf-type intf-id	Enters the interface configuration mode.
Step3	no location civic	Deletes the location information of civic id.
Step4	no location elin	Deletes the location information of elin id.

### 1.3.12 Configuring Show-Relative Commands

You can observe the information about the neighbor, statistics or port state received by the LLDP module by running show-relative commands..

Run the following commands in EXEC or global configuration mode:

Command	Purpose
Show lldp errors	Displays the error information about the LLDP module.
Show lldp interface interface-name	Displays the information about port state, that is, the transmission mode and the reception mode.
Show lldp neighbors	Displays the abstract information about the neighbor.
Show lldp neighbors detail	Displays the detailed information about the neighbor.
Show lldp traffic	Displays all received and transmitted statistics information.
Show location elin	Displays the information of location elin.
Show location civic	Displays the information of location civic.

### 1.3.13 Configuring the Deletion Commands

You can delete the received neighbor lists and all statistics information by running the following command.

Run the following commands in EXEC mode:

Command	Purpose
clear lldp counters	Deletes all statistics data.
clear lldp table	Deletes all received neighbor information.

## 1.4 Configuration Example

### 1.4.1 Network Environment Requirements

Configure LLDP protocol on the port connecting two switches.

### 1.4.2 Network Topology

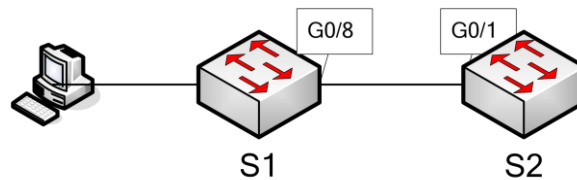


Figure 2 Network Topology

### 1.4.3 Configuration Procedure

#### 1. Basic Settings

Configuring switch S1:

```
Switch_config#lldp run
```

```
Switch_config#
```

Configuring switch S2:

```
Switch_config#lldp run
```

```
Switch_config#
```

The information of Neighbor B will be displayed on Switch A about 1 minute later. MED-TLV information is not sent by default.

S1:

```
Switch_config#show lldp neighbors
```

Capability Codes:

(R)Router,(B)Bridge,(C)DOCSIS Cable Device,(T)Telephone

(W)WLAN Access Point, (P)Repeater,(S)Station,(O)Other

Device-ID	Local-Intf	Hldtme	Port-ID	Capability
Switch	Gig0/8	99	Gig0/1	B

---

Total entries displayed: 1

Switch\_config#show lldp neighbors detail

chassis id: 00e0.0fac.32ff port id:

Gig0/1 port description:

GigaEthernet0/1 system name:

Switch

system description: SWITCH Software, Version 4.1.0B

Serial: S24090103

Compiled: 2011-9-21 9:24:8 by WRL

Time remaining: 96

system capabilities: R B

enabled capabilities: B

Management Address:

IP: 90.0.0.21

Port VLAN ID: 1

PPVID: 1

VLAN 1 name: Default Auto

Negotiation: supported,enabled

Physical media capabilities:

1000baseX(FD)

1000baseX(HD)

100baseTX(FD)

100baseTX(HD)

Operational MAU type: 2 pair category 5 UTP, full duplex mode(16)

## Power Via MDI:

MDI power support --

PSE MDI power support: support

Port class: PSE

PSE MDI power state: enabled

PSE pairs selection control ability: can not be controlled

PSE power pair: signal

Power Classification: Class 0

## Link Aggregation:

Aggregation capability: capable of being aggregated

Aggregation status: not currently in aggregation

**Maximum frame size: 1500**

-----

Total entries displayed: 1

## 2. TLV Configuration

Configuring switch S1:

Switch\_config#lldp run

Switch\_config#

Configuring switch S2:

Switch\_config#lldp run

Switch\_config# no lldp tlv-select system-name

Switch\_config#int g0/8

Switch\_config\_g0/8#no lldp dot1-tlv-select port-vlan-id

Switch\_config\_g0/8#no lldp dot3-tlv-select max-frame-size

Switch\_config\_g0/8#

The information of Neighbor B will be displayed on Switch A about 1 minute later, which is highlighted in red. To differentiate, the information displayed in the basic configuration of 1.4.3.1 is highlighted in blue.

S1:

Switch\_config#show lldp neighbors

Capability Codes:

(R)Router,(B)Bridge,(C)DOCSIS Cable Device,(T)Telephone

(W)WLAN Access Point, (P)Repeater,(S)Station,(O)Other

Device-ID	Local-Intf	Hldtme	Port-ID	Capability
Switch	Gas0/8	92	Gig0/1	R B
Total entries displayed: 1				

Switch\_config#show lldp neighbors detail

chassis id: 00e0.0fac.32ff port id:

Gig0/1 port description:

GigaEthernet0/1 system name: --

not advertised

system description: SWITCH Software, Version 4.1.0B

Serial: S24090103

Compiled: 2011-9-21 9:24:8 by WRL

Time remaining: 95

system capabilities: R B

enabled capabilities: B

Management Address:

IP: 90.0.0.21

Port VLAN ID -- not advertised

PPVID: 1

VLAN 1 name: Default

Auto Negotiation: supported,enabled

Physical media capabilities:

1000baseX(FD)

1000baseX(HD)

100baseTX(FD)

100baseTX(HD)

Operational MAU type: 2 pair category 5 UTP, full duplex mode(16)

Power Via MDI:

MDI power support -PSE MDI

power support: support

Port class: PSE

PSE MDI power state: enabled

PSE pairs selection control ability: can not be controlled

PSE power pair: signal

Power Classification: Class 0

Link Aggregation:

Aggregation capability: capable of being aggregated

Aggregation status: not currently in aggregation

-----

Total entries displayed: 1

### 3. Location Configuration

Configuring switch S1:

Switch\_config#lldp run

```

Switch_config#
Configuring switch S2:

Switch_config#lldp run
Switch_config#location elin identifier 1 1234567890//Configuring      elin
information

Switch_config#location civic identifier 1 //Entering      location
configuration mode

Switch_config_civic#language English

Switch_config_civic#city Shanghai

Switch_config_civic#street Curie

Switch_config_civic#script EN //The above configured is
civic information

Switch_config_civic#quit

Switch_config#int g0/8

Switch_config_g0/8#location elin 1 //Set elin id for the
interface

Switch_config_g0/8#location elin 1 //Set civic id for the
interface

Switch_config_g0/8#show location elin //Display elin configuration
information elin

information:

elin 1: 1234567890

total: 1

Switch_config_g0/8#show location elin //Display      civic
configuration information civic

address information:

identifier: 1

City: Shanghai

Language: English

Script: EN

Street: Curie

-----

total: 1

```

```
Switch_config_g0/8#
```

The information of Neighbor B will be displayed on Switch A about 1 minute later.

```
S1:
```

```
Switch_config#show lldp neighbors
```

```
Capability Codes:
```

```
(R)Router,(B)Bridge,(C)DOCSIS Cable Device,(T)Telephone
```

```
(W)WLAN Access Point, (P)Repeater,(S)Station,(O)Other
```

Device-ID	Local-Intf	Hldtme	Port-ID	Capability
Switch	Gig0/8	115	Gig0/1	B

Total entries displayed: 1

```
Switch_config#show lldp neighbors detail
```

```
chassis id: 00e0.0fac.32ff port id:
```

```
Gig0/1 port description:
```

```
GigaEthernet0/1 system name:
```

```
Switch
```

```
system description: SWITCH Software, Version 4.1.0B
```

```
Serial: S24090103
```

```
Compiled: 2011-9-21 9:24:8 by WRL
```

```
Time remaining: 109
```

```
system capabilities: R B
```

```
enabled capabilities: B
```

```
Management Address:
```

```
IP: 90.0.0.21
```



Port VLAN ID: 1

Auto Negotiation: supported,enabled

Physical media capabilities:

1000baseX(FD)

1000baseX(HD)

100baseTX(FD)

100baseTX(HD)

Operational MAU type: 2 pair category 5 UTP, full duplex mode(16)

Power Via MDI:

MDI power support -PSE MDI

power support: support

Port class: PSE

PSE MDI power state: enabled

PSE pairs selection control ability: can not be controlled

PSE power pair: signal

Power Classification: Class 0 MED

Information:

MED Codes:

(CA)Capabilities, (NP)Network Policy, (LI)Location Identification

(PS)Power via MDI "CPSE, (PD)Power via MDI "CPD, (IN)Inventory

Hardware Revision: 0.4.0

Software Revision: 4.1.0B

Serial Number: S24090103

Manufacturer Name:

Model Name: SWITCH

Asset ID: S24090103

Capabilities: CA,NP,LI,PS,IN

Device type: Network Connectivity

Network Policy: Voice

Policy: Unknown

Power requirements:

Type: PSE Device

Source: Unknown

Priority: Low

Value: 150(0.1 Watts)

Civic address location:

Language: English

City: Shanghai

Street: Curie

Script: EN

ELIN location:

ELIN: 1234567890

-----

Total entries displayed: 1

Switch\_config#