# **36. CDP and LLDP (Layer 2 Discovery Protocol)**

## **Introduction to Layer 2 Discovery Protocols**

Layer 2 Discovery Protocols, such as **CDP** and **LLDP**, allow devices to **share information** with and **discover** neighboring (connected) devices.

### **Shared Information Includes:**

* Hostname
* IP Address
* Device Type
* Etc.
* **CDP** is a **Cisco Proprietary Protocol**.
* **LLDP** is an **Industry Standard Protocol** (IEEE 802.1AB).

Since these protocols **share network information**, they can be considered a **security risk** and are often disabled. It is the responsibility of the **Network Engineer / Administrator** to decide whether to enable them.

## **Cisco Discovery Protocol (CDP)**

* **CDP is a Cisco proprietary protocol**.
* It is **enabled by default** on Cisco devices (routers, switches, firewalls, IP phones, etc.).

💡 **CDP Messages** are periodically sent to the **Multicast MAC Address** 0100.0CCC.CCCC.

### **CDP Functionality:**

* When a device receives a **CDP message**, it **processes and discards** it. It does **not** forward it.
* By **default**, CDP messages are sent **every 60 seconds**.
* By **default**, the **CDP hold-time** is **180 seconds**. If a message is not received within this time, the neighbor is **removed** from the **CDP Neighbor Table**.
* **CDPv2 messages** are sent by default.

### **CDP Neighbor Tables:**

* **Device ID** – Lists devices discovered by CDP.
* **Local Interface** – Interface to which neighbors are connected.
* **Holdtime** – Countdown timer before a device is removed.
* **Capabilities** – Describes the device function.
* **Platform** – Displays the **model** of the neighbor device.
* **Port ID** – Neighbor's port connected to the local device.

## **CDP Configuration Commands:**

* **CDP is globally enabled by default**.
* **CDP is also enabled on each interface by default**.

R1 #show cdp <neighbors> or <interface>

### **Enable/Disable CDP**

* Globally: R1(config)# [no] cdp run
* On an interface: R1(config-if)# [no] cdp enable

### **Modify CDP Timers**

* Set CDP timer: R1(config)# cdp timer <seconds>
* Set CDP hold-time: R1(config)# cdp holdtime <seconds>
* Enable/Disable CDPv2: R1(config)# [no] cdp advertise-v2

## **Link Layer Discovery Protocol (LLDP)**

* **LLDP is an industry-standard protocol** (IEEE 802.1AB).
* **LLDP is usually disabled on Cisco devices by default**.
* A device can run **both CDP and LLDP simultaneously**.

💡 **LLDP Messages** are periodically sent to the **Multicast MAC Address** 0180.c200.000E.

### **LLDP Functionality:**

* When a device receives an **LLDP message**, it **processes and discards** it. It does **not** forward it.
* **Default LLDP Message Timer:** **30 seconds**.
* **Default LLDP Hold-Time:** **120 seconds**.
* **LLDP has an additional timer** called the **‘reinitialization delay’**:
  + If **LLDP is enabled**, this timer delays the actual initialization of LLDP (**2 seconds by default**).

## **LLDP Configuration Commands:**

* **LLDP is usually globally disabled by default**.
* **LLDP is also disabled on each interface by default**.

### **Enable LLDP**

* Globally: R1(config)# lldp run
* On an interface (transmit only): R1(config-if)# lldp transmit
* On an interface (receive only): R1(config-if)# lldp receive
* **To send and receive LLDP messages, both must be enabled.**

### **Modify LLDP Timers**

* Set LLDP timer: R1(config)# lldp timer <seconds>
* Set LLDP holdtime: R1(config)# lldp holdtime <seconds>
* Set LLDP reinit timer: R1(config)# lldp reinit <seconds>

## **Show Commands for CDP and LLDP**

### **CDP Show Commands:**

* Show CDP neighbors: show cdp neighbors
* Show detailed CDP neighbor information: show cdp neighbors detail
* Show a specific CDP neighbor entry: show cdp entry <device-ID>

### **LLDP Show Commands:**

* Show LLDP status: show lldp <traffic> or <interface>
* Show all LLDP neighbors: show lldp neighbors
* Show LLDP neighbors in detail: show lldp neighbors detail
* Show a specific LLDP device entry: show lldp entry <device-ID>