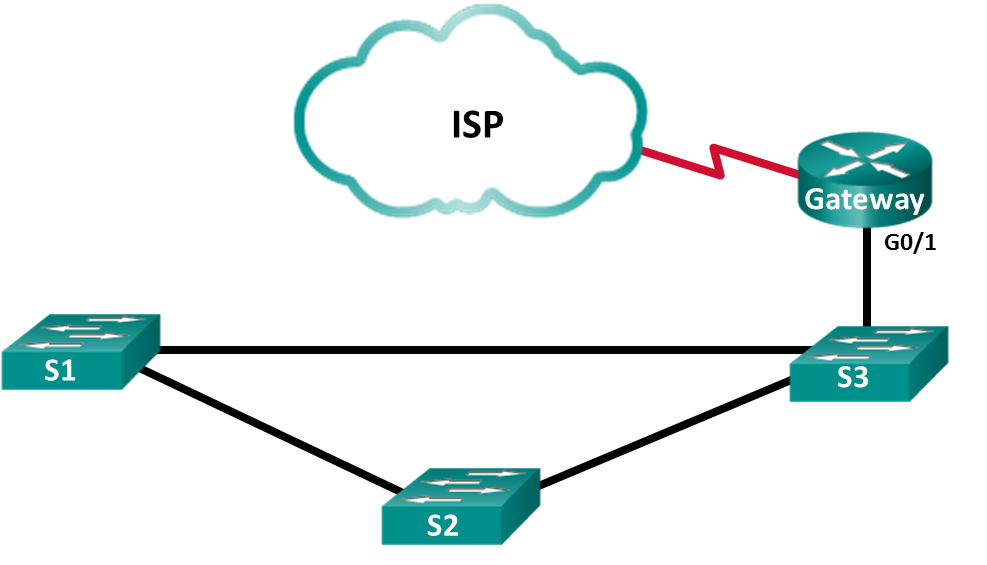
Lab - Configure CDP and LLDP



1. Addressing Table

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Interface** | **IP Address** | **Subnet Mask** |
| **Gateway** | **G0/0/1** | 192.168.1.254 | 255.255.255.0 |
|  | **S0/1/1** | 209.165.200.226 | 255.255.255.252 |
| **ISP** | **S0/1/1 (DCE)** | 209.165.200.225 | 255.255.255.252 |

1. Objectives

Part 1: Build the Network and Configure Basic Device Settings

Part 2: Network Discovery with CDP

Part 3: Network Discovery with LLDP

1. Background / Scenario

Cisco Discovery Protocol (CDP) is a Cisco proprietary protocol for network discovery on the data link layer. It can share information such as device names and IOS versions, with other physically connected Cisco devices. Link Layer Discovery Protocol (LLDP) is vendor-neutral protocol using on the data link layer for network discovery. It is mainly used with network devices in the local area network (LAN). The network devices advertise information, such as their identities and capabilities to their neighbors.

In this lab, you must document the ports that are connected to other switches using CDP and LLDP. You will document your findings in a network topology diagram. You will also enable or disable these discovery protocols as necessary.

1. Build the Network and Configure Basic Device Settings

In Part 1, you will set up the network topology and configure basic settings on the router and switches.

* 1. Configure basic device settings for the switches.
     1. Console into the device and enable privileged EXEC mode.
     2. Enter configuration mode.
     3. Disable DNS lookup to prevent the switch from attempting to translate incorrectly entered commands as though they were host names.
     4. Configure the hostname according to the topology.
     5. Verify that the switchports with connected Ethernet cables are enabled.
     6. Save the running configuration to the startup configuration file.
  2. Configure basic device settings for the routers.
     1. Console into the device and enable privileged EXEC mode.
     2. Enter configuration mode.
     3. Copy and paste the following configurations into the routers.

**ISP:**

hostname ISP

no ip domain lookup

interface Serial0/0/1

ip address 209.165.200.225 255.255.255.252

no shutdown

**Gateway:**

hostname Gateway

no ip domain lookup

interface GigabitEthernet0/1

ip address 192.168.1.254 255.255.255.0

ip nat inside

no shutdown

interface Serial0/0/1

ip address 209.165.200.226 255.255.255.252

ip nat outside

no shutdown

ip nat inside source list 1 interface Serial0/0/1 overload

access-list 1 permit 192.168.1.0 0.0.0.255

* + 1. Save the running configuration to the startup configuration file.

1. Network Discovery with CDP

On Cisco devices, CDP is enabled by default. You will use CDP to discover the ports that are currently connected.

* + 1. On router Gateway, enter the **show cdp** command in the privileged EXEC mode to verify that CDP is currently enabled on router Gateway.

Gateway# **show cdp**

Global CDP information:

Sending CDP packets every 60 seconds

Sending a holdtime value of 180 seconds

Sending CDPv2 advertisements is enabled

How often are CDP packets sent?

**CDP packets are sent out every 60 seconds.**

If CDP is disabled on Gateway, enable CDP by issuing the **cdp run** command in the global configuration mode.

Gateway(config)# **cdp run**

Gateway(config)# **end**

**Holdtime : El tiempo de espera es la cantidad de tiempo que los dispositivos de red mantendrán los paquetes CDP hasta que los descarten.**

* + 1. Issue the **show cdp interface** to list the interfaces that are participating in CDP advertisements.

Gateway# **show cdp interface**

Vlan1 is administratively down, line protocol is down

Sending CDP packets every 60 seconds

Holdtime is 180 seconds

GigabitEthernet0/0/0 is administratively down, line protocol is down

Sending CDP packets every 60 seconds

Holdtime is 180 seconds

GigabitEthernet0/0/1 is up, line protocol is up

Sending CDP packets every 60 seconds

Holdtime is 180 seconds **TIEMPO DE ESPERA 180 SEGUNDOS**

Serial0/1/0 is administratively down, line protocol is down

Sending CDP packets every 60 seconds

Holdtime is 180 seconds

Serial0/1/1 is up, line protocol is up

Sending CDP packets every 60 seconds

Holdtime is 180 seconds

How many interfaces are participating in the CDP advertisement?

**Five interfaces are participating in CDP.**

Which interfaces are up?

**The interfaces S0/1/1 and G0/0/1 are up.**

* + 1. Issue the **show cdp neighbors** command to determine the CDP neighbors.

Gateway# **show cdp neighbors**

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge

S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone

Device ID Local Intrfce Holdtme Capability Platform Port ID

Switch Gig 0/0/1 177 S 2960 Gig 0/1

ISP Ser 0/1/1 177 R ISR4300 Ser 0/1/1

D - Remote, C - CVTA, M - Two-port Mac Relay

* + 1. For more details on CDP neighbors, issue the **show cdp neighbors detail** command.

Gateway# **show cdp neighbors detail**

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Device ID: Switch

Entry address(es):

Platform: cisco 2960, Capabilities: Switch

Interface: GigabitEthernet0/0/1, Port ID (outgoing port): GigabitEthernet0/1

Holdtime: 165

Version :

Cisco IOS Software, C2960 Software (C2960-LANBASE-M), Version 12.2(25)FX, RELEASE SOFTWARE (fc1)

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Compiled Wed 12-Oct-05 22:05 by pt\_team

advertisement version: 2

Duplex: full

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Device ID: ISP

Entry address(es):

IP address : 209.165.200.225

Platform: cisco ISR4300, Capabilities: Router

Interface: Serial0/1/1, Port ID (outgoing port): Serial0/1/1

Holdtime: 165

Version :

Cisco IOS XE Software, Version 03.13.04.S - Extended Support Release

Cisco IOS Software, ISR Software (X86\_64\_LINUX\_IOSD-UNIVERSALK9-M), Version 15.5(3)S5, RELEASE SOFTWARE (fc2)

Technical Support: http://www.cisco.com/techsupport

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Compiled Mon 05-Oct-15 11:24 by mcpre

advertisement version: 2

Duplex: full

* + 1. What can you learn about ISP and S3 from the outputs of the **show cdp neighbors detail** command?
* **ISP: The IOS version, device model, and the IP Address on S0/0/1 interface for ISP.**
* **S3: IOS versión and device model**
  + 1. Configure the SVI on S3. Use an available IP address in 192.168.1.0 / 24 network. Configure 192.168.1.254 as the default gateway.

S3(config)# **interface vlan 1**

S3(config-if)# **ip address 192.168.1.3 255.255.255.0**

S3(config-if)# **no shutdown**

S3(config-if)# **exit**

S3(config)# **ip default-gateway 192.168.1.254**

* + 1. Issue the **show cdp neighbors detail** command on Gateway. What additional information is available?
* **The output includes the IP address for SVI on S3 that was just configured.**

Gateway# **show cdp neighbors detail**

Device ID: S3

Entry address(es):

IP address : 192.168.1.3

Platform: cisco 2960, Capabilities: Switch

Interface: GigabitEthernet0/0/1, Port ID (outgoing port): GigabitEthernet0/1

Holdtime: 130

Version :

Cisco IOS Software, C2960 Software (C2960-LANBASE-M), Version 12.2(25)FX, RELEASE SOFTWARE (fc1)

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advertisement version: 2

Duplex: full

* + 1. For security reasons, it is a good idea to turn off CDP on an interface facing an external network. Issue the **no cdp enable** in the interface configuration mode on the S0/0/1 interface on Gateway.

Gateway(config)# **interface s0/0/1**

Gateway(config-if)# **no cdp enable**

Gateway(config-if)# **end**

To verify that CDP has been turned off on the interface S0/0/1, issue the **show cdp neighbors** or **show cdp interface** command. You may need to wait for the hold time to expire. The hold time is the amount of time the network devices will hold the CDP packets until the devices discard them.

Gateway# **show cdp neighbors**

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge

S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,

D - Remote, C - CVTA, M - Two-port Mac Relay

Device ID Local Intrfce Holdtme Capability Platform Port ID

S3 Gig 0/1 161 S I WS-C2960- Fas 0/5

The interface S0/0/1 on Gateway no longer has a CDP adjacency with the ISP router. But it still has CDP adjacencies with other interfaces. **La interfaz S0 / 0/1 en Gateway ya no tiene una adyacencia CDP con el enrutador ISP. Pero todavía tiene adyacencias CDP con otras interfaces.**

Gateway# **show cdp interface**

Embedded-Service-Engine0/0 is administratively down, line protocol is down

Encapsulation ARPA

Sending CDP packets every 60 seconds

Holdtime is 180 seconds

GigabitEthernet0/0 is administratively down, line protocol is down

Encapsulation ARPA

Sending CDP packets every 60 seconds

Holdtime is 180 seconds

GigabitEthernet0/1 is up, line protocol is up

Encapsulation ARPA

Sending CDP packets every 60 seconds

Holdtime is 180 seconds

Serial0/0/0 is administratively down, line protocol is down

Encapsulation HDLC

Sending CDP packets every 60 seconds

Holdtime is 180 seconds

Serial0/1/1 is up, line protocol is up (SIGUE APARECIENDO)

Sending CDP packets every 60 seconds

Holdtime is 180 seconds

cdp enabled interfaces : 4

interfaces up : 1

interfaces down : 3

* + 1. To disable CDP globally, issue the **no cdp run** command in the global configuration mode.

Gateway# **conf t**

Gateway(config)# **no cdp run**

Gateway(config)# **end**

Which command(s) would you use to verify that CDP has been disabled?

**show cdp, show cdp neighbors, show cdp neighbors detail, or show cdp interface**

* + 1. Enable CDP globally on Gateway.

How many interfaces are CDP enabled? **Four interfaces are CDP enabled.**

Which interfaces are CDP disabled? **The interface S0/1/1 is CDP disabled.**

* + 1. Console into all the switches and use the CDP commands to determine the Ethernet ports that connected to other devices. An example of the CDP commands for S3 is displayed below.

S3# **show cdp neighbors**

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge

S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,

D - Remote, C - CVTA, M - Two-port Mac Relay

Device ID Local Intrfce Holdtme Capability Platform Port ID

Gateway Fas 0/5 143 R B S I CISCO1941 Gig 0/1

S2 Fas 0/2 173 S I WS-C2960- Fas 0/4

S1 Fas 0/4 171 S I WS-C2960- Fas 0/4

1. Network Discovery with LLDP

On Cisco devices, LLDP maybe enabled by default. You will use LLDP to discover the ports that are currently connected.

* + 1. On Gateway, enter the **show lldp** command in the privileged EXEC mode.

Gateway# **show lldp**

% LLDP is not enabled

If LLDP is disabled, enter the **lldp run** command in the global configuration mode.

Gateway(config)# **lldp run**

* + 1. Use the **show lldp** command to verify that LLDP is enabled on Gateway.

Gateway# **show lldp**

Global LLDP Information:

Status: ACTIVE

LLDP advertisements are sent every 30 seconds

LLDP hold time advertised is 120 seconds

LLDP interface reinitialisation delay is 2 seconds

Issue the **show lldp neighbors** command.

Which devices are neighbors to Gateway? **S3**

Gateway# **show lldp neighbors**

Capability codes:

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

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

Device ID Local Intf Hold-time Capability Port ID

S3 Gi0/1 120 B Fa0/5

Total entries displayed: 1

* + 1. If there are no LLDP neighbors for Gateway, enable LLDP on the switches. Issue **lldp run** in the global configuration mode on the devices.

S1(config)# **lldp run**

S2(config)# **lldp run**

S3(config)# **lldp run**

* + 1. Issue the **show lldp neighbors** command on the switches and router to list the LLDP enabled ports. The output for Gateway is shown below.
    2. Issue the **show lldp neighbors detail** command on Gateway.

Gateway# **show lldp neighbors detail**

------------------------------------------------

Chassis id: 0030.F252.D419

Port id: Gig0/1

Port Description: GigabitEthernet0/1

System Name: S3

System Description:

Cisco IOS Software, C2960 Software (C2960-LANBASE-M), Version 12.2(25)FX, RELEASE SOFTWARE (fc1)

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Time remaining: 90 seconds

System Capabilities: B

Enabled Capabilities: B

Management Addresses - not advertised

Auto Negotiation - supported, enabled

Physical media capabilities:

100baseT(HD)

100baseT(FD)

1000baseT(FD)

Media Attachment Unit type: 10

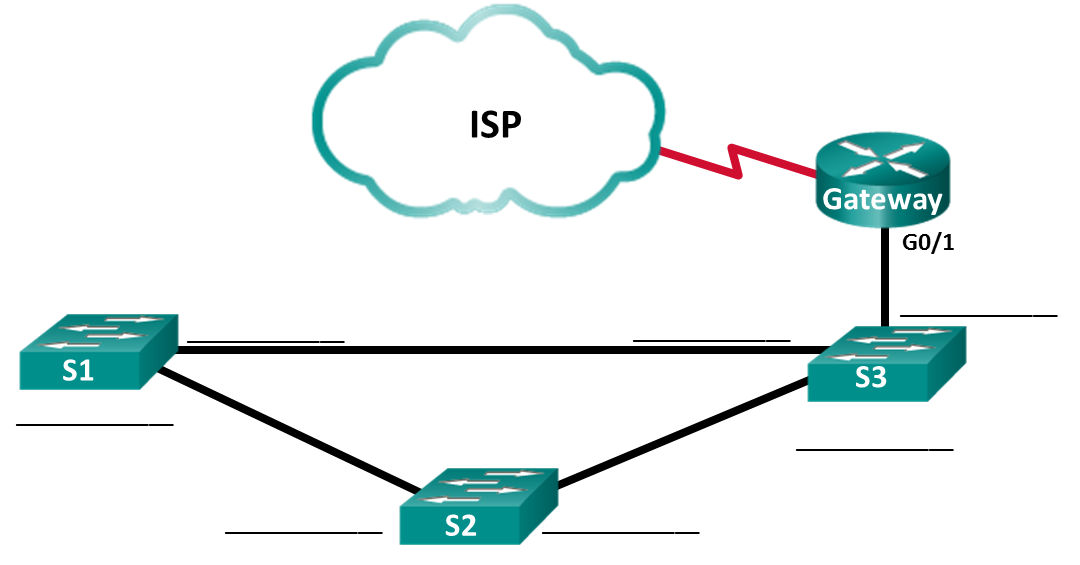
Vlan ID: 1

Total entries displayed: 1

What port is used on S3 to connect to the Gateway router?

**G0/1**

Use the **show** command outputs from CDP and LLDP to document the connected ports in the network topology.



**F0/24**

**G0/2**

**F0/24**

**G0/1**

**G0/2**

**F0/24**

**G0/1**

1. Reflection

**Dentro de una red, ¿en qué interfaces no debería utilizar protocolos de descubrimiento? Explicar.**

**Los protocolos de descubrimiento no deben usarse en interfaces que se enfrentan a redes externas porque estos protocolos brindan información sobre la red interna. Esta información permite a los atacantes obtener información valiosa sobre la red interna y explotarla.**