

Packet Tracer - Use CDP to Map a Network



Background / Scenario

A senior network administrator requires you to map the Remote Branch Office network and discover the name of a recently installed switch that still needs an IP address to be configured. Your task is to create a map of the branch office network. You must record all of the network device names, IP addresses and subnet masks, and physical interfaces interconnecting the network devices, as well as the name of the switch that does not have an IP address.

To map the network, you will use SSH for remote access and the Cisco Discovery Protocol (CDP) to discover information about neighboring network devices. Because CDP is a Layer 2 protocol, it can be used to discover information about devices that do not have IP addresses. You will record the gathered information to complete the Addressing Table and provide a topology diagram of the Remote Branch Office network.

Part 1: Use SSH to Remotely Access Network Devices

- On the Admin-PC, open a command prompt.
- SSH into the gateway router at 192.168.1.1 using the username **admin01** and the password **S3cre7P@55**.
- Use the **show ip interface brief** and **show interfaces** commands to document the Edge1 router's physical interfaces, IP addresses, and subnet masks in the Addressing Table.

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ssh -l admin01 192.168.1.1
```

```
Password:
```

```
Edge1#show ip interfa
```

```
Edge1#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0	192.168.1.1	YES	manual	up	up
GigabitEthernet0/1	unassigned	YES	unset	administratively down	down
Serial0/0/0	209.165.200.5	YES	manual	up	up
Serial0/0/1	unassigned	YES	unset	administratively down	down
Vlan1	unassigned	YES	unset	administratively down	down

```
Edge1#show interfaces
```

```
GigabitEthernet0/0 is up, line protocol is up (connected)
  Hardware is CN Gigabit Ethernet, address is 00e0.a3dd.7001 (bia 00e0.a3dd.7001)
  Internet address is 192.168.1.1/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
```

```

Serial0/0/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 209.165.200.5/30
MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)

```

- d. From Edge1, use SSH to access the Remote Branch Office at 209.165.200.10 with the username **branchadmin** and the same password as above:

```

Edge1#ssh -l branchadmin 209.165.200.10

Password:

Branch-Edge#

```

Part 2: Use CDP to Discover Neighboring Devices

- a. Issue the **show ip interface brief** and **show interfaces** commands to document the Branch-Edge router's network interfaces, IP addresses, and subnet masks. Add the missing information to the Addressing Table to map the network:

```

Branch-Edge#show ip interface brief

```

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0	192.168.3.249	YES	manual	up	up
GigabitEthernet0/1	unassigned	YES	unset	administratively down	down
Serial0/0/0	unassigned	YES	unset	administratively down	down
Serial0/0/1	209.165.200.10	YES	manual	up	up
Vlan1	unassigned	YES	unset	administratively down	down

```

Branch-Edge#show interfaces
GigabitEthernet0/0 is up, line protocol is up (connected)
  Hardware is CN Gigabit Ethernet, address is 0001.9660.0053 (bia 0001.9660.0053)
  Internet address is 192.168.3.249/29
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255

Serial0/0/1 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 209.165.200.10/30
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255

```

- b. Security best practice recommends only running CDP when needed, so CDP may need to be turned on. Use the **show cdp** command to display its status.
- c. You need to turn on CDP, but it is a good idea to only broadcast CDP information to internal network devices and not to external networks. To do this, turn on the CDP protocol and then disable CDP on the S0/0/1 interface.

```

Branch-Edge#show cdp
% CDP is not enabled
Branch-Edge#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Branch-Edge(config)#cdp run
Branch-Edge(config)#interface s0/0/1
Branch-Edge(config-if)#no cdp enable
Branch-Edge(config-if)#end

```

- d. Issue a **show cdp neighbors** command to find any neighboring network devices.

Note: CDP will only show connected Cisco devices that are also running CDP.

```
Branch-Edge#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
Branch-Firewall
Gig 0/0          156        R          C1900       Gig 0/0
```

- e. To find the IP address of the neighboring device use the **show cdp neighbors detail** command and record the ip address:

```
Branch-Edge#show cdp neighbors detail

Device ID: Branch-Firewall
Entry address(es):
  IP address : 192.168.3.253
Platform: cisco C1900, Capabilities: Router
Interface: GigabitEthernet0/0, Port ID (outgoing port): GigabitEthernet0/0
Holdtime: 170
```

- f. Now that you know the IP address of the neighbor device, connect to it with SSH in order to discover other devices that may be its neighbors. And do the same to the rest of the devices.

For 192.168.3.253:

```
Branch-Edge#ssh -l branchadmin 192.168.3.253

Password:

Branch-Firewall#show ip interface brief
Interface          IP-Address      OK? Method Status        Protocol
GigabitEthernet0/0 192.168.3.253   YES manual up             up
GigabitEthernet0/1 192.168.4.129   YES manual up             up
Vlan1              unassigned      YES unset  administratively down down
```

```
Branch-Firewall#show interfaces
GigabitEthernet0/0 is up, line protocol is up (connected)
  Hardware is CN Gigabit Ethernet, address is 00d0.d351.0601 (bia 00d0.d351.0601)
  Internet address is 192.168.3.253/29
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
```

```
GigabitEthernet0/1 is up, line protocol is up (connected)
  Hardware is CN Gigabit Ethernet, address is 00d0.d351.0602 (bia 00d0.d351.0602)
  Internet address is 192.168.4.129/25
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
```

```
Branch-Firewall#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
sw-br-floor2
Gig 0/1          164        S          2960       Gig 0/1
Branch-Edge Gig 0/0          135        R          C1900       Gig 0/0
Branch-Firewall#
```

```
Branch-Firewall#show cdp neighbors detail

Device ID: sw-br-floor2
Entry address(es):
  IP address : 192.168.4.132
Platform: cisco 2960, Capabilities: Switch
Interface: GigabitEthernet0/1, Port ID (outgoing port): GigabitEthernet0/1
Holdtime: 134
```

```

Device ID: Branch-Edge
Entry address(es):
  IP address : 192.168.3.249
Platform: cisco C1900, Capabilities: Router
Interface: GigabitEthernet0/0, Port ID (outgoing port): GigabitEthernet0/0
Holdtime: 165

```

For 192.168.4.132:

```
Branch-Firewall#ssh -l branchadmin 192.168.4.132
```

```
Password:
```

```
% Password: timeout expired!
```

```
% Login invalid
```

```
[Connection to 192.168.4.132 closed by foreign host]
```

```
Branch-Firewall#ssh -l branchadmin 192.168.4.132
```

```
Password:
```

```
sw-br-floor2>show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/1	unassigned	YES	manual	down	down
FastEthernet0/2	unassigned	YES	manual	down	down

GigabitEthernet0/1	unassigned	YES	manual	up	up
GigabitEthernet0/2	unassigned	YES	manual	up	up
Vlan1	192.168.4.132	YES	manual	up	up

```
sw-br-floor2>
```

```
sw-br-floor2>show interfaces
```

```
FastEthernet0/1 is down, line protocol is down (disabled)
```

```
  Hardware is Lance, address is 0090.0c3c.5d01 (bia 0090.0c3c.5d01)
```

```
  BW 100000 Kbit, DLY 1000 usec,
```

```
Vlan1 is up, line protocol is up
```

```
  Hardware is CPU Interface, address is 0060.70c4.e374 (bia 0060.70c4.e374)
```

```
  Internet address is 192.168.4.132/25
```

```
  MTU 1500 bytes, BW 100000 Kbit, DLY 1000000 usec,
```

```
sw-br-floor2> 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
sw-br-floor3	Fas 0/24	155	S	2960	Fas 0/24
Branch-Firewall	Gig 0/1	155	R	C1900	Gig 0/1
sw-br-floor1	Gig 0/2	155	S	2960	Gig 0/2

```
sw-br-floor2>
```

```
sw-br-floor2> show cdp neighbors detail
```

```
Device ID: sw-br-floor3
```

```
Entry address(es):
```

```
  IP address : 192.168.4.133
```

```
Platform: cisco 2960, Capabilities: Switch
```

```
Interface: FastEthernet0/24, Port ID (outgoing port): FastEthernet0/24
```

```
Holdtime: 161
```



```

Device ID: sw-br-floor1
Entry address(es):
Platform: cisco 2960, Capabilities: Switch
Interface: GigabitEthernet0/2, Port ID (outgoing port): GigabitEthernet0/2
Holdtime: 161

```

No IP address for sw-br-floor1.

For 192.168.4.133-sw-br-floor3:

```

sw-br-floor2>ssh -l branchadmin 192.168.4.133

Password:

sw-br-floor3>sho
sw-br-floor3>show ip inter
sw-br-floor3>show ip interface brie
sw-br-floor3>show ip interface brief

```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/1	unassigned	YES	manual	down	down
FastEthernet0/2	unassigned	YES	manual	down	down
GigabitEthernet0/1	unassigned	YES	manual	up	up
GigabitEthernet0/2	unassigned	YES	manual	down	down
Vlan1	192.168.4.133	YES	manual	up	up

```

sw-br-floor3>

```

```

sw-br-floor3>show interfaces
FastEthernet0/1 is down, line protocol is down (disabled)
  Hardware is Lance, address is 00d0.97ba.3701 (bia 00d0.97ba.3701)
  BW 100000 Kbit, DLY 1000 usec,

Vlan1 is up, line protocol is up
  Hardware is CPU Interface, address is 0090.2173.ac1d (bia 0090.2173.ac1d)
  Internet address is 192.168.4.133/25
  MTU 1500 bytes, BW 100000 Kbit, DLY 1000000 usec,
    reliability 255/255, txload 1/255, rxload 1/255

```

```

sw-br-floor3> 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
sw-br-floor2
  Fas 0/24        172         S          2960        Fas 0/24
sw-br-floor1
  Gig 0/1         172         S          2960        Gig 0/1
sw-br-floor3>

```

We already know the IP addresses of sw-br-floor2.

Here is the final address table.

Device	Interface	IP Address	Subnet Mask	Local Interface and Connected Neighbor
Edge1	G0/0	192.168.1.1	255.255.255.0	G0/1 - S1
	S0/0/0	209.165.200.5	255.255.255.252	S0/0/0 - ISP
Brach-Edge	S0/0/1	209.165.200.10	255.255.255.252	S0/0/1 - ISP
	G0/0	192.168.3.249	255.255.255.248	G0/0 – Branch-Firewall
Branch-Firewall	G0/0	192.168.3.253	255.255.255.248	G0/0 – Branch-Edge
	G0/1	192.168.4.129	255.255.255.128	G0/1 – sw-br-floor2
sw-br-floor2	G0/1			G0/1– Branch-Firewall
	G0/2			G0/2 – sw-br-floor1
	F0/24			F0/24 – sw-br-floor3
	SVI	192.168.4.132	255.255.255.128	
sw-br-floor1	G0/1			G0/1– sw-br-floor3
	G0/2			G0/2 – sw-br-floor2
Sw-br-floor3	F0/24			F0/24 – sw-br-floor2
	G0/1			G0/1– sw-br-floor1
	SVI	192.168.4.133	255.255.255.128	

Draw a topology of the Remote Branch Office network using the information you have gathered using CDP.

