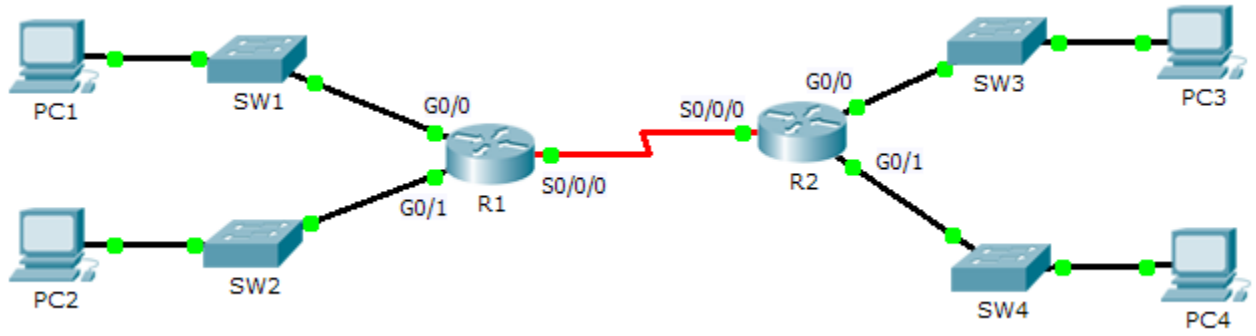
Packet Tracer - Investigating Directly Connected Routes

Topology



Objectives

Part 1: Investigate IPv4 Directly Connected Routes

Part 2: Investigate IPv6 Directly Connected Routes

Background

The network in the activity is already configured. You will log in to the routers and use **show** commands to discover and answer the questions below about the directly connected routes.

Note: The user EXEC password is **cisco** and the privileged exec password is **class.**

Part 1: Investigate IPv4 Directly Connected Routes

Step 1: Use show commands to gather information about the IPv4 directly connected networks.

Enter the following command on **R1**:

```
R1> show ip route ?
```

a. What option would be most beneficial in determining the networks assigned to the interfaces of the router?

connected

b. Which networks are directly connected on **R1**? Hint: Use the option determined above.

C 172.31.20.0/23 is directly connected, GigabitEthernet0/0

C 172.31.22.0/23 is directly connected, GigabitEthernet0/1

C 209.165.200.224/30 is directly connected, Serial0/0/0

c. Which IP addresses are assigned to the LAN interfaces on **R1**?

172.31.21.254
172.31.23.254

d. Which networks are directly connected on **R2**?

C 172.31.24.0/24 is directly connected, GigabitEthernet0/0

C 172.31.25.0/24 is directly connected, GigabitEthernet0/1

C 209.165.200.224/30 is directly connected, Serial0/0/0

e. Which IP addresses are assigned to the LAN interfaces on **R2**?

172.31.24.254

172.31.25.254

Step 2: Verify PC addressing and test connectivity.

a. Open a command prompt on **PC1**. Issue the command to display the IP settings. Based on the output, would you expect **PC1** to be able to communicate with all interfaces on the router? Provide a short answer describing your expectations.

The PC has the correct gateway address and the router lists all connected networks in the routing table.

b. Open a command prompt on **PC2**. Issue the command to display the IP settings. Based on the output, would you expect **PC2** to be able to communicate with **PC1**? Verify your expectations.

Ping is successful

c. Determine the IP addresses of **PC3** and **PC4**. Record the results and determine if **PC3** and **PC4** are able to communicate.

PC3 – IP address 172.31.24.10, PC4 – IP address 172.31.25.10

d. Test connectivity from **PC1** to **PC3**. Was the test successful?

Yes

e. **Bonus**: Looking at the outputs of the routing tables on **R1** and **R2**, what might indicate a reason for the success or failure of communication between **PC1** and **PC3**?

The default static route 0.0.0.0/0

Part 2: Investigate IPv6 Directly Connected Routes

Step 1: Use show commands to gather information about the IPv6 directly connected networks.

a. Which IPv6 networks are available on **R1**?

```
R1#show ipv6 route
IPv6 Routing Table - 8 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
S   ::/0 [1/0]
     via Serial0/0/0, directly connected
C   2001:DB8:C001:1::/64 [0/0]
     via GigabitEthernet0/0, directly connected
L   2001:DB8:C001:1::1/128 [0/0]
     via GigabitEthernet0/0, receive
C   2001:DB8:C001:2::/64 [0/0]
     via GigabitEthernet0/1, directly connected
L   2001:DB8:C001:2::1/128 [0/0]
     via GigabitEthernet0/1, receive
C   2001:DB8:C001:ACE::/64 [0/0]
     via Serial0/0/0, directly connected
L   2001:DB8:C001:ACE::1/128 [0/0]
     via Serial0/0/0, receive
L   FF00::/8 [0/0]
     via Null0, receive
R1#
```

b. Which IPv6 unicast addresses are assigned to the LAN interfaces on **R1**?

L 2001:DB8:C001:1::1/128 [0/0]via ::, GigabitEthernet0/0

L 2001:DB8:C001:2::1/128 [0/0]via ::, GigabitEthernet0/1

c. Which IPv6 networks are available on R2?

C 2001:DB8:C001:3::/64 [0/0]via ::, GigabitEthernet0/0

L 2001:DB8:C001:3::1/128 [0/0]via ::, GigabitEthernet0/0

C 2001:DB8:C001:4::/64 [0/0]via ::, GigabitEthernet0/1

L 2001:DB8:C001:4::1/128 [0/0]via ::, GigabitEthernet0/1

C 2001:DB8:C001:ACE::/64 [0/0]via ::, Serial0/0/0

L 2001:DB8:C001:ACE::2/128 [0/0]via ::, Serial0/0/0

d. Which IPv6 addresses are assigned to the LAN interfaces on **R2**?

L 2001:DB8:C001:3::1/128 [0/0]via ::, GigabitEthernet0/0

L 2001:DB8:C001:4::1/128 [0/0]via ::, GigabitEthernet0/1

Step 2: Verify PC settings and connectivity.

a. Open a command prompt on **PC1**. Issue the command to display the IPv6 settings. Based on the output, would you expect **PC1** to be able to communicate with all interfaces on the router? Provide a short answer describing your expectations

The PC has the correct gateway address based on the router's link-local address, and the router lists all connected networks in its routing table.

b. Open a command prompt on **PC2**. Issue the command to display the IPv6 settings. Based on the output, would you expect **PC2** to be able to communicate with **PC1**? Verify your expectations.

Ping is successful

c. Determine the IPv6 addresses of **PC3** and **PC4**. Record the results and determine if **PC3** and **PC4** are able to communicate.

PC3 – IP address 2001:DB8:C001:3::10/64, PC4 – IP address 2001:DB8:C001:4::10/64

d. Test connectivity from **PC1** to **PC3**. Was the test successful?

Yes

e. **Bonus**: What might indicate a reason for the success or failure of communication between **PC1** and **PC3** after looking at the outputs of the IPv6 routing tables on **R1** and **R2**?

S ::/0 [1/0]via ::, Serial0/0/0

Suggested Scoring Rubric

Activity Section	Question Location	Possible Points	Earned Points
Part 1: Investigate IPv4 Directly Connected Routes	Step 1	25	
	Step 2	25	
Part 2: Investigate IPv6 Directly Connected Routes	Step 1	25	
	Step 2	25	
	Total Score	**100**	