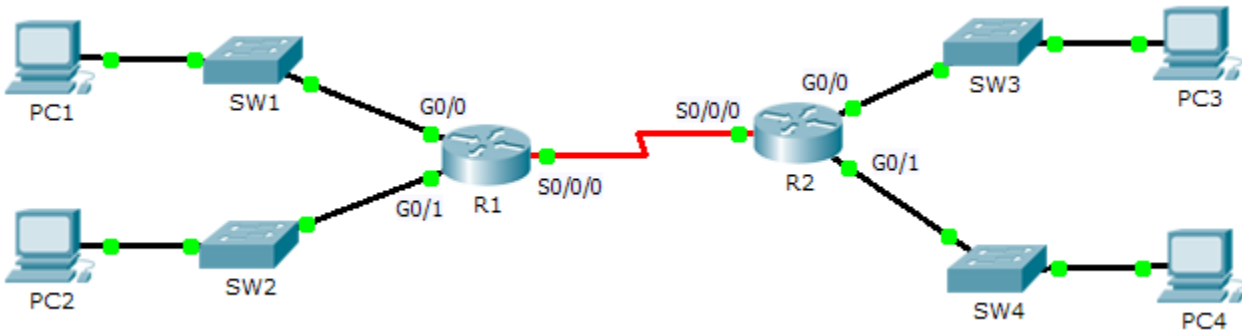


Packet Tracer - Investigating Directly Connected Routes (Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

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 ?
```

- What option would be most beneficial in determining the networks assigned to the interfaces of the router? connected
- 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
```

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

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0	172.31.21.254	YES	manual	up	up
GigabitEthernet0/1	172.31.23.254	YES	manual	up	up

Investigating Directly Connected Routes

- 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**?

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0	172.31.24.254	YES	manual	up	up
GigabitEthernet0/1	172.31.25.254	YES	manual	up	up

Step 2: Verify PC addressing and test connectivity.

- 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 of the connected networks in the routing table.**
- 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**
- 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**
- Test connectivity from **PC1** to **PC3**. Was the test successful? **yes**
- 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**?

```
C 2001:DB8:C001:1::/64 [0/0]
   via ::, GigabitEthernet0/0
L 2001:DB8:C001:1::1/128 [0/0]
   via ::, GigabitEthernet0/0
C 2001:DB8:C001:2::/64 [0/0]
   via ::, GigabitEthernet0/1
L 2001:DB8:C001:2::1/128 [0/0]
   via ::, GigabitEthernet0/1
C 2001:DB8:C001:ACE::/64 [0/0]
   via ::, Serial0/0/0
L 2001:DB8:C001:ACE::1/128 [0/0]
   via ::, Serial0/0/0
```

- 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**?

Investigating Directly Connected Routes

```
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.

- 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 using the link local address on the router and the router lists all of the connected networks in the routing table.
- 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
- 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
- Test connectivity from **PC1** to **PC3**. Was the test successful? **yes**
- 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**? The default IPv6 static route

```
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	