

Shaun Lim

Packet Tracer - Connect a Router to a LAN

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	192.168.10.1	255.255.255.0	N/A
	G0/1	192.168.11.1	255.255.255.0	N/A
	S0/0/0 (DCE)	209.165.200.225	255.255.255.252	N/A
R2	G0/0	10.1.1.1	255.255.255.0	N/A
	G0/1	10.1.2.1	255.255.255.0	N/A
	S0/0/0	209.165.200.226	255.255.255.252	N/A
PC1	NIC	192.168.10.10	255.255.255.0	192.168.10.1
PC2	NIC	192.168.11.10	255.255.255.0	192.168.11.1
PC3	NIC	10.1.1.10	255.255.255.0	10.1.1.1
PC4	NIC	10.1.2.10	255.255.255.0	10.1.2.1

Objectives

Part 1: Display Router Information

Part 2: Configure Router Interfaces

Part 3: Verify the Configuration

Background

In this activity, you will use various **show** commands to display the current state of the router. You will then use the Addressing Table to configure router Ethernet interfaces. Finally, you will use commands to verify and test your configurations.

Note: The routers in this activity are partially configured. Some of the configurations are not covered in this course but they are provided to assist you in using verification commands.

Part 1: Display Router Information

Step 1: Display interface information on R1.

Note: Click a device and then click the **CLI** tab to access the command line directly. The console password is **cisco**. The privileged EXEC password is **class**.

- Which command displays the statistics for all interfaces configured on a router?

show interfaces

- Which command displays the information about the Serial 0/0/0 interface only?

show interfaces serial 0/0/0

- c. Enter the command to display the statistics for the Serial 0/0/0 interface on R1 and answer the following questions:
- 1) What is the IP address configured on **R1**?
209.165.200.225/30
 - 2) What is the bandwidth on the Serial 0/0/0 interface?
BW 1544 Kbit
- d. Enter the command to display the statistics for the GigabitEthernet 0/0 interface and answer the following questions:
- 1) What is the IP address on **R1**?
There is no IP address configured on the GigabitEthernet 0/0 interface of R1.
 - 2) What is the MAC address of the GigabitEthernet 0/0 interface?
000d.bd6c.7d01
 - 3) What is the bandwidth (BW) of the GigabitEthernet 0/0 interface?
BW 1000000 Kbit

Step 2: Display a summary list of the interfaces on R1.

- a. Which command displays a brief summary of the current interfaces, interface status, and the IP addresses assigned to them?
show ip interface brief
- b. Enter the command on each router and answer the following questions:
- 1) How many serial interfaces are there on **R1** and **R2**?
There are 2 serial interfaces on R1 and 2 n R2, meaning there are 4 serial interfaces for both.
 - 2) How many Ethernet interfaces are there on **R1** and **R2**?
There are 6 (2 Giga 4 Fast) on R1 and 2 (2 Giga) on R2, for a total of 8 Ethernet Interfaces for both.
 - 3) Are all the Ethernet interfaces on **R1** the same? If no, explain the difference(s).

No, 2 are Gigabit Ethernet Interfaces and 4 are Fast Ethernet Interfaces. The difference between the two is Gigabit Ethernet interfaces support speeds of up to 1,000,000,000 bits per second and Fast Ethernet interfaces support speeds of up to 1,000,000 bits per second.

Step 3: Display the routing table on R1.

- a. What command displays the contents of the routing table?
- b. Enter the command on **R1** and answer the following questions:
- 1) How many connected routes are there (uses the **C** code)?
1 (C 209.165.200.224/30 is directly connected, Serial0/0/0)

- 2) Which route is listed?

209.165.200.224/30

- 3) How does a router handle a packet destined for a network that is not listed in the routing table?

**If a network is listed in the routing table, the router will send packets to that specific network.
If it does not exist in the routing table, the packets will be dropped.**

Step 4: Configure the GigabitEthernet 0/0 interface on R1.

- a. Enter the following commands to address and activate the GigabitEthernet 0/0 interface on **R1**:

```
R1(config)# interface gigabitethernet 0/0
R1(config-if)# ip address 192.168.10.1 255.255.255.0
R1(config-if)# no shutdown
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
```

- b. It is good practice to configure a description for each interface to help document the network. Configure an interface description that indicates the device to which it is connected.

```
R1(config-if)# description LAN connection to S1
```

- c. **R1** should now be able to ping PC1.

```
R1(config-if)# end
%SYS-5-CONFIG_I: Configured from console by console
R1# ping 192.168.10.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.10, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/2/8 ms
```

Step 5: Configure the remaining Gigabit Ethernet Interfaces on R1 and R2.

- a. Use the information in the Addressing Table to finish the interface configurations for **R1** and **R2**. For each interface, do the following:
- 1) Enter the IP address and activate the interface.
 - 2) Configure an appropriate description.
- b. Verify interface configurations.

Step 6: Back up the configurations to NVRAM.

Save the configuration files on both routers to NVRAM. What command did you use?

copy running-config startup-config

Part 2: Verify the Configuration

Step 1: Use verification commands to check your interface configurations.

- a. Use the **show ip interface brief** command on both **R1** and **R2** to quickly verify that the interfaces are configured with the correct IP address and are active.

How many interfaces on **R1** and **R2** are configured with IP addresses and in the “up” and “up” state?

3 for R1 and 3 for R2, for a total of 6 on both routers.

What part of the interface configuration is NOT displayed in the command output?

The subnet mask

What commands can you use to verify this part of the configuration?

show running-config, show interfaces, show ip protocols

- b. Use the **show ip route** command on both **R1** and **R2** to view the current routing tables and answer the following questions:

- 1) How many connected routes (uses the **C** code) do you see on each router?

3 connected routes can be found in R1 and 3 connected routes for R2, for a total of 6 connected routes in both routers that uses C.

- 2) How many OSPF routes (uses the **O** code) do you see on each router?

2 OSPF routes can be found in R1 and 2 OSPF routes for R2, for a total of 4 connected routes in both routers that uses O.

- 3) If the router knows all the routes in the network, then the number of connected routes and dynamically learned routes (OSPF) should equal the total number of LANs and WANs. How many LANs and WANs are in the topology?

5

- 4) Does this number match the number of C and O routes shown in the routing table?

e Yes. for R1 there are 2 O routes and 3 C routes and for R2, it has the same number of O and C routes, which is the same as the definition mentioned previously (The number of connected routes and dynamically learned routes (OSPF) should equal the total number of LANs and WANs)

Note: If your answer is “no”, then you are missing a required configuration. Review the steps in Part 2.

Step 2: Test end-to-end connectivity across the network.

You should now be able to ping from any PC to any other PC on the network. In addition, you should be able to ping the active interfaces on the routers. For example, the following tests should be successful:

- From the command line on PC1, ping PC4.
- From the command line on R2, ping PC2.

Note: For simplicity in this activity, the switches are not configured. You will not be able to ping them.

Packet Tracer - Connect a Router to a LAN

The screenshot shows the Packet Tracer interface with a document titled "10.3.4 Packet Tracer - Connect a Router to a LAN". The left sidebar contains a "Navigation" pane with a "Background" section expanded, showing steps for displaying router information and verifying configuration. The main workspace displays the "Command Prompt" window for PC1. The output shows a successful ping to 10.1.1.10 with 32 bytes of data. The ping statistics indicate 4 packets sent, 3 received, and 1 lost (25% loss), with an average round trip time of 24ms.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.1.1.10

Pinging 10.1.1.10 with 32 bytes of data:

Request timed out.
Reply from 10.1.1.10: bytes=32 time=10ms TTL=126
Reply from 10.1.1.10: bytes=32 time=20ms TTL=126
Reply from 10.1.1.10: bytes=32 time=20ms TTL=126

Ping statistics for 10.1.1.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 20ms, Average = 24ms

C:\>
```

The screenshot shows the Packet Tracer interface with a document titled "10.3.4 Packet Tracer - Connect a Router to a LAN". The left sidebar contains a "Navigation" pane with a "Background" section expanded, showing steps for displaying router information and verifying configuration. The main workspace displays the "CLI" window for R2. The output shows the configuration of the router, including the running configuration, interface status, and a successful ping to 10.1.1.10.

```
R2#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R2#show ip interface brief
Interface      IP-Address      OK? Method Status  Protocol
GigabitEthernet0/0  10.1.1.1        YES manual  up      IP
GigabitEthernet0/1  10.1.2.1        YES manual  up      IP
Serial0/0/0        209.165.200.226 YES manual  up      IP
Serial0/0/1        unassigned      YES unset   administratively down down
Vlan1            unassigned      YES unset   administratively down down
R2#show ip route
Codes: C - local, L - learned, S - static, R - RIP, N - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C  10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C    10.1.1.0/24 is directly connected, GigabitEthernet0/0
L    10.1.1.1/32 is directly connected, GigabitEthernet0/0
C    10.1.2.0/24 is directly connected, GigabitEthernet0/1
L    10.1.2.1/32 is directly connected, GigabitEthernet0/1
O    192.168.10.0/24 [110/65] via 209.165.200.225, 00:11:01, Serial0/0/0
O    192.168.11.0/24 [110/65] via 209.165.200.225, 00:00:53, Serial0/0/0
C    209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
C    209.165.200.224/30 is directly connected, Serial0/0/0
L    209.165.200.226/32 is directly connected, Serial0/0/0

R2#ping
?Bad filename
?Error parsing filename (Bad file number)
R2#ping 192.168.11.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.11.10, timeout is 2 seconds:
.....
Success rate is 80 percent (4/5), round-trip min/avg/max = 13/14/16 ms

R2#
```

Packet Tracer - Connect a Router to a LAN

Cisco Packet Tracer - C:/Users/Dell/Downloads/10.3.4 Packet Tracer - Connect a Router to a LAN.pka - Shaun Lim - 2023-06-26 16:56:55

— □ ×

File Edit Options View Tools Extensions Window Help

Activity Results

Time Elapsed: 00:21:47

Congratulations Shaun Lim! You completed the activity.

Overall Feedback Assessment Items Connectivity Tests

Expand/Collapse All Show Incorrect Items

Assessment Items	Status	Points	Component(s)	Feedback
Network				
R1				
Ports				
GigabitEthernet0/0				
✓ Description	Correct	3	Device Inte...	
✓ IP Address	Correct	3	Device Inte...	
✓ Port Status	Correct	3	Device Inte...	
✓ Subnet Mask	Correct	3	Device Inte...	
GigabitEthernet0/1				
✓ Description	Correct	3	Device Inte...	
✓ IP Address	Correct	3	Device Inte...	
✓ Port Status	Correct	3	Device Inte...	
✓ Subnet Mask	Correct	3	Device Inte...	
✓ Startup Config	Correct	3	Configurati...	
R2				
Ports				
GigabitEthernet0/0				
✓ Description	Correct	3	Device Inte...	
✓ IP Address	Correct	3	Device Inte...	
✓ Port Status	Correct	3	Device Inte...	
✓ Subnet Mask	Correct	3	Device Inte...	
GigabitEthernet0/1				
✓ Description	Correct	3	Device Inte...	
✓ IP Address	Correct	3	Device Inte...	
✓ Port Status	Correct	3	Device Inte...	
✓ Subnet Mask	Correct	3	Device Inte...	
✓ Startup Config	Correct	3	Configurati...	

Score : 54/54
Item Count : 18/18

Component	Items/Total	Score
Configuration Management	2/2	6/6
Device Interface Configuration	16/16	48/48

Close

