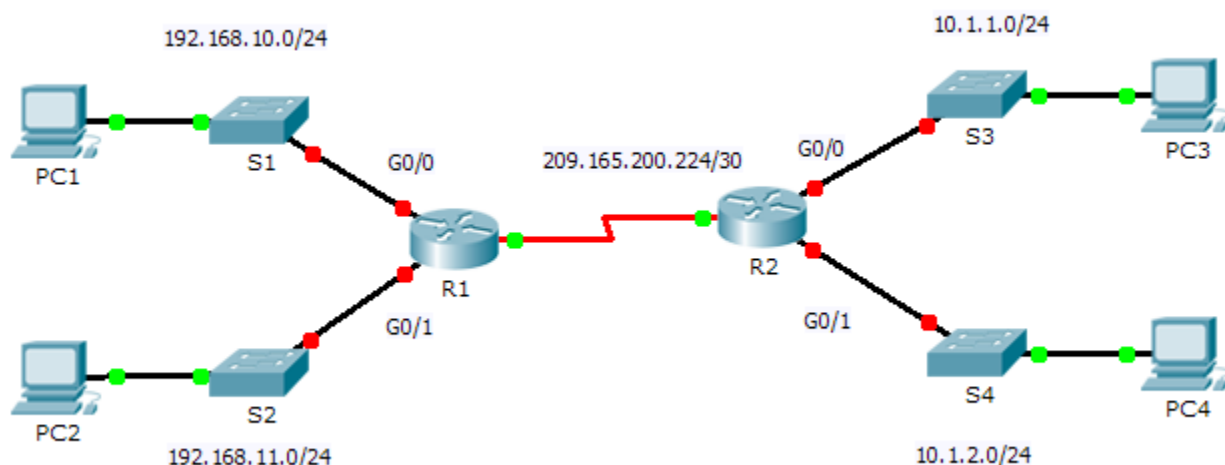


Packet Tracer - Connect a Router to a LAN

Topology



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 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 interface serial0/0/0**
- Enter the command to display the statistics for the Serial 0/0/0 interface on R1 and answer the following questions:
 - What is the IP address configured on R1? **209.165.200.225/30**
 - What is the bandwidth on the Serial 0/0/0 interface? **1544 Kbit**
- Enter the command to display the statistics for the GigabitEthernet 0/0 interface and answer the following questions:
 - What is the IP address on R1? **There is no IP address configured on the GigabitEthernet 0/0 interface.**
 - What is the MAC address of the GigabitEthernet 0/0 interface? **000d.bd6c.7d01**
 - What is the bandwidth on the GigabitEthernet 0/0 interface? **1000000 Kbit**

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

- Which command displays a brief summary of the current interfaces, statuses, and IP addresses assigned to them?

_____ R1# **show ip interface brief** _____

- Enter the command on each router and answer the following questions:
 - How many serial interfaces are there on R1 and R2? **Each router has 2 serial interfaces**
 - How many Ethernet interfaces are there on R1 and R2?
R1 has 6 Ethernet interfaces and R2 has 2 Ethernet interfaces.
 - Are all the Ethernet interfaces on R1 the same? If no, explain the difference(s).
No they are not. There are two Gigabit Ethernet interfaces and 4 Fast Ethernet interfaces. Gigabit Ethernet interfaces support speeds of up to 1,000,000,000 bits and Fast Ethernet interfaces support speeds of up to 1,000,000 bits

Step 3: Display the routing table on R1.

- What command displays the content of the routing table? **Show ip route**
- Enter the command on R1 and answer the following questions:
 - How many connected routes are there (uses the C code)? **1**

Which route is listed? **209.165.200.224/30**

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

A router will only send packets to a network listed in the routing table. If a network is not listed, the packet will be dropped.

Part 2: Configure Router Interfaces

Step 1: Configure the GigabitEthernet 0/0 interface on R1.

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

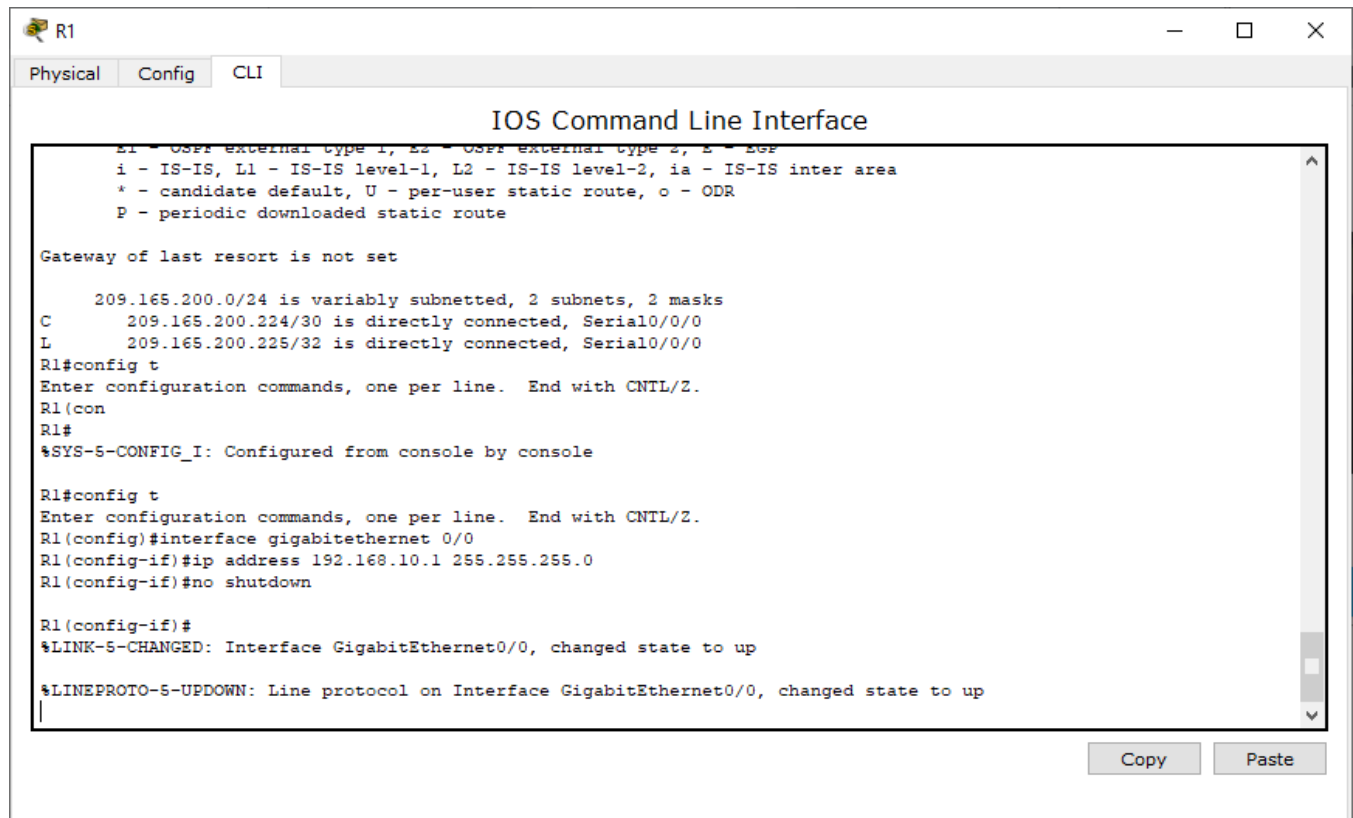
```
R1(config)# interface gigabitethernet 0/0
```

```
R1(config-if)# ip address 192.168.10.1 255.255.255.0
```

```
R1(config-if)# no shutdown
```

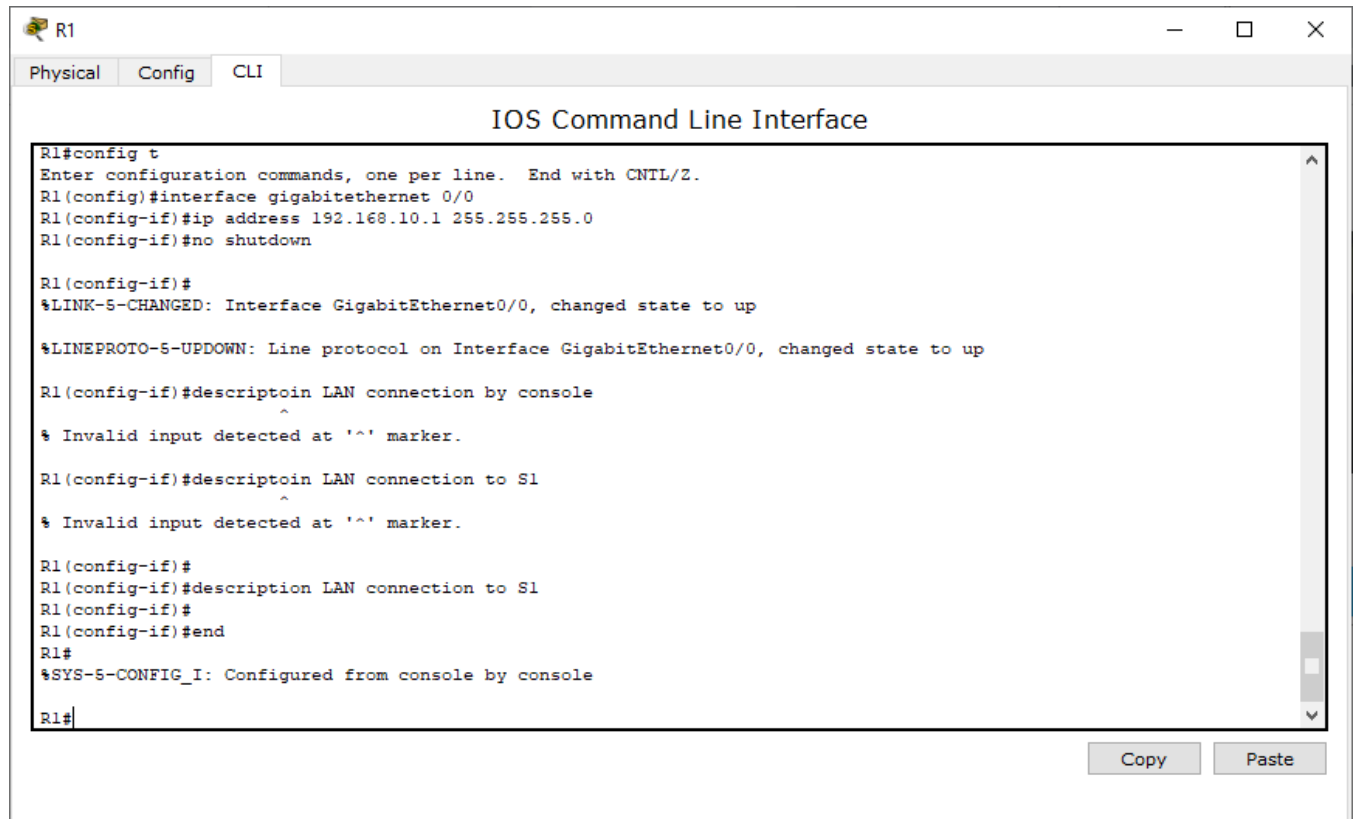
```
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
```

```
%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 information. Configure an interface description indicating to which device 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

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

R1#ping 192.168.10.10

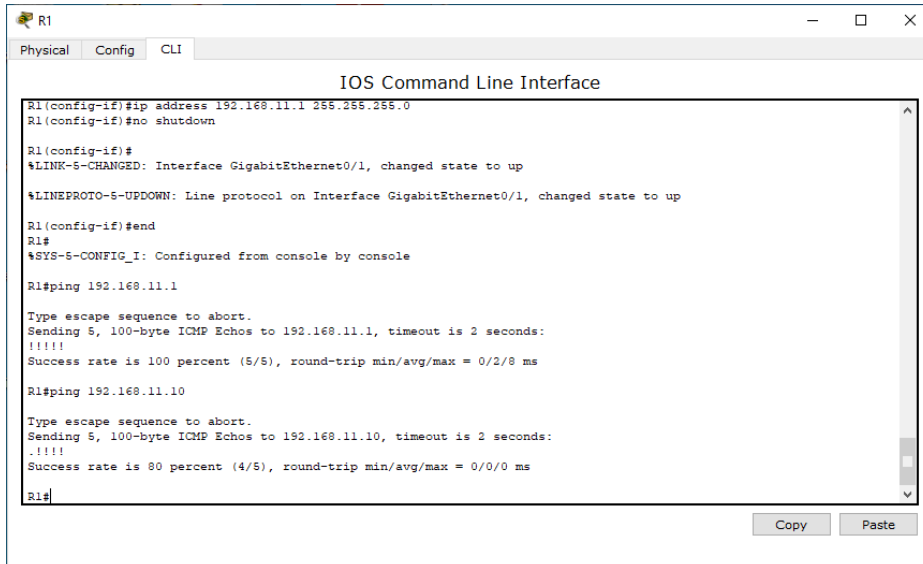
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.10, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

R1#
```

Step 2: 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.

R1



```
R1
Physical Config CLI
IOS Command Line Interface
R1(config-if)#ip address 192.168.11.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#ping 192.168.11.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.11.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/2/8 ms
R1#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 = 0/0/0 ms
R1#
```

R2 -gigabite-0

The screenshot shows the R2 CLI window with the 'CLI' tab selected. The title bar reads 'R2'. Below the tabs, the text 'IOS Command Line Interface' is displayed. The main window contains the following text:

```
GigabitEthernet0/0    unassigned    YES unset    administratively down down
GigabitEthernet0/1    unassigned    YES unset    administratively down down
Serial0/0/0          209.165.200.226 YES manual  up            up
Serial0/0/1          unassigned    YES unset    administratively down down
Vlan1                unassigned    YES unset    administratively down down
R2#
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface gigabitEthernet0/0
R2(config-if)#ip address 10.1.1.1 255.255.255.0
R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

R2(config-if)#description connection to pc3
R2(config-if)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console
R2#
```

At the bottom right of the window, there are 'Copy' and 'Paste' buttons.

R2-gigabite1

The screenshot shows the R2 CLI window with the 'CLI' tab selected. The title bar reads 'R2'. Below the tabs, the text 'IOS Command Line Interface' is displayed. The main window contains the following text:

```
R2#show ip interface brief
Interface            IP-Address    OK? Method Status      Protocol
GigabitEthernet0/0   10.1.1.1      YES manual  up          up
GigabitEthernet0/1   unassigned    YES unset   administratively down down
Serial0/0/0          209.165.200.226 YES manual  up          up
Serial0/0/1          unassigned    YES unset   administratively down down
Vlan1                unassigned    YES unset   administratively down down
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface GigabitEthernet0/1
R2(config-if)#ip address 10.1.2.1 255.255.255.0
R2(config-if)#no shutdown

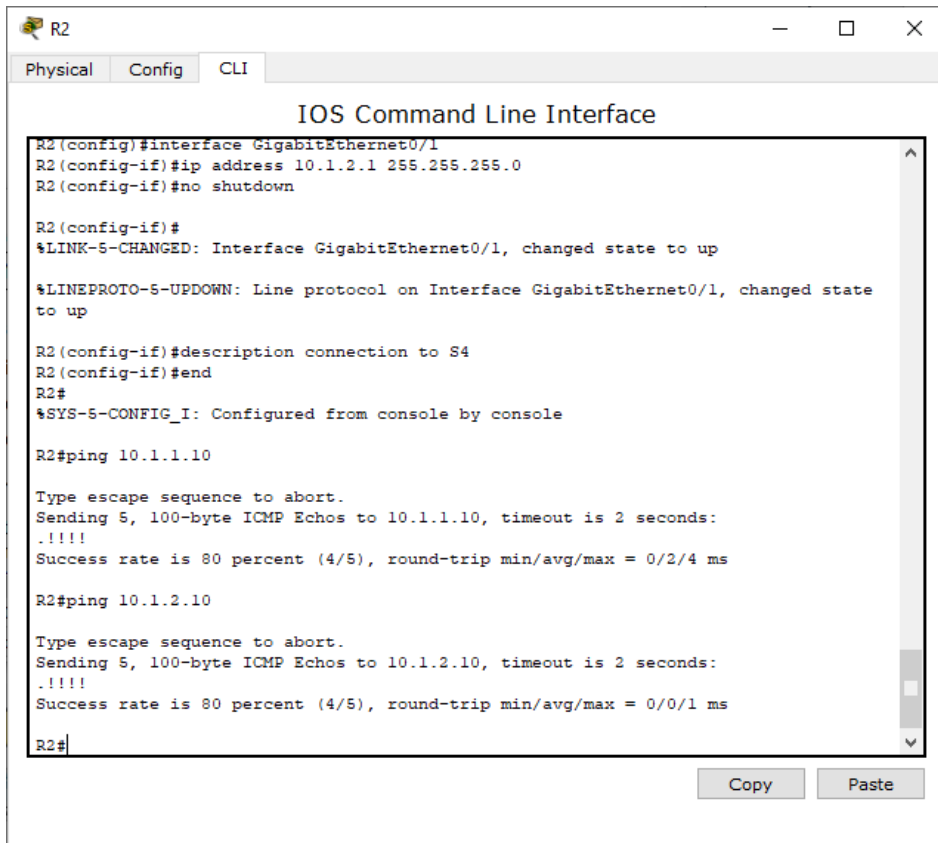
R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

R2(config-if)#description connection to S4
R2(config-if)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console
R2#
```

At the bottom right of the window, there are 'Copy' and 'Paste' buttons.

Checking connection in both



```
R2
Physical Config CLI
IOS Command Line Interface
R2(config)#interface GigabitEthernet0/1
R2(config-if)#ip address 10.1.2.1 255.255.255.0
R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

R2(config-if)#description connection to S4
R2(config-if)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#ping 10.1.1.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.10, timeout is 2 seconds:
..!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/2/4 ms

R2#ping 10.1.2.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.2.10, timeout is 2 seconds:
..!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/1 ms

R2#
```

Step 3: Back up the configurations to NVRAM.

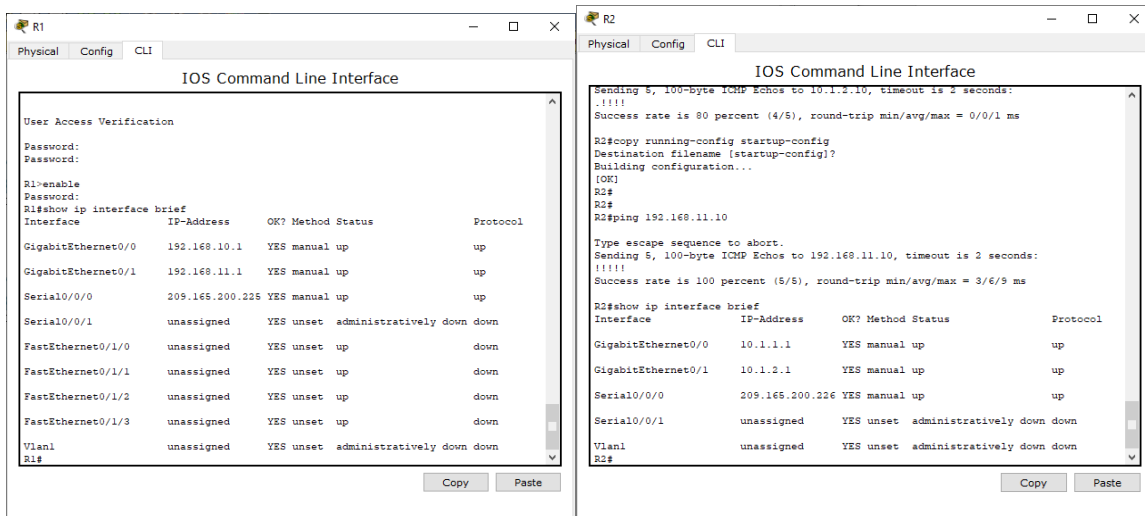
Save the configuration files on both routers to NVRAM. What command did you use?

Part 3: Verify the Configuration

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

- 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 active.

Packet Tracer - Connect a Router to a LAN



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

3 on each router

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

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

show run, 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
- 2) How many EIGRP routes (uses the **D** code) do you see on each router? 2
- 3) If the router knows all the routes in the network, then the number of connected routes and dynamically learned routes (EIGRP) 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 D routes shown in the routing table? yes

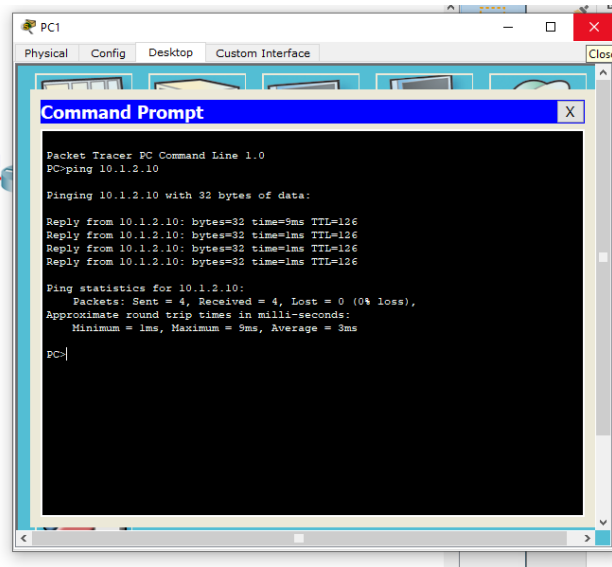
Note: If your answer is “no”, then you are missing a required configuration. Review the steps in Part 2.

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.

Packet Tracer - Connect a Router to a LAN



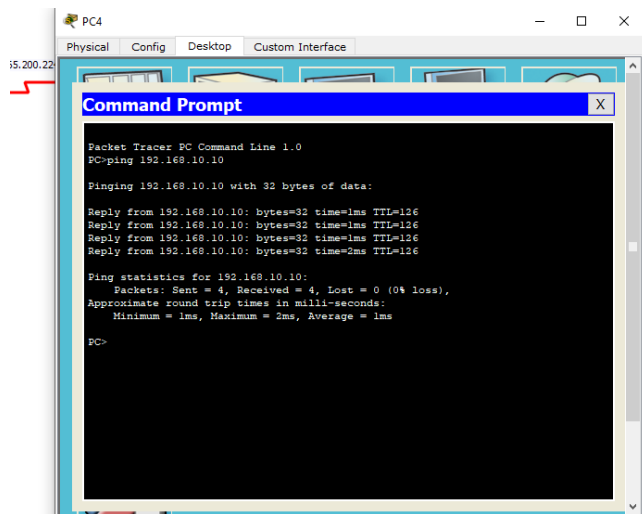
Addressing Table

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

- From the command line on R2, ping PC2.

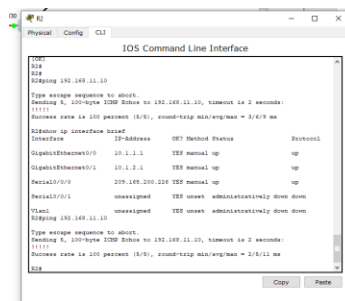


Addressing Table

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



From the router and from PC4 to PC1

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

Suggested Scoring Rubric

Activity Section	Question Location	Possible Points	Earned Points
Part 1: Display Router Information	Step 1a	2	
	Step 1b	2	
	Step 1c	4	
	Step 1d	6	
	Step 2a	2	
	Step 2b	6	
	Step 3a	2	
	Step 3b	6	
Part 1 Total		30	
Part 2: Configure Router Interfaces	Step 3	2	
Part 2 Total		2	
Part 3: Verify the Configuration	Step 1a	6	
	Step 1b	8	
Part 3 Total		14	
Packet Tracer Score		54	
Total Score (with bonus)		100	

Packet Tracer - Connect a Router to a LAN

Cisco Packet Tracer Student - C:\Users\PC 48\Downloads\Packet Tracer - Connect a Router to a LAN (1).pka

File Edit Options View Tools Extensions Help

Activity Results

Time Elapsed: 01:29:43

Congratulations Omar Alomory! You completed the activity.

Overall Feedback Assessment Items Connectivity Tests

Expand/Collapse All

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

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