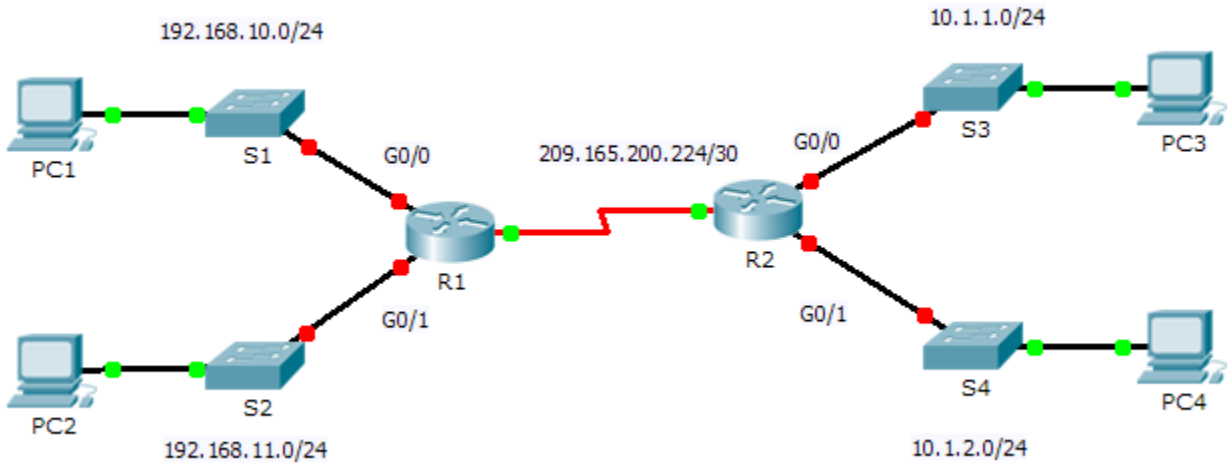
Packet Tracer - Connect a Router to a LAN

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**.

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

b. Which command displays the information about the Serial 0/0/0 interface only? Show interface serial0/0/0

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? 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.

2) What is the MAC address of the GigabitEthernet 0/0 interface? 000d.bd6c.7d01

3) What is the bandwidth on the GigabitEthernet 0/0 interface? 1000000 Kbit

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

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

_____R1#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**? Each router has 2 serial interfaces

2) How many Ethernet interfaces are there on **R1** and **R2**?

_R1 has 6 Ethernet interfaces and R2 has 2 Ethernet interfaces._____

3) 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.

a. What command displays the content of the routing table? Show ip route

b. Enter the command on **R1** and answer the following questions:

1) 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?

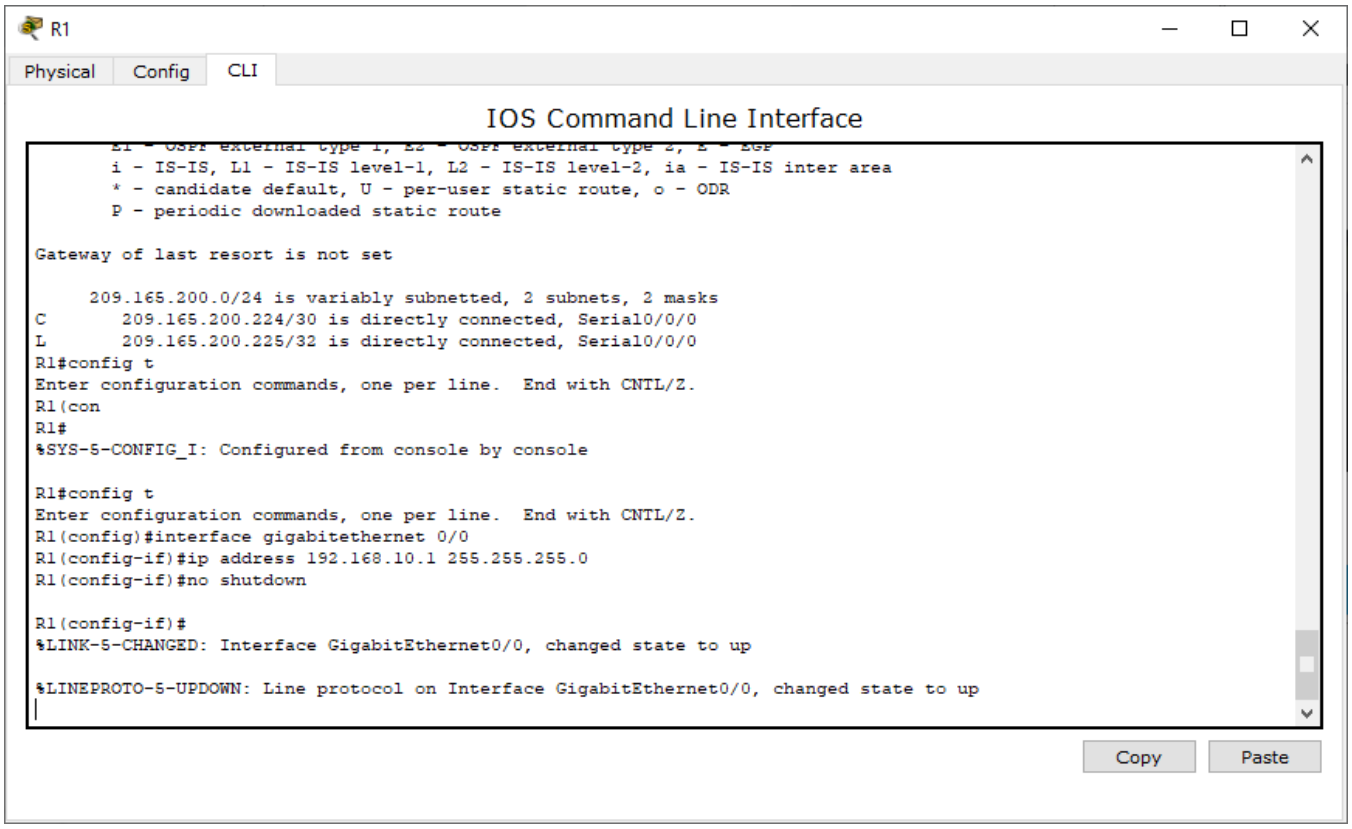
A router will only send packets to a network listed in the routing table. If a network is not listed, the packet will be dropped.

Part 2: Configure Router Interfaces

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

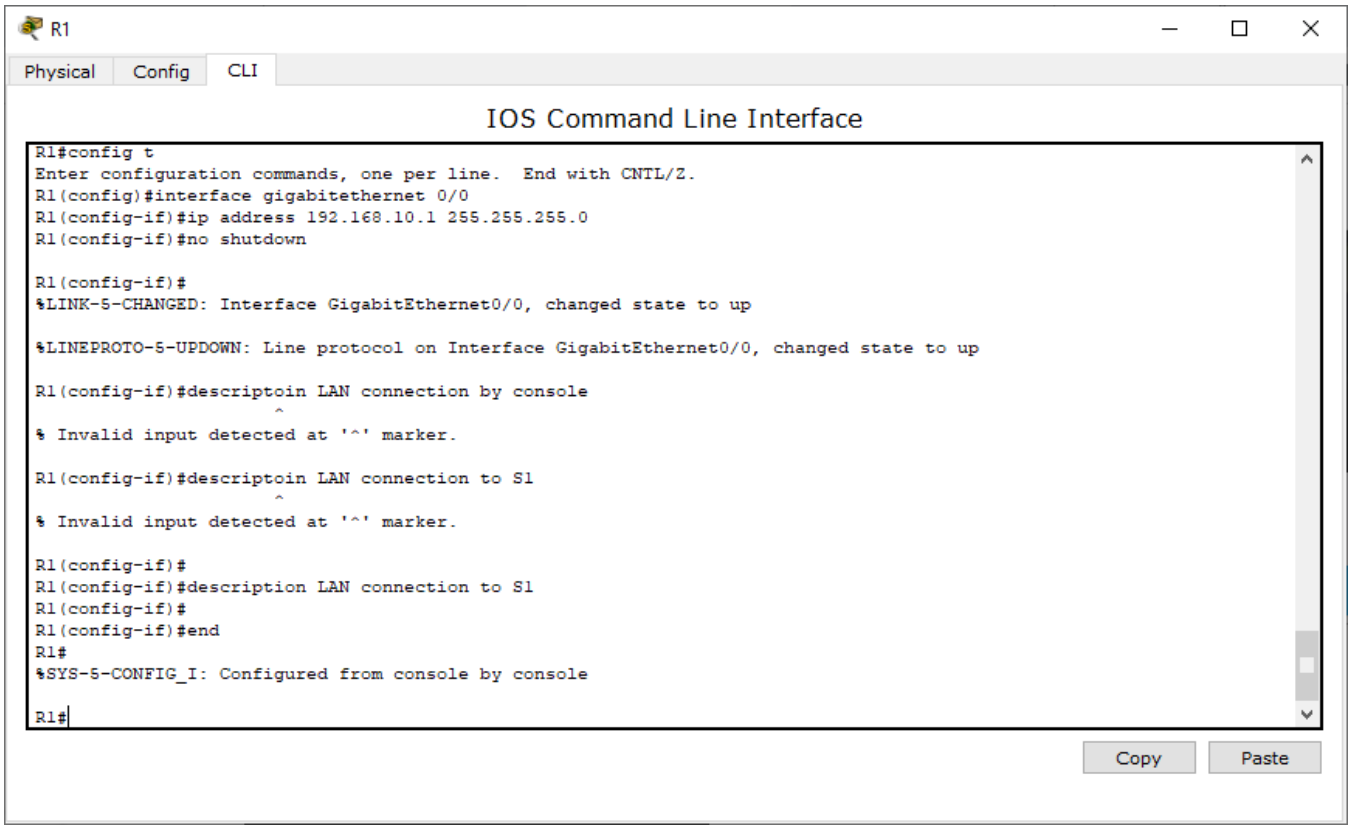
a. Enter the following commands to address and activate the GigabitEthernet 0/0 interface on **R1**:

```
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.

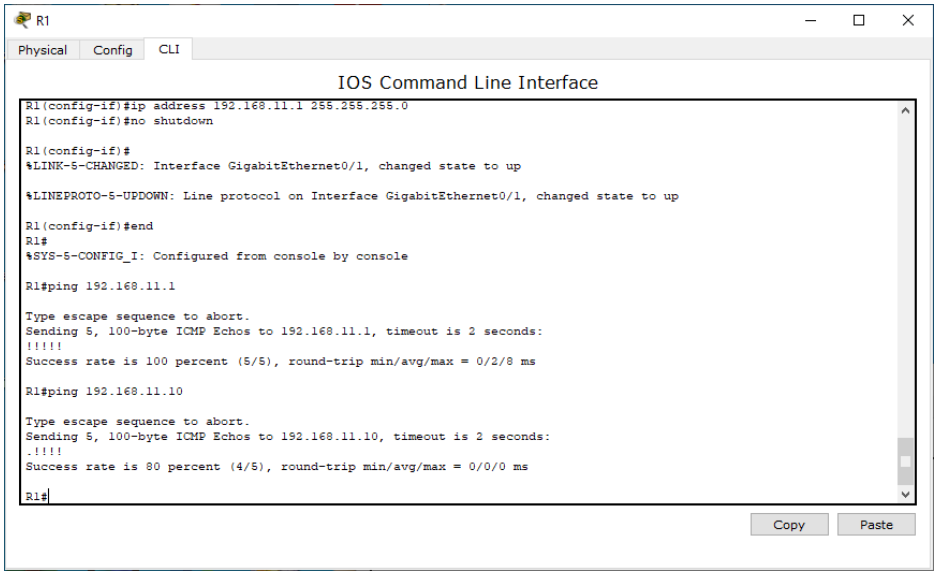
a. Use the information in the Addressing Table to finish the interface configurations for **R1** and **R2**. For each interface, do the following:

1) Enter the IP address and activate the interface.

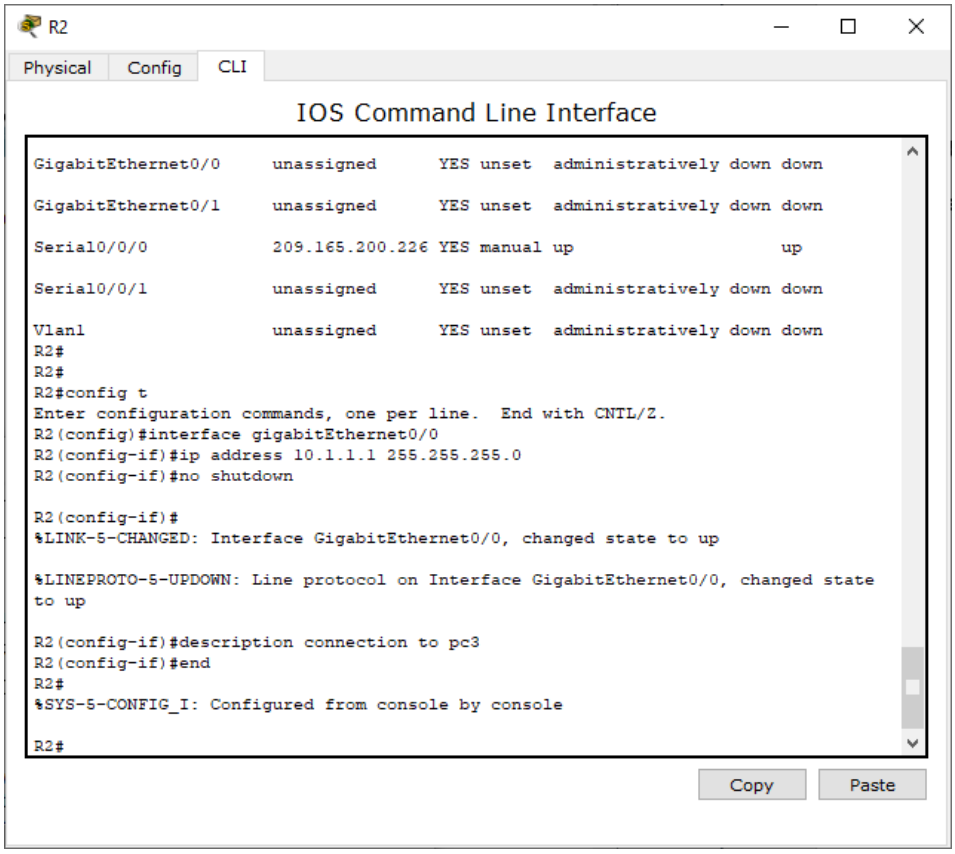
2) Configure an appropriate description.

b. Verify interface configurations.

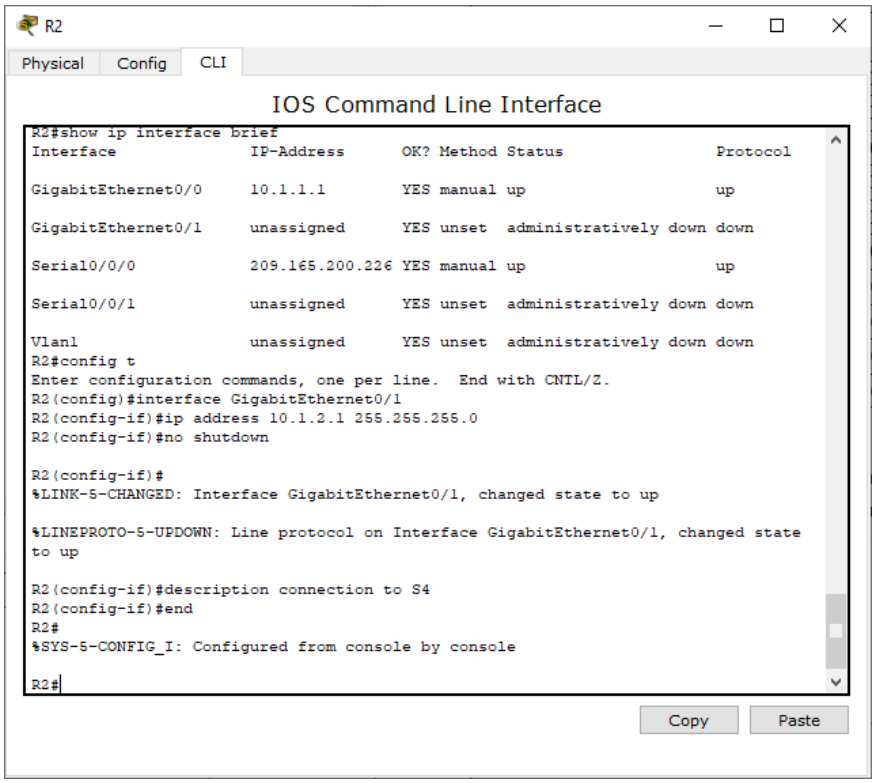
R1



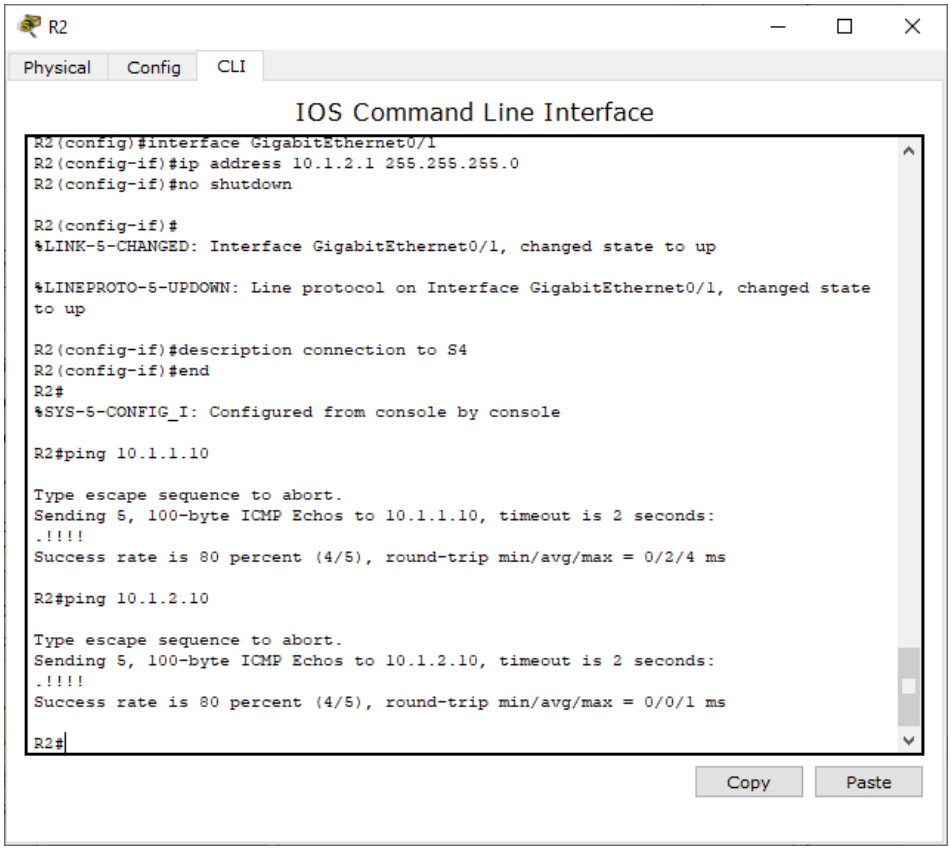
R2 -gigabite-0



R2-gigabite1



Checking connection in both



Step 3: Back up the configurations to NVRAM.

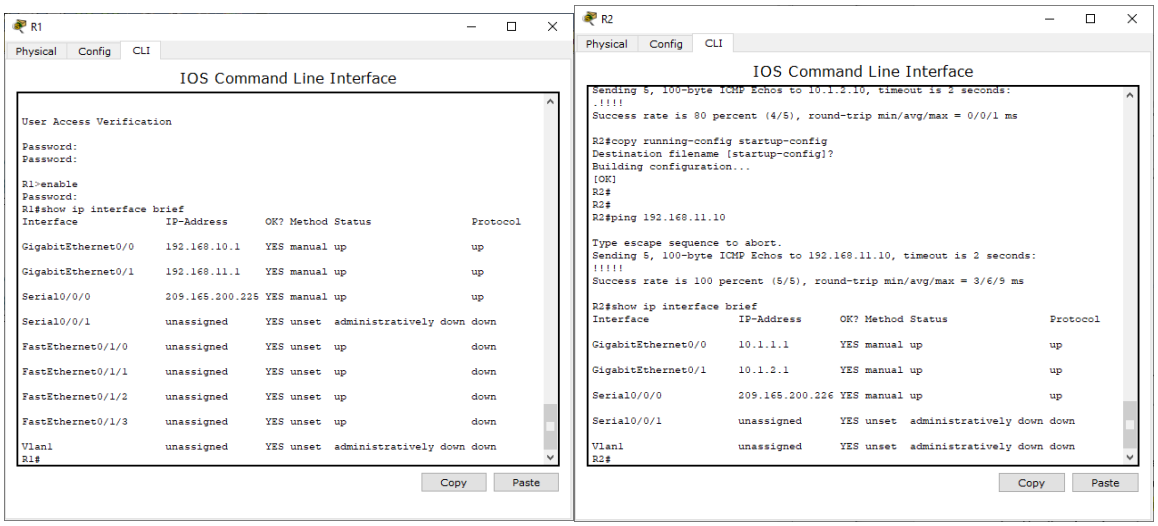
Save the configuration files on both routers to NVRAM. What command did you use?

_____

Part 3: Verify the Configuration

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

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 active.



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

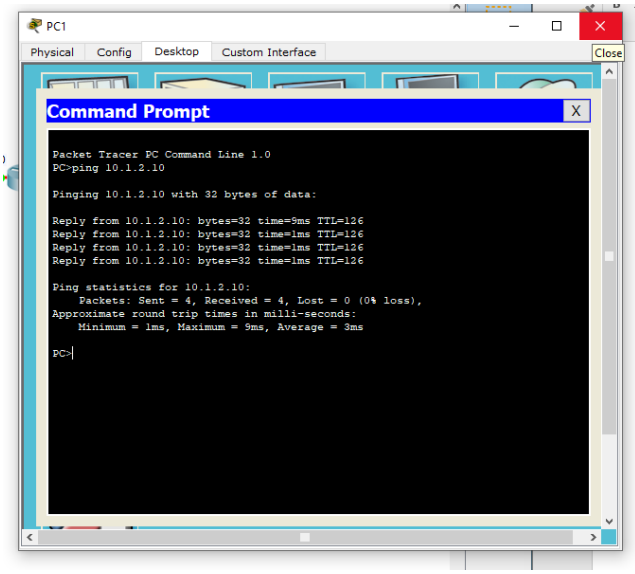
4) Does this number match the number of C and D routes shown in the routing table? yes

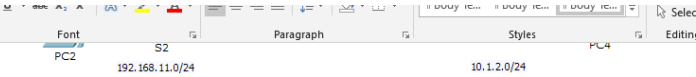
Note: If your answer is “no”, then you are missing a required configuration. Review the steps in Part 2.

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 should tests should be successful:

- From the command line on PC1, ping PC4.





Addressing Table

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	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
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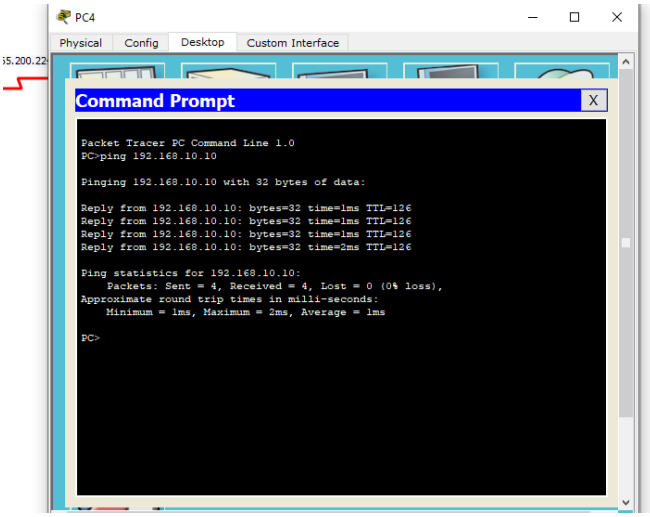
Objectives

Part 1: Display Router Information

Part 2: Configure Router Interfaces

Part 3: Verify the Configuration

- From the command line on R2, ping PC2.



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	G0/1	10.1.2.1	255.255.255.0	N/A
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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
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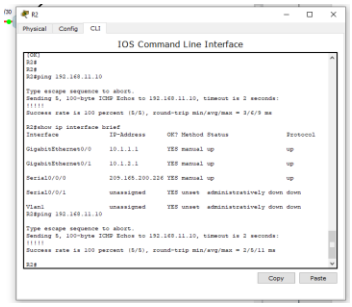
PC4	NIC	10.1.2.10	255.255.255.0	10.1.2.1

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**