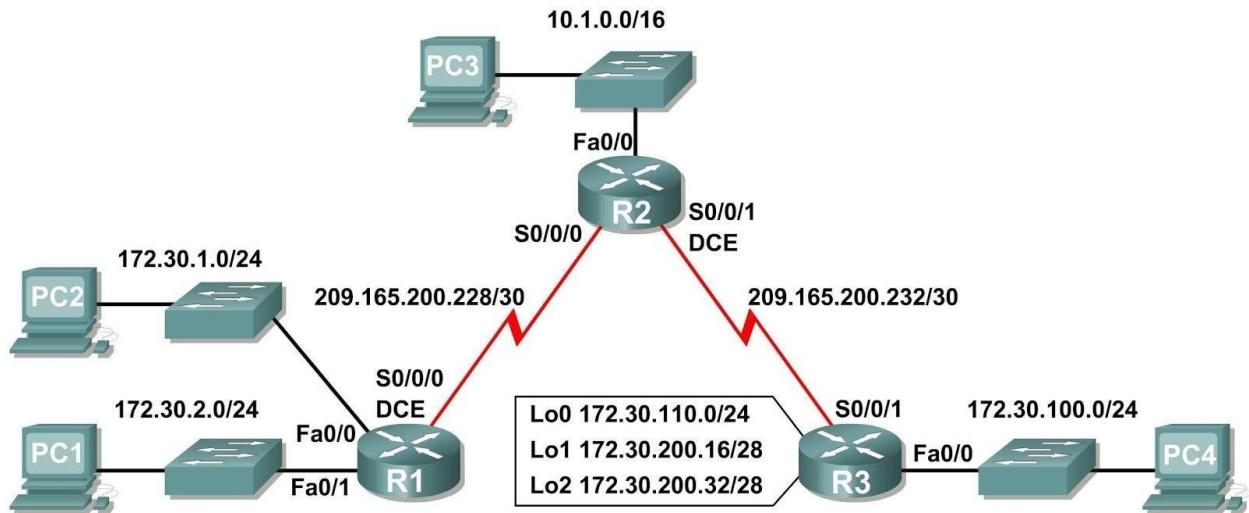


Ankeet Thongire
UID: 2018130056
Batch: D

CEL 51, DCCN, Monsoon 2020

Lab 7: RIPv2 Router Configuration

Topology Diagram



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	Fa0/0	172.30.1.1	255.255.255.0	N/A
	Fa0/1	172.30.2.1	255.255.255.0	N/A
	S0/0/0	209.165.200.230	255.255.255.252	N/A
R2	Fa0/0	10.1.0.1	255.255.0.0	N/A
	S0/0/0	209.165.200.229	255.255.255.252	N/A
	S0/0/1	209.165.200.233	255.255.255.252	N/A
R3	Fa0/0	172.30.100.1	255.255.255.0	N/A
	S0/0/1	209.165.200.234	255.255.255.252	N/A
	Lo0	172.30.110.1	255.255.255.0	N/A
	Lo1	172.30.200.17	255.255.255.240	N/A
	Lo2	172.30.200.33	255.255.255.240	N/A
PC1	NIC	172.30.2.10	255.255.255.0	172.30.2.1

PC2	NIC	172.30.1.10	255.255.255.0	172.30.1.1
PC3	NIC	10.1.0.10	255.255.0.0	10.1.0.1
PC4	NIC	172.30.100.10	255.255.255.0	172.30.100.1

Learning Objectives

Upon completion of this lab, you will be able to:

- Cable a network according to the Topology Diagram.
- Load provided scripts onto the routers.
- Examine the current status of the network.
- Configure RIPv2 on all routers.
- Examine the automatic summarization of routes.
- Examine routing updates with **debug ip rip**.
- Disable automatic summarization.
- Examine the routing tables.
- Verify network connectivity.
- Document the RIPv2 configuration.

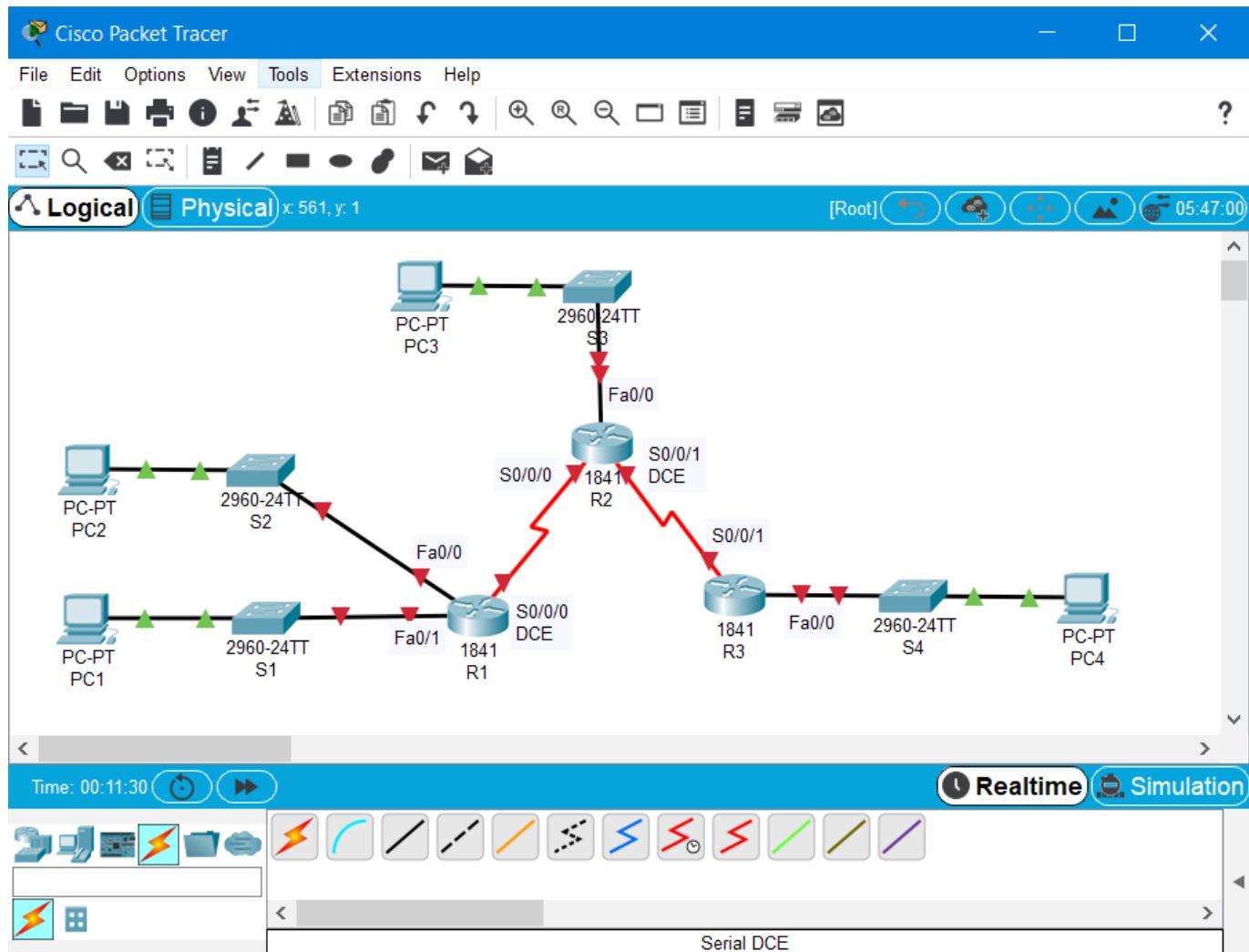
Scenario

The network shown in the Topology Diagram contains a discontiguous network, 172.30.0.0. This network has been subnetted using VLSM. The 172.30.0.0 subnets are physically and logically divided by at least one other classful or major network, in this case the two serial networks 209.165.200.228/30 and 209.165.200.232/30. This can be an issue when the routing protocol used does not include enough information to distinguish the individual subnets. RIPv2 is a classless routing protocol that can be used to provide subnet mask information in the routing updates. This will allow VLSM subnet information to be propagated throughout the network.

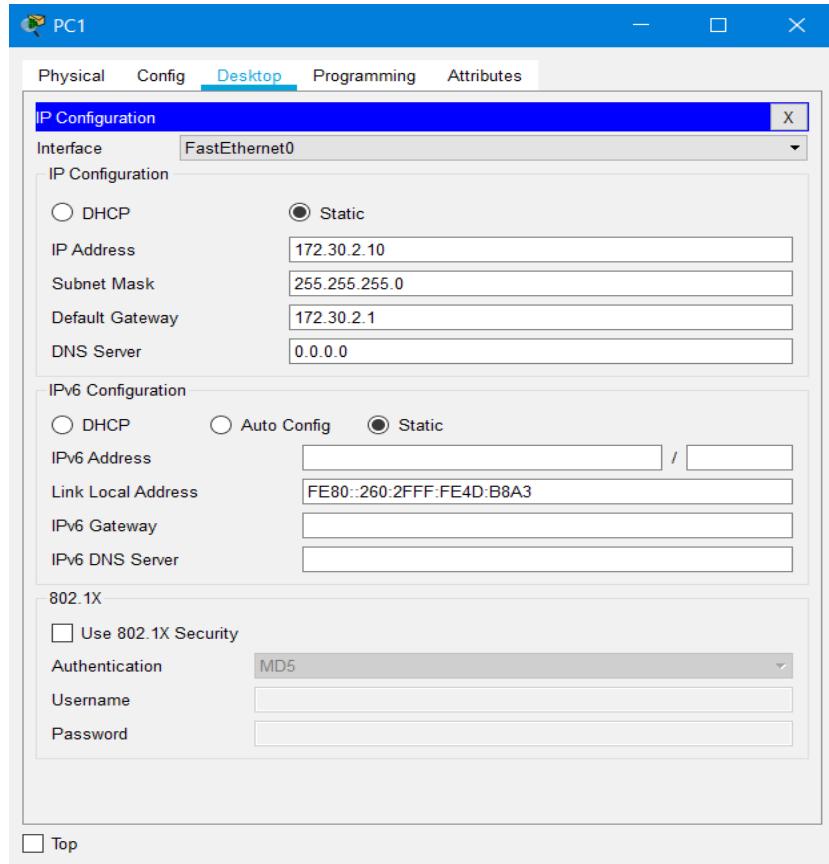
Task 1: Cable, Erase, and Reload the Routers.

Step 1: Cable a network.

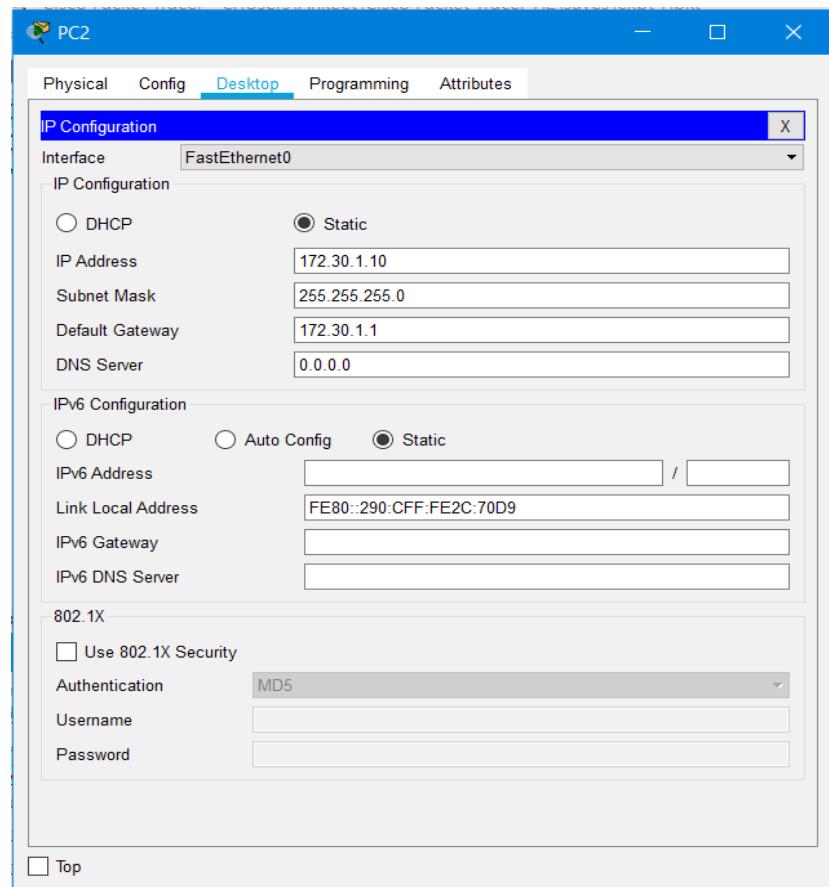
Cable a network that is similar to the one in the Topology Diagram.



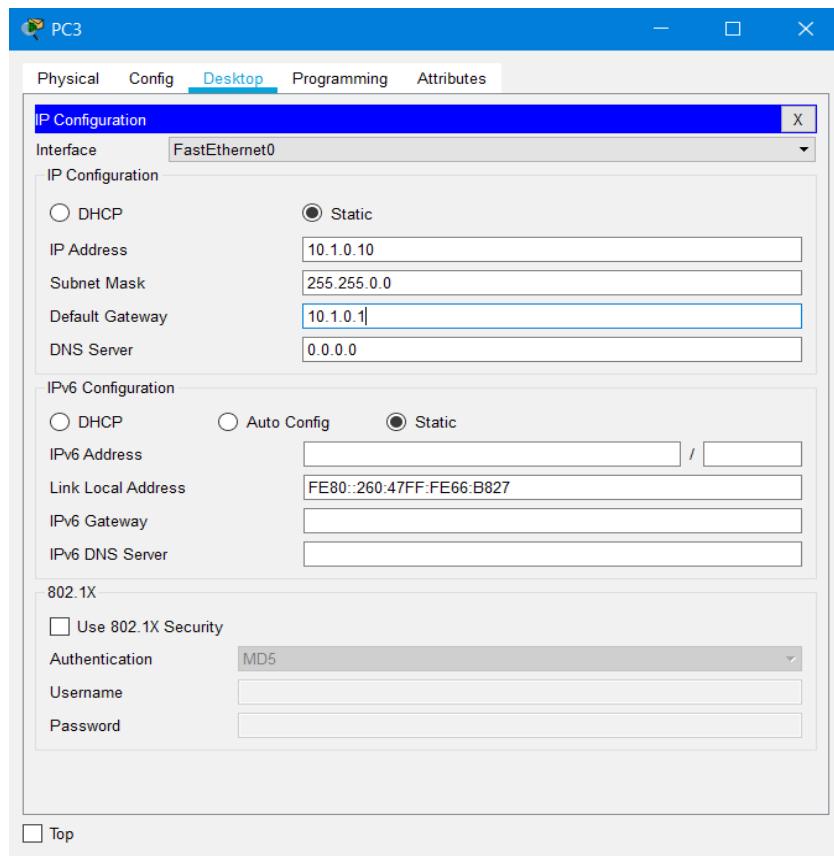
Configuration of PC1



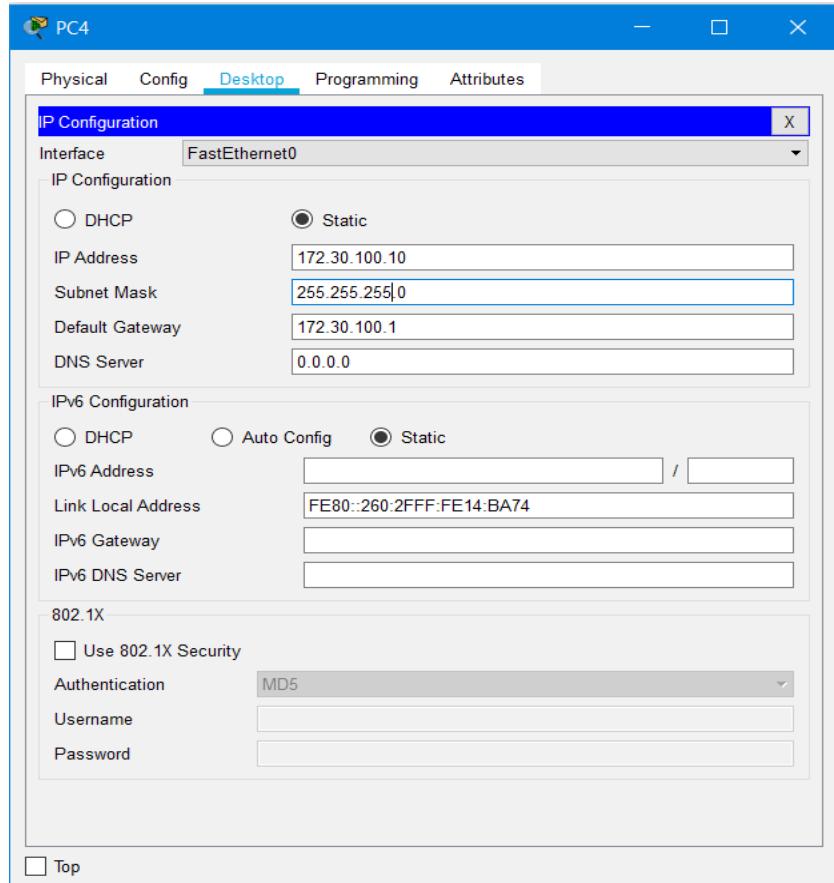
Configuration of PC2



Configuration of PC3



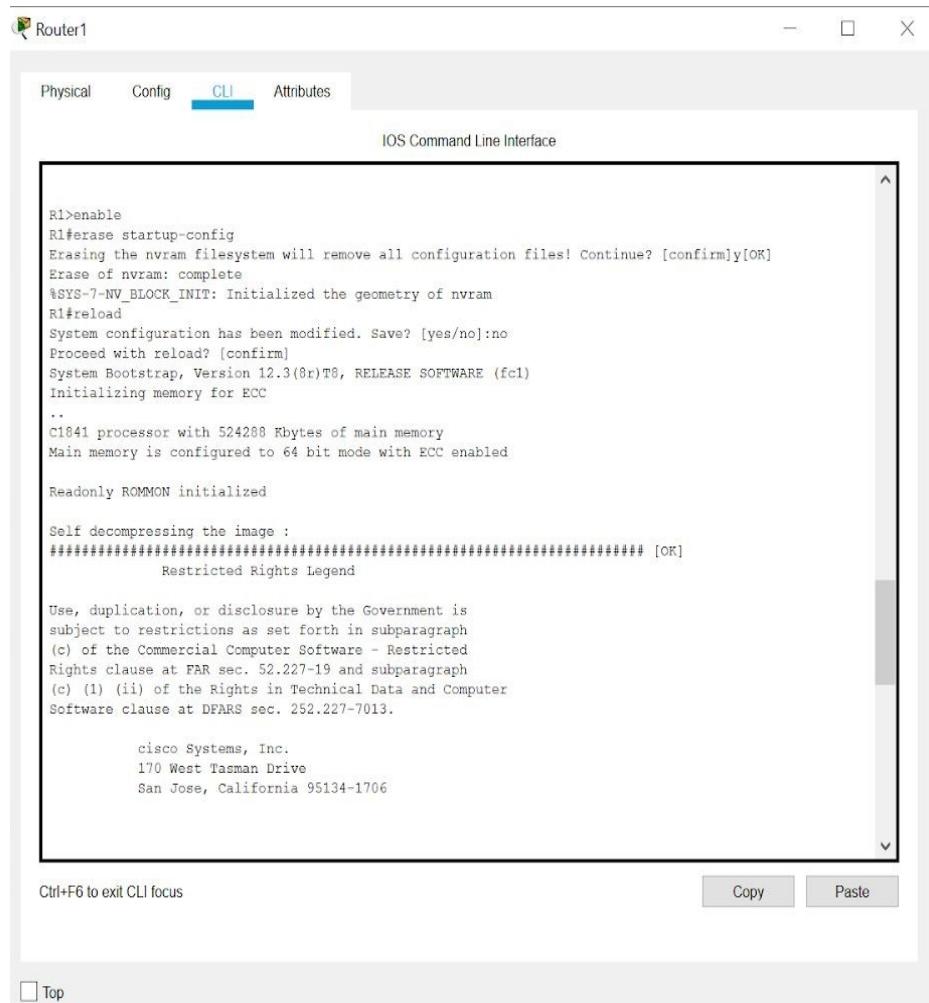
Configuration of PC4



Step 2: Clear the configuration on each router.

Clear the configuration on each of routers using the **erase startup-config** command and then **reload** the routers. Answer **no** if asked to save changes.

Clearing configuration of R1 and Reloading R1.



The screenshot shows the CCC software interface with the title bar "Router1". The "CLI" tab is selected. The main window displays the IOS Command Line Interface (CLI) output:

```
R1>enable
R1#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]y[OK]
Erase of nvram: complete
*SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
R1#reload
System configuration has been modified. Save? [yes/no]:no
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
...
C1841 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

 Readonly ROMMON initialized

Self decompressing the image :
#####
[OK]
Restricted Rights Legend

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Software clause at DFARS sec. 252.227-7013.

cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706
```

At the bottom of the terminal window, there are "Copy" and "Paste" buttons. Below the terminal window, there is a status bar with the text "Ctrl+F6 to exit CLI focus" and a "Top" button.

Clearing configuration of R2 and Reloading R2.

```
R2>enable
R2#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
$SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
R2>reload
System configuration has been modified. Save? [yes/no]:no
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
.
C1841 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

 Readonly ROMMON initialized

Self decompressing the image :
#####
[OK]
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Software clause at DFARS sec. 252.227-7013.

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San Jose, California 95134-1706
```

Clearing configuration of R3 and Reloading R3

```
Router3>enable
Router3#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
$SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router3>reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
.
C1841 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

 Readonly ROMMON initialized

Self decompressing the image :
#####
[OK]
Restricted Rights Legend

Use, duplication, or disclosure by the Government is
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(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.

cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706
```

Task 2: Load Routers with the Supplied Scripts.

Step 1: Load the following script onto R1.

```
!
hostname R1
!
!
!
interface FastEthernet0/0
ip address 172.30.1.1 255.255.255.0
duplex auto
speed auto
no shutdown
!
interface FastEthernet0/1
ip address 172.30.2.1 255.255.255.0
duplex auto
speed auto
no shutdown
!
interface Serial0/0/0
ip address 209.165.200.230 255.255.255.252
clock rate 64000
no shutdown
!
router rip
passive-interface FastEthernet0/0
passive-interface FastEthernet0/1
network 172.30.0.0
network 209.165.200.0
!
line con 0
line vty 0 4
login
!
end
```

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
%SYS-5-CONFIG_I: Configured from console by console
R1#show running-config
Building configuration...

Current configuration : 857 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R1
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
!--More--
```

Ctrl+F6 to exit CLI focus

Top

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
interface FastEthernet0/0
 ip address 172.30.1.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 ip address 172.30.2.1 255.255.255.0
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 209.165.200.230 255.255.255.252
 clock rate 64000
!
interface Serial0/0/1
 no ip address
 clock rate 2000000
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
router rip
 passive-interface FastEthernet0/0
 passive-interface FastEthernet0/1
 network 172.30.0.0
 network 209.165.200.0
!
ip classless
!
ip flow-export version 9
!
!--More-- |
```

Ctrl+F6 to exit CLI focus

Top

Step 2: Load the following script onto R2.

```
hostname R2
!
!
!
interface FastEthernet0/0
ip address 10.1.0.1 255.255.0.0
duplex auto
speed auto
no shutdown
!
interface Serial0/0/0
ip address 209.165.200.229 255.255.255.252
no shutdown
!
interface Serial0/0/1
ip address 209.165.200.233 255.255.255.252
clock rate 64000
no shutdown
!
router rip
passive-interface FastEthernet0/0
network 10.0.0.0
network 209.165.200.0
!
line con 0
line vty 0 4
login
!
end
```

Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
% Invalid input detected at '^' marker.

R2(config)#router rip
R2(config-router)#passive-interface FastEthernet0/0
R2(config-router)#network 10.0.0.0
R2(config-router)#network 209.165.200.0
R2(config-router)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#show running-config
Building configuration...

Current configuration : 803 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R2
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!--More--
```

Ctrl+F6 to exit CLI focus

Top

Copy Paste

Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
!
interface FastEthernet0/0
ip address 10.1.0.1 255.255.0.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/0/0
ip address 209.165.200.229 255.255.255.252
!
interface Serial0/0/1
ip address 209.165.200.233 255.255.255.252
clock rate 64000
!
interface Vlan1
no ip address
shutdown
!
router rip
passive-interface FastEthernet0/0
network 10.0.0.0
network 209.165.200.0
!
ip classless
!
ip flow-export version 9
!
!--More--
```

Ctrl+F6 to exit CLI focus

Top

Copy Paste

Step 3: Load the following script onto R3.

```
hostname R3
!
!
!
interface FastEthernet0/0
ip address 172.30.100.1 255.255.255.0
duplex auto
speed auto
no shutdown
!
interface Serial0/0/1
ip address 209.165.200.234 255.255.255.252
no shutdown
!
interface Loopback0
ip address 172.30.110.1 255.255.255.0
!
interface Loopback1
ip address 172.30.200.17 255.255.255.240
!
interface Loopback2
ip address 172.30.200.33 255.255.255.240
!
router rip
passive-interface FastEthernet0/0
network 172.30.0.0
network 209.165.200.0
!
line con 0
line vty 0 4
login
!
end
```

Router3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Current configuration : 903 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R3
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
--More-- |
```

Ctrl+F6 to exit CLI focus

Top

Router3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
ip address 209.165.200.234 255.255.255.252
!
interface Vlan1
no ip address
shutdown
!
router rip
passive-interface FastEthernet0/0
network 172.30.0.0
network 209.165.200.0
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
end

R3#
```

Ctrl+F6 to exit CLI focus

Top

Router3

Physical Config CLI Attributes

IOS Command Line Interface

```

interface Loopback0
 ip address 172.30.110.1 255.255.255.0
!
interface Loopback1
 ip address 172.30.200.17 255.255.255.240
!
interface Loopback2
 ip address 172.30.200.33 255.255.255.240
!
interface FastEthernet0/0
 ip address 172.30.100.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial0/0/1
 ip address 209.165.200.234 255.255.255.252
!
interface Vlan1
 no ip address
 shutdown
!
router rip
 passive-interface FastEthernet0/0
--More-- |

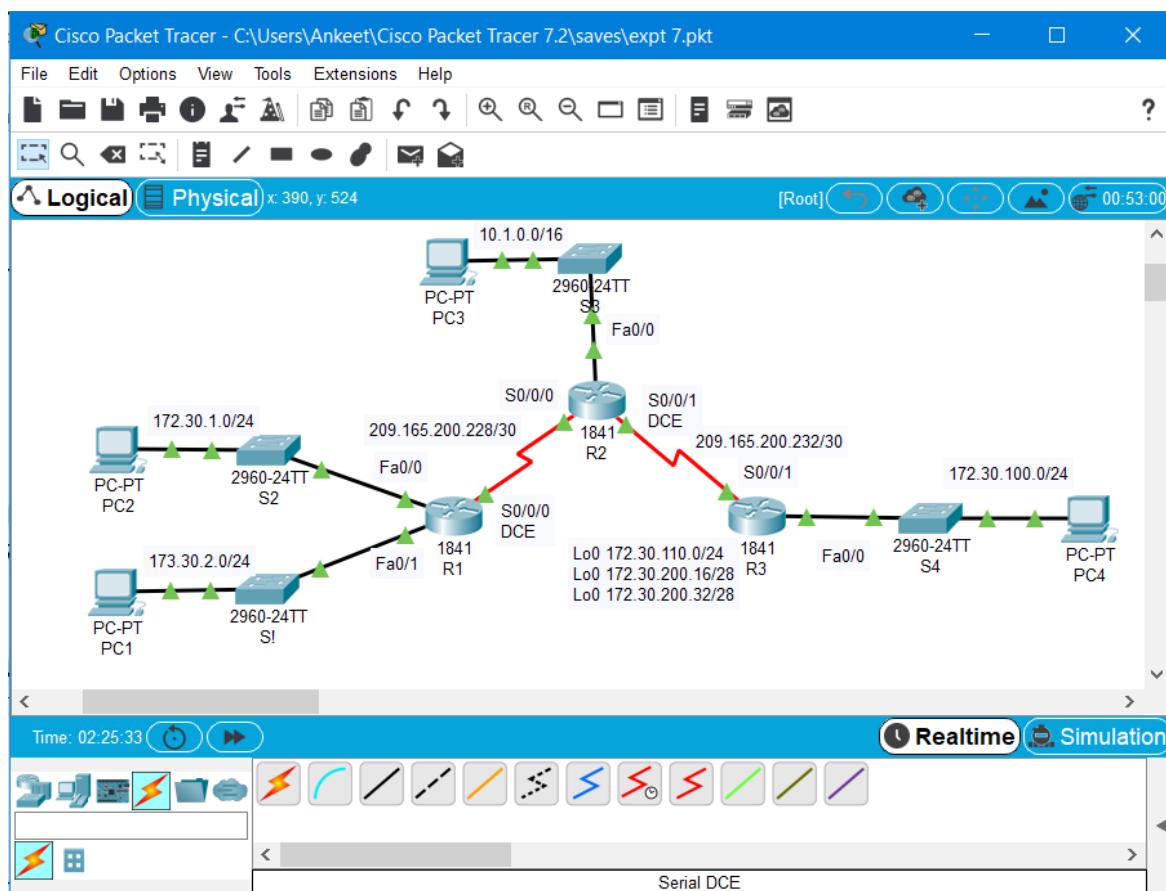
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

Complete Network



Task 3: Examine the Current Status of the Network.

Step 1: Verify that both serial links are up.

The two serial links can quickly be verified using the **show ip interface brief** command on R2.

R2#**show ip interface brief**

The screenshot shows the Cisco IOS CLI interface. The title bar says "Router2". Below it are tabs: "Physical", "Config", "CLI" (which is selected), and "Attributes". The main area is labeled "IOS Command Line Interface". It displays the following text:

```
R2 con0 is now available
Press RETURN to get started.

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

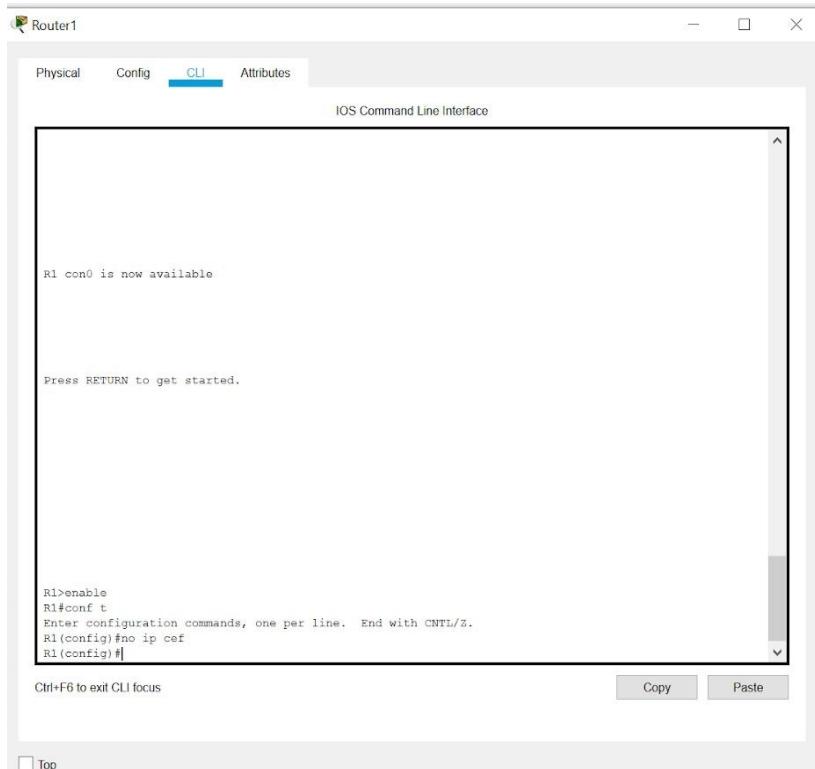
R2>enable
R2#show ip interface brief
Interface          IP-Address      OK? Method Status          Protocol
FastEthernet0/0     10.1.0.1       YES manual up           up
FastEthernet0/1     unassigned     YES NVRAM administratively down down
Serial0/0/0         209.165.200.229 YES manual up           up
Serial0/0/1         209.165.200.233 YES manual up           up
Vlan1              unassigned     YES NVRAM administratively down down
R2#
```

At the bottom left is the text "Ctrl+F6 to exit CLI focus". At the bottom right are "Copy" and "Paste" buttons. A "Top" button is at the very bottom.

Step 2: Check the connectivity from R2 to the hosts on the R1 and R3 LANs.

Note: For the 1841 router, you will need to disable IP CEF to obtain the correct output from the **ping** command. Although a discussion of IP CEF is beyond the scope of this course, you may disable IP CEF by using the following command in global configuration mode:

R2(config)#no ip cef



Router1

Physical Config **CLI** Attributes

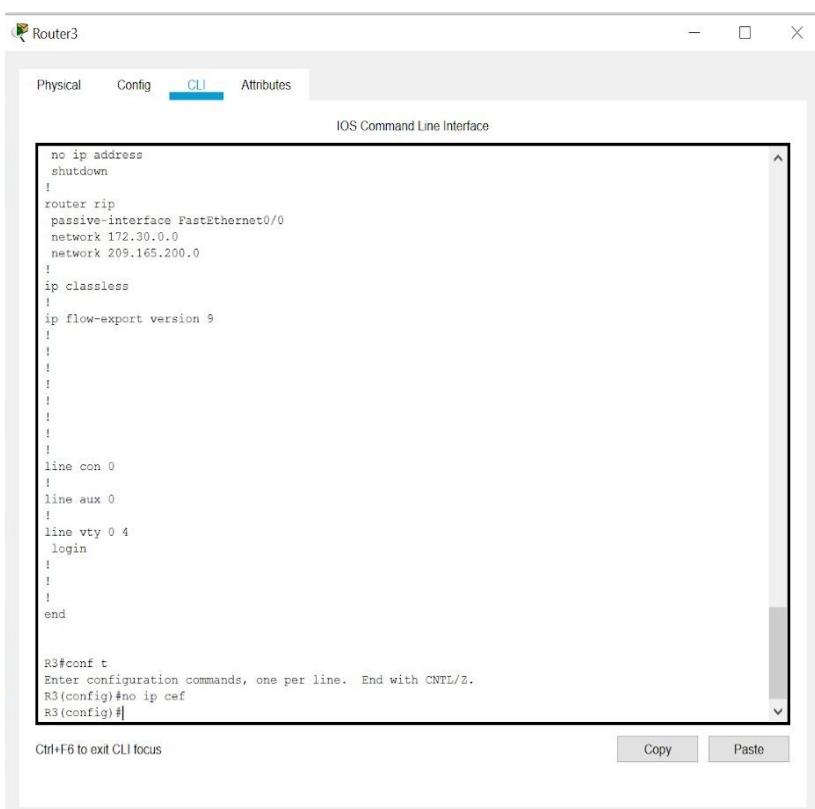
IOS Command Line Interface

```
R1>enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#no ip cef
R1(config)#
```

Ctrl+F6 to exit CLI focus Copy Paste

Top

This screenshot shows the Cisco IOS Command Line Interface (CLI) for Router1. The interface is titled 'Router1' and has tabs for Physical, Config, CLI (which is selected), and Attributes. The main window displays the command-line input area. The user has entered 'enable', switched to configuration mode with 'conf t', and then issued the 'no ip cef' command to disable IP CEF. A message at the bottom of the screen says 'Press RETURN to get started.' and there is a note 'Ctrl+F6 to exit CLI focus' at the bottom left.



Router3

Physical Config **CLI** Attributes

IOS Command Line Interface

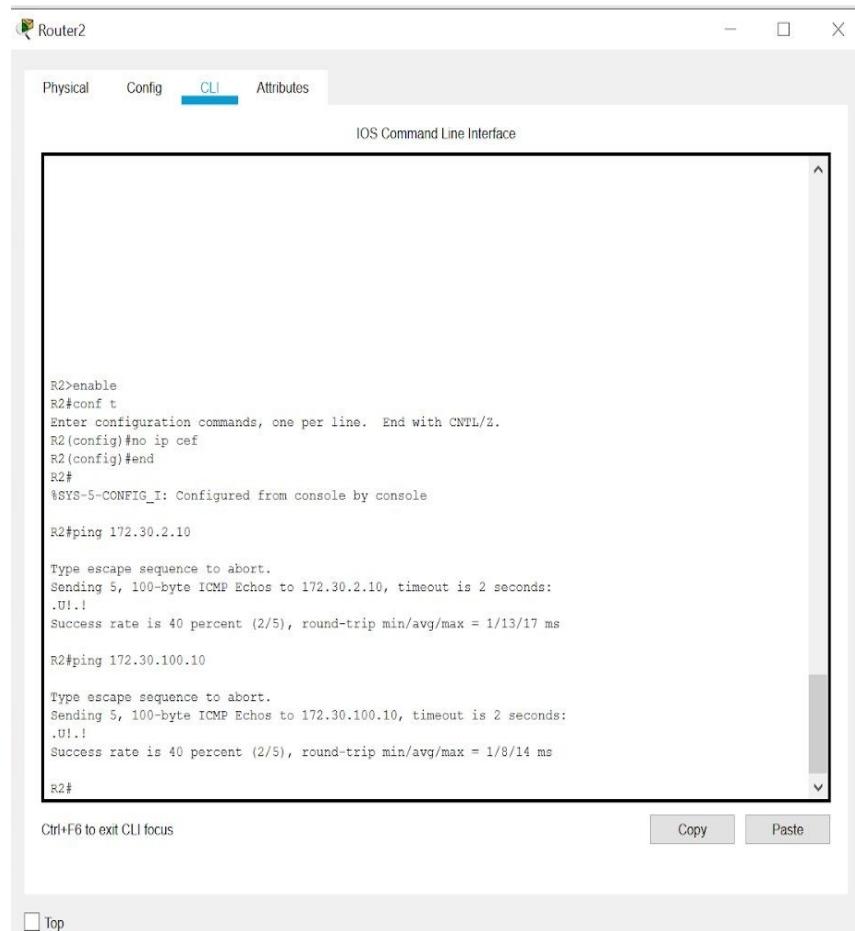
```
no ip address
shutdown
!
router rip
passive-interface FastEthernet0/0
network 172.30.0.0
network 209.165.200.0
!
ip classless
!
ip flow-export version 9
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
end

R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#no ip cef
R3(config)#
```

Ctrl+F6 to exit CLI focus Copy Paste

This screenshot shows the Cisco IOS Command Line Interface (CLI) for Router3. The interface is titled 'Router3' and has tabs for Physical, Config, CLI (selected), and Attributes. The main window shows the current running configuration of Router3, which includes network statements for RIP and IP classless, and configuration for multiple lines (con 0, aux 0, vty 0-4). The user has switched to configuration mode with 'conf t', issued the 'no ip cef' command to disable IP CEF, and then returned to configuration mode with another '#'. A note 'Ctrl+F6 to exit CLI focus' is visible at the bottom left.

Pinging PC1 and PC4 from R2



The screenshot shows the Router2 CLI interface. The title bar says "Router2". The tabs at the top are "Physical", "Config", "CLI" (which is selected), and "Attributes". Below the tabs is the text "IOS Command Line Interface". The main window displays the following command-line session:

```
R2>enable
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#no ip cef
R2(config)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console
R2#ping 172.30.2.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.30.2.10, timeout is 2 seconds:
.U1.!
Success rate is 40 percent (2/5), round-trip min/avg/max = 1/13/17 ms
R2#ping 172.30.100.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.30.100.10, timeout is 2 seconds:
.U1.!
Success rate is 40 percent (2/5), round-trip min/avg/max = 1/8/14 ms
R2#
```

At the bottom left is the text "Ctrl+F6 to exit CLI focus". At the bottom right are "Copy" and "Paste" buttons. A "Top" button is also present.

From the R2 router, how many ICMP messages are successful when pinging PC1?

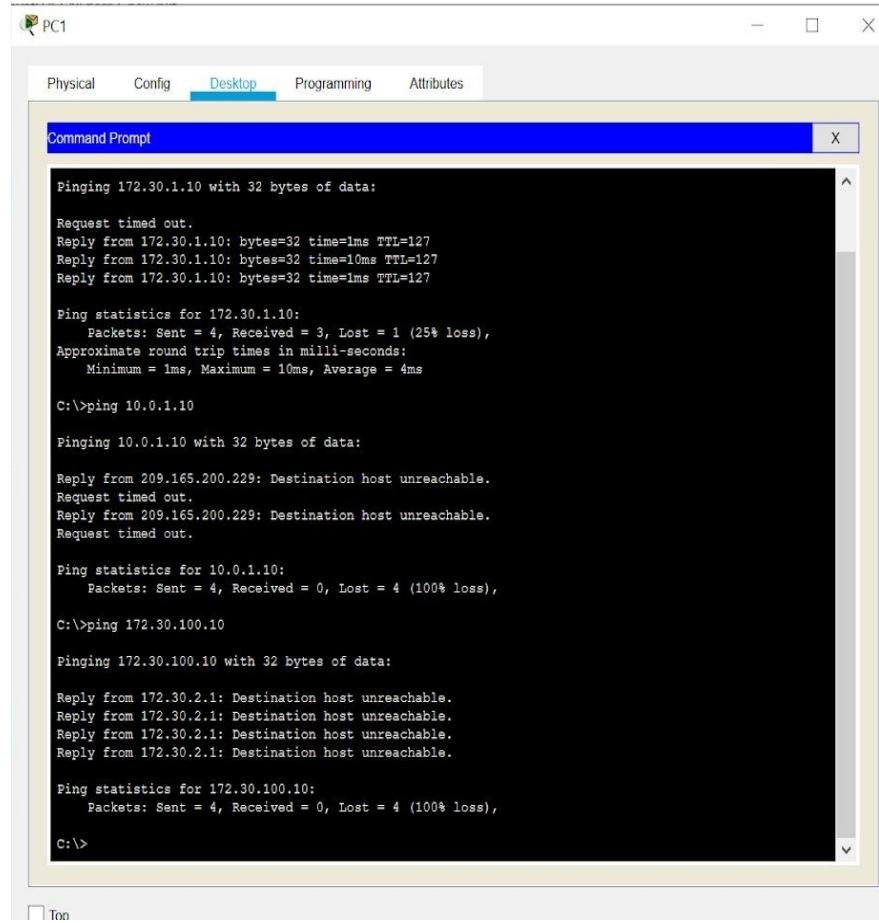
Ans: 2 ICMP messages are successful

From the R2 router, how many ICMP messages are successful when pinging PC4?

Ans: 2 ICMP messages are successful

Step 3: Check the connectivity between the PCs.

Pinging PC2, PC3 and PC4 from PC1



```
Pinging 172.30.1.10 with 32 bytes of data:
Request timed out.
Reply from 172.30.1.10: bytes=32 time=1ms TTL=127
Reply from 172.30.1.10: bytes=32 time=10ms TTL=127
Reply from 172.30.1.10: bytes=32 time=1ms TTL=127

Ping statistics for 172.30.1.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 10ms, Average = 4ms

C:\>ping 10.0.1.10

Pinging 10.0.1.10 with 32 bytes of data:

Reply from 209.165.200.229: Destination host unreachable.
Request timed out.
Reply from 209.165.200.229: Destination host unreachable.
Request timed out.

Ping statistics for 10.0.1.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 172.30.100.10

Pinging 172.30.100.10 with 32 bytes of data:

Reply from 172.30.2.1: Destination host unreachable.

Ping statistics for 172.30.100.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>
```

From the PC1, is it possible to ping PC2?

Ans. Yes,it is possible to ping PC2 from PC1.

What is the success rate?

Ans. The success rate is 100%

From the PC1, is it possible to ping PC3?

Ans. Yes,it is not possible to ping PC3 from PC1.

What is the success rate?

Ans. The success rate is 50%

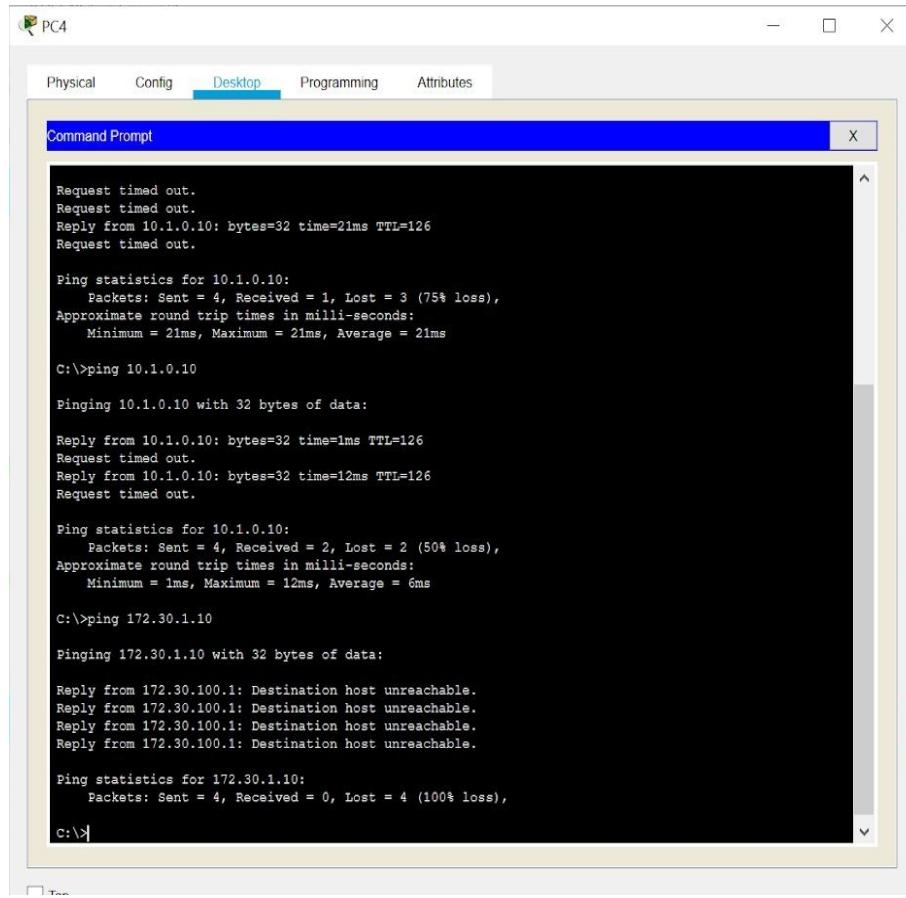
From the PC1, is it possible to ping PC4?

Ans. No,it is not possible to ping PC4 from PC1.

What is the success rate?

Ans. 0%

Pinging PC2 and PC3 from PC4



The screenshot shows a Windows Command Prompt window titled "Command Prompt". The window is part of a software interface for "PC4" with tabs for Physical, Config, Desktop (which is selected), Programming, and Attributes. The command prompt itself displays the following output:

```
Request timed out.  
Request timed out.  
Reply from 10.1.0.10: bytes=32 time=21ms TTL=126  
Request timed out.  
  
Ping statistics for 10.1.0.10:  
    Packets: Sent = 4, Received = 1, Lost = 3 (75% loss),  
    Approximate round trip times in milli-seconds:  
        Minimum = 21ms, Maximum = 21ms, Average = 21ms  
  
C:\>ping 10.1.0.10  
  
Pinging 10.1.0.10 with 32 bytes of data:  
  
Reply from 10.1.0.10: bytes=32 time=1ms TTL=126  
Request timed out.  
Reply from 10.1.0.10: bytes=32 time=12ms TTL=126  
Request timed out.  
  
Ping statistics for 10.1.0.10:  
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),  
    Approximate round trip times in milli-seconds:  
        Minimum = 1ms, Maximum = 12ms, Average = 6ms  
  
C:\>ping 172.30.1.10  
  
Pinging 172.30.1.10 with 32 bytes of data:  
  
Reply from 172.30.100.1: Destination host unreachable.  
  
Ping statistics for 172.30.1.10:  
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),  
C:\>
```

From the PC4, is it possible to ping PC2?

Ans: No

What is the success rate?

Ans: 0%

From the PC4, is it possible to ping PC3?

Ans: Yes

What is the success rate?

Ans: 50%

Step 4: View the routing table on R2.

Both the R1 and R3 are advertising routes to the 172.30.0.0/16 network; therefore, there are two entries for this network in the R2 routing table. The R2 routing table only shows the major classful network address of 172.30.0.0—it does not show any of the subnets for this network that are used on the LANs attached to R1 and R3. Because the routing metric is the same for both entries, the router alternates the routes that are used when forwarding packets that are destined for the 172.30.0.0/16 network.

```
R2#show ip route
```

```
R2>enable
R2#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

      10.0.0.0/16 is subnetted, 1 subnets
C        10.1.0.0 is directly connected, FastEthernet0/0
R        172.30.0.0/16 [120/1] via 209.165.200.230, 00:00:06, Serial0/0/0
                  [120/1] via 209.165.200.234, 00:00:19, Serial0/0/1
          209.165.200.0/30 is subnetted, 2 subnets
C            209.165.200.228 is directly connected, Serial0/0/0
C            209.165.200.232 is directly connected, Serial0/0/1

R2#
```

Ctrl+F6 to exit CLI focus Copy Paste

Step 5: Examine the routing table on the R1 router.

Both R1 and R3 are configured with interfaces on a discontiguous network, 172.30.0.0. The 172.30.0.0 subnets are physically and logically divided by at least one other classful or major network—in this case, the two serial networks 209.165.200.228/30 and 209.165.200.232/30. Classful routing protocols like RIPv1 summarize networks at major network boundaries. Both R1 and R3 will be summarizing 172.30.0.0/24 subnets to 172.30.0.0/16. Because the route to 172.30.0.0/16 is directly connected, and because R1 does not have any specific routes for the 172.30.0.0 subnets on R3, packets destined for the R3 LANs will not be forwarded properly.

```
R1#show ip route
```

The screenshot shows the Router1 CLI interface. The window title is "Router1". The tab bar has "Physical", "Config", "CLI" (which is selected), and "Attributes". Below the tabs is the text "IOS Command Line Interface" and "Press RETURN to get started.". The main terminal area displays the output of the "show ip route" command:

```
R1>enable
R1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

R    10.0.0.0/8 [120/1] via 209.165.200.229, 00:00:12, Serial0/0/0
      172.30.0.0/24 is subnetted, 2 subnets
C      172.30.1.0 is directly connected, FastEthernet0/0
C      172.30.2.0 is directly connected, FastEthernet0/1
      209.165.200.0/30 is subnetted, 2 subnets
C      209.165.200.228 is directly connected, Serial0/0/0
R      209.165.200.232 [120/1] via 209.165.200.229, 00:00:12, Serial0/0/0

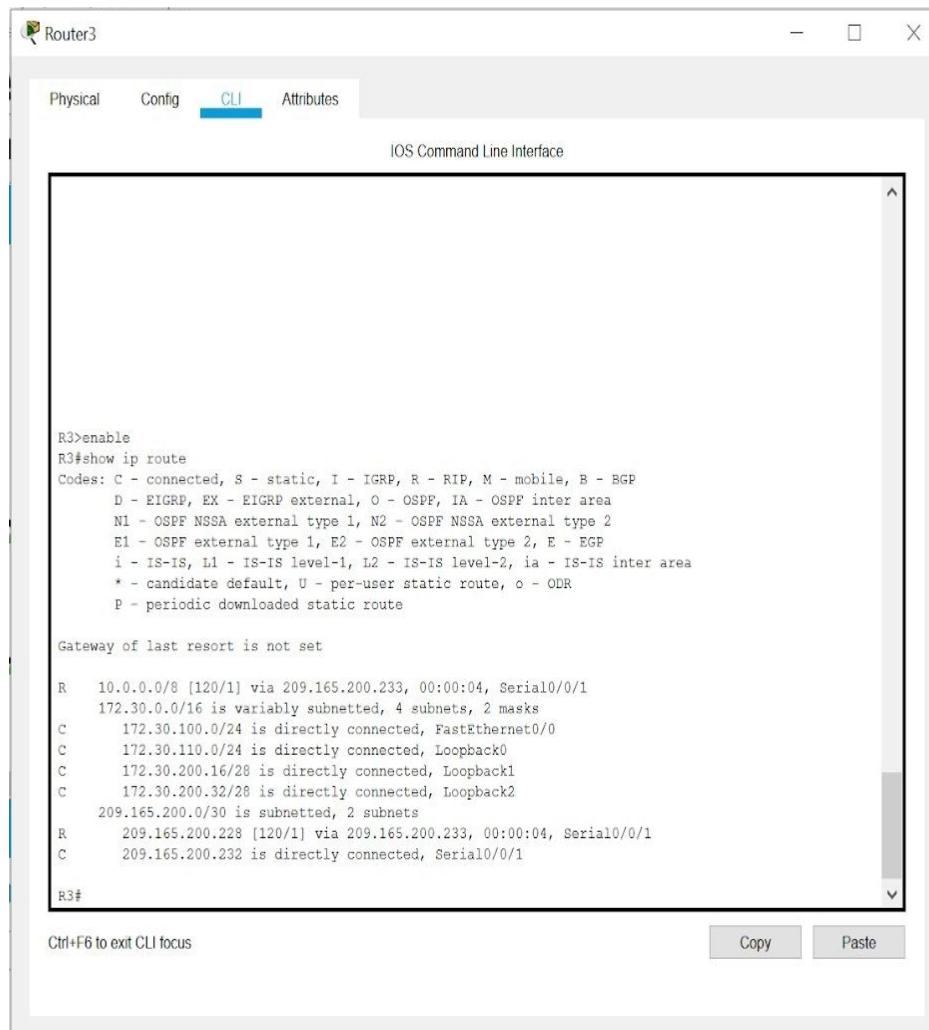
R1#
```

At the bottom of the terminal window, there are "Copy" and "Paste" buttons. A "Top" button is located at the bottom left. The status bar at the bottom says "Ctrl+F6 to exit CLI focus".

Step 6: Examine the routing table on the R3 router.

R3 only shows its own subnets for 172.30.0.0 network: 172.30.100/24, 172.30.110/24, 172.30.200.16/28, and 172.30.200.32/28. R3 does not have any routes for the 172.30.0.0 subnets on R1.

```
R3#show ip route
```



```
R3>enable
R3#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

R    10.0.0.0/8 [120/1] via 209.165.200.233, 00:00:04, Serial0/0/1
      172.30.0.0/16 is variably subnetted, 4 subnets, 2 masks
C      172.30.100.0/24 is directly connected, FastEthernet0/0
C      172.30.110.0/24 is directly connected, Loopback0
C      172.30.200.16/28 is directly connected, Loopback1
C      172.30.200.32/28 is directly connected, Loopback2
      209.165.200.0/30 is subnetted, 2 subnets
R      209.165.200.228 [120/1] via 209.165.200.233, 00:00:04, Serial0/0/1
C      209.165.200.232 is directly connected, Serial0/0/1

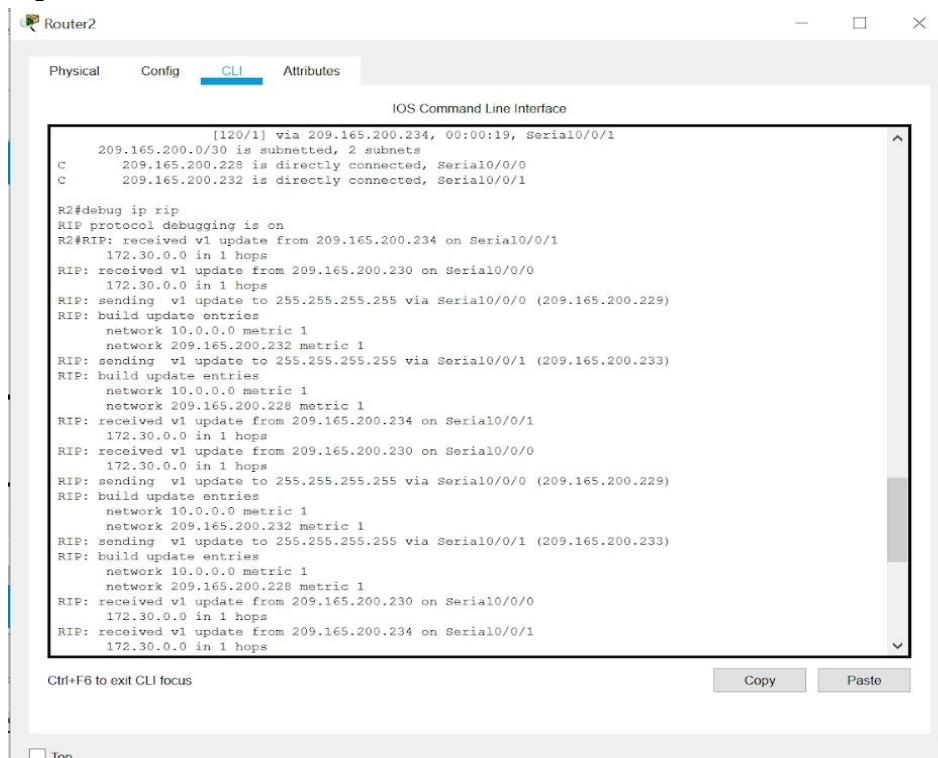
R3#
```

Ctrl+F6 to exit CLI focus Copy Paste

Step 7: Examine the RIPv1 packets that are being received by R2.

Use the **debug ip rip** command to display RIP routing updates. R2 is receiving the route 172.30.0.0, with 1 hop, from both R1 and R3. Because these are equal cost metrics, both routes are added to the R2 routing table. Because RIPv1 is a classful routing protocol, no subnet mask information is sent in the update.

R2#**debug ip rip**



The screenshot shows the IOS Command Line Interface window for Router2. The title bar says "Router2". The tabs at the top are "Physical", "Config", "CLI" (which is selected), and "Attributes". The main area is titled "IOS Command Line Interface". The output of the "debug ip rip" command is displayed, showing various RIP events such as receiving and sending V1 updates for networks 172.30.0.0 and 10.0.0.0, and building update entries for these networks via Serial0/0/0 and Serial0/0/1 interfaces.

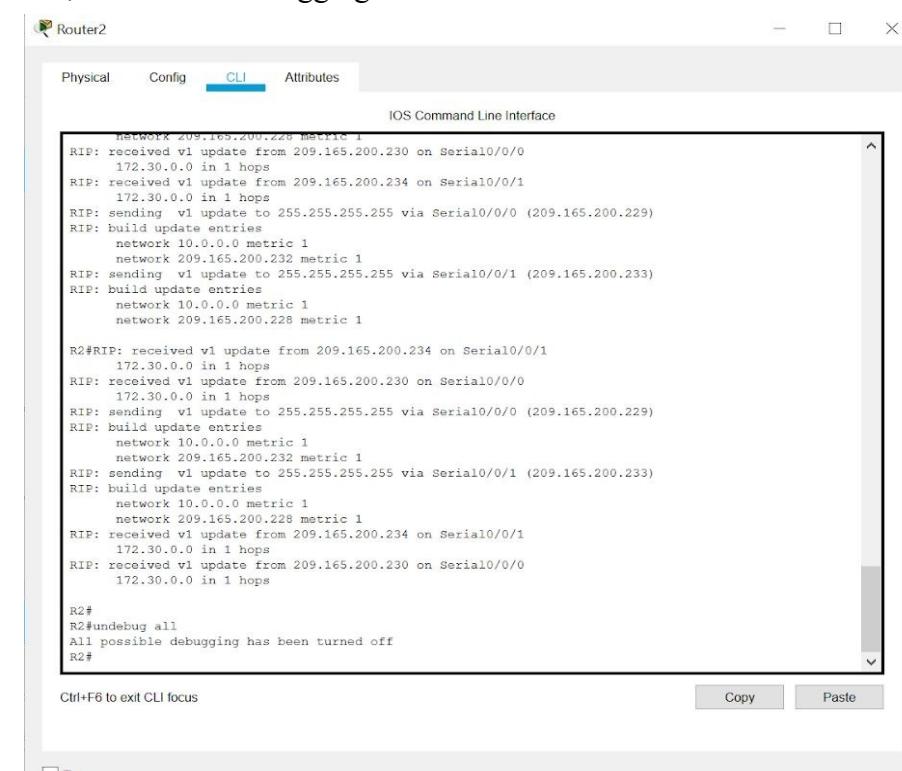
```
[120/1] via 209.165.200.234, 00:00:19, Serial0/0/1
209.165.200.0/30 is subnetted, 2 subnets
C   209.165.200.228 is directly connected, Serial0/0/0
C   209.165.200.232 is directly connected, Serial0/0/1

R2#debug ip rip
RIP protocol debugging is on
R2#RIP: received v1 update from 209.165.200.234 on Serial0/0/1
172.30.0.0 in 1 hops
RIP: received v1 update from 209.165.200.230 on Serial0/0/0
172.30.0.0 in 1 hops
RIP: sending v1 update to 255.255.255.255 via Serial0/0/0 (209.165.200.229)
RIP: build update entries
network 10.0.0.0 metric 1
network 209.165.200.232 metric 1
RIP: sending v1 update to 255.255.255.255 via Serial0/0/1 (209.165.200.233)
RIP: build update entries
network 10.0.0.0 metric 1
network 209.165.200.228 metric 1
RIP: received v1 update from 209.165.200.234 on Serial0/0/1
172.30.0.0 in 1 hops
RIP: received v1 update from 209.165.200.230 on Serial0/0/0
172.30.0.0 in 1 hops
RIP: sending v1 update to 255.255.255.255 via Serial0/0/0 (209.165.200.229)
RIP: build update entries
network 10.0.0.0 metric 1
network 209.165.200.232 metric 1
RIP: sending v1 update to 255.255.255.255 via Serial0/0/1 (209.165.200.233)
RIP: build update entries
network 10.0.0.0 metric 1
network 209.165.200.228 metric 1
RIP: received v1 update from 209.165.200.230 on Serial0/0/0
172.30.0.0 in 1 hops
RIP: received v1 update from 209.165.200.234 on Serial0/0/1
172.30.0.0 in 1 hops

Ctrl+F6 to exit CLI focus
```

R2 is sending only the routes for the 10.0.0.0 LAN and the two serial connections to R1 and R3. R1 and R3 are not receiving any information about the 172.30.0.0 subnet routes.

When you are finished, turn off the debugging.



The screenshot shows the IOS Command Line Interface window for Router2. The title bar says "Router2". The tabs at the top are "Physical", "Config", "CLI" (which is selected), and "Attributes". The main area is titled "IOS Command Line Interface". The output of the "undebug all" command is displayed, showing the message "All possible debugging has been turned off".

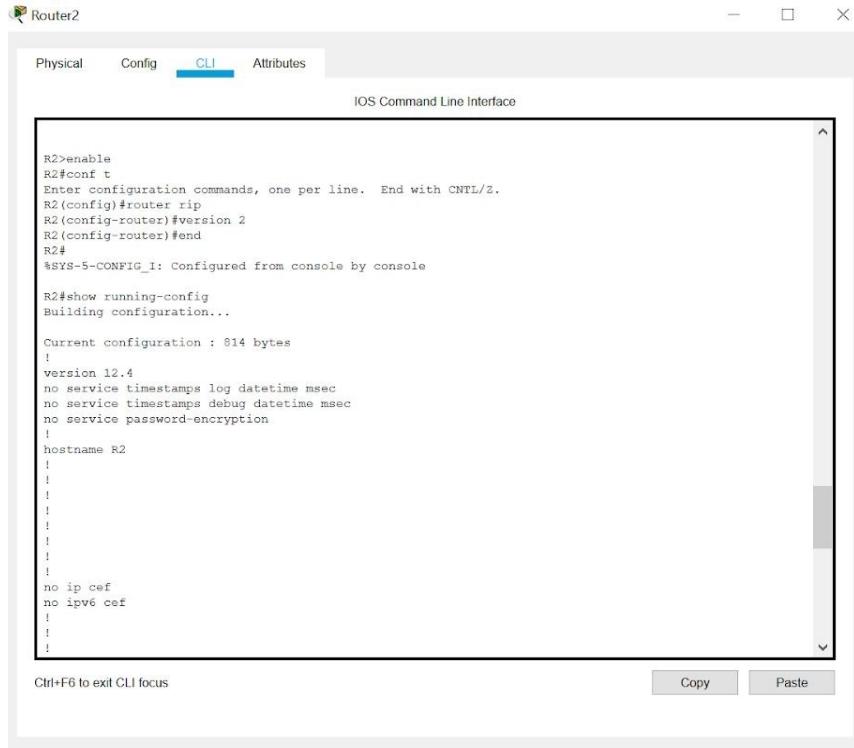
```
network 209.165.200.228 metric 1
RIP: received v1 update from 209.165.200.230 on Serial0/0/0
172.30.0.0 in 1 hops
RIP: received v1 update from 209.165.200.234 on Serial0/0/1
172.30.0.0 in 1 hops
RIP: sending v1 update to 255.255.255.255 via Serial0/0/0 (209.165.200.229)
RIP: build update entries
network 10.0.0.0 metric 1
network 209.165.200.232 metric 1
RIP: sending v1 update to 255.255.255.255 via Serial0/0/1 (209.165.200.233)
RIP: build update entries
network 10.0.0.0 metric 1
network 209.165.200.228 metric 1
R2#RIP: received v1 update from 209.165.200.234 on Serial0/0/1
172.30.0.0 in 1 hops
RIP: received v1 update from 209.165.200.230 on Serial0/0/0
172.30.0.0 in 1 hops
RIP: sending v1 update to 255.255.255.255 via Serial0/0/0 (209.165.200.229)
RIP: build update entries
network 10.0.0.0 metric 1
network 209.165.200.232 metric 1
RIP: sending v1 update to 255.255.255.255 via Serial0/0/1 (209.165.200.233)
RIP: build update entries
network 10.0.0.0 metric 1
network 209.165.200.228 metric 1
RIP: received v1 update from 209.165.200.234 on Serial0/0/1
172.30.0.0 in 1 hops
RIP: received v1 update from 209.165.200.230 on Serial0/0/0
172.30.0.0 in 1 hops

R2#
R2#undebug all
All possible debugging has been turned off
R2#
```

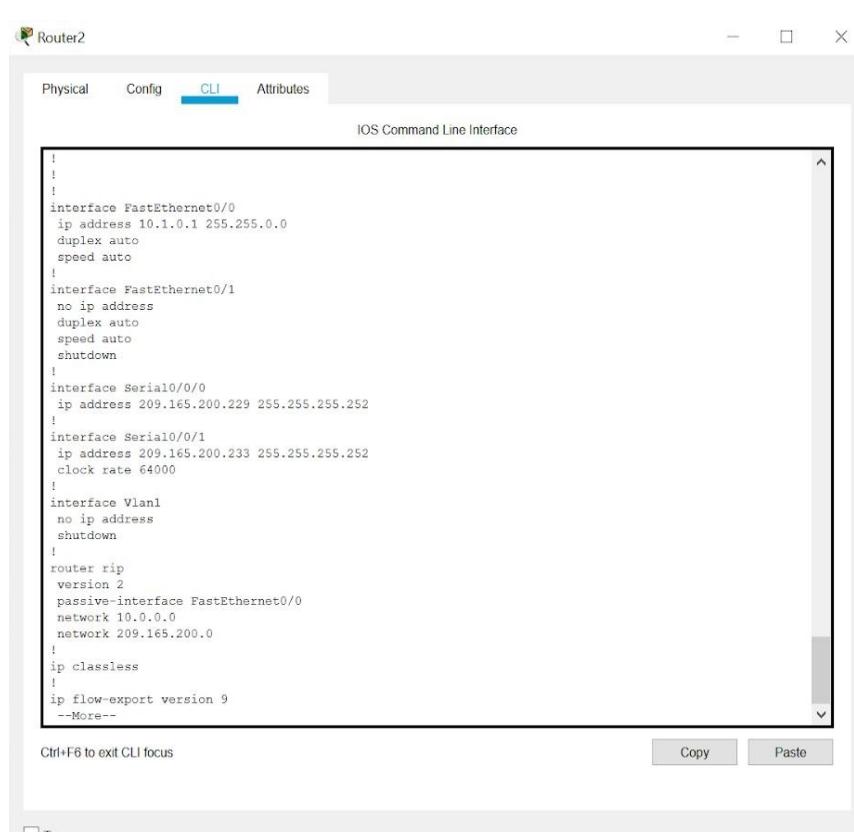
Task 4: Configure RIP Version 2.

Step 1: Use the `version 2` command to enable RIP version 2 on each of the routers.

```
R2(config)#router rip  
R2(config-router)#version 2
```

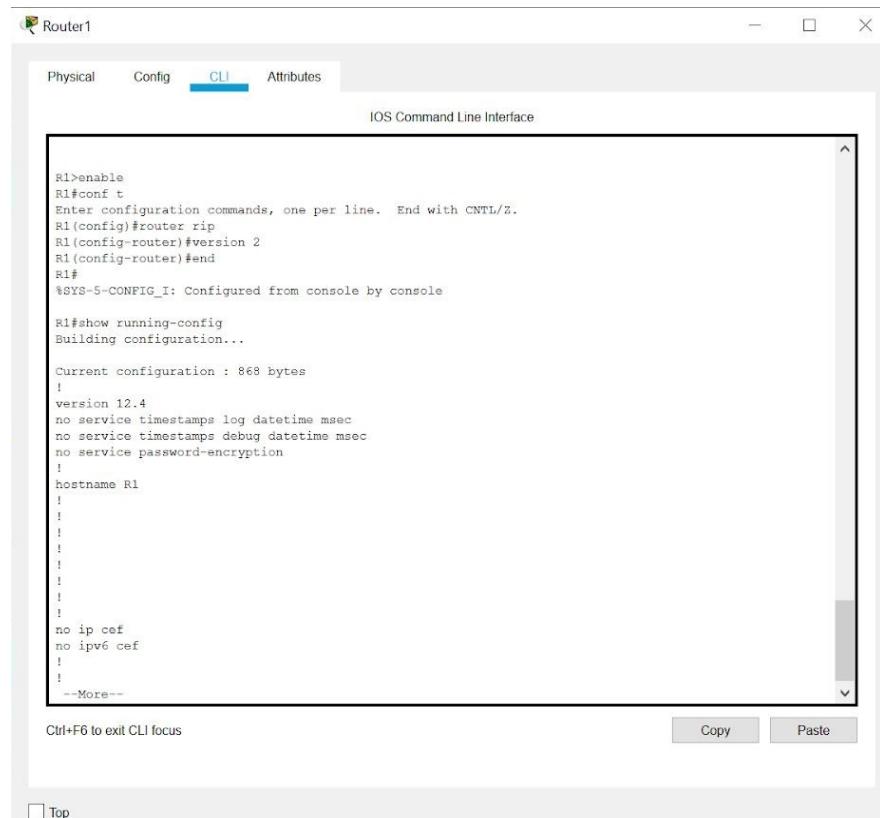


```
R2>enable  
R2#conf t  
Enter configuration commands, one per line. End with CNTL/Z.  
R2(config)#router rip  
R2(config-router)#version 2  
R2(config-router)#end  
R2#  
%SYS-5-CONFIG_I: Configured from console by console  
  
R2#show running-config  
Building configuration...  
  
Current configuration : 814 bytes  
!  
version 12.4  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname R2  
!  
!  
!  
!  
!  
!  
no ip cef  
no ipv6 cef  
!
```



```
!  
!  
!  
interface FastEthernet0/0  
ip address 10.1.0.1 255.255.255.0  
duplex auto  
speed auto  
!  
interface FastEthernet0/1  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Serial0/0/0  
ip address 209.165.200.229 255.255.255.252  
!  
interface Serial0/0/1  
ip address 209.165.200.233 255.255.255.252  
clock rate 64000  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router rip  
version 2  
passive-interface FastEthernet0/0  
network 10.0.0.0  
network 209.165.200.0  
!  
ip classless  
!  
ip flow-export version 9  
--More--
```

```
R1(config)#router rip
R1(config-router)#version 2
```



Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

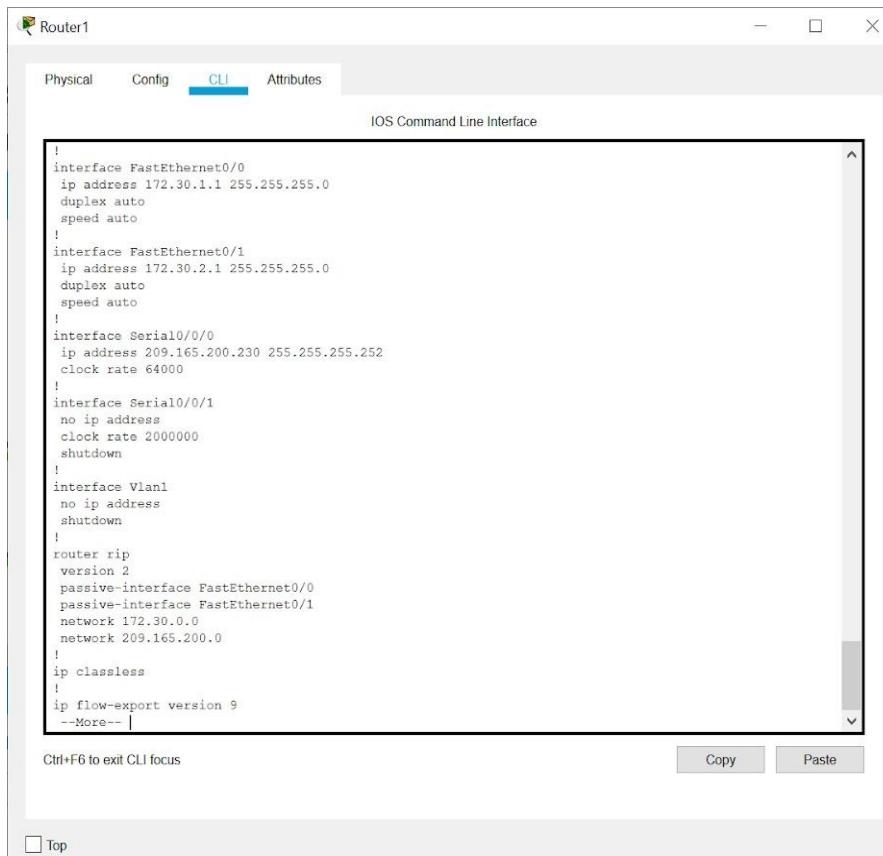
```
R1>enable
R1>conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#show running-config
Building configuration...

Current configuration : 868 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R1
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
--More--
```

Ctrl+F6 to exit CLI focus

Top



Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
!
interface FastEthernet0/0
ip address 172.30.1.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
ip address 172.30.2.1 255.255.255.0
duplex auto
speed auto
!
interface Serial0/0/0
ip address 209.165.200.230 255.255.255.252
clock rate 64000
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router rip
version 2
passive-interface FastEthernet0/0
passive-interface FastEthernet0/1
network 172.30.0.0
network 209.165.200.0
!
ip classless
!
ip flow-export version 9
--More--
```

Ctrl+F6 to exit CLI focus

Top

```
R3(config)#router rip  
R3(config-router)#version 2
```

The screenshot shows the Cisco Configuration Constructor (CNC) interface. The window title is "Router3". The tab bar at the top has "Physical", "Config", "CLI" (which is selected), and "Attributes". Below the tab bar is a status message "IOS Command Line Interface". The main area contains the following configuration commands:

```
ip address 172.30.100.1 255.255.255.0  
duplex auto  
speed auto  
!  
interface FastEthernet0/1  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Serial0/0/0  
no ip address  
clock rate 2000000  
shutdown  
!  
interface Serial0/0/1  
ip address 209.165.200.234 255.255.255.252  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router rip  
version 2  
passive-interface FastEthernet0/0  
network 172.30.0.0  
network 209.165.200.0  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
--More-- |
```

At the bottom of the CLI window, there are buttons for "Copy" and "Paste". A status message "Ctrl+F6 to exit CLI focus" is also present.

The screenshot shows the Cisco Configuration Constructor (CNC) interface. The window title is "Router3". The tab bar at the top has "Physical", "Config", "CLI" (which is selected), and "Attributes". Below the tab bar is a status message "IOS Command Line Interface". The main area contains the following running configuration output:

```
R3>enable  
R3#conf t  
Enter configuration commands, one per line. End with CNTL/Z.  
R3(config)#router rip  
R3(config-router)#version 2  
R3(config-router)#end  
R3#  
%SYS-5-CONFIG_I: Configured from console by console  
  
R3#show running-config  
Building configuration...  
  
Current configuration : 994 bytes  
!  
version 12.4  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname R3  
!  
!  
!  
!  
!  
!  
no ip cef  
no ipv6 cef  
!
```

At the bottom of the CLI window, there are buttons for "Copy" and "Paste". A status message "Ctrl+F6 to exit CLI focus" is also present.

RIPv2 messages include the subnet mask in a field in the routing updates. This allows subnets and their masks to be included in the routing updates. However, by default RIPv2 summarizes networks at major network boundaries, just like RIPv1, except that the subnet mask is included in the update.

Step 2: Verify that RIPv2 is running on the routers.

The **debug ip rip**, **show ip protocols**, and **show run** commands can all be used to confirm that RIPv2 is running. The output of the **show ip protocols** command for R1 is shown below.

```
R1# show ip protocols
```

The screenshot shows a CLI window titled "Router1". The tab bar at the top has "Physical", "Config", "CLI" (which is highlighted in blue), and "Attributes". Below the tabs, it says "IOS Command Line Interface". The main area displays the output of the "show ip protocols" command:

```
!
end

R1#
R1#
R1#
R1#
R1#
R1#
R1#
R1#
R1#
R1#show ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 7 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Redistributing: rip
  Default version control: send version 2, receive 2
    Interface          Send   Recv   Triggered RIP  Key-chain
    Serial0/0           2       2
  Automatic network summarization is in effect
  Maximum path: 4
  Routing for Networks:
    172.30.0.0
    209.165.200.0
  Passive Interface(s):
    FastEthernet0/0
    FastEthernet0/1
  Routing Information Sources:
    Gateway            Distance      Last Update
    209.165.200.229      120          00:00:26
  Distance: (default is 120)
R1#
```

At the bottom of the window, there are buttons for "Copy" and "Paste". Below the window, there is a "Top" button and a status message: "Ctrl+F6 to exit CLI focus".

Task 5: Examine the Automatic Summarization of Routes.

The LANs connected to R1 and R3 are still composed of discontiguous networks. R2 still shows two equal cost paths to the 172.30.0.0/16 network in the routing table. R2 still shows only the major classful network address of 172.30.0.0 and does not show any of the subnets for this network.

R2#show ip route

Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
end

R2#
R2#
R2#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

  10.0.0.0/16 is subnetted, 1 subnets
C    10.1.0.0/16 is directly connected, FastEthernet0/0
R    172.30.0.0/16 [120/1] via 209.165.200.230, 00:00:29, Serial0/0/0
                  [120/16] via 209.165.200.234, 00:00:30, Serial0/0/1
  209.165.200.0/30 is subnetted, 2 subnets
C      209.165.200.228 is directly connected, Serial0/0/0
C      209.165.200.232 is directly connected, Serial0/0/1

R2#
```

Ctrl+F6 to exit CLI focus Copy Paste

R1 still shows only its own subnets for the 172.30.0.0 network. R1 still does not have any routes for the 172.30.0.0 subnets on R3.

R1#show ip route

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Default version control: send version 2, receive 2
Interface          Send Recv Triggered RIP Key-chain
Serial0/0/0         2      2
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
  172.30.0.0
  209.165.200.0
Passive Interface(s):
  FastEthernet0/0
  FastEthernet0/1
Routing Information Sources:
  Gateway          Distance   Last Update
  209.165.200.229     120      00:00:26
Distance: (default is 120)
R1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

R    10.0.0.0/8 [120/1] via 209.165.200.229, 00:00:17, Serial0/0/0
  172.30.0.0/24 is subnetted, 2 subnets
C      172.30.1.0 is directly connected, FastEthernet0/0
C      172.30.2.0 is directly connected, FastEthernet0/1
  209.165.200.0/30 is subnetted, 2 subnets
C      209.165.200.228 is directly connected, Serial0/0/0
R      209.165.200.232 [120/1] via 209.165.200.229, 00:00:17, Serial0/0/0

R1#
```

Ctrl+F6 to exit CLI focus Copy Paste

R3 still only shows its own subnets for the 172.30.0.0 network. R3 still does not have any routes for the 172.30.0.0 subnets on R1.

R3#show ip route

The screenshot shows the Router3 CLI interface. The title bar says "Router3". Below it are tabs: Physical, Config, **CLI**, and Attributes. The main window is titled "IOS Command Line Interface". The output of the "show ip route" command is displayed:

```
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
end

R3#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

R    10.0.0.0/8 [120/1] via 209.165.200.233, 00:00:01, Serial0/0/1
      172.30.0.0/16 is variably subnetted, 4 subnets, 2 masks
C      172.30.100.0/24 is directly connected, FastEthernet0/0
C      172.30.110.0/24 is directly connected, Loopback0
C      172.30.200.16/28 is directly connected, Loopback1
C      172.30.200.32/28 is directly connected, Loopback2
      209.165.200.0/30 is subnetted, 2 subnets
R      209.165.200.228 [120/1] via 209.165.200.233, 00:00:01, Serial0/0/1
C      209.165.200.232 is directly connected, Serial0/0/1

R3#
```

At the bottom of the window, there are buttons for "Copy", "Paste", and "Copy to Clipboard".

Use the output of the `debug ip rip` command to answer the following questions:

R3:

The screenshot shows the Router3 CLI interface. The title bar says "Router3". Below it are tabs: Physical, Config, **CLI**, and Attributes. The main window is titled "IOS Command Line Interface". The output of the "debug ip rip" command is displayed:

```
R    209.165.200.228 [120/1] via 209.165.200.233, 00:00:01, Serial0/0/1
C    209.165.200.232 is directly connected, Serial0/0/1

R3#debug ip rip
RIP protocol debugging is on
R3#RIP: received v2 update from 209.165.200.233 on Serial0/0/1
  10.0.0.0/8 via 0.0.0.0 in 1 hops
  209.165.200.228/30 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Loopback0 (172.30.110.1)
RIP: build update entries
  10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
  172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
  172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
  209.165.200.0/24 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Loopback1 (172.30.200.17)
RIP: build update entries
  10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
  172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
  209.165.200.0/24 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Loopback2 (172.30.200.33)
RIP: build update entries
  10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
  172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
  209.165.200.0/24 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.234)
RIP: build update entries
  172.30.0.0/16 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Loopback0 (172.30.110.1)
RIP: build update entries
  10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
```

At the bottom of the window, there are buttons for "Copy", "Paste", and "Copy to Clipboard".

The screenshot shows the Router3 CLI interface with the 'CLI' tab selected. The output of the 'show ip route' command is displayed in a scrollable window. The output lists various IP routes, primarily RIP entries, detailing their destination networks, via interfaces, metrics, and tags.

```
RIP: build update entries
    172.30.0.0/16 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Loopback0 (172.30.110.1)
RIP: build update entries
    10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
    172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
    172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
    209.165.200.0/24 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Loopback1 (172.30.200.17)
RIP: build update entries
    10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
    172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
    209.165.200.0/24 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Loopback2 (172.30.200.33)
RIP: build update entries
    10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
    172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
    209.165.200.0/24 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.234)
RIP: build update entries
    172.30.0.0/16 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.233 on Serial0/0/1
    10.0.0.0/8 via 0.0.0.0 in 1 hops
    209.165.200.228/30 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Loopback0 (172.30.110.1)
RIP: build update entries
    10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
    172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
    172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
```



Router3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
RIP: build update entries
    10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
    172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
    172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
    209.165.200.0/24 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via loopback1 (172.30.200.17)
RIP: build update entries
    10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
    172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
    209.165.200.0/24 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Loopback2 (172.30.200.33)
RIP: build update entries
    10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
    172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
    209.165.200.0/24 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.234)
RIP: build update entries
    172.30.0.0/16 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.233 on Serial0/0/1
    10.0.0.0/8 via 0.0.0.0 in 1 hops
    209.165.200.228/30 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Loopback0 (172.30.110.1)
RIP: build update entries
    10.0.0.0/8 via 0.0.0.0, metric 2, tag 0
    172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
    172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
    172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
    209.165.200.0/24 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Loopback1 (172.30.200.17)
RIP: build update entries
```

Ctrl+F6 to exit CLI focus

Copy Paste

R2:

Router2

Physical Config CLI Attributes

IOS Command Line Interface

```
R2#debug ip route
^
t Invalid input detected at '^' marker.

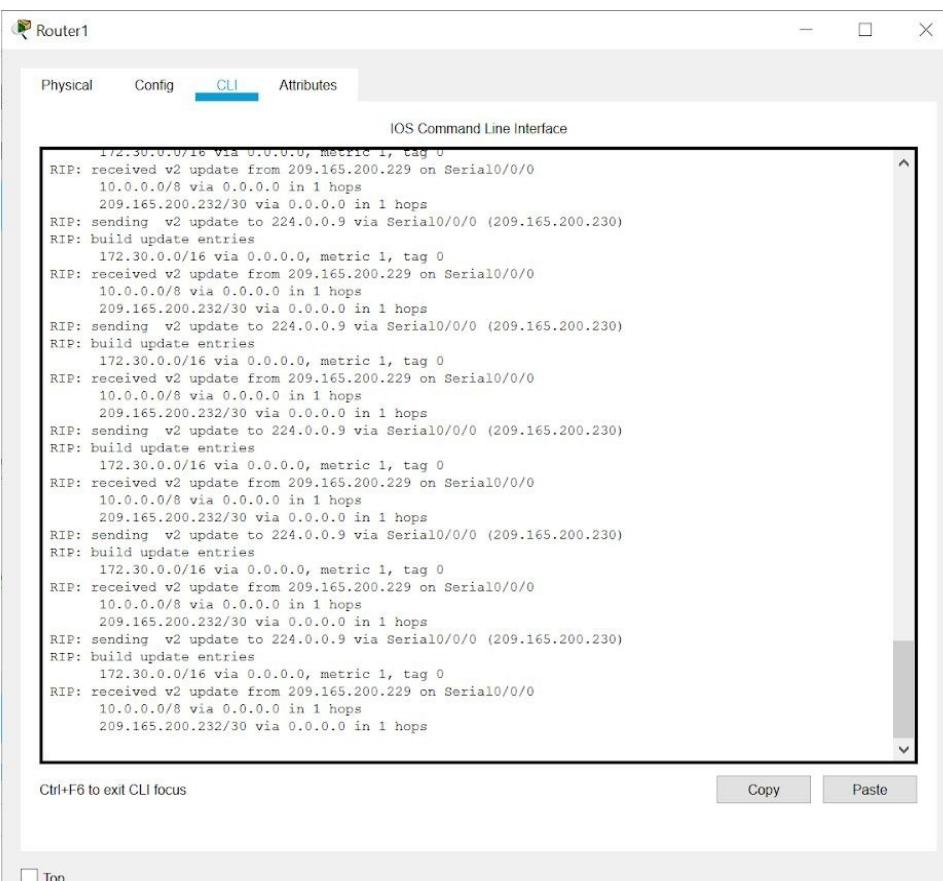
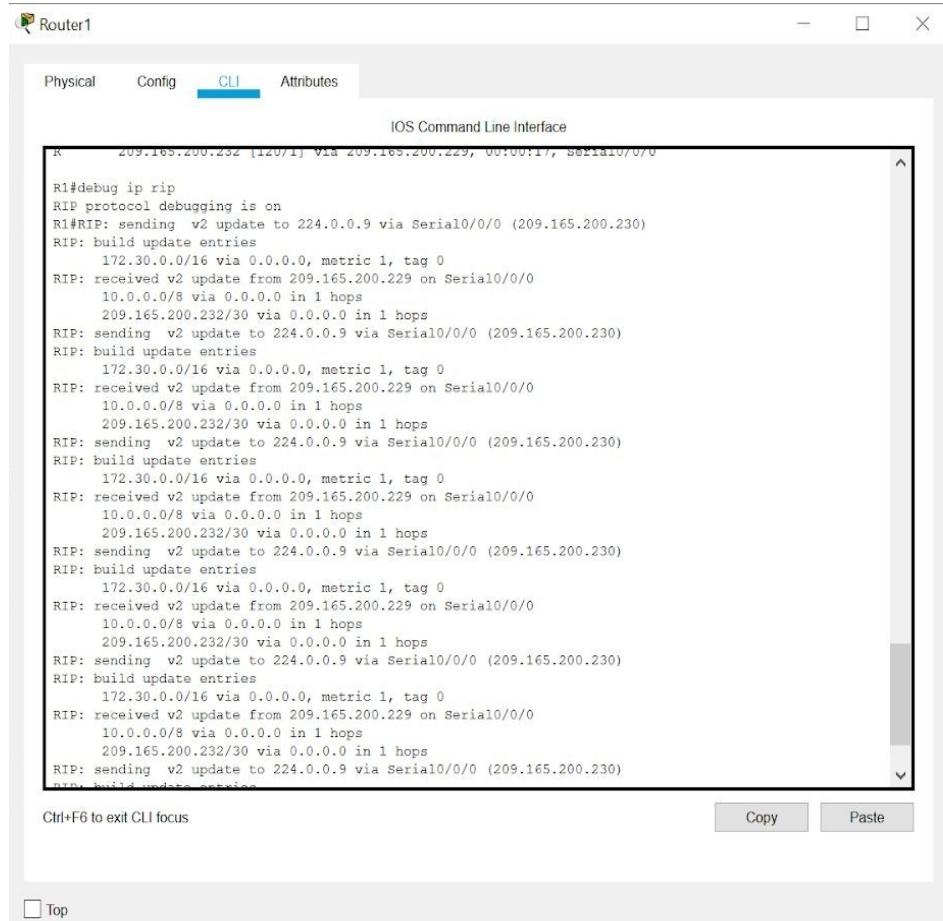
R2#debug ip rip
RIP protocol debugging is on
R2#RIP: received v2 update from 209.165.200.234 on Serial0/0/1
  172.30.0.0/16 via 0.0.0.0 in 1 hops
RIP: received v2 update from 209.165.200.230 on Serial0/0/0
  172.30.0.0/16 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.229)
RIP: build update entries
  10.0.0.0/8 via 0.0.0.0, metric 1, tag 0
  209.165.200.232/30 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.233)
RIP: build update entries
  10.0.0.0/8 via 0.0.0.0, metric 1, tag 0
  209.165.200.228/30 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.234 on Serial0/0/1
  172.30.0.0/16 via 0.0.0.0 in 1 hops
RIP: received v2 update from 209.165.200.230 on Serial0/0/0
  172.30.0.0/16 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.229)
RIP: build update entries
  10.0.0.0/8 via 0.0.0.0, metric 1, tag 0
  209.165.200.232/30 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.233)
RIP: build update entries
  10.0.0.0/8 via 0.0.0.0, metric 1, tag 0
  209.165.200.228/30 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.230 on Serial0/0/0
  172.30.0.0/16 via 0.0.0.0 in 1 hops
RIP: received v2 update from 209.165.200.234 on Serial0/0/1
  172.30.0.0/16 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.229)
```

Ctrl+F6 to exit CLI focus

Copy Paste

Physical	Config	CLI	Attributes
IOS Command Line Interface			
<pre>RIP: received v2 update from 209.165.200.230 on Serial0/0/0 172.30.0.0/16 via 0.0.0.0 in 1 hops RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.229) RIP: build update entries 10.0.0.0/8 via 0.0.0.0, metric 1, tag 0 209.165.200.232/30 via 0.0.0.0, metric 1, tag 0 RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.233) RIP: build update entries 10.0.0.0/8 via 0.0.0.0, metric 1, tag 0 209.165.200.228/30 via 0.0.0.0, metric 1, tag 0 RIP: received v2 update from 209.165.200.230 on Serial0/0/0 172.30.0.0/16 via 0.0.0.0 in 1 hops RIP: received v2 update from 209.165.200.234 on Serial0/0/1 172.30.0.0/16 via 0.0.0.0 in 1 hops RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.229) RIP: build update entries 10.0.0.0/8 via 0.0.0.0, metric 1, tag 0 209.165.200.232/30 via 0.0.0.0, metric 1, tag 0 RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.233) RIP: build update entries 10.0.0.0/8 via 0.0.0.0, metric 1, tag 0 209.165.200.228/30 via 0.0.0.0, metric 1, tag 0 RIP: received v2 update from 209.165.200.234 on Serial0/0/1 172.30.0.0/16 via 0.0.0.0 in 1 hops RIP: received v2 update from 209.165.200.230 on Serial0/0/0 172.30.0.0/16 via 0.0.0.0 in 1 hops RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.229) RIP: build update entries 10.0.0.0/8 via 0.0.0.0, metric 1, tag 0 209.165.200.232/30 via 0.0.0.0, metric 1, tag 0 RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.233) RIP: build update entries 10.0.0.0/8 via 0.0.0.0, metric 1, tag 0 209.165.200.228/30 via 0.0.0.0, metric 1, tag 0</pre>			

R1:



What entries are included in the RIP updates sent out from R3?

Ans. The following entries are sent out from R3:

- i) 10.0.0.0/8
- ii) 172.30.100.0/24
- iii) 172.30.110.0/24
- iv) 172.30.200.16/24
- v) 209.165.200.0/24

On R2, what routes are in the RIP updates that are received from R3?

Ans: On R2, 172.30.0.0/16 is in the RIP updates received from R3.

R3 is not sending any of the 172.30.0.0 subnets—only the summarized route of 172.30.0.0/16, including the subnet mask. This is why R2 and R1 are not seeing the 172.30.0.0 subnets on R3.

Task 6: Disable Automatic Summarization.

The **no auto-summary** command is used to turn off automatic summarization in RIPv2. Disable auto summarization on all routers. The routers will no longer summarize routes at major network boundaries.

```
R2(config)#router rip
R2(config-router)#no auto-summary
```

Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
!
!
!
interface FastEthernet0/0
ip address 10.1.0.1 255.255.0.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/0/0
ip address 209.165.200.229 255.255.255.252
!
interface Serial0/0/1
ip address 209.165.200.233 255.255.255.252
clock rate 64000
!
interface Vlan1
no ip address
shutdown
!
router rip
version 2
passive-interface FastEthernet0/0
network 10.0.0.0
network 209.165.200.0
no auto-summary
!
ip classless
!
--More--
```

Ctrl+F6 to exit CLI focus

Top

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R1 (config) #**router rip**
R1 (config-router) #**no auto-summary**

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
R1#enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router rip
R1(config-router)#no auto-summary
R1(config-router)#end
R1#
*SYS-5-CONFIG_I: Configured from console by console

R1#show running-config
Building configuration...

Current configuration : 885 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R1
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
--More-- |
```

Ctrl+F6 to exit CLI focus

Top

Copy Paste

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
ip address 172.30.1.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
ip address 172.30.2.1 255.255.255.0
duplex auto
speed auto
!
interface Serial0/0/0
ip address 209.165.200.230 255.255.255.252
clock rate 64000
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router rip
version 2
passive-interface FastEthernet0/0
passive-interface FastEthernet0/1
network 172.30.0.0
network 209.165.200.0
no auto-summary
!
ip classless
!
ip flow-export version 9
!
--More-- |
```

Ctrl+F6 to exit CLI focus Copy Paste **Copy to Clipboard**

R3 (config)#**router rip**
R3 (config-router)#**no auto-summary**

Router3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

R3>enable
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router rip
R3(config-router)#no auto-summary
R3(config-router)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console
show running-config
Building configuration...

Current configuration : 1011 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R3
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
--More-- |
```

Ctrl+F6 to exit CLI focus Copy Paste

```

!
interface FastEthernet0/0
 ip address 172.30.100.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/0/0
 no ip address
 clock rate 2000000
 shutdown
!
interface Serial0/0/1
 ip address 209.165.200.234 255.255.255.252
!
interface Vlan1
 no ip address
 shutdown
!
router rip
 version 2
 passive-interface FastEthernet0/0
 network 172.30.0.0
 network 209.165.200.0
 no auto-summary
!
ip classless
!
ip flow-export version 9
--More--

```

Ctrl+F6 to exit CLI focus

Top

The **show ip route** and **ping** commands can be used to verify that automatic summarization is off.

Task 7: Examine the Routing Tables.

The LANs connected to R1 and R3 should now be included in all three routing tables.

R2#**show ip route**

```

end

R2#
R2#
R2#
R2#
R2#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

      10.0.0.0/16 is subnetted, 1 subnets
C        10.1.0.0 is directly connected, FastEthernet0/0
      172.30.0.0/16 is variably subnetted, 7 subnets, 3 masks
R          172.30.0.0/16 [120/1] via 209.165.200.234, 00:01:37, Serial0/0/1
                  is possibly down, routing via 209.165.200.230, Serial0/0/0
R          172.30.1.0/24 [120/1] via 209.165.200.230, 00:00:17, Serial0/0/0
R          172.30.2.0/24 [120/1] via 209.165.200.230, 00:00:17, Serial0/0/0
R          172.30.100.0/24 [120/1] via 209.165.200.234, 00:00:16, Serial0/0/1
R          172.30.110.0/24 [120/1] via 209.165.200.234, 00:00:16, Serial0/0/1
R          172.30.200.16/28 [120/1] via 209.165.200.234, 00:00:16, Serial0/0/1
R          172.30.200.32/28 [120/1] via 209.165.200.234, 00:00:16, Serial0/0/1
C        209.165.200.0/30 is subnetted, 2 subnets
C          209.165.200.228 is directly connected, Serial0/0/0
C          209.165.200.232 is directly connected, Serial0/0/1

R2#
R2#

```

Ctrl+F6 to exit CLI focus

Top

```
R1#show ip route
```

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
R1>enable
R1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

  10.0.0.0/16 is subnetted, 1 subnets
R    10.1.0.0 [120/1] via 209.165.200.229, 00:00:13, Serial0/1/0
  172.30.0.0/16 is variably subnetted, 6 subnets, 2 masks
C      172.30.1.0/24 is directly connected, FastEthernet0/0
C      172.30.2.0/24 is directly connected, FastEthernet0/1
R      172.30.100.0/24 [120/2] via 209.165.200.229, 00:00:13, Serial0/1/0
R      172.30.110.0/24 [120/2] via 209.165.200.229, 00:00:13, Serial0/1/0
R      172.30.200.16/28 [120/2] via 209.165.200.229, 00:00:13, Serial0/1/0
R      172.30.200.32/28 [120/2] via 209.165.200.229, 00:00:13, Serial0/1/0
  209.165.200.0/30 is subnetted, 2 subnets
C      209.165.200.228 is directly connected, Serial0/1/0
R      209.165.200.232 [120/1] via 209.165.200.229, 00:00:13, Serial0/1/0
--More--
```

Ctrl+F6 to exit CLI focus Copy Paste

Top

```
R3#show ip route
```

Router3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
R3#
R3#
R3#
R3#
R3#
R3#
R3#
R3#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

  10.0.0.0/16 is subnetted, 1 subnets
R    10.1.0.0 [120/1] via 209.165.200.233, 00:00:13, Serial0/0/1
  172.30.0.0/16 is variably subnetted, 6 subnets, 2 masks
R    172.30.1.0/24 [120/2] via 209.165.200.233, 00:00:13, Serial0/0/1
R    172.30.2.0/24 [120/2] via 209.165.200.233, 00:00:13, Serial0/0/1
C    172.30.100.0/24 is directly connected, FastEthernet0/0
C    172.30.110.0/24 is directly connected, Loopback0
C    172.30.200.16/28 is directly connected, Loopback1
C    172.30.200.32/28 is directly connected, Loopback2
  209.165.200.0/30 is subnetted, 2 subnets
R    209.165.200.228 [120/1] via 209.165.200.233, 00:00:13, Serial0/0/1
C      209.165.200.232 is directly connected, Serial0/0/1

R3#
R3#
R3#
```

Ctrl+F6 to exit CLI focus Copy Paste

Top

Use the output of the **debug ip rip** command to answer the following questions:

R3

Router3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
RIP: sending v2 update to 224.0.0.9 via Loopback2 (172.30.200.33)
RIP: build update entries
  10.1.0.0/16 via 0.0.0.0, metric 2, tag 0
  172.30.1.0/24 via 0.0.0.0, metric 3, tag 0
  172.30.2.0/24 via 0.0.0.0, metric 3, tag 0
  172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
  209.165.200.228/30 via 0.0.0.0, metric 2, tag 0
  209.165.200.232/30 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.234)
RIP: build update entries
  172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
  172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.233 on Serial0/0/1
  10.1.0.0/16 via 0.0.0.0 in 1 hops
  172.30.1.0/24 via 0.0.0.0 in 2 hops
  172.30.2.0/24 via 0.0.0.0 in 2 hops
  209.165.200.228/30 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Loopback0 (172.30.110.1)
RIP: build update entries
  10.1.0.0/16 via 0.0.0.0, metric 2, tag 0
  172.30.1.0/24 via 0.0.0.0, metric 3, tag 0
  172.30.2.0/24 via 0.0.0.0, metric 3, tag 0
  172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
  172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
  209.165.200.228/30 via 0.0.0.0, metric 2, tag 0
  209.165.200.232/30 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Loopback1 (172.30.200.17)
RIP: build update entries
  10.1.0.0/16 via 0.0.0.0, metric 2, tag 0
  172.30.1.0/24 via 0.0.0.0, metric 3, tag 0
```

Ctrl+F6 to exit CLI focus **Copy** **Paste**

Top

Router3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
  172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
  209.165.200.228/30 via 0.0.0.0, metric 2, tag 0
  209.165.200.232/30 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Loopback2 (172.30.200.33)
RIP: build update entries
  10.1.0.0/16 via 0.0.0.0, metric 2, tag 0
  172.30.1.0/24 via 0.0.0.0, metric 3, tag 0
  172.30.2.0/24 via 0.0.0.0, metric 3, tag 0
  172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
  209.165.200.228/30 via 0.0.0.0, metric 2, tag 0
  209.165.200.232/30 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.234)
RIP: build update entries
  172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.110.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
  172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.233 on Serial0/0/1
  10.1.0.0/16 via 0.0.0.0 in 1 hops
  172.30.1.0/24 via 0.0.0.0 in 2 hops
  172.30.2.0/24 via 0.0.0.0 in 2 hops
  209.165.200.228/30 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Loopback0 (172.30.110.1)
RIP: build update entries
  10.1.0.0/16 via 0.0.0.0, metric 2, tag 0
  172.30.1.0/24 via 0.0.0.0, metric 3, tag 0
  172.30.2.0/24 via 0.0.0.0, metric 3, tag 0
  172.30.100.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
  172.30.200.32/28 via 0.0.0.0, metric 1, tag 0
  209.165.200.228/30 via 0.0.0.0, metric 2, tag 0
```

Ctrl+F6 to exit CLI focus **Copy** **Paste**

Top

R2:

Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
R 172.30.200.32/28 [120/1] via 209.165.200.234, 00:00:16, Serial0/0/1
209.165.200.0/30 is subnetted, 2 subnets
C 209.165.200.228 is directly connected, Serial0/0/0
C 209.165.200.232 is directly connected, Serial0/0/1

R2#
R2#debug ip rip
RIP protocol debugging is on
R2#RIP: received v2 update from 209.165.200.230 on Serial0/0/0
 172.30.1.0/24 via 0.0.0.0 in 1 hops
 172.30.2.0/24 via 0.0.0.0 in 1 hops
RIP: received v2 update from 209.165.200.234 on serial0/0/1
 172.30.100.0/24 via 0.0.0.0 in 1 hops
 172.30.110.0/24 via 0.0.0.0 in 1 hops
 172.30.200.16/28 via 0.0.0.0 in 1 hops
 172.30.200.32/28 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.233)
RIP: build update entries
 10.1.0.0/16 via 0.0.0.0, metric 1, tag 0
 172.30.1.0/24 via 0.0.0.0, metric 2, tag 0
 172.30.2.0/24 via 0.0.0.0, metric 2, tag 0
 209.165.200.228/30 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.229)
RIP: build update entries
 10.1.0.0/16 via 0.0.0.0, metric 1, tag 0
 172.30.100.0/24 via 0.0.0.0, metric 2, tag 0
 172.30.110.0/24 via 0.0.0.0, metric 2, tag 0
 172.30.200.16/28 via 0.0.0.0, metric 2, tag 0
 172.30.200.32/28 via 0.0.0.0, metric 2, tag 0
 209.165.200.232/30 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.230 on serial0/0/0
 172.30.1.0/24 via 0.0.0.0 in 1 hops
 172.30.2.0/24 via 0.0.0.0 in 1 hops
RIP: received v2 update from 209.165.200.234 on serial0/0/1
 172.30.100.0/24 via 0.0.0.0 in 1 hops
```

Ctrl+F6 to exit CLI focus **Copy** **Paste**

Top

Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
172.30.1.0/24 via 0.0.0.0, metric 2, tag 0
172.30.2.0/24 via 0.0.0.0, metric 2, tag 0
209.165.200.228/30 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.229)
RIP: build update entries
 10.1.0.0/16 via 0.0.0.0, metric 1, tag 0
 172.30.100.0/24 via 0.0.0.0, metric 2, tag 0
 172.30.110.0/24 via 0.0.0.0, metric 2, tag 0
 172.30.200.16/28 via 0.0.0.0, metric 2, tag 0
 172.30.200.32/28 via 0.0.0.0, metric 2, tag 0
 209.165.200.232/30 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.230 on Serial0/0/0
 172.30.1.0/24 via 0.0.0.0 in 1 hops
 172.30.2.0/24 via 0.0.0.0 in 1 hops
RIP: received v2 update from 209.165.200.234 on Serial0/0/1
 172.30.100.0/24 via 0.0.0.0 in 1 hops
 172.30.110.0/24 via 0.0.0.0 in 1 hops
 172.30.200.16/28 via 0.0.0.0 in 1 hops
 172.30.200.32/28 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Serial0/0/1 (209.165.200.233)
RIP: build update entries
 10.1.0.0/16 via 0.0.0.0, metric 1, tag 0
 172.30.1.0/24 via 0.0.0.0, metric 2, tag 0
 172.30.2.0/24 via 0.0.0.0, metric 2, tag 0
 209.165.200.228/30 via 0.0.0.0, metric 1, tag 0
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.229)
RIP: build update entries
 10.1.0.0/16 via 0.0.0.0, metric 1, tag 0
 172.30.100.0/24 via 0.0.0.0, metric 2, tag 0
 172.30.110.0/24 via 0.0.0.0, metric 2, tag 0
 172.30.200.16/28 via 0.0.0.0, metric 2, tag 0
 172.30.200.32/28 via 0.0.0.0, metric 2, tag 0
 209.165.200.232/30 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.230 on Serial0/0/0
 172.30.1.0/24 via 0.0.0.0 in 1 hops
 172.30.2.0/24 via 0.0.0.0 in 1 hops
```

Ctrl+F6 to exit CLI focus **Copy** **Paste**

Top

R1:

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
R1>enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#debug ip rip
RIP protocol debugging is on
R1#RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.230)
RIP: build update entries
  172.30.1.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.2.0/24 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.229 on Serial0/0/0
  10.1.0.0/16 via 0.0.0.0 in 1 hops
  172.30.100.0/24 via 0.0.0.0 in 2 hops
  172.30.110.0/24 via 0.0.0.0 in 2 hops
  172.30.200.16/28 via 0.0.0.0 in 2 hops
  172.30.200.32/28 via 0.0.0.0 in 2 hops
  209.165.200.232/30 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.230)
RIP: build update entries
  172.30.1.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.2.0/24 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.229 on Serial0/0/0
  10.1.0.0/16 via 0.0.0.0 in 1 hops
  172.30.100.0/24 via 0.0.0.0 in 2 hops
  172.30.110.0/24 via 0.0.0.0 in 2 hops
  172.30.200.16/28 via 0.0.0.0 in 2 hops
  172.30.200.32/28 via 0.0.0.0 in 2 hops
  209.165.200.232/30 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.230)
RIP: build update entries
  172.30.1.0/24 via 0.0.0.0, metric 1, tag 0
```

Ctrl+F6 to exit CLI focus **Copy** **Paste**

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
209.165.200.232/30 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.230)
RIP: build update entries
  172.30.1.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.2.0/24 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.229 on Serial0/0/0
  10.1.0.0/16 via 0.0.0.0 in 1 hops
  172.30.100.0/24 via 0.0.0.0 in 2 hops
  172.30.110.0/24 via 0.0.0.0 in 2 hops
  172.30.200.16/28 via 0.0.0.0 in 2 hops
  172.30.200.32/28 via 0.0.0.0 in 2 hops
  209.165.200.232/30 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.230)
RIP: build update entries
  172.30.1.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.2.0/24 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.229 on Serial0/0/0
  10.1.0.0/16 via 0.0.0.0 in 1 hops
  172.30.100.0/24 via 0.0.0.0 in 2 hops
  172.30.110.0/24 via 0.0.0.0 in 2 hops
  172.30.200.16/28 via 0.0.0.0 in 2 hops
  172.30.200.32/28 via 0.0.0.0 in 2 hops
  209.165.200.232/30 via 0.0.0.0 in 1 hops
RIP: sending v2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.230)
RIP: build update entries
  172.30.1.0/24 via 0.0.0.0, metric 1, tag 0
  172.30.2.0/24 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.229 on Serial0/0/0
  10.1.0.0/16 via 0.0.0.0 in 1 hops
  172.30.100.0/24 via 0.0.0.0 in 2 hops
  172.30.110.0/24 via 0.0.0.0 in 2 hops
  172.30.200.16/28 via 0.0.0.0 in 2 hops
  172.30.200.32/28 via 0.0.0.0 in 2 hops
  209.165.200.232/30 via 0.0.0.0 in 1 hops
```

Ctrl+F6 to exit CLI focus **Copy** **Paste**

What entries are included in the RIP updates sent out from R1?

Ans. The following entries are sent out from R1:

i) 172.30.1.0/24

ii) 172.30.2.0/24

On R2, what routes are in RIP updates that are received from R1?

Ans. The following entries are received out from R1:

i) 172.30.1.0/24

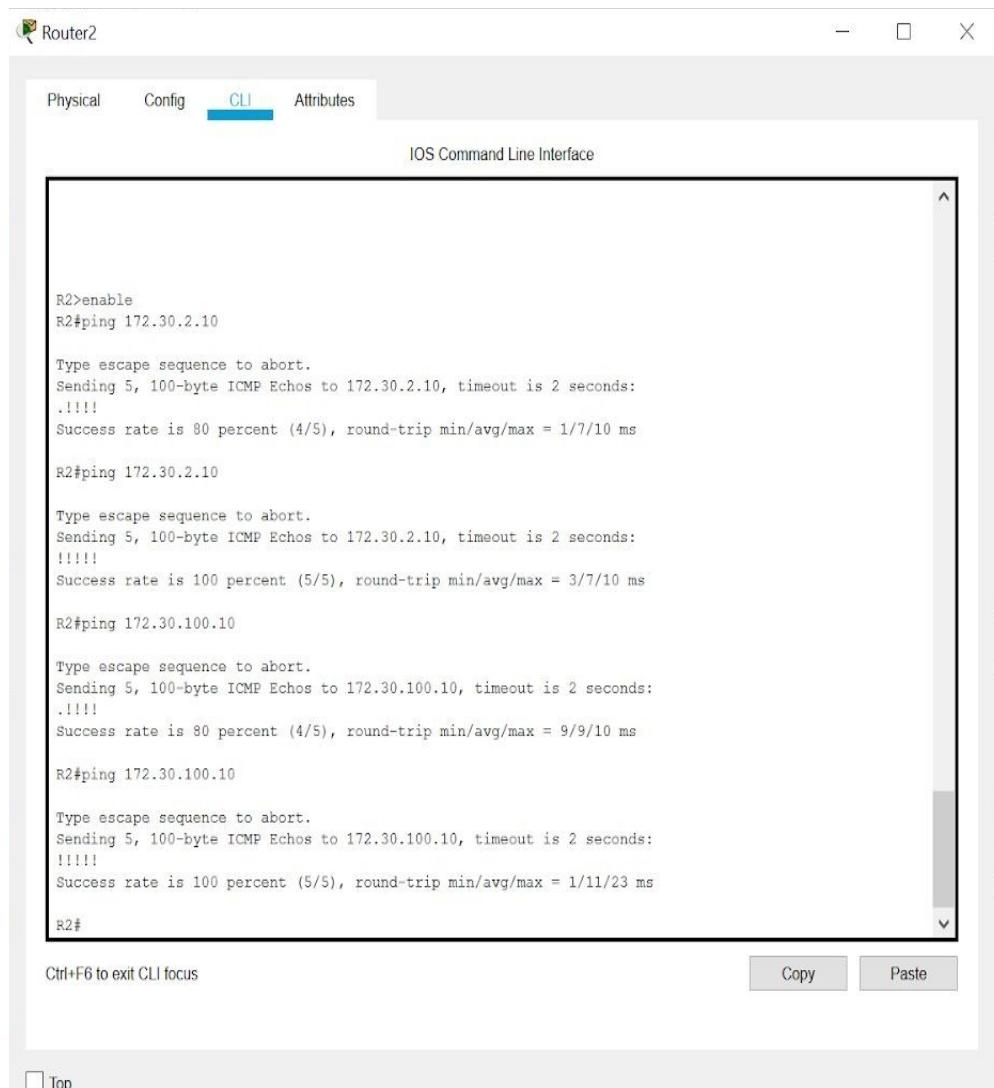
ii) 172.30.2.0/24

Are the subnet masks now included in the routing updates?

Ans. Yes, the subnet masks are now included in the routing updates.

Task 8: Verify Network Connectivity.

Step 1: Check connectivity between R2 router and PCs.



The screenshot shows the Cisco Network Assistant interface with a window titled "Router2". The tab bar at the top has "Physical", "Config", "CLI" (which is selected and highlighted in blue), and "Attributes". Below the tab bar is the text "IOS Command Line Interface". The main area contains the following CLI session output:

```
R2>enable
R2#ping 172.30.2.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.30.2.10, timeout is 2 seconds:
!!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 1/7/10 ms

R2#ping 172.30.2.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.30.2.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 3/7/10 ms

R2#ping 172.30.100.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.30.100.10, timeout is 2 seconds:
!!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 9/9/10 ms

R2#ping 172.30.100.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.30.100.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/11/23 ms

R2#
```

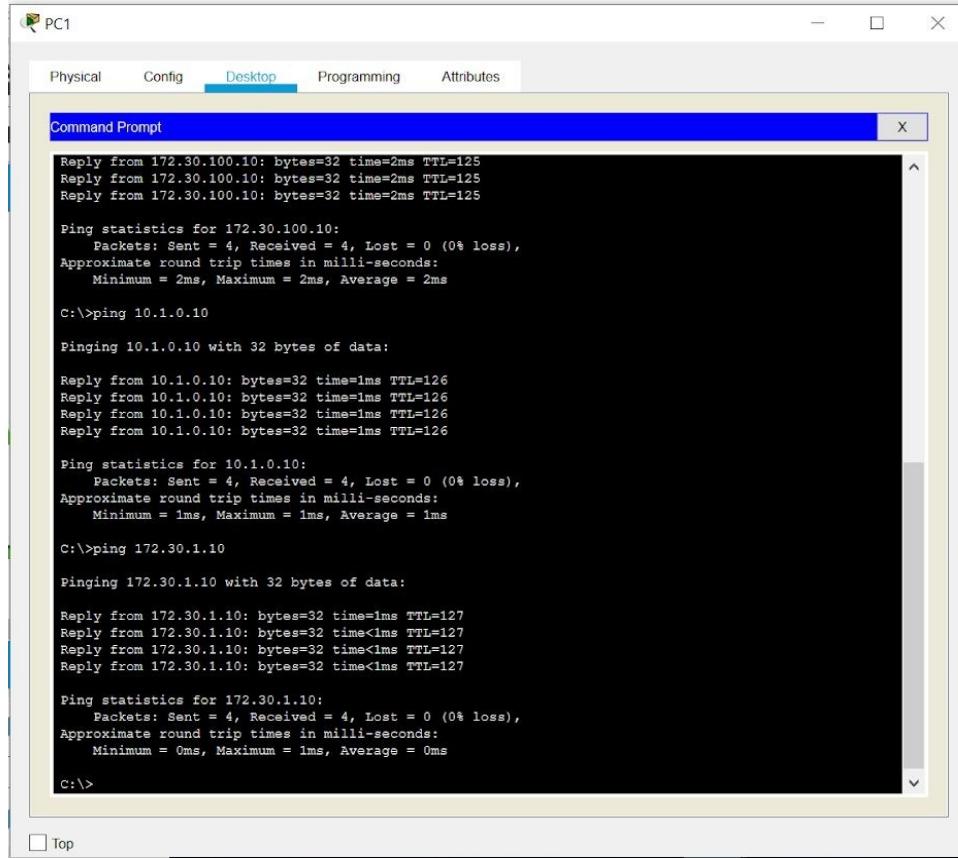
At the bottom left of the window, there is a note: "Ctrl+F6 to exit CLI focus". At the bottom right, there are "Copy" and "Paste" buttons. A small "Top" button is located at the bottom center.

From R2, how many ICMP messages are successful when pinging PC1?

Ans. There are 5 successful ICMP messages when pinging PC1.

From R2, how many ICMP messages are successful when pinging PC4? Ans. There are 5 successful ICMP messages when pinging PC4.

Step 2: Check the connectivity between the PCs.



The screenshot shows a Windows desktop environment with a window titled "PC1". Inside the window, there is a tab bar with "Physical", "Config", "Desktop" (which is selected), "Programming", and "Attributes". Below the tab bar is a "Command Prompt" window. The command prompt output is as follows:

```
Reply from 172.30.100.10: bytes=32 time=2ms TTL=125
Reply from 172.30.100.10: bytes=32 time=2ms TTL=125
Reply from 172.30.100.10: bytes=32 time=2ms TTL=125

Ping statistics for 172.30.100.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 2ms, Average = 2ms

C:\>ping 10.1.0.10

Pinging 10.1.0.10 with 32 bytes of data:

Reply from 10.1.0.10: bytes=32 time=1ms TTL=126

Ping statistics for 10.1.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

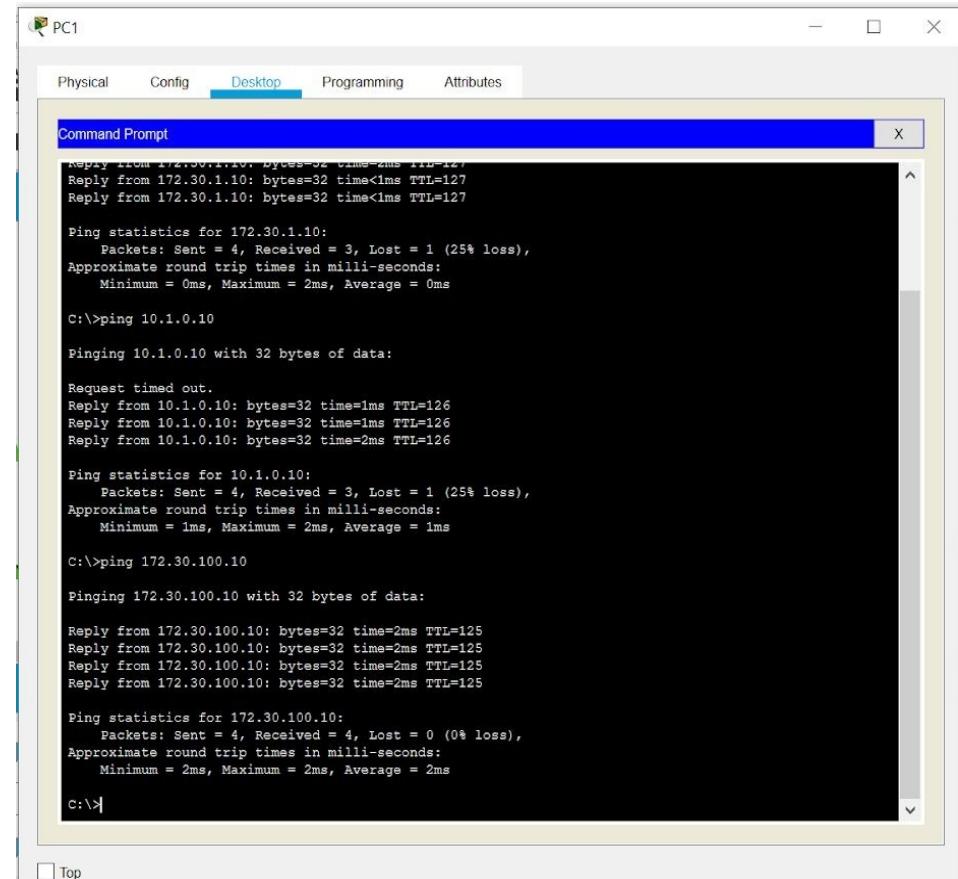
C:\>ping 172.30.1.10

Pinging 172.30.1.10 with 32 bytes of data:

Reply from 172.30.1.10: bytes=32 time=1ms TTL=127
Reply from 172.30.1.10: bytes=32 time<1ms TTL=127
Reply from 172.30.1.10: bytes=32 time<1ms TTL=127
Reply from 172.30.1.10: bytes=32 time<1ms TTL=127

Ping statistics for 172.30.1.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```



The screenshot shows a Windows desktop environment with a window titled "PC1". Inside the window, there is a tab bar with "Physical", "Config", "Desktop" (which is selected), "Programming", and "Attributes". Below the tab bar is a "Command Prompt" window. The command prompt output is as follows:

```
Reply from 172.30.1.10: bytes=32 time=2ms TTL=127
Reply from 172.30.1.10: bytes=32 time<1ms TTL=127
Reply from 172.30.1.10: bytes=32 time<1ms TTL=127

Ping statistics for 172.30.1.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>ping 10.1.0.10

Pinging 10.1.0.10 with 32 bytes of data:
Request timed out.

Reply from 10.1.0.10: bytes=32 time=1ms TTL=126
Reply from 10.1.0.10: bytes=32 time=1ms TTL=126
Reply from 10.1.0.10: bytes=32 time=2ms TTL=126

Ping statistics for 10.1.0.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\>ping 172.30.100.10

Pinging 172.30.100.10 with 32 bytes of data:

Reply from 172.30.100.10: bytes=32 time=2ms TTL=125

Ping statistics for 172.30.100.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 2ms, Average = 2ms

C:\>
```

From PC1, is it possible to ping PC2?

Ans. Yes,it is possible to ping PC2 from
PC1. What is the success rate?

Ans. The success rate is 100%

From PC1, is it possible to ping PC3?

Ans. Yes,it is possible to ping PC3 from PC1.

What is the success rate?

Ans. The success rate is 100%

From PC1, is it possible to ping PC4?

Ans. Yes,it is possible to ping PC4 from
PC1. What is the success rate?

Ans. The success rate is 100%

The screenshot shows a Windows desktop environment with a window titled "Command Prompt" open. The window is part of "PC4". The tab bar at the top has "Physical", "Config", "Desktop" (which is selected), "Programming", and "Attributes". The command prompt window contains the following text:

```
Packet Tracer PC Command Line 1.0
C:\>ping 172.30.1.10

Pinging 172.30.1.10 with 32 bytes of data:

Reply from 172.30.1.10: bytes=32 time=2ms TTL=125

Ping statistics for 172.30.1.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 2ms, Average = 2ms

C:\>ping 10.1.0.10

Pinging 10.1.0.10 with 32 bytes of data:

Reply from 10.1.0.10: bytes=32 time=18ms TTL=126
Reply from 10.1.0.10: bytes=32 time=8ms TTL=126
Reply from 10.1.0.10: bytes=32 time=1ms TTL=126
Reply from 10.1.0.10: bytes=32 time=9ms TTL=126

Ping statistics for 10.1.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 18ms, Average = 9ms

C:\>
```

Top

From PC4, is it possible to ping PC2?

Ans. Yes,it is possible to ping PC4 from

PC2. What is the success rate?

Ans. The success rate is 100%

From PC4, is it possible to ping PC3?

Ans. Yes,it is possible to ping PC4 from

PC3. What is the success rate?

Ans. The success rate is 100%

Task 9: Documentation

On each router, capture the following command output to a text (.txt) file and save for future reference.

- **show running-config**
- **show ip route**
- **show ip interface brief**
- **show ip protocols**

If you need to review the procedures for capturing command output, refer to Lab 1.5.1.

For R1:

- 1. show running-config**

R1>enable

```
R1#show running-
config Building
configuration...
```

Current configuration : 885 bytes

```
!
version 12.4
no service timestamps log datetime msec
  no service timestamps debug datetime
    msec no service password-encryption
!
```

```
hostname R1
!
```

```
!
!
!
!
!
```

```
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
!
!
!
!
!
interface FastEthernet0/0
    ip address 172.30.1.1 255.255.255.0
    duplex auto
    speed auto
!
interface FastEthernet0/1
    ip address 172.30.2.1 255.255.255.0
    duplex auto
    speed auto
!
interface Serial0/0/0
    ip address 209.165.200.230 255.255.255.252
```

```
clock rate 64000
!
interface
  Serial0/0/1 no ip
  address
    clock rate
    2000000
    shutdown
!
interface
  Vlan1 no ip
  address
    shutdown
!
router rip
  version 2
  passive-interface
    FastEthernet0/0      passive-
    interface      FastEthernet0/1
    network 172.30.0.0
    network
      209.165.200.0 no
      auto-summary
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
line con 0
```

```
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

R1#

2. show ip route

R1#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

10.0.0.0/16 is subnetted, 1 subnets

R 10.1.0.0 [120/1] via 209.165.200.229, 00:00:21, Serial0/0/0

172.30.0.0/16 is variably subnetted, 6 subnets, 2

masks C 172.30.1.0/24 is directly connected,

FastEthernet0/0

```
C    172.30.2.0/24 is directly connected, FastEthernet0/1
R    172.30.100.0/24 [120/2] via 209.165.200.229, 00:00:21,
Serial0/0/0 R    172.30.110.0/24 [120/2] via 209.165.200.229,
00:00:21, Serial0/0/0 R    172.30.200.16/28 [120/2] via
209.165.200.229, 00:00:21, Serial0/0/0 R 172.30.200.32/28 [120/2]
via 209.165.200.229, 00:00:21, Serial0/0/0
209.165.200.0 /30 is subnetted, 2 subnets
C    209.165.200.228 is directly connected, Serial0/0/0
R    209.165.200.232 [120/1] via 209.165.200.229, 00:00:21,
```

Serial0/0/0 R1#

3. show ip interface brief

```
R1#show ip interface brief
Interface      IP-Address  OK? Method Status      Protocol
FastEthernet0/0          172.30.1.1      YES
manual up      up FastEthernet0/1
                      172.30.2.1      YES manual up      up
Serial0/0/0          209.165.200.230  YES manual up      up
Serial0/0/1          unassigned     YES NVRAM administratively down
down Vlan1          unassigned     YES unset administratively down down
R1#
```

4. show ip protocols

```
R1#show ip protocols Routing
Protocol is "rip"
Sending updates every 30 seconds, next due in 22
seconds Invalid after 180 seconds, hold down 180,
flushed after 240 Outgoing update filter list for all
interfaces is not set Incoming update filter list for all
interfaces is not set Redistributing: rip
```

Default version control: send version 2, receive 2

```
Interface      Send Recv Triggered RIP Key-
chain Serial0/0/0        2        2
```

Automatic network summarization is not in
effect Maximum path: 4

Routing for Networks:

172.30.0.0
209.165.200.0

Passive Interface(s):

FastEthernet0/0
FastEthernet0/1

Routing Information Sources:

Gateway	Distance	Last Update
209.165.200.229	120	00:00:13

Distance: (default is
120) R1#

For R2:

1. show running-config

R2>enable

R2#show running-
config Building
configuration...

Current configuration : 831 bytes

!

version 12.4

no service timestamps log datetime msec
 no service timestamps debug datetime
 msec no service password-encryption

!

hostname R2

!

!

!

!

!

!

!

no ip cef

no ipv6 cef

```
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
interface FastEthernet0/0
    ip address 10.1.0.1
    255.255.0.0 duplex auto
    speed auto
!
interface
    FastEthernet0/1 no ip
    address
    duplex auto
    speed auto
    shutdown
!
interface Serial0/0/0
    ip address 209.165.200.229 255.255.255.252
!
interface Serial0/0/1
    ip address 209.165.200.233 255.255.255.252
```

```
clock rate 64000
!
interface
  Vlan1 no ip
  address
  shutdown
!
router rip
  version 2
  passive-interface FastEthernet0/0
  network 10.0.0.0
  network
  209.165.200.0 no
  auto-summary
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
  login
!
!
!
end
```

R2#

2 . show ip route

R2#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

10.0.0.0/16 is subnetted, 1 subnets
C 10.1.0.0 is directly connected, FastEthernet0/0
172.30.0.0/16 is variably subnetted, 6 subnets,
2 masks

R 172.30.1.0/24 [120/1] via 209.165.200.230, 00:00:23, Serial0/0/0
R 172.30.2.0/24 [120/1] via 209.165.200.230, 00:00:23, Serial0/0/0

R 172.30.100.0/24 [120/1] via 209.165.200.234, 00:00:15,
Serial0/0/1 R 172.30.110.0/24 [120/1] via 209.165.200.234,
00:00:15, Serial0/0/1 R 172.30.200.16/28 [120/1] via
209.165.200.234, 00:00:15, Serial0/0/1 R 172.30.200.32/28 [120/1]
via 209.165.200.234, 00:00:15, Serial0/0/1
209.165.200.0/30 is subnetted, 2 subnets
C 209.165.200.228 is directly connected,
Serial0/0/0 C 209.165.200.232 is directly
connected, Serial0/0/1

3 . show ip interface brief

R2#show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	10.1.0.1	YES	manual	up	
FastEthernet0/1	unassigned	YES	NVRAM	administratively down	
down Serial0/0/0	209.165.200.229	YES	manual	up	

```
      up
Serial0/0/1    209.165.200.233 YES manual up      up
Vlan1         unassigned   YES unset administratively down
down R2#
```

4. show ip protocols

```
R2#show ip protocols Routing
Protocol is "rip"
Sending updates every 30 seconds, next due in 7
seconds Invalid after 180 seconds, hold down 180,
flushed after 240 Outgoing update filter list for all
interfaces is not set Incoming update filter list for all
interfaces is not set Redistributing: rip
```

Default version control: send version 2, receive 2

```
Interface      Send Recv Triggered RIP Key-
chain
Serial0/0/1    2    2
Serial0/0/0    2    2
```

Automatic network summarization is not in
effect Maximum path: 4

Routing for Networks:

```
10.0.0.0
209.165.200.0
```

Passive Interface(s):

```
FastEthernet0/0
```

Routing Information

Sources:

Gateway	Distance	Last Update
209.165.200.230	120	00:00:12
209.165.200.234	120	00:00:05

Distance: (default is

```
120) R2#
```

For R3:

5. show running-config

R3>enable

```
R3#show running-
config Building
configuration...
```

Current configuration : 1011 bytes

```
!
version 12.4
no service timestamps log datetime msec
  no service timestamps debug datetime
    msec no service password-encryption
```

!

hostname R3

```
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
```

```
no ip cef
no ipv6 cef
```

```
!
!
!
!
!
!
!
!
!
!
!
```

```
!
spanning-tree mode pvst
!
!
!
!
!
!
!
interface Loopback0
    ip address 172.30.110.1 255.255.255.0
!
interface Loopback1
    ip address 172.30.200.17 255.255.255.240
!
interface Loopback2
    ip address 172.30.200.33 255.255.255.240
!
interface FastEthernet0/0
    ip address 172.30.100.1 255.255.255.0
    duplex auto
    speed auto
!
interface
FastEthernet0/1 no ip
address
duplex auto
speed auto
shutdown
!
interface
Serial0/0/0 no ip
address
clock rate 2000000
shutdown
!
interface Serial0/0/1
```

```
ip address 209.165.200.234 255.255.255.252
!
interface
Vlan1 no ip
address
shutdown
!
router rip
version 2
passive-interface FastEthernet0/0
network 172.30.0.0
network
209.165.200.0 no
auto-summary
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

6. show ip route

R3#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - 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

10.0.0.0/16 is subnetted, 1 subnets

R 10.1.0.0 [120/1] via 209.165.200.233, 00:00:08, Serial0/0/1

172.30.0.0/16 is variably subnetted, 6 subnets, 2 masks

R 172.30.1.0/24 [120/2] via 209.165.200.233, 00:00:08,

Serial0/0/1 R 172.30.2.0/24 [120/2] via 209.165.200.233,

00:00:08, Serial0/0/1

C 172.30.100.0/24 is directly connected, FastEthernet0/0

C 172.30.110.0/24 is directly connected,

Loopback0 C 172.30.200.16/28 is directly

connected, Loopback1 C 172.30.200.32/28 is

directly connected, Loopback2

209.165.200.0/30 is subnetted, 2 subnets

R 209.165.200.228 [120/1] via 209.165.200.233, 00:00:08, Serial0/0/1

C 209.165.200.232 is directly connected, Serial0/0/1

7. show ip interface brief

R3#show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	172.30.100.1	YES	manual	up	
FastEthernet0/1	unassigned	YES	NVRAM	administratively down	
down	Serial0/0/0		unassigned		YES
					NVRAM administratively down
				down	Serial0/0/1

	209.165.200.234	YES	manual	up
Loopback0	172.30.110.1	YES	manual	up
Loopback1	172.30.200.17	YES	manual	up
Loopback2	172.30.200.33	YES	manual	up
Vlan1	unassigned	YES	unset	administratively down
				down

8. show ip protocols

R3#show ip protocols Routing

Protocol is "rip"

Sending updates every 30 seconds, next due in 25
seconds Invalid after 180 seconds, hold down 180,
flushed after 240

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Redistributing: rip

Default version control: send version 2, receive 2

Interface	Send	Recv	Triggered RIP	Key-chain
Loopback0	2	2		
Loopback1	2	2		
Loopback 2	2	2		
Serial0/0/1	2	2		

Automatic network summarization is not in

effect Maximum path: 4

Routing for Networks:

172.30.0.0

209.165.200.0

Passive Interface(s):

FastEthernet0/0

Routing Information

Sources:

Gateway	Distance	Last Update
209.165.200.233	120	00:00:27

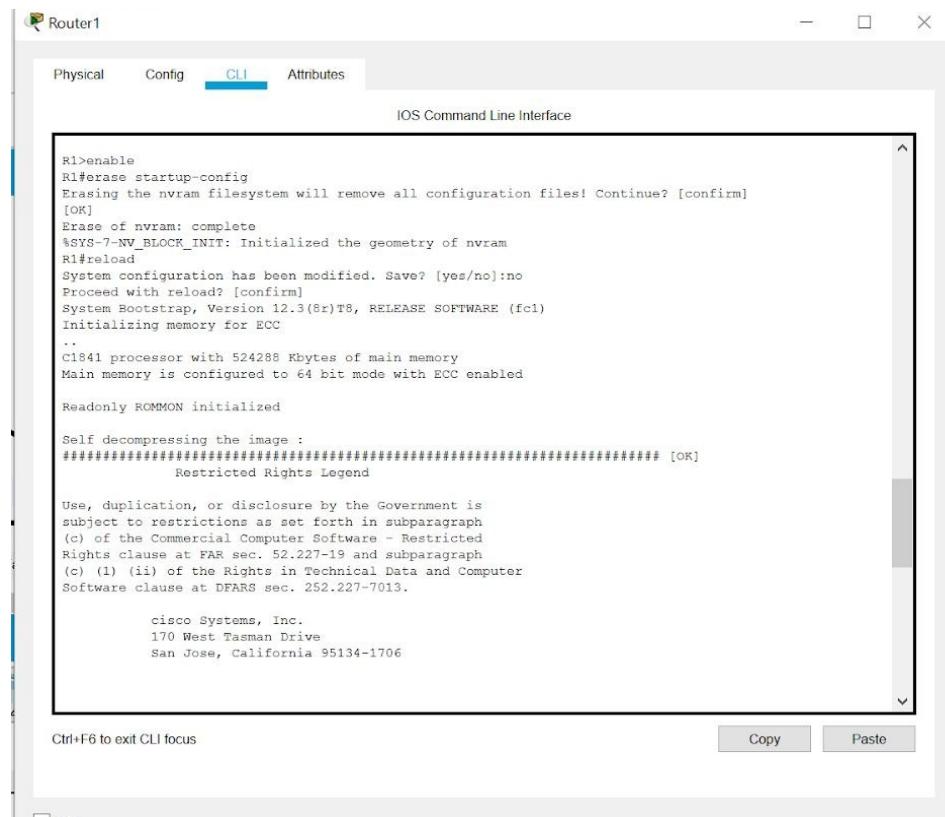
Distance: (default is

120) R3#

Task 10: Clean Up

Erase the configurations and reload the routers. Disconnect and store the cabling. For PC hosts that are normally connected to other networks (such as the school LAN or to the Internet), reconnect the appropriate cabling and restore the TCP/IP settings.

Erasing and reloading the Routers



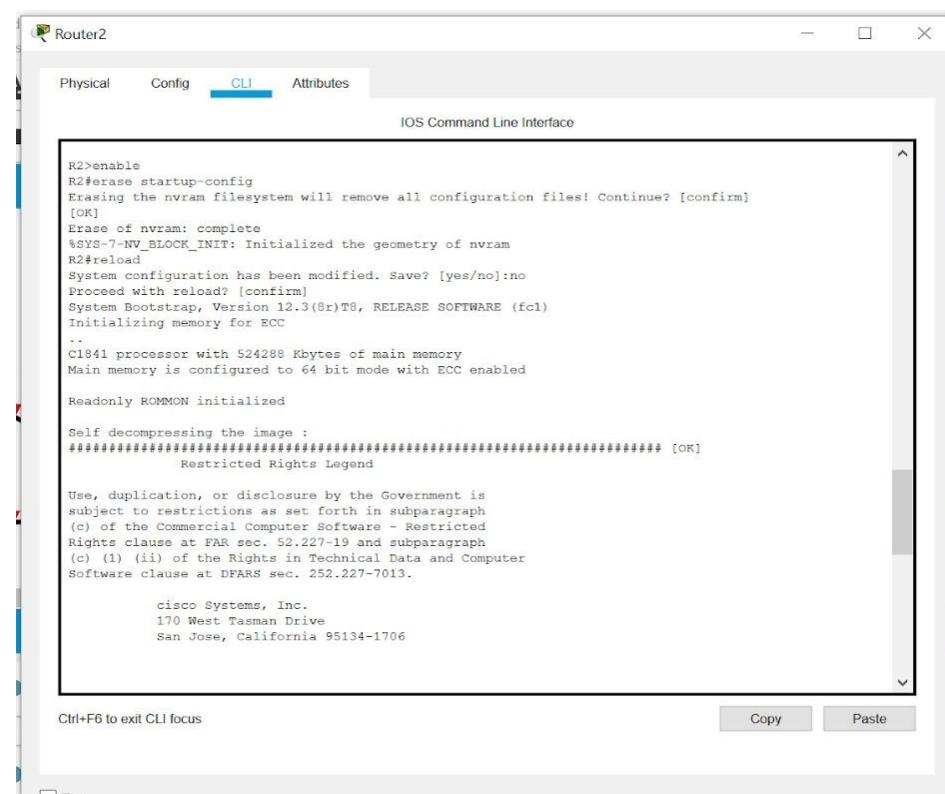
R1>enable
R1#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
R1#reload
System configuration has been modified. Save? [yes/no]:no
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
.
C1841 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

Readonly ROMMON initialized

Self decompressing the image :
#####
[OK]
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R2>enable
R2#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
R2#reload
System configuration has been modified. Save? [yes/no]:no
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
.
C1841 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

Readonly ROMMON initialized

Self decompressing the image :
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Router3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
R3>enable
R3#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
R3#
R3#reload
System configuration has been modified. Save? [yes/no]:no
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T0, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
...
C1841 processor with 524288 Kbytes of main memory
Main memory is configured to 64 bit mode with ECC enabled

 Readonly ROMMON initialized

 Self decompressing the image :
#####
##### [OK]
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```

Ctrl+F6 to exit CLI focus

Top

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