

**CEL 51, DCCN, Monsoon 2020**

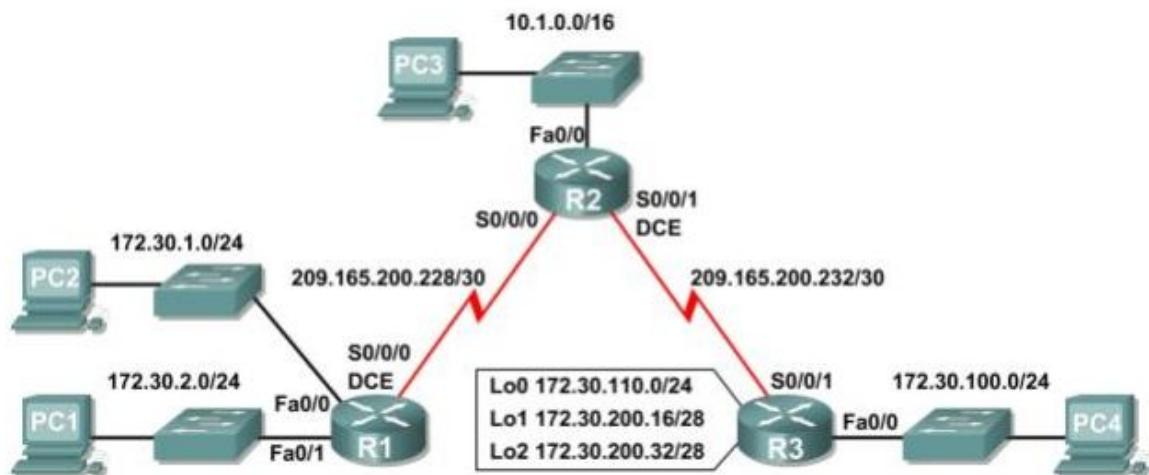
## **Lab 7: RIPv2 Router Configuration**

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**BATCH D TE COMPS**

**UID : 2018130051**

### **Topology Diagram:**



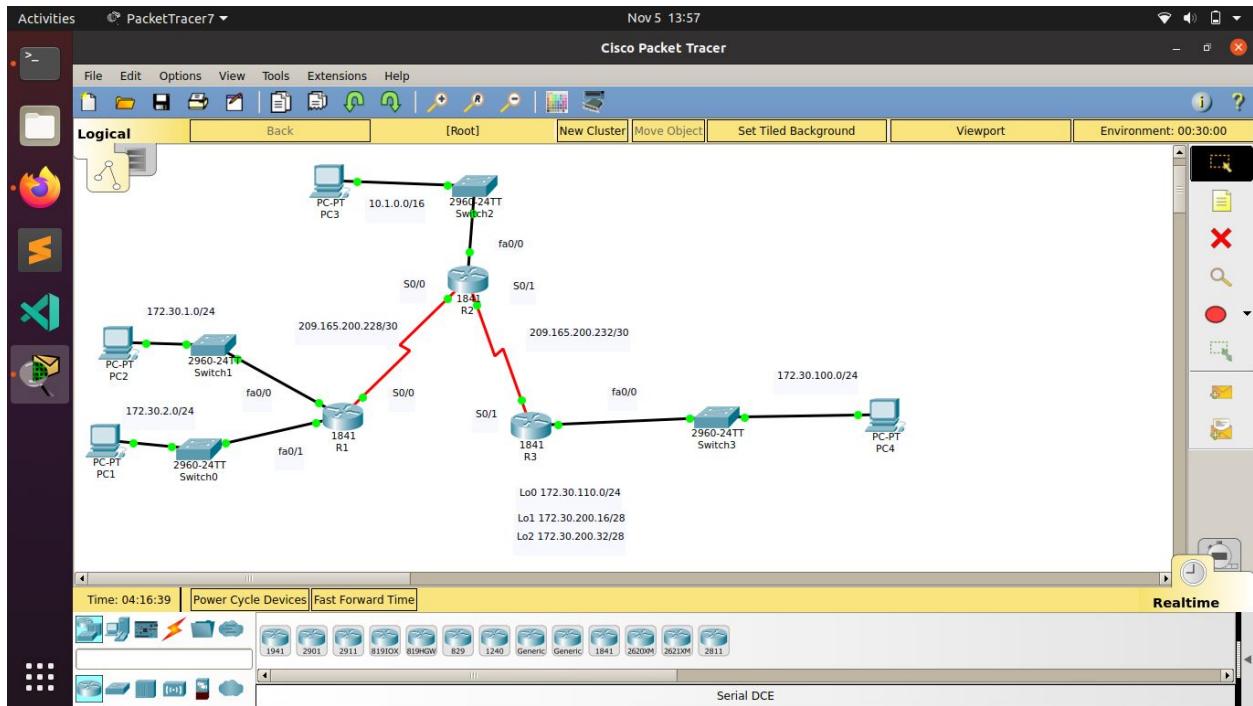
## **Addressing Table**

<b>Device</b>	<b>Interface</b>	<b>IP Address</b>	<b>Subnet Mask</b>	<b>Default Gateway</b>
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	172.30.1.10	255.255.255.0	172.30.2.1
PC2	NIC	172.30.2.10	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

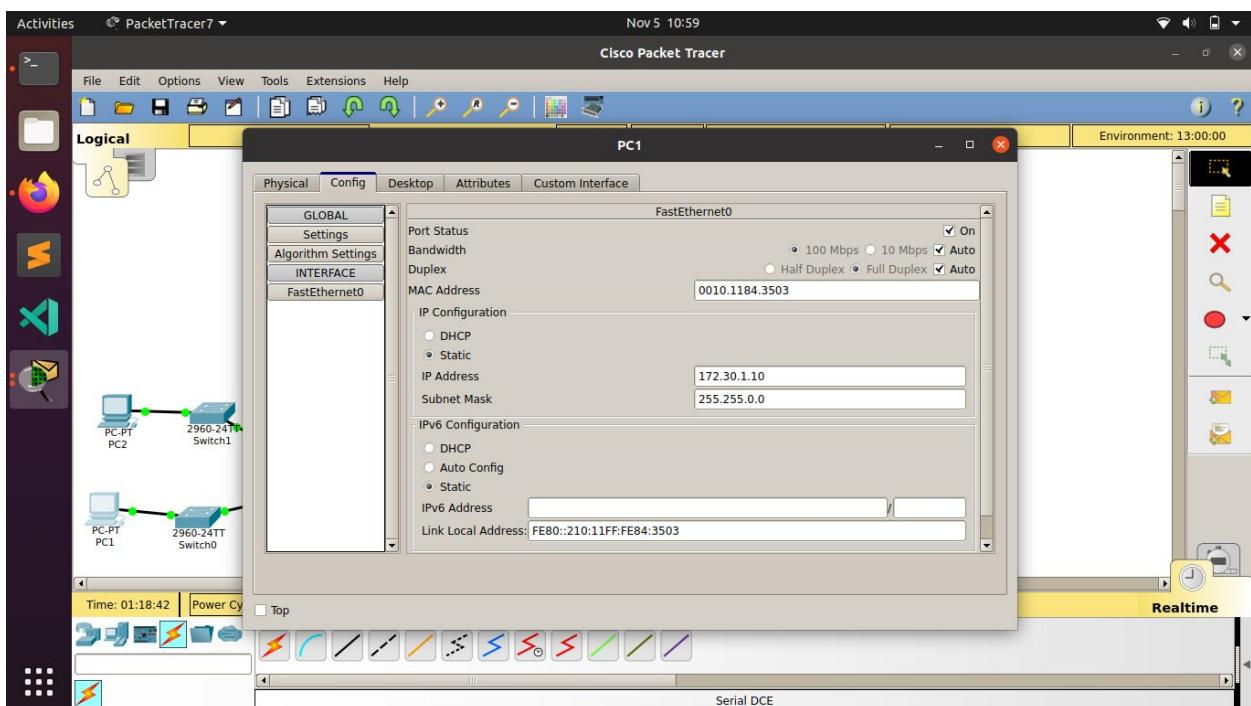
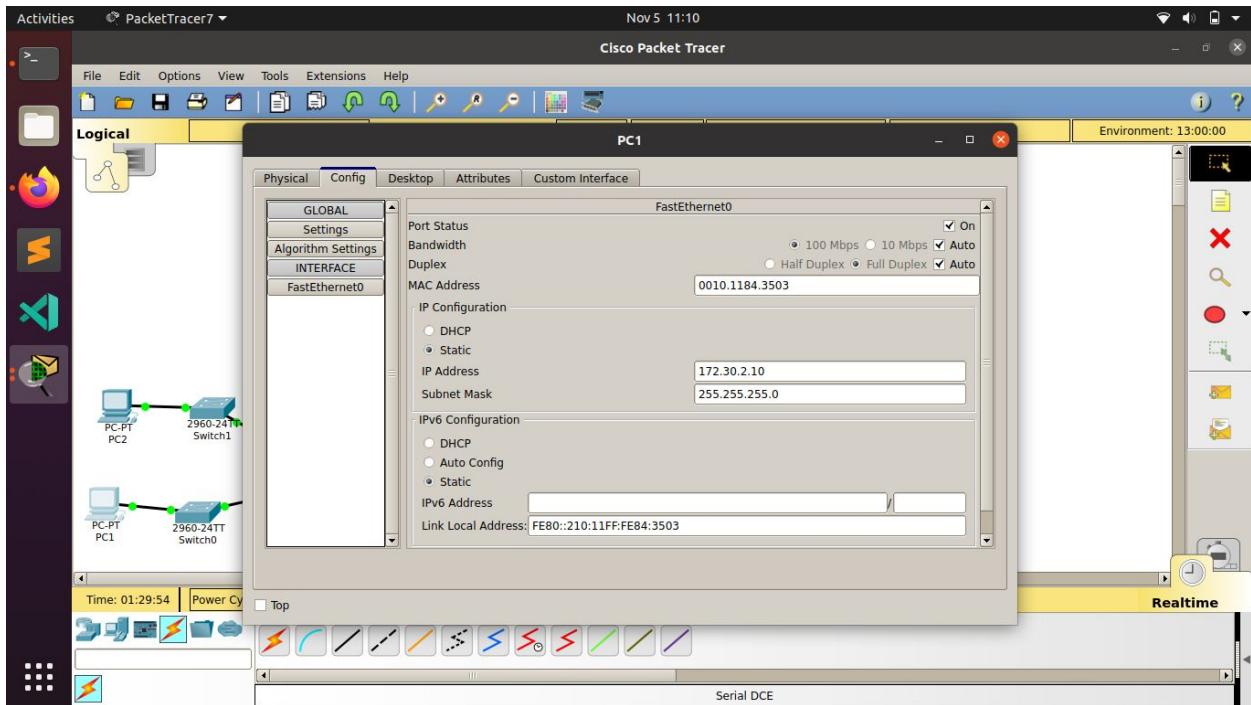
## Final Addressing Table

<b>Device</b>	<b>Interface</b>	<b>IP Address</b>	<b>Subnet Mask</b>	<b>Default Gateway</b>
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

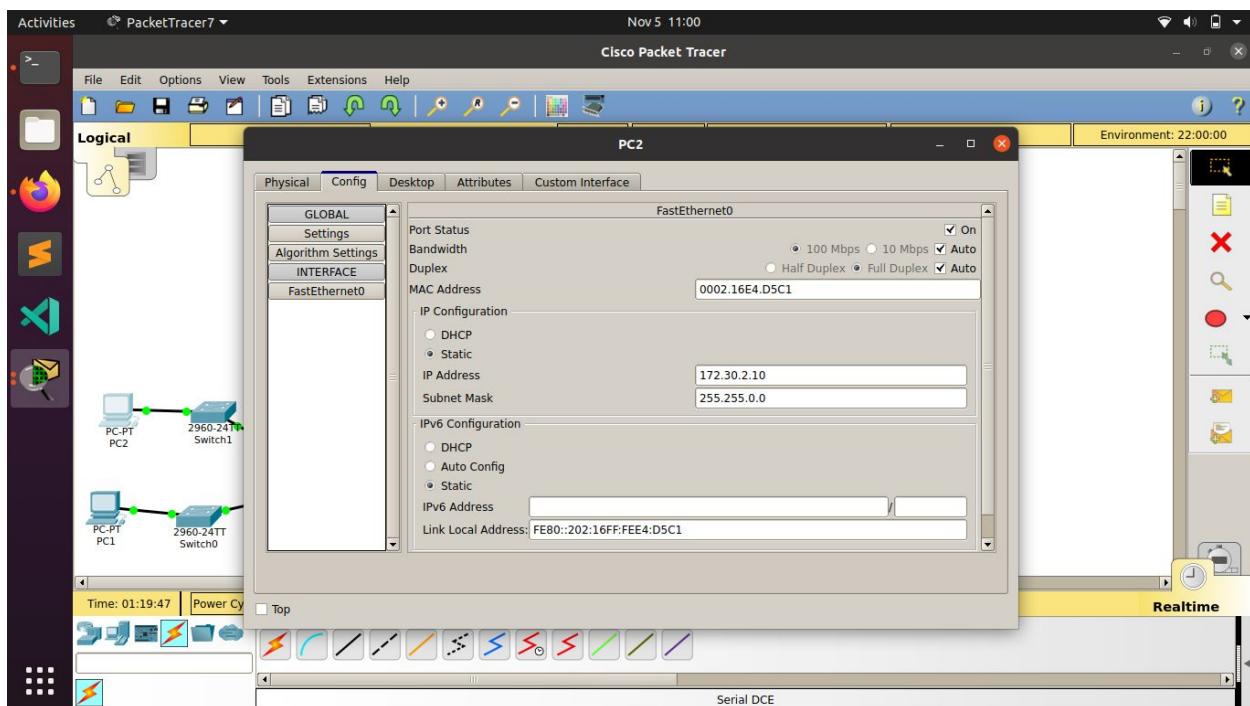
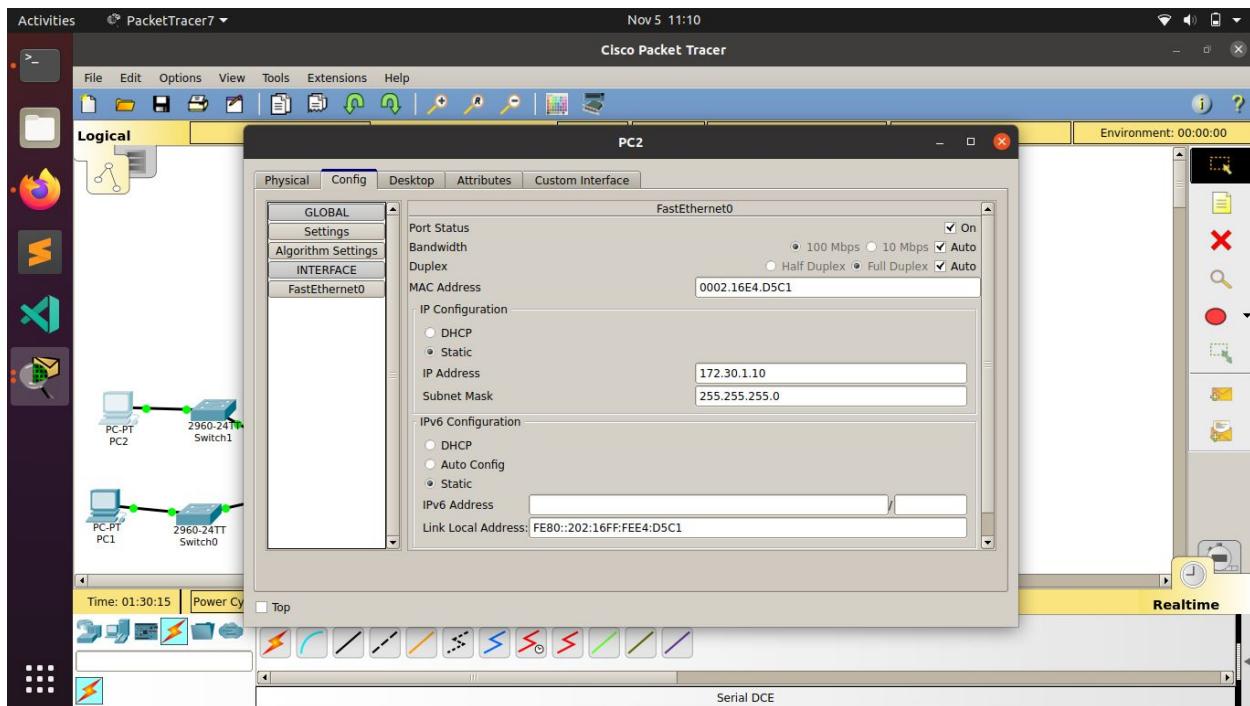
# Task 1: Build the Network



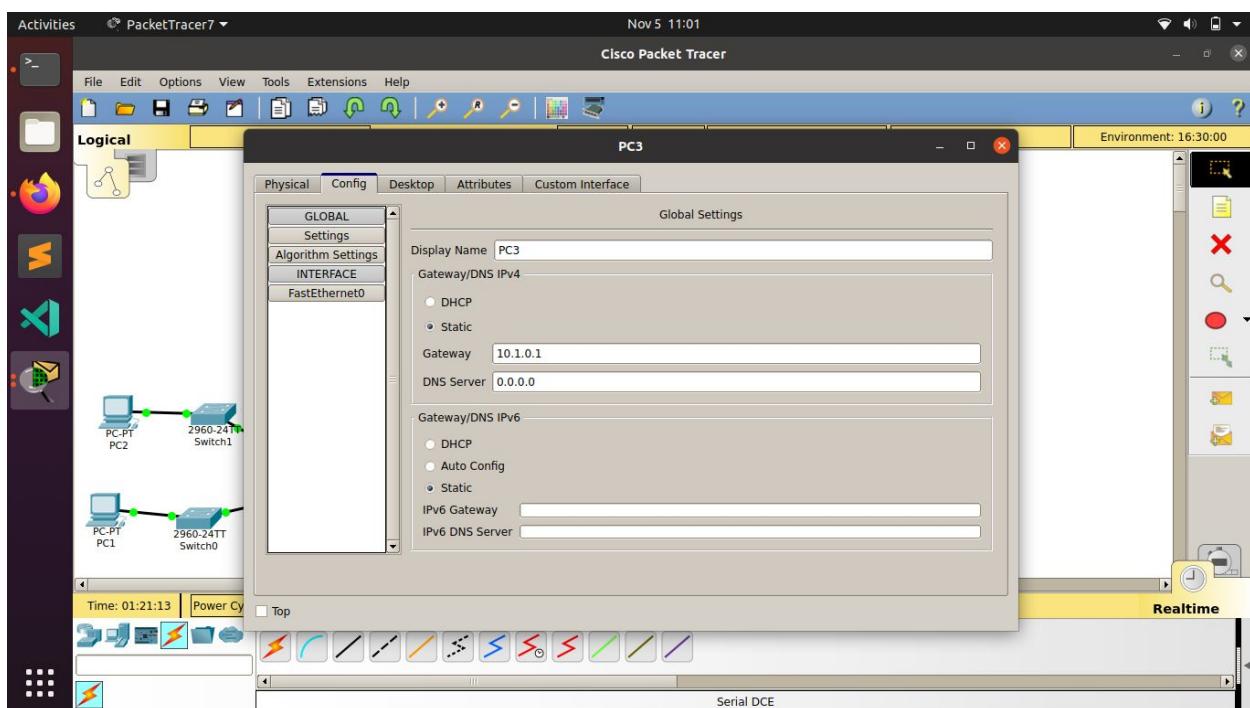
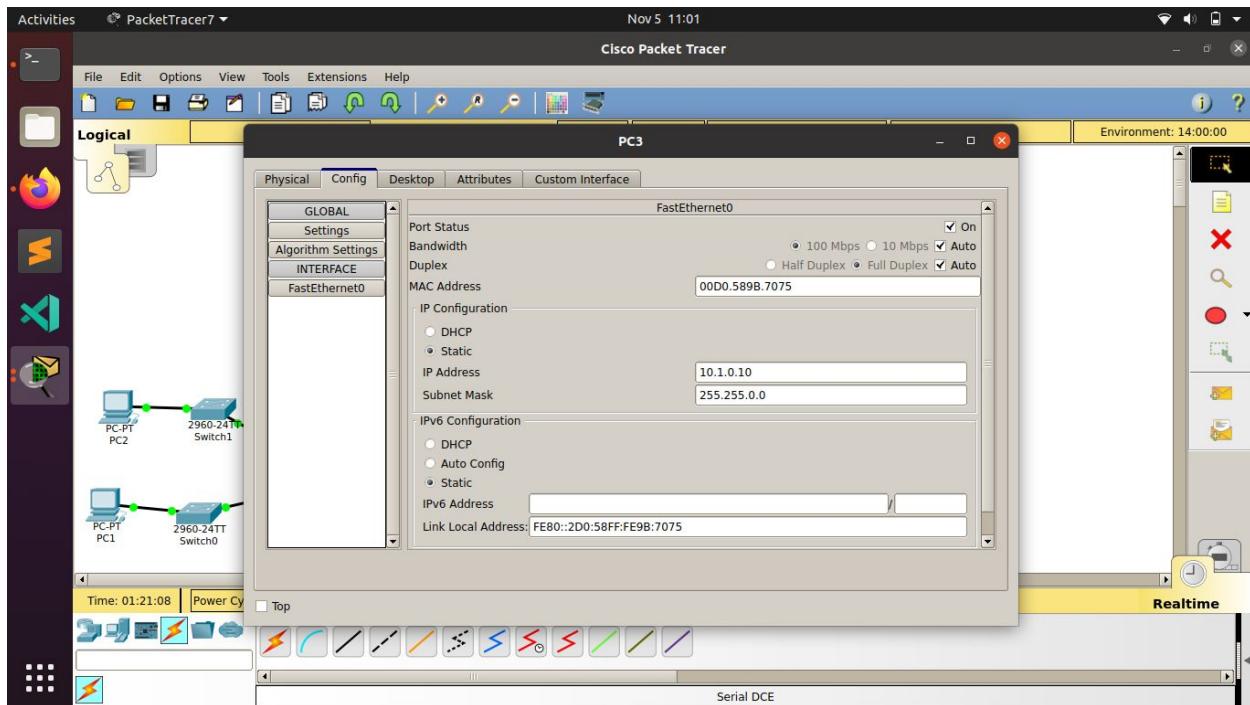
# PC1 CONFIG



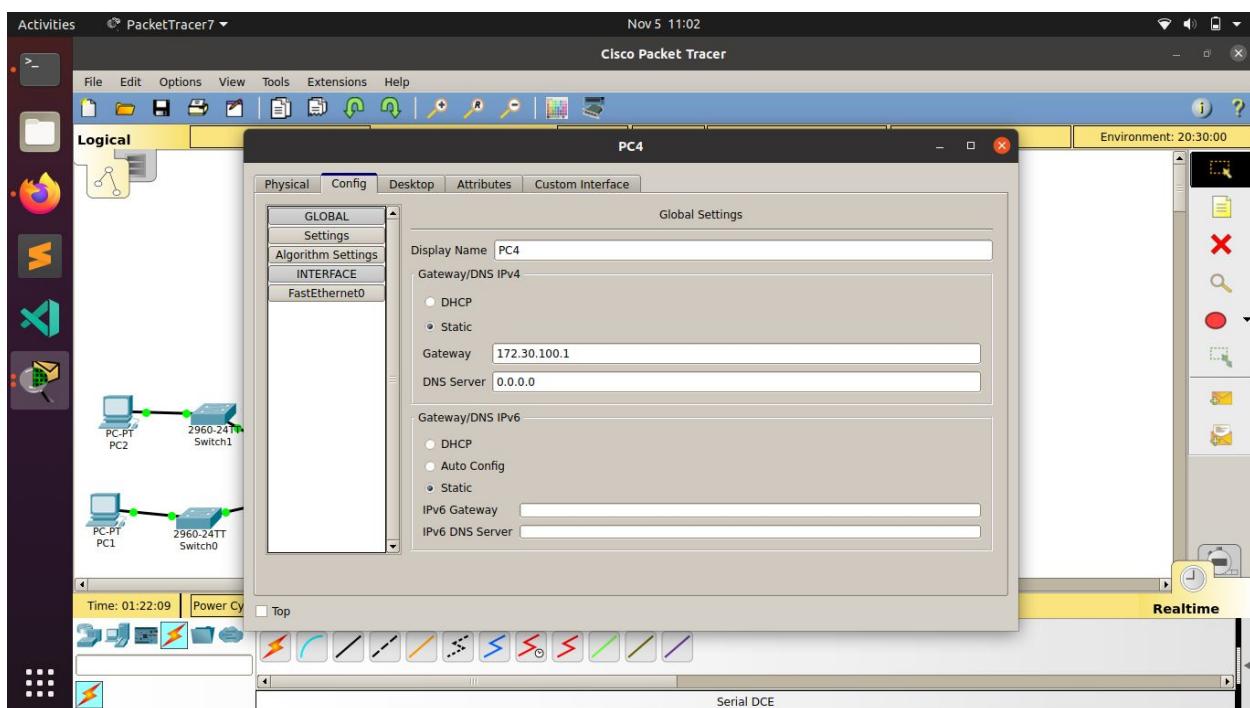
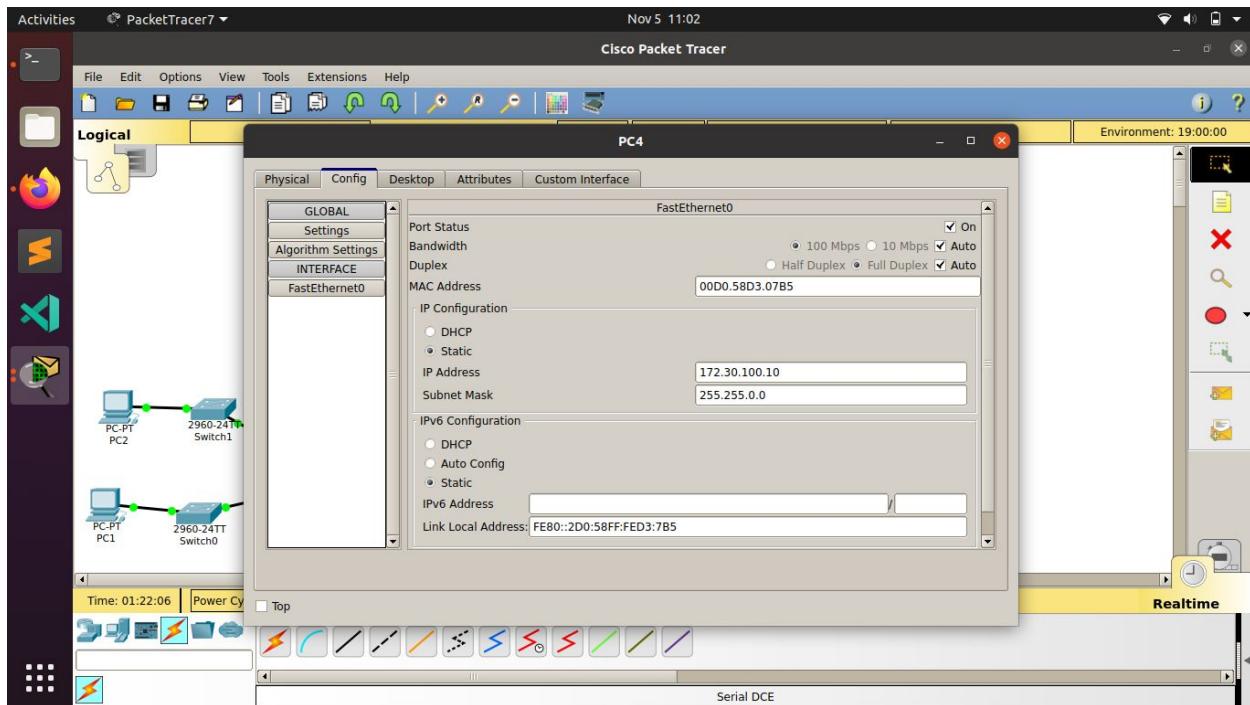
## PC2 CONFIG



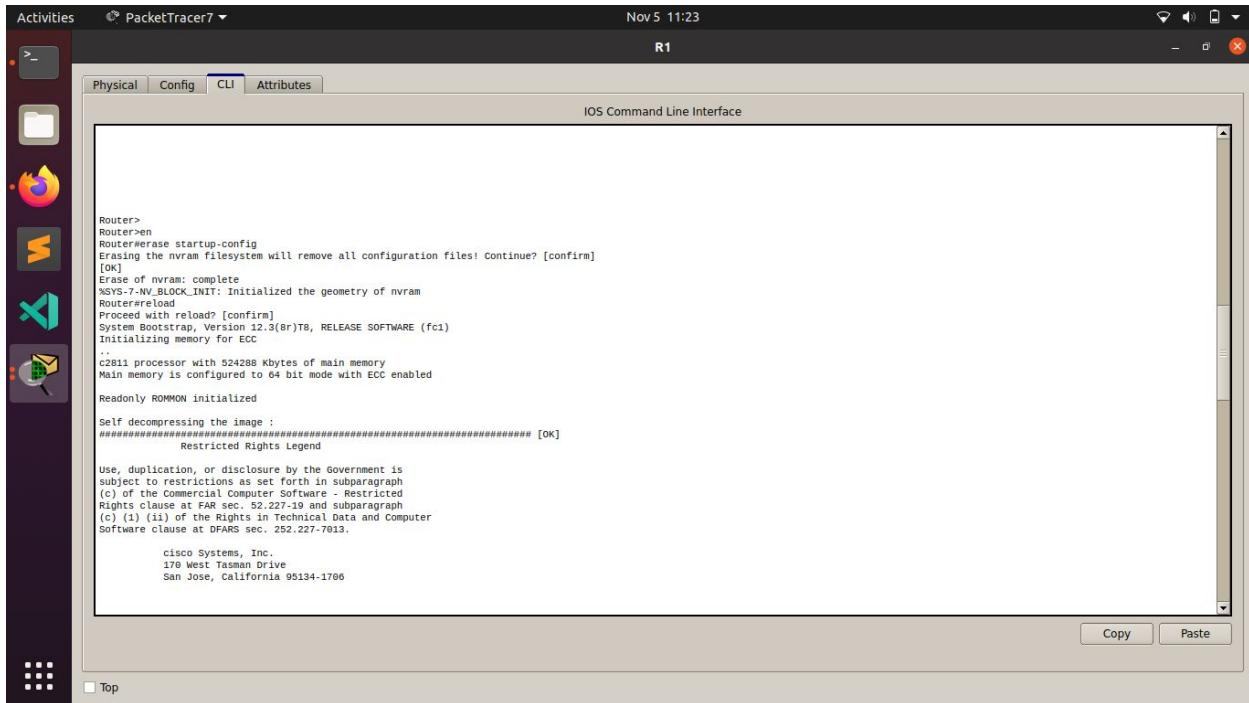
## PC3 CONFIG



## PC4 CONFIG



## R1 CONFIG

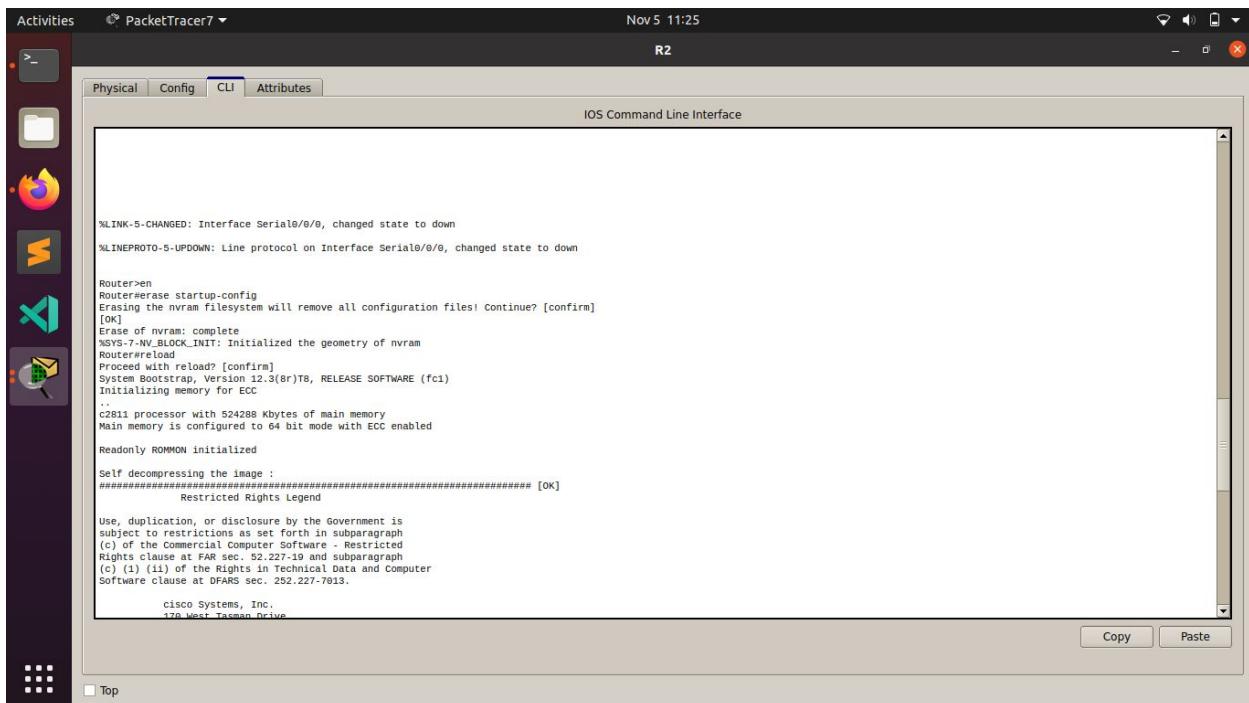


```
Router>
Router#en
Router#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
.
.
c2811 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 :
#####
Restricted Rights Legend

Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR clause 52.227-19 and subparagraph
(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
```

## R2 CONFIG



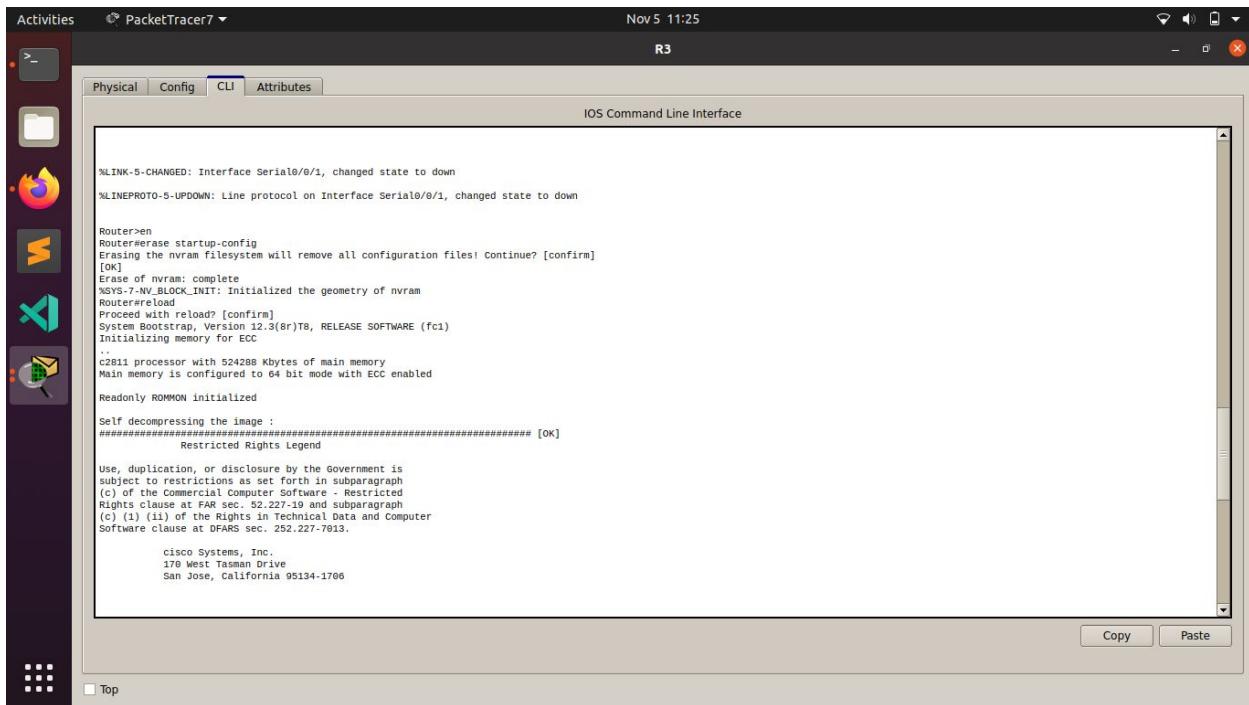
```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to down

Router>
Router#en
Router#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
Router#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
.
.
c2811 processor with 524288 Kbytes of main memory
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```

# R3 CONFIG



The screenshot shows a Linux desktop environment with a terminal window titled "PacketTracer7". The window is titled "R3" and has tabs for "Physical", "Config", "CLI" (which is selected), and "Attributes". The terminal window displays the "IOS Command Line Interface". The output of the CLI session includes:

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

Router>en
Router#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
Router#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC

c2811 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 :
#####
Restricted Rights Legend

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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.
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San Jose, California 95134-1706
```

At the bottom right of the terminal window, there are "Copy" and "Paste" buttons. At the bottom left, there is a checkbox labeled "Top".

## Task 2: Load Routers with the Supplied Scripts.

### R1 SCRIPT + CONFIG

```
!
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
```

```

Router(config-if)=
Router(config-if)=!
Router(config-if)#hostname R1
R1(config)#
R1(config)#
R1(config)#
R1(config-if)interface FastEthernet0/0
R1(config-if)ip address 172.38.1.1 255.255.255.0
R1(config-if)duplex auto
R1(config-if)speed auto
R1(config-if)no shutdown

R1(config-if)#
R1(config-if)interface FastEthernet0/1
R1(config-if)ip address 172.38.2.1 255.255.255.0
R1(config-if)duplex auto
R1(config-if)speed auto
R1(config-if)no shutdown

R1(config-if)#
R1(config-if)interface Serial0/0/0
R1(config-if)ip address 209.165.200.229 255.255.255.252
R1(config-if)clock rate 64000
R1(config-if)no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#
R1(config-if)router rip
R1(config-router)passive-interface FastEthernet0/0
R1(config-router)passive-interface FastEthernet0/1
R1(config-router)network 172.38.0.0
R1(config-router)network 209.165.200.0
R1(config-router)line con 0
R1(config-line)line vty 0 4
R1(config-line)login
% Login disabled on line 194, until 'password' is set
% Login disabled on line 195, until 'password' is set
% Login disabled on line 196, until 'password' is set
% Login disabled on line 197, until 'password' is set
% Login disabled on line 198, until 'password' is set

```

Copy      Paste

Top

## R2 SCRIPT + CONFIG

```

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
```

Activities >\_ PacketTracer7 Nov 5 11:36 R2

Physical Config CLI Attributes

IOS Command Line Interface

```
Router(config)#  
Router(config)#  
Router(config)#  
Router(config)#  
Router(config)#  
Router(config)#  
Router(config)#  
Router(config)#hostname R2  
R2(config)#!  
R2(config)#!  
R2(config)#interface FastEthernet0/0  
R2(config-if)ip address 10.1.0.1 255.255.0.0  
R2(config-if)duplex auto  
R2(config-if)speed auto  
R2(config-if)no shutdown  
  
R2(config-if)#!  
R2(config-if)interface Serial0/0/0  
R2(config-if)ip address 209.165.200.229 255.255.255.252  
R2(config-if)no shutdown  
  
R2(config-if)#!  
R2(config-if)interface Serial0/0/1  
R2(config-if)ip address 209.165.200.233 255.255.255.252  
R2(config-if)clock rate 64000  
R2(config-if)no shutdown  
  
R2(config-if)#!  
R2(config-if)router rip  
R2(config-if-router)passive-interface FastEthernet0/0  
R2(config-router)network 10.0.0.0  
R2(config-router)network 209.165.200.0  
R2(config-router)#!  
R2(config-router)line con 0  
R2(config-line)login  
% Login disabled on line 194, until 'password' is set  
% Login disabled on line 195, until 'password' is set  
% Login disabled on line 196, until 'password' is set  
% Login disabled on line 197, until 'password' is set  
% Login disabled on line 198, until 'password' is set
```

Copy Paste

## **R3 SCRIPT + CONFIG**

```
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
```

```
!
```

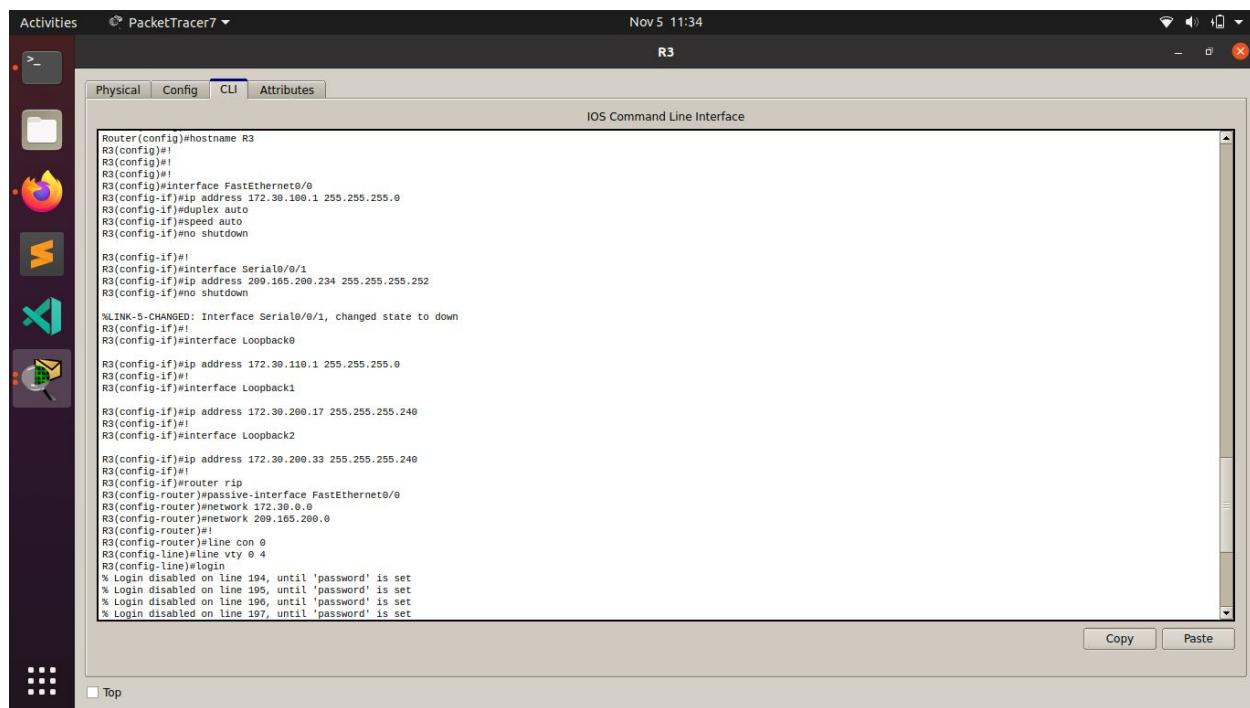
```
line con 0
```

```
line vty 0 4
```

```
login
```

```
!
```

```
End
```



```
Router(config)#hostname R3
R3(config)#
R3(config)#
R3(config)#
R3(config)#interface FastEthernet0/0
R3(config-if)#ip address 172.30.100.1 255.255.255.0
R3(config-if)#duplex auto
R3(config-if)#speed auto
R3(config-if)#no shutdown

R3(config-if)#
R3(config-if)#interface Serial0/0/1
R3(config-if)#ip address 209.165.200.234 255.255.255.252
R3(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R3(config-if)#
R3(config-if)#interface Loopback0

R3(config-if)#ip address 172.30.110.1 255.255.255.0
R3(config-if)#
R3(config-if)#interface Loopback1

R3(config-if)#ip address 172.30.200.17 255.255.255.240
R3(config-if)#
R3(config-if)#router rip
R3(config-router)#passive-interface FastEthernet0/0
R3(config-router)#network 172.30.0.0
R3(config-router)#network 209.165.200.0
R3(config-router)#
R3(config-router)#line con 0
R3(config-router)#line vty 0 4
R3(config-line)#
% Login disabled on line 194, until 'password' is set
% Login disabled on line 195, until 'password' is set
% Login disabled on line 196, until 'password' is set
% Login disabled on line 197, until 'password' is set
```

## 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

```
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           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#
```

## **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`. 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 ce
```

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

The screenshot shows the PacketTracer7 application window. The title bar reads "Activities PacketTracer7 Nov 5 11:44". The main area is titled "IOS Command Line Interface" and contains the following terminal session:

```
R2(config)#interface Serial0/0/0
R2(config-if)#
R2(config-if-exit)
R2(config)interface Serial0/0/1
R2(config-if)exit
R2(config)exit
R2#
%SYS-5-CONFIO:I: Configured from console by console

R2#show ip interface brief
Interface          IP-Address      OK? Method Status       Protocol
FastEthernet0/0    10.1.0.1        YES NVRAM  up            up
FastEthernet0/1    unassigned      YES NVRAM  administratively down  down
Serial0/0/0         200.165.200.229 YES manual up            up
Serial0/0/1         200.165.200.233 YES manual up            up
Vlan1              unassigned      YES NVRAM  administratively down  down

R2#
R2#
R2#
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:
!U!.
Success rate is 40 percent (2/5), round-trip min/avg/max = 1/1/1 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:
!U!.!
Success rate is 40 percent (2/5), round-trip min/avg/max = 1/3/3 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:
!U!.!
Success rate is 60 percent (3/5), round-trip min/avg/max = 1/3/6 ms

R2#
```

At the bottom right of the terminal window are "Copy" and "Paste" buttons. At the bottom left is a "Top" checkbox.

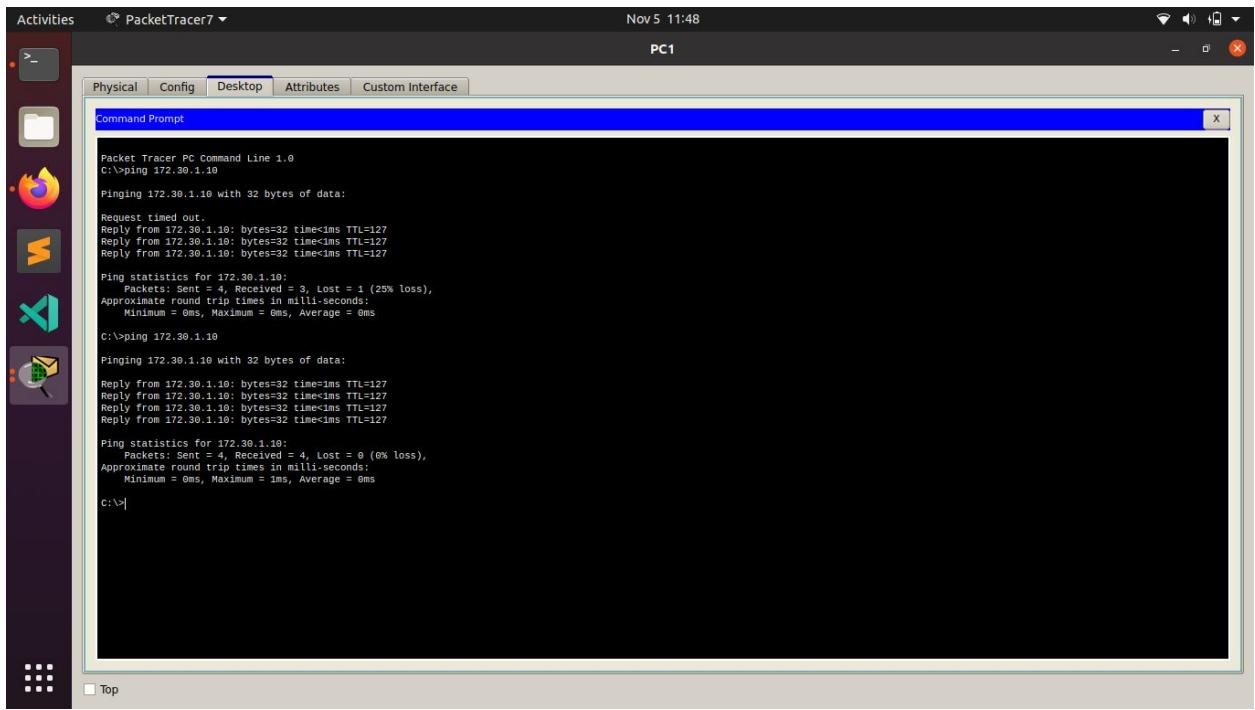
From the R2 router, how many ICMP messages are successful when pinging PC4?



```
R2#  
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 = 1/1/1 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:  
.U1.!  
Success rate is 40 percent (2/5), round-trip min/avg/max = 1/3/3 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:  
.U1.!  
Success rate is 60 percent (3/5), round-trip min/avg/max = 1/3/6 ms  
  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
R2#  
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 = 1/1/1 ms  
R2#
```

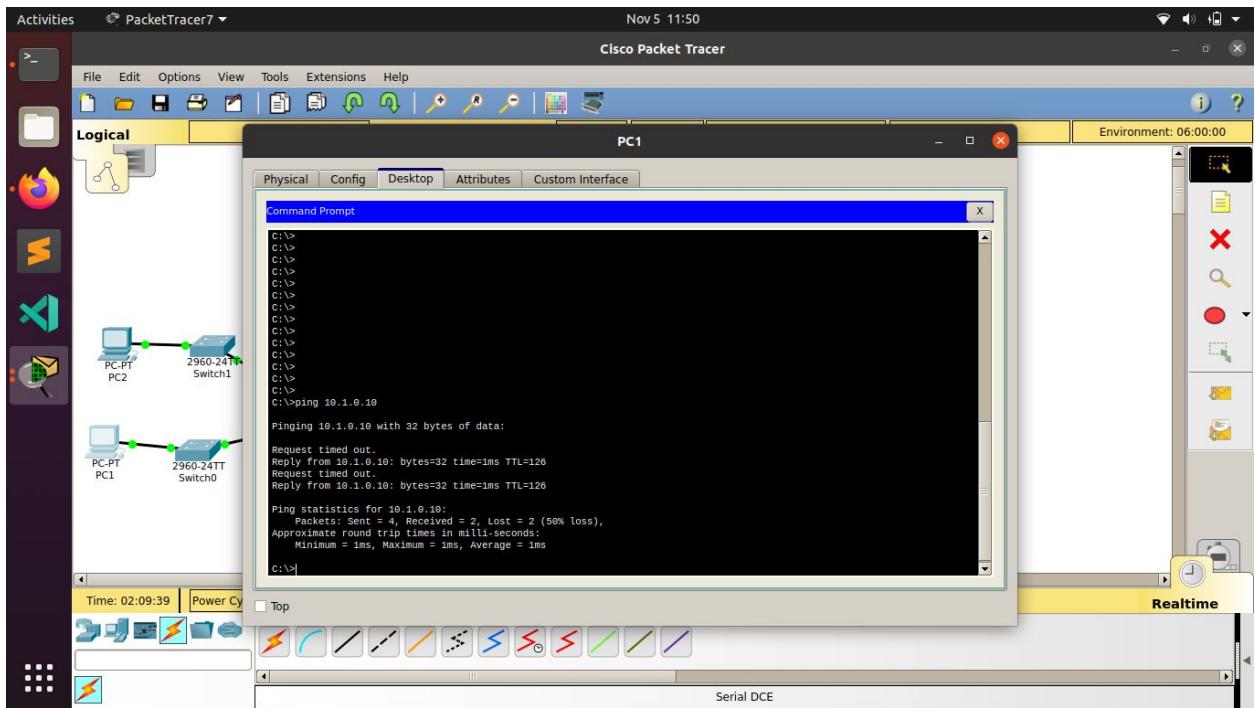
Step 3: Check the connectivity between the PCs.

From the PC1, is it possible to ping PC2?



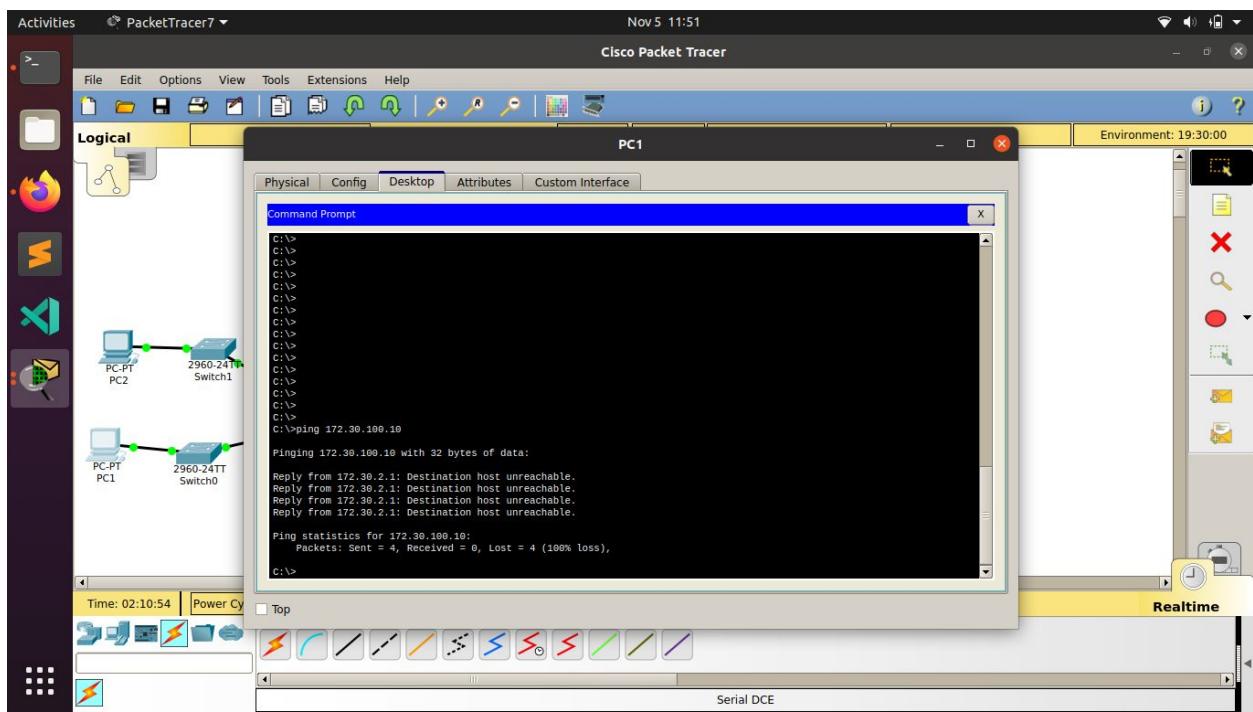
Success Rate is 100 %

From the PC1, is it possible to ping PC3?



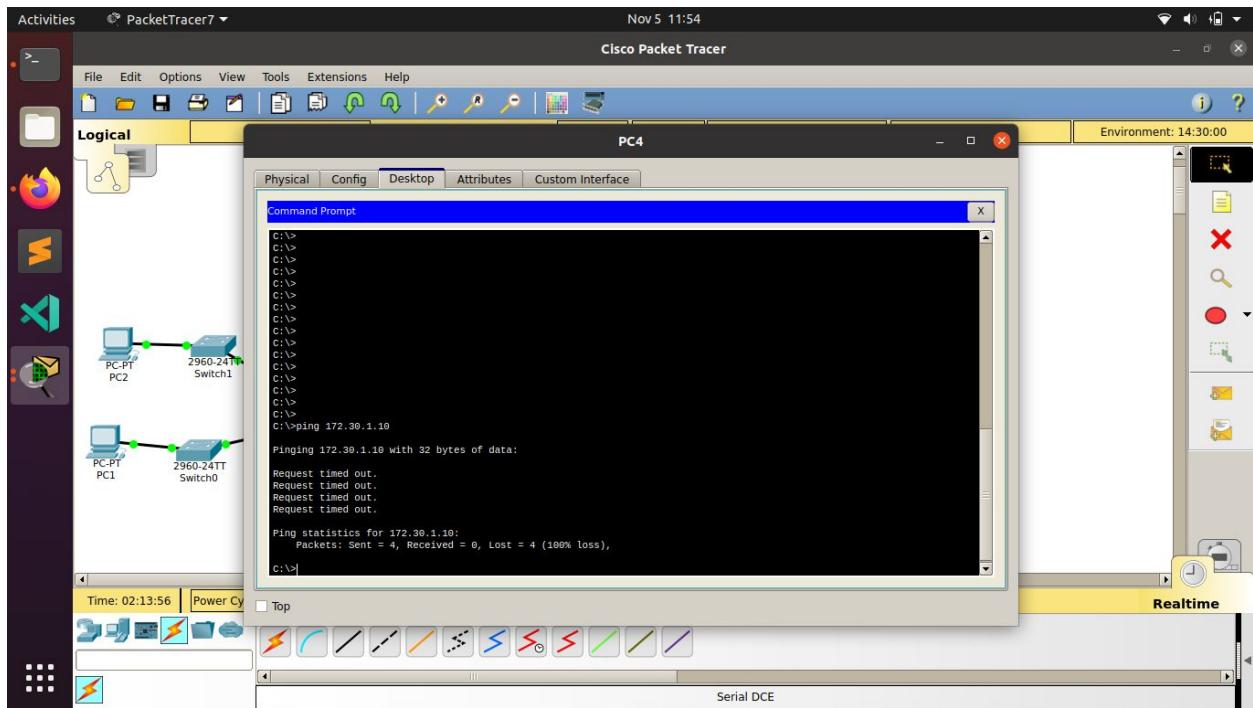
Success Rate is 50%

From the PC1, is it possible to ping PC4?



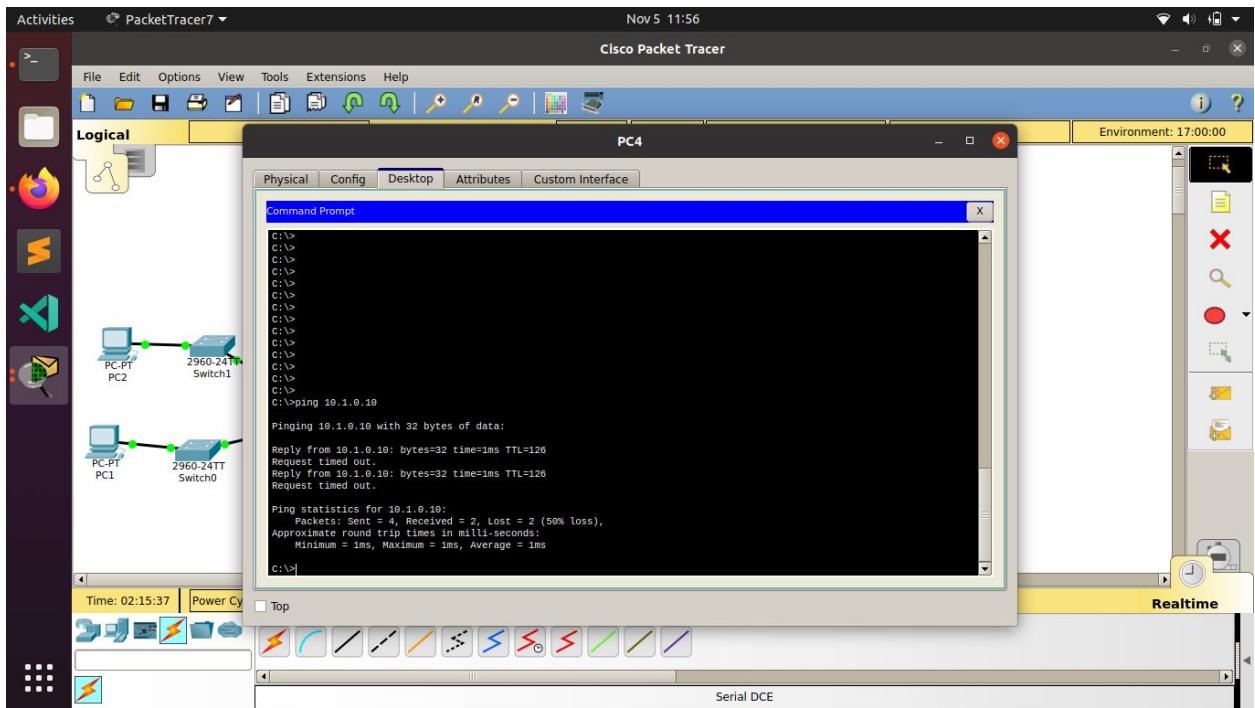
Success Rate 0%

From the PC4, is it possible to ping PC2?



Success Rate is 0%

From the PC4, is it possible to ping PC3?



Success Rate is 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 LANd 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>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 209.165.200.238, 00:00:04, Serial0/0/0
          209.165.200.0/24 is subnetted, 2 subnets
          C       209.165.200.238 is directly connected, Serial0/0/0
          C       209.165.200.232 is directly connected, Serial0/0/1

R2>
```

**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
```

```

Activities   PacketTracer7 ▾ Nov 5 12:00
R1
Physical Config CLI Attributes

Press RETURN to get started.

R1>
R1>R1#show ip route
^
% Invalid input detected at '^' marker.

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 209.165.200.220, 00:00:04, Serial0/0/0
      172.30.0.0/24 is subnetted, 2 subnets
C      172.30.0.0 is directly connected, FastEthernet0/1
      172.30.2.0 is subnetted, 2 subnets
C      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, 00:00:04, Serial0/0/0

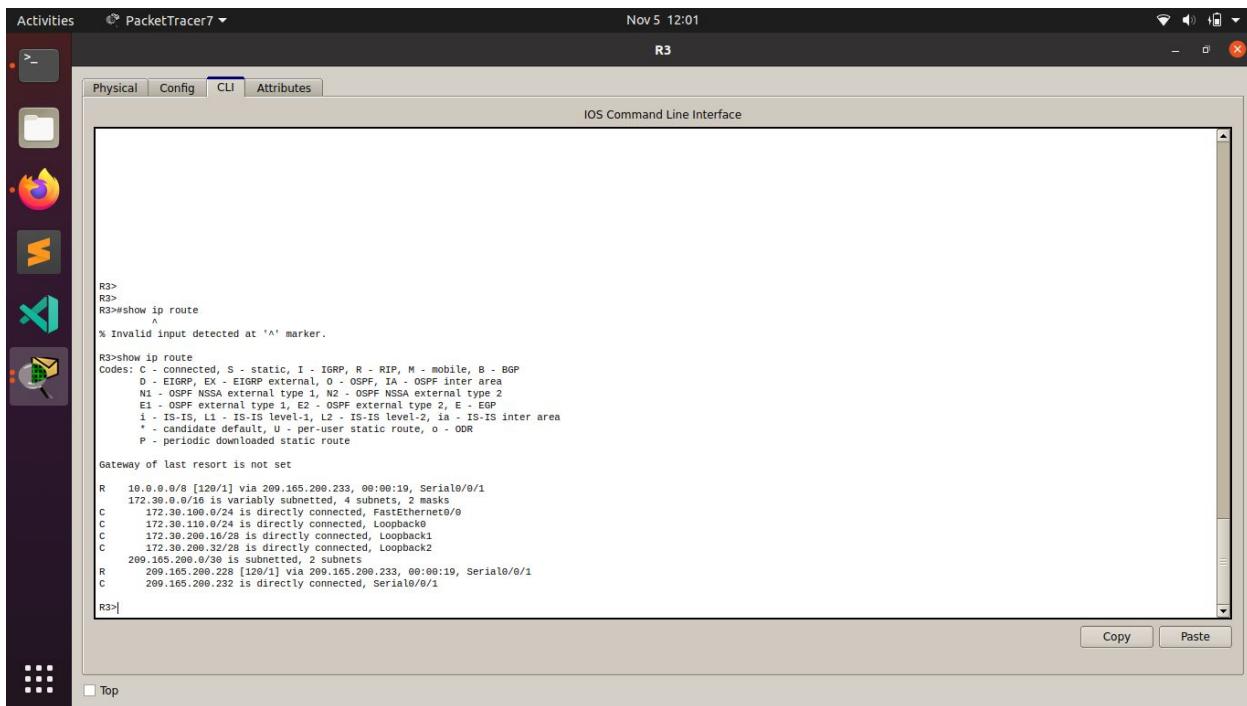
R1>

```

## 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>
R3>#show ip route
% Invalid input detected at '^' marker.

R3>show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - direct, E1 - External, E2 - 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 - EIGRP
      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, 00:00:19, 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
R    209.165.200.0/30 is subnetted, 2 subnets
R      209.165.200.228 [120/1] via 209.165.200.233, 00:00:19, Serial0/0/1
C      209.165.200.232 is directly connected, Serial0/0/1

R3|
```

**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
```

```
R2>
R2>
R2>
R2>debug ip rip
% Invalid input detected at '^' marker.

R2>en
R2#debug ip rip
RIP protocol debugging is on
R2#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
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
undebbug
% Incomplete command.
R2#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
undebugRIP: received v1 update from 209.165.200.230 on Serial0/0/0
    172.30.0.0 in 1 hops
unRIP: received v1 update from 209.165.200.234 on Serial0/0/1
    172.30.0.0 in 1 hops
undebug all
```

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.

## Task 4: Configure RIP Version 2.

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

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.

## **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
```

```
R1#show ip route
```

```
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 in effect
Maximum path: 4
Routing for Networks:
  172.30.0.0
    299.165.200.0
Passive Interface(s):
  FastEthernet0/0
  FastEthernet0/1
Routing Information Sources:
  Gateway          Distance      Last Update
    299.165.200.229  120          00:00:29
Distance: (default is 120)
R1#
R1#
R1#
R1#
R1#
R1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - OSPF external type 1, L1 - OSPF inter area
       N1 - OSPF NSSA external type 1, L2 - OSPF NSSA inter area
       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 299.165.200.229, 00:00:18, 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
C   299.165.200.0/30 is subnetted, 2 subnets
C     299.165.200.228 is directly connected, Serial0/0/0
R   299.165.200.232 [120/1] via 299.165.200.229, 00:00:18, Serial0/0/0
R1#
```

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.

R3#show ip route

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.

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

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

```

Activities   PacketTracer7 ▾ Nov 5 12:19
R3
Physical Config CLI Attributes

IOS Command Line Interface

C 172.30.118.0/24 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
   209.165.200.228 [120/1] via 209.165.200.233, 00:00:00, Serial0/0/1
   209.165.200.232 is directly connected, Serial0/0/1

R3#
R3#
R3#
R3#
R3#debug ip rip
RIP protocol debugging is on
R3#RIP: sending v2 update to 224.0.0.9 via Loopback0 (172.30.118.1)
RIP: build update entries
   10.0.0.8 via 0.0.0.0, metric 2, tag 0
   172.30.118.0/24 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
   10.0.0.8 via 0.0.0.0, metric 2, tag 0
   172.30.118.0/24 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
   10.0.0.8 via 0.0.0.0, metric 2, tag 0
   172.30.118.0/24 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 224.0.0.0 via Serial0/0/1 (209.165.200.234)
RIP: build update entries
   172.30.118.0/24 via 0.0.0.0, metric 1, tag 0
RIP: received v2 update from 209.165.200.233 on Serial0/0/1
   10.0.0.8 via 0.0.0.0 in 1 hops
   209.165.200.228/30 via 0.0.0.0 in 1 hops

```

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Ans :

10.0.0.0/8  
 172.30.100.0/24  
 172.30.200.16/28  
 172.30.200.32/28  
 209.165.200.0/24

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

```
R2>
R2>debug ip rip
^
% Invalid input detected at '^' marker.

R2>debug ip rip
^
% Invalid input detected at '^' marker.

R2>en
R2#debug rip
RIP protocol debugging is on
R2#RIP: received v2 update from 209.165.200.238 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: received v2 update from 209.165.200.234 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 Serial0/0/1 (209.165.200.233)
RIP: build update entries
  10.0.0.0/8 via 0.0.0.0, metric 1, tag 0
  209.165.200.232/30 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
undebug rip: received v2 update from 209.165.200.238 on Serial0/0/0
172.30.0.0/16 via 0.0.0.0 in 1 hops
undebug all
```

Ans:

172.30.0.0/16

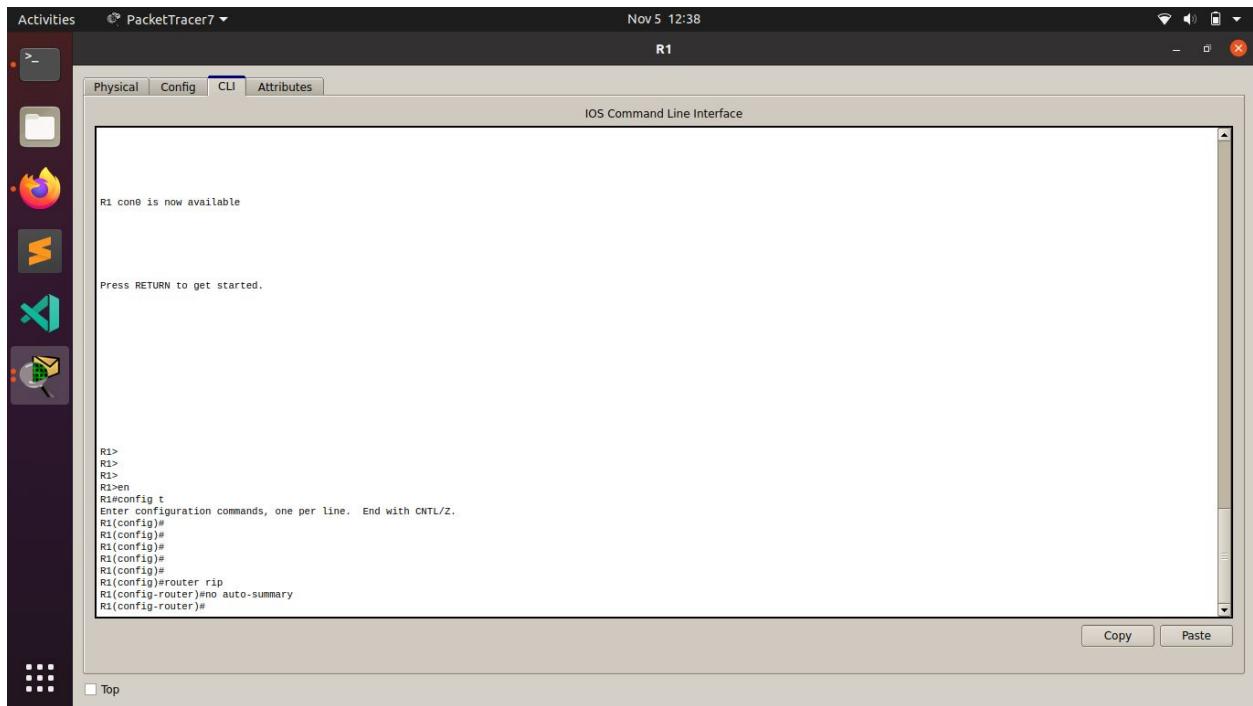
R3 is not sending any of the 172.30.0.0 subnets—only the summarized route of 172.30.0.0/16, including the subnet mask. This is why R2 and R1 are not seeing the 172.30.0.0 subnets on R3.

## Task 6: Disable Automatic Summarization.

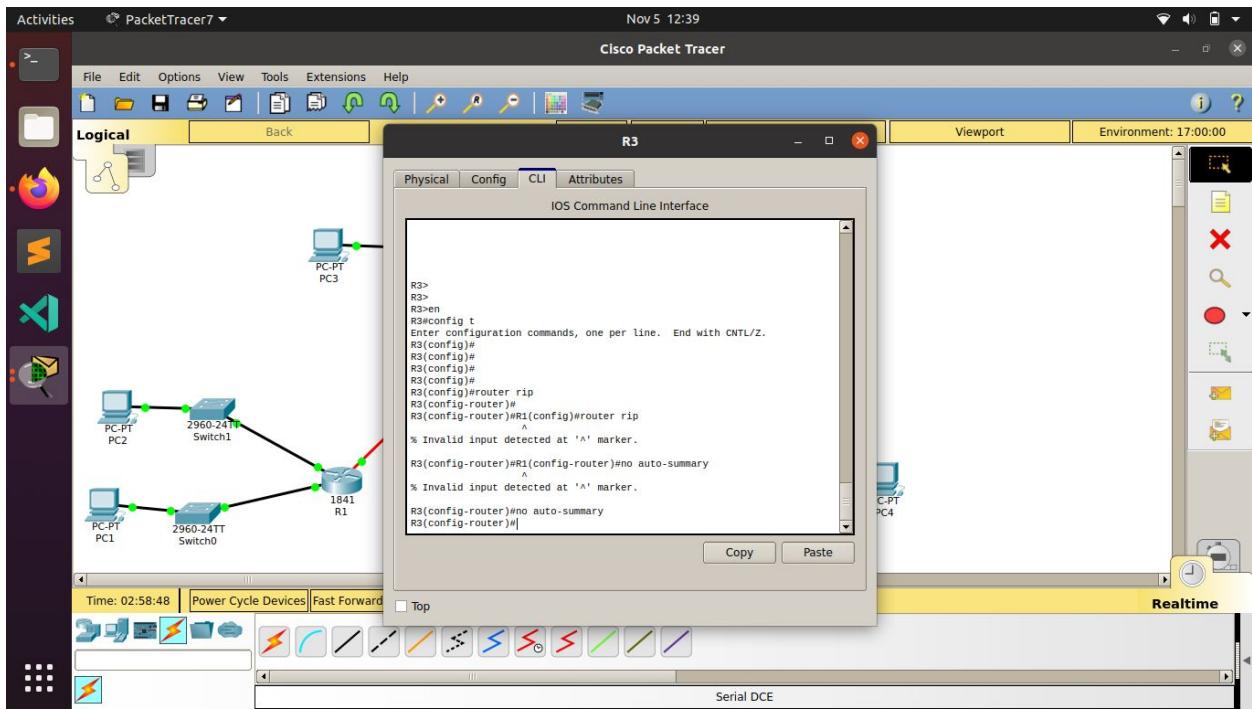
The `no auto-summary` command is used to turn off automatic summarization in RIPv2. Disable auto summarization on all routers. The routers will no longer summarize routes at major network boundaries.

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

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



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

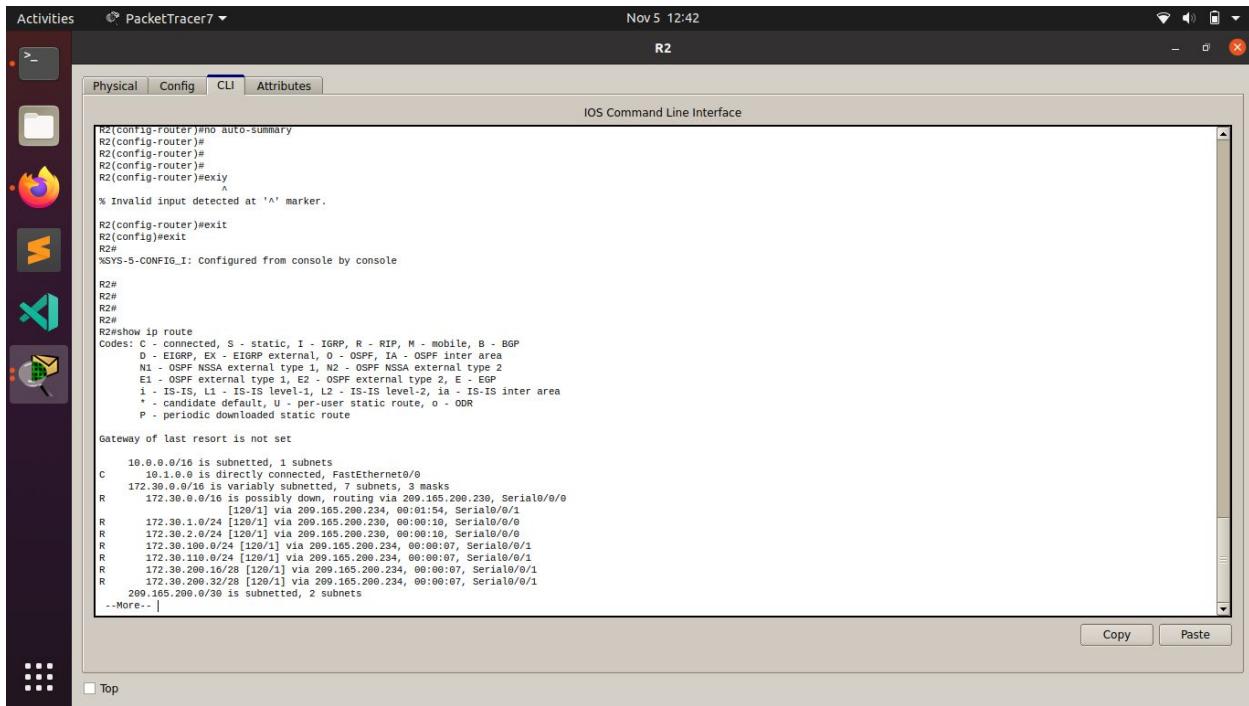


The `show ip route` and `ping` commands can be used to verify that automatic summarization is off.

## **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



```
Activities   PacketTracer7 ▾ Nov 5 12:42
R2
Physical | Config | CLI | Attributes
IOS Command Line Interface
R2(config-router)no auto-summary
R2(config-router)#
R2(config-router)#
R2(config-router)#
R2(config-router)#
R2(config-router)exit
^
% Invalid input detected at '^' marker.

R2(config-router)exit
R2(config)exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

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
  172.38.0.0/16 is variably subnetted, 7 subnets, 3 masks
R    172.30.0.0/16 is possibly down, routing via 209.165.200.230, Serial0/0/0
      [120/1] via 209.165.200.234, 00:01:54, Serial0/0/1
R    172.38.1.0/24 [120/1] via 209.165.200.230, 00:00:10, Serial0/0/0
R    172.38.2.0/24 [120/1] via 209.165.200.230, 00:00:10, Serial0/0/0
R    172.38.100.0/24 [120/1] via 209.165.200.234, 00:00:07, Serial0/0/1
R    172.38.110.0/24 [120/1] via 209.165.200.234, 00:00:07, Serial0/0/1
R    172.30.200.16/28 [120/1] via 209.165.200.234, 00:00:07, Serial0/0/1
R    172.30.200.32/28 [120/1] via 209.165.200.234, 00:00:07, Serial0/0/1
209.165.200.0/30 is subnetted, 2 subnets
--More-- |
```

R1#show ip route

Activities PacketTracer7 Nov 5 12:43 R1

**Physical Config CLI Attributes**

**IOS Command Line Interface**

```
R1(config)# 
R1(config)#
R1(config)#
R1(config)#
R1(config)#
R1(config)router rip
R1(config-router)no auto-summary
R1(config-router)#
R1(config-router)exit
R1(config)exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#
R1#
R1#
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 299.165.200.229, 00:00:05, Serial0/0/0
  172.30.0.0/16 is variably subnetted, 6 subnets, 2 masks
C    172.30.2.0/24 is directly connected, FastEthernet0/0
C    172.30.100.0/24 [120/2] via 299.165.200.229, 00:00:05, Serial0/0/0
R    172.30.101.0/24 [120/2] via 299.165.200.229, 00:00:05, Serial0/0/0
R    172.30.102.0/24 [120/2] via 299.165.200.229, 00:00:05, Serial0/0/0
R    172.30.200.32/28 [120/2] via 299.165.200.229, 00:00:05, Serial0/0/0
  299.165.200.0/30 is subnetted, 2 subnets
C    299.165.200.228 is directly connected, Serial0/0/0
R    299.165.200.232 [120/1] via 299.165.200.229, 00:00:05, Serial0/0/0
--More--
```

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R3#show ip route

Activities PacketTracer7 Nov 5 12:47 R3

**Physical Config CLI Attributes**

**IOS Command Line Interface**

```
%LINEPROTO-5-UPDOWN: Line protocol on interface Serial0/0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on interface FastEthernet0/0, changed state to up
%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

R3(config-router)#
R3(config-router)#
R3(config-router)exit
R3(config)exit
R3#
%SYS-5-CONFIG_I: Configured from console by console

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 299.165.200.233, 00:00:04, Serial0/0/1
  172.30.0.0/16 is variably subnetted, 6 subnets, 2 masks
R    172.30.2.0/24 [120/2] via 299.165.200.233, 00:00:04, 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    172.30.200.10/24 is directly connected, Loopback1
C    172.30.200.32/28 is directly connected, Loopback2
  299.165.200.0/30 is subnetted, 2 subnets
R    299.165.200.228 [120/1] via 299.165.200.233, 00:00:04, Serial0/0/1
C    299.165.200.232 is directly connected, Serial0/0/1
--More-- |
```

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Use the output of the `debug ip rip` command to answer the following questions: What entries are included in the RIP updates sent out from R1?

```
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, 00:00:05, Serial0/0/0

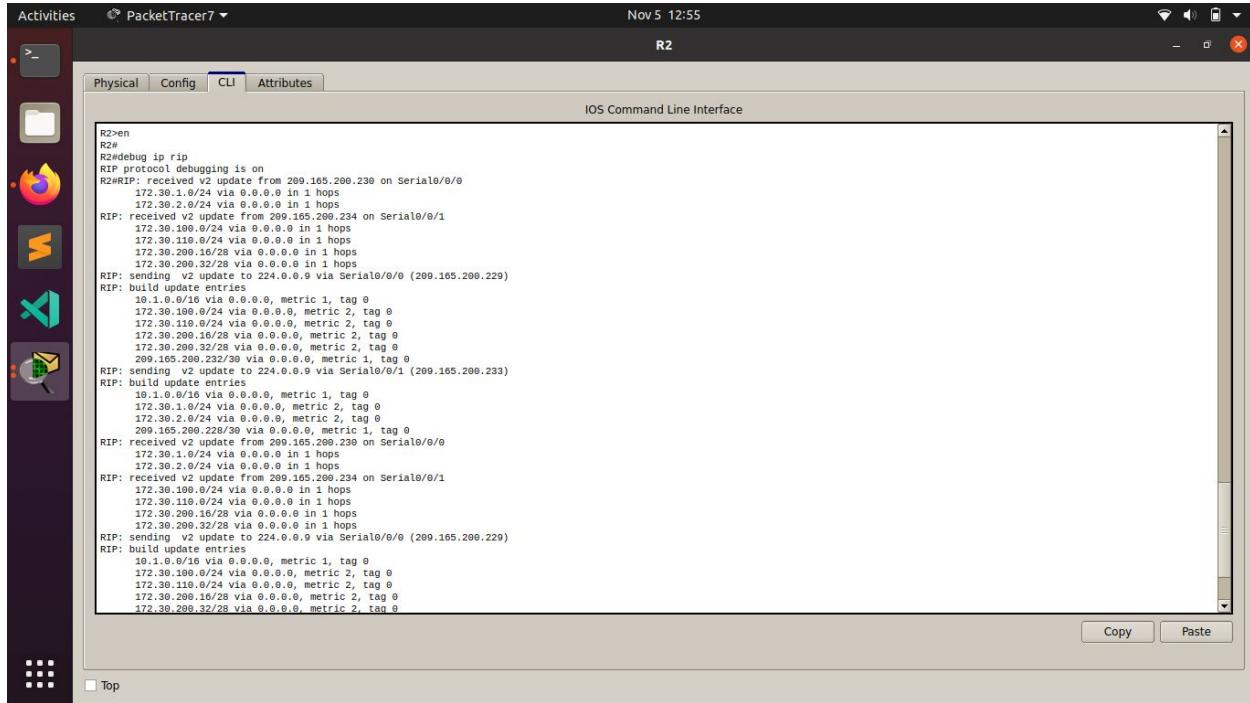
R1#
R1#rip
R1#rip
R1#rip
R1#rip
R1#debug ip rip
RIP protocol debugging is on
R1#RIP: received v2 update from 209.165.200.229 on Serial0/0/0
 10.1.0.0/16 via 0.0.0.0 in 1 hops
 172.30.100.0/24 via 0.0.0.0 in 2 hops
 172.30.110.0/24 via 0.0.0.0 in 2 hops
 172.30.200.10/28 via 0.0.0.0 in 2 hops
 172.30.200.32/28 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 (209.165.200.239)
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
 172.30.200.10/28 via 0.0.0.0 in 2 hops
 172.30.200.32/28 via 0.0.0.0 in 2 hops
 209.165.200.232/39 via 0.0.0.0 in 1 hops
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
 172.30.200.10/28 via 0.0.0.0 in 2 hops
 172.30.200.32/28 via 0.0.0.0 in 2 hops
 209.165.200.232/39 via 0.0.0.0 in 1 hops
RIP: sending V2 update to 224.0.0.9 via Serial0/0/0 (209.165.200.239)
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
```

Ans:

172.30.1.0/24

172.30.2.0/24

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



```
R2>en
R2>
R2#debug ip rip
RIP protocol debugging is on
R2#RIP: received v2 update from 209.165.200.238 on Serial0/0/0
    172.30.1.0/24 via 0.0.0.0 in 1 hops
    172.30.10.0/24 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 Serial0/0/0 (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 in 1 hops
    172.30.200.16/28 via 0.0.0.0, metric 2, tag 0
    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
    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: received v2 update from 209.165.200.234 on Serial0/0/1
    172.30.1.0/24 via 0.0.0.0 in 1 hops
    172.30.10.0/24 via 0.0.0.0 in 1 hops
    172.30.200.16/28 via 0.0.0.0, metric 1, tag 0
    172.30.2.0/24 via 0.0.0.0 in 1 hops
    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
```

Ans :

172.30.1.0/24

172.30.2.0/24

Are the subnet masks now included in the routing updates?

YES

## **Task 8: Verify Network Connectivity.**

## **Step 1: Check connectivity between R2 router and PCs.**

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

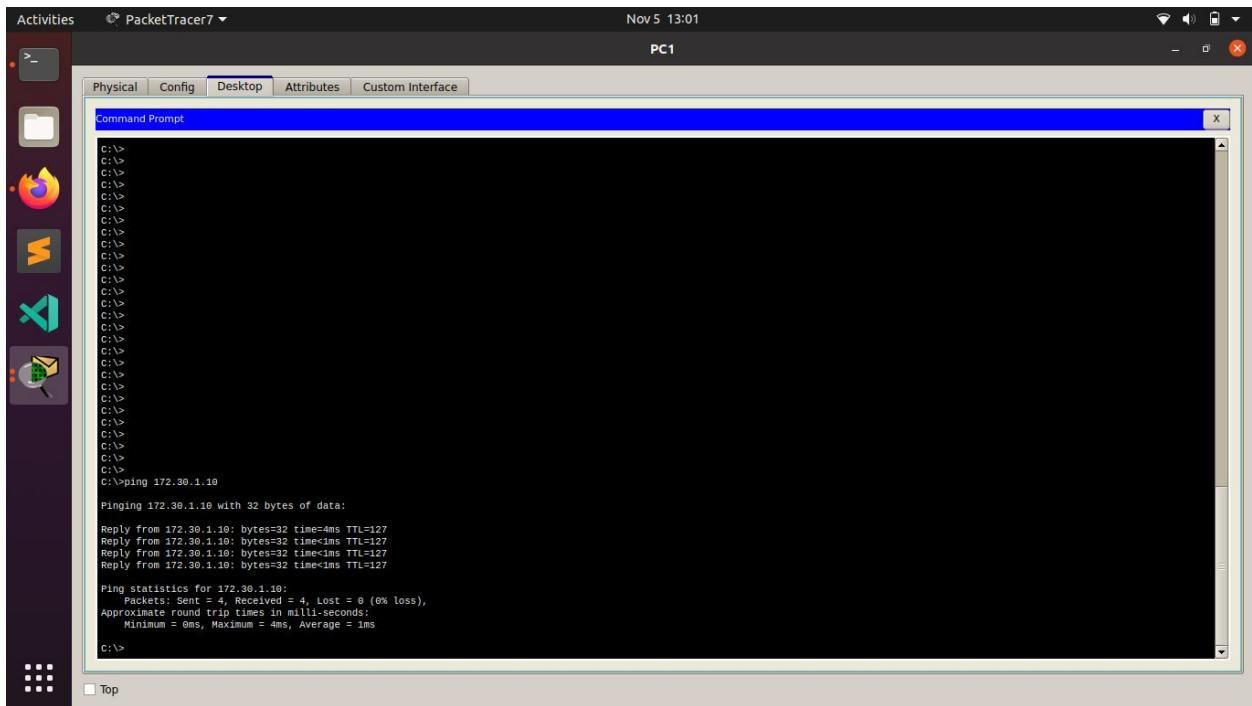
Success Rate : 100%

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

Success Rate : 100%

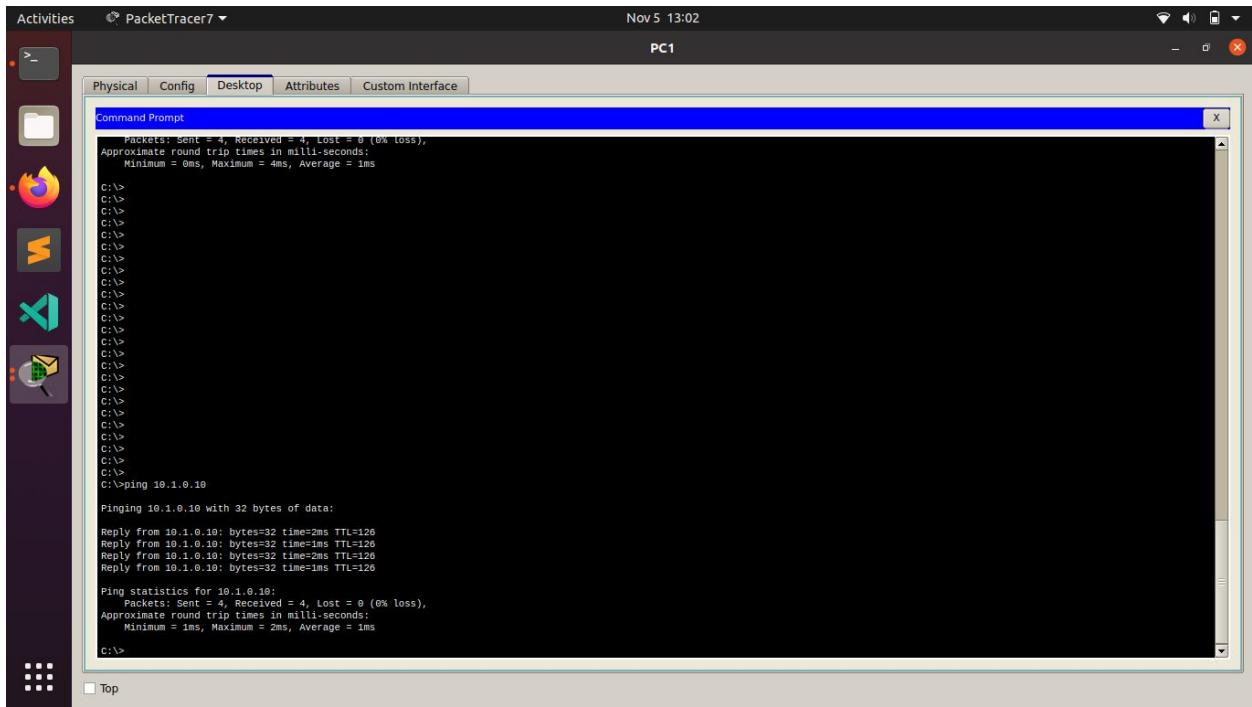
## Step 2: Check the connectivity between the PCs.

From PC1, is it possible to ping PC2?



Success Rate : 100%

From PC1, is it possible to ping PC3?



The screenshot shows a Linux desktop environment with a terminal window titled "Command Prompt" running on "PC1". The terminal displays the following output:

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

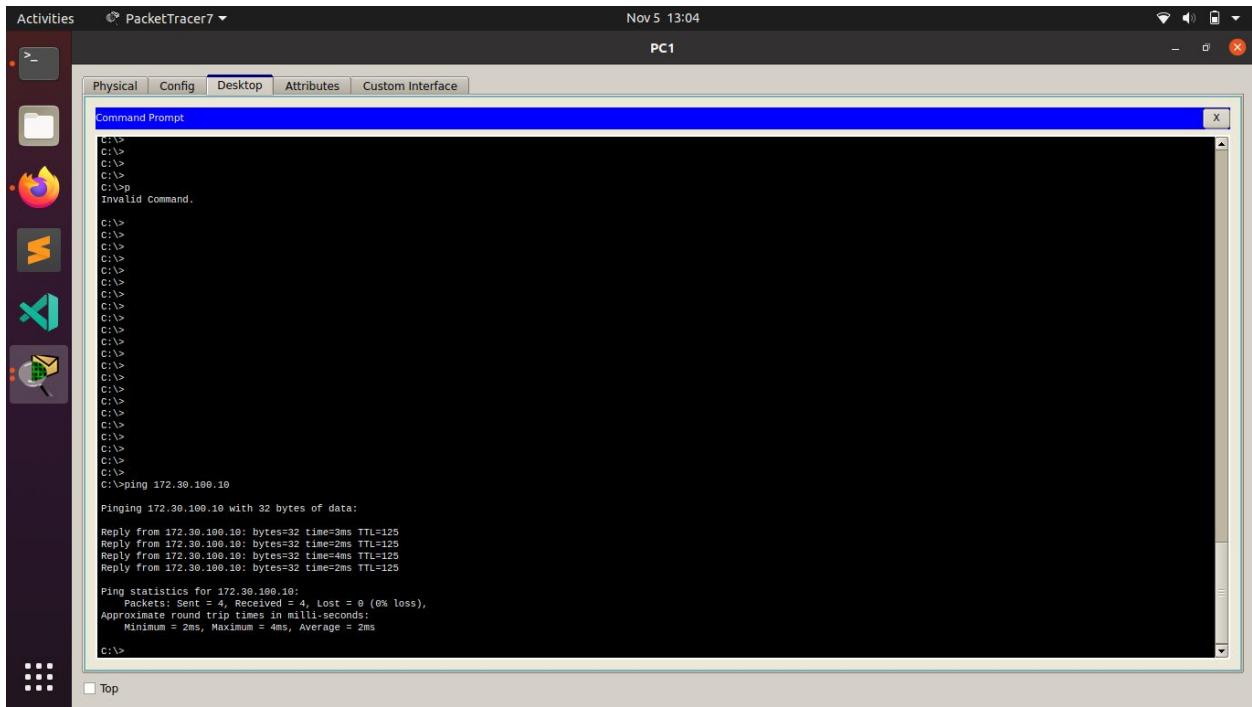
C:\>
C:\>ping 10.1.0.10
Pinging 10.1.0.10 with 32 bytes of data:
Reply from 10.1.0.10: bytes=32 time=2ms TTL=128
Reply from 10.1.0.10: bytes=32 time=2ms TTL=128
Reply from 10.1.0.10: bytes=32 time=2ms TTL=128
Reply from 10.1.0.10: bytes=32 time=1ms TTL=128

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 = 2ms, Average = 1ms

C:\>
```

Success Rate : 100%

From PC1, is it possible to ping PC4?



Activities PacketTracer7 Nov 5 13:04

PC1

Physical Config Desktop Attributes Custom Interface

Command Prompt

```
C:\>
C:\>
C:\>
C:\>
C:\>p
Invalid command.

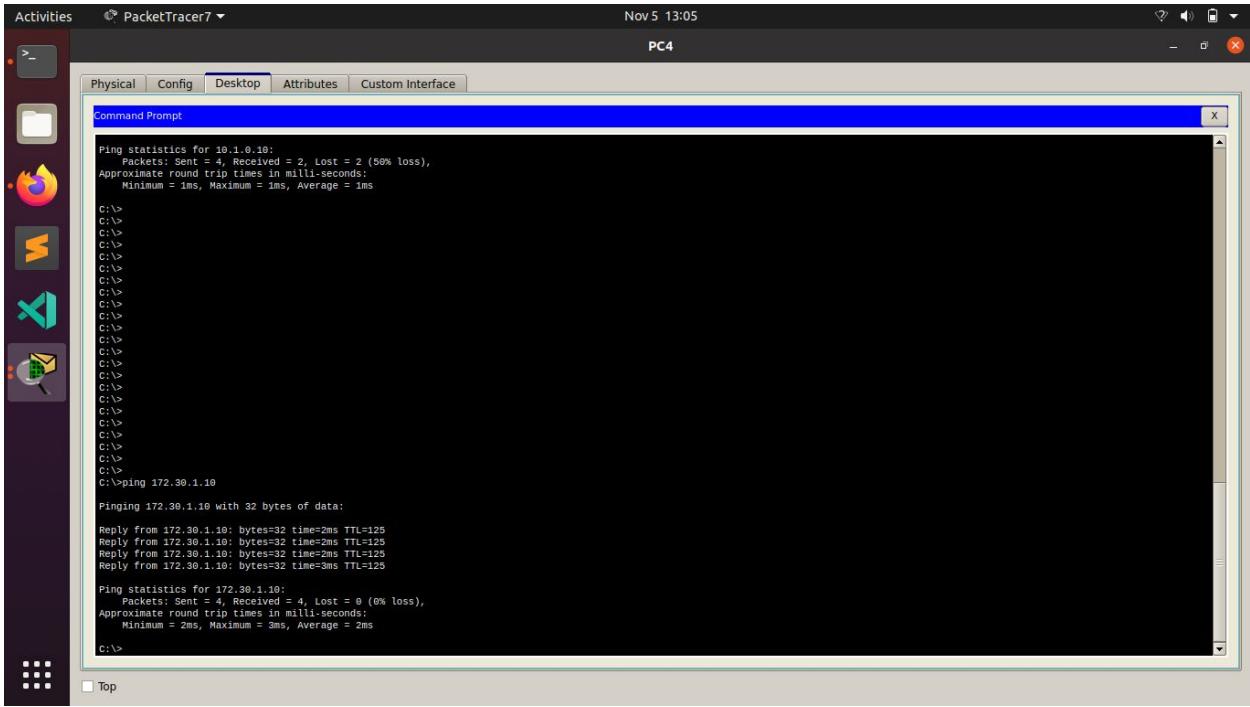
C:\>
C:\>ping 172.30.100.10
Pinging 172.30.100.10 with 32 bytes of data:
Reply from 172.30.100.10: bytes=32 time=2ms TTL=128
Reply from 172.30.100.10: bytes=32 time=2ms TTL=128
Reply from 172.30.100.10: bytes=32 time=4ms TTL=128
Reply from 172.30.100.10: bytes=32 time=2ms TTL=128

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 = 4ms, Average = 2ms
C:\>
```

Top

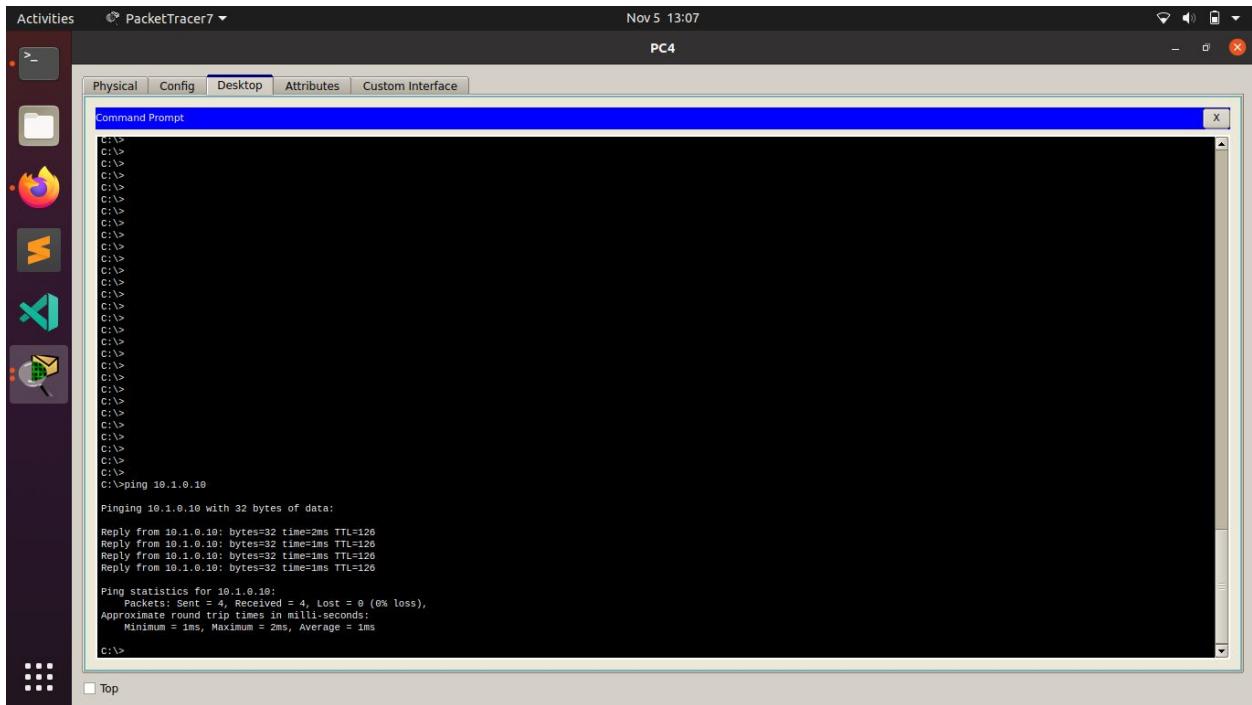
Success Rate : 100%

## From PC4, is it possible to ping PC2?



Success Rate : 100%

From PC4, is it possible to ping PC3?



Success Rate : 100%

## Task 9: Documentation

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

### Router 1

- show running-config

Building configuration...

```
Current configuration : 883 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
```

- 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, 00:00:16, 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, 00:00:16,
Serial0/0/0
R 172.30.110.0/24 [120/2] via 209.165.200.229, 00:00:16,
Serial0/0/0
R 172.30.200.16/28 [120/2] via 209.165.200.229, 00:00:16,
Serial0/0/0
R 172.30.200.32/28 [120/2] via 209.165.200.229, 00:00:16,
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, 00:00:16,
Serial0/0/0
```

- 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 NVRAM administratively down down
```

- show ip protocols

```
R1#show ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 6 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 00:00:10
Distance: (default is 120)
```

## Router 2

- show running-config

```
R2#show running-config
Building configuration...

Current configuration : 829 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
!
!
R2#
R2#
R2#
R2#
```



```
!
!
!
!
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
```

- 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, 00:00:26,
Serial0/0/0
R 172.30.2.0/24 [120/1] via 209.165.200.230, 00:00:26,
Serial0/0/0
R 172.30.100.0/24 [120/1] via 209.165.200.234, 00:00:18,
Serial0/0/1
R 172.30.110.0/24 [120/1] via 209.165.200.234, 00:00:18,
Serial0/0/1
```

```
R 172.30.200.16/28 [120/1] via 209.165.200.234, 00:00:18,  
Serial0/0/1  
R 172.30.200.32/28 [120/1] via 209.165.200.234, 00:00:18,  
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
```

- 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 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
```

- show ip protocols

```
R2#show ip protocols  
Routing Protocol is "rip"  
  Sending updates every 30 seconds, next due in 13 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  
    Serial0/0/1 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 00:00:20
 209.165.200.234 120 00:00:09
Distance: (default is 120)
```

## Router 3

- show running-config

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

Current configuration : 1009 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

```

- 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, 00:00:03, 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, 00:00:03,
Serial0/0/1
R 172.30.2.0/24 [120/2] via 209.165.200.233, 00:00:03,
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, 00:00:03,
Serial0/0/1
C 209.165.200.232 is directly connected, Serial0/0/1
```

- 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 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 up
Loopback0 172.30.110.1 YES manual up up
Loopback1 172.30.200.17 YES manual up up
Loopback2 172.30.200.33 YES manual up up
Vlan1 unassigned YES NVRAM administratively down down
```

- show ip protocols

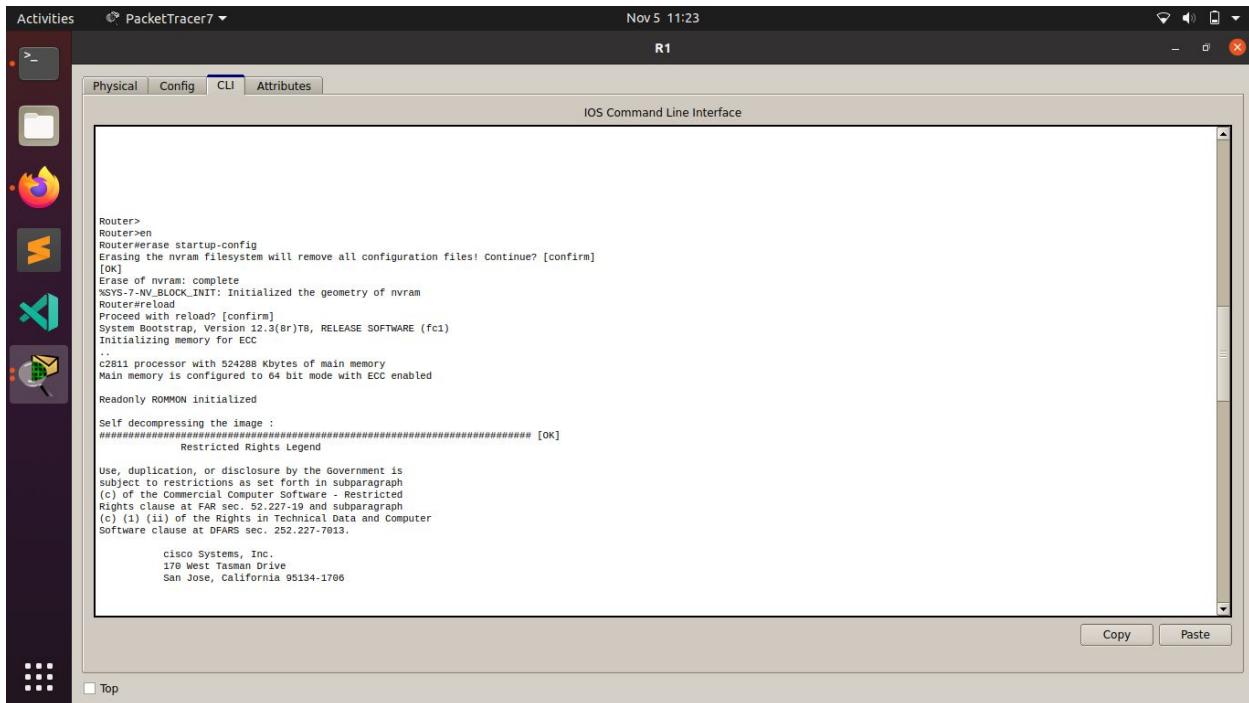
```
R3#show ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 23 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Outgoing update filter list for all interfaces is not set
```

```
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
Loopback2 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 00:00:08
Distance: (default is 120)
```

## 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.

## R1 CLEANUP



Activities PacketTracer7 ▾ Nov 5 11:23 R1

Physical Config CLI Attributes

IOS Command Line Interface

```
Router>
Router>en
Router>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
Router>reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
.
C2811 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
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.

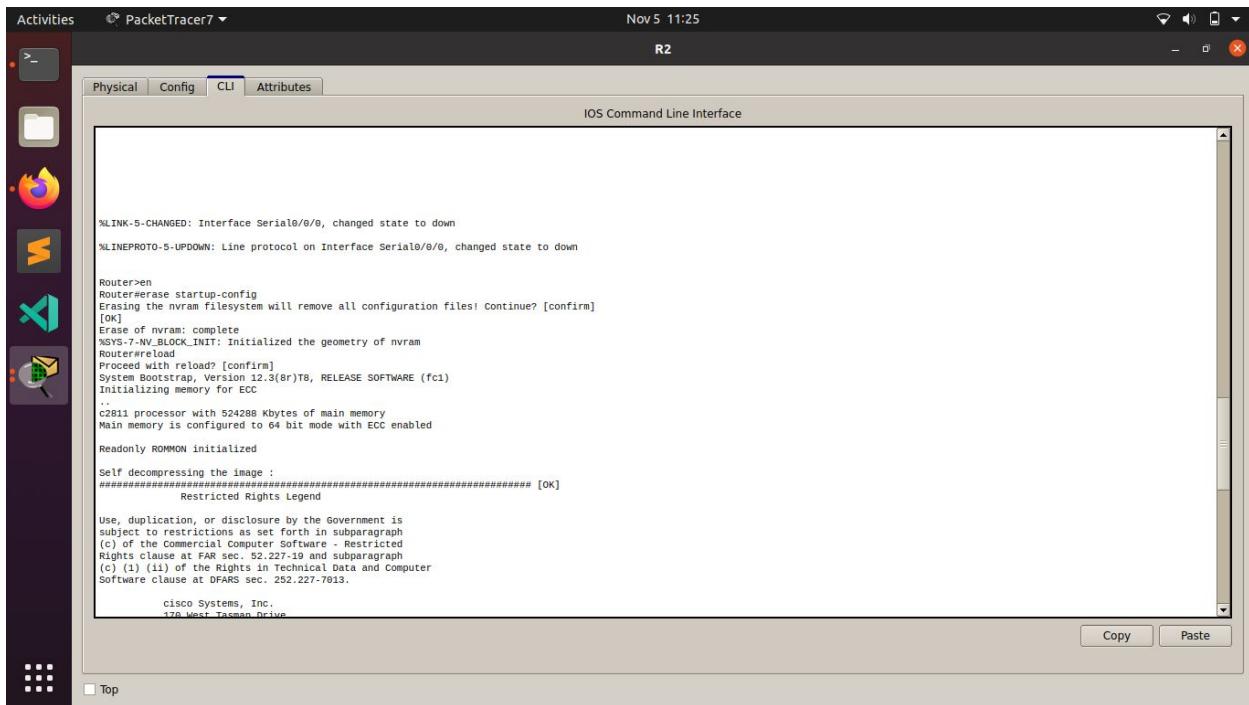
cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706
```

Copy Paste

Top

This screenshot shows the Cisco Packet Tracer interface for router R1. The terminal window displays the IOS Command Line Interface (CLI). The user has entered 'erase startup-config' to clear the configuration. After confirming, the nvram is erased, and the geometry is initialized. The router then reloads, decompressing the image and initializing memory. It shows a C2811 processor with 524288 Kbytes of main memory configured in 64-bit mode with ECC. The ROMMON is initialized. A self-decompression message follows, mentioning Cisco's rights and restrictions. The Cisco Systems address is listed at the bottom.

## R2 CLEANUP



Activities PacketTracer7 ▾ Nov 5 11:25 R2

Physical Config CLI Attributes

IOS Command Line Interface

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

Router>en
Router>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
Router>reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
.
C2811 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
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(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
```

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Top

This screenshot shows the Cisco Packet Tracer interface for router R2. The terminal window displays the IOS Command Line Interface (CLI). Similar to R1, it shows the clearing of the startup configuration, nvram erasure, and subsequent reload. The process involves decompression and memory initialization for a C2811 processor. The ROMMON is initialized, followed by a self-decompression message with rights and restrictions information, and the Cisco Systems address.

# R3 CLEANUP

Nov 5 11:25

R3

Physical Config CLI Attributes

IOS Command Line Interface

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

Router>en
Router>eraset 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
Router>reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
c2811 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 :
#####
Restricted Rights Legend

Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(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
```

Copy Paste

Top

Here we have Erased all configurations and disconnected and stored the cables.