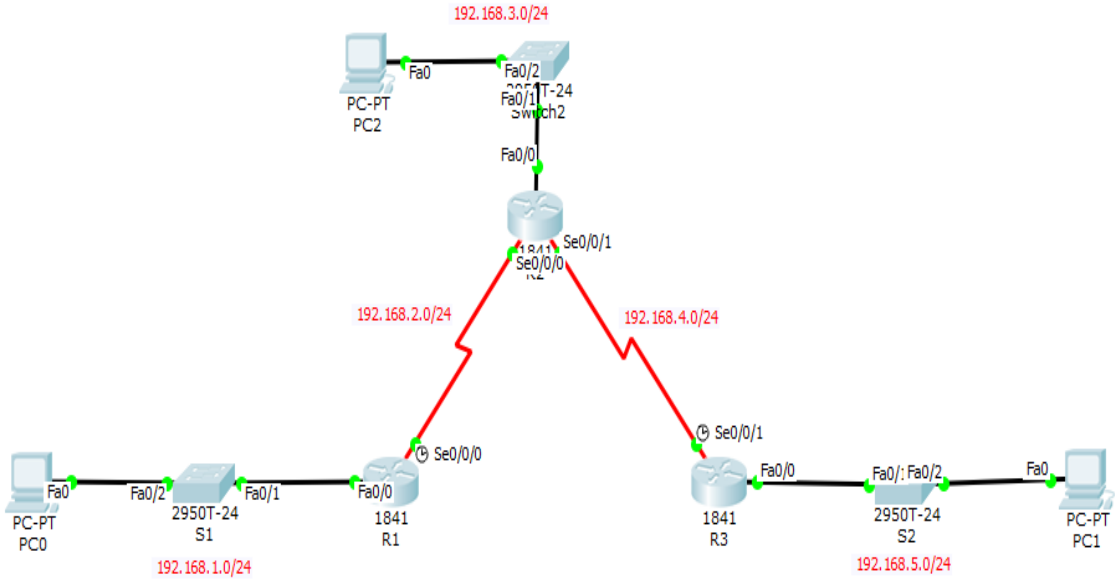
Phần A

Task 1: Prepare the Network



Task 2: Perform Basic Router Configurations.

Router R1

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
R1(config)#no ip domain-lookup
R1(config)#enable secret class
R1(config)#banner motd &
Enter TEXT message.  End with the character '&'.
&

R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#line vty 0 4
R1(config-line)#password telnet
R1(config-line)#login
R1(config-line)#exit
R1(config)#
```

Router R2

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R2
```

```
R2(config)#no ip domain-lookup
R2(config)#enable secret class
R2(config)#banner motd &
Enter TEXT message.  End with the character '&'.
&

R2(config)#line console 0
R2(config-line)#password cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#line vty 0 4
R2(config-line)#password telnet
R2(config-line)#login
R2(config-line)#exit
R2(config)#
```

Router R3

```
Router>EN
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R3
R3(config)#no ip domain-lookup
R3(config)#enable secret class
R3(config)#banner motd &
Enter TEXT message.  End with the character '&'.
&

R3(config)#line console 0
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#line vty 0 4
R3(config-line)#password telnet
R3(config-line)#login
R3(config-line)#exit
R3(config)#
```

Task 3: Configure and Activate Serial and Ethernet Addresses.

Màn hình CLI của R1

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
R1(config)#
R1(config)#interface FastEthernet0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shut

R1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

R1(config-if)#exit
R1(config)#
R1(config)#interface FastEthernet0/0
R1(config-if)#
R1(config-if)#exit
R1(config)#interface Serial0/0/0
R1(config-if)#ip address 192.168.2.1 255.255.255.0
R1(config-if)#no shut
```

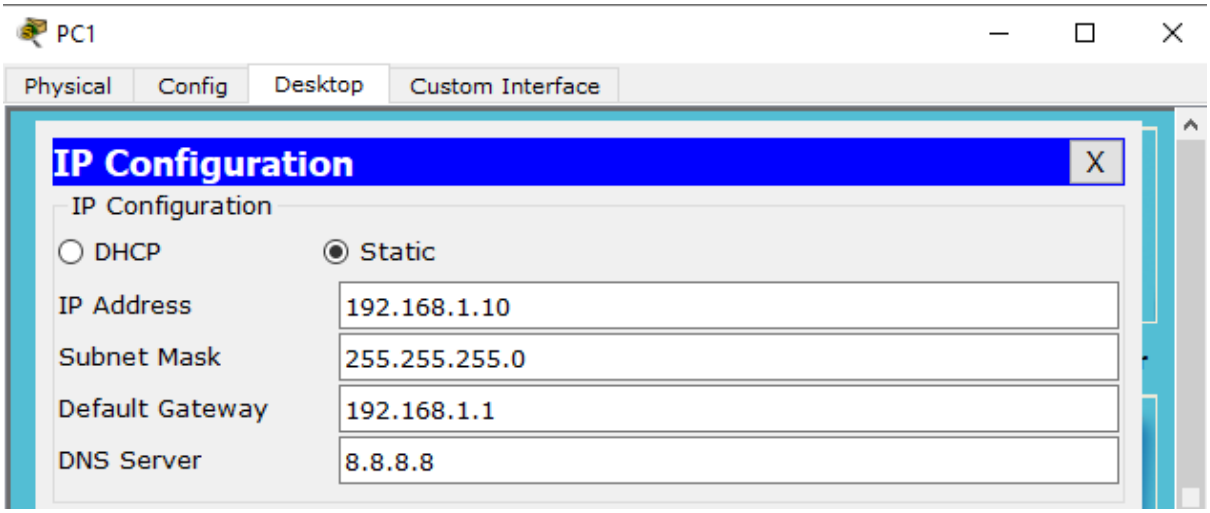
Màn hình CLI của R2

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R2
R2(config)#
R2(config)#interface FastEthernet0/0
R2(config-if)#ip address 192.168.3.1 255.255.255.0
R2(config-if)#no shut

R2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

R2(config-if)#exit

R2(config)#interface Serial0/0/0
R2(config-if)#ip address 192.168.2.2 255.255.255.0
R2(config-if)#
R2(config-if)#exit
R2(config)#interface Serial0/0/1
R2(config-if)#ip address 192.168.4.2 255.255.255.0
R2(config-if)#exit
```

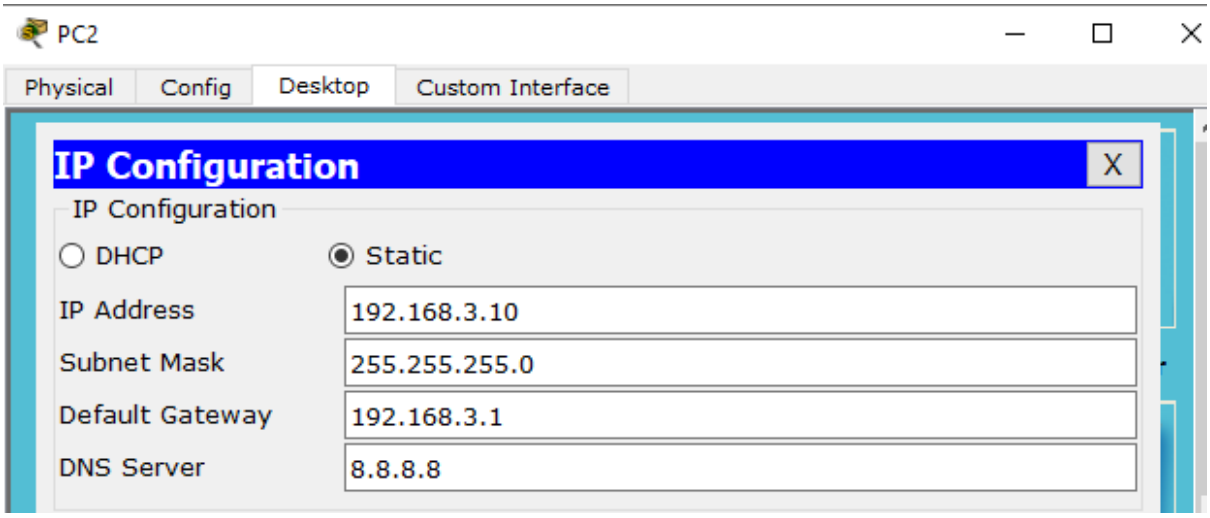
Màn hình CLI của R3

```
Router>EN
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R3
R3(config)#
R3(config)#interface Serial0/0/0
R3(config-if)#
R3(config-if)#exit
R3(config)#interface FastEthernet0/0
R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#
R3(config-if)#exit
R3(config)#interface Serial0/0/1
R3(config-if)#ip address 192.168.4.1 255.255.255.0
R3(config-if)#exit
R3(config)#
```

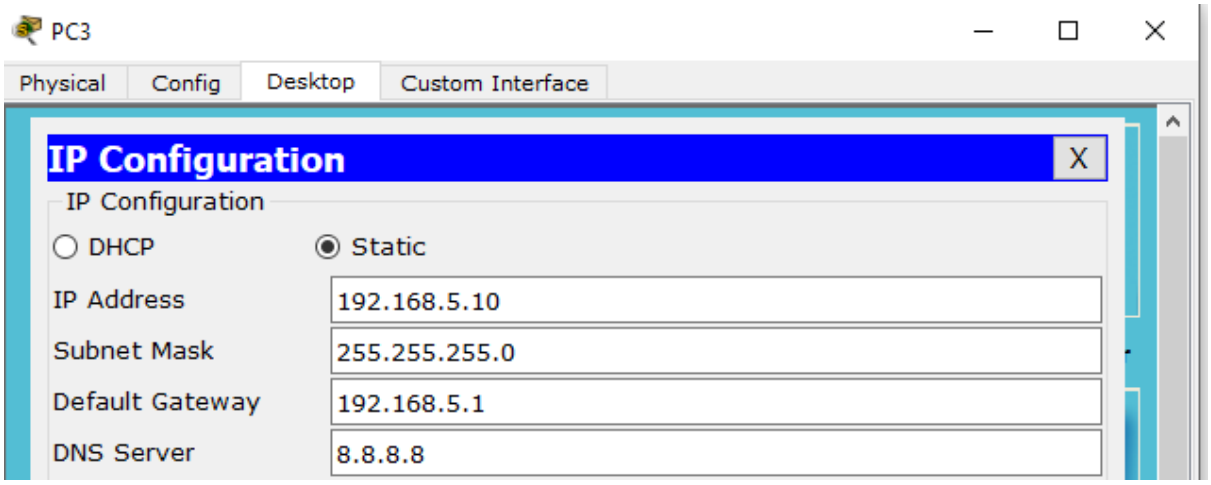
Cấu hình PC1



Cấu hình PC2



Cấu hình PC3



Màn hình ping giữa các PC, và PC với Router

```
PC>ping 192.168.5.10

Pinging 192.168.5.10 with 32 bytes of data:

Reply from 192.168.5.10: bytes=32 time=13ms TTL=128
Reply from 192.168.5.10: bytes=32 time=8ms TTL=128
Reply from 192.168.5.10: bytes=32 time=0ms TTL=128
Reply from 192.168.5.10: bytes=32 time=0ms TTL=128

Ping statistics for 192.168.5.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 13ms, Average = 5ms
```

```
PC>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=0ms TTL=255
Reply from 192.168.1.1: bytes=32 time=0ms TTL=255
Reply from 192.168.1.1: bytes=32 time=1ms TTL=255
Reply from 192.168.1.1: bytes=32 time=0ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Task 4: Configure RIP

Màn hình CLI của R1 khi cấu hình RIP

```
R1(config)#router rip
R1(config-router)#network 192.168.1.0
R1(config-router)#network 192.168.2.0
R1(config-router)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Màn hình CLI của R2 khi cấu hình RIP

```
R2(config-router)#exit
R2(config)#router rip
R2(config-router)#network 192.168.2.0
R2(config-router)#network 192.168.3.0
R2(config-router)#network 192.168.4.0
R2(config-router)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Màn hình CLI của R3 khi cấu hình RIP

```
R3>en
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#router rip
R3(config-router)#network 192.168.4.0
R3(config-router)#network 192.168.5.0
R3(config-router)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Task 5: Verify RIP Routing.

Step 1: Use the show ip route command to verify that each router has all of the networks in the topology entered in the routing table.

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

C    192.168.1.0/24 is directly connected, FastEthernet0/0
C    192.168.2.0/24 is directly connected, Serial0/0/0
R    192.168.3.0/24 [120/1] via 192.168.2.2, 00:00:06, Serial0/0/0
R    192.168.4.0/24 [120/1] via 192.168.2.2, 00:00:06, Serial0/0/0
R    192.168.5.0/24 [120/2] via 192.168.2.2, 00:00:06, Serial0/0/0
R1#
```

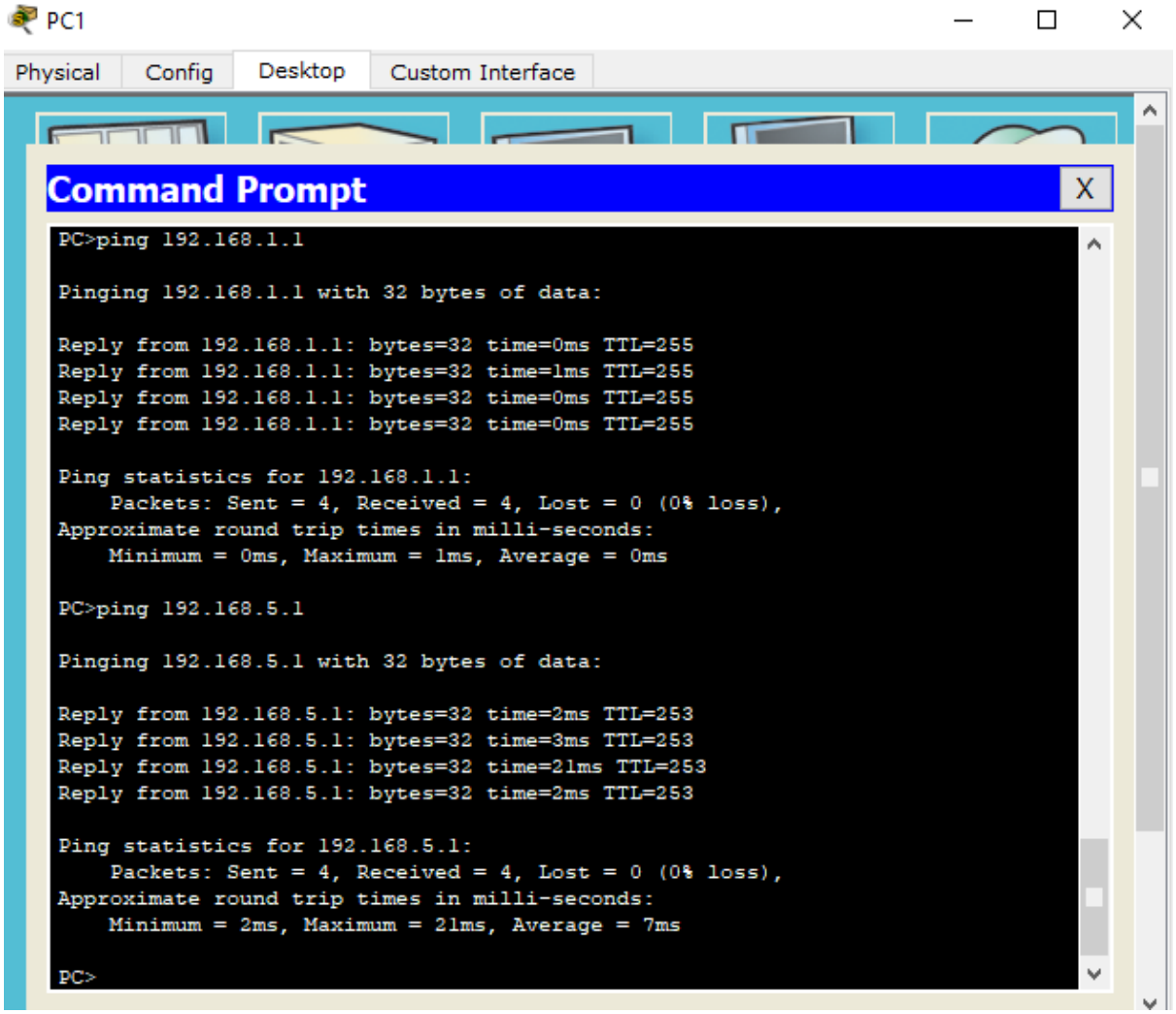
R2

```
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

R    192.168.1.0/24 [120/1] via 192.168.2.1, 00:00:08, Serial0/0/0
C    192.168.2.0/24 is directly connected, Serial0/0/0
C    192.168.3.0/24 is directly connected, FastEthernet0/0
C    192.168.4.0/24 is directly connected, Serial0/0/1
R    192.168.5.0/24 [120/1] via 192.168.4.1, 00:00:18, Serial0/0/1
R2#
```

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

R    192.168.1.0/24 [120/2] via 192.168.4.2, 00:00:04, Serial0/0/1
R    192.168.2.0/24 [120/1] via 192.168.4.2, 00:00:04, Serial0/0/1
R    192.168.3.0/24 [120/1] via 192.168.4.2, 00:00:04, Serial0/0/1
C    192.168.4.0/24 is directly connected, Serial0/0/1
C    192.168.5.0/24 is directly connected, FastEthernet0/0
```

-Máy Ping:



Step 2: Use the show ip protocols command to view information about the routing processes.

```
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 1, receive any version
  Interface             Send  Recv  Triggered RIP  Key-chain
  FastEthernet0/0       1     2 1
  Serial0/0/0           1     2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
           192.168.1.0
           192.168.2.0
Passive Interface(s):
Routing Information Sources:
           Gateway         Distance      Last Update
           192.168.2.2           120      00:00:22
Distance: (default is 120)
R1#
```

Step 3: Use the debug ip rip command to view the RIP messages being sent and received

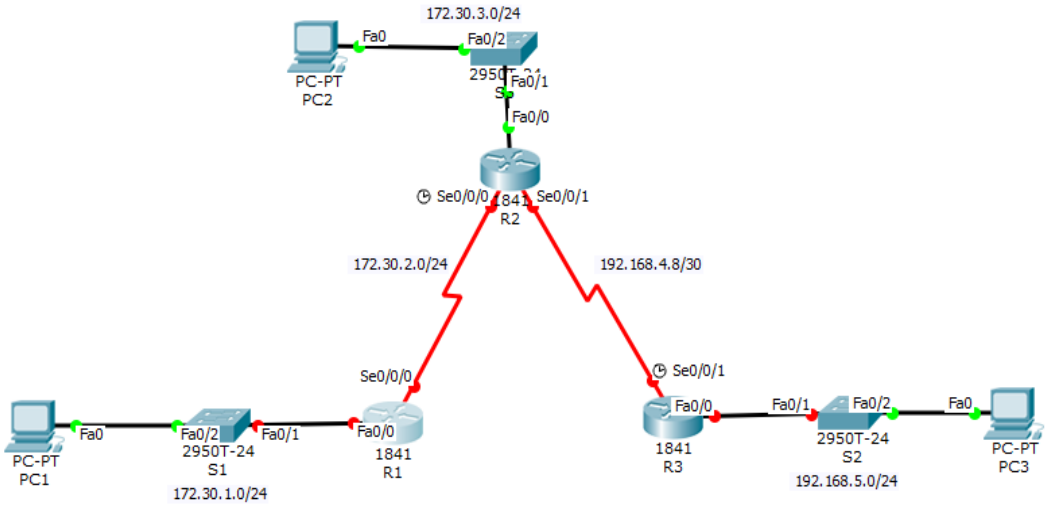
```
R1#debug ip rip
RIP protocol debugging is on
R1#RIP: received v1 update from 192.168.2.2 on Serial0/0/0
      192.168.3.0 in 1 hops
      192.168.4.0 in 1 hops
      192.168.5.0 in 2 hops
RIP: sending  v1 update to 255.255.255.255 via FastEthernet0/0 (192.168.1.1)
RIP: build update entries
      network 192.168.2.0 metric 1
      network 192.168.3.0 metric 2
      network 192.168.4.0 metric 2
      network 192.168.5.0 metric 3
RIP: sending  v1 update to 255.255.255.255 via Serial0/0/0 (192.168.2.1)
RIP: build update entries
      network 192.168.1.0 metric 1
```

Step 4: Discontinue the debug output with the undebug all command.

```
R1#undebug all
All possible debugging has been turned off
```

Phần B

Task 1: Make Changes between Scenario A and Scenario B



Perform Basic Router Configurations.

Router R1

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
R1(config)#no ip domain-lookup
R1(config)#enable secret class
R1(config)#banner motd &
Enter TEXT message.  End with the character '&'.
&

R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#line vty 0 4
R1(config-line)#password telnet
R1(config-line)#login
R1(config-line)#exit
R1(config)#
```

Router R2

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R2

R2(config)#no ip domain-lookup
R2(config)#enable secret class
R2(config)#banner motd &
Enter TEXT message.  End with the character '&'.
&

R2(config)#line console 0
R2(config-line)#password cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#line vty 0 4
R2(config-line)#password telnet
R2(config-line)#login
R2(config-line)#exit
R2(config)#
```

Router R3

```
Router>EN
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R3
R3(config)#no ip domain-lookup
R3(config)#enable secret class
R3(config)#banner motd &
Enter TEXT message.  End with the character '&'.
&

R3(config)#line console 0
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#line vty 0 4
R3(config-line)#password telnet
R3(config-line)#login
R3(config-line)#exit
R3(config)#
```

Cấu hình cho Router

R1

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int f0/0
R1(config-if)#ip add 172.30.1.1 255.255.255.0
R1(config-if)#shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
down

R1(config-if)#no shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
up

R1(config-if)#ex
R1(config)#int s0/0/0
R1(config-if)#ip add 172.30.2.1 255.255.255.0
R1(config-if)#shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to administratively down

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

R1(config-if)#no shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

R1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

R1(config-if)#ex
```

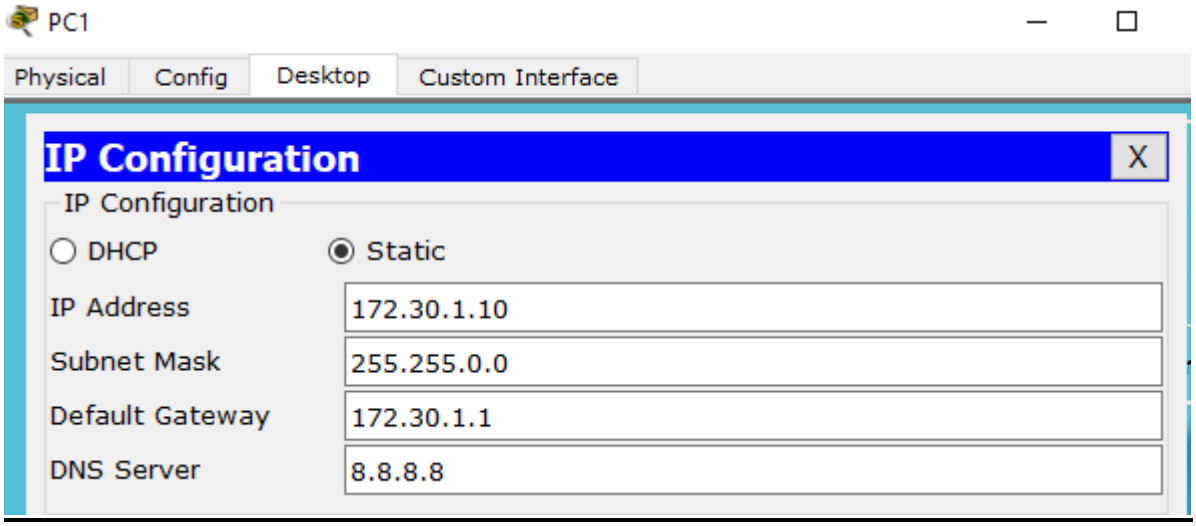
R2

```
R2>en
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int f0/0
R2(config-if)#ip add 172.30.3.1 255.255.255.0
R2(config-if)#shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
down

R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
up

R2(config-if)#ex
R2(config)#int s0/0/0
R2(config-if)#ip add 172.30.2.2 255.255.255.0
R2(config-if)#shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to administratively down

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

R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

R2(config-if)#ex
R2(config)#int s0/0/1
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

R2(config-if)#ip add 192.168.4.9 255.255.255.252
R2(config-if)#shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to administratively down

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

R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

R2(config-if)#ex
```

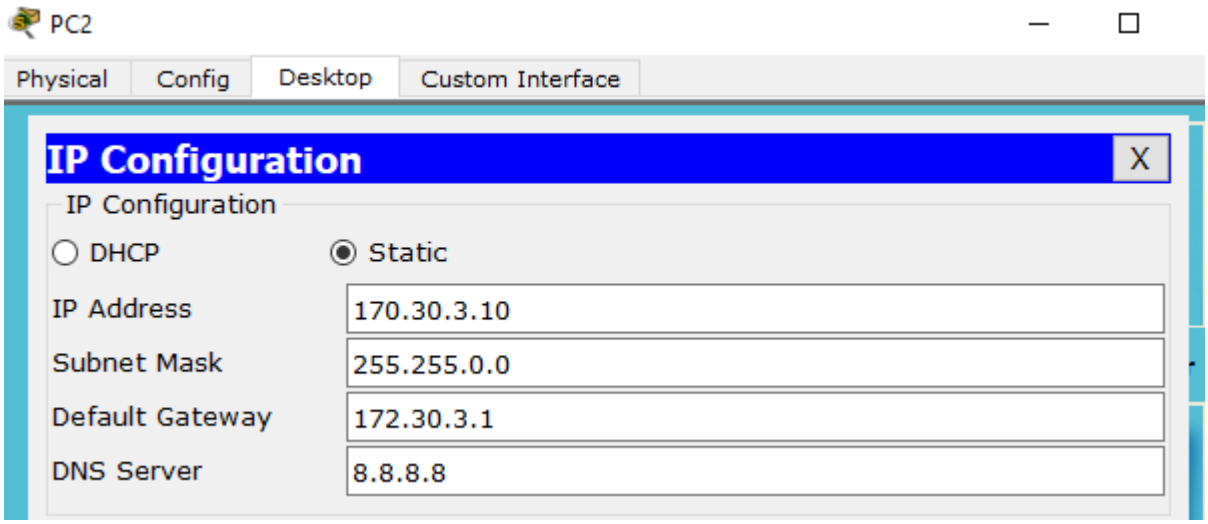
R3

```
R3>en
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#int f0/0
R3(config-if)#ip add 192.168.5.1 255.255.255.0
R3(config-if)#shutdown

R3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
down

R3(config-if)#no shutdown

R3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
up

R3(config-if)#ex
R3(config)#int s0/0/1
R3(config-if)#ip add 192.168.4.10 255.255.255.252
R3(config-if)#shutdown

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

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

R3(config-if)#no shutdown

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

R3(config-if)#ex
```

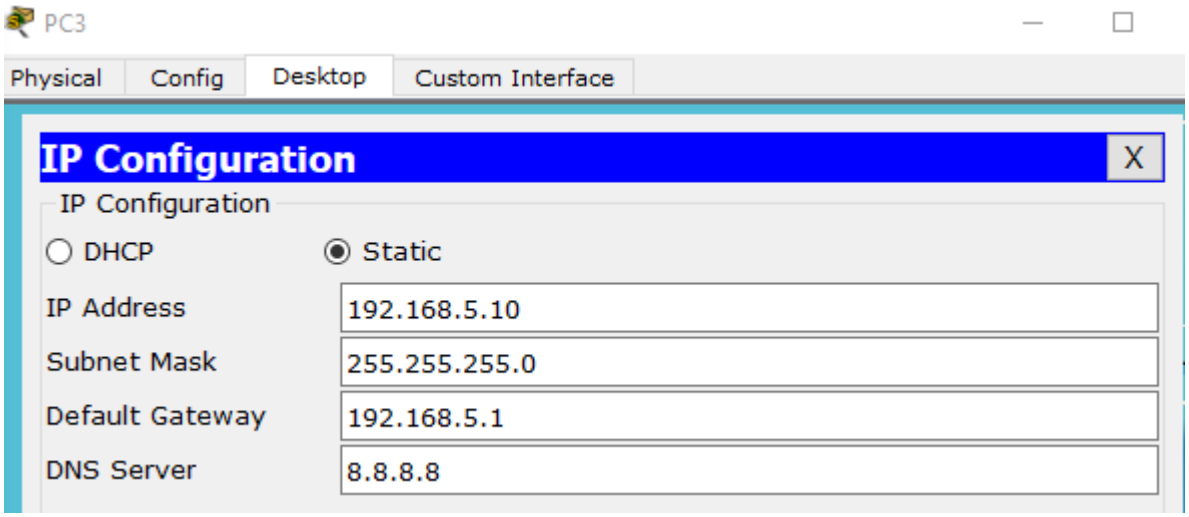
Cấu hình PC1



Cấu hình PC2



Cấu hình PC3



Màn hình ping giữa các PC, và PC với Router

```
PC>ping 172.30.1.1

Pinging 172.30.1.1 with 32 bytes of data:

Reply from 172.30.1.1: bytes=32 time=0ms TTL=255
Reply from 172.30.1.1: bytes=32 time=0ms TTL=255
Reply from 172.30.1.1: bytes=32 time=0ms TTL=255
Reply from 172.30.1.1: bytes=32 time=0ms TTL=255

Ping statistics for 172.30.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Task 2: Configure RIP

Màn hình CLI của R1 khi cấu hình RIP

```
R1(config)#no router rip
R1(config)#router rip
R1(config-router)#network 172.30.0.0
R1(config-router)#passive-interface fastethernet 0/0
R1(config-router)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Màn hình CLI của R2 khi cấu hình RIP

```
R2(config)#no router rip
R2(config)#router rip
R2(config-router)#network 172.30.0.0
R2(config-router)#network 172.30.4.0
R2(config-router)#passive-interface fastethernet 0/0
R2(config-router)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Màn hình CLI của R3 khi cấu hình RIP

```
R3(config)#no router rip
R3(config)#router rip
R3(config-router)#network 192.168.4.0
R3(config-router)#network 192.168.5.0
R3(config-router)#passive-interface fastethernet 0/0
R3(config-router)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

+

Step 1: Use the show ip route command to verify that each router has all of the networks in the topology in the routing table.

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

     172.30.0.0/24 is subnetted, 3 subnets
C       172.30.1.0 is directly connected, FastEthernet0/0
C       172.30.2.0 is directly connected, Serial0/0/0
R       172.30.3.0 [120/1] via 172.30.2.2, 00:00:08, Serial0/0/0
R    192.168.4.0/24 [120/1] via 172.30.2.2, 00:00:08, Serial0/0/0
R    192.168.5.0/24 [120/2] via 172.30.2.2, 00:00:08, Serial0/0/0
R1#
```

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

     172.30.0.0/24 is subnetted, 3 subnets
R       172.30.1.0 [120/1] via 172.30.2.1, 00:00:20, Serial0/0/0
C       172.30.2.0 is directly connected, Serial0/0/0
C       172.30.3.0 is directly connected, FastEthernet0/0
     192.168.4.0/30 is subnetted, 1 subnets
C       192.168.4.8 is directly connected, Serial0/0/1
R    192.168.5.0/24 [120/1] via 192.168.4.10, 00:00:09, Serial0/0/1
R2#
```

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

R    172.30.0.0/16 [120/1] via 192.168.4.9, 00:00:06, Serial0/0/1
     192.168.4.0/30 is subnetted, 1 subnets
C       192.168.4.8 is directly connected, Serial0/0/1
C    192.168.5.0/24 is directly connected, FastEthernet0/0
R3#
```

Step 2: Verify that all necessary interfaces are active.

```
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 1, receive any version
  Interface             Send  Recv  Triggered RIP  Key-chain
  Serial0/0/0           1     2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
           172.30.0.0
Passive Interface(s):
           FastEthernet0/0
Routing Information Sources:
           Gateway         Distance      Last Update
           172.30.2.2           120      00:00:22
Distance: (default is 120)
```

Step 3: View the RIP messages being sent and received.

```
R1#debug ip rip
RIP protocol debugging is on
R1#RIP: sending  v1 update to 255.255.255.255 via Serial0/0/0 (172.30.2.1)
RIP: build update entries
      network 172.30.1.0 metric 1
RIP: received v1 update from 172.30.2.2 on Serial0/0/0
      172.30.3.0 in 1 hops
      192.168.4.0 in 1 hops
      192.168.5.0 in 2 hops
```

Step 4: Discontinue the debug output with the undebug all command.

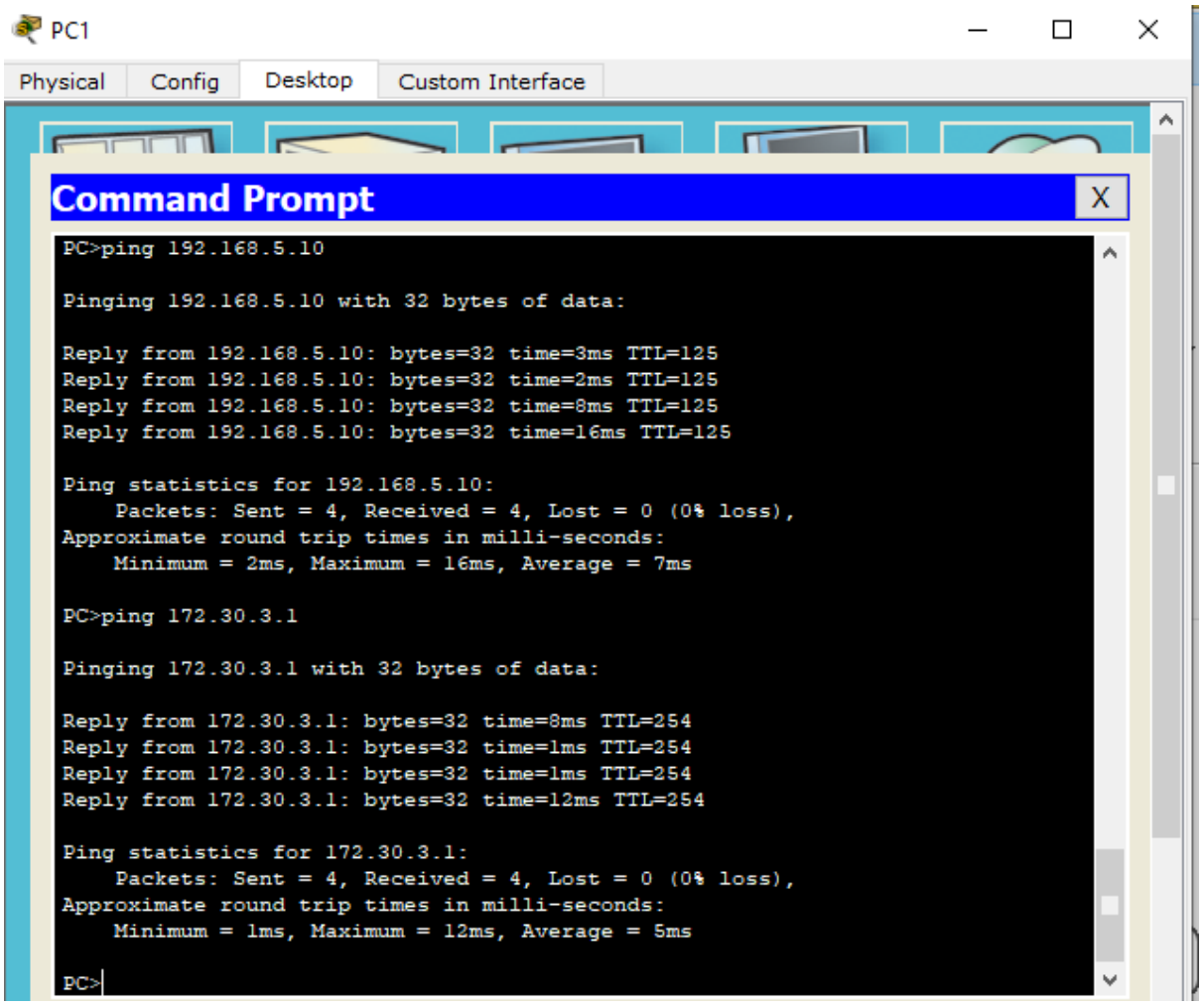
```
R1#undebug all
All possible debugging has been turned off
R1#
```

-Ping Router với Router, máy với máy, Router với máy.

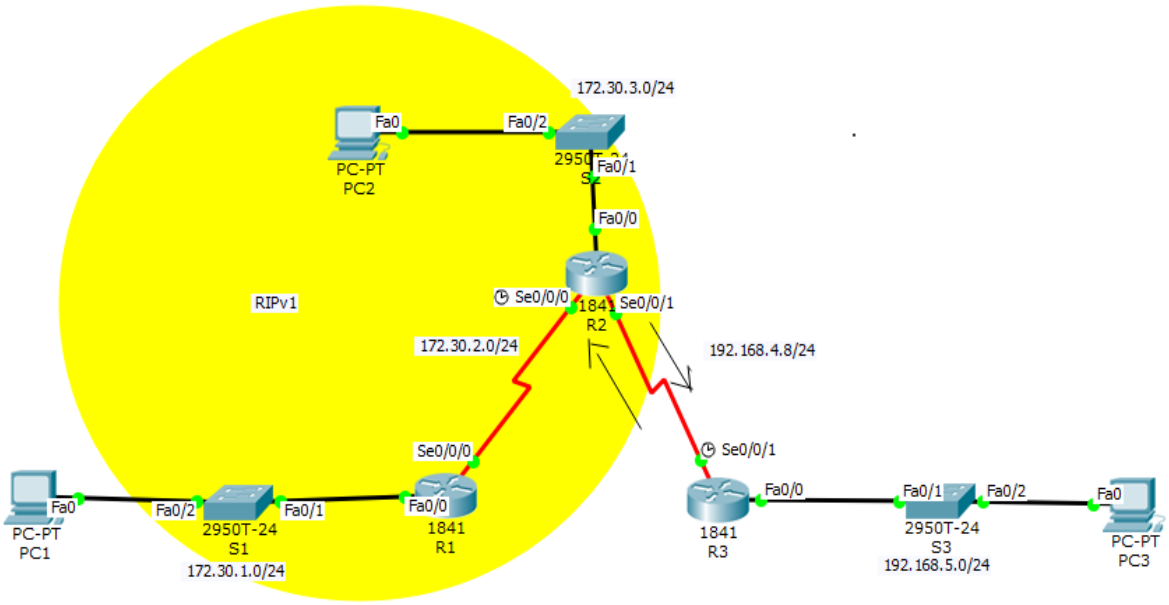
```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#do ping 172.30.3.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.30.3.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/9/20 ms
```

```
R3>en
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#do ping 172.30.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.30.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/18/30 ms
```

```
R1(config)#do ping 172.30.1.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.30.1.10, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/1/7 ms


R3(config)#do ping 172.30.3.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.30.3.10, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 1/3/9 ms


R2(config)#do ping 192.168.5.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.5.10, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 3/9/15 ms
```



Phần C



Task 1: Make Changes between Scenario B and Scenario C.

Step 1: Remove network 192.168.4.0 from the RIP configuration for R2.

```
R2(config)#router rip
R2(config-router)#no network 192.168.4.0
R2(config-router)#
```

Step 2: Completely remove RIP routing from R3.

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

Task 2: Configure the Static Route on R3 for the 172.30.0.0/16 network.

```
R3(config)#ip route 172.30.0.0 255.255.255.0 s0/0/1
R3(config)#
```

Task 3: Configure a Default Static Route on R2.

Step 1: Configure R2 to send default traffic to R3.

```
R2(config-router)#exit
R2(config)#ip route 0.0.0.0 0.0.0.0 serial 0/0/1
R2(config)#
```

Step 2: Configure R2 to send default static route information to R1.

```
R2(config)#router rip
R2(config-router)#default-information originate
R2(config-router)#
```

Task 4: Verify RIP Routing.

Step 1: Use the show ip route command to view the routing table on R2 and R1.

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 0.0.0.0 to network 0.0.0.0

     172.30.0.0/24 is subnetted, 3 subnets
R       172.30.1.0 [120/1] via 172.30.2.1, 00:00:01, Serial0/0/0
C       172.30.2.0 is directly connected, Serial0/0/0
C       172.30.3.0 is directly connected, FastEthernet0/0
     192.168.4.0/30 is subnetted, 1 subnets
C       192.168.4.8 is directly connected, Serial0/0/1
S*   0.0.0.0/0 is directly connected, Serial0/0/1
R2#
```

R1

```
R1>en
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 172.30.2.2 to network 0.0.0.0

     172.30.0.0/24 is subnetted, 3 subnets
C       172.30.1.0 is directly connected, FastEthernet0/0
C       172.30.2.0 is directly connected, Serial0/0/0
R       172.30.3.0 [120/1] via 172.30.2.2, 00:00:19, Serial0/0/0
R*   0.0.0.0/0 [120/1] via 172.30.2.2, 00:00:19, Serial0/0/0
```

Step 2: View the RIP updates that are sent and received on R1 with the debug ip rip command.

```
R1#debug ip rip
RIP protocol debugging is on
R1#RIP: received v1 update from 172.30.2.2 on Serial0/0/0
      0.0.0.0 in 1 hops
      172.30.3.0 in 1 hops
RIP: sending  v1 update to 255.255.255.255 via Serial0/0/0 (172.30.2.1)
RIP: build update entries
      network 172.30.1.0 metric 1
```

Step 3: Discontinue the debug output with the undebug all command.

```
R1#undebug all
All possible debugging has been turned off
```

Step 4: Use the show ip route command to view the routing table on 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

     172.30.0.0/22 is subnetted, 1 subnets
S       172.30.0.0 is directly connected, Serial0/0/1
     192.168.4.0/30 is subnetted, 1 subnets
C       192.168.4.8 is directly connected, Serial0/0/1
C    192.168.5.0/24 is directly connected, FastEthernet0/0
R3#
```

Task 5: Document the Router Configurations

R1

```
R1>en
R1#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 10 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 1, receive any version
  Interface              Send  Recv  Triggered RIP  Key-chain
  Serial0/0/0            1     2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
           172.30.0.0
Passive Interface(s):
           FastEthernet0/0
Routing Information Sources:
           Gateway         Distance      Last Update
           172.30.2.2           120      00:00:16
Distance: (default is 120)
R1#
```

R2

```
R2# show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 15 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 1, receive any version
  Interface              Send  Recv  Triggered RIP  Key-chain
  Serial0/0/0            1     2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
           172.30.0.0
Passive Interface(s):
           FastEthernet0/0
Routing Information Sources:
           Gateway         Distance      Last Update
           172.30.2.1           120      00:00:24
Distance: (default is 120)
```

R3

```
R3# show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 5 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 1, receive any version
  Interface             Send  Recv  Triggered RIP  Key-chain
  Serial0/0/1           1     2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
            192.168.4.0
            192.168.5.0
Passive Interface(s):
            FastEthernet0/0
Routing Information Sources:
            Gateway         Distance      Last Update
Distance: (default is 120)
```

Task 6: Clean Up

R1

```
R1>enable
R1#write erase
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
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
```

R2

```
R2>en
R2#write erase
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
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
```

R3

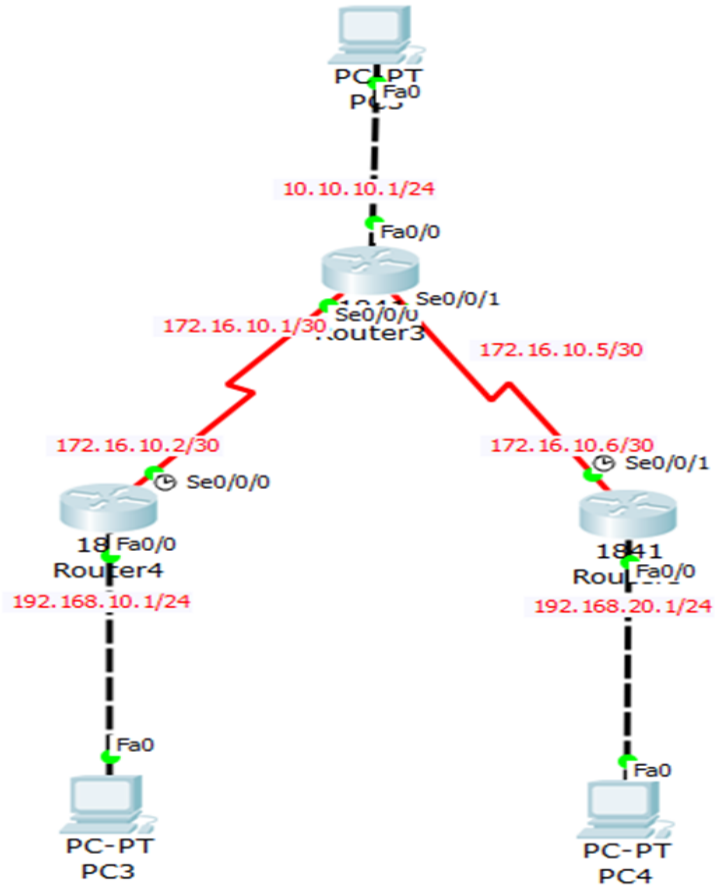
```
R3>en
R3#write erase
Erasing the nvram filesystem will remove all configuration files! Continue?
[confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
R3#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Initializing memory for ECC
```

-Máy ping

```
PC>ping 172.30.3.10

Pinging 172.30.3.10 with 32 bytes of data:

Reply from 172.30.3.10: bytes=32 time=3ms TTL=126
Reply from 172.30.3.10: bytes=32 time=11ms TTL=126
Reply from 172.30.3.10: bytes=32 time=1ms TTL=126
Reply from 172.30.3.10: bytes=32 time=8ms TTL=126

Ping statistics for 172.30.3.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 11ms, Average = 5ms

PC>192ping
PC>ping 192.168.5.10

Pinging 192.168.5.10 with 32 bytes of data:
```

```
Reply from 192.168.5.10: bytes=32 time=2ms TTL=125
Reply from 192.168.5.10: bytes=32 time=2ms TTL=125
Reply from 192.168.5.10: bytes=32 time=2ms TTL=125
Reply from 192.168.5.10: bytes=32 time=2ms TTL=125

Ping statistics for 192.168.5.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 2ms, Average = 2ms

PC>
```

BÀI 2



<u>Màn hình CLI của R1</u>

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int f0/0
Router(config-if)#ip add 192.168.20.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#ex
Router(config)#int s0/0/1
Router(config-if)#ip add 172.16.10.6 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

Router(config-if)#ex
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

Router(config)#router rip
Router(config-router)#network 172.16.10.0
Router(config-router)#network 192.168.20.0
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
```

Màn hình CLI của R2

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int f0/0
Router(config-if)#ip add 192.168.10.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#ex
Router(config)#int s0/0/0
Router(config-if)#ip add 172.16.10.2 255.255.255.252
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Router(config-if)#
Router(config-if)#ex
Router(config)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

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

Router(config)#router rip
Router(config-router)#network 192.168.10.0
Router(config-router)#network 172.16.10.0
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Router#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 172.16.10.1, 00:00:20, Serial0/0/0
     172.16.0.0/30 is subnetted, 2 subnets
C       172.16.10.0 is directly connected, Serial0/0/0
R       172.16.10.4 [120/1] via 172.16.10.1, 00:00:20, Serial0/0/0
C    192.168.10.0/24 is directly connected, FastEthernet0/0
R    192.168.20.0/24 [120/2] via 172.16.10.1, 00:00:12, Serial0/0/0
Router#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 3 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 1, receive any version
  Interface              Send  Recv  Triggered RIP  Key-chain
  FastEthernet0/0        1     2 1
  Serial0/0/0            1     2 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
          172.16.0.0
          192.168.10.0
Passive Interface(s):
Routing Information Sources:
          Gateway         Distance      Last Update
          172.16.10.1           120      00:00:04
Distance: (default is 120)
Router#debug ip rip
RIP protocol debugging is on
Router#RIP: received v1 update from 172.16.10.1 on Serial0/0/0
      10.0.0.0 in 1 hops
      172.16.10.4 in 1 hops
      192.168.20.0 in 2 hops

Router#undebug all
All possible debugging has been turned off
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#do ping 172.16.10.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.10.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/7/15 ms

Router(config)#do ping 10.10.10.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.10, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 1/6/21 ms
```

```
Router(config)#do ping 172.16.10.6

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.10.6, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/33/82 ms

Router(config)#do ping 192.168.20.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.20.10, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 3/17/27 ms

Router(config)#
```

Màn hình CLI của R3

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int f0/0
Router(config-if)#ip ad 10.10.10.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#ex
Router(config)#int s0/0/0
Router(config-if)#ip add 172.16.10.1 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Router(config-if)#ex
Router(config)#int s0/0/1
Router(config-if)#ip add 172.16.10.5 255.25
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
                                      ^
% Invalid input detected at '^' marker.

Router(config-if)#ip add 172.16.10.5 255.255.255.252
Router(config-if)#no shutdown

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

Router(config)#router rip
Router(config-router)#network 172.16.10.0
Router(config-router)#network 10.10.10.0
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
```

PING máy với máy, máy với Router

```
Pinging 172.16.10.2 with 32 bytes of data:

Reply from 172.16.10.2: bytes=32 time=18ms TTL=255
Reply from 172.16.10.2: bytes=32 time=0ms TTL=255
Reply from 172.16.10.2: bytes=32 time=0ms TTL=255
Reply from 172.16.10.2: bytes=32 time=1ms TTL=255

Ping statistics for 172.16.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 18ms, Average = 4ms

PC>ping 172.16.10.1

Pinging 172.16.10.1 with 32 bytes of data:

Reply from 172.16.10.1: bytes=32 time=1ms TTL=254
Reply from 172.16.10.1: bytes=32 time=4ms TTL=254
Reply from 172.16.10.1: bytes=32 time=3ms TTL=254
Reply from 172.16.10.1: bytes=32 time=1ms TTL=254

Ping statistics for 172.16.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 4ms, Average = 2ms

PC>ping 10.10.10.10

Pinging 10.10.10.10 with 32 bytes of data:

Reply from 10.10.10.10: bytes=32 time=22ms TTL=126
Reply from 10.10.10.10: bytes=32 time=3ms TTL=126
Reply from 10.10.10.10: bytes=32 time=1ms TTL=126
Reply from 10.10.10.10: bytes=32 time=1ms TTL=126

Ping statistics for 10.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 22ms, Average = 6ms

PC>ping 192.168.20.10

Pinging 192.168.20.10 with 32 bytes of data:

Reply from 192.168.20.10: bytes=32 time=2ms TTL=125
Reply from 192.168.20.10: bytes=32 time=2ms TTL=125
Reply from 192.168.20.10: bytes=32 time=2ms TTL=125
Reply from 192.168.20.10: bytes=32 time=66ms TTL=125

Ping statistics for 192.168.20.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 66ms, Average = 18ms
```

Giải thích lệnh LAB02

-default-information originate: chỉ quảng bá tuyến default route vào những con chạy RIPv1 bên trong, con bên ngoài k cần tạo default route

-no router rip: tắt RIP

-no network x.x.x.x: tắt network x.x.x.x

-no router rip: tắt RIP

-shutdown ….. no shutdown: tắt và bật interface

-passive-interface fastethernet: vô hiệu hóa các bản cập nhật RIPv1

-router rip …… network x.x.x.x : mở RIP trên interface x.x.x.x

-copy run start: lưu cấu hình hiện tại từ DRAM vào NVRAM

-show ip protocols, show route rip: để hiện ra các ip protocols và route rip

-debug ip rip: bật chức năng debugging, hiển thị các thông điệp mô tả từng tuyến trong các gói gửi và nhận.

-undebug all: vô hiệu hóa chức năng debug.