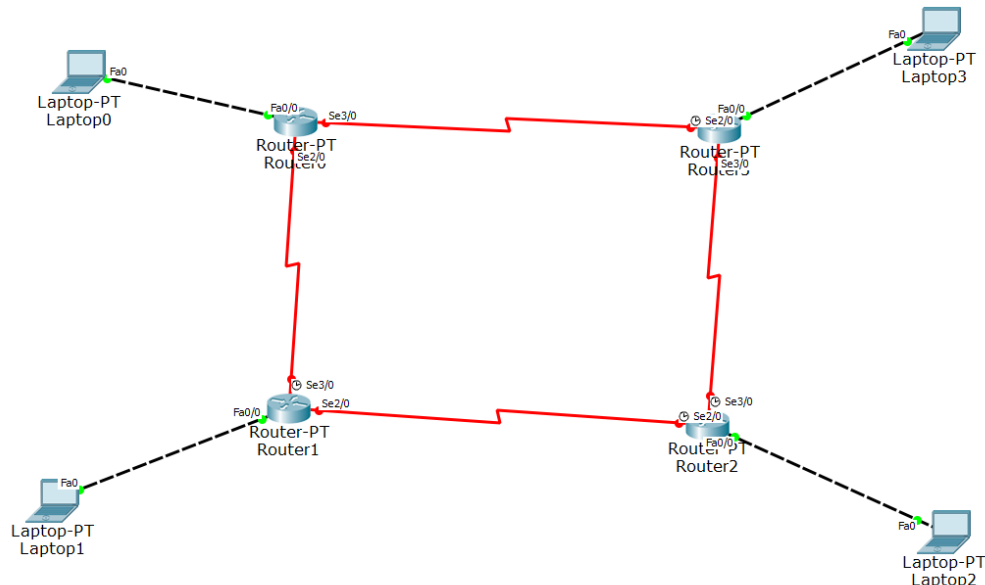


NATIONAL UNIVERSITY OF
COMPUTER & EMERGING SCIENCE
Computer Network Lab (CL3001)
Lab Session 10

Q1: Implement Subnetting with IP address of XX.XX.0.0/24. where xx is your roll no same are midterm. Then assign ip address in such a way that very less ip address should waste. Last run RIP routing protocol in such a way that all devices can communicate easily. What will be the administrative distance of the routing? Use figure 8 for your reference.

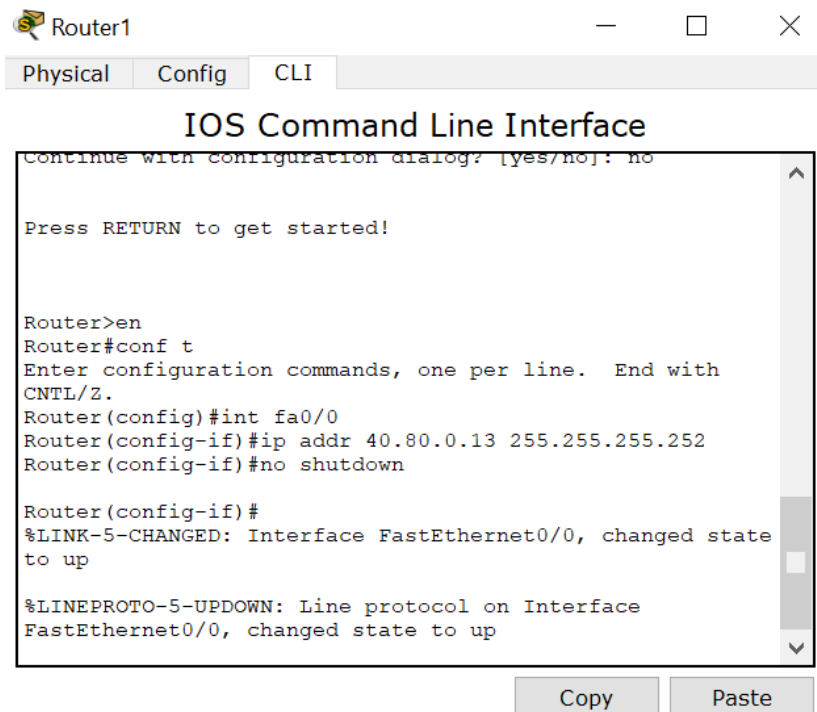


```
Router0
Physical Config CLI
IOS Command Line Interface

Router>en
Router#conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Router(config)#fa0/0
^
% Invalid input detected at '^' marker.

Router(config)#int fa0/0
Router(config-if)#ip addr 40.80.0.13 255.255.255.252
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
```



Router1

Physical Config CLI

IOS Command Line Interface

```
Continue with configuration dialog? [yes/no]: no

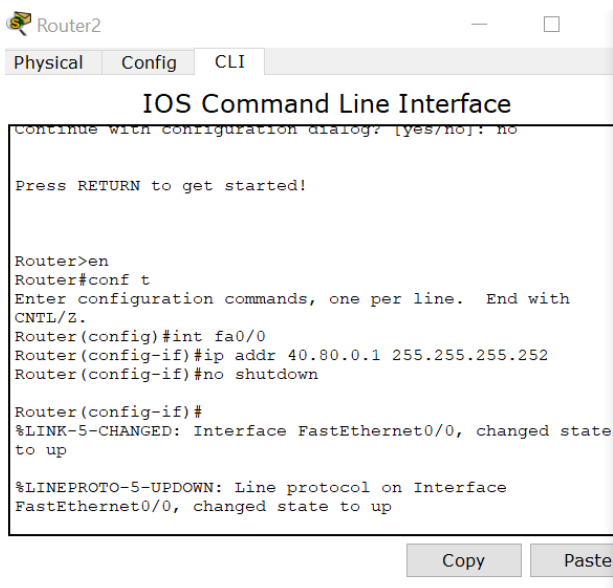
Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip addr 40.80.0.13 255.255.255.252
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
```

Copy Paste



Router2

Physical Config CLI

IOS Command Line Interface

```
Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip addr 40.80.0.1 255.255.255.252
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
```

Copy Paste



Router3

Physical Config CLI

IOS Command Line Interface

```
Continue with configuration dialog? [yes/no]: no

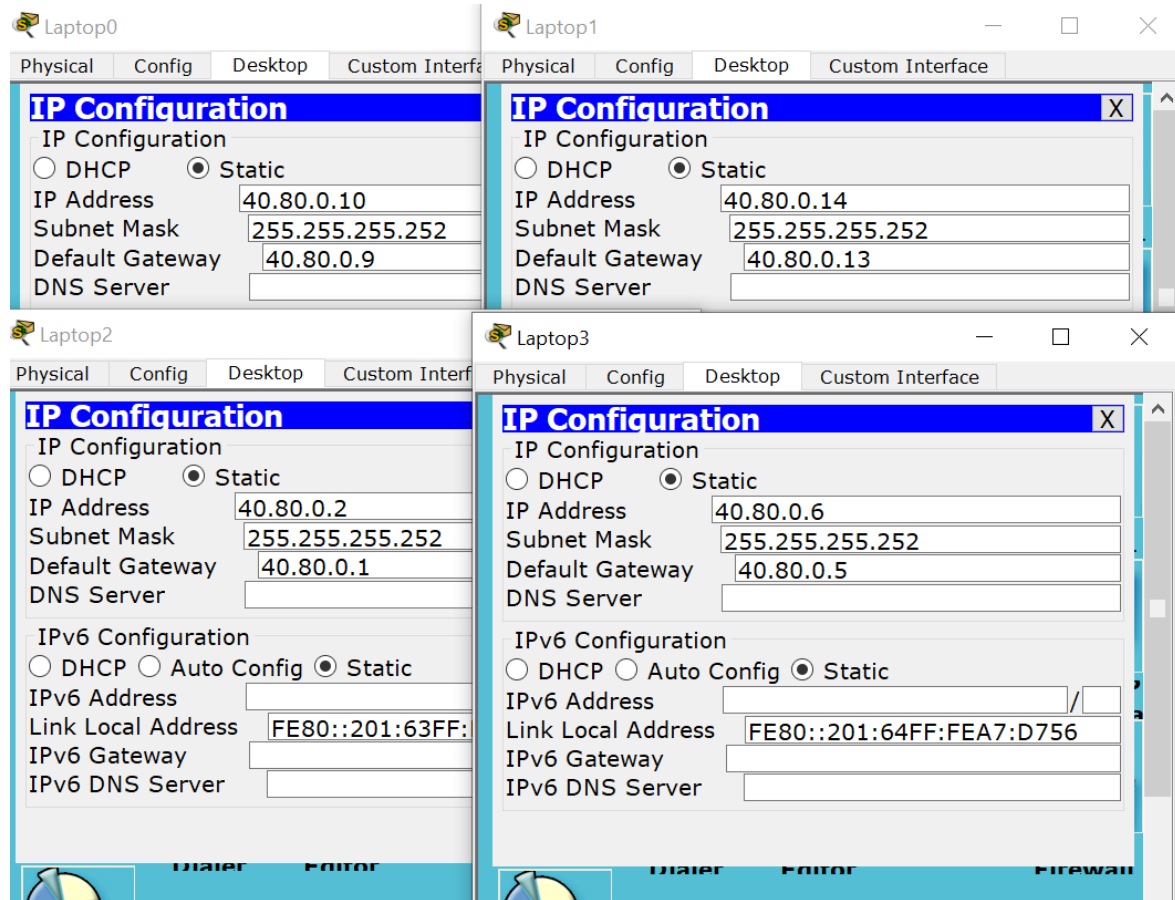
Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip addr 40.80.0.5 255.255.255.252
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
```

Copy Paste



The screenshot displays four Cisco Packet Tracer router configuration windows, each showing the configuration for a specific serial interface. The windows are titled Router0, Router2, Router1, and Router3. Each window has tabs for Physical, Config, and CLI. The Config tab is active, showing the configuration for the Serial2/0 interface. The configuration includes Port Status (On), Duplex (Full Duplex), Clock Rate (Not Set), IP Configuration (IP Address and Subnet Mask), and Tx Ring Limit (10). The IP addresses are 40.80.0.22 for Router0, 40.80.0.21 for Router2, 40.80.0.25 for Router1, and 40.80.0.26 for Router3. All subnets are 255.255.255.252. Below the configuration fields, there is a section for Equivalent IOS Commands, which includes the commands to configure the interface and set the IP address.

Router0

Serial2/0

Port Status: ☒ On

Duplex: ☐ Full Duplex

Clock Rate: Not Set

IP Configuration:

IP Address: 40.80.0.22

Subnet Mask: 255.255.255.252

Tx Ring Limit: 10

Router2

Serial2/0

Port Status: ☒ On

Duplex: ☐ Full Duplex

Clock Rate: Not Set

IP Configuration:

IP Address: 40.80.0.21

Subnet Mask: 255.255.255.252

Tx Ring Limit: 10

Router1

Serial2/0

Port Status: ☒ On

Duplex: ☐ Full Duplex

Clock Rate: Not Set

IP Configuration:

IP Address: 40.80.0.25

Subnet Mask: 255.255.255.252

Tx Ring Limit: 10

Router3

Serial2/0

Port Status: ☒ On

Duplex: ☐ Full Duplex

Clock Rate: Not Set

IP Configuration:

IP Address: 40.80.0.26

Subnet Mask: 255.255.255.252

Tx Ring Limit: 10

Equivalent IOS Commands

Router0:

```
Router(config-if)#  
%LINK-5-CHANGED: Interface Serial2/0, changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

Router2:

```
Router(config-if)#ip address 40.80.0.21 255.255.255.252  
Router(config-if)#no shutdown  
  
%LINK-5-CHANGED: Interface Serial2/0, changed state to down  
Router(config-if)#
```

Router1:

```
Router(config-if)#  
%LINK-5-CHANGED: Interface Serial2/0, changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

Router3:

```
Router(config-if)#ip address 40.80.0.26 255.255.255.252  
Router(config-if)#no shutdown  
  
%LINK-5-CHANGED: Interface Serial2/0, changed state to down  
Router(config-if)#
```

The screenshot displays two Cisco Packet Tracer router configuration windows, each showing the configuration for a specific serial interface. The windows are titled Router1 and Router2. Each window has tabs for Physical, Config, and CLI. The Config tab is active, showing the configuration for the Serial3/0 interface. The configuration includes Port Status (On), Duplex (Full Duplex), Clock Rate (Not Set), IP Configuration (IP Address and Subnet Mask), and Tx Ring Limit (10). The IP addresses are 40.80.0.17 for Router1 and 40.80.0.18 for Router2. All subnets are 255.255.255.252. Below the configuration fields, there is a section for Equivalent IOS Commands, which includes the commands to configure the interface and set the IP address.

Router1

Serial3/0

Port Status: ☒ On

Duplex: ☐ Full Duplex

Clock Rate: Not Set

IP Configuration:

IP Address: 40.80.0.17

Subnet Mask: 255.255.255.252

Tx Ring Limit: 10

Router2

Serial3/0

Port Status: ☒ On

Duplex: ☐ Full Duplex

Clock Rate: Not Set

IP Configuration:

IP Address: 40.80.0.18

Subnet Mask: 255.255.255.252

Tx Ring Limit: 10

Equivalent IOS Commands

Router1:

```
Router(config-if)#  
%LINK-5-CHANGED: Interface Serial3/0, changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
```

Router2:

```
Router(config-if)#  
%LINK-5-CHANGED: Interface Serial3/0, changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
```

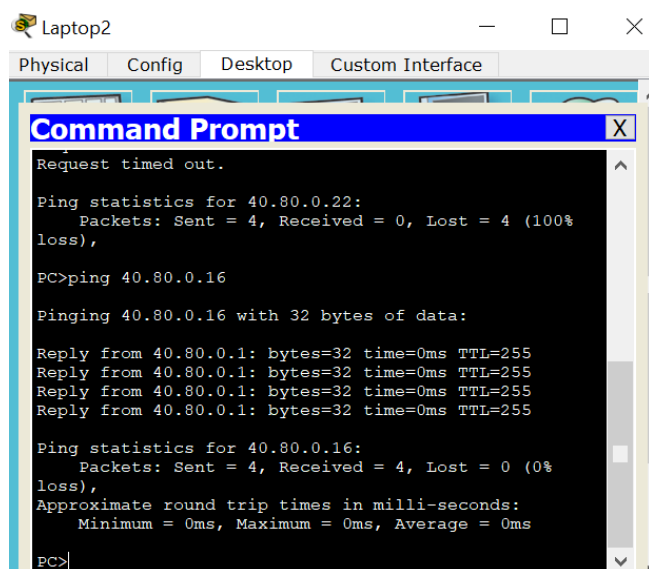
The image displays four screenshots of the Cisco IOS Command Line Interface (CLI) for different routers, showing configuration steps and route tables.

Router1: The CLI shows the configuration of interface Serial3/0 with IP address 40.80.0.17/24. The configuration includes enabling the interface, setting the IP address, and enabling RIP. The route table shows the network 40.80.0.0/30 is subnetted, with 3 subnets: 40.80.0.0/30 (FastEthernet0/0), 40.80.0.16/30 (Serial3/0), and 40.80.0.20/30 (Serial2/0).

Router0: The CLI shows the configuration of interface Serial2/0 with IP address 40.80.0.22/24. The configuration includes enabling the interface, setting the IP address, and enabling RIP. The route table shows the network 40.80.0.0/30 is subnetted, with 2 subnets: 40.80.0.12/30 (FastEthernet0/0) and 40.80.0.20/30 (Serial2/0).

Router2: The CLI shows the configuration of interface Serial3/0 with IP address 40.80.0.0/24. The configuration includes enabling the interface, setting the IP address, and enabling RIP. The route table shows the network 40.80.0.0/30 is subnetted, with 3 subnets: 40.80.0.0/30 (FastEthernet0/0), 40.80.0.16/30 (Serial3/0), and 40.80.0.20/30 (Serial2/0).

Router3: The CLI shows the configuration of interface Serial3/0 with IP address 40.80.0.4/24. The configuration includes enabling the interface, setting the IP address, and enabling RIP. The route table shows the network 40.80.0.0/30 is subnetted, with 2 subnets: 40.80.0.4/30 (FastEthernet0/0) and 40.80.0.24/30 (Serial3/0).



The screenshot shows a Packet Tracer interface with a 'Command Prompt' window open. The window title is 'Laptop2'. The tabs at the top are 'Physical', 'Config', 'Desktop', and 'Custom Interface'. The Command Prompt window has a blue title bar with 'Command Prompt' and a close button. The text inside the window is as follows:

```
Request timed out.

Ping statistics for 40.80.0.22:
    Packets: Sent = 4, Received = 0, Lost = 4 (100%
    loss),

PC>ping 40.80.0.16

Pinging 40.80.0.16 with 32 bytes of data:

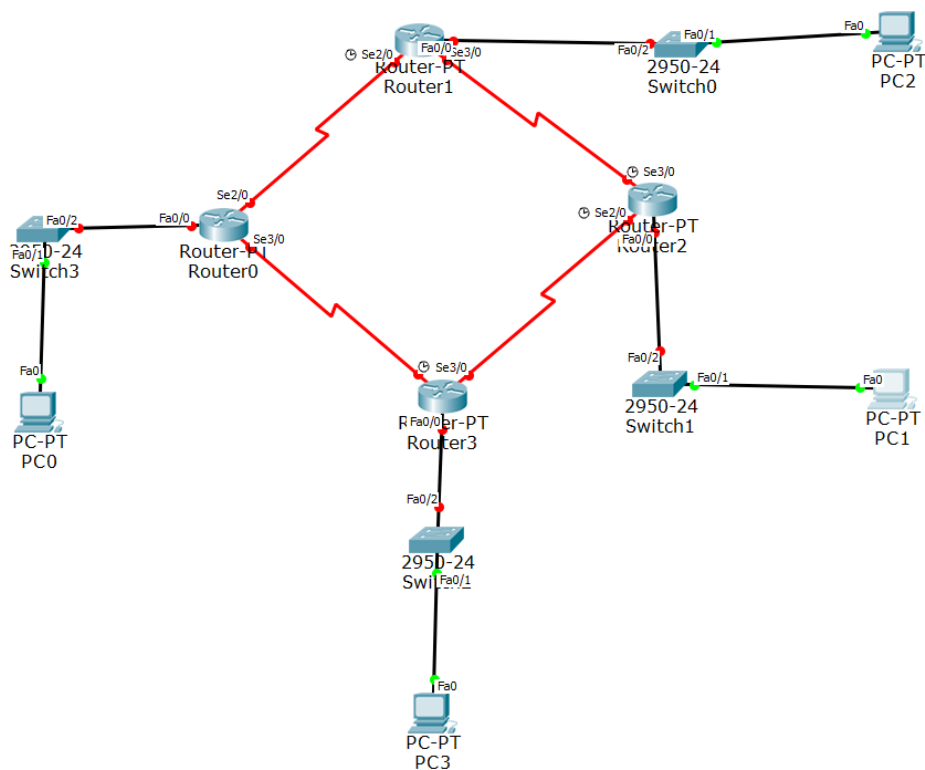
Reply from 40.80.0.1: bytes=32 time=0ms TTL=255
Reply from 40.80.0.1: bytes=32 time=0ms TTL=255
Reply from 40.80.0.1: bytes=32 time=0ms TTL=255
Reply from 40.80.0.1: bytes=32 time=0ms TTL=255

Ping statistics for 40.80.0.16:
    Packets: Sent = 4, Received = 4, Lost = 0 (0%
    loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>
```

The administrative distance of rip version2 is 120.

Q2: Implement Subnetting with IP address of 172.168.1.0/24. All the assignment of IP should be done dynamically in such a way that there should be less waste of Ips. Run the dynamic routing protocol with less administrative distance. What will be the administrative distance of the routing? Use Figure 9 as reference.



Router0

Physical Config CLI

IOS Command Line Interface

```

Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip addr 172.168.1.25 255.255.255.252
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

```

Router1

Physical Config CLI

IOS Command Line Interface

```

Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip addr 172.168.1.21 255.255.255.252
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

```

Router2

Physical Config CLI

IOS Command Line Interface

```

Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip addr 172.168.1.29 255.255.255.252
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

```

Router3

Physical Config CLI

IOS Command Line Interface

```

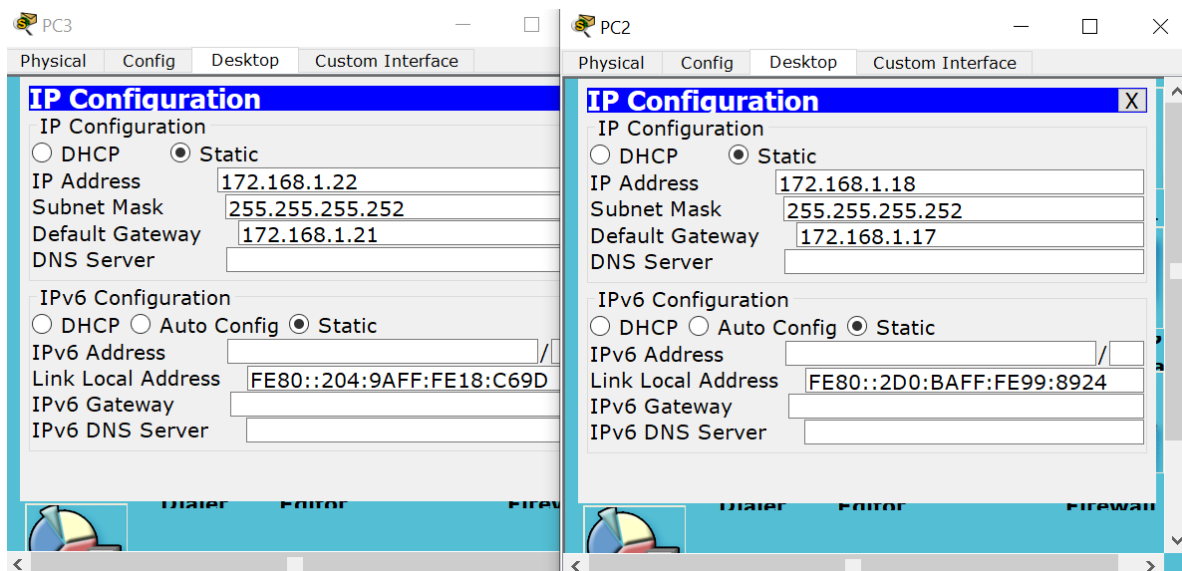
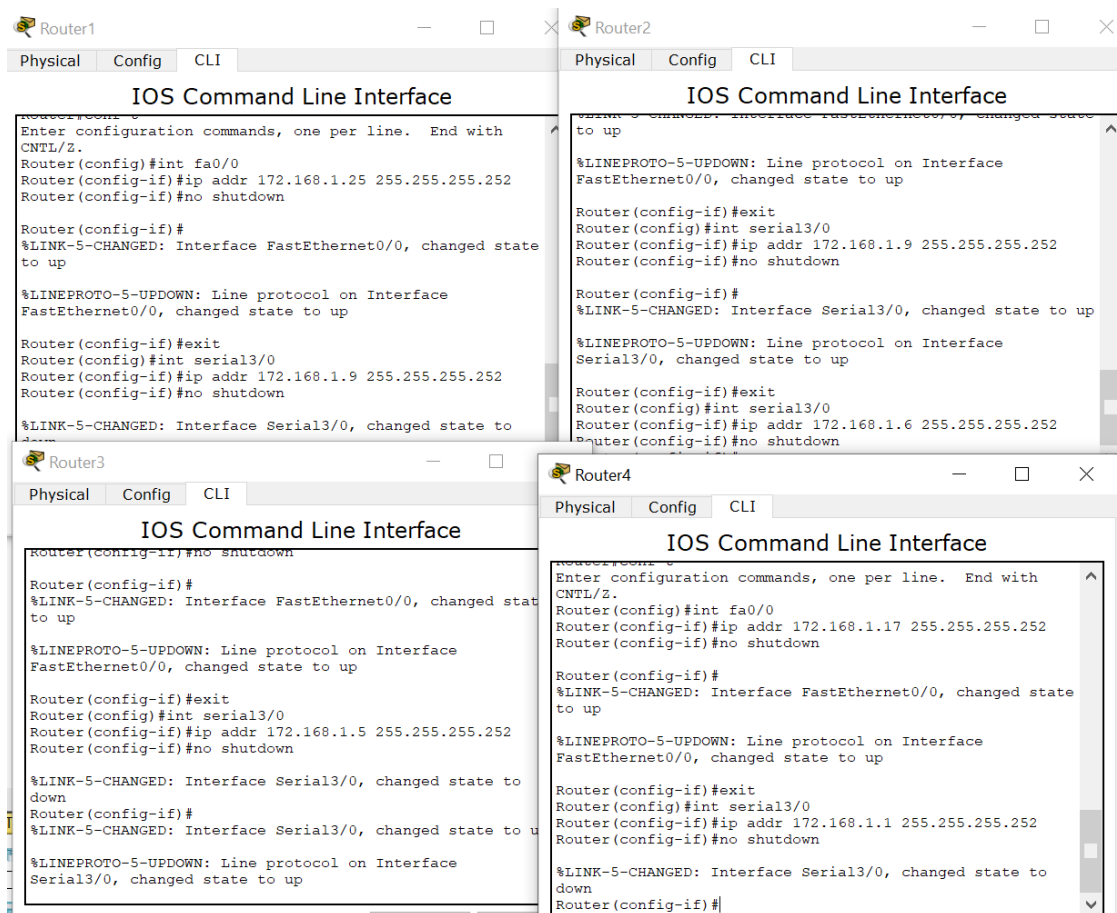
Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip addr 172.168.1.17 255.255.255.252
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

```

Wild card subnet mask calculation: $255.255.255.255 - 255.255.255.252 = 0.0.0.3$

Router1

Physical Config CLI

IOS Command Line Interface

```

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)#exit
Router(config)#int serial3/0
Router(config-if)#ip addr 172.168.1.9 255.255.255.252
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#router ospf 1
Router(config-router)#network 172.168.1.24 0.0.0.3 area 0
Router(config-router)#network 172.168.1.0 0.0.0.3 area 0
Router(config-router)#network 172.168.1.8 0.0.0.3 area 0
Router(config-router)#exit
Router(config)#

```

Router2

Physical Config CLI

IOS Command Line Interface

```

Router(config-if)#exit
Router(config)#int serial3/0
Router(config-if)#ip addr 172.168.1.9 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

Router(config-if)#exit
Router(config)#int serial3/0
Router(config-if)#ip addr 172.168.1.6 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#router ospf 1
Router(config-router)#network 172.168.1.20 0.0.0.3 area 0
Router(config-router)#network 172.168.1.4 0.0.0.3 area 0
Router(config-router)#network 172.168.1.8 0.0.0.3 area 0
Router(config-router)#exit
Router(config)#

```

Router3

Physical Config CLI

IOS Command Line Interface

```

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
^
% Invalid input detected at '^' marker.

Router(config)#router ospf 1
Router(config-router)#network 172.168.1.28 0.0.0.3 area 0
^
% Invalid input detected at '^' marker.

Router(config-router)#network 172.168.1.28 0.0.0.3 area 0
Router(config-router)#network 172.168.1.0 0.0.0.3 area 0
Router(config-router)#network 172.168.1.12 0.0.0.3 area 0
Router(config-router)#exit
Router(config)#

```

Router4

Physical Config CLI

IOS Command Line Interface

```

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 172.168.1.16 0.0.0.3 area 0
Router(config-router)#network 172.168.1.4 0.0.0.3 area 0
Router(config-router)#network 172.168.1.12 0.0.0.3 area 0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

```

Router4

Physical Config CLI

IOS Command Line Interface

```

%SYS-5-CONFIG_I: Configured from console by console

00:27:18: %OSPF-5-ADJCHG: Process 1, Nbr 172.168.1.21 on Serial3/0 from LOADING to FULL, Loading Done

00:30:27: %OSPF-5-ADJCHG: Process 1, Nbr 172.168.1.29 on Serial2/0 from LOADING to FULL, Loading Done

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

    172.168.0.0/30 is subnetted, 8 subnets
O       172.168.1.0 [110/128] via 172.168.1.14, 00:00:40, Serial2/0
C       172.168.1.4 is directly connected, Serial3/0
O       172.168.1.8 [110/128] via 172.168.1.6, 00:03:30, Serial3/0
C       172.168.1.12 is directly connected, Serial2/0
C       172.168.1.16 is directly connected, FastEthernet0/0
O       172.168.1.20 [110/65] via 172.168.1.6, 00:03:45, Serial3/0
O       172.168.1.24 [110/129] via 172.168.1.6, 00:00:40, Serial3/0
         [110/129] via 172.168.1.14, 00:00:40, Serial2/0
O       172.168.1.28 [110/65] via 172.168.1.14, 00:00:40, Serial2/0
Router#

```

Router1

Physical Config CLI

IOS Command Line Interface

```

Router(config)#
00:34:49: %OSPF-5-ADJCHG: Process 1, Nbr 172.168.1.29 on Serial3/0 from LOADING to
FULL, Loading Done

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

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

      172.168.0.0/30 is subnetted, 8 subnets
C       172.168.1.0 is directly connected, Serial3/0
O       172.168.1.4 [110/128] via 172.168.1.10, 00:03:01, Serial2/0
C       172.168.1.8 is directly connected, Serial2/0
O       172.168.1.12 [110/128] via 172.168.1.1, 00:01:38, Serial3/0
O       172.168.1.16 [110/129] via 172.168.1.1, 00:01:38, Serial3/0
          [110/129] via 172.168.1.10, 00:01:38, Serial2/0
O       172.168.1.20 [110/65] via 172.168.1.10, 00:03:01, Serial2/0
C       172.168.1.24 is directly connected, FastEthernet0/0
O       172.168.1.28 [110/65] via 172.168.1.1, 00:01:51, Serial3/0
Router#

```

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Router2

Physical Config CLI

IOS Command Line Interface

```

Router(config)#
00:33:32: %OSPF-5-ADJCHG: Process 1, Nbr 172.168.1.25 on Serial2/0 from LOADING to
FULL, Loading Done

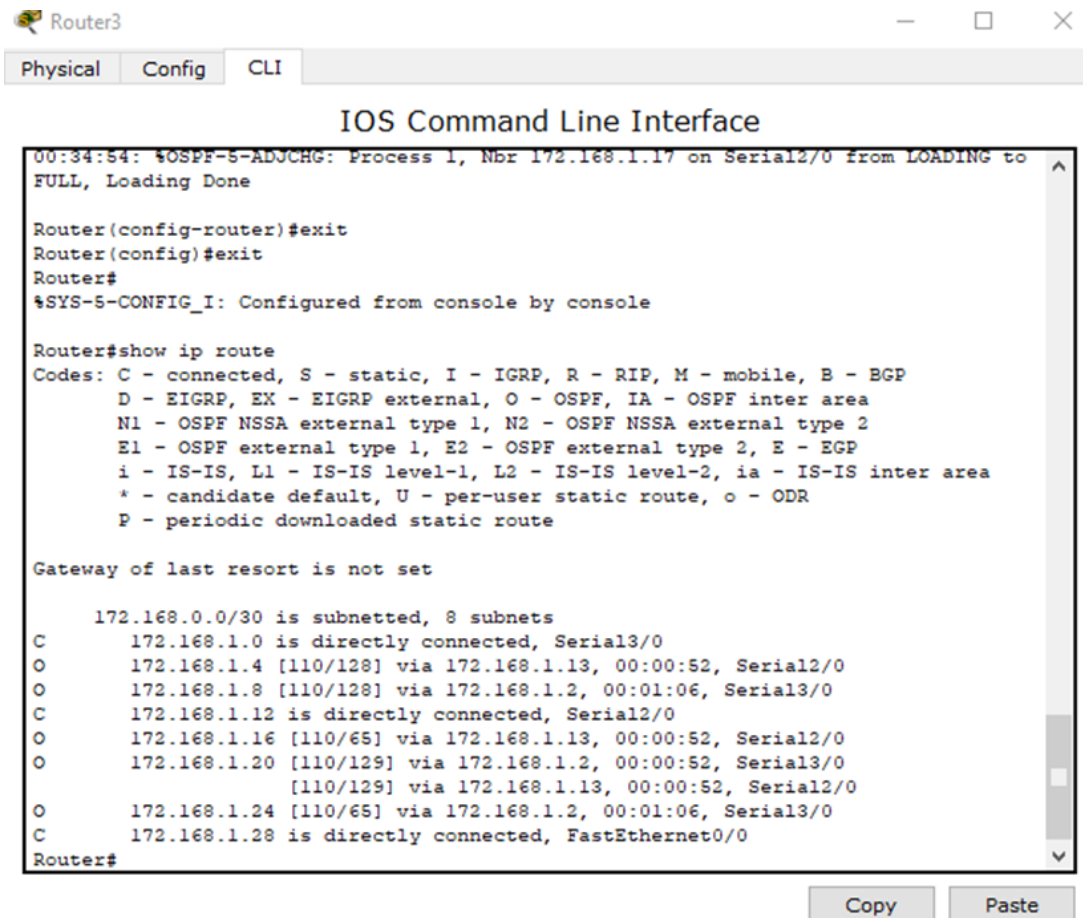
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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

      172.168.0.0/30 is subnetted, 8 subnets
O       172.168.1.0 [110/128] via 172.168.1.9, 00:02:49, Serial2/0
C       172.168.1.4 is directly connected, Serial3/0
C       172.168.1.8 is directly connected, Serial2/0
O       172.168.1.12 [110/128] via 172.168.1.5, 00:04:35, Serial3/0
O       172.168.1.16 [110/65] via 172.168.1.5, 00:04:35, Serial3/0
C       172.168.1.20 is directly connected, FastEthernet0/0
O       172.168.1.24 [110/65] via 172.168.1.9, 00:02:49, Serial2/0
O       172.168.1.28 [110/129] via 172.168.1.5, 00:01:29, Serial3/0
          [110/129] via 172.168.1.9, 00:01:29, Serial2/0
Router#

```



Router3

Physical Config CLI

IOS Command Line Interface

```

00:34:54: %OSPF-5-ADJCHG: Process 1, Nbr 172.168.1.17 on Serial2/0 from LOADING to
FULL, Loading Done

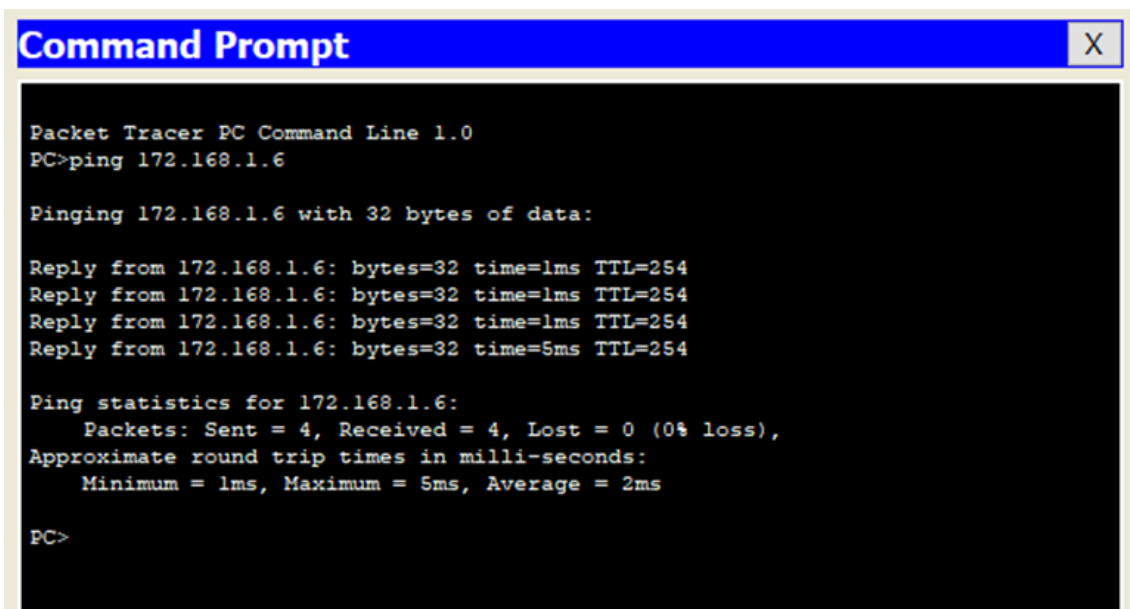
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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

    172.168.0.0/30 is subnetted, 8 subnets
C       172.168.1.0 is directly connected, Serial3/0
O       172.168.1.4 [110/128] via 172.168.1.13, 00:00:52, Serial2/0
O       172.168.1.8 [110/128] via 172.168.1.2, 00:01:06, Serial3/0
C       172.168.1.12 is directly connected, Serial2/0
O       172.168.1.16 [110/65] via 172.168.1.13, 00:00:52, Serial2/0
O       172.168.1.20 [110/129] via 172.168.1.2, 00:00:52, Serial3/0
           [110/129] via 172.168.1.13, 00:00:52, Serial2/0
O       172.168.1.24 [110/65] via 172.168.1.2, 00:01:06, Serial3/0
C       172.168.1.28 is directly connected, FastEthernet0/0
Router#
  
```

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Command Prompt

```

Packet Tracer PC Command Line 1.0
PC>ping 172.168.1.6

Pinging 172.168.1.6 with 32 bytes of data:

Reply from 172.168.1.6: bytes=32 time=1ms TTL=254
Reply from 172.168.1.6: bytes=32 time=1ms TTL=254
Reply from 172.168.1.6: bytes=32 time=1ms TTL=254
Reply from 172.168.1.6: bytes=32 time=5ms TTL=254

Ping statistics for 172.168.1.6:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 5ms, Average = 2ms

PC>
  
```

Administrative distance of OSPF is 110

Q3: Implement the subnetting on the given scenario of figure 10. You have to implement the static routing on the same. What will be the administrative distance of the routing?
Use Network Address as follows: 192.168.4.0/24.

The screenshot displays a network simulation environment with three routers and a PC. The routers' CLI windows show the following configurations:

Router0:

```
Router(config)#int fa0/0
Router(config-if)#ip addr 192.168.4.9 255.255.255.252
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)#exit
Router(config)#int serial2/0
Router(config-if)#ip addr 192.168.4.1 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

Router1:

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

Router(config-if)#int serial2/0
Router(config-if)#ip addr 192.168.4.2 255.255.255.252
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to down

Router(config-if)#exit
Router(config)#int serial3/0
Router(config-if)#ip addr 192.168.4.5 255.255.255.252
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial3/0, changed state to down

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

Router2:

```
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip addr 192.168.4.17 255.255.255.252
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)#int serial3/0
Router(config-if)#ip addr 192.168.4.17 255.255.255.252
% 192.168.4.16 overlaps with FastEthernet0/0
Router(config-if)#ip addr 192.168.4.6 255.255.255.252
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial3/0, changed state to down

Router(config-if)#
```

PC1:

IP Configuration

☐ DHCP ☒ Static

IP Address: 192.168.4.14

Subnet Mask: 255.255.255.252

Default Gateway: 192.168.4.13

DNS Server:

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address:

Link Local Address: FE80::2D0:97FF:FE92:7631

IPv6 Gateway:

IPv6 DNS Server:

The screenshot displays the configuration of three routers and a PC in Packet Tracer:

- Router0:**
 - Static Routes:**
 - Network: 192.168.4.12, Mask: 255.255.255.252, Next Hop: 192.168.4.2
 - INTERFACE:**
 - FastEthernet0/0: 192.168.4.12/30 via 192.168.4.2
- Router1:**
 - Static Routes:**
 - Network: 192.168.4.16, Mask: 255.255.255.252, Next Hop: 192.168.4.1
 - INTERFACE:**
 - FastEthernet0/0: 192.168.4.16/30 via 192.168.4.1
- Router2:**
 - Static Routes:**
 - Network: 192.168.4.12, Mask: 255.255.255.252, Next Hop: 192.168.4.5
 - INTERFACE:**
 - FastEthernet0/0: 192.168.4.12/30 via 192.168.4.5
- PC1:**
 - Command Prompt:**

```

Packet Tracer PC Command Line 1.0
PC>ping 192.168.4.1

Pinging 192.168.4.1 with 32 bytes of data:

Reply from 192.168.4.1: bytes=32 time=2ms TTL=254
Reply from 192.168.4.1: bytes=32 time=1ms TTL=254
Reply from 192.168.4.1: bytes=32 time=2ms TTL=254
Reply from 192.168.4.1: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0%
    loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms
          
```

Administrative distance of OSPF is 1

Q4: In what case we use static routing or dynamic routing given a topological reason for this question.

Static routing is mainly used to connect a smaller number of devices, whereas dynamic routing is used for larger networks in which multiple devices share data and network messages.