Default Route and its Configurations

Lab Exercises on November 26, 2020

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1 Objectives

- Familiarization with default route and its configuration.

2 Required Tools

2.1 Cisco Packet Tracer

Cisco Packet Tracer is a visual simulation software developed and distributed by Cisco Systems. Packet Tracer is a cross platform tool that allows simulated environment for modern computer network and network topologies.

3 Simulation Activities

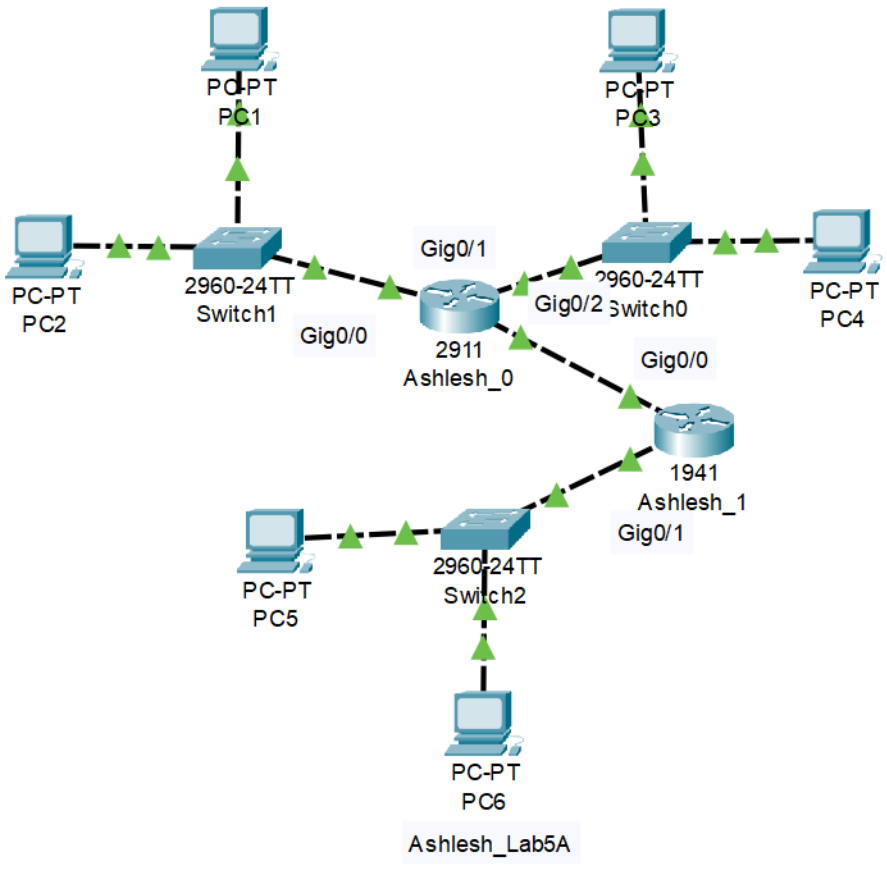

Figure 1: Simulated network for Activity A

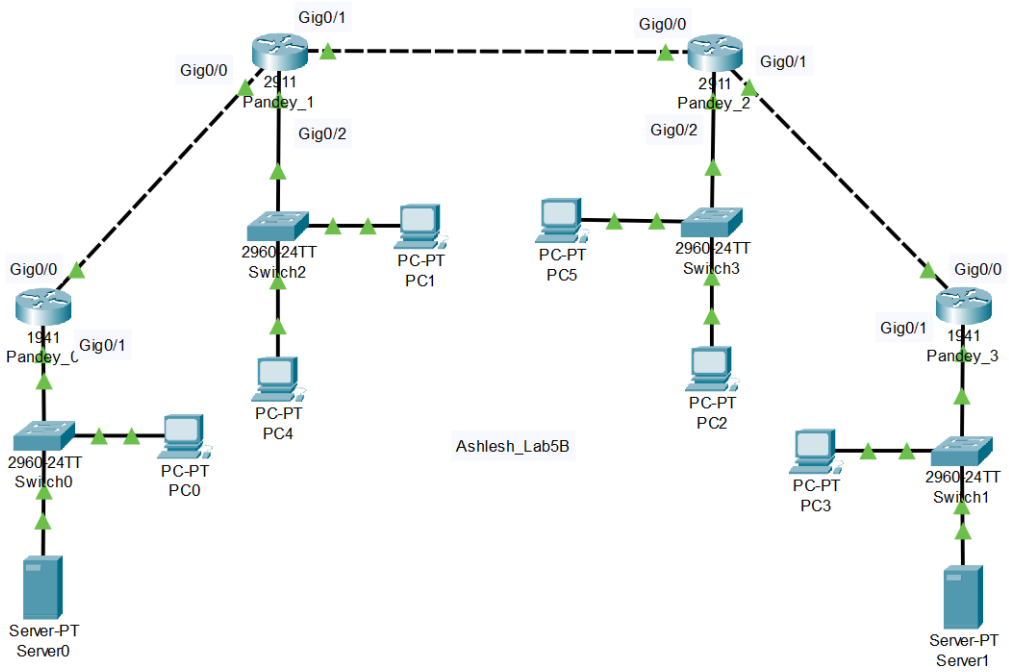

Figure 2: Simulated network for Activity B and C

4 Exercises

Problem 1
What is a default route? Explain its significance.

Default route is a special kind of static route that is defined as the route the packets take when a router can't locate the destination host within its routing table. Static routes are defined as pre-set routes for packets corresponding to certain network identifiers, but this process of assigning routes can become hectic if there are multiple destination hosts that eventually need the same router as the next hop coming from the host. This is solved by defining a static route such that the packets that don't correspond to any entries in the routing table are forwarded to the immediate router with most number of connection, hence making it the default route for packets. Real life sitaution where default routes are used can be found in ISPs where the packets that don't have the destination address in the routing table are forwarded to an upstream ISP.
The major significances of default route are:

- Reduction of entries in routing table.
- Reduction of latency within the router since unidentified packets are fowarded via the default route.

Problem 2
Explain the default route configuration command of router with its syntax.

```
ip route Destination_Network Subnet_Mask [next-hop-address or
                                          outgoing interface]
where,
Destination_Network ==> Destination network address [0.0.0.0]
Subnet_mask         ==> Subnet mask that reveals the network address
                        of destination [0.0.0.0]
```

```
next-hop-address or outgoing interface  ⟹  IP address of the nearest router in the path or the next interface
```

Listing 1: Syntax for configuring default route

Problem 3
Note down the observations of each step with necessary commands specified in activities A, B and C mentioned above and comment on it.

a. Activity A

Sub activity 1

The network shown in Figure 1 is created using Packet Tracer with basic settings as,

PC	IP address	Subnet mask
1	200.20.20.2	255.255.255.0
2	200.20.20.3	255.255.255.0
3	200.20.21.2	255.255.255.0
4	200.20.21.3	255.255.255.0
5	200.20.23.2	255.255.255.0
6	200.20.23.3	255.255.255.0

Note: The ip addressess and subnet masks are set using the IP configuration application. The default gateways for the PCs were also set as, PC1 and PC2: 200.20.20.1, PC3 and PC4: 200.20.21.1, PC5 and PC6: 200.20.23.1

Table 1: IP address and subnet masks for the PCs in the network

The gigabitethernet interfaces on the routers were set as,

Gigabitethernet interfaces	IP address	Subnet mask
Router 0: 0/0	200.20.20.1	255.255.255.0
Router 0: 0/1	200.20.21.1	255.255.255.0
Router 0: 0/2	200.20.22.1	255.255.255.0
Router 1: 0/0	200.20.22.2	255.255.255.0
Router 1: 0/1	200.20.23.1	255.255.255.0

Note: The ip addressess and subnet masks are set using the commands enlisted in Listings 2 and 3

Table 2: IP address and subnet masks for the gigabitethernet interfaces on the routers

```
Router>enable
Router#config terminal
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#ip address 200.20.20.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#interface gigabitEthernet 0/1
```

```
Router(config-if)#ip address 200.20.21.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#interface gigabitEthernet 0/2
Router(config-if)#ip address 200.20.22.1
Router(config-if)#ip address 200.20.22.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#exit
Router#
Router#disable
Router>
```

Listing 2: Syntax for configuring interfaces on Router 0

```
Router>enable
Router#configure terminal
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#ip address 200.20.22.2 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#interface gigabitEthernet 0/1
Router(config-if)#ip address 200.20.23.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#exit
Router#
Router#disable
Router>
```

Listing 3: Syntax for configuring interfaces on Router 1

Sub activity 2

```
C:\>ping 200.20.20.2

Pinging 200.20.20.2 with 32 bytes of data:

Reply from 200.20.20.2: bytes=32 time=1ms TTL=128
Reply from 200.20.20.2: bytes=32 time<1ms TTL=128
Reply from 200.20.20.2: bytes=32 time<1ms TTL=128
Reply from 200.20.20.2: bytes=32 time<1ms TTL=128
```

```
Ping statistics for 200.20.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 4: Observation for ping test from PC2 to PC1

```
C:\>ping 200.20.21.2

Pinging 200.20.21.2 with 32 bytes of data:

Reply from 200.20.21.2: bytes=32 time<1ms TTL=127
Reply from 200.20.21.2: bytes=32 time<1ms TTL=127
Reply from 200.20.21.2: bytes=32 time<1ms TTL=127
Reply from 200.20.21.2: bytes=32 time<1ms TTL=127

Ping statistics for 200.20.21.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 5: Observation for ping test from PC2 to PC3

```
C:\>ping 200.20.23.2

Pinging 200.20.23.2 with 32 bytes of data:

Reply from 200.20.20.1: Destination host unreachable.
Reply from 200.20.20.1: Destination host unreachable.
Reply from 200.20.20.1: Destination host unreachable.
Reply from 200.20.20.1: Destination host unreachable.

Ping statistics for 200.20.23.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 6: Observation for ping test from PC2 to PC5

```
C:\>ping 200.20.20.1

Pinging 200.20.20.1 with 32 bytes of data:

Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time=1ms TTL=255

Ping statistics for 200.20.20.1:
```

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

Listing 7: Observation for ping test from PC2 to Router 0: 0/0

```
C:\>ping 200.20.21.1

Pinging 200.20.21.1 with 32 bytes of data:

Reply from 200.20.21.1: bytes=32 time=1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.21.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 8: Observation for ping test from PC2 to Router 0: 0/1

```
C:\>ping 200.20.22.1

Pinging 200.20.22.1 with 32 bytes of data:

Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.22.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 9: Observation for ping test from PC2 to Router 0: 0/2

```
C:\>ping 200.20.22.2

Pinging 200.20.22.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.
```

```
Ping statistics for 200.20.22.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 10: Observation for ping test from PC2 to Router 1: 0/0

```
C:\>ping 200.20.23.1

Pinging 200.20.23.1 with 32 bytes of data:

Reply from 200.20.20.1: Destination host unreachable.
Reply from 200.20.20.1: Destination host unreachable.
Reply from 200.20.20.1: Destination host unreachable.
Reply from 200.20.20.1: Destination host unreachable.

Ping statistics for 200.20.23.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 11: Observation for ping test from PC2 to Router 1: 0/1

Sending Host	Destination	Ping status
PC2	PC1 PC2 PC3 PC4	Successful
	PC5 PC6	Destination host unreachable
	Router0: 0/0 Router0: 0/1 Router0: 0/2	Successful
	Router1: 0/0	Request timed out
	Router1: 0/1	Destination host unreachable

Table 3: Observation for ping tests from PC2 to other PCs and router interfaces

Sub activity 3

```
C:\>ping 200.20.20.2

Pinging 200.20.20.2 with 32 bytes of data:

Reply from 200.20.20.2: bytes=32 time<1ms TTL=127
Reply from 200.20.20.2: bytes=32 time<1ms TTL=127
Reply from 200.20.20.2: bytes=32 time<1ms TTL=127
Reply from 200.20.20.2: bytes=32 time<1ms TTL=127

Ping statistics for 200.20.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 12: Observation for ping test from PC4 to PC1

```
C:\>ping 200.20.21.2

Pinging 200.20.21.2 with 32 bytes of data:

Reply from 200.20.21.2: bytes=32 time<1ms TTL=128
Reply from 200.20.21.2: bytes=32 time<1ms TTL=128
Reply from 200.20.21.2: bytes=32 time<1ms TTL=128
Reply from 200.20.21.2: bytes=32 time<1ms TTL=128

Ping statistics for 200.20.21.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 13: Observation for ping test from PC4 to PC3

```
C:\>ping 200.20.23.2

Pinging 200.20.23.2 with 32 bytes of data:

Reply from 200.20.21.1: Destination host unreachable.
Reply from 200.20.21.1: Destination host unreachable.
Reply from 200.20.21.1: Destination host unreachable.
Reply from 200.20.21.1: Destination host unreachable.

Ping statistics for 200.20.23.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 14: Observation for ping test from PC4 to PC5

```
C:\>ping 200.20.20.1

Pinging 200.20.20.1 with 32 bytes of data:

Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
```

```
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 15: Observation for ping test from PC4 to Router 0: 0/0

```
C:\>ping 200.20.21.1

Pinging 200.20.21.1 with 32 bytes of data:

Reply from 200.20.21.1: bytes=32 time<1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.21.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 16: Observation for ping test from PC4 to Router 0: 0/1

```
C:\>ping 200.20.22.1

Pinging 200.20.22.1 with 32 bytes of data:

Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.22.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 17: Observation for ping test from PC4 to Router 0: 0/2

```
C:\>ping 200.20.22.2

Pinging 200.20.22.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 200.20.22.2:
```

```
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 18: Observation for ping test from PC4 to Router 1: 0/0

```
C:\>ping 200.20.23.1

Pinging 200.20.23.1 with 32 bytes of data:

Reply from 200.20.21.1: Destination host unreachable.
Reply from 200.20.21.1: Destination host unreachable.
Reply from 200.20.21.1: Destination host unreachable.
Reply from 200.20.21.1: Destination host unreachable.

Ping statistics for 200.20.23.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 19: Observation for ping test from PC4 to Router 1: 0/1

Sending Host	Destination	Ping status
PC4	PC1 PC2 PC3 PC4	Successful
	PC5 PC6	Destination host unreachable
	Router0: 0/0 Router0: 0/1 Router0: 0/2	Successful
	Router1: 0/0	Request timed out
	Router1: 0/1	Destination host unreachable

Table 4: Observation for ping tests from PC4 to other PCs and router interfaces

Sub activity 4

```
C:\>ping 200.20.20.2

Pinging 200.20.20.2 with 32 bytes of data:

Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.

Ping statistics for 200.20.20.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 20: Observation for ping test from PC6 to PC1

```
C:\>ping 200.20.21.2

Pinging 200.20.21.2 with 32 bytes of data:

Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.

Ping statistics for 200.20.21.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 21: Observation for ping test from PC6 to PC3

```
C:\>ping 200.20.23.2

Pinging 200.20.23.2 with 32 bytes of data:

Reply from 200.20.23.2: bytes=32 time<1ms TTL=128
Reply from 200.20.23.2: bytes=32 time<1ms TTL=128
Reply from 200.20.23.2: bytes=32 time<1ms TTL=128
Reply from 200.20.23.2: bytes=32 time<1ms TTL=128

Ping statistics for 200.20.23.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 22: Observation for ping test from PC6 to PC5

```
C:\>ping 200.20.20.1

Pinging 200.20.20.1 with 32 bytes of data:

Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.

Ping statistics for 200.20.20.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 23: Observation for ping test from PC6 to Router 0: 0/0

```
C:\>ping 200.20.21.1

Pinging 200.20.21.1 with 32 bytes of data:

Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.
Reply from 200.20.23.1: Destination host unreachable.

Ping statistics for 200.20.21.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 24: Observation for ping test from PC6 to Router 0: 0/1

```
C:\>ping 200.20.22.1

Pinging 200.20.22.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 200.20.22.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 25: Observation for ping test from PC6 to Router 0: 0/2

```
C:\>ping 200.20.22.2

Pinging 200.20.22.2 with 32 bytes of data:

Reply from 200.20.22.2: bytes=32 time<1ms TTL=255
Reply from 200.20.22.2: bytes=32 time<1ms TTL=255
Reply from 200.20.22.2: bytes=32 time<1ms TTL=255
Reply from 200.20.22.2: bytes=32 time=8ms TTL=255

Ping statistics for 200.20.22.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 8ms, Average = 2ms
```

Listing 26: Observation for ping test from PC6 to Router 1: 0/0

```
C:\>ping 200.20.23.1

Pinging 200.20.23.1 with 32 bytes of data:

Reply from 200.20.23.1: bytes=32 time<1ms TTL=255
Reply from 200.20.23.1: bytes=32 time<1ms TTL=255
Reply from 200.20.23.1: bytes=32 time<1ms TTL=255
Reply from 200.20.23.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.23.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 27: Observation for ping test from PC6 to Router 1: 0/1

Sending Host	Destination	Ping status
PC6	PC1 PC2 PC3 PC4	Destination host unreachable
	PC5 PC6	Successful
	Router0: 0/0 Router0: 0/1	Destination host unreachable
	Router0: 0/2	Request timed out
	Router1: 0/0 Router1: 0/1	Successful

Table 5: Observation for ping tests from PC6 to other PCs and router interfaces

Sub activity 5

```
Router>enable
Router#config terminal
Router(config)#ip route 0.0.0.0 0.0.0.0 200.20.22.2
Router(config)#exit

Router#show ip route
Codes: L - local, C - connected, S - static, 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 200.20.22.2 to network 0.0.0.0

     200.20.20.0/24 is variably subnetted, 2 subnets, 2 masks
C       200.20.20.0/24 is directly connected, GigabitEthernet0/0
L       200.20.20.1/32 is directly connected, GigabitEthernet0/0
     200.20.21.0/24 is variably subnetted, 2 subnets, 2 masks
C       200.20.21.0/24 is directly connected, GigabitEthernet0/1
L       200.20.21.1/32 is directly connected, GigabitEthernet0/1
     200.20.22.0/24 is variably subnetted, 2 subnets, 2 masks
C       200.20.22.0/24 is directly connected, GigabitEthernet0/2
L       200.20.22.1/32 is directly connected, GigabitEthernet0/2
S*   0.0.0.0/0 [1/0] via 200.20.22.2
```

Listing 28: Observation for setting default route in Router 0 followed by show ip route

```
Router>enable
Router#config terminal
Router(config)#ip route 0.0.0.0 0.0.0.0 200.20.22.1
Router(config)#exit

Router#show ip route
Codes: L - local, C - connected, S - static, 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 200.20.22.1 to network 0.0.0.0

     200.20.22.0/24 is variably subnetted, 2 subnets, 2 masks
C       200.20.22.0/24 is directly connected, GigabitEthernet0/0
L       200.20.22.2/32 is directly connected, GigabitEthernet0/0
     200.20.23.0/24 is variably subnetted, 2 subnets, 2 masks
C       200.20.23.0/24 is directly connected, GigabitEthernet0/1
L       200.20.23.1/32 is directly connected, GigabitEthernet0/1
S*   0.0.0.0/0 [1/0] via 200.20.22.1
```

Listing 29: Observation for setting default route in Router 1 followed by show ip route

Once the default route is added in Router 0 and Router 1 with the next hop being 200.20.22.2 and 200.20.22.1 respectively, the entries in the routing table are changed with entries as S* where the S denotes static and * denotes the default candidate. Also, the gateway for last resort is set to 200.20.22.2 and 200.20.22.1

respectively for the network 0.0.0.0 which also indicates the configured default route.

Sub activity 6

```
C:\>ping 200.20.20.2

Pinging 200.20.20.2 with 32 bytes of data:

Reply from 200.20.20.2: bytes=32 time=1ms TTL=128
Reply from 200.20.20.2: bytes=32 time<1ms TTL=128
Reply from 200.20.20.2: bytes=32 time<1ms TTL=128
Reply from 200.20.20.2: bytes=32 time<1ms TTL=128

Ping statistics for 200.20.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 30: Observation for ping test from PC2 to PC1

```
C:\>ping 200.20.21.2

Pinging 200.20.21.2 with 32 bytes of data:

Reply from 200.20.21.2: bytes=32 time<1ms TTL=127
Reply from 200.20.21.2: bytes=32 time<1ms TTL=127
Reply from 200.20.21.2: bytes=32 time<1ms TTL=127
Reply from 200.20.21.2: bytes=32 time<1ms TTL=127

Ping statistics for 200.20.21.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 31: Observation for ping test from PC2 to PC3

```
C:\>ping 200.20.23.2

Pinging 200.20.23.2 with 32 bytes of data:

Reply from 200.20.23.2: bytes=32 time=15ms TTL=126
Reply from 200.20.23.2: bytes=32 time<1ms TTL=126
Reply from 200.20.23.2: bytes=32 time<1ms TTL=126
Reply from 200.20.23.2: bytes=32 time<1ms TTL=126

Ping statistics for 200.20.23.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 15ms, Average = 3ms
```

Listing 32: Observation for ping test from PC2 to PC5

```
C:\>ping 200.20.20.1

Pinging 200.20.20.1 with 32 bytes of data:

Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time=1ms TTL=255

Ping statistics for 200.20.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 33: Observation for ping test from PC2 to Router 0: 0/0

```
C:\>ping 200.20.21.1

Pinging 200.20.21.1 with 32 bytes of data:

Reply from 200.20.21.1: bytes=32 time=1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.21.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 34: Observation for ping test from PC2 to Router 0: 0/1

```
C:\>ping 200.20.22.1

Pinging 200.20.22.1 with 32 bytes of data:

Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.22.1:
```

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

Listing 35: Observation for ping test from PC2 to Router 0: 0/2

```
C:\>ping 200.20.22.2

Pinging 200.20.22.2 with 32 bytes of data:

Reply from 200.20.22.2: bytes=32 time<1ms TTL=254
Reply from 200.20.22.2: bytes=32 time=1ms TTL=254
Reply from 200.20.22.2: bytes=32 time<1ms TTL=254
Reply from 200.20.22.2: bytes=32 time<1ms TTL=254

Ping statistics for 200.20.22.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 36: Observation for ping test from PC2 to Router 1: 0/0

```
C:\>ping 200.20.23.1

Pinging 200.20.23.1 with 32 bytes of data:

Reply from 200.20.23.1: bytes=32 time<1ms TTL=254
Reply from 200.20.23.1: bytes=32 time<1ms TTL=254
Reply from 200.20.23.1: bytes=32 time<1ms TTL=254
Reply from 200.20.23.1: bytes=32 time<1ms TTL=254

Ping statistics for 200.20.23.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 37: Observation for ping test from PC2 to Router 1: 0/1

```
C:\>ping 200.20.20.2

Pinging 200.20.20.2 with 32 bytes of data:

Reply from 200.20.20.2: bytes=32 time<1ms TTL=127
Reply from 200.20.20.2: bytes=32 time<1ms TTL=127
Reply from 200.20.20.2: bytes=32 time<1ms TTL=127
Reply from 200.20.20.2: bytes=32 time<1ms TTL=127
```

```
Ping statistics for 200.20.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 38: Observation for ping test from PC4 to PC1

```
C:\>ping 200.20.21.2

Pinging 200.20.21.2 with 32 bytes of data:

Reply from 200.20.21.2: bytes=32 time<1ms TTL=128
Reply from 200.20.21.2: bytes=32 time<1ms TTL=128
Reply from 200.20.21.2: bytes=32 time<1ms TTL=128
Reply from 200.20.21.2: bytes=32 time<1ms TTL=128

Ping statistics for 200.20.21.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 39: Observation for ping test from PC4 to PC3

```
C:\>ping 200.20.23.2

Pinging 200.20.23.2 with 32 bytes of data:

Reply from 200.20.23.2: bytes=32 time<1ms TTL=126
Reply from 200.20.23.2: bytes=32 time<1ms TTL=126
Reply from 200.20.23.2: bytes=32 time<1ms TTL=126
Reply from 200.20.23.2: bytes=32 time<1ms TTL=126

Ping statistics for 200.20.23.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 40: Observation for ping test from PC4 to PC5

```
C:\>ping 200.20.20.1

Pinging 200.20.20.1 with 32 bytes of data:

Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
Reply from 200.20.20.1: bytes=32 time<1ms TTL=255
```

```
Ping statistics for 200.20.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 41: Observation for ping test from PC4 to Router 0: 0/0

```
C:\>ping 200.20.21.1

Pinging 200.20.21.1 with 32 bytes of data:

Reply from 200.20.21.1: bytes=32 time<1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255
Reply from 200.20.21.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.21.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 42: Observation for ping test from PC4 to Router 0: 0/1

```
C:\>ping 200.20.22.1

Pinging 200.20.22.1 with 32 bytes of data:

Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255
Reply from 200.20.22.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.22.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 43: Observation for ping test from PC4 to Router 0: 0/2

```
C:\>ping 200.20.22.2

Pinging 200.20.22.2 with 32 bytes of data:

Reply from 200.20.22.2: bytes=32 time<1ms TTL=254
Reply from 200.20.22.2: bytes=32 time<1ms TTL=254
Reply from 200.20.22.2: bytes=32 time=1ms TTL=254
```

```
Reply from 200.20.22.2: bytes=32 time<1ms TTL=254

Ping statistics for 200.20.22.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 44: Observation for ping test from PC4 to Router 1: 0/0

```
C:\>ping 200.20.23.1

Pinging 200.20.23.1 with 32 bytes of data:

Reply from 200.20.23.1: bytes=32 time<1ms TTL=254
Reply from 200.20.23.1: bytes=32 time=13ms TTL=254
Reply from 200.20.23.1: bytes=32 time<1ms TTL=254
Reply from 200.20.23.1: bytes=32 time<1ms TTL=254

Ping statistics for 200.20.23.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 13ms, Average = 3ms
```

Listing 45: Observation for ping test from PC4 to Router 1: 0/1

```
C:\>ping 200.20.20.2

Pinging 200.20.20.2 with 32 bytes of data:

Reply from 200.20.20.2: bytes=32 time<1ms TTL=126
Reply from 200.20.20.2: bytes=32 time<1ms TTL=126
Reply from 200.20.20.2: bytes=32 time<1ms TTL=126
Reply from 200.20.20.2: bytes=32 time<1ms TTL=126

Ping statistics for 200.20.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 46: Observation for ping test from PC6 to PC1

```
C:\>ping 200.20.21.2

Pinging 200.20.21.2 with 32 bytes of data:

Reply from 200.20.21.2: bytes=32 time<1ms TTL=126
Reply from 200.20.21.2: bytes=32 time<1ms TTL=126
```

```
Reply from 200.20.21.2: bytes=32 time<1ms TTL=126
Reply from 200.20.21.2: bytes=32 time<1ms TTL=126

Ping statistics for 200.20.21.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 47: Observation for ping test from PC6 to PC3

```
C:\>ping 200.20.23.2

Pinging 200.20.23.2 with 32 bytes of data:

Reply from 200.20.23.2: bytes=32 time<1ms TTL=128
Reply from 200.20.23.2: bytes=32 time<1ms TTL=128
Reply from 200.20.23.2: bytes=32 time=8ms TTL=128
Reply from 200.20.23.2: bytes=32 time<1ms TTL=128

Ping statistics for 200.20.23.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 8ms, Average = 2ms
```

Listing 48: Observation for ping test from PC6 to PC5

```
C:\>ping 200.20.20.1

Pinging 200.20.20.1 with 32 bytes of data:

Reply from 200.20.20.1: bytes=32 time<1ms TTL=254
Reply from 200.20.20.1: bytes=32 time<1ms TTL=254
Reply from 200.20.20.1: bytes=32 time<1ms TTL=254
Reply from 200.20.20.1: bytes=32 time=1ms TTL=254

Ping statistics for 200.20.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 49: Observation for ping test from PC6 to Router 0: 0/0

```
C:\>ping 200.20.21.1

Pinging 200.20.21.1 with 32 bytes of data:

Reply from 200.20.21.1: bytes=32 time=2ms TTL=254
```

```
Reply from 200.20.21.1: bytes=32 time<1ms TTL=254
Reply from 200.20.21.1: bytes=32 time<1ms TTL=254
Reply from 200.20.21.1: bytes=32 time<1ms TTL=254

Ping statistics for 200.20.21.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms
```

Listing 50: Observation for ping test from PC6 to Router 0: 0/1

```
C:\>ping 200.20.22.1

Pinging 200.20.22.1 with 32 bytes of data:

Reply from 200.20.22.1: bytes=32 time<1ms TTL=254
Reply from 200.20.22.1: bytes=32 time<1ms TTL=254
Reply from 200.20.22.1: bytes=32 time<1ms TTL=254
Reply from 200.20.22.1: bytes=32 time<1ms TTL=254

Ping statistics for 200.20.22.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 51: Observation for ping test from PC6 to Router 0: 0/2

```
C:\>ping 200.20.22.2

Pinging 200.20.22.2 with 32 bytes of data:

Reply from 200.20.22.2: bytes=32 time=1ms TTL=255
Reply from 200.20.22.2: bytes=32 time<1ms TTL=255
Reply from 200.20.22.2: bytes=32 time<1ms TTL=255
Reply from 200.20.22.2: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.22.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 52: Observation for ping test from PC6 to Router 1: 0/0

```
C:\>ping 200.20.23.1

Pinging 200.20.23.1 with 32 bytes of data:
```

```
Reply from 200.20.23.1: bytes=32 time<1ms TTL=255
Reply from 200.20.23.1: bytes=32 time<1ms TTL=255
Reply from 200.20.23.1: bytes=32 time<1ms TTL=255
Reply from 200.20.23.1: bytes=32 time<1ms TTL=255

Ping statistics for 200.20.23.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 53: Observation for ping test from PC6 to Router 1: 0/1

Sending Host	Destination	Ping status
PC2 or PC4 or PC6	PC1 PC2 PC3 PC4 PC5 PC6 Router0: 0/0 Router0: 0/1 Router0: 0/2 Router1: 0/0 Router1: 0/1	Successful

Table 6: Observation for ping tests from PC2 or PC4 or PC6 to other PCs and router interfaces

The ping requests that were initially failing due to the missing network entries in the routing table now succeed. This is due to the default route configuration. Once the router doesn't locate a destination within the routing table, it simply forwards the packets via the default route, which is set such that the next hop for the packet is the router that links the two networks together.

Sub activity 7

```
Router>enable
Router#configure terminal
Router(config)#hostname Ashlesh_0
Ashlesh_0(config)#exit
Ashlesh_0#disable
Ashlesh_0>
```

Listing 54: Syntax for configuring hostname on Router 0

```
Router>enable
Router#config terminal
Router(config)#hostname Ashlesh_1
Ashlesh_1(config)#exit
```

```
Ashlesh_1#disable
Ashlesh_1>
```

Listing 55: Syntax for configuring hostname on Router 1

b. Activity B

Sub activity 1

Router	hostname	console password	enable password	vty password
0	Pandey_0	ashlesh	407	pandey
1	Pandey_1			
2	Pandey_2			
3	Pandey_3			

Note: Listing 56 shows the configuration for Router0. Other routers are configured from their respective CLI.

Table 7: Configuration parameters for routers

```
Router>enable
Router#configure terminal
Router(config)#hostname Pandey_0

Pandey_0(config)#line console 0
Pandey_0(config-line)#password ashlesh
Pandey_0(config-line)#login
Pandey_0(config-line)#exit

Pandey_0(config)#enable password 407

Pandey_0(config)#line vty 0 4
Pandey_0(config-line)#password pandey
Pandey_0(config-line)#login
Pandey_0(config-line)#exit
Pandey_0(config)#exit

Pandey_0#disable
Pandey_0>
```

Listing 56: Syntax for configuring mentioned parameters on Router 0

Sub activity 2

The gigabitethernet interfaces on the routers were set as,

Gigabitethernet interfaces	IP address	Subnet mask
Router 0: 0/0	202.60.1.1	255.255.255.0
Router 0: 0/1	202.60.0.1	255.255.255.0
Router 1: 0/0	202.60.1.2	255.255.255.0
Router 1: 0/1	202.60.3.1	255.255.255.0
Router 1: 0/1	202.60.2.1	255.255.255.0
Router 2: 0/0	202.60.3.2	255.255.255.0
Router 2: 0/1	202.60.5.1	255.255.255.0
Router 2: 0/1	202.60.4.1	255.255.255.0
Router 3: 0/0	202.60.5.2	255.255.255.0
Router 3: 0/1	202.60.6.1	255.255.255.0

Note: The interfaces are marked on the Figure 2.

Table 8: IP address and subnet masks for the gigabitethernet interfaces on the routers

Sub activity 3

Device	IP address	Subnet mask
PC0	202.60.0.3	255.255.255.0
PC1	202.60.2.2	255.255.255.0
PC2	202.60.4.3	255.255.255.0
PC3	202.60.6.3	255.255.255.0
PC4	202.60.2.3	255.255.255.0
PC5	202.60.4.2	255.255.255.0
Server0	202.60.0.2	255.255.255.0
Server1	202.60.6.2	255.255.255.0

Note: The ip addressess and subnet masks are set using the IP configuration application. The default gateways for the PCs and servers were also set as, PC0 and Server0: 202.60.0.1, PC1 and PC4: 202.60.2.1, PC2 and PC5: 202.60.4.1, PC3 and Server1: 202.60.6.1

Table 9: IP address and subnet masks for the PCs and servers in the network

Sub activity 5

```
Pandey_0#show ip route
Codes: L - local, C - connected, S - static, 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

     202.60.0.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.0.0/24 is directly connected, GigabitEthernet0/1
L       202.60.0.1/32 is directly connected, GigabitEthernet0/1
     202.60.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.1.0/24 is directly connected, GigabitEthernet0/0
L       202.60.1.1/32 is directly connected, GigabitEthernet0/0
```

Listing 57: Observation for show ip route on Router 0

```
Pandey_1#show ip route
Codes: L - local, C - connected, S - static, 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

     202.60.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.1.0/24 is directly connected, GigabitEthernet0/0
L       202.60.1.2/32 is directly connected, GigabitEthernet0/0
     202.60.2.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.2.0/24 is directly connected, GigabitEthernet0/2
L       202.60.2.1/32 is directly connected, GigabitEthernet0/2
     202.60.3.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.3.0/24 is directly connected, GigabitEthernet0/1
L       202.60.3.1/32 is directly connected, GigabitEthernet0/1
```

Listing 58: Observation for show ip route on Router 1

```
Pandey_2#show ip route
Codes: L - local, C - connected, S - static, 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

     202.60.3.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.3.0/24 is directly connected, GigabitEthernet0/0
L       202.60.3.2/32 is directly connected, GigabitEthernet0/0
     202.60.4.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.4.0/24 is directly connected, GigabitEthernet0/2
L       202.60.4.1/32 is directly connected, GigabitEthernet0/2
     202.60.5.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.5.0/24 is directly connected, GigabitEthernet0/1
L       202.60.5.1/32 is directly connected, GigabitEthernet0/1
```

Listing 59: Observation for show ip route on Router 2

```
Pandey_3#show ip route
Codes: L - local, C - connected, S - static, 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

     202.60.5.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.5.0/24 is directly connected, GigabitEthernet0/0
L       202.60.5.2/32 is directly connected, GigabitEthernet0/0
     202.60.6.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.6.0/24 is directly connected, GigabitEthernet0/1
L       202.60.6.1/32 is directly connected, GigabitEthernet0/1
```

Listing 60: Observation for show ip route on Router 3

Sub activity 6

```
C:\>ping 202.60.0.3

Pinging 202.60.0.3 with 32 bytes of data:

Reply from 202.60.0.3: bytes=32 time<1ms TTL=128
Reply from 202.60.0.3: bytes=32 time=4ms TTL=128
Reply from 202.60.0.3: bytes=32 time<1ms TTL=128
Reply from 202.60.0.3: bytes=32 time<1ms TTL=128
```

```
Ping statistics for 202.60.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 1ms
```

Listing 61: Observation for ping test from PC0 to PC0

```
C:\>ping 202.60.2.2

Pinging 202.60.2.2 with 32 bytes of data:

Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.

Ping statistics for 202.60.2.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 62: Observation for ping test from PC0 to PC1

```
C:\>ping 202.60.4.3

Pinging 202.60.4.3 with 32 bytes of data:

Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.

Ping statistics for 202.60.4.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 63: Observation for ping test from PC0 to PC2

```
C:\>ping 202.60.6.3

Pinging 202.60.6.3 with 32 bytes of data:

Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.

Ping statistics for 202.60.6.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 64: Observation for ping test from PC0 to PC3

```
C:\>ping 202.60.0.2

Pinging 202.60.0.2 with 32 bytes of data:

Reply from 202.60.0.2: bytes=32 time=1ms TTL=128
Reply from 202.60.0.2: bytes=32 time<1ms TTL=128
Reply from 202.60.0.2: bytes=32 time<1ms TTL=128
Reply from 202.60.0.2: bytes=32 time<1ms TTL=128

Ping statistics for 202.60.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 65: Observation for ping test from PC0 to Server 0

```
C:\>ping 202.60.6.2

Pinging 202.60.6.2 with 32 bytes of data:

Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.

Ping statistics for 202.60.6.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 66: Observation for ping test from PC0 to Server 1

```
C:\>ping 202.60.1.1

Pinging 202.60.1.1 with 32 bytes of data:

Reply from 202.60.1.1: bytes=32 time=1ms TTL=255
Reply from 202.60.1.1: bytes=32 time<1ms TTL=255
Reply from 202.60.1.1: bytes=32 time<1ms TTL=255
Reply from 202.60.1.1: bytes=32 time<1ms TTL=255

Ping statistics for 202.60.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 67: Observation for ping test from PC0 to Router 0: 0/0

```
C:\>ping 202.60.0.1

Pinging 202.60.0.1 with 32 bytes of data:

Reply from 202.60.0.1: bytes=32 time<1ms TTL=255
Reply from 202.60.0.1: bytes=32 time<1ms TTL=255
Reply from 202.60.0.1: bytes=32 time<1ms TTL=255
Reply from 202.60.0.1: bytes=32 time<1ms TTL=255

Ping statistics for 202.60.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 68: Observation for ping test from PC0 to Router 0: 0/1

```
C:\>ping 202.60.1.2

Pinging 202.60.1.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 202.60.1.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 69: Observation for ping test from PC0 to Router 1: 0/0

```
C:\>ping 202.60.3.1

Pinging 202.60.3.1 with 32 bytes of data:

Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Request timed out.
Reply from 202.60.0.1: Destination host unreachable.

Ping statistics for 202.60.3.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 70: Observation for ping test from PC0 to Router 1: 0/1

```
C:\>ping 202.60.2.1

Pinging 202.60.2.1 with 32 bytes of data:

Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Request timed out.

Ping statistics for 202.60.2.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 71: Observation for ping test from PC0 to Router 1: 0/2

```
C:\>ping 202.60.3.2

Pinging 202.60.3.2 with 32 bytes of data:

Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.

Ping statistics for 202.60.3.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 72: Observation for ping test from PC0 to Router 2: 0/0

```
C:\>ping 202.60.5.1

Pinging 202.60.5.1 with 32 bytes of data:

Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.

Ping statistics for 202.60.5.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 73: Observation for ping test from PC0 to Router 2: 0/1

```
C:\>ping 202.60.4.1

Pinging 202.60.4.1 with 32 bytes of data:
```

```
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.

Ping statistics for 202.60.4.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 74: Observation for ping test from PC0 to Router 2: 0/2

```
C:\>ping 202.60.5.2

Pinging 202.60.5.2 with 32 bytes of data:

Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.

Ping statistics for 202.60.5.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 75: Observation for ping test from PC0 to Router 3: 0/0

```
C:\>ping 202.60.6.1

Pinging 202.60.6.1 with 32 bytes of data:

Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.
Reply from 202.60.0.1: Destination host unreachable.

Ping statistics for 202.60.6.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 76: Observation for ping test from PC0 to Router 3: 0/1

Sending Host	Destination	Ping status
PC0	PC0 Server0	Successful
	PC1 PC4 PC2 PC5 PC3 Server1	Destination host unreachable
	Router0: 0/0 Router0: 0/1	Successful
	Router1: 0/0	Request timed out
	Router1: 0/1 Router1: 0/2 Router2: 0/0 Router2: 0/1 Router2: 0/2 Router3: 0/0 Router3: 0/1	Destination host unreachable

Table 10: Observation for ping tests from PC0 to other PCs, servers and router interfaces

Sub activity 7

```
C:\>ping 202.60.0.3

Pinging 202.60.0.3 with 32 bytes of data:

Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.

Ping statistics for 202.60.0.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 77: Observation for ping test from PC1 to PC0

```
C:\>ping 202.60.2.2

Pinging 202.60.2.2 with 32 bytes of data:

Reply from 202.60.2.2: bytes=32 time=4ms TTL=128
Reply from 202.60.2.2: bytes=32 time=4ms TTL=128
Reply from 202.60.2.2: bytes=32 time=3ms TTL=128
Reply from 202.60.2.2: bytes=32 time=3ms TTL=128
```

```
Ping statistics for 202.60.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 4ms, Average = 3ms
```

Listing 78: Observation for ping test from PC1 to PC1

```
C:\>ping 202.60.4.3

Pinging 202.60.4.3 with 32 bytes of data:

Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.

Ping statistics for 202.60.4.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 79: Observation for ping test from PC1 to PC2

```
C:\>ping 202.60.6.3

Pinging 202.60.6.3 with 32 bytes of data:

Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.

Ping statistics for 202.60.6.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 80: Observation for ping test from PC1 to PC3

```
C:\>ping 202.60.0.2

Pinging 202.60.0.2 with 32 bytes of data:

Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.

Ping statistics for 202.60.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 81: Observation for ping test from PC1 to Server 0

```
C:\>ping 202.60.6.2

Pinging 202.60.6.2 with 32 bytes of data:

Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.

Ping statistics for 202.60.6.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 82: Observation for ping test from PC1 to Server 1

```
C:\>ping 202.60.1.1

Pinging 202.60.1.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 202.60.1.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 83: Observation for ping test from PC1 to Router 0: 0/0

```
C:\>ping 202.60.0.1

Pinging 202.60.0.1 with 32 bytes of data:

Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.

Ping statistics for 202.60.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 84: Observation for ping test from PC1 to Router 0: 0/1

```
C:\>ping 202.60.1.2

Pinging 202.60.1.2 with 32 bytes of data:
```

```
Reply from 202.60.1.2: bytes=32 time<1ms TTL=255
Reply from 202.60.1.2: bytes=32 time<1ms TTL=255
Reply from 202.60.1.2: bytes=32 time<1ms TTL=255
Reply from 202.60.1.2: bytes=32 time=1ms TTL=255

Ping statistics for 202.60.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 85: Observation for ping test from PC1 to Router 1: 0/0

```
C:\>ping 202.60.3.1

Pinging 202.60.3.1 with 32 bytes of data:

Reply from 202.60.3.1: bytes=32 time<1ms TTL=255
Reply from 202.60.3.1: bytes=32 time<1ms TTL=255
Reply from 202.60.3.1: bytes=32 time<1ms TTL=255
Reply from 202.60.3.1: bytes=32 time<1ms TTL=255

Ping statistics for 202.60.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 86: Observation for ping test from PC1 to Router 1: 0/1

```
C:\>ping 202.60.2.1

Pinging 202.60.2.1 with 32 bytes of data:

Reply from 202.60.2.1: bytes=32 time<1ms TTL=255
Reply from 202.60.2.1: bytes=32 time<1ms TTL=255
Reply from 202.60.2.1: bytes=32 time<1ms TTL=255
Reply from 202.60.2.1: bytes=32 time<1ms TTL=255

Ping statistics for 202.60.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 87: Observation for ping test from PC1 to Router 1: 0/2

```
C:\>ping 202.60.3.2

Pinging 202.60.3.2 with 32 bytes of data:
```

```
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 202.60.3.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 88: Observation for ping test from PC1 to Router 2: 0/0

```
C:\>ping 202.60.5.1

Pinging 202.60.5.1 with 32 bytes of data:

Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.

Ping statistics for 202.60.5.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 89: Observation for ping test from PC1 to Router 2: 0/1

```
C:\>ping 202.60.4.1

Pinging 202.60.4.1 with 32 bytes of data:

Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.

Ping statistics for 202.60.4.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 90: Observation for ping test from PC1 to Router 2: 0/2

```
C:\>ping 202.60.5.2

Pinging 202.60.5.2 with 32 bytes of data:

Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
```

```
Ping statistics for 202.60.5.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 91: Observation for ping test from PC1 to Router 3: 0/0

```
C:\>ping 202.60.6.1

Pinging 202.60.6.1 with 32 bytes of data:

Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.
Reply from 202.60.2.1: Destination host unreachable.

Ping statistics for 202.60.6.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 92: Observation for ping test from PC1 to Router 3: 0/1

Sending Host	Destination	Ping status
PC1	PC0 Server0	Destination host unreachable
	PC1 PC4	Successful
	PC2 PC5 PC3 Server1	Destination host unreachable
	Router0: 0/0	Request timed out
	Router0: 0/1	Destination host unreachable
	Router1: 0/0 Router1: 0/1 Router1: 0/2	Successful
	Router2: 0/0	Request timed out
	Router2: 0/1 Router2: 0/2 Router3: 0/0 Router3: 0/1	Destination host unreachable

Table 11: Observation for ping tests from PC1 to other PCs, servers and router interfaces

Sub activity 8

```
C:\>ping 202.60.0.3

Pinging 202.60.0.3 with 32 bytes of data:
```

```
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.

Ping statistics for 202.60.0.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 93: Observation for ping test from PC2 to PC0

```
C:\>ping 202.60.2.2

Pinging 202.60.2.2 with 32 bytes of data:

Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.

Ping statistics for 202.60.2.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 94: Observation for ping test from PC2 to PC1

```
C:\>ping 202.60.4.3

Pinging 202.60.4.3 with 32 bytes of data:

Reply from 202.60.4.3: bytes=32 time=7ms TTL=128
Reply from 202.60.4.3: bytes=32 time=3ms TTL=128
Reply from 202.60.4.3: bytes=32 time=5ms TTL=128
Reply from 202.60.4.3: bytes=32 time=3ms TTL=128

Ping statistics for 202.60.4.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 7ms, Average = 4ms
```

Listing 95: Observation for ping test from PC2 to PC2

```
C:\>ping 202.60.6.3

Pinging 202.60.6.3 with 32 bytes of data:

Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
```

```
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.

Ping statistics for 202.60.6.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 96: Observation for ping test from PC2 to PC3

```
C:\>ping 202.60.0.2

Pinging 202.60.0.2 with 32 bytes of data:

Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.

Ping statistics for 202.60.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 97: Observation for ping test from PC2 to Server 0

```
C:\>ping 202.60.6.2

Pinging 202.60.6.2 with 32 bytes of data:

Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.

Ping statistics for 202.60.6.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 98: Observation for ping test from PC2 to Server 1

```
C:\>ping 202.60.1.1

Pinging 202.60.1.1 with 32 bytes of data:

Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.

Ping statistics for 202.60.1.1:
```

```
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 99: Observation for ping test from PC2 to Router 0: 0/0

```
C:\>ping 202.60.0.1

Pinging 202.60.0.1 with 32 bytes of data:

Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.

Ping statistics for 202.60.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 100: Observation for ping test from PC2 to Router 0: 0/1

```
C:\>ping 202.60.1.2

Pinging 202.60.1.2 with 32 bytes of data:

Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.

Ping statistics for 202.60.1.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 101: Observation for ping test from PC2 to Router 1: 0/0

```
C:\>ping 202.60.3.1

Pinging 202.60.3.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 202.60.3.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 102: Observation for ping test from PC2 to Router 1: 0/1

```
C:\>ping 202.60.2.1

Pinging 202.60.2.1 with 32 bytes of data:

Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.

Ping statistics for 202.60.2.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 103: Observation for ping test from PC2 to Router 1: 0/2

```
C:\>ping 202.60.3.2

Pinging 202.60.3.2 with 32 bytes of data:

Reply from 202.60.3.2: bytes=32 time=1ms TTL=255
Reply from 202.60.3.2: bytes=32 time<1ms TTL=255
Reply from 202.60.3.2: bytes=32 time<1ms TTL=255
Reply from 202.60.3.2: bytes=32 time<1ms TTL=255

Ping statistics for 202.60.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 104: Observation for ping test from PC2 to Router 2: 0/0

```
C:\>ping 202.60.5.1

Pinging 202.60.5.1 with 32 bytes of data:

Reply from 202.60.5.1: bytes=32 time=1ms TTL=255
Reply from 202.60.5.1: bytes=32 time<1ms TTL=255
Reply from 202.60.5.1: bytes=32 time<1ms TTL=255
Reply from 202.60.5.1: bytes=32 time<1ms TTL=255

Ping statistics for 202.60.5.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 105: Observation for ping test from PC2 to Router 2: 0/1

```
C:\>ping 202.60.4.1

Pinging 202.60.4.1 with 32 bytes of data:

Reply from 202.60.4.1: bytes=32 time=1ms TTL=255
Reply from 202.60.4.1: bytes=32 time<1ms TTL=255
Reply from 202.60.4.1: bytes=32 time<1ms TTL=255
Reply from 202.60.4.1: bytes=32 time<1ms TTL=255

Ping statistics for 202.60.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 106: Observation for ping test from PC2 to Router 2: 0/2

```
C:\>ping 202.60.5.2

Pinging 202.60.5.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 202.60.5.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 107: Observation for ping test from PC2 to Router 3: 0/0

```
C:\>ping 202.60.6.1

Pinging 202.60.6.1 with 32 bytes of data:

Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.
Reply from 202.60.4.1: Destination host unreachable.

Ping statistics for 202.60.6.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 108: Observation for ping test from PC2 to Router 3: 0/1

Sending Host	Destination	Ping status
PC2	PC0 Server0 PC1 PC4	Destination host unreachable
	PC2 PC5	Successful
	PC3 Server1 Router0: 0/0 Router0: 0/1 Router1: 0/0	Destination host unreachable
	Router1: 0/1	Request timed out
	Router1: 0/2	Destination host unreachable
	Router2: 0/0 Router2: 0/1 Router2: 0/2	Successful
	Router3: 0/0	Request timed out
	Router3: 0/1	Destination host unreachable

Table 12: Observation for ping tests from PC2 to other PCs, servers and router interfaces

Sub activity 9

```
C:\>ping 202.60.0.3

Pinging 202.60.0.3 with 32 bytes of data:

Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.

Ping statistics for 202.60.0.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 109: Observation for ping test from PC3 to PC0

```
C:\>ping 202.60.2.2

Pinging 202.60.2.2 with 32 bytes of data:

Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
```

```
Ping statistics for 202.60.2.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 110: Observation for ping test from PC3 to PC1

```
C:\>ping 202.60.4.3

Pinging 202.60.4.3 with 32 bytes of data:

Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.

Ping statistics for 202.60.4.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 111: Observation for ping test from PC3 to PC2

```
C:\>ping 202.60.6.3

Pinging 202.60.6.3 with 32 bytes of data:

Reply from 202.60.6.3: bytes=32 time=4ms TTL=128
Reply from 202.60.6.3: bytes=32 time<1ms TTL=128
Reply from 202.60.6.3: bytes=32 time<1ms TTL=128
Reply from 202.60.6.3: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.6.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 112: Observation for ping test from PC3 to PC3

```
C:\>ping 202.60.0.2

Pinging 202.60.0.2 with 32 bytes of data:

Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.

Ping statistics for 202.60.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 113: Observation for ping test from PC3 to Server 0

```
C:\>ping 202.60.6.2

Pinging 202.60.6.2 with 32 bytes of data:

Reply from 202.60.6.2: bytes=32 time=1ms TTL=128
Reply from 202.60.6.2: bytes=32 time<1ms TTL=128
Reply from 202.60.6.2: bytes=32 time<1ms TTL=128
Reply from 202.60.6.2: bytes=32 time<1ms TTL=128

Ping statistics for 202.60.6.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 114: Observation for ping test from PC3 to Server 1

```
C:\>ping 202.60.1.1

Pinging 202.60.1.1 with 32 bytes of data:

Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.

Ping statistics for 202.60.1.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 115: Observation for ping test from PC3 to Router 0: 0/0

```
C:\>ping 202.60.0.1

Pinging 202.60.0.1 with 32 bytes of data:

Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.

Ping statistics for 202.60.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 116: Observation for ping test from PC3 to Router 0: 0/1

```
C:\>ping 202.60.1.2

Pinging 202.60.1.2 with 32 bytes of data:

Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.

Ping statistics for 202.60.1.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 117: Observation for ping test from PC3 to Router 1: 0/0

```
C:\>ping 202.60.3.1

Pinging 202.60.3.1 with 32 bytes of data:

Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.

Ping statistics for 202.60.3.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 118: Observation for ping test from PC3 to Router 1: 0/1

```
C:\>ping 202.60.2.1

Pinging 202.60.2.1 with 32 bytes of data:

Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.

Ping statistics for 202.60.2.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 119: Observation for ping test from PC3 to Router 1: 0/2

```
C:\>ping 202.60.3.2

Pinging 202.60.3.2 with 32 bytes of data:
```

```
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.

Ping statistics for 202.60.3.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 120: Observation for ping test from PC3 to Router 2: 0/0

```
C:\>ping 202.60.5.1

Pinging 202.60.5.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 202.60.5.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 121: Observation for ping test from PC3 to Router 2: 0/1

```
C:\>ping 202.60.4.1

Pinging 202.60.4.1 with 32 bytes of data:

Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.
Reply from 202.60.6.1: Destination host unreachable.

Ping statistics for 202.60.4.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Listing 122: Observation for ping test from PC3 to Router 2: 0/2

```
C:\>ping 202.60.5.2

Pinging 202.60.5.2 with 32 bytes of data:

Reply from 202.60.5.2: bytes=32 time=1ms TTL=255
Reply from 202.60.5.2: bytes=32 time=10ms TTL=255
Reply from 202.60.5.2: bytes=32 time<1ms TTL=255
Reply from 202.60.5.2: bytes=32 time<1ms TTL=255
```

```
Ping statistics for 202.60.5.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 10ms, Average = 2ms
```

Listing 123: Observation for ping test from PC3 to Router 3: 0/0

```
C:\>ping 202.60.6.1

Pinging 202.60.6.1 with 32 bytes of data:

Reply from 202.60.6.1: bytes=32 time=1ms TTL=255
Reply from 202.60.6.1: bytes=32 time<1ms TTL=255
Reply from 202.60.6.1: bytes=32 time<1ms TTL=255
Reply from 202.60.6.1: bytes=32 time<1ms TTL=255

Ping statistics for 202.60.6.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 124: Observation for ping test from PC3 to Router 3: 0/1

Sending Host	Destination	Ping status
PC3	PC0 Server0 PC1 PC4 PC2 PC5	Destination host unreachable
	PC3 Server1	Successful
	Router0: 0/0 Router0: 0/1 Router1: 0/0 Router1: 0/1 Router1: 0/2 Router2: 0/0	Destination host unreachable
	Router2: 0/1	Request timed out
	Router2: 0/2	Destination host unreachable
	Router3: 0/0 Router3: 0/1	Successful

Table 13: Observation for ping tests from PC3 to other PCs, servers and router interfaces

Sub activity 10

```
Pandey_0>ping 202.60.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.0.3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

Listing 125: Observation for ping test from Router 0 to PC0

```
Pandey_0>ping 202.60.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.2.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 126: Observation for ping test from Router 0 to PC1

```
Pandey_0>ping 202.60.4.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.4.3, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 127: Observation for ping test from Router 0 to PC2

```
Pandey_0>ping 202.60.6.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.6.3, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 128: Observation for ping test from Router 0 to PC3

```
Pandey_0>ping 202.60.1.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

Listing 129: Observation for ping test from Router 0 to Router 1: 0/0

```
Pandey_0>ping 202.60.3.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.3.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 130: Observation for ping test from Router 0 to Router 1: 0/1

```
Pandey_0>ping 202.60.2.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.2.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 131: Observation for ping test from Router 0 to Router 1: 0/2

```
Pandey_0>ping 202.60.3.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.3.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 132: Observation for ping test from Router 0 to Router 2: 0/0

```
Pandey_0>ping 202.60.5.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.5.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 133: Observation for ping test from Router 0 to Router 2: 0/1

```
Pandey_0>ping 202.60.4.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.4.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 134: Observation for ping test from Router 0 to Router 2: 0/2

```
Pandey_0>ping 202.60.5.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.5.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 135: Observation for ping test from Router 0 to Router 3: 0/0

```
Pandey_0>ping 202.60.6.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.6.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 136: Observation for ping test from Router 0 to Router 3: 0/1

Sending Host	Destination	Ping status
Router 0	PC0 Server0	Successful
	PC1 PC4 PC2 PC5 PC3 Server1	Failed
	Router1: 0/0	Successful
	Router1: 0/1 Router1: 0/2 Router2: 0/0 Router2: 0/1 Router2: 0/2 Router3: 0/0 Router3: 0/1	Failed

Table 14: Observation for ping tests from Router 0 to other PCs, servers and router interfaces

Sub activity 11

```
Pandey_1>ping 202.60.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.0.3, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 137: Observation for ping test from Router 1 to PC0

```
Pandey_1>ping 202.60.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.2.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

Listing 138: Observation for ping test from Router 1 to PC1

```
Pandey_1>ping 202.60.4.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.4.3, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 139: Observation for ping test from Router 1 to PC2

```
Pandey_1>ping 202.60.6.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.6.3, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 140: Observation for ping test from Router 1 to PC3

```
Pandey_1>ping 202.60.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

Listing 141: Observation for ping test from Router 1 to Router 0: 0/0

```
Pandey_1>ping 202.60.0.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.0.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 142: Observation for ping test from Router 1 to Router 0: 0/1

```
Pandey_1>ping 202.60.3.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.3.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

Listing 143: Observation for ping test from Router 1 to Router 2: 0/0

```
Pandey_1>ping 202.60.5.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.5.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 144: Observation for ping test from Router 1 to Router 2: 0/1

```
Pandey_1>ping 202.60.4.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.4.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 145: Observation for ping test from Router 1 to Router 2: 0/2

```
Pandey_1>ping 202.60.5.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.5.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 146: Observation for ping test from Router 1 to Router 3: 0/0

```
Pandey_1>ping 202.60.6.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.6.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 147: Observation for ping test from Router 1 to Router 3: 0/1

Sending Host	Destination	Ping status
Router 1	PC0 Server0	Failed
	PC1 PC4	Successful
	PC2 PC5 PC3 Server1	Failed
	Router0: 0/0	Successful
	Router0: 0/1	Failed
	Router2: 0/0	Successful
	Router2: 0/1 Router2: 0/2 Router3: 0/0 Router3: 0/1	Failed

Table 15: Observation for ping tests from Router 1 to other PCs, servers and router interfaces

Sub activity 12

```
Pandey_2>ping 202.60.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.0.3, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 148: Observation for ping test from Router 2 to PC0

```
Pandey_2>ping 202.60.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.2.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 149: Observation for ping test from Router 2 to PC1

```
Pandey_2>ping 202.60.4.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.4.3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

Listing 150: Observation for ping test from Router 2 to PC2

```
Pandey_2>ping 202.60.6.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.6.3, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 151: Observation for ping test from Router 2 to PC3

```
Pandey_2>ping 202.60.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.1.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 152: Observation for ping test from Router 2 to Router 0: 0/0

```
Pandey_2>ping 202.60.0.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.0.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 153: Observation for ping test from Router 2 to Router 0: 0/1

```
Pandey_2>ping 202.60.1.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.1.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 154: Observation for ping test from Router 2 to Router 1: 0/0

```
Pandey_2>ping 202.60.3.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.3.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

Listing 155: Observation for ping test from Router 2 to Router 1: 0/1

```
Pandey_2>ping 202.60.2.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.2.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 156: Observation for ping test from Router 2 to Router 1: 0/2

```
Pandey_2>ping 202.60.5.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.5.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

Listing 157: Observation for ping test from Router 2 to Router 3: 0/0

```
Pandey_2>ping 202.60.6.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.6.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 158: Observation for ping test from Router 2 to Router 3: 0/1

Sending Host	Destination	Ping status
Router 2	PC0 Server0 PC1 PC4	Failed
	PC2 PC5	Successful
	PC3 Server1	Failed
	Router0: 0/0 Router0: 0/1 Router1: 0/0	Failed
	Router1: 0/1	Successful
	Router1: 0/2	Failed
	Router3: 0/0	Successful
	Router3: 0/1	Failed

Table 16: Observation for ping tests from Router 2 to other PCs, servers and router interfaces

Sub activity 13

```
Pandey_3>ping 202.60.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.0.3, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 159: Observation for ping test from Router 3 to PC0

```
Pandey_3>ping 202.60.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.2.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 160: Observation for ping test from Router 3 to PC1

```
Pandey_3>ping 202.60.4.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.4.3, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 161: Observation for ping test from Router 3 to PC2

```
Pandey_3>ping 202.60.6.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.6.3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

Listing 162: Observation for ping test from Router 3 to PC3

```
Pandey_3>ping 202.60.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.1.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 163: Observation for ping test from Router 3 to Router 0: 0/0

```
Pandey_3>ping 202.60.0.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.0.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 164: Observation for ping test from Router 3 to Router 0: 0/1

```
Pandey_3>ping 202.60.1.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.1.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 165: Observation for ping test from Router 3 to Router 1: 0/0

```
Pandey_3>ping 202.60.3.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.3.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 166: Observation for ping test from Router 3 to Router 1: 0/1

```
Pandey_3>ping 202.60.2.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.2.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 167: Observation for ping test from Router 3 to Router 1: 0/2

```
Pandey_3>ping 202.60.3.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.3.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 168: Observation for ping test from Router 3 to Router 2: 0/0

```
Pandey_3>ping 202.60.5.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.5.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

Listing 169: Observation for ping test from Router 3 to Router 2: 0/1

```
Pandey_3>ping 202.60.4.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.60.4.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Listing 170: Observation for ping test from Router 3 to Router 2: 0/2

Sending Host	Destination	Ping status
Router 3	PC0 Server0 PC1 PC4 PC2 PC5	Failed
	PC3 Server1	Successful
	Router0: 0/0 Router0: 0/1 Router1: 0/0 Router1: 0/1 Router1: 0/2 Router2: 0/0	Failed
	Router2: 0/1	Successful
	Router2: 0/2	Failed

Table 17: Observation for ping tests from Router 3 to other PCs, servers and router interfaces

Sub activity 14

```
C:\>telnet 202.60.0.1
Trying 202.60.0.1 ...Open


User Access Verification

Password:
Pandey_0>enable
Password:
Pandey_0#configure terminal

Pandey_0(config)#ip route 202.60.2.0 255.255.255.0 202.60.1.2
Pandey_0(config)#ip route 202.60.3.0 255.255.255.0 202.60.1.2
Pandey_0(config)#ip route 202.60.4.0 255.255.255.0 202.60.1.2
Pandey_0(config)#ip route 202.60.5.0 255.255.255.0 202.60.1.2
Pandey_0(config)#ip route 202.60.6.0 255.255.255.0 202.60.1.2
Pandey_0(config)#exit
Pandey_0#
```

Listing 171: Configuring static route on Router 0 using telnet from PC0

Sub activity 15

```
Pandey_0#telnet 202.60.1.2
Trying 202.60.1.2 ...Open
```

```
User Access Verification

Password:
Pandey_1>enable
Password:
Pandey_1#config terminal

Pandey_1(config)#ip route 202.60.0.0 255.255.255.0 202.60.1.1
Pandey_1(config)#ip route 202.60.4.0 255.255.255.0 202.60.3.2
Pandey_1(config)#ip route 202.60.5.0 255.255.255.0 202.60.3.2
Pandey_1(config)#ip route 202.60.6.0 255.255.255.0 202.60.3.2
Pandey_1(config)#exit
Pandey_1#
```

Listing 172: Configuring static route on Router 1 using telnet from Router 0

Sub activity 16

```
Pandey_1#telnet 202.60.3.2
Trying 202.60.3.2 ...Open


User Access Verification

Password:
Pandey_2>enable
Password:
Pandey_2#config terminal

Pandey_2(config)#ip route 202.60.0.0 255.255.255.0 202.60.3.1
Pandey_2(config)#ip route 202.60.1.0 255.255.255.0 202.60.3.1
Pandey_2(config)#ip route 202.60.2.0 255.255.255.0 202.60.3.1
Pandey_2(config)#ip route 202.60.6.0 255.255.255.0 202.60.5.2
Pandey_2(config)#exit
Pandey_2#
```

Listing 173: Configuring static route on Router 2 using telnet from Router 1

```
Pandey_2#telnet 202.60.5.2
Trying 202.60.5.2 ...Open


User Access Verification

Password:
Pandey_3>enable
```

```
Password:
Pandey_3#configure terminal

Pandey_3(config)#ip route 202.60.0.0 255.255.255.0 202.60.5.1
Pandey_3(config)#ip route 202.60.1.0 255.255.255.0 202.60.5.1
Pandey_3(config)#ip route 202.60.2.0 255.255.255.0 202.60.5.1
Pandey_3(config)#ip route 202.60.3.0 255.255.255.0 202.60.5.1
Pandey_3(config)#ip route 202.60.4.0 255.255.255.0 202.60.5.1
Pandey_3(config)#exit
Pandey_3#exit

[Connection to 202.60.5.2 closed by foreign host]
Pandey_2#exit

[Connection to 202.60.3.2 closed by foreign host]
Pandey_1#exit

[Connection to 202.60.1.2 closed by foreign host]
Pandey_0#exit

[Connection to 202.60.0.1 closed by foreign host]
C:\>
```

Listing 174: Configuring static route on Router 3 using telnet from Router 2

Sub activity 17

```
C:\>ping 202.60.2.2

Pinging 202.60.2.2 with 32 bytes of data:

Reply from 202.60.2.2: bytes=32 time=1ms TTL=126
Reply from 202.60.2.2: bytes=32 time=1ms TTL=126
Reply from 202.60.2.2: bytes=32 time<1ms TTL=126
Reply from 202.60.2.2: bytes=32 time=2ms TTL=126

Ping statistics for 202.60.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 1ms
```

Listing 175: Observation for ping test from PC0 to PC1

```
C:\>ping 202.60.4.3

Pinging 202.60.4.3 with 32 bytes of data:

Reply from 202.60.4.3: bytes=32 time=1ms TTL=125
```

```
Reply from 202.60.4.3: bytes=32 time<1ms TTL=125
Reply from 202.60.4.3: bytes=32 time<1ms TTL=125
Reply from 202.60.4.3: bytes=32 time<1ms TTL=125

Ping statistics for 202.60.4.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 176: Observation for ping test from PC0 to PC2

```
C:\>ping 202.60.6.3

Pinging 202.60.6.3 with 32 bytes of data:

Reply from 202.60.6.3: bytes=32 time=1ms TTL=124
Reply from 202.60.6.3: bytes=32 time<1ms TTL=124
Reply from 202.60.6.3: bytes=32 time<1ms TTL=124
Reply from 202.60.6.3: bytes=32 time<1ms TTL=124

Ping statistics for 202.60.6.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 177: Observation for ping test from PC0 to PC3

```
C:\>ping 202.60.6.2

Pinging 202.60.6.2 with 32 bytes of data:

Reply from 202.60.6.2: bytes=32 time<1ms TTL=124
Reply from 202.60.6.2: bytes=32 time<1ms TTL=124
Reply from 202.60.6.2: bytes=32 time<1ms TTL=124
Reply from 202.60.6.2: bytes=32 time<1ms TTL=124

Ping statistics for 202.60.6.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 178: Observation for ping test from PC0 to Server 1

```
C:\>ping 202.60.1.2

Pinging 202.60.1.2 with 32 bytes of data:
```

```
Reply from 202.60.1.2: bytes=32 time<1ms TTL=254
Reply from 202.60.1.2: bytes=32 time=2ms TTL=254
Reply from 202.60.1.2: bytes=32 time<1ms TTL=254
Reply from 202.60.1.2: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms
```

Listing 179: Observation for ping test from PC0 to Router 1 0/0

```
C:\>ping 202.60.3.1

Pinging 202.60.3.1 with 32 bytes of data:

Reply from 202.60.3.1: bytes=32 time=1ms TTL=254
Reply from 202.60.3.1: bytes=32 time<1ms TTL=254
Reply from 202.60.3.1: bytes=32 time<1ms TTL=254
Reply from 202.60.3.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 180: Observation for ping test from PC0 to Router 1 0/1

```
C:\>ping 202.60.2.1

Pinging 202.60.2.1 with 32 bytes of data:

Reply from 202.60.2.1: bytes=32 time<1ms TTL=254
Reply from 202.60.2.1: bytes=32 time<1ms TTL=254
Reply from 202.60.2.1: bytes=32 time<1ms TTL=254
Reply from 202.60.2.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 181: Observation for ping test from PC0 to Router 1 0/2

```
C:\>ping 202.60.3.2

Pinging 202.60.3.2 with 32 bytes of data:
```

```
Reply from 202.60.3.2: bytes=32 time<1ms TTL=253
Reply from 202.60.3.2: bytes=32 time<1ms TTL=253
Reply from 202.60.3.2: bytes=32 time<1ms TTL=253
Reply from 202.60.3.2: bytes=32 time<1ms TTL=253

Ping statistics for 202.60.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 182: Observation for ping test from PC0 to Router 2 0/0

```
C:\>ping 202.60.5.1

Pinging 202.60.5.1 with 32 bytes of data:

Reply from 202.60.5.1: bytes=32 time<1ms TTL=253
Reply from 202.60.5.1: bytes=32 time<1ms TTL=253
Reply from 202.60.5.1: bytes=32 time<1ms TTL=253
Reply from 202.60.5.1: bytes=32 time<1ms TTL=253

Ping statistics for 202.60.5.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 183: Observation for ping test from PC0 to Router 2 0/0

```
C:\>ping 202.60.4.1

Pinging 202.60.4.1 with 32 bytes of data:

Reply from 202.60.4.1: bytes=32 time<1ms TTL=253
Reply from 202.60.4.1: bytes=32 time=2ms TTL=253
Reply from 202.60.4.1: bytes=32 time<1ms TTL=253
Reply from 202.60.4.1: bytes=32 time<1ms TTL=253

Ping statistics for 202.60.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms
```

Listing 184: Observation for ping test from PC0 to Router 2 0/2

```
C:\>ping 202.60.5.2

Pinging 202.60.5.2 with 32 bytes of data:

Reply from 202.60.5.2: bytes=32 time<1ms TTL=252
Reply from 202.60.5.2: bytes=32 time<1ms TTL=252
Reply from 202.60.5.2: bytes=32 time<1ms TTL=252
Reply from 202.60.5.2: bytes=32 time<1ms TTL=252

Ping statistics for 202.60.5.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 185: Observation for ping test from PC0 to Router 3 0/0

```
C:\>ping 202.60.6.1

Pinging 202.60.6.1 with 32 bytes of data:

Reply from 202.60.6.1: bytes=32 time<1ms TTL=252
Reply from 202.60.6.1: bytes=32 time<1ms TTL=252
Reply from 202.60.6.1: bytes=32 time<1ms TTL=252
Reply from 202.60.6.1: bytes=32 time<1ms TTL=252

Ping statistics for 202.60.6.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 186: Observation for ping test from PC0 to Router 3 0/1

```
C:\>ping 202.60.0.3

Pinging 202.60.0.3 with 32 bytes of data:

Reply from 202.60.0.3: bytes=32 time<1ms TTL=126
Reply from 202.60.0.3: bytes=32 time<1ms TTL=126
Reply from 202.60.0.3: bytes=32 time<1ms TTL=126
Reply from 202.60.0.3: bytes=32 time<1ms TTL=126

Ping statistics for 202.60.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 187: Observation for ping test from PC1 to PC0

```
C:\>ping 202.60.4.3

Pinging 202.60.4.3 with 32 bytes of data:

Reply from 202.60.4.3: bytes=32 time<1ms TTL=126
Reply from 202.60.4.3: bytes=32 time<1ms TTL=126
Reply from 202.60.4.3: bytes=32 time<1ms TTL=126
Reply from 202.60.4.3: bytes=32 time<1ms TTL=126

Ping statistics for 202.60.4.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 188: Observation for ping test from PC1 to PC2

```
C:\>ping 202.60.6.3

Pinging 202.60.6.3 with 32 bytes of data:

Reply from 202.60.6.3: bytes=32 time<1ms TTL=125
Reply from 202.60.6.3: bytes=32 time<1ms TTL=125
Reply from 202.60.6.3: bytes=32 time<1ms TTL=125
Reply from 202.60.6.3: bytes=32 time<1ms TTL=125

Ping statistics for 202.60.6.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 189: Observation for ping test from PC1 to PC3

```
C:\>ping 202.60.0.2

Pinging 202.60.0.2 with 32 bytes of data:

Reply from 202.60.0.2: bytes=32 time<1ms TTL=126
Reply from 202.60.0.2: bytes=32 time<1ms TTL=126
Reply from 202.60.0.2: bytes=32 time=2ms TTL=126
Reply from 202.60.0.2: bytes=32 time<1ms TTL=126

Ping statistics for 202.60.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms
```

Listing 190: Observation for ping test from PC1 to Server 0

```
C:\>ping 202.60.6.2

Pinging 202.60.6.2 with 32 bytes of data:

Reply from 202.60.6.2: bytes=32 time<1ms TTL=125
Reply from 202.60.6.2: bytes=32 time<1ms TTL=125
Reply from 202.60.6.2: bytes=32 time<1ms TTL=125
Reply from 202.60.6.2: bytes=32 time<1ms TTL=125

Ping statistics for 202.60.6.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 191: Observation for ping test from PC1 to Server 1

```
C:\>ping 202.60.1.1

Pinging 202.60.1.1 with 32 bytes of data:

Reply from 202.60.1.1: bytes=32 time<1ms TTL=254
Reply from 202.60.1.1: bytes=32 time<1ms TTL=254
Reply from 202.60.1.1: bytes=32 time<1ms TTL=254
Reply from 202.60.1.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 192: Observation for ping test from PC1 to Router 0 0/0

```
C:\>ping 202.60.0.1

Pinging 202.60.0.1 with 32 bytes of data:

Reply from 202.60.0.1: bytes=32 time<1ms TTL=254
Reply from 202.60.0.1: bytes=32 time<1ms TTL=254
Reply from 202.60.0.1: bytes=32 time<1ms TTL=254
Reply from 202.60.0.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 193: Observation for ping test from PC1 to Router 0 0/1

```
C:\>ping 202.60.3.2

Pinging 202.60.3.2 with 32 bytes of data:

Reply from 202.60.3.2: bytes=32 time=1ms TTL=254
Reply from 202.60.3.2: bytes=32 time<1ms TTL=254
Reply from 202.60.3.2: bytes=32 time<1ms TTL=254
Reply from 202.60.3.2: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 194: Observation for ping test from PC1 to Router 2 0/0

```
C:\>ping 202.60.5.1

Pinging 202.60.5.1 with 32 bytes of data:

Reply from 202.60.5.1: bytes=32 time=1ms TTL=254
Reply from 202.60.5.1: bytes=32 time<1ms TTL=254
Reply from 202.60.5.1: bytes=32 time<1ms TTL=254
Reply from 202.60.5.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.5.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Listing 195: Observation for ping test from PC1 to Router 2 0/1

```
C:\>ping 202.60.4.1

Pinging 202.60.4.1 with 32 bytes of data:

Reply from 202.60.4.1: bytes=32 time<1ms TTL=254
Reply from 202.60.4.1: bytes=32 time<1ms TTL=254
Reply from 202.60.4.1: bytes=32 time<1ms TTL=254
Reply from 202.60.4.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 196: Observation for ping test from PC1 to Router 2 0/2

```
C:\>ping 202.60.5.2

Pinging 202.60.5.2 with 32 bytes of data:

Reply from 202.60.5.2: bytes=32 time<1ms TTL=253
Reply from 202.60.5.2: bytes=32 time<1ms TTL=253
Reply from 202.60.5.2: bytes=32 time<1ms TTL=253
Reply from 202.60.5.2: bytes=32 time<1ms TTL=253

Ping statistics for 202.60.5.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 197: Observation for ping test from PC1 to Router 3 0/0

```
C:\>ping 202.60.6.1

Pinging 202.60.6.1 with 32 bytes of data:

Reply from 202.60.6.1: bytes=32 time<1ms TTL=253
Reply from 202.60.6.1: bytes=32 time<1ms TTL=253
Reply from 202.60.6.1: bytes=32 time<1ms TTL=253
Reply from 202.60.6.1: bytes=32 time<1ms TTL=253

Ping statistics for 202.60.6.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 198: Observation for ping test from PC1 to Router 3 0/1

```
C:\>ping 202.60.0.3

Pinging 202.60.0.3 with 32 bytes of data:

Reply from 202.60.0.3: bytes=32 time<1ms TTL=126
Reply from 202.60.0.3: bytes=32 time<1ms TTL=126
Reply from 202.60.0.3: bytes=32 time<1ms TTL=126
Reply from 202.60.0.3: bytes=32 time<1ms TTL=126

Ping statistics for 202.60.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 199: Observation for ping test from PC2 to PC0

```
C:\>ping 202.60.2.2

Pinging 202.60.2.2 with 32 bytes of data:

Reply from 202.60.2.2: bytes=32 time<1ms TTL=126
Reply from 202.60.2.2: bytes=32 time<1ms TTL=126
Reply from 202.60.2.2: bytes=32 time<1ms TTL=126
Reply from 202.60.2.2: bytes=32 time<1ms TTL=126

Ping statistics for 202.60.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 200: Observation for ping test from PC2 to PC1

```
C:\>ping 202.60.6.3

Pinging 202.60.6.3 with 32 bytes of data:

Reply from 202.60.6.3: bytes=32 time<1ms TTL=254
Reply from 202.60.6.3: bytes=32 time<1ms TTL=254
Reply from 202.60.6.3: bytes=32 time<1ms TTL=254
Reply from 202.60.6.3: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.6.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 201: Observation for ping test from PC2 to PC3

```
C:\>ping 202.60.0.2

Pinging 202.60.0.2 with 32 bytes of data:

Reply from 202.60.0.2: bytes=32 time<1ms TTL=254
Reply from 202.60.0.2: bytes=32 time<1ms TTL=254
Reply from 202.60.0.2: bytes=32 time<1ms TTL=254
Reply from 202.60.0.2: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 202: Observation for ping test from PC2 to Server 0

```
C:\>ping 202.60.6.2

Pinging 202.60.6.2 with 32 bytes of data:

Reply from 202.60.6.2: bytes=32 time<1ms TTL=254
Reply from 202.60.6.2: bytes=32 time<1ms TTL=254
Reply from 202.60.6.2: bytes=32 time<1ms TTL=254
Reply from 202.60.6.2: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.6.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 203: Observation for ping test from PC2 to Server 1

```
C:\>ping 202.60.1.1

Pinging 202.60.1.1 with 32 bytes of data:

Reply from 202.60.1.1: bytes=32 time<1ms TTL=254
Reply from 202.60.1.1: bytes=32 time<1ms TTL=254
Reply from 202.60.1.1: bytes=32 time<1ms TTL=254
Reply from 202.60.1.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 204: Observation for ping test from PC2 to Router 0 0/0

```
C:\>ping 202.60.0.1

Pinging 202.60.0.1 with 32 bytes of data:

Reply from 202.60.0.1: bytes=32 time<1ms TTL=254
Reply from 202.60.0.1: bytes=32 time<1ms TTL=254
Reply from 202.60.0.1: bytes=32 time<1ms TTL=254
Reply from 202.60.0.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 205: Observation for ping test from PC2 to Router 0 0/1

```
C:\>ping 202.60.1.2

Pinging 202.60.1.2 with 32 bytes of data:

Reply from 202.60.1.2: bytes=32 time<1ms TTL=254
Reply from 202.60.1.2: bytes=32 time<1ms TTL=254
Reply from 202.60.1.2: bytes=32 time<1ms TTL=254
Reply from 202.60.1.2: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 206: Observation for ping test from PC2 to Router 1 0/0

```
C:\>ping 202.60.3.1

Pinging 202.60.3.1 with 32 bytes of data:

Reply from 202.60.3.1: bytes=32 time<1ms TTL=254
Reply from 202.60.3.1: bytes=32 time<1ms TTL=254
Reply from 202.60.3.1: bytes=32 time<1ms TTL=254
Reply from 202.60.3.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 207: Observation for ping test from PC2 to Router 1 0/1

```
C:\>ping 202.60.2.1

Pinging 202.60.2.1 with 32 bytes of data:

Reply from 202.60.2.1: bytes=32 time<1ms TTL=254
Reply from 202.60.2.1: bytes=32 time<1ms TTL=254
Reply from 202.60.2.1: bytes=32 time<1ms TTL=254
Reply from 202.60.2.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 208: Observation for ping test from PC2 to Router 1 0/2

```
C:\>ping 202.60.5.2

Pinging 202.60.5.2 with 32 bytes of data:

Reply from 202.60.5.2: bytes=32 time<1ms TTL=254
Reply from 202.60.5.2: bytes=32 time<1ms TTL=254
Reply from 202.60.5.2: bytes=32 time<1ms TTL=254
Reply from 202.60.5.2: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.5.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 209: Observation for ping test from PC2 to Router 3 0/0

```
C:\>ping 202.60.6.1

Pinging 202.60.6.1 with 32 bytes of data:

Reply from 202.60.6.1: bytes=32 time<1ms TTL=254
Reply from 202.60.6.1: bytes=32 time<1ms TTL=254
Reply from 202.60.6.1: bytes=32 time<1ms TTL=254
Reply from 202.60.6.1: bytes=32 time<1ms TTL=254

Ping statistics for 202.60.6.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Listing 210: Observation for ping test from PC2 to Router 3 0/1

```
C:\>ping 202.60.0.3

Pinging 202.60.0.3 with 32 bytes of data:

Reply from 202.60.0.3: bytes=32 time=4ms TTL=128
Reply from 202.60.0.3: bytes=32 time<1ms TTL=128
Reply from 202.60.0.3: bytes=32 time<1ms TTL=128
Reply from 202.60.0.3: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 211: Observation for ping test from PC3 to PC0

```
C:\>ping 202.60.2.2

Pinging 202.60.2.2 with 32 bytes of data:

Reply from 202.60.2.2: bytes=32 time=4ms TTL=128
Reply from 202.60.2.2: bytes=32 time<1ms TTL=128
Reply from 202.60.2.2: bytes=32 time<1ms TTL=128
Reply from 202.60.2.2: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 212: Observation for ping test from PC3 to PC1

```
C:\>ping 202.60.4.3

Pinging 202.60.4.3 with 32 bytes of data:

Reply from 202.60.4.3: bytes=32 time=4ms TTL=128
Reply from 202.60.4.3: bytes=32 time<1ms TTL=128
Reply from 202.60.4.3: bytes=32 time<1ms TTL=128
Reply from 202.60.4.3: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.4.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 213: Observation for ping test from PC3 to PC2

```
C:\>ping 202.60.0.2

Pinging 202.60.0.2 with 32 bytes of data:

Reply from 202.60.0.2: bytes=32 time=4ms TTL=128
Reply from 202.60.0.2: bytes=32 time<1ms TTL=128
Reply from 202.60.0.2: bytes=32 time<1ms TTL=128
Reply from 202.60.0.2: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 214: Observation for ping test from PC3 to Server 0

```
C:\>ping 202.60.1.1

Pinging 202.60.1.1 with 32 bytes of data:

Reply from 202.60.1.1: bytes=32 time=4ms TTL=128
Reply from 202.60.1.1: bytes=32 time<1ms TTL=128
Reply from 202.60.1.1: bytes=32 time<1ms TTL=128
Reply from 202.60.1.1: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 215: Observation for ping test from PC3 to Router 0 0/0

```
C:\>ping 202.60.0.1

Pinging 202.60.0.1 with 32 bytes of data:

Reply from 202.60.0.1: bytes=32 time=4ms TTL=128
Reply from 202.60.0.1: bytes=32 time<1ms TTL=128
Reply from 202.60.0.1: bytes=32 time<1ms TTL=128
Reply from 202.60.0.1: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 216: Observation for ping test from PC3 to Router 0 0/1

```
C:\>ping 202.60.1.2

Pinging 202.60.1.2 with 32 bytes of data:

Reply from 202.60.1.2: bytes=32 time=4ms TTL=128
Reply from 202.60.1.2: bytes=32 time<1ms TTL=128
Reply from 202.60.1.2: bytes=32 time<1ms TTL=128
Reply from 202.60.1.2: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 217: Observation for ping test from PC3 to Router 1 0/0

```
C:\>ping 202.60.3.1

Pinging 202.60.3.1 with 32 bytes of data:

Reply from 202.60.3.1: bytes=32 time=4ms TTL=128
Reply from 202.60.3.1: bytes=32 time<1ms TTL=128
Reply from 202.60.3.1: bytes=32 time<1ms TTL=128
Reply from 202.60.3.1: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 218: Observation for ping test from PC3 to Router 1 0/1

```
C:\>ping 202.60.2.1

Pinging 202.60.2.1 with 32 bytes of data:

Reply from 202.60.2.1: bytes=32 time=4ms TTL=128
Reply from 202.60.2.1: bytes=32 time<1ms TTL=128
Reply from 202.60.2.1: bytes=32 time<1ms TTL=128
Reply from 202.60.2.1: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 219: Observation for ping test from PC3 to Router 1 0/2

```
C:\>ping 202.60.3.2

Pinging 202.60.3.2 with 32 bytes of data:

Reply from 202.60.3.2: bytes=32 time=4ms TTL=128
Reply from 202.60.3.2: bytes=32 time<1ms TTL=128
Reply from 202.60.3.2: bytes=32 time<1ms TTL=128
Reply from 202.60.3.2: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 220: Observation for ping test from PC3 to Router 2 0/0

```
C:\>ping 202.60.5.1

Pinging 202.60.5.1 with 32 bytes of data:

Reply from 202.60.5.1: bytes=32 time=4ms TTL=128
Reply from 202.60.5.1: bytes=32 time<1ms TTL=128
Reply from 202.60.5.1: bytes=32 time<1ms TTL=128
Reply from 202.60.5.1: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.5.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 221: Observation for ping test from PC3 to Router 2 0/1

```
C:\>ping 202.60.4.1

Pinging 202.60.4.1 with 32 bytes of data:

Reply from 202.60.4.1: bytes=32 time=4ms TTL=128
Reply from 202.60.4.1: bytes=32 time<1ms TTL=128
Reply from 202.60.4.1: bytes=32 time<1ms TTL=128
Reply from 202.60.4.1: bytes=32 time=4ms TTL=128

Ping statistics for 202.60.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Listing 222: Observation for ping test from PC3 to Router 2 0/2

Sending Host	Destination	Ping status
PC0 or PC1 or PC2 or PC3	PC0 Server0 PC1 PC4 PC2 PC5 PC3 Server1 Router0: 0/0 Router0: 0/1 Router1: 0/0 Router1: 0/1 Router1: 0/2 Router2: 0/0 Router2: 0/1 Router2: 0/2 Router3: 0/0 Router3: 0/1	Successful

Table 18: Observation for ping tests from PC0, PC1, PC2 and PC3 to other PCs, servers and router interfaces

Similar ping tests from the Routers 0, 1, 2 and 3 resulted as,

Sending Host	Destination	Ping status
Router 0	PC0 Server0 PC1 PC4 PC2 PC5 PC3 Server1 Router1: 0/0 Router1: 0/1 Router1: 0/2 Router2: 0/0 Router2: 0/1 Router2: 0/2 Router3: 0/0 Router3: 0/1	Successful

Table 19: Observation for ping tests from Router 0 to other PCs, servers and router interfaces

Sending Host	Destination	Ping status
Router 1	PC0	Successful
	Server0	
	PC1	
	PC4	
	PC2	
	PC5	
	PC3	
	Server1	
	Router0: 0/0	
	Router0: 0/1	
	Router2: 0/0	
	Router2: 0/1	
	Router2: 0/2	
	Router3: 0/0	
	Router3: 0/1	

Table 20: Observation for ping tests from Router 1 to other PCs, servers and router interfaces

Sending Host	Destination	Ping status
Router 2	PC0	Successful
	Server0	
	PC1	
	PC4	
	PC2	
	PC5	
	PC3	
	Server1	
	Router0: 0/0	
	Router0: 0/1	
	Router1: 0/0	
	Router1: 0/1	
	Router1: 0/2	
	Router3: 0/0	
	Router3: 0/1	

Table 21: Observation for ping tests from Router 2 to other PCs, servers and router interfaces

Sending Host	Destination	Ping status
Router 3	PC0	Successful
	Server0	
	PC1	
	PC4	
	PC2	
	PC5	
	PC3	
	Server1	
	Router0: 0/0	
	Router0: 0/1	
	Router1: 0/0	
	Router1: 0/1	
	Router1: 0/2	
	Router2: 0/0	
	Router2: 0/1	
	Router2: 0/2	

Table 22: Observation for ping tests from Router 3 to other PCs, servers and router interfaces

The ping requests that were initially failing due to the missing network entries in the routing table now succeed. This is due to the static route configuration. The network identifiers are set corresponding to the correct router as the next hop which makes sure the packets go through without error.

Sub activity 18

```
Pandey_0>show ip route
Codes: L - local, C - connected, S - static, 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

     202.60.0.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.0.0/24 is directly connected, GigabitEthernet0/1
L       202.60.0.1/32 is directly connected, GigabitEthernet0/1
     202.60.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.1.0/24 is directly connected, GigabitEthernet0/0
L       202.60.1.1/32 is directly connected, GigabitEthernet0/0
S    202.60.2.0/24 [1/0] via 202.60.1.2
S    202.60.3.0/24 [1/0] via 202.60.1.2
```

```
S    202.60.4.0/24 [1/0] via 202.60.1.2
S    202.60.5.0/24 [1/0] via 202.60.1.2
S    202.60.6.0/24 [1/0] via 202.60.1.2
```

Listing 223: Observation for show ip route on Router 0

```
Pandey_1>show ip route
Codes: L - local, C - connected, S - static, 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

S    202.60.0.0/24 [1/0] via 202.60.1.1
     202.60.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.1.0/24 is directly connected, GigabitEthernet0/0
L       202.60.1.2/32 is directly connected, GigabitEthernet0/0
     202.60.2.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.2.0/24 is directly connected, GigabitEthernet0/2
L       202.60.2.1/32 is directly connected, GigabitEthernet0/2
     202.60.3.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.3.0/24 is directly connected, GigabitEthernet0/1
L       202.60.3.1/32 is directly connected, GigabitEthernet0/1
S    202.60.4.0/24 [1/0] via 202.60.3.2
S    202.60.5.0/24 [1/0] via 202.60.3.2
S    202.60.6.0/24 [1/0] via 202.60.3.2
```

Listing 224: Observation for show ip route on Router 1

```
Pandey_2>show ip route
Codes: L - local, C - connected, S - static, 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
```

```
S    202.60.0.0/24 [1/0] via 202.60.3.1
S    202.60.1.0/24 [1/0] via 202.60.3.1
S    202.60.2.0/24 [1/0] via 202.60.3.1
     202.60.3.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.3.0/24 is directly connected, GigabitEthernet0/0
L       202.60.3.2/32 is directly connected, GigabitEthernet0/0
     202.60.4.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.4.0/24 is directly connected, GigabitEthernet0/2
L       202.60.4.1/32 is directly connected, GigabitEthernet0/2
     202.60.5.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.5.0/24 is directly connected, GigabitEthernet0/1
L       202.60.5.1/32 is directly connected, GigabitEthernet0/1
S    202.60.6.0/24 [1/0] via 202.60.5.2
```

Listing 225: Observation for show ip route on Router 2

```
Pandey_3>show ip route
Codes: L - local, C - connected, S - static, 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

S    202.60.0.0/24 [1/0] via 202.60.5.1
S    202.60.1.0/24 [1/0] via 202.60.5.1
S    202.60.2.0/24 [1/0] via 202.60.5.1
S    202.60.3.0/24 [1/0] via 202.60.5.1
S    202.60.4.0/24 [1/0] via 202.60.5.1
     202.60.5.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.5.0/24 is directly connected, GigabitEthernet0/0
L       202.60.5.2/32 is directly connected, GigabitEthernet0/0
     202.60.6.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.6.0/24 is directly connected, GigabitEthernet0/1
L       202.60.6.1/32 is directly connected, GigabitEthernet0/1
```

Listing 226: Observation for show ip route on Router 3

Additional static entries are visible in the routing table. Even if the next hop address is same for multiple network identifiers, we've set them as static which makes the table lengthy.

c. Activity C

Sub Activity 1

```
Pandey_0>enable
Password:
Pandey_0#configure terminal

Pandey_0(config)#no ip route 202.60.2.0 255.255.255.0 202.60.1.2
Pandey_0(config)#no ip route 202.60.3.0 255.255.255.0 202.60.1.2
Pandey_0(config)#no ip route 202.60.4.0 255.255.255.0 202.60.1.2
Pandey_0(config)#no ip route 202.60.5.0 255.255.255.0 202.60.1.2
Pandey_0(config)#no ip route 202.60.6.0 255.255.255.0 202.60.1.2
Pandey_0(config)#ip route 0.0.0.0 0.0.0.0 202.60.1.2
Pandey_0(config)#
```

Listing 227: Minimizing use of static route by configuring default route on Router 0

```
Pandey_1>enable
Password:
Pandey_1#configure terminal

Pandey_1(config)#no ip route 202.60.5.0 255.255.255.0 202.60.3.2
Pandey_1(config)#no ip route 202.60.4.0 255.255.255.0 202.60.3.2
Pandey_1(config)#no ip route 202.60.6.0 255.255.255.0 202.60.3.2
Pandey_1(config)#ip route 0.0.0.0 0.0.0.0 202.60.3.2
Pandey_1(config)#
```

Listing 228: Minimizing use of static route by configuring default route on Router 1

```
Pandey_2>enable
Password:
Pandey_2#configure terminal

Pandey_2(config)#no ip route 202.60.1.0 255.255.255.0 202.60.3.1
Pandey_2(config)#no ip route 202.60.2.0 255.255.255.0 202.60.3.1
Pandey_2(config)#no ip route 202.60.0.0 255.255.255.0 202.60.3.1
Pandey_2(config)#ip route 0.0.0.0 0.0.0.0 202.60.3.1
Pandey_2(config)#
```

Listing 229: Minimizing use of static route by configuring default route on Router 2

```
Pandey_3>enable
Password:
Pandey_3#configure terminal

Pandey_3(config)#no ip route 202.60.0.0 255.255.255.0 202.60.5.1
```

```
Pandey_3(config)#no ip route 202.60.1.0 255.255.255.0 202.60.5.1
Pandey_3(config)#no ip route 202.60.2.0 255.255.255.0 202.60.5.1
Pandey_3(config)#no ip route 202.60.3.0 255.255.255.0 202.60.5.1
Pandey_3(config)#no ip route 202.60.4.0 255.255.255.0 202.60.5.1
Pandey_3(config)#ip route 0.0.0.0 0.0.0.0 202.60.5.1
Pandey_3(config)#
```

Listing 230: Minimizing use of static route by configuring default route on Router 3

Sub Activity 2

Sending Host	Destination	Ping status
PC0 or PC1 or PC2 or PC3	PC0 Server0 PC1 PC4 PC2 PC5 PC3 Server1 Router0: 0/0 Router0: 0/1 Router1: 0/0 Router1: 0/1 Router1: 0/2 Router2: 0/0 Router2: 0/1 Router2: 0/2 Router3: 0/0 Router3: 0/1	Successful

Table 23: Observation for ping tests from PC0, PC1, PC2 and PC3 to other PCs, servers and router interfaces

Sub Activity 3

```
Pandey_0>show ip route
Codes: L - local, C - connected, S - static, 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 202.60.1.2 to network 0.0.0.0
```

```
     202.60.0.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.0.0/24 is directly connected, GigabitEthernet0/1
L       202.60.0.1/32 is directly connected, GigabitEthernet0/1
     202.60.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.1.0/24 is directly connected, GigabitEthernet0/0
L       202.60.1.1/32 is directly connected, GigabitEthernet0/0
S*   0.0.0.0/0 [1/0] via 202.60.1.2
```

Listing 231: Observation for show ip route on Router 0

```
Pandey_1>show ip route
Codes: L - local, C - connected, S - static, 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 202.60.3.2 to network 0.0.0.0

S    202.60.0.0/24 [1/0] via 202.60.1.1
     202.60.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.1.0/24 is directly connected, GigabitEthernet0/0
L       202.60.1.2/32 is directly connected, GigabitEthernet0/0
     202.60.2.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.2.0/24 is directly connected, GigabitEthernet0/2
L       202.60.2.1/32 is directly connected, GigabitEthernet0/2
     202.60.3.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.3.0/24 is directly connected, GigabitEthernet0/1
L       202.60.3.1/32 is directly connected, GigabitEthernet0/1
S*   0.0.0.0/0 [1/0] via 202.60.3.2
```

Listing 232: Observation for show ip route on Router 1

```
Pandey_2>show ip route
Codes: L - local, C - connected, S - static, 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 202.60.3.1 to network 0.0.0.0

     202.60.3.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.3.0/24 is directly connected, GigabitEthernet0/0
L       202.60.3.2/32 is directly connected, GigabitEthernet0/0
     202.60.4.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.4.0/24 is directly connected, GigabitEthernet0/2
L       202.60.4.1/32 is directly connected, GigabitEthernet0/2
     202.60.5.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.5.0/24 is directly connected, GigabitEthernet0/1
L       202.60.5.1/32 is directly connected, GigabitEthernet0/1
S    202.60.6.0/24 [1/0] via 202.60.5.2
S*   0.0.0.0/0 [1/0] via 202.60.3.1
```

Listing 233: Observation for show ip route on Router 2

```
Pandey_3>show ip route
Codes: L - local, C - connected, S - static, 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 202.60.5.1 to network 0.0.0.0

     202.60.5.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.5.0/24 is directly connected, GigabitEthernet0/0
L       202.60.5.2/32 is directly connected, GigabitEthernet0/0
     202.60.6.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.6.0/24 is directly connected, GigabitEthernet0/1
L       202.60.6.1/32 is directly connected, GigabitEthernet0/1
S*   0.0.0.0/0 [1/0] via 202.60.5.1
```

Listing 234: Observation for show ip route on Router 3

Sub Activity 4

The *show ip route* from Sub Activity 18 of Activity B and that from Sub Activity 3 of Activity C are different where the latter one is better optimized. The default route configuration allows multiple network identifiers that needed individual static routes to fall under the same default route denoted as S*. Minimized entries in the table are results of the side where there are more possible destinations being handled by a default route.

5 Conclusion

The activities provided in the lab sheet were performed using Packet Tracer. While performing activity A, the concept of default route was dealt to in brief. SInce the network was fairly straight forward with only two routers, not much difference was visible while choosing the default route configuration over static route. Only one hop for either of the routers was enough to reach all possible network addresses. During activty B, which was a more complex network setup, we had to configure the network to communicate with each other by using static route configuration. Since the activity was similar to that of the previous lab experiment, there wasn't much problem in configuration of the netowrk routers. One of the key concepts that could be taken away from activty B was that configuring static routes in multi-router network can be a hectic procedure since there can be multiple network identifiers that eventually need the same next hop. While performing activity C, the core concept of why default route can be of great use was understood. There were instances in activity B where multiple packets had to hop on to the same address despite having different identifiers, and configuring this setup using default route is quite easy since the default route is set such that if a destination address isn't located within the routing table, then it is passed on to the default route's next hop. This helped us minimize the number of statically defined routes from activity B. The overall completion of the lab experiment helped us gain much needed knowledge of the use cases of static and default routes and the kinds of netowrk where such configurations can be helpful.