

Week - 4

Experiment : Static Routing and Default Routing Configure.

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23/10/2024

Aim → Configure default route, Static route to the router.

procedure →

1. Select 2 PCs and 3 Routers from the tools (Ethernetic).
Connect 3 routers each other using Serial DCE.
connect one PC to router 0 and another PC to router 1 using copper crossover wire.
2. Config IP address for the PCs
PC0 = 10.0.0.10
PC1 = 40.0.0.10
3. Set the Gateway for the Both PCs.
PC0 = 10.0.0.1
PC1 = 40.0.0.1

To establish connection between PC0 and router 0.
Follow these Commands in router 0 CLI ⇒

1. enable
2. Config terminal
3. interface fastEthernet 0/0
4. ip address 10.0.0.1 255.0.0.0
5. no shutdown.

To establish Connection between router 0 and router 1.
Follow these Commands ⇒

In router 0 CLI,

1. enable
2. config terminal.
3. interface serial 2/0
4. ip address 20.0.0.1 255.0.0.0

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In router 1 CLI,

1. enable
2. config terminal.
3. interface Serial 2/0
4. ip address 20.0.0.2 255.0.0.0

To establish connection between PC and router 2 follow these Commands \Rightarrow

2 In router 2 CLI,

1. enable
2. config terminal.
3. interface fastethernet 0/0
4. ip address 40.0.0.1 255.0.0.0
5. no shutdown

To establish Connection b/w router 1 and router 2 Follow these Commands \Rightarrow

In router 2 CLI,

1. enable
2. config terminal.
3. interface Serial 3/0
4. IP address 30.0.0.2 255.0.0.0

In router 1 CLI,

1. enable
2. Config terminal
3. Interface Serial 3/0
4. IP address 30.0.0.1 255.0.0.0

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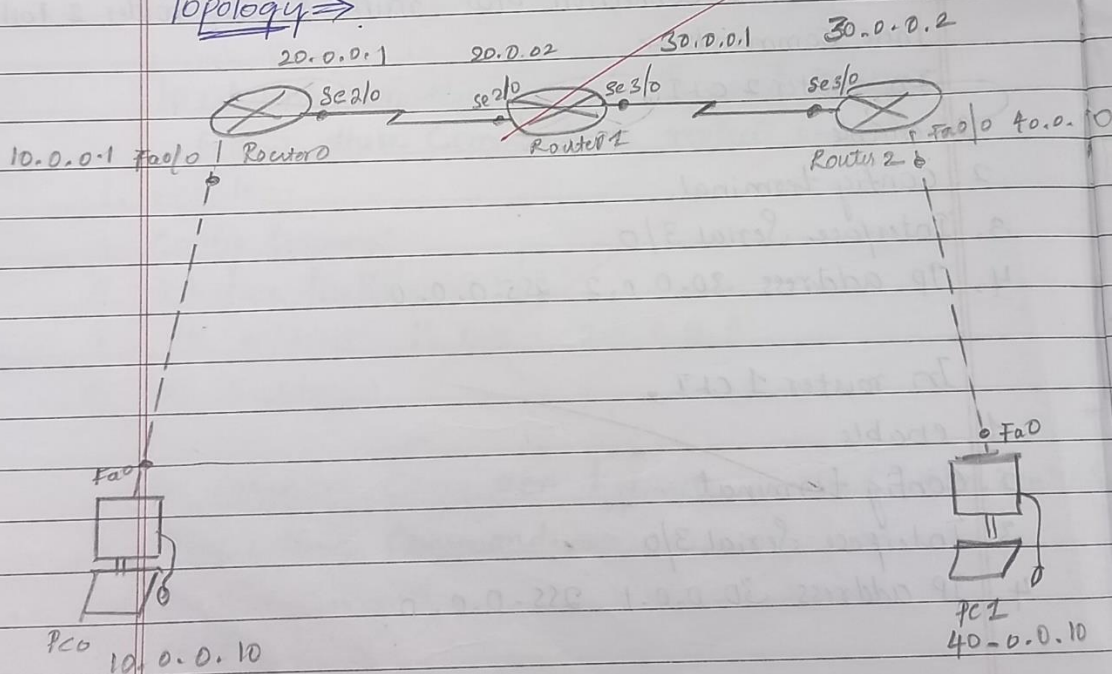
To establish the connection between router 1 and PC0 →
In router 1 CLI,

1. enable
2. config terminal.
3. ip route 10.0.0.0 255.0.0.0 20.0.0.1
4. exit.

To establish the connection between router 1 and PC1 →
In router 1 CLI,

1. enable
2. Config terminal.
3. ip route 40.0.0.0 255.0.0.0 30.0.0.2
4. exit.

Topology →



Observation ⇒

⇒ All the Routers and PCs are connected each other. If we ping all the devices from PC0 and PC1, we can successfully able to view the packets which are send, receive and lost.

⇒ If all the packets which are send is equal to receive then the connection successfully established.

⇒ Connection established from router 0 ⇒

C 10.0.0.0/8 is directly connected, FastEthernet 0/0

C 20.0.0.0/8 is directly connected, Serial 2/0

S* 0.0.0.0/0 [1/0] via 20.0.0.2

⇒ Connection established from router 1 ⇒

S 10.0.0.0/8 [1/0] via 20.0.0.1

C 20.0.0.0/8 is directly connected Serial 2/0

C 30.0.0.0/8 is directly connected Serial 3/0

S 40.0.0.0/8 [1/0] via 30.0.0.2

⇒ Connection established from router 2 ⇒

C 30.0.0.0/8 connected Serial 3/0

C 40.0.0.0/8 connected FastEthernet 0/0

S* 0.0.0.0/0 [1/0] via 30.0.0.1

To check the connection Follow these Commands,

1. enable
2. Show ip route.

Output \Rightarrow

Pc > ping 10.0.0.1

pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1 bytes=32 time=4ms TTL=128

Reply from 10.0.0.1 bytes=32 time=4ms TTL=128

Reply from 10.0.0.1 bytes=32 time=4ms TTL=128

Reply from 10.0.0.1 bytes=32 time=4ms TTL=128

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

ping 20.0.0.1

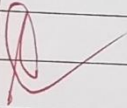
ping 20.0.0.2

ping 30.0.0.1

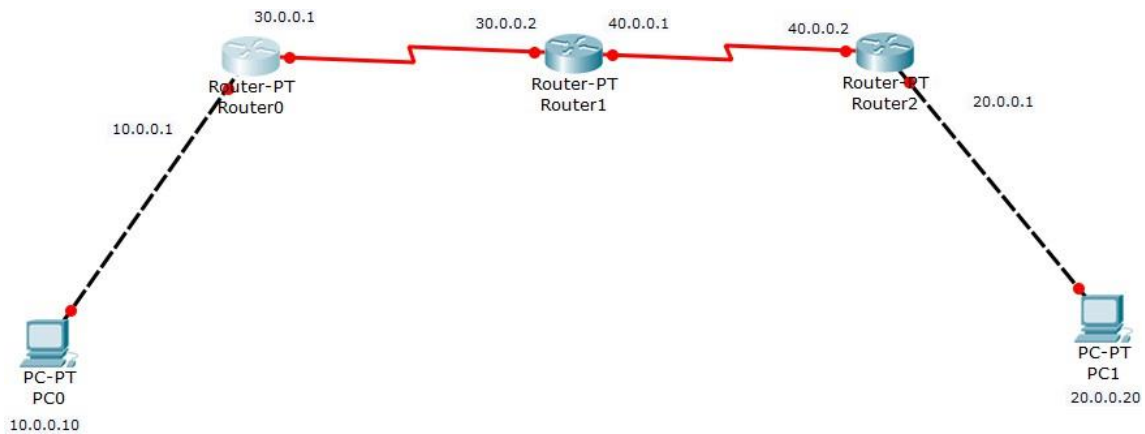
ping 30.0.0.2

ping 40.0.0.1

ping 40.0.0.10



Initial Topology:



ROUTER 0:

```
Router#enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#no shut

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

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

Router(config-if)#interface Serial2/0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#no shut

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

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

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    30.0.0.0/8 is directly connected, Serial2/0
```

```

Router(config)#ip route 0.0.0.0 0.0.0.0 30.0.0.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 30.0.0.2 to network 0.0.0.0

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    30.0.0.0/8 is directly connected, Serial2/0
S*   0.0.0.0/0 [1/0] via 30.0.0.2

Router(config)#ip route 0.0.0.0 0.0.0.0 30.0.0.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 30.0.0.2 to network 0.0.0.0

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    30.0.0.0/8 is directly connected, Serial2/0
S*   0.0.0.0/0 [1/0] via 30.0.0.2

```

ROUTER 1:

```

Router(config-if)#interface Serial3/0
Router(config-if)#ip address 30.0.0.2 255.0.0.0
Router(config-if)#no shut

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

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

Router(config-if)#interface Serial2/0
Router(config-if)#ip address 40.0.0.1 255.0.0.0
Router(config-if)#no shut

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

```



```
Router>enable
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route
```

Gateway of last resort is not set

```
C    30.0.0.0/8 is directly connected, Serial3/0
C    40.0.0.0/8 is directly connected, Serial2/0
```

```
Router(config)#ip route 10.0.0.0 255.0.0.0 30.0.0.0
Router(config)#ip route 20.0.0.0 255.0.0.0 40.0.0.2
```

ROUTER 2:

```
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface FastEthernet1/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up

Router(config-if)#interface Serial3/0
Router(config-if)#ip address 40.0.0.2 255.0.0.0
Router(config-if)#no shut

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

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

Router>enable
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route

Gateway of last resort is not set

C    20.0.0.0/8 is directly connected, FastEthernet1/0
C    40.0.0.0/8 is directly connected, Serial3/0
```



```

Router(config)#ip route 0.0.0.0 0.0.0.0 40.0.0.1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 40.0.0.1 to network 0.0.0.0

C    20.0.0.0/8 is directly connected, FastEthernet1/0
C    40.0.0.0/8 is directly connected, Serial3/0
S*   0.0.0.0/0 [1/0] via 40.0.0.1

```

PC 0 PING RESULTS:

```

C:\>ping 30.0.0.1

Pinging 30.0.0.1 with 32 bytes of data:

Reply from 30.0.0.1: bytes=32 time<1ms TTL=255
Reply from 30.0.0.1: bytes=32 time<1ms TTL=255
Reply from 30.0.0.1: bytes=32 time<1ms TTL=255
Reply from 30.0.0.1: bytes=32 time<1ms TTL=255

Ping statistics for 30.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

```

```

C:\>ping 30.0.0.2

Pinging 30.0.0.2 with 32 bytes of data:

Reply from 30.0.0.2: bytes=32 time=2ms TTL=254
Reply from 30.0.0.2: bytes=32 time=1ms TTL=254
Reply from 30.0.0.2: bytes=32 time=1ms TTL=254
Reply from 30.0.0.2: bytes=32 time=1ms TTL=254

Ping statistics for 30.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

```

```

C:\>ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Reply from 40.0.0.1: bytes=32 time=4ms TTL=254
Reply from 40.0.0.1: bytes=32 time=3ms TTL=254
Reply from 40.0.0.1: bytes=32 time=3ms TTL=254
Reply from 40.0.0.1: bytes=32 time=3ms TTL=254

Ping statistics for 40.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 4ms, Average = 3ms

```

```
C:\>ping 40.0.0.2

Pinging 40.0.0.2 with 32 bytes of data:

Reply from 40.0.0.2: bytes=32 time=6ms TTL=253
Reply from 40.0.0.2: bytes=32 time=2ms TTL=253
Reply from 40.0.0.2: bytes=32 time=5ms TTL=253
Reply from 40.0.0.2: bytes=32 time=2ms TTL=253

Ping statistics for 40.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 6ms, Average = 3ms
```

```
C:\>ping 20.0.0.20

Pinging 20.0.0.20 with 32 bytes of data:

Reply from 20.0.0.20: bytes=32 time=2ms TTL=125
Reply from 20.0.0.20: bytes=32 time=4ms TTL=125
Reply from 20.0.0.20: bytes=32 time=4ms TTL=125
Reply from 20.0.0.20: bytes=32 time=2ms TTL=125

Ping statistics for 20.0.0.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 4ms, Average = 3ms
```

PC1 PING RESULTS:

```
C:\>ping 40.0.0.2

Pinging 40.0.0.2 with 32 bytes of data:

Reply from 40.0.0.2: bytes=32 time=1ms TTL=255
Reply from 40.0.0.2: bytes=32 time<1ms TTL=255
Reply from 40.0.0.2: bytes=32 time<1ms TTL=255
Reply from 40.0.0.2: bytes=32 time<1ms TTL=255

Ping statistics for 40.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
C:\>ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Reply from 40.0.0.1: bytes=32 time=1ms TTL=254
Reply from 40.0.0.1: bytes=32 time=1ms TTL=254
Reply from 40.0.0.1: bytes=32 time=3ms TTL=254
Reply from 40.0.0.1: bytes=32 time=1ms TTL=254

Ping statistics for 40.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 3ms, Average = 1ms
```

```
C:\>ping 30.0.0.1

Pinging 30.0.0.1 with 32 bytes of data:

Reply from 30.0.0.1: bytes=32 time=8ms TTL=253
Reply from 30.0.0.1: bytes=32 time=4ms TTL=253
Reply from 30.0.0.1: bytes=32 time=4ms TTL=253
Reply from 30.0.0.1: bytes=32 time=2ms TTL=253

Ping statistics for 30.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 8ms, Average = 4ms
```

```
C:\>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:

Reply from 10.0.0.10: bytes=32 time=8ms TTL=125
Reply from 10.0.0.10: bytes=32 time=5ms TTL=125
Reply from 10.0.0.10: bytes=32 time=2ms TTL=125
Reply from 10.0.0.10: bytes=32 time=4ms TTL=125

Ping statistics for 10.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 8ms, Average = 4ms
```

FINAL TOPOLOGY :

