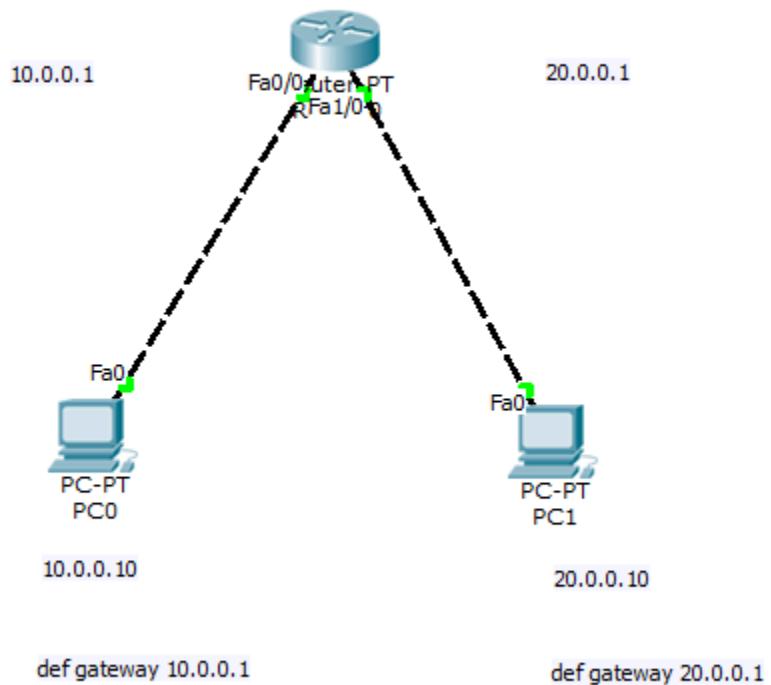


CN LAB

1BM22CS083

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9-10-24



Router2

Physical Config CLI

```
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 10.0.0.1 255.0.0.0
Router(config-if)#no shutdown

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
o up
exit
Router(config)#interface fastethernet1/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#no shutdown

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
o up
exit
```

PC0

Physical Config Desktop Custom Interface

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 20.0.0.10

Pinging 20.0.0.10 with 32 bytes of data:

Request timed out.
Reply from 20.0.0.10: bytes=32 time=0ms TTL=127
Reply from 20.0.0.10: bytes=32 time=0ms TTL=127
Reply from 20.0.0.10: bytes=32 time=0ms TTL=127

Ping statistics for 20.0.0.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>ping 20.0.0.10

Pinging 20.0.0.10 with 32 bytes of data:

Reply from 20.0.0.10: bytes=32 time=0ms TTL=127

Ping statistics for 20.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

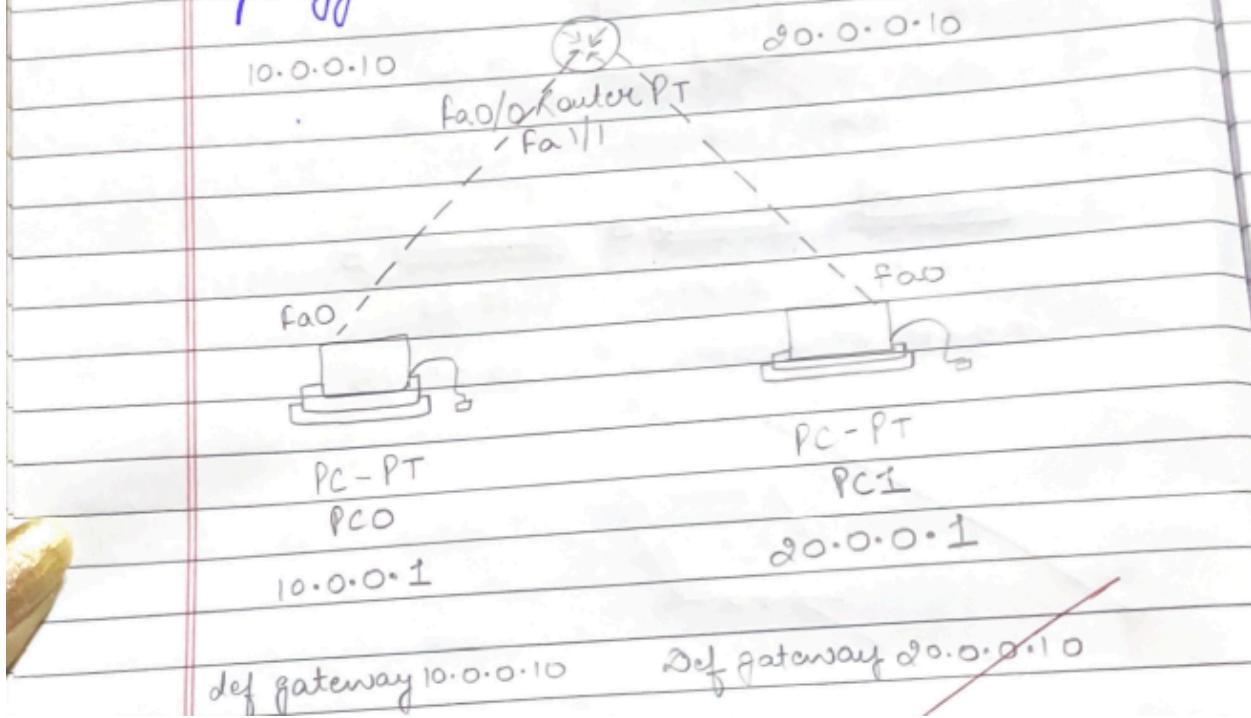
PC>
```

OBSERVATION

9-10-24

Lab - Obj:- Configure IP address to router & tracer. Explore the following messages:- ping, route etc.
Aim:- To connect two PC's in two different network using a router.

Topology :-



Procedure :-

- Select two PC from the device type section and place it on the workbench using placement cursor pointing towards min as its width.
- Similarly select router and place it on the workspace.

- Connect two devices i.e. PC's to router using copper crossover cable.
- Assigned IP address for both the PC's.
- Assigned gateway for both the PC's
- Set up Router config. in CLI

~~Router > enable~~

~~Router # config terminal~~

~~Router (config) # interface fastethernet 0/0~~

~~Router (config-if) # ip address 10.0.0.1 255.0.0.0~~

~~Router (config-if) # no shutdown.~~

~~Router (config) # interface fastethernet 1/0~~

~~Router (config-if) # ip address 20.0.0.1 255.0.0.0~~

~~Router (config-if) # no shutdown.~~

- click on the pc and go to desktop and choose command line prompt using 20.0.0.10 to observe status of the packets.

~~Observation:-~~

→ The buttons on the copper crossover connection turned green indicating correct connection.

→ Packets were successfully transferred showing results as:-

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

Router show ip route

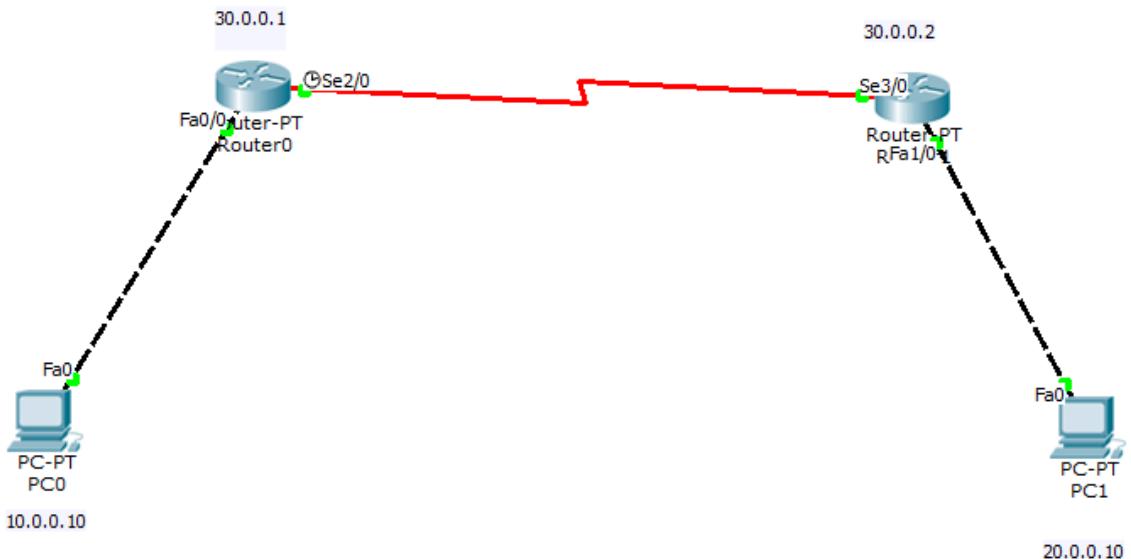
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile
D - EIGRP, E - EIGRP external; O - OSPF; IA
N1 - OSPF NSSA external type 1
E1 - OSPF external type 1
i - IS-IS, L1 - IS-IS level-1
* - candidate default route
p - periodic download static route.

Gateway of last resort not set.

- C 10.0.0.0/8 is directly connected, fastethernet1/0
C 20.0.0.0/8 is directly connected, fastethernet1/0.

16-10-24

lab-2



```
def gateway 10.0.0.1
```

```
def gateway 20.0.0.1
```

Router0

Physical Config CLI

IOS Command Line Interface

```

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    10.0.0.0/8 is directly connected, FastEthernet0/0
C    30.0.0.0/8 is directly connected, Serial1/0
Router#

```

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 20.0.0.10

Pinging 20.0.0.10 with 32 bytes of data:

Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Request timed out.

Ping statistics for 20.0.0.10:
  Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 30.0.0.1

Pinging 30.0.0.1 with 32 bytes of data:

Reply from 30.0.0.1: bytes=32 time=0ms 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

PC>ping 30.0.0.2

Pinging 30.0.0.2 with 32 bytes of data:

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

Ping statistics for 30.0.0.2:
  Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>
```

OBSERVATION

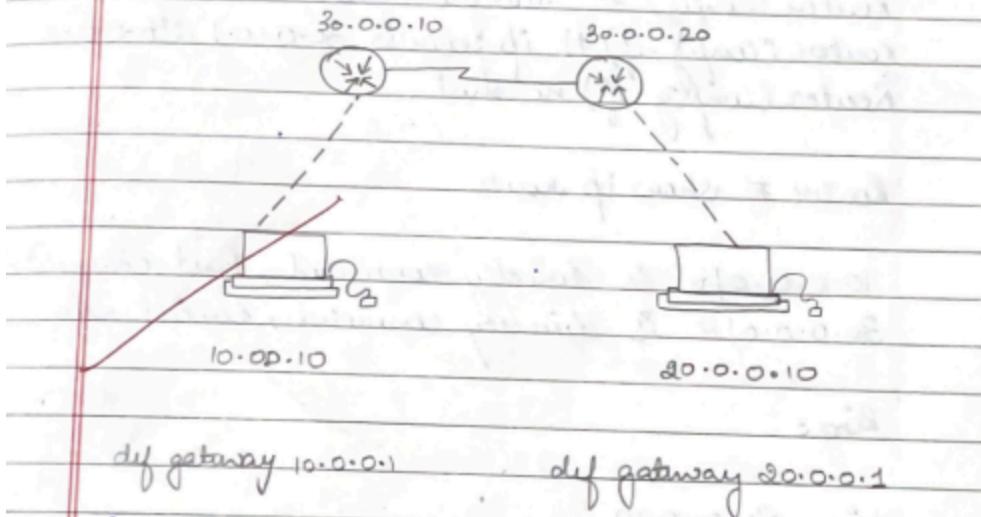
16-10-24

Lab-3

Qb Configure IP address to default route, static routes to the Router.

Sim :- Analyzing error messages and static routing between different routers.

Topology :-



Procedure :-

- Select two generic routers - PT from device type selection and place it on workbench.
- Select two end devices (PC's) and place on workbench.
- Assign IP address 10.0.0.10 to 1st PC and 20.0.0.10 to other and set gateway 10.0.0.1 and 20.0.0.1 respectively.

3) Connect PC in 10.0.0.1 IP to route 30.0.0.1 and 20.0.0.1 to 30.0.0.2 router using copper crossover cable.

4) Connect 2 routers using Serial DCE cable.

Router (IP 30.0.0.1) CLI :

Router > enable

Router # config terminal

Router (config) # interface fastethernet 0/0

Router (config-if) # ip address 30.0.0.1 255.0.0.0

Router (config-if) no shut.

Router # show ip route

10.0.0.0/8 is directly connected, Fast ethernet 0/0

30.0.0.0/8 is directly connected, Serial 0/0

Ping:

ping 20.0.0.10

Packet: sent = 4 , Received = 0 , Lost = 1

Ping 30.0.0.1

Packet: sent = 4 , Received = 4 , Lost = 0

Ping : 30.0.0.2

Packet: sent = 4 , Received = 0 , Lost = 4

Observation :-

Two routers are successfully connected with nodes through proper cable.

Both routers configured.

Routers not able to communicate with their nodes.

Experiment 3a:-

Configure default route, static route, to router.

→ Same as previous topic for all routers

Procedure

CLI

```
Router(config)# ip route 0.0.0.0 30.0.0.2  
Router# show ip route  
10.0.0.0/8 directly connected, FastEthernet 0/0  
30.0.0.0/8 [1/0] via 30.0.0.2  
30.0.0.0/8 is directly connected .
```

Ping 20.0.0.10

~~Ping 20.0.0.10~~

~~Packets : Sent = 4 , Received = 4 , Lost = 0~~

~~Ping 30.0.0.1~~

~~Packets : Sent = 4 , Received = 4 , Lost = 0~~

~~Ping 30.0.0.2~~

~~Packets : Sent = 4 , Received = 4 , Lost = 0~~

~~+ which has no IP address~~

~~Observation :-~~

~~all the nodes receive the ping from~~

~~Partners successfully communicate with their~~

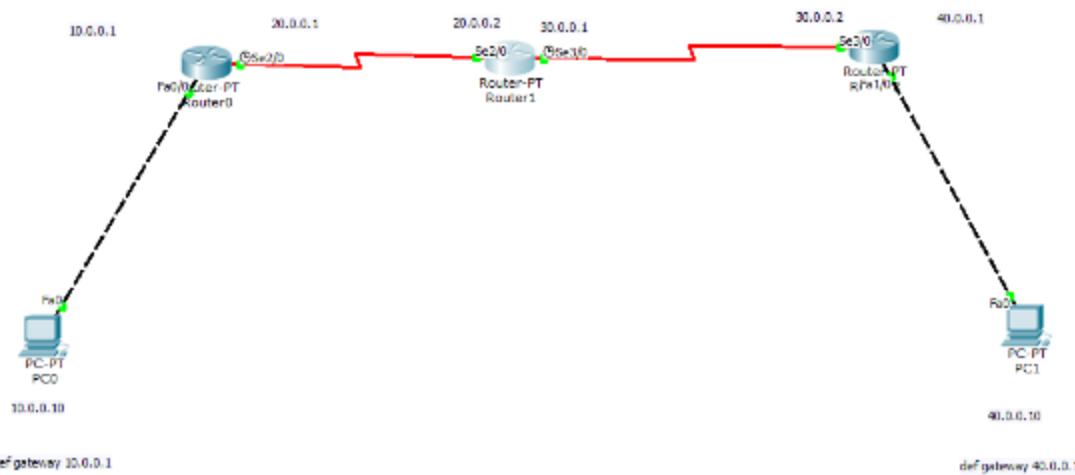
~~nodes.~~

~~C:\>~~

~~g310~~

23-10-24

LAB-3



Router>enable
 Router#config terminal
 Enter configuration commands, one per line. End with CNTL/Z.
 Router(config)#interface fastethernet0/0
 ^
 % Invalid input detected at '^' marker.
 Router(config)#interface fastethernet 0/0
 Router(config-if)#ip address 10.0.0.1 255.0.0.0
 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)#exit
 Router(config)#interface serial 2/0
 Router(config-if)#ip address 20.0.0.1 255.0.0.0
 Router(config-if)#no shut
 *LINK-5-CHANGED: Interface Serial2/0, changed state to down

```
Router>enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.2 255.0.0.0
Router(config-if)#no shut

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

Router(config)#interface serial 3/0
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 Serial3/0, changed state to up

*LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
exit
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.1
Router(config)#ip route 40.0.0.0 255.0.0.0 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 not set

S    10.0.0.0/8 [1/0] via 20.0.0.1
C    20.0.0.0/8 is directly connected, Serial2/0
C    30.0.0.0/8 is directly connected, Serial3/0
S    40.0.0.0/8 [1/0] via 30.0.0.2
Router#
```

```

Router>enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 30.0.0.1
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 30.0.0.1 to network 0.0.0.0

C    30.0.0.0/8 is directly connected, Serial3/0
C    40.0.0.0/8 is directly connected, FastEthernet1/0
S*   0.0.0.0/0 [1/0] via 30.0.0.1
Router#

```

Command Prompt

```

Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:

Reply from 10.0.0.10: bytes=32 time=7ms TTL=125
Reply from 10.0.0.10: bytes=32 time=6ms TTL=125
Reply from 10.0.0.10: bytes=32 time=8ms TTL=125
Reply from 10.0.0.10: bytes=32 time=9ms 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 = 6ms, Maximum = 9ms, Average = 7ms

PC>ping 40.0.0.10

Pinging 40.0.0.10 with 32 bytes of data:

Reply from 40.0.0.10: bytes=32 time=3ms TTL=128
Reply from 40.0.0.10: bytes=32 time=3ms TTL=128
Reply from 40.0.0.10: bytes=32 time=0ms TTL=128
Reply from 40.0.0.10: bytes=32 time=0ms TTL=128

Ping statistics for 40.0.0.10:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms

PC>

```

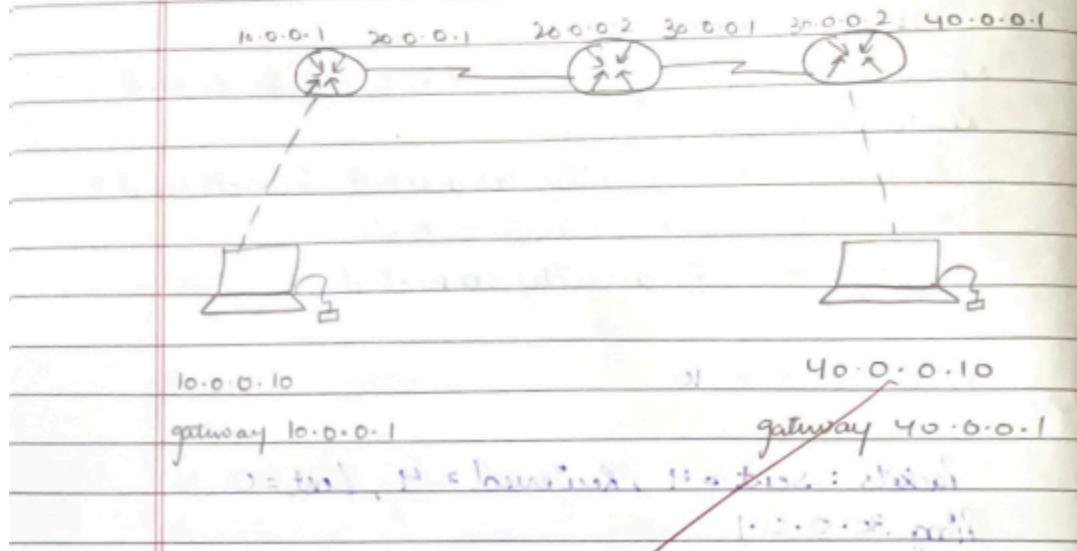
OBSERVATION

03-10-24 Lab-4

configure Default Route to router.

Aim:- Two connect three routers and observe the responses.

Topology :-



~~Procedure :-~~ ~~1 = hardware~~ ~~2 = software~~

- 1) Select 3 generic RT router and place on workbench. Select two end devices (PC)
- 2) Connect 1st PC to router 0 and end to router 2 through copper (cross over)
- 3) Connect router 0 and router 1, router 1 and router 2 using Serial DCE
- 4) Configure IP addresses 10.0.0.10 to PC1 and 40.0.0.1 to PC2.

```
R(config)# ip route 10.0.0.0 255.0.0.0 20.0.0.1  
# ip route 40.0.0.0 255.0.0.0 30.0.0.2  
# exit.
```

Now the 2 PC's can send messages to each other.

Now to configure default route -

Route 0

```
# IP route 0.0.0.0 0.0.0.0 20.0.0.2
```

Route 2

```
# IP route 0.0.0.0 0.0.0.0 30.0.0.1
```

Ping

PC> Ping 40.0.0.10

Packet sent = 4, Received=4, Lost=0

Route 0

IP route 0.0.0.0 0.0.0.0 20.0.0.2

Route 2

IP route 0.0.0.0 0.0.0.0 30.0.0.1

Ping

PC > Ping 40.0.0.10

Packet Sent = 4, Received = 4, Lost = 0

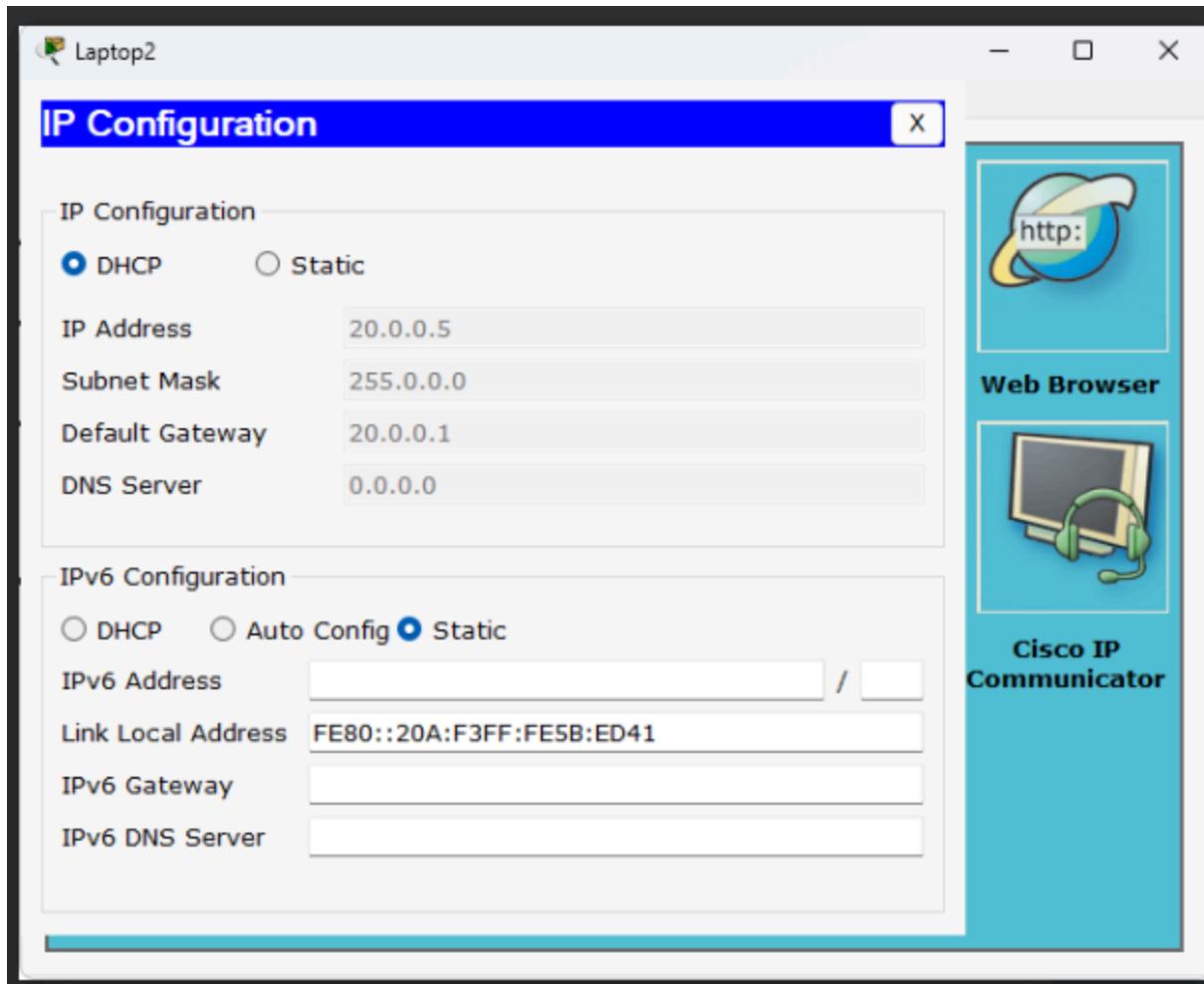
observed:

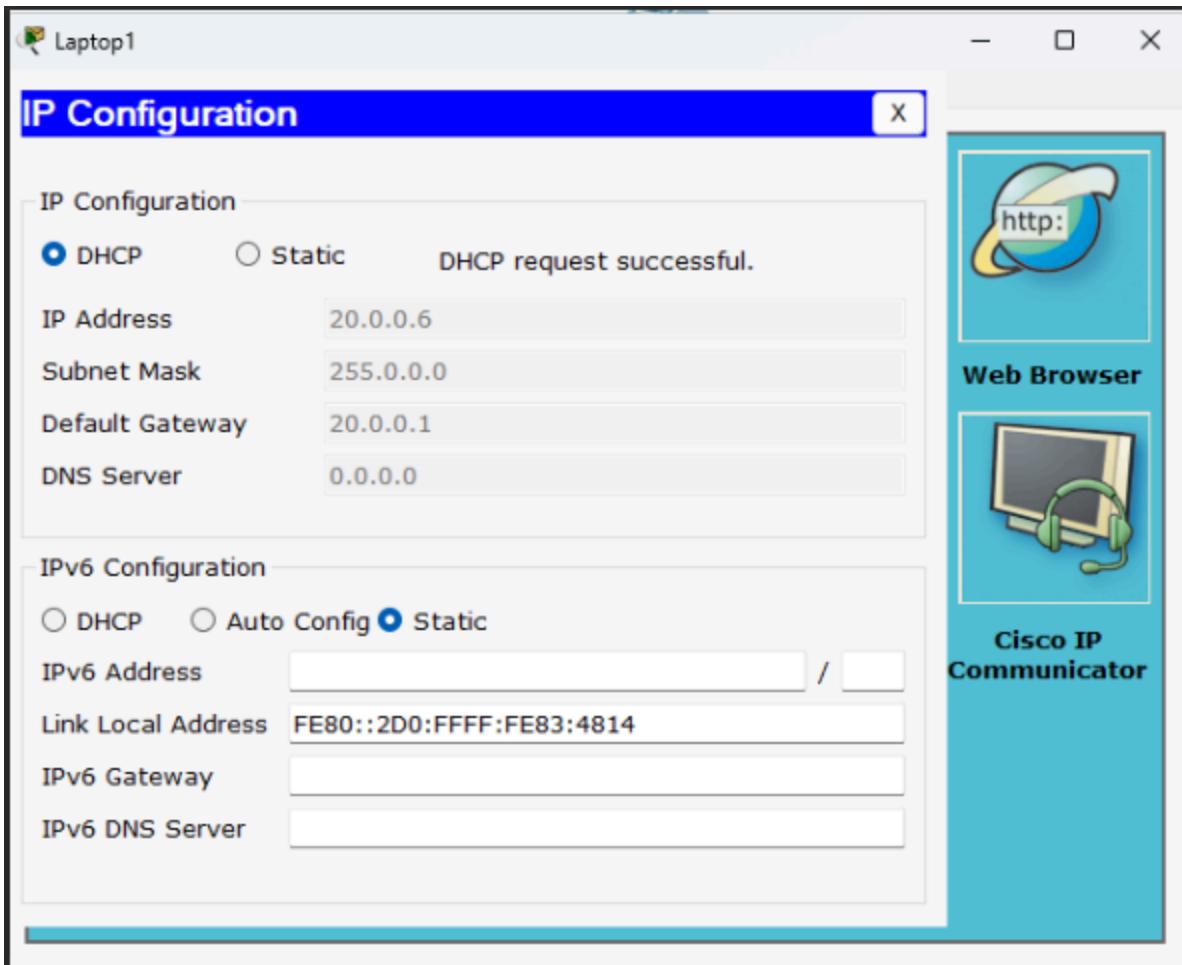
3 routers are connected with nodes configured
and they have communication.



13-11-24

Lab-4





PC3

IP Configuration

IP Configuration

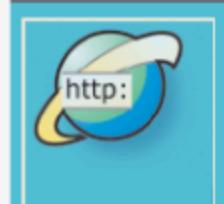
DHCP Static

IP Address: 20.0.0.4
Subnet Mask: 255.0.0.0
Default Gateway: 20.0.0.1
DNS Server: 0.0.0.0

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address: /
Link Local Address: FE80::2E0:8FFF:FE07:C6C2
IPv6 Gateway:
IPv6 DNS Server:



Web Browser



Cisco IP Communicator

IP Configuration

X

Interface

FastEthernet0

IP Configuration

DHCP Static

IP Address 10.0.0.2

Subnet Mask 255.0.0.0

Default Gateway 10.0.0.1

DNS Server 0.0.0.0

IPv6 Configuration

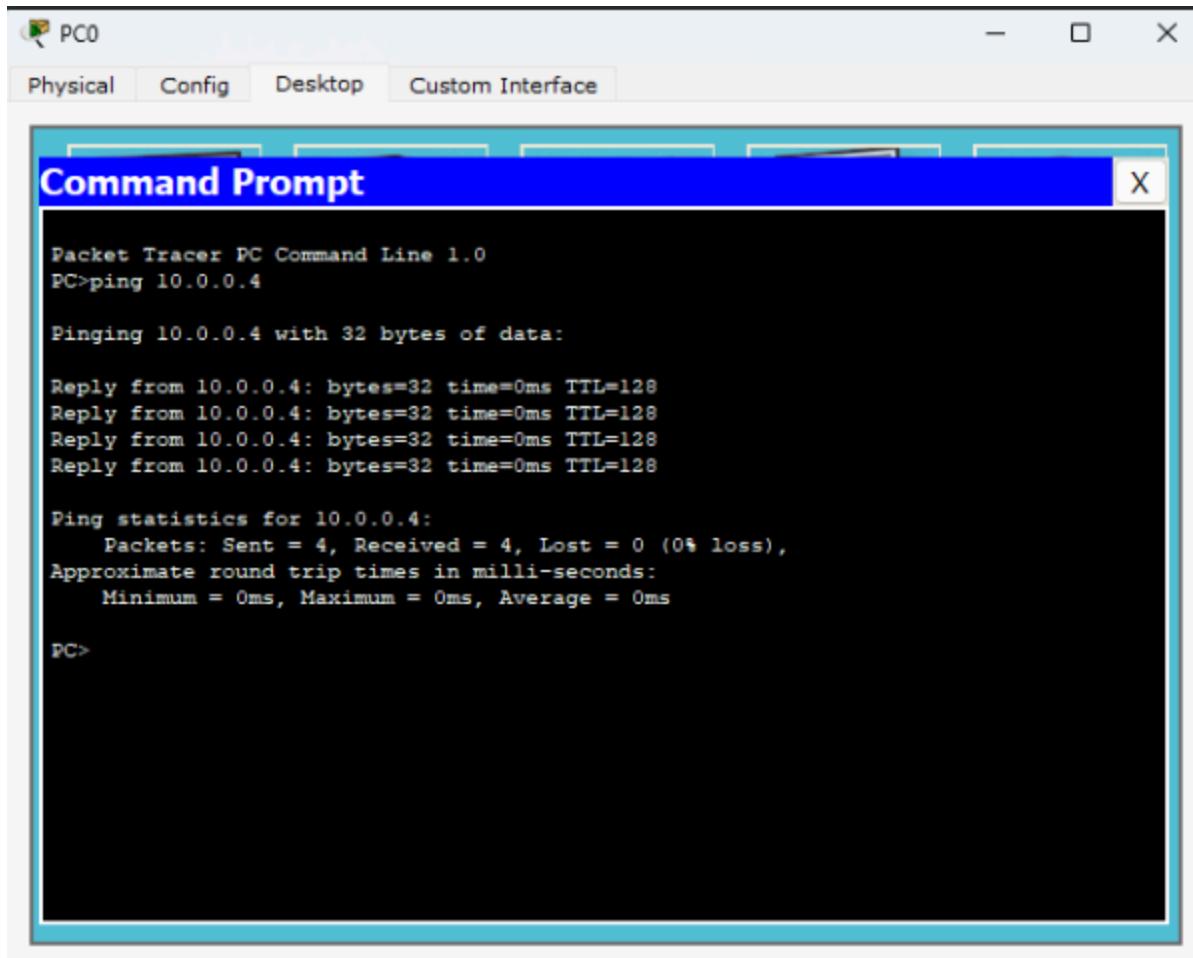
DHCP Auto Config Static

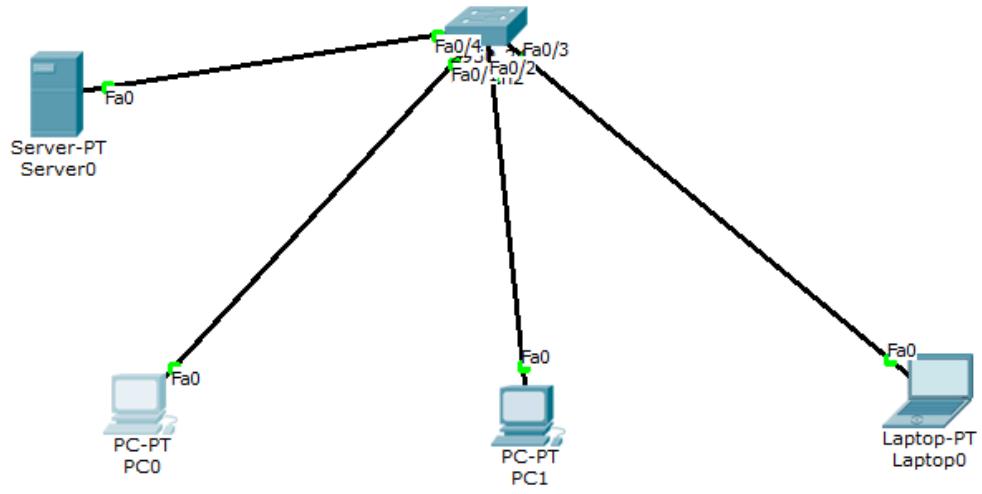
IPv6 Address /

Link Local Address FE80::2E0:F9FF:FEBE:665C

IPv6 Gateway

IPv6 DNS Server





18-11-24

Lab 5.

- Configure DHC P module on port and outside a LAN.

- Aim :- To configure DHC P module on LAN and outside LAN.

Topology :-



Procedure:-

- Select a Switch from device selection.
- add 3 end devices on workbench and one server.
- Connect all this to switch through copper straight cable.
- Create same topology to set other network.
- Place one router on workbench and connect two switches.

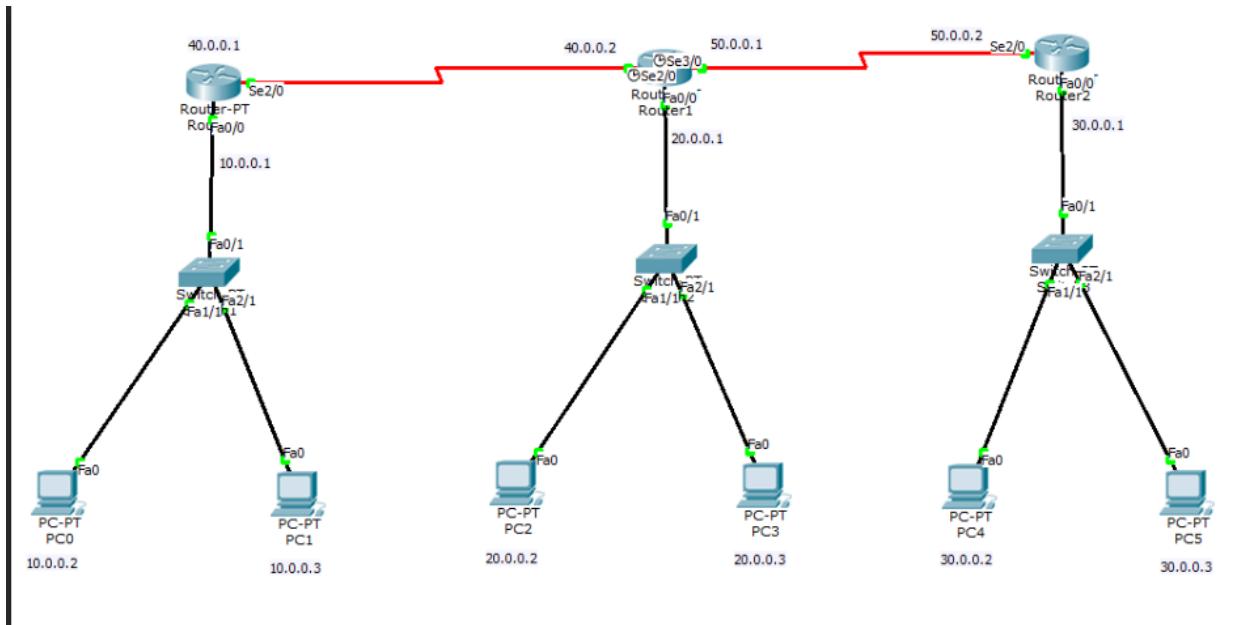
Router config :

```
Router>enable
Router#config terminal
Router(config)# interface fastethernet 4/0
ip address 10.0.0.1 255.0.0.0
ip helper-address 10.0.0.2
no shut
exit

H interface fastethernet 0/0
ip address 20.0.0.1 255.0.0.0
ip helper-address 10.0.0.2
no shut
exit.
```

~~Star 2~~
13/11

20-11-24
Lab - 6



Router>show ip |
 % Incomplete command.
 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 40.0.0.0/8 is directly connected, Serial2/0
 Router>

Copy Paste

Router2

Physical Config CLI

IOS Command Line Interface

```
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, FastEthernet0/0
C      50.0.0.0/8 is directly connected, Serial2/0
Router>
```

Router1

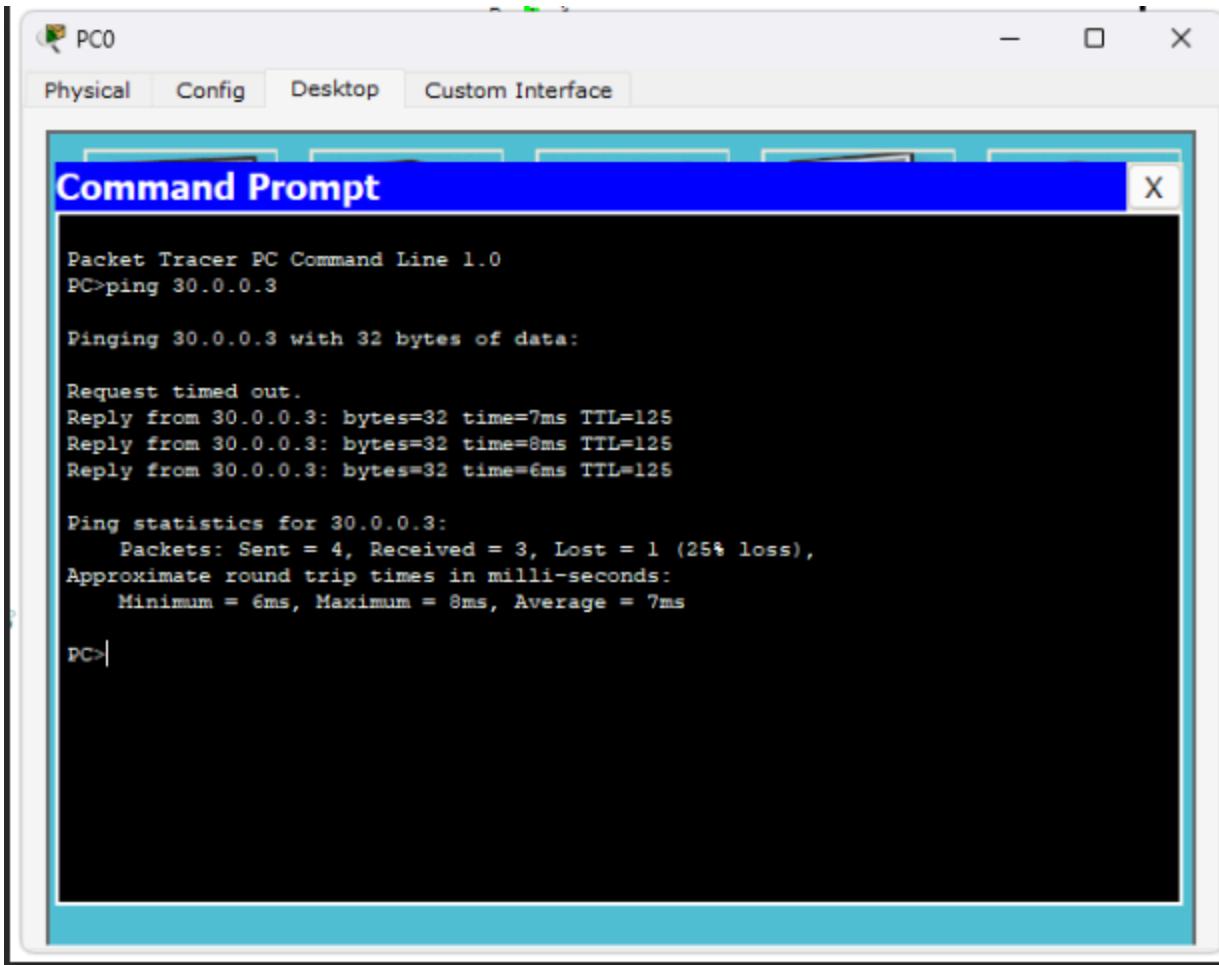
Physical Config CLI

IOS Command Line Interface

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

Gateway of last resort is not set

R    10.0.0.0/8 [120/1] via 40.0.0.1, 00:00:05, Serial2/0
C    20.0.0.0/8 is directly connected, FastEthernet0/0
R    30.0.0.0/8 [120/1] via 50.0.0.2, 00:00:08, Serial3/0
C    40.0.0.0/8 is directly connected, Serial2/0
C    50.0.0.0/8 is directly connected, Serial3/0
Router>
```



```

Packet Tracer PC Command Line 1.0
PC>ping 30.0.0.3

Pinging 30.0.0.3 with 32 bytes of data:

Request timed out.
Reply from 30.0.0.3: bytes=32 time=7ms TTL=126
Reply from 30.0.0.3: bytes=32 time=6ms TTL=126
Reply from 30.0.0.3: bytes=32 time=6ms TTL=126

Ping statistics for 30.0.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 6ms, Maximum = 8ms, Average = 7ms

PC>ping 30.0.0.2

Pinging 30.0.0.2 with 32 bytes of data:

Request timed out.
Reply from 30.0.0.2: bytes=32 time=3ms TTL=126
Reply from 30.0.0.2: bytes=32 time=9ms TTL=126
Reply from 30.0.0.2: bytes=32 time=10ms TTL=126

Ping statistics for 30.0.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 10ms, Average = 7ms

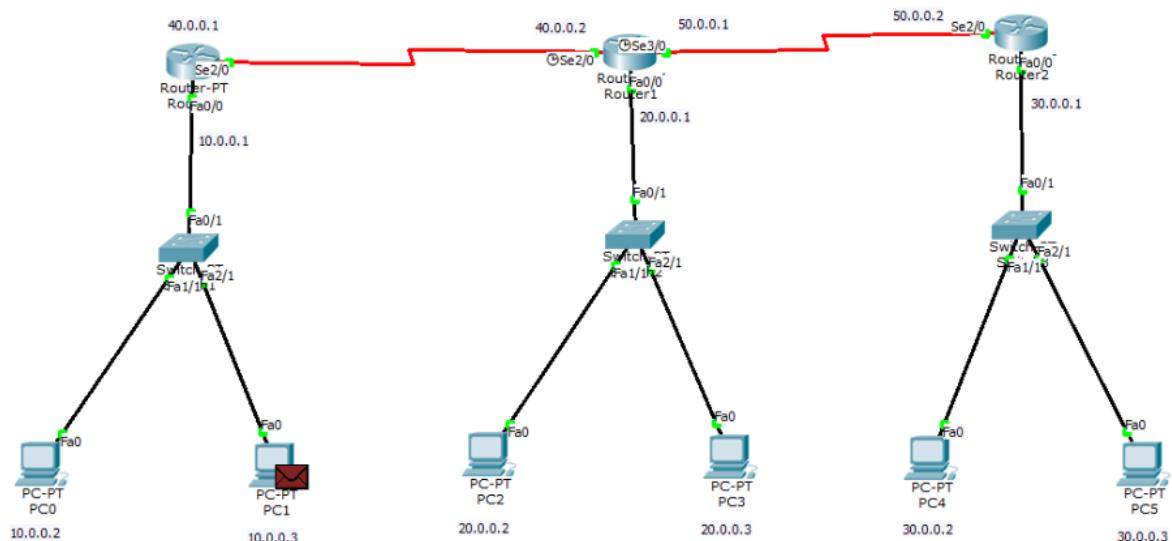
PC>ping 20.0.0.3

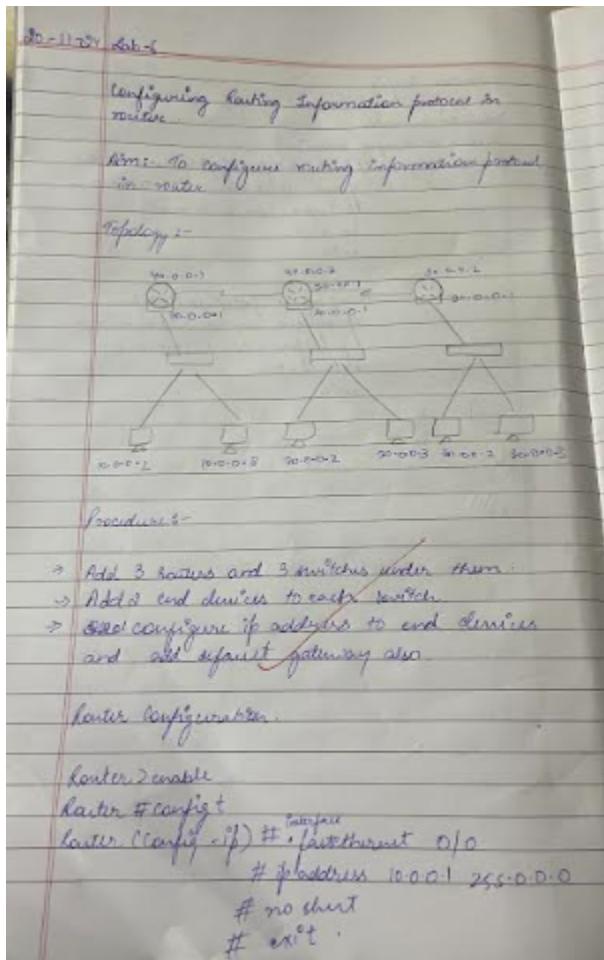
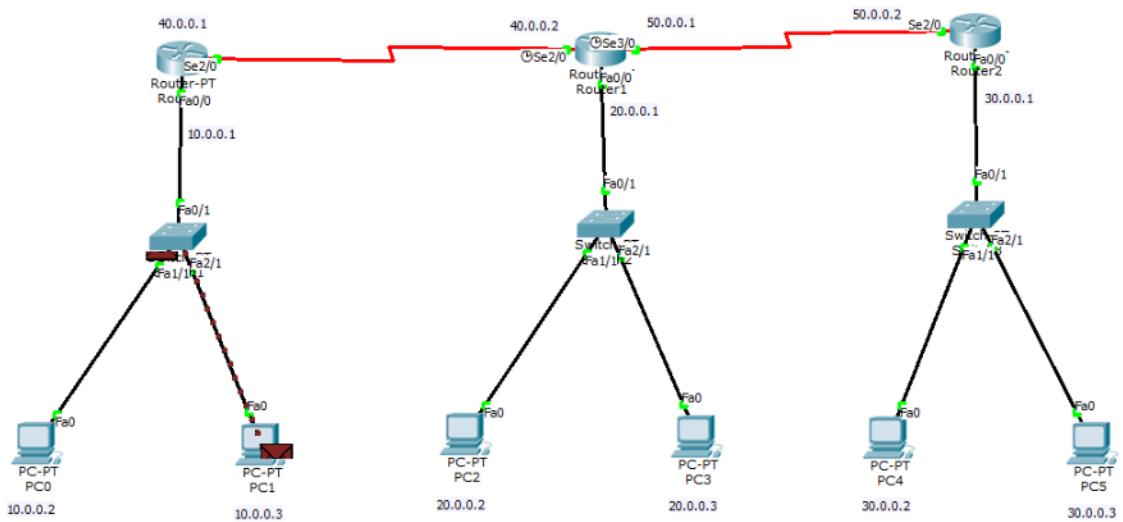
Pinging 20.0.0.3 with 32 bytes of data:

Request timed out.
Reply from 20.0.0.3: bytes=32 time=2ms TTL=126
Reply from 20.0.0.3: bytes=32 time=1ms TTL=126
Reply from 20.0.0.3: bytes=32 time=2ms TTL=126

Ping statistics for 20.0.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

```





Interface serial 0/0
ip address 40.0.0.2 255.0.0.0
no shut
exit

Interface fastethernet 0/0
ip address 30.0.0.1 255.0.0.0
no shut
exit

interface serial 0/0
ip address 50.0.0.2 255.0.0.0
no shut
exit

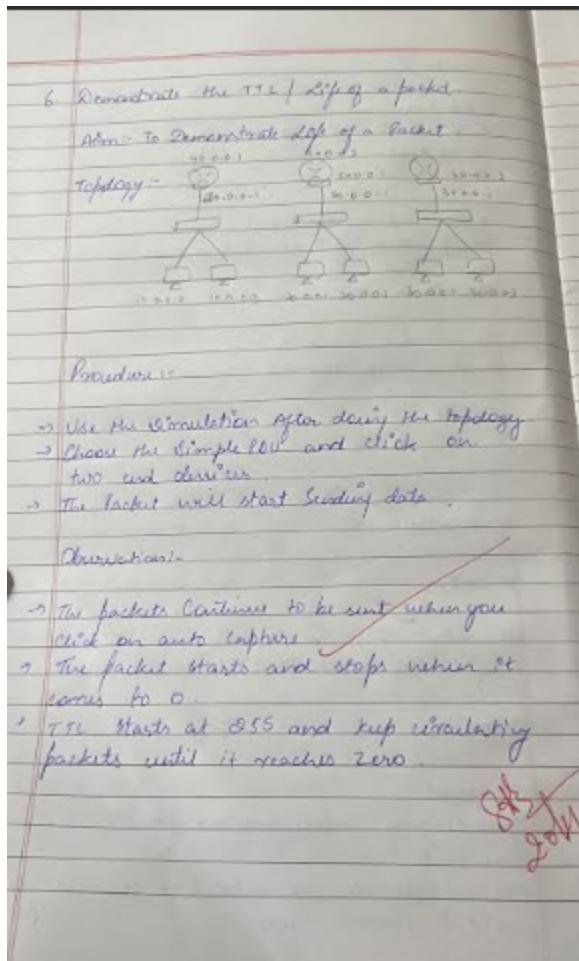
Router 3
Interface serial 0/0
ip address 50.0.0.1 255.0.0.0
no shut
exit

interface fastethernet 0/1
ip address 30.0.0.1 255.0.0.0
no shut
exit

Observed :-

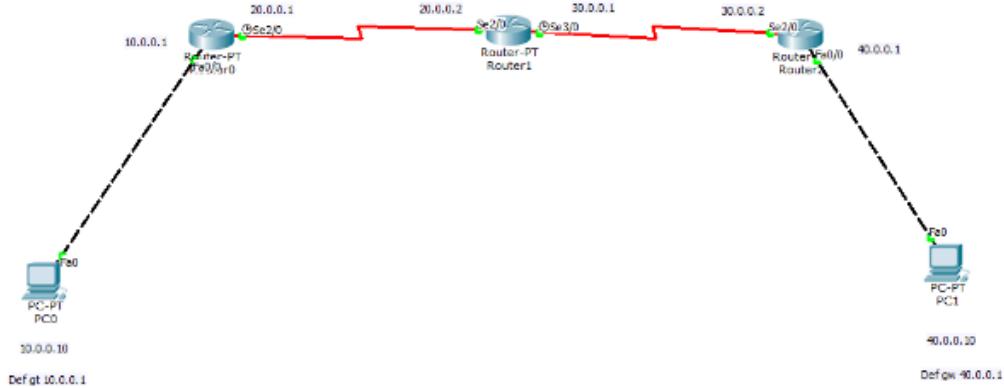
After ringing from network 1 to 3 , the p
were sent.

TTL starts at 255 and keep circulating
until it reaches zero .



27-11-24

Lab-7



```

Router>enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet 0/0
Router(config-if)#ip address 10.0.0.1 255.
^
% Invalid input detected at '^' marker.

Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#no shut

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

Router(config-if)#interface serial 2/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#clock rate 64000
Router(config-if)#no shut

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

```

```
Router>enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#router-id 1.1.1.1
Router(config-router)#network 10.0.0.0 0.255.255.255 area 3
Router(config-router)#network 20.0.0.0 0.255.255.255 area 1
Router(config-router)#exit
Router(config)#
00:30:14: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial2/0 from LOADING to FULL, Loading Done
```

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface loopback 0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

Router(config-if)#ip add 172.16.1.252 255.255.0.0
Router(config-if)#no shut
Router(config-if)#

```