

Aim-3

3. Configure default route, static route to the Router

Static Route:

Topology:

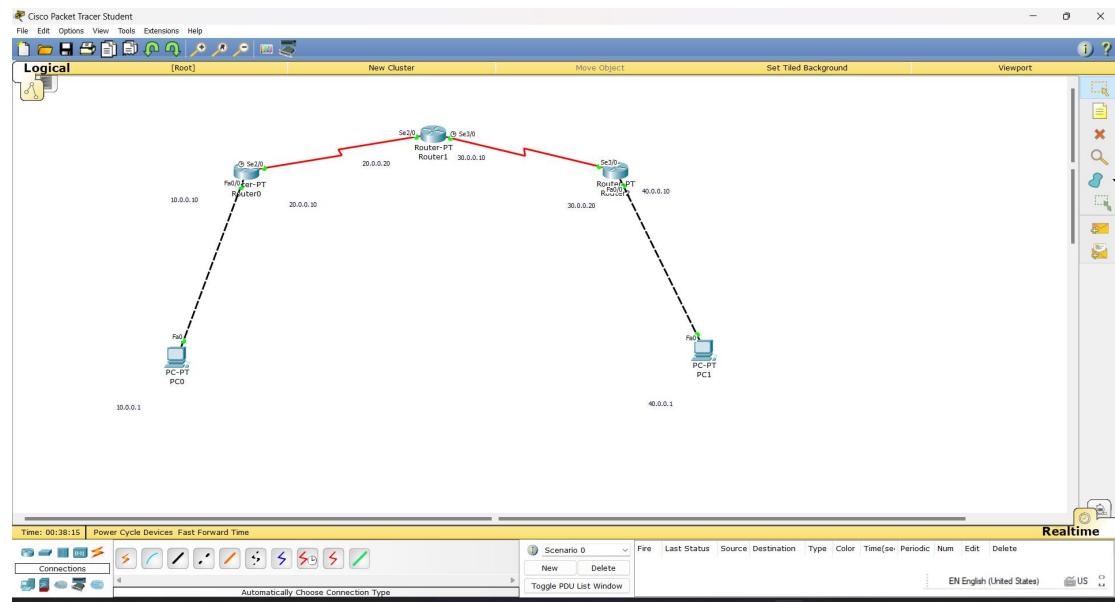


Fig 1: Topology

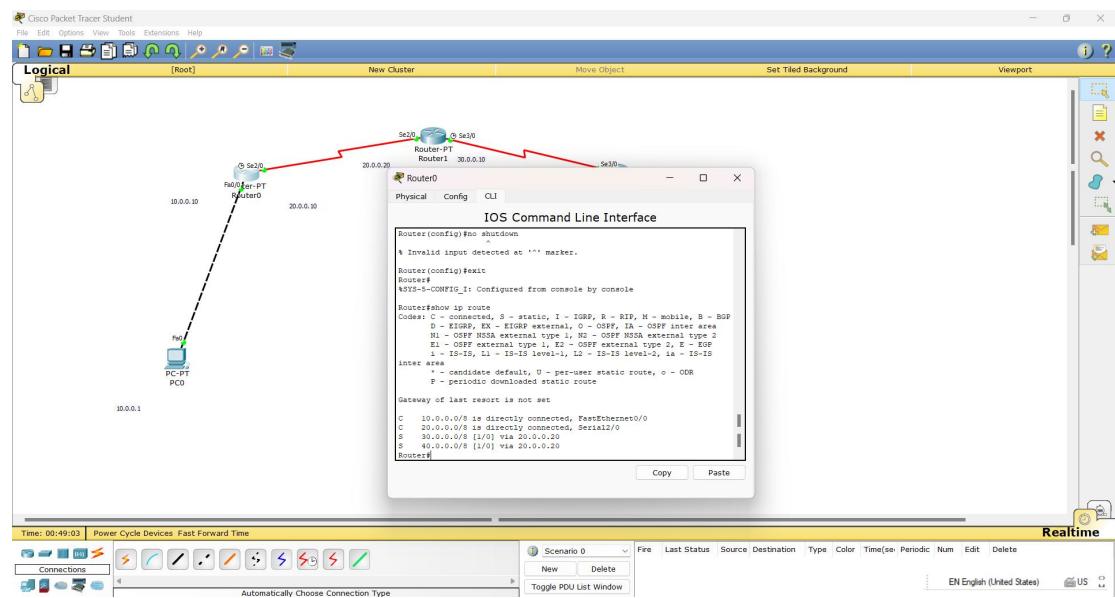


Fig 2: Router0 Connections

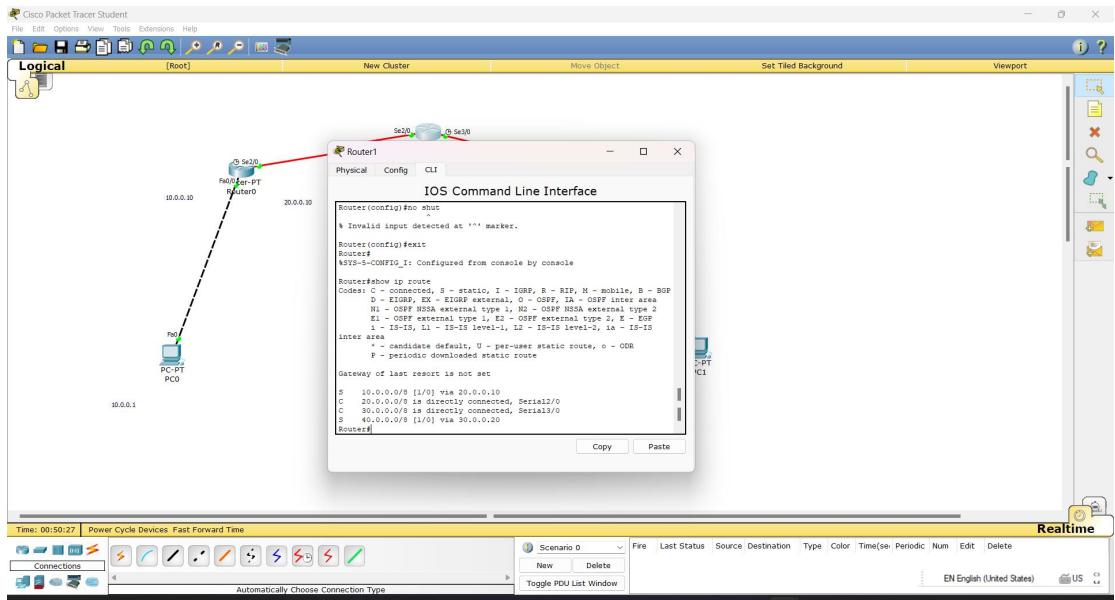


Fig 3: Router1 Connections

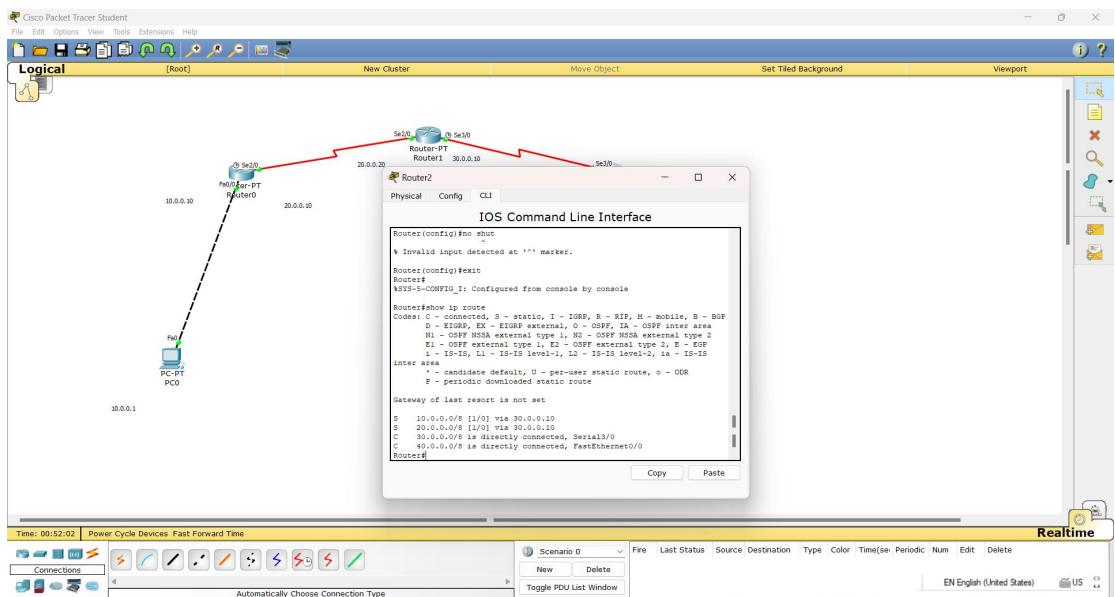
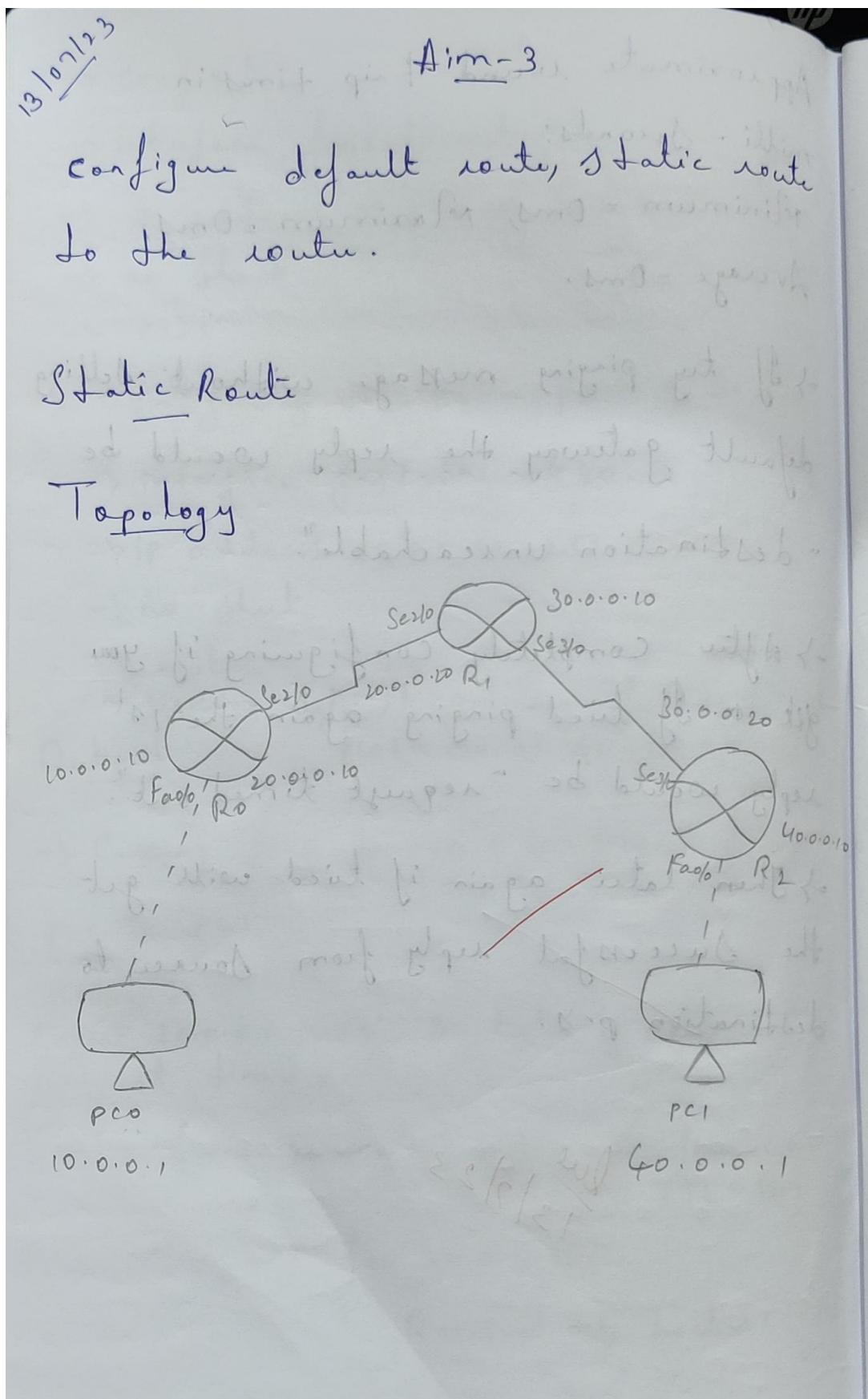


Fig 4: Router2 Connections

Procedure and Observation:



Procedure

→ Configure the IP addresses of the PCs
i.e; for PC0 (10.0.0.1) & for PC1 (40.0.0.1).

→ Now configuring the routes.

Route 0

→ n

→ enable

→ config t

→ interface fastethernet 0/0 (Ethernet 0/0)

→ IP address 10.0.0.10 255.0.0.0

→ no shut

→ exit

(for Serial).

→ interface serial 2/0

→ IP address 20.0.0.10 255.0.0.0

→ no shut

→ exit

Router 1

```
→ n  
→ enable  
→ config t  
→ interface serial 2/0  
→ ip address 20.0.0.20 255.0.0.0  
→ no shut down  
→ exit  
(for serial 3 port)  
→ interface serial 3/0  
→ ip address 20.0.0.10 255.0.0.0  
→ no shut
```

Router 2

```
→ n  
→ enable  
→ config t  
→ ip address interface serial 3/0
```

-> ip address 30.0.0.20 255.0.0.0
-> no shut
-> exit.
(for fastethernet).
-> interface fastethernet 0/0
-> ip address 40.0.0.10 255.0.0.0
-> no shut
-> exit.
-> now check the connections and see if
all of them are connected.

Router 0

-> exit
-> show ip route

C 10.0.0.0/8 is directly connected, FastEther-

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

Router 1

-> exit

-> show ip route

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

C 30.0.0.0/8 is directly connected, Serial 3/0

Router 2

=> config

=> show ip route

if 30.0.0.0/8 is directly connected, Serial 3%

if 40.0.0.0/8 is directly connected, Fastethernet 0%

=> Now configuring the static IP addresses

of routes so that the communication can happen by / through all the networks present.

Router 0

=> config t

=> ip route 30.0.0.0 255.0.0.0 20.0.0.20

=> ip route 40.0.0.0 255.0.0.0 20.0.0.20

=> no shut => exit

Router 1

=> config t

=> ip route 10.0.0.0 255.0.0.0 20.0.0.10

-> ip route 40.0.0.0 255.0.0.0 30.0.0.20
=> no shut -> exit

Router 2

-> config

=> ip route 10.0.0.0 255.0.0.0 30.0.0.10

=> ip route 20.0.0.0 255.0.0.0 30.0.0.10

=> no shut -> exit.

-> Now again check if connections are made properly.

Router 0

-> exit

-> show ip route

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 30.0.0.0/8 [1/0] Via 20.0.0.20

S 40.0.0.0/8 [1/0] Via 20.0.0.20

Router 1

-> exit

-> show ip route

S 10.0.0.0/8 [1/0] Via 20.0.0.10
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 30.0.0.20

Router 2

=> exit

=> show ip route

S 10.0.0.0/8 [1/0] Via 30.0.0.10
S 20.0.0.0/8 [1/0] Via 30.0.0.10
C 30.0.0.0/8 is directly connected, Serial 3/0
C 40.0.0.0/8 is directly connected, FastEthernet 0/0

Output

=> allow passing ping message from PC0 to PC1

-> ping 40.0.0.1

pinging 40.0.0.1 with 32 bytes of data!

Reply from 40.0.0.1: bytes = 32 time = 2 ms
TTL = 125

Reply from 40.0.0.1: bytes = 32 time = 18 ms
TTL = 125

Reply from 40.0.0.1: bytes = 32 time = 13 ms
TTL = 125

Reply from 40.0.0.1: bytes = 32 time = 9 ms
TTL = 125

ping statistics for: 40.0.0.1

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

(0% loss),

Approximate round trip times in milliseconds:

Minimum = 2 ms, Maximum = 18 ms,

Average = 10 ms

Now passing ping message from

pc1 to pc0

→ Ping 10.0.0.1

Reply from 10.0.0.1: bytes = 32 Time = 16 ms
TTL = 125

Reply from 10.0.0.1: bytes = 32 Time = 4 ms
TTL = 125

Reply from 10.0.0.1: bytes = 32 Time = 12 ms
TTL = 125

Reply from 10.0.0.1: bytes = 32 Time = 4 ms
TTL = 125

Ping statistics for 10.0.0.1:

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

Approximate round trip in milliseconds:

Minimum = 4 ms, Maximum = 16 ms,

Average = 9 ms.

free

Output:

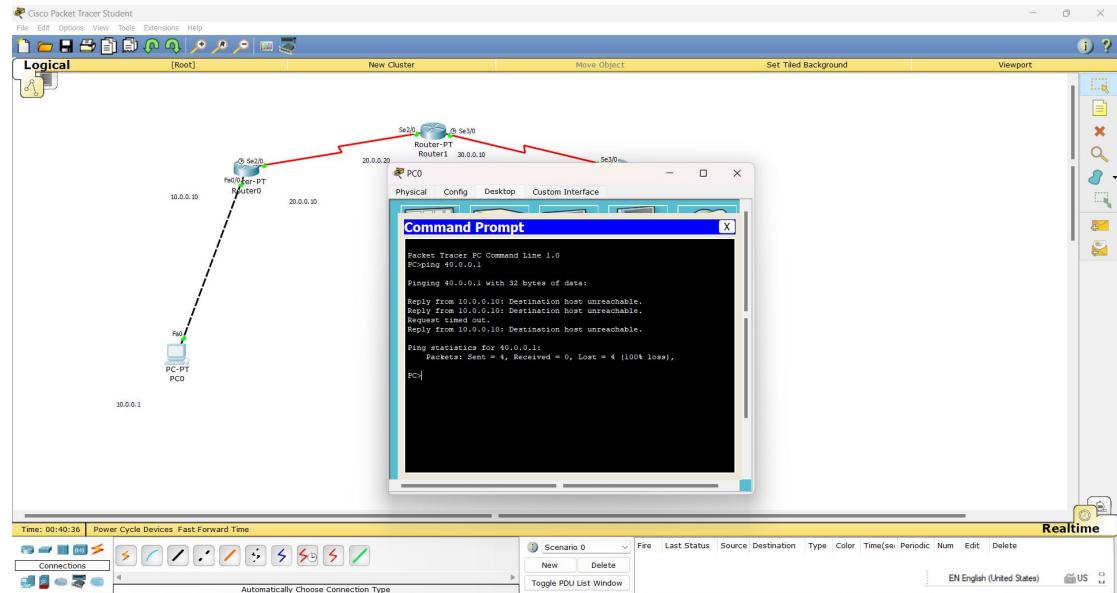


Fig 5: Pinging from pc0 to pc1 (with the messages destination host unreachable and request timed out)

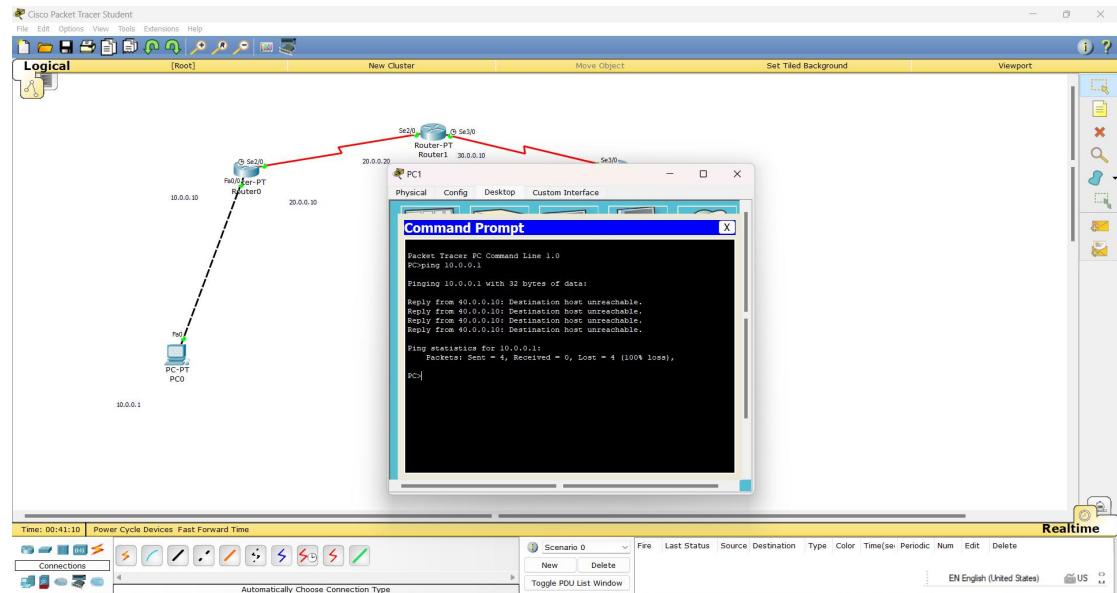


Fig 6: Pinging from pc1 to pc0 (with the messages destination host unreachable)

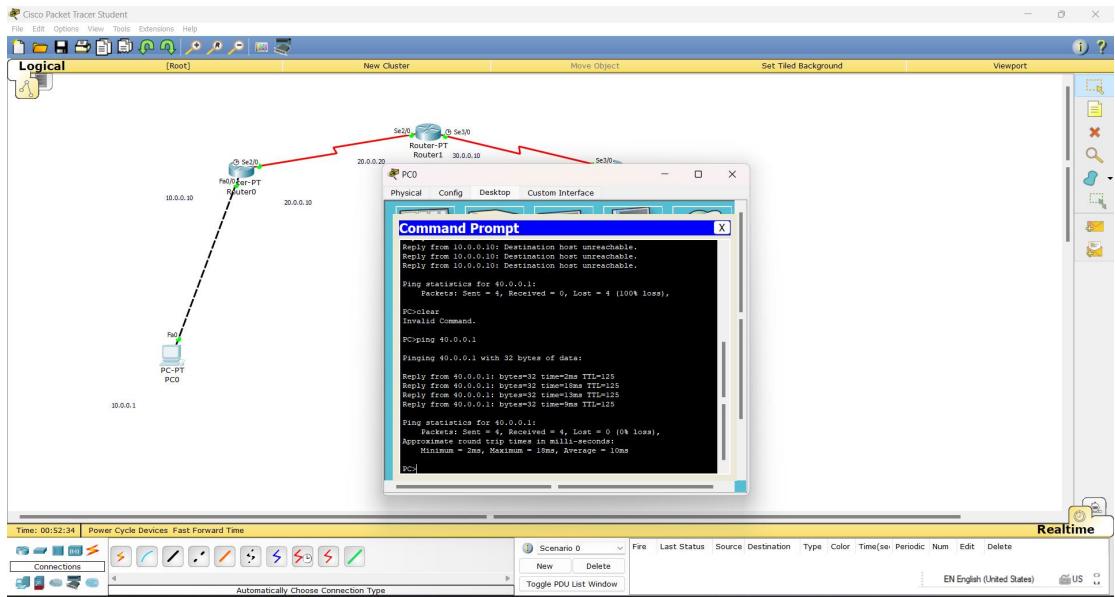


Fig 7: Pinging from pc0 to pc1 (message passing successful)

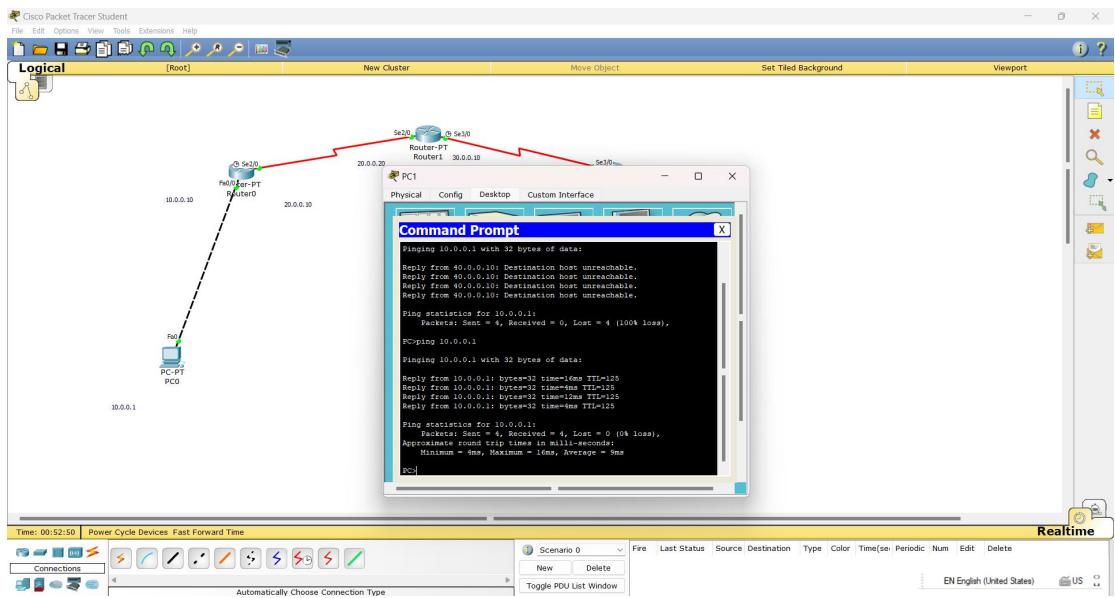


Fig 8: Pinging from pc1 to pc0 (message passing successful)

Default Route:

Topology:

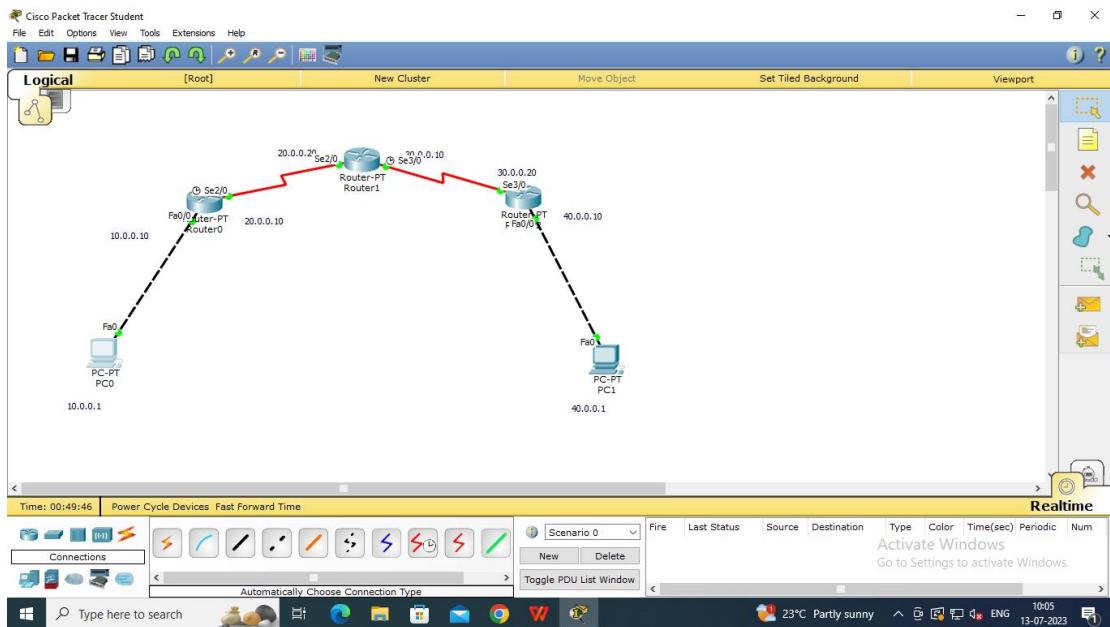


Fig 1: Topology

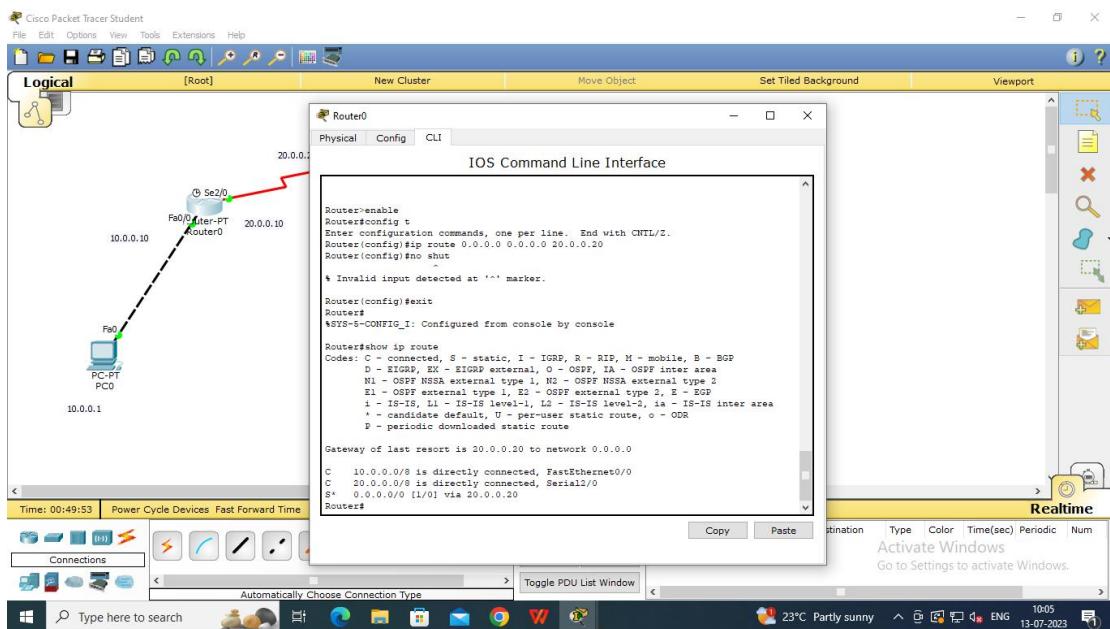


Fig 2: Router0 Connections

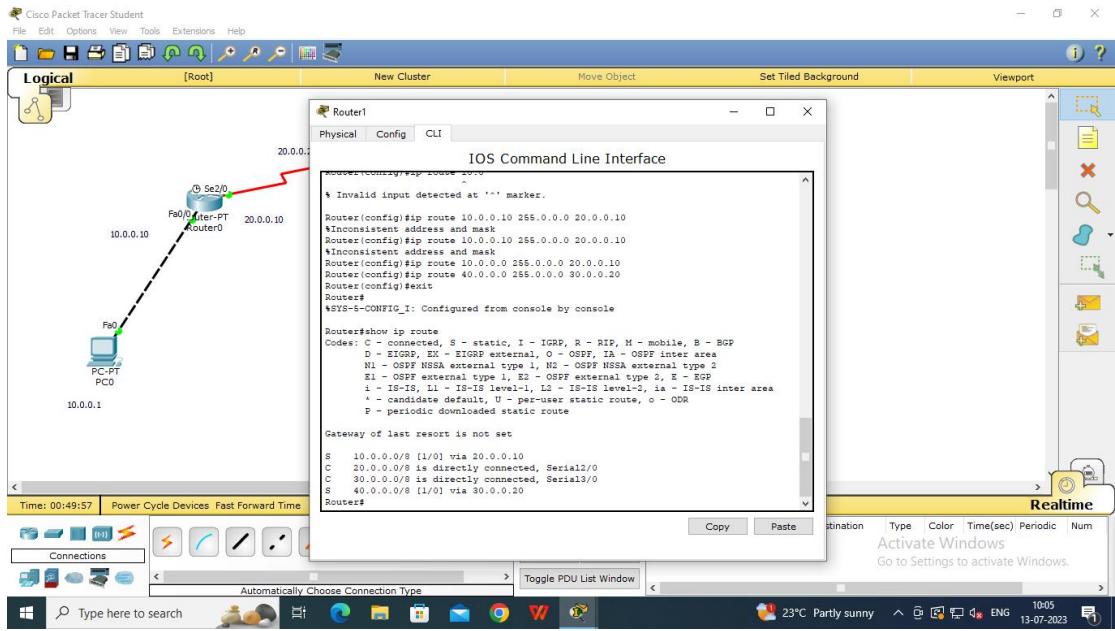


Fig 3: Router1 Connections

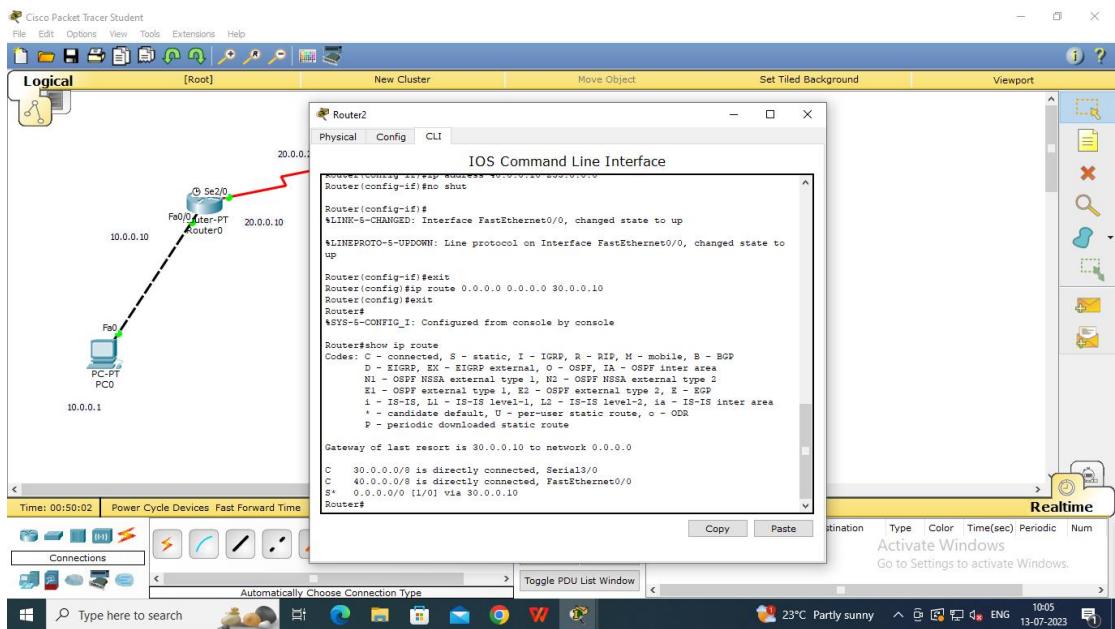
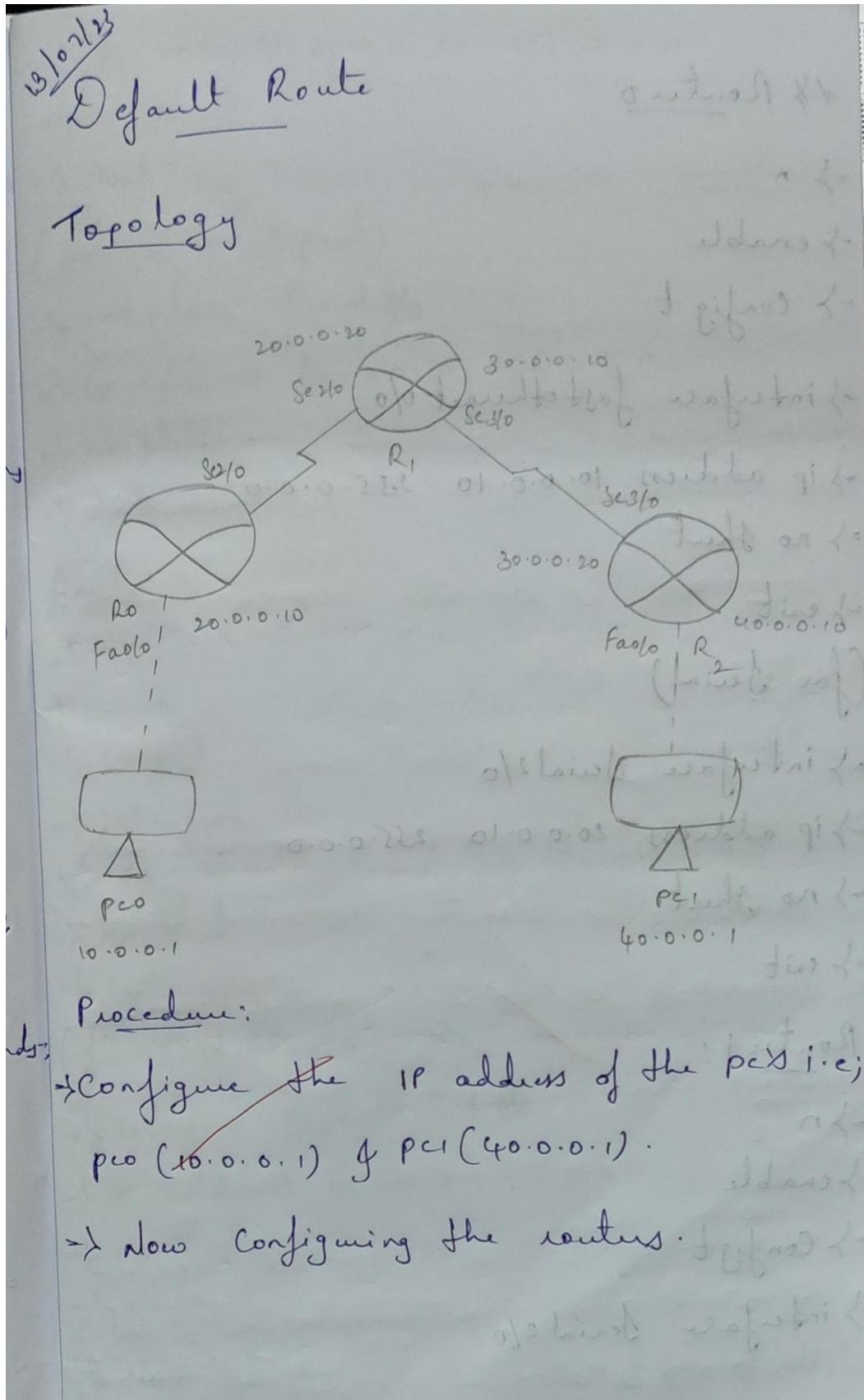


Fig 4: Router2 Connections

Procedure and Observation:



Router

```
-> n  
-> enable  
-> config t  
-> interface fastethernet 0/0  
-> ip address 10.0.0.10 255.0.0.0  
-> no shut  
-> exit
```

(for Serial)

```
-> interface serial 2/0  
-> ip address 20.0.0.10 255.0.0.0  
-> no shut  
-> exit
```

Router 1:

```
-> n  
-> enable  
-> config t  
-> interface serial 2/0
```

-> ip address 20.0.0.20 255.0.0.0
-> no shut
-> exit
(for Serial 3 port)
-> interface Serial 3/0
-> ip address 30.0.0.10 255.0.0.0
-> no shut
-> exit

Router 2: ~~Router 2 has address 30.0.0.08~~

-> ?
-> enable
-> config
-> interface Serial 3/0
-> no ip address 30.0.0.20 255.0.0.0
-> no shut
-> exit
(for fastethernet)
-> interface fastethernet 0/0
-> ip address 40.0.0.10 255.0.0.0
-> no shut
-> exit
-> Now check the connection & see if all

→ They are connected.

Router 0

→ exit

→ show ip route

* c 10.0.0.0/8 is directly connected,
FastEthernet 0/0

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

Router 1

→ exit

→ show ip route

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

c 30.0.0.0/8 is directly connected, Serial 3/0

Router 2

→ exit

→ show ip route

c 30.0.0.0/8 is directly connected, Serial 3/0

c 40.0.0.0/8 is directly connected, FastEthernet 0/0

→ Now configuring the default route
all the routes connected or present, so that
the communication can happen by/through
all the routes present.

Route 0

→ Config terminal interface is 8/0/0/0

→ ip route 0.0.0.0 0.0.0.0 20.0.0.20

→ exit

Route 1

→ config

→ ip route 10.0.0.0 255.0.0.0 20.0.0.10

→ ip route 40.0.0.0 255.0.0.0 30.0.0.20

→ exit

Route 2

→ config

→ ip route 0.0.0.0 0.0.0.0 30.0.0.10

→ exit

→ Now again check if connections the
default route is proper.

Router 0

→ show ip route

c 10.0.0.0/8 is directly connected,
FastEthernet 0%

c 20.0.0.0/8 is directly connected Serial 0%

S* 0.0.0.0 [1/0] Via 20.0.0.20

Router 1

→ show ip route

S 10.0.0.0/8 [1/0] Via 20.0.0.10

c 20.0.0.0/8 is directly connected, Serial 4%

c 30.0.0.0/8 is directly connected, Serial 3%

S 40.0.0.0/8 [1/0] Via 30.0.0.20

Router 2

→ show ip route

c 30.0.0.0/8 is directly connected, Serial 3%

c 40.0.0.0/8 is directly connected, FastEthernet 0%

S* 0.0.0.0/0 [1/0] Via 30.0.0.10

Output

⇒ Now passing ping message from pc0 to
pc1.

* → ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Request timed out

Reply from 40.0.0.1: bytes = 32 time = 15ms
TTL = 125

Reply from 40.0.0.1: bytes = 32 time = 2ms
TTL = 125

Reply from 40.0.0.1: bytes = 32 time = 2ms
TTL = 125

Ping statistics for 40.0.0.1:

Packets: Sent = 4, Received = 3, Lost = 1
(25% loss)

Approximate round trip times in milli-seconds:

/ Minimum = 2ms, Maximum = 15ms, Average
= 6ms

Now again sending the ping message

from PC0 to PC1.

⇒ Ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data,

Reply from 40.0.0.1: bytes = 32 time = 2ms TTL = 125

Reply from 40.0.0.1: bytes = 32 time = 2ms

TTL = 125

Reply from 40.0.0.1: bytes = 32 time = 2ms

TTL = 125

Reply from 40.0.0.1: bytes = 32 time = 2ms

TTL = 125

Ping statistics for 40.0.0.1:

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

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 2ms,

Average = 2ms.

=> now pinging from PC1 to PC2

-> ping 10.0.0.1

Pinging from 10.0.0.1: bytes = 32 time = 3 ms
TTL = 125

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes = 32 time = 3 ms
TTL = 125

Reply from 10.0.0.1: bytes = 32 time = 8 ms
TTL = 125

Reply from 10.0.0.1: bytes = 32 time = 3 ms
TTL = 125

Reply from 10.0.0.1: bytes = 32 time = 3 ms
TTL = 125

(loss)
Ping statistics for 10.0.0.1:

4 packets sent, 4 received, 0% loss = 0 ms

Approximate round trip times in milli-seconds:

Minimum = 3 ms, Maximum = 9 ms, Average = 4 ms

Observations

- Configuring default ip route ensures that the packet passes through the default route when no other route is available for an ip destination address.
- The simulation of sending a simple PDU from source to destination (Here from pco to pci) shows the route taken by the ICMP protocol.

201 - SRTT
202 - RTT
~~free~~

Output:

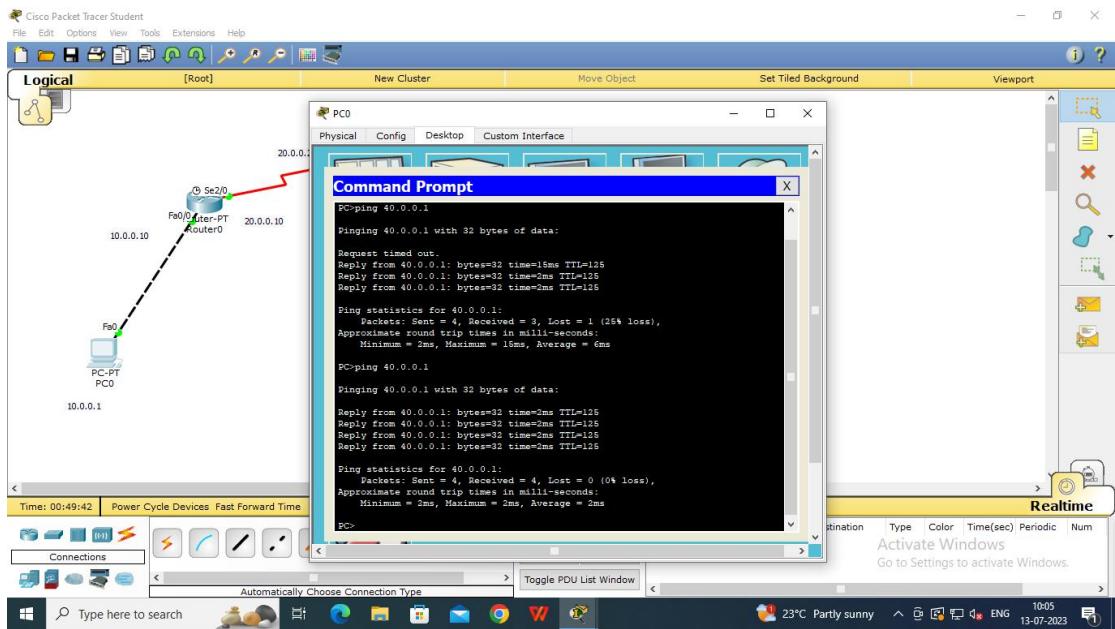


Fig 5: Pinging from pc0 to pc1

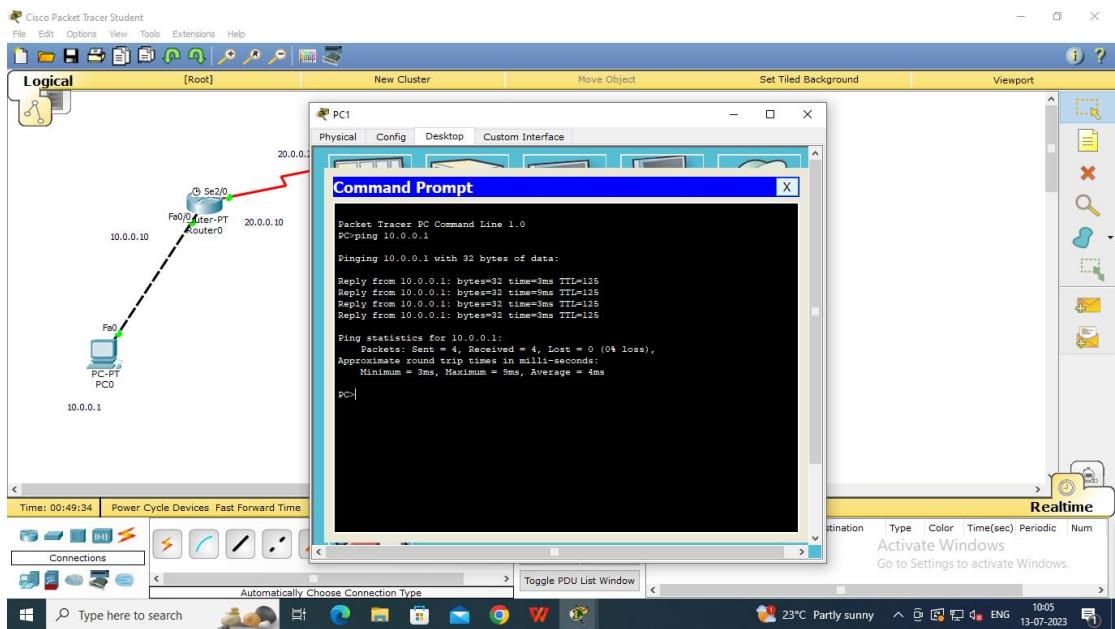


Fig 6: Pinging from pc0 to pc1