Aim-9

9. To construct a VLAN and make the PC's communicate among a VLAN

Topology:

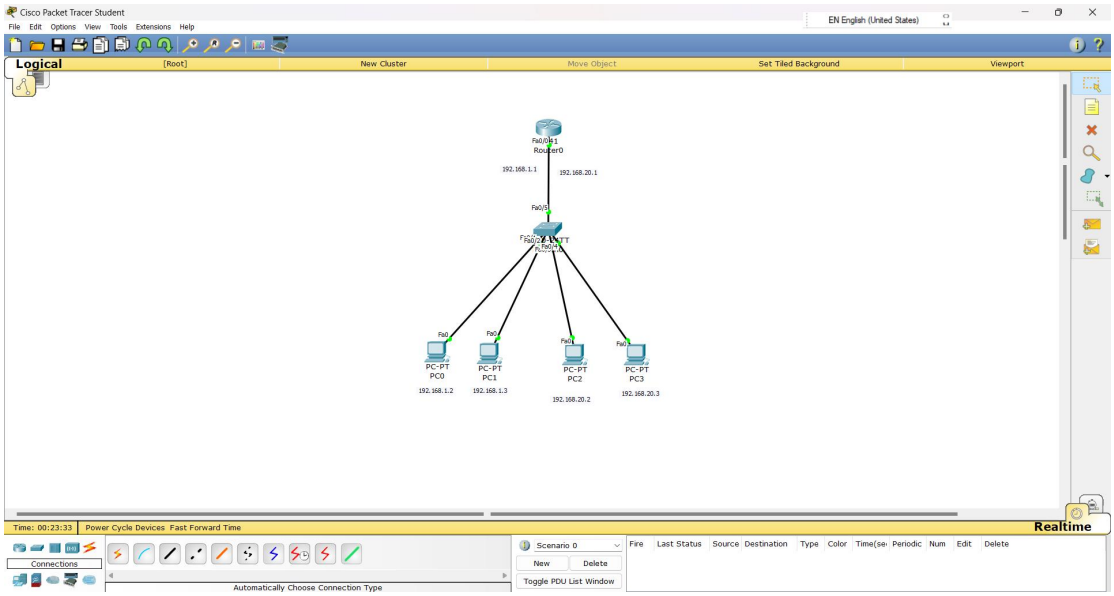


Fig 1: Topology

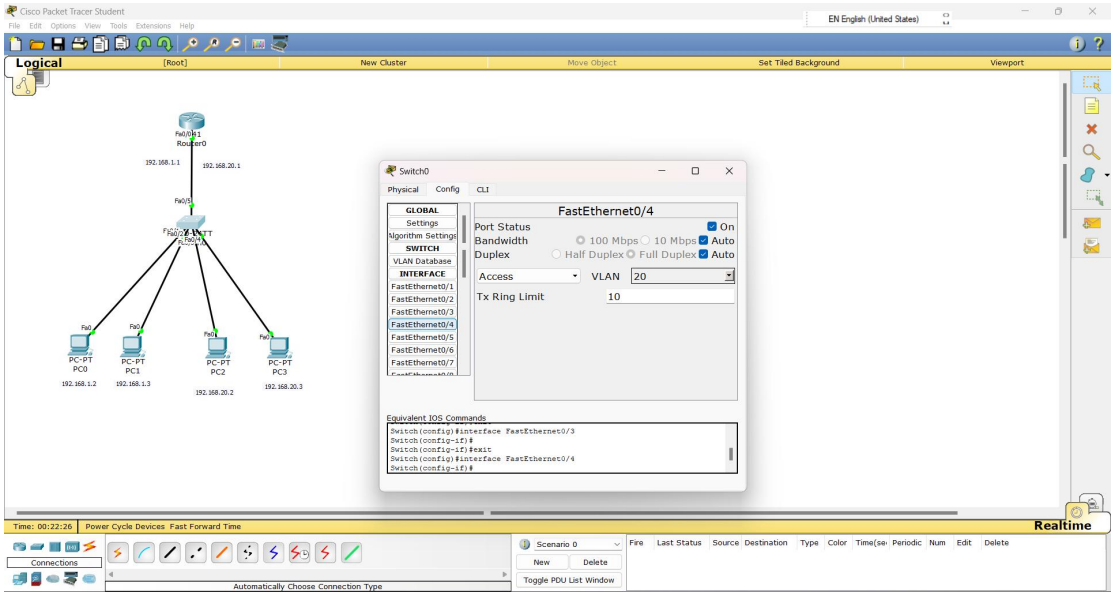


Fig 2: Fastethernet port configuration

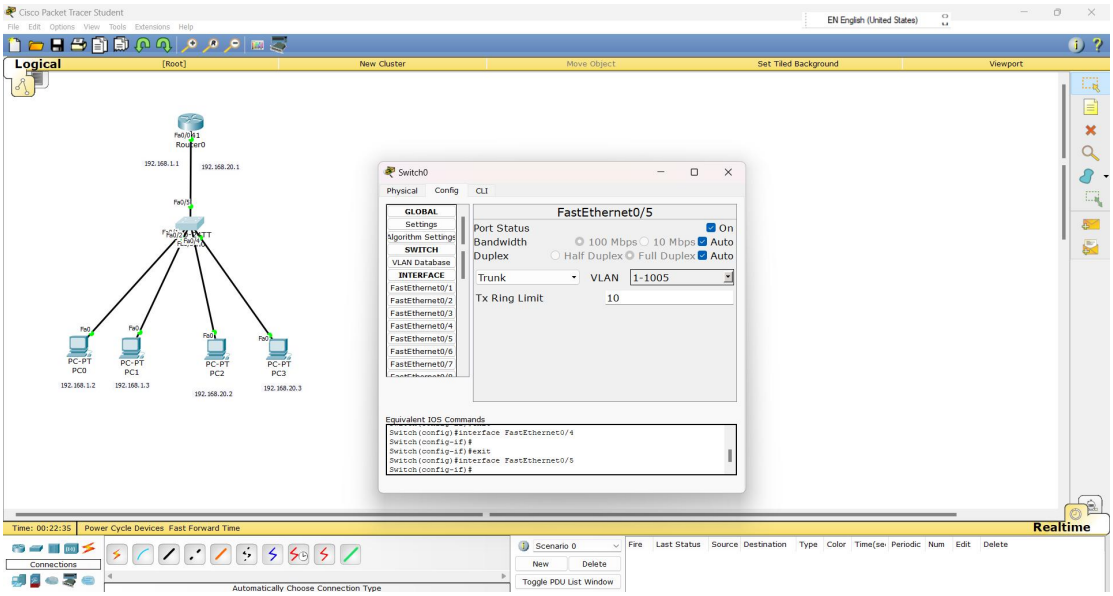


Fig 3: Port Configuration

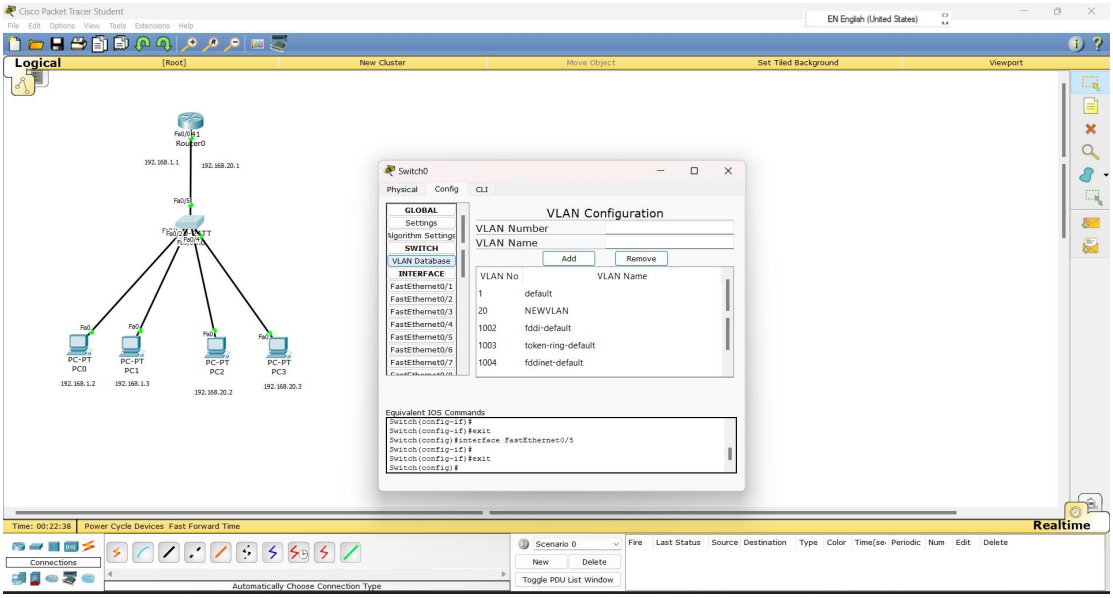


Fig 4: VLAN configuration

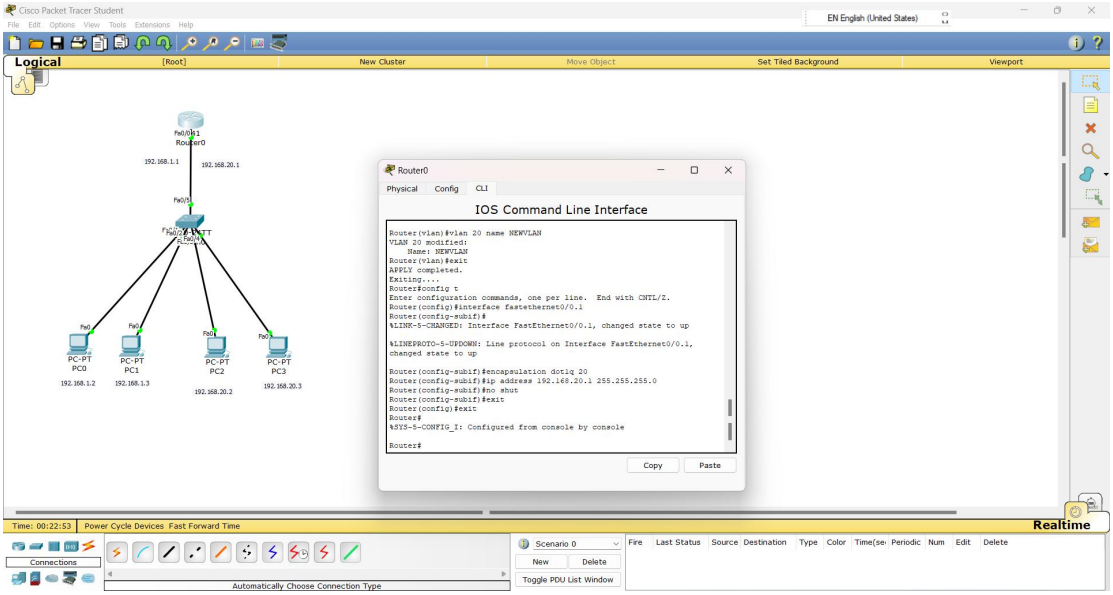


Fig 5: Virtual port configuration

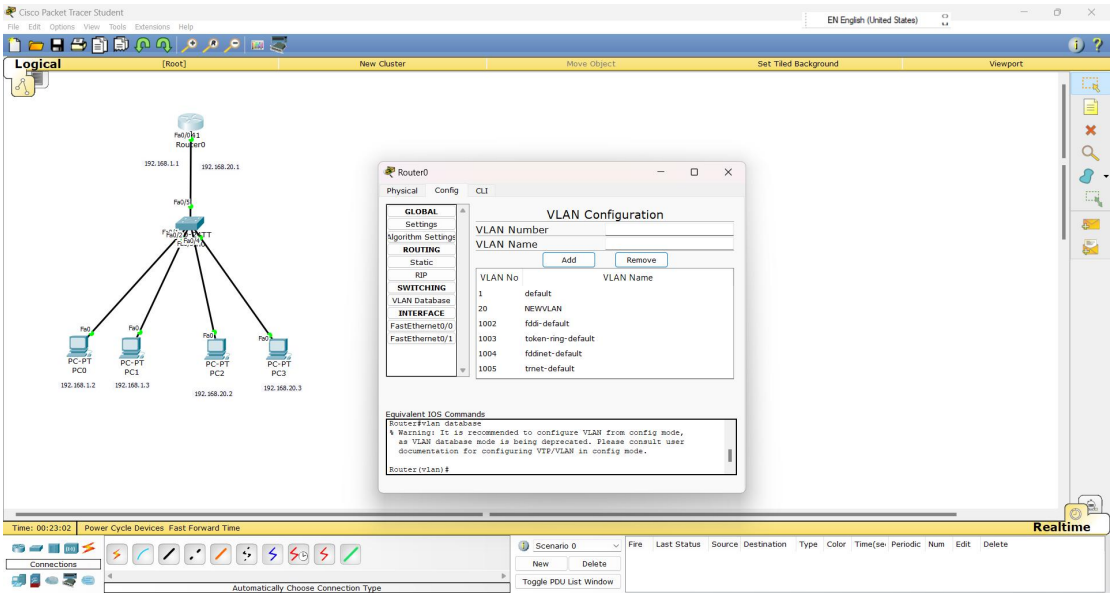


Fig 6: Newly created VLAN

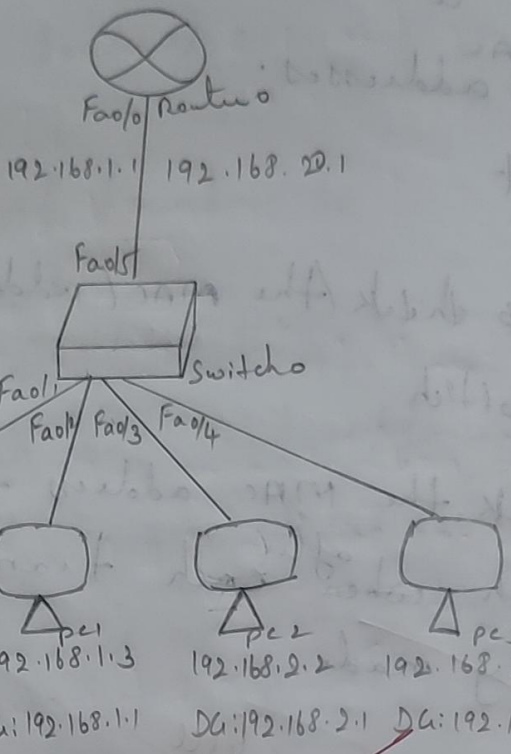
Procedure and Observation:

6/08/23

Aim-9

9. To Construct a VLAN and make the pc's communicate among a VLAN.

Topology:



Procedure:

-> Create a topology of one router (1841), a Switch and 4 PC's

-> Assign the IP addresses of the PC's as shown above.

-> Now only configure the interface which near router (i.e; Fa0/0) just assign the ip address & subnet mask (i.e; 192.168.1.1 and ~~255.0.0~~ 255.255.255.0 respectively).

-> In the Switch, go to config tab and Select VLAN Database.

(give based on the IP adding given/used/selected)

-> In place of VLAN Number give "20" (any VLAN number can be given) and in place of VLAN Name give any name ~~i.e~~ for ex (NEWVLAN) and click on "Add".

-> Select the interface which near the Switch from router (i.e; Fa0/5) in the Switch's config tab.

-> Select "trunk" by clicking on drop down (left side).

-> Select the interfaces which are near the Switch from the PCs i.e; Fa0/3 & Fa0/4 in the Switch's config tab.

-> Click on VLAN drop down and Select the or check tick on the 20: NEWVLAN.

-> Now go to router config tab click on VLAN Database and enter the number and name of VLAN created i.e; here we gave (20, NEWVLAN).

-> Now Goto router CLI and give the below commands

```
Router(VLAN) # exit
Router # config t
Router (config) # interface fastethernet 0/0.1
Router (config-subif) # encapsulation dot1q 20
Router (config-subif) # ip address 192.168.20.1
                        255.255.255.0
Router (config-subif) # no shut
Router (config-subif) # exit
Router (config) # exit
```

Output

⇒ Passing ping commands from pc0 to pc3 and from pc3 to pc0.

"pc0 to pc3"

pc> ping 192.168.20.3

Pinging 192.168.20.3 with 32 bytes of data:

Request timed out

Reply from 192.168.20.3: bytes = 32 time = 1ms TTL = 127

Reply from 192.168.20.3: bytes = 32 time = 0ms TTL = 127

Reply from 192.168.20.3: bytes = 32 time = 0ms TTL = 127

Ping statistics for 192.168.20.3:

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

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 1ms, Average = 0ms

"pc8 to pc0"

pc8 Ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=0ms TTL=127

Reply from 192.168.1.2: bytes=32 time=0 ms TTL=127

Reply from 192.168.1.2: bytes=32 time=1ms TTL=127

Reply from 192.168.1.2: bytes=32 time=0 ms TTL=127

Ping Statistics for 192.168.1.2:

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

Approximate round trip times in milli-seconds:

Minimum=0ms, Maximum=1ms, Average=0 ms

"pc1 to pc2"

pc> ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Request timed out.

Reply from 192.168.20.2: bytes=32 time=1ms TTL=127

Reply from 192.168.20.2: bytes=32 time=0ms TTL=127

Reply from 192.168.20.2: bytes=32 time=0ms TTL=127

Ping Statistics for 192.168.20.2:

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

Approximate ~~round~~ trip times in milli-seconds:

Minimum=0ms, Maximum=1ms, Average=0ms

"pc2 to pc1"

pc> Ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=0 ms
TTL=127

Reply from 192.168.1.3: bytes=32 time=0 ms
TTL=127

Reply from 192.168.1.3: bytes=32 time=0 ms
TTL=127

Reply from 192.168.1.3: bytes=32 time=0 ms
TTL=127

Ping Statistics for 192.168.1.3:

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

Approximate round trip times in milli-seconds:

Minimum=0ms, Maximum=0ms,
Average=0ms.

observation:

-> Virtual LAN (VLAN).

-> Here we use a concept called VLAN trunking allows switches to forwards frames different VLANS over a single link called trunk.

-> This is done by adding an additional header information called tag to the Ethernet frame. The process of adding this small header is called VLAN tagging.

lab
10/8/23

Output:

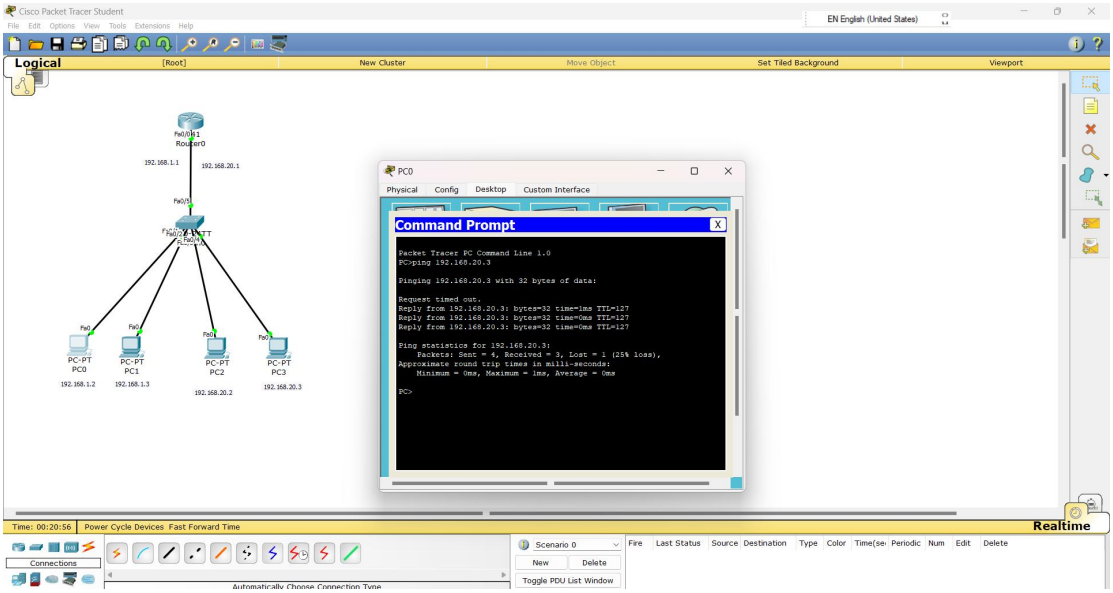


Fig 7: pinging from pc0 to pc3

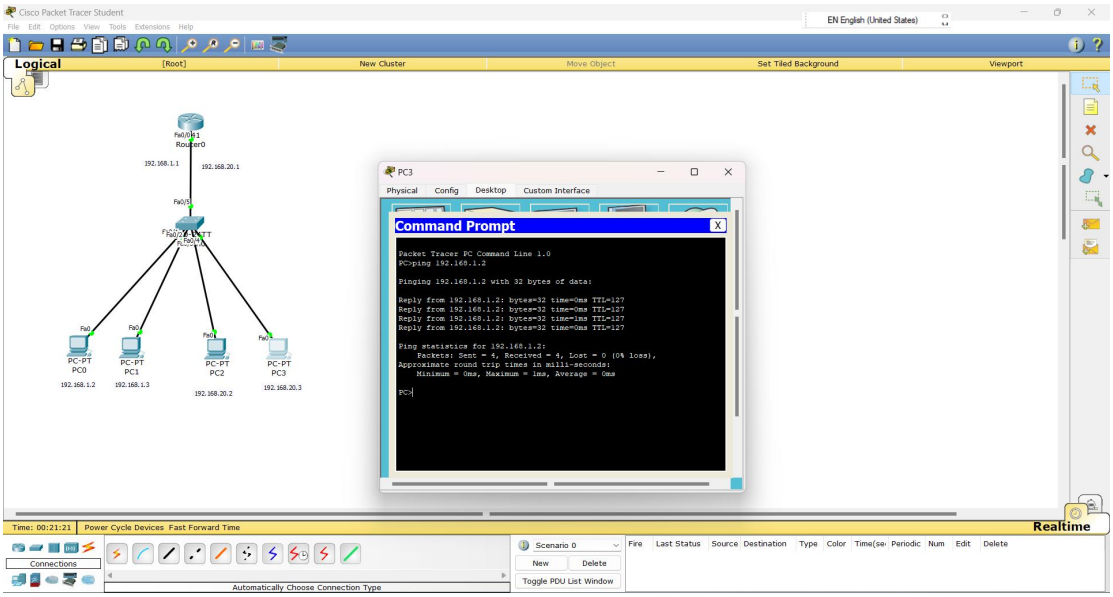


Fig 8: pinging from pc3 to pc0

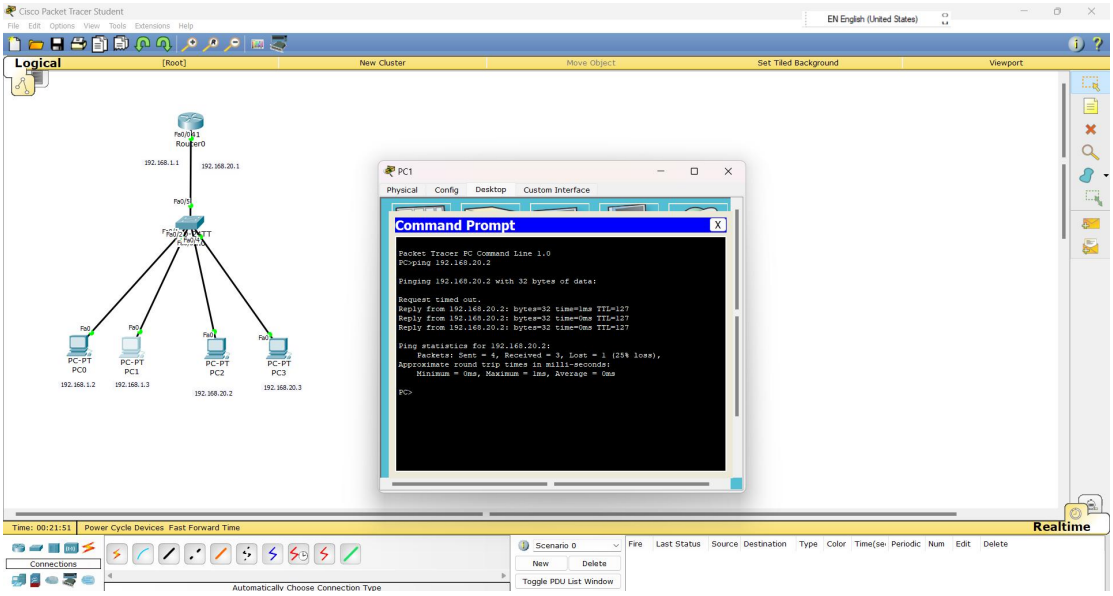


Fig 9: pinging from pc1 to pc2

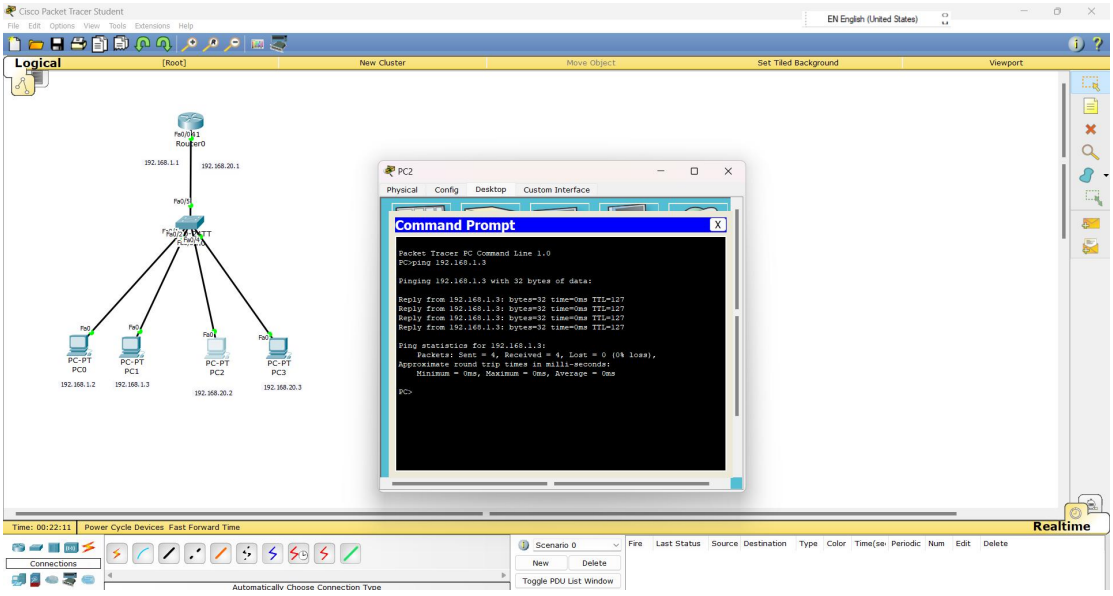


Fig 10: pinging from pc2 to pc1