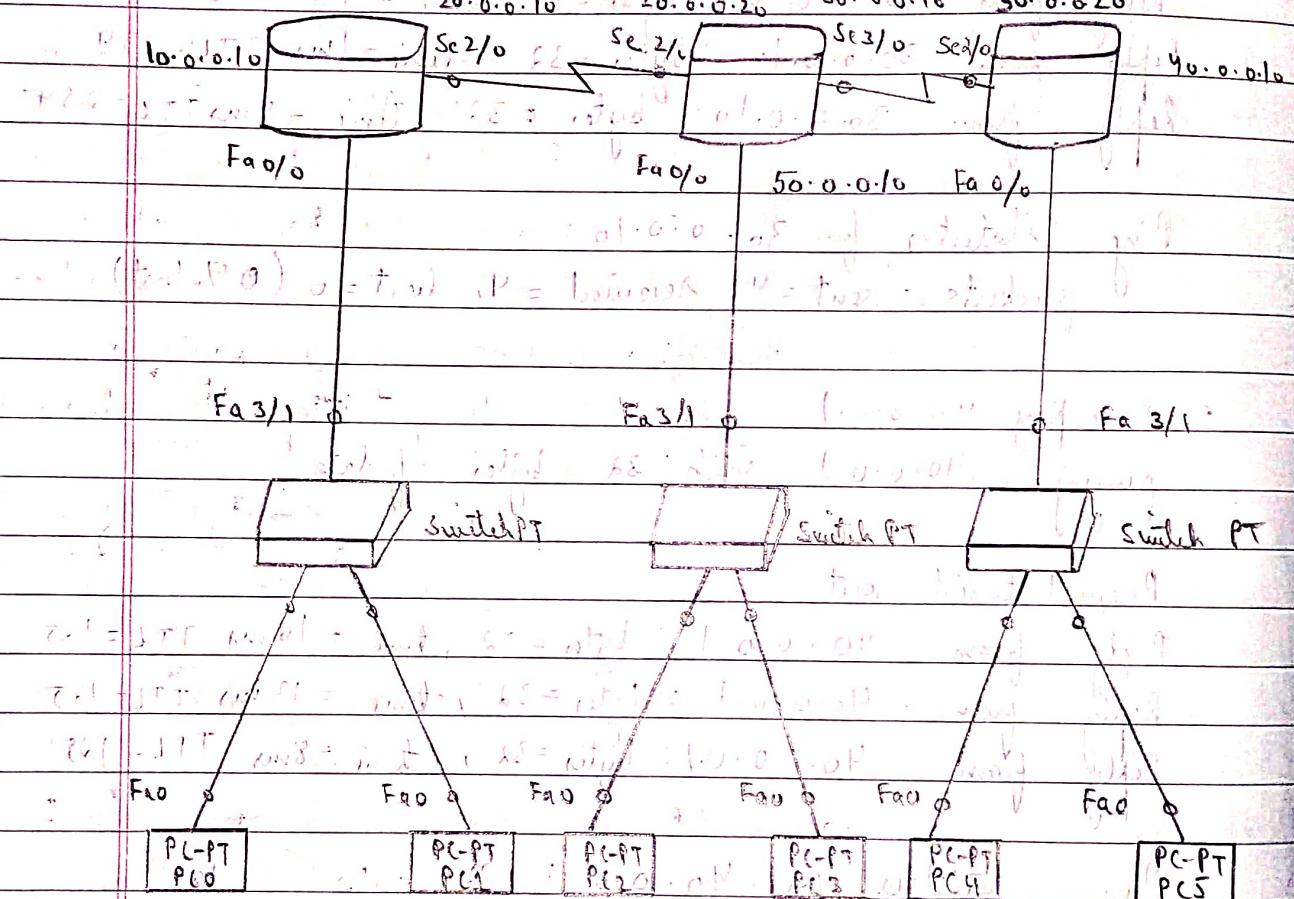


Lab: Week 3 Experiment using Router & Switches.

- ↳ Aim: To configure default router to a router via switch using minimum commands.

↳ Topology:



(a) 10.0.0.1 (Default) 10.0.0.2 10.0.0.3 10.0.0.4 10.0.0.5 10.0.0.6 10.0.0.7 10.0.0.8 10.0.0.9 10.0.0.10

↳ Procedure:

- Place 3 generic routers, 3 generic switches and 6 generic PCs in the workspace.

- Connect all the PCs to the switch using copper straight-through wires.

- Connect the switches to routers also using copper straight-through wires.

- iv) Connect the routers with one another using serial DCE.
- v) Set the IP address of each PC and subnet mask in fast ethernet 0.
- vi) Set the default gateway for each PC using settings.
- vii) Click on the router and enter the following commands to establish connection with the switch.

```

→ enable
→ config t
→ interface fast ethernet 0/0
→ ip address 10.0.0.10 255.0.0.0
→ no shut.

```

After some time the light which was amber for the switch will turn green indicating the switch and router are ready for communication.

Repeat the same for the other three routers.

Click on the router to now establish connection with the neighbouring router.

```

→ enable
→ config t
→ interface serial 2/0
→ ip address 20.0.0.10 255.0.0.0
→ no shut.

```

→ Click on router 1

→ enable

→ config t

→ interface serial 2/0

→ ip address 20.0.0.20 255.0.0.0

→ no shut

The red light between of the two routers will turn green indicating they are ready for communication.

Teaching Router 0 about network 30, 40 & 50:

Click on router 0, open CLI : right click ->

→ enable

→ config t

→ interface serial 2/0

→ ip route 0.0.0.0 0.0.0.0 20.0.0.20

→ exit

→ show ip route

It will show that networks 30, 40 & 50 are connected via gateway 20.0.0.20.

Teaching Router 1 of network 10 & 40:

→ enable

→ config t

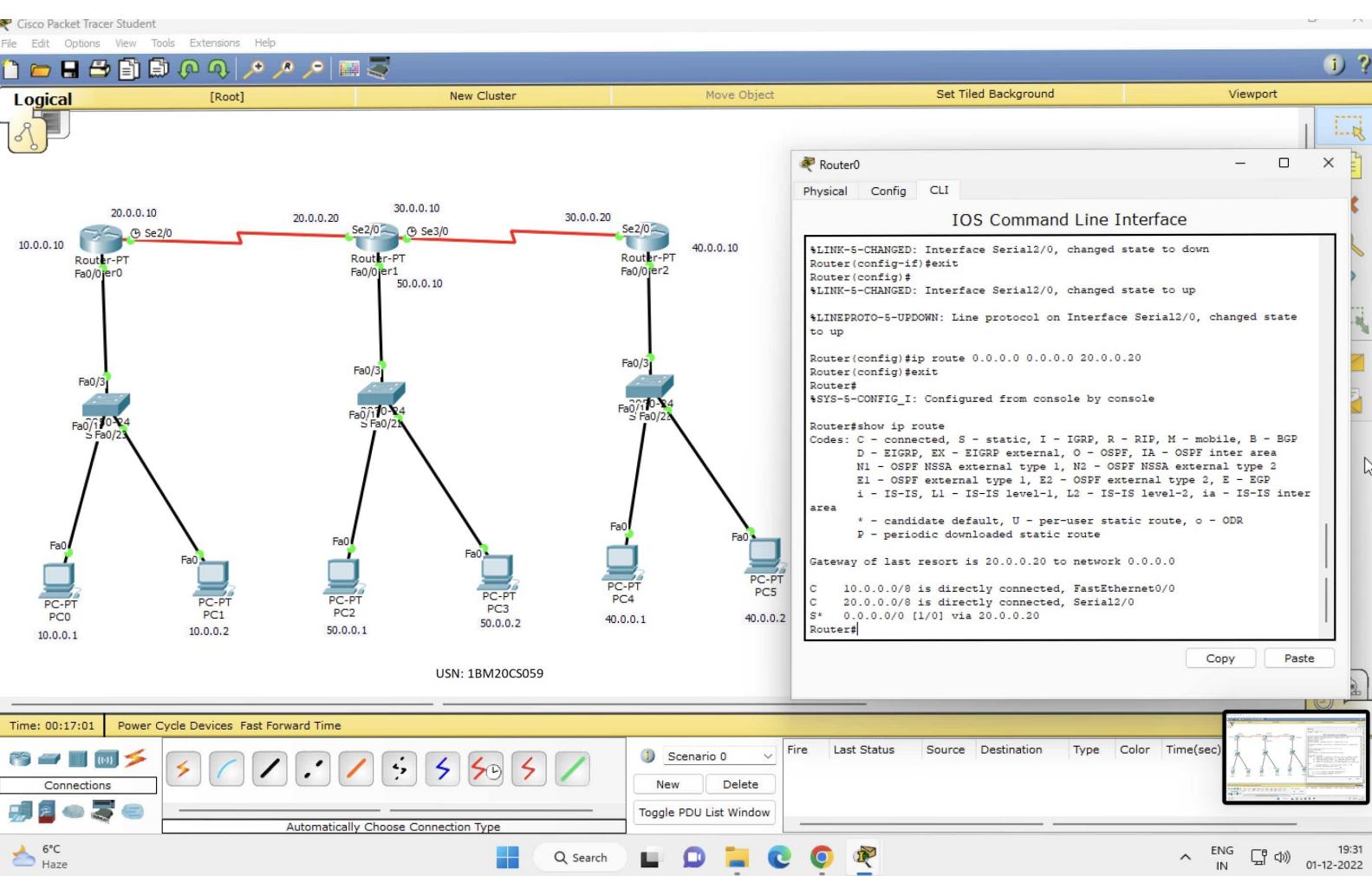
→ interface serial 2/0

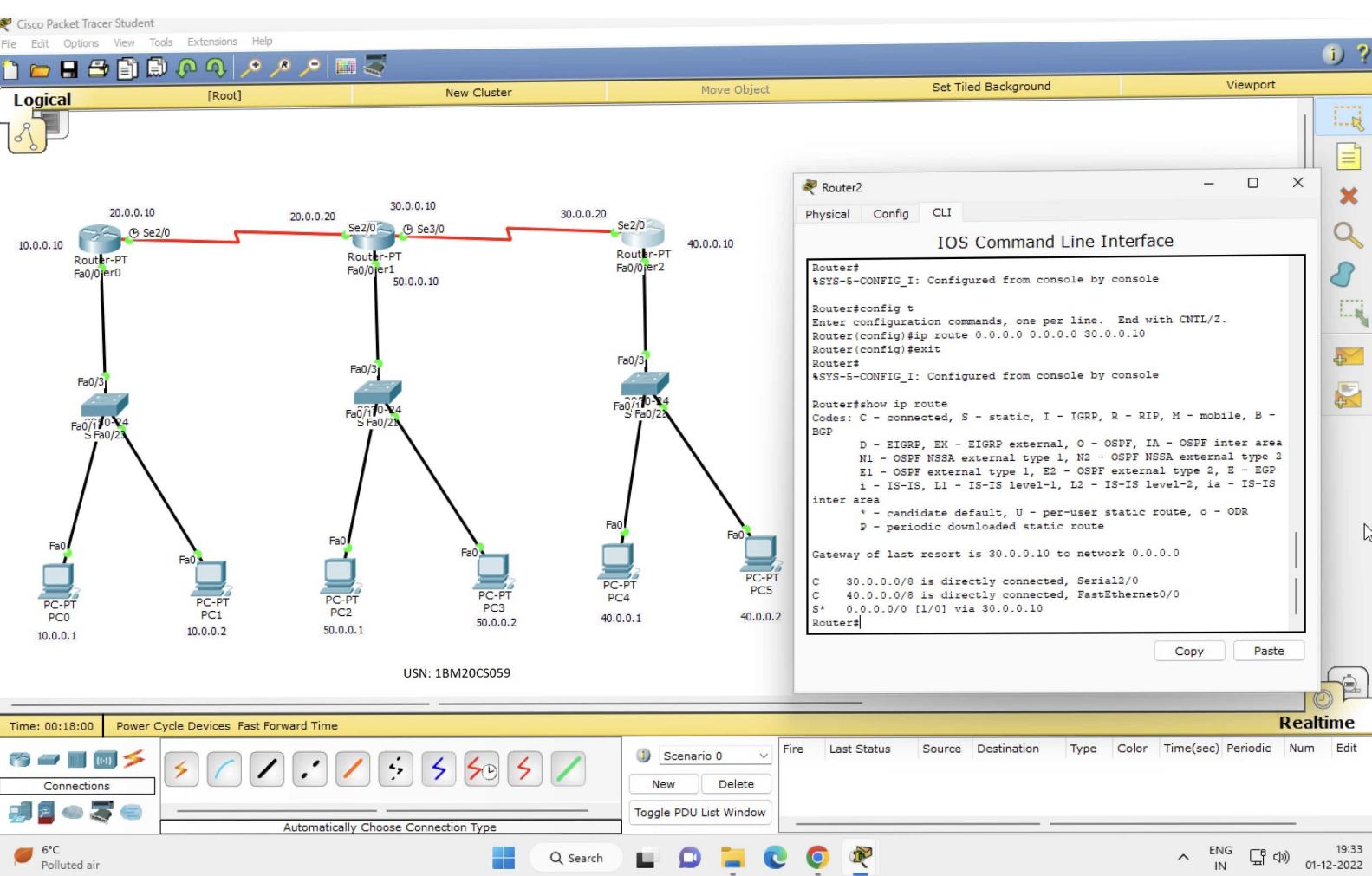
→ ip route 10.0.0.0 255.0.0.0 20.0.0.10

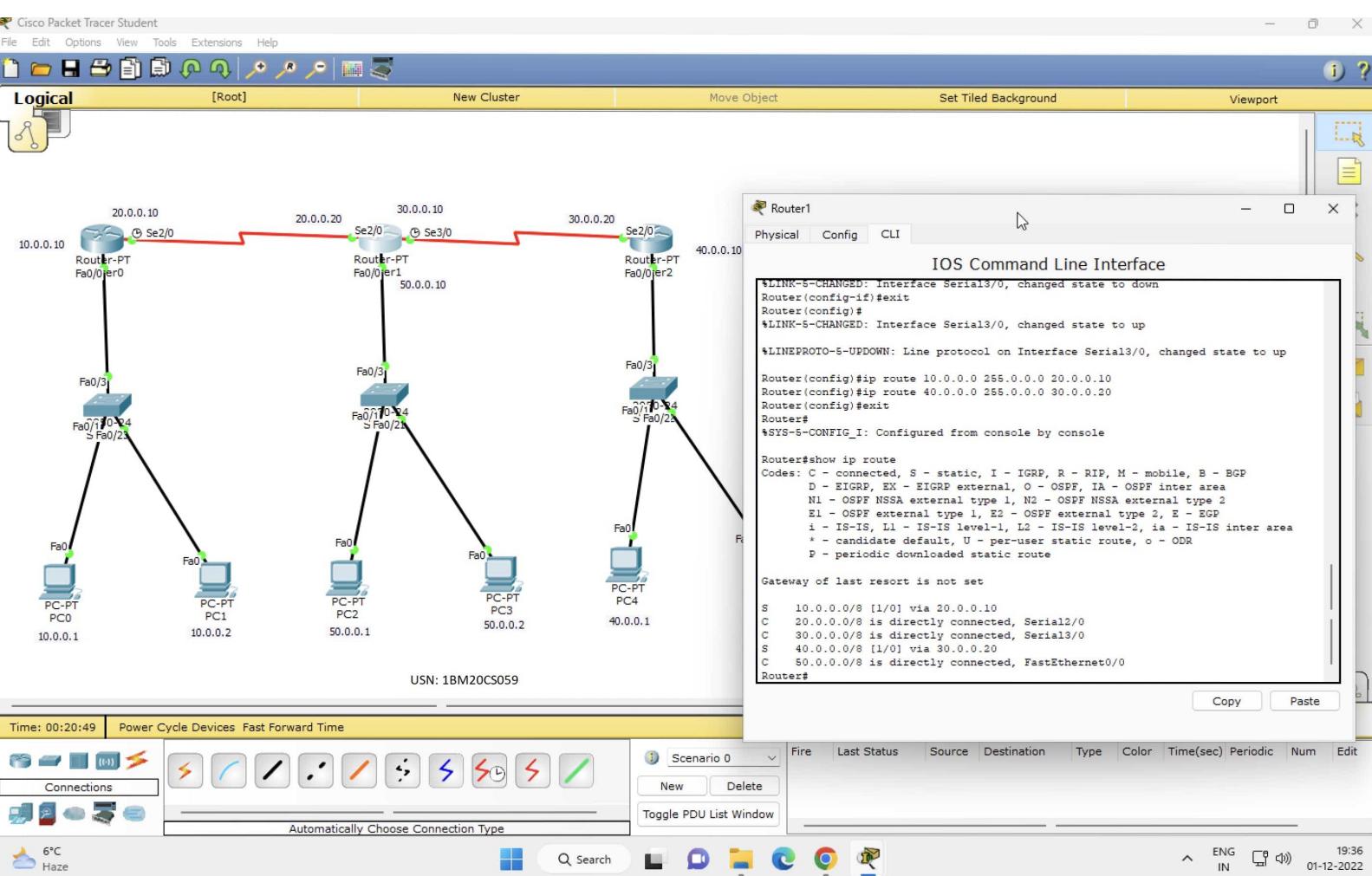
→ exit

→ interface serial 2/0

→ ip route 40.0.0.0 255.0.0.0 30.0.0.10







- `exit`
- `show ip route`

Teaching router R_2 of network 10.20.850:

- `enable`
- `configure terminal`
- `interface Serial 2/0`
- `ip route 0.0.0.0 0.0.0.0 30.0.0.10`
- `exit`
- `show ip route`

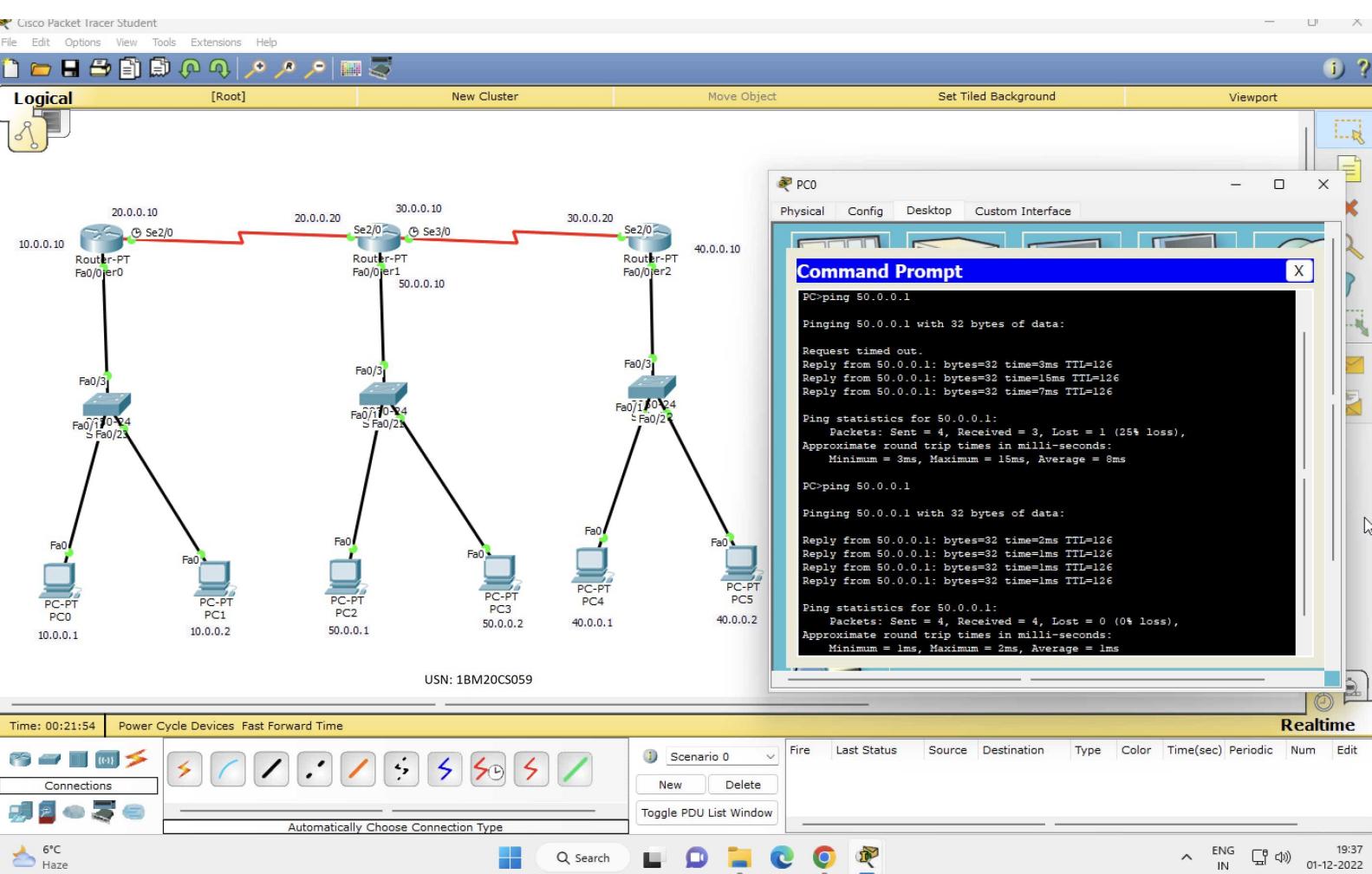
Simulation mode: Add a simple PDU by selecting the PCs and click on the "auto capture" from right panel.

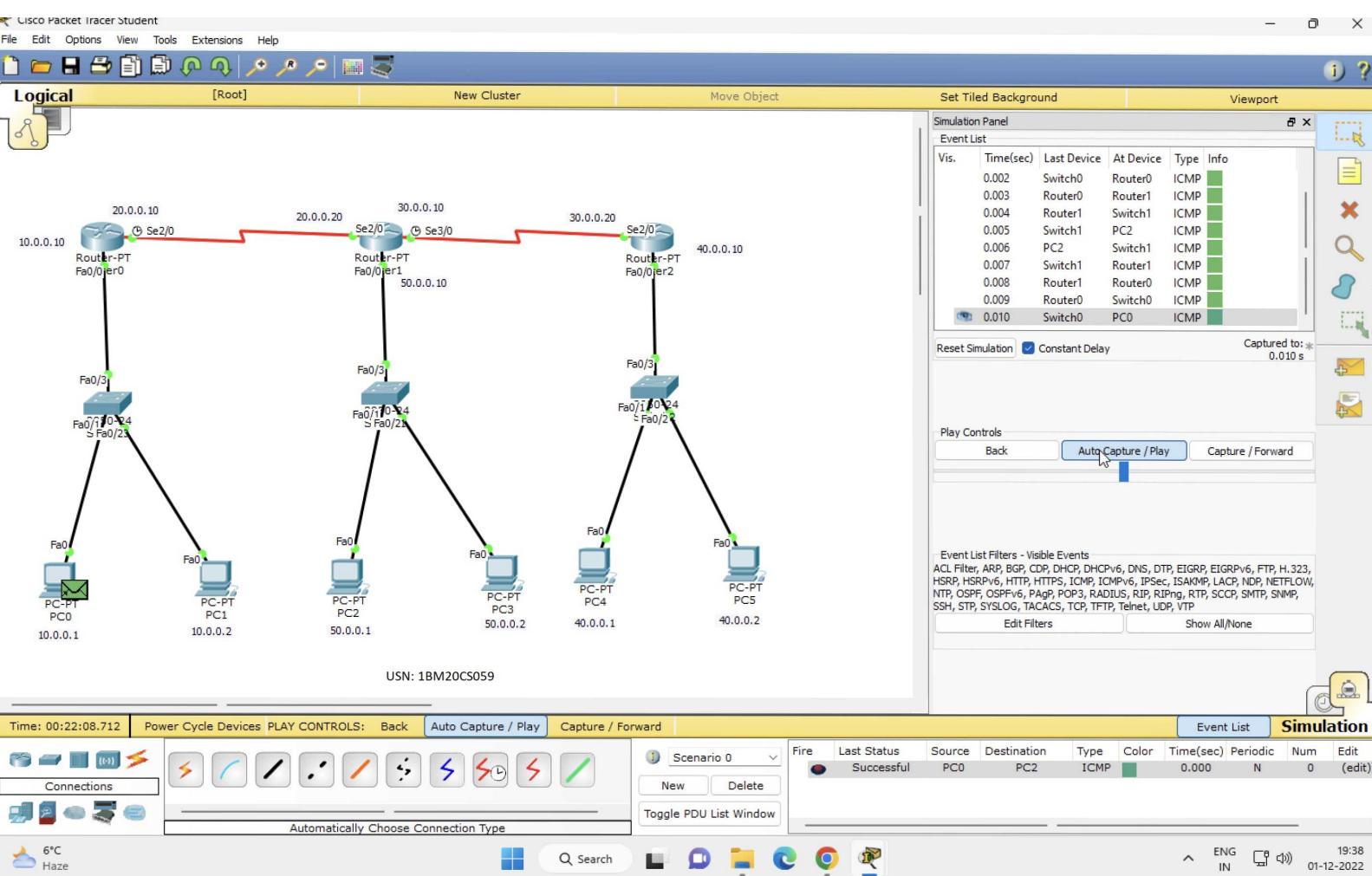
Real-time mode: Select the PC P_{C_0} and go to its command prompt & and ping a PC in network 50.

At first it will show request timed out & 1st packet will be lost during transmission. But on executing the command one more, the PC will now have learnt the network and the message will be successfully sent to the PC in network 50 without any loss. Finally ping a PC in network 40 and repeat the same. We will observe that the message is sent successfully.

4 Observation:

Learning outcome: In this network router R_1 does not have a default router because R_0 and R_2 cannot become a default router simultaneously and if any one of R_0 and R_1 is default then the packets that are supposed to enter R_1 can go to R_2/R_0 as they are default.





↳ Result:

1. PC > Ping 50.0.0.1

Pinging 50.0.0.1 with 32 bytes of data:

Request timed out.

Reply from 50.0.0.1 : bytes = 32 time = 14 ms TTL = 128

Reply from 50.0.0.1 : bytes = 32 time = 12 ms TTL = 127

Reply from 50.0.0.1 : bytes = 32 time = 3 ms TTL = 124

Ping statistics for 50.0.0.1:

Packets: sent = 4, received = 3, lost = 1 (25% loss)

2. PC > Ping 50.0.0.1

Pinging 50.0.0.1 with 32 bytes of data:

Reply from 50.0.0.1 : bytes = 32 time = 2 ms TTL = 124

Reply from 50.0.0.1 : bytes = 32 time = 2 ms TTL = 124

Reply from 50.0.0.1 : bytes = 32 time = 11 ms TTL = 124

Reply from 50.0.0.1 : bytes = 32 time = 2 ms TTL = 124

Ping statistics for 50.0.0.1:

Packets: sent = 4, received = 4, lost = 0 (0% loss)

3. PC > 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 = 20 ms TTL = 125

Reply from 40.0.0.1 : bytes = 32 time = 3 ms TTL = 125

Reply from 40.0.0.1 : bytes = 32 time = 10 ms TTL = 125

Ping statistics for 40.0.0.1:

Packets: sent = 4, received = 3, lost = 1 (25% loss)

4. $\text{PC} \rightarrow \text{Ping } 40.0.0.1$ from 31 ms, time = 18 ms, TTL = 125.

Pinging 40.0.0.1 with 32 bytes of data.

Reply from 40.0.0.1: bytes = 32 time = 23 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 = 14 ms TTL = 125.

Reply from 40.0.0.1: bytes = 32 time = 3 ms TTL = 125.

Ping statistics for 40.0.0.1:

Packets: sent = 4, received = 4, lost = 0 (0% loss).