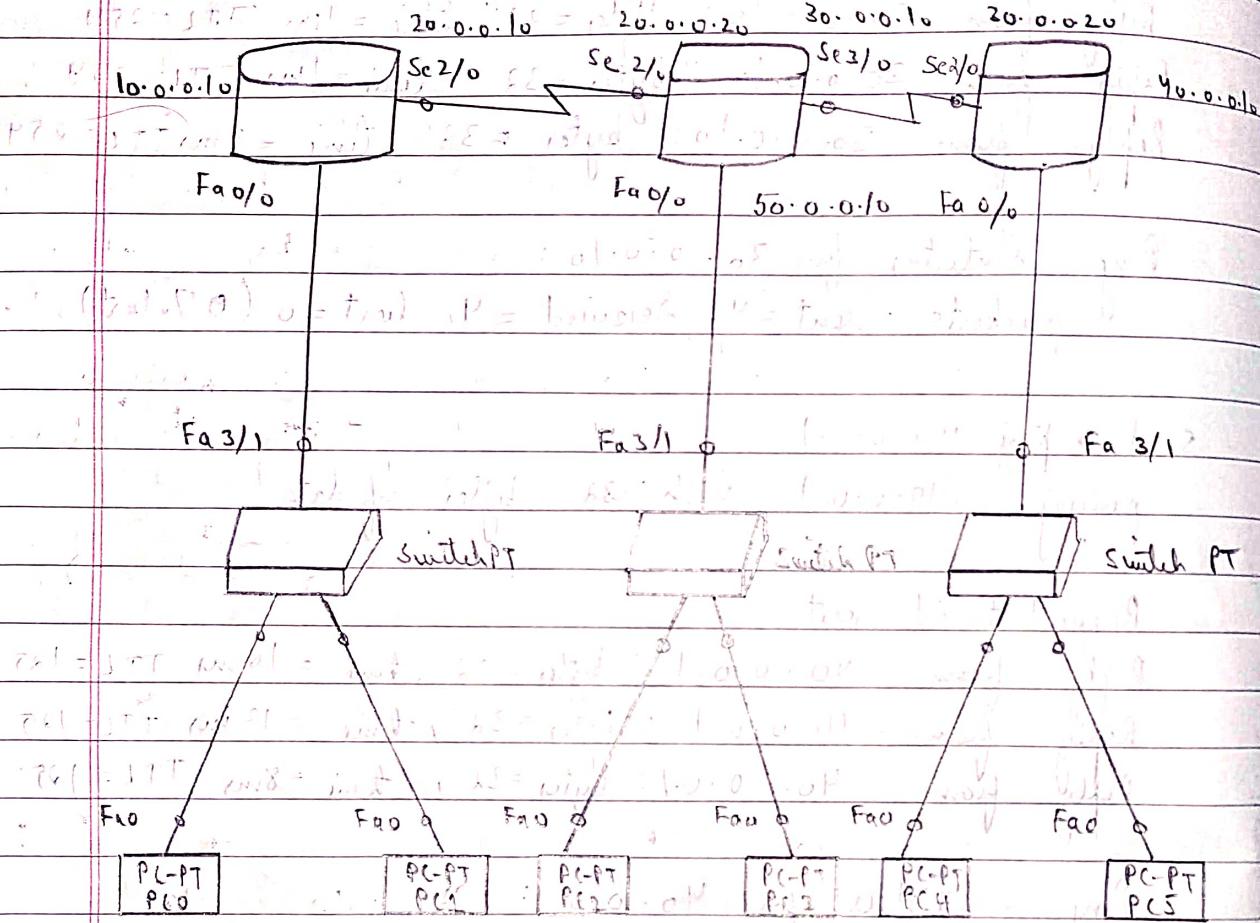


# Lab: Week 3 Experiment using Router & Switches

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

## ↳ Topology:



(iv) Procedure:

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

- Connect the PCs to the switches using straight-through wires. IP of PCs: 10.0.0.0-5

- Connect the switches to routers also using straight-through wires. IP of routers: 10.0.0.1-3

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 two 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 shutdown

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

### Teaching Router 0 about network 30, 40 & 50:

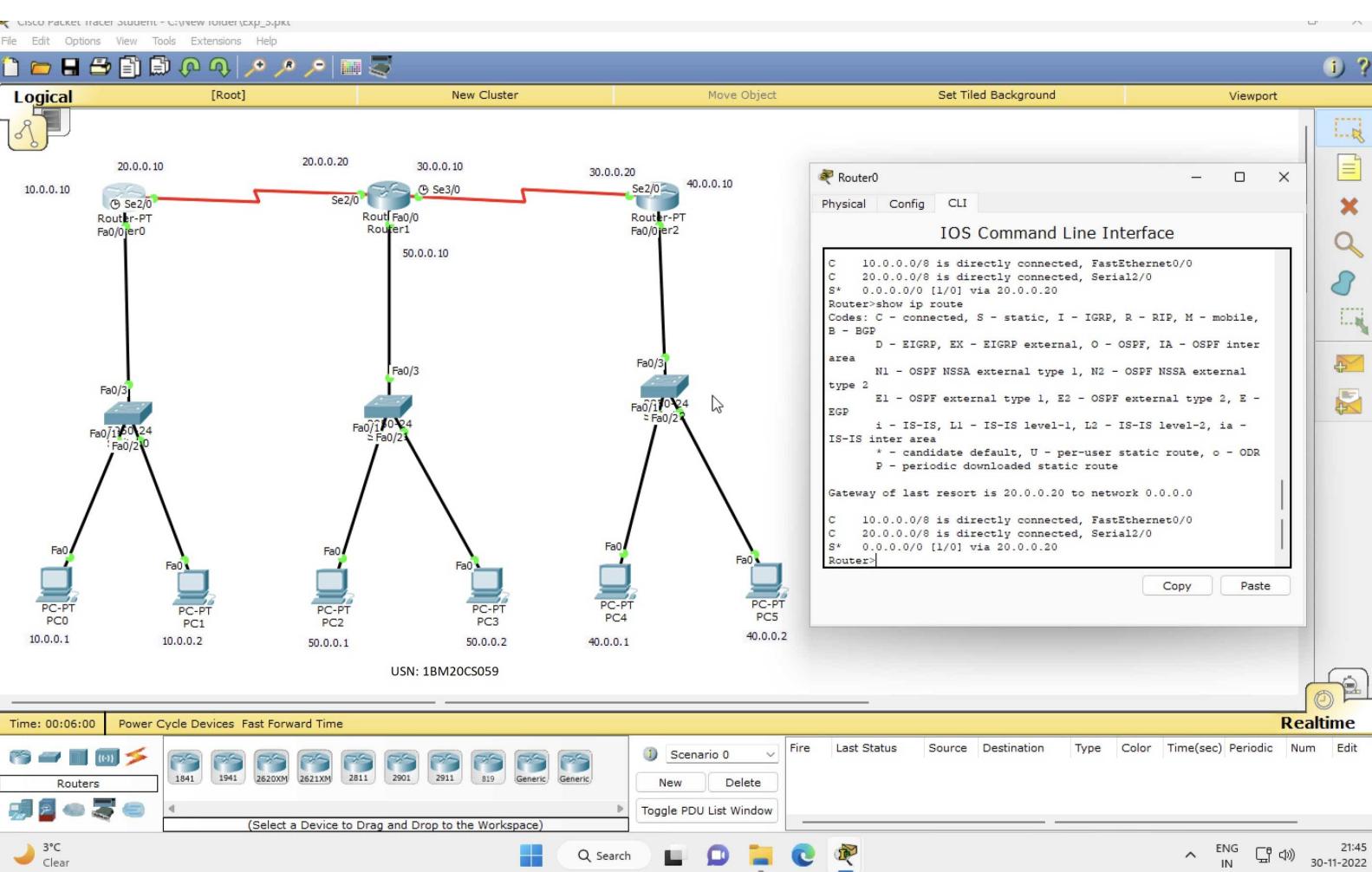
Click on router 0, open CLI window and enter the following command:

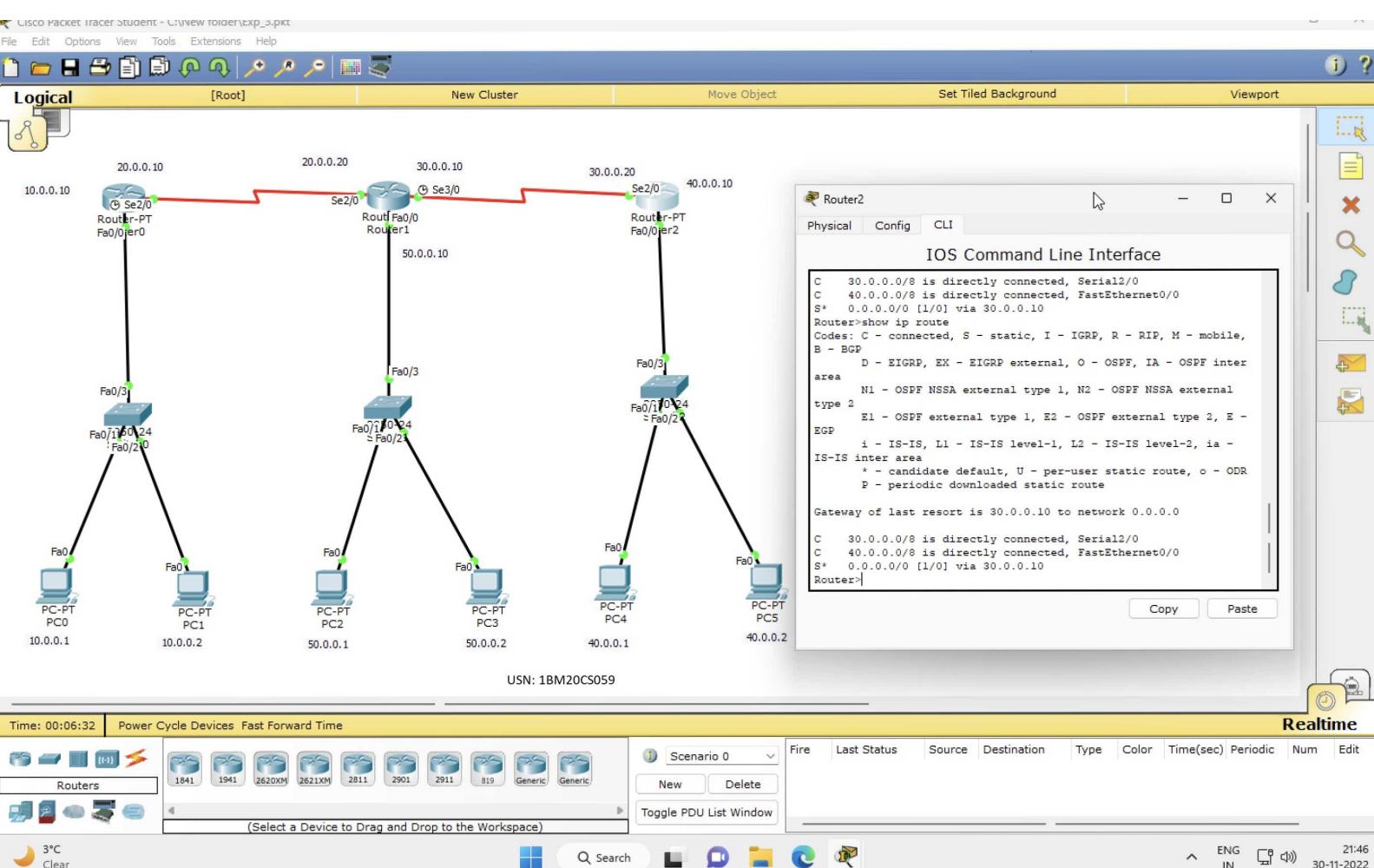
- enable
- config t
- interface serial 2/0
- ip route 0.0.0.0 0.0.0.0 20.0.0.20
- exit
- show ip route

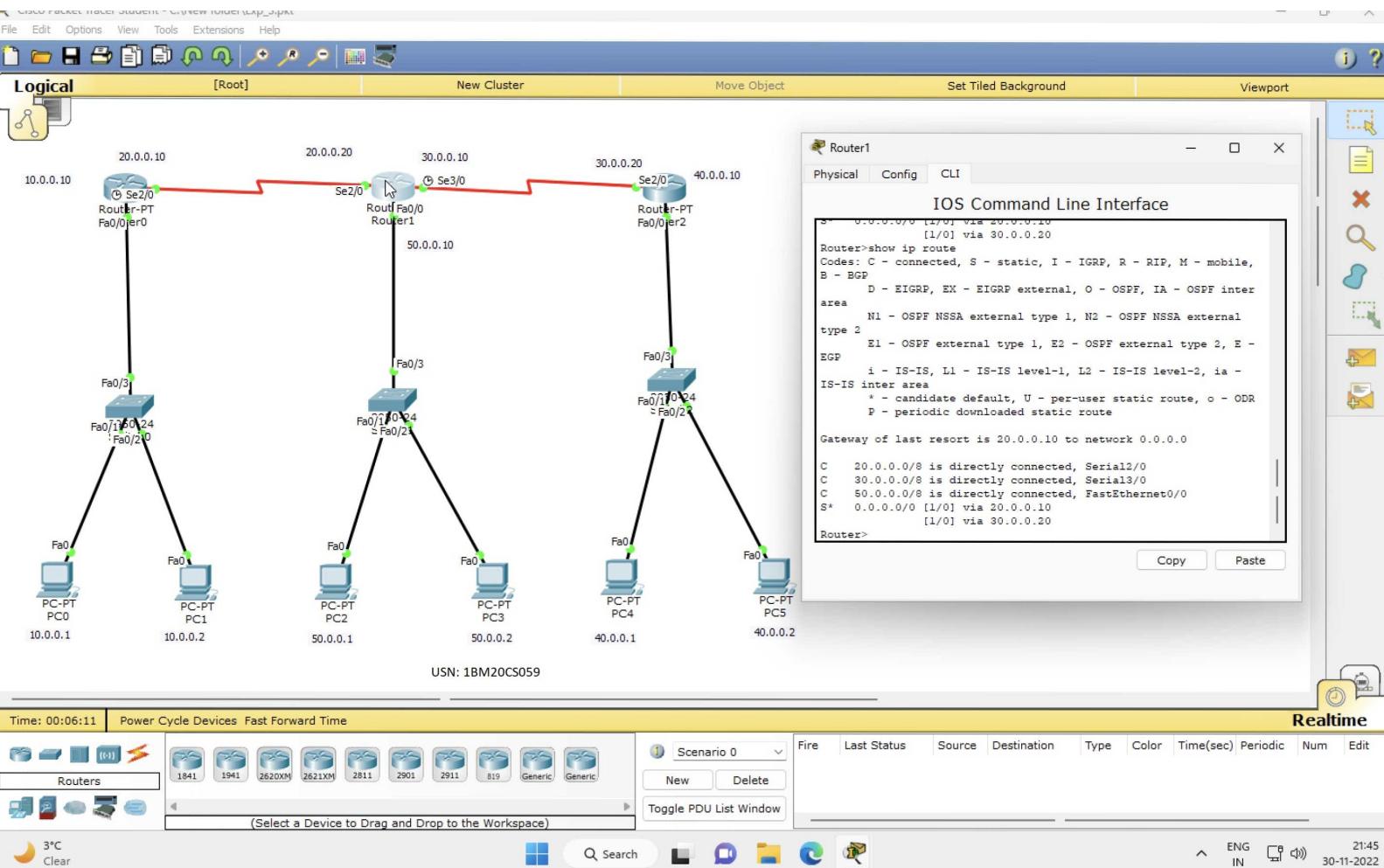
It will show that networks 30, 40 & 50 are connected to the gateway 20.0.0.20.

### Teaching Router 1 of network 10 & 40:

- enable
- config t
- interface serial 2/0
- ip route 0.0.0.0 0.0.0.0 20.0.0.10
- exit
- interface serial 3/0
- ip route 0.0.0.0 0.0.0.0 20.0.0.20







- exit
- show ip route

Teaching router 2 of network 10, 20 & 50:

- enable
- config t
- 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 "route capture" from right panel.

Real-time mode: Select the PC PDU and go to its command prompt and ping a PC in network 50. At first it will show request timed out & 1 packet will be lost during transmission. But on executing the ping 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<sub>1</sub> does not have a default router because R<sub>0</sub> and R<sub>2</sub> cannot become a default router simultaneously and if any one of R<sub>0</sub> and R<sub>1</sub> is default then the packets that are supposed to enter R<sub>1</sub> can go to R<sub>2</sub>/R<sub>0</sub> as they are default.

## b) Result:

1. PC &gt; Ping 50.0.0.1

Ping to 50.0.0.1 with 32 bytes of data:

Request timed out.

Reply from 50.0.0.1: bytes = 32 time = 14 ms TTL = 125

Reply from 50.0.0.1: bytes = 32 time = 12 ms TTL = 124

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 &gt; Ping 50.0.0.1 with 32 bytes of data:

Ping to 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 &gt; Ping 40.0.0.1

Ping to 40.0.0.1 with 32 bytes of data:

Request timed out after 1 minute timeout

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. PC > Ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data.

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

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

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

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

Ping statistics for 40.0.0.1:

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

