classmate
Date 3/11/22
Page 1

Lab: Week 0 (Cisco Packet Tracer)

↳ Interface Overview:

The ten main components of the main interface are as follows:

1. Menu Bar
2. Main Toolbar
3. Common Tools Bar
4. Logical / Physical Workspace and Navigation Bar
5. Workspace
6. Realtime / simulation Bar
7. Network Component Box
8. Device-Type Selection Box
9. Device - Specific Selection Box
10. User Created Packet Window

The Packet tracer has two workspaces (Logical and Physical) and two modes (Realtime and Simulation)
We can switch between the Physical Workspace and Logical Workspace with the tabs on this bar.
In the logical workspace, we can switch between various options like creating a New Cluster, Move Object, Set Tiled Background and Viewport. While as in the logical workspace, the bar will allow to navigate through various spaces and locations, like creating a new city, Home, Corporate office or a New Building. We can even move objects and set some background and go to the working Closet.

The two modes available in Packet Tracer Software include the Realtime and Simulation.

We can toggle or switch between realtime and simulation modes.

At the beginning, the Packet Tracer we work in real-time mode in which the networking protocols work in realtime.

Using the simulation mode, we can see packets flowing from one node to another and can also click on a packet to see detailed information categorized by OSI layers.

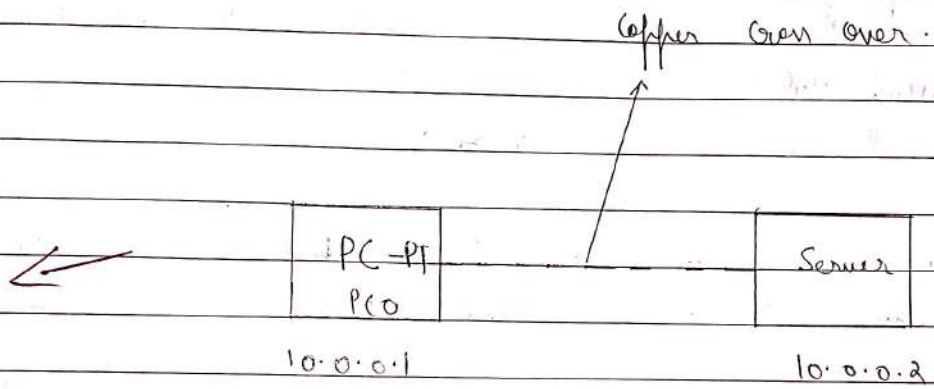
Using the realtime / simulation tab we can switch from one mode to another.

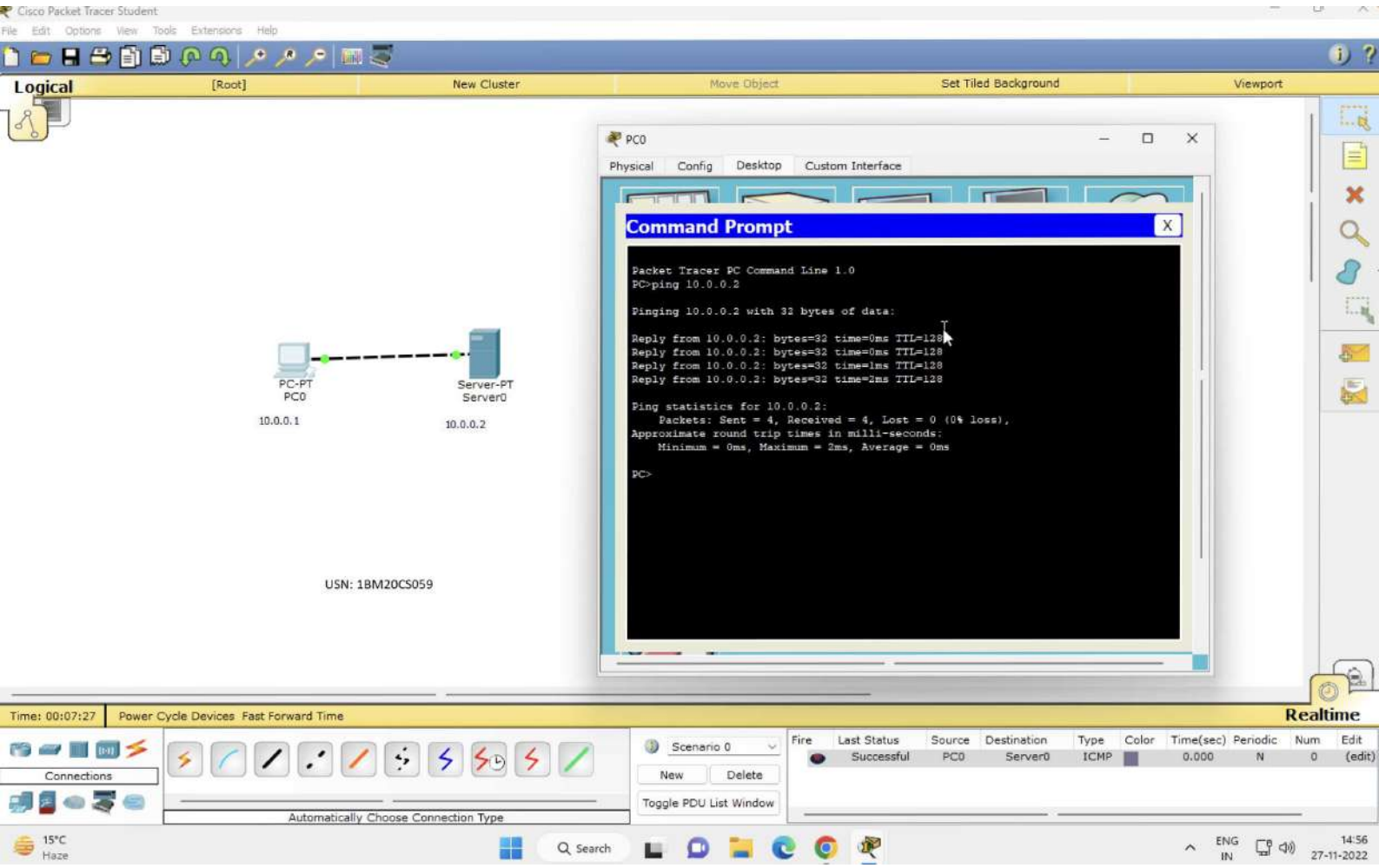
4 My First PT Lab:

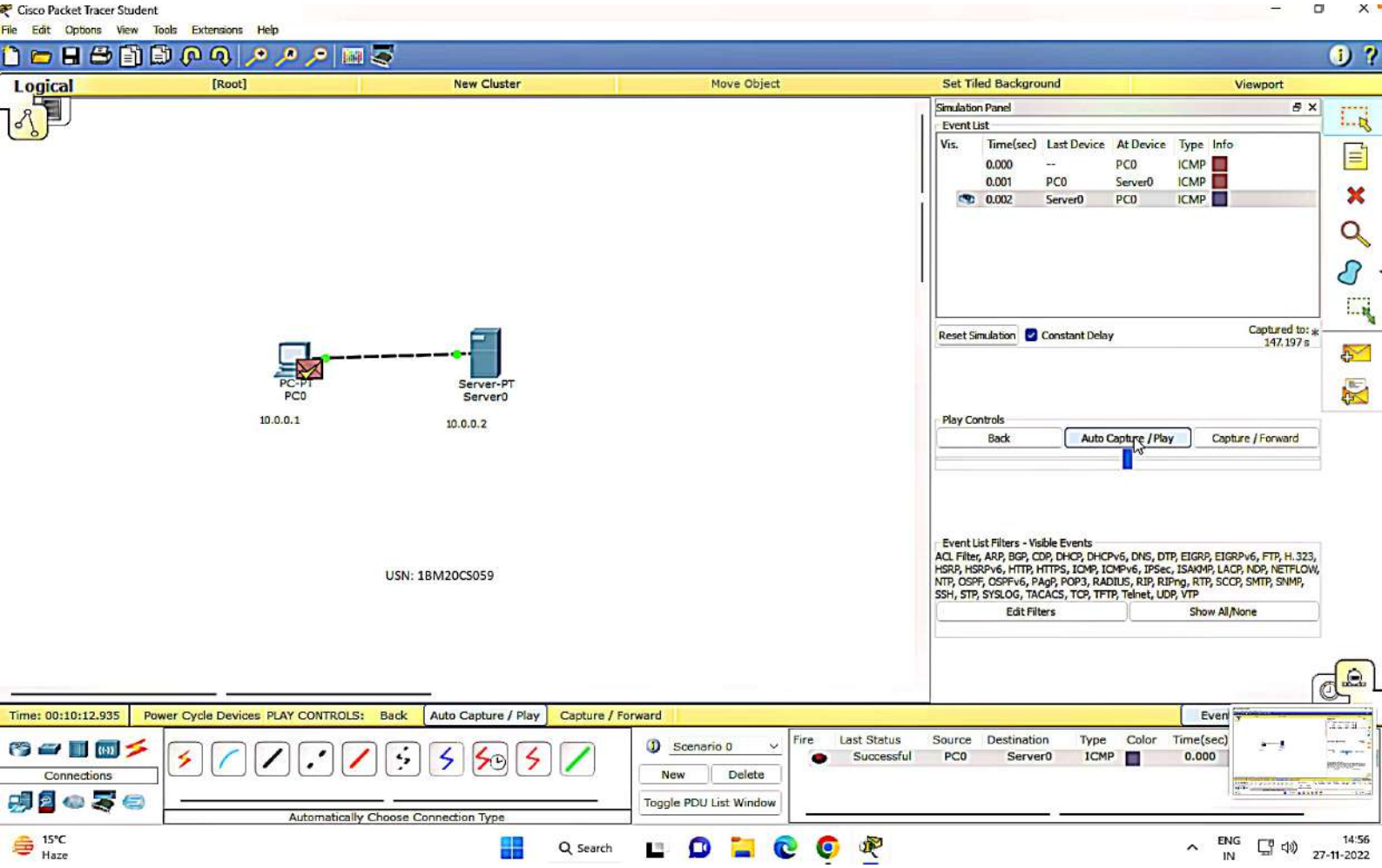
1. Launch Packet Tracer.
2. Creating first network with the help of a generic PC and a generic server.
3. Under connection, select copper straight cable and connect PC & server.
4. Configure IP addresses.
5. Select simple PDU and click on both devices.
6. Finally click on Auto Capture / Play & here animation can be viewed of the Packet Tracer in simulation mode.
7. In real time mode, open command-prompt and send ping using commands & destination IP address.

10/11/22

Topology :




Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.2
Pinging 10.0.0.2 with 32 bytes of data:
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=0ms TTL=128
Reply from 10.0.0.2: bytes=32 time=1ms TTL=128
Reply from 10.0.0.2: bytes=32 time=2ms TTL=128
Ping statistics for 10.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 2ms, Average = 0ms
PC>
PC-PT
PC0
10.0.0.1
Server-PT
Server0
10.0.0.2
USN: 1BM20CS059
Time: 00:07:27
Power Cycle Devices Fast Forward Time
Realtime
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Successful
PC0
Server0
ICMP
0.000
N
0
(edit)
15°C
Haze
Search
ENG
IN
14:56
27-11-2022

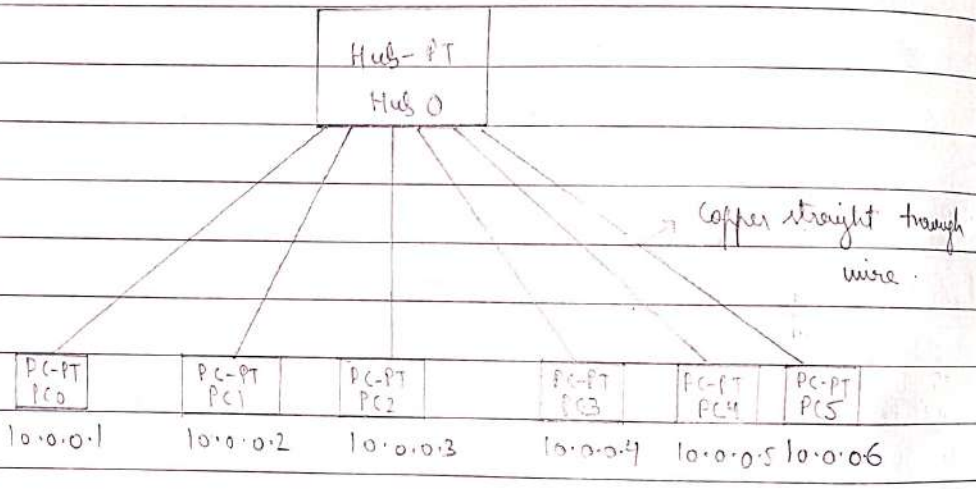

Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
0.001 PC0 Server0 ICMP
0.002 Server0 PC0 ICMP
Reset Simulation
Constant Delay
Captured to:
147.197 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
PC-PT
PC0
10.0.0.1
Server-PT
Server0
10.0.0.2
USN: 1BM20CS059
Time: 00:10:12.935
Power Cycle Devices PLAY CONTROLS: Back
Auto Capture / Play
Capture / Forward
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec)
Successful PC0 Server0 ICMP 0.000
15°C
Haze
Search
ENG
IN
14:56
27-11-2022

Lab: Week 1 (Hubs and Switches)

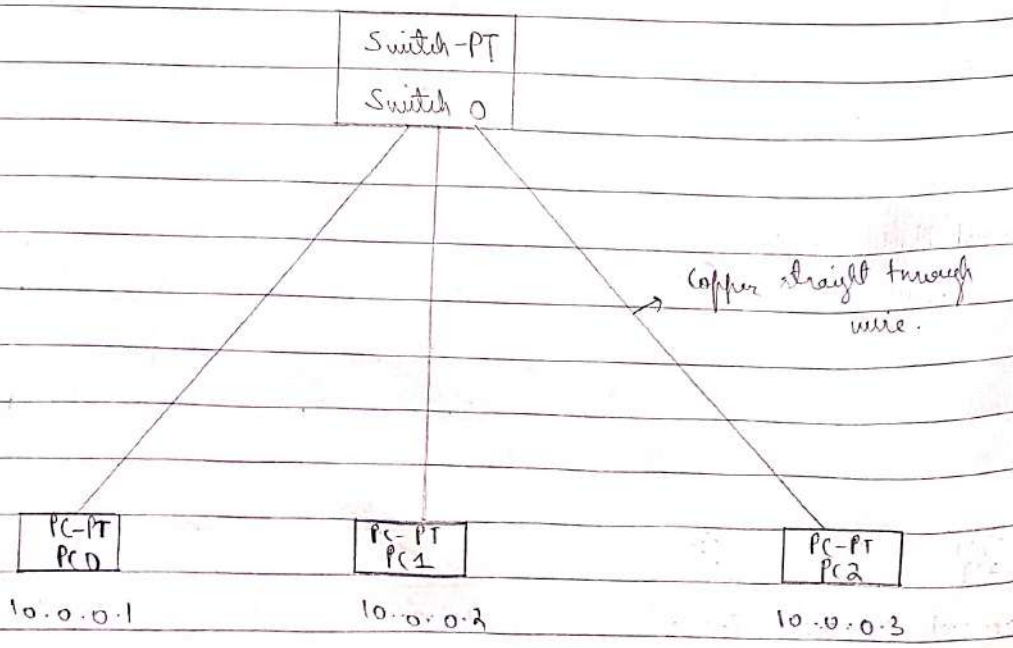
↳ Aim: Creating a topology and simulate sending a simple PDU from source to destination using simple hub and switch as connecting devices.

↳ Topology:

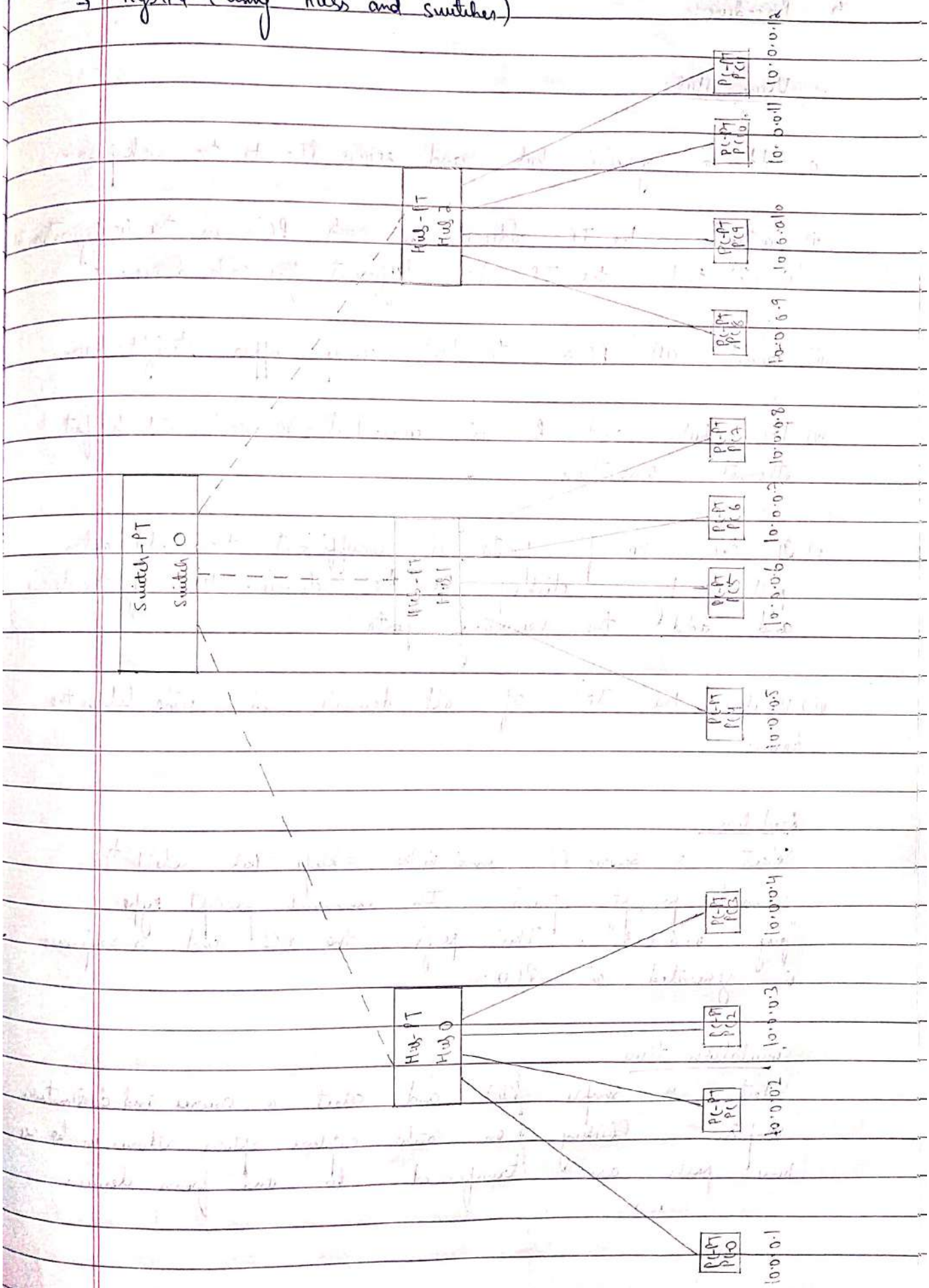
→ Using Hub.

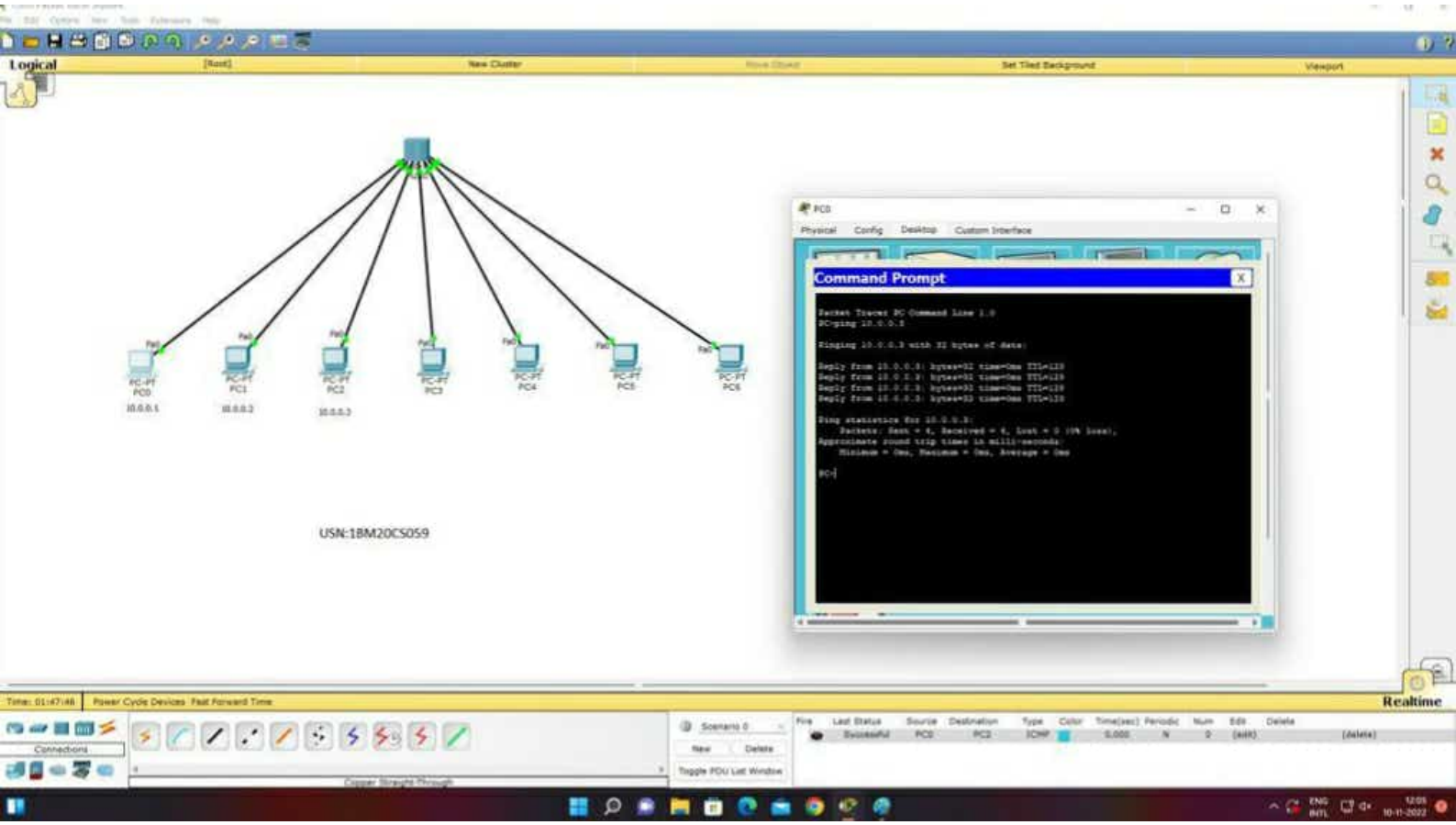


→ Using Switch

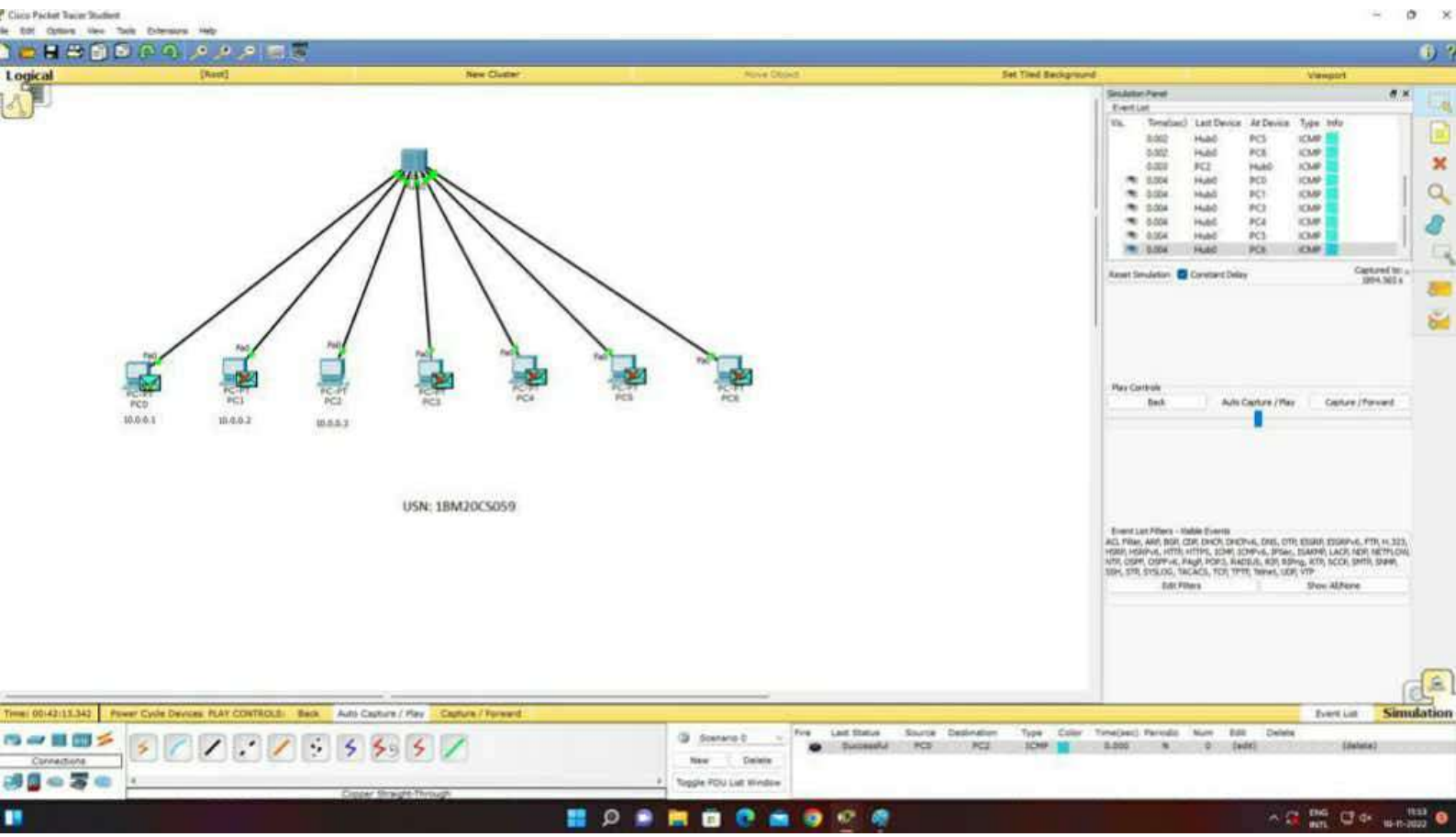


→ Hybrid (Using Hubs and switches)

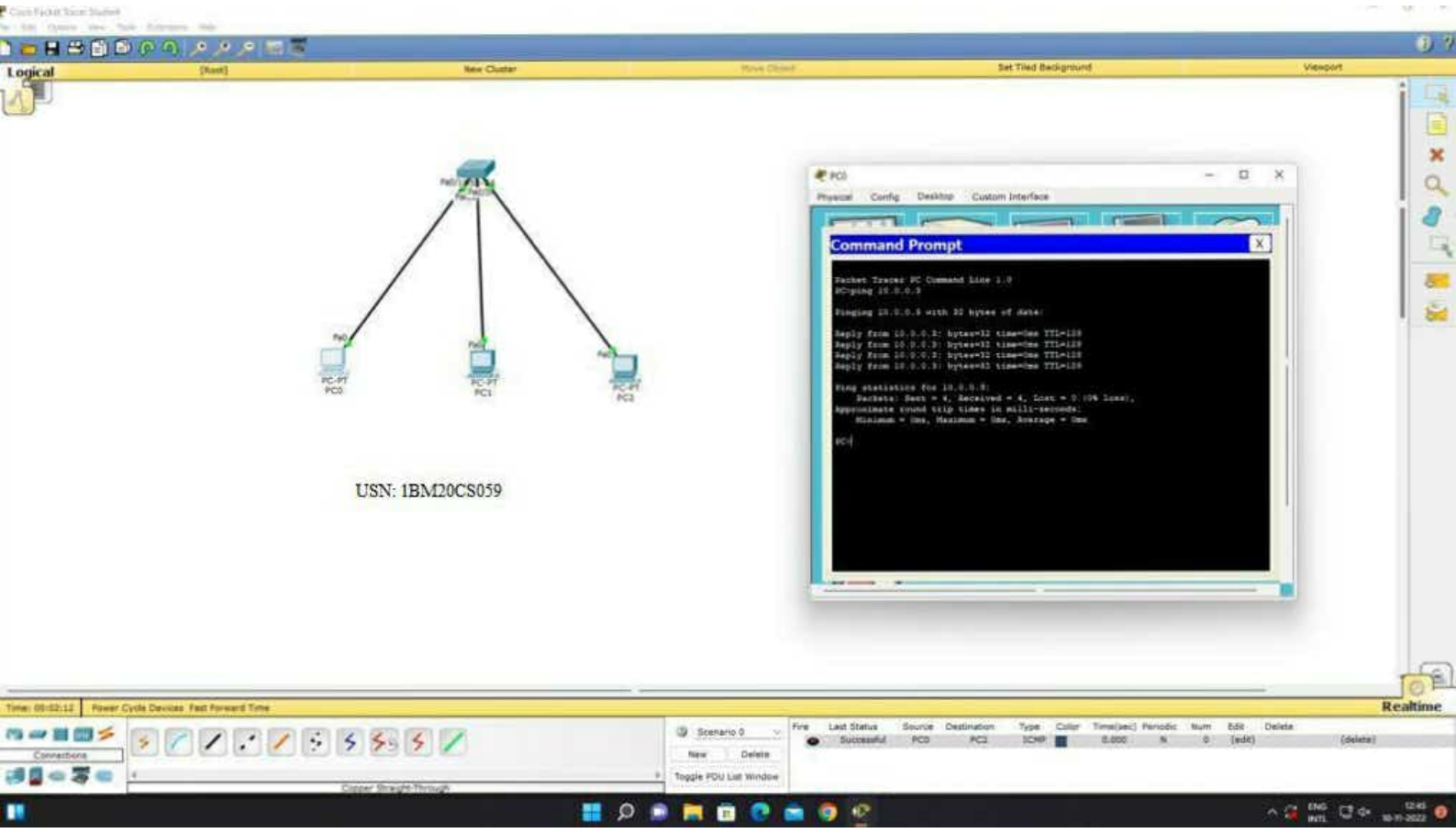




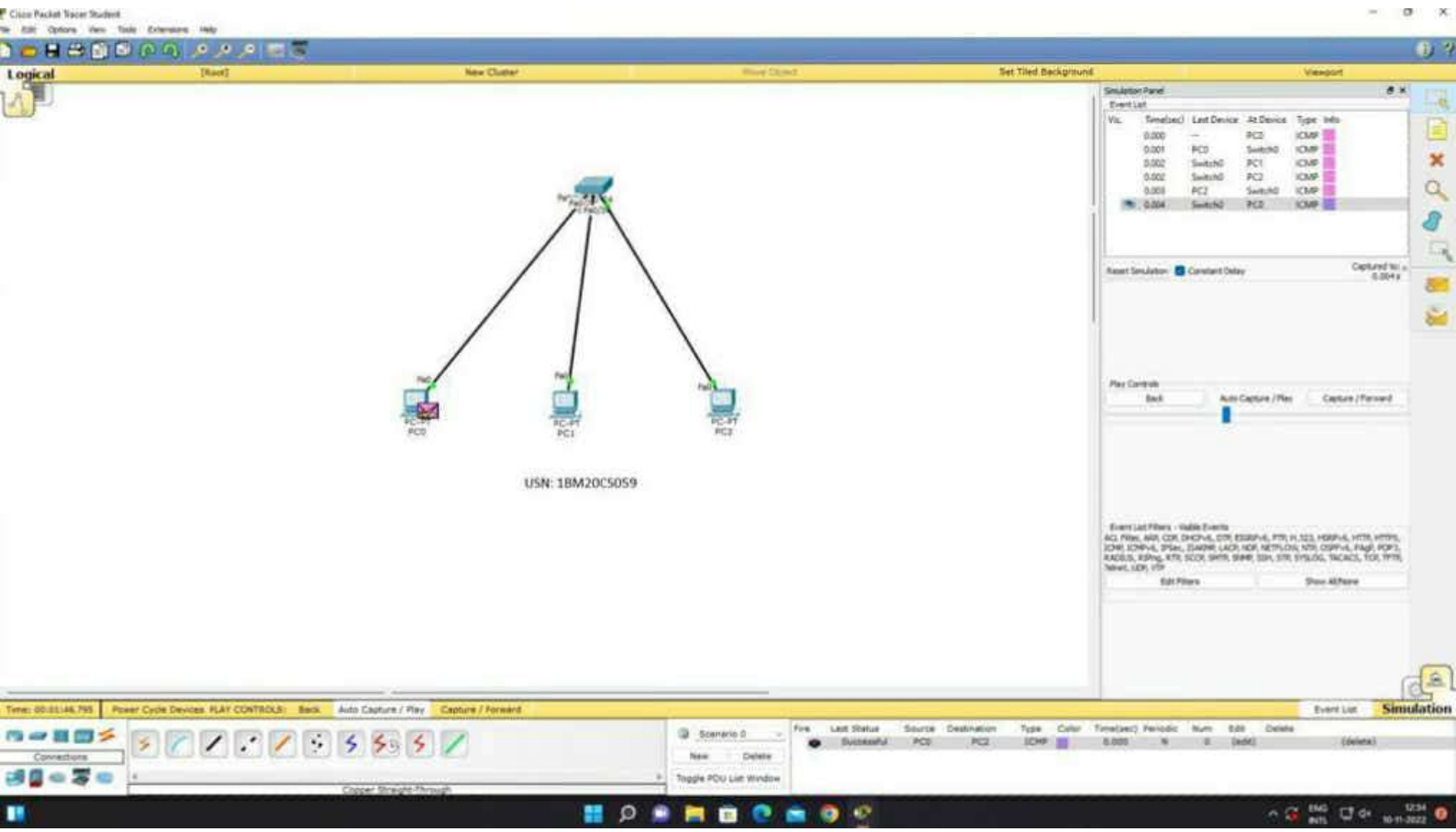
USN:1BM20CS059

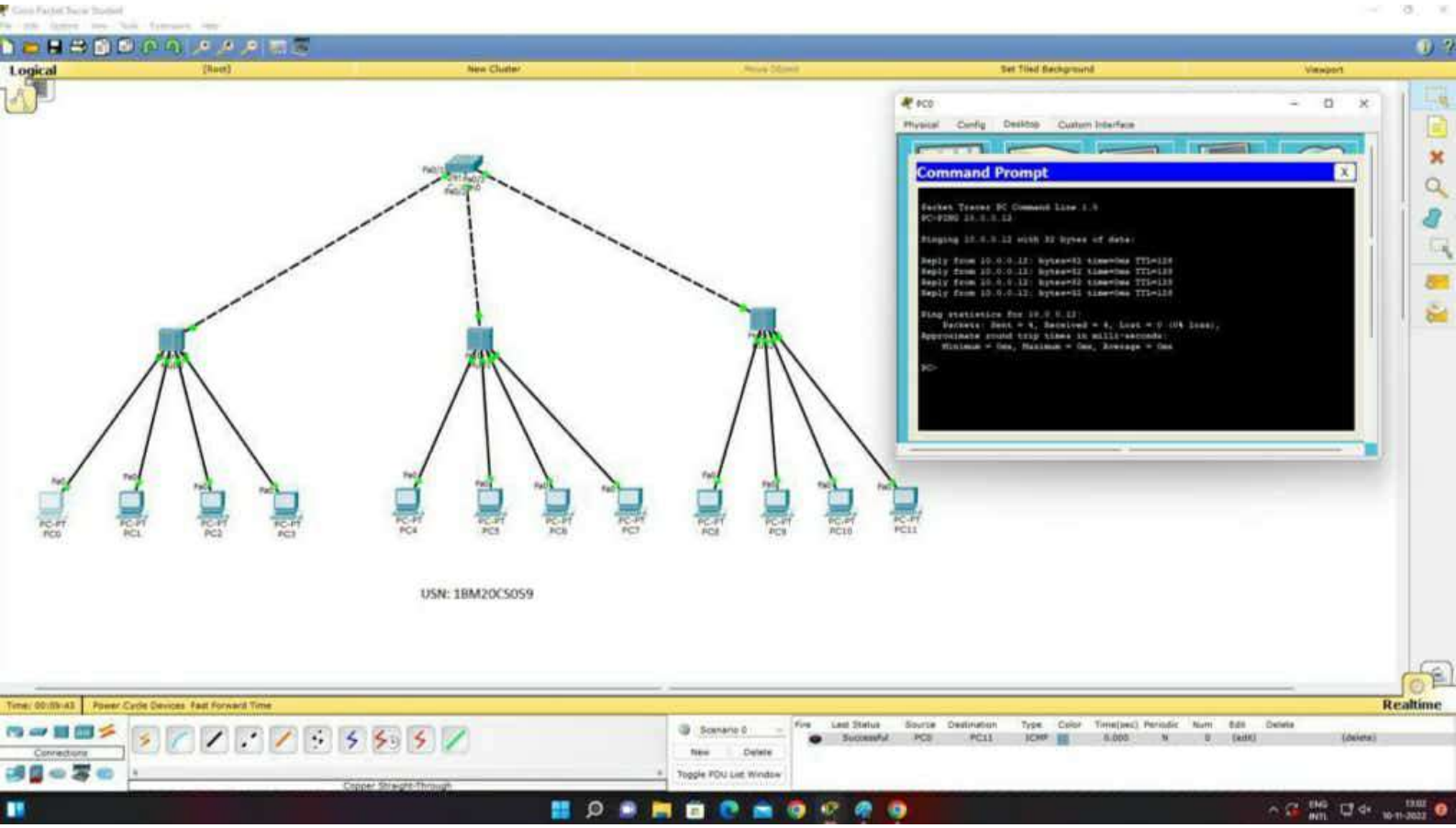


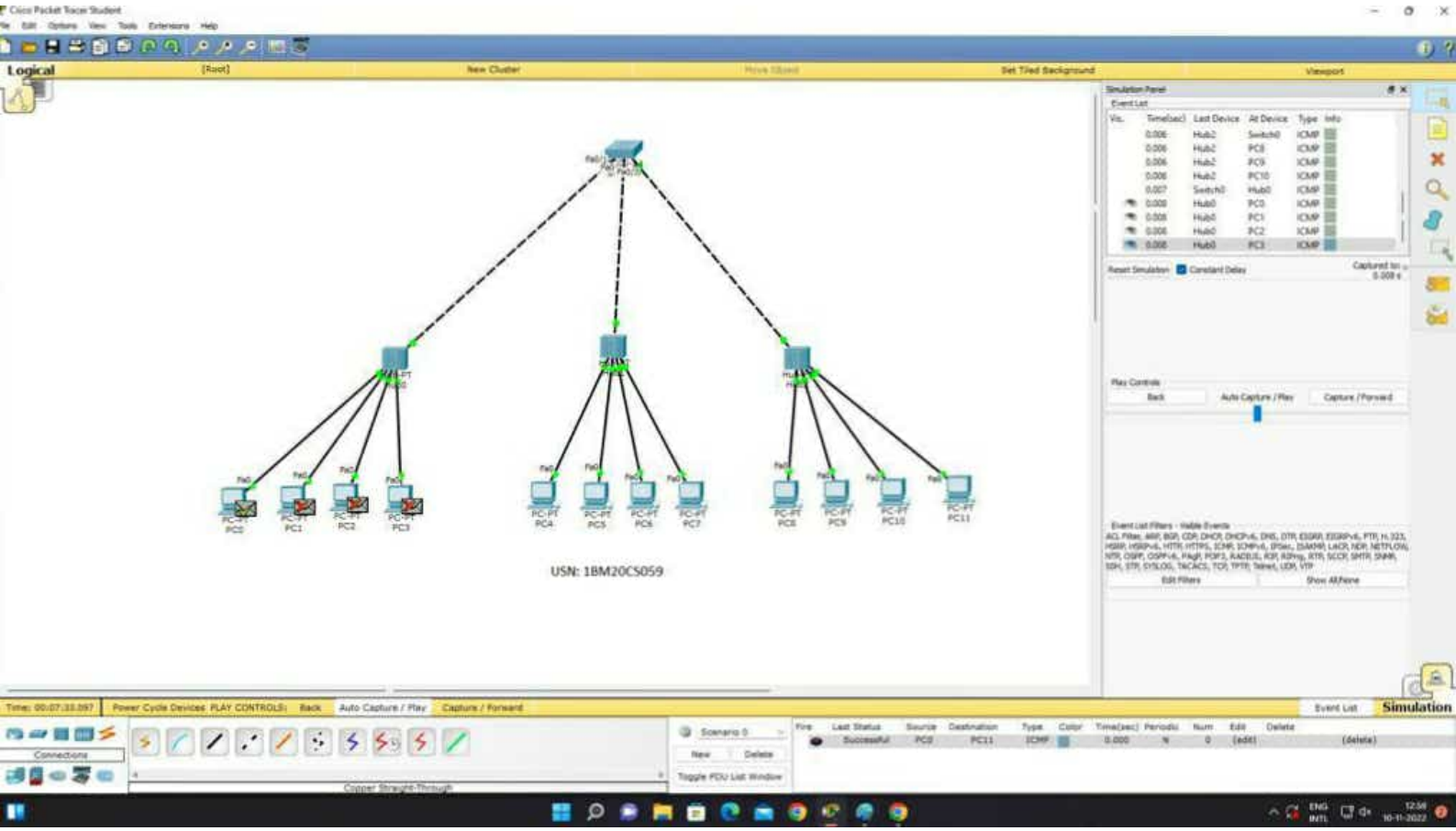
USN: 1BM20CS059



USN: 1BM20CS059


Cisco Packet Tracer Student
Logical
PC0
PC1
PC2
USN: 1BM20C5059


Logical
PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>PING 10.0.0.12
Pinging 10.0.0.12 with 32 bytes of data:
Reply from 10.0.0.12: bytes=32 time=0ms TTL=128
Reply from 10.0.0.12: bytes=32 time=0ms TTL=128
Reply from 10.0.0.12: bytes=32 time=0ms TTL=128
Reply from 10.0.0.12: bytes=32 time=0ms TTL=128
Ping statistics for 10.0.0.12:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>
PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
PC-PT PC4
PC-PT PC5
PC-PT PC6
PC-PT PC7
PC-PT PC8
PC-PT PC9
PC-PT PC10
PC-PT PC11
USN: 1BM20CS059
Realtime


Cisco Packet Tracer Student
Logical
[Root]
New Cluster
Set Tiled Background
Viewport
Simulation Panel
Event List
PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7
PC8
PC9
PC10
PC11
USN: 1BM20CS059
Power Cycle Devices
Auto Capture / Play
Capture / Forward
Event List
Simulation

4 Procedure:

→ Using Hub:

i) Add a generic hub and seven PCs to the workspace.

ii) Configure the IP address of each PC's in the configuration tab. Ensure that the IP is different for each device.

iii) Connect all PC's to hub using copper straight wire.

iv) The hub and PC is connected to each other's fast ethernet connection.

v) If the no. of ports is insufficient then add extra port by clicking on the device. Turn off the device and add the necessary ports.

vi) Write the IP's of all devices in a note below the device.

Real time:

Select a source PC and in the desktop tab select the command prompt option. In command prompt type "ping 10.0.0.3". This pings the PC2 and a response is generated in PC0.

Simulation time:

Select a simple PDU and select a source and destination computer. Clicking on auto capture option allows us to see how ports are transferred to and from device.

→ Using Switch:

i) Add a generic switch and three PCs to the workspace.

ii) Configure the IP addresses of each PC's in the configuration tab. Ensure that IP is different for each device.

iii) Connect all PC's to the switch using copper straight through.

iv) If no. of ports are insufficient then add extra ports by clicking on device. Turn off the device and add the necessary ports.

v) Write the IP's of all devices in a note below the device.

Real time:

Select a source PC and in the desktop tab select command prompt option. In command prompt option, ping the destination PC by specifying its IP.

Simulation time:

Select a simple PDU and select a source and destination computer. Clicking on auto capture option allows us to see how packets are transferred.

4 Hybrid Mode:

i) Add a switch, 3 hubs and 12 PC's to workspace.

ii) Connect the three hubs to the switch and 4 PC's to each of the hubs using copper cross over and copper straight through wires respectively.

iii) Configure the IP of each of the PC in configure and add a note below each PC containing IP addresses.

Real time mode:
Select the PC you want to send the packet from and open its command prompt. Specify the destination PC by specifying its IP addres. A response is sent by the destination PC to source PC.

Simulation mode:
Add a simple PDU by selecting the pair of PC and Click on add a capture from right panel.

4 Observation:

→ Hub:

Learning outcome:

i) When a source sends a packet in the network the hub scanner the packet and ends broadcast over the network, i.e. it sends data to all the end devices in the network and the node where it matches with the specified address accepts the packet and acknowledges it. Remaining nodes denied / ignore the message.

ii) The communication between hub and end devices is established through copper straight through wire as they belong to different layers.

iii) The number of ports can be added if needed by clicking on the device and adding the necessary ports.

Result:

```
PC > ping 10.0.0.3

pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3 : byte=32 time=0ms.
Reply from 10.0.0.3 : byte=32 time=0ms.
Reply from 10.0.0.3 : byte=32 time=0ms.
Reply from 10.0.0.3 : byte=32 time=0ms
Ping statistic for 10.0.0.3.
Packets sent=4, received=4, lost=0.
```

→ Switch:

Learning outcome:

i) When a source device sends a message to the switch once a connection is established. Which takes some time called as learning time, the switch receives the packet. It initially broadcasts the packet to all connected devices to locate the destination. Once the destination is located the message is sent only to that device.

ii) The connection between the switch and end device is established using copper straight through as they belong to different network layers.

iii) The number of ports can be added if needed by clicking on the device and adding the necessary ports.

Result:

```
PC > ping 10.0.0.3

pinging 10.0.0.3 with 32 bytes of data
Reply from 10.0.0.3 : bytes=32 time=0ms
Reply from 10.0.0.3 : bytes=32 time=0ms.
Reply from 10.0.0.3 : bytes=32 time=0ms.
```

Reply from 10.0.0.3 : bytes = 32 time = 0 ms

Ping statistics for 10.0.0.3:
Packets : Sent = 4, Received = 4, Lost = 0.

→ Hybrid Mode

Learning Outcome :

i) The switch and hub are connected through copper cross over as they belong to the same network layer but PC and hubs are connected through copper straight through as they belong the different network layer.

ii) The message from the source PC to destination is sent through the hub which then sends to all its connected PC's and the switch. The switch then sends the message to the respective hub and the hub sends the message to all its connected PC. The destination PC acknowledges that it has received the message by sending a acknowledged back to the source PC.

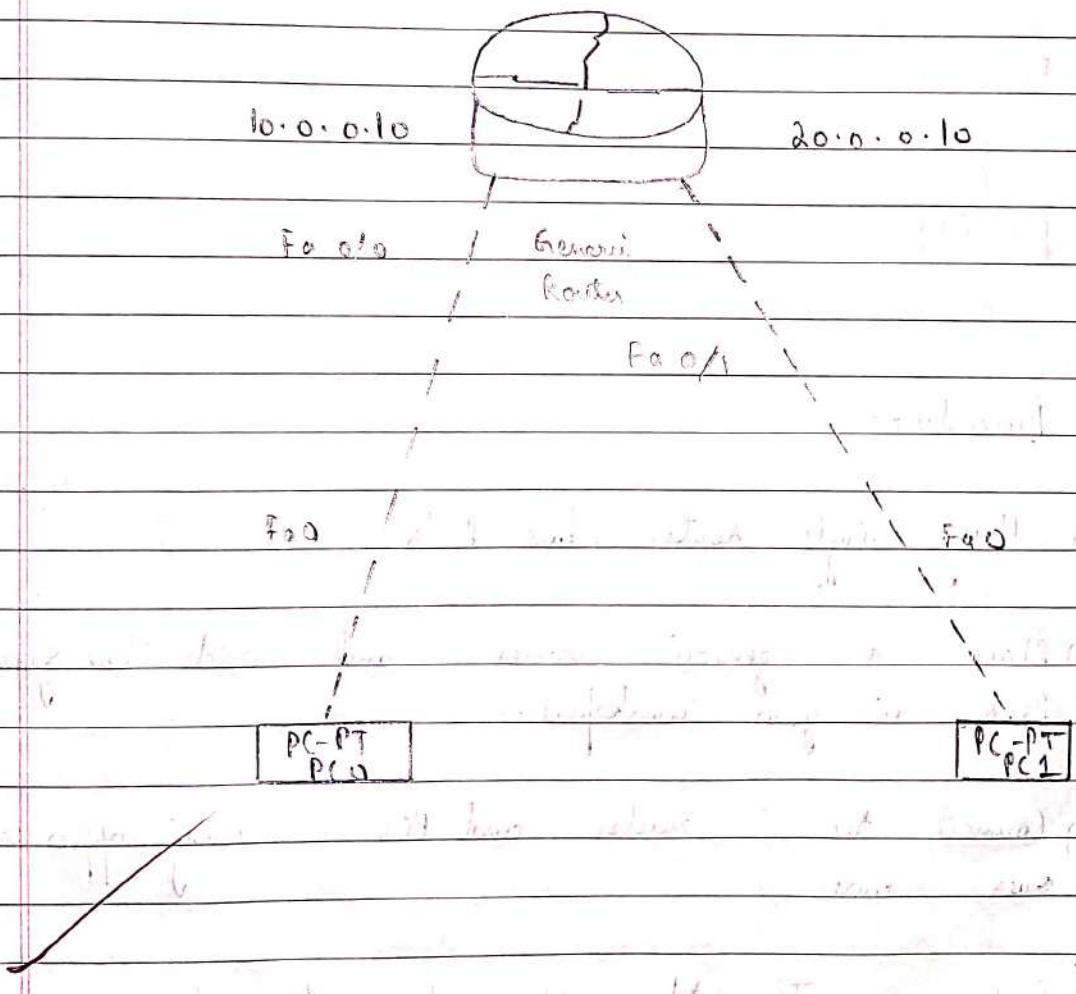
iii) The number of ports can be added if needed by clicking on the device and adding the necessary ports.

Lab: Week 2 Experiment using routers and PCs

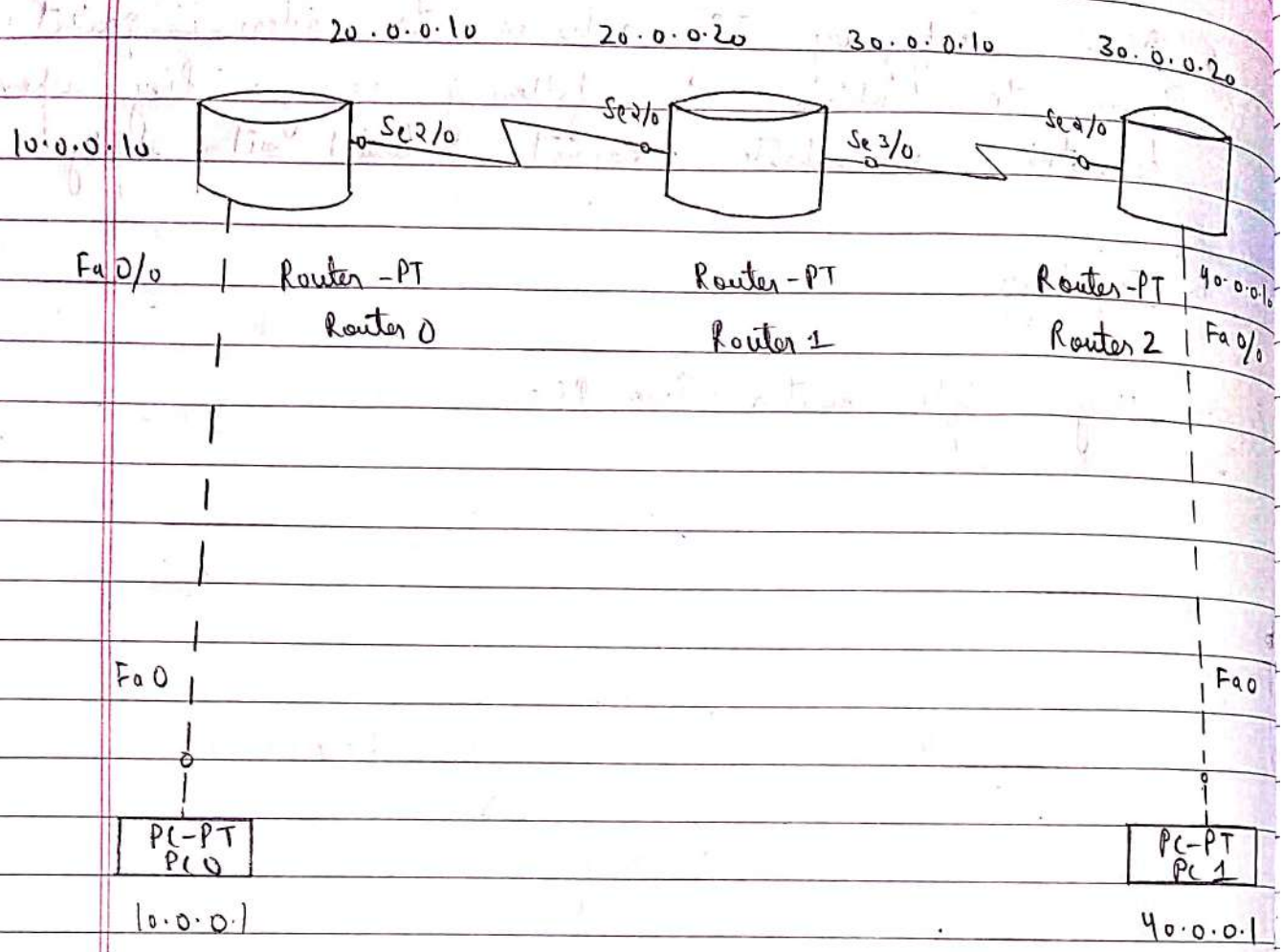
↳ Aim: Configuring IP addresses to routers in packet tracer to explore the following messages: Ping responses, Destination unreachable, Request timed out, Reply.

↳ Topology:

→ Using single router, two PCs:



→ Using three routers, two PCs:



↳ Procedure:

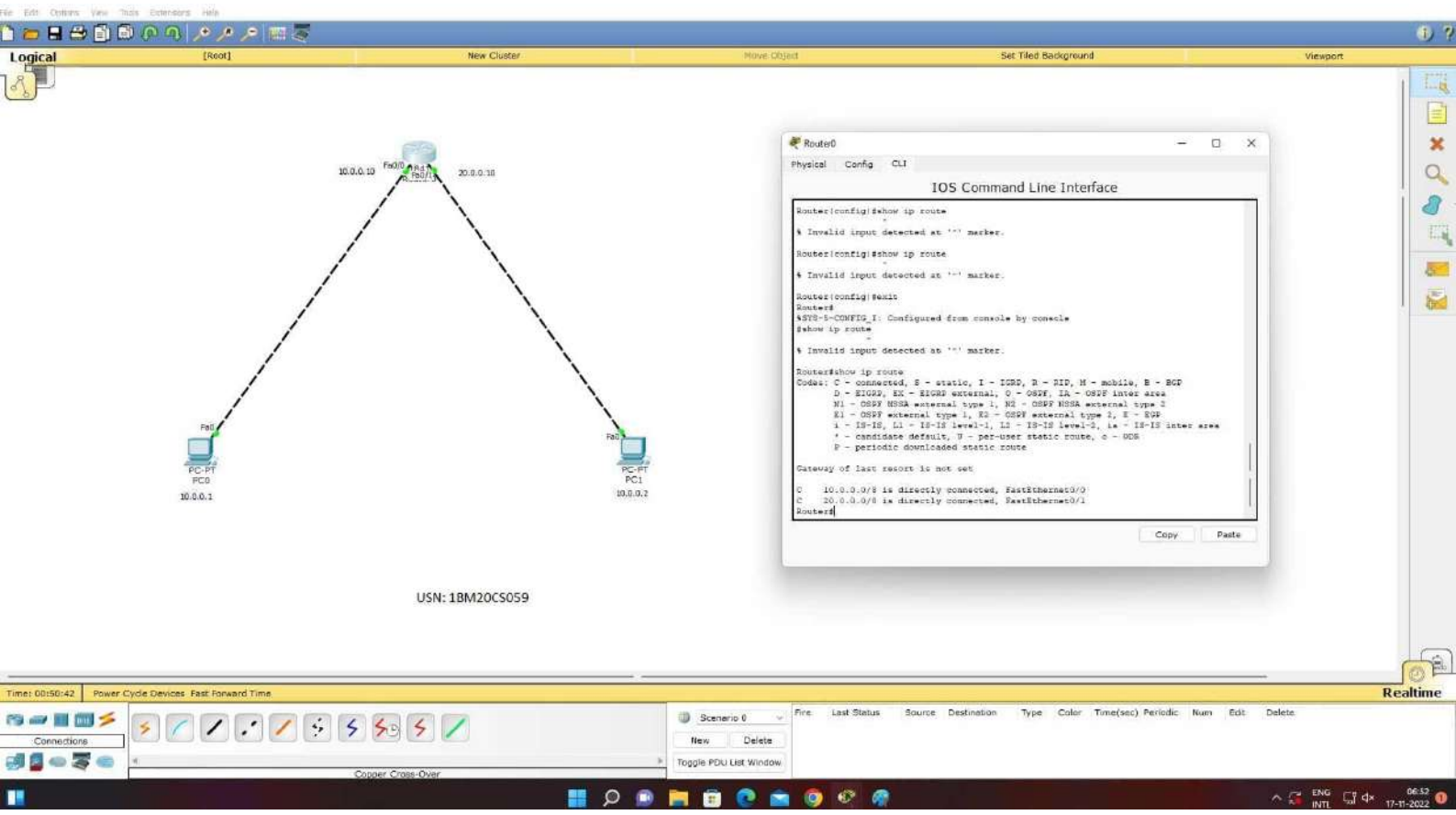
→ Using single router, two PC's

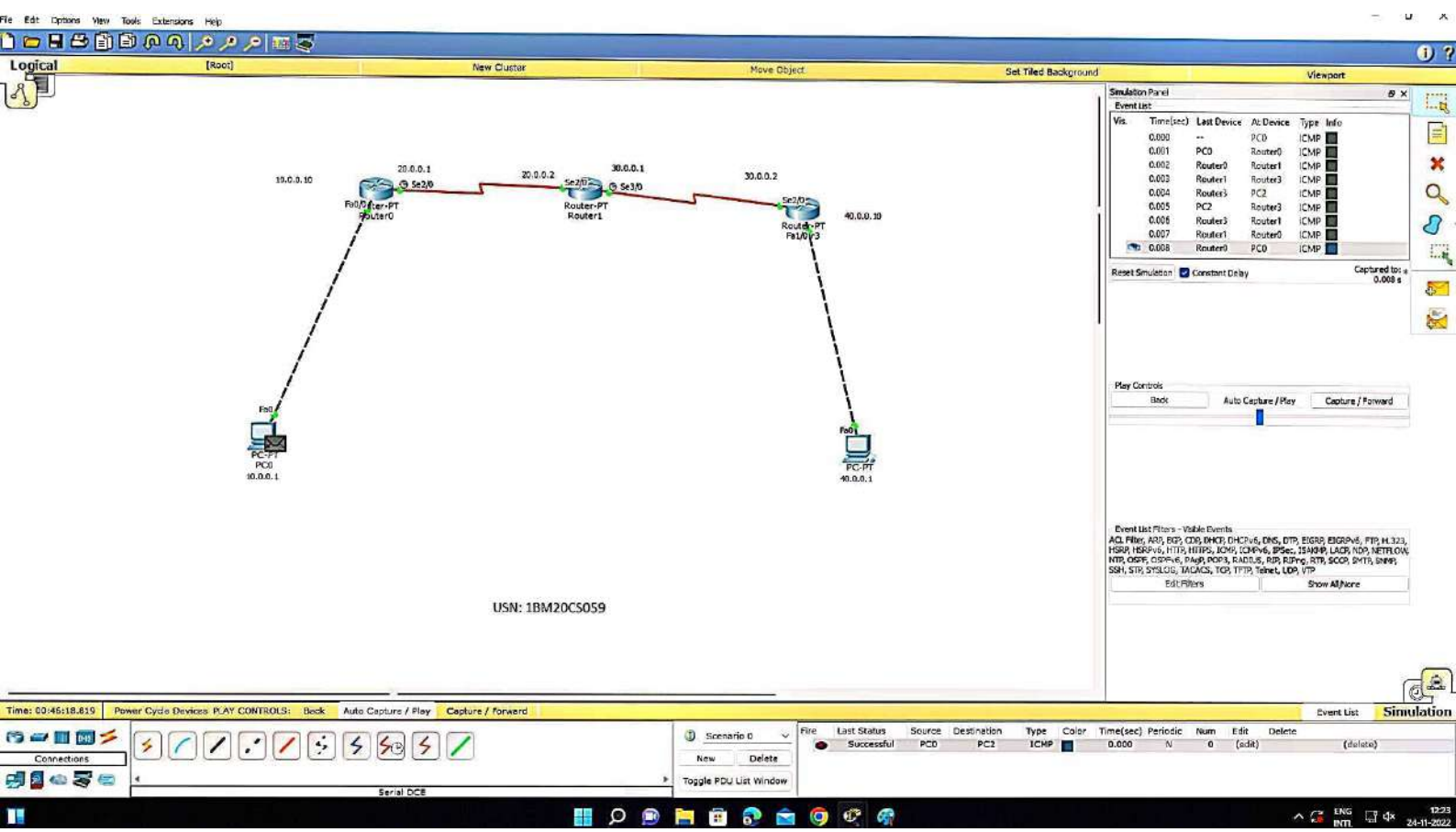
i) Place a generic router and add two generic PC's in your workspace.

ii) Connect the router and PCs using copper cross over wire.

iii) Configure IP address of each PC and in the configuration tab under settings set gateways for both PCs to the router.

iv) Click on the generic router and go to the CLI


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
Fa0/0
Fa0/1
20.0.0.10
Fa0
PC-PT
PC0
10.0.0.1
Fa0
PC-PT
PC1
10.0.0.2
Router0
Physical
Config
CLI
IOS Command Line Interface
Router(config)#show ip route
% Invalid input detected at '^' marker.
Router(config)#show ip route
% Invalid input detected at '^' marker.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
#show ip route
% Invalid input detected at '^' marker.
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 20.0.0.0/8 is directly connected, FastEthernet0/1
Router#
Copy
Paste
USN: 1BM20CS059
Time: 00:50:42
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Copper Cross-Over
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
ENG
INTL
06:52
17-11-2022



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tab. Enter the following commands to set up a connection between PC0 (1) and generic router through gateway 10.0.0.10.

→ No
→ enable
config t
(config) # interface fastethernet 0/0.
(config-if) # ip addres 10.0.0.10 255.0.0.0
no shut
exit

Now to set up connection between PC2 and the router through gateway 20.0.0.10

interface fastethernet 1/0
ip address 20.0.0.10 255.0.0.0
no shut
exit

Once we enter no shut both times the amber light between the PC and router turns green indicating that the two devices are ready for use.

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

Real time mode: Select the PC you want to send the packet from which is PC0 in our case and open its command prompt from desktop tab. Specify the destination tab address. A response is sent from destination PC to source PC.

→ Using three routers, two PCs

i) Place 3 generic routers and 2 generic PCs in the workspace.

ii) Place a note for each device [PC and router] and specify the IP address.

iii) Connect the router and PC using copper cross-over.

iv) Connect the routers using serial DCE.

v) Click on each PC, go to the configure tab. Set the IP address and subnet mask in fastethernet

vi) Next click on settings in the config tab. Set the gateway as the IP address of the next router [e.g 10.0.0.10]

vii) IP address of PC and its gateway address should belong to the same network.

For connecting two routers:

Click on Router 0. Go to CLI and enter the following commands.

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

Click on router 1, open CLI and enter the following commands.

→ no
→ enable
→ config t
→ interface serial 2/0
→ ip address 20.0.0.20 255.0.0.0
→ no shut

After this procedure, the red lights between the two routers will now turn green [router 0 and router 1]. Indicating that they are now ready for communication.

For connecting two devices [1 PC and one router].

i) Since IP address of the PC0 is already configured, go to router.

ii) Open CLI for router 0 and enter the following commands.

→ no
→ enable
→ config t
→ interface fastethernet 0/0
→ ip address 10.0.0.10 255.0.0.0
→ no shut

The red light turns green meaning that the router is ready for communication.

Teaching Router 0 of network 30:

→ no
→ enable
→ config t
→ interface serial 2/0
→ ip route 30.0.0.0 255.0.0.0 20.0.0.20
→ exit
→ show ip route

Teaching Router 0 of network 40:

→ no
→ enable
→ config t
→ interface serial 2/0
→ ip route 40.0.0.0 255.0.0.0 20.0.0.20
→ exit
→ show ip route.

Similarly repeat this for routes 1 and router 2.

Simulation mode: Add a simple PDU by selecting the PC 2 and click on outer capture from right panel.

Real time mode: Select the PC PC0 and go to its command prompt and ping the router 0.
Once the message has been sent sucessfully Repeat this with routes 1 and 2 as well. Finally, ping PC1

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5 Observation:
Learning outcome

→ 1 Router:
When PC0 pings PC1 for the first time, we get the first packet as request timed out.
Now, if we ping PC1 again from PC0 we get all 4 packets without any loss. Now reverse pinging of PC0 from PC1 will also not lead to any loss, all packets are acknowledged.

→ 3 routers:

Before training the routers, we get the results as destination host unreachable. After training the routers, we get clear statistics as the result.

6 Result:

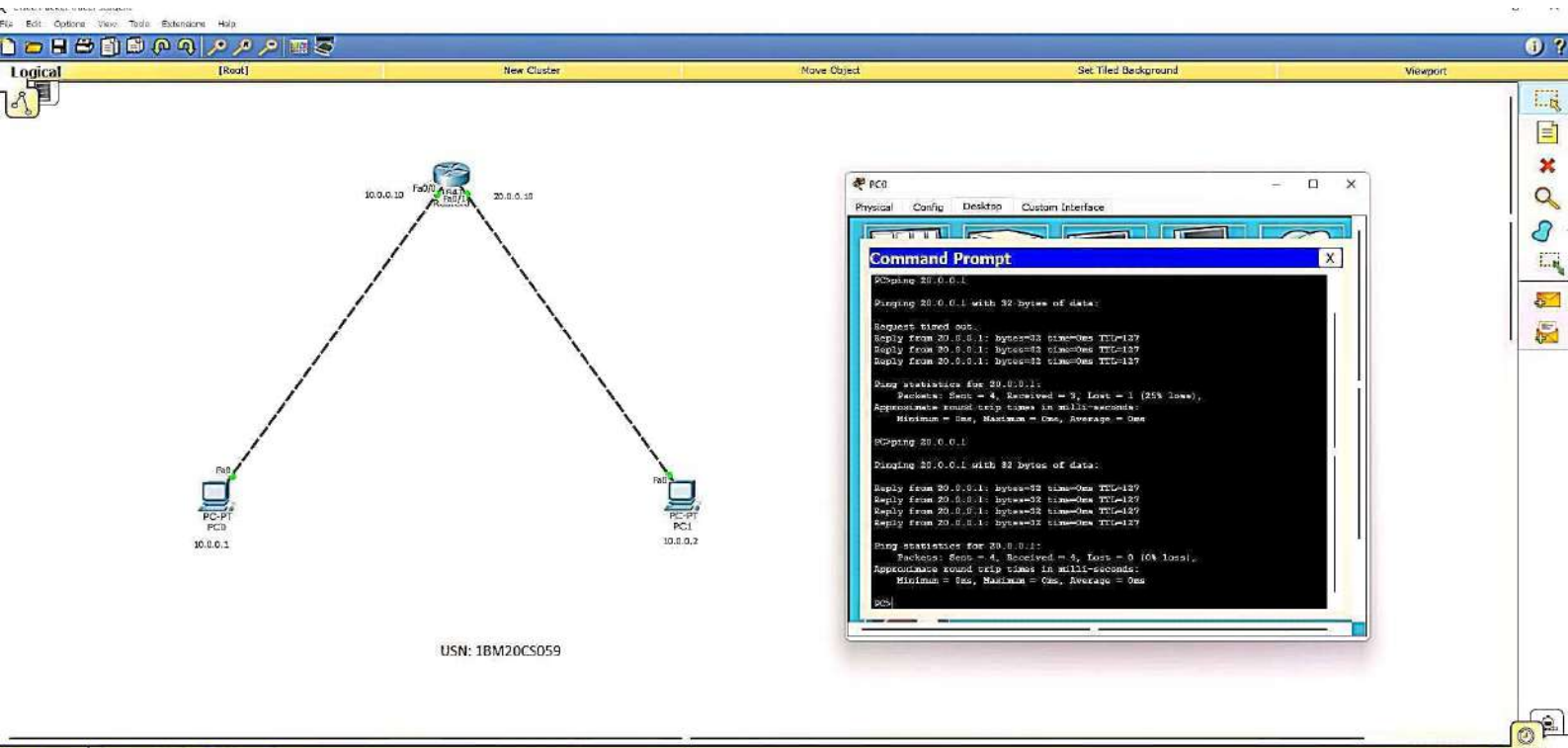
→ Using 1 router, three PCs.

C:\> Ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of data:
Request timed out
Reply from 20.0.0.1 : bytes = 32 time < 1 ms TTL = 127.
Reply from 20.0.0.1 : bytes = 32 time < 1 ms TTL = 127.
Reply from 20.0.0.1 : bytes = 32 time < 1 ms. TTL = 127.

Ping statistics for 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data:

Reply from 20.0.0.1 : bytes = 32 time < 1 ms TTL = 127
Reply from 20.0.0.1 : bytes = 32 time < 1 ms TTL = 127.


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
Fa0/0
Fa0/1
20.0.0.10
Fa0
PC-PT
PC0
10.0.0.1
Fa0
PC-PT
PC1
10.0.0.2
PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
PC>ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Ping statistics for 20.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of data:
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Ping statistics for 20.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>
USN: 1BM20CS059
Time: 00:46:42
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Copper Cross-Over
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
ENG
INTL
06:48
17-11-2022

Reply from 20.0.0.1 : bytes=32 time<1ms TTL=127.
Reply from 20.0.0.1 : bytes=32 time<1ms TTL=127.

Ping statistics for 20.0.0.1:

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

→ Using three routers, two PCs:

1. PC> Ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data

Reply from 10.0.0.10 : destination host unreachable.
Reply from 10.0.0.10 : destination host unreachable.
Reply from 10.0.0.10 : destination host unreachable
Reply from 10.0.0.10 : destination host unreachable
Ping statistics for 40.0.0.1
Packets : sent = 4, received = 0 , lost = 4 (100% loss)

2. PC> Ping 10.0.0.10 with 32 bytes of data

Reply from 10.0.0.10 : bytes = 32 time = 0ms TTL=255
Reply from 10.0.0.10 : bytes = 32 time = 0 ms TTL= 255
Reply from 10.0.0.10 : bytes = 32 time = 0 ms TTL=255
Reply from 10.0.0.10 : bytes = 32 time = 0 ms TTL= 255.
Ping statistics for 10.0.0.10:
Packets : sent = 4, Received = 4, lost = 0 (0% lost)

3. PC> Ping 20.0.0.10 with 32 bytes of data

Reply from 20.0.0.10 : bytes = 32 time = 1ms TTL=255
Reply from 20.0.0.10 : bytes = 32 time = 0ms TTL = 255
Reply from 20.0.0.10 : bytes = 32 time = 0ms TTL=255
Reply from 20.0.0.10 : bytes = 32 time = 0 ms TTL=255.

Ping statistics for 20.0.0.10:
Packets: sent = 4, received = 4, lost = 0 (0% lost)

4. PC> ping 30.0.0.10
Pinging 30.0.0.10 with 32 bytes of data

Reply from 30.0.0.10: bytes=32 time = 1ms TTL = 254.
Reply from 30.0.0.10: bytes=32 time = 1ms TTL = 254
Reply from 30.0.0.10: bytes=32 time=1ms TTL=254
Reply from 30.0.0.10: bytes=32 time=8ms TTL=254.

Ping statistics for 30.0.0.10:
packets: sent = 4, received = 4, lost = 0 (0% lost)

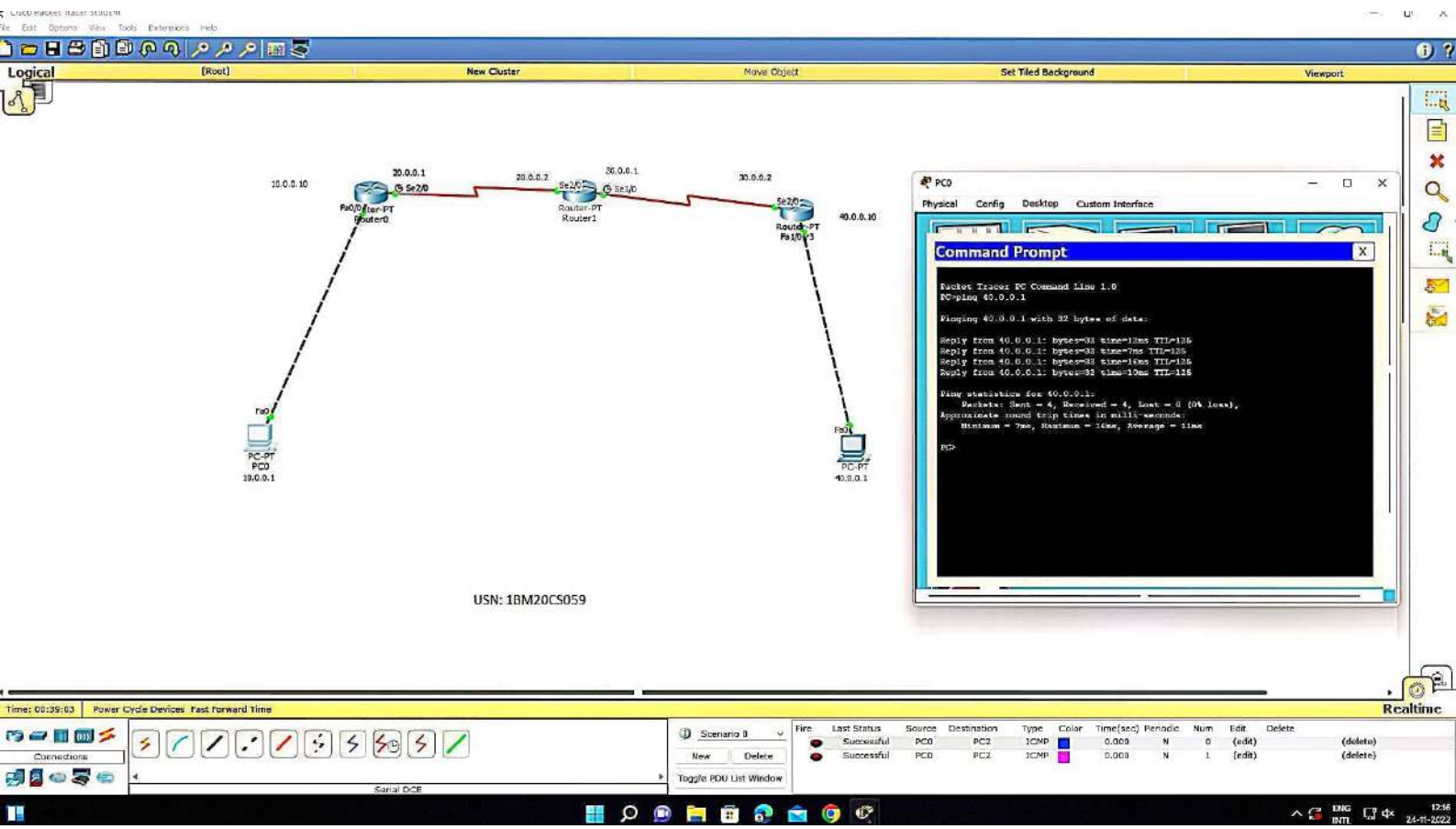
5. PC> ping 40.0.0.1
pinging 40.0.0.1 with 32 bytes of data

Request timed out
Reply from 40.0.0.1: bytes=32, time = 10ms TTL=125
Reply from 40.0.0.1: bytes=32, time = 13ms TTL=125
Reply from 40.0.0.1: bytes=32, time=8ms TTL=125.

Ping statistics for 40.0.0.1:
Packets: sent = 4, received = 3, lost=1 (25% loss)

6. 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 = 2ms TTL=125.
Reply from 40.0.0.1: bytes=32 time=24ms TTL=125.
Reply from 40.0.0.1: bytes=32 time = 9ms TTL=125.
Reply from 40.0.0.1: bytes=32 time = 9ms TTL=125.
Ping statistics for 40.0.0.1:
packets: sent = 4, received = 4, lost=0 (0% loss).

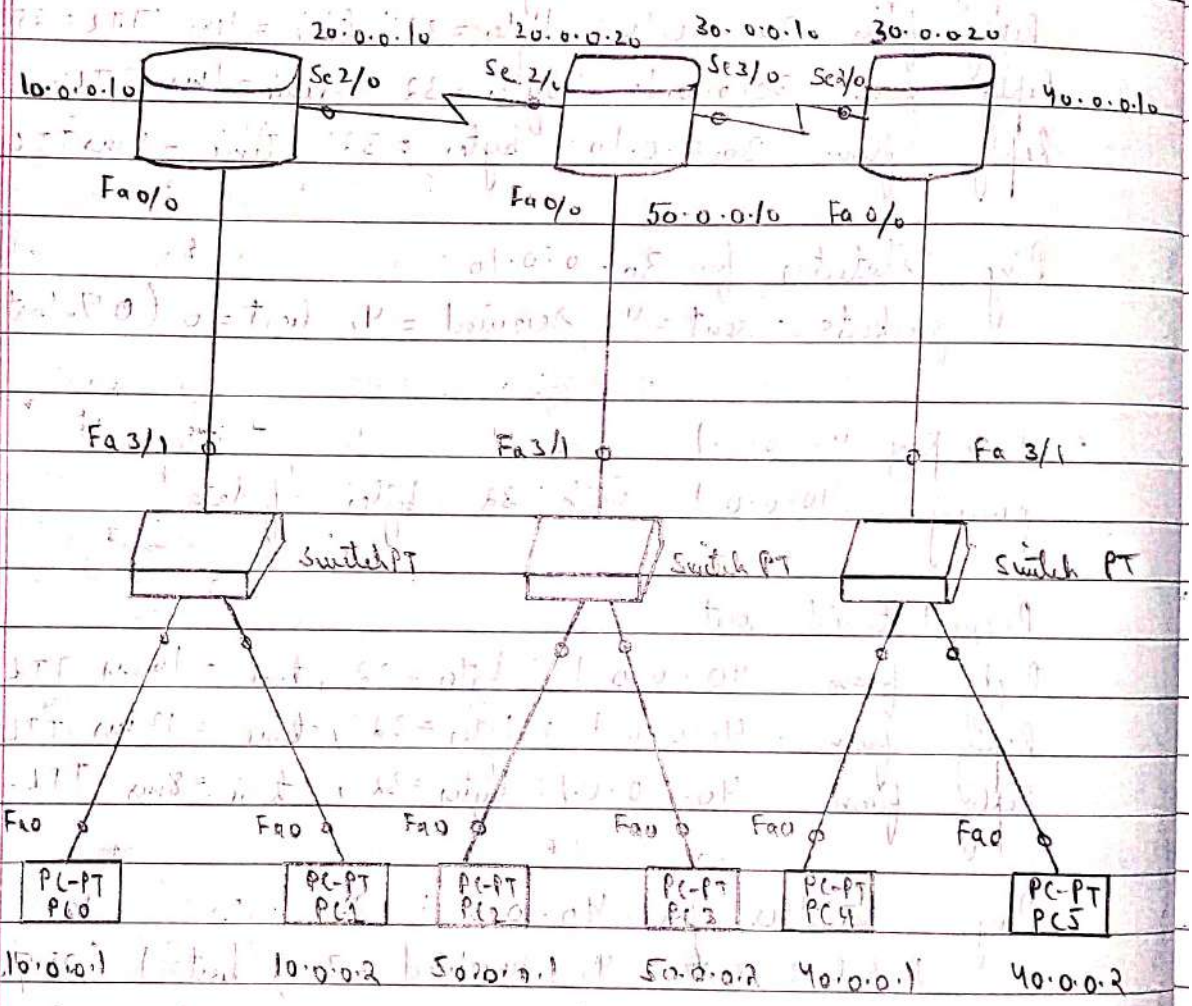

Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
20.0.0.1
Se2/0
20.0.0.2
Se3/0
30.0.0.1
Se2/0
30.0.0.2
Router-PT
Router0
Router-PT
Router1
Router-PT
40.0.0.10
Fa0
PC-PT
PC0
10.0.0.1
Fa0
PC-PT
40.0.0.1
PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
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=12ms TTL=125
Reply from 40.0.0.1: bytes=32 time=7ms TTL=125
Reply from 40.0.0.1: bytes=32 time=16ms TTL=125
Reply from 40.0.0.1: bytes=32 time=10ms TTL=125
Ping statistics for 40.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 7ms, Maximum = 16ms, Average = 11ms
PC>
USN: 1BM20CS059
Time: 00:39:03
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Serial DCE
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC0
PC2
ICMP
0.000
N
0
(edit)
(delete)
Successful
PC0
PC2
ICMP
0.000
N
1
(edit)
(delete)

Date 14/11/22
Page

Lab: Week 3 Experiment using Routers & Switches.

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

↳ Topology:



↳ Procedure:

(i) Place 3 generic routers 3 generic switches and 6 generic PCs in the workspace.

ii) Connect the PCs to the switch using copper straight through wire.

iii) Connect the switches to routers also using copper straight throughs

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 the two routers will turn green indicating they are ready for communication

Teaching Router 0 about network 30, 40 & 50 :

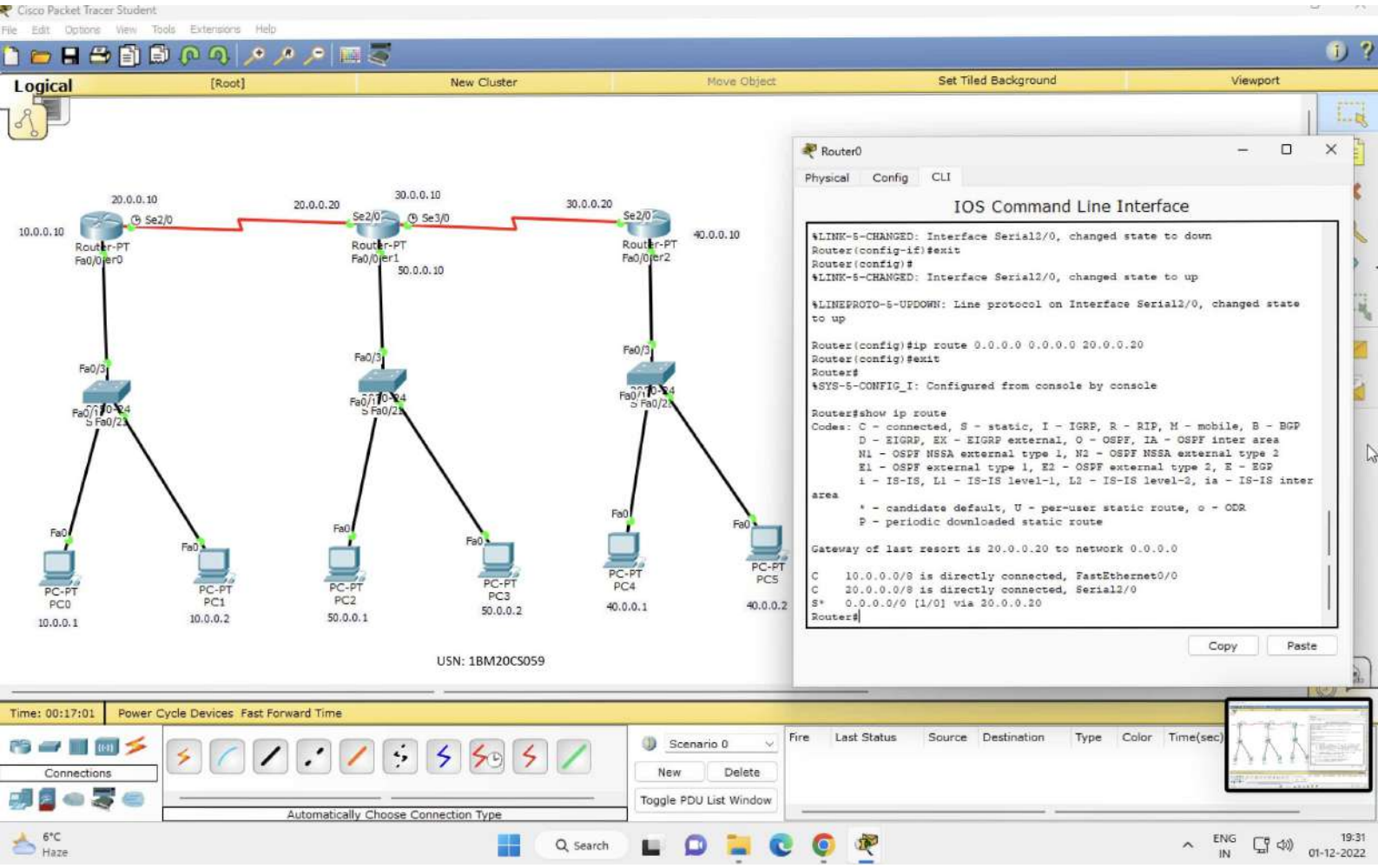
Click on router 0, open CLI :

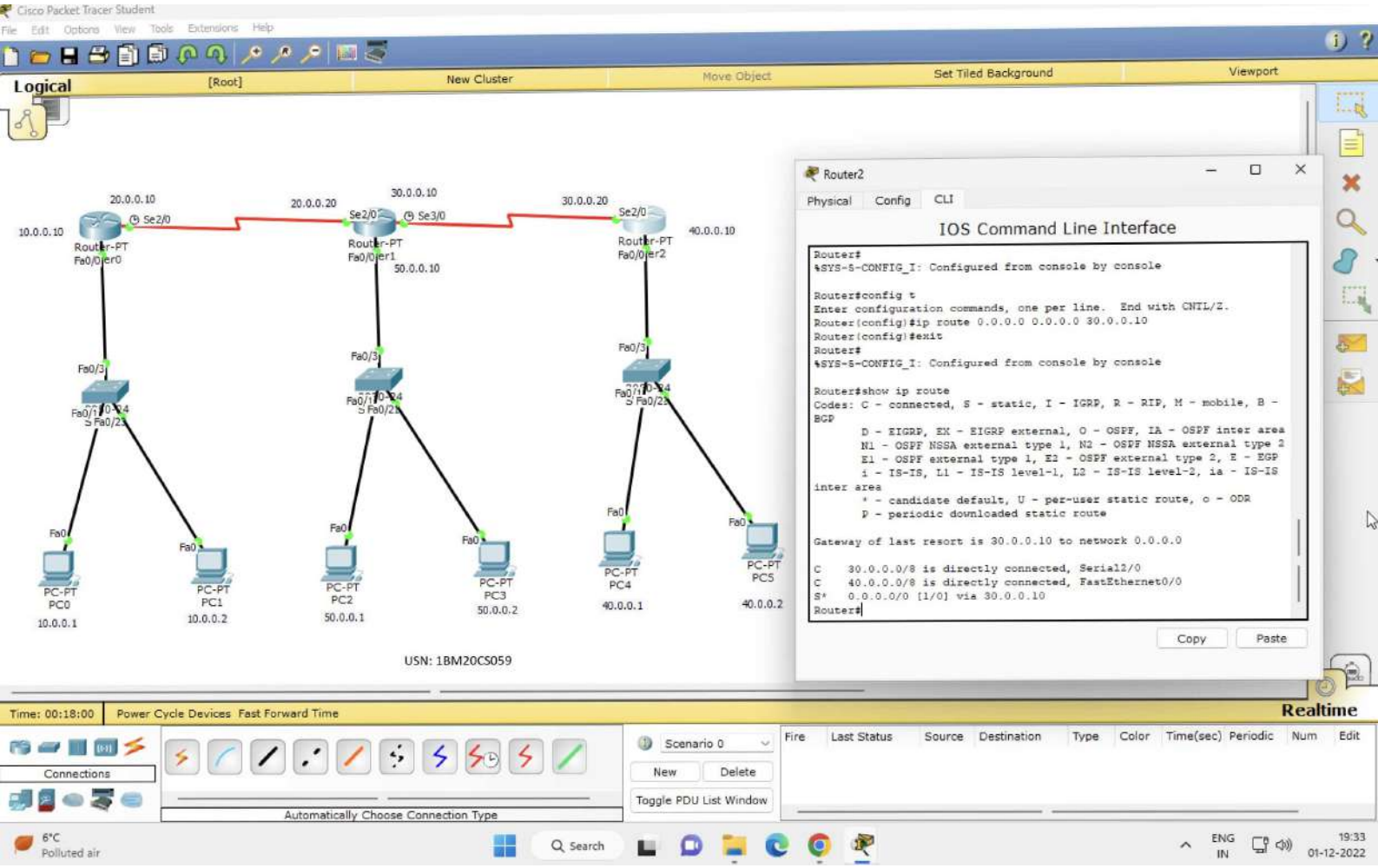
→ enable
→ config t
→ interface serial 2/0
→ ip route 0.0.0.0 0.0.0.0 20.0.0.20
→ exit
→ show ip route

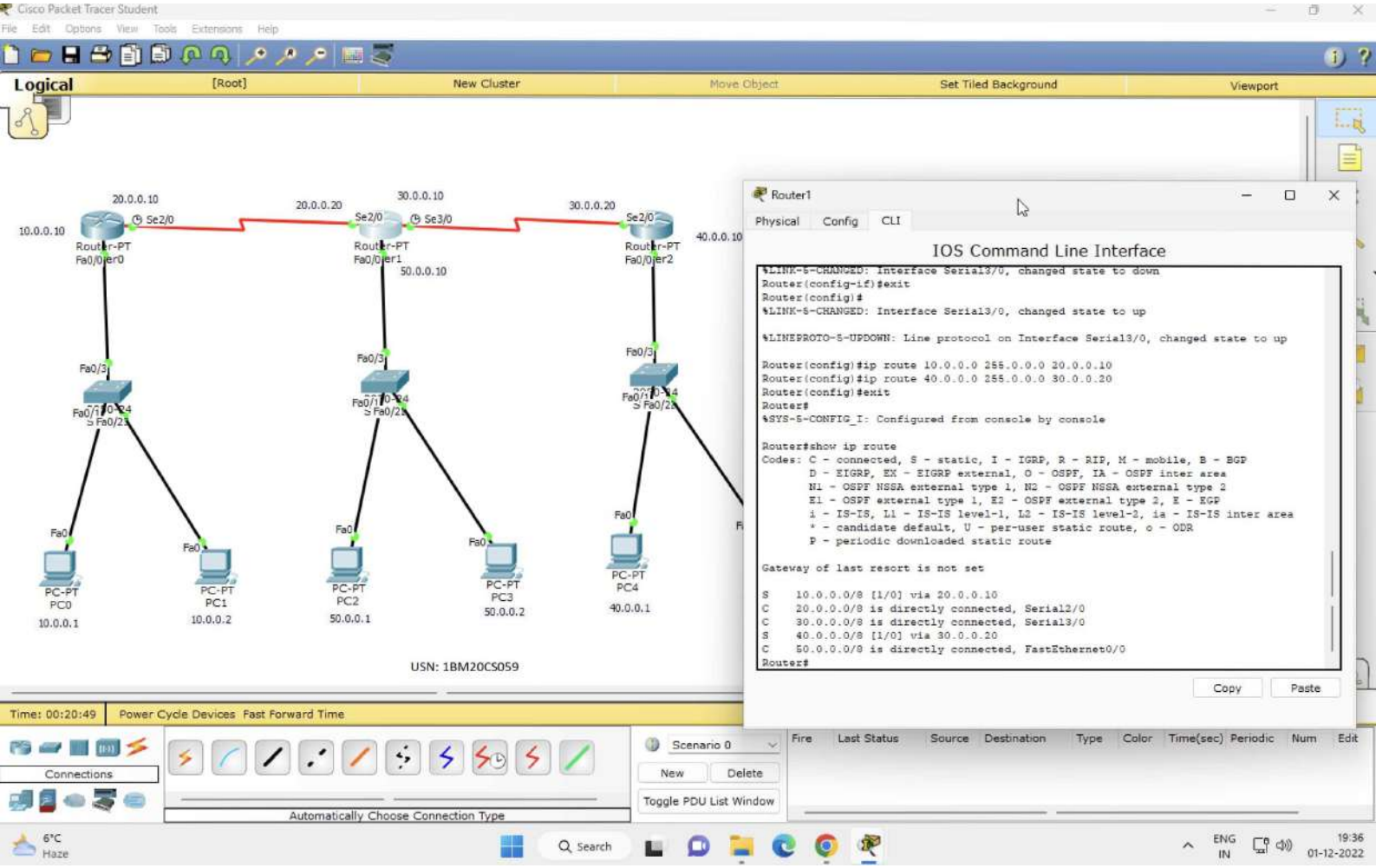
It will show that networks 30, 40 & 50 are connected via gateway 20.0.0.20.

Teaching Router 1 of network 10 & 40 :

→ enable
→ config t
→ interface serial 2/0
→ ip route 40.0.0.0 255.0.0.0 20.0.0.10
→ exit
→ interface serial 3/0
→ ip route 40.0.0.0 255.0.0.0 30.0.0.20


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
10.0.0.10
40.0.0.10
50.0.0.10
Se2/0
Se3/0
Router-PT
Fa0/0
Fa0/3
Fa0/1
S Fa0/2
PC-PT
PC0
PC1
PC2
PC3
PC4
PC5
10.0.0.1
10.0.0.2
50.0.0.1
50.0.0.2
40.0.0.1
40.0.0.2
USN: 1BM20CS059
Router0
Physical
Config
CLI
IOS Command Line Interface
%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config)#ip route 0.0.0.0 0.0.0.0 20.0.0.20
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 20.0.0.20 to network 0.0.0.0
C 10.0.0.0/8 is directly connected, FastEthernet0/0
C 20.0.0.0/8 is directly connected, Serial2/0
S* 0.0.0.0/0 [1/0] via 20.0.0.20
Router#
Copy
Paste
Time: 00:17:01
Power Cycle Devices Fast Forward Time
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
6°C
Haze
Search
ENG
IN
19:31
01-12-2022


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
10.0.0.10
40.0.0.10
50.0.0.10
Se2/0
Se3/0
Router-PT
Fa0/0
Fa0/3
Fa0/23
PC-PT
PC0
PC1
PC2
PC3
PC4
PC5
10.0.0.1
10.0.0.2
50.0.0.1
50.0.0.2
40.0.0.1
40.0.0.2
USN: 1BM20CS059
Router2
Physical
Config
CLI
IOS Command Line Interface
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 30.0.0.10
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 30.0.0.10 to network 0.0.0.0
C 30.0.0.0/8 is directly connected, Serial2/0
C 40.0.0.0/8 is directly connected, FastEthernet0/0
S* 0.0.0.0/0 [1/0] via 30.0.0.10
Router#
Copy
Paste
Time: 00:18:00
Power Cycle Devices Fast Forward Time
Realtime
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
6°C
Polluted air
Search
ENG
IN
19:33
01-12-2022


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
20.0.0.10
Se2/0
10.0.0.10
Router-PT
Fa0/0ter0
20.0.0.20
30.0.0.10
Se2/0
Se3/0
Router-PT
Fa0/0ter1
50.0.0.10
30.0.0.20
Se2/0
Router-PT
Fa0/0ter2
40.0.0.10
Fa0/3
Fa0/1
Fa0
PC-PT
PC0
10.0.0.1
PC-PT
PC1
10.0.0.2
PC-PT
PC2
50.0.0.1
PC-PT
PC3
50.0.0.2
PC-PT
PC4
40.0.0.1
USN: 1BM20CS059
Router1
Physical
Config
CLI
IOS Command Line Interface
%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)$exit
Router(config)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.10
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.20
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 20.0.0.10
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 30.0.0.20
C 50.0.0.0/8 is directly connected, FastEthernet0/0
Router#
Copy
Paste
Time: 00:20:49
Power Cycle Devices Fast Forward Time
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
6°C
Haze
Search
ENG
IN
19:36
01-12-2022

→ exit
→ show ip route

Teaching router 2 of network 10.20.850:

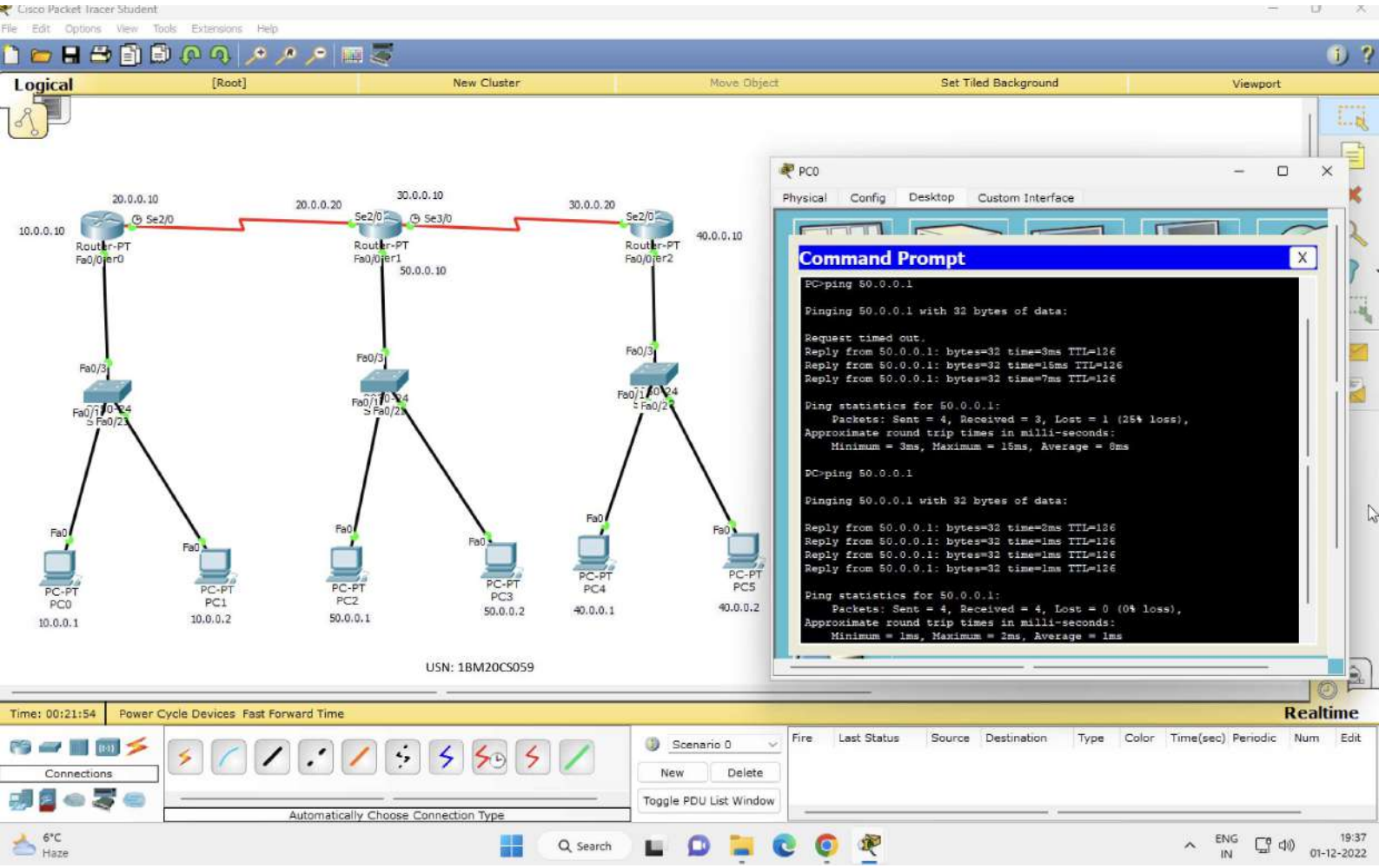
→ enable
→ config t
→ interface serial 2/0
→ ip route 0.0.0.0 0.0.0.0 30.0.0.10
→ exit
→ show ip route

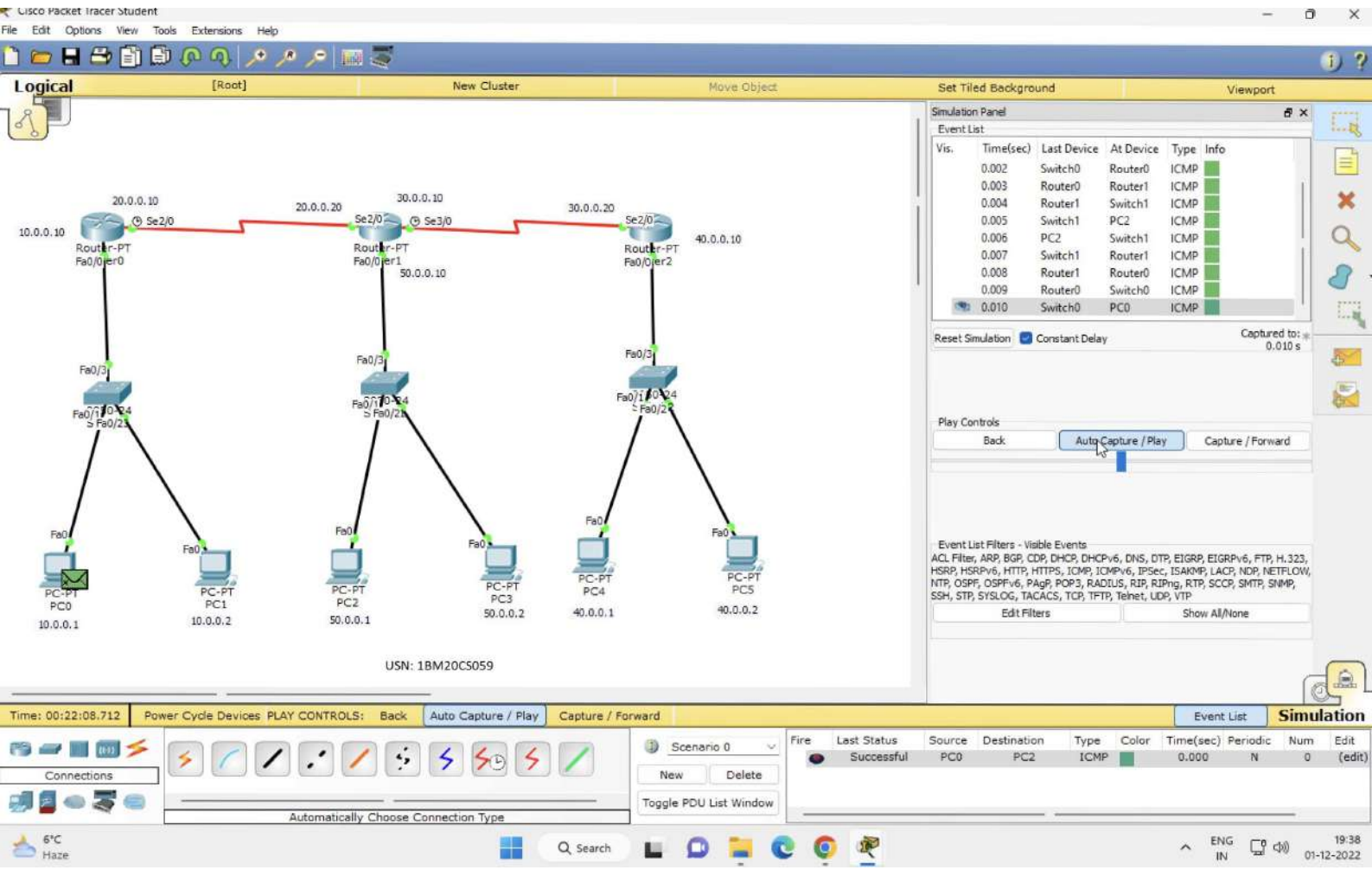
Simulation mode: Add a simple PDU by selecting the PCs and click on the auto capture from right panel.

Real time mode: Select the PC PC0 and go the its command prompt and ping a P.C in network 50. At first it will show request timed out & 1 packet will be lost during transmission. But on executing the command once more, the PC will now have learnt the network and the message will be successfully sent to the PC in network 50 without any losses. Finally ping a PC in network 40 and repeat the same. We will observe that the message is sent successfully.

↳ Observation:

Learning outcome: In this network router R1 does not have a default router, because R0 and R2 cannot become a default router simultaneously and if any one of R0 and R1 is default then the packets that are supposed to enter R1 can go to R2/R0 as they are default.


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
10.0.0.10
40.0.0.10
50.0.0.10
Se2/0
Se3/0
Router-PT
Fa0/3
Fa0/23
Fa0
PC-PT PC0 10.0.0.1
PC-PT PC1 10.0.0.2
PC-PT PC2 50.0.0.1
PC-PT PC3 50.0.0.2
PC-PT PC4 40.0.0.1
PC-PT PC5 40.0.0.2
USN: 1BM20CS059
PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
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=3ms TTL=126
Reply from 50.0.0.1: bytes=32 time=15ms TTL=126
Reply from 50.0.0.1: bytes=32 time=7ms TTL=126
Ping statistics for 50.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 3ms, Maximum = 15ms, Average = 8ms
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=2ms TTL=126
Reply from 50.0.0.1: bytes=32 time=1ms TTL=126
Reply from 50.0.0.1: bytes=32 time=1ms TTL=126
Reply from 50.0.0.1: bytes=32 time=1ms TTL=126
Ping statistics for 50.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 2ms, Average = 1ms
Time: 00:21:54
Power Cycle Devices Fast Forward Time
Realtime
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
6°C
Haze
Search
ENG
IN
19:37
01-12-2022


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
20.0.0.10
Se2/0
10.0.0.10
Router-PT
Fa0/0er0
20.0.0.20
30.0.0.10
Se2/0
Se3/0
Router-PT
Fa0/0er1
50.0.0.10
30.0.0.20
Se2/0
Router-PT
Fa0/0er2
40.0.0.10
Fa0/3
Fa0/23
Fa0/24
Fa0/1
PC-PT
PC0
10.0.0.1
PC-PT
PC1
10.0.0.2
PC-PT
PC2
50.0.0.1
PC-PT
PC3
50.0.0.2
PC-PT
PC4
40.0.0.1
PC-PT
PC5
40.0.0.2
USN: 1BM20CS059
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.002 Switch0 Router0 ICMP
0.003 Router0 Router1 ICMP
0.004 Router1 Switch1 ICMP
0.005 Switch1 PC2 ICMP
0.006 PC2 Switch1 ICMP
0.007 Switch1 Router1 ICMP
0.008 Router1 Router0 ICMP
0.009 Router0 Switch0 ICMP
0.010 Switch0 PC0 ICMP
Reset Simulation
Constant Delay
Captured to: 0.010 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Time: 00:22:08.712
Power Cycle Devices PLAY CONTROLS: Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit
Successful PC0 PC2 ICMP 0.000 N 0 (edit)
6°C
Haze
Search
ENG
IN
19:38
01-12-2022

Page

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 = 126
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 > 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 = 4 (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. 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 = 18 ms 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.

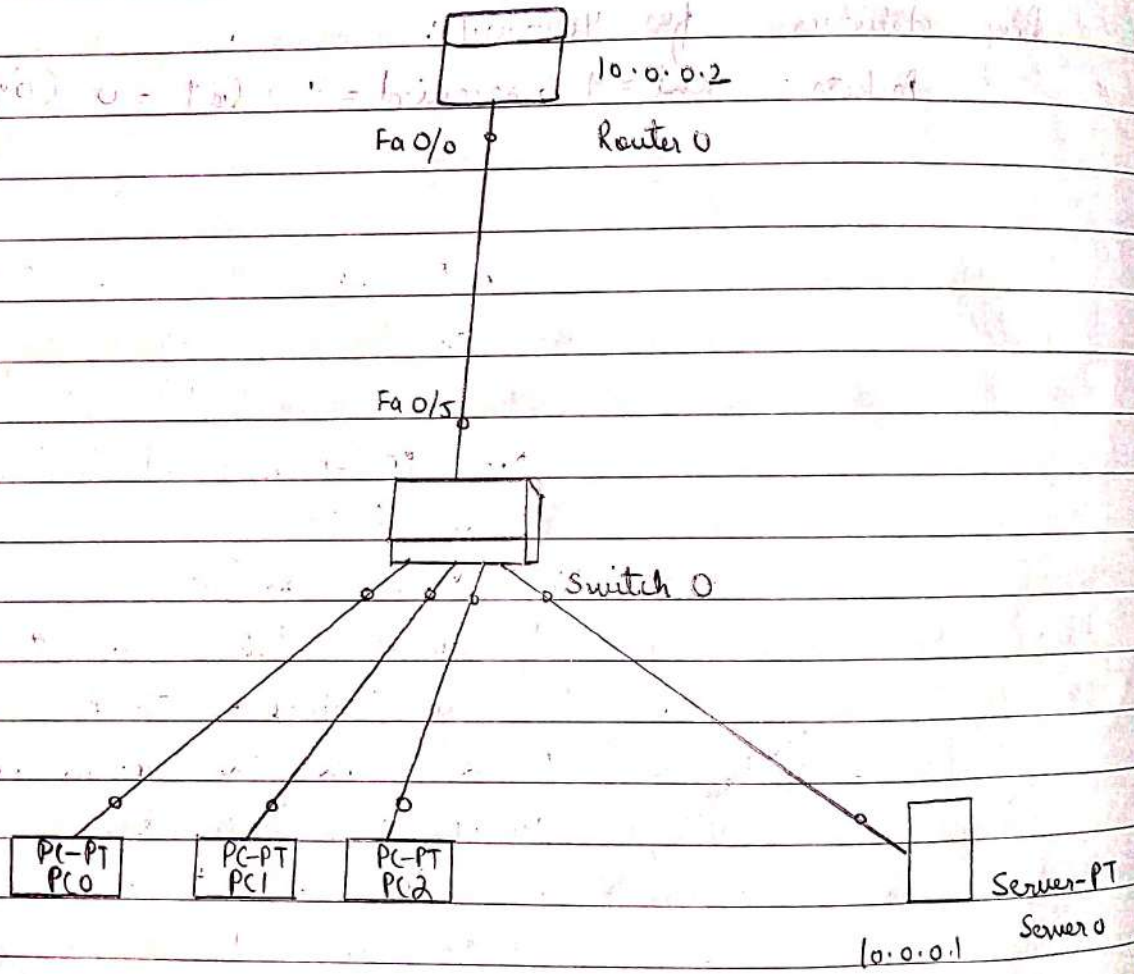
Ping statistics for 40.0.0.1 :
Packets : sent = 4, received = 4, lost = 0 (0% loss).

Date 1/12/22
Page

Lab: Week 4 DHCP configuration

4 Aim: Configuring DHCP within a LAN in a packet tracer.

4 Topology:



4 Procedure:

i) Place a generic router, a generic switch, 3 generic PCs and a generic server in the workspace as shown in the given topology

ii) Connect the PCs to the switch through copper straight through.

iii) Connect the server to the switch and switch to the router using copper straight through

(iv) Place a note below the server and write the ip addres as 10.0.0.1

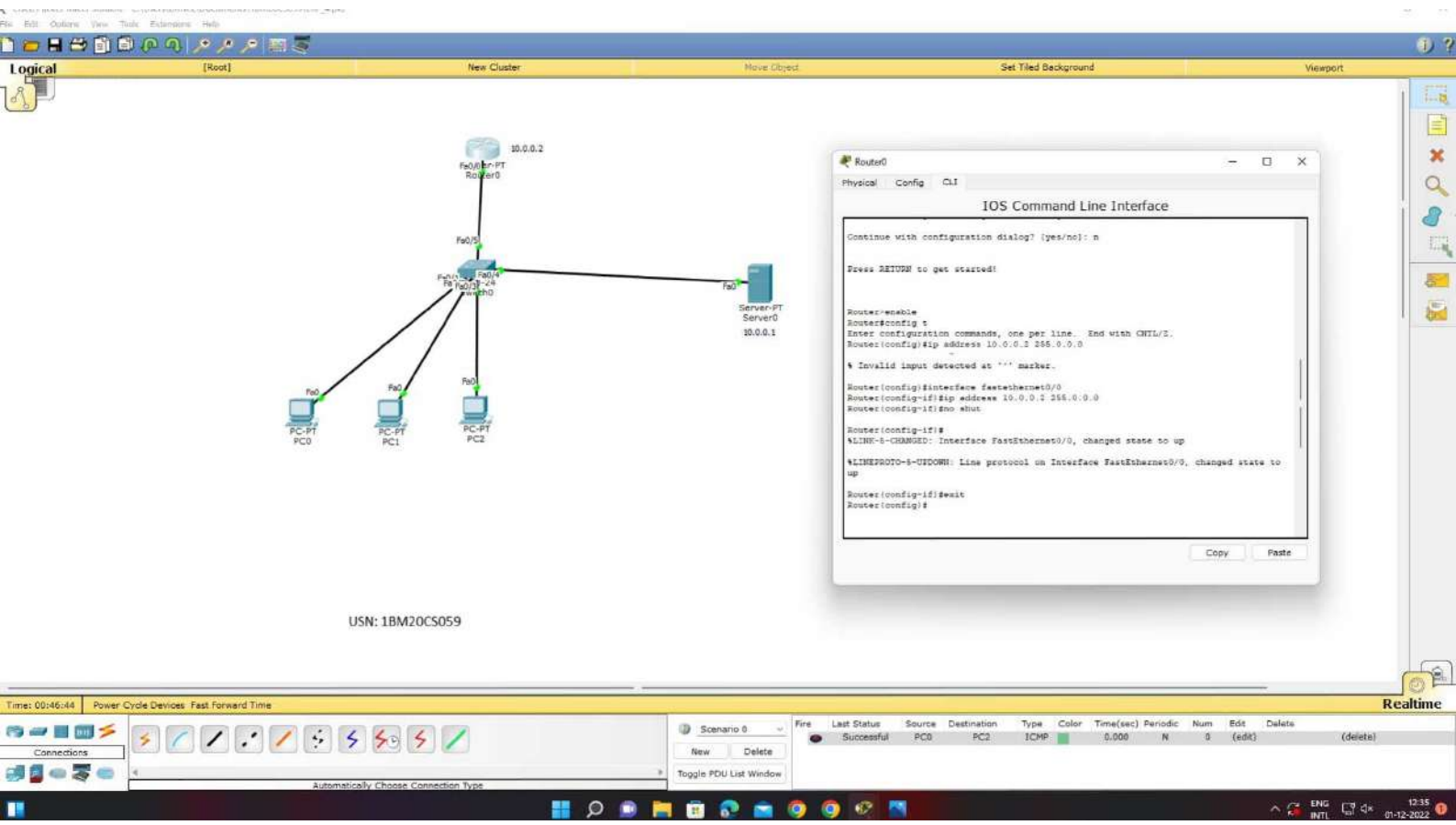
v) Configure the ip addres of the server as 10.0.0.1 and configure the gateway as 10.0.0.2.

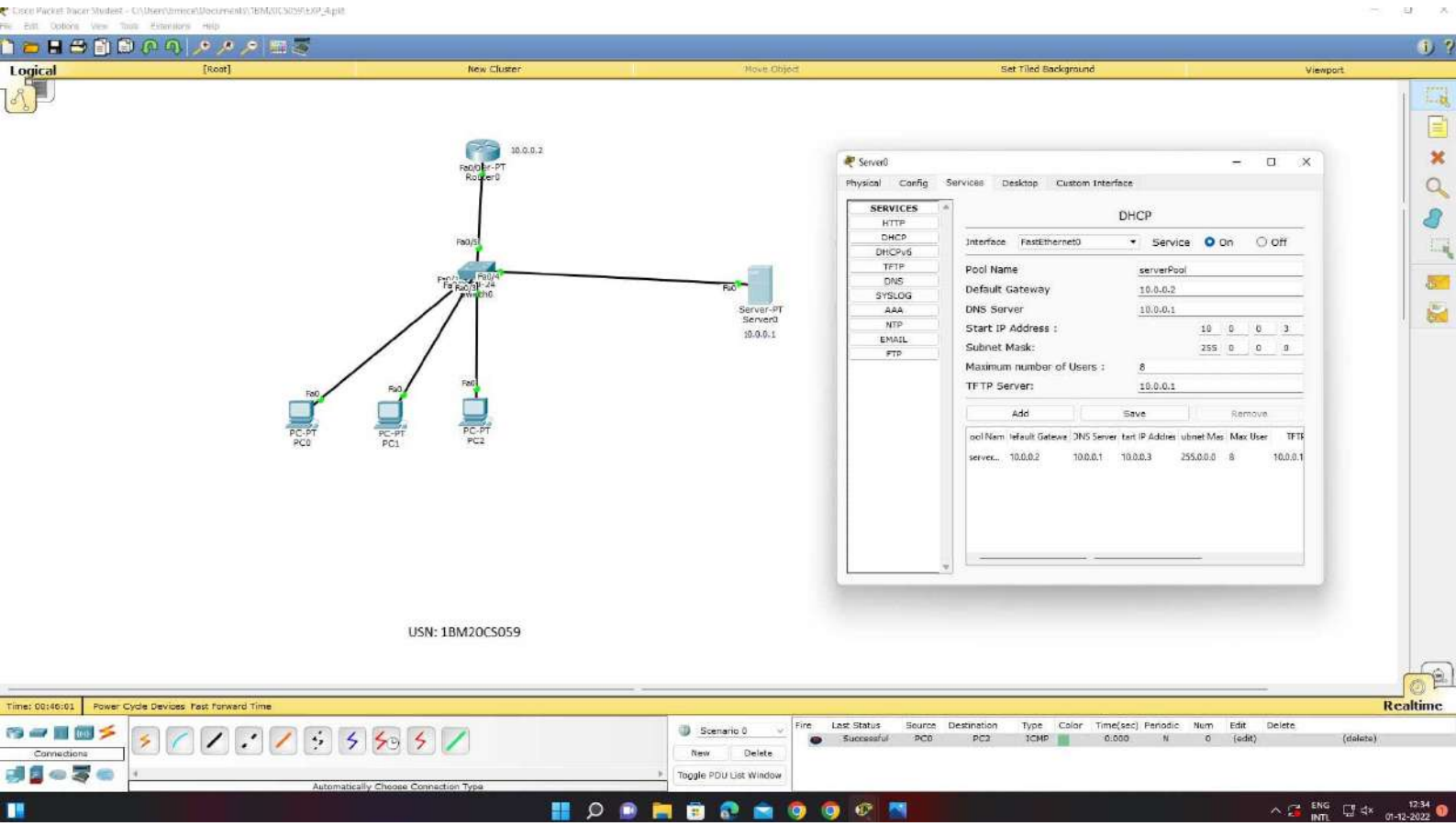
vi) Open the CLI of the router on clicking the router and enter the following commands

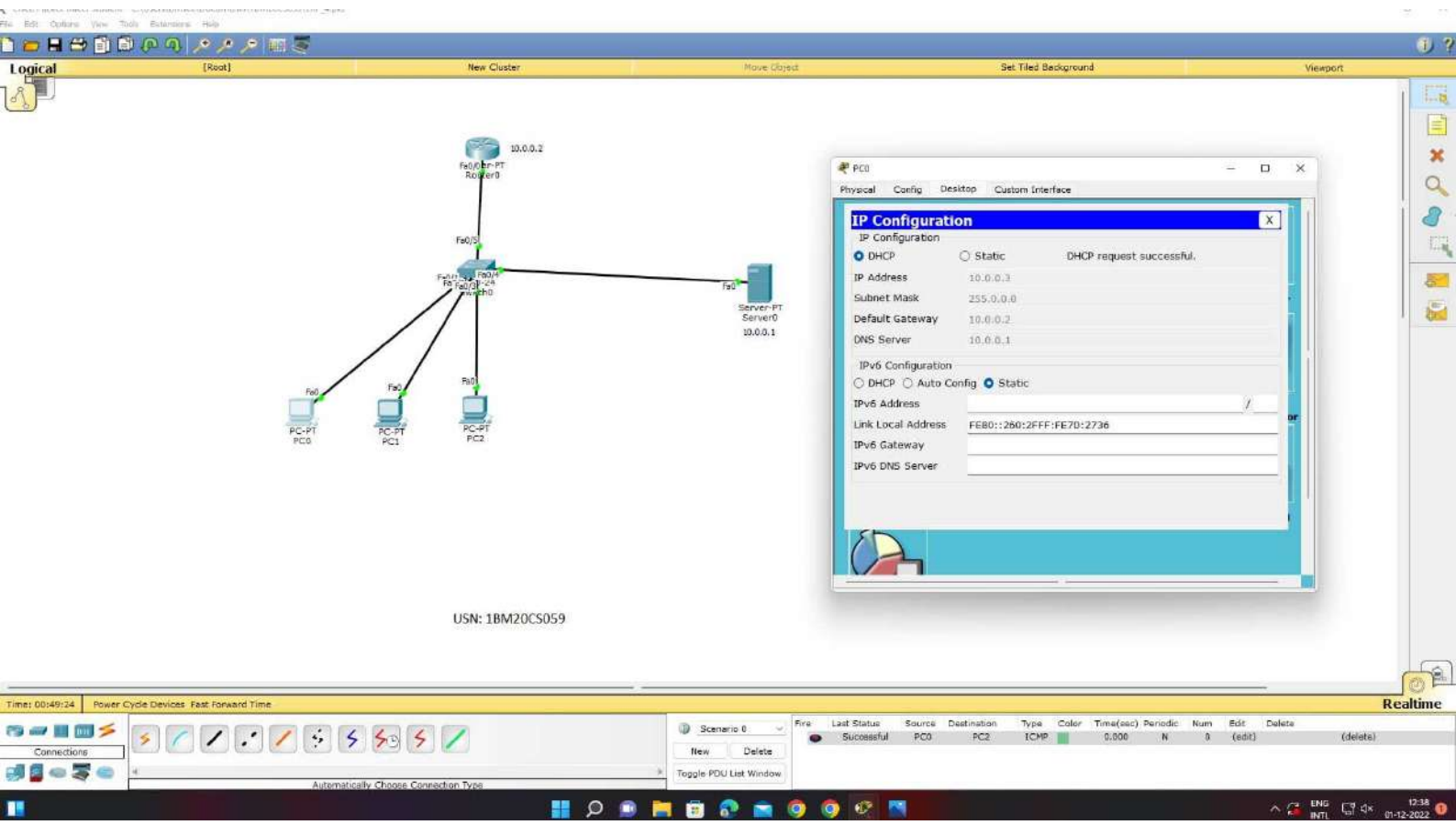
→ enable
→ config t
→ interface fastEthernet 0/0
→ ip address 10.0.0.2 255.0.0.0
→ no shut

The light will turn green for router and amber for the switch.
After some time, the amber color also changes to green.

Now, click on the server
→ open the services tab
→ Click on DHCP
→ Turn the switch ON
→ Set default gateway as 10.0.0.2
→ DNS server as 10.0.0.1 (same as IP address)
→ TFTP Server as 10.0.0.1 (same as IP address)
→ Keep the maximum number of users to 8.
→ Keep the start IP address as 10.0.0.3 & subnet mask as 255.0.0.0
After this procedure, save the load.


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.2
Fa0/0
Router-PT
Router0
Fa0/5
Fa0/4
Fa0/1
Switch0
Fa0
Server-PT
Server0
10.0.0.1
Fa0
PC-PT
PC0
Fa0
PC-PT
PC1
Fa0
PC-PT
PC2
Router0
Physical
Config
CLI
IOS Command Line Interface
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip address 10.0.0.2 255.0.0.0
% Invalid input detected at '^' marker.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 10.0.0.2 255.0.0.0
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)#
Copy
Paste
USN: 1BM20CS059
Time: 00:46:44
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC0
PC2
ICMP
0.000
N
0
(edit)
(delete)
ENG
INTL
12:35
01-12-2022


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.2
Router-PT
Router0
Fa0/0
Fa0/1
Fa0/2
Fa0/3
Fa0/4
2960-24
switch0
Server-PT
Server0
10.0.0.1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
Server0
Physical
Config
Services
Desktop
Custom Interface
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
DHCP
Interface
FastEthernet0
Service
On
Off
Pool Name
serverPool
Default Gateway
10.0.0.2
DNS Server
10.0.0.1
Start IP Address :
Subnet Mask:
Maximum number of Users :
8
TFTP Server:
10.0.0.1
Add
Save
Remove
server...
10.0.0.2
10.0.0.1
10.0.0.3
255.0.0.0
8
10.0.0.1
USN: 1BM20CS059
Time: 00:46:01
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC0
PC2
ICMP
0.000
N
0
(edit)
(delete)
ENG
INTL
12:34
01-12-2022


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.2
Fa0/0
Router-PT
Router0
Fa0/5
Fa0/4
Fa0/3
Fa0/2
Fa0/1
Fa0
Server-PT
Server0
10.0.0.1
Fa0
PC-PT
PC0
Fa0
PC-PT
PC1
Fa0
PC-PT
PC2
PC0
Physical
Config
Desktop
Custom Interface
IP Configuration
IP Configuration
DHCP
Static
DHCP request successful.
IP Address
10.0.0.3
Subnet Mask
255.0.0.0
Default Gateway
10.0.0.2
DNS Server
10.0.0.1
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::260:2FFF:FE7D:2736
IPv6 Gateway
IPv6 DNS Server
USN: 1BM20CS059
Time: 00:49:24
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC0
PC2
ICMP
0.000
N
0
(edit)
(delete)
ENG
INTL
12:38
01-12-2022

Now, click on PC 0 and under the desktop tab. Go to IP configuration and click on DHCP. If there are no errors, it will show 'DHCP request successful' and the IP address will be 10.0.0.3.
Similarly, repeat this procedure for the rest other PCs.

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

Realtime mode: Select the PC PC0 and ping the PC1 in the command prompt. Once the ping statistics are successfully displayed, we can repeat this with PC 1 as well.

↳ Observation:
Learning outcome: The server automatically sets the IP address and subnet, and gateway to all the PCs and IP address is allocated serially in DHCP protocol.

↳ Result:

1. PC> Ping 10.0.0.5

Pinging 10.0.0.5 with 32 bytes of data:

Reply from 10.0.0.5: bytes=32 time=0ms TTL=128
Reply from 10.0.0.5: bytes=32 time=0ms TTL=128
Reply from 10.0.0.5: bytes=32 time=0ms TTL=128
Reply from 10.0.0.5: bytes=32 time=0ms TTL=128

Ping statistics for 10.0.0.5:

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

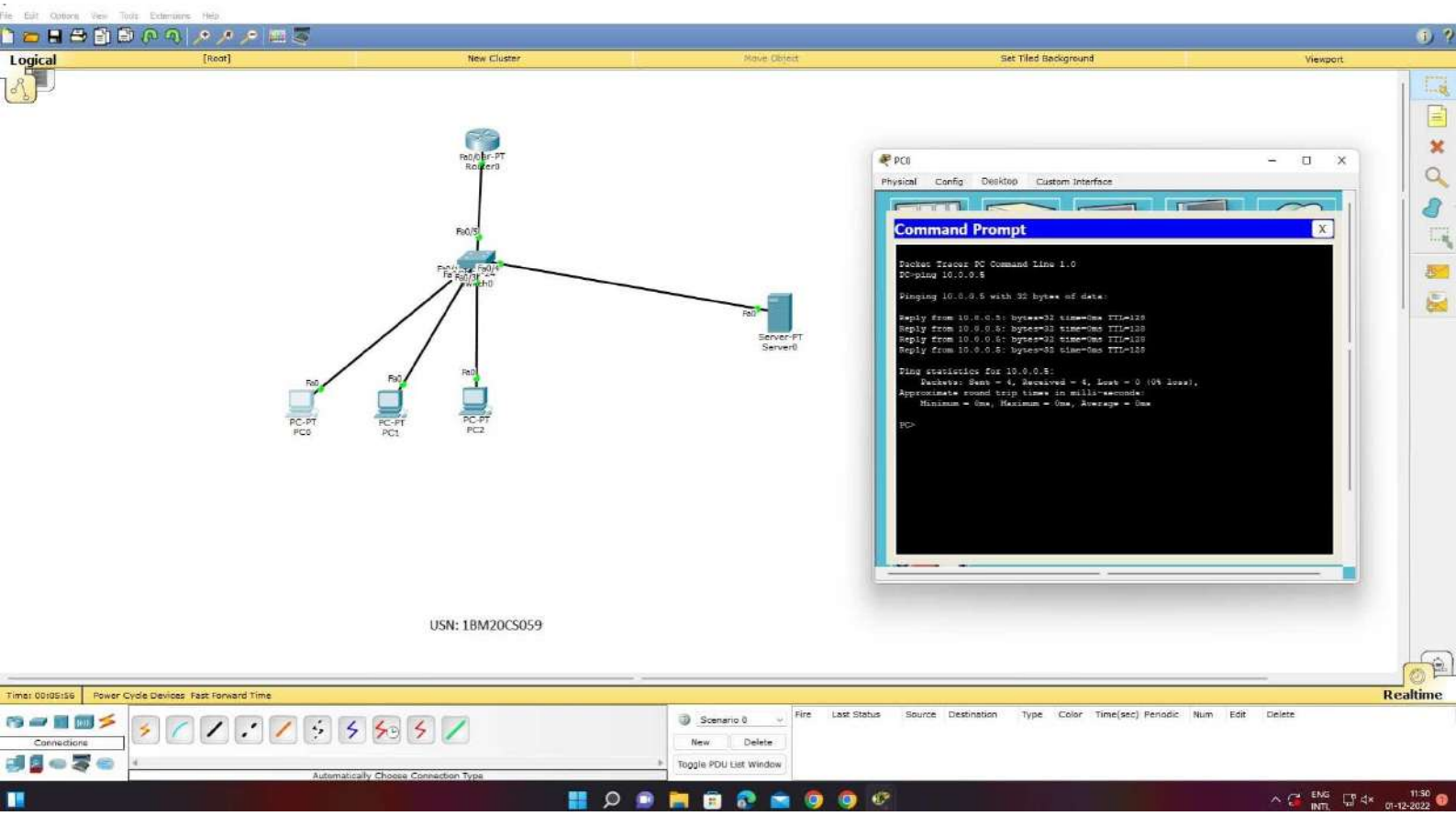
2. PC> ping 10.0.0.4

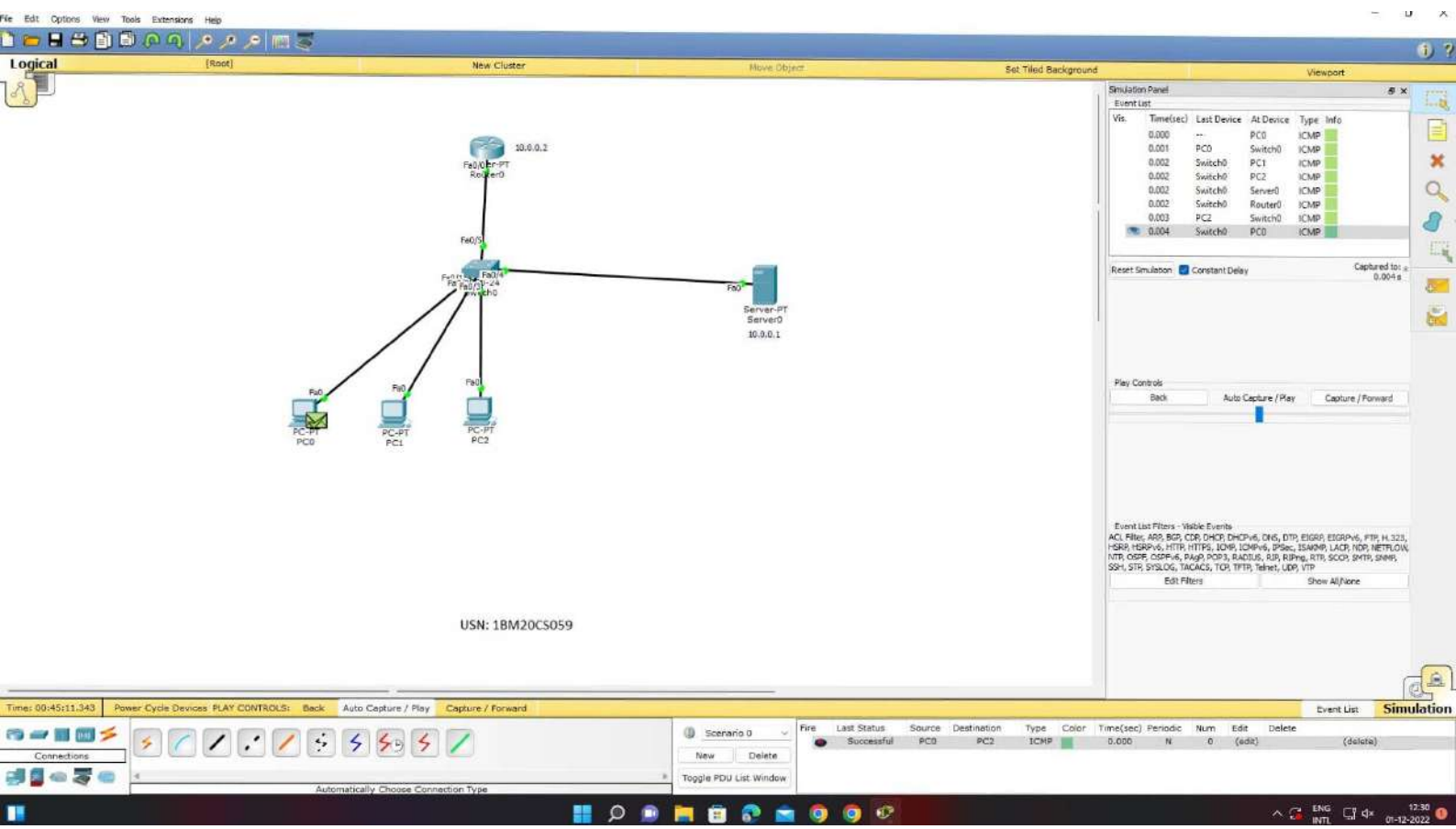
Pinging 10.0.0.4 with 32 bytes of data :

Reply from 10.0.0.4 : bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.4 : bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.4 : bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.4 : bytes = 32 time = 5ms TTL = 128.

Ping statistics for 10.0.0.4:

Packets : sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round - trip times in milli- seconds :
Minimum = 0ms, Maximum = 5ms, Average = 1ms.

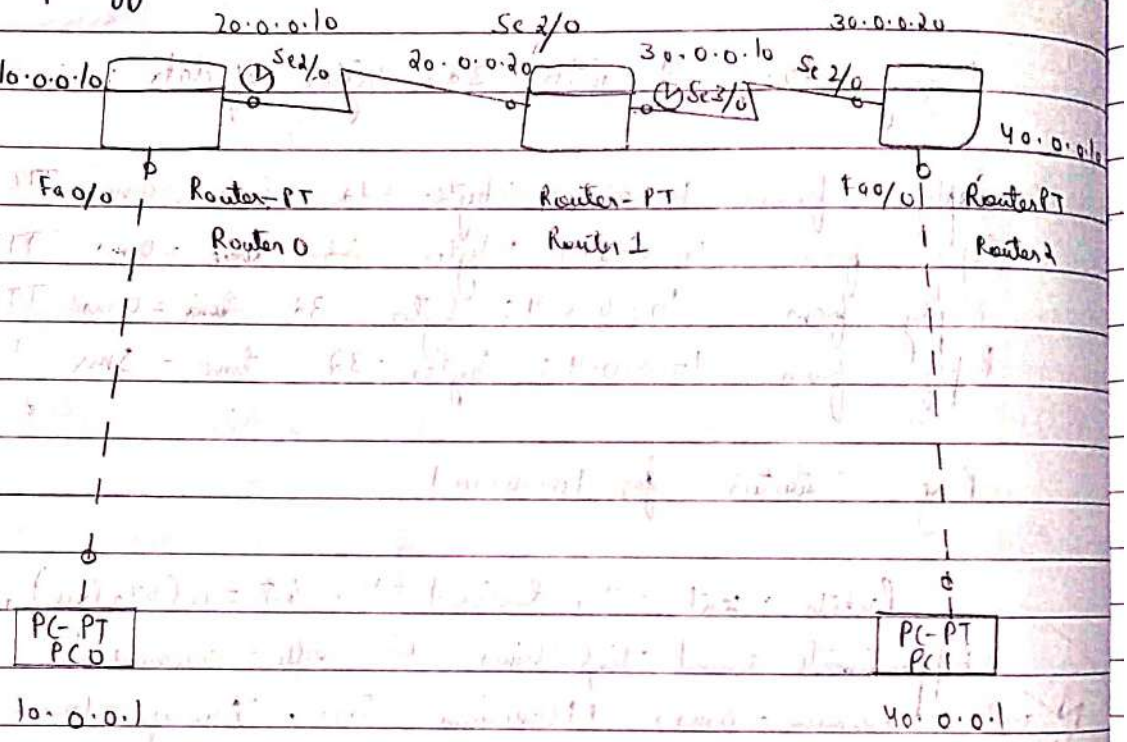

Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router-PT
Router0
Fa0/5
Switch0
Server-PT
Server0
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.5
Pinging 10.0.0.5 with 32 bytes of data:
Reply from 10.0.0.5: bytes=32 time=0ms TTL=128
Reply from 10.0.0.5: bytes=32 time=0ms TTL=128
Reply from 10.0.0.5: bytes=32 time=0ms TTL=128
Reply from 10.0.0.5: bytes=32 time=0ms TTL=128
Ping statistics for 10.0.0.5:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>
USN: 1BM20CS059
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete


File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.2
Server-PT
Server0
10.0.0.1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
0.001 PC0 Switch0 ICMP
0.002 Switch0 PC1 ICMP
0.002 Switch0 PC2 ICMP
0.002 Switch0 Server0 ICMP
0.002 Switch0 Router0 ICMP
0.003 PC2 Switch0 ICMP
0.004 Switch0 PC0 ICMP
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Edit Filters
Show All/None
USN: 1BM20CS059
Time: 00:45:11.343
Power Cycle Devices
PLAY CONTROLS:
Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC0 PC2 ICMP 0.000 N 0 (edit) (delete)

Lab: Week 5 Routing Information Protocol

↳ Aim: Configuring RIP routing protocol in routers.

↳ Topology:



↳ Procedure:

i) Place 3 generic routers and 2 generic PCs in the workspace

ii) Connect the routers and the two PCs using copper cross over

iii) Connect the routers using serial DCE with clock symbol.

iv) Place notes near the PCs and routers.

v) Select the IP address of PC0 and PC1 as well as their subnet mask and default gateway.

vi) Go the CLI of router 0 and enter the following

commands:

→ enable
→ config t
→ interface fastEthernet 0/0
→ ip addres 10.0.0.10 255.0.0.0
→ no shut

The connection should turn green. Repeat for PC1 and router 2 as well.

Now, Open CLI of router 0 and enter the following commands:

→ enable
→ config t
→ interface serial 2/0
→ ip addres 20.0.0.10 255.0.0.0
→ encapsulation PPP
→ clock rate 64000
→ no shut.

Open CLI of router 1:
→ enable
→ config t
→ interface serial 2/0
→ ip addres 20.0.0.20 255.0.0.0
→ encapsulation PPP
→ no shut.

The connection will turn green.

Open CLI of router 1 again:
→ enable
→ config t
→ interface serial 3/0
→ ip addres 30.0.0.10 255.0.0.0.

→ encapsulation PPP
→ clock rate 64000
→ no shut.

Open CLI of router 2:
→ enable
→ config t
→ interface serial 2/0
→ ip addres 30.0.0.20 255.0.0.0
→ encapsulation PPP
→ no shut.

Now,
Open CLI of router 0 and enter the following comands:

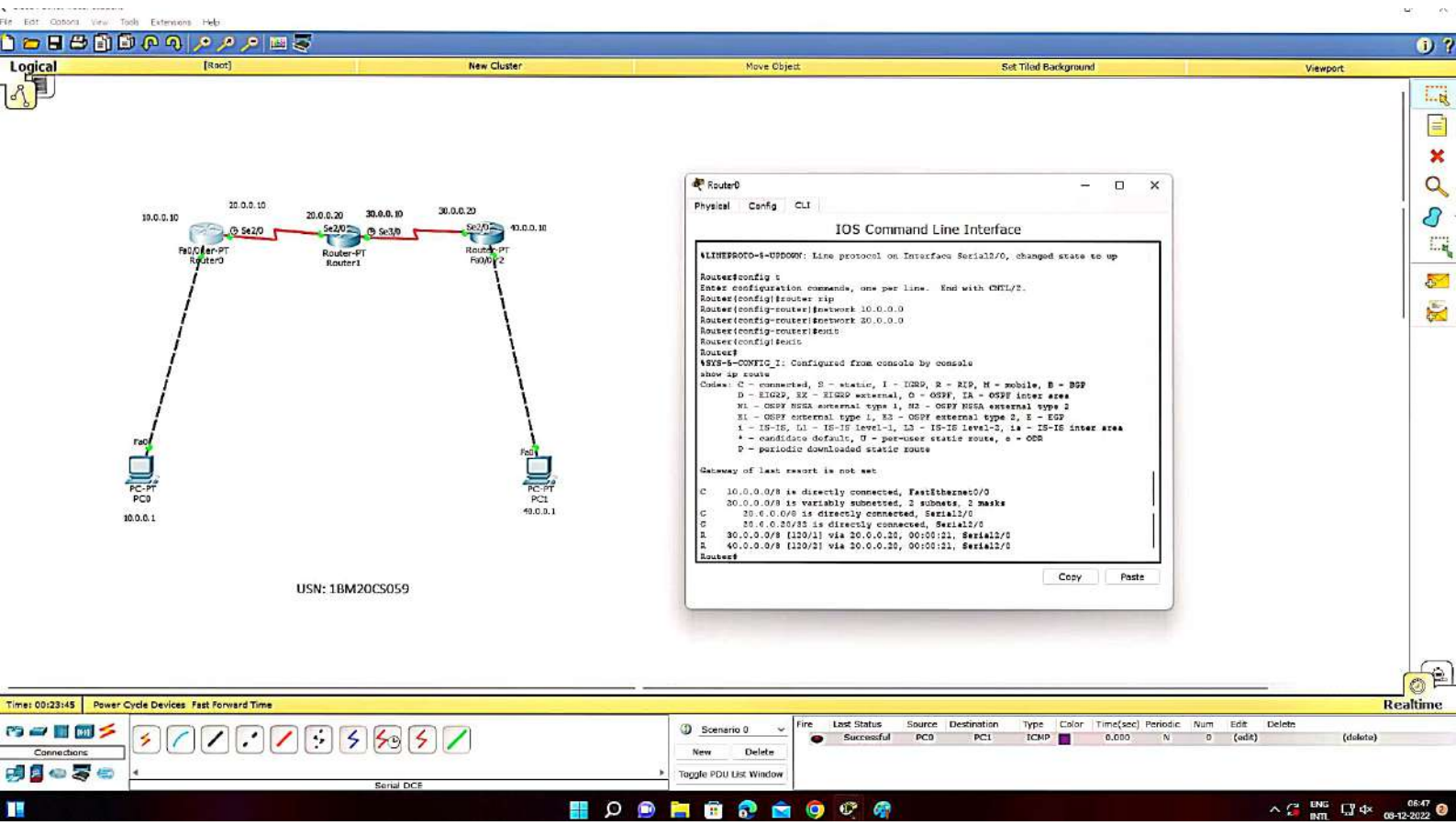
(Config) # router ip
config - router # network 10.0.0.0
Config - router # network 20.0.0.0
Config - router # eint
→ show ip route.

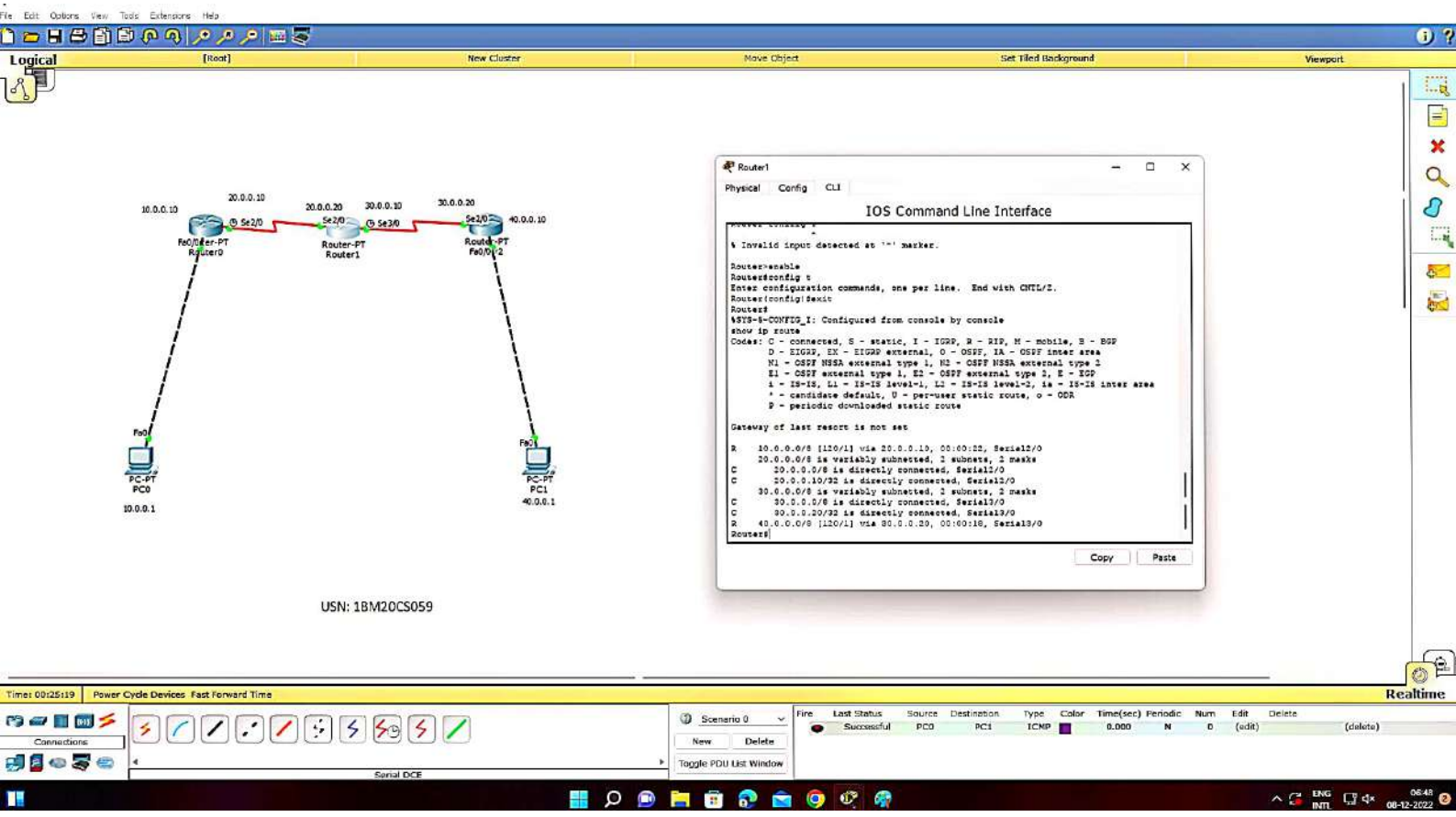
Similarly repeat for router 1 and router 2 with networks 20 & 30 and 30 & 40.

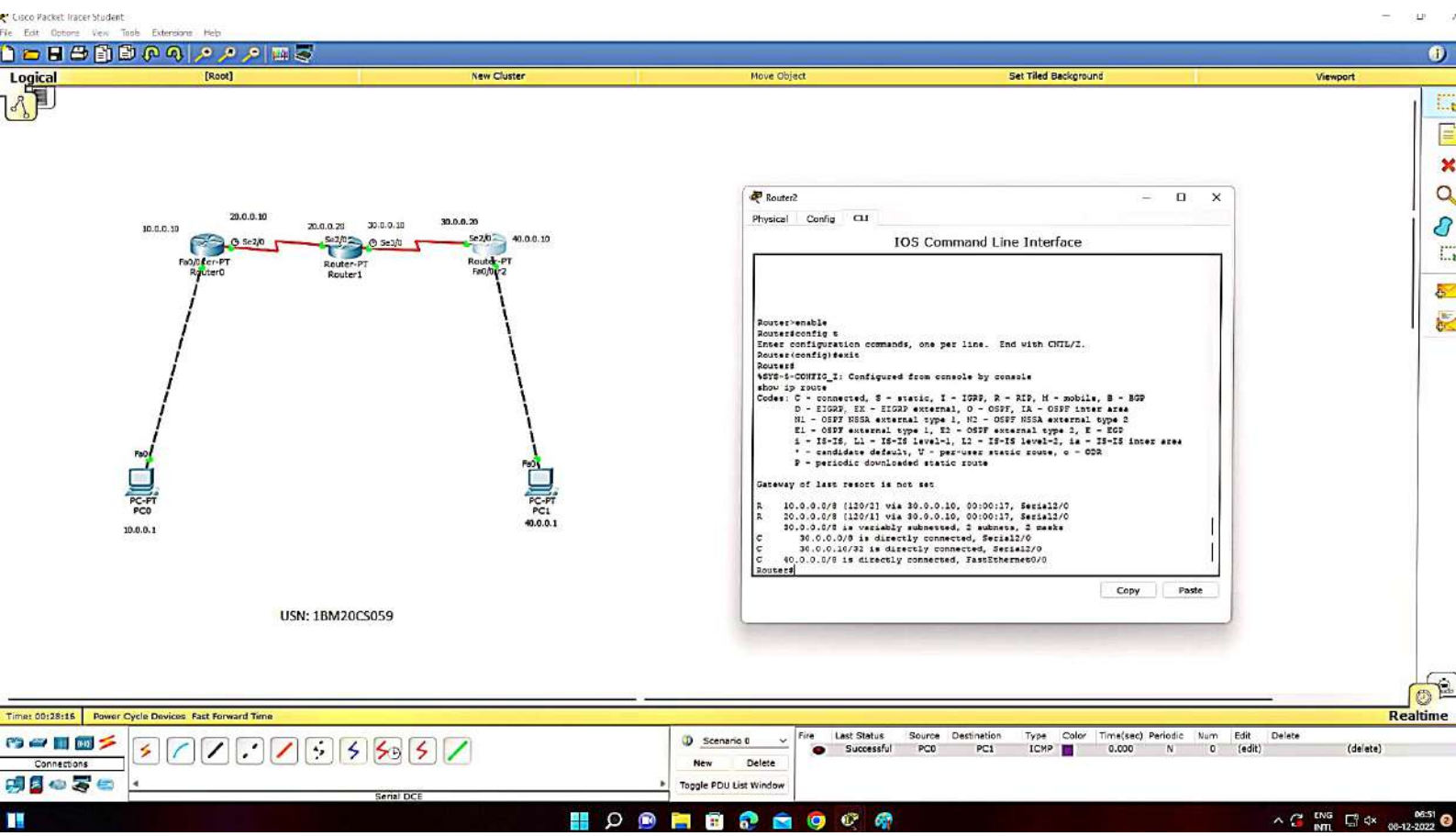
Simulation mode: Add a simple PDV by selecting the PCs and click on auto capture from right panel.

Real time mode: Select PC0 go to command prompt and select the destination addres 40.0.0.2.

4 Observation:
Learning outcome: Routing information protocol is a protocol that routers use to exchange information of topology among the network.


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
Se2/0
Se3/0
Router-PT
Router0
Router1
Router2
Fa0
PC-PT
PC0
PC1
10.0.0.1
40.0.0.1
USN: 1BM20CS059
Router0
Physical
Config
CLI
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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
30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial2/0
C 20.0.0.20/32 is directly connected, Serial2/0
R 30.0.0.0/8 [120/1] via 20.0.0.20, 00:00:21, Serial2/0
R 40.0.0.0/8 [120/2] via 20.0.0.20, 00:00:21, Serial2/0
Router#
Copy
Paste
Time: 00:23:45
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Serial DCE
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC0
PC1
ICMP
0.000
N
0
(edit)
(delete)


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
Se2/0
Se3/0
Router-PT
Router0
Router1
Router2
PC-PT
PC0
PC1
Fa0
10.0.0.1
40.0.0.1
Router1
Physical
Config
CLI
IOS Command Line Interface
% Invalid input detected at '^' marker.
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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 20.0.0.10, 00:00:22, Serial2/0
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial2/0
C 20.0.0.10/32 is directly connected, Serial2/0
30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 30.0.0.0/8 is directly connected, Serial3/0
C 30.0.0.20/32 is directly connected, Serial3/0
R 40.0.0.0/8 [120/1] via 30.0.0.20, 00:00:18, Serial3/0
Router#
Copy
Paste
USN: 1BM20CS059
Time: 00:25:19
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Serial DCE
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC0
PC1
ICMP
0.000
N
0
(edit)
(delete)


Cisco Packet Tracer Student
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
Se2/0
Se3/0
Router-PT
Router0
Router1
Router2
Fa0
PC-PT
PC0
PC1
10.0.0.1
40.0.0.1
USN: 1BM20CS059
Router2
Physical
Config
CLI
IOS Command Line Interface
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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 [120/2] via 30.0.0.10, 00:00:17, Serial2/0
R 20.0.0.0/8 [120/1] via 30.0.0.10, 00:00:17, Serial2/0
30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 30.0.0.0/8 is directly connected, Serial2/0
C 30.0.0.10/32 is directly connected, Serial2/0
C 40.0.0.0/8 is directly connected, FastEthernet0/0
Router#
Copy
Paste
Time: 00:28:16
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Serial DCE
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC0
PC1
ICMP
0.000
N
0
(edit)
(delete)
ENG
INTL
06:51
08-12-2022

It is used when in place of static IP routing became with the help of rip protocol routing it becomes easy when large scale of routers is present.

4 Result:

1. PC> ping 40.0.0.1

Request timed out
Reply from 40.0.0.1 : bytes = 32 time=6ms TTL=125
Reply from 40.0.0.1: bytes=32 time = 9ms TTL=125.
Reply from 40.0.0.1 : bytes = 32 time = 9ms TTL=125.

Ping statistics for 40.0.0.1:

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

2. PC> ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

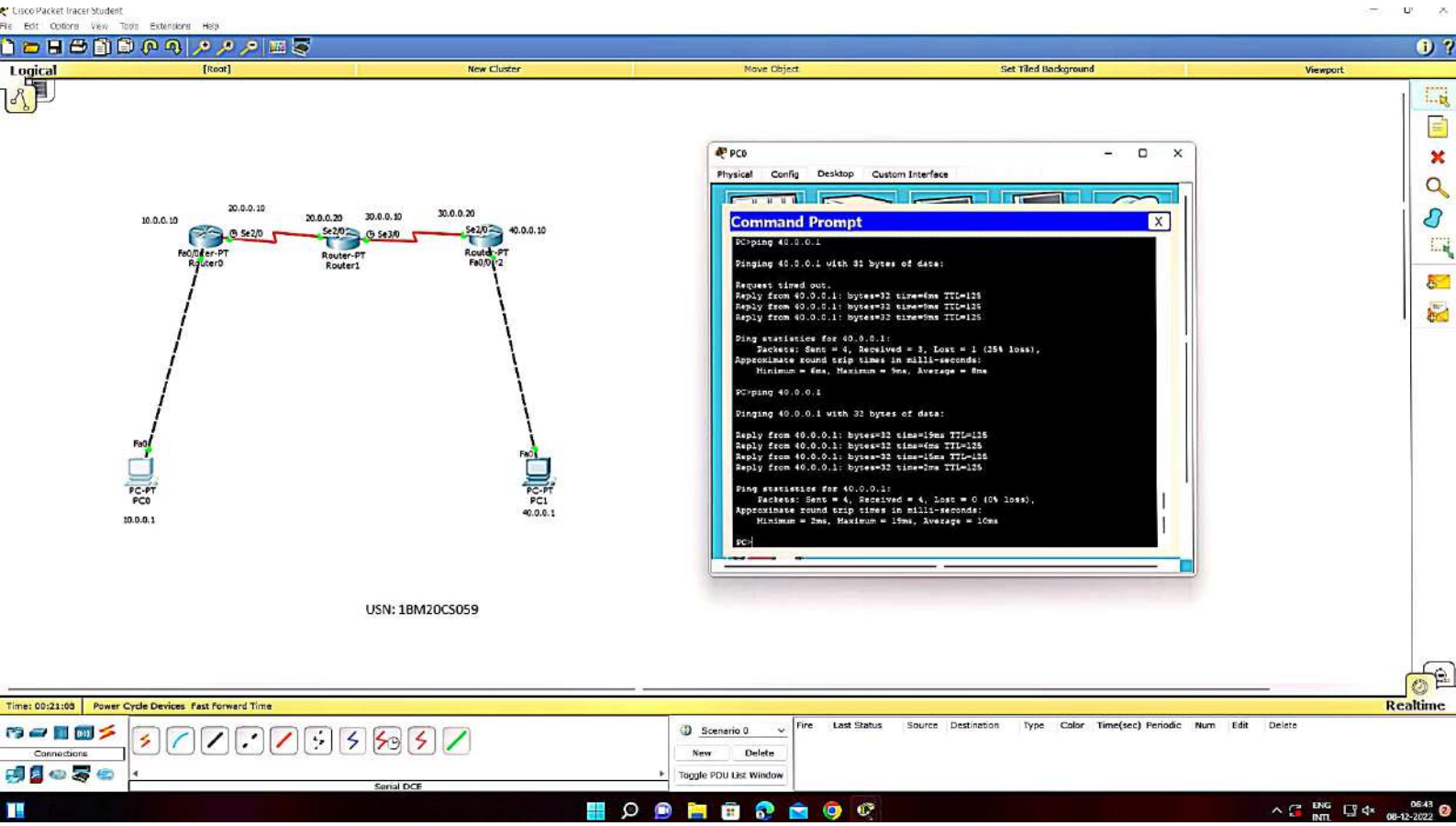
Reply from 40.0.0.1: bytes =32 time = 19ms TTL=125.
Reply from 40.0.0.1: bytes = 32 time =6ms TTL=125.
Reply from 40.0.0.1: bytes =32 time =15ms TTL=125.
Reply from 40.0.0.1: bytes =32 time = 2ms TTL=125.

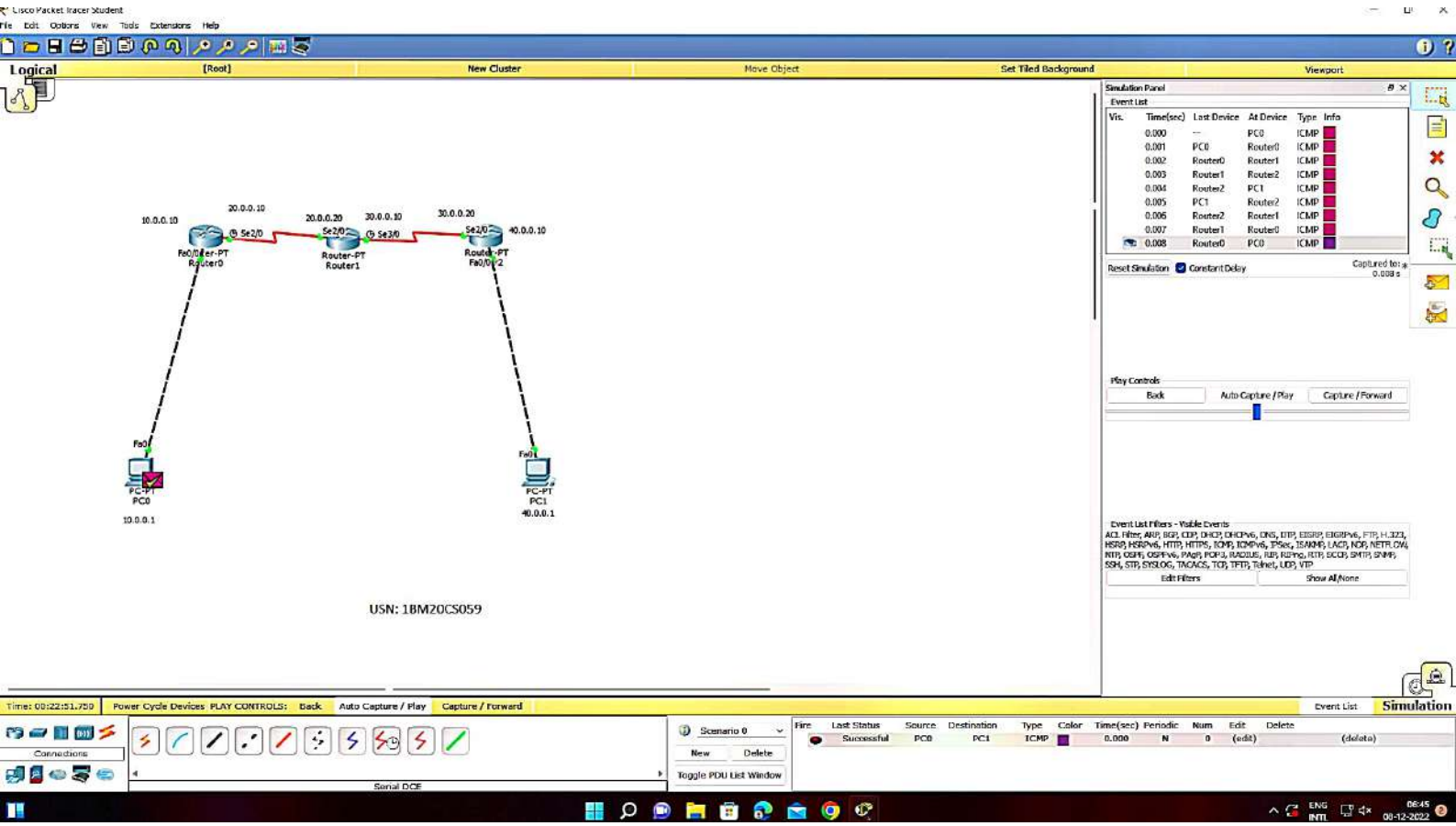
Ping statistics for 40.0.0.1:

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

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 19ms, Average =10 ms.

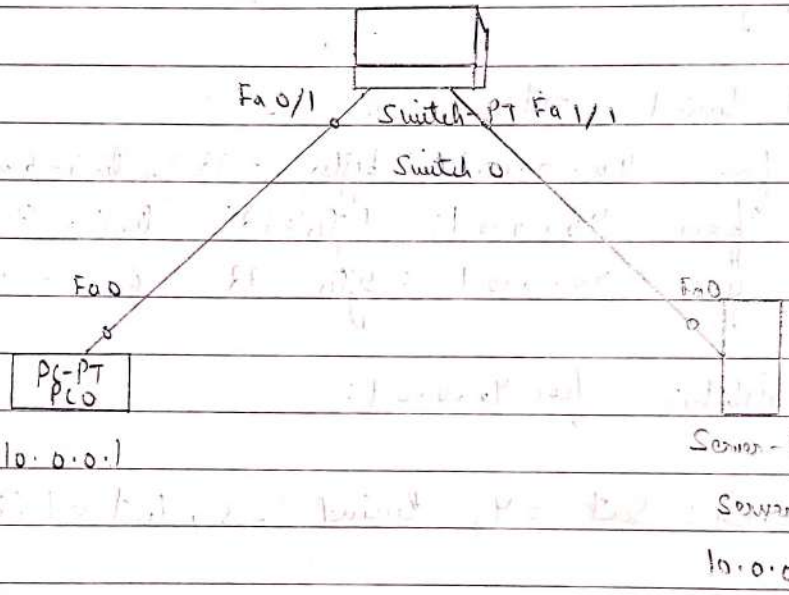

Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
Se2/0
Se3/0
Router-PT
Router0
Router1
Router2
Fa0
PC-PT
PC0
10.0.0.1
PC1
40.0.0.1
PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
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=6ms TTL=125
Reply from 40.0.0.1: bytes=32 time=9ms TTL=125
Reply from 40.0.0.1: bytes=32 time=9ms 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 = 6ms, Maximum = 9ms, Average = 8ms
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=19ms TTL=125
Reply from 40.0.0.1: bytes=32 time=6ms TTL=125
Reply from 40.0.0.1: bytes=32 time=15ms 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% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 19ms, Average = 10ms
PC>
USN: 1BM20CS059
Time: 00:21:03
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Serial DCE
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
ENG
INTL
08-12-2022


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
Se2/0
Se3/0
Router-PT
Router0
Router1
Router2
Fa0
PC-PT
PC0
PC1
10.0.0.1
40.0.0.1
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
0.001 PC0 Router0 ICMP
0.002 Router0 Router1 ICMP
0.003 Router1 Router2 ICMP
0.004 Router2 PC1 ICMP
0.005 PC1 Router2 ICMP
0.006 Router2 Router1 ICMP
0.007 Router1 Router0 ICMP
0.008 Router0 PC0 ICMP
Reset Simulation
Constant Delay
Captured to: 0.008 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
Edit Filters
Show All/None
USN: 1BM20CS059
Time: 00:22:51.759
Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation
Connections
Serial DCE
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
ENG INTL
08:45
08-12-2022

Lab: Week 6 Domain Name Service.

↳ Aim: Demonstration of web server and DNS using packet tracer.

↳ Topology:



↳ Procedure:

(i) Place a generic PC, switch, and server in the workspace.

ii) Place the note of ip address under PC as 10.0.0.2 and under server as 10.0.0.2.

iii) Connect the PC to switch and switch to server with copper straight through.

iv) Set ip address of PC as 10.0.0.1 and server as 10.0.0.2.

→ Click on PC
Go to desktop tab

Open the web browser and enter the ip address 10.0.0.9.

→ Now, click on server.
→ Go to services
→ Under HTTP go to index.html. Click on edit and make some changes. Click on save and then 'yes overwrite'.

→ Now go to PC and under web browser :→
i) In the url give the ip address as 10.0.0.2.
Click on Go. It will display the changes made in the index.html.

→ Now, go to the server again:
(i) Under services, go to DNS.
Configure name as : cse.bmsce
Address : 10.0.0.2
Click on Add. Click Save.

→ Now, go to PC and under web browser :→
(i) In the url enter : cse.bmsce
It will display the index.html page.

→ Click on server
HTTP
Click on new file [bottom right corner].
Enter file name as cv.html.

```
<html>
<head> <h1> CSE STUDENT DETAILS </h1> </head>
<table>
  <tr>
    <th> Name </th>
    <th> Branch </th>
    <th> Class </th>
```

```
<th> USN </th>
<th> DOB </th>
</tr>
<tr>
<td> Imadh Ajoz </td>
<td> CSE </td>
<td> S-B </td>
<td> 1BM20CS059 </td>
<td> 11-05-2001 </td>
</tr>
</table>
```

→ Now, go to PC and invoke the web browser:

i) In the url, enter : csebmsce
It will show a new link in the index.html page as cv.html. Click on cv.html and it will display the Student Details page.

↳ Observation:

Learning outcomes:

i) We can view the web page when we type "csebmsce" in browser because 10.0.0.2 address is mapped to the name "csebmsce".

ii) Mapping is required because it's difficult to remember IP's, hence IP is mapped with a name.

↳ Result:

classmate
Date
Page

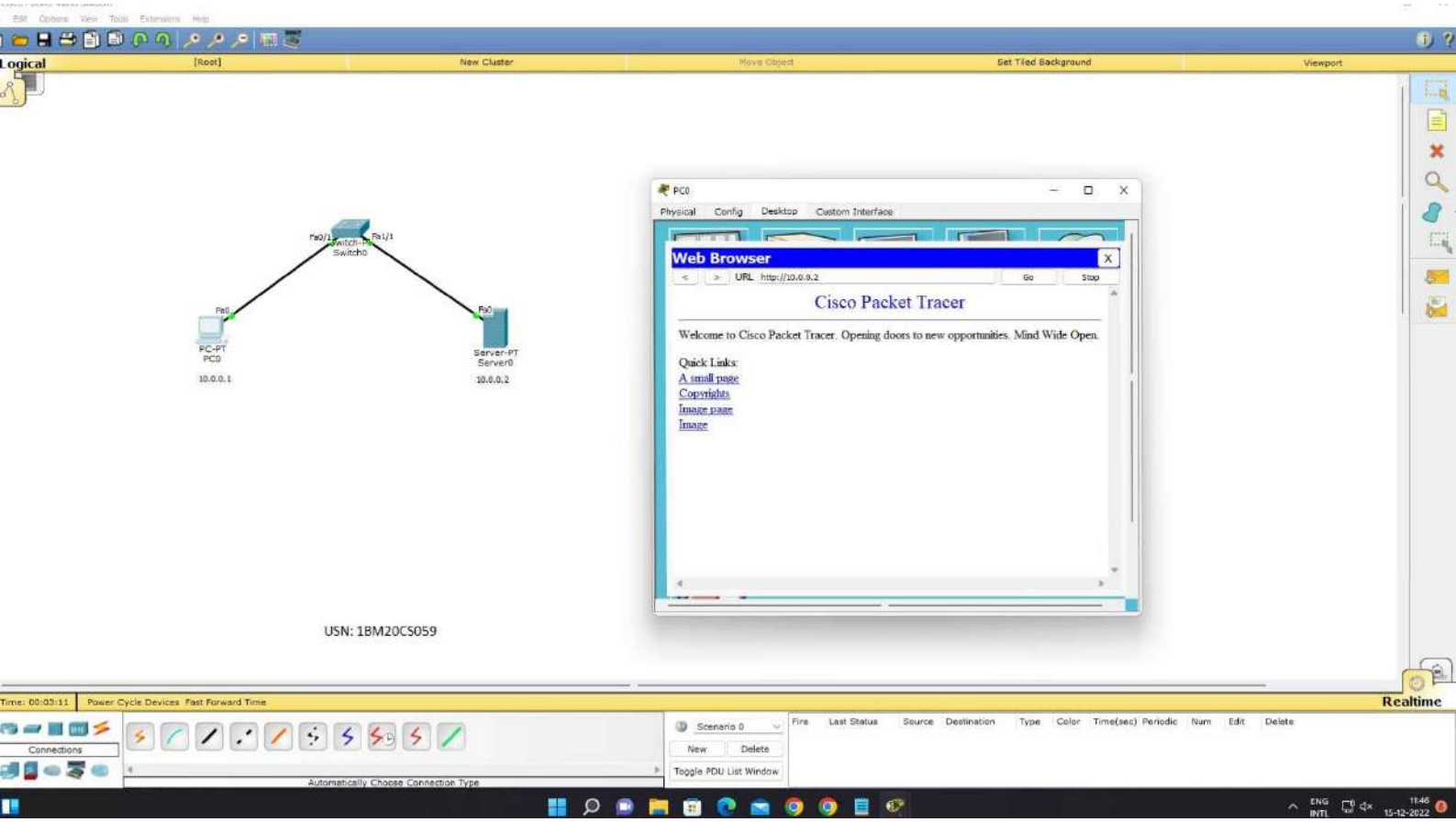
Web Browser ×

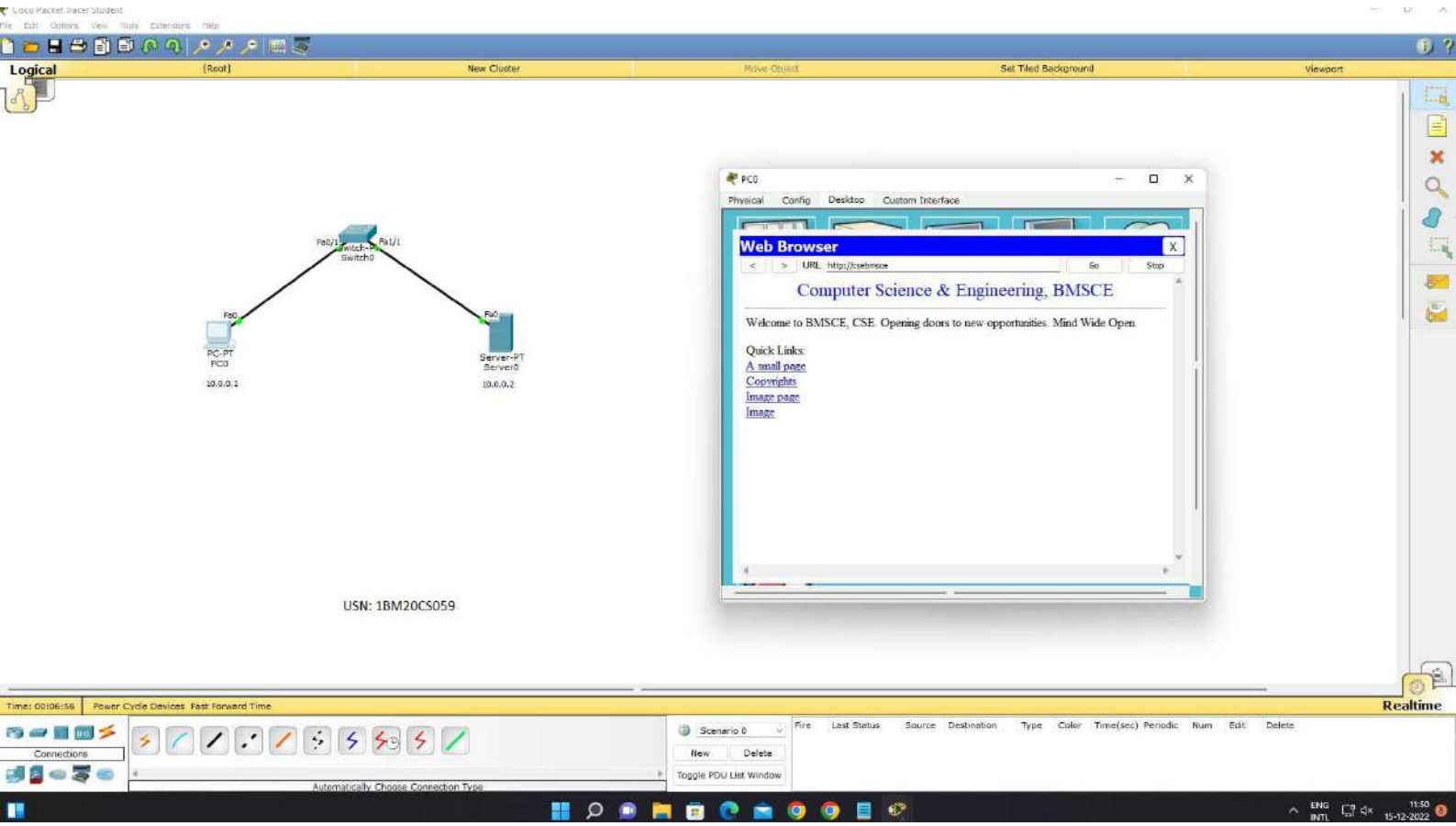
<> URL http://csebmsce/cv.html

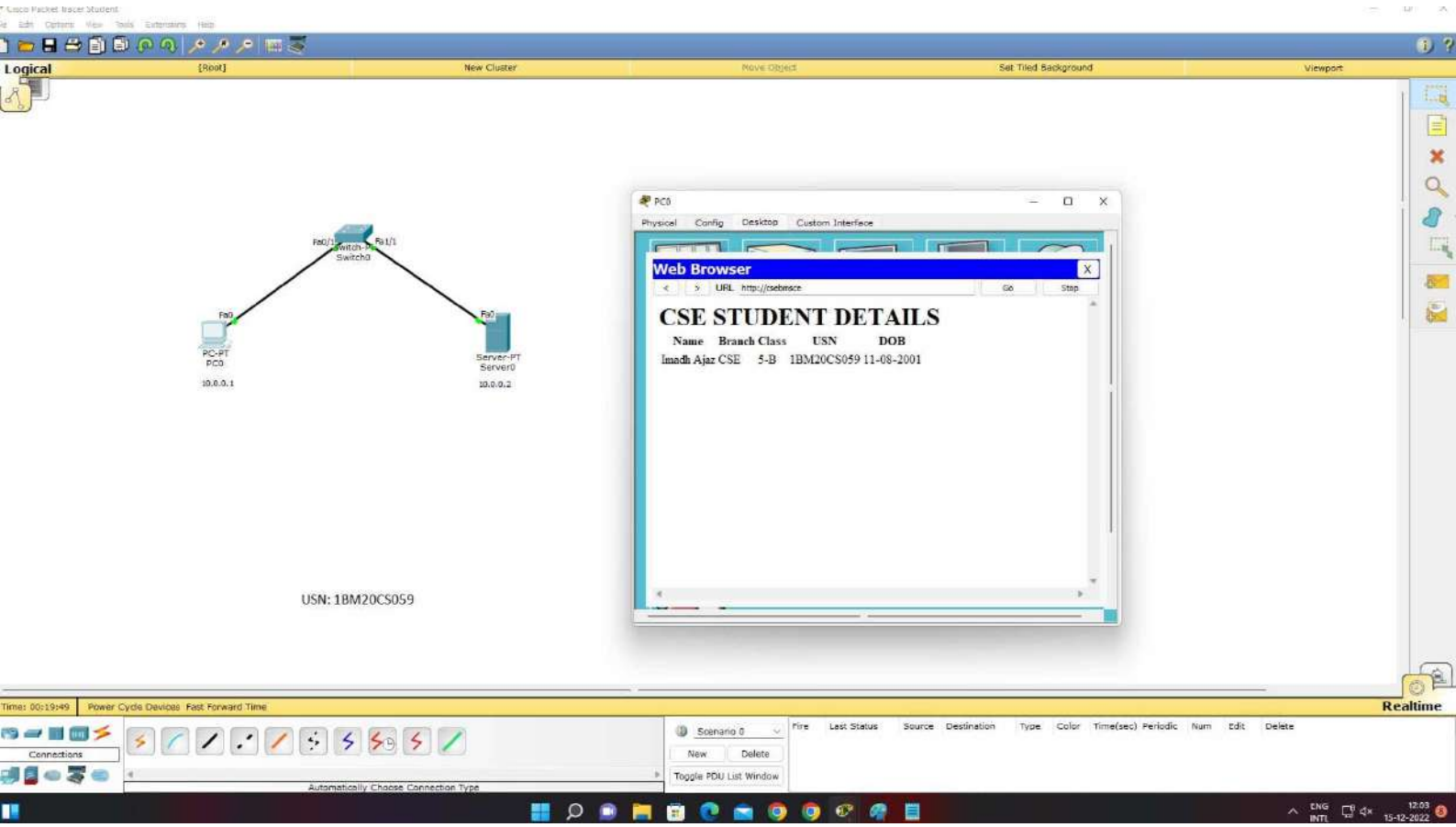
Name	Branch	Class	USN	DOB
Imadh Ajaz	CSE	5-B	1BM20CS059	11-08-2001

15/12/22

CYCLE 1 Completed


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Fa0/1
Fa1/1
Switch0
Fa0
PC-PT
PC0
10.0.0.1
Fa0
Server-PT
Server0
10.0.0.2
PC0
Physical
Config
Desktop
Custom Interface
Web Browser
URL
http://10.0.0.2
Go
Stop
Cisco Packet Tracer
Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
Quick Links:
A small page
Copyrights
Image page
Image
USN: 1BM20CS059
Time: 00:03:11
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
ENG
INTL
11:46
15-12-2022


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Fa0/1
Fa1/1
Switch-PT
Switch0
Fa0
PC-PT
PC0
10.0.0.1
Fa0
Server-PT
Server0
10.0.0.2
PC0
Physical
Config
Desktop
Custom Interface
Web Browser
URL
http://csebmsce
Go
Stop
Computer Science & Engineering, BMSCE
Welcome to BMSCE, CSE. Opening doors to new opportunities. Mind Wide Open.
Quick Links:
A small page
Copyrights
Image page
Image
USN: 1BM20CS059
Time: 00:06:56
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Switch-PT
Switch0
Fa0/1
Fa1/1
Fa0
PC-PT
PC0
10.0.0.1
Fa0
Server-PT
Server0
10.0.0.2
PC0
Physical
Config
Desktop
Custom Interface
Web Browser
URL
http://csebmsce
Go
Stop
CSE STUDENT DETAILS
Name Branch Class USN DOB
Imadh Ajaz CSE 5-B 1BM20CS059 11-08-2001
USN: 1BM20CS059
Time: 00:19:49
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete

Date 29/12/22
Page

Cycle 2

Lab: Week 7 CRC

Exp 1: Write a program for error detecting code using CRC-CCITT (16 bits)

Program:

```
#include <stdio.h>
#include <string.h>
#define N strlen(gen_poly)
char data[30];
char check_value[30];
char gen_poly[10];
int data_length,i,j;
void XOR(){
    for(j=1; j<N; j++)
        check_value[j] = ((check_value[j] == gen_poly[j])
                          ? '0' : '1');
}
void crc(){
    for(i=0; i<N; i++)
        check_value[i] = data[i];
    do{
        if(check_value[0]=='1')
            XOR();
        for(j=0; j<N; j++)
            check_value[j] = check_value[j+1];
        check_value[j] = data[i++];
    }while(i<=data_length+N-1);
}
void receiver(){
    printf("Enter the data received at receiver site:");
    scanf("%s", data);
    printf("Data received: %s", data);
```

```
xor();
for (i=0; i<N-1) && (check_value[i] != '1'); i++);
    if (i<N-1){
        printf("\n CRC at receiver site is: %s", check_value);
        printf("\n Error detected!\n\n");
    }
    else {
        printf("\n CRC at receiver site is: %s",
                check_value);
        printf("\n No error detected\n\n");
    }
}
int main(){
    printf("\n Enter data to be transmitted:");
    scanf("%s", data);
    printf("\n Enter the generating polynomial:");
    scanf("%s", gen_poly);
    data_length = strlen(data);
    for(i=data_length; i<data_length+N-1; i++)
        data[i] = '0';
    printf("\n Padded Data: %s", data);
    xor();
    printf("\n CRC at sender site is: %s", check_value);
    for(i=data_length; i<data_length+N-1; i++)
        data[i] = check_value[i-data_length];
    printf("\n Final data to be sent from sender site:
            %s\n", data);
    receiver();
    return 0;
}
```

$x^{16} + x^{12} + x^5 + 1$

OUTPUT:

Enter data to be transmitted : 1011010101
Enter the Generating Polynomial : 1010
Padded Data : 1011010101000
CRC at sender site : 000
Final data to be sent from sender site : 1011010101000
Enter the data received at receiver site : 1011010101000
Data received : 1011010101000
CRC at receiver site is : 000
No error detected

Enter data to be transmitted : 1011010101
Enter the Generating Polynomial : 1010
Padded Data : 1011010101000
CRC at sender site is : 000
Final data to be sent from sender site : 1011010101000
Enter the data received at receiver site : 1111010101000
Data received : 1111010101000
CRC at receiver site is : 010
Error detected !

```
Enter data to be transmitted: 1011010101

Enter the Generating polynomial: 1010

Padded Data: 1011010101000
CRC at sender site is: 000
Final data to be sent from sender site: 1011010101000
Enter the date received at receiver site: 1011010101000
Data received: 1011010101000
CRC at receiver site is: 000
No error detected


...Program finished with exit code 0
Press ENTER to exit console.
```

```
Enter data to be transmitted: 1011010101

Enter the Generating polynomial: 1010

Padded Data: 1011010101000
CRC at sender site is: 000
Final data to be sent from sender site: 1011010101000
Enter the date received at receiver site: 1111010101000
Data received: 1111010101000
CRC at receiver site is: 010
Error detected!


...Program finished with exit code 0
Press ENTER to exit console.
```

Date 5/1/23
Page

Lab: week 8 Leaky Bucket

Exp 2: Write a program for congestion control using Leaky Bucket Algorithm.

Program:

```
#include <stdio.h>
int main () {
  int capacity = 0, packet = 0, bsize = 0, rate = 0;
      char ans = 'y';
      printf ("Enter the bucket size: ");
      scanf ("%d", &capacity);
      printf ("Enter the leaking rate:");
      scanf ("%d", &rate);
        while (ans == 'y')
      {
        printf ("\n enter the packet size:");
        scanf ("%d", &packet);
        if ((bsize + packet) > capacity) {
        printf ("\n buffer full at the moment");
        }
      else if ((bsize + packet) <= capacity)
        {
        bsize += packet;
        }
      bsize -= rate;
      printf ("remaining bucket capacity is %d", bsize);
      printf ("\n do you wish to keep adding
                packets ? y/n : ");
      scanf ("%s", &ans);
      }
}
```

OUTPUT:

Enter the bucket size : 500
Enter the leaking rate : 5
Enter the packet size : 250
Remaining bucket capacity is : 245
do you wish to keep adding packets ? y/n : y
Enter the packet size : 240
Remaining bucket capacity is 480
do you wish to keep adding packets ? y/n : y
Enter the packet size : 300
buffer full at the moment
remaining bucket capacity is 475.
do you wish to keep adding packets ? y/n : y
Enter the packet size : 500
buffer full at the moment
remaining bucket capacity is 470
do you wish to keep adding packets ? y/n : y.
Enter the packet size : 550
buffer full at the moment
remaining bucket capacity is 465
do you wish to keep adding packets ? y/n : n.

input

```
enter the bucket capacity: 500
enter the leaking rate: 5

enter the packet size: 250

remaining bucket capacity is 245
do you wish to keep adding packets? y/n: y

enter the packet size: 240

remaining bucket capacity is 480
do you wish to keep adding packets? y/n: y

enter the packet size: 300

buffer full at the moment
remaining bucket capacity is 475
do you wish to keep adding packets? y/n: y

enter the packet size: 500

buffer full at the moment
remaining bucket capacity is 470
do you wish to keep adding packets? y/n: y

enter the packet size: 550

buffer full at the moment
remaining bucket capacity is 465
do you wish to keep adding packets? y/n: n


...Program finished with exit code 0
Press ENTER to exit console.
```

classmate
Date 12/1/23
Page

Lab: Week 9 Bellman Ford Algorithm & Dijkstra's Algorithm

Exp 3: Write a program for distance vector algorithm to find suitable path for transmission.

Program:

```
#include <stdio.h>
struct node
{
  unsigned dist [20];
  unsigned from [20];
} rt [10];
int main ()
{
int costmat [20][20];
int nodes i, j, k, count =0;
printf ("\n Enter the number of nodes :");
scanf ("%d", &nodes);
printf ("\n Enter the cost matrix :\n");
for (i=0; i< nodes; i++)
  {
    for (j=0; j < nodes ; j++)
    {
      scanf ("%d", & costmat [i] [j]);
      costmat [i] [j] =0;
      rt [i]. dist [j] = costmat [i] [j];
      rt [i] . from [j] = j;
    }
  }
do
{
count =0;
```

```
for (i=0; i< nodes; i++)
for (j=0; j< nodes ; j++)
for (k=0; k< nodes ; k++)
    if (rt[i].dist[j] > cost mat[i][k]+rt[k].dist[j])
    {
    rt[i].dist[j] = rt[i].dist[k] + rt[k].dist[j];
      rt[i].from[j] = k;
      count++;
    }
} while (count !=0);
  for(i=0; i< nodes ; i++)
  {
     printf("\n For router %d\n",i+1);
        for (j=0; j< nodes ; j++)
        {
            printf("\t\n node %d via %d
    Distance %d ", j+1, rt[i].from[j]+1,
                                rt[i].dist[j]);
        }
  }
  printf("\n\n");
}
```

OUTPUT:

Enter the number of nodes : 3

Enter the cost matrix :

0	2	7
2	0	1
7	1	0

For router 1:

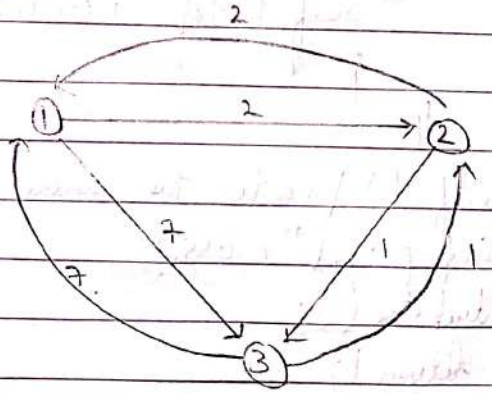
node 1 via 1 Distance 0
node 2 via 2 Distance 2
node 3 via 2 Distance 3.

For router 2

node 1 via 1 Distance 2
node 2 via 2 Distance 0
node 3 via 3 Distance 1

For router 3

node 1 via 2 Distance 3
node 2 via 2 Distance 1
node 3 via 3 Distance 0.



Classmate
Date 13/1/22
Page

Exp 4: Implement Dijikstra's algorithm to compute the shortest path for a given topology.

Program:

```
#include <stdio.h>
#include <conio.h>

int c[10][10], n, src;
void dijikstra();
int main()
{
    printf("\n enter the number of vertices\n");
    scanf("%d", &n);
    printf("\n enter the cost matrix\n");
    for (int i=1; i<=n; i++)
    {
        for (int j=1; j<=n; j++)
        {
            scanf("%d", &c[i][j]);
        }
    }
    printf("\n enter the source vertex\n");
    scanf("%d", &src);
    dijikstra();
    return 1;
}
void dijikstra()
{
int dist[10], vis[10], j, count, min, u;
for (j=1; j<=n; j++)
{
    dist[j] = c[src][j];
}
```

```
for (j=1;j<=n;j++)
{
  vis[j] = 0;
}
dis[src] = 0;
vis[src]=1;
count = 1;
while (count != n)
{
  min = 9999;
  for (j=1; j<=n;j++)
  {
    if (dist[j]<min && vis[j] != 1)
    {
      min = dist[j];
      u=j;
    }
  }
vis[u]=1;
count++;
for (j=1;j<=n;j++)
{
  if (min + c[u][j] < dist[j] && vis[j] != 1)
  {
    dist[j] = min + c[u][j];
  }
}
printf("\n shortest distance is \n");
for (j=1;j<=n;j++)
{
  printf("\n no.d ------> no.d = no.d\n",src,j,dist[j]);
}
}
```

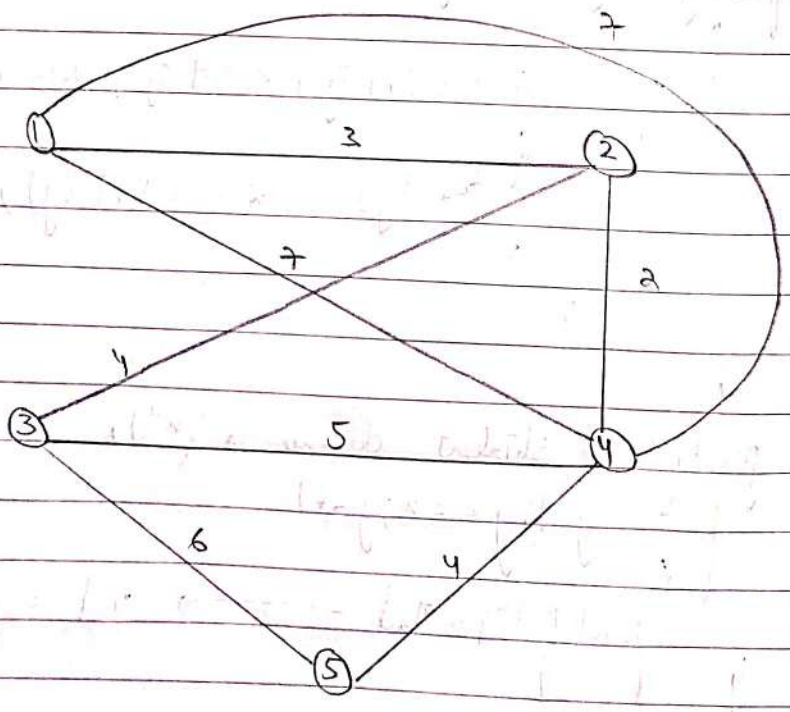
OUTPUT:

Enter the number of vertices
5

Enter the cost matrix
9999 3 9999 7 9999
3 9999 4 2 9999
9999 4 9999 5 6
7 2 5 9999 4
9999 9999 6 4 9999

Enter the source vertex
1

Shortest distance is
1 ------> 1 = 0
1 ------> 2 = 3
1 ------> 3 = 7
1 ------> 4 = 5
1 ------> 5 = 9.



classmate
Date 27/1/23
Page

Ex: Week 10 TCP / IP Socket.

Exp 5:

Aim: Using TCP/IP sockets write a client-server program to make the client sending the file name and the server to send back the contents of the required file if present.

Code: Client:

```
from socket import *
server name = 'DESKTOP-9CJ0B77'
server port = 12530
client socket = socket (AF-INET, SOCK-STREAM)
Client socket : connect (( 'server Name, server Port ))
Sentence = input ("\n Enter the name");
Client socket . send (sentence encode (1)
print ("\n From server \n");
    print ( From server, file contents)
client socket - close)
```

Server:

```
    from socket import
server name = 'DESKTOP_9CJ0B77'
server port = 12530.
server socket = socket (AF_INET, SOCK_STREAM)
server socket . bind (( server Name, server Port ))
server Socket . listen (1)
print (" The server is ready to receive").
```

```
while (1):
    connection Socket, addr = server Socket . accept
    Sentence = connection Socket . recv (1024). decode
    file = open (sentence, "r")
```

```
l = file.read(1024)
connection.Socket.send(l.encode())
file.close()
connection Socket.close()
```

OUTPUT:

create a file a.txt

>> Hello Iam Imadh

Running server

Server_1) running

On Client side

Enter file name a.txt

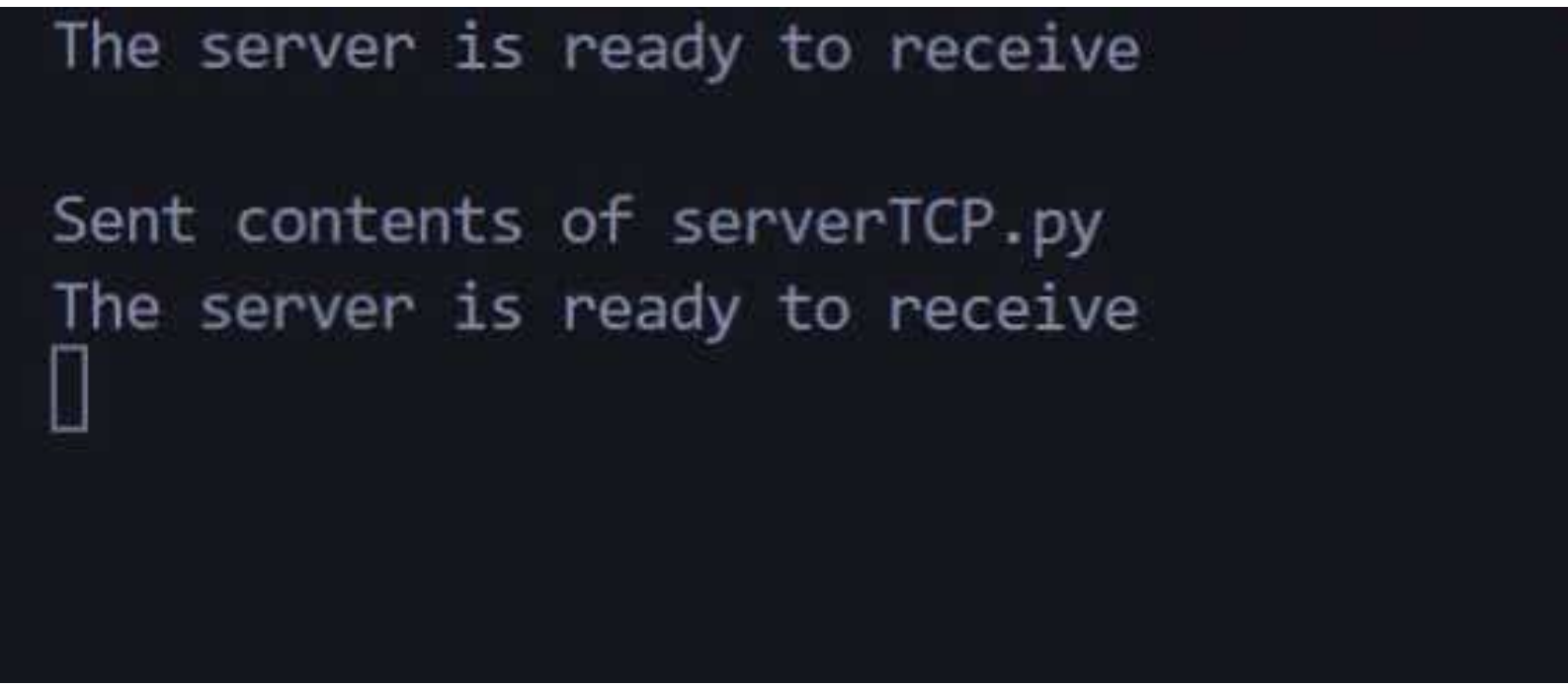
>> Hello Iam Imadh.

```
Enter file name: serverTCP.py

From Server:
 connectionSocket, addr = serverSocket.accept()
 sentence = connectionSocket.recv(1024).decode()

 file=open(sentence,"r")
 l=file.read(1024)

 connectionSocket.send(l.encode())
 print ('\nSent contents of ' + sentence)
 file.close()
 connectionSocket.close()
```


The server is ready to receive
Sent contents of serverTCP.py
The server is ready to receive

classmate
Date 27/1/23
Page

Exp 6: UDP

Aim: Using UDP sockets. Write a client server program to make client sending the filename and the server to send back. The contents of the requested file if present.

Code:

Server udp.py

```
from socket import *
server Port = 12000
Server Socket = socket. (AF_INET, SOCK_DGRAM)
Server. socket. bind (("127.0.0.1", server Port))
print ("The server is ready to receive");

while 1:
    sentence, client Addres = server Socket. recv from (2073)
    sentence = sentence. decode ("UTF-8")
    file = open (sentence, "r")
    l = file. read (2048)
    server Socket = send to (bytes (l, "UTF-8"),
                             client Address))
    print ("\n. sent contents of end = '')
    print (sentence)
    file. close ()
```

Client:

```
from socket import *
Server Name = "127.0.0.1"
Server Port = 12000.
```

client Socket = socket (AF_INET, SOCK_DGRAM)
Sentence = input ("\n Enter file name")
client socket . send to (bytes (sentence, "UTF-8"
server Name, server Port))

File contents, server Address = client socket.
recv from (2045)

print ("\n Reply from server")
print ("File contents . decode ("UTF-8"))
client socket . close ()
client socket . close ()

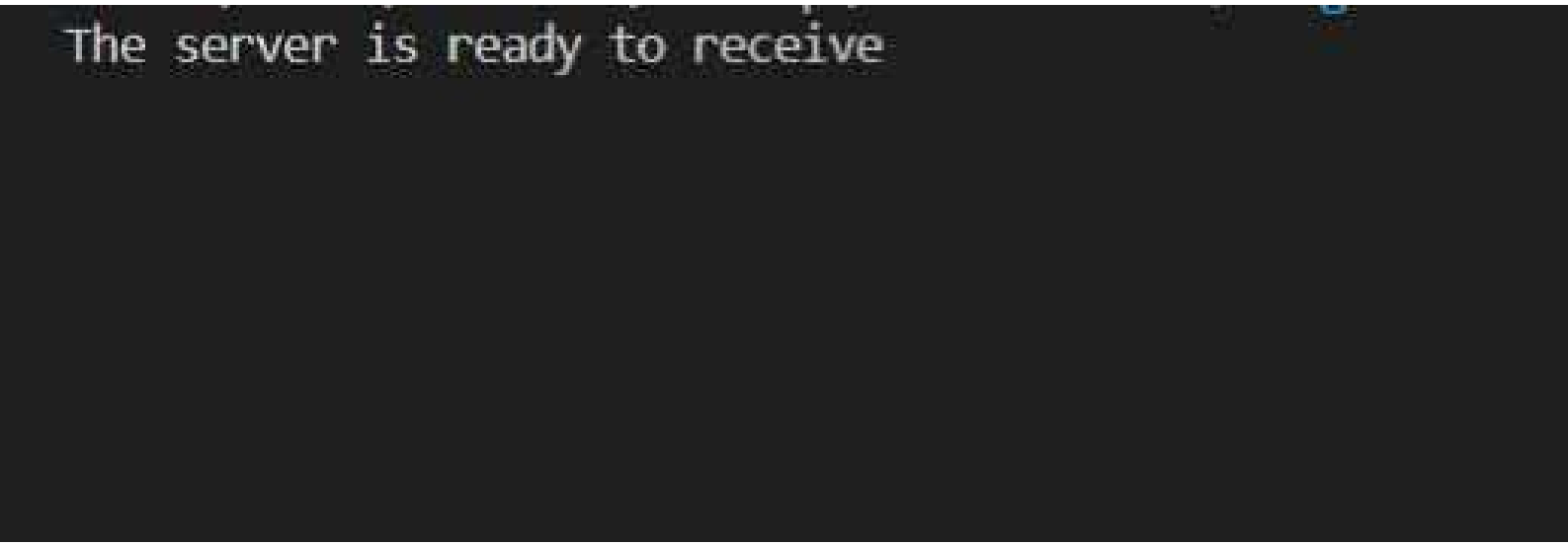
OUTPUT:

server udp.py
File server is ready to receive
Sent contents of server udp.py

Client udp.py

```
PS C:\Users\Lokesh R\Desktop\socket> & "C:/Program Files/Python311/python.exe" "c:/Users/Lokesh R/Desktop/socket/serverudp.py"
The server is ready to receive

Sent contents of  serverudp.py
```


The server is ready to receive

```
Enter file name: serverudp.py

Reply from Server:

from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print ("The server is ready to receive")
while 1:
 sentence, clientAddress = serverSocket.recvfrom(2048)
 sentence = sentence.decode("utf-8")
 file=open(sentence,"r")
 l=file.read(2048)

 serverSocket.sendto(bytes(l,"utf-8"),clientAddress)
 print ('\nSent contents of ', end = ' ')
 print (sentence)
 # for i in sentence:
 # print (str(i), end = '')
 file.close()
```