VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB REPORT
on

COMPUTER NETWORKS

Submitted by

AMULYA S A (1BM21CS020)

in partial fulfillment for the award of the degree of
BACHELOR OF ENGINEERING
in
COMPUTER SCIENCE AND ENGINEERING

B.M.S. COLLEGE OF ENGINEERING
(Autonomous Institution under VTU)
BENGALURU-560019
JUN-2023 to SEP-2023

B. M. S. College of Engineering,
Bull Temple Road, Bangalore 560019

(Affiliated To Visvesvaraya Technological University, Belgaum)
Department of Computer Science and Engineering

CERTIFICATE

This is to certify that the Lab work entitled "COMPUTER NETWORKS" carried out by **AMULYA S A (1BM21CS020),** who is bonafide student of **B. M. S. College of Engineering.** It is in partial fulfillment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum during the year 2023. The Lab report has been approved as it satisfies the academic requirements in respect of a **computer networks - (Course code)** work prescribed for the said degree.

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Designation
Department of CSE
BMSCE, Bengaluru

Dr. Jyothi S Nayak
Professor and Head
Department of CSE
BMSCE, Bengaluru

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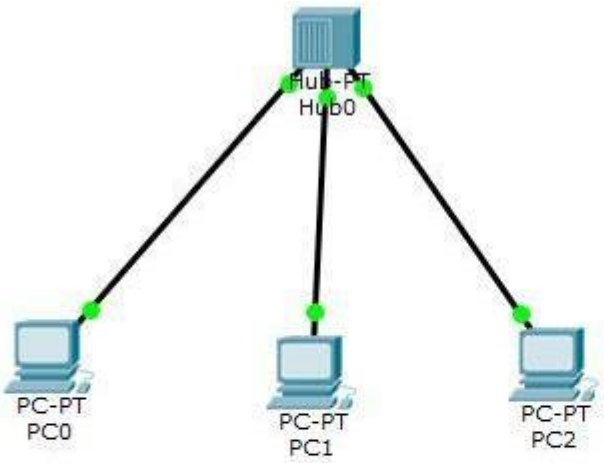
Index

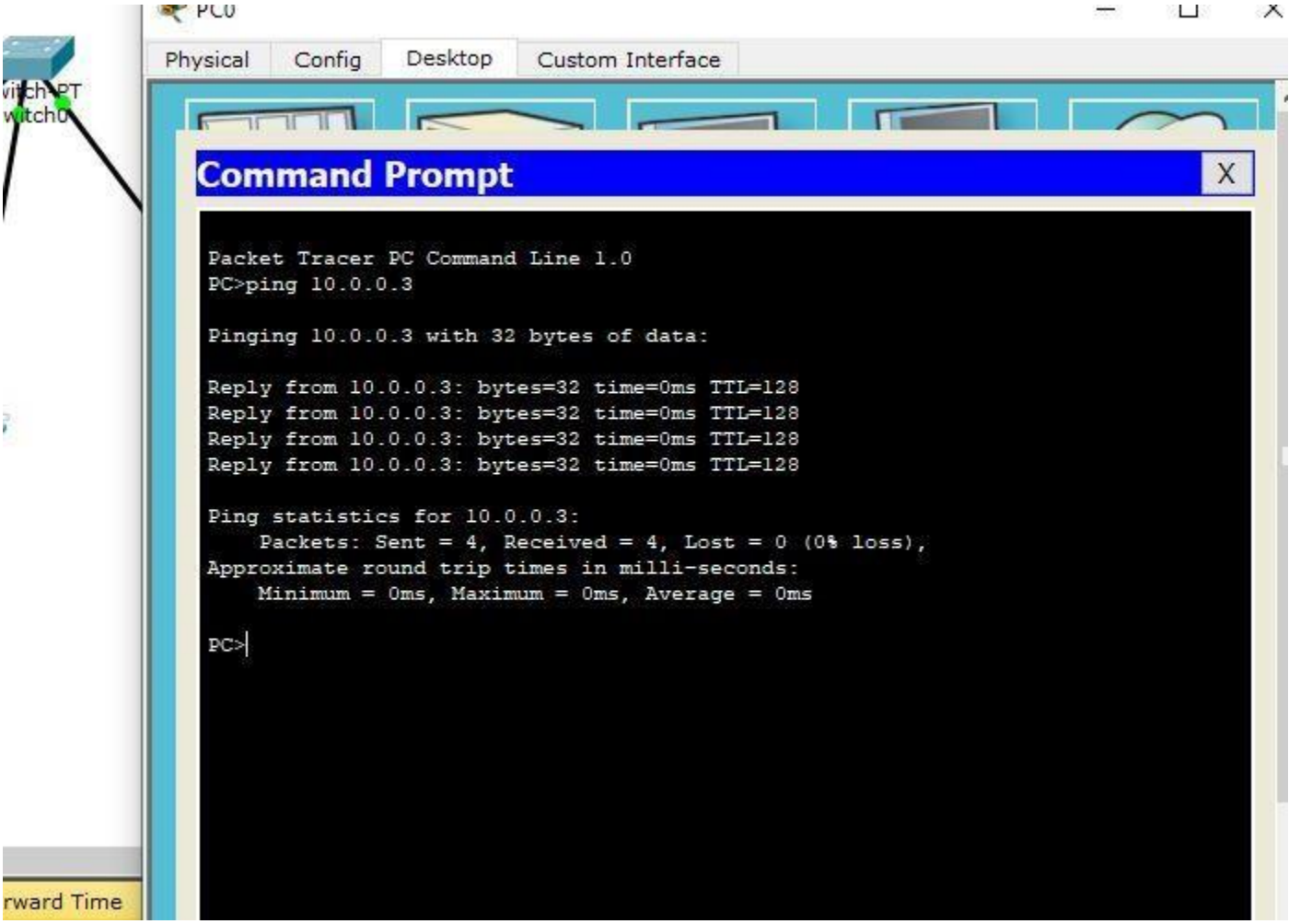
Sl. No.	Date	Experiment Title	Page No.
1		Week1	
2		Week2	
3		Week3	

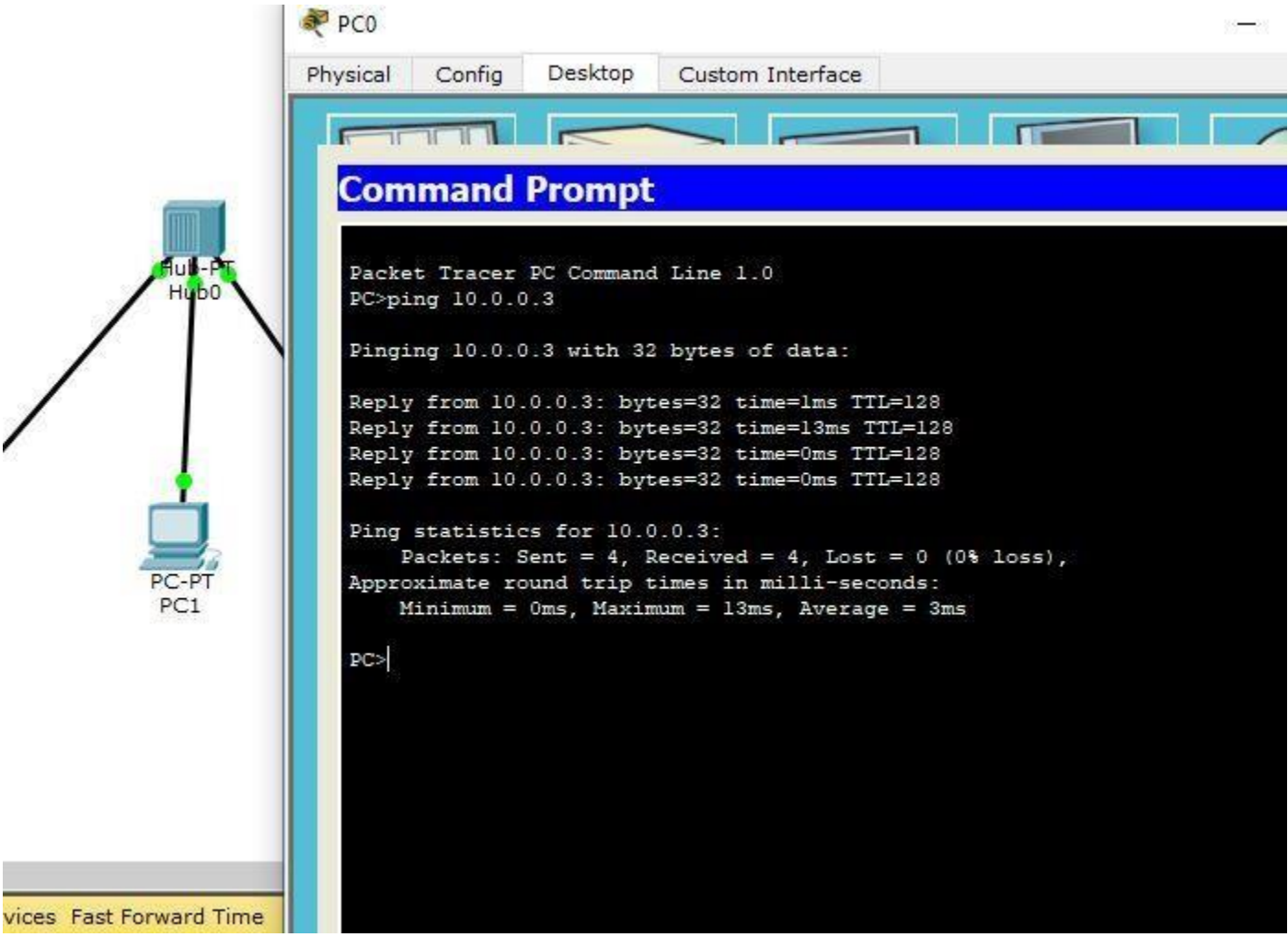
4		**Week4**	
5		**Week5**	
6		**Week6**	
7		**Week7**	
8		**Week8**	
9		**Week9**	
10		**Week10**	
11		**Week11**	
12		**Week12**	
13		**Week13**	
14		**Week14**	
15		**Week15**	
16		**Week16**	

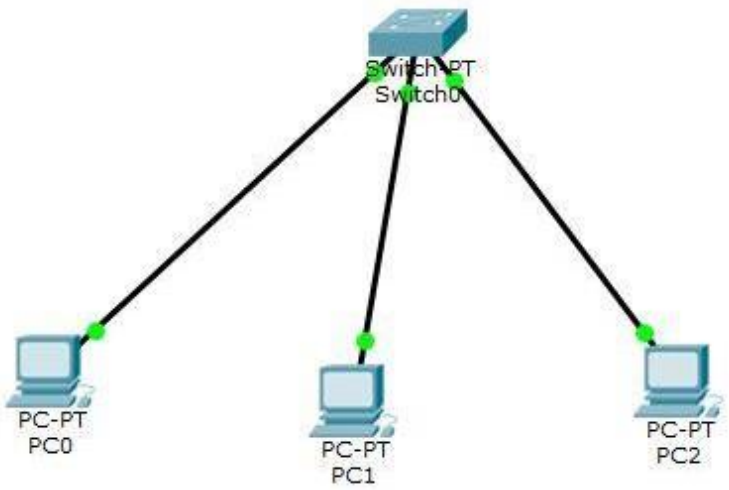
WEEK:1

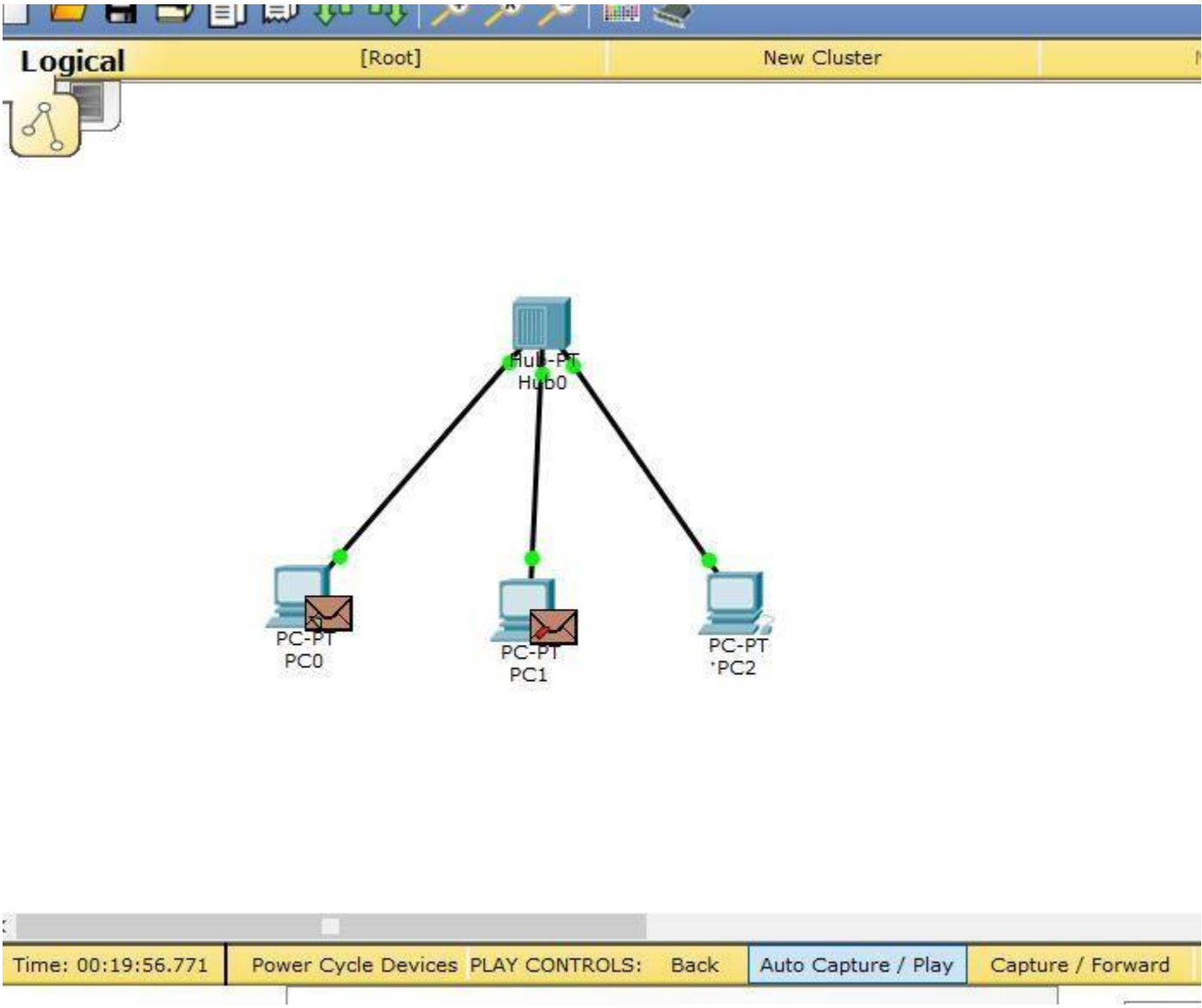
AIM:Create a topology and simulate sending a simple PDUfrom source to destination using hub and switch as connecting devicesand demonstrate ping messages.

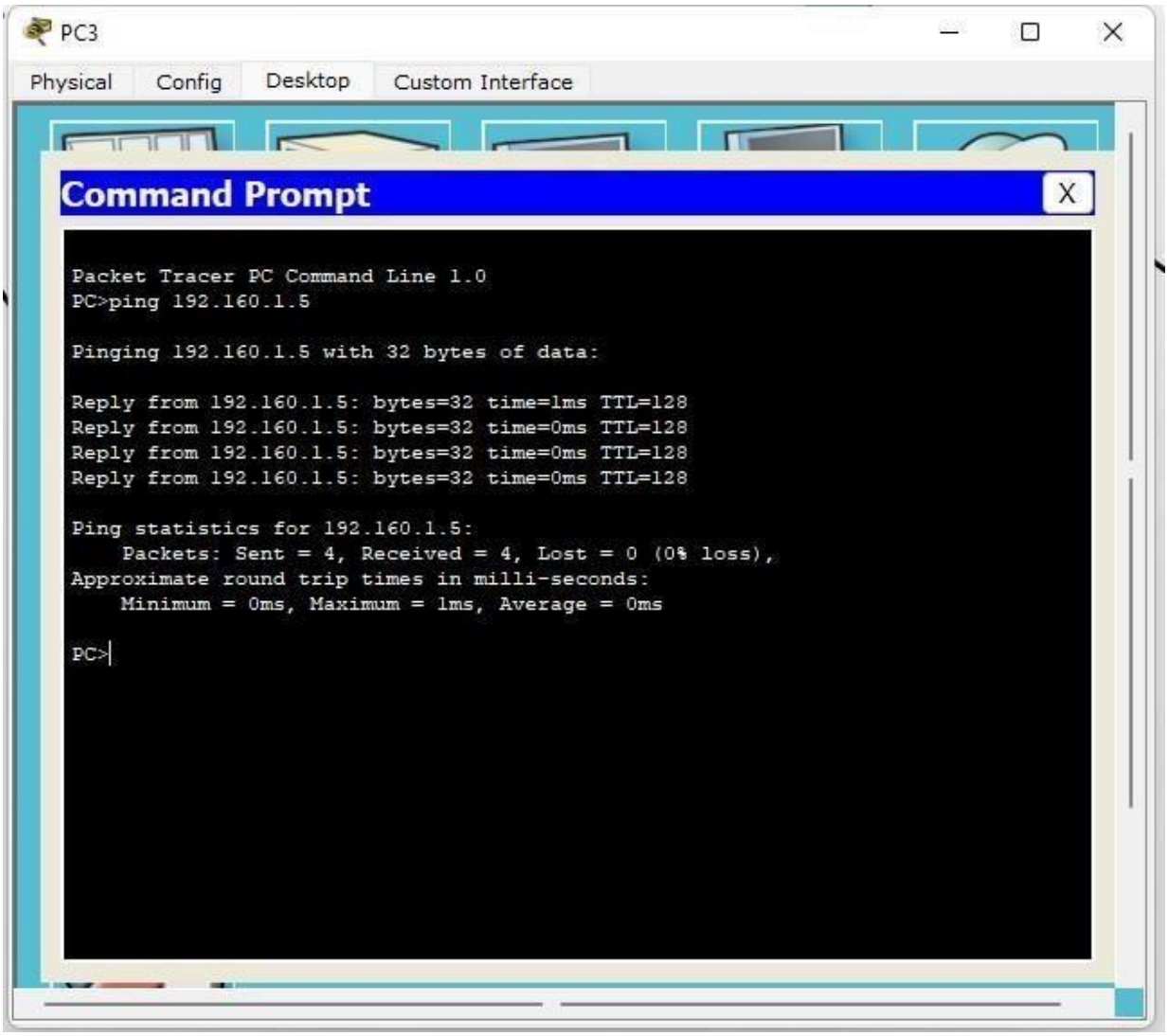

Hub-PT
Hub0
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2

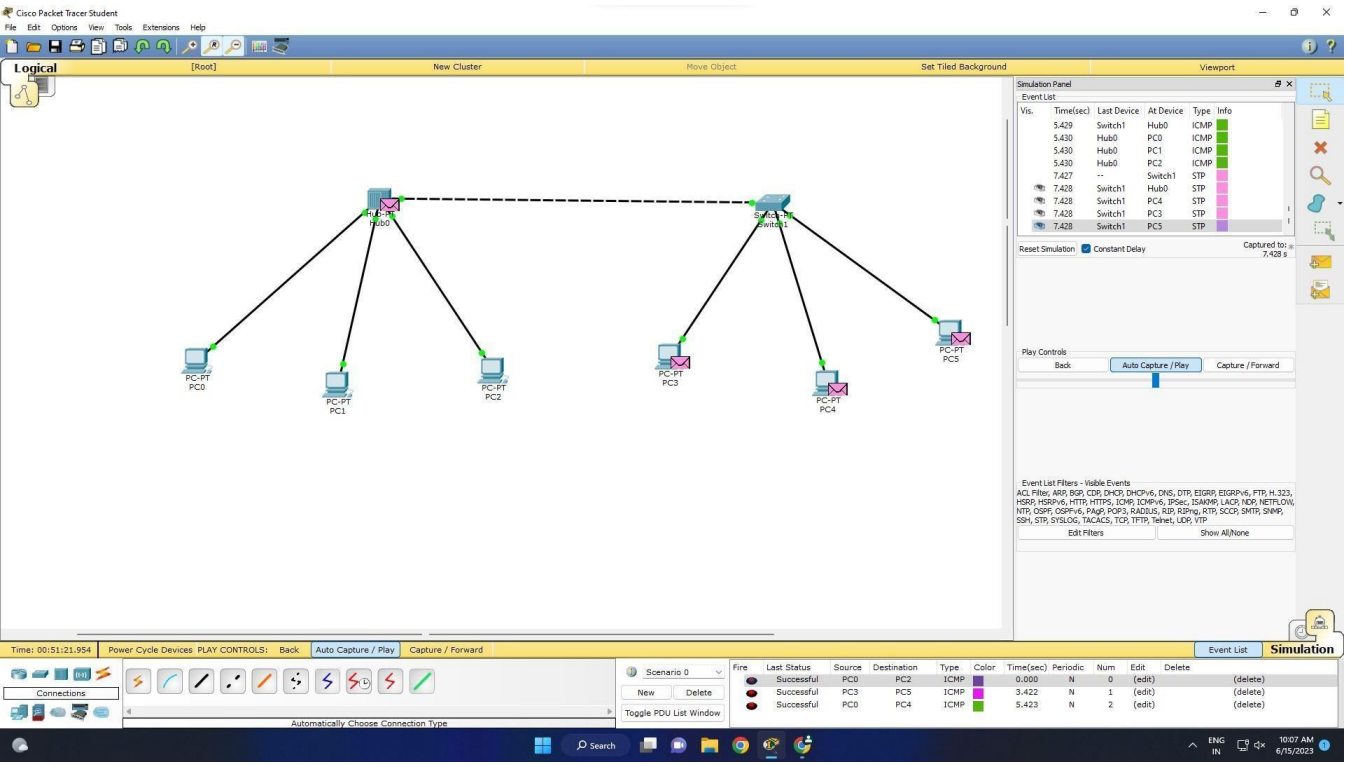

PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.3
Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>
rward Time


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
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=1ms TTL=128
Reply from 10.0.0.3: bytes=32 time=13ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 13ms, Average = 3ms
PC>
Hub-PT
Hub0
PC-PT
PC1
vices Fast Forward Time


Switch-PT
Switch0
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2


Logical
[Root]
New Cluster
Hub-PT
Hub0
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
Time: 00:19:56.771
Power Cycle Devices
PLAY CONTROLS:
Back
Auto Capture / Play
Capture / Forward


PC3
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 192.160.1.5
Pinging 192.160.1.5 with 32 bytes of data:
Reply from 192.160.1.5: bytes=32 time=1ms TTL=128
Reply from 192.160.1.5: bytes=32 time=0ms TTL=128
Reply from 192.160.1.5: bytes=32 time=0ms TTL=128
Reply from 192.160.1.5: bytes=32 time=0ms TTL=128
Ping statistics for 192.160.1.5:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
PC>



am

observation

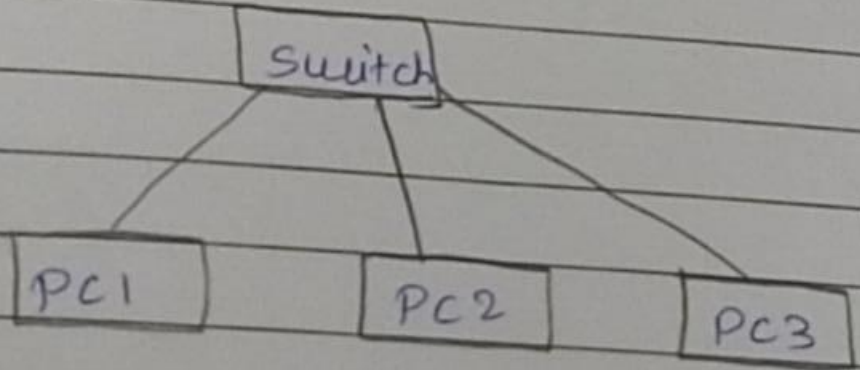
Lab-1

1. create a topology and simulate s
simple PDU from source to destina
hub and switch as connecting devi
demonstrate ping message

Switch

Aim:- Create a topoly and simula
simple PDU from source to dest
switch

Topology



Result:- PC ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes o
Reply from 10.0.0.3 bytes =32 time =1
Reply from 10.0.0.3 bytes =32 time
Reply from 10.0.0.3 bytes =32 time
Reply from 10.0.0.3 bytes =32 time
Ping statistics for 10.0.0-3 : Packets
Recived =4 (0% loss) Approximate round trip times in
minimum = 0ms, maxim

Observation:-

The PDU is sent from
is broadcasted to all the PC'
PC's which are not destination PC's
PDU, Acknowledgement is sent to
The destination PC.

Hub:-

of PDU from one PC to
Real time Ping a PC by
Promt of PC

Result :-

PC > Ping 10.0.0.9

Pinging 10.0.0.9 with 32 bytes

Reply from 10.0.0.9 : bytes = 32

Reply from 10.0.0.9 : bytes = 32

Reply from 10.0.0.9 : bytes = 32

Reply from 10.0.0.9 : bytes = 32

Ping statistics for 10.0.0.9 :

Packets : sent = 4, Received = 4

Approximate

WEEK 2

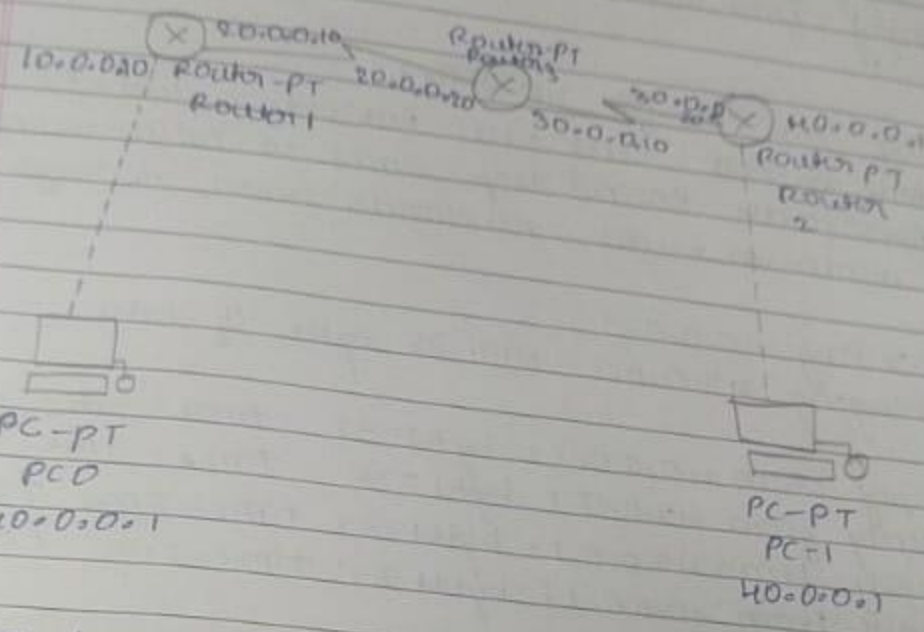
Configure IP address to routers (one and three) in packet tracer. Explore the following messages: ping responses, destination unreachable, request timed out, reply.

OBSERVATION:

2b) Aim: configure IP address to router in packet tracer PING response destination unreachable Reply

Topology

Topology Rem-conf



Procedure:- Take two PC's and 3 routers connect one PC to one Router and another PC to another router. connect these two Routers to another Router and set IP adress and gate ways of PC & Router, when the Routers are ready to communicate Sent Message from one PC to another PC and see the Results

Results:

ping 40.0.0.1

Pinging 40.0.0.1 with 32 byte of data

Request timed out.
Reply from 40.0.0.1 : bytes = 32 time<1ms TTL=
Reply from 40.0.0.1 : bytes = 32 time = 1ms TT
Reply from 40.0.0.1 : bytes = 32 time = 8ms TTL=

Ping statistics for 40.0.0.1
Ping packets : sent = 10, Received = 3, lost = 1, (3
Approximate Round trip times in milli-seconds
minimum = 4ms, maximum = 13ms, Average = 8m

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 = 3ms TTL=
Reply from 40.0.0.1 : bytes = 32 time = 3ms TTL=
Reply from 40.0.0.1 : bytes = 32 time = 2ms TTL=
Reply from 40.0.0.1 : bytes = 32 time = 2ms TTL=

Ping statistics for 40.0.0.1 :
Packets : sent = 4, Received = 4, Lost = 0 (0%

Approximate Round trip times in milli seconds
minimum = 2ms maximum = 3ms Average = 2ms

Observation : connect PC and Router as shown in topoly, when the Routers are Ready to communicate with each other send message from one pc to another pc and Ping in command Promt and see the Results

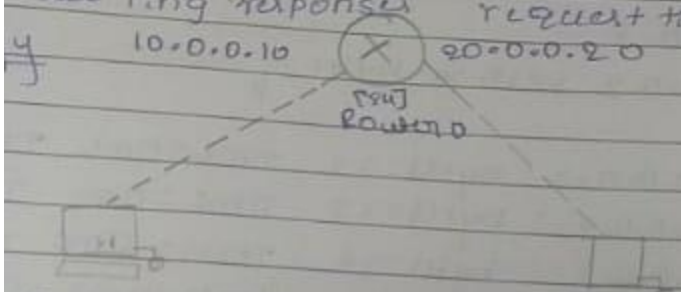
ab 2

DATE: 22-06- PAGE:

configure IP address to router in packet tracer
Explore the following messages : Ping responses
destination unreachable, request timed out, Reply

Topology

Aim : configue IP address to router in packet tracer
Ping responses request timed out, Reply

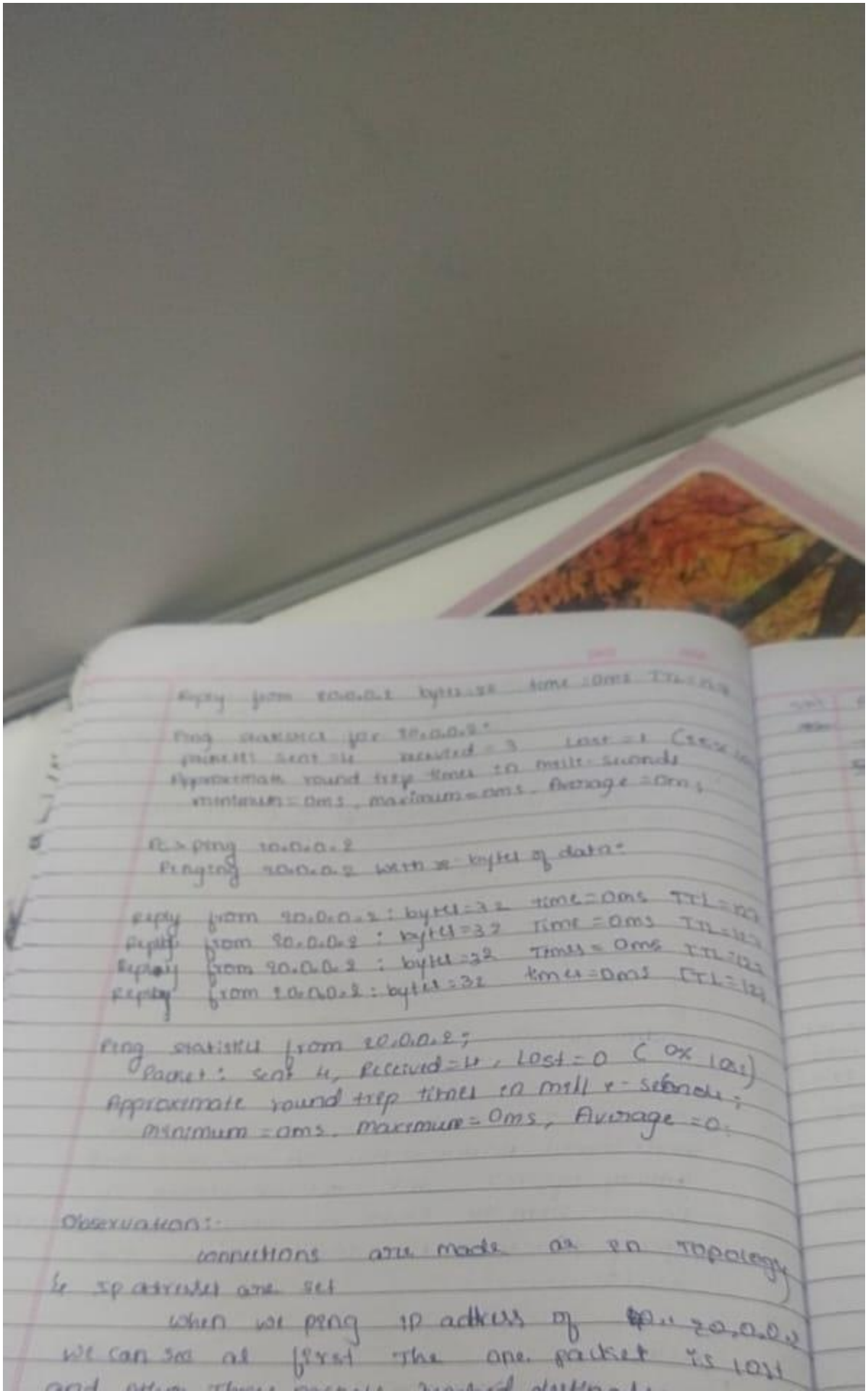


cedure :- Take two pcs and one router
nect connect Router to Pc's, Set IP adress and
teway of PC's and set IP adresss of
outer. When the Router is ready to communicate
ping pc0 to pc1 and observe the
sults

ut:

ping 20.0.0.2

ing 20.0.0.2 with 32 bytes of data:



Reply from 20.0.0.2 bytes=32 time=0ms TTL=128

Ping statistics for 20.0.0.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 20.0.0.2
Pinging 20.0.0.2 with 32 bytes of data:

Reply from 20.0.0.2: bytes=32 time=0ms TTL=128
Reply from 20.0.0.2: bytes=32 time=0ms TTL=128
Reply from 20.0.0.2: bytes=32 time=0ms TTL=128
Reply from 20.0.0.2: bytes=32 time=0ms TTL=128

Ping statistics from 20.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms

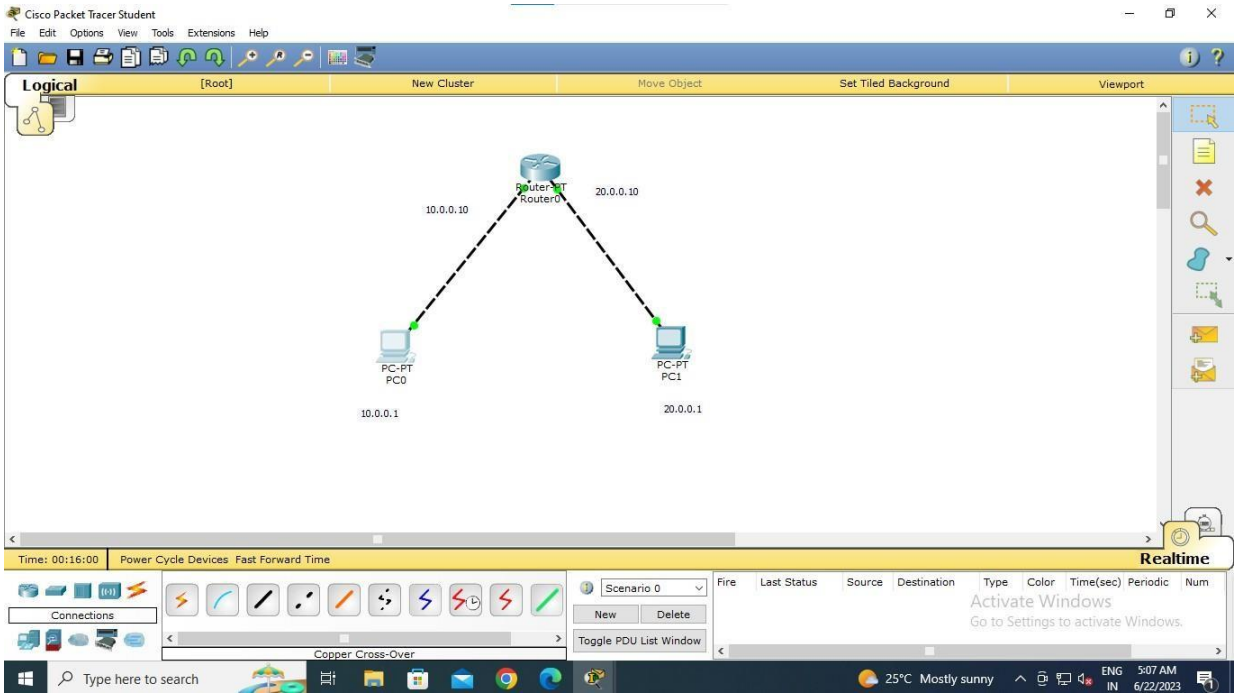
Observation:

connections are made as in topology
& ip address are set

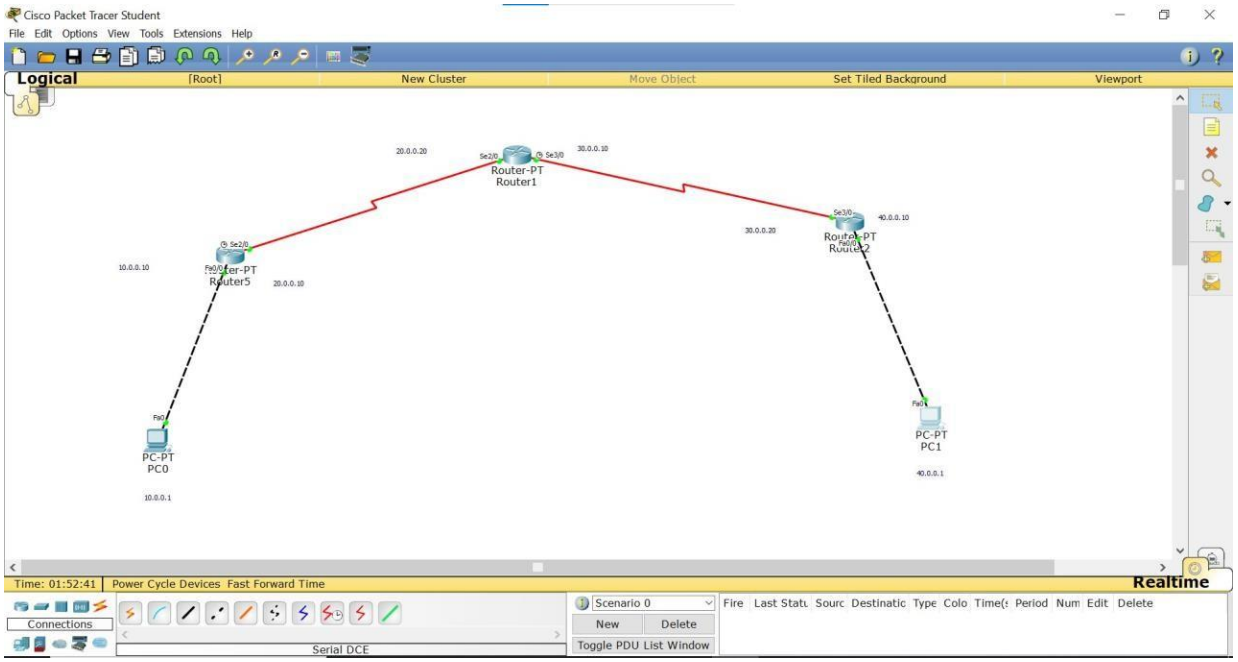
when we ping ip adress of 20.0.0.2
we can see at first the one packet is lost

TOPOLOGY:

PROGRAM 2.1

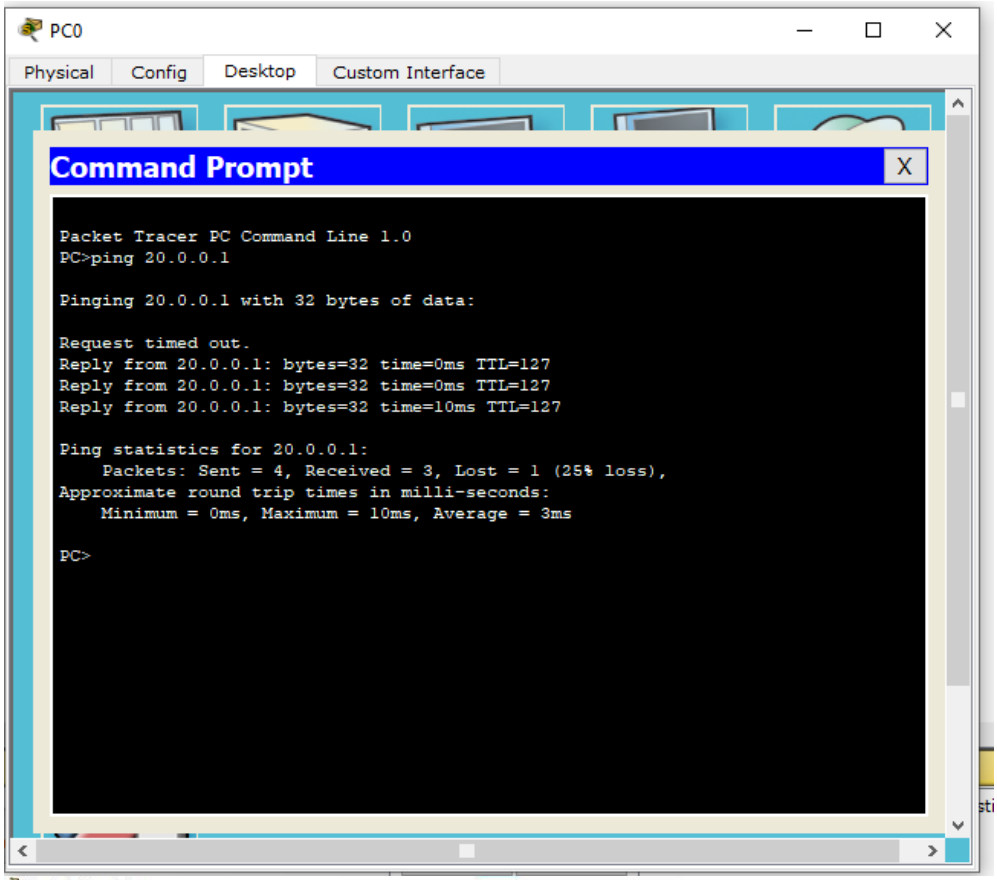


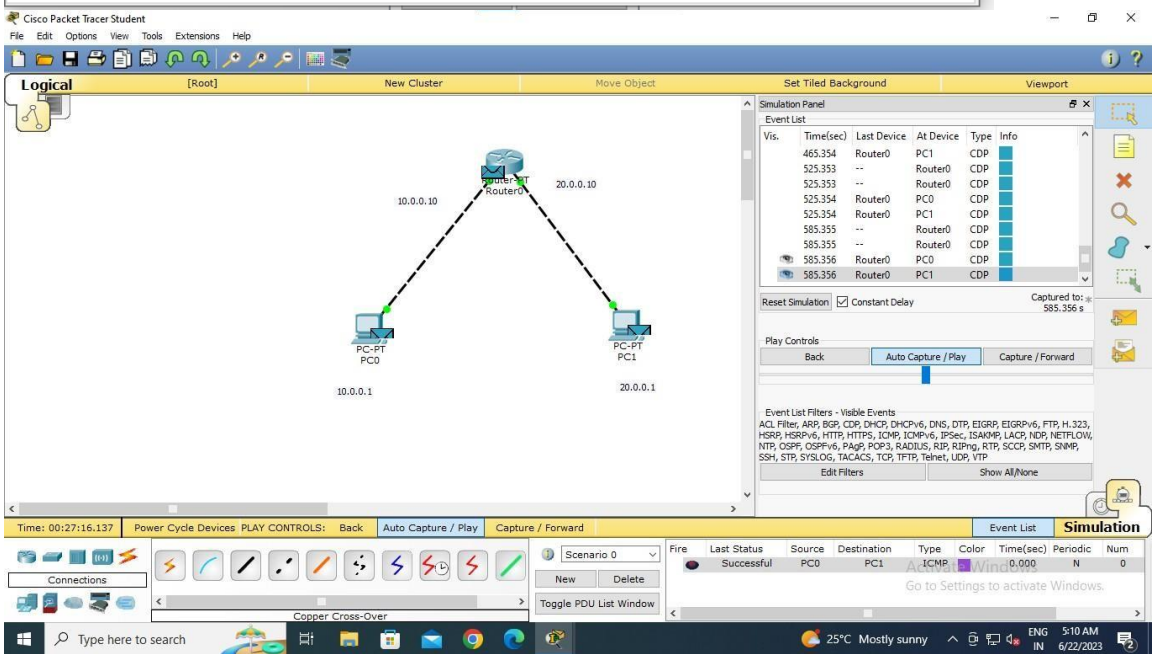
PROGRAM 2.2



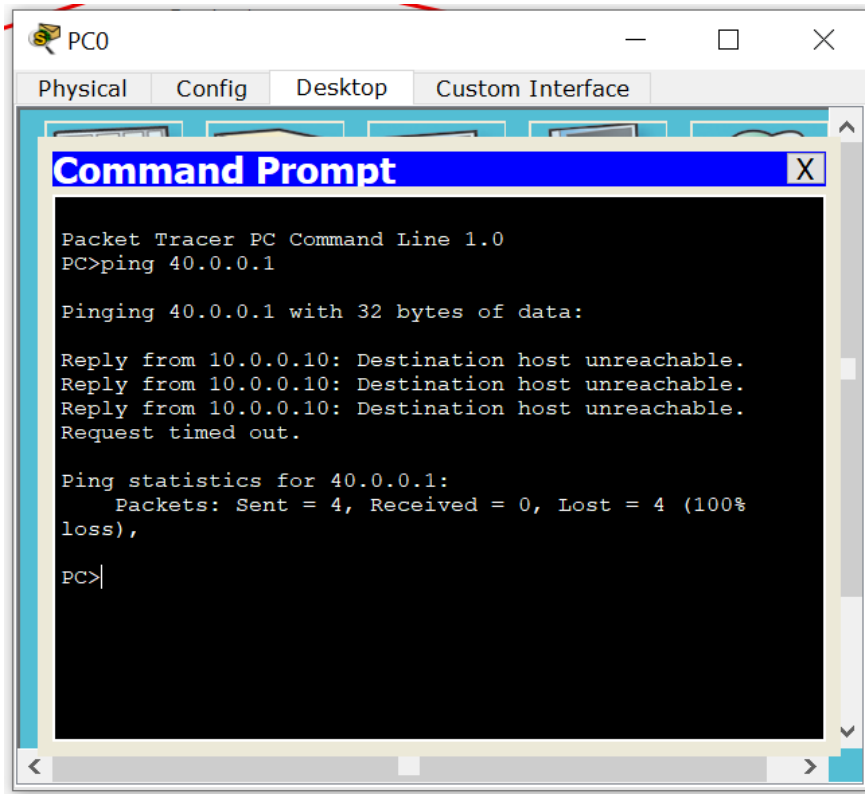
OUTPUT:

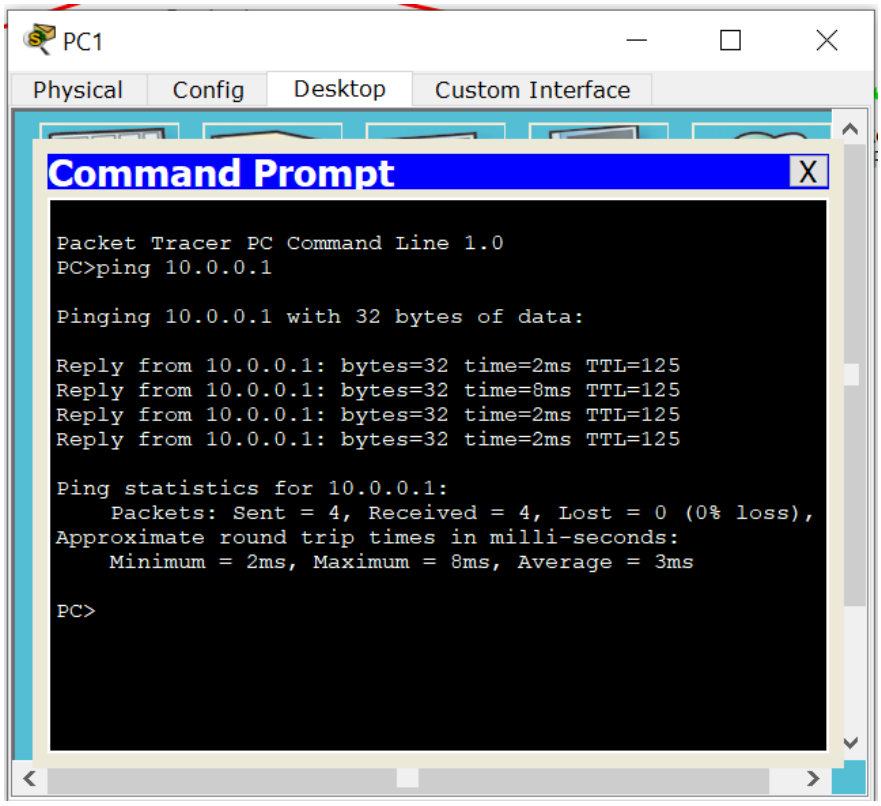
PROGRAM 2.1

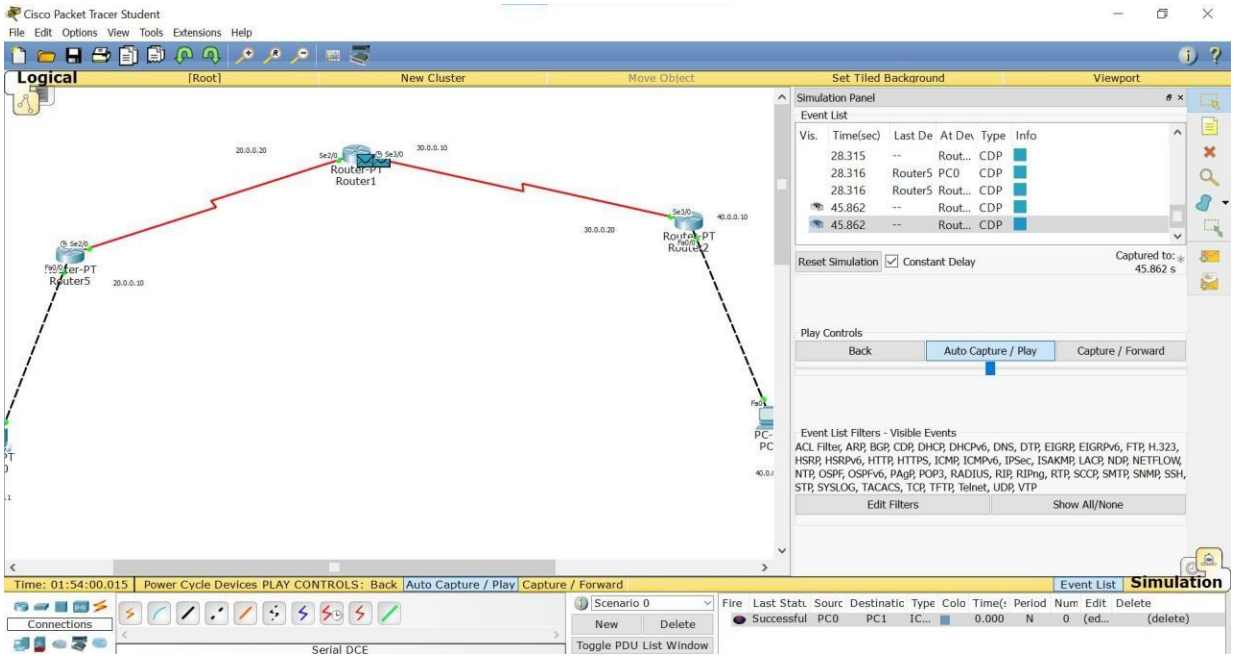




PROGRAM 2.2


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 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.
Request timed out.
Ping statistics for 40.0.0.1:
Packets: Sent = 4, Received = 0, Lost = 4 (100%
loss),
PC>

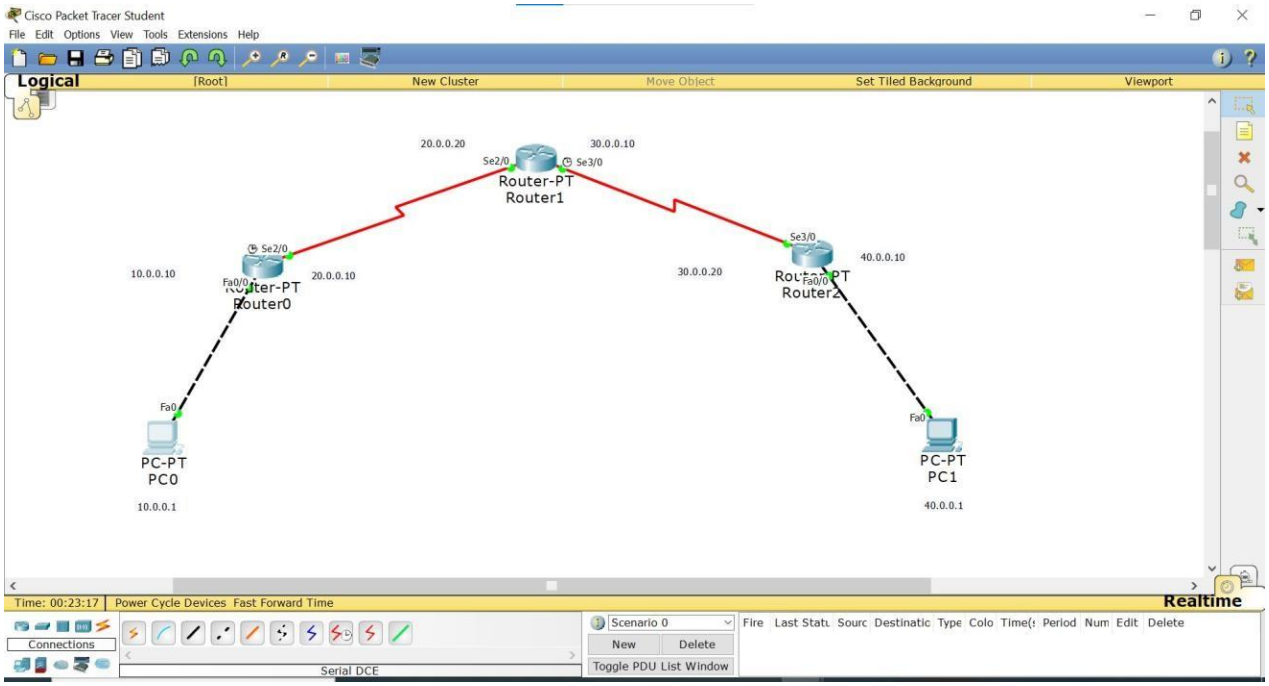

PC1
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.1
Pinging 10.0.0.1 with 32 bytes of data:
Reply from 10.0.0.1: bytes=32 time=2ms TTL=125
Reply from 10.0.0.1: bytes=32 time=8ms TTL=125
Reply from 10.0.0.1: bytes=32 time=2ms TTL=125
Reply from 10.0.0.1: bytes=32 time=2ms TTL=125
Ping statistics for 10.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 8ms, Average = 3ms
PC>


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router-PT
Router1
Router-PT
Router2
Router-PT
Router5
PC-PC
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
20.0.0.10
Simulation Panel
Event List
Vis. Time(sec) Last De At De Type Info
28.315 -- Rout... CDP
28.316 Router5 PC0 CDP
28.316 Router5 Rout... CDP
45.862 -- Rout... CDP
45.862 -- Rout... CDP
Reset Simulation
Constant Delay
Captured to: 45.862 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: 01:54:00.015
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 Statu Sourc Destinatic Type Colo Time(s Period Num Edit Delete
Successful PC0 PC1 IC... 0.000 N 0 (ed... (delete)

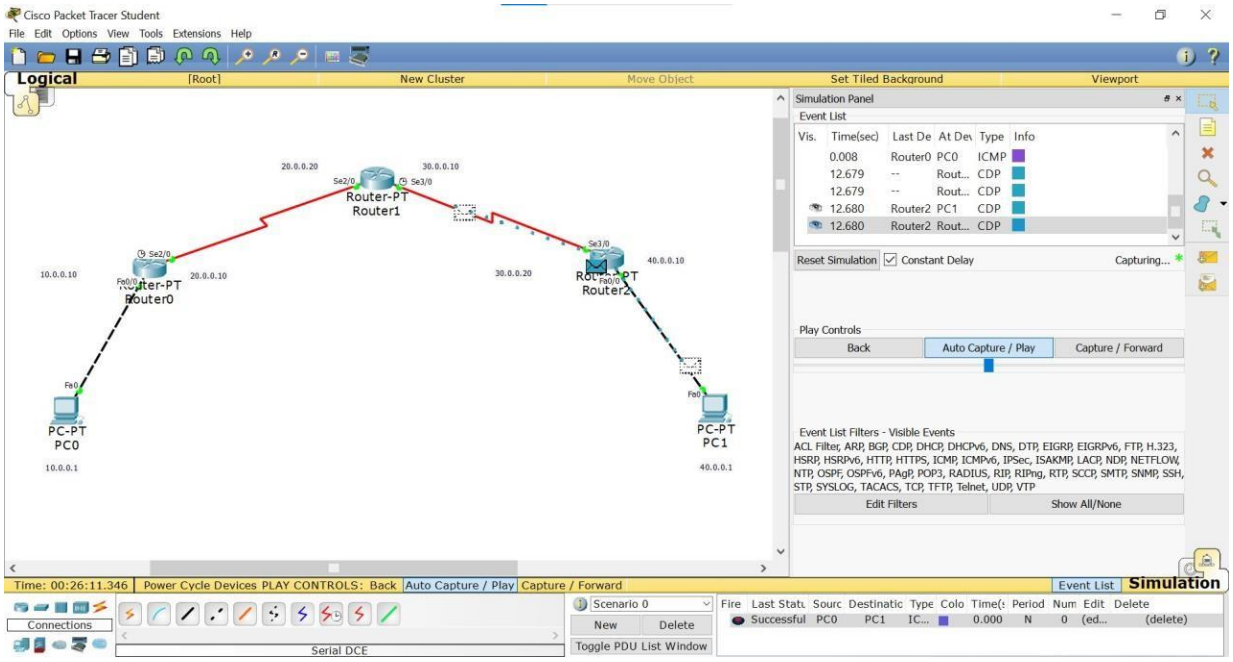
WEEK 3

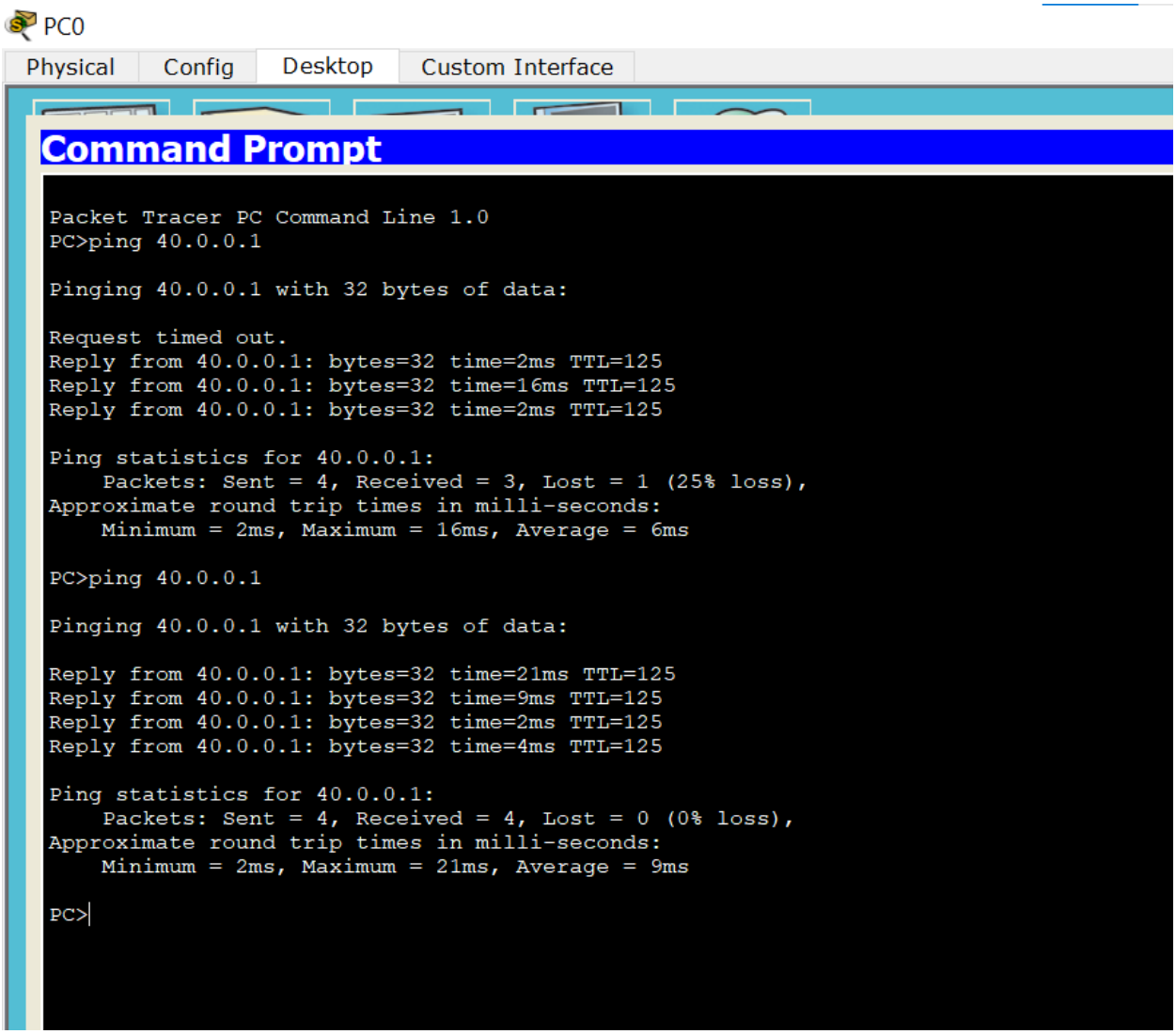
Configure default route, static route to the Router.

TOPOLOGY:



OUTPUT:





Observation:

Go to Pc's command Prompt and type ping message to send packets across

Ping output

Packet trace Pc command line IO

Pc > Ping 40.0.0.0.1

Pinging 40.0.0.1 with 32 byte of data

Request timed out

Reply from 40.0.0.1 bytes=32 time 2ms TTL=127

Reply from 40.0.0.1 bytes=32 time=16ms TTL=127

Reply from 40.0.0.1 bytes=32 time=2ms TTL=127

Ping statistic for 40.0.0.1

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

Approx. round trip in milli seconds

minimum=2ms maximum=16ms Average=6ms

Observation.

- A default route is the route which take effect when no other route is available for an IP address current
- If a packet is received, the device first check the IP destination address, If the IP destination address is not local the device checks its routing table
- If the remote destination subnet is not listed then the packet is forwarded to the next hop toward the destination using the default route
- The process repeats until the packet is delivered

Go to Pc's command Prompt and type ping message to send packets across

Ping output

Packet trace Pc command line IO

Pc > Ping 40.0.0.0.1

Pinging 40.0.0.1 with 32 byte of data

Request timed out

Reply from 40.0.0.1 bytes=32 time 2ms TTL=127

Reply from 40.0.0.1 bytes=32 time=16ms TTL=127

Reply from 40.0.0.1 bytes=32 time=2ms TTL=127

Ping statistic for 40.0.0.1

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

Approx. round trip in milli seconds

minimum=2ms maximum=16ms Average=6ms

Observation.

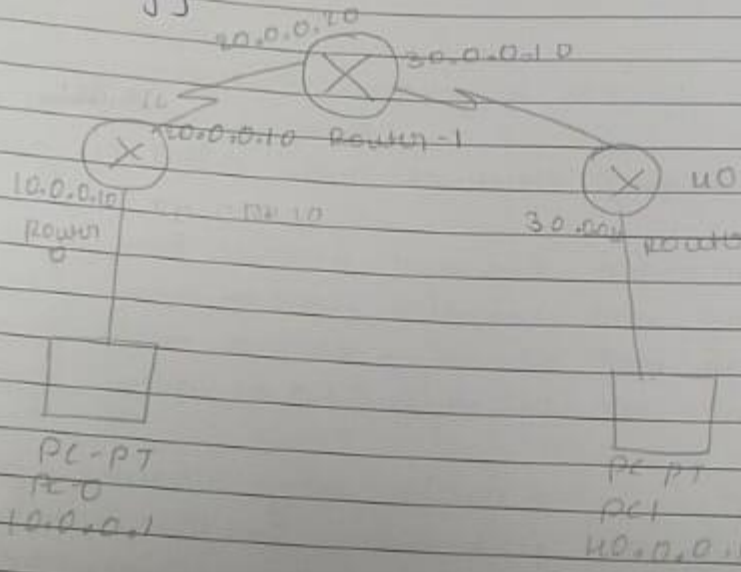
- A default route is the route which take effect when no other route is available for an IP address current
- If a packet is received, the device first check the IP destination address, If the IP destination address is not local the device checks its routing table
- If the remote destination subnet is not listed then the packet is forwarded to the next hop toward the destination using the default route
- The process repeats until the packet is delivered

DATE: 13/7/23

Aim

Configure default route, static route to the Router

Topology



Procedure

- Connect 3 Router and 2 PC's using copper cross over cable for PC to router and a serial DCE cable to connect router to router
- Set the IP address of both PC's and respective gateway number
- For All 3 Routers set the Respective 2 IP address in CLI mode by using the commands

Step1 : Enable

Step2 : config T

Step 3 : Interface fast Ethernet 0/0

Step 4 : IP address

step 6 : Exit
step 7 : interface se 2/0
step 8 : IP address 20.0.0.10 255.0.0.0
step 9 : no shut
step 10 : Exit
step 11 : Exit

- Repeat the command for other two router with their respective IP addresses
- for Router 1, set the IP route of other IP address statically by using following steps

step 1 : config T
step 2 : IP route 10.0.0.0 255.0.0.0 30.0.0.10
step 3 : IP route 40.0.0.0 255.0.0.0 30.00.20
step 4 : exit
step 5 : exit
step 6 : show IP route

- ~~Repeat~~ These commands for other two router with their respective IP address
For Router 1 set the IP route of other IP address statically by using following

For Router 0 & Router we set default IP route which means it can acces any IP address with any subnet mask
set the default IP route by following this command
step 1 : config T
step 2 : IP route 0.0.0.0 0.0.0.0 20.0.0.20
step 3 : IP route 0.0.0.0 0.0.0.0 30.0.0.10
given for Router 0 & step 3 command

Well request for an IP address are successfully get
The DHCP request also sets the IP address
Replat this steps for other 2 PC's
to send a packet across PC's go to PC's command
Prompt and type ping destination IP address

Ping output
Packet tracer PC command line 10
PC > Ping 10.0.0.3
Ping 10.0.0.3 with 32 bytes of data

Reply from 10.0.0.3 bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.3 bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.3 bytes = 32 time = 0ms TTL = 128
Reply from 10.0.0.3 bytes = 32 time = 0ms TTL = 128

Ping statistics from 10.0.0.3
Packets: sent = 4, Recived = 4 lost = 0 (0% loss)
Approximate round trip time in milli seconds
minimum = 0ms, maximum = 1ms Average = 0ms

Observation:
DHCP is used to dynamically assign an IP address
to any device or node
It is a client - server protocal to which servers
manage a pool of unique IP address & also
about client configuration parameter
DHCP enabled client sends a request to DHCP server
When they want to connect to a network
The DHCP server responds to the client request
by providing IP configuration information

from address pools, previously specified by a network administrator

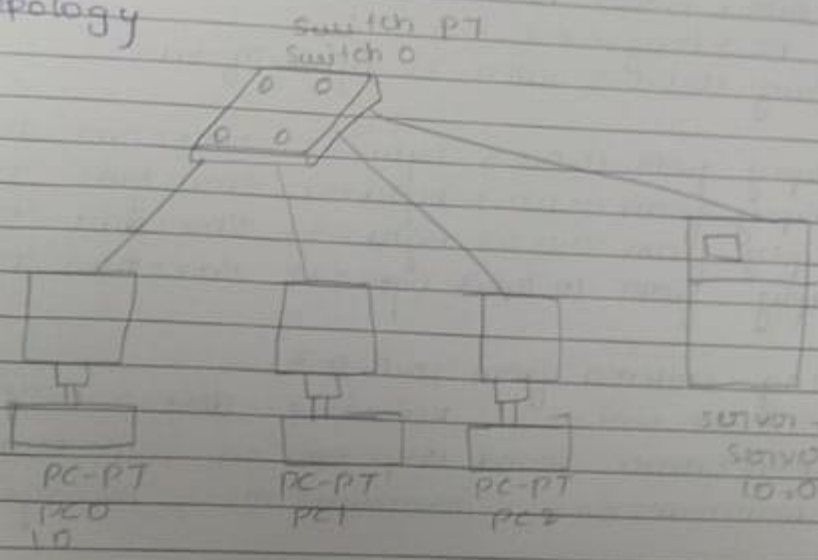
DATE 13/7/23

configure defaut route

Aim:-

configure DHCP within a LAN and outside LAN

Topology



Procedure:-

Connect 3 pc's and 1 server to a Switch using upper Straight Through cable

click on server and go to services tab select DHCP and turn ON the DHCP service

Set the IP address of the start IP address as 10.0.0.2 and click on save button

Before this, set the IP address of server in config Tab under fast ethernet as 10.0.0.1

Next click on Pc_0 and go to desktop tab,

WEEK 4

Configure DHCP within a LAN and outside LAN.

OBSERVATION:

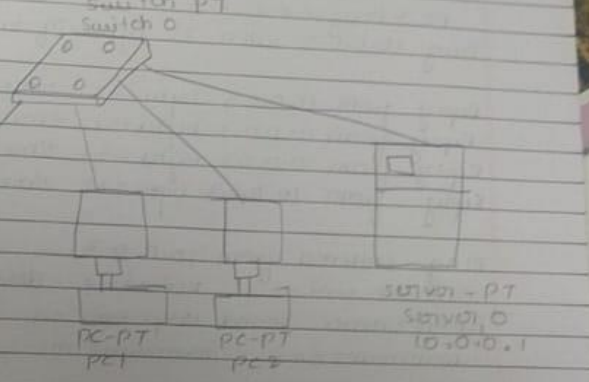
DATE 15/7/23

configure defaut route

Aim:-

configure DHCP within a LAN and outside LAN

Topology



Procedure:-

connect 3 pc's and 1 server to a switch using upper straight through cable

click on server and go to services tab select DHCP and turn ON the DHCP service

Set the IP address of the start IP address as 10.0.0.2 and click on save button

Before this, set the IP address of server in config tab under fast ethernet as 10.0.0.1

Next click on Pc_0 and go to desktop tab, click on IP configuration, select DHCP here it

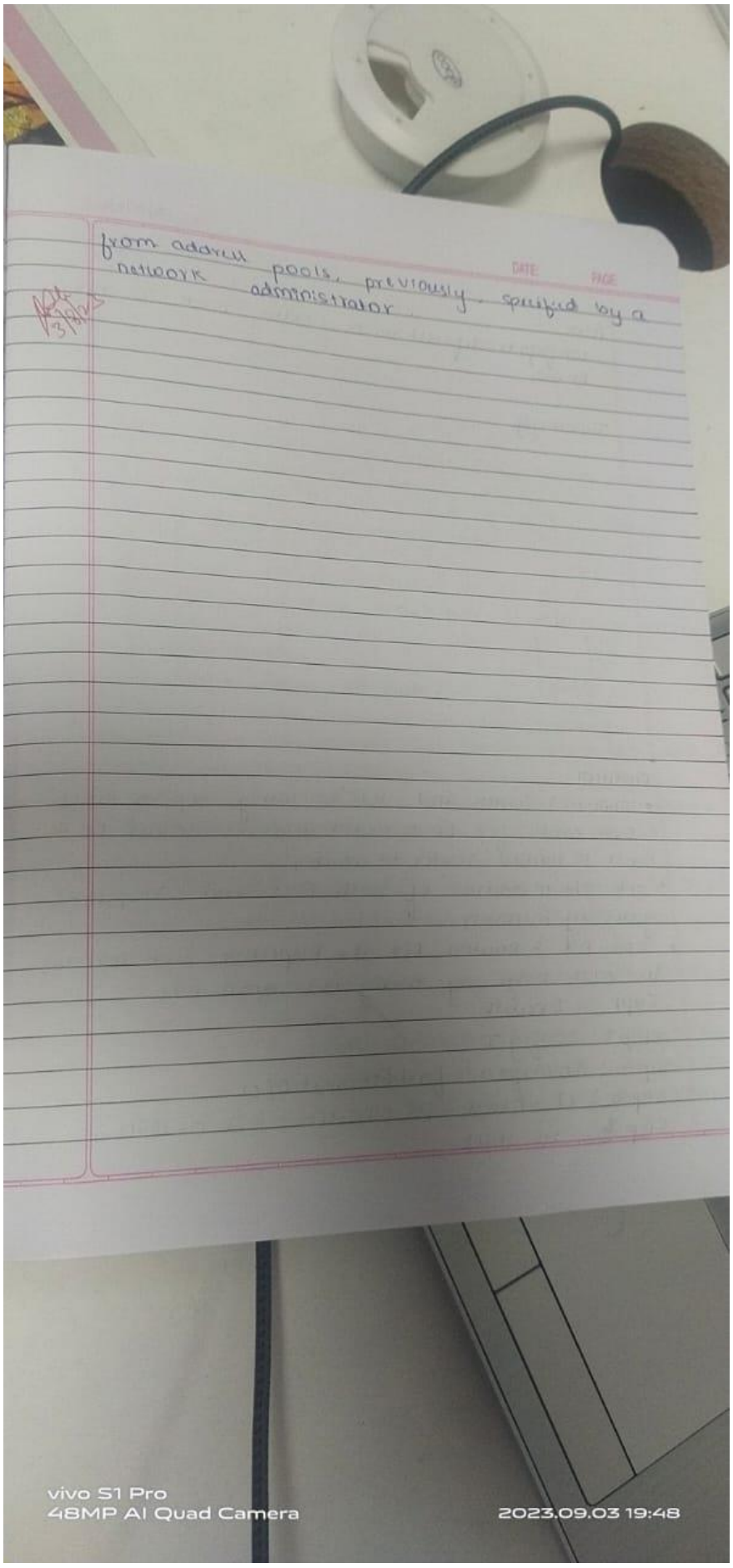
will request for an IP address and successfully get
The DHCP request also sets the IP address
Replat this steps for other 2 PC's
to send a packet across PC's go to PC's command
Prompt and type ping destination IP address

Ping output
Packet tracer PC command line 1.0
PC > Ping 10.0.0.3
Ping 10.0.0.3 with 32 bytes of data

Reply from 10.0.0.3 bytes=32 time=0ms TTL=128
Reply from 10.0.0.3 bytes=32 time=0ms TTL=128
Reply from 10.0.0.3 bytes=32 time=0ms TTL=128
Reply from 10.0.0.3 bytes=32 time=0ms TTL=128

Ping statistics from 10.0.0.3
Packets: sent=4, Received=4, lost=0 (0% loss)
Approximate round trip time in milli seconds
minimum=0ms, maximum=1ms Average=0ms

Observation:
DHCP is used to dynamically assign an IP address
to any device or node
It is a client-server protocol to which servers
manage a pool of unique IP address & also
about client configuration parameter
DHCP enabled client sends a request to DHCP server
When they want to connect to a network
The DHCP server responds to the client request
by providing IP configuration information


from address pools, previously specified by a network administrator

DATE PAGE

3/8/23

vivo S1 Pro
48MP AI Quad Camera
2023.09.03 19:48

address in their respective command prompt

Ping output

Pc > Ping 20.0.0.2

Ping 20.0.0.2 with 32 byte of data

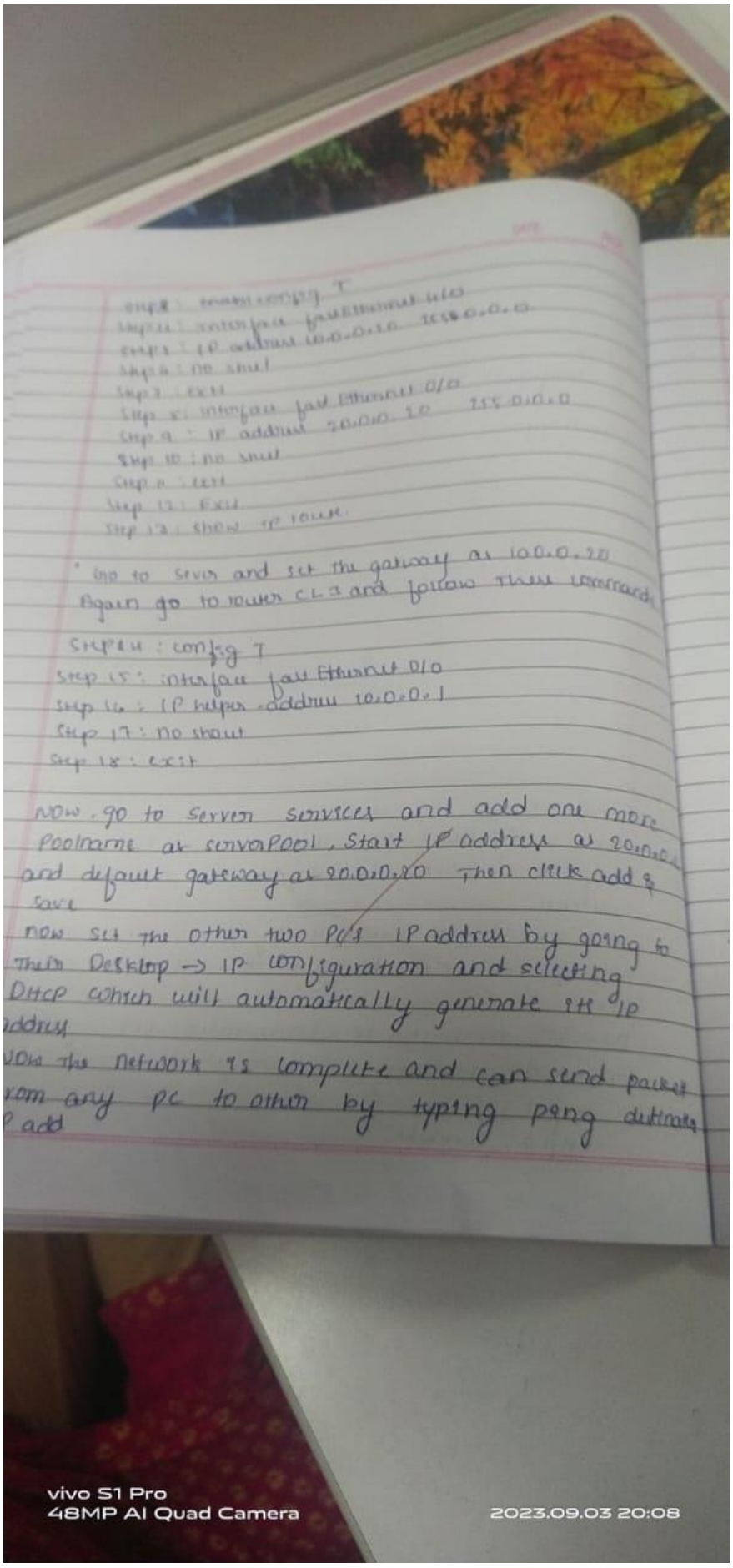
Request timed out

Reply from 20.0.0.2 : byte = 32 time = 0ms TTL = 127
Reply from 20.0.0.2 : byte = 32 time = 0ms TTL = 127
Reply from 20.0.0.2 : byte = 32 time = 0ms TTL = 127

Ping statistics for 20.0.0.2
Packet sent = 4 Recived = 3 , lost = 1 (25% loss)
Approximate round trip time in milliseconds
minimum = 0ms maximum = 0ms Average = 0ms

observation

- DHCP is used to assign IP address dynamically to different device
- To assign continous IP address we create a server pool where we assign the starting IP address and a default gateway number. For Pc's under different switches we create a different servrpool again and start. this takes care of delivering the packets to correct destination IP address and also sends back the ACK to the initial device

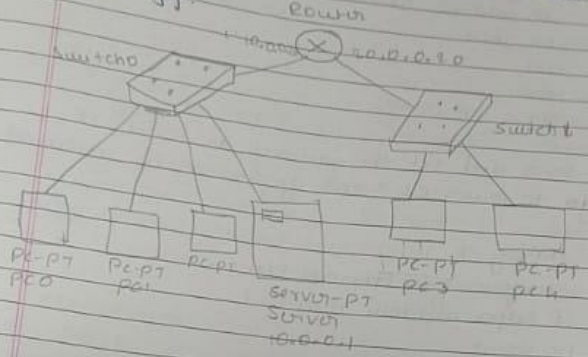

Step 8 : no shut
Step 9 : exit
Step 10 : interface fast Ethernet 0/0
Step 11 : IP address 20.0.0.20 255.0.0.0
Step 12 : no shut
Step 13 : exit
Step 14 : Exit
Step 15 : show ip route.
* Go to sever and set the gateway as 10.0.0.20
Again go to router CLI and follow these commands
Step 14 : config T
Step 15 : interface fast Ethernet 0/0
Step 16 : IP helper-address 10.0.0.1
Step 17 : no shout
Step 18 : exit
NOW, go to Server services and add one more
Poolname as servrPool, Start IP address as 20.0.0.
and default gateway as 20.0.0.20 Then click add &
save
now set the other two PC's IP address by going to
their Desktop → IP configuration and selecting
DHCP which will automatically generate the IP
address
Now the Network is complete and can send packet
from any PC to other by typing ping destinat
IP add
vivo S1 Pro
48MP AI Quad Camera
2023.09.03 20:08

DATE: 13/9/23

Aim

Configure DHCP within a LAN and outside LAN.

Topology:



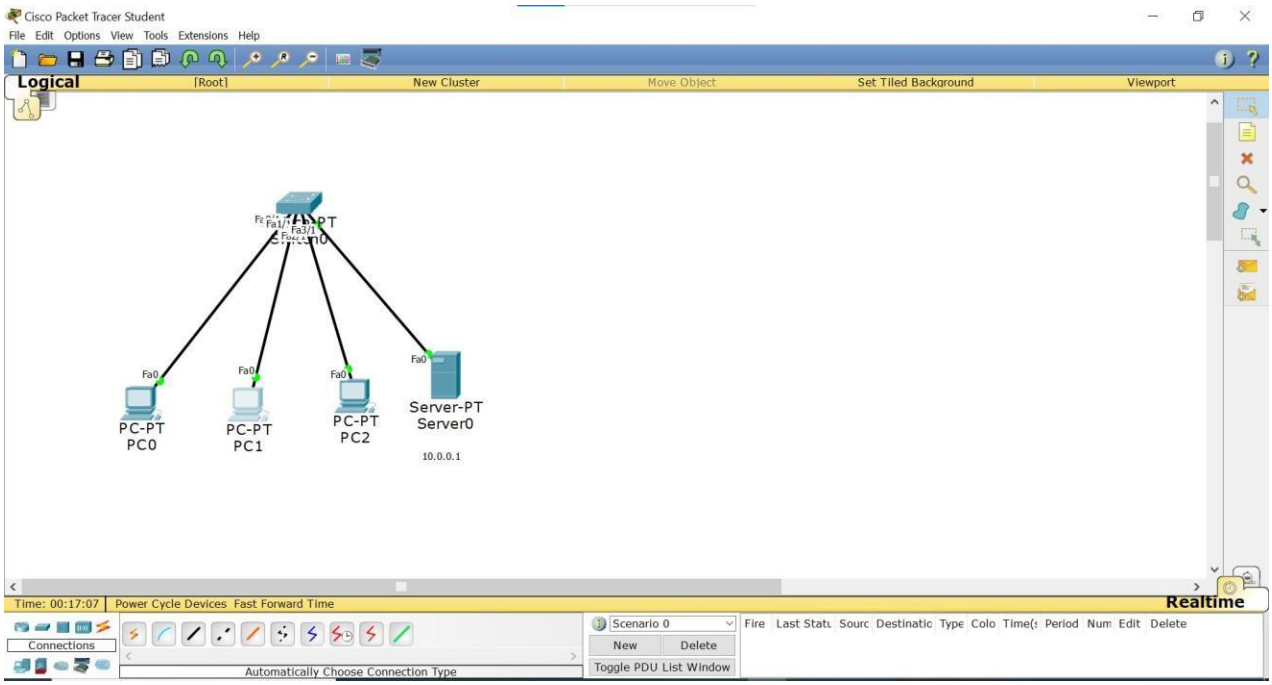
Procedure

Add a Router, a Switch and 2 PCs to it.
Program networks & connect the router to both Switches.
Set the server IP address of server and with the help of server set the first 3PC's IP address through DHCP
Now set the router IP address with the following commands statically

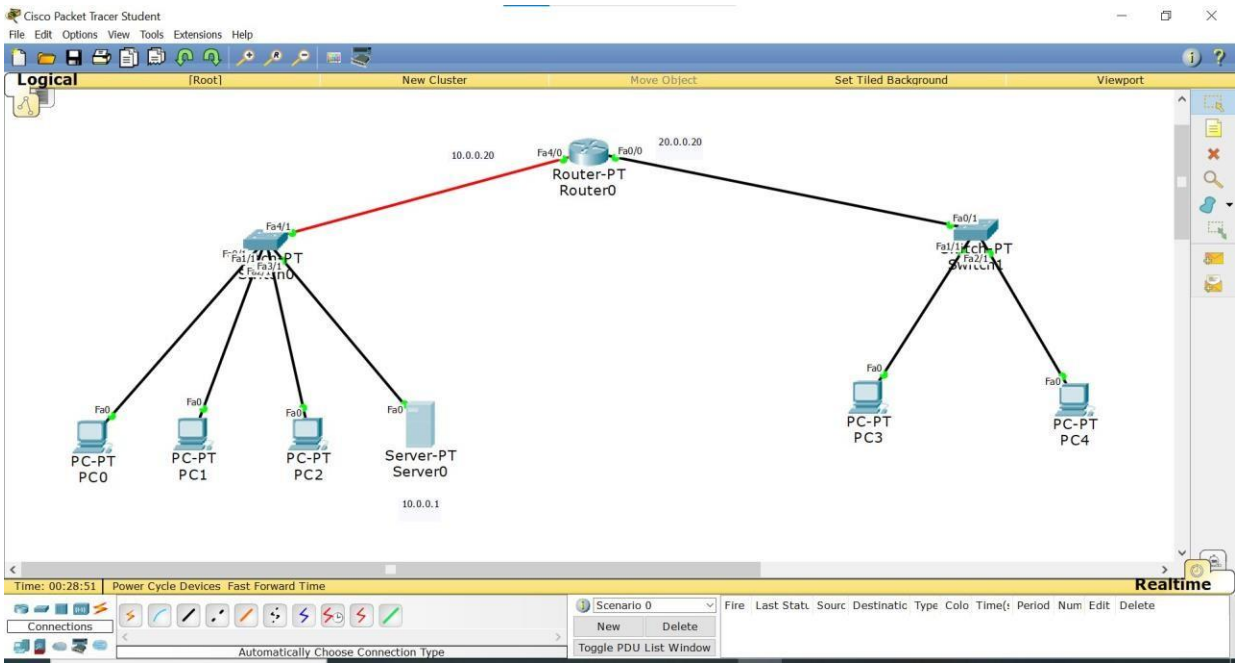
step 1: no
step 2: enable

TOPOLOGY:

PROGRAM 4.1:

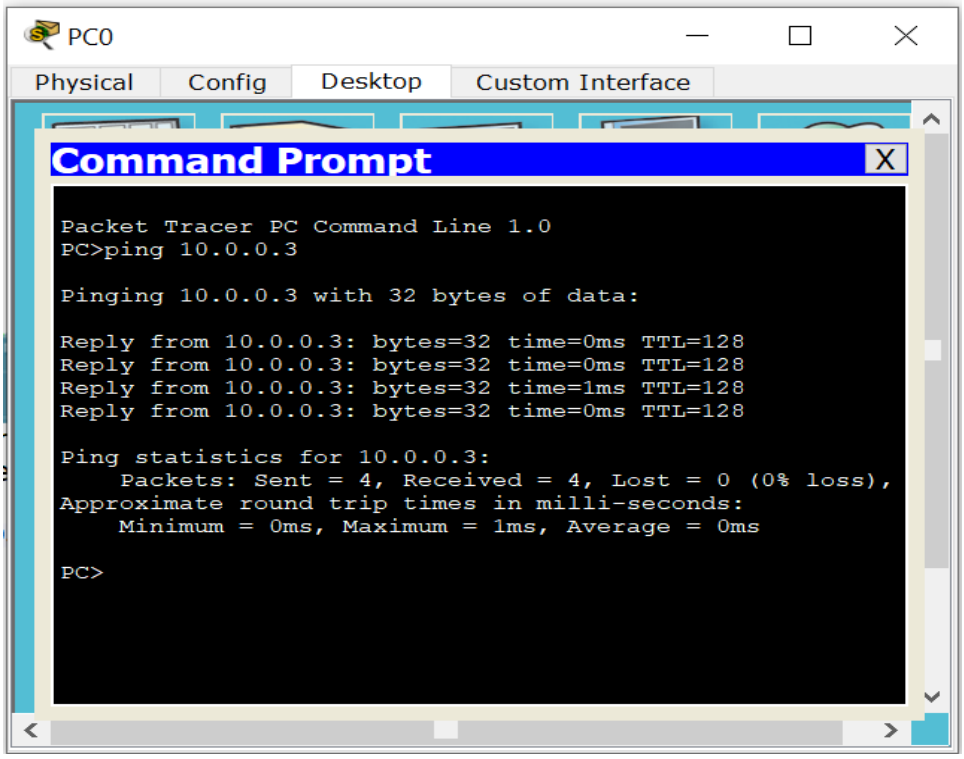


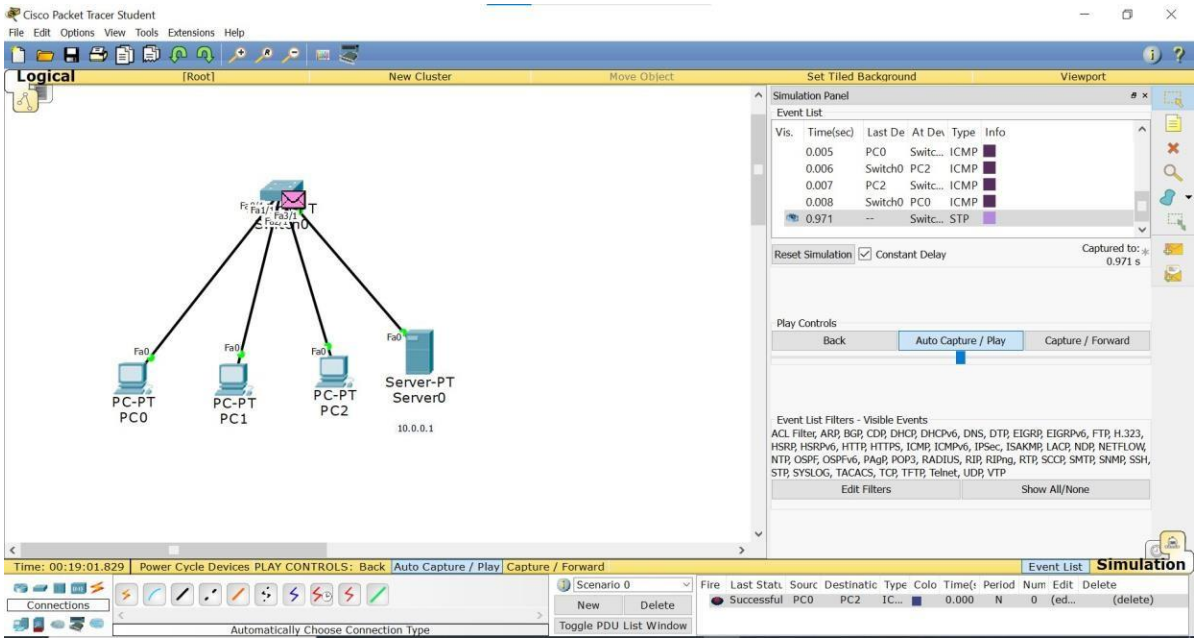
PROGRAM 4.2:



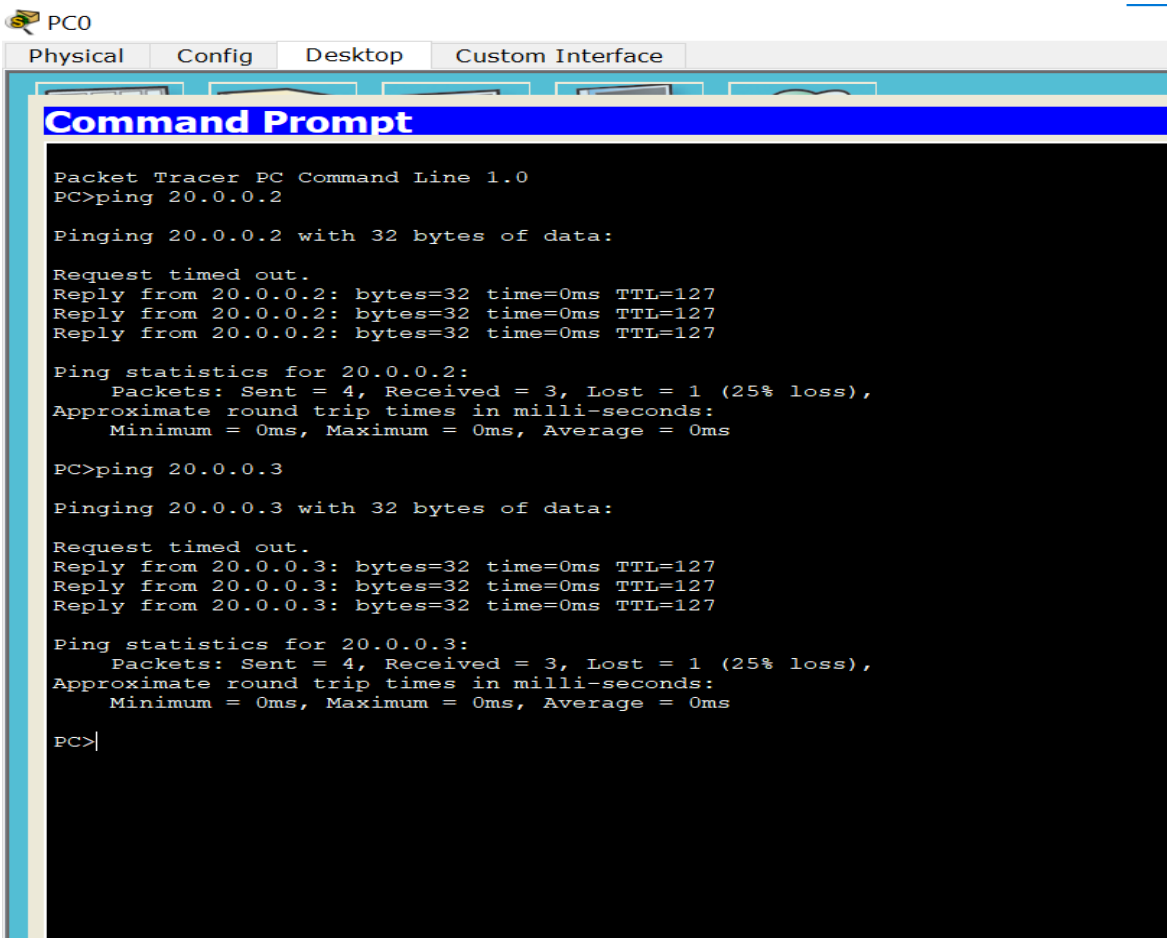
OUTPUT:

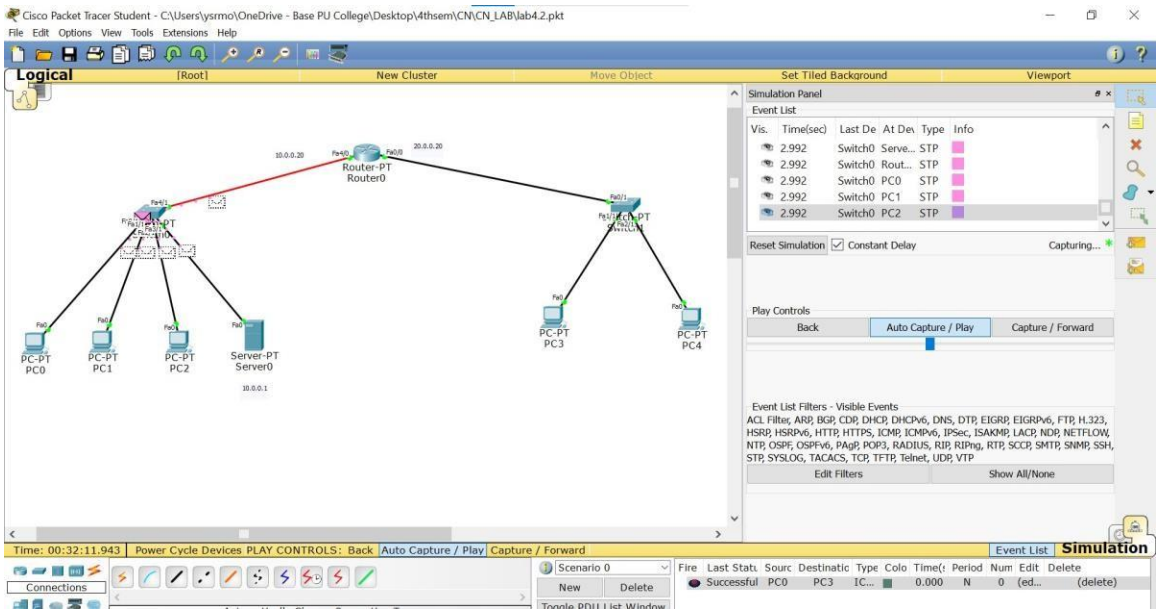
PROGRAM 4.1:





PROGRAM 4.2:


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 20.0.0.2
Pinging 20.0.0.2 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.2: bytes=32 time=0ms TTL=127
Reply from 20.0.0.2: bytes=32 time=0ms TTL=127
Reply from 20.0.0.2: bytes=32 time=0ms TTL=127
Ping statistics for 20.0.0.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>ping 20.0.0.3
Pinging 20.0.0.3 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.3: bytes=32 time=0ms TTL=127
Reply from 20.0.0.3: bytes=32 time=0ms TTL=127
Reply from 20.0.0.3: bytes=32 time=0ms TTL=127
Ping statistics for 20.0.0.3:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>


Logical
Router-PT Router0
PC-PT PC0
PC-PT PC1
PC-PT PC2
Server-PT Server0
PC-PT PC3
PC-PT PC4
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Edit Filters
Show All/None
Simulation

WEEK 6

Configure RIP routing Protocol in Routers.

OBSERVATION

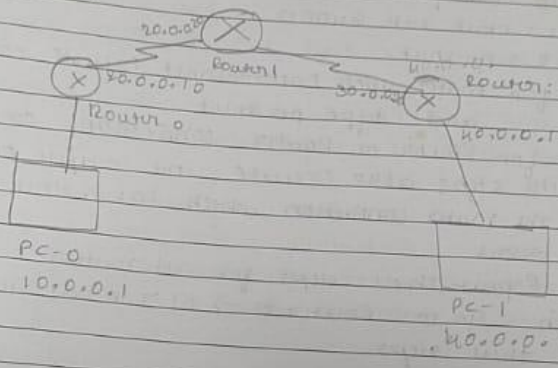
L-A

DATE 20-7-23 PAGE

Aim -

Configure RIP routing protocal in Routers

Topology



Procedure

- Create a Network using 3 routers and 2PC's connect routers using serial DCE cable and PC to router using copper-cross over cable
- Set the IP address and gateway no of both PC's as

10.0.0.1 IP 10.0.0.10 gateway - PC 0

40.0.0.1 IP 40.0.0.10 gateway - PC 1

- Go to Router -> CLI mode and execute the following commands

Step 1 : en

Step 2 : Enable

Step 3 : config T

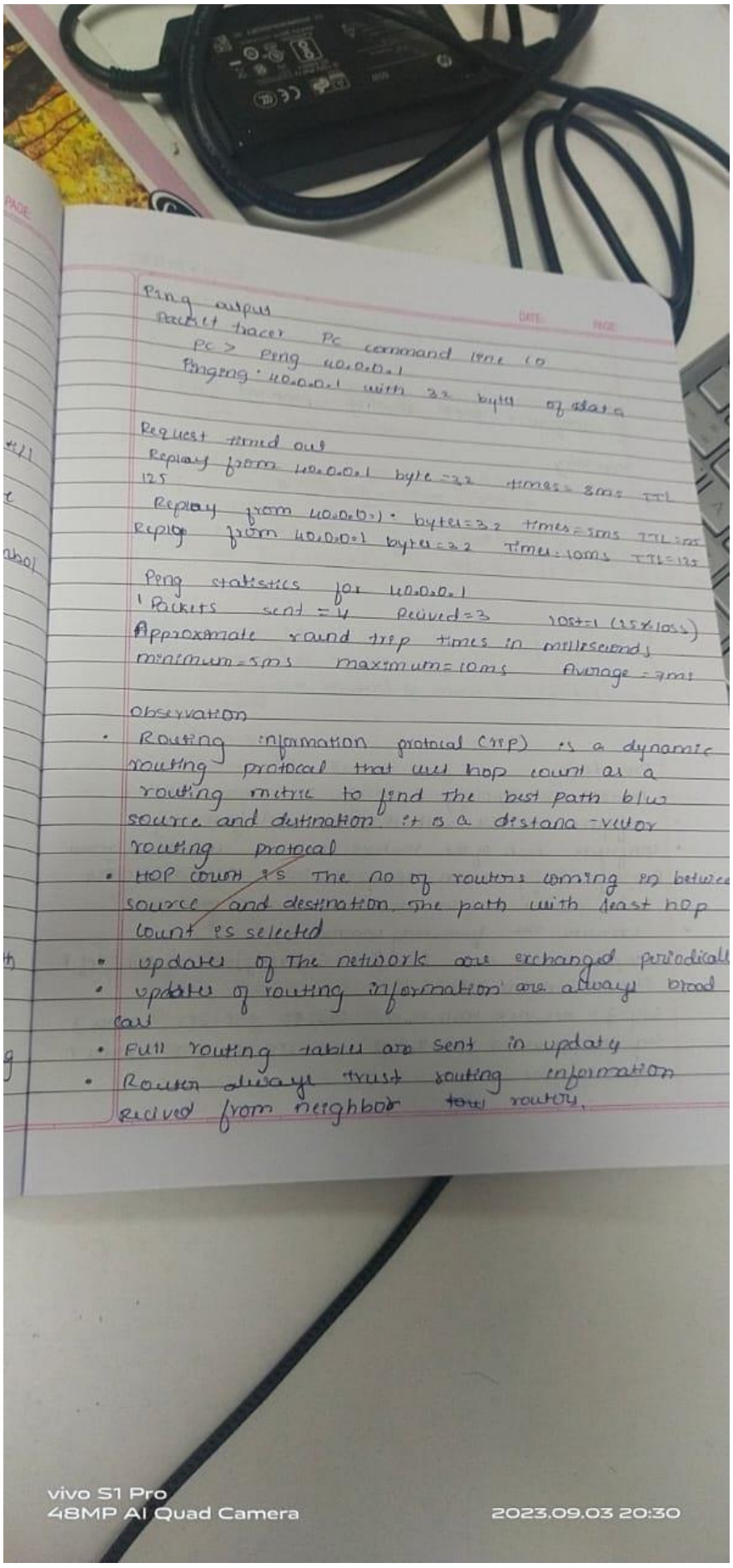
Step 4 : interface FastEthernet 0/0

Step 5 : IP address 10.0.0.10 255.0.0.0
Step 6 : no shut
Step 7 : exit
Step 8 : interface se2/0
Step 9 : IP address 20.0.0.10 255.0.0.0
Step 10 : Encapsulation PPP
Step 11 : clock rate 64000
Step 12 : no shut

- Here for router with FastEthernet execute only till Step 9 and type no shut
- only for Router to Router connection execute all the steps also execute the step 11 only for the router connection which has a clock symbol at start
- ~~Repeat~~ Repeat these steps for all routers
- Again go to Router 0 → CLI mode and type these steps

Step 1 : config T
Step 2 : router rip
Step 3 : network 10.0.0.0
Step 4 : network 20.0.0.0
Step 5 : exit

- Repeat these steps for all routers
- At last now go to each router and type show IP route Here the IP address associated with that router will be labelled as C and other IP address are labelled as R
- Lastly go to PC0 and Ping msg to PC1 using ping destination IP address command



Ping output

Packet tracer PC command line 10

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 byte=32 times=8ms TTL 125

Reply from 40.0.0.1 byte=32 times=3ms TTL=125

Reply from 40.0.0.1 byte=32 times=10ms TTL=125

Ping statistics for 40.0.0.1

Packets sent = 4 Recived=3 lost=1 (25% loss)

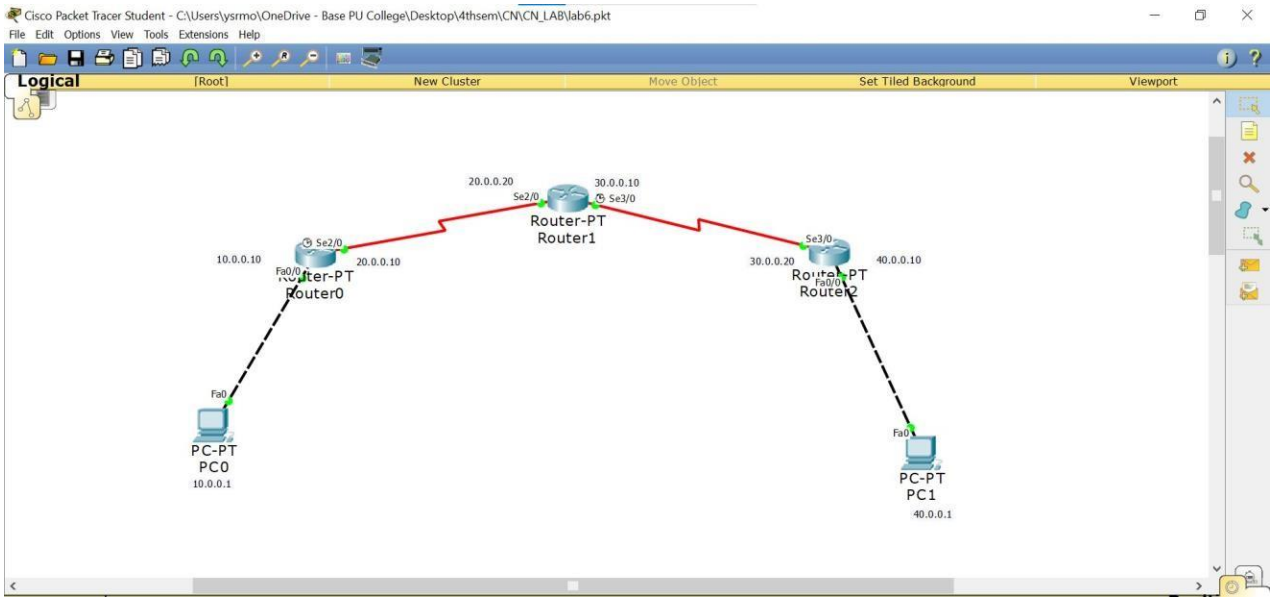
Approximate round trip times in milliseconds

minimum=5ms maximum=10ms Average = 7ms

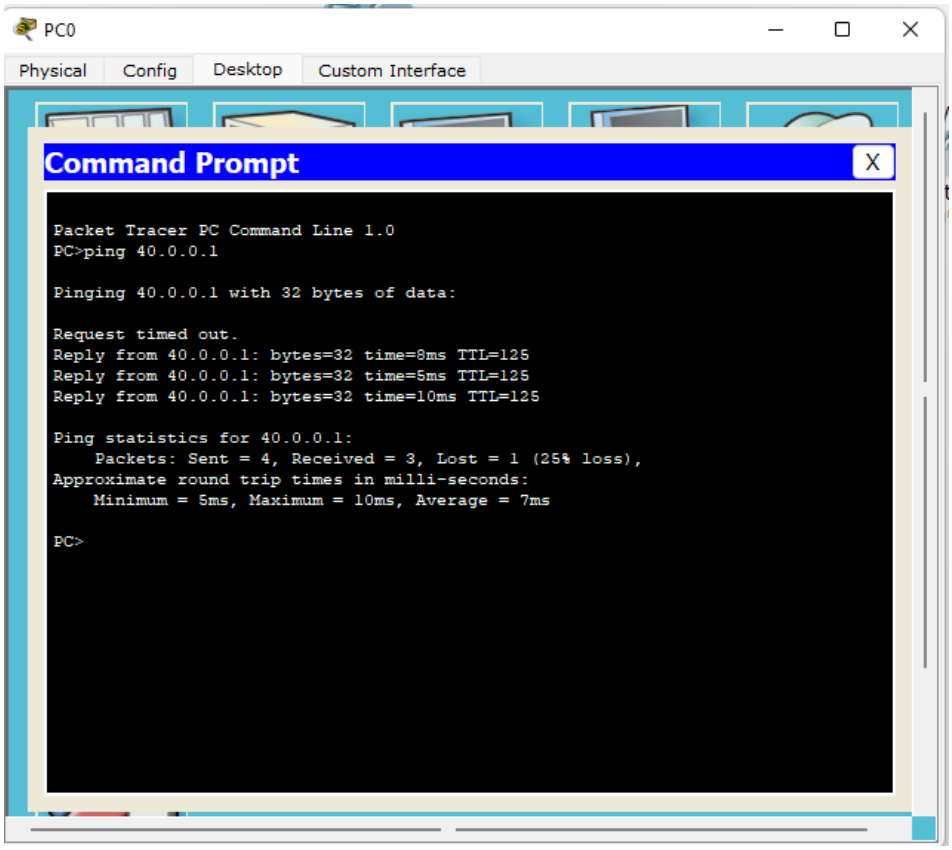
Observation

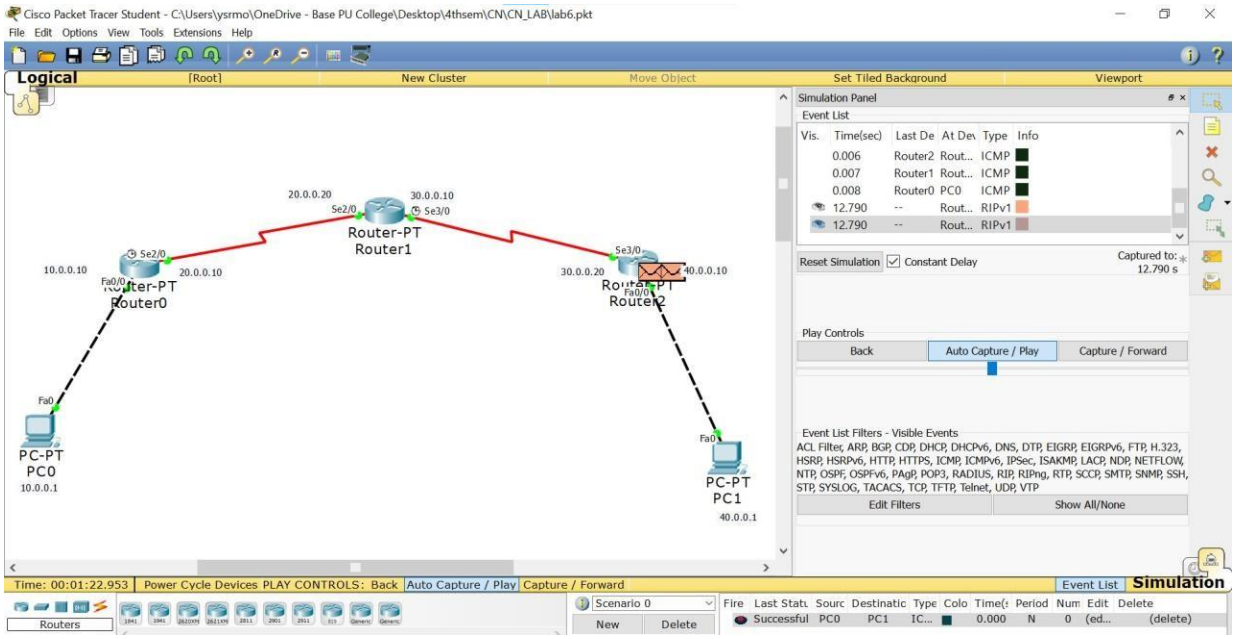
- Routing information protocal (RIP) is a dynamic routing protocal that use hop count as a routing metric to find the best path b/w source and destination. it is a distance-vector routing protocal
- HOP count is the no of routers coming in between source and destination. the path with least hop count is selected
- updates of the networks are exchanged periodically
- updates of routing information are always broad cast
- Full routing tables are sent in updates
- Router always trust routing information recived from neighbor ~~row~~ routers.

TOPOLOGY:



OUTPUT:




Cisco Packet Tracer Student - C:\Users\ysrmo\OneDrive - Base PU College\Desktop\4thsem\CN\CN_LAB\lab6.pkt
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router-PT
Router1
Router-PT
Router0
Router-PT
Router2
PC-PT
PC0
10.0.0.1
PC-PT
PC1
40.0.0.1
20.0.0.20
30.0.0.10
Se2/0
Se3/0
10.0.0.10
20.0.0.10
30.0.0.20
40.0.0.10
Fa0/0
Fa0
Simulation Panel
Event List
Vis. Time(sec) Last De At De Type Info
0.006 Router2 Rout... ICMP
0.007 Router1 Rout... ICMP
0.008 Router0 PC0 ICMP
12.790 -- Rout... RIPv1
12.790 -- Rout... RIPv1
Reset Simulation
Constant Delay
Captured to: 12.790 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: 00:01:22.953
Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation
Routers
Scenario 0
New
Delete
Fire Last Statu Sourc Destinatic Type Colo Time(s Period Num Edit Delete
Successful PC0 PC1 IC... 0.000 N 0 (ed... (delete)

WEEK 5

Configure Web Server, DNS within a LAN.

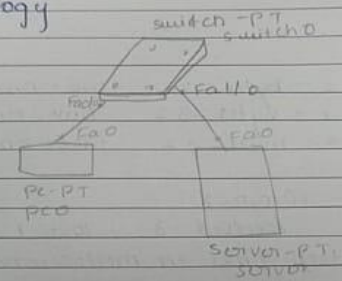
OBSERVATION:

DATE 20/7/23

Aim

Configure web server, DNS within a LAN

Topology



Procedure

- Connect a switch, PC and a server to form a LAN
- Set PC's IP address by clicking on it and go to Config tab, there in fast Ethernet option set IP address as 10.0.0.1 and subnet mask
- Set Server's IP address as 10.0.0.2 and Subnet Mask respectively
- Go to pc's Desktop and click on web browser in the URL tab type 10.0.0.2 you will get a default display

To make a CV here, we need to make changes in server services

- Go to server → services → HTTP → index.html here create the CV and click on save
- Again go to PC → Desktop → web browser and type 10.0.0.2 you will get the CV or content that is changed
- Next go to server → services → DNS and switch on the services now add a domain name and type the IP address as 10.0.0.2 plus add & save it
- Again go back to PC → Desktop → web browser and type the given domain name, here we can see the CV which has been created earlier as

Output

web browser

< > URL http://gAmulya Go Stop

CV

Amulya SA

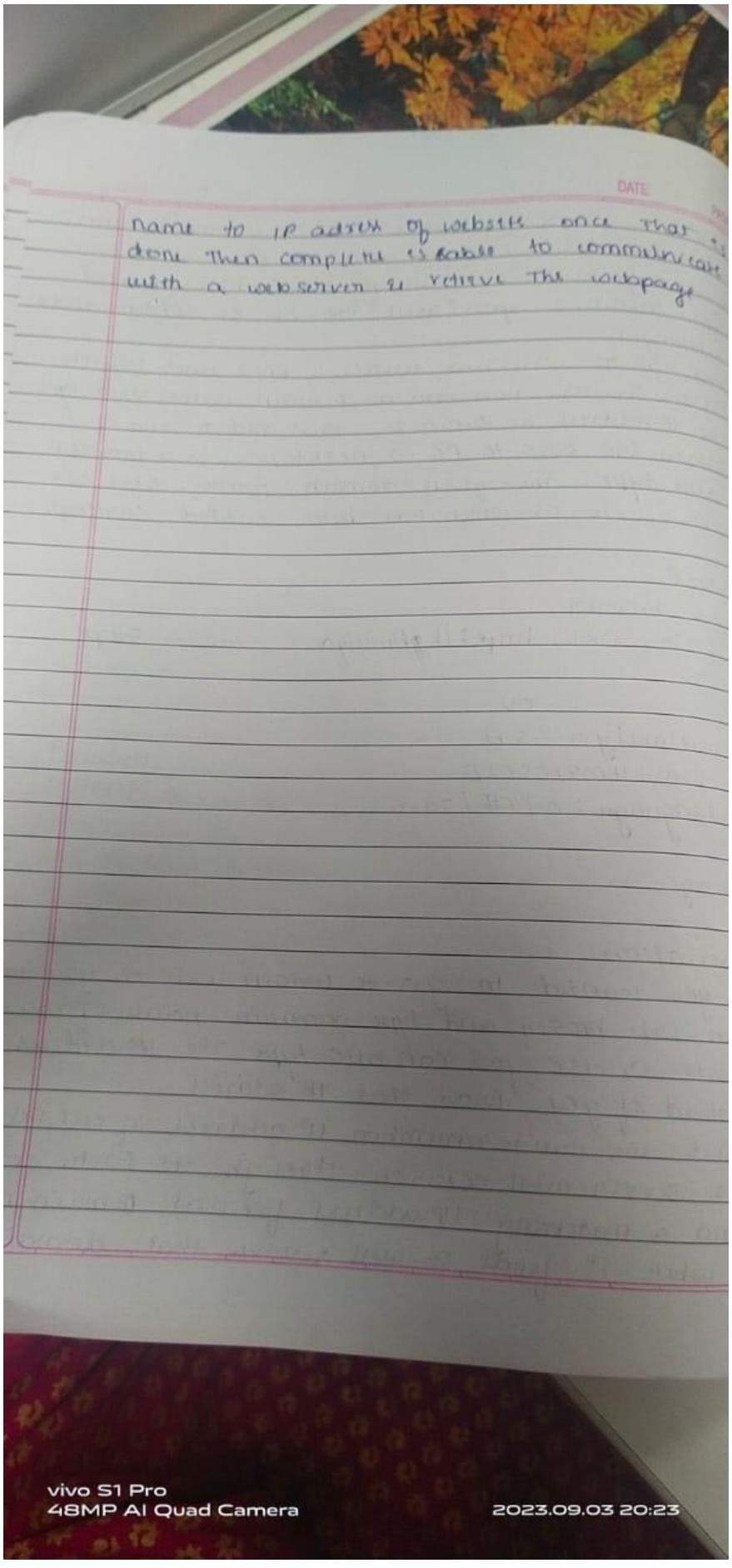
USN : 1BM21CS020

Language : C / C# / Java.

Image

Observation

- If you wanted to go to certain website you would open web broser and type domain name of that website or else you can also type the IP address instead if you know that IP address
- since we can't remember IP address of all websites DNS server will search through it cache to find a matching IP address for that domain name & when it finds it will resolve that domain


DATE

Name to IP adress of website once that is done Then complete is able to communicate with a web server & retrieve the webpage

vivo S1 Pro
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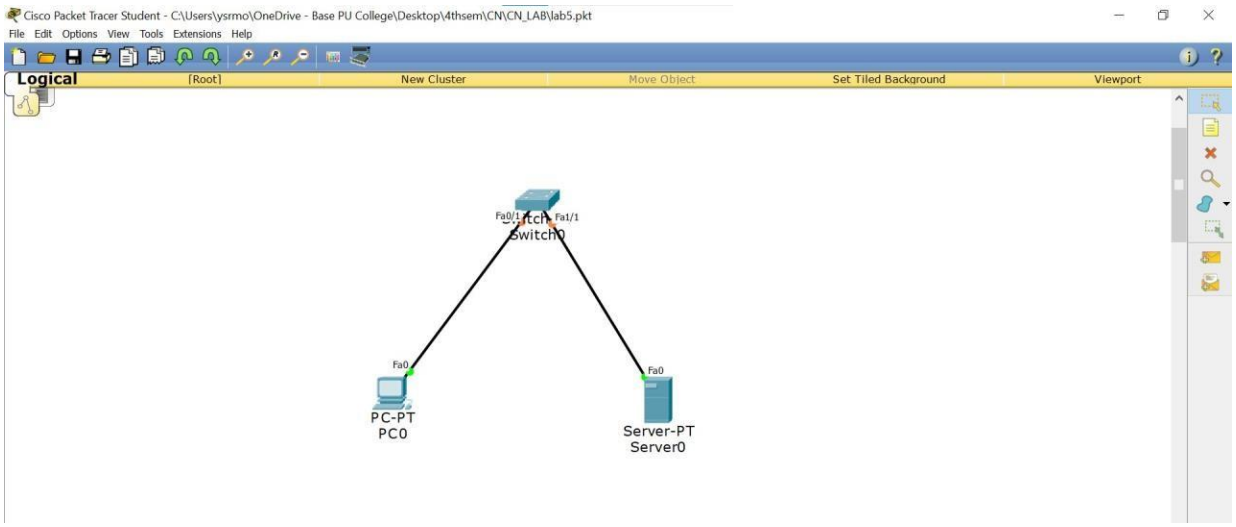
2023.09.03 20:23

TOPOLOGY:


Cisco Packet Tracer Student - C:\Users\ysrmo\OneDrive - Base PU College\Desktop\4thsem\CN\CN_LAB\lab5.pkt
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Fa0/1
Fa1/1
Switch0
Fa0
PC-PT
PC0
Fa0
Server-PT
Server0

WEEK 7

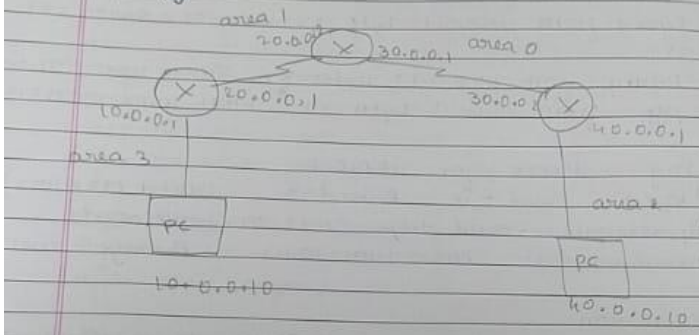
Configure OSPF routing protocol.

OBSERVATION:

DATE 27/7/23

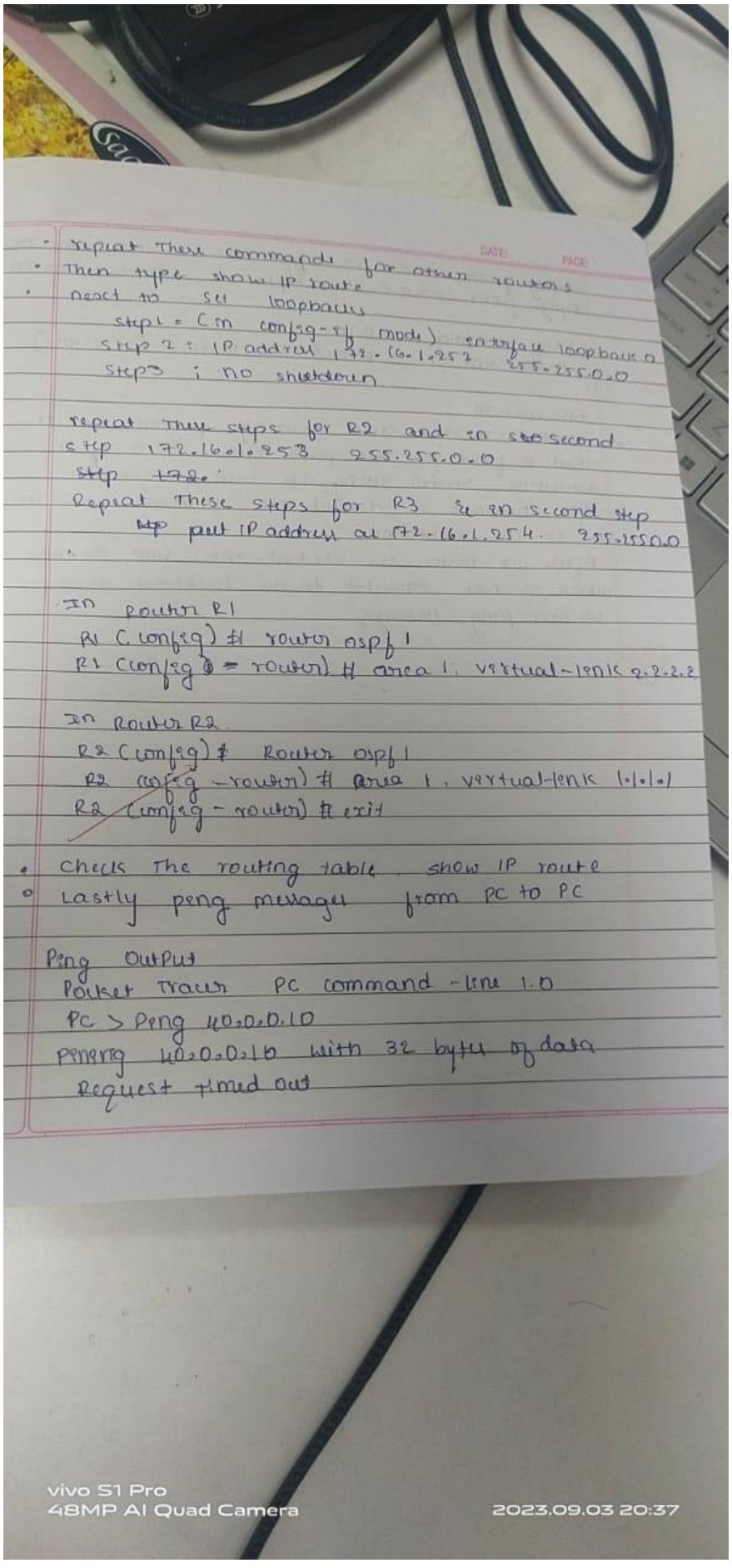
Aim :-
Configure OSPF routing protocal

Topology



Procedure
- Create the topology using 3 routers & 2 PC's
- Configure the PC's with IP address and gateway
- Configure each of the routers acc to IP address given
- During configuration, encapsulation PPP and clock rate should be set as done in RIP protocal
- execute the following commands.

Step 1 : router OSPF 1 // R1(config)# router ospf 1
Step 2 : router-id 1.1.1.1
Step 3 : network 10.0.0.0 0.255.255.255 area 3
Step 4 : network 20.0.0.0 0.255.255.255 area 1
Step 5 : exit



- Repeat these commands for other routers
- Then type show IP route
- Next to set loopbacks
  step 1 = (in config-if mode) interface loopback 0
  step 2 : IP address 172.16.1.252 255.255.0.0
  step 3 : no shutdown

Repeat these steps for R2 and in second step
~~step 172.16.1.253 255.255.0.0~~
~~step 172.~~
Repeat these steps for R3 & in second step
~~step~~ put IP address as 172.16.1.254. 255.255.0.0

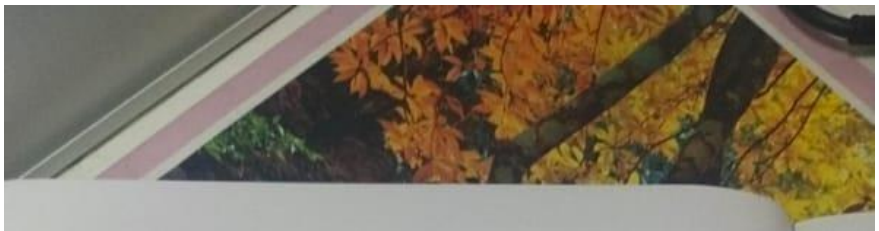
In router R1
R1 (config) # router ospf 1
R1 (config) = router) # area 1. virtual-link 2.2.2.2

In Router R2
R2 (config) # Router ospf 1
R2 (config-router) # Area 1. virtual-link 1.1.1.1
R2 (config-router) # exit

- Checks the routing table. show IP route
- Lastly peng message from PC to PC

Ping OutPut
Packet Tracer PC command-line 1.0
PC > Ping 40.0.0.10
Pinging 40.0.0.10 with 32 bytes of data
Request timed out

vivo S1 Pro
48MP AI Quad Camera
2023.09.03 20:37



DATE: PAGE:

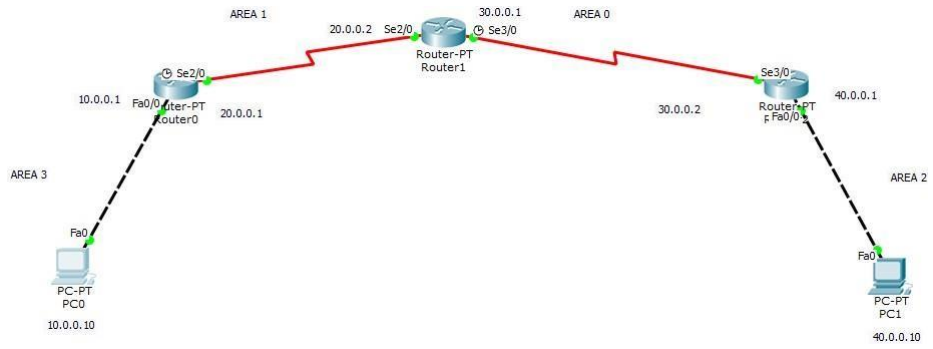
Reply from 40.0.0.10 byte=32 time=11ms TTL
Reply from 40.0.0.10 byte=32 time=8ms TTL

Ping statistic 40.0.0.10
Packet sent = 4 Recived = 3 lost = 1 (25% loss)

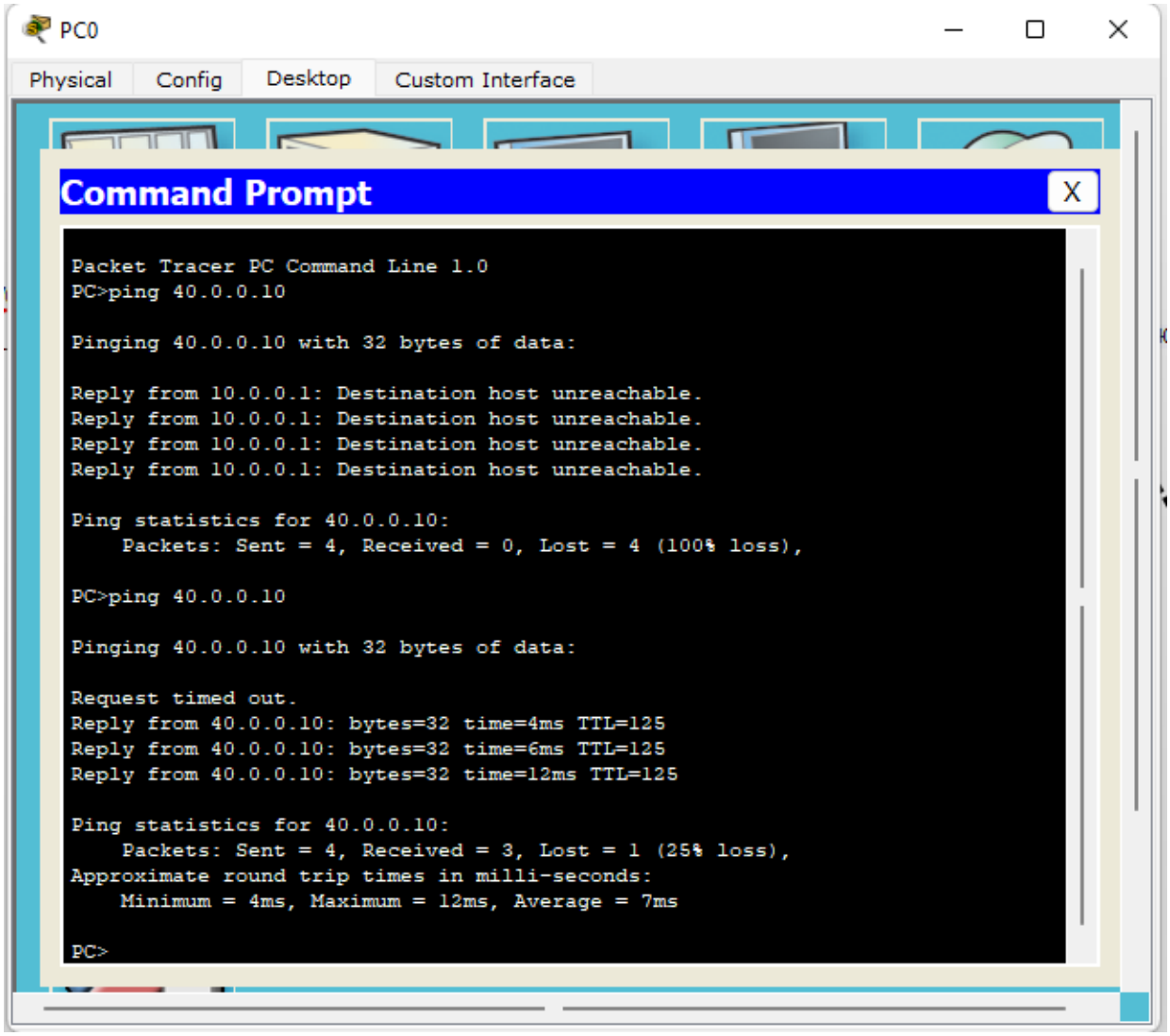
observation

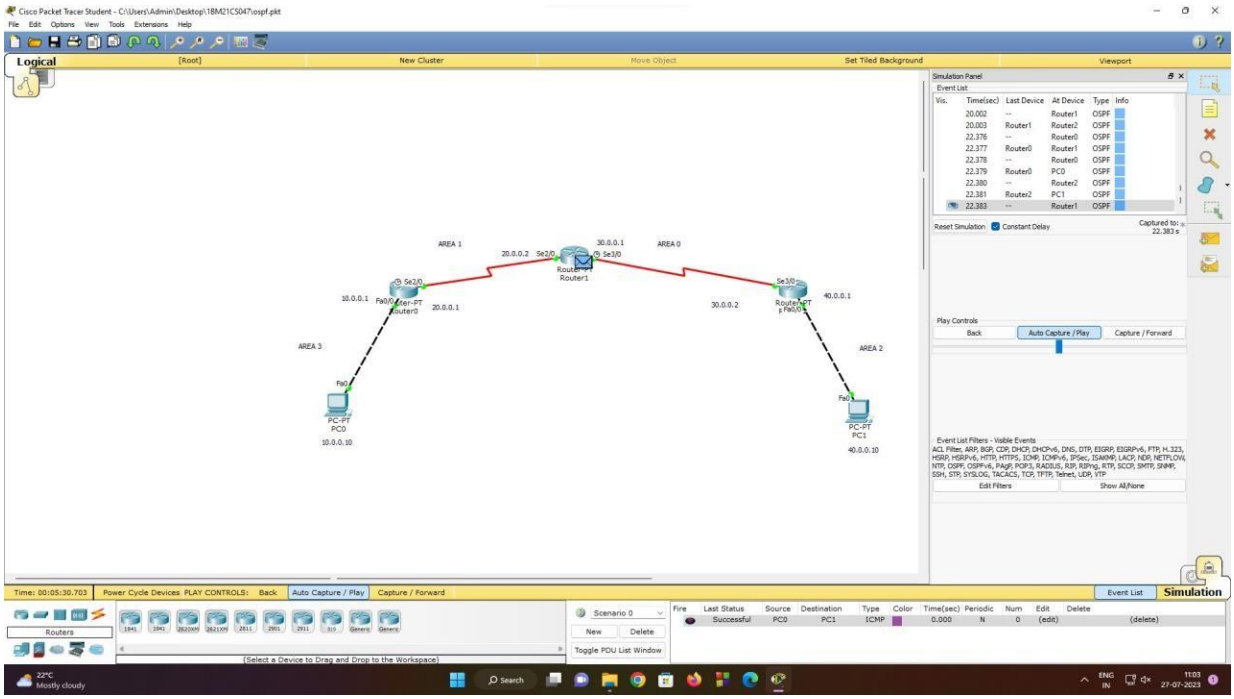
- OSPF is a link state routing protocal that is used to find the best path blw source & destination router using its own Algorithm
- This network is divided into 4 area where area 0 is the backbone
- After we make the virtual-link blw the area which is not connected to the backbone area, we can ping messages.

TOPOLOGY:



OUTPUT:




Cisco Packet Tracer Student - C:\Users\Admin\Desktop\1BM21CS047\ospf.pkt
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
AREA 1
AREA 0
AREA 3
AREA 2
20.0.0.2
Se2/0
30.0.0.1
Se3/0
Router1
Router0
10.0.0.1
Fa0/0
20.0.0.1
30.0.0.2
40.0.0.1
PC-PT PC0
10.0.0.10
PC-PT PC1
40.0.0.10
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Edit Filters
Show All/None
Time: 00:05:30.703
Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation
Routers
Scenario 0
New
Delete
Toggle PDU List Window
(Select a Device to Drag and Drop to the Workspace)
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
22°C
Mostly cloudy
Search
ENG
IN
11:03
27-07-2023

WEEK 8

To construct a simple LAN and understand the concept and operation of Address Resolution Protocol (ARP).

OBSERVATION:

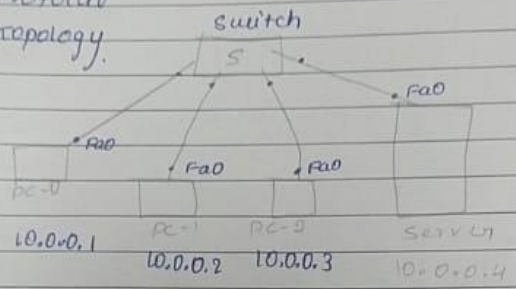
DATE:

~~Ex~~

Experiment

Aim:- To construct simple LAL and understand the concept and operation of Address Resolution Protocal

Topology.



Procedure :-

Create a topology of 3 PC's and server & IP address assigned to all. connect them through switch.

use the inspect tool to click on a PC to see the ARP table.

~~Command~~ type command in CLI for the same : arp-a. Initially ARP Table is empty

Also in CLI of switch the command - show mac address-table can be given on transaction see how the switch learns from transactions and build address table

use the capture button in the simulation pa to go step by step so that the changes in AR can be clearly noted

Result :-

go to pc04 desktop - command Promt and type

Ping 10.0.0.4

Replay from 10.0.0.4 byte=32 time=5ms TTL=128
Replay from 10.0.0.4 byte=32 time=1ms TTL=128
Replay from 10.0.0.4 : byte=32 time=0ms TTL=128
Replay from 10.0.0.4 : byte=32 time=0ms TTL=128

Ping statistic for 10.0.0.4
Packet : Sent=4, Received=4, Lost=0 (0% loss)
Approximate round trip time in milli-seconds
Minimum=0ms, maximum=5ms Average=1ms

- Pc> ~~ping~~ arp -a

Internet Address	Physical Address	Type
10.0.0.2	000b.bed5.1563	dynamic
10.0.0.3	0090.21b1.7e22	dynamic
10.0.0.4	0009.7cc4.eb03	dynamic

-> go to switch CLI & type
Switch > show mac-address-table

Mac Address Table

Vlan	mac Address	TYPE	Ports
1	0009.7cc4.eb03	Dynamic	Fa3/1
1	000b.bed5.1563	Dynamic	Fa7/1
1	0090.21b1.7e22	Dynamic	Fa2/1
1	00d0.9758.70c6	Dynamic	Fa0/1

ARP table for PC0

IP Address	Hardware Address	Interface
10.0.0.2	000B.BED5.1563	FastEthernet
10.0.0.3	0090.21B1.7E22	FastEthernet
10.0.0.4	0009.7CC4.EB03	FastEthernet

ARP table for PC1

IP address	Hardware Address	Interface
10.0.0.1	0000.9578.20E6	FastEthernet
10.0.0.3	0090.21B1.7E22	FastEthernet
10.0.0.4	0009.7CC4.EB03	FastEthernet

ARP table for PC2

IP address	Hardware Address	Interface
10.0.0.1	0000.9578.20E6	FastEthernet
10.0.0.2	000B.BED5.1563	FastEthernet
10.0.0.4	0009.7CC4.EB03	FastEthernet

ARP table for Server0

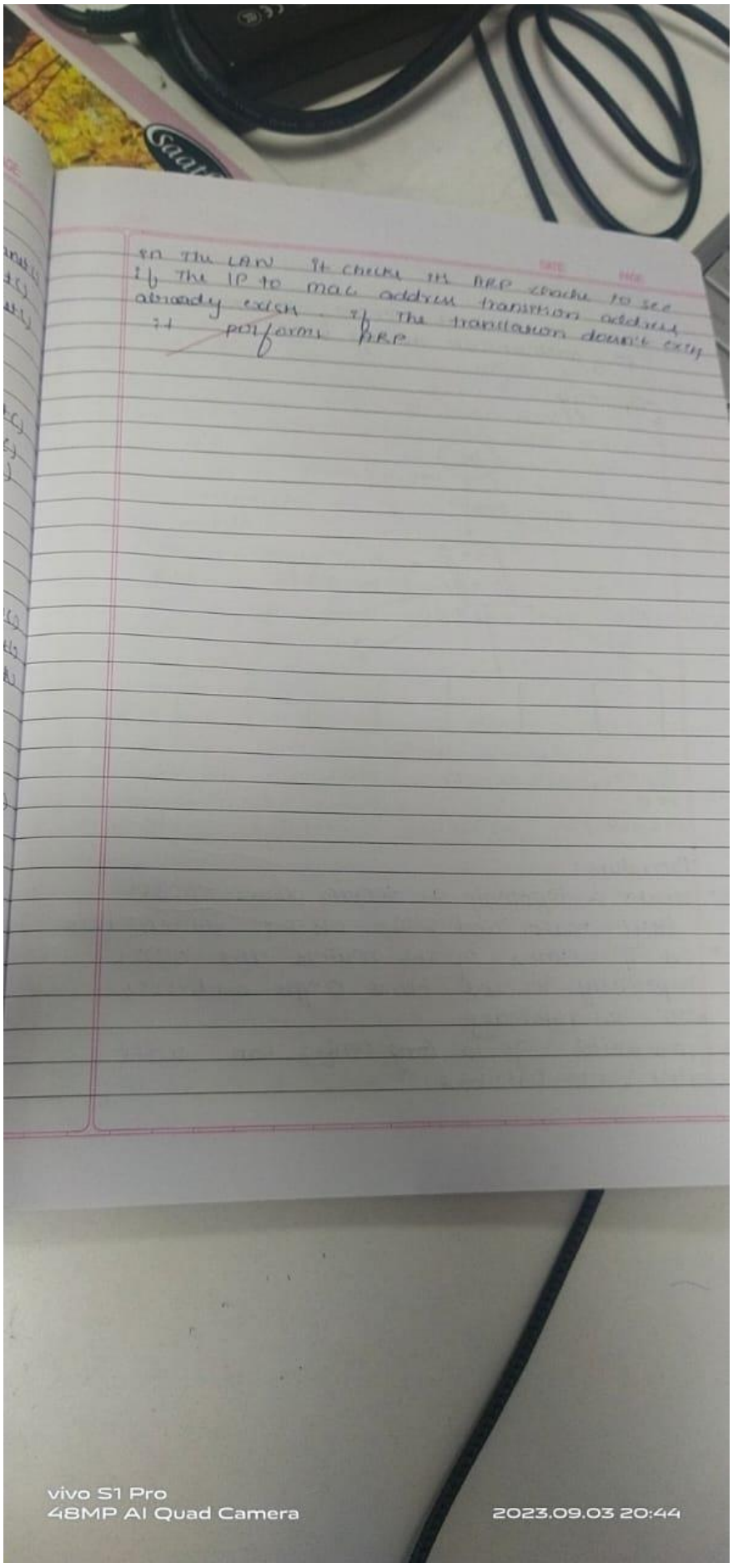
IP address	Hardware Address	Interface
10.0.0.1	0000.9578.20E6	FastEthernet
10.0.0.2	000B.BED5.1563	FastEthernet
10.0.0.3	0090.21B1.7E22	FastEthernet

observation

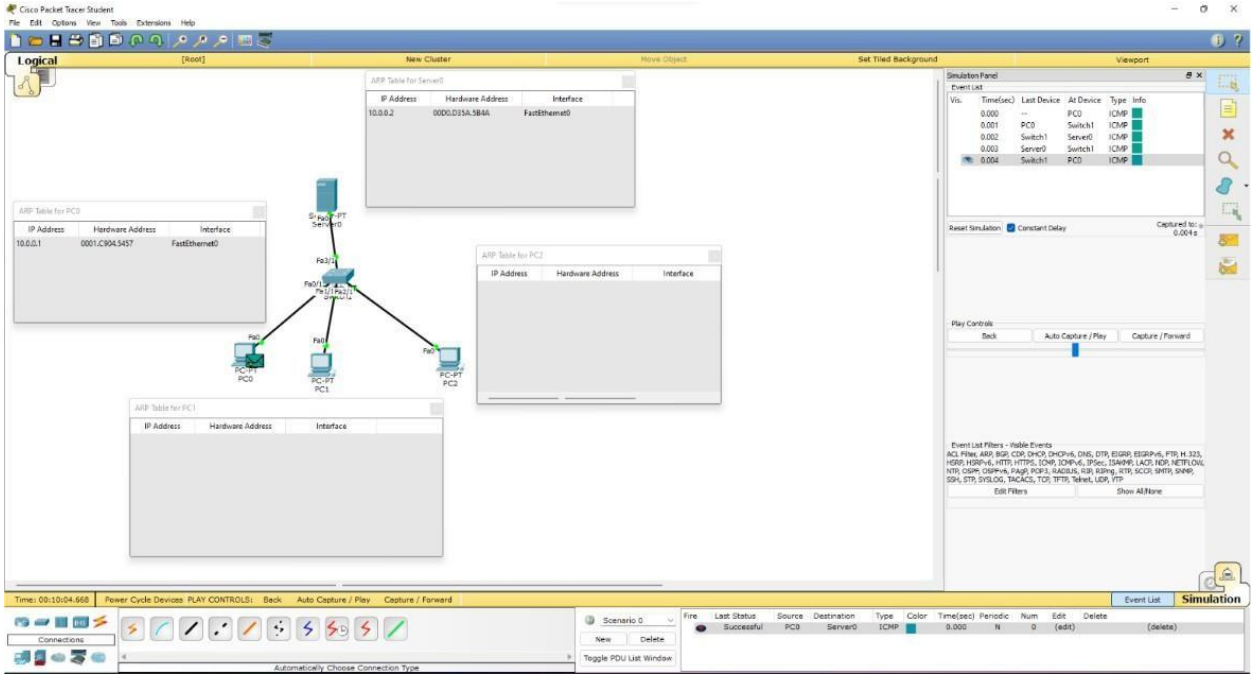
When we Ping PC and server the address of server is known to PC & vese versa

When we Ping b/w other two PC's simultaneously the address of each other are known

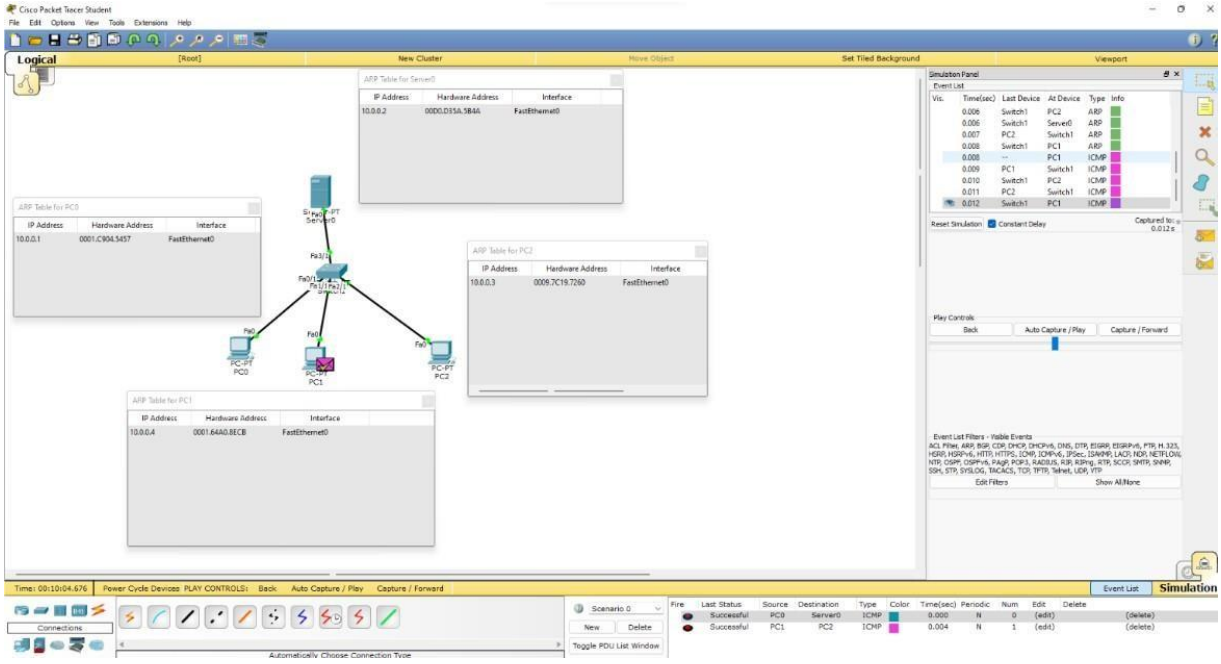
Every time a host requests a mac address in order to send a packet to another host

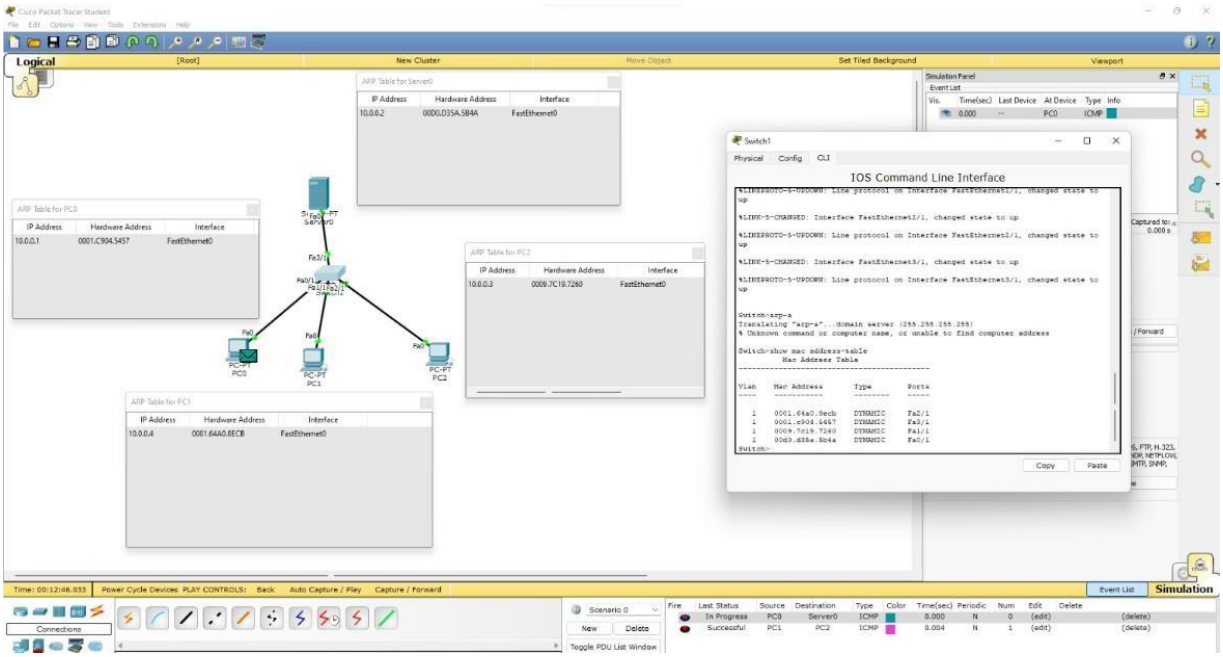

In the LAN it checks its ARP cache to see if the IP to MAC address translation address already exist. If the translation doesn't exist it performs ARP
vivo S1 Pro
48MP AI Quad Camera
2023.09.03 20:44

TOPOLOGY:



OUTPUT:




Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
ARP Table for Server0
IP Address
Hardware Address
Interface
10.0.0.2
00D0.D35A.5B4A
FastEthernet0
ARP Table for PC0
10.0.0.1
0001.C904.5457
FastEthernet0
ARP Table for PC2
10.0.0.3
0009.7C19.7260
FastEthernet0
ARP Table for PC1
10.0.0.4
0001.64A0.8ECB
FastEthernet0
Switch1
Physical
Config
CLI
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet3/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/1, changed state to up
Switch>arp-a
Translating "arp-a"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address
Switch>show mac address-table
Mac Address Table
Vlan Mac Address Type Ports
1 0001.64a0.8ecb DYNAMIC Fa2/1
1 0001.c904.5457 DYNAMIC Fa3/1
1 0009.7c19.7260 DYNAMIC Fa1/1
1 00d0.d35a.5b4a DYNAMIC Fa0/1
Switch>
Copy
Paste
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
At Device
Type
Info
0.000
PC0
ICMP
Time: 00:12:46.033
Power Cycle Devices
PLAY CONTROLS:
Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Connections
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
In Progress
PC0
Server0
ICMP
0.000
N
0
(edit)
(delete)
Successful
PC1
PC2
ICMP
0.004
N
1
(edit)
(delete)

WEEK 9

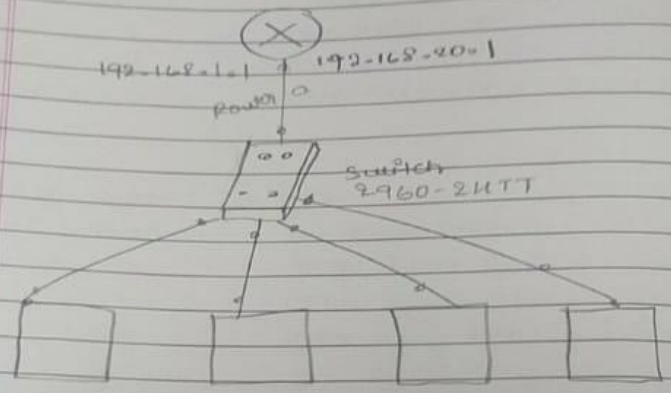
To construct a VLAN and make a pc communicate among VLAN.

OBSERVATION:

DATE: PAGE:

Aim:- To construct a VLAN and make a PC communicate among VLAN

Topology.



PC-PT	PC-PT	PC-PT	PC-PT
PC0	PC1	PC2	PC3
192.168.1.2	192.168.1.3	192.168.20.2	192.168.20.3

Procedure:

Create a topology as shown above chose 1841 router and 2960-24TT switch here set ip address of the routers and 4 PC's respectively we use class C type address also set gateway

On switch, go to config tab and select VLAN Database

give any VLAN no like 2 and name as VLAN
select the interface fastethor 4/1 and make it trunk
- next select the switches under end interface which has interface 0/3 & 0/4 click on each of them and set VLAN number 2.
- go to router → config tab and select VLAN Database and enter the name VLAN & no 2 created
- go to router → CLI and type following command

step 1 : config T
step 2 : interface fa0/0
step 3 : ip address 192.168.1.1 255.255.255.0
step 4 : no shut
step 5 : exit
step 6 : config T
step 7 : interface fa 0/0.1
step 8 : encapsulation dot1q 2
step 9 : IP address 192.168.20.1 255.255.255.0
step 10 : no shut
step 11 : exit

Ping message from PC to another VLAN pc

Ping output
Packet tracer PC command line 1.0
PC > Ping 192.168.20.3
Pinging 192.168.20.3 with 32 bytes of data:
Request timed out

DATE: PAGE:

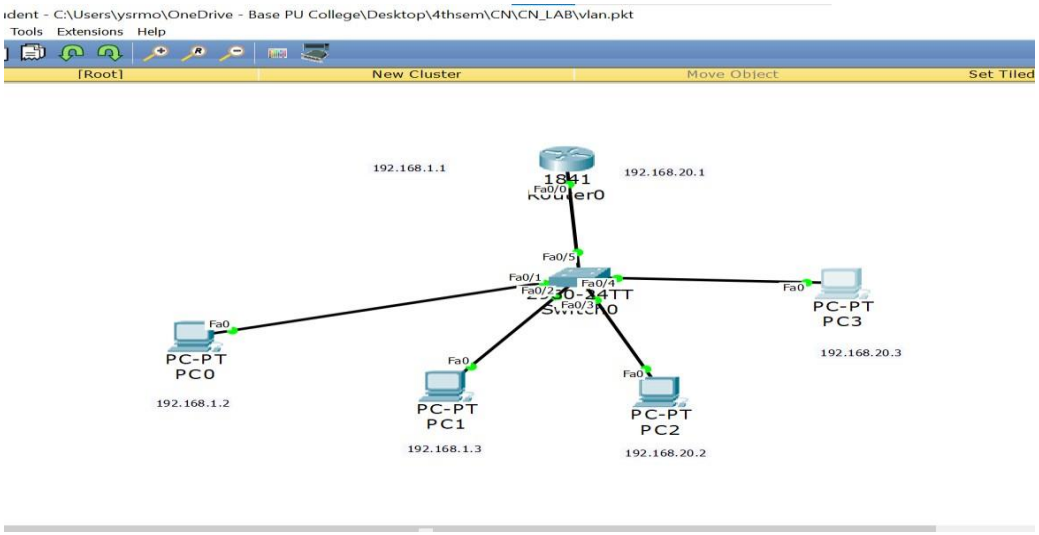
Reply from 192.168.20.3: bytes=32 times=0ms
Reply from 192.168.20.3: bytes=32 times=5ms
Reply from 192.168.20.3: bytes=32 time=0ms
ping statistics for 192.168.20.3

Packets: sent=4, Recived=3 lost 1 (25% loss)
Approx round trip times in ms
Minimum=0ms maximum=5ms Average=1ms

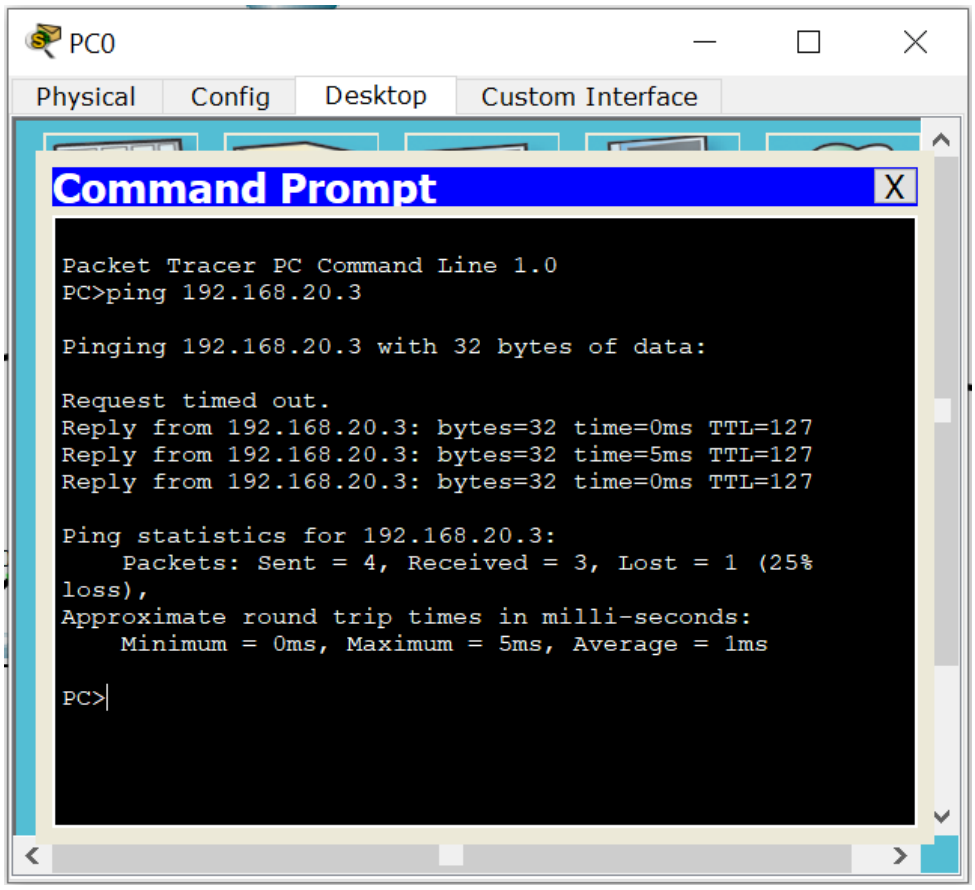
Observation:-

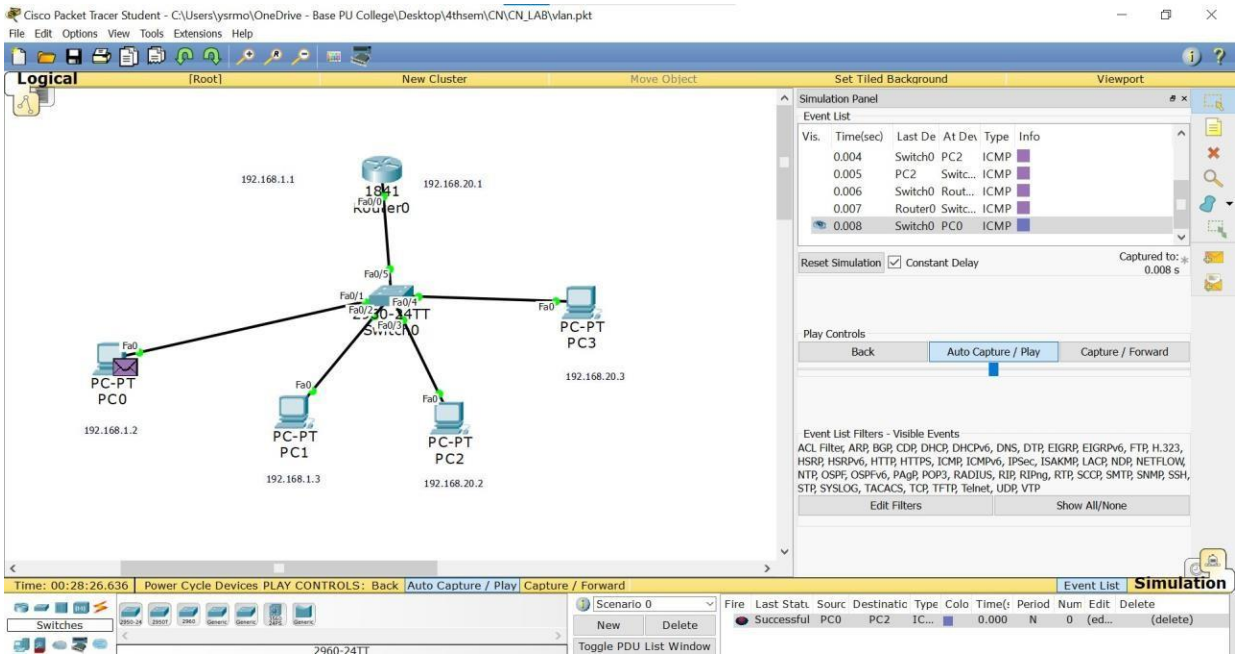
- We can have one device on one VLAN & another on another VLAN connected to the same switch. They will only hear other broadcast traffic from within their VLAN, as if they were connected to two switches
- here VLANs doesn't use IP address instead deal with subnets / classic type address
- Inter-VLAN routing gives a flexible tool to logically subdivide their networks that has potential to enhance security & performance

TOPOLOGY:


ident - C:\Users\ysrmo\OneDrive - Base PU College\Desktop\4thsem\CN\CN_LAB\vlan.pkt
Tools Extensions Help
[Root]
New Cluster
Move Object
Set Tiled
192.168.1.1
1841
Router0
192.168.20.1
Fa0/0
Fa0/5
Fa0/1
Fa0/4
Fa0/3
Fa0
PC-PT
PC0
192.168.1.2
PC-PT
PC1
192.168.1.3
PC-PT
PC2
192.168.20.2
PC-PT
PC3
192.168.20.3

OUTPUT:


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 192.168.20.3
Pinging 192.168.20.3 with 32 bytes of data:
Request timed out.
Reply from 192.168.20.3: bytes=32 time=0ms TTL=127
Reply from 192.168.20.3: bytes=32 time=5ms TTL=127
Reply from 192.168.20.3: bytes=32 time=0ms TTL=127
Ping statistics for 192.168.20.3:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 5ms, Average = 1ms
PC>


Logical
PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
192.168.1.2
192.168.1.3
192.168.20.2
192.168.20.3
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Edit Filters
Show All/None
Simulation

WEEK 10

Demonstrate the TTL/ Life of a Packet.

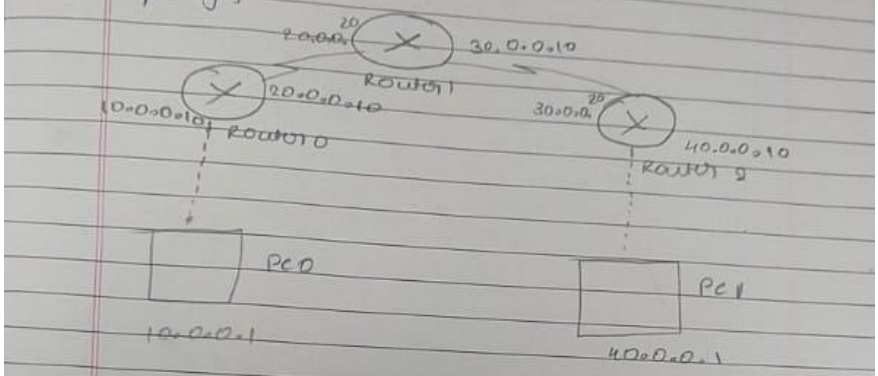
OBSERVATION:

Router(config-router)# exit

Aim

Demonstrate the TTL / life of a packet

Topology

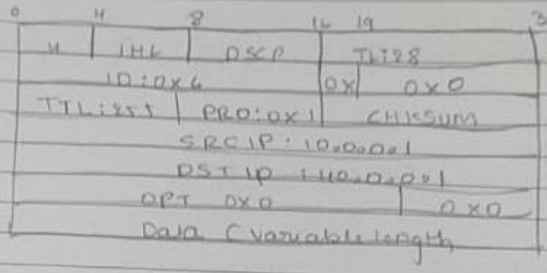


Procedure:

- Create a topology as shown above with two PC's and 3 Routers
- Set the IP address and gateway for both PC's
- Configure the router either static / default routing
- In simulation mode send a simple PDU from one PC to another
- Use capture button to capture every transfer.
- Click on the PDU during every transfer to see the Inbound & outbound PDU details

DATE PAGE

Output



Observation

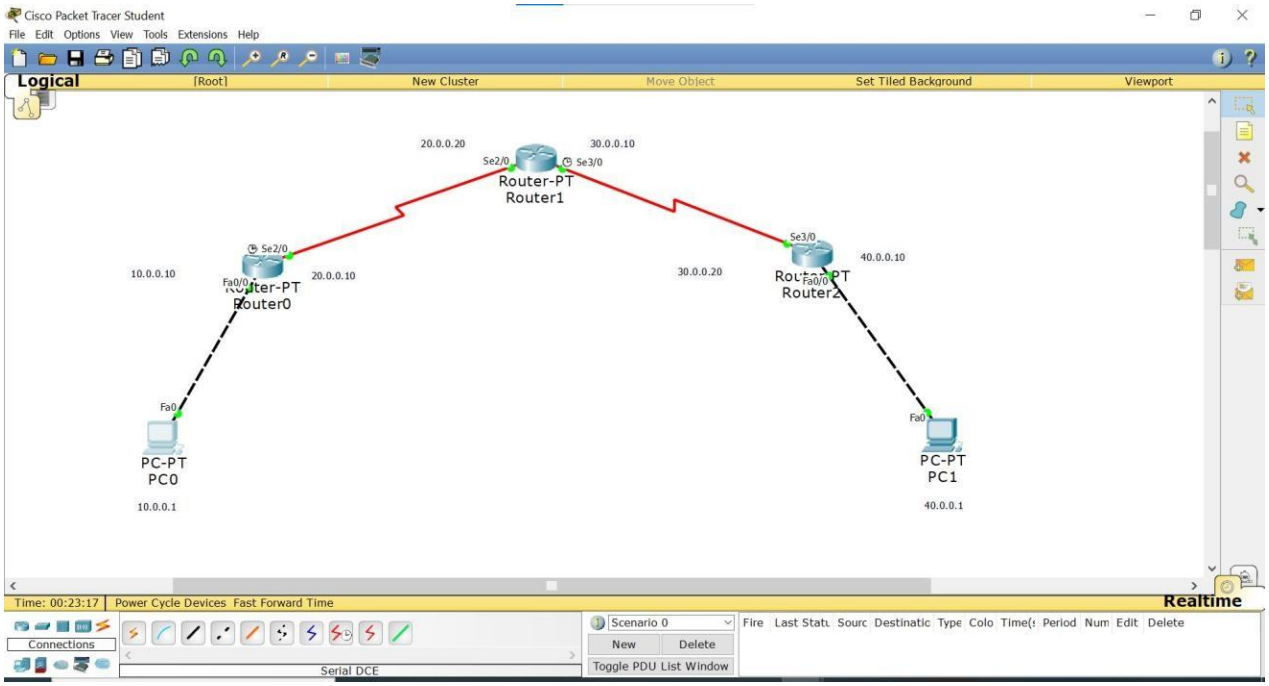
The no of hops the packet travel before being discared as TTL

Datagrams TTL field is set by the sender & reduced by each router along the path to its destination

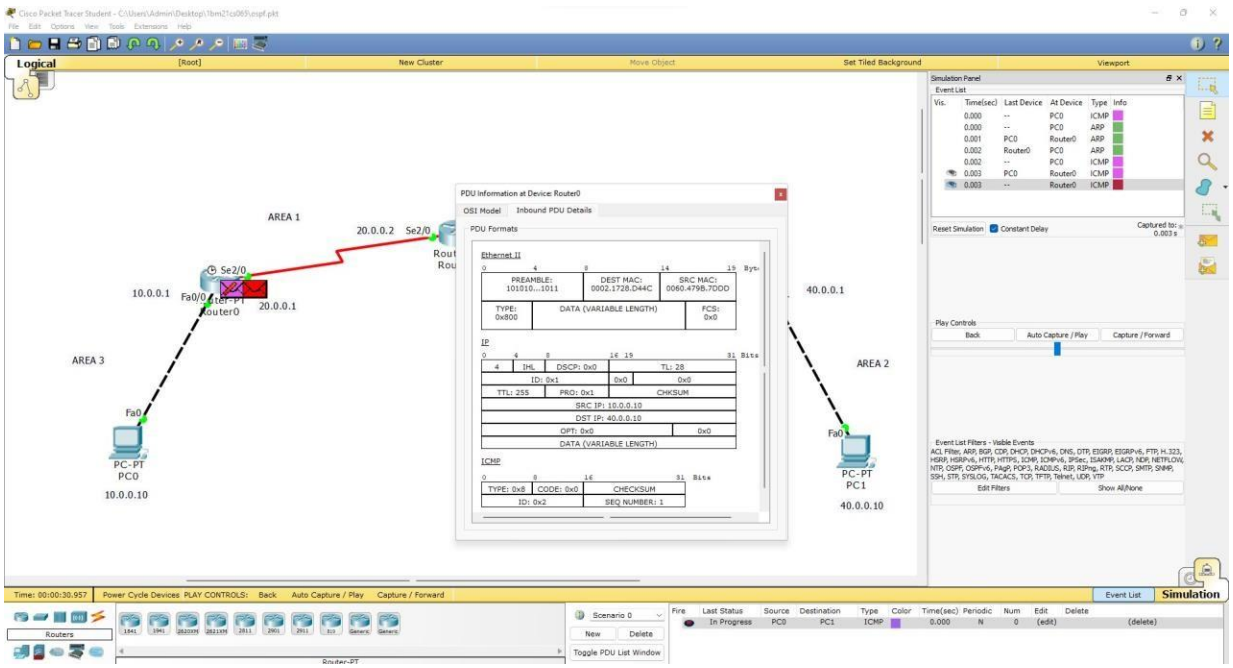
The router reduce TTL value by one while forwarding the packets

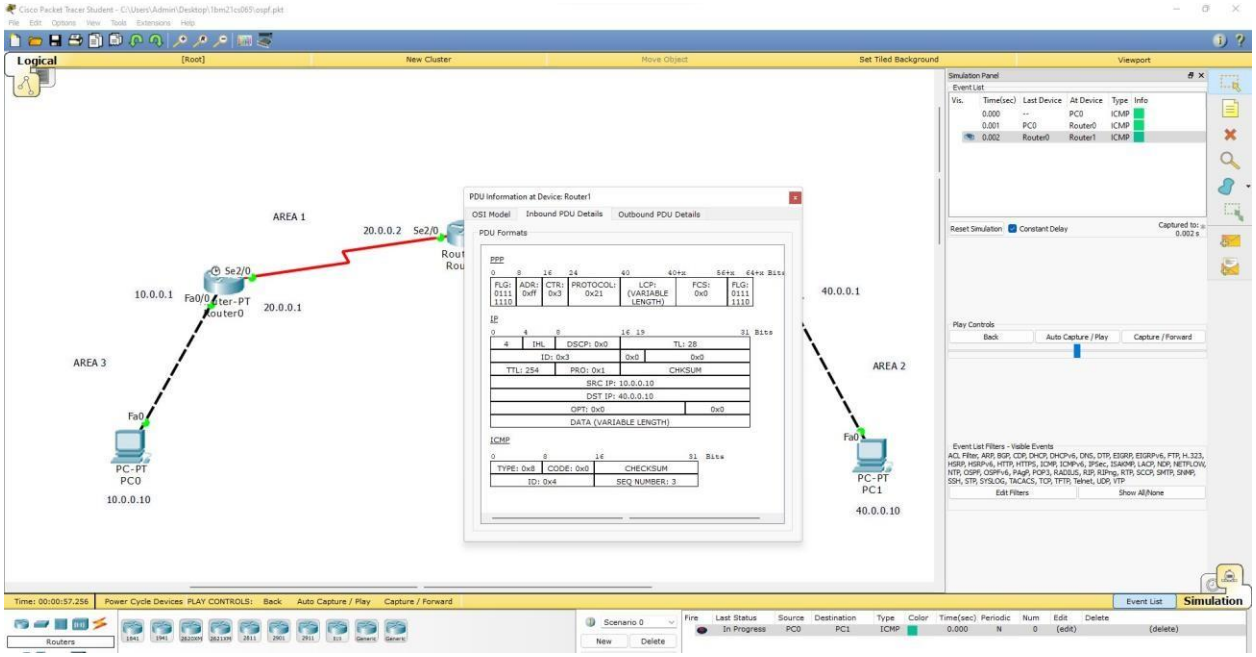
when the TTL value is 0, the router discards it & sends an ICMP message

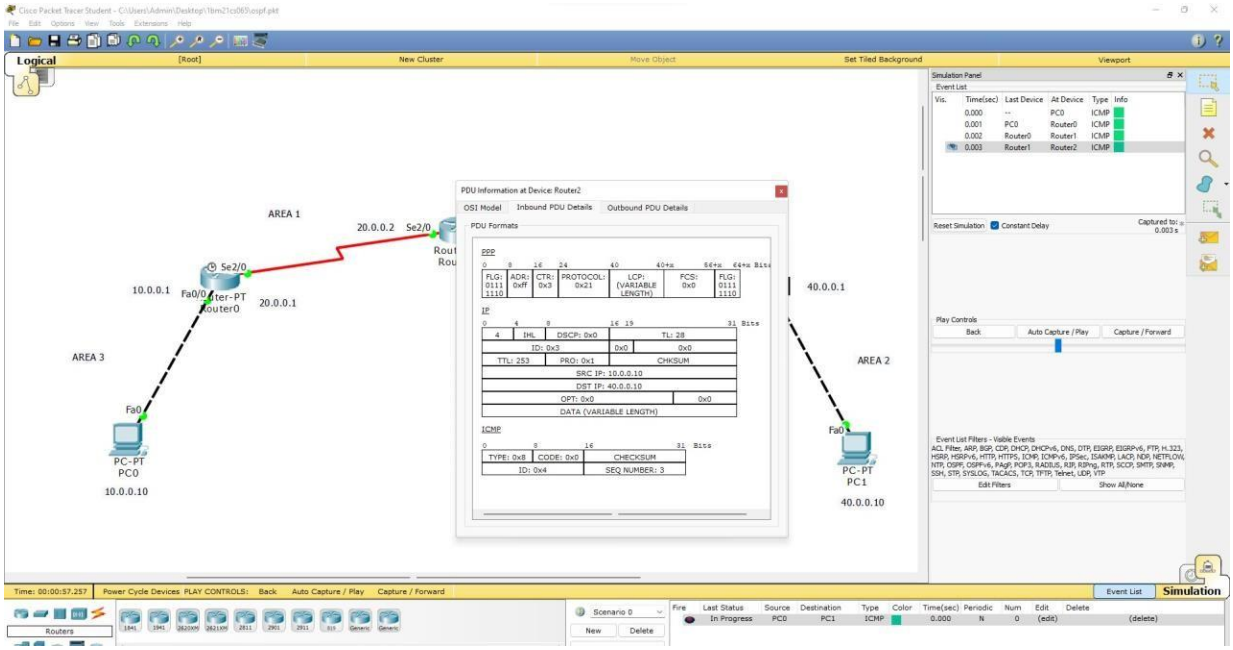
TOPOLOGY:

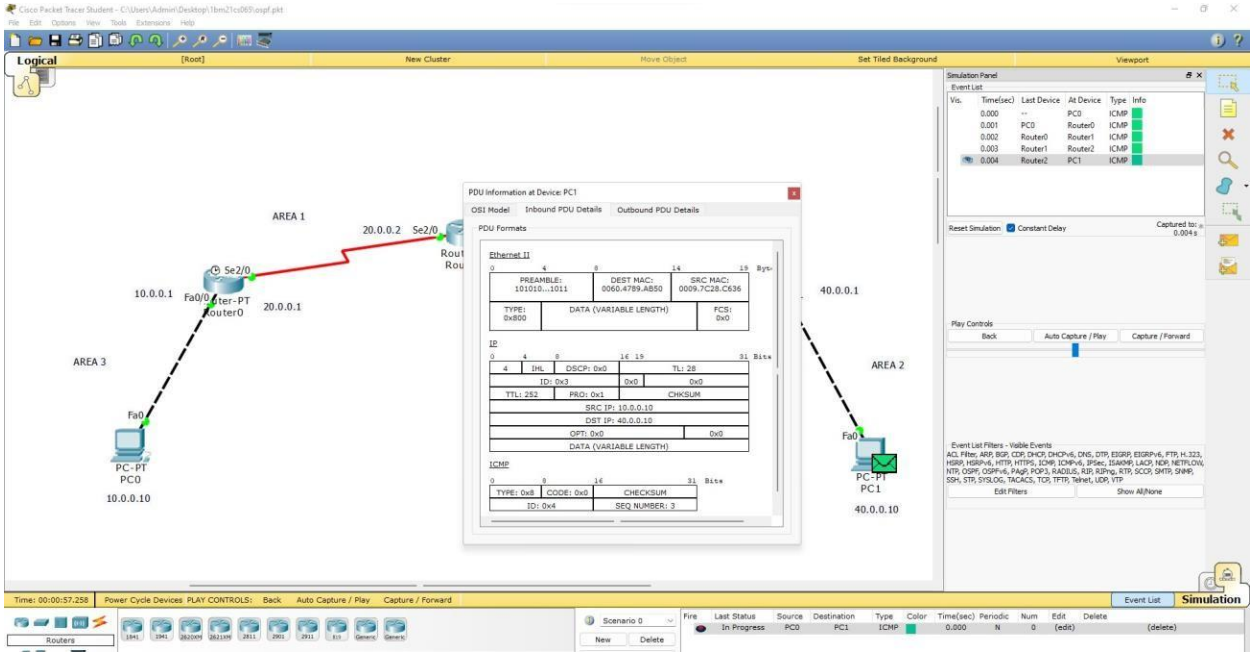


OUTPUT:




Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
AREA 1
AREA 2
AREA 3
20.0.0.2
Se2/0
10.0.0.1
Fa0/0
20.0.0.1
40.0.0.1
Fa0
PC-PT
PC0
10.0.0.10
PC-PT
PC1
40.0.0.10
PDU Information at Device: Router1
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
Simulation Panel
Event List
Play Controls
Back
Auto Capture / Play
Capture / Forward
Time: 00:00:57.256
Power Cycle Devices
PLAY CONTROLS:
Event List
Simulation


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
AREA 1
AREA 2
AREA 3
20.0.0.2
Se2/0
10.0.0.1
Fa0/0
20.0.0.1
40.0.0.1
Fa0
PC-PT
PC0
10.0.0.10
PC-PT
PC1
40.0.0.10
PDU Information at Device: Router2
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
Simulation Panel
Event List
Play Controls
Back
Auto Capture / Play
Capture / Forward
Time: 00:00:57.257
Power Cycle Devices
PLAY CONTROLS:
Event List
Simulation


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
AREA 1
20.0.0.2
Se2/0
10.0.0.1
Fa0/0
20.0.0.1
AREA 3
AREA 2
40.0.0.1
Fa0
PC-PT
PC0
10.0.0.10
PC-PT
PC1
40.0.0.10
PDU Information at Device: PC1
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
Ethernet II
PREAMBLE: 101010...1011
DEST MAC: 0060.4789.AB50
SRC MAC: 0009.7C28.C636
TYPE: 0x800
DATA (VARIABLE LENGTH)
FCS: 0x0
IP
SRC IP: 10.0.0.10
DST IP: 40.0.0.10
ICMP
TYPE: 0x8
CODE: 0x0
CHECKSUM
ID: 0x4
SEQ NUMBER: 3
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Edit Filters
Show All/None
Time: 00:00:57.258
Power Cycle Devices
PLAY CONTROLS:
Routers
Scenario 0
New
Delete
Event List
Simulation
In Progress
ICMP

WEEK 11

To construct a WLAN and make the nodes communicate wirelessly

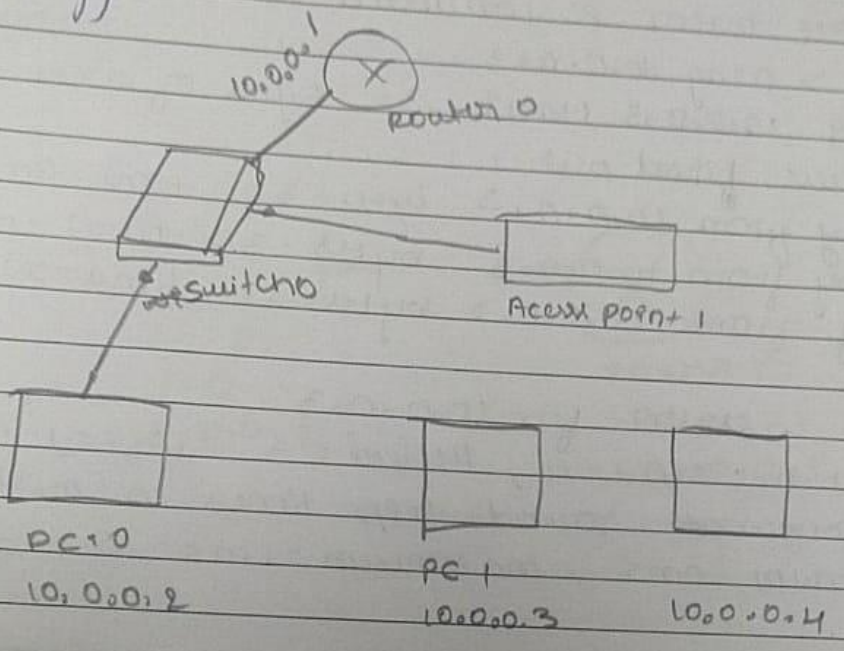
OBSERVATION:

DATE PAGE

Aim:

to construct a WLAN and make the nodes communicate wirelessly

Topology



Procedure

Construct the above topology

configure PC0 & Router 0 as normally done

configure Access point 1 - port 1 -> SSID name - WLAN

Select 'OPEN' & give any 10 digit key - 1234567890

configure PC1 & laptop with wireless standard

Switch off the device Drag the existing PT-HOST-NM-1AM to the component listed in LHS

drag WMP300N wireless interface to the empty port, switch on the device

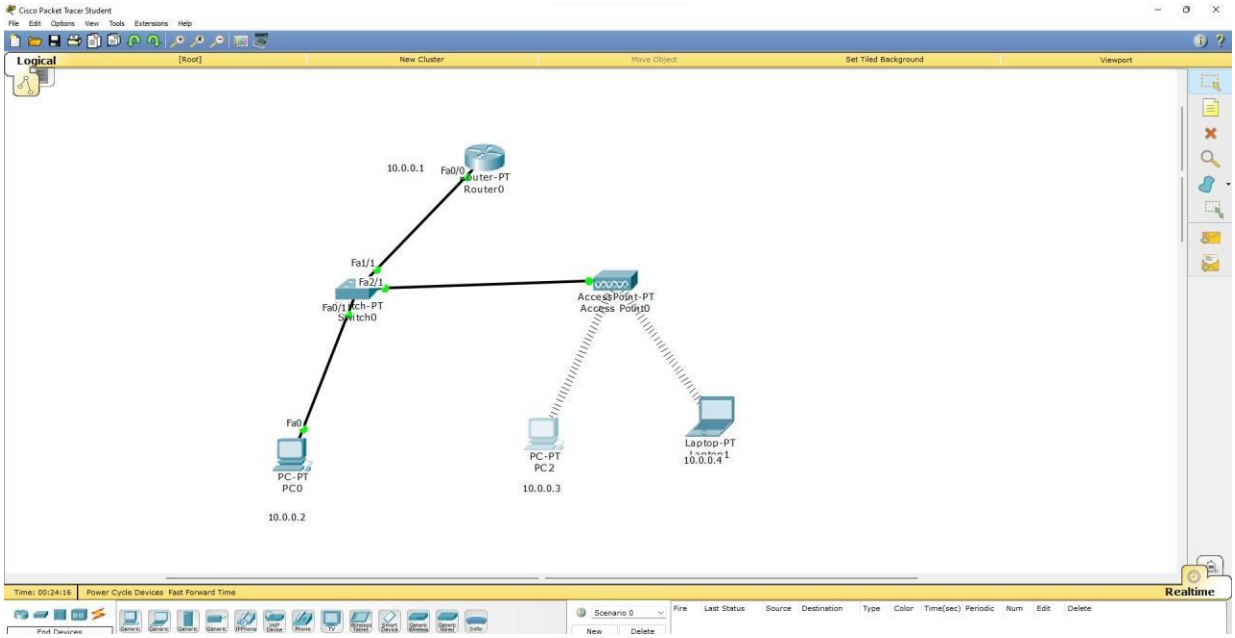
In the config tab a new wireless interface would have been added. Now configure SSID, WEP, WEP key IP address and gateway to the device
- Ping from every device to every other device

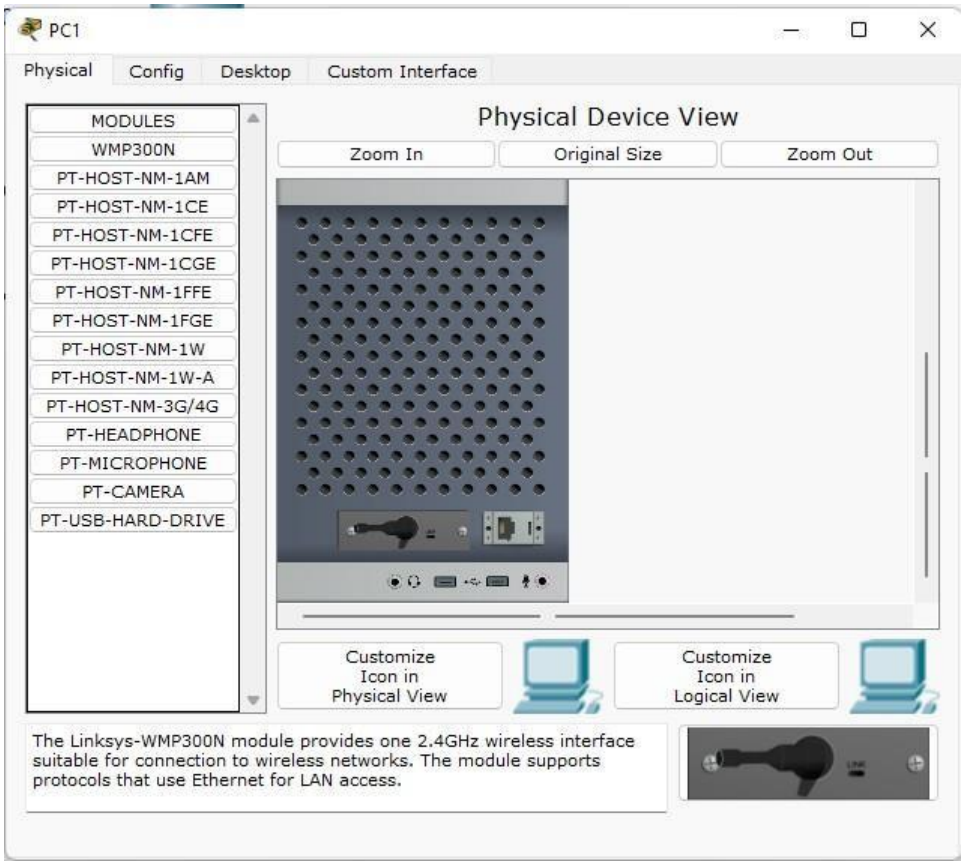
Ping output
Packet tracer PC command line 1.0
PC > ping 10.0.0.3
Pening 10.0.0.3 with 32 bytes of data
Request timed out
Reply from 10.0.0.3 bytes=32 time=0ms TTL=128
Reply from 10.0.0.3 bytes=32 time=0ms TTL=128
Reply from 10.0.0.3 bytes=32 time=2ms TTL=128

Ping statistics for 10.0.0.3
Packets: sent=4, Recived=3 lost=1 (25% loss)
Approximate round trip times in milliseconds:
minimum=0ms, maximum=1ms Average=0ms

observation
- A WLAN is a group of colocated devices that form a network is based on radio transmissions
- Data sent in packets contain layers with labels & instruction MAC address to end point for routing.
- The Access point is the base station that server as a hub to which another stations connect
- with one accesspoint we can connect to multiple devices wirelessly & transmit data

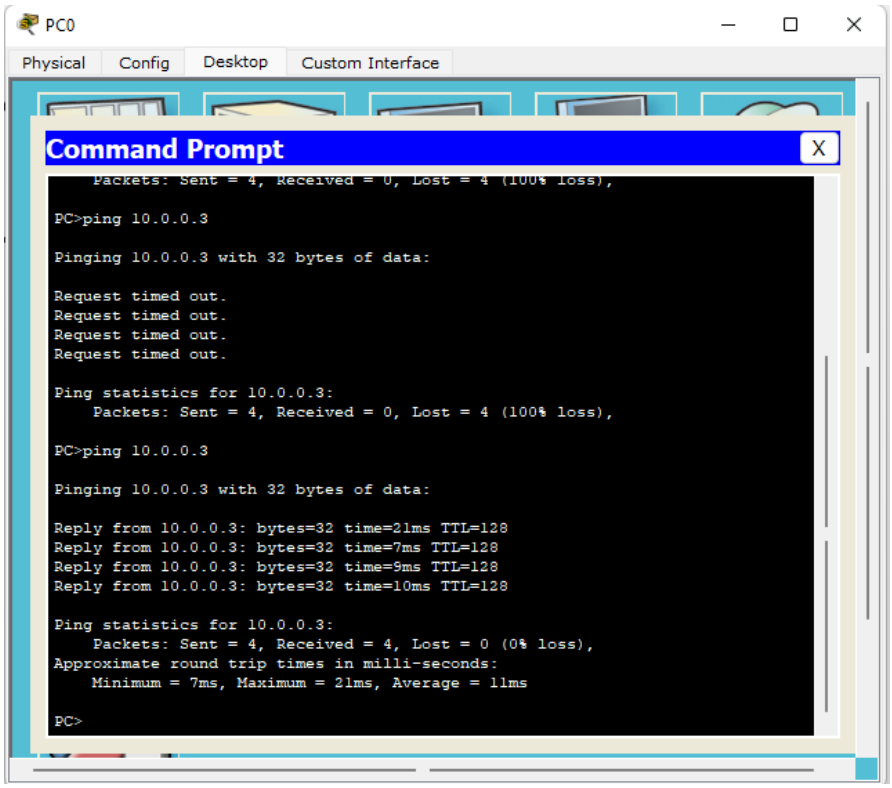
TOPOLOGY:


Logical
10.0.0.1
Router-PT
Router0
Fa1/1
Fa2/1
Switch-PT
Switch0
Access Point-PT
Access Point0
PC-PT
PC0
10.0.0.2
PC-PT
PC2
10.0.0.3
Laptop-PT
10.0.0.4
Realtime


PC1
Physical
Config
Desktop
Custom Interface
MODULES
WMP300N
PT-HOST-NM-1AM
PT-HOST-NM-1CE
PT-HOST-NM-1CFE
PT-HOST-NM-1CGE
PT-HOST-NM-1FFE
PT-HOST-NM-1FGE
PT-HOST-NM-1W
PT-HOST-NM-1W-A
PT-HOST-NM-3G/4G
PT-HEADPHONE
PT-MICROPHONE
PT-CAMERA
PT-USB-HARD-DRIVE
Physical Device View
Zoom In
Original Size
Zoom Out
Customize Icon in Physical View
Customize Icon in Logical View
The Linksys-WMP300N module provides one 2.4GHz wireless interface suitable for connection to wireless networks. The module supports protocols that use Ethernet for LAN access.


Laptop0
Physical
Config
Desktop
Custom Interface
MODULES
WPC300N
PT-LAPTOP-NM-1AM
PT-LAPTOP-NM-1CE
PT-LAPTOP-NM-1CFE
PT-LAPTOP-NM-1CGE
PT-LAPTOP-NM-1FFE
PT-LAPTOP-NM-1FGE
PT-LAPTOP-NM-1W
PT-LAPTOP-NM-1W-A
PT-LAPTOP-NM-3G/4G
PT-HEADPHONE
PT-MICROPHONE
PT-CAMERA
PT-USB-HARD-DRIVE
Physical Device View
Zoom In
Original Size
Zoom Out
Customize Icon in Physical View
Customize Icon in Logical View
The Linksys-WPC300N module provides one 2.4GHz wireless interface suitable for connection to wireless networks. The module supports protocols that use Ethernet for LAN access.

OUTPUT:


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 10.0.0.3
Pinging 10.0.0.3 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
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=21ms TTL=128
Reply from 10.0.0.3: bytes=32 time=7ms TTL=128
Reply from 10.0.0.3: bytes=32 time=9ms TTL=128
Reply from 10.0.0.3: bytes=32 time=10ms TTL=128
Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 7ms, Maximum = 21ms, Average = 11ms
PC>

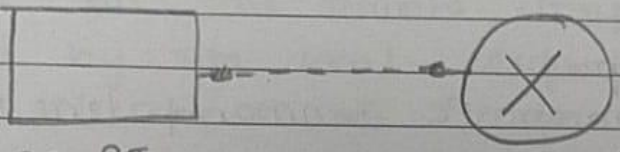
WEEK 12

To understand the operation of TELNET by accessing the router in server room from a PC in IT office.

OBSERVATION:

Aim:
To understand the operation of TELNET by accessing router in server room from a PC in IT office

Topology



PC-PT
PC0
10.0.0.2

ROUTER-PT
Router-1
10.0.0.1

Procedure

Create a topology as shown above

- Configure the IP address & gateway for PC0

Configure the router by executing the following commands

Step 1 : enable
Step 2 : config T
Step 3 : hostname R1
Step 4 : enable secret P1
Step 5 : interface fastethernet 0/0
Step 6 : IP address 10.0.0.1 255.0.0.0
Step 7 : no shut
Step 8 : line vty 0 5

Step 9: login
step 10: password P0
step 11: exit: exit
Step 12: wr

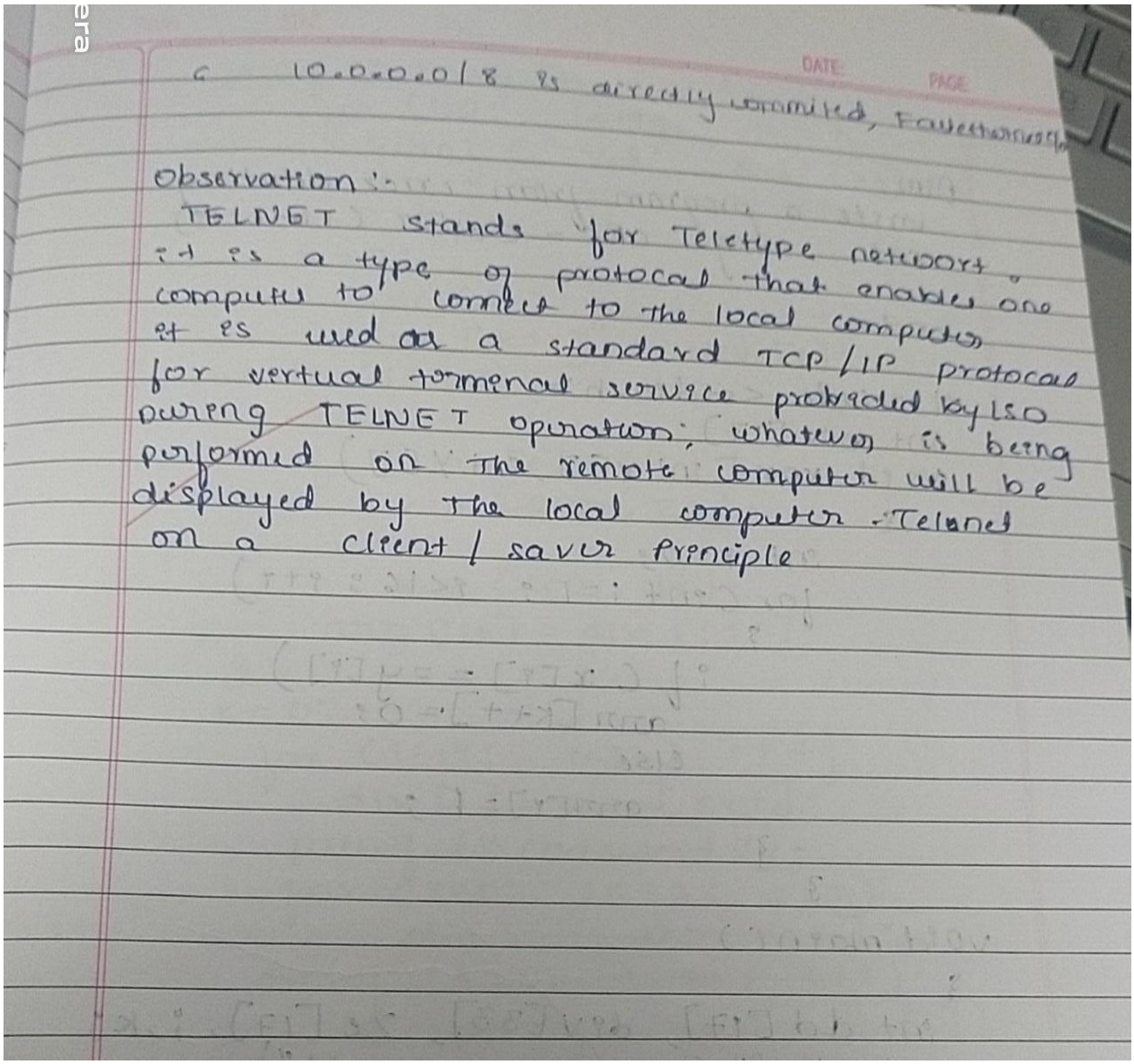
Ping message to router
Password for user Acss verification is P0
Password for enable is P1
Accessing router CLI from PC
show ip route

Ping output
packet Tracer Pc command line 1.0
Pc > Ping 10.0.0.1
Pinging 10.0.0.1 with 32 byte of data:

Reply from 10.0.0.1: bytes = 32 time=0ms TTL=255
Reply from 10.0.0.1: bytes = 32 time=0ms TTL=255
Reply from 10.0.0.1: bytes=32, time=0ms, TTL=255
Reply from 10.0.0.1: bytes=32 time=0ms TTL=255

Ping statistics for 10.0.0.1
Packets: Sent = 4 Received = 4 lost = 0 (0% loss)
Approximate round trip times in millie seconds
minimum = 0ms, maximum = 0ms, Average = 0ms

PC > telnet 10.0.0.1
Typing 10.0.0.1 - - - Open
User Acss verification
P1> enable
Password: P1
r1 # show ip route

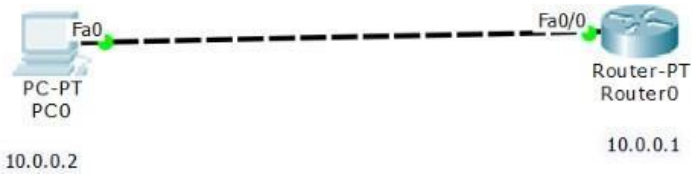


c 10.0.0.0/8 is directly connected, FastEthernet0/1

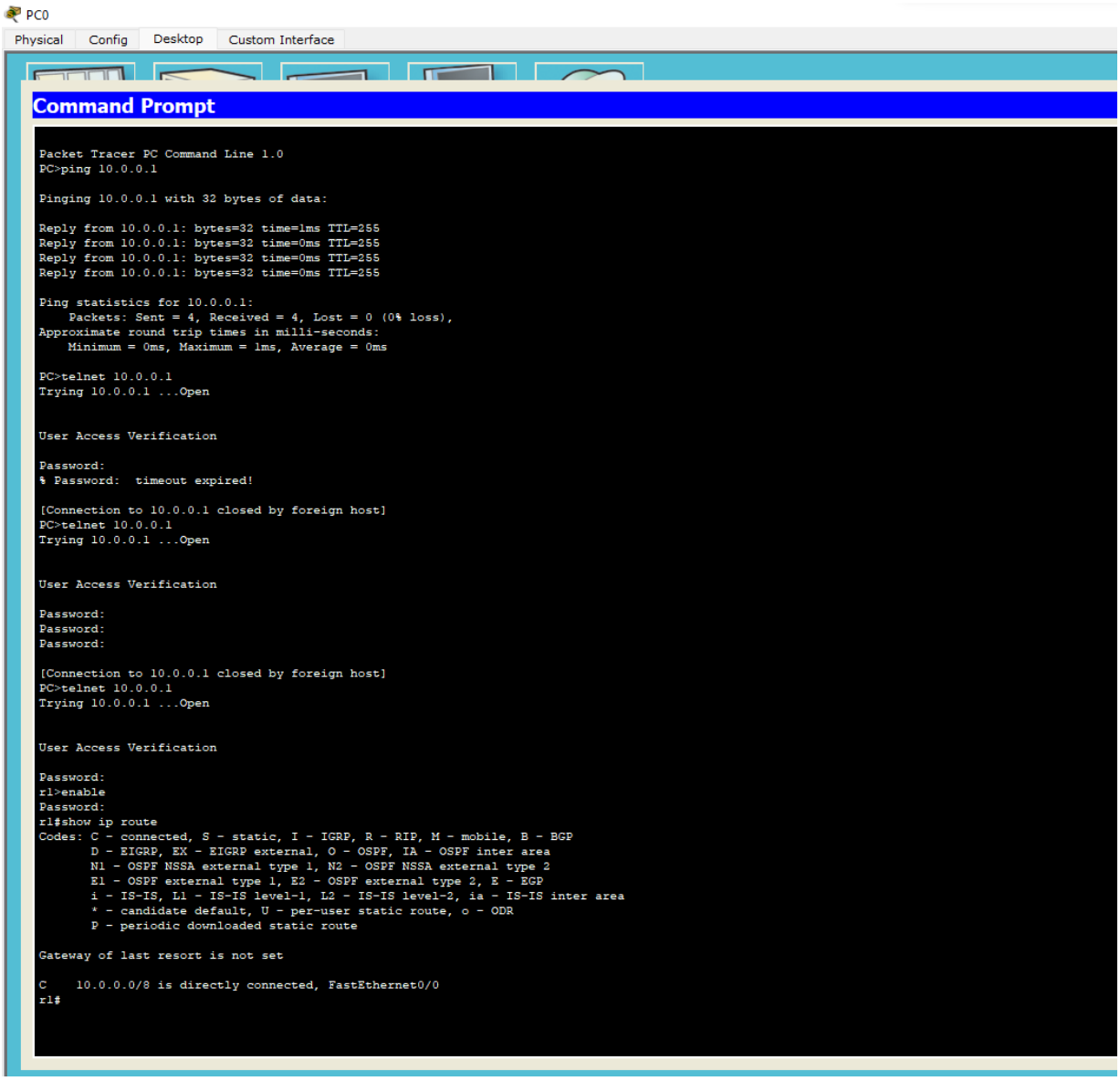
Observation:-

TELNET stands for Teletype network. It is a type of protocol that enables one computer to connect to the local computer. It is used as a standard TCP/IP protocol for virtual terminal service provided by ISO. During TELNET operation, whatever is being performed on the remote computer will be displayed by the local computer. Telnet on a client / saver principle

TOPOLOGY:


Fa0
Fa0/0
PC-PT
PC0
Router-PT
Router0
10.0.0.2
10.0.0.1

OUTPUT:


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.1
Pinging 10.0.0.1 with 32 bytes of data:
Reply from 10.0.0.1: bytes=32 time=1ms TTL=255
Reply from 10.0.0.1: bytes=32 time=0ms TTL=255
Reply from 10.0.0.1: bytes=32 time=0ms TTL=255
Reply from 10.0.0.1: bytes=32 time=0ms TTL=255
Ping statistics for 10.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
PC>telnet 10.0.0.1
Trying 10.0.0.1 ...Open
User Access Verification
Password:
% Password: timeout expired!
[Connection to 10.0.0.1 closed by foreign host]
PC>telnet 10.0.0.1
Trying 10.0.0.1 ...Open
User Access Verification
Password:
Password:
Password:
[Connection to 10.0.0.1 closed by foreign host]
PC>telnet 10.0.0.1
Trying 10.0.0.1 ...Open
User Access Verification
Password:
r1>enable
Password:
r1#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
r1#

WEEK 14

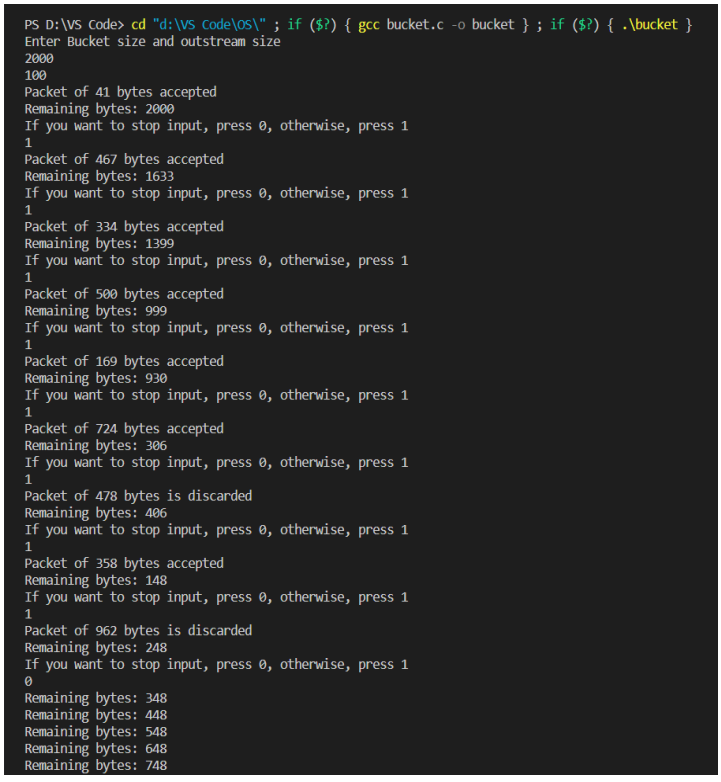
Write a program for congestion control using Leaky bucket algorithm.

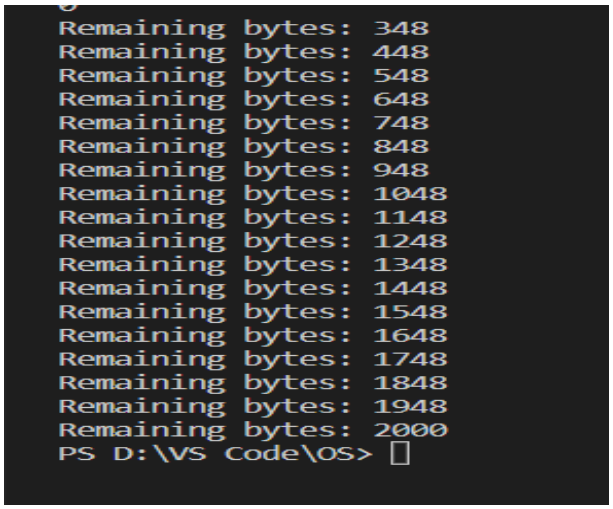
CODE:

```
#include <stdio.h>
#include <stdlib.h> // Include this for the rand() function
int main()
{
   int buckets, outlets, k = 1, num, remaining;
   printf("Enter Bucket size and outstream size\n");
   scanf("%d %d", &buckets, &outlets);
   remaining = buckets;
   while (k)
   {
      num = rand() % 1000; // Generate a random number between 0 and
999
      if (num < remaining)
      {
         remaining = remaining - num;
         printf("Packet of %d bytes accepted\n", num); // Added missing
variable
      }
      else
      {
         printf("Packet of %d bytes is discarded\n", num);
      }
      if (buckets - remaining > outlets)
      {
         remaining += outlets; // Fixed the calculation
      }
      else
         remaining = buckets;
      printf("Remaining bytes: %d \n", remaining);
```

```
        printf("If you want to stop input, press 0, otherwise, press 1\n");
        scanf("%d", &k);
    }
    while (remaining < buckets) // Fixed the condition
    {
        if (buckets - remaining > outlets)
        {
            remaining += outlets; // Fixed the calculation
        }
        else
            remaining = buckets;
        printf("Remaining bytes: %d \n", remaining);
    }
    return 0; // Added a return statement to indicate successful completion
}
```

OUTPUT:





OBSERVATION:

Aim:-
write a program for congestion control using leaky bucket algorithm

code:

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
int buckets, outlets, k=1, num, remaining;
printf("Enter Bucket size and the outstream size");
scanf("%d %d", &buckets, &outlets);
remaining = buckets

while(k){
num = rand() %1000;
if (num < remaining){
remaining = remaining - num
printf("packets of %d byte are accepted", num);
}
else
{
printf("Packet of %d byte is discarded", num);
}
```

```
if (buckets - remaining > outlets)
{
  remaining += outlets;
}
else
  remaining = buckets;
printf("Remaining bucket : %d \n", remaining);
printf("if you want to stop input press 0, else press 1");
scanf("%d", &k);
}
while (remaining < buckets)
{
  if (buckets - remaining > outlets)
  {
    remaining += outlets;
  }
  else
  remaing = buckets;
printf("Remaining byte : %d", remaining)
}
return 0;
}
```

Output

Enter Bucket size and outstream size

1000 200

Packets of 411 bytes are accepted
Remaining bytes :1000

if you want to stop input press 0, otherwise press 1 :1

Packet of 467 bytes are accepted
Remaining bytes :533

if you want to stop input press 0, otherwise press 1

1

Packets of 334 bytes are accepted
Remaining bytes 599.

WEEK 15

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

CODE:

ClientTCP.py

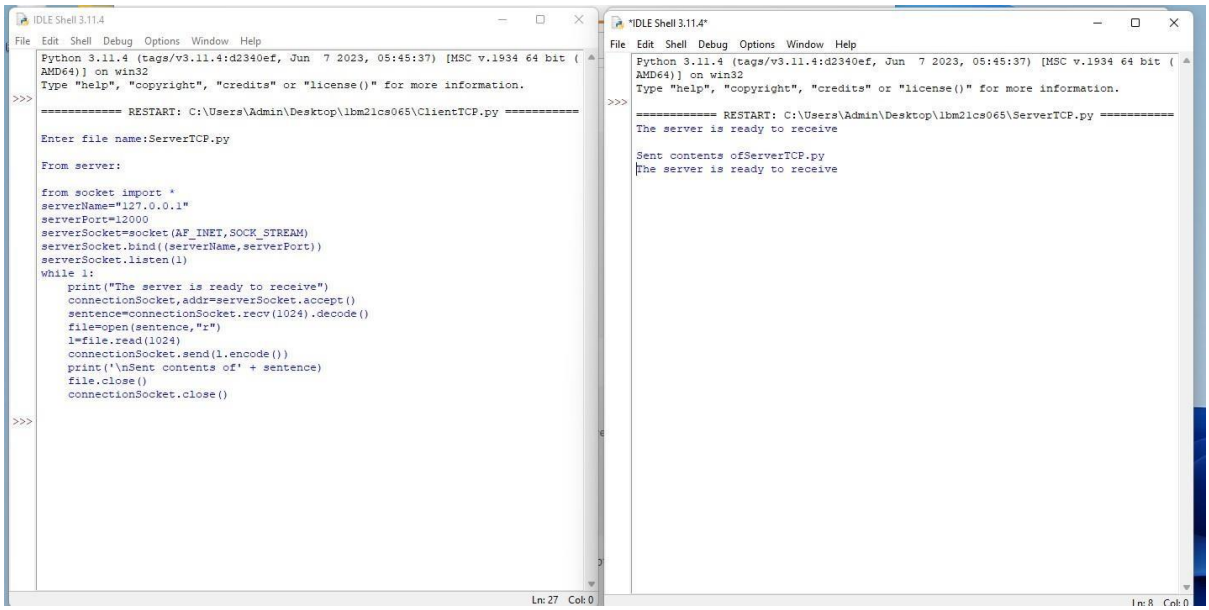
```
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName,serverPort))
sentence = input("\nEnter file name: ")
clientSocket.send(sentence.encode())
filecontents = clientSocket.recv(1024).decode()
print ("\nFrom Server:\n")
print(filecontents)
clientSocket.close()
```

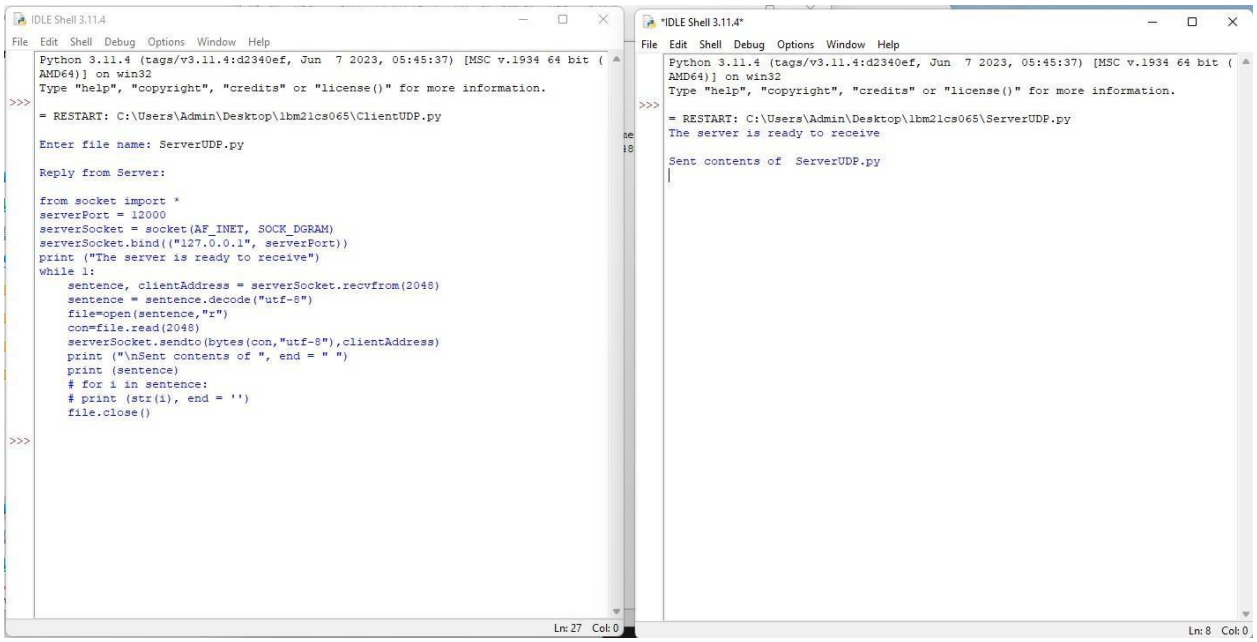
ServerTCP.py

```
from socket import *
serverName="127.0.0.1"
serverPort = 12000
serverSocket = socket(AF_INET,SOCK_STREAM)
serverSocket.bind((serverName,serverPort))
serverSocket.listen(1)
while 1:
print ("The server is ready to receive")
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()

OUTPUT:





observation

Cycle - 3

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

Solution:

ClientTCP.py

```
from socket import *
serverName = '127.0.0.1'
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName, serverPort))
sentence = input("\nEnter file name:")
clientSocket.send(sentence.encode())
filecontents = clientSocket.recv(1024).decode()
print("\nFrom Server:\n")
Print(filecontents)
clientSocket.close()
```

ServerTCP.py

```
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_STREAM)
serverSocket.bind((serverName, serverPort))
serverSocket.listen(1)
while(1)
```

```
Print ("the server is ready to recive")
connectionSocket, addr = serverSocket.accept
sentence = connectionSocket.recv(1024).decode()
    file = open(sentence, "r")
    l = file.read(1024)
connectionSocket.send(l.encode())
print("In sent contents of " + sentence)
file.close()
connectionSocket.close
```

output

Server sede

The server is Ready to recive

Client sede

Enter file name serverTCP.py

From server:

From socket import *

:

(code under serverTCP.Py is Printed as written above)

server sede:

The server is ready to recive

sent contents of serverTCP.Py

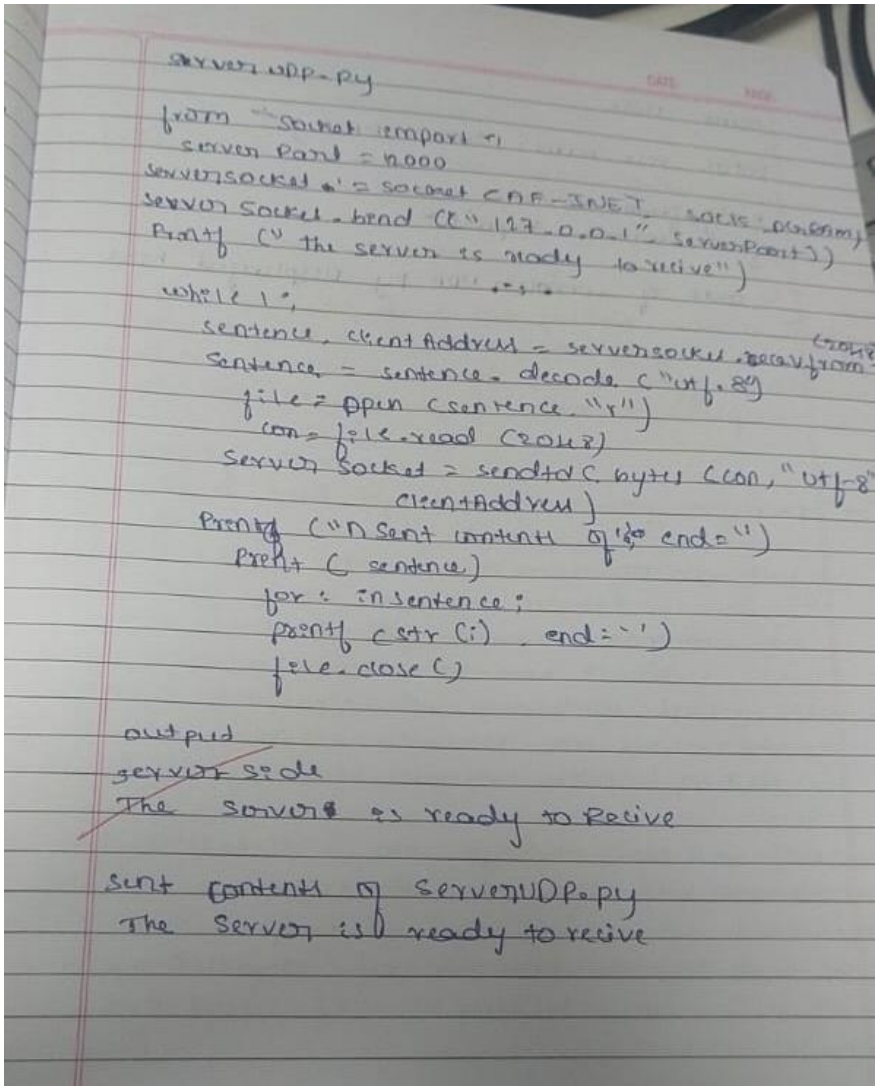
The server is ready to recive

Aim :- Using UDP Socket, write a client-server Program to make client sending the file name and the server to send back the content of the requested file if present.

solution

→ client UDP.py

```
from socket import *
ServerName = "127.0.0.1"
ServerPort = 12000
clientSocket = socket(AF_INET, SOCK_DGRAM)
sentence = input("\nEnter File name:")
clientSocket.sendto(bytes(sentence, "utf-8"),
(ServerName, ServerPort)
fileContents, ServerAddress = clientSocket.recvfrom
(2048)
print("\nReply from server:")
print(fileContents.decode("utf-8"))
For i in fileContents:
    print(str(i), end="")
clientSocket.close()
clientSocket.close()
```



Server UDP.py

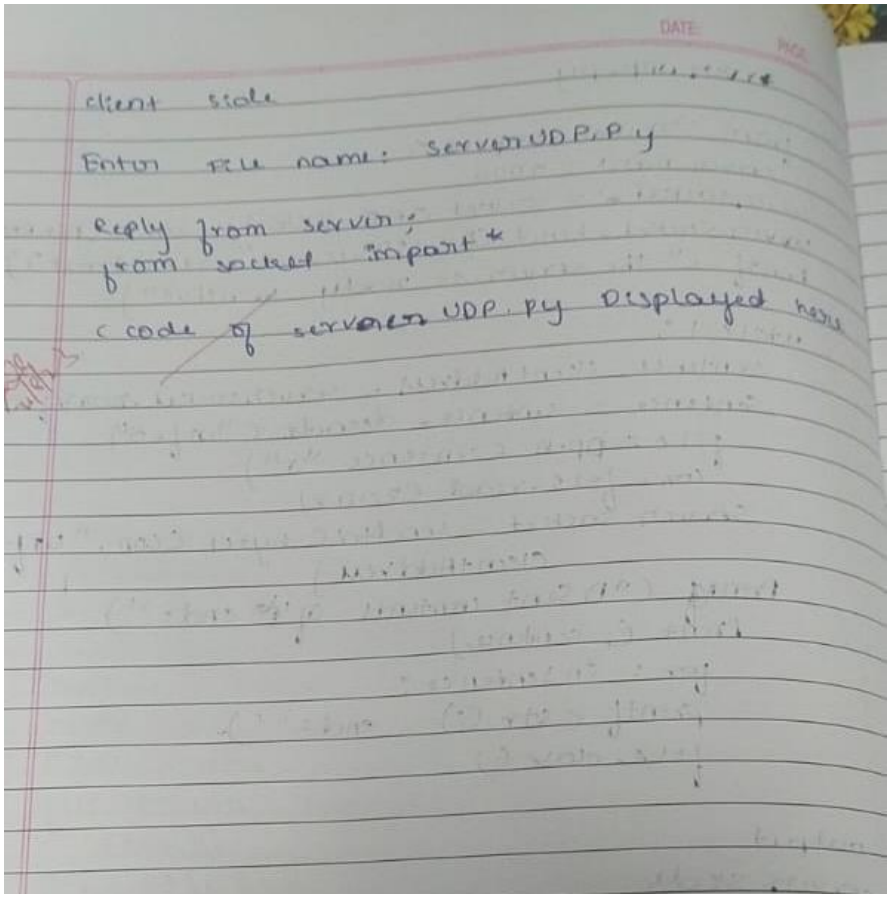
```
from socket import *
server Port = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
Print("the server is ready to receive")
while 1:
    sentence, clientAddress = serverSocket.recvfrom(2048)
    sentence = sentence.decode("utf-8")
    file = open(sentence, "r")
    con = file.read(2048)
    serverSocket = sendto(bytes(con, "utf-8"),
                          clientAddress)
    Print("\n Sent content of: ", end=" ")
    Print(sentence)
    for i in sentence:
        print(str(i), end="")
    file.close()
```

output

server side

The Server is ready to Recive

Sent content of ServerUDP.py
The Server is ready to recive


client side

Enter file name: serverUDP.py

Reply from server:
from socket import *

code of serverUDP.py Displayed here

WEEK 16

Tool Exploration -Wireshark

OBSERVATION:

Wireshark

Wireshark is an open-source packet analyzer, which is used for education, analysis, software development, communication protocol development, and networks troubleshooting

it is used to track the packets so that each one is filtered to meet our specific needs.
it is commonly called as a sniffer, network protocol analyzer, and network analyzer

Uses of Wireshark:
-> it is used by network security engineers to examine security problems
-> it allows the user to watch all the traffic being passed over the network
-> it is used by network engineers to troubleshoot network issues.
-> it also helps to troubleshoot latency issues and malicious activities on your network
-> it can also analyze dropped packets

A packet is a unit of data which is transmit over a network blw the orgin and the destina network packets are small, ie, maximum 1.5 kilobytes for Ethernet packets and 64 kilobyte for IP packets

The bottom window called the packet contents window, which displays the content is a low is the filter field which is at the top of the display. The capture packets on the screen can be filtered based on any components according to your requirements

Packet list

No. This field indicates which packets are part of same conversation

Source: This column contains the address where the packet originated

Destination: This column contains the address that packet is being sent to

Protocal

The packet protocal name, such as TCP can be found in this colum

Length

The packet length in bytes is displayed in the colum

Info:

Additional details about packet are present in this column. The contents of this column are very greatly depending on packet contents

WEEK 13

Write a program for error detecting code using CRC- CCITT (16-bits).

CODE:

```
#include<stdio.h>
int arr[17];

void xor(int x[], int y[])
{
    int k=0;
    for(int i=1;i<16;i++)
    {
        if(x[i]==y[i])
            arr[k++]=0;
        else
            arr[i]=1;
    }
}

void main()
{
    int dd[17],div[33],ze[17],i,k;

    printf("Enter the dataword \n");
    for(i=0;i<17;i++)
        scanf("%d",&div[i]);

    for(i=i;i<33;i++)
        div[i]=0;

    for(i=0;i<17;i++)
        ze[i]=0;
    printf("Enter dividend \n");
```

```
for(i=0;i<17;i++)
    scanf("%d",&dd[i]);

i=0;
k=0;
    for(i=i;i<17;i++)
        arr[k++]=div[i];
while(i<33)
{
    if(arr[0]==0)
        xor(arr,ze);
    else
        xor(arr,dd);

    arr[16]=div[i++];

}
k=0;
for(i=17;i<33;i++)
    div[i]=arr[k++];
printf("Codeword: ");
    for(i=0;i<33;i++)
        printf("%d",div[i]);

for(i=0;i<17;i++)
    arr[i]=0;

printf("\nAt receiver end \n");

 k=0;
    for(i=i;i<17;i++)
        arr[k++]=div[i];
while(i<33)
{
    if(arr[0]==0)
```

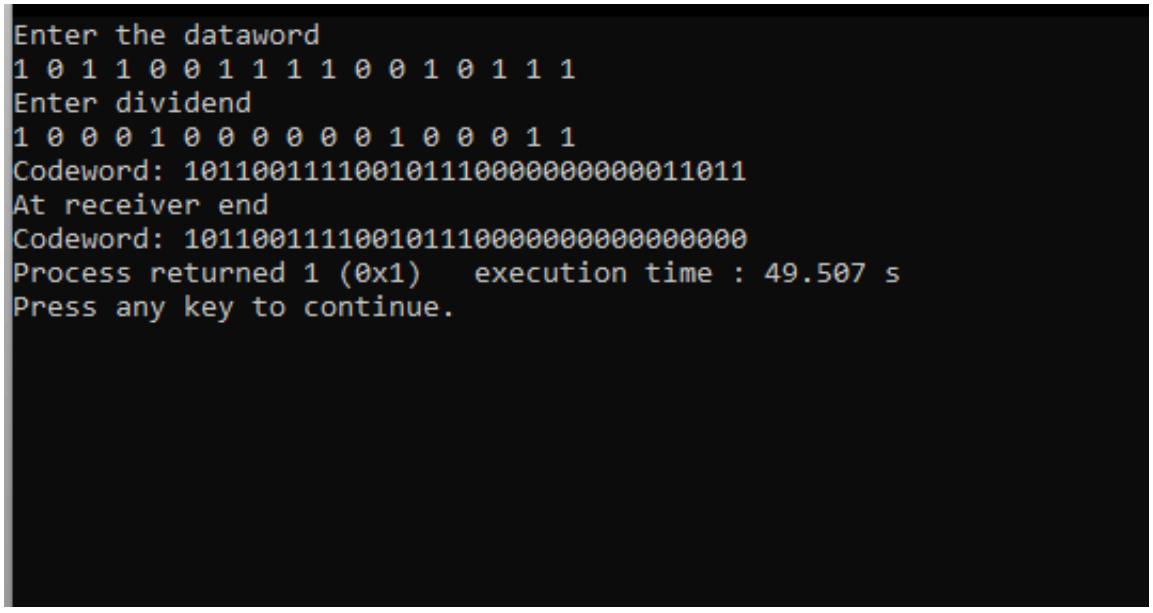
```
            xor(arr,ze);
        else
            xor(arr,dd);

        arr[16]=div[i++];

    }
    k=0;
    for(i=17;i<33;i++)
        div[i]=arr[k++];

    printf("Codeword: ");
        for(i=0;i<33;i++)
            printf("%d",div[i]);
}
```

OUTPUT:



OBSERVATION:

Aim:-
write a program from error detecting code using CRC-CCITT (16-bits)

code

```
#include<stdio.h>
int arr[17];
void xor(int x[], int y[])
{
    int k=0;
    for(int i=1; i<16; i++)
    {
        if(x[i]==y[i])
            arr[k++]=0;
        else
            arr[i]=1;
    }
}
void main()
{
    int dd[17], div[33], ze[17], i, k;
    printf("Enter the dataword");
    for(i=0; i<17; i++)
        scanf("%d", &div[i]);
    for(i=1, i<33; j++)
        div[i]=0)
    [i=0 i<17; i++)
        ze[i]=0;
```

```
printf("Enter dividend");
for(i=0; i<17; i++)
scanf("%d", &dd[i]);

i=0
k=0;
for(i=i; i<17; i++)
arr[k++] = div[i];
while(i<33)
{
if(arr[0]==0)
xor(arr, ze);
else
xor(arr, dd);
arr[16] = div[i++];
}
k=0;
for(i=17; i<33; i++)
div[i] = arr[k++];
printf("codeword");
for(i=0; i<33; i++)
div[i] = arr[k++];
printf(i=0; i<33; i++)
printf("%d", div[i]);
for(i=0; i<17; i++)
arr[i] = 0;
printf("At reciver end");
k=0;
for(i=i; i<17; i++)
arr[k++] = div[i];
while(i<33)
{
```

```
    if (arr[0] == 0)
        xor(arr, zero);
else
    xor(arr, div);
    arr[16] = div[i++];
}
k=0;
for (i=17; i<33; i++)
    div[i] = arr[i++];
printf("codeword");
for (i=0; i<33; i++)
    printf("%d", div[i]);
}
```

Output

Enter the dataword
10110011110010111
Enter the divisor
10001000000100011
codeword : 10110011110010111000000000000000
At reciver end
codeword : 10110011110010111000000000000000