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Name : P. Vineetha Subject : Computer Networks

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Ex-01 Configuration of Networks Devices

Aim :- To study the following Network Devices in detail

- ⇒ PC
- ⇒ Server
- ⇒ Repeater
- ⇒ Hub
- ⇒ Switch
- ⇒ Bridge
- ⇒ Router
- ⇒ Gate away
- ⇒ Transmission median

Apparatus :- (Software)

CISCO packet Software

Node :- In a Communication network, a network node is a connection point that can receive, Create, store or send data along distributed network routes.

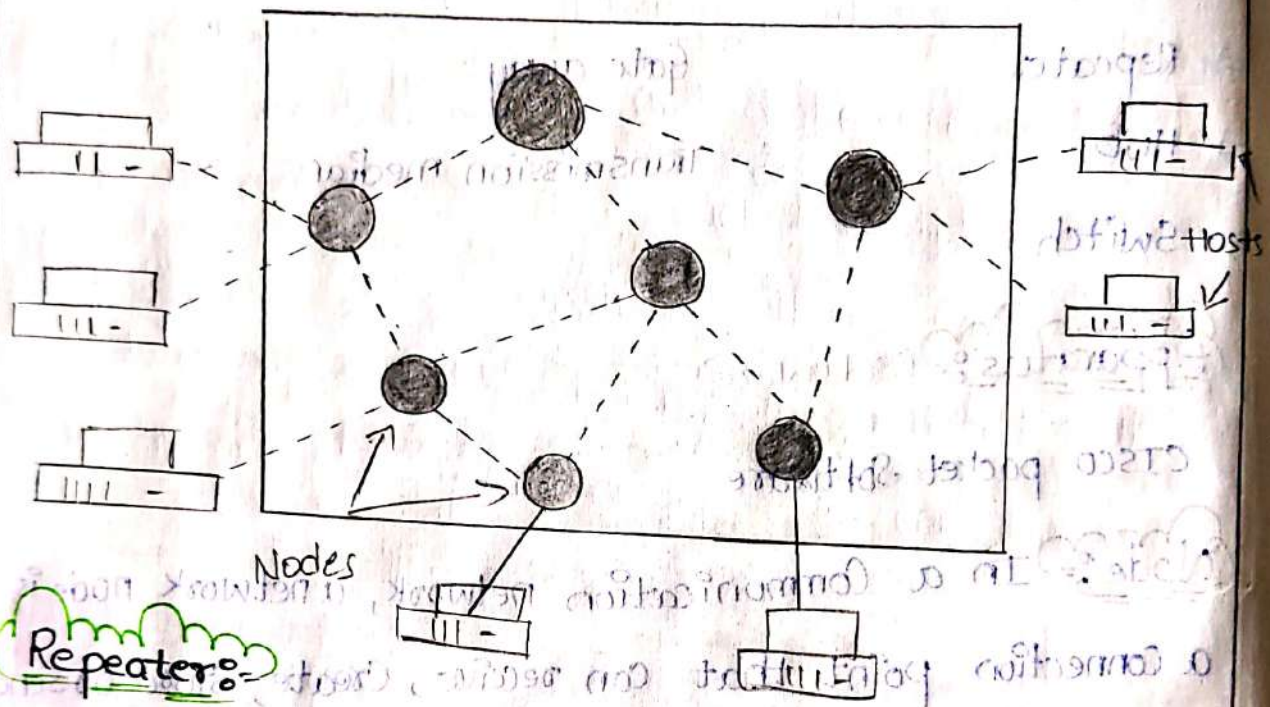
Repeater :- Functioning at physical layer

A Repeater is an electronic device that recieve a signal and retransmits it at a higher level and lower level, or onto the other side at an obstruction, so that the signal can cover longer distance.

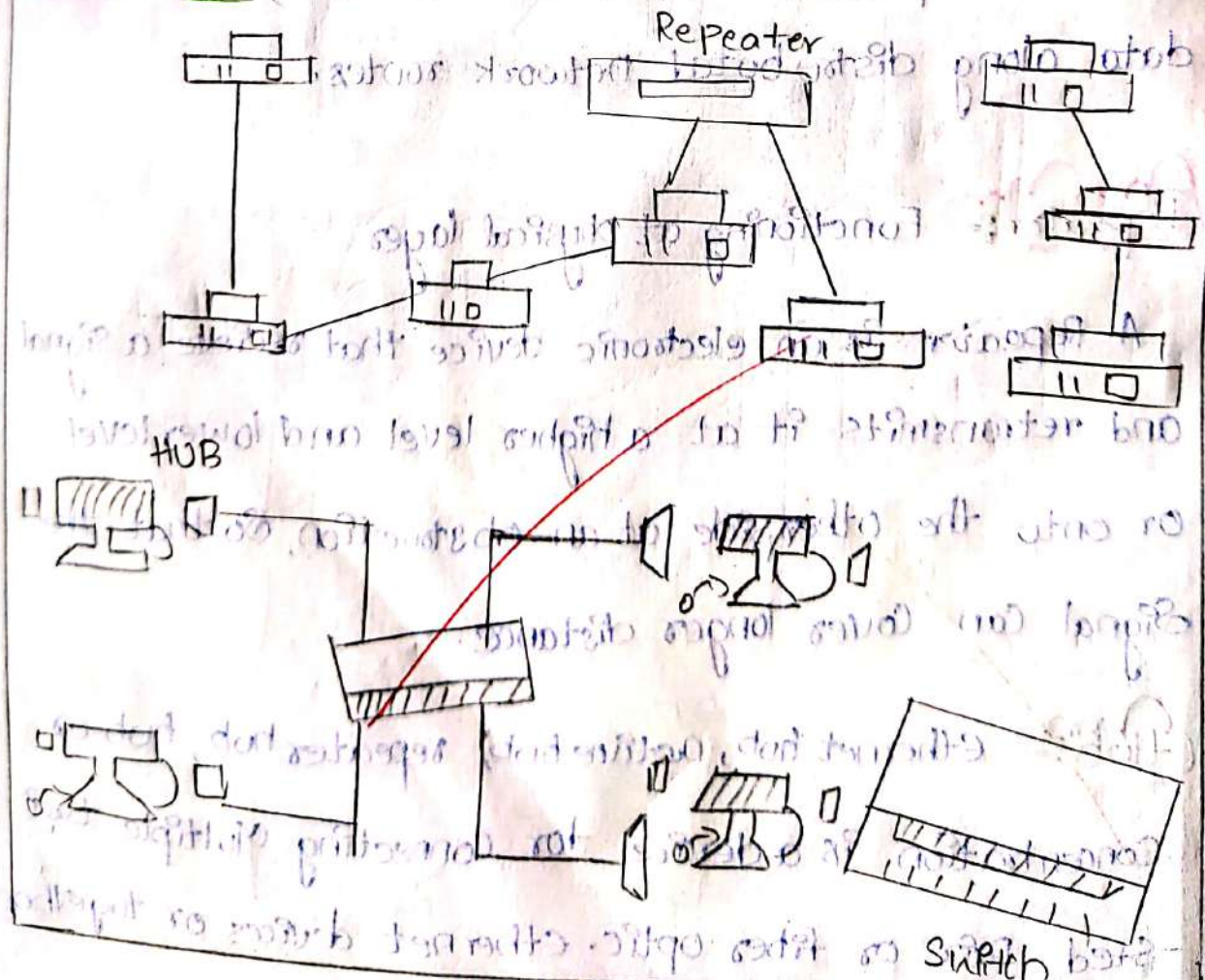
Hub :- Ethernet hub, active hub, repeater hub, hub or Concentration is a device for connecting Multiple twi -sted pair or fiber optic. ethernet devices or together

and making act as a single network segment the physical layer of the OSI model.

Node:=



Repeater:=

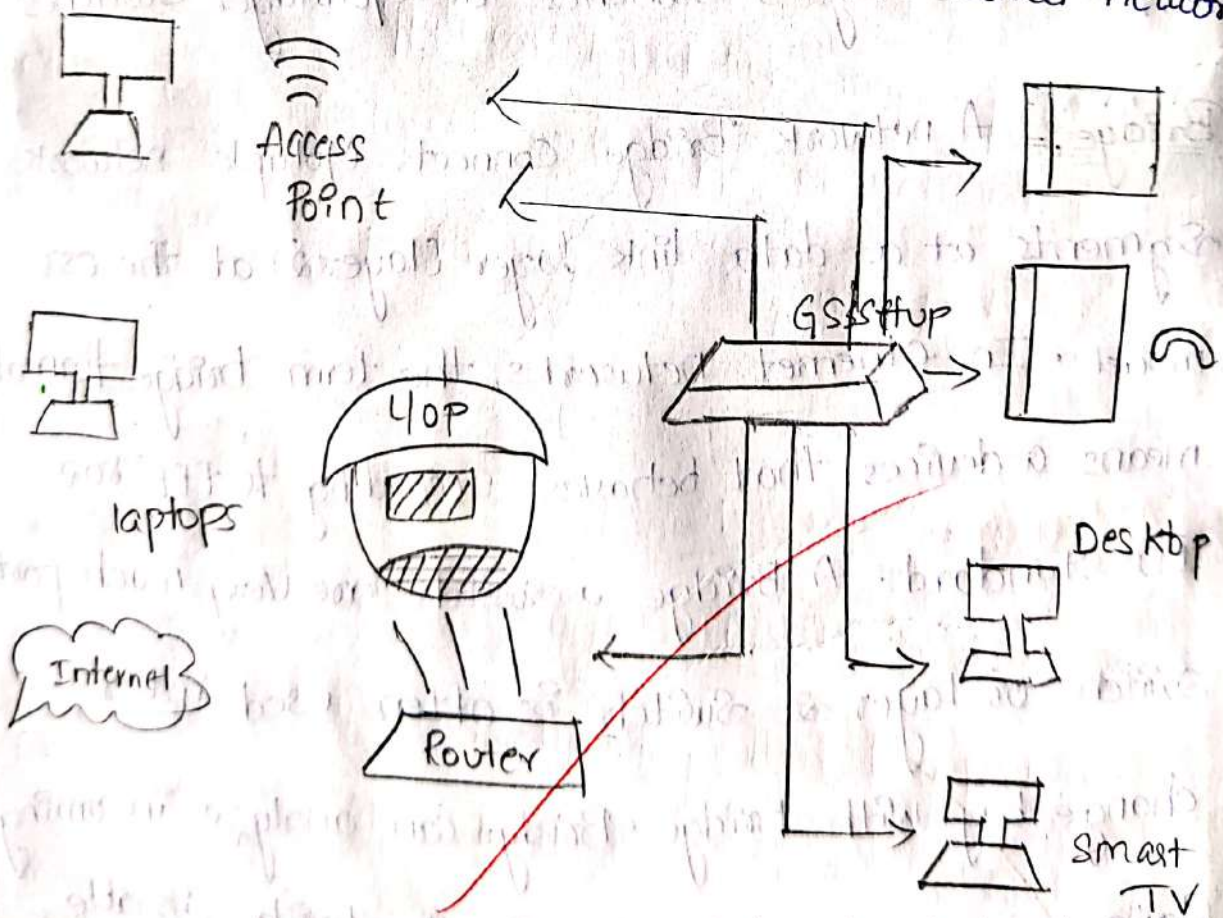


The device is a from of Multiport repeater. Repeater hubs also participate in collision detection, forwarding a jam signal to all ports it detects a collision

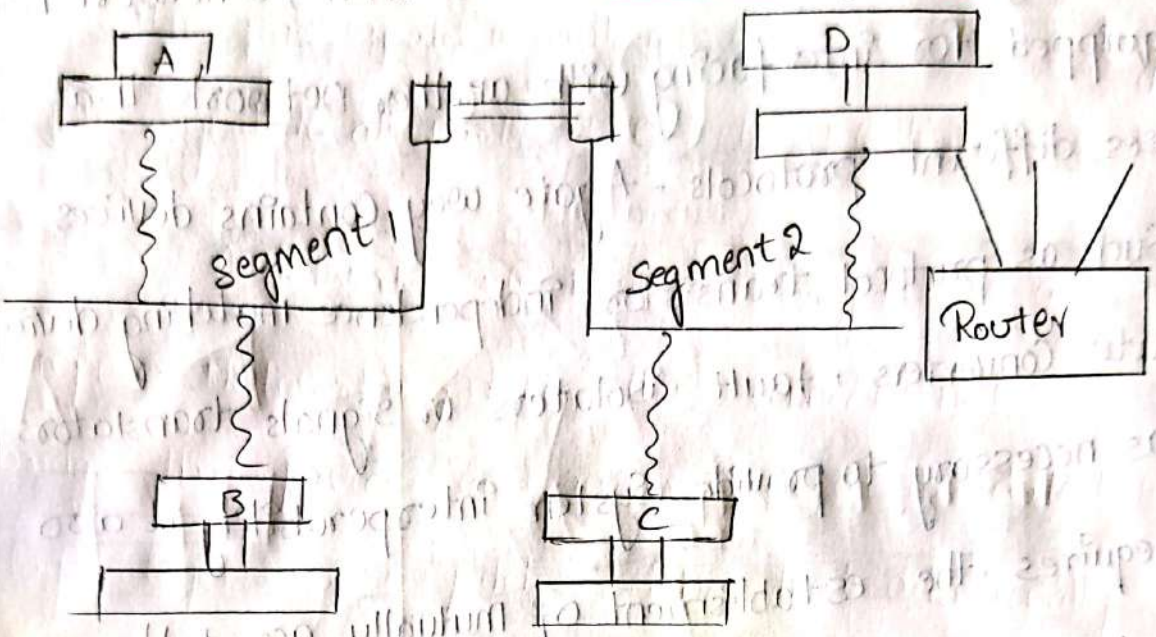
Switch: A network switch or switching hub is a Computer Networking device that connects network bridge that process and routes data at the data link layer (layer 2) OSI model. Switches that additionally Process data at the network layer (layer 3) are often reffered to a layer3 switches or Multilayer switches

Bridge: A network Bridge connects Multiple network segments at a data link layer (layer 2) at the OSI model. In Ethernet networks, the term bridge formally means. a devices that behaves according to EEE 802. ID standard. A Bridge a switch are very much ports switch or layer 2 switch is often used inter change by with bridge. Bridge can analyze incoming data packets to determine in the bridge is able to send the given packet to another segment of the network.

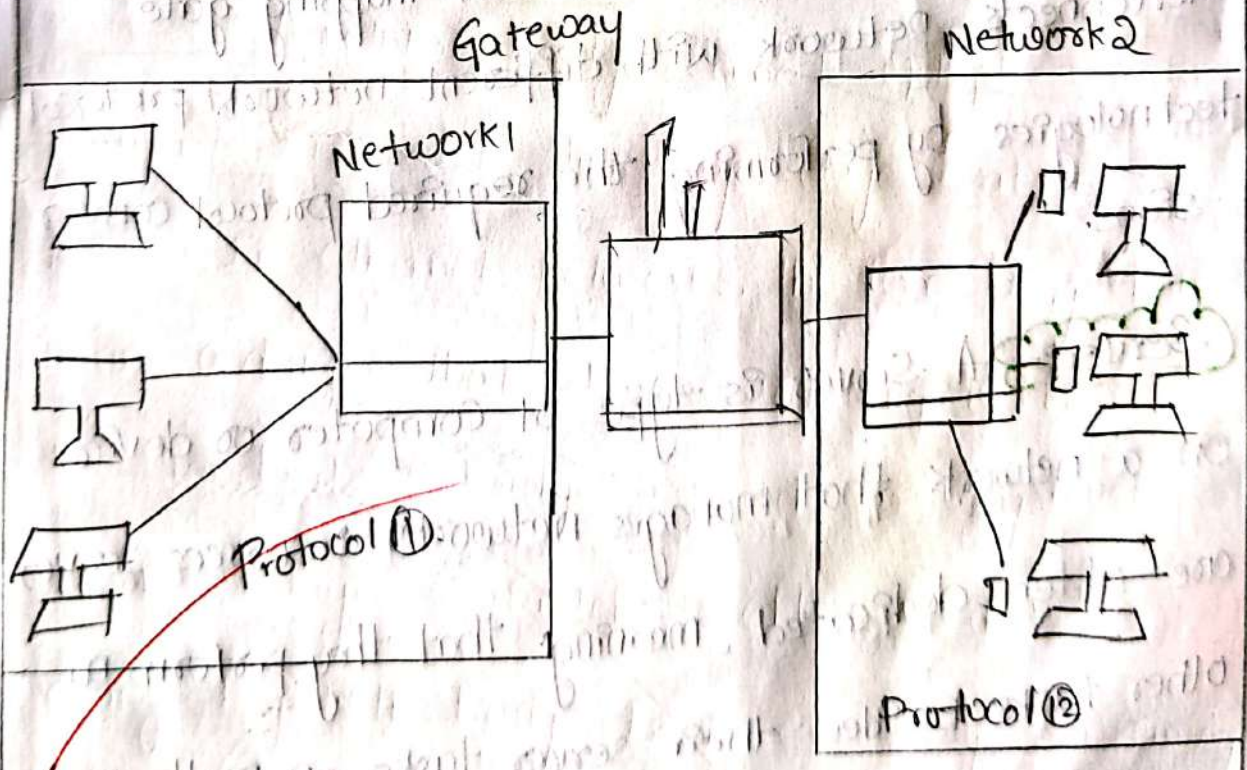
Router:- A router is an electronic device that interconnects two or more computer networks, and selectively interchanges packets of data between them each data Packet contain address information that router can use to determine if the source and destination are on the same network or it is data packet must be transferred from one network to another so that, each router can build up a table showing the preffered paths between any two system on the interconnected networks.



An Ethernet Bridge Connection two Segments :-



Hardware Components used in Communication :-

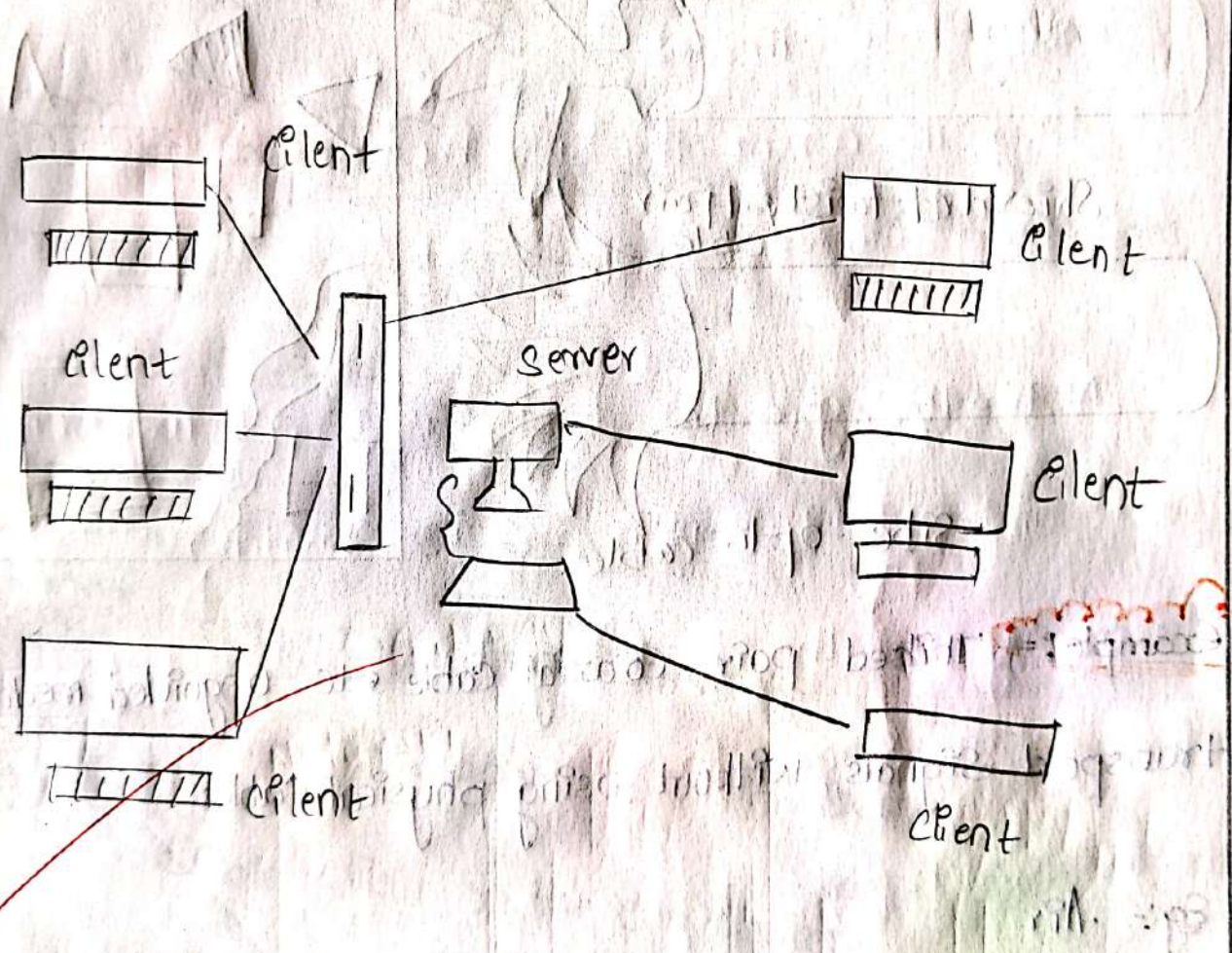


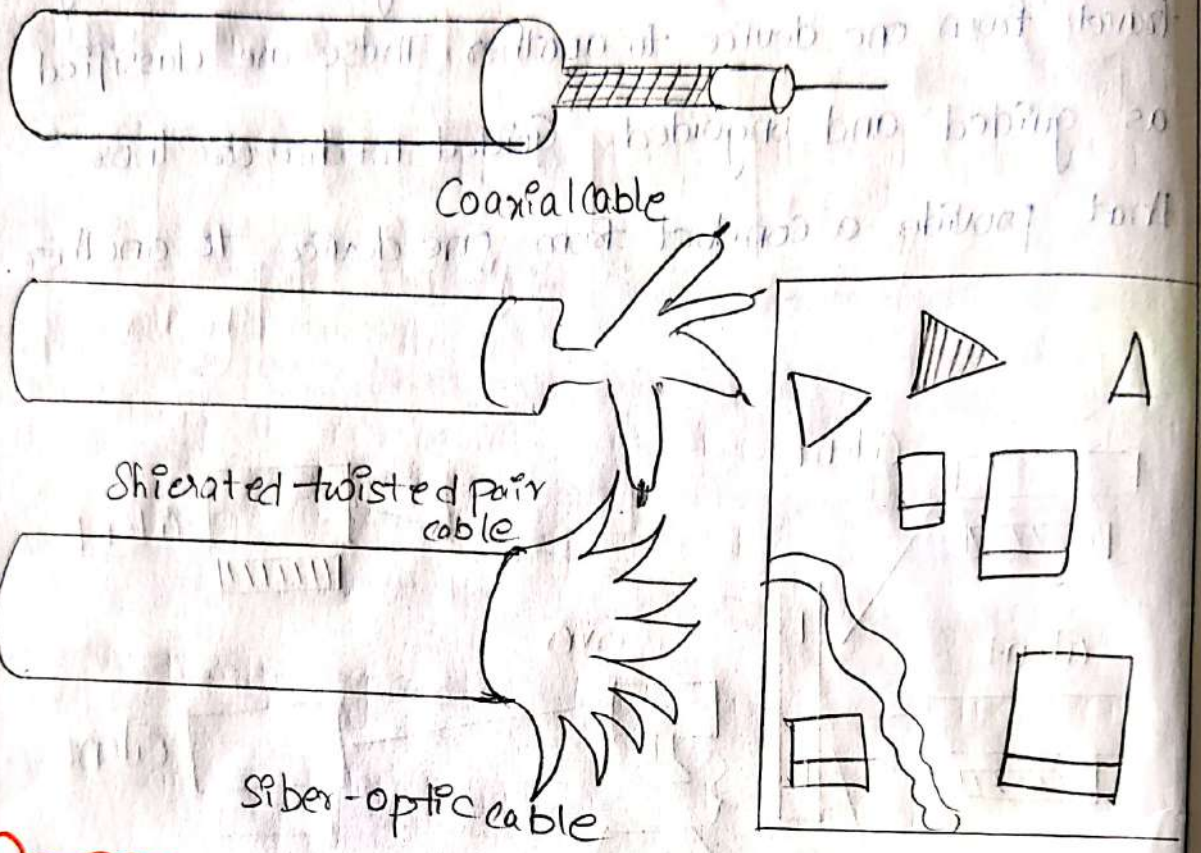
Gateway:- In a Communication network, a network node equipped for interfacing with another network that uses different protocols. A gate way contains devices such as protocol transistor, independence matching devices rate converters, fault isolaters or signals translators as necessary to provide system interperability it also requires the establisment of mutually acceptable adminstrative procedure between both networks.

A protocal translation mapping gate interconnects network with different network protocol technologies by performing the required protocol conver -sions.

Server:- A sever is type of computer or device on a network that manages networks resources sevices are often dedicated, meaning that they perform no other tasks besides their server tasks on multe proce -ssing operation systems that is managing resarce rather than entire computer.

Transmission Media: The medium through which the signals travel from one device to another. These are classified as guided and unguided. Guided media are those that provide a conduct from one device to another.





Example:- Twisted pair, Coaxial cable etc. Unguided media transport signals without using physical cables

Eg:- Air

Result:- Thus the network components are studied in detail.

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Ex-02:- Implementation of star topology

Aim:- To implement a star topology using packet tracer and hence to transmit data between the devices connected using star topology.

Apparatus Required:- Packet tracer | end devices, bridges, connectors.

Steps for Bulding Topology:-

Step 1:- For bulding packet tracer

Step 2:- Choosing Devices and connectors

Step 3:- Building the topology : Adding hosts

Single click on the end devices

Single click on the Generic Host

move the cursor into topology area.

Single click the topology connecting the hosts to switches

Select

Step 4:- Building the topology connecting the hosts to Switches

Select a switch, by clicking once on a switches and once on a 2950-24 switch

Step 5:- Connect Pcs to switch by first choosing connec-tions

click once the copper-Straight through cable click once on Pc2

choose Fast ethernet

Drag the cursor the switch 0

Drag click once on Switch 0

Notice the green link lights on Pc ethernet NLTC and amber light switch part the switch part is temporarily not the forwading foames while it goes through the stages for spining tree while it goes trough on the switch part.

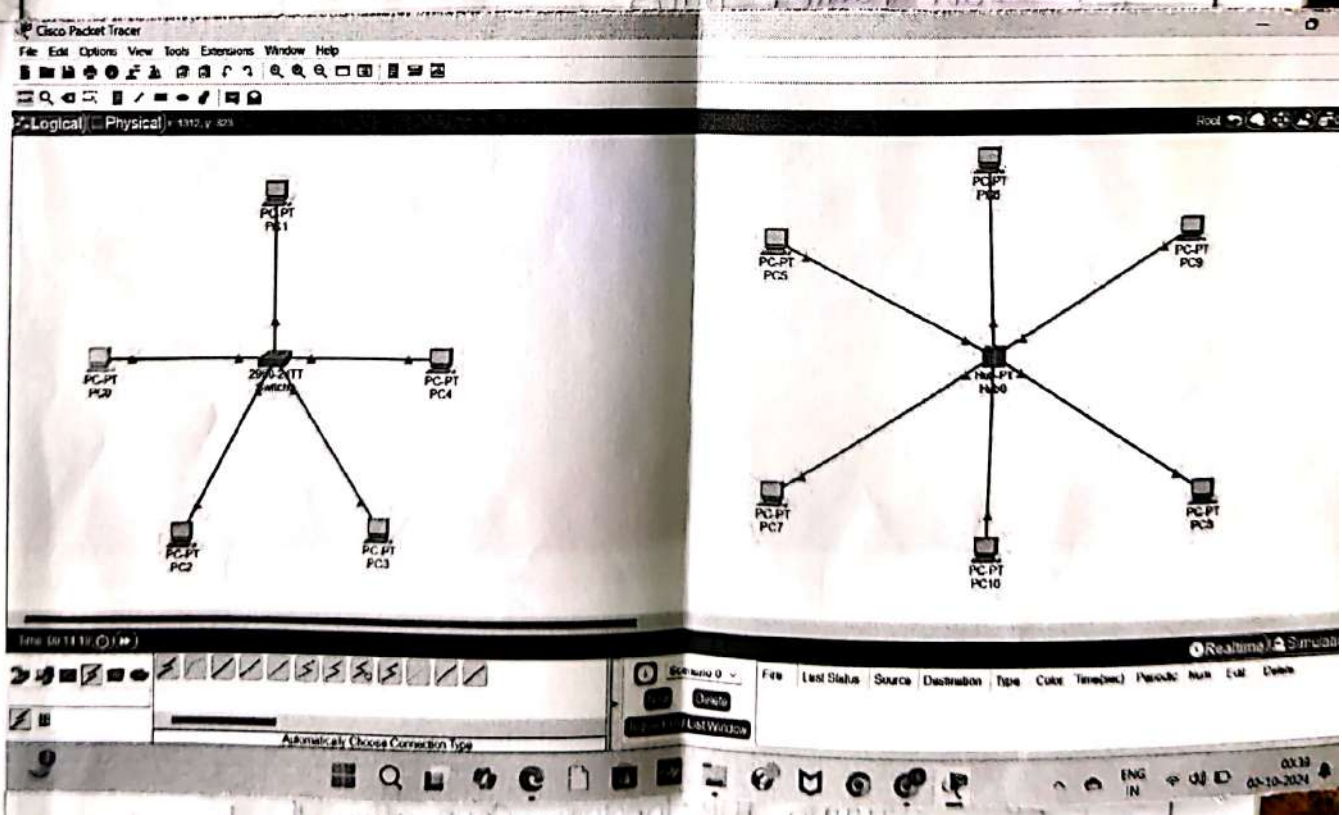
Step 6:- Configuration IP adress and Subnet masks on the Hosts.

To the start Communication between the hosts IP address and Subnet masks had to be configured on the devices type of IP-Address inft fields.

Click on Subnet, mask it will be generated Automatically

Step 7:- To transfer data transfer data between the devices command prompt. once the window pops up. IP Adress of the devices to which node 0 is connected Ping statistics will be displayed.

Result:- Thus the star topology is implement with Packet tracer simulation Tool.



EX-03:- Implemention of Bus Topology

Aim:- To implement a bus topology using packet tracer and hence to transmit data between the devices connected using bus topology.

Apparatus Required:- Packet tracer, Hubs, Connectors.

Steps for building topology Adding hosts to Switches

Select a Switch, by clicking once the switches and once on a 2950-24 Switch add the Switch by moving the plus '+' sign.

Step1:- Start Packet Tracer

Step2:- choosing devices and Connectors

Step3:- Bulding the topology Adding hosts

Single click on the End devices

Single click on the Generic host

move the cursor into topology area

single click in the topology area and it copies the device

Step4:- Building the topology connection the hosts to Switch.

Select a Switch, by clicking once the Switches and one on 2950-24 Switch. Add the Switch by moving the Plus Sign '+'.

Step 5:- Connect the pcs to switch by first choosing connections

click once on the copper Straight-through cable

click once on PC2

Choose Fast ethernet

Drag the cursor to switch 0

Click once the switch 0

Notice the green link lights on the Pc ethernet NIC and amber light switch port. The switch port is temporay not forwarding frames, while it goes through the stages for the Spaining tree protocol (STP) proces Frames can now forward out the switch port.

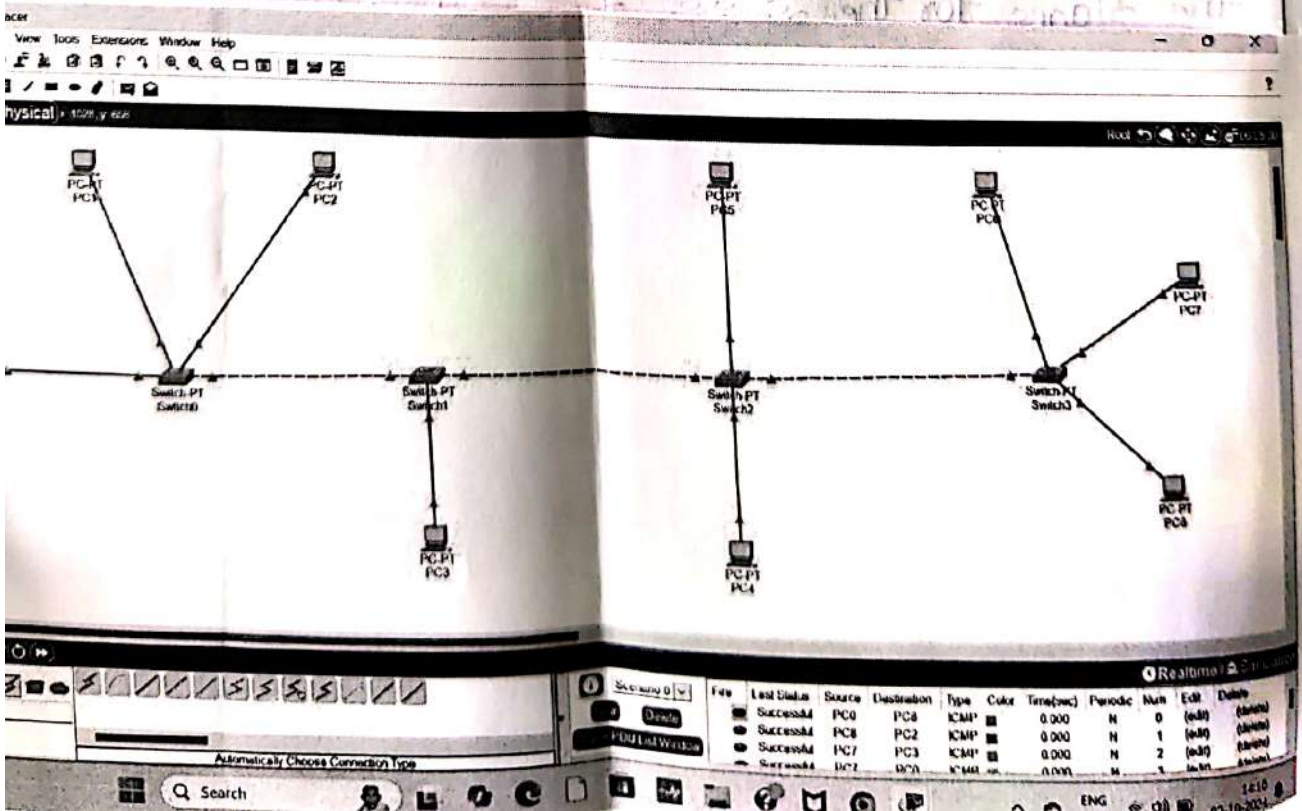
Step 6:- Configuration Ipadress and Subnet masks on the hosts

To start Communication between the hosts IP Addres and Subnet masks had to be Configured on the devices click once on PC0. choose the config tab and click

on fast enthernet. Type the IP address in field. click on Subnet mask it will generated automatically.

Step 7:- To confirm data transfer between the devices click once on the node select desktop option and the command prompt. Once the window pops up. ping the IP Address of the devices to which node 0 is connect -ed ping statistics will be displayed.

Result:- Thus the bus Topology is impremented with packet tracer simulation tool.



Ex-04 :- Implementation Of Ring Topology

Aim :- To implement a Ring Topology using pocket and hence to transmit data between the devices connected using Ring Topology.

Apparatus Required :- Pocket tracer, Hubs, Connectors

Steps for building Topology.

Step 1 :- Start pocket tracer

Step 2 :- choosing devices and connectors

Step 3 :- Building the topology adding hosts

Single click on the end devices

Single click on the generic host

Move the cursor into topology area

Single click on the topology area and it copies the devices.

Step 4 :- Building the topology - Connecting the hosts to the Switches.

Select click in the topology by clicking once on 2950-24 Switch. Add the Switch by moving plus sign '+'.

Step 5 :- Connect pcs to Switch by first choosing Connections click on the copper straight - through cable.

Click once on PC2

Choose fast ethernet

Drag the cursor to switch

Click once on Switch0

Notice the green link lights on PC_2 ethernet NIC and amber light switch part the switch part is temporily not forwarding frames. While it goes through the stages for the Spanning tree protocol process. After about 30 sec. ends the amber light will changes it green indicate the part has entered the forwading stage. Frames can now forward out the switch part.

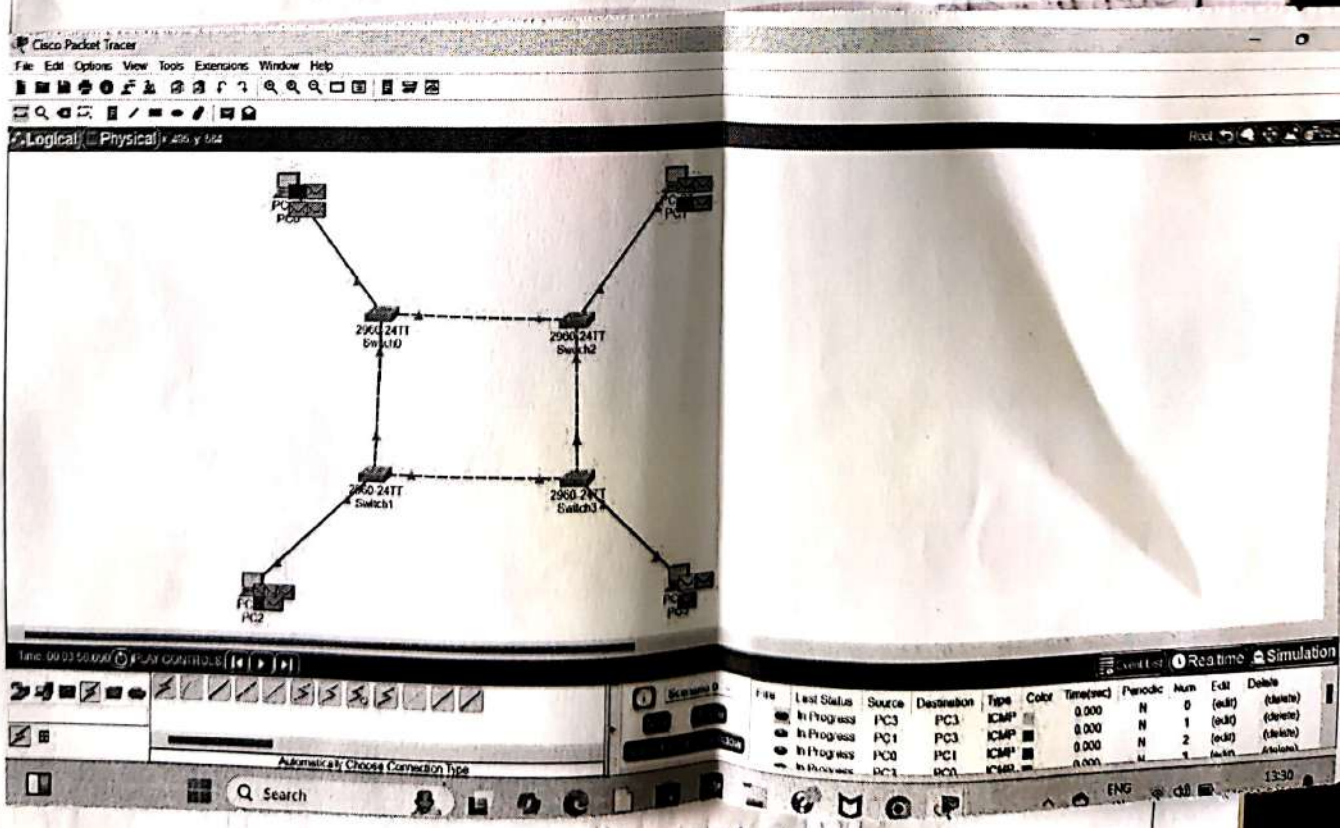
Step 6:- Configuration IP address and Submit masks on the Hosts.

The Start Communication between the hosts. IP Adress and Subnet masks had to be configured on the devices. Click once on Fast ethernet. Type the IP adresses in the field. Click on the Subnet mask it will be generated Automatically.

Step 7:- To confirm data transfer between the devices click on the Node. Select desktop option and then Comand prompt. Once the window pops op. ping the IP adress at the devices to which node 0 is connected ping Statistics will be displayed.

Result:- Thus the ring topology is implemented with Packet tracer simulation tool.

(10)



Ex-05 :- Implement of Mesh Topology

Aim :- To implement to mesh topology using packet tracer and hence to transmit data between the devices connected using mesh topology.

Apparatus Required :- Packet tracer, Hubs, Connectors

steps for building Topology.

Step 1 :- Start packet Tracer

Step 2 :- choosing devices and connections

Step 3 :- Building the topology - Adding Hosts

Single click on the End devices

Single click on the Generic Host

Move the corsor into topology area.

Single click in Topology area and it copies the devices

Step 4 :- Binding the topology - connecting the hosts to switch

Select a switch, by clicking once on switches and once on 2950-24 switch.

Add the switch by moving by plus sign '+'

Step 5 :- Connect PC's to the switch by first choosing Connect

click once on copper straight-through cable

click once on PC_2

choose fast ethernet

click once on switch0

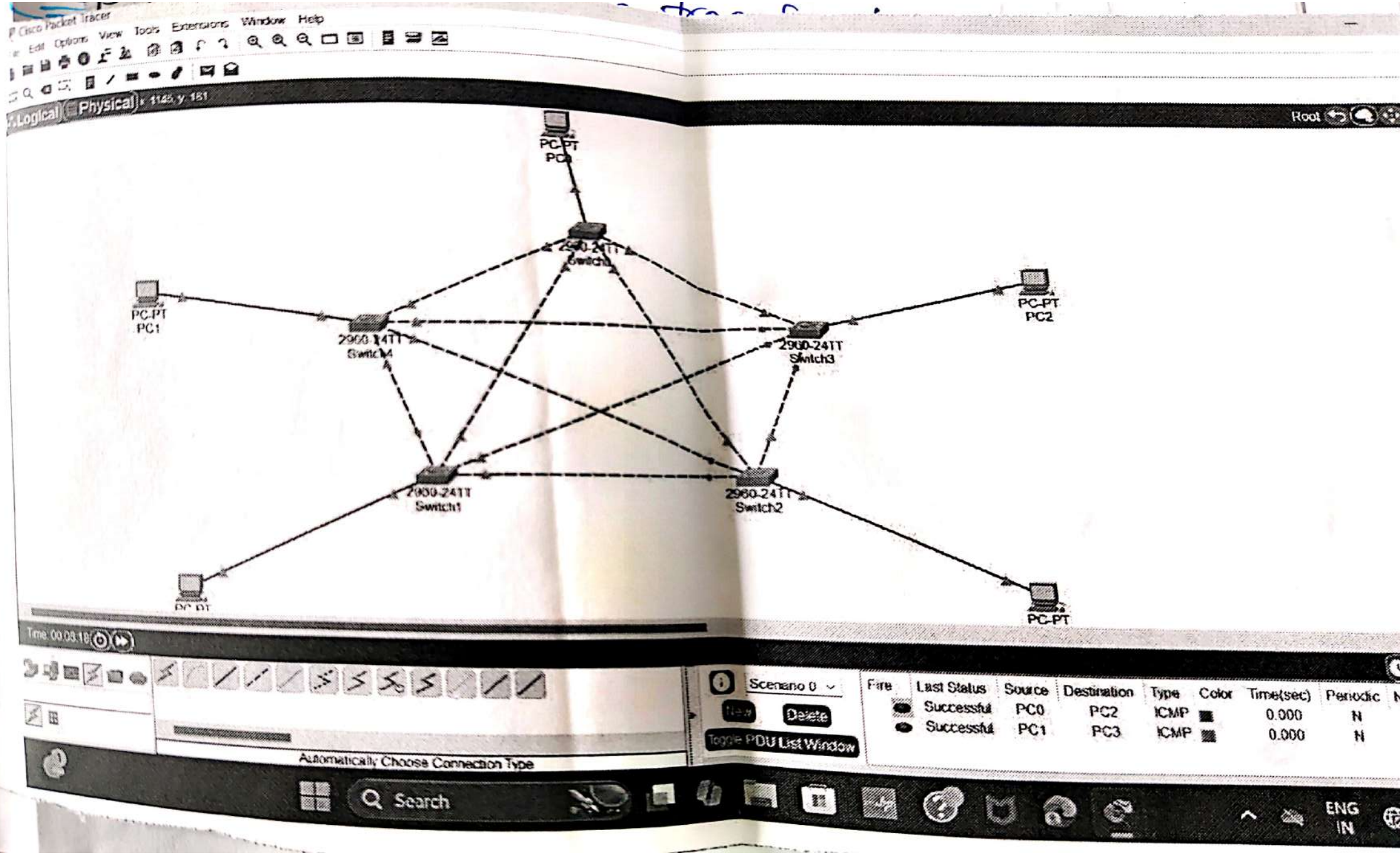
Note the green link lights on Pc. ether NIC and amber light switch port the switch part is temporily not forwading frames while, it goes through the stages to spanning tree protocol (STP) process. After about 30 seconds the amber light will change to green indicating that the part has entered the forwading stage frames can now forwad out the switch part.

Step 6:- Configurating IP adress and subnet masks on the hosts.

To start communication between the hosts IP adress and subnet masks had to be configured on the devices type the IP adress in the field click on the subnet mask it will be generated automatically

Step 7:- To conform data transfer between the devices click on the nodes. select desk top option and then command prompt once the window pops up then IP adres of the device to which node 0 is connected ping statistic will be displayed

Result:- Thus the mesh Topology is implemented with packet tracer simulation.


Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical Physical x: 1145, y: 151
Root
PC-PT PC0
2960-24TT Switch0
PC-PT PC1
2960-24TT Switch4
2960-24TT Switch3
PC-PT PC2
2960-24TT Switch1
2960-24TT Switch2
PC-PT
Time: 00:03:18
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic
Successful PC0 PC2 ICMP 0.000 N
Successful PC1 PC3 ICMP 0.000 N
Search
ENG IN

Ex-06 :- Implement of Tree Topology

Aim :- To implement a tree topology using packet tracer and hence to transmit data between the devices connected using topology.

Apparatus Required :- Packet Tracer, Hubs, Connectors

Procedure :-

Step 1 :- Start Packet Tracer

Step 2 :- Choosing devices and connections

Step 3 :- Building the topology - Adding Hosts

Single click on the end devices

Single click on Generic Host

Move the cursor into topology area

Single click in the topology area and it copies the devices.

Step 4 :- Bulding the star topology connecting the hosts to hub

Select a hub, by clicking once on Hob and once on Hub and once on generic Hub

Add the hub by moving the plus sign '+'

Step 5 :- Connect Pcs to Hub by first choosing connects

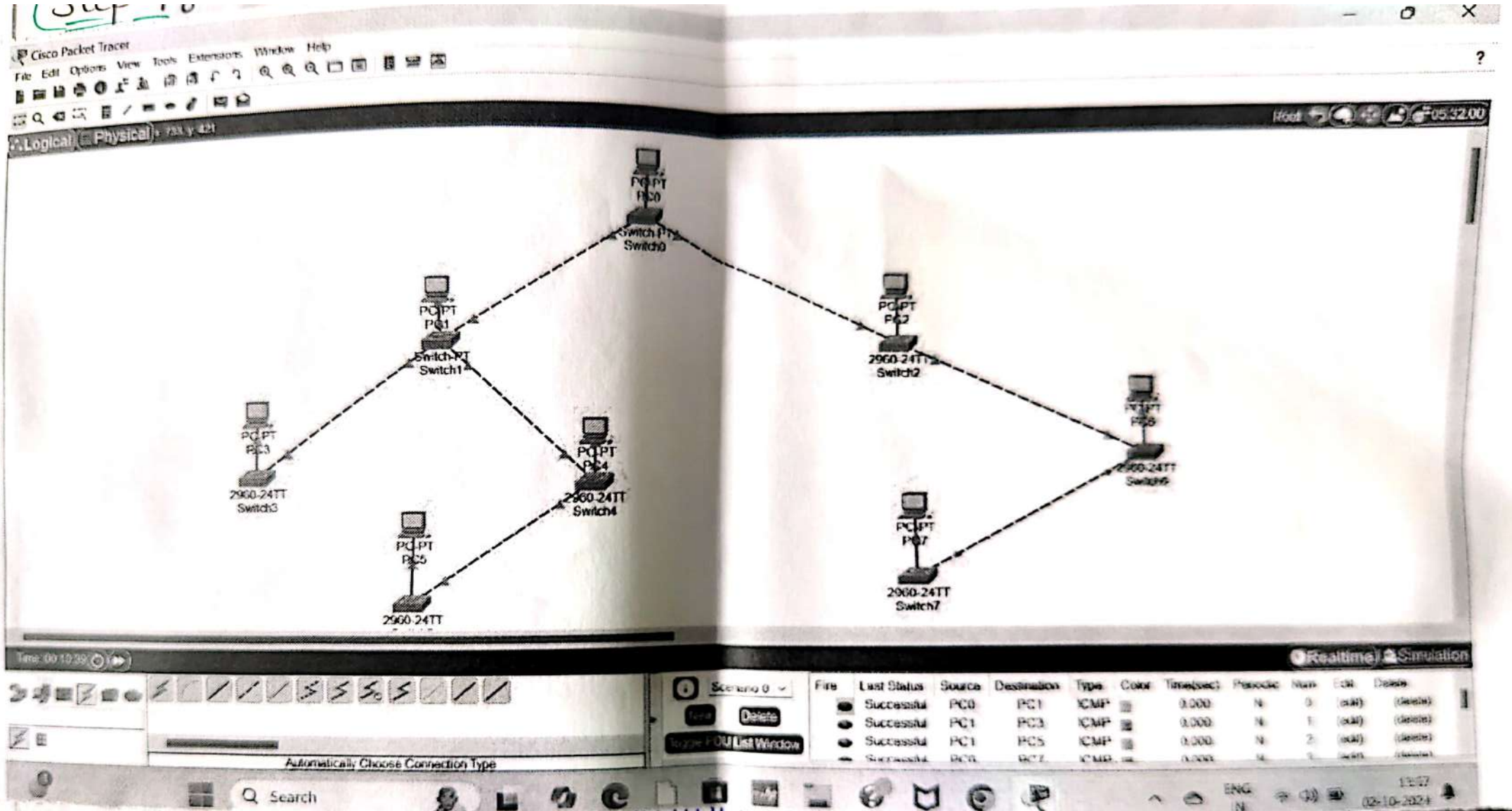
Clicks once on the Automatic Cable selector

click once on PC2

Choose fast ethernet

click once on Hubo

Drag the cursor to Hubo


Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical Physical
PC-PT PC0
Switch-PT Switch0
PC-PT PC1
Switch-PT Switch1
PC-PT PC2
2960-24TT Switch2
PC-PT PC3
2960-24TT Switch3
PC-PT PC4
2960-24TT Switch4
PC-PT PC5
2960-24TT
PC-PT PC7
2960-24TT Switch7
Realtime Simulation
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC0 PC1 ICMP
Successful PC1 PC3 ICMP
Successful PC1 PC5 ICMP
Automatically Choose Connection Type
Search
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Proceding in this way create the 3 star topology.

Step 6:- Building the tree topology - connecting hubs to Active Hub.

Step 7:- Configuring IP adress and Subset masks on the hosts

To start Communication between the hosts IP Adress and Subnet masks had to be configured on the deuice click once on Pco choose confing tab. Type IP adress in its field. Click on Submit mark it will be generated automatically.

Step 8:- Verify Connectivity in real time node

Besure you in real time mode.

Select the add Sample PDU tool used toping devices

The PDU lost status should show us sucessful

Step 9:- Verify Connectivity in simulation mode Besure you in Simulation mode.

Deselect all frters (All/None) and SELECT only ICMP

Select the add simple PDO tool used to ping devices

click once Pco, then once on Pc3

Continue clicking capture.

10

Result:- Thus the tree topology implemented with res packet Tracer Simulation Tool.

Ex-07 :- Implementation of Hybrid topology

Aim :- To implement a tree hybrid topology using packet Tracer and hence to transmit data between the devices Connected using topology.

Apparatus Required :- Packet Tracer, Hubs, Connectors

Steps for building topology.

Step1 :- Start Packet tracer

Step2 :- Choosing devices and connections

Step3 :- Bolding the topology - Adding hosts

Single click on the end devices

Single click on Generic hosts

Move the cursor into topology area

Single click in the topology area and it copies the device.

Step4 :- Building the bus topology - Connecting hosts to hubs

Select a hub, by clicking once on Hub and once on a genric hub add the hub by moving the plus sign '+'

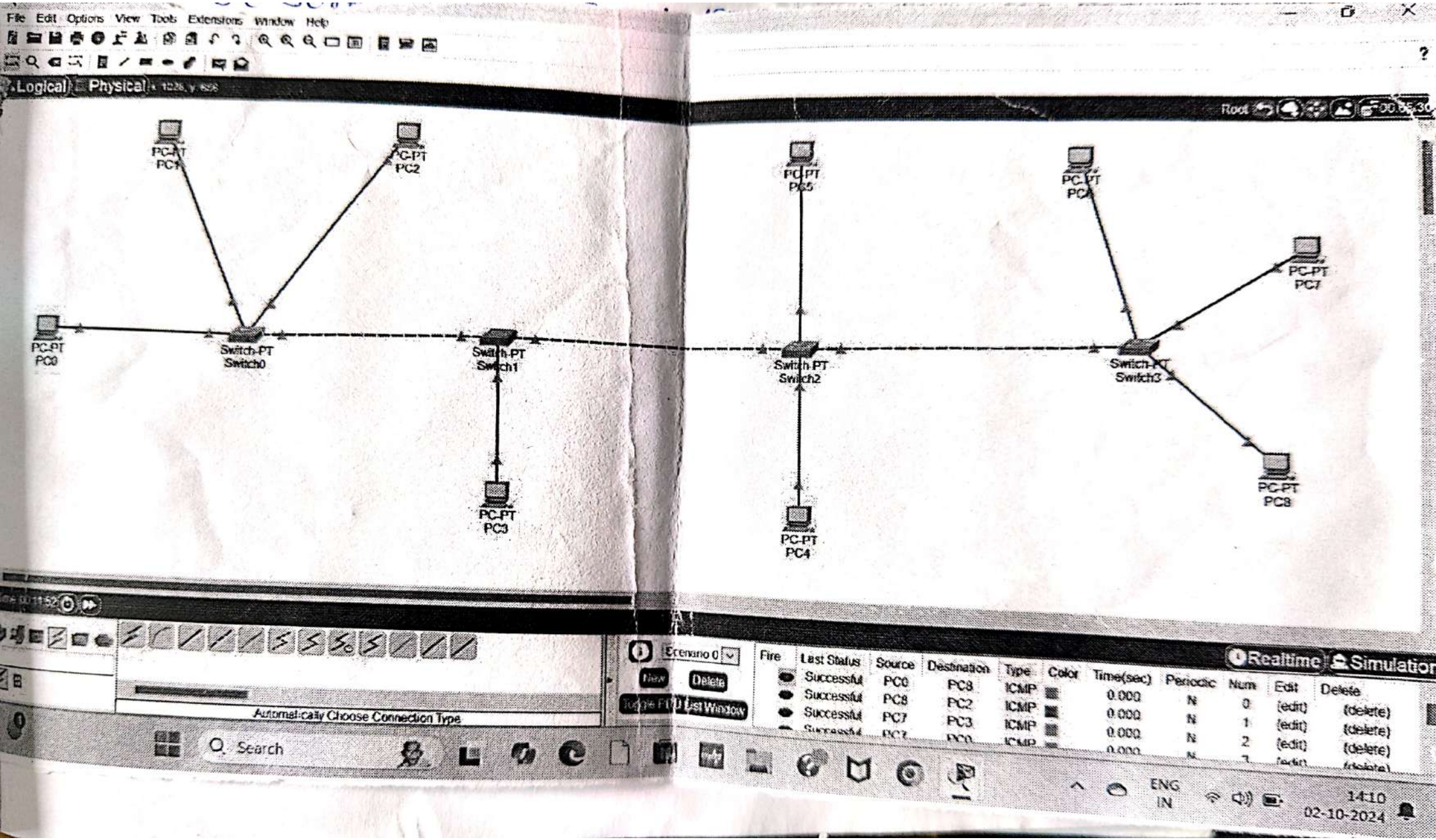
Step5 :- Connect Pcs to hub by first choosing connections click one on the Automatic cableSecto

Click once on PC2

Choose fast ethernet

Drag the cursor to Hub0

Click once to Hub0


File Edit Options View Tools Extensions Window Help
Logical Physical
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
Switch-PT Switch0
Switch-PT Switch1
Switch-PT Switch2
Switch-PT Switch3
Root
Automatically Choose Connection Type
Search
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful PC0 PC8 ICMP 0.000 N 0 (edit) (delete)
Successful PC8 PC2 ICMP 0.000 N 1 (edit) (delete)
Successful PC7 PC3 ICMP 0.000 N 2 (edit) (delete)
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Proceding in this Na 4 Create three Topologies

Step 6:= Building the tree topology Connecting the Hubs to Active Hub:

Connects the Hubs of star topologies to active hub to create tree topology.

Step 8:= Configuring IP Adress and Subnet masks on the hosts to start Communication between the hosts IP Adress and Subnet masks had to be configured on the devices click once on Pco choose the config tab and click on fast ethernet type the IPadress in this field. click on the subnet mask it will be generated automatically

Step 9:= Verfying Connectivity in simulation mode.

Be Sure are in Simulation mode

Deselect are filters (ALL/NONE) and select only ICMP

Select the add simple PPu tool used to ping devices

click once on Pco, then once on PC3

Button until the ICC topping is completed. The ICMP message until the hosts, hab and switch. The PDU last status should show as succesful.

Result:= Thus the Hybrid Topology is implemented with Packet Tracer simulation Tool.

EX-08:- DATA LINK LAYER TRAFIC SIMULATION OF ARP

Aim:- To implement data link layer traffic simulation using Packet tracer Analysis of ARP

Software Required:- Packet tracer, Switches, Connectors

requirments.

1) End devices - They are the devices through which we can pass message from one device to another device and they are inter connected.

2) Switch - Interface between two devices

3) Cable - Used to connect two devices.

Procedure:-

⇒ Open Packet Tracer

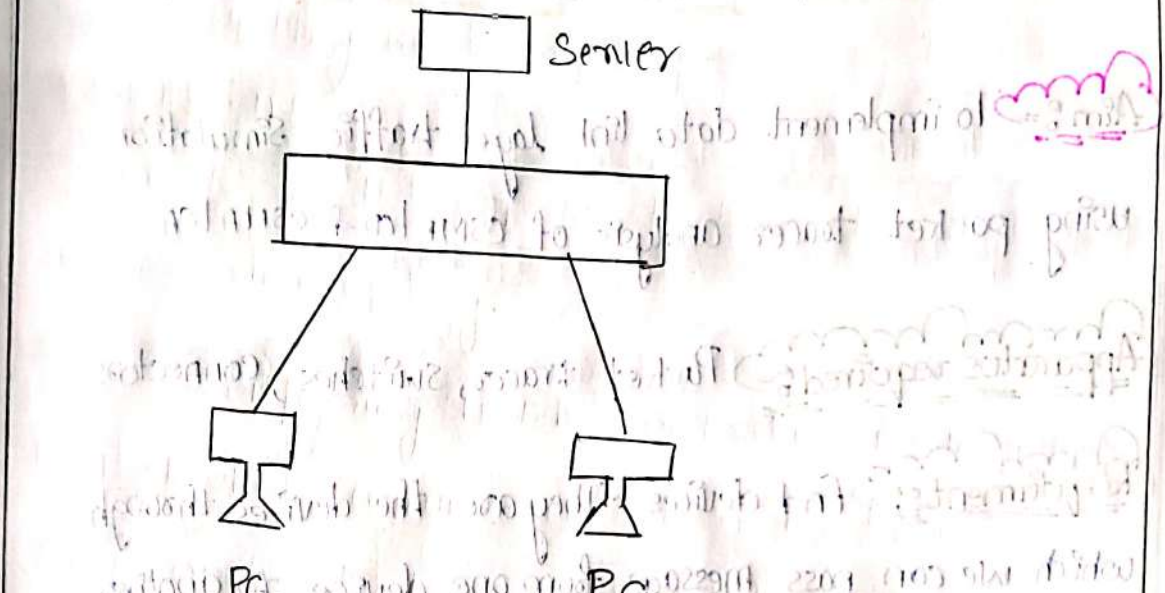
⇒ Click on the list the available capture

⇒ Choose the Pcs, Server and Hubs

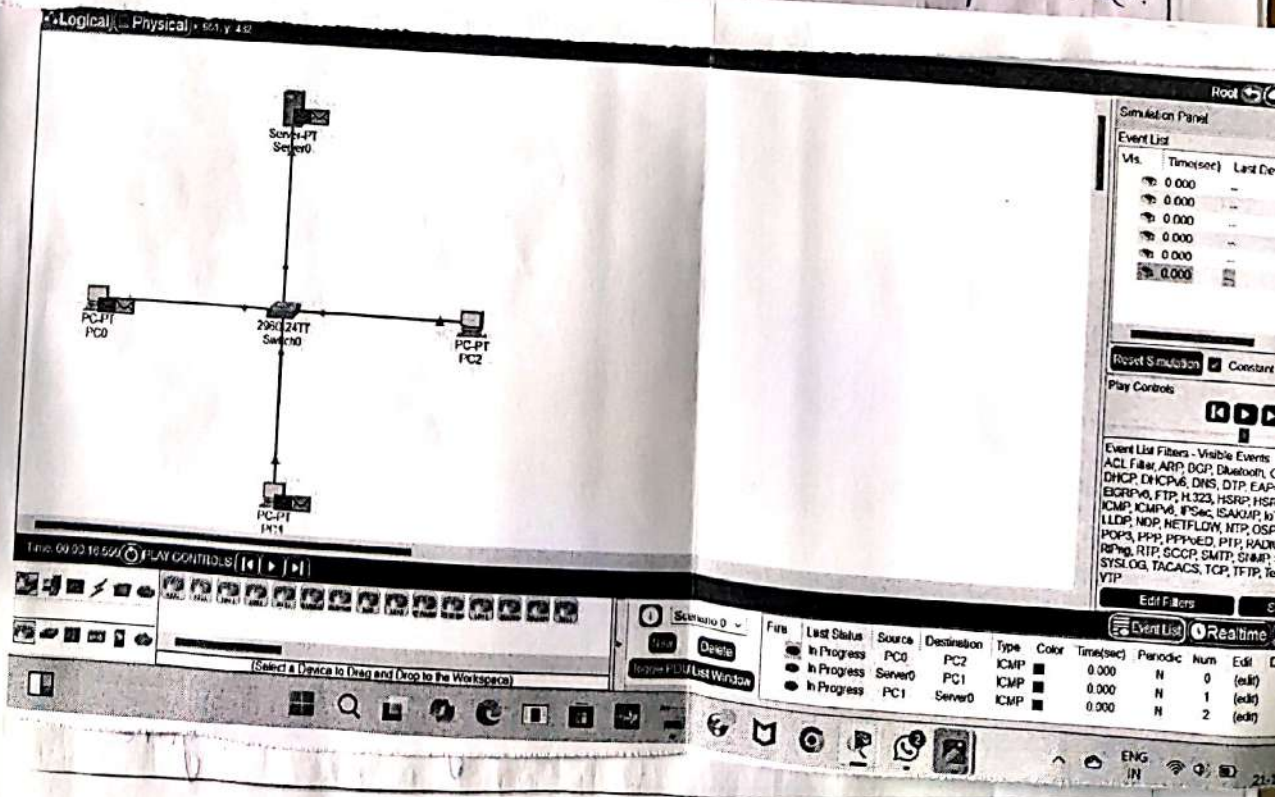
⇒ Later give connection from Hub to the remaing Pcs

⇒ Give IP adress to the Pcs with configuration

⇒ Simulation the source and alstination.



Result:- Thus the data link layer traffic simulation using packet tracer Analysis of ARP is implemented.



Ex.no 19 :- Data link Layer traffic Simulation and Analysis of CSMA/CD & CSMA/CA

Aim :- To implement data link layer traffic simulation using packet tracer analysis of CSMA/CD & CSMA/CA

Apparatus required :- Packet tracer, switches, connectors

Requirments :- End devices - They are the devices through which we can pass message from one device to another and they are inter connected.

2) **Hub :-** Interface between devices

3) **Cable :-** Used to connect two devices

Procedure :-

Step 1 :- Click on end devices, Select generic PC's drag and drop it on the window. click on switch drag and drop it on the window.

Step 2 :- Select the straight through cable and connect all end device to switch.

Step 3 :- Now set the IP adress to host 'A' in static mode. Similarly set IP address for host B and host C

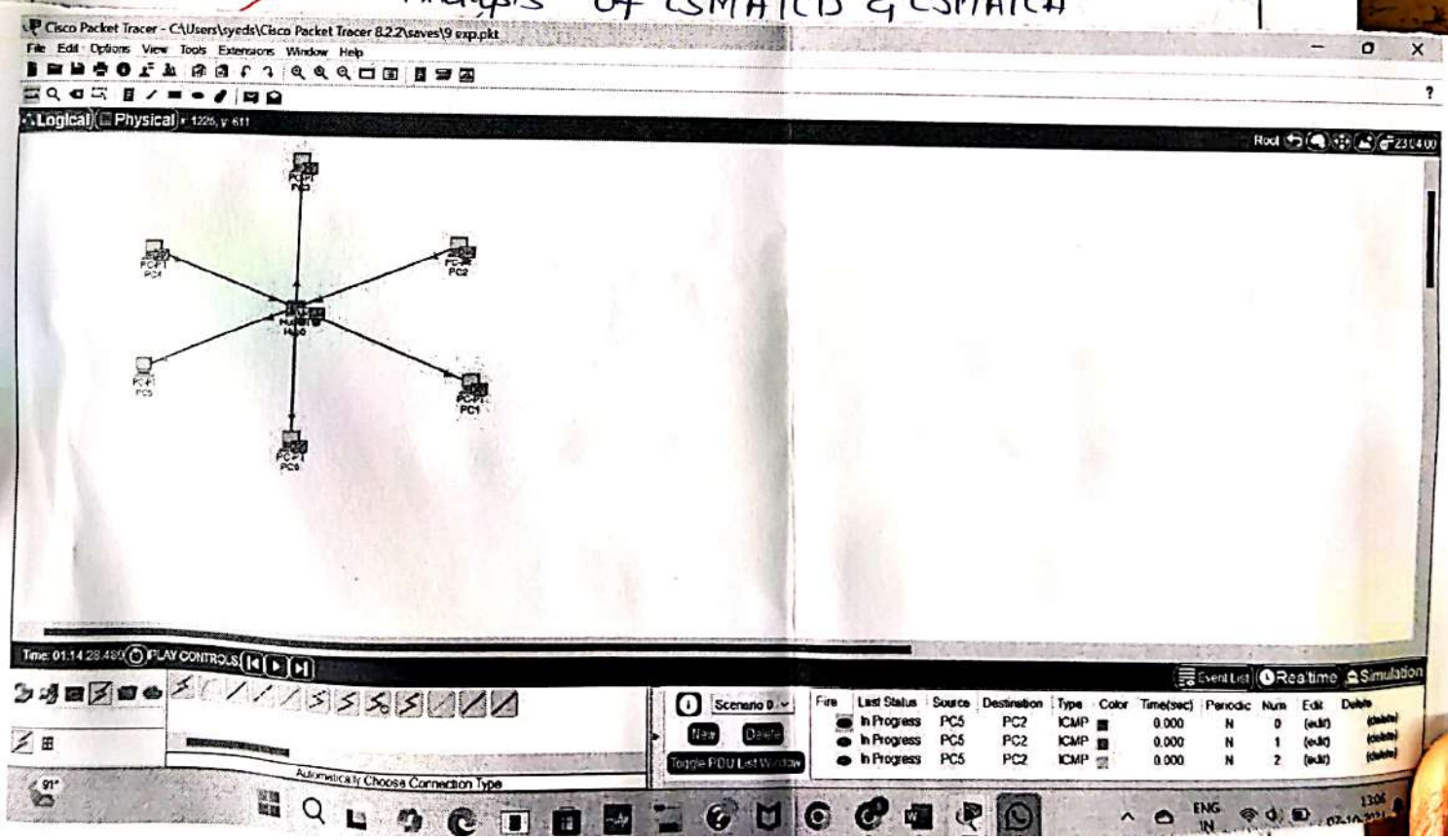
Step 4 :- To view the IP Adress, give IP configure

5-10-24

command prompt using ping command, which we establish communication between two hosts.

Step 5:- Now display the packet transmission in simulation mode.

Result:- The data link layer traffic simulation using Packet Tracer Analysis of CSMA/CD & CSMA/CA



Exp no:-10 Data link layer traffic Simulation and Analysis of LLDP.

5-10-24

Aim:- To Implement Data link layer Traffic simulation using packet Tracer Analysis of LLDP

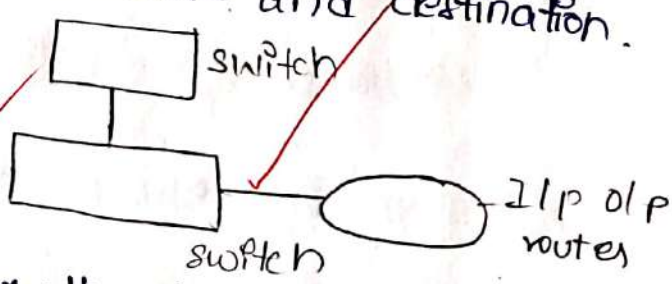
Soft Requriment:- Packet tracer, Switches, Connectors,

Requirments:-

1) **End devices:-** They are the devices through which we pass message from one device to another and they are interconnected
2) **Switch** - Interface between two devices.
3) **Cable** - Used to connect two devices.

Procedure:-

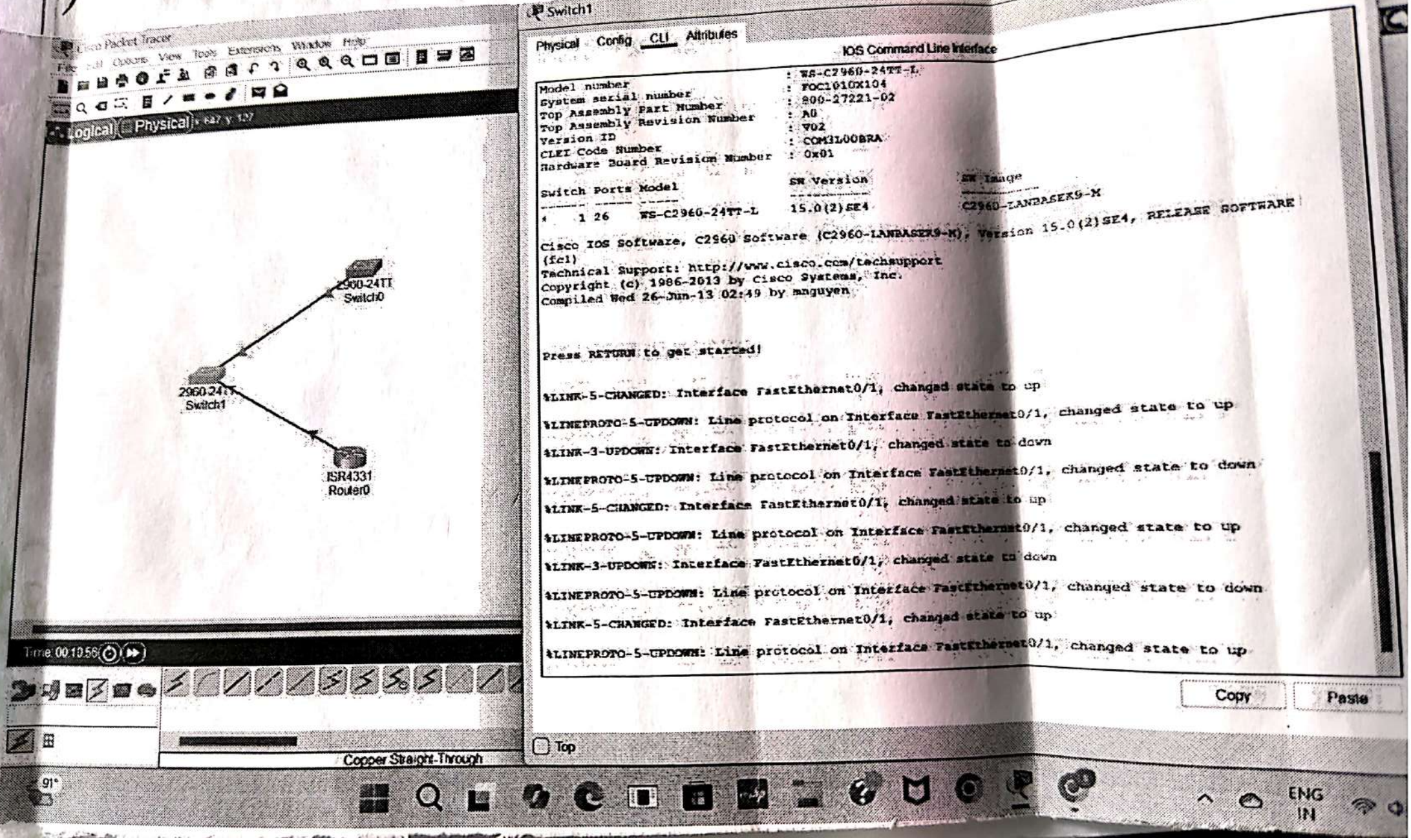
1) Open packet tracer
2) click on the list the avaiable capture interface
3) Choose the PCs, Server and hub.
4) later give connections from hub to remaing PCs
5) Give IP Adress to PCs with Configuration
6) Simulate the Source and destination.



Result:- Thus the data link layer Traffic Simulation using packet Tracer Analysis of LLDP is implemented

1) Open packet Tracer

2) Click on the list the avaiable Capture Interface



Ex-no:11 Configuration of a Sample Static Routing Routers in Packet Tracer Using a Simple Topology.

5-10-24

Aim:- To Configure a router using packet tracer software and hence transmit data between the devices in real time mode and simulation mode.

Apparatus Required:- Packet Tracer, Hubs, Connectors

Procedure:-

Step 1:- Start Packet Tracer

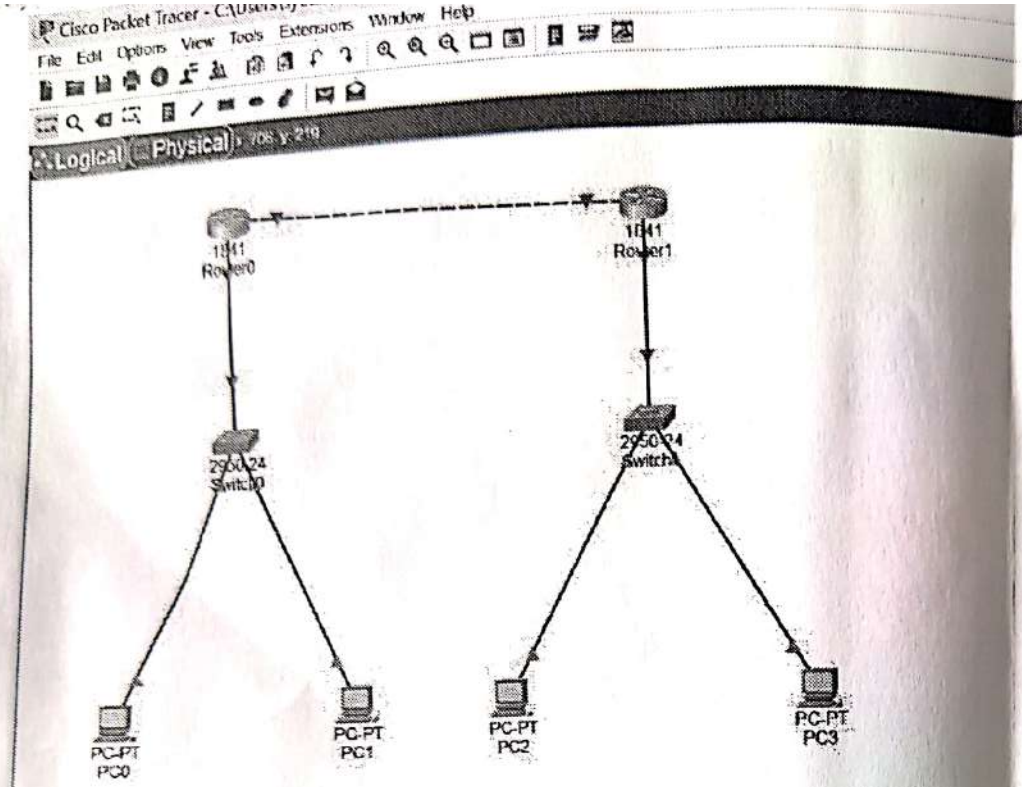
Step 2:- Choosing Devices and Connections

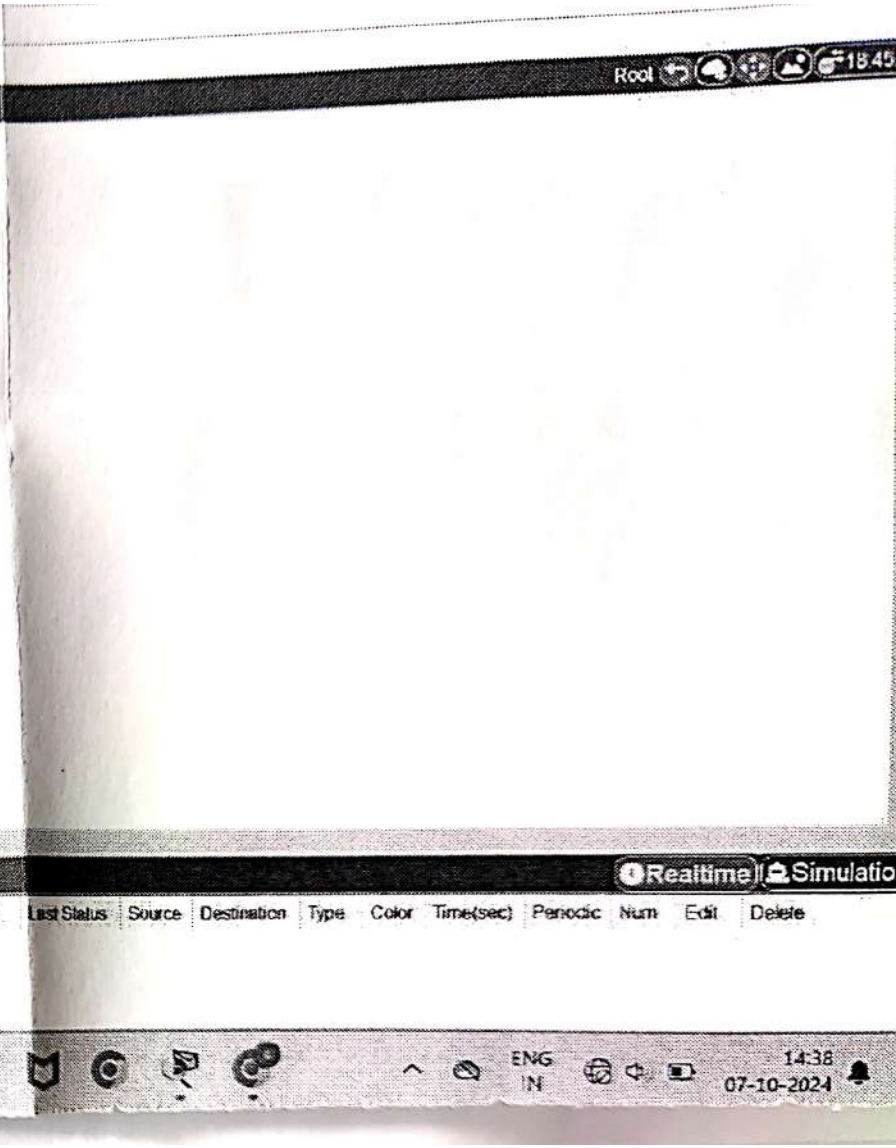
Step 3:- Single click on the end devices Generic Host Place 1 PC0, PC1 on topology area

Connect Pcs to switch 1 and 2 respectively through connecting wires.

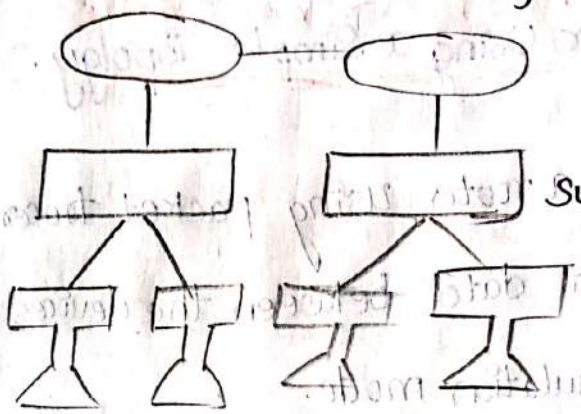
Step 4:- Configuring IP Adress, Gate way and Subnet masks on the hosts.

To star communication between the host IP Adres, Subnet masks and Gate way had to be configured on the devices. Click on Fast ethero. Type IP adress in the field. Based on router create gate way click on the Subnet mask it will be generated Automatically.


Cisco Packet Tracer - C:\Users\
File Edit Options View Tools Extensions Window Help
Logical
Physical
1941
Router0
1941
Router1
2950-24
Switch0
2950-24
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
Time: 01:17:10
Automatically Choose Connection Type


Root
18:45
Realtime
Simulatio
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
ENG
IN
14:38
07-10-2024

Static Routing



192.16.8.11

192.168.1.5

Step 5:- Verifying Connectively in simulation mode

Be sure you are in simulation mode

Deselect all filters (All/None) and select only ICMP

Select the Add Simple PDU tool used ping devices

Click once on PC_0, then once on PC_3 continue clicking capture/Forward button

until ICMP ping is completed. The ICMP message moves between the hosts, hub and switch.

The PDO last status should show

Result:- The configuration of simple static routing in Packet tracer using a simple topology with two router

Ex-no:-12 Configuration of Simple dynamic Routing in Packet Tracer Using a topology with two router:

5-10-24

Aim:- To Configure a router using pocket Trace Software and hence to transmit data blw the devices in real time mode and simulation mode.

Apparatus Required:- Packet Tracer, Hubs, Connectors.

Procedure:-

Step 1:- Start packet Tracer

Step 2:- Choosing devices and connectors

Step 3:- Single click on the Generic Hosts

Place PC0, PC2 on topology Area

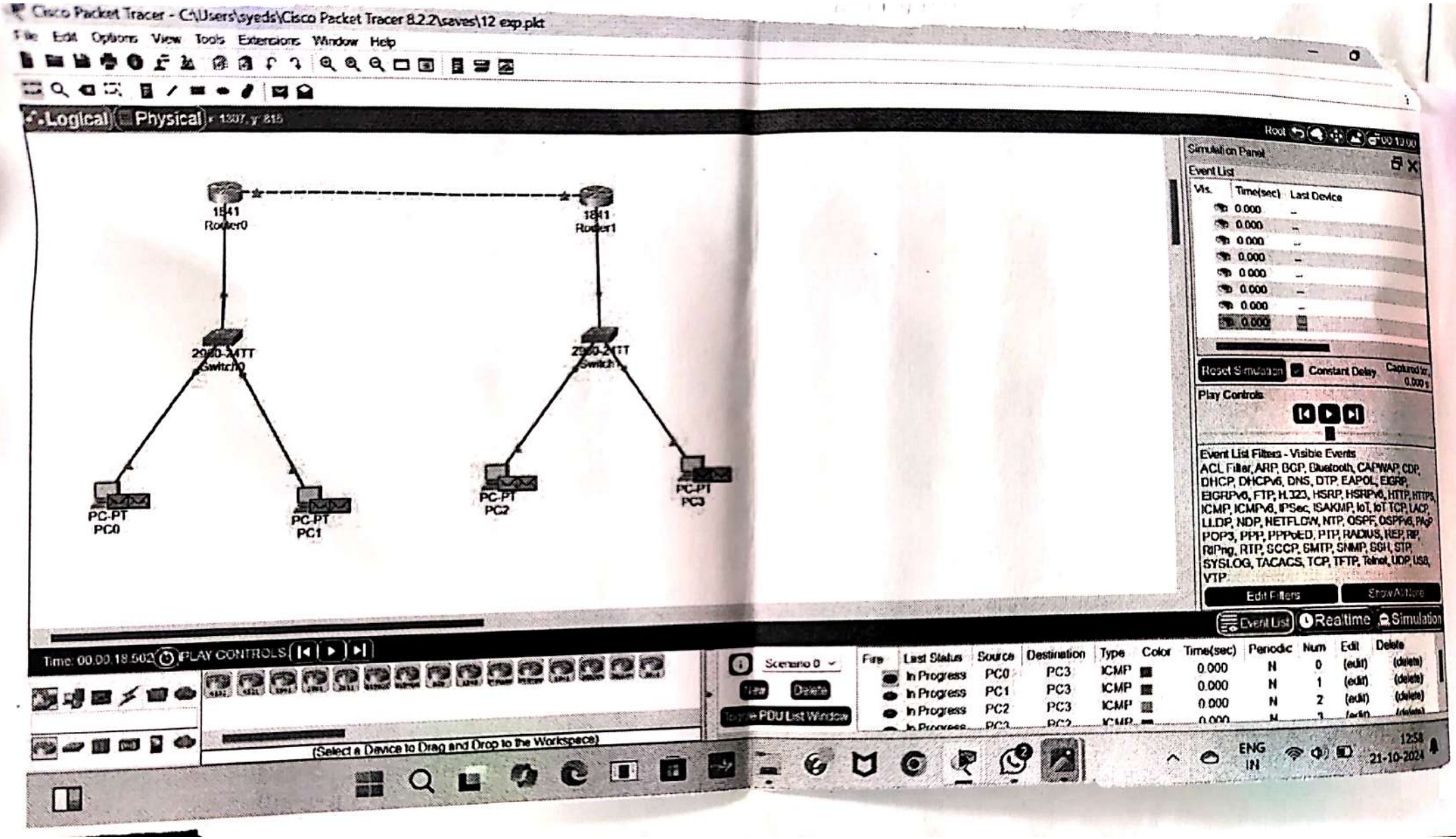
Connect PCs to switch I

Similarly Place PC2, PC3 on topology area for recieved side.

Connect these PCs with 1&2 respectively through connecting wires.

Step 3:- Configuring IP Adress, Gate way and Subnet masks on the hosts.

To start Communication between the hosts IP Adress. Subnet masks and gate way had to be Configured


Cisco Packet Tracer - C:\Users\syeds\Cisco Packet Tracer 8.2.2\saves\12 exp.pkt
File Edit Options View Tools Extensions Window Help
Logical Physical
1841 Router0
1841 Router1
2960-24TT Switch0
2960-24TT Switch1
PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
Simulation Panel
Event List
Vis. Time(sec) Last Device
Reset Simulation
Constant Delay
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation
Time: 00:00:18.502
PLAY CONTROLS
(Select a Device to Drag and Drop to the Workspace)
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
In Progress PC0 PC3 ICMP 0.000 N 0 (edit) (delete)
In Progress PC1 PC3 ICMP 0.000 N 1 (edit) (delete)
In Progress PC2 PC3 ICMP 0.000 N 2 (edit) (delete)
ENG IN
1258
21-10-2024

on the devices. click once on Pcs, Choose the Config tab and click on fast ethernet 0. Type IPadress in its field. Based on router creates gateway click on Subnet mask it will be geneated Automatically

Step 4:- Verifying Connectivity in real time mode be Sure you are in real time mode.

Select the add simple PDU tool used to ping devices

click once on PC0, then once on PC3 Continue

Click once on PC0, then once on PC3 until the ICMP ping is completed the ICMP message move blw the hosts, hub and Switch. The PDU last status show at Successful

Result:- The Configuration of simple dynamic Routing in Packet Tracer using a simple topology with two routers was done Sucessfully.

Ex.No:-13 Design the functionalities and exploration of TCP Using Packet Tracer.

8 to 24 no

Aim :- To design the functionalities and exploration of TCP Using Packet Tracer.

Apparatus Required :- Packet tracer, Hub, Connectors

Procedure :-

Step 1 :- Setup the network topology

Step 2 :- To begin, we will create a simple network topology consits of two computers connected by a router. open Packet tracer and drag two PCs and a router onto a workspace. Connect the two pcs to the router using ethernet cables.

Step 3 :- We will Configure IP address for the computers, Double-Click on each PC to open the Configuration Window and navigtive to the Desktop tab. Click on the IP Configuration icon and after and Subnet masks for each computer. For example, PC1 can have and IP adress of 192.168.1.2 with the same Subnet mask.

Commands:

Enable

Configure terminal

Interface fast ethernet 0/0

IP Adress 192.168.1254 255.255.255.0

no shut down

exit

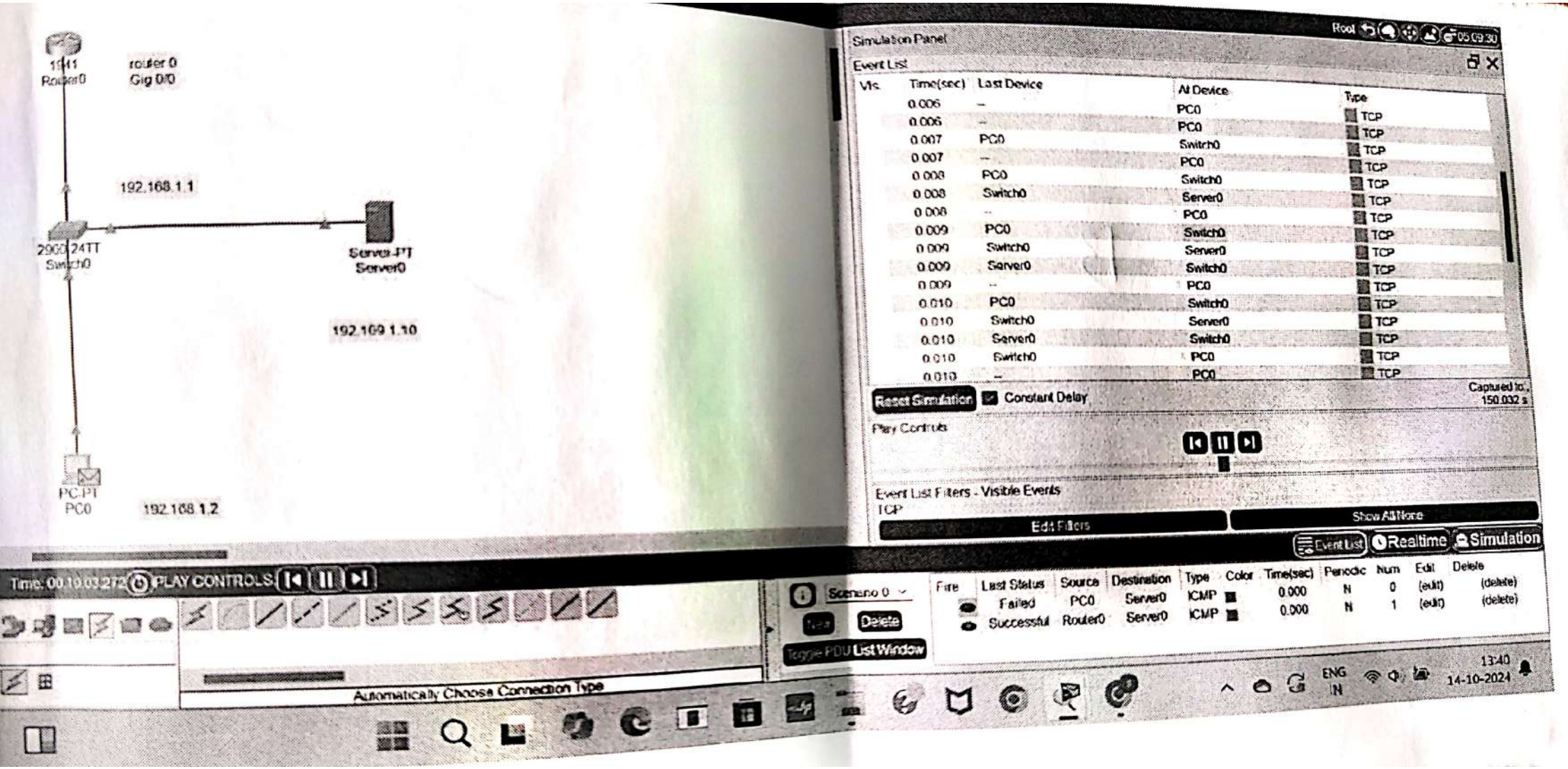
exit

Step 4:- Test the Connection

Now that the network is setup and configured. we can test the connection between the two computers. Open a Command prompt. if the ping is sucessful, it means that the two computers are communicating with each other.

Step 5:- Explore TCP functionalities

Now, let's explore the functionalities of TCP we will use the Netcat Utility to establish a TCP connection between the two computers. Netcat is a versatile networking tool that can be used for various purpose, including establishing TCP connections


1941
Router0
router 0
Gig 0/0
192.168.1.1
2960-24TT
Switch0
Server-PT
Server0
192.169.1.10
PC-PT
PC0
192.168.1.2
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
At Device
Type
Reset Simulation
Constant Delay
Play Controls
Event List Filters - Visible Events
TCP
Edit Filters
Show All/None
Event List
Realtime
Simulation
Time: 00:10:03:272
PLAY CONTROLS
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Failed
PC0
Server0
ICMP
0.000
N
0
(edit)
(delete)
Successful
Router0
Server0
ICMP
0.000
N
1
(edit)
(delete)
Automatically Choose Connection Type
ENG
IN
13:40
14-10-2024

ting

Result:- Those the functionalities and exploration of TCP using packet Tracer is designed sucessfully

10

Ex.no 14:- Design the functionalities and exploration of UDP using Packet Tracer.

08-10-24

Aim:- To design the functionalities and exploration of UDP using Packet Tracer.

Apparatus Required:- Packet tracer, Hub, connectors

Procedure:-

Step 1:- Setup the network topology

To begin create a simple network topology consiting of two Computer Connected by routers open packet tracer and drag two Pc's and router on the workspace. Connect the two Pc's to the router using ethernet cables

Step 2:- Configure IP Adress

Next we will Configure IP Adress for the Computers Double-click on each Pc to open the Configuration window and navigate to the desk-top tab. Click on the IP Configuration icon and enter the IP adress and subnet mask for each computer.

Step 3:- Configure the router

Now, we will Configure the router. Double-click on the router to open the Configuration window and navi-gate to the Click tab.

Commands:- Enable

Configure terminal

Interface fast ethernet 0/0

IP adress 192.168.254 255.255.255.0

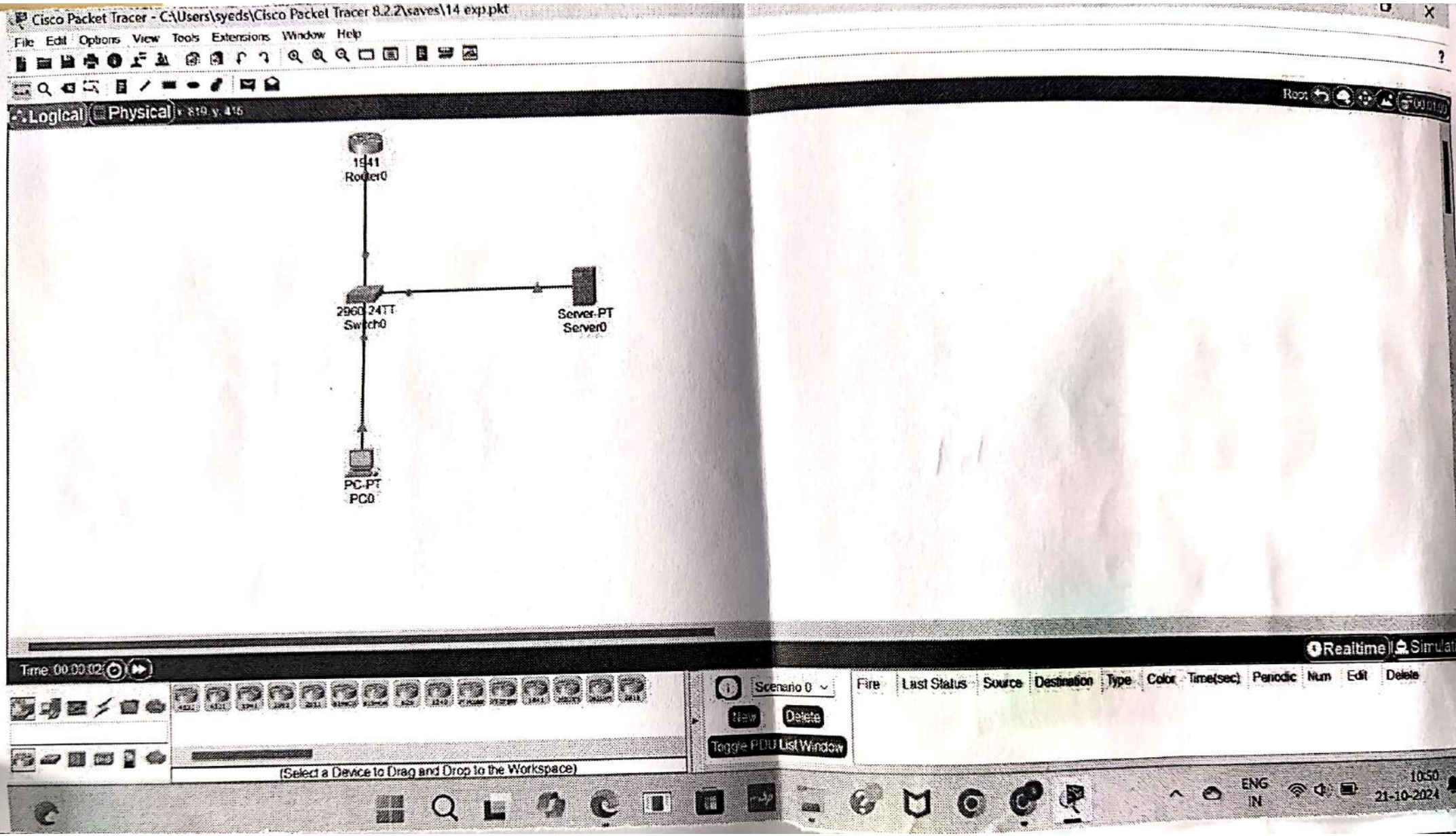
no shut down

exit

exit

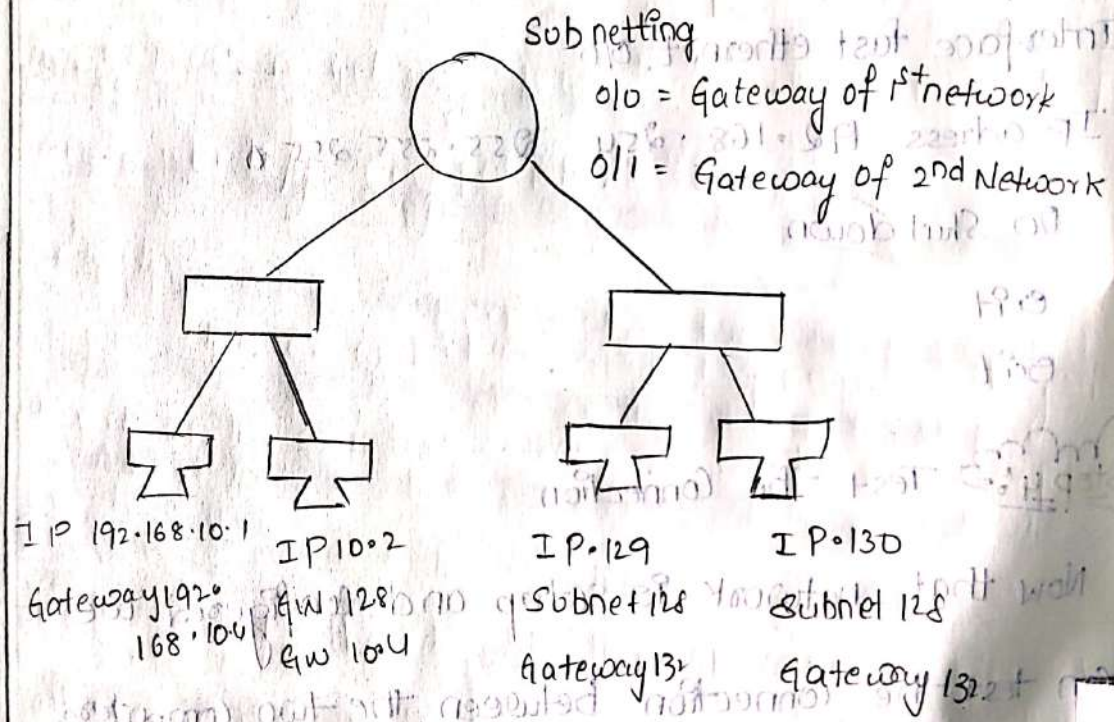
Step 4:- Test the Connection

Now that network is setup and configured we can test the connection between the two computers. Open a Command prompt. on pc1 and pings by typing ping 192.168.1.2 on the command prompt. If the ping sucessfull it means that the two Computers are Communicating with each other.


Cisco Packet Tracer - C:\Users\syeds\Cisco Packet Tracer 8.2.2\saves\14 exp.pkt
File Edit Options View Tools Extensions Window Help
Logical Physical
1941
Router0
2960-24TT
Switch0
Server-PT
Server0
PC-PT
PC0
Root
Time: 00:00:02
(Select a Device to Drag and Drop to the Workspace)
Scenario 0
New
Delete
Toggle PDU List Window
Realtime
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
ENG
IN
10:50
21-10-2024

Step 5:- Explore TCP functionalities

Now let's explore the functionalities of UDP we will use Netcat utility to establish a UDP connection between the two computers. Netcat is a versatile networking tool that can be used various purpose including establishing UDP connections.



Result:- Thus the functionalities and Exploration of UDP using packet tracer is a signed Sucessfully

Ex.no 16:- Design the network model for Subnetting

Classic & Addressing Using Packet Tracer.

8-10-24

Aim:- To design the network model for subnetting class c addressing using packet tracer.

Appartus Required:- Packet Tracer, Hub, Connectors.

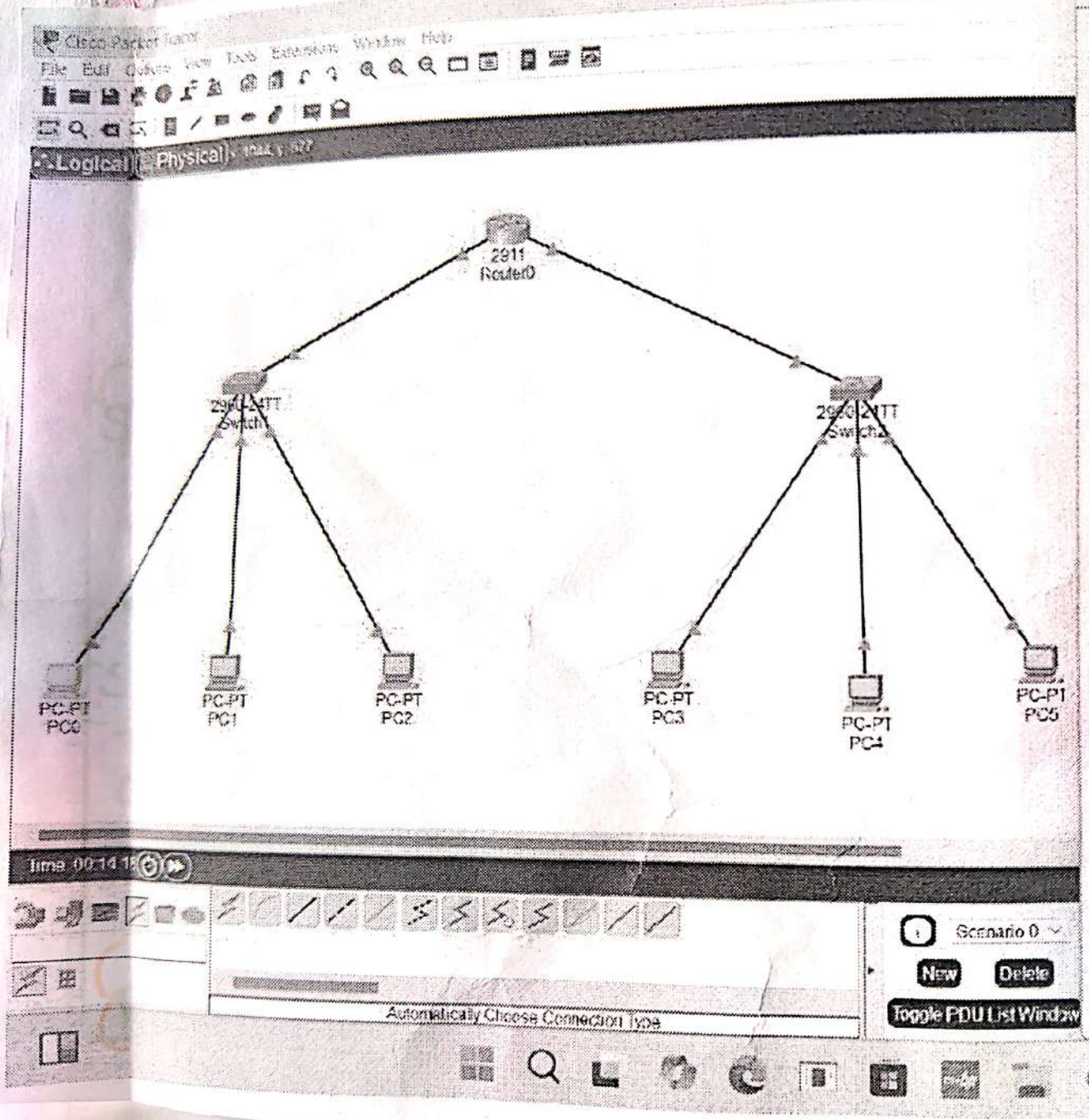
Algorithm:-

1) Determine the network requirments identify the number of subnets and hosts required number of subnet an

2) Choose a subnet mask. Select a subnet mask that can accommodate the required number of subnet and hosts.

3) Calculate the subnet mask and prefix length use the formula $2^P - 2 >= n$, where 'P' is the number of hosts bits and 'n' is required number of hosts per subnet to calculate number of host bit required. Add these host bits to the classic network address to create the subnet address.

4) Configure the router. Configure the router interface with the subnet address and subnet mask.



PC0

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.131

Pinging 192.168.10.131 with 32 bytes of data:

Request timed out.
Reply from 192.168.10.131: bytes=32 time=17ms TTL=127
Reply from 192.168.10.131: bytes=32 time<1ms TTL=127
Reply from 192.168.10.131: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.131:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 17ms, Average = 5ms

C:\>ping 192.168.10.132

Pinging 192.168.10.132 with 32 bytes of data:

Reply from 192.168.10.132: bytes=32 time=5ms TTL=255
Reply from 192.168.10.132: bytes=32 time<1ms TTL=255
Reply from 192.168.10.132: bytes=32 time<1ms TTL=255
Reply from 192.168.10.132: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.10.132:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 5ms, Average = 1ms

C:\>
```

Top

ENG
IN

5) Configure the host with an IP address and subnet mask that matches the subnet address and subnet mask used on the router interface.

6) Test the network: Verify that the hosts can communicate with each other and with devices on other subnets.

7) Monitor network traffic: Use packet Tracers built in network monitoring tools to Monitor network traffic and identify any potential issue.

Procedure:-

Step1:- click on end devices, select generic pcs drag and drop it on the window, click on switch drag & drop it on the window.

Step2:- Select the straight through cable and connect all end device to switch Assign IP address for all end devices.

Step3:- Now set the IP address to host A in static mode. Similarly set IP address for Host B and Host C

Step4:- To view the IP-Address give ip configuration command in command prompt using ping command. We can establish communication between two host device

Result:- Here for designing

Ex.No:-15 Simulating x,y,z Company Network

Design and Simulate Using Packet Tracer

8-10-24

Aim:- To simulate x,y,z Company network design and simulate Using Packet Tracer.

Apparatus Required:- Packet Tracer, Hubs, Connectors

Algorithm:-

1) **Identify the network requirments** Determine the number of users, devices, and servers that will be connected to the network.

2) **Create a network diagram** Use a network diagram tool to create a visual representation of the network design, including the devices, services, switches, routers and connections

3) **Configure the Switches** Configure the routers with IP Address, subnet masks, and routing protocols as needed.

4) **Configure the Routers:-** Configure the switches with VLANs, and assign ports to each VLAN.

5) **Configure the Services:-** Configure the services with IP Address, subnet masks and any necessary Application or Services.

6) Configure the Workstation :- Configure the workstation with IP address, subnet masks and any neccessary applications or services.

7) Configure Security :- Security means such as firewalls access control lists and instrusion detection system as needed.

8) Test the network :- Test the network contectivity by pinning devices.

Procedure :-

1) start packet Tracer, lanch Packet tracer on your computer.

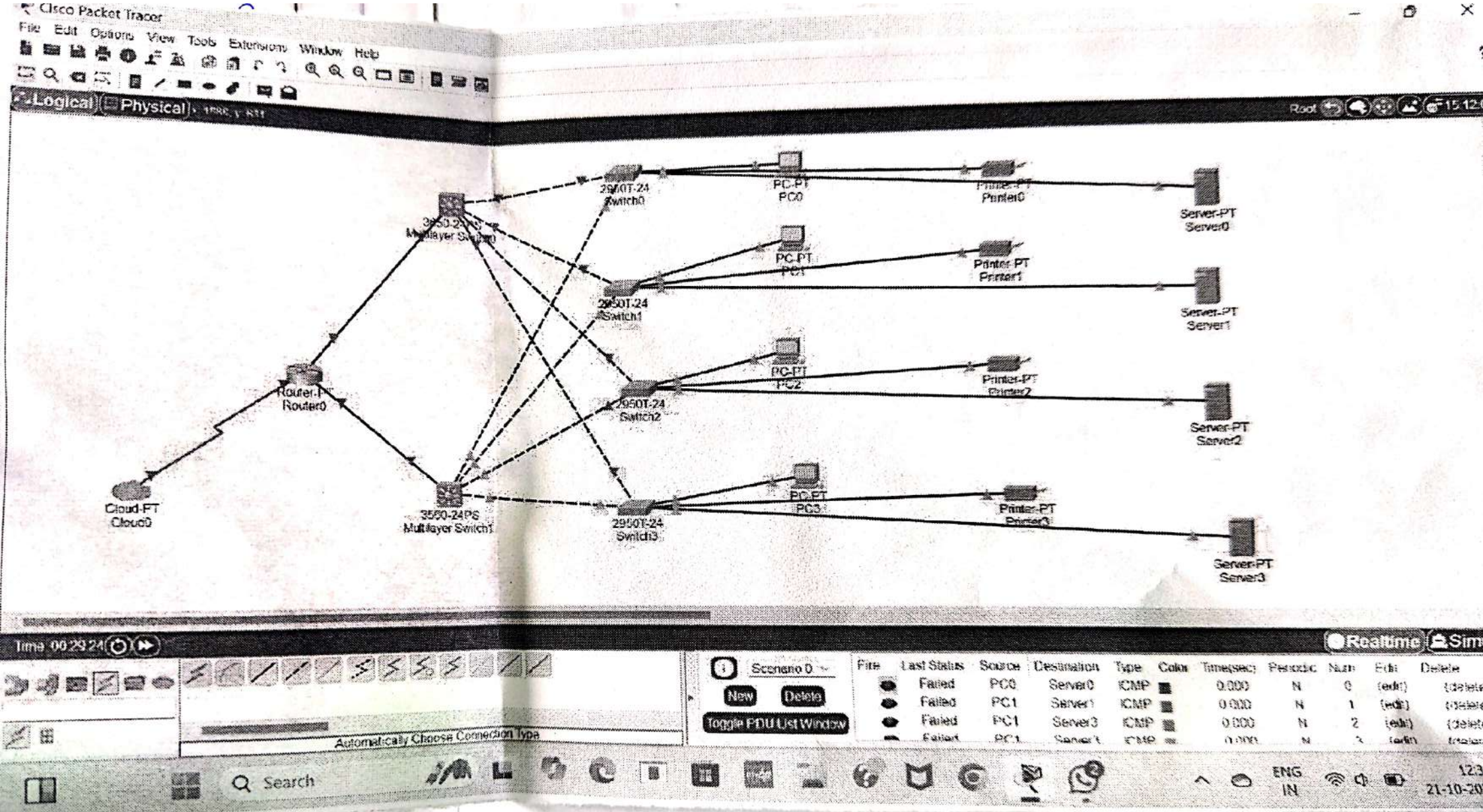
2) Create new project :- click on the select network from options

3) Add devices :- click on the devices tab in the bottom-left corner of the window.

4) Connect devices :- Use the Cable tool to connect the device together.

5) Configure devices :- Double click on each device to open its configuration menu, and configuration in setting such as IP Address and routing protocols.

6) Add Applications :- click on Application tab in bottom left corner of the window & dropand drag



G dropand drag

applications.

7) Test the network :- Use packet Tracer and verify

8) Monitor Network Traffic :- Use packet Tracer built in network monitoring tools.

9) Make Adjusment needed :- Make adjostment to the network Configuration needed for security

10) Save the project :- Click on file and select to save the project

Ex.no:-17 Configuration of DHCP in Packet Tracer

16-10-24

Aim:- To Configure DHCP (dynamic host Configuration Protocal) in packet Tracer

Apparatus Required:- Packet Tracer, Hubs, Connectors

Algorithm:-

1) Start

2) Set up the network Topology in packet tracer with a DHCP server and DHCP Clients connected to a switch

* Configure the DHP Server.
* Assign an IP address to the Server interface
* Enable the DHCP service on the Server.

3) Configure the switch

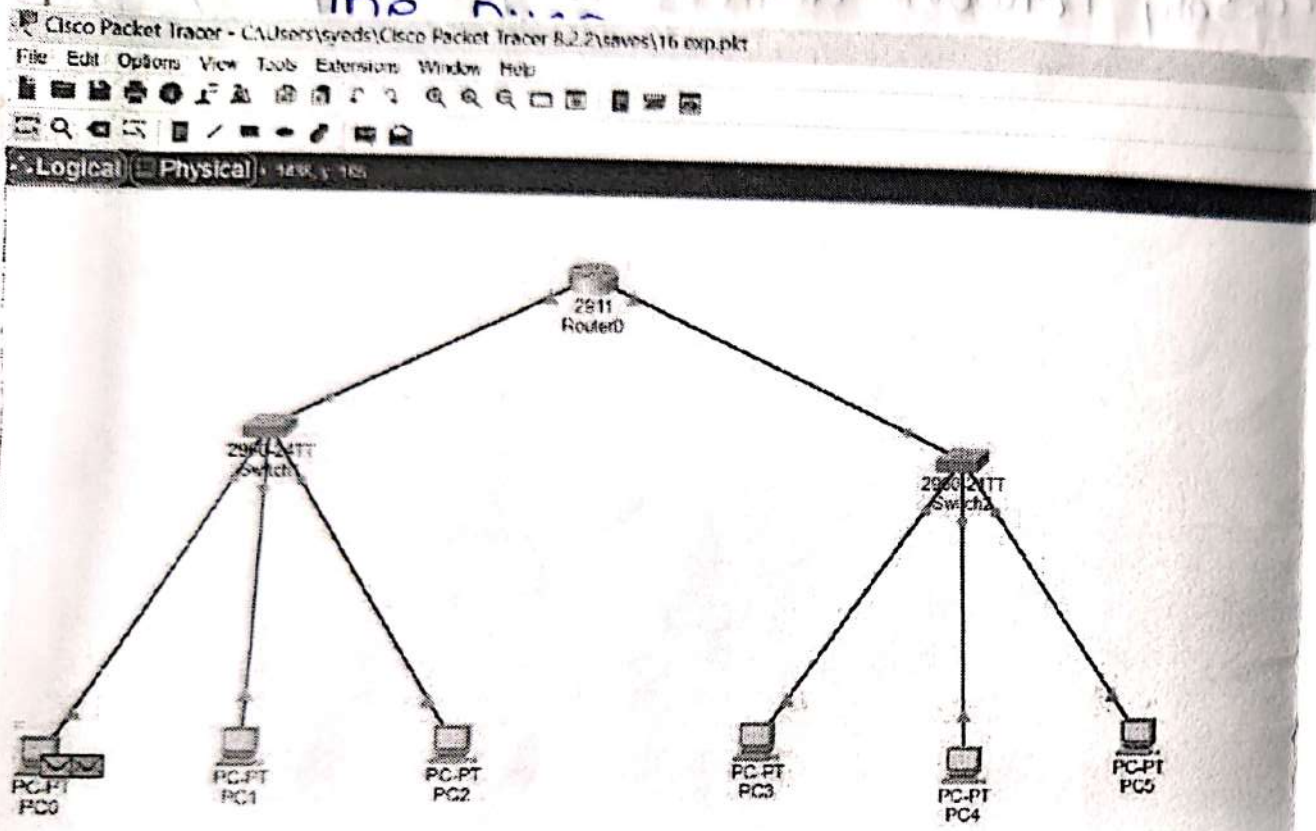
* Enable the switch interances that connect to the

4) DHCP Clients

* Configure the DHCP clients
* Configure the client to obtain IP address Automa-tically using DHCP.
* Verify the clients are set to use DHCP as the Pretted Method for IP

Acknowledgement :-

The



Renewal and Expiration:-

5) Client request and Server response.

* When a DHCP client boots up or its lease expires, it sends a DHCP discover message as a broadcast on the local network.

* The server includes other network Configuration Parameters in the order message.

6. Client selection and request

* The Client recieves multiple offer message from diffe -rent DHCP server it avaiable.

7) Server Acknowledgement :-

The DHCP Server recieves the request message d a DHCP Acknoledgement message to the client conforming the IP address assigment

8) Client Configuration

The Client recieves the Ack message and Configures it network interface with the assign of IP address and any other parameters provided by DHCP server.

9) Lease Renewal and expiration:-

Ex.no 18:- Configuration of fire wall in Packet Tr

10-10-24

Aim:- To Configure firewall in Packet Tracer

Software:- Packet Tracer, Hubs, Connectors

Procedure:-

Step 1:- Set up the Network topology.

To, begin We will Create a simple Network topology open P.T. A router and a fire wall open PT and drag three Pc's a router and small fire wall on to the workspace. Connect pcs to router using Ethernet.

Step 2:- Configore IP Address

Next, We will Configure IP address for Computer Double click on IP click icon and enters the IP address and Subnet mask for each Computer

Step 3:- Configure the Router:-

Now, we will can figure the router. Double click on the window and navigate to CIT tab enter the following. Commands.


File Edit Options View Tools Extensions Window Help
Logical
Physical
2811
Router0
2960-24TT
Switch0
PC-PT
PC0
PC-PT
PC1
Root
Realtime
Simul
Scenario 0
New
Delete
Toggle PDU List Window
Automatically Choose Connection Type
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Failed
PC0
PC1
ICMP
0.000
N
0
(edit)
(delete)
Failed
PC1
PC0
ICMP
0.000
N
1
(edit)
(delete)
Failed
PC0
PC1
ICMP
0.000
N
2
(edit)
(delete)
Failed
PC1
PC0
ICMP
0.000
N
3
(edit)
(delete)
ENG
IN
14:23
17-10-2024

Commands:-

(i) Enable

(ii) Configure terminal

(iii) No Shutdown

(iv) Exit.

Step 4:- No we will Configure the firewall. Double click on firewall to open the Configuration Window.

Step 5:- Now that firewall is Configured we can test Connections blw the Computers by Command prompt on PC1 and PC2. If the pings are Sucessfully it means Computer are Comunicating.

6:- To test the firewall, try to Connect to from internet using protocol on port that is not allowed by access rule. for example you can try to Connect PC using Tablet on port.

Result:- Hence the Configuration of firewall in packet Tracer is Succesfull.

Ex.no:-19 Make a Computer lab to Transfer a Message from one node to another to Design and Simulate.

10-10-24

Aim:- To make a computer lab to transfer a message from one node to another to design and simulate using Cisco packet Tracer.

Apparatus Required:- Packet Tracer, Hubs, Connectors.

Procedure:- Given

Step 1:- Create the network technology first, we need to create the network topology for computer lab in Packet tracer, drag two computers, a switch, and two routers onto the Workspace the network should look like this.

Code:-

PC1 PC2

| |

Switch ----- Router1 --- Router2

Step 2:- Configure IP Address

Next we will Configure IP Address for the Compu

Double-click on each PC to open the Configurat window & navigate to the Desktop tab. click on

IP Configuration icon and enter IP address and subnet mask for each Computer.

Step 3:- Configure the routers

Now, we will Configure the Routers Double-click on Router1 to open the Configuration Window and navigate to CLI Tab. Enter the following Command Configure terminal.

Interface first ethernet
IP address
No Shut down
Serial
IP address
No Shut down
exit

Now exit on Router2 to open Configuration window and navigate to CLI Tab.

enable
Terminal
Serial
IP address
NO Shut down
Fast ethernet
IP address
No Shutdown
Exit

These Commands will Configure a reach of IP address network.

Enable

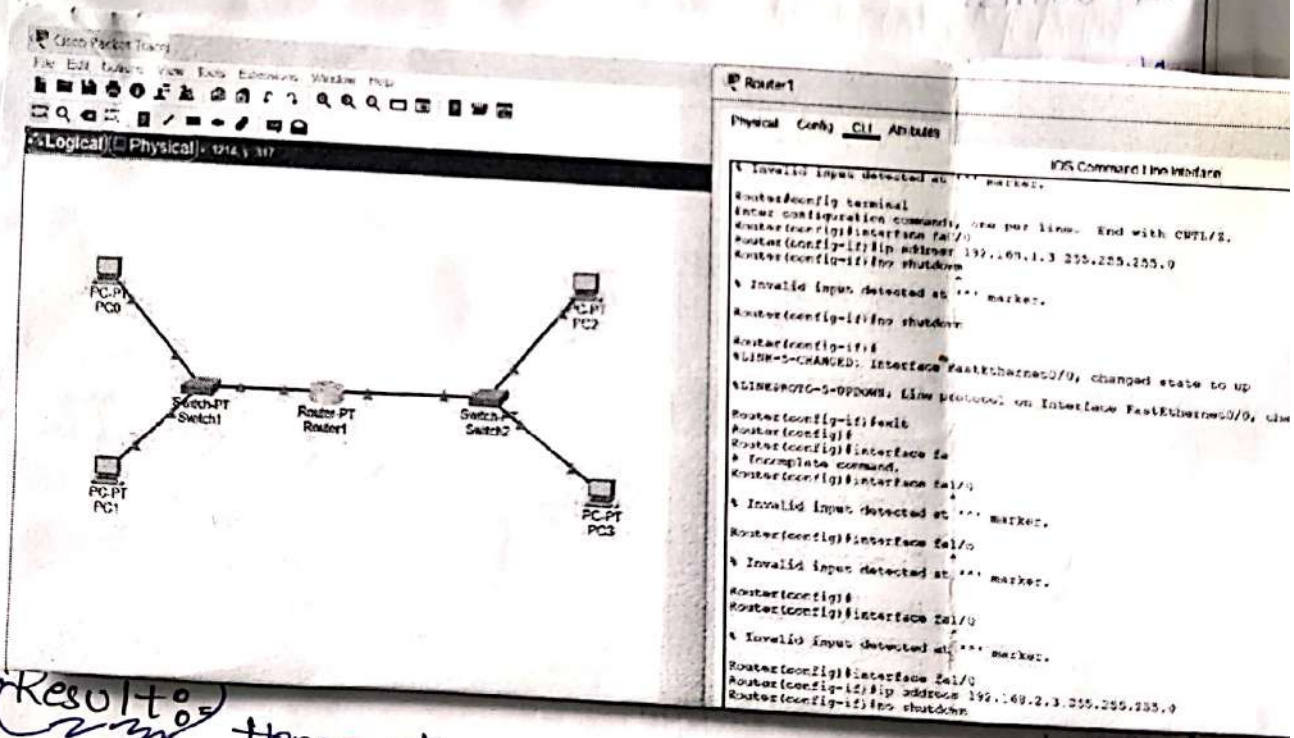
Configuration terminal.

Ip route

exit

Step 5:- Sents a Message

To Send a Message from PC and pc2, Open the Command prompt on Pc and type ping.



Result:- Hence the message is transfered from one node to another using P.T.

Ex.no 20 :- Simulate a Multi Media Network in Packet Tracer

10-10-24

Aim :- To Simulate a Multimedia Network

Software :- End devices, Hubs, Connectors

Procedure :-

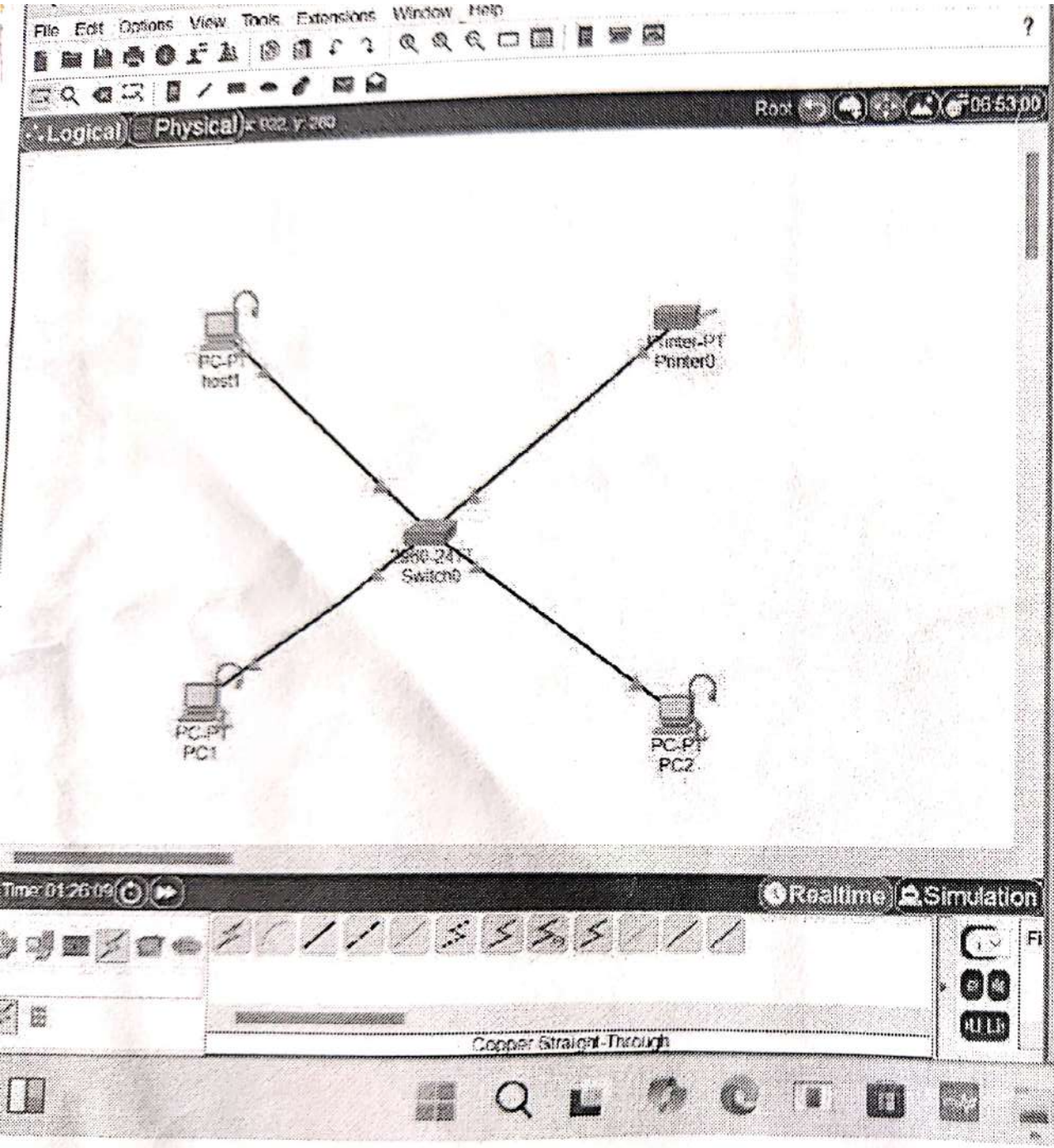
1) Lanch Asco packet Tracer network devices from your multi-media devices such as IP phones you can find devices in end devices.

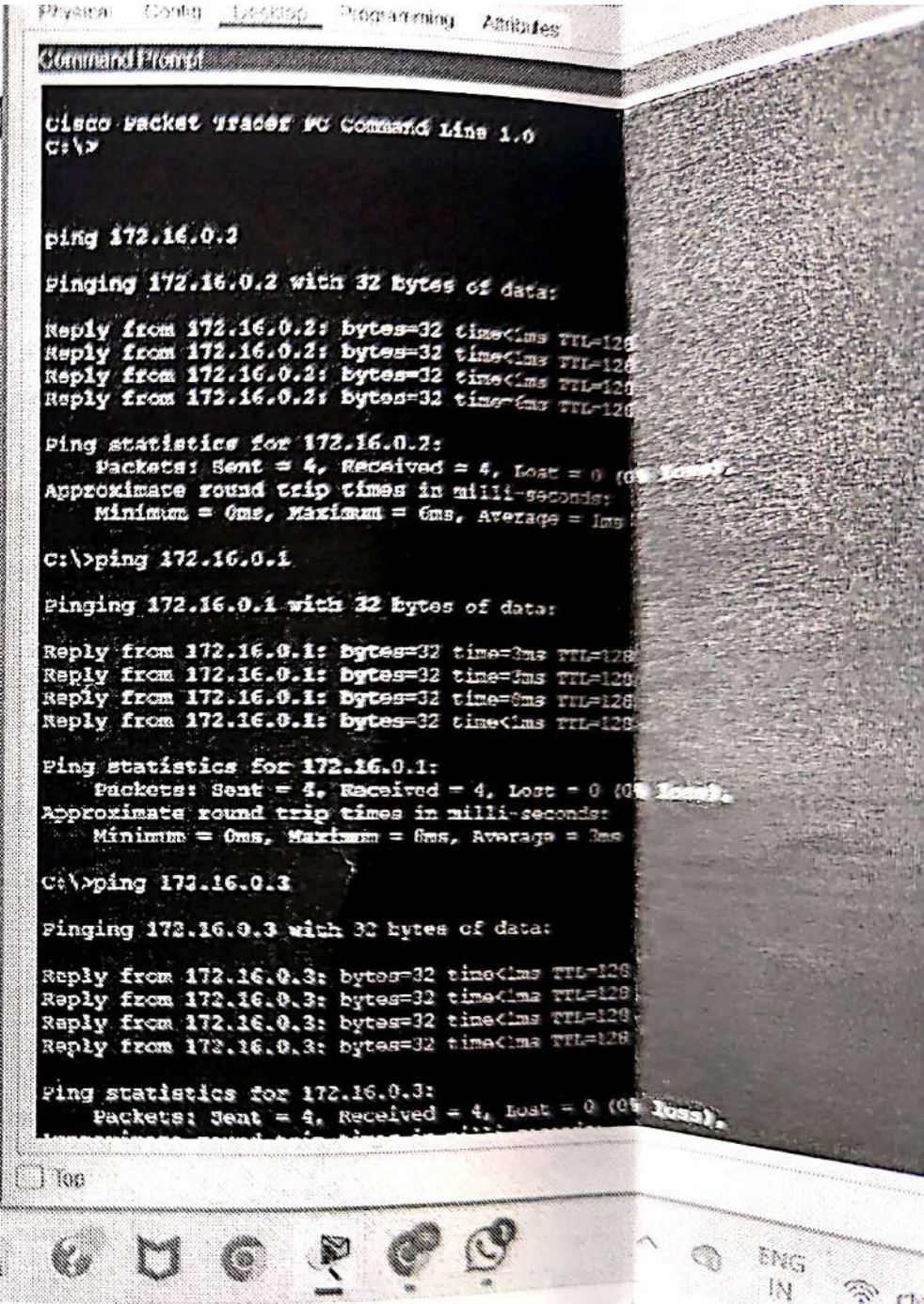
2) Select the appropriate network devices from your Multimedia devices such as IP phones. you can find devices in End devices.

3) Design the network topology devices from your layout of your network and connection blue devices.

4) Drag and Drop the devices onto workshop area connect devices using cables or wireless connection

5) Configure IP Address. Assign IP address, Subnet masks, default gateway to computer, Configure the router inteface with address provide by your IP address.


File Edit Options View Tools Extensions Window Help
Logical
Physical
Root
06:53:00
PC-PT
host1
Printer-PT
Printer0
Switch0
PC-PT
PC1
PC-PT
PC2
Time: 01:26:09
Realtime
Simulation
Copper Straight-Through


Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>
ping 172.16.0.2
Pinging 172.16.0.2 with 32 bytes of data:
Reply from 172.16.0.2: bytes=32 time<1ms TTL=128
Reply from 172.16.0.2: bytes=32 time<1ms TTL=128
Reply from 172.16.0.2: bytes=32 time<1ms TTL=128
Reply from 172.16.0.2: bytes=32 time=6ms TTL=128
Ping statistics for 172.16.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 6ms, Average = 1ms
C:\>ping 172.16.0.1
Pinging 172.16.0.1 with 32 bytes of data:
Reply from 172.16.0.1: bytes=32 time=3ms TTL=128
Reply from 172.16.0.1: bytes=32 time=3ms TTL=128
Reply from 172.16.0.1: bytes=32 time=8ms TTL=128
Reply from 172.16.0.1: bytes=32 time<1ms TTL=128
Ping statistics for 172.16.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 8ms, Average = 3ms
C:\>ping 172.16.0.3
Pinging 172.16.0.3 with 32 bytes of data:
Reply from 172.16.0.3: bytes=32 time<1ms TTL=128
Reply from 172.16.0.3: bytes=32 time<1ms TTL=128
Reply from 172.16.0.3: bytes=32 time<1ms TTL=128
Reply from 172.16.0.3: bytes=32 time<1ms TTL=128
Ping statistics for 172.16.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Top

6) Setup Multimedia Service. Configure necessary service for connection such as VOIP for phones and Streaming Protocols for IP address. This may involve Configure Protocols like I.P

7) The Connectivity and Multimedia Services. Verify the at devices can Communicate each other and Multimedia Service are functioning correctly

) Monitor and trouble shoot. Use Network Monitor tools in PT to observe Network traffic and Performance. Trouble shoot any issue that arrise such as Connectivity problems ... etc..

Document the lab expirement. Record observe and any issues encountered the Simulation. This documentation will help to analyze the result and make improvements neccesarily. Remember to save your project of Regularly Preserve you force with media network allowing you to understand the challanges and requirments

Result:- This is a Multimedia Network in CISCO Packet Tracer is Simulated Sucessfully.

Ex.no 21:- IoT Based Smart Home Applications

16-10-24

Aim:- To implement IoT, based smart home application.

Software:- Packet Tracer, Hubs, Connectors

Procedure:-

1) Create a Network Topology in cisco Packet Tracer that includes IOT devices such as sensors, gateway.

2) Configure the I.O.T devices such as sensors gateway subsnet marks and gateway address.

3) Set up Communication protocol between I.O.T devices using MQTT, COAP

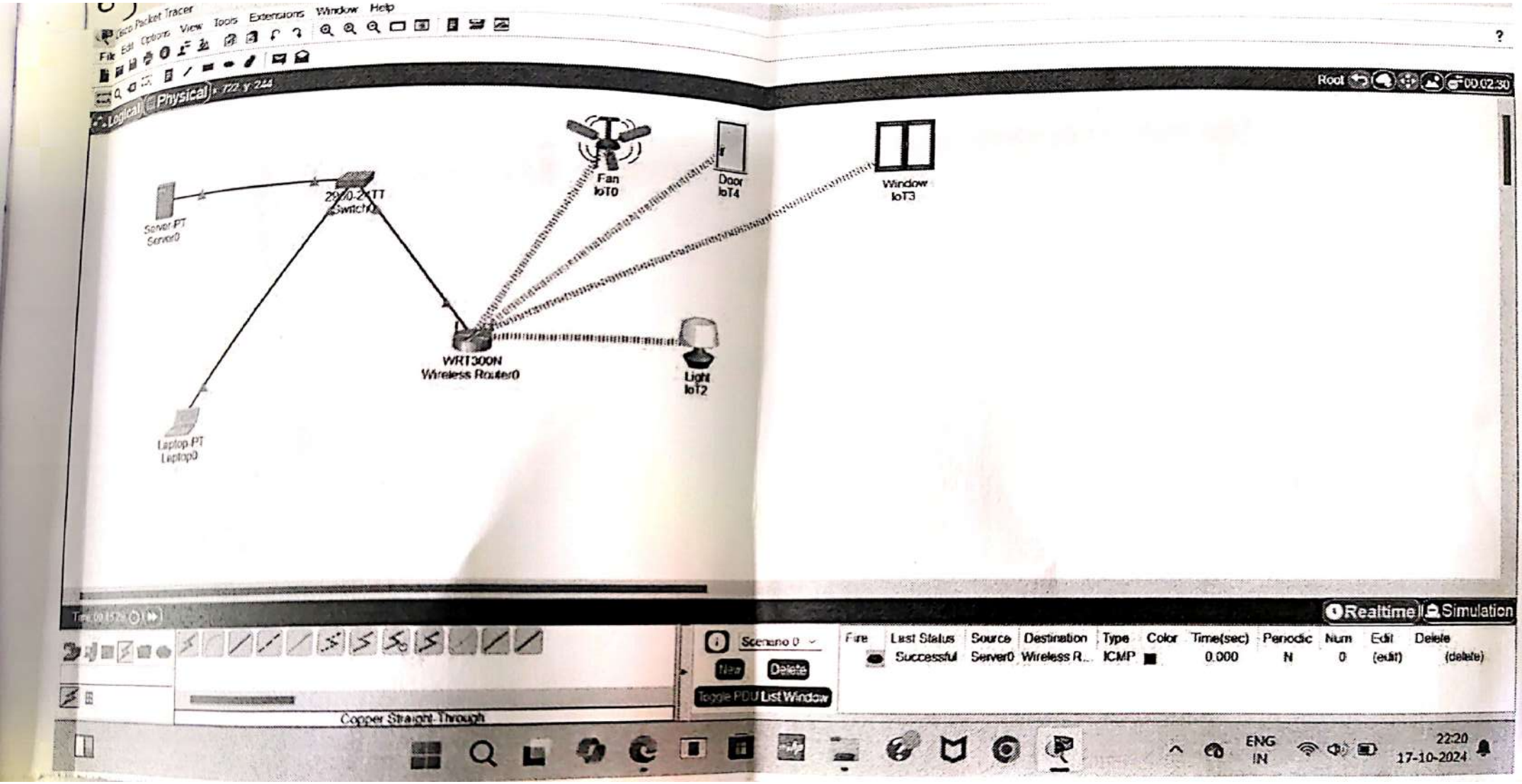
4) Write a Code of Collect data from sensors and send it to gateway

5) Use the gateway to process the data and send Comand to Actors.

6) Finally we interface (or) mobile application to Monitor and Concpt IOT devices.

By following these steps on IOT based smart Application in cisco can be Created. This can be used for various Application such as home Automation, smart cities etc..

Result:- The I.O.T based smart home Applicaffony in cisco packet Tracer is implemented sucessfully


Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical Physical x: 722 y: 244
Root 00:02:30
Server-PT Server0
2960-24TT Switch0
Fan IoT0
Door IoT4
Window IoT3
WRT300N Wireless Router0
Light IoT2
Laptop-PT Laptop0
Realtime Simulation
Scenario 0
New Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful Server0 Wireless R... ICMP 0.000 N 0 (edit) (delete)
Copper Straight-Through
ENG IN
22:20 17-10-2024

Ex.no 22:- Implementation of IOT Based on Smart Gardening

10-10-24

Aim:- To implement of IOT based on smart gardening using Cisco packet tracer.

Apparatus Required:- Packet Tracer, Hubs, Connectors.

Procedure:-

Step 1:- Create a new project in Cisco packet tracer and drag a generic IOT device. from the IOT devices section the workspace.

Step 2:- Right-click on the IOT device and selection and configure IOT server from the drop-down list.

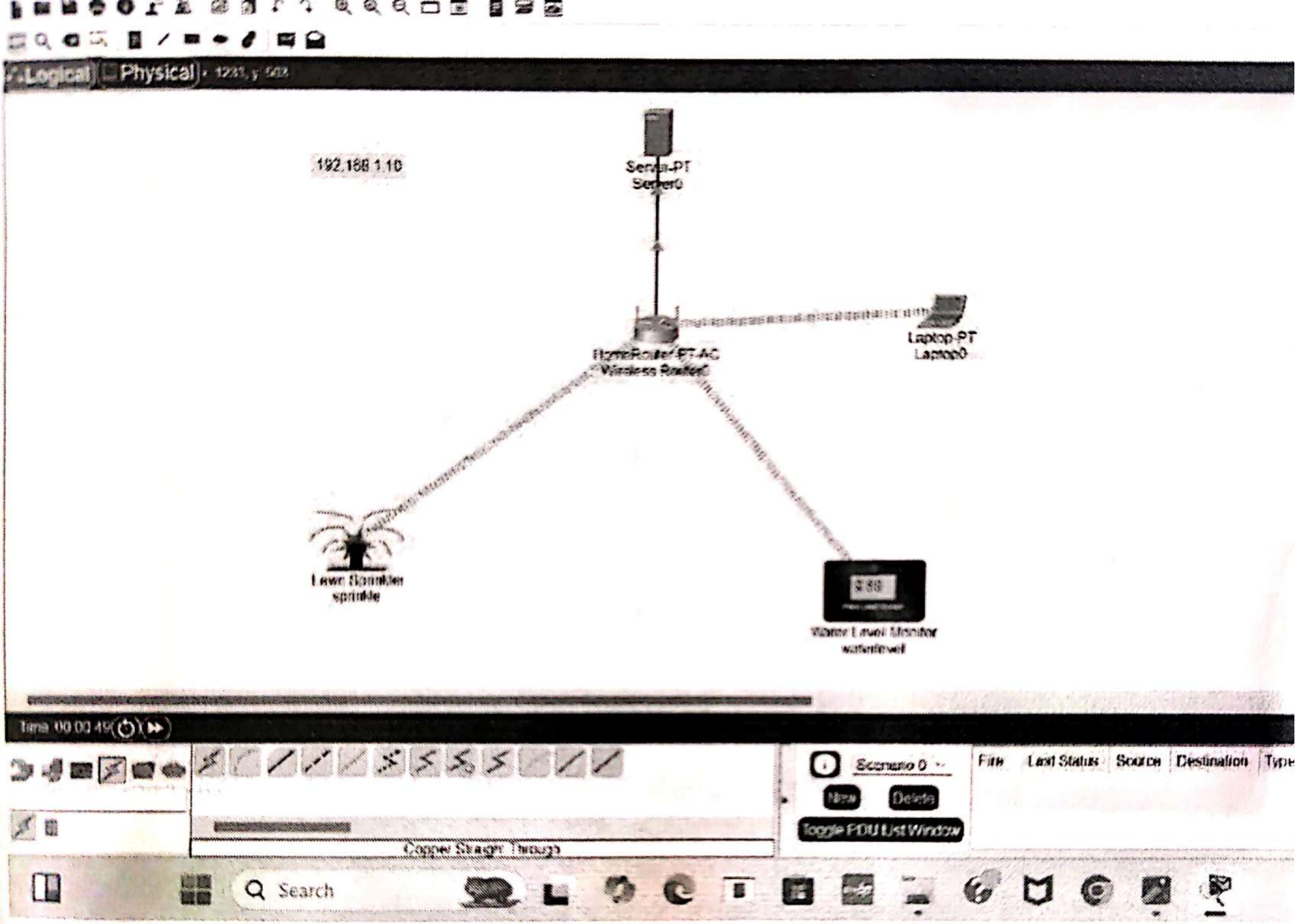
Step 3:- In Configuration tab, select config/Arithbutes the device IOT server from Cloud Service of your choice.

Step 4:- In the Artributes tab, add following arttibutes
→ Temperature → Humidity → Soil Moisture → Intensity

Step 5:- Create a Soil Moisture Sensor and light sensor from the Sensor section of device pannel. Drag and drop these sensors onto the workspace.

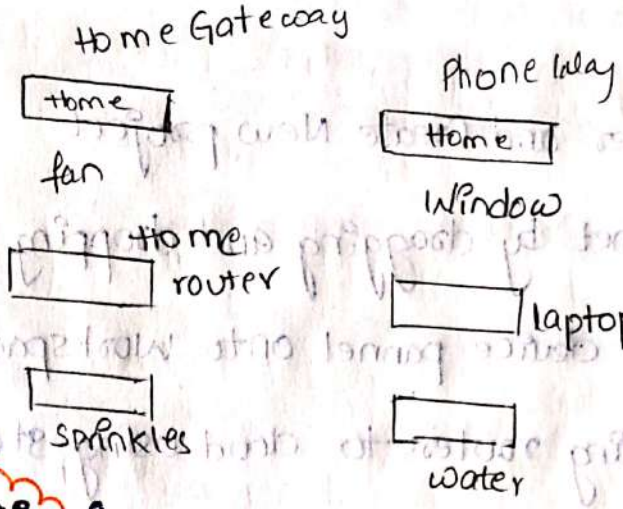
Step 6:- Connect the sensor to IOT devices using the writing Tool.

Step 7:- Configure the Sensor by right clicking on them and


Logical
Physical
192.168.1.10
Server-PT
Server0
Laptop-PT
Laptop0
Lawn Sprinkler
sprinkle
Time: 00:00:49
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Search

collecting Address. Set the Sensor type unit of measurment

Step8:- Create a Water pump and light bub from Accessor of devices parcel.



Step9:- Connect the Actuators I.o.T devices using Winningtoo.

Step10:- Configure the Actuators by right-clicking on them and selecting on them and selecting Artibutes set type, unit of Measurments and other, parameters.

Step11:- Save the Configuration and run andsimulation for that your I.o.T Smart garden

Step12:- Monitor the department, Humidity, Soil Moisture and Intensity reading on I.o.T device dash board.

Step13:- use the dash board to control the water pump and light based on sensor readings.

Result:- Implementation of small gatherings carried out using I.o.T Sucessfully.

Ex no 25:- Implementation of I.O.T devices IONet

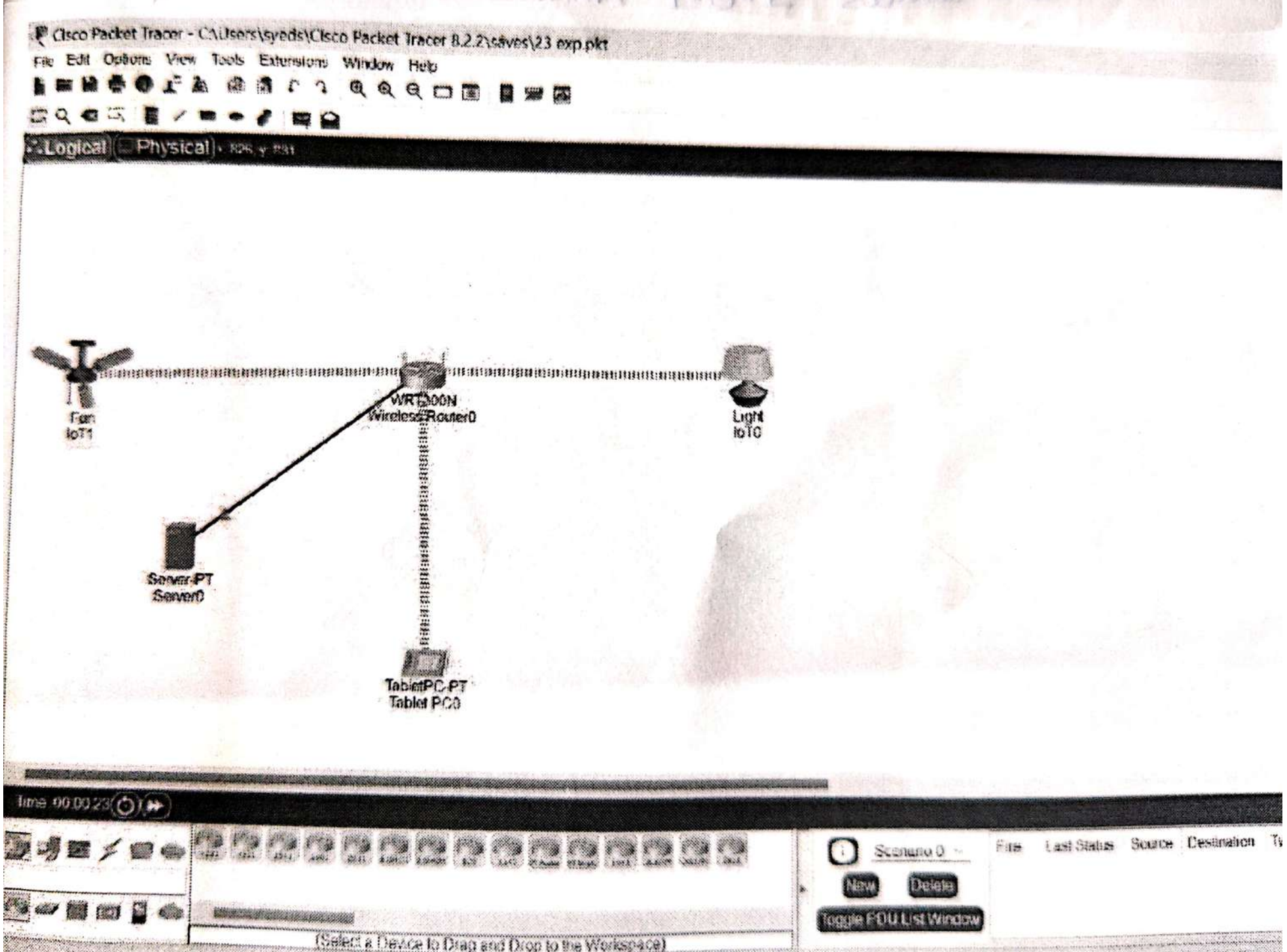
10-10-24

Aim:- To implement on I.O.T devices on Networking

software:- Packet Tracer, Hubs, Connectors

Procedure:-

1) Open Cisco packet Tracer and Create New project
2) Connect Router to internet by dragging and dropping a "Could" device from the device pannel onto workspace areas, and then Connecting routers to cloud using straight through cable.
3) Add on IOT devices to network by draging and droping a devices from device pannel on the work space Area. There are various I.OT device avaible in devices pannel such as Raspberry P or Adurina
4) Connect the IOT devices by clicking on it and then clicking of the CLI Table and then click on config tab under interface selection, Select then clickon '+' button to add a new interface.
5) Configure the IOT devices by clicking on it and then clicking on CLI tab. This will bring up the command the lin interface for IOT devices when you can Configure in settings.


Cisco Packet Tracer - C:\Users\syeds\Cisco Packet Tracer 8.2.2\saves\23 exp.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
Fan
IoT1
WRT300N
Wireless Router0
Light
IoT0
Server-PT
Server0
TabletPC-PT
Tablet PC0
Time: 00:00:23
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
(Select a Device to Drag and Drop to the Workspace)

6) Test the Connectivity of IoT devices by pinging it from router on from another devices on Network

) There are just general step and specific will depend on specific IoT device on network. Configuration you want to create. Additionally may need to configure the router and cloud devices to enable internet for IoT device.

Result:- Thus an IoT device in networking is implemented using CISO packet tracer Sucessfully.

10

Ex.no 24 :- Implement IOT based Smart building

10-10-24

Using W.P.A by P.T

Aim :- Implementation of I.O.T based Smart building using W.P.A Sercurity by Cisco P.T.

Software :- Packet Tracer, Hubs, Connectors

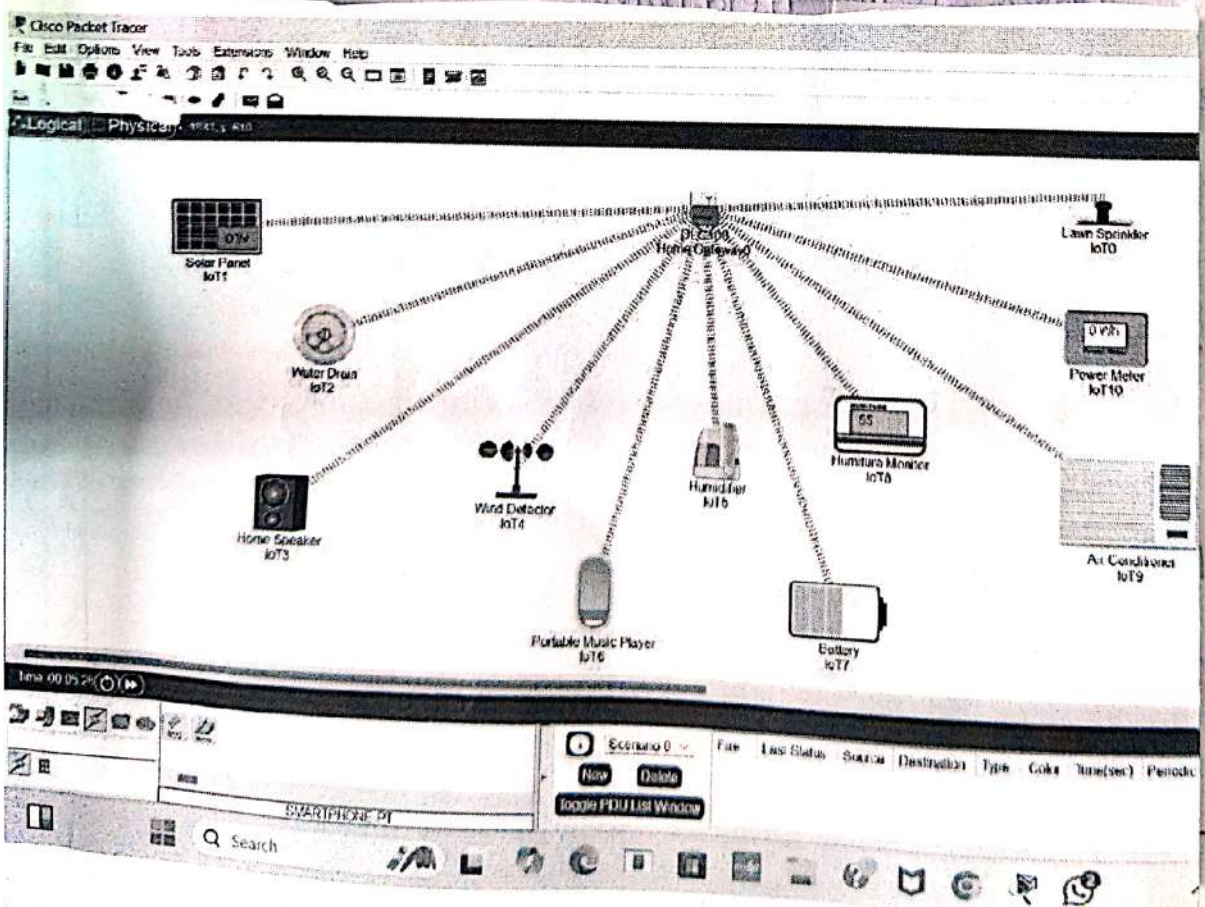
Procedure :-

1) Open Cisco packet Tracer and Create New project
2) Connect Router to internet by dragging and dropping a "cloud" device.
3) Add on I.O.T device to Network by changing and dropping a device from device panel onto workspace Area. These are various I.O.T device availble in the device panel, such as Rasp berry or Aduino.
4) Connect the I.O.T devices by clicking on + and then click on Config tab under interface Selection, Select the ethernet them click on it to add new interface where you can Configure ip settings
5) Configure the I.O.T device by clicking on it the the click on "CLI" tab. they will bring up

the Command line interface its setting.

6) Test the connectivity of I.O.T device by pinging from the Router on from another device on network.

7) These are just general steps and specific of the implementation will depend the specific IoT devices and Network Configured. you want to create Additionally you may needed to configure internet connectivity for I.O.T devices



Result:- Thus on I.O.T device in Smart Building

n implemented Using Cisco packet tracer.

21-10-24

Ex.No:=25 Transport layer protocol Header Analysis

Using Wire Shark - TCP.

Aim:= To Analze capturing of transport layer protocol header Analysis using wire shark TCP.

Software required:= Wireshark network analeyzer

Procedure:=

1) Open Wireshark
2) Click on list the avaiable capture interface
3) Choose the LAN interface
4) Choose or click on start button.
5) Active Packets and select any IP address
6) Capture the packets and IPaddress from the source
7) Click on the expression and select IPV4 - IP address course address in the field name.
8) Select the double equals (==) from the solution & ente the Selected IP Source - Address
9) Click on apply button.
10) All the packets will be filtered using Source address.

Result:= Hence the Capturing of packets using Shark network Analyzer was Analyzed for Tcp.

12 MS

Ex.No:26 Transport layer protocol Header Analysis-UDP

Aim:- To Analyzing Capuring of transport layer protocol header Analysis using wireshake- UDP.

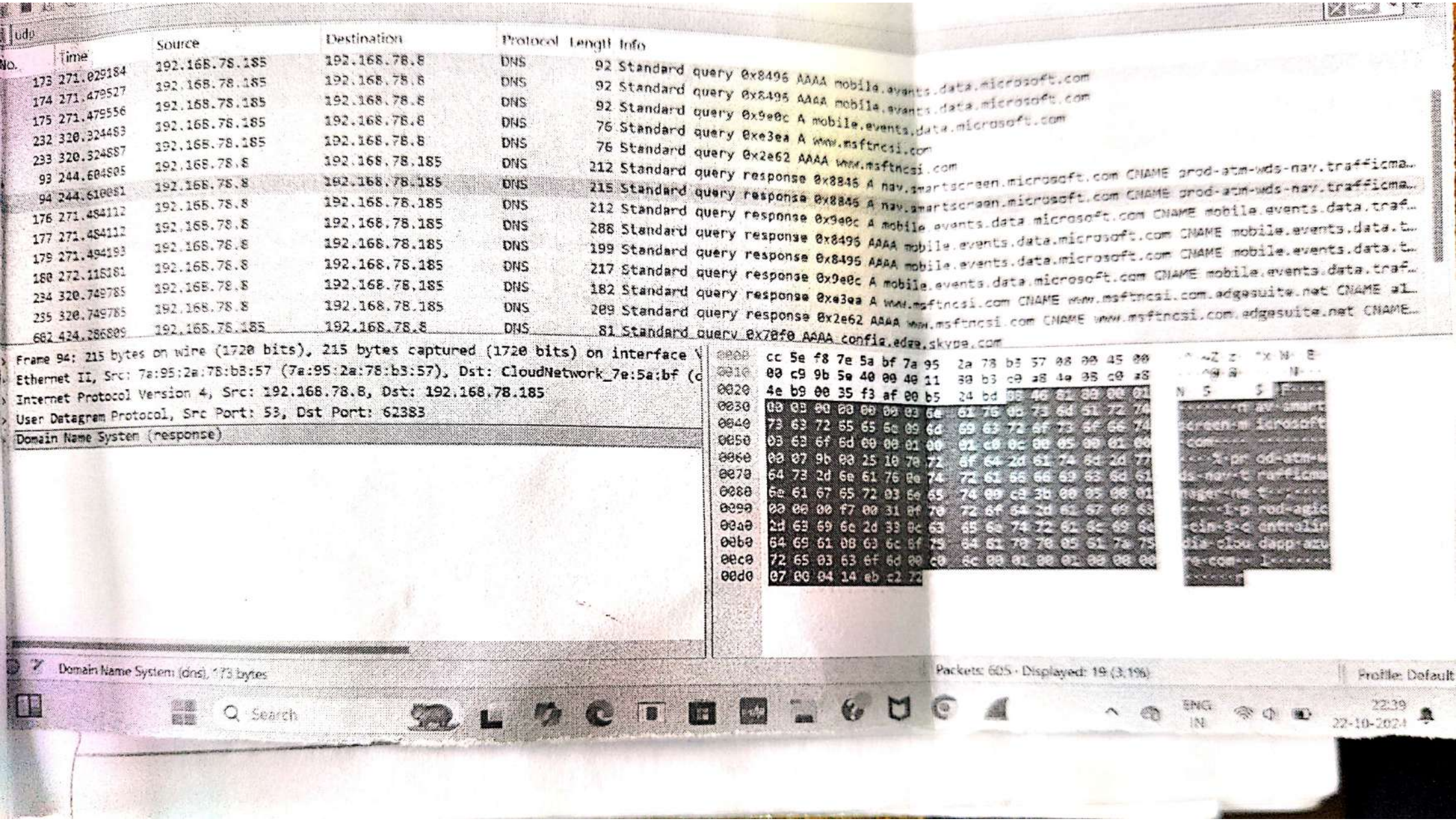
Software Required:- Wireshark network Analyzes.

Procedurce:-

1) Open wire shark
2) Click on list the available capture interface
3) Choose the LAN interface
4) Click on the start button
5) Active Packets will be displayed
6) Capture, the packets and select any IP address from the source
7) Click on the expression and select IPV -IP add Source address from the field name
8) Select the double equals (==) from the solution and enter the selected IP Source Address
9) Click on Apply button.
10) All the packets will be filtered using Source address.

Result:- Hence the capturing of packets using Shark network Analyzer was Analyzed for UDP.

10 MS


udp
No. Time Source Destination Protocol Length Info
173 271.029184 192.168.78.185 192.168.78.8 DNS 92 Standard query 0x8496 AAAA mobile.events.data.microsoft.com
174 271.479527 192.168.78.185 192.168.78.8 DNS 92 Standard query 0x8496 AAAA mobile.events.data.microsoft.com
175 271.479556 192.168.78.185 192.168.78.8 DNS 76 Standard query 0x9e0c A mobile.events.data.microsoft.com
232 320.324483 192.168.78.185 192.168.78.8 DNS 76 Standard query 0xe3ea A www.msftncsi.com
233 320.324887 192.168.78.8 192.168.78.185 DNS 212 Standard query response 0x8845 A nav.smartscreen.microsoft.com CNAME prod-atm-wds-nav.trafficma...
93 244.604505 192.168.78.8 192.168.78.185 DNS 215 Standard query response 0x8845 A nav.smartscreen.microsoft.com CNAME prod-atm-wds-nav.trafficma...
94 244.610091 192.168.78.8 192.168.78.185 DNS 212 Standard query response 0x9e0c A mobile.events.data.microsoft.com CNAME mobile.events.data.traf...
176 271.484112 192.168.78.8 192.168.78.185 DNS 286 Standard query response 0x8496 AAAA mobile.events.data.microsoft.com CNAME mobile.events.data.t...
177 271.484112 192.168.78.8 192.168.78.185 DNS 199 Standard query response 0x8496 AAAA mobile.events.data.microsoft.com CNAME mobile.events.data.t...
179 271.494193 192.168.78.8 192.168.78.185 DNS 217 Standard query response 0x9e0c A mobile.events.data.microsoft.com CNAME mobile.events.data.traf...
180 272.116181 192.168.78.8 192.168.78.185 DNS 182 Standard query response 0xe3ea A www.msftncsi.com CNAME www.msftncsi.com.edgesuite.net CNAME a1...
234 320.749785 192.168.78.8 192.168.78.185 DNS 209 Standard query response 0x2e62 AAAA www.msftncsi.com CNAME www.msftncsi.com.edgesuite.net CNAME...
235 320.749785 192.168.78.185 192.168.78.8 DNS 81 Standard query 0x70f0 AAAA config.edge.skype.com
682 424.286809
Frame 94: 215 bytes on wire (1720 bits), 215 bytes captured (1720 bits) on interface \
Ethernet II, Src: 7a:95:2a:78:b8:57 (7a:95:2a:78:b3:57), Dst: CloudNetwork_7e:5a:bf (c
Internet Protocol Version 4, Src: 192.168.78.8, Dst: 192.168.78.185
User Datagram Protocol, Src Port: 53, Dst Port: 62383
Domain Name System (response)
0000 cc 5e f8 7e 5a bf 7a 95 2a 78 b3 57 08 00 45 00
0010 00 c9 9b 5e 40 00 40 11 30 b3 c0 a8 4e 08 c0 a8
0020 4e b9 00 35 f3 af 00 b5 24 bd 88 46 81 80 00 01
0030 00 03 00 00 00 00 03 64 61 7a 0c 73 6d 61 72 74
0040 73 63 72 65 65 6e 09 6d 69 63 72 6f 73 6f 66 74
0050 03 63 6f 6d 00 00 01 00 01 c0 0c 00 05 00 01 00
0060 00 07 9b 00 25 10 70 72 6f 64 2d 61 74 6d 2d 77
0070 64 73 2d 6e 61 76 0e 74 72 61 66 66 69 63 6d 61
0080 6e 61 67 65 72 03 6e 65 74 00 c0 3d 00 05 00 01
0090 00 00 00 f7 00 31 0f 70 72 6f 64 2d 61 67 69 63
00a0 2d 63 69 6e 2d 33 0c 63 65 6e 74 72 61 6c 69 6d
00b0 64 69 61 08 63 6c 6f 75 64 61 70 70 05 61 7a 75
00c0 72 65 03 63 6f 6d 00 c0 6c 00 01 00 01 00 00 00
00d0 07 00 04 14 eb c2 72
Domain Name System (dns), 173 bytes
Packets: 605 · Displayed: 19 (3.1%)
Profile: Default
Search
ENG
IN
22:39
22-10-2024

21-10-24

Ex-no-27:- Network Layer Protocol Header Analysis - SMTP

Aim :- To Analyze capturing of transport layer protocol header Analysis using wire shark - SMTP.

Software Required Wire shark network Analyzer

Procedure :-

1) Open Wire shark
2) Click on the list available capture interface
3) Choose the LAN interface
4) Click on start button
5) Active packets & select any IP address from the source
6) Capture the packets and select ip address from the source
7) Click on the Expression and select IPV4 -> IP address Source adress in the field name.
8) Select the double equals (==) from the Selected and enter the selected IP source address
9) Click on apply button.
10) All the packets will be filtered using Source address

Result :- Hence the capturing of packets using wire Shark network Analyzer was Analyzed for SMTP

Ex-no-28 :- Network Layer Protocol Header Analysis - ICMP

Aim :- To Analyze Capturing of Transport layer Protocol header Analysis using wire shark ICMP.

Software Required :- Wire shark network Analyzer.

Procedure :-

1) Open wire Shark
2) Click on the list available capture interface
3) Choose the LAN interface
4) Click on start button
5) Active packets will be displayed.
6) Capture the packet and selecte any IP address from source
7) Click on the expression & select IPV4 → IP address source address in the field name
8) Select the double equals (==) from the selection & enter the selected IP source address.
9) Click on apply button.
10) All the packets will be filtered using source address

Result :- Hence the capturing of packets wire shark network Analyzer was Analyzed for ICMP.

Ex.no:29 = Network Layer Protocol header Analysis Using

23-10-24

Wire Shark ARP:

Aim:= To Analyze Capturing of transparent layer protocol Analysis Using Wireshark ARP.

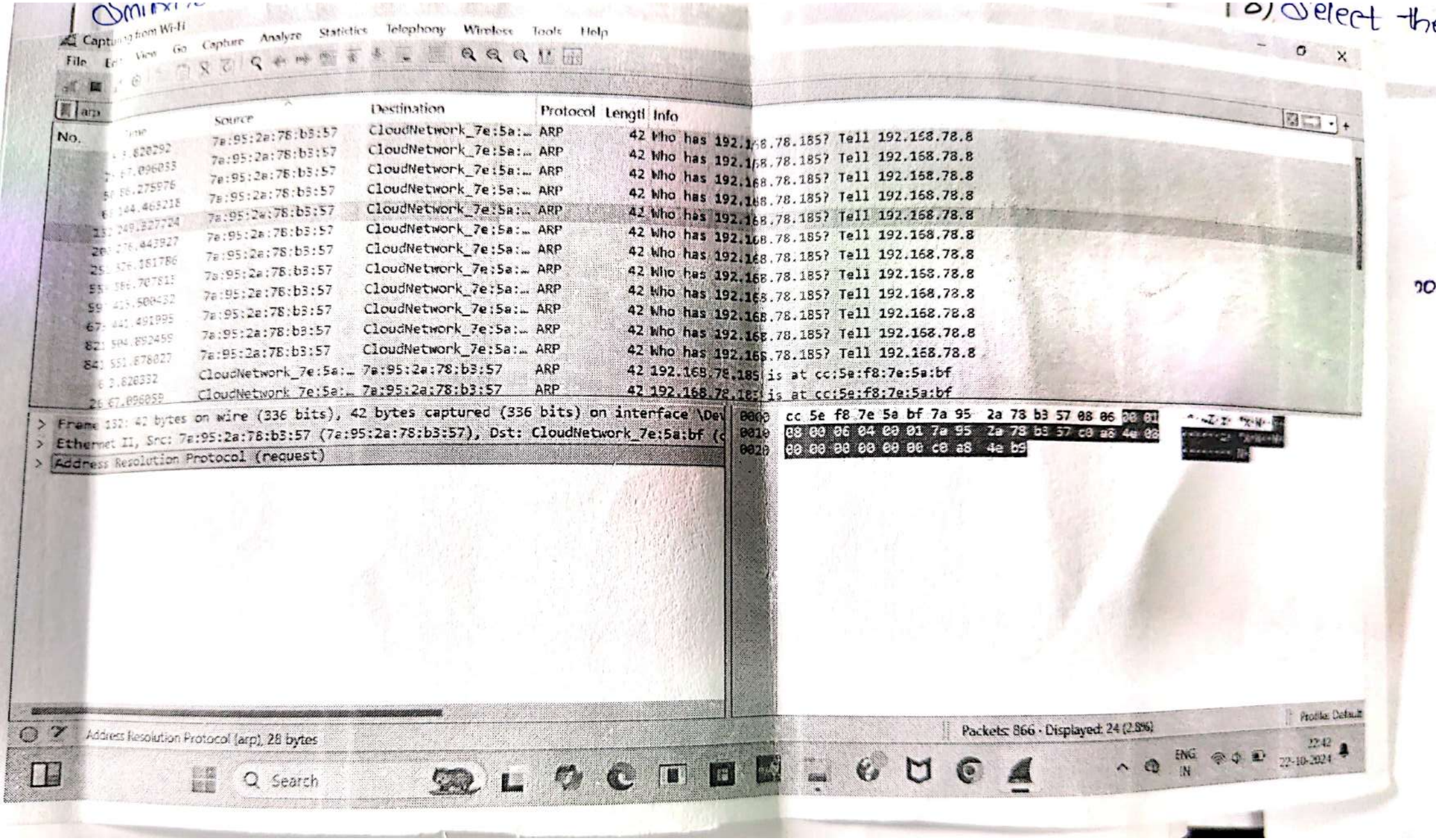
Software Required:- Wire Shark network Analyzer

Procedure:-

1) open Wireshark
2) click on the list Available Capture Interface
3) Choose the LAN Interface
4) Click on the start button
5) Active packets will be displayed
6) Capture the packets & Select any IP address from the Source
7) click on the Expression & Select $IPV_4 \rightarrow$ IP addr, Source addres in the field name
8) Select the double equals (==) from the selection & Enter the Selected IP address.
9) click on Apply address
10) All the packets will be filtered using source address

Result:=

Hence the capturing of packets wireshark etwork Analyzer was Analyzed for ARP.


Capturing from Wi-Fi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
arp
No. Time Source Destination Protocol Length Info
7a:95:2a:78:b3:57 CloudNetwork_7e:5a:... ARP 42 Who has 192.168.78.185? Tell 192.168.78.8
CloudNetwork_7e:5a:... 7a:95:2a:78:b3:57 ARP 42 192.168.78.185 is at cc:5e:f8:7e:5a:bf
Frame 132: 42 bytes on wire (336 bits), 42 bytes captured (336 bits) on interface \Dev
Ethernet II, Src: 7a:95:2a:78:b3:57 (7a:95:2a:78:b3:57), Dst: CloudNetwork_7e:5a:bf (c
Address Resolution Protocol (request)
0000 cc 5e f8 7e 5a bf 7a 95 2a 78 b3 57 08 06 00 01
0010 08 00 06 04 00 01 7a 95 2a 78 b3 57 c0 a8 4e 08
0020 00 00 00 00 00 00 c0 a8 4e b9
Address Resolution Protocol (arp), 28 bytes
Packets: 866 · Displayed: 24 (2.8%)
Profile: Default
Search
ENG IN
22-10-2024

Ex. NO: 30 :- Network layer Protocol header Analysis Using WS - HTTP

23-10-24

Aim:- To Analyze capturing of packets of transport layer Protocol header Analyze wire shark HTTP.

Software Required:- Wire Shark Network Analyzer.

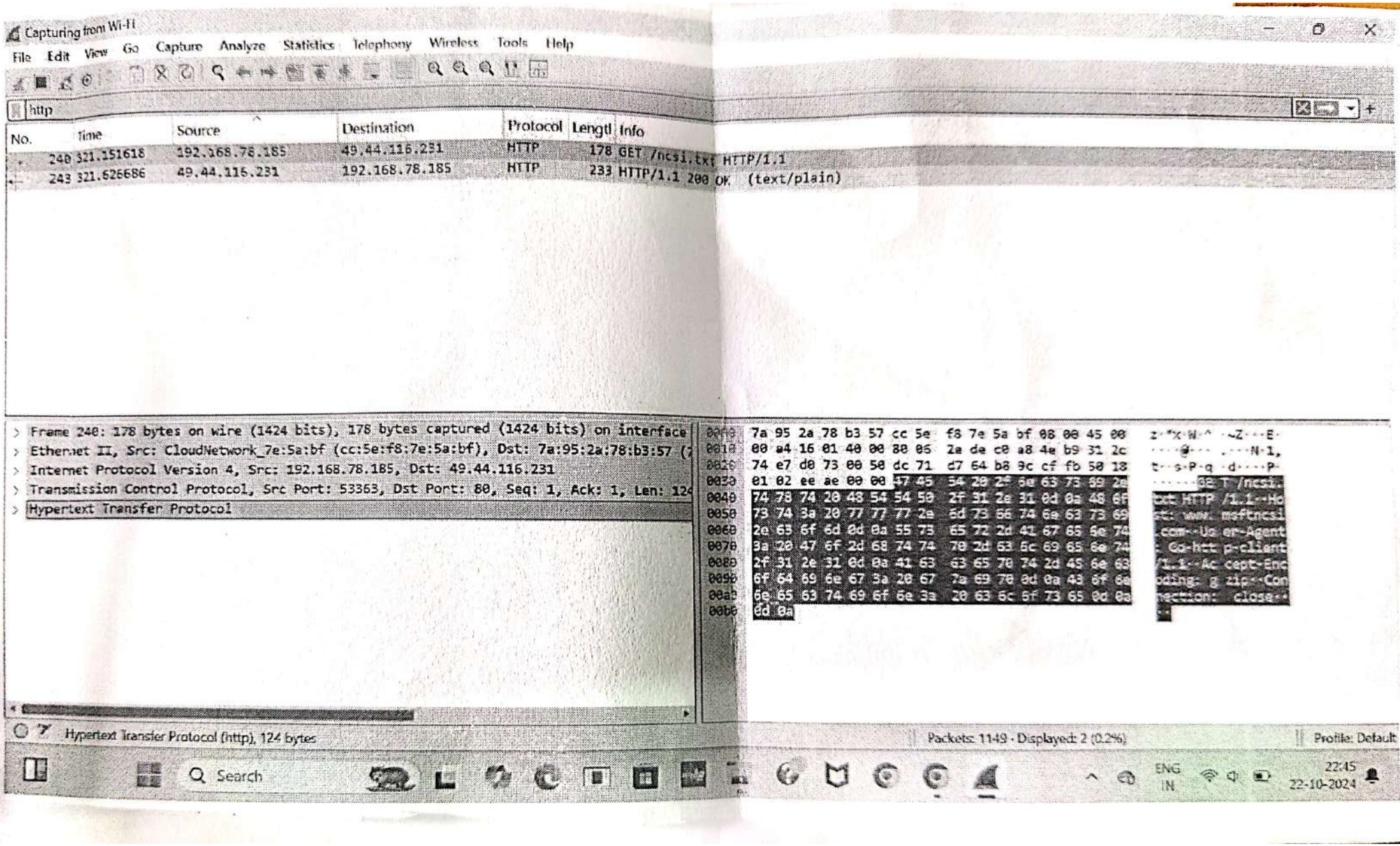
Procedure:-

1) Open wireshark
2) click on list available capture interface.
3) choose the LAN interface
4) Click on the Start button.
5) Activate Packets will be displayed.
6) Capture the packets & select any IP address from sour
7) click on the expression & select any IPV4 → IP addr Source address in the field name.
8) Select the double equal (==) from the section and ente he IP Source address
) click on apply button
) All the packets will be filtered using source addres

Result:-

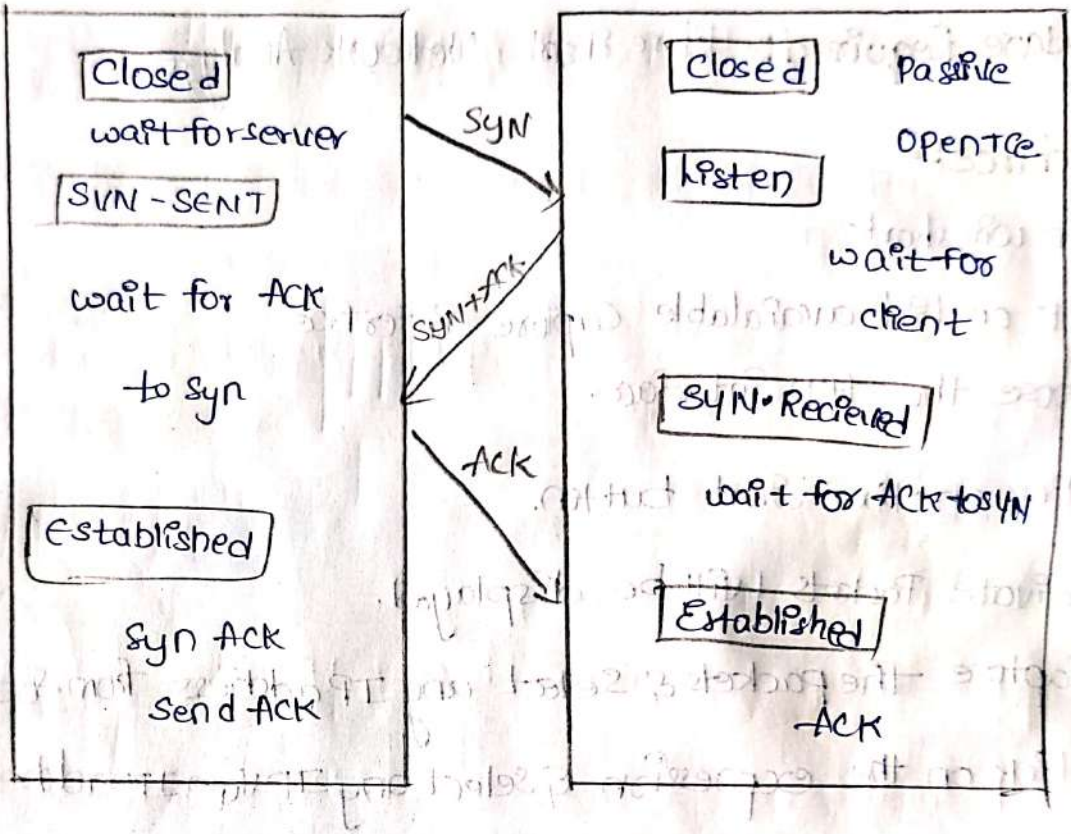
Hence the capturing of packets will be using wireshark Analyzer was Analyzed for HTTP.

(10) MA

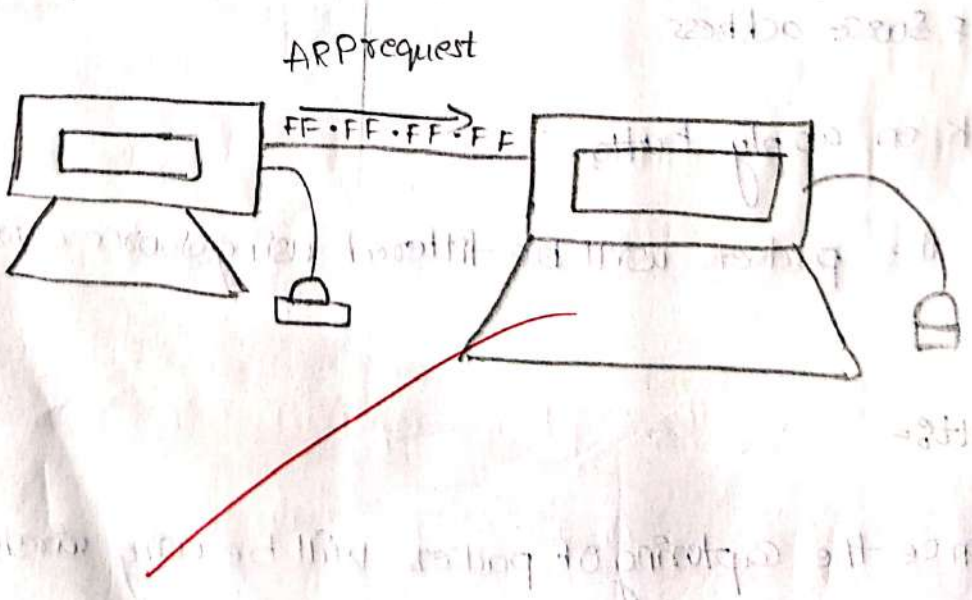

Capturing from Wi-Fi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
http
No. Time Source Destination Protocol Length Info
240 321.151618 192.168.78.185 49.44.116.231 HTTP 178 GET /ncsi.txt HTTP/1.1
243 321.626686 49.44.116.231 192.168.78.185 HTTP 233 HTTP/1.1 200 OK (text/plain)
Frame 240: 178 bytes on wire (1424 bits), 178 bytes captured (1424 bits) on interface
Ethernet II, Src: CloudNetwork_7e:5a:bf (cc:5e:f8:7e:5a:bf), Dst: 7a:95:2a:78:b3:57
Internet Protocol Version 4, Src: 192.168.78.185, Dst: 49.44.116.231
Transmission Control Protocol, Src Port: 53363, Dst Port: 80, Seq: 1, Ack: 1, Len: 124
Hypertext Transfer Protocol
0000 7a 95 2a 78 b3 57 cc 5e f8 7e 5a bf 08 00 45 00
0010 00 a4 16 01 40 00 80 06 2a de c0 a8 4e b9 31 2c
0020 74 e7 d0 73 00 50 dc 71 d7 64 b8 9c cf fb 50 18
0030 01 02 ee ae 00 00 47 45 54 20 2f 6e 63 73 69 2e
0040 74 78 74 20 48 54 54 50 2f 31 2e 31 0d 0a 48 6f
0050 73 74 3a 20 77 77 77 2e 6d 73 66 74 6e 63 73 69
0060 2e 63 6f 6d 0d 0a 55 73 65 72 2d 41 67 65 6e 74
0070 3a 20 47 6f 2d 68 74 74 70 2d 63 6c 69 65 6e 74
0080 2f 31 2e 31 0d 0a 41 63 63 65 70 74 2d 45 6e 63
0090 6f 64 69 6e 67 3a 20 67 7a 69 70 0d 0a 43 6f 6e
00a0 6e 65 63 74 69 6f 6e 3a 20 63 6c 6f 73 65 0d 0a
00b0 0d 0a
Hypertext Transfer Protocol (http), 124 bytes
Packets: 1149 · Displayed: 2 (0.2%)
Profile: Default
Search
ENG IN
22:45 22-10-2024

Ex 30

Block diagram for transport layer protocol header using Wire shark - TCP



Black diagram for ARP- Using Wireshark



Ex. No: 3 :- Checksum Calculation Using Wireshark.

23-10-24

Aim:- To calculate the checksum for given data using wireshark

Apparatus Required:- Wireshark network Analyzer

Procedure:- C Program

```
#include <stdio.h>
#define Polynomial 0x8005
unsigned short CRC16(unsigned char *data, unsigned int length)
{
unsigned short CRC = 0x0000; //
Initial Valoe
for (unsigned int i=0; i<length; i++)
{
CRC ^= ((data[i] <<8);
for (unsigned char bit = 0; bit<8; bit++){
if (crc & 0x8000){
crc = (crc <<1) ^ Polynomial;
} else {
crc <<=1;
} }
return crc;
}
int main(){
unsigned char data[] = "123456789"
unsigned short result = crc16(data, length);
```

Programiz

C Online Compiler

main.c

Share

Run

Output

```c
#include <stdio.h>
#include <stdint.h>

unsigned short checksum(unsigned short *buf, int nwords) {
    unsigned long sum = 0;

    for(int i = 0; i < nwords; i++) {
        sum += *buf++;
    }

    // Fold 32-bit sum to 16 bits
    while (sum >> 16) {
        sum = (sum & 0xFFFF) + (sum >> 16);
    }

    return (unsigned short)(~sum);
}

int main() {
    // Example data (e.g., IP header or TCP/UDP packet)
    unsigned short data[] = {0x4500, 0x003c, 0x1c46, 0x4000, 0x4006, 0xb1e6, 0xc0a8, 0x0001,
        0xc0a8, 0x00c7};
    int nwords = sizeof(data) / 2;

    unsigned short result = checksum(data, nwords);
    printf("Checksum: 0x%04x\n", result);

    return 0;
}
```

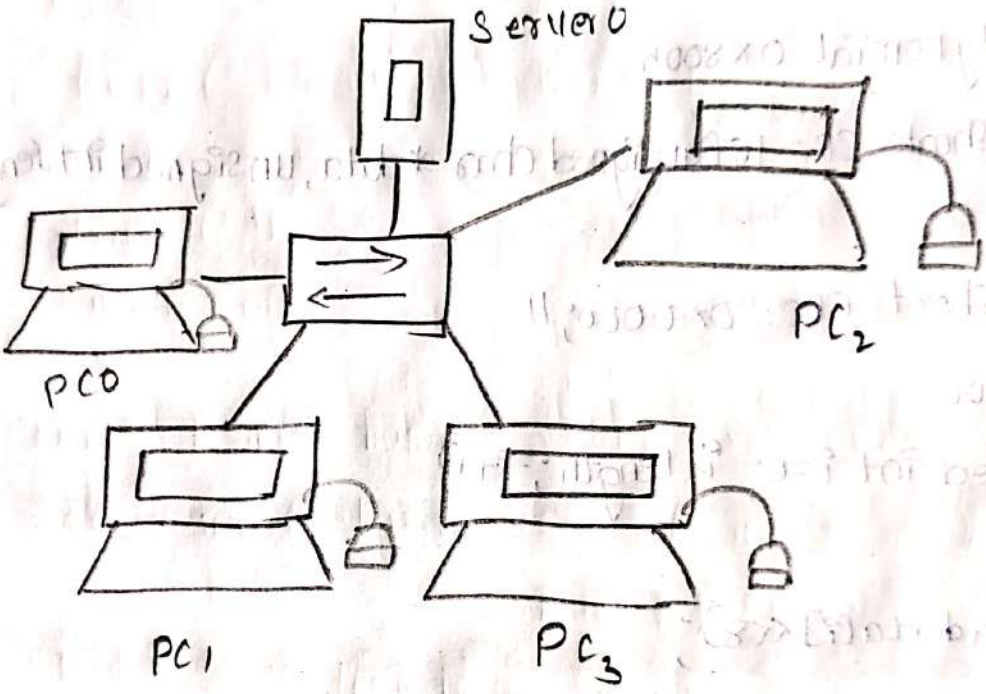
Checksum:

--- Code

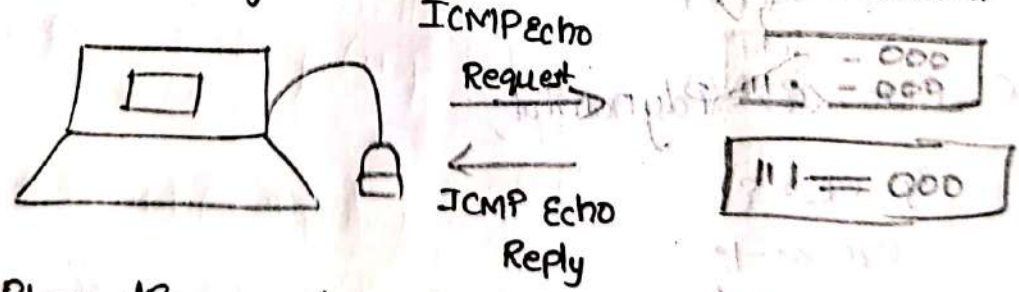
```
Printf ("CRC" 6 "result : 0x%1. 01x\n", result);
    return 0;
```

Result:- Hence CRC calculation done by using Wiresha

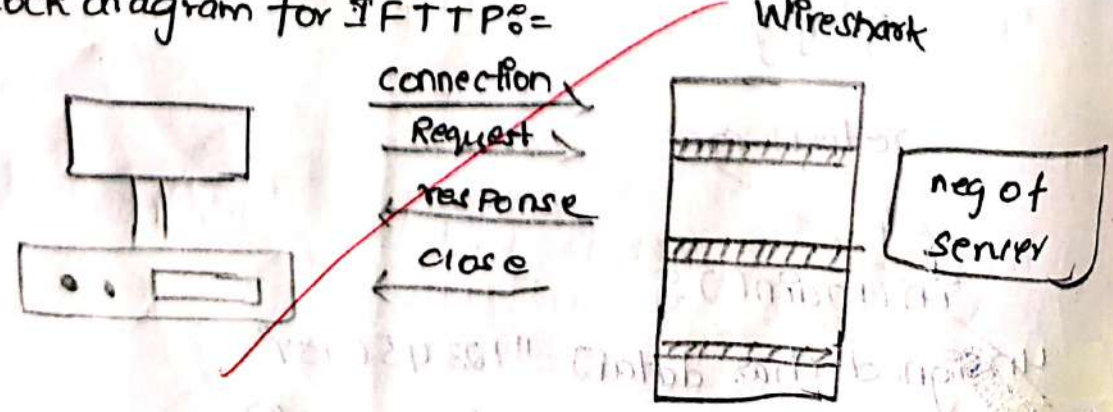
Block diagram for UDP- Using Wireshark.



Block diagram for ICMP- Using Wireshark



Block diagram for IFTTP:-



Ex.no.32 :- Bit Stuffing Using Wire Shark

24-10-24

Aim :- Bit stuffing using wire shark

Apparatus :- wireshark

Program :-

```
#include <stdio.h>
#include <stdint.h>
#include <string.h>

void bitstuffing (uint8_t * input, size_t, inputlength,
    uint8_t * output, size_t * output)
{
size_t outputindex=0;
uint8_t flagsequence[1] = {0x7e};
output [outputindex++] = flagsequence[0];
for(size_t i=0; i<inputlength; i++)
  {
uint8_t currentbyte = input[i];
for(int j=7; j>=0; j--){
if ((currentbyte>>j)&1){
   bitcount++;
   if(bitcount==5)
   {
output [outputindex++]=0;
   bitcount=0;
   }else{ bitcount=0; }
```

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main.c

Share Run

```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>

#define PORT 8080
#define BUFFER_SIZE 1024

int main() {
    int server_fd, new_socket;
    struct sockaddr_in address;
    int addrlen = sizeof(address);
    char buffer[BUFFER_SIZE] = {0};
    const char *hello = "Hello from server";

    // Creating socket file descriptor
    if ((server_fd = socket(AF_INET, SOCK_STREAM, 0)) == 0) {
        perror("Socket failed");
        exit(EXIT_FAILURE);
    }

    // Setting up the server address structure
    address.sin_family = AF_INET;            // IPv4
    address.sin_addr.s_addr = INADDR_ANY; // Bind to any available interface
    address.sin_port = htons(PORT);       // Convert port number to network byte order

    // Binding socket to the address and port
    if (bind(server_fd, (struct sockaddr *)&address, sizeof(address)) < 0) {
        perror("Bind failed");
        close(server_fd);
        exit(EXIT_FAILURE);
    }
```

Output

```
/tmp/...
Server listening on port 8080
```

bit count=0; }

```
output[output_index++] = (current_byte >> j) & 1;
    }
}
output[output_index++] = flag_sequence[0];
output_length = output_index;
}
void print_hex(uint8_t *data, size_t length) {
for (size_t i = 0; i < length; i++) {
printf("%02x", data[i]);
}
printf("\n");
}
int main()
{
uint8_t input_frame[] = {0xFF, 0x00, 0xAA};
size_t input_length = sizeof(input_name) / sizeof(input_frame[0]);
uint8_t output_frame[1024];
size_t output_length = 0;
bit_stuffing(input_frame, input_length, output_frame, output_length);
printf("Input frame:\n");
printf_hex(output_frame, output_length);
return 0;
```

Result:- Hence the bit stuffing is done by using wire shark.

Ex.No.33 Simple TCP Server in 'C' Using the Sockets API

24-10-24

Aim:- Simple TCP Server in 'C' using the Sockets.

Apparatus Required:- Wireshark.

Procedure:-

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <unistd.h>
#include <arpa/inet.h>
#define PORT 8080
#define BUFFER_SIZE 1024
int main(){
int server_fd, new_socket;
struct sockaddr_in address;
int addrlen = sizeof(address);
char buffer[BUFFER_SIZE] = {0};
char *hello = "Hello from server";
if ((server_fd = socket(AF_INET, SOCK_STREAM, 0)) == 0)
{
perror("Socket failed");
}
address.sin_family = AF_INET;
address.sin_addr.s_addr = INADDR_ANY;
```

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Share Run Output

main.c

```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>

#define PORT 8080
#define BUFFER_SIZE 1024

int main() {
    int sockfd;
    char buffer[BUFFER_SIZE];
    struct sockaddr_in servaddr, cliaddr;
    socklen_t len;
    const char *message = "Hello from UDP server";

    // Creating socket file descriptor
    if ((sockfd = socket(AF_INET, SOCK_DGRAM, 0)) < 0) {
        perror("Socket creation failed");
        exit(EXIT_FAILURE);
    }

    // Filling server information
    memset(&servaddr, 0, sizeof(servaddr));
    memset(&cliaddr, 0, sizeof(cliaddr));

    servaddr.sin_family = AF_INET;          // IPv4
    servaddr.sin_addr.s_addr = INADDR_ANY; // Bind to any available interface
    servaddr.sin_port = htons(PORT);        // Port number

    // Binding the socket with the server address
    if (bind(sockfd, (const struct sockaddr *)&servaddr, sizeof(servaddr)) < 0) {
        perror("Bind failed");
```

```
/tmp/dIfyHvEOJ.o
UDP Server is listening on port 8080
```

```
    Perror ("bind failed");
    close (server-fd);
    exit (EXIT_FAILURE);
        }
if (listen (server_fd, 3)<0){
 Perror ("listen failed");
   exit (EXIT_FAILURE, }
Print f ("Server is listening on port %d\n", PORT)
if ((new_socket = accept (server_fd, (struct sockaddr)
 &address, (socklen_t) & addrlen))<0)
        {
       Perror ("Accept failed")
       close(server_fd);
       exit (EXIT_FAILURE); }
   read (new_socket, buffer, BUFFER_SIZE);
    Print (" client %s\n", buffer);
   Send (new_socket, hello, strlen (hello),0);
    Print f ("Hello message sent\n");
        close(new_socket);
        close (server_fd);
            return 0;
            }
```

Result:-

Hence simple TCP server in C using the socket API is done by using wireshark.

Ex.no.34 Simple UDP Client in C Using Wireshark

24-10-24

Aim:- UDP client in C Program using Wireshark

Apparatus Required:- Wireshark.

Procedure:-

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <unistd.h>
#include <arpa/inet.h>
#define PORT 8080
#define BUFFER_SIZE 1024
int main() {
int sockfd;
char buffer[BUFFER_SIZE];
char *hello = "Hello From server";
struct sockaddr_in servaddr, cliaddr;
if ((sockfd = socket(AF_INET, SOCK_DGRAM, 0))
<0){
perror("Socket creation failed");
exit(EXIT_FAILURE);
}
memset(&servaddr, 0, sizeof(servaddr));
memset(&cliaddr, 0, sizeof(cliaddr));
servaddr.sin_family = AF_INET;
```

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main.c

Share Run

```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>

#define PORT 8080
#define BUFFER_SIZE 1024

int main() {
    int sockfd;
    char buffer[BUFFER_SIZE];
    struct sockaddr_in servaddr, cliaddr;
    socklen_t len;
    const char *message = "Hello from UDP server";

    // Creating socket file descriptor
    if ((sockfd = socket(AF_INET, SOCK_DGRAM, 0)) < 0) {
        perror("Socket creation failed");
        exit(EXIT_FAILURE);
    }

    // Filling server information
    memset(&servaddr, 0, sizeof(servaddr));
    memset(&cliaddr, 0, sizeof(cliaddr));

    servaddr.sin_family = AF_INET;          // IPv4
    servaddr.sin_addr.s_addr = INADDR_ANY; // Bind to any available interface
    servaddr.sin_port = htons(PORT);        // Port number

    // Binding the socket with the server address
    if (bind(sockfd, (const struct sockaddr *)&servaddr, sizeof(servaddr)) < 0) {
        perror("bind failed");
```

Output

```
/tmp/ubfyfwut0j.o
UDP Server is listening on port 8080
```

```
servaddr.sin_addr.s_addr = INADDR_ANY;
servaddr.sin_port = htons(PORT);
if(bind(sockfd, (const struct sockaddr *)&
    servaddr, sizeof(servaddr))<0){
        perror("Bind failed");
        close(sockfd);
        exit(EXIT_FAILURE);
        }
    int len,n;
    len = sizeof(cliaddr);
n = recvfrom(sockfd, (char *)buffer, BUFFER_SIZE,
        buffer[n]='\0';
printf("Client :%s\n", buffer);
sendto(sockfd, (const char *)hello, strlen(hello)
MSG_CONFIRM, (const char *) sockaddr *) &cliaddr,
                                        len);
printf("Hello message sent\n");
        close(sockfd);
        return 0;
```

Result

Simple UDP client server is done by using wireshark..

Ex-no-35:- Simulation of UDP Server in C.

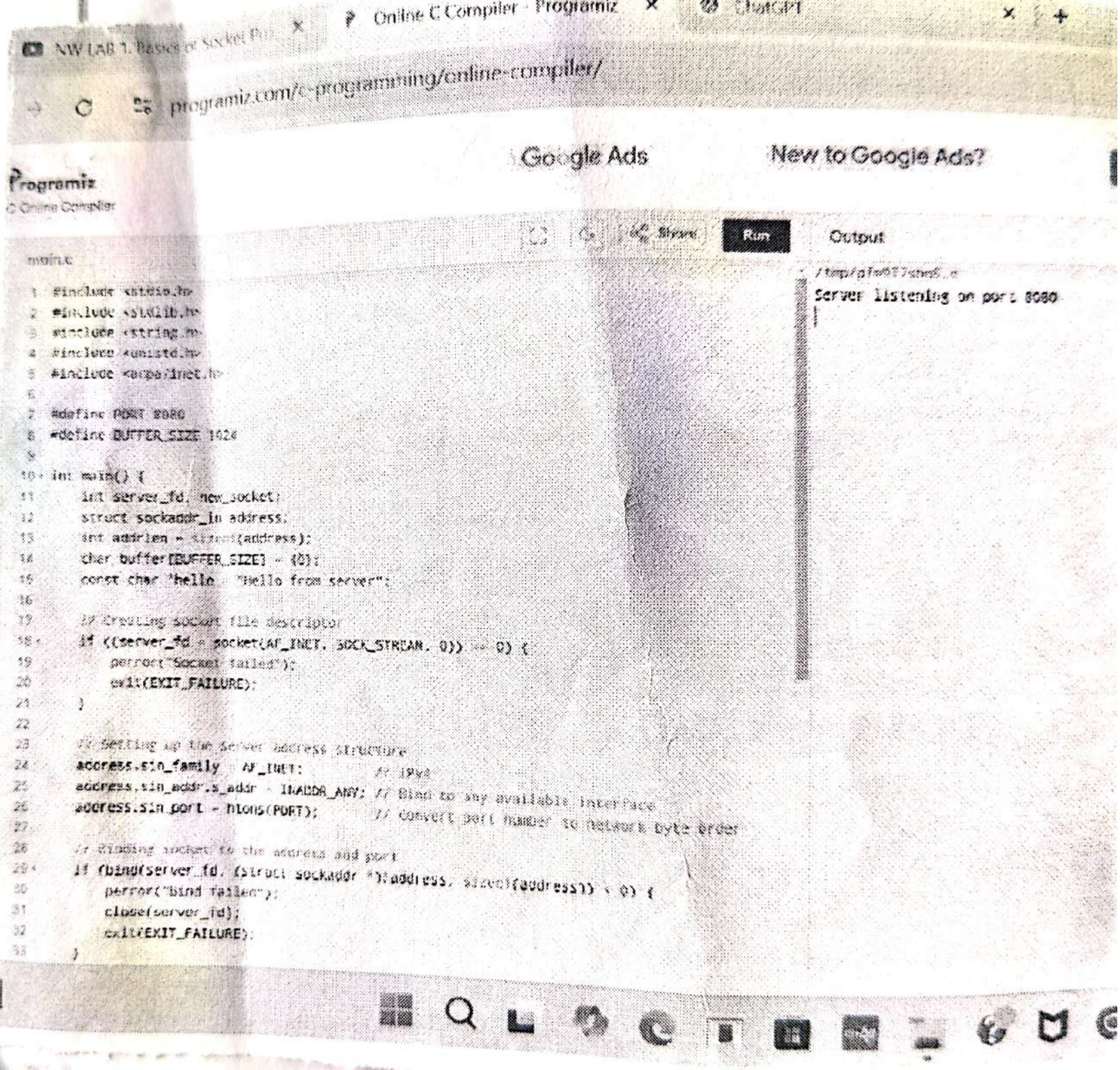
Date:- 10-24

Aim:- Simulation of UDP server in C Program.

Apparatus Required:- WireShark.

Procedure:-

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <unistd.h>
#include <arpa/inet.h>
#define PORT 8080
#define BUFFER_SIZE 1024
int main()
{
int sockfd;
char buffer[BUFFER_SIZE];
char *hello = "Hello from server";
struct sockaddr_in servaddr, cliaddr;
if((sockfd = socket(AF_INET, SOCK_DGRAM, 0))
    <0){
perror("Socket creation failed");
    exit(EXIT_FAILURE);
    }
Memset(&servaddr, 0, sizeof(servaddr));
Memset(&cliaddr, 0, sizeof(cliaddr));
```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Output
main.c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>
#define PORT 8080
#define BUFFER_SIZE 1024
int main() {
int server_fd, new_socket;
struct sockaddr_in address;
int addrlen = sizeof(address);
char buffer[BUFFER_SIZE] = {0};
const char *hello = "Hello from server";
// Creating socket file descriptor
if ((server_fd = socket(AF_INET, SOCK_STREAM, 0)) == 0) {
perror("Socket failed");
exit(EXIT_FAILURE);
}
// Setting up the server address structure
address.sin_family = AF_INET; // IPv4
address.sin_addr.s_addr = INADDR_ANY; // Bind to any available interface
address.sin_port = htons(PORT); // Convert port number to network byte order
// Binding socket to the address and port
if (bind(server_fd, (struct sockaddr *)&address, sizeof(address)) < 0) {
perror("bind failed");
close(server_fd);
exit(EXIT_FAILURE);
}
Server listening on port 8080

```
Servaddr.sin_addr.s_addr = INADDR_ANY
servaddr.sin_port = htons (port);
if (bind (sockfd, (const struct sockaddr *)&servaddr,
    sizeof (servaddr)) <)
    Perror ("bind failed");
    close (sockfd);
    Exit (EXIT_FAILURE);
    }
    int len, n;
    len = sizeof (cliaddr);
    n = recvfrom (sockfd, (char*) buffer
BUFFER_SIZE, MSG_WATAIL, (STRUCT_sockaddr*)
    & cliaddr, &len);
        buffer [n] = '\0';
    Printf ("Client %s : %s \n", buffer)
Sendto (sockfd, (const char*) hello, strlen (hello,
MSG-CONFIRM, (const struct sockaddr *)&
    cliaddr, len),
Printf ("Hello message sent \n")
        close (sockfd);
        return 0;
    }
```

Result:-

Simulation of UDP server in using wire shark -