JAGAN INSTITUTE OF MANAGEMENT STUDIES

SECTOR – 5, ROHINI,NEW DELHI

(Affiliated to)

GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY

SECTOR – 16 C, DWARKA, NEW DELHI

PRACTICAL FILE : COMPUTER NETWORKS

Submitted To : Dr. Deepshikha
Professor(IT)

Submitted By: Kartik Sharma
Enrollment No.: :01914004424
MCA Ist Year (Section - A)
[Ist Semester]

ACKNOWLEGEMENT

I take this opportunity to present my votes of thanks to my faculty who really acted as pillars to help my way throughout the execution of lab exercises that has led to successful and satisfactory completion of the study of Subject (COMPUTER NETWORKS).

I feel great sense of gratitude for **Dr. Deepshikha** under whose guidance and motivation this work has been performed.

I would also like to express my thanks to all **lab assistants** for giving me opportunity to work under their esteemed guidance. This project would not have completed without their guidance and coordination.

The inspiration of the faculty members of the Information Technology Department of JIMS Rohini (Sec-5) enabled me to make a thorough study of these subjects.

Student Name : Kartik Sharma

Enrollment No. : :01914004424

CERTIFICATE

This is certified to be the bonafide work of the student,

Name: **Kartik Sharma**, Enrollment No.: :01914004424 for the purpose of subject Computer Networks of MCA, Ist semester under the supervision of Dr. Deepshikha during the academic year 2024-2026.

Dr. Deepshikha

Professor (IT)

JIMS, Rohini

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LAB ASSIGNMENT-1

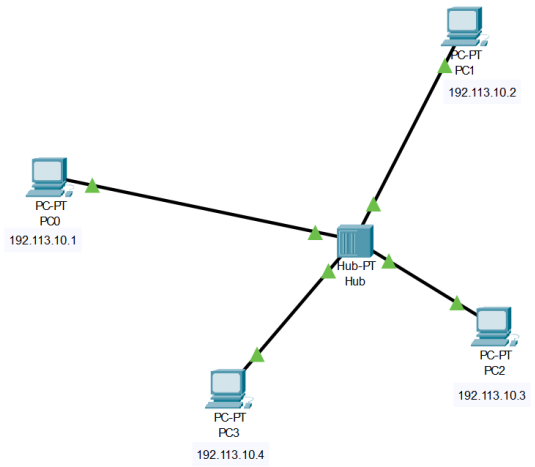
AIM: To create a network in cisco packet tracer to demonstrate the working of the hub and a switch.

METHOD: Insert the following devices into the workspace.

- Hub
- Switch
- PCs
- Copper straight-through wire

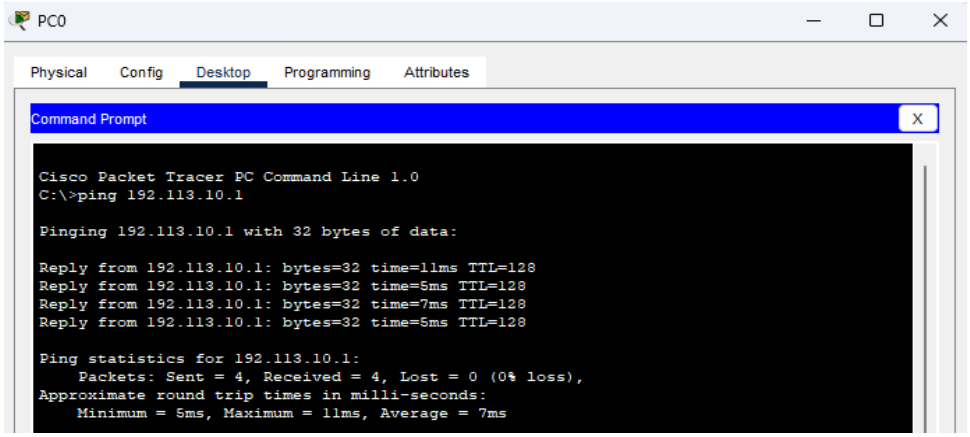
Using Hub: Connecting 4 PCs with a Hub.

PC NAME	IP ADDRESS
PC0	192.113.10.1
PC1	192.113.10.2
PC2	192.113.10.3
PC3	192.113.10.4

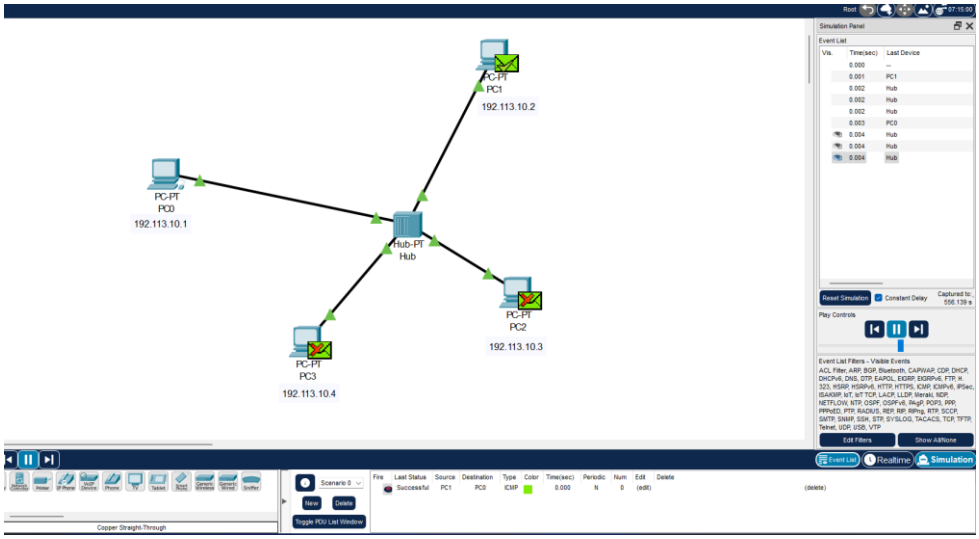


Checking the connection: Running the ping ip_address command for all the Pc's.

PC-> Desktop-> Command Prompt.

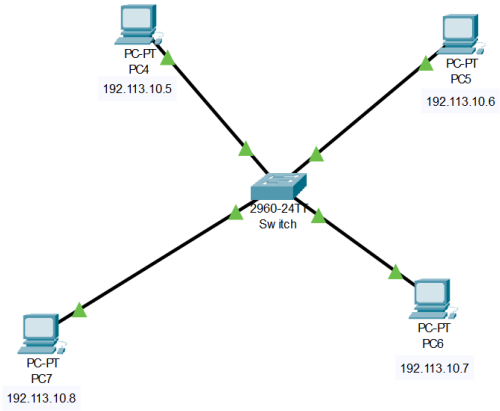


On simulation: The message is returned to PC1 from PC0.



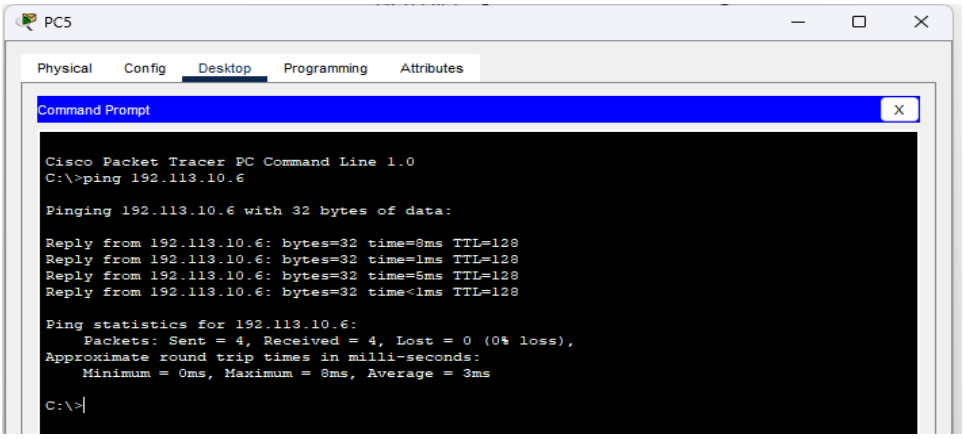
Using Switch: Connecting 4 PCs with a Switch.

PC NAME	IP ADDRESS
PC4	192.113.10.5
PC5	192.113.10.6
PC6	192.113.10.7
PC7	192.113.10.8

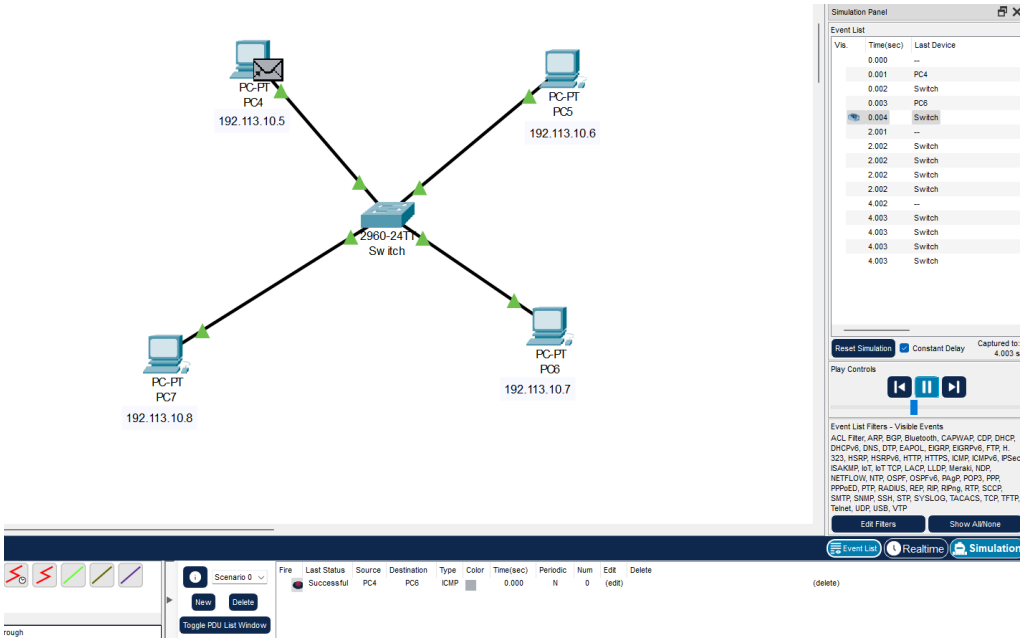


Checking the connection: Running the ping ip_address command for all the Pc's.

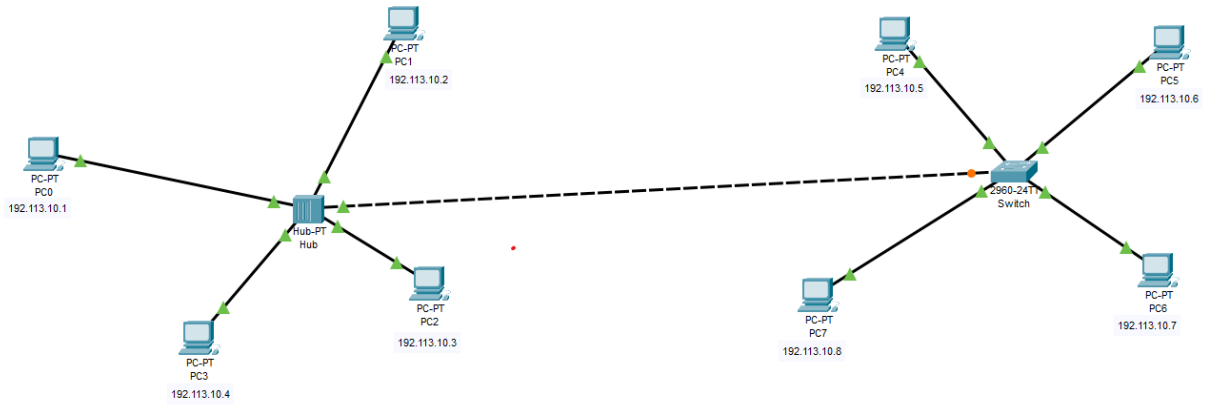
PC-> Desktop-> Command Prompt.



On simulation: The message is returned to PC4 from PC6.



Result: Connecting Hub and Switch.



LAB ASSIGNMENT 2

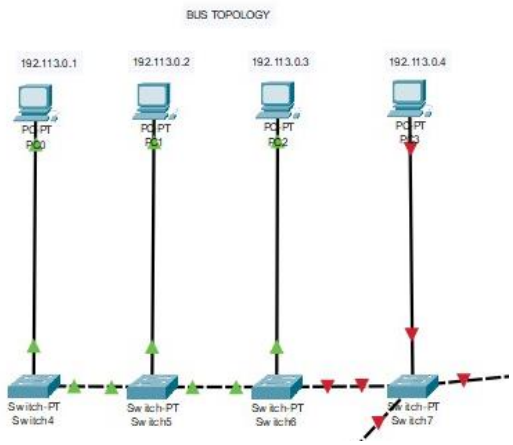
AIM: To create different network topologies using Cisco Packet Tracer.

METHOD: Insert the following devices into the workspace.

- Switch
- PCs
- Copper straight-through wire
- Copper cross-over wire

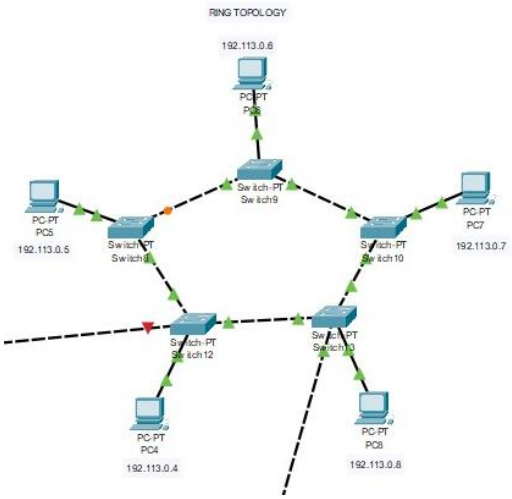
Bus Topology:

PC NAME	IP ADDRESS
PC0	192.113.0.1
PC1	192.113.0.2
PC2	192.113.0.3
PC3	192.113.0.4



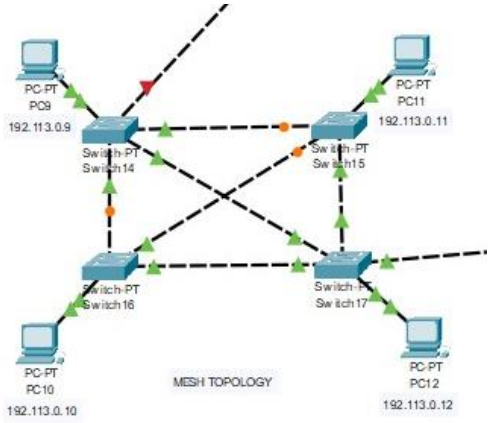
Ring Topology:

PC NAME	IP ADDRESS
PC4	192.113.0.4
PC5	192.113.0.5
PC6	192.113.0.6
PC7	192.113.0.7
PC8	192.113.0.8



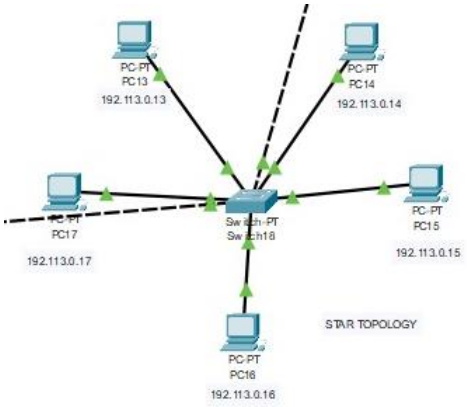
Mesh Topology:

PC NAME	IP ADDRESS
PC9	192.113.0.9
PC10	192.113.0.10
PC11	192.113.0.11
PC12	192.113.0.12

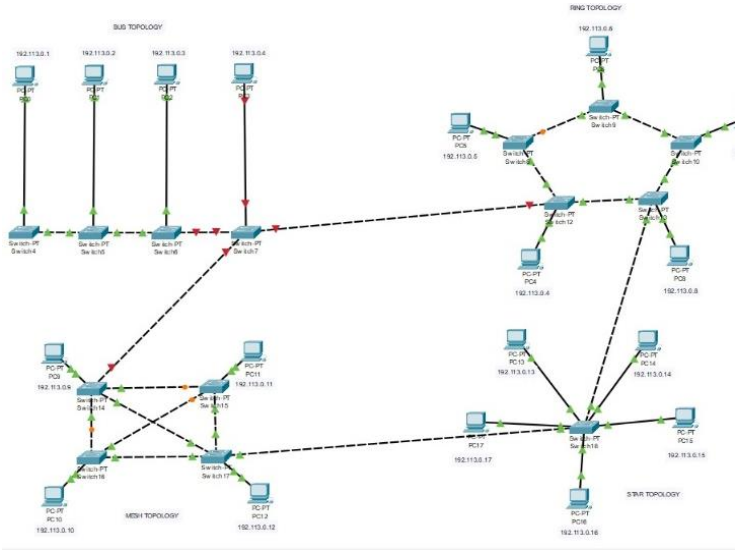


Star Topology:

PC NAME	IP ADDRESS
PC13	192.113.0.13
PC14	192.113.0.14
PC15	192.113.0.15
PC16	192.113.0.16
PC17	192.113.0.

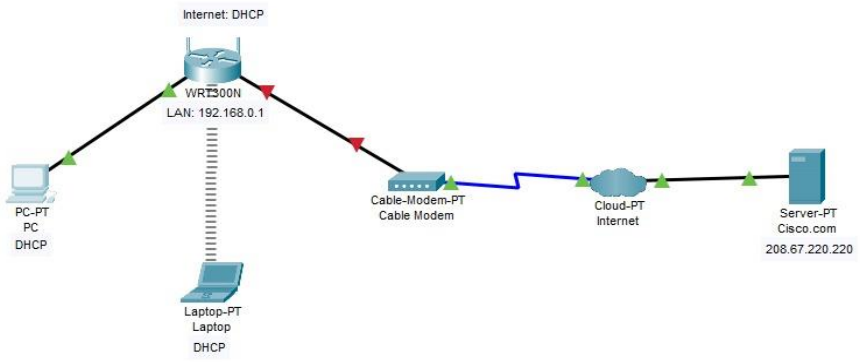


Result: Connect all the topologies together and check their working:



LAB ASSIGNMENT 3

AIM: Create a Simple Network Using Packet Tracer.



DEVICE	INTERFACE	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
PC	ETHERNET0	DHCP		192.168.0.1
WIRELESS ROUTER	LAN	192.168.0.1	255.255.255.0	
	INTERNET	DHCP		
CISCO.COM SERVER	ETHERNET0	208.67.220.220	255.255.255.0	
LAPTOP	WIRELESS0	DHCP		

OBJECTIVE:

Part 1: Build a Simple Network in the Logical Topology Workspace .

Part 2: Configure the Network Devices.

Part 3: Test connectivity between network devices.

Part 4: Save the File and Close Packet Tracer.

Background / Scenario: In this activity you will build a simple network in Packet Tracer from scratch and then save the network as a Packet Tracer Activity File (.pkt).

Part 1: Build a Simple Network in the Logical Topology Workspace

Step 1: Launch Packet Tracer: Launch Packet Tracer on your PC or laptop computer .

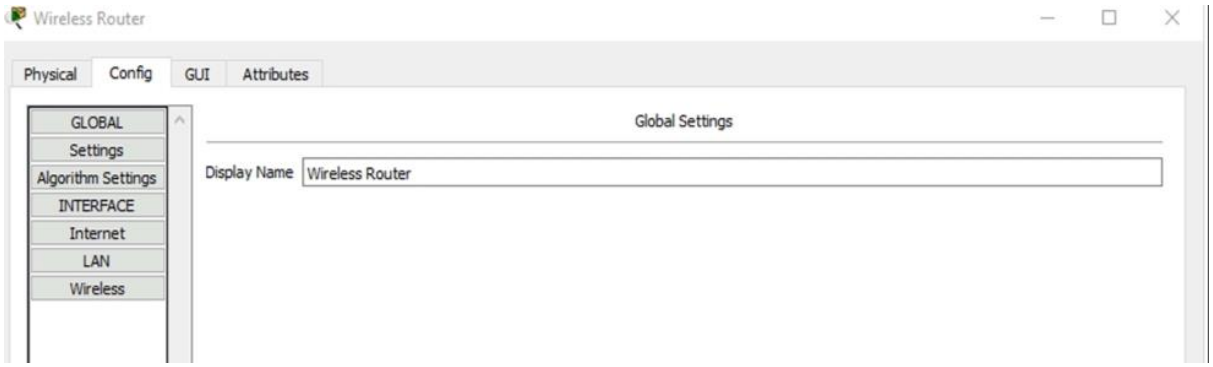
Step 2: Build the topology:

A. Add network devices to the workspace

B. Change display names of the network devices

To change the display names of the network devices click on the device icon on the Packet Tracer Logical workspace, then click on the Config tab in the device configuration window. In the Config tab type the new name of the device into the Display Name box as show in the figure.

C. Add the physical cabling between devices on the workspace.



Part 2: Configure the Network Devices:

Step 1: Configure the Wireless Router

a) Create the wireless network on the Wireless Router

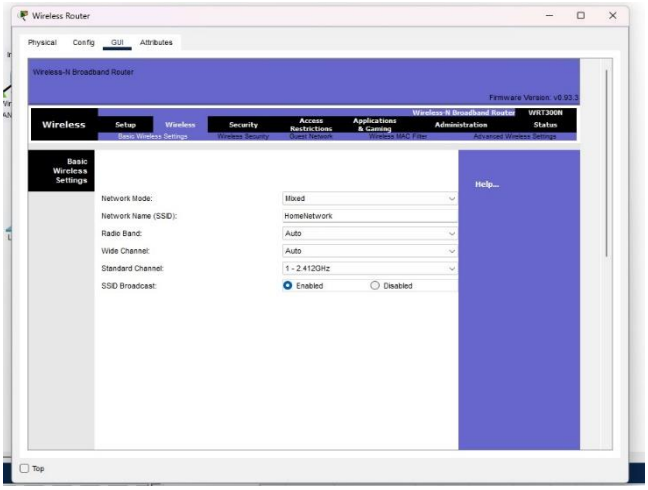
● In the Wireless Router configuration window click on the GUI tab to view configuration options for the Wireless Router.

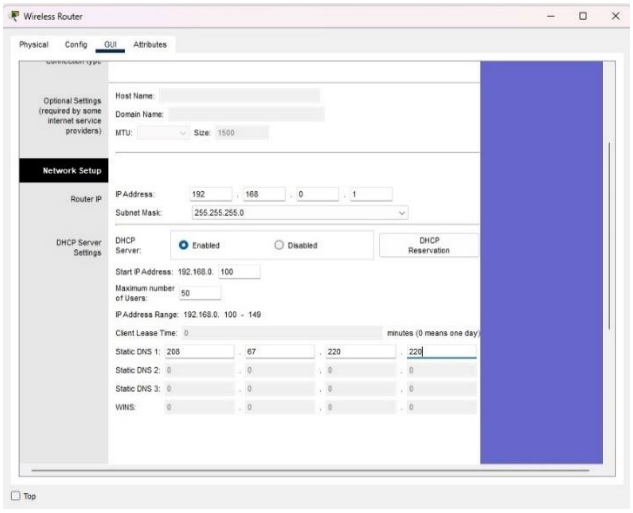
● Click on the Wireless tab in the GUI to view the wireless settings. The only setting that needs to be changed from the defaults is the Network Name (SSID). Type the name “HomeNetwork” as shown in the figure.

● Configure the Internet connection on the Wireless RouterClick on the Setup tab in the Wireless Router GUI.

● In the DHCP Server settings verify that the Enabled button is selected and configure the static IP addressof the DNS server as 208.67.220.220 as shown in the figure.

● Click on the Save Settings tab.





Step 2: Configure the Laptop

a) Configure the Laptop to access the wireless network

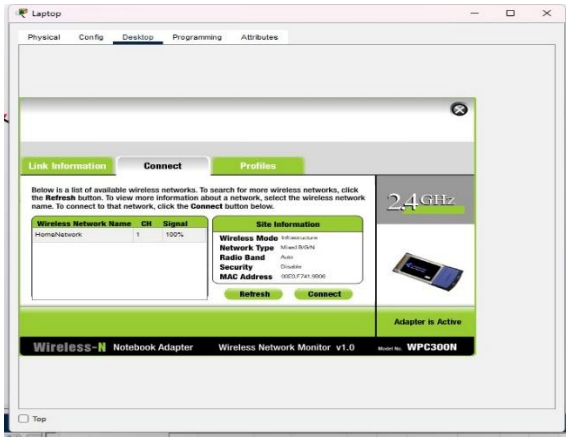
● Click on the Laptop icon.

● In the Physical tab you will need to remove the Ethernet copper module and replace it with the Wireless WPC300N module.

● Click on the Desktop tab at the top of the Laptop configuration window and select the PC Wireless icon.

● Once the Wireless-N Notebook Adapter settings are visible, select the Connect tab. The wireless network “HomeNetwork” should be visible in the list of wireless networks as shown in the figure.

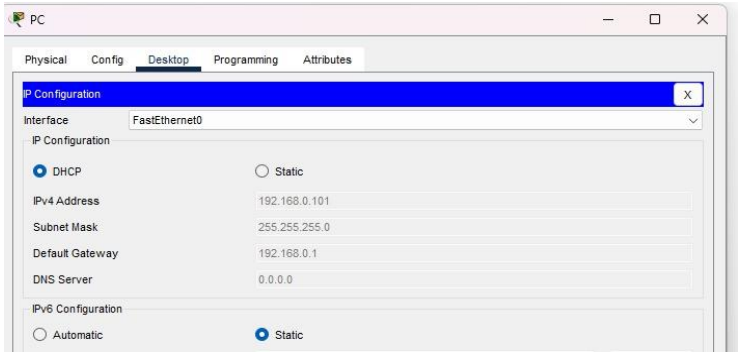
● Select the network, and click on the Connect tab found below the Site Info.

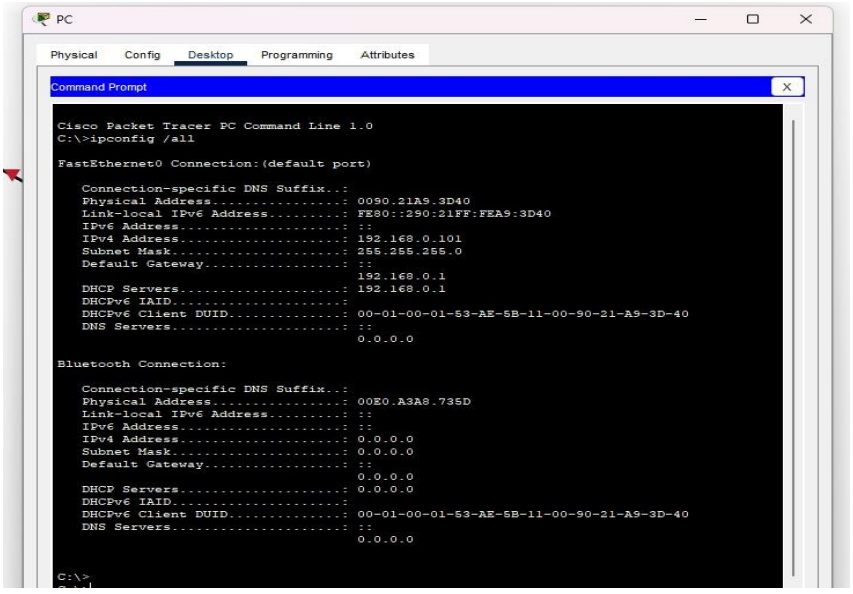


Step 3: Configure the PC

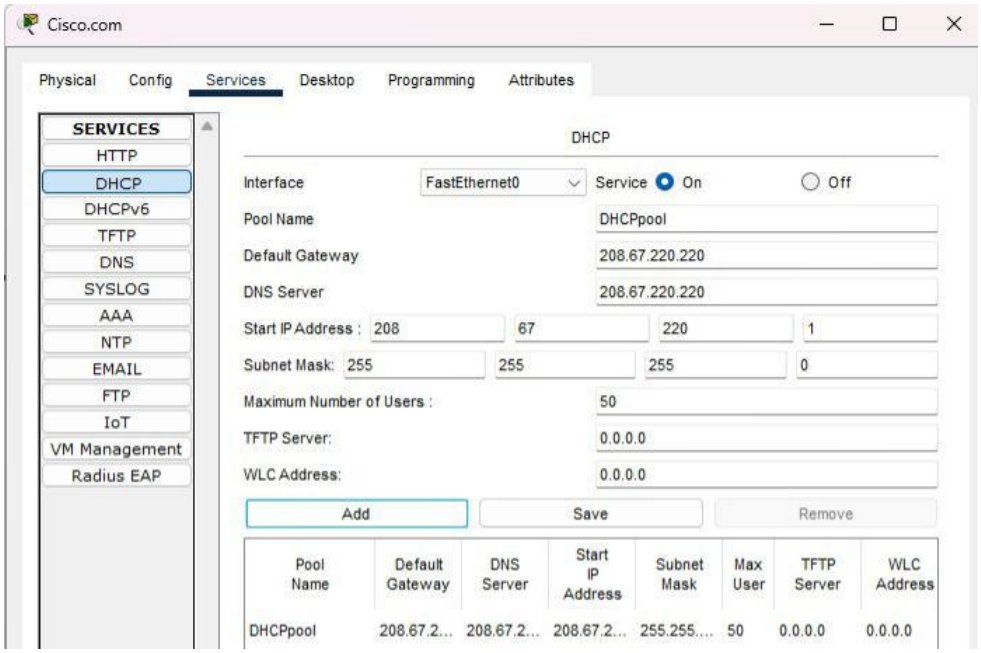
a) Configure the PC for the wired network Click on the PC icon on the Packet Tracer Logical workspace and select the Desktop tab and then the IP Configuration icon. In the IP Configuration window, select the DCHP radio button as shown in the figure so that the PC will use DCHP to receive an IPv4 address from the Wireless router. Close the IP Configuration window.

Verify the PC has received an IPv4 address by issuing the ipconfig The PC should receive an IPv4 address in the192.168.0.x range.



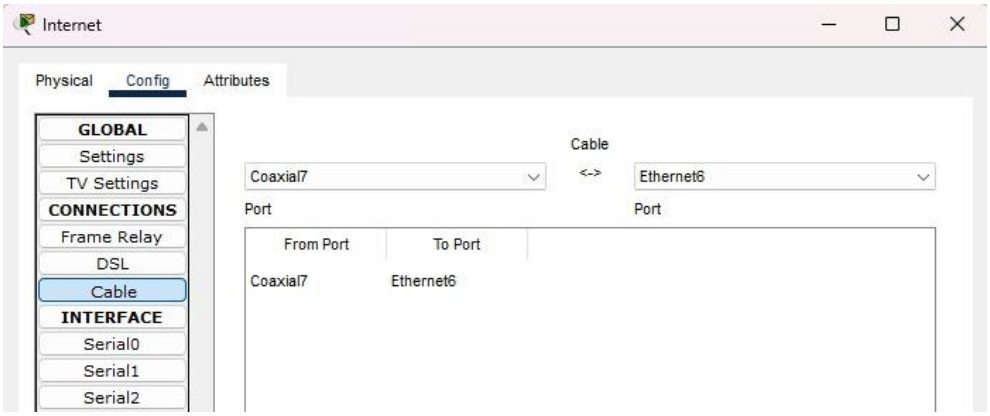


Step 4: Configure the Internet cloud



a) Install network modules if necessary

b) Identify the From and To Ports Click on the Config tab in the Cloud device window. In the left pane click on Cable under CONNECTIONS. In the first drop down box choose Coaxial and in the second drop down box choose Ethernet then click the Add button to add these as the From Port and To Port as shown in the figure and identify the type of provider.



Step 5: Configure the Cisco.com server

a) Configure the Cisco.com server as a DHCP server Click on the Cisco.com server icon on the Packet Tracer Logical workspace and select the Services tab.Select DHCP from the SERVICES list in the left pane.

In the DHCP configuration window, configure a DHCP as shown in the figure with the following settings.

- Click On to turn the DCHP service on
- Pool name: DHCPpool
- Default Gateway: 208.67.220.220
- DNS Server: 208.67.220.220
- Starting IP Address: 208.67.220.1
- Subnet Mask 255.255.255.0
- Maximum number of Users: 50 Click Add to add the pool

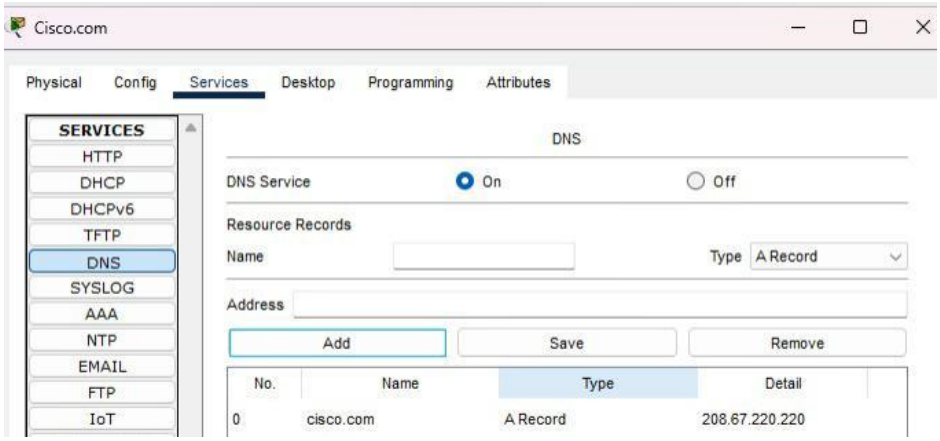
b) Configure the Cisco.com server as a DNS server to provide domain name to IPv4 address resolution. Still in the Services tab, select DNS from the SERVICES listed in the left pane.

Configure the DNS service using the following settings as shown in the figure.

a. Click On to turn the DNS service
b. Name: Cisco.com
c. Type: A Record
d. Address: 208.67.220.220

Click Add to add the DNS service settings

c) Configure the Cisco.com server Global settings.

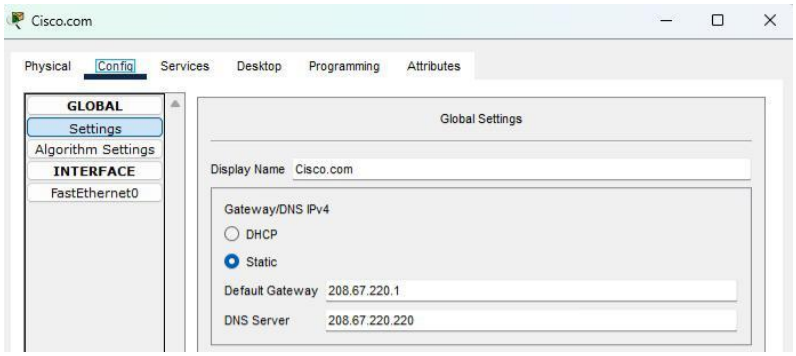


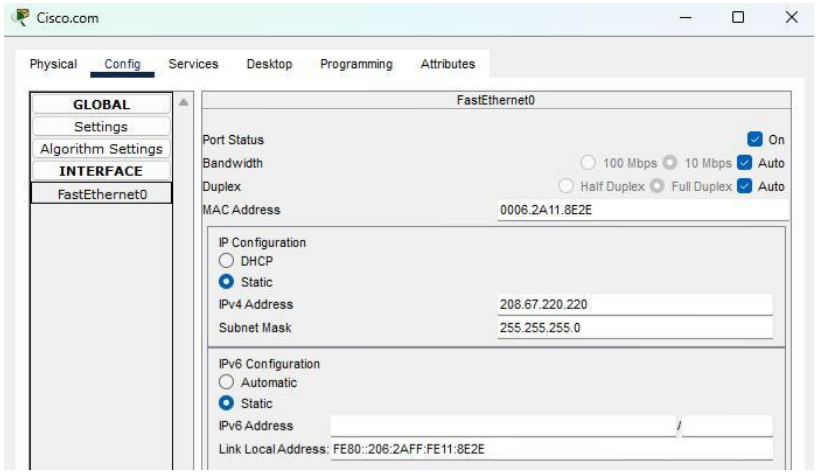
d) Configure the Cisco.com server FastEthernet0 Interface settings.

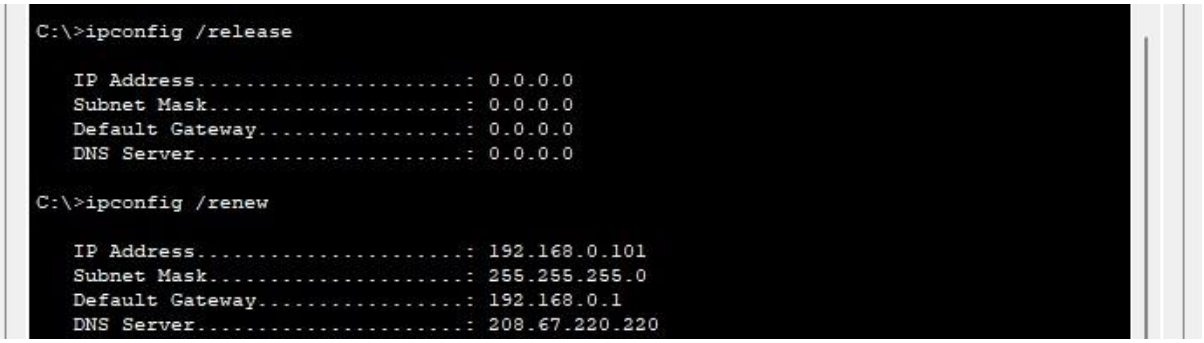
Part 3: Verify Connectivity

Step 1:

a) Verify that the PC is receiving IPv4 configuration information from DHCP.





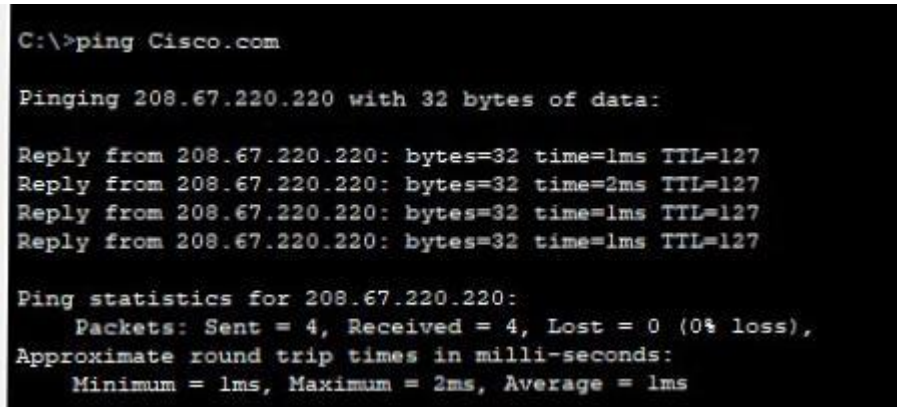


Test connectivity to the Cisco.com server from the PC.

Part 4: Save the File and Close Packet Tracer.

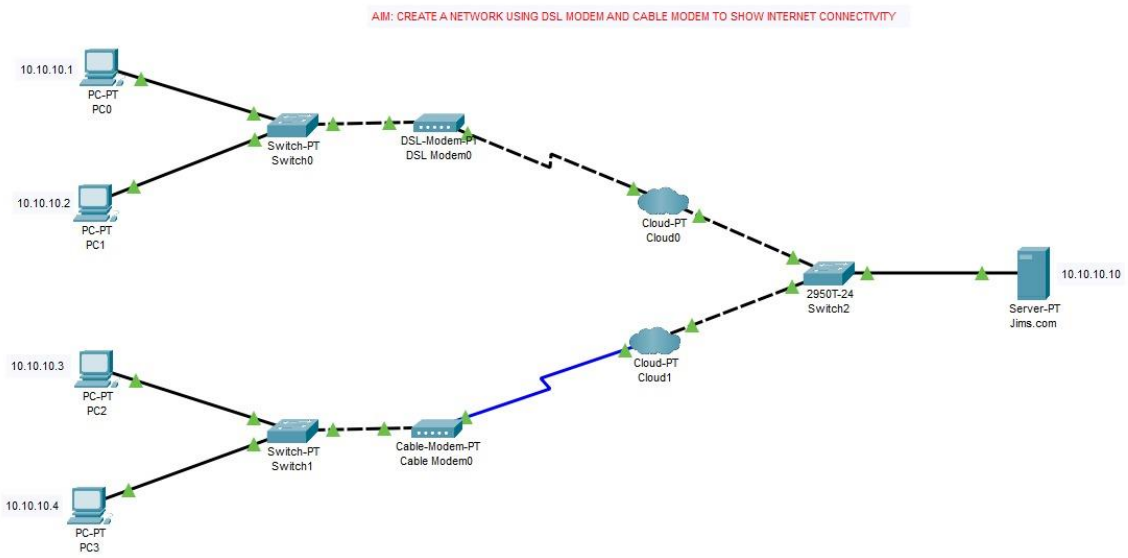
Step 1: Save the File as a Packet Tracer Activity File (*.pkt)

Step 2: Close Packet Tracer



LAB ASSIGNMENT 4

AIM: Create a network using DSL MODEM and CABEL MODEM to show internet connectivity



Part 1: Build a Network in the Logical Topology Workspace.

Step 1: Launch Packet Tracer: Launch Packet Tracer on your PC or laptop computer .

Step 2: Build the topology:

A. Add network devices to the workspace

B. Change display names of the network devices

To change the display names of the network devices click on the device icon on the Packet Tracer Logical workspace, then click on the Config tab in the device configuration window. In the Config tab type the new name of the device into the Display Name box as show in the figure.

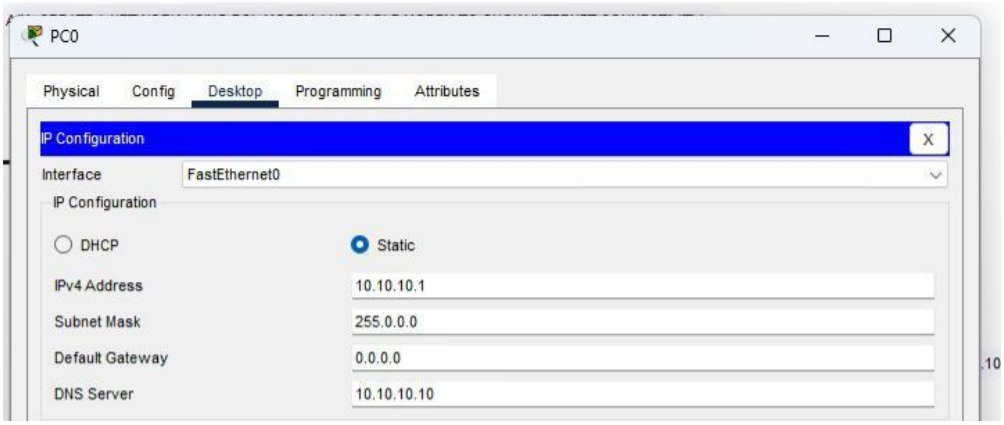
Add the physical cabling between devices on the workspace.

Part 2: Configure the Network Devices:

Step 1: Configure the PC

a) Configure the PC for the wired network Click on the PC icon on the Packet Tracer Logical workspace and select the Desktop tab and then the IP Configuration icon. In the IP Configuration window, select the DCHP radio button as shown in the figure so that the PC will use DCHP to receive an IPv4 address from the Wireless router. Close the IP Configuration window.

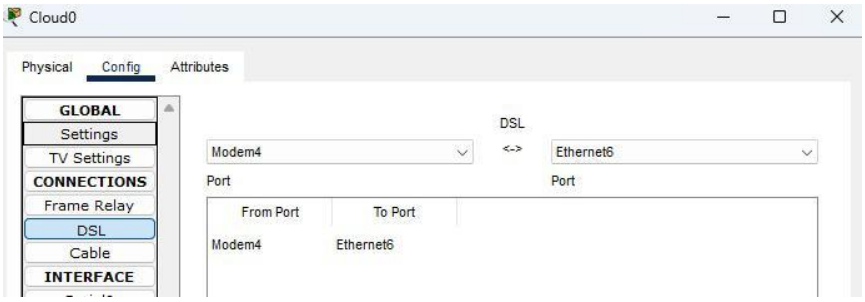
Verify the PC has received an IPv4 address by issuing the ipconfig The PC should receive an IPv4 address in the 10.10.10.x range.



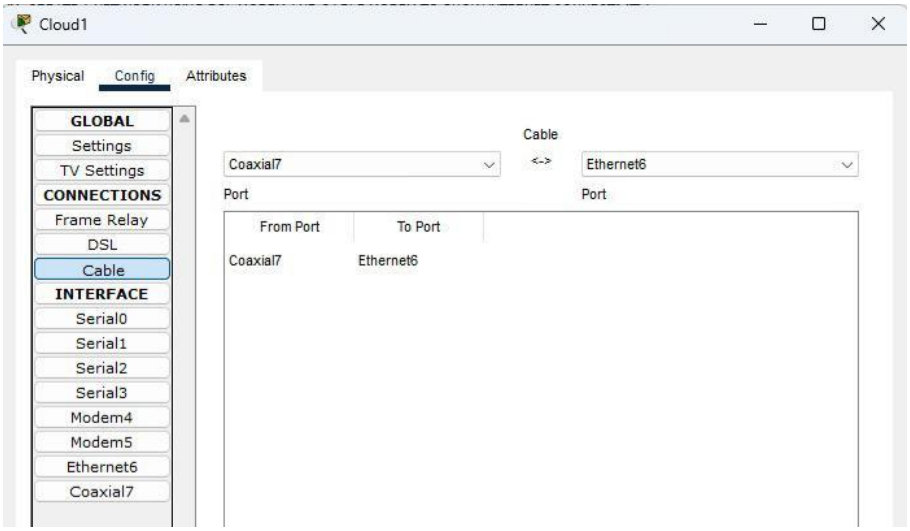
Step 2: Configure the Internet cloud

a) Install network modules if necessary

b) Identify the From and To Ports Click on the Config tab in the Cloud device window. In the left pane click on Cable under CONNECTIONS. In the first drop down box choose Modem and in the second drop down box choose Ethernet then click the Add button to add these as the From Port and To Port as shown in the figure and identify the type of provider.

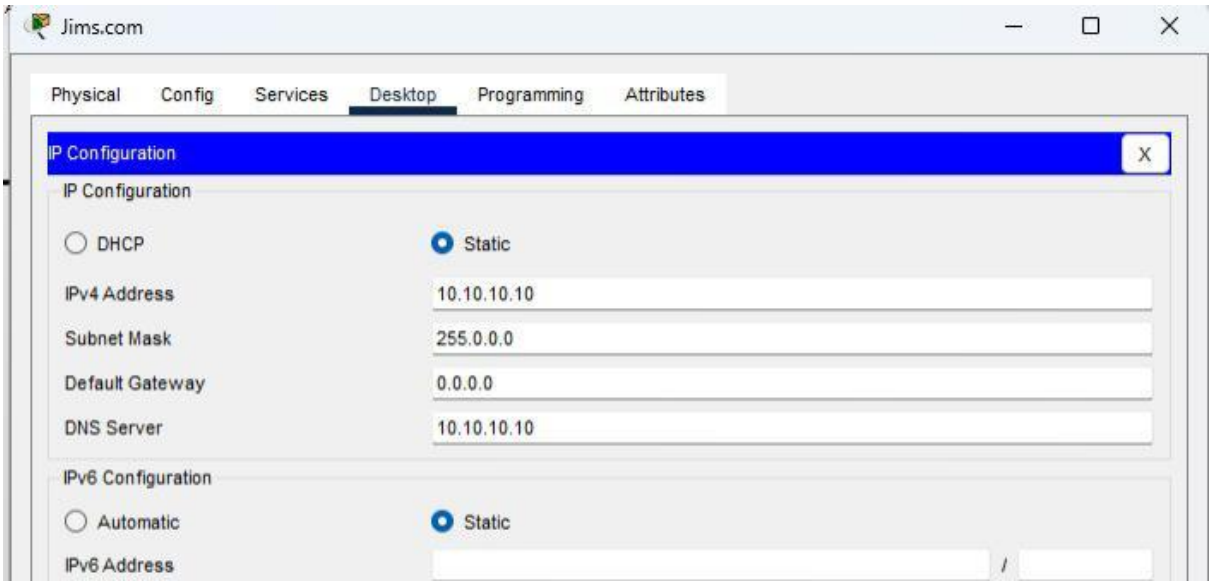


Similarly, for other cloud in the first drop down box choose Coaxial and in the second drop down box choose Ethernet then click the Add button to add these as the From Port and To Port as shown in the figure and identify the type of provider.



Step 3: Configure the Jims.com server

a) Configure the Jims.com server as a static server Click on the Jims.com server icon on the Packet Tracer Logical workspace and select the Desktop tab. Select Static and set

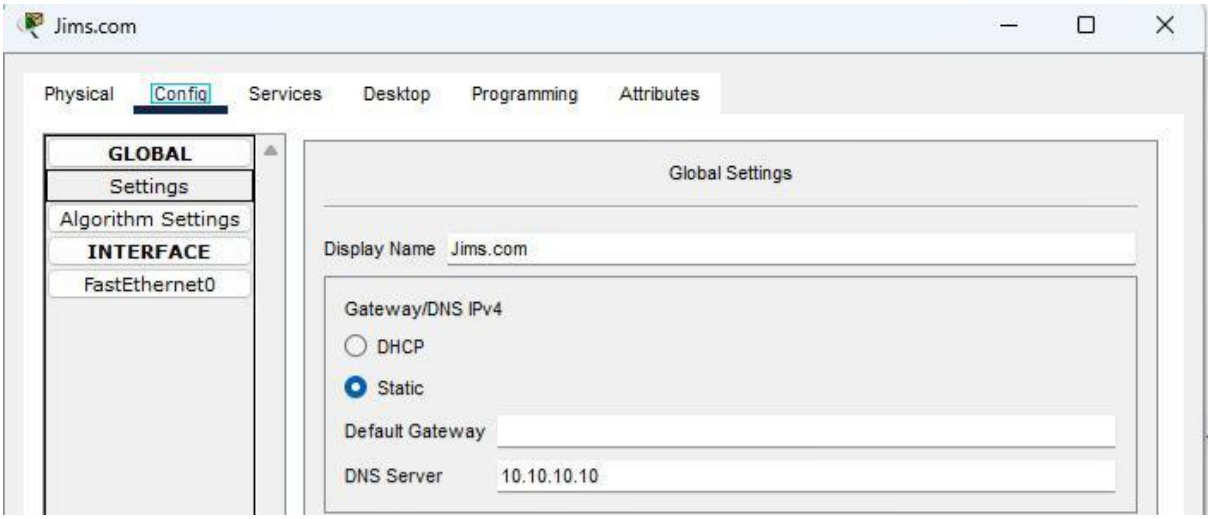


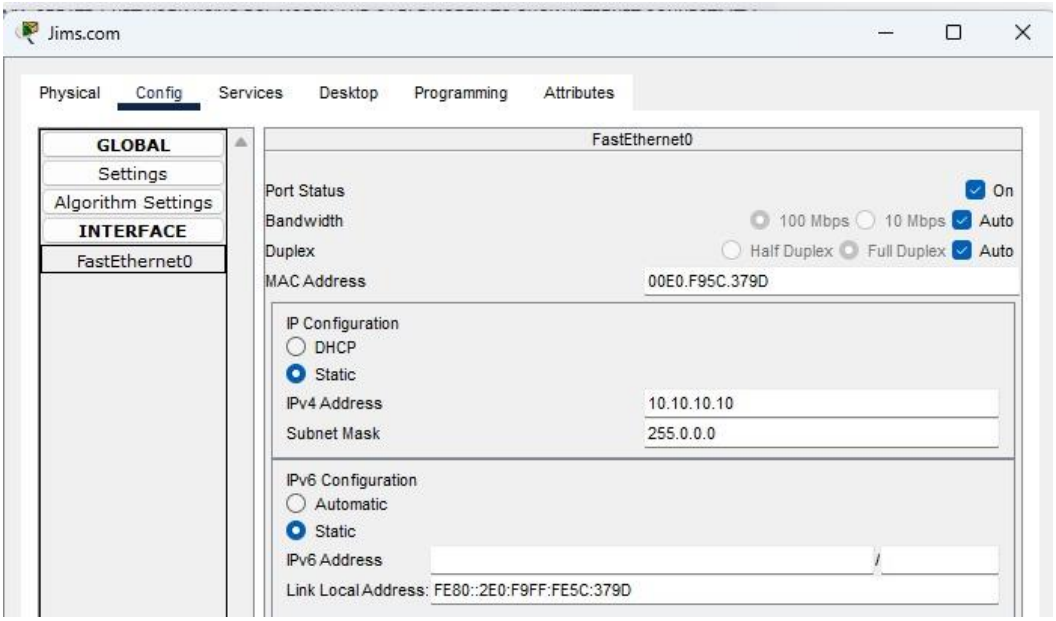
the ip address and subnet mask.

Part 3: Verify Connectivity

Step 1:

a) Verify that the PC is receiving IPv4 configuration information from Static.





a) Test connectivity to the Jims.com server from the PC.

Part 4: Save the File and Close Packet Tracer.

Step 1: Save the File as a Packet Tracer Activity File (*.pkt)

Step 2: Close Packet Tracer

LAB ASSIGNMENT 5

AIM: To construct a VLAN and make the PC's communicate among VLAN

REQUIREMENTS:

- Windows PC (6 units)
- Cisco Packet Tracer (Student Version)
- 8-port switch
- Cat-5 LAN cable

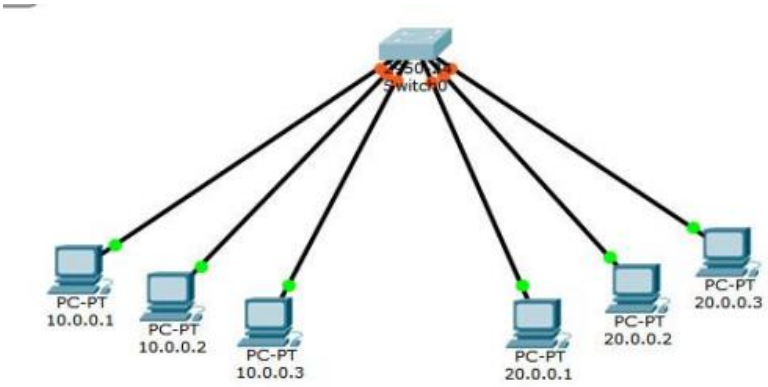
PROCEDURE:

- Use Cisco Packet Tracer software.
- Add 6 PCs and connect them to an 8-port switch using straight-through Ethernet cables.
- Assign IP addresses and observe communication in real/simulation mode.

THEORY: A VLAN is a group of devices on one or more LANs that are configured to communicate as if they were attached to the same wire, when in fact they are located on a number of different LAN segments. Because VLANs are based on logical instead of physical connections, they are extremely flexible.

VLANs define broadcast domains in a layer 2 network. A broadcast domain is the set of all devices that will receive broadcast frames originating from any device within the set. Broadcast domains are typically bounded by routers because routers do not forward broadcast frames. Layer 2 switches create broadcast domains based on the configuration of the switch.

Switches are multiport bridges that allow you to create multiple broadcast domains. Each broadcast domain is like a distinct virtual bridge within a switch.



INPUT DETAILS FOR VLAN 10:

PC0	PC1	PC2
IP ADDRESS: 10.0.0.1 SUBNET: 255.255.255.0 GATEWAY: 10.0.0.50	IP ADDRESS: 10.0.0.2 SUBNET: 255.255.255.0 GATEWAY: 10.0.0.50	IP ADDRESS: 10.0.0.3 SUBNET: 255.255.255.0 GATEWAY: 10.0.0.50

INPUT DETAILS FOR VLAN 20:

PC0	PC1	PC2
IP ADDRESS: 20.0.0.1 SUBNET: 255.255.255.0 GATEWAY: 20.0.0.50	IP ADDRESS: 20.0.0.2 SUBNET: 255.255.255.0 GATEWAY: 20.0.0.50	IP ADDRESS: 20.0.0.3 SUBNET: 255.255.255.0 GATEWAY: 20.0.0.50

CONFIGURATION OF THE SWITCHPORT FOR VLAN:

```
Switch>en
Switch#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#ex
Switch(config)#vlan 20
Switch(config-vlan)#ex
Switch(config)#interface range fastEthernet 0/1-3
Switch(config-if-range)#switchport access vlan 10
Switch(config-if-range)#ex
Switch(config)#interface range fastEthernet 0/4-6
Switch(config-if-range)#switchport access vlan 20
Switch(config-if-range)#ex
Switch(config)#ex
Switch#
%SYS-5-CONFIG_I: Configured from console by console
```

VLAN OUTPUT: (PINGING FROM PC0)

C:\>PING 10.0.0.2

```
Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=1ms TTL=128
Reply from 10.0.0.2: bytes=32 time<1ms TTL=128
Reply from 10.0.0.2: bytes=32 time<1ms TTL=128
Reply from 10.0.0.2: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

C:\>PING 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 20.0.0.1:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

MAC- ADDRESS TABLE:

```
Switch#show mac-address-table
          Mac Address Table
-------------------------------------------      -------------------------------------------

Vlan    Mac Address       Type        Ports      Vlan    Mac Address       Type        Ports
----    -----------       --------    -----      ----    -----------       --------    -----

  10    0009.7c61.c0d0    DYNAMIC     Fa0/1        20    0060.3e8d.3936    DYNAMIC     Fa0/5
  10    000d.bdc2.3317    DYNAMIC     Fa0/2        20    00d0.bcb6.54aa    DYNAMIC     Fa0/6
  10    0090.0ce6.60c9    DYNAMIC     Fa0/3        20    00e0.a371.aec7    DYNAMIC     Fa0/4
```

LAB ASSIGNMENT 6

AIM: To construct a Inter-VLAN and make the PC's communicate among VLAN

REQUIREMENTS:

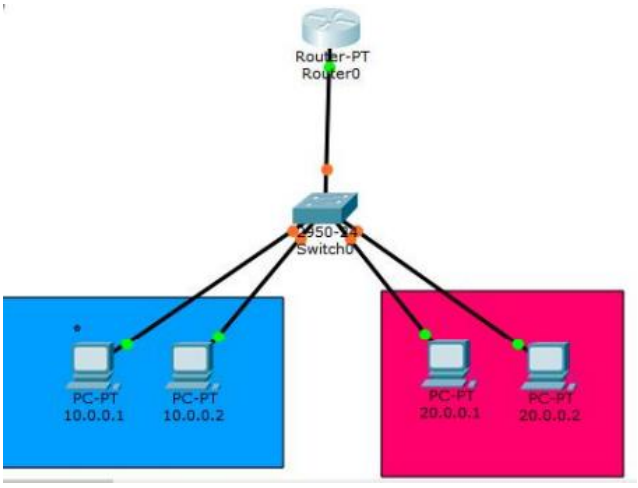
- Windows PC (4 units)
- Cisco Packet Tracer (Student Version)
- 8-port switch
- Cat-5 LAN cable

PROCEDURE:

- Use Cisco Packet Tracer software.
- Add 4 PCs and connect them to an 8-port switch using straight-through Ethernet cables.
- Assign IP addresses and observe communication in real/simulation mode.

THEORY: Inter-VLAN routing can be defined as a way to forward traffic between different VLAN by implementing a router in the network. As we previously, VLANs logically segment the switch into different subnets, When a router is connected to the switch, an administrator can configure the router to forward the traffic between the various VLANs configured on the switch. The user nodes in the VLANs forwards traffic to the router which thenforward the traffic to the destination network regardless of the VLAN configured on the switch.

The use of VLANs means that users would not be able to communicate across departments, i.e. a user in FINANCE, would not be able to send a message to a user in SALES since they are on different broadcast domains



INPUT DETAILS FOR VLAN 10:

PC0	PC1
IP ADDRESS: 10.0.0.1 SUBNET: 255.255.255.0 GATEWAY: 10.0.0.50	IP ADDRESS: 10.0.0.2 SUBNET: 255.255.255.0 GATEWAY: 10.0.0.50

INPUT DETAILS FOR VLAN 20:

PC0	PC1
IP ADDRESS: 20.0.0.1 SUBNET: 255.255.255.0 GATEWAY: 20.0.0.50	IP ADDRESS: 20.0.0.2 SUBNET: 255.255.255.0 GATEWAY: 20.0.0.50

CONFIGURING THE TRUNK PORT IN SWITCH:

```
Switch#configure ter
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface fastEthernet 0/7
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan 10,20
Switch(config-if)#no shut
Switch(config-if)#no shutdown
Switch(config-if)#exit
Switch(config)#exit
```

ROUTER CONFIGURATION:

```
Router>en
Router#config ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastEthernet 0/0
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface fastEthernet 0/0.10
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.10, changed state to
up

Router(config-subif)#encapsulation dot1Q 10
Router(config-subif)#ip address 10.0.0.50 255.0.0.0
Router(config-subif)#no shut
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#interface fastEthernet 0/0.20
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.20, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.20, changed state to
up

Router(config-subif)#encapsulation dot1Q 20
Router(config-subif)#ip address 20.0.0.50 255.0.0.0
Router(config-subif)#no shut
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B – BGP D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1, E2 - OSPF external type 2, E – EGP i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area * - candidate default, U - per-user static route, o – ODR P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, FastEthernet0/0.10
C 20.0.0.0/8 is directly connected, FastEthernet0/0.20

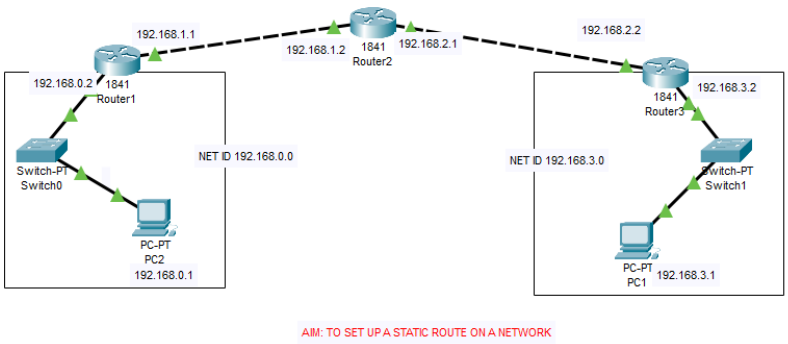
OUTPUT:(PINGING PC3 IN VLAN20 FROM PC0 IN VLAN10)

C:\>ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.1: bytes=32 time<1ms TTL=127
Reply from 20.0.0.1: bytes=32 time<1ms TTL=127
Reply from 20.0.0.1: bytes=32 time=4ms TTL=127
Ping statistics for 20.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 4ms, Average = 1ms

LAB ASSIGNMENT 7

AIM: To set up a network with static routing.



PC0	PC1
IP ADDRESS: 192.168.3.1 GATEWAY: 192.168.3.2	IP ADDRESS: 192.168.0.1 GATEWAY: 192.168.0.2

Method:

1. Place 2 PCs on the Tab.

2. Place 3 Routers on the Tab.

3. Place 2 Switches on the Tab.

4. Connect each PC to a different Switch using Straight Through Cable.

5. Connect each of the Switches to a different Router.

6. Routers that are connected to Switches, connect them to the Single Router present on the tab using Cross-Over.

7. Configure the PCs as shown in the table.

8. Configure the Routers under Interface tab as shown in the table respectively.

9. Configure Router0, Router1 and Router2 by going to the Config tab and selecting Static under Routing.

10.Follow the table for Static Routing Configuration as shown in the table.

ROUTER 1:

INTERFACE	IP ADDRESS	SUBNET MASK
FASTETHERNET0/0	192.168.0.2	255.255.255.0
FASTETHERNET0/1	192.168.1.1	255.255.255.0

ROUTER 2:

INTERFACE	IP ADDRESS	SUBNET MASK
FASTETHERNET0/0	192.168.1.2	255.255.255.0
FASTETHERNET0/1	192.168.2.1	255.255.255.0

ROUTER 3:

INTERFACE	IP ADDRESS	SUBNET MASK
FASTETHERNET0/0	192.168.2.2	255.255.255.0
FASTETHERNET0/1	192.168.3.2	255.255.255.0

ROUTER 1:

Router(config-if)#EX

Router(config)#IP ROUTE 192.168.3.0 255.255.255.0 192.168.1.2

ROUTER 2:

Router(config)#IP ROUTE 192.168.0.0 255.255.255.0 192.168.1.1

Router(config)#IP ROUTE 192.168.3.0 255.255.255.0 192.168.2.2

ROUTER 3:

Router(config)#IP ROUTE 192.168.0.0 255.255.255.0 192.168.2.1

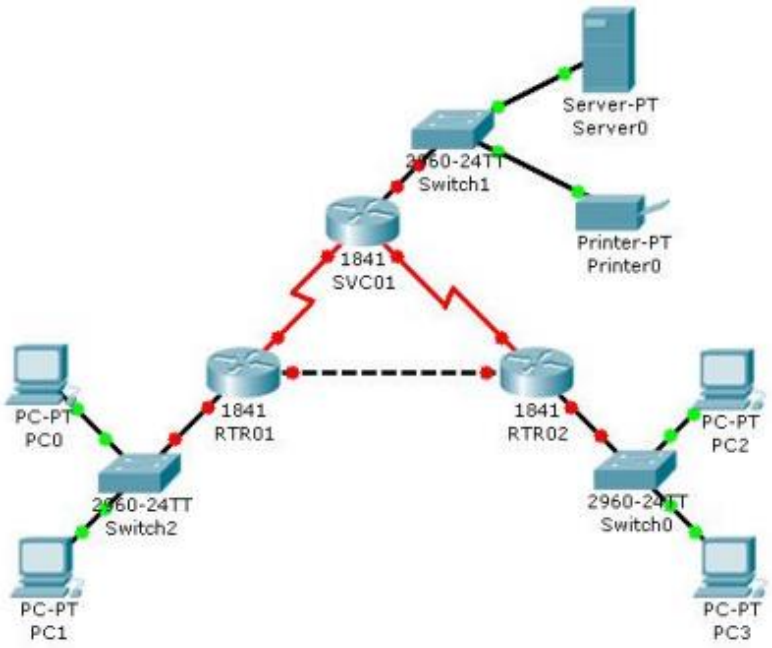
RESULT:

Static Routing was implemented using Cisco Packet Tracer for the given Computer Network.

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)	

LAB ASSIGNMENT 8

AIM: To implement RIP routing in a Computer Network using Cisco Packet Tracer



OBJECTIVES:

- Confugure routers using basic interface configuration commands.
- Enable RIP.
- Verify the RIP configuration.

Background / Preparation

A simple routed network has been set up to assist in reviewing RIP routing behavior. In this activity, you will configure RIP across the network and set up end devices to communicate on the network.

Step 1: Configure the SVC01 router and enable RIP.

a. From the CLI, configure interface Fast Ethernet 0/0 using the IP address 10.0.0.254 /8.

b. Configure interface serial 0/0/0 using the first usable IP address in network 192.168.1.0 /24 to connect to the RTR01 router. Set the clock rate at 64000.

c. Configure interface serial 0/0/1 using the first usable IP address in network 192.168.2.0 /24 with a clock rate of 64000.

d. Using the **no shutdown** command, enable the configured interfaces.

e. Configure RIP to advertise the networks for the configured interfaces.

f. Configure the end devices.

i. Server0 uses the first usable IP address in network 10.0.0.0 /8. Specify the appropriate default gateway and subnet mask.

ii. Printer0 uses the second usable IP address in network 10.0.0.0 /8. Specify the appropriate default gateway and subnet mask.

Step 2: Configure the RTR01 router and enable RIP.

a. Configure interface Fast Ethernet 0/0 using the first usable IP address in network 192.168.0.0 /24 to connect to the RTR02 router.

b. Configure interface serial 0/0/0 using the second usable IP address in network 192.168.1.0 /24 to connect to the SVC01 router.

c. Configure interface Fast Ethernet 0/1 using the IP address 172.16.254.254 /16.

d. Using the **no shutdown** command, enable the configured interfaces.

e. Configure RIP to advertise the networks for the configured interfaces.

f. Configure the end devices.

i. PC0 uses the first usable IP addresses in network 172.16.0.0 /16.

ii. PC1 uses the second usable IP address in network 172.16.0.0 /16.

iii. Specify the appropriate default gateway and subnet mask on each PC.

Step 3: Configure the RTR02 router and enable RIP.

a. Configure interface Fast Ethernet 0/0 using the second usable IP address in network 192.168.0.0 /24 to connect to the RTR01 router.

b. Configure interface serial 0/0/0 using the second usable IP address in network 192.168.2.0 /24 to connect to the SVC01 router.

c. Configure interface Fast Ethernet 0/1 using the IP address 172.17.254.254 /16.

d. Using the **no shutdown** command, enable the configured interfaces.

e. Configure RIP to advertise the networks for the configured interfaces.

f. Configure the end devices.

i. PC2 uses the first usable IP addresses in network 172.17.0.0 /16.

ii. PC3 uses the second usable IP address in network 172.17.0.0 /16.

iii. Specify the appropriate default gateway and subnet mask on each PC.

Step 4: Verify the RIP configuration on each router.

a. At the command prompt for each router, issue the commands **show ip protocols** and **show ip route** to verify RIP routing is fully converged. The **show ip protocols** command displays the networks the router is advertising and the addresses of other RIP routing neighbors. The **show ip route** command output displays all routes know to the local router including the RIP routes which are indicated by an "R".

b. Every device should now be able to successfully ping any other device in this activity.

c. Click the **Check Results** button at the bottom of this instruction window to check your work.

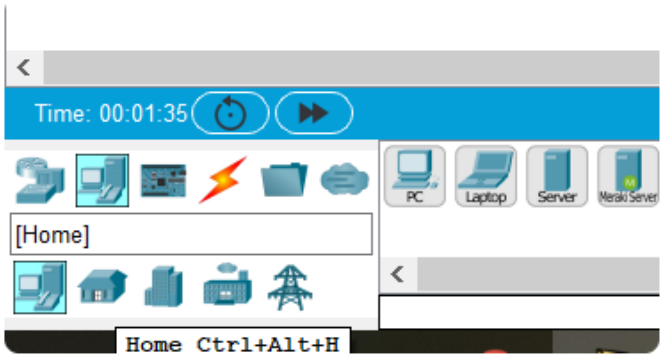
LAB ASSIGNMENT 9

AIM: To simulate and connect multiple IOT devices on the network using Cisco Packet Tracer.

THEORY: Internet of Things (IoT) devices are pieces of hardware that can transmit data over the internet or other networks. They have sensors, processing ability, software, and other technologies that connect and exchange data with other devices and systems. Smart devices are electrical items that connect to the internet (or to your home network), usually via wifi. They include 'hi-tech' devices (think smart speakers, fitness trackers and security cameras) and also standard household items (such as fridges, thermostats, kettles and washing machines). A home gateway is a device that connects a local area network (LAN) to a wide area network (WAN). It acts as both a modem and a router for a home network, combining the features of both in a single piece of hardware.

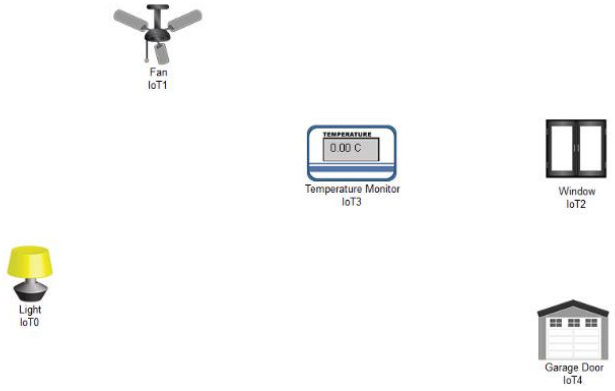
STEPS TO SIMULATE IOT BSED HOME AUTOMATION:

1. Place distinct IoT devices on the tab .
2. Firstly, select home icon at the left bottom corner and now and now choose the required home components.

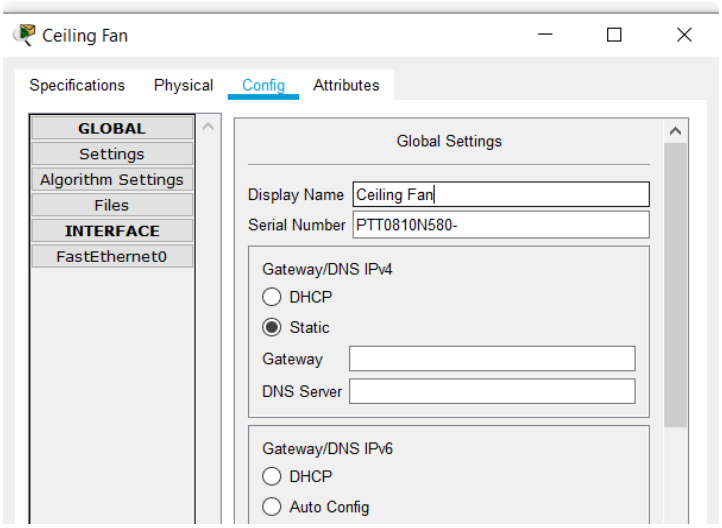


Click on Home icon

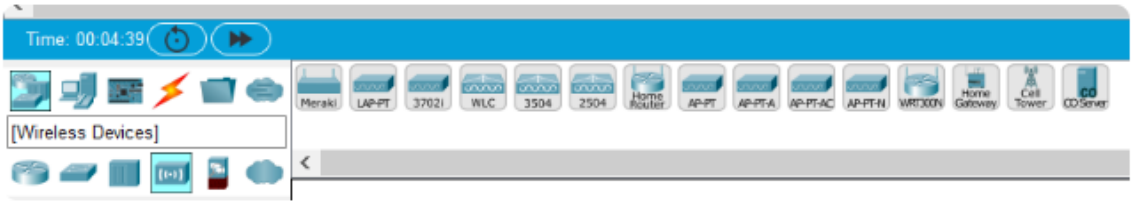
3. Select Home Appliances.
4. Drag and place the components.
5. Drag and drop.



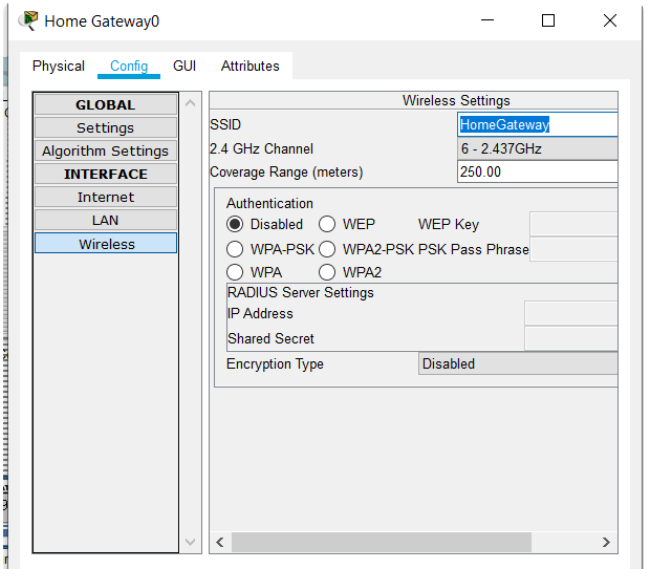
6. Additionally, you can change the name of appliances by clicking on respective appliances and select the config option. You have to repeat the same steps to rename the other devoces too.
7. Enter the name.



8. Thus now lets establish a wireless connection. Got to wireless devices and choose Home gateway.

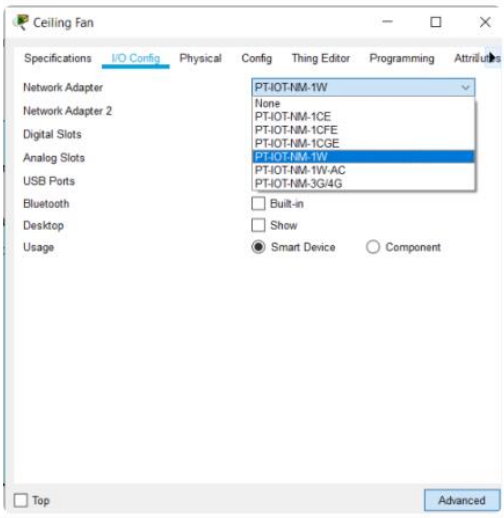


9. Now copy the SSID of Home Gateway by clicking on the Home gateway.

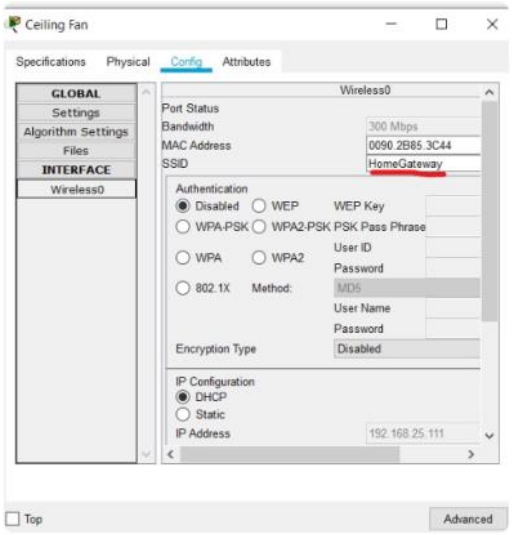


10. Copy the SSID.
11. . Therefore It's necessary to configure all devices to connect wirelessly to Home Gateway.

12. Hence you can achieve this by right-clicking a device-> Advanced->I/O config->select PT-IOT-NW-1W. Similarly, repeat the steps for other devices as well.



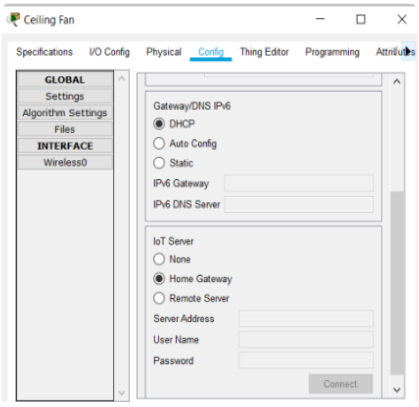
13. Then paste the SSID In each appliance by clicking on the config option. Similarly repeat the steps for other devices as well.



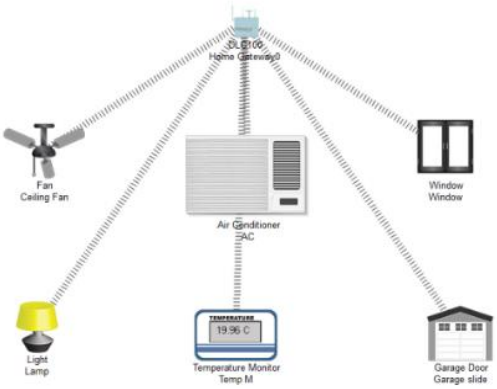
14. Now select IOT server as Home gateway to all appliances.

Click on **Appliances->select Advanced->config->choose Home Gateway**.

Similarly repeat the steps for other devices as well.

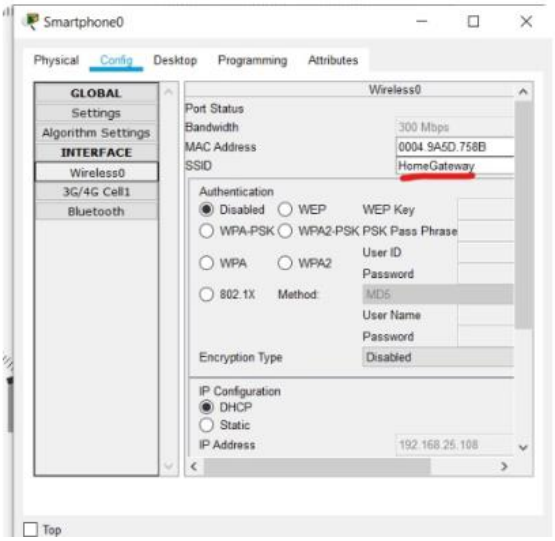


15. Choose Home Gateway as IOT Server.
16. Thus you can notice that all devices are connected to the Home Gateway.

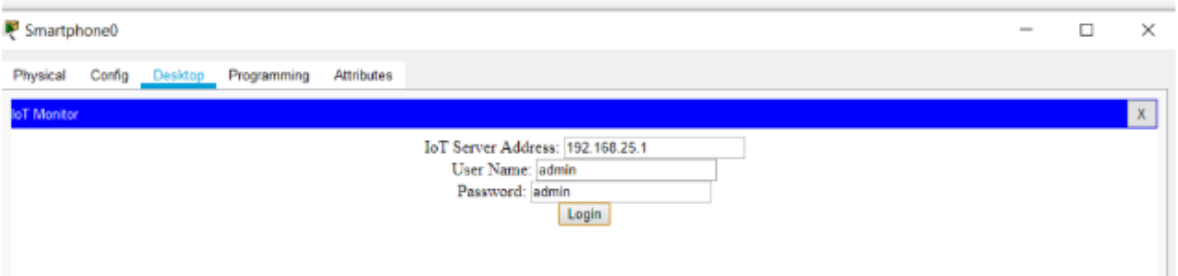


17. Now select smart devices to control and monitor appliances.

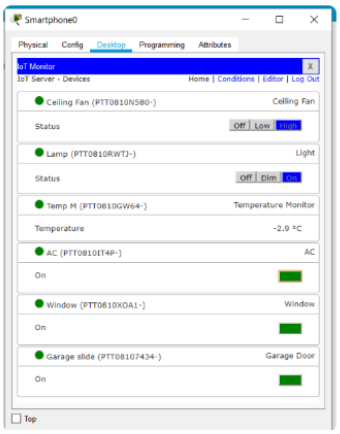
18. Now connect your smart devices also to your Home gateway.



19. Thus your smart device is connected to your Home gateway. Click on smart device and choose desktop. You can now login.



20. Finally, you can control and monitor in the dashboard.



RESULT: