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PRACTICAL FILE

SESSION: 2023-24

Computer Networks Lab (CIC 355)

III Year, V Sem

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EXPERIMENT NO. 1

AIM: Introduction to Networking Simulation Tools: Cisco Packet Tracer

Packet Tracer is a protocol simulator developed by Dennis Frezzo and his team at Cisco Systems. Packet Tracer (PT) is a powerful and dynamic tool that displays the various protocols used in networking, in either Real Time or Simulation mode. This includes layer 2 protocols such as Ethernet and PPP, layer 3 protocols such as IP, ICMP, and ARP, and layer 4 protocols such as TCP and UDP. Routing protocols can also be traced.

Purpose:

The purpose of this lab is to become familiar with the Packet Tracer interface. Learn how to use existing topologies and build your own.

Requisite knowledge:

This lab assumes some understanding of the Ethernet protocol. At this point we have not discussed other protocols, but will use Packet Tracer in later labs to discuss those as well. Version: This lab is based on

Packet Tracer 7.3.

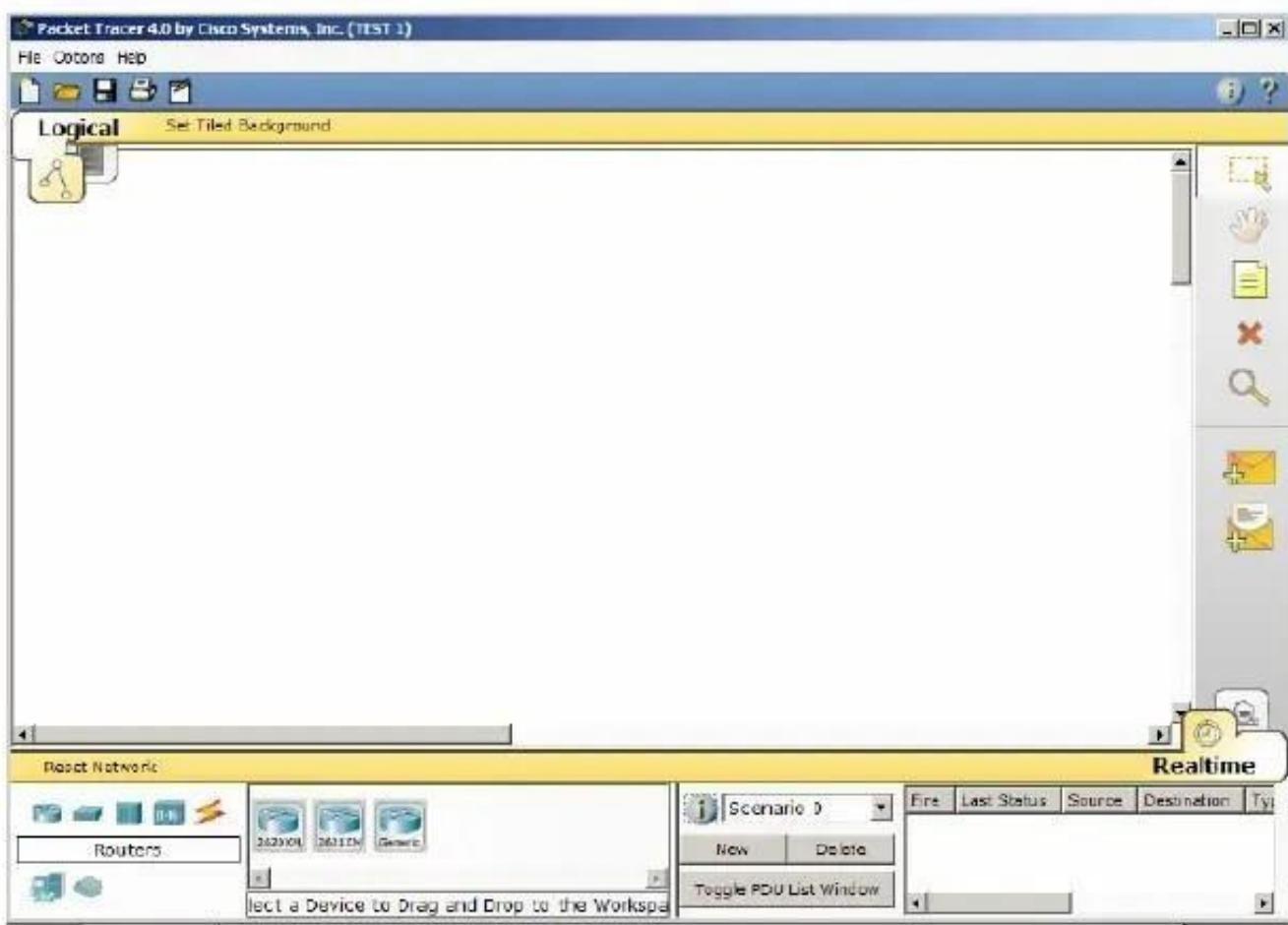


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Introduction to the Packet Tracer Interface using a Hub Topology

Step 1: Start Packet Tracer and Entering Simulation Mode 1



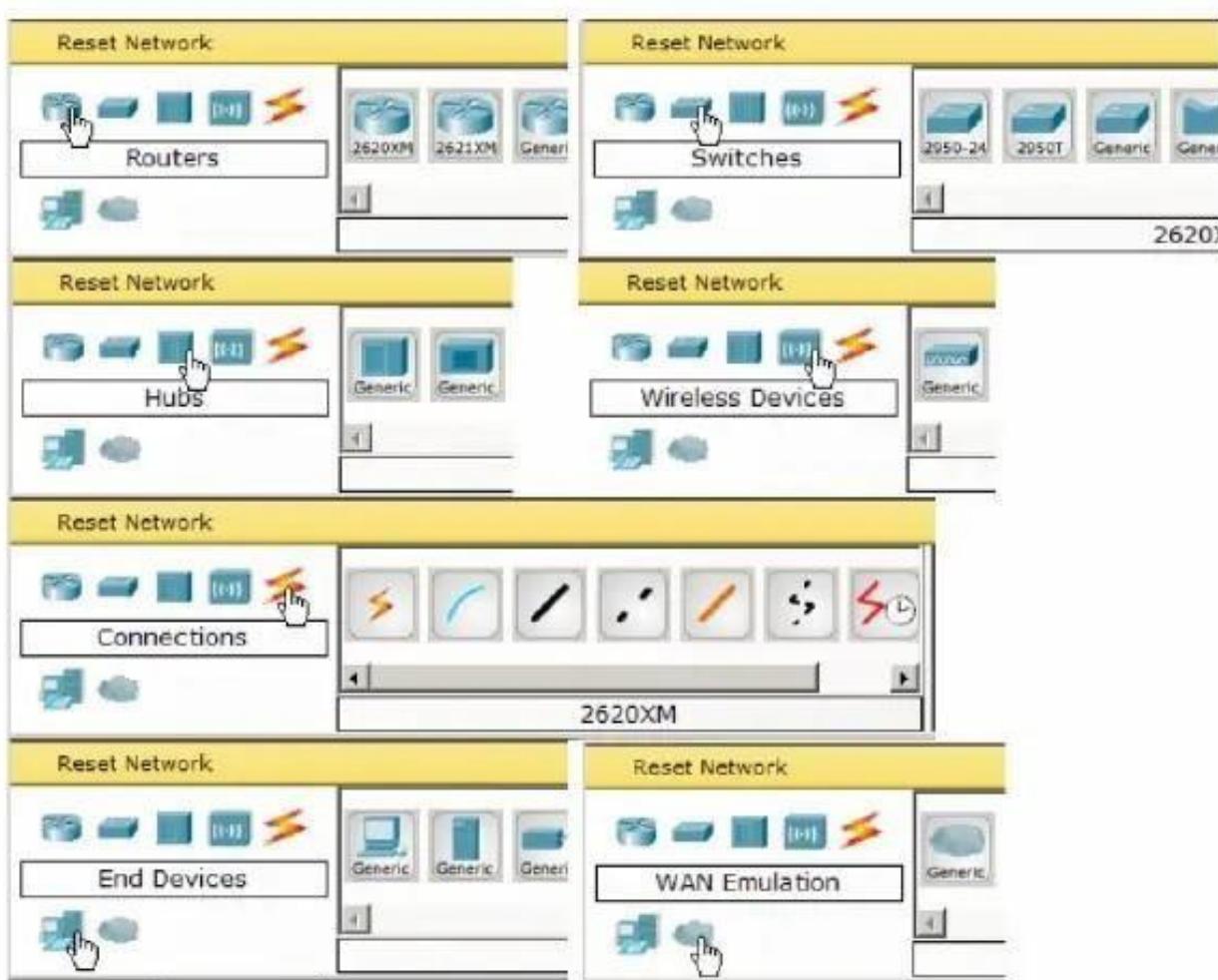
Step 2: Choosing Devices and Connections

We will begin building our network topology by selecting devices and the media in which to connect them. Several types of devices and network connections can be used. For this lab we will keep it simple by using End Devices, Switches, Hubs, and Connections.

Single click on each group of devices and connections to display the various choices



Step 3: Building the Topology – Adding Hosts Single click on the End Devices.





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EXPERIMENT NO. 2

AIM: Study of following Network Devices in Detail

- Repeater
- Hub
- Switch
- Bridge
- Router
- Gate Way

Apparatus (Software): No software or hardware needed.

Procedure: Following should be done to understand this practical.

1. **Repeater:** Functioning at Physical Layer. A **repeater** is an electronic device that receives a signal and retransmits it at a higher level and/or higher power, or onto the other side of an obstruction, so that the signal can cover longer distances. Repeater have two ports, so cannot be used to connect for more than two devices
2. **Hub:** An **Ethernet hub, active hub, network hub, repeater hub, hub** or **concentrator** is a device for connecting multiple twisted pair or fiber optic Ethernet devices together and making them act as a single network segment. Hubs work at the physical layer (layer 1) of the OSI model. The device is a form of multiport repeater. Repeater hubs also participate in collision detection, forwarding a jam signal to all ports if it detects a collision.
3. **Switch:** A **network switch** or **switching hub** is a computer networking device that connects network segments. The term commonly refers to a network bridge that processes and routes data at the data link layer (layer 2) of the OSI model. Switches that additionally process data at the network layer (layer 3 and above) are often referred to as Layer 3 switches or multilayer switches.
4. **Bridge:** A **network bridge** connects multiple network segments at the data link layer (Layer 2) of the OSI model. In Ethernet networks, the term *bridge* formally means a device that behaves according to the IEEE 802.1D standard. A bridge and switch are very much alike; a switch being a bridge with numerous ports. *Switch* or *Layer 2 switch* is often used interchangeably with *bridge*. Bridges can analyse incoming data packets to determine if the bridge is able to send the given packet to another segment of the network.



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5. 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 contains address information that a router can use to determine if the source and destination are on the same network, or if the data packet must be transferred from one network to another. Where multiple routers are used in a large collection of interconnected networks, the routers exchange information about target system addresses, so that each router can build up a table showing the preferred paths between any two systems on the interconnected networks.

6. Gate Way: In a communications network, a network node equipped for interfacing with another network that uses different protocols.

- A gateway may contain devices such as protocol translators, impedance matching devices, rate converters, fault isolators, or signal translators as necessary to provide system interoperability. It also requires the establishment of mutually acceptable administrative procedures between both networks.

A protocol translation/mapping gateway interconnects networks with different network protocol technologies by performing the required protocol conversions.



EXPERIMENT NO. 3

AIM: Study of basic network command and Network configuration commands.

Apparatus (Software): Command Prompt and Packet Tracer.

Procedure: To do this EXPERIMENT- follows these steps:

In this EXPERIMENT- students have to understand basic networking commands e.g. ping, tracert etc.

All commands related to Network configuration which includes how to switch to privilege mode and normal mode and how to configure router interface and how to save this configuration to flash memory or permanent memory.

These commands include

- Configuring the Router commands
- General Commands to configure network
- Privileged Mode commands of a router
- Router Processes & Statistics
- IP Commands
- Other IP Commands e.g. show Ip route etc.

ping:

ping sends an ICMP ECHO_REQUEST packet to the specified host. If the host responds, you get an ICMP packet back. Sound strange? Well, you can “ping” an IP address to see if a machine is alive. If there is no response, you know something is wrong.

A screenshot of a Windows Command Prompt window titled "Command Prompt". The window shows the output of a ping command being run on a PC named "PC1". The output shows the ping command being sent to the IP address 192.168.1.2, with three replies received from the target host. The statistics at the end show 4 packets sent, 3 received, and 1 lost.

```
PC1
Physical Config Desktop

Command Prompt

Packet Tracer PC Command Line 1.0
PC>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.2: bytes=32 time=15ms TTL=127
Reply from 192.168.1.2: bytes=32 time=94ms TTL=127
Reply from 192.168.1.2: bytes=32 time=11ms TTL=127

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 11ms, Maximum = 94ms, Average = 40ms

PC>
```



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Traceroute:

Tracert is a command which can show you the path a packet of information taken from your computer to one you specify. It will list all the routers it passes through until it reaches its destination, or fails to and is discarded. In addition to this, it will tell you how long each 'hop' from router to router takes.

```
PC1
Physical Config Desktop

Command Prompt

Packet Tracer PC Command Line 1.0
PC>tracert 192.168.1.2

Tracing route to 192.168.1.2 over a maximum of 30 hops:
  1  11 ms      5 ms      2 ms      192.168.2.1
  2  *          81 ms     14 ms      192.168.1.2

Trace complete.

PC>
```

nslookup:

Displays information from Domain Name System (DNS) name servers.

NOTE :If you write the command as above it shows as default your pc's server name firstly.

pathping:

A better version of tracert that gives you statics about packet lost and latency.

```
Administrator: C:\windows\system32\cmd.exe

C:\>pathping 192.168.1.12

Tracing route to 192.168.1.12 over a maximum of 30 hops
  0  lenovo-PC.dronacharya [192.168.1.97]
  1  lenovo-PC.dronacharya [192.168.1.97]  reports: Destination host unreachable

Computing statistics for 25 seconds...
      Source to Here   This Node/Link
Hop  RTT      Lost/Sent = Pct  Lost/Sent = Pct  Address
  0          100/ 100 =100%    100/ 100 =100%  lenovo-PC.dronacharya [192.168.1.97]
  1  ---      100/ 100 =100%    0/ 100 = 0%  lenovo-PC [0.0.0.0]

Trace complete.

C:\>
```



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Getting Help:

In any command mode, you can get a list of available commands by entering a question mark (?). Router>?

To obtain a list of commands that begin with a particular character sequence, type in those characters followed immediately by the question mark (?).

Router#co?

configure connect copy:

To list keywords or arguments, enter a question mark in place of a keyword or argument. Include a space before the question mark.

Router#configure ? memory Configure from NV memory network Configure from a TFTP network host terminal Configure from the terminal .

You can also abbreviate commands and keywords by entering just enough characters to make the command unique from other commands. For example, you can abbreviate the show command to sh.

Configuration Files:

Any time you make changes to the router configuration, you must save the changes to memory because if you do not, they will be lost if there is a system reload or power outage. There are two types of configuration files: the running (current operating) configuration and the startup configuration.

Use the following privileged mode commands to work with configuration files.



EXPERIMENT NO. 4

AIM: a) To configure a Bus Topology Network using CISCO Packet Tracer Software.

Packet tracer: Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface. Packet Tracer makes use of a drag and drop user interface, allowing users to add and remove simulated network devices as they see fit.

Bus Topology: Bus topology is a network type in which every computer and network devices is connected to single cable.

Advantages:

- The bus topology is easy to understand, install, and use for small network.
- Cable required is least compared to other network topology.
- Cost effective.
- Easy to joining two cables together.

Disadvantages:

- Entire network shuts down if there is a break in the main cable.
- Terminators are required at both ends of the backbone cable.
- Difficult to identify the problem if the entire network shuts down.
- Not meant to be used as a stand-alone solution.

Introduction to the Packet Tracer Interface using a Bus Topology

Step 1: Start Packet Tracer and Entering Simulation Mode 1

Step 2: Choose switch then select generic

Step 3: After selecting generic click on the main area.

Step 4: Select end devices and then click on generic.

Step 5: click at workspace to see the PC.

Step 6: select connections from power cycle devices and click on automatically choose connection type.



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Step 7: Draw connections from switch to PC.

Step 8: Double click on a PC, a box will appear, click on the Desktop tab. **Step 9:** Then select IP configuration.

Step 10: Write the IP address of your network and click at the Subnet mask field. Subnet mask will appear automatically.

Step 11: Repeat step 10 to set the IPs for all the PCs.

Step 12: now add a router and repeat the above step for connecting second LAN.

Step 13: Select “ADD simple message”.

Step 14: Drag and drop the message to the source device and then to the destination device.

Step 15: Select the simulation mode at the bottom right corner. Step 16:

Click at “Auto capture/play”

Step 17: Observe the path of the message from source to switch. Then to all devices and then move to the destination.

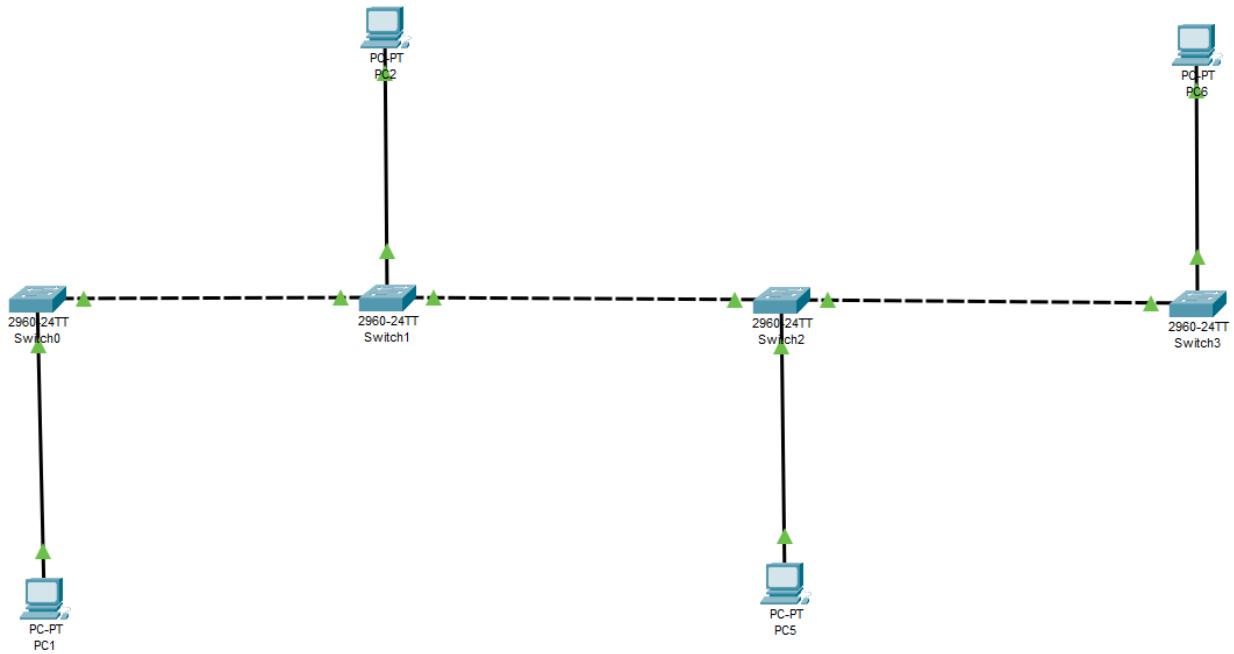
Step 18: Finally observe the marks. If the source PC is marked correct it means you have successfully established connection.



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b) To Configure a star Topology network using CISCO packet tracer software.

Packet tracer: Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface. Packet Tracer makes use of a drag and drop user interface, allowing users to add and remove simulated network devices as they see fit.

Star Topology: A star topology is a topology for a Local Area Network (LAN) in which all nodes are individually connected to a central connection point, like a hub or a switch. A star takes more cable than e.g. a bus, but the benefit is that if a cable fails, only one node will be brought down.

Advantages:

- Low network traffic.
- No disruptions to the network when connecting or removing devices.
- Easy to detect faults and to remove parts.

Disadvantages:

- Requires more cable length than a linear topology.
- If the hub, switch, or concentrator fails, nodes attached are disabled.
- More expensive than linear bus topologies because of the cost of the hubs, etc.

Introduction to the Packet Tracer Interface using a Star Topology

Step 1: Start packet tracer

Step 2: Choose Hub then select generic

Step 3: After selecting generic click on the main area.

Step 4: Select end devices and then click on generic.

Step 5: click at workspace to see the PC.

Step 6: select connections from power cycle devices and click on automatically choose connection type.

Step 7: Draw connections from switch to PC.

Step 8: Double click on a PC, a box will appear, click on the Desktop tab.

Step 9: Then select IP configuration.



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Step 10: Write the IP address of your network and click at the Subnet mask filed. Subnet mask will appear automatically.

Step 11: Repeat step 10 to set the IPs for all the PCs.

Step 12: now add a router and repeat the above step for connecting second LAN.

Step 13: Select "ADD simple message".

Step 14: Drag and drop the message to the source device and then to the destination device.

Step 15: Select the simulation mode at the bottom right corner.

Step 16: Click at "Auto capture/play"

Step 17: Observe the path of the message from source to switch. Then to all devices and then move to the destination.

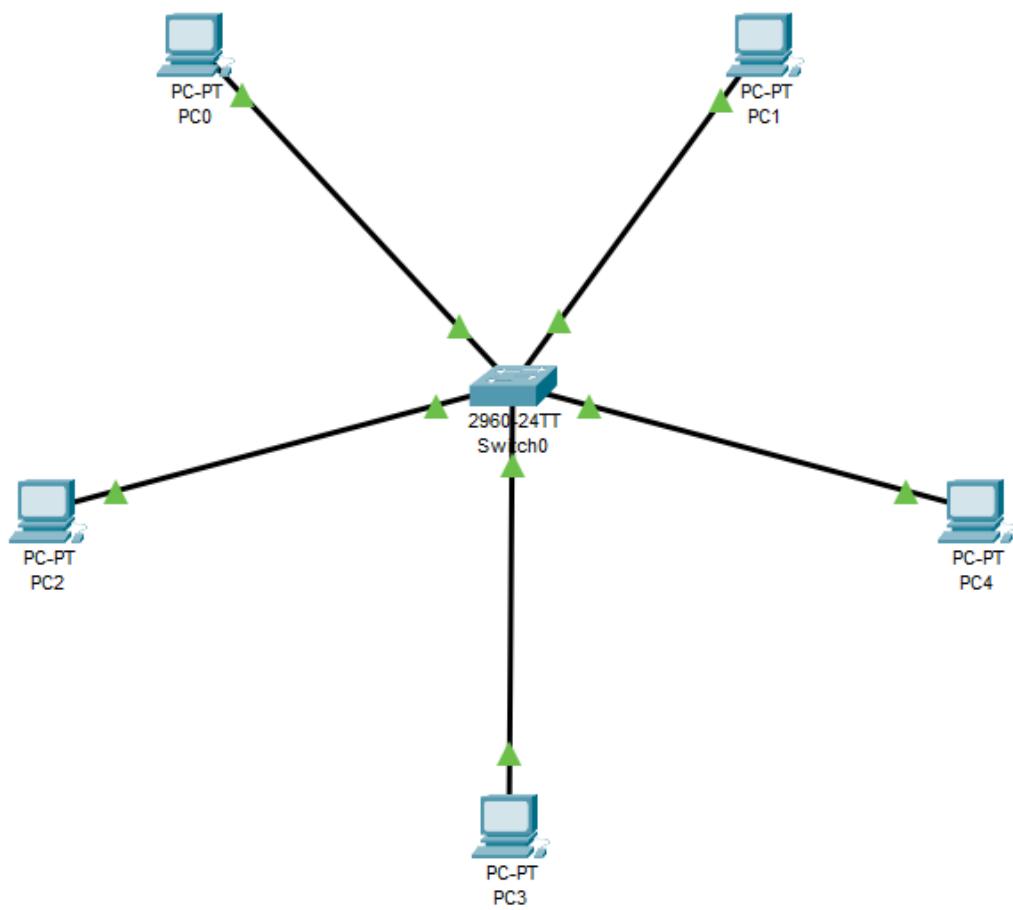
Step 18: Finally observe the marks. If the source PC is marked correct it means you have successfully established connection.



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c) To Configure a Ring Topology network using CISCO packet tracer software.

Packet tracer: Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface. Packet Tracer makes use of a drag and drop user interface, allowing users to add and remove simulated network devices as they see fit.

Ring Topology: A ring topology is a network configuration in which device connections create a circular data path. Each networked device is connected to two others, like points on a circle. Together, devices in a ring topology are referred to as a ring network.

Advantages:

- Cheap to install and expand.
- No one is master in the Network.
- Data can transfer between workstations at high speeds.
- Additional workstations can be added without impacting performance of the network.

Disadvantages:

- Design complex compare to Bus topology.
- Single node failure collapse full network.
- Failure of one computer disturbs the whole network.

Introduction to the Packet Tracer Interface using a Ring Topology

Step 1: Start packet tracer

Step 2: Choose switch then select generic.

Step 3: After selecting generic click on the main area.

Step 4: Select end devices and then click on generic.

Step 5: Click at workspace to see the PC.

Step 6: Select connections from power cycle devices and click on automatically choose connection type.

Step 7: Draw connections from switch to PC.

Step 8: Double click on a PC, a box will appear, click on the Desktop tab.



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Step 9: Then select IP configuration.

Step 10: Write the IP address of your network and click at the Subnet mask filed. Subnet mask will appear automatically.

Step 11: Repeat step 10 to set the IPs for all the PCs.

Step 12: Select "ADD simple message".

Step 13: Drag and drop the message to the source device and then to the destination device.

Step 14: Select the simulation mode at the bottom right corner.

Step 15: Click at "Auto capture/play"

Step 16: Observe the path of the message from source to switch. Then to all devices and then move to the destination.

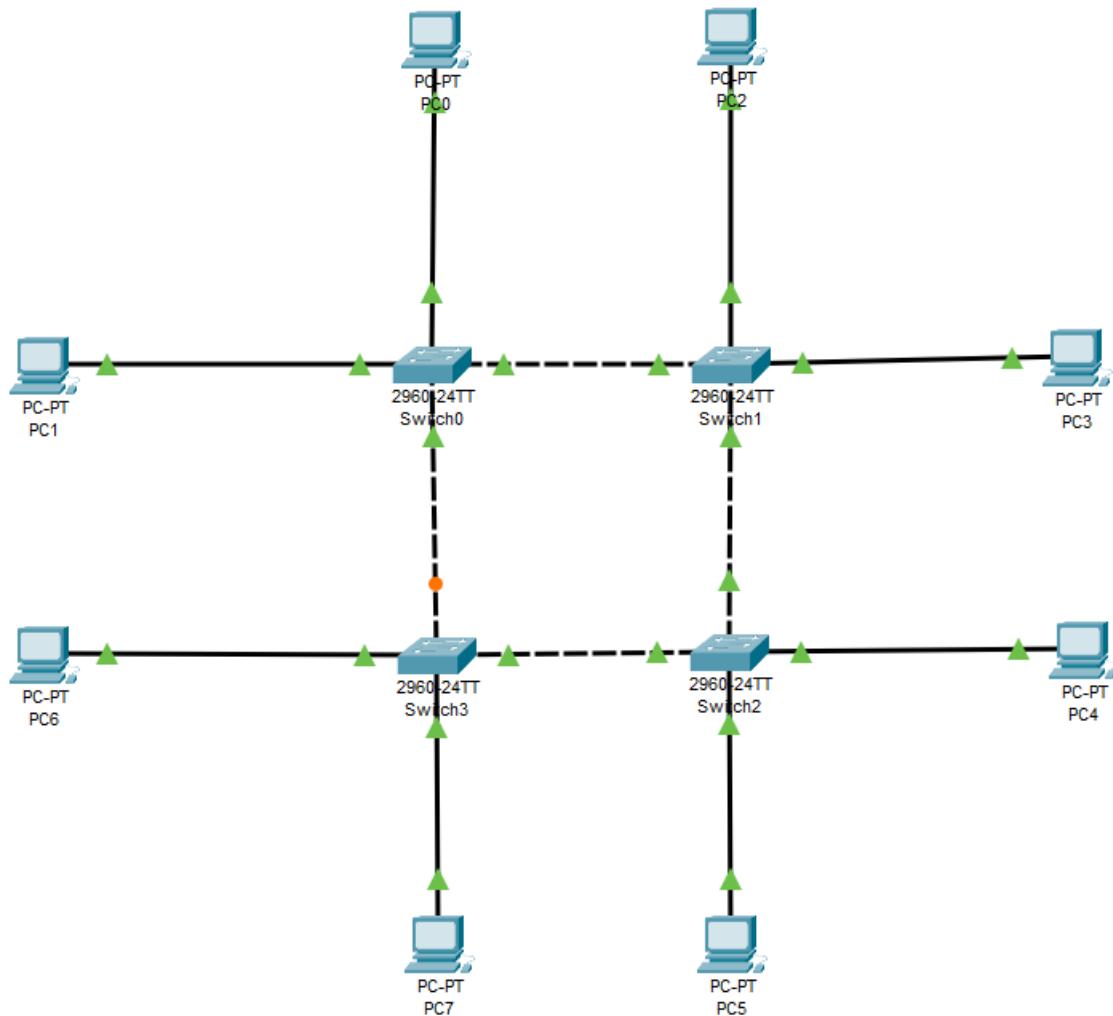
Step 17: Finally observe the marks. If the source PC is marked correct it means you have successfully established connection.



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d) To Configure a Mesh Topology network using CISCO packet tracer software.

Packet tracer: Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface. Packet Tracer makes use of a drag and drop user interface, allowing users to add and remove simulated network devices as they see fit.

Mesh Topology: A mesh topology is a network topology in which all the network nodes are individually connected to most of the other nodes. There is not a concept of a central switch, hub or computer which acts as a central point of communication to pass on the messages.

A fully connected mesh topology has all the nodes connected to every other node. If you know the graph theory, then it is like a fully connected graph where all the nodes are connected to every other node. On the other hand, a partially connected mesh topology does not have all the nodes connected to each other.

Advantages:

- Each connection can carry its own data load.
- It is robust.
- A fault is diagnosed easily
- Provides security and privacy

Disadvantages:

- Installation and configuration are difficult if the connectivity gets more
- Cabling cost is more and the most in case of a fully connected mesh topology
- Bulk wiring is required

Introduction to the Packet Tracer Interface using a Mesh Topology

Step 1: Start packet trace.

Step 2: Choose switch then select generic.

Step 3: After selecting generic click on the main area.

Step 4: Select end devices and then click on generic.

Step 5: click at workspace to see the PC.

Step 6: select connections from power cycle devices and click on automatically choose connection type.



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Step 7: Draw connections from switch to PC.

Step 8: Double click on a PC, a box will appear, click on the Desktop tab.

Step 9: Then select IP configuration.

Step 10: Write the IP address of your network and click at the Subnet mask field. Subnet mask will appear automatically.

Step 11: Repeat step 10 to set the IPs for all the PCs.

Step 12: Select “ADD simple message”.

Step 13: Drag and drop the message to the source device and then to the destination device.

Step 14: Select the simulation mode at the bottom right corner.

Step 15: Click at "Auto capture/play"

Step 16: Observe the path of the message from source to switch. Then to all devices and then move to the destination.

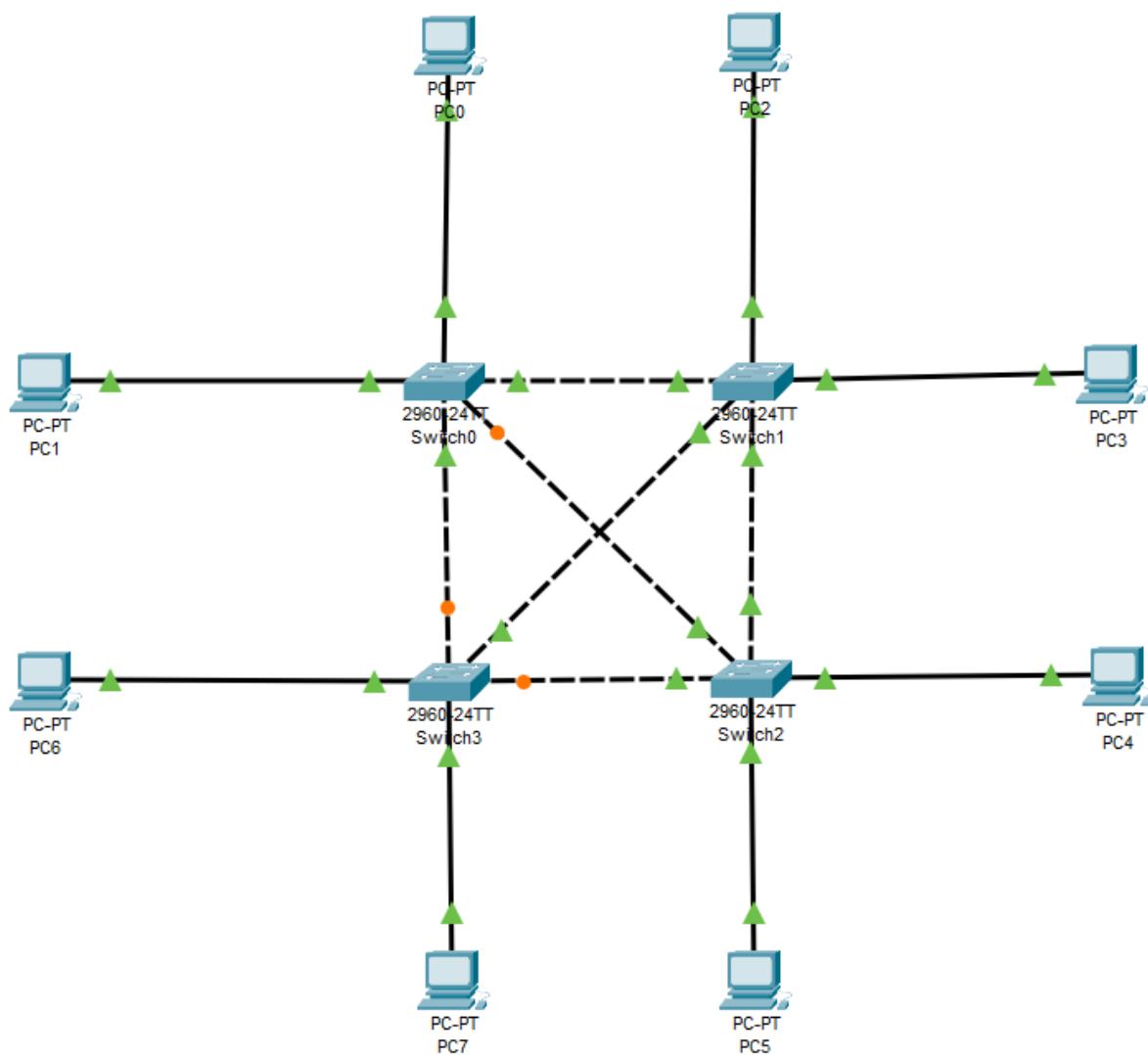
Step 17: Finally observe the marks. If the source PC is marked correct it means you have successfully established connection.



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EXPERIMENT NO. 5

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

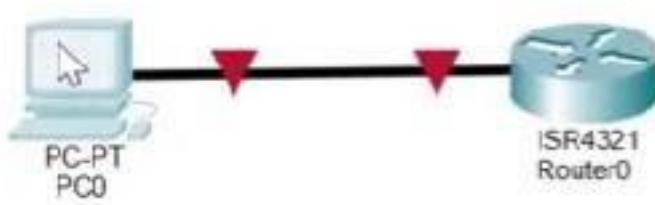
THEORY: -

Telnet:

- Telnet is an application layer protocol that allows a network administrator to access and manage remote devices.
- A user on a client machine can use a software (also known as a Telnet client) to access a command-line interface of another, remote machine that is running a Telnet server program.
- A network administrator can access the device by telnetting to the IP address or hostname of a remote device. The network administrator will then be presented with a virtual terminal that can interact with the remote host.

STEPS: -

1. For PC choose fast Ethernet and for Router choose Gigabit ethernet 0/0/0





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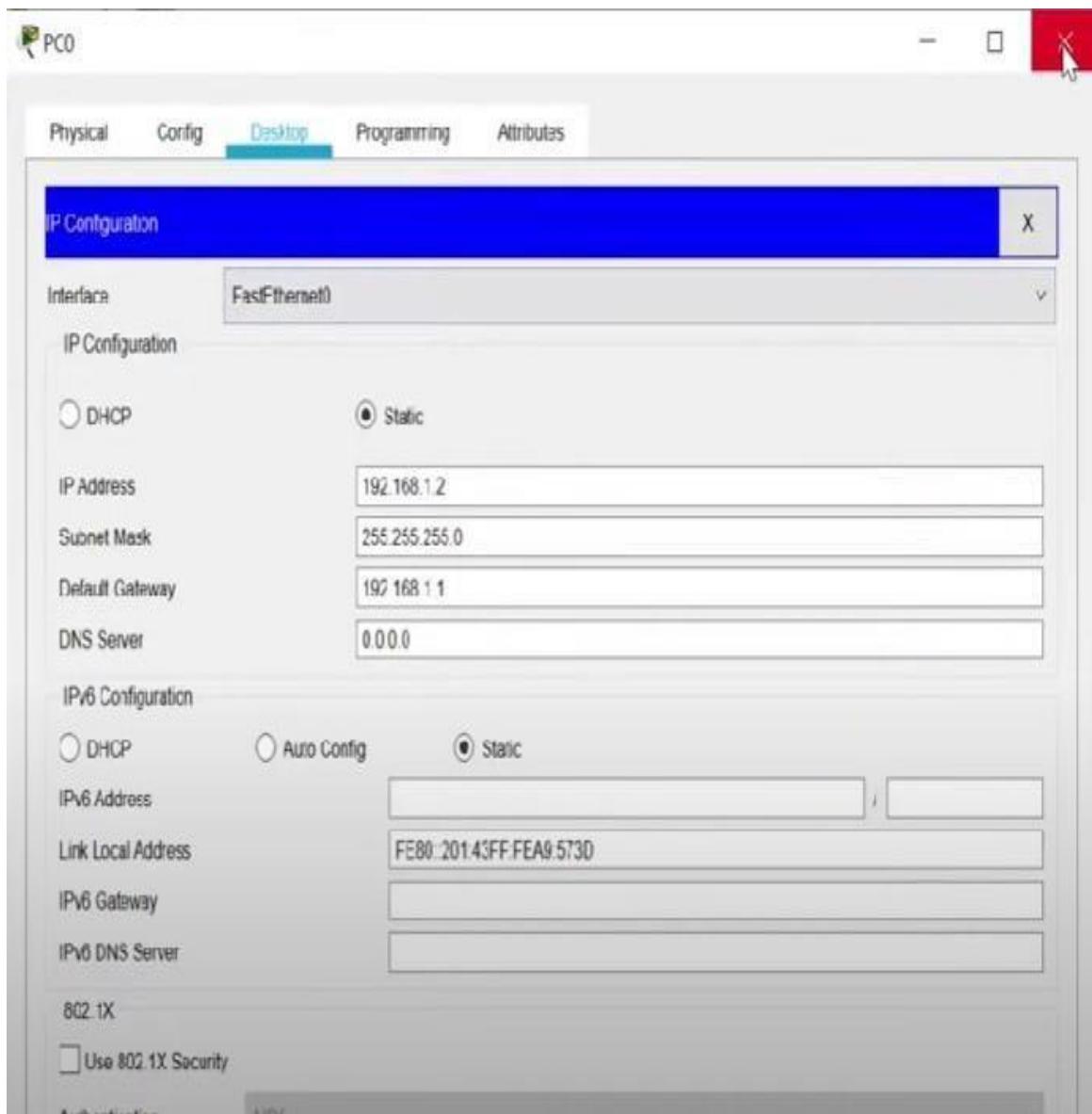
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2. Setting in end device

Choose Ip config from desktop from the end device

Set the Ip address, subnet mask and default gateway as shown.





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3. Setting in Router

Choose CLI then type the following

```
Would you like to enter the initial configuration dialog? [yes/no]: n
```

```
Press RETURN to get started!
```

```
Router>
Router>en
Router#
Router#
Router#
Router#
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#hostname R1
R1(config)#enable secret rp
R1(config)#int g0/0/0
R1(config-if)#ip add 192.168.1.1 255.255.255.0
R1(config-if)#no shut
```



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```
R1(config-if)#no shut

R1(config-if)#
#LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up

#LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up

R1(config-if)#
R1(config-if)#line vty 0 5
R1(config-line)#login
# Login disabled on line 2, until 'password' is set
# Login disabled on line 3, until 'password' is set
# Login disabled on line 4, until 'password' is set
# Login disabled on line 5, until 'password' is set
# Login disabled on line 6, until 'password' is set
# Login disabled on line 7, until 'password' is set
R1(config-line)#password tp
R1(config-line)#exit
R1(config)#
R1(config)#
R1(config)#exit
R1#
#SYS-5-CONFIG_I: Configured from console by console

R1#wr
Building configuration...
[OK]
R1#
R1#
```



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4. In the pc

Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>telnet 192.168.1.1
Trying 192.168.1.1 ...Open
```

User Access Verification

```
Password:
R1>
R1>
R1>
```

Password:

R1>

R1>

R1>en

Password:

R1#

R1#

R1#

R1#|

EXPERIMENT NO. 6

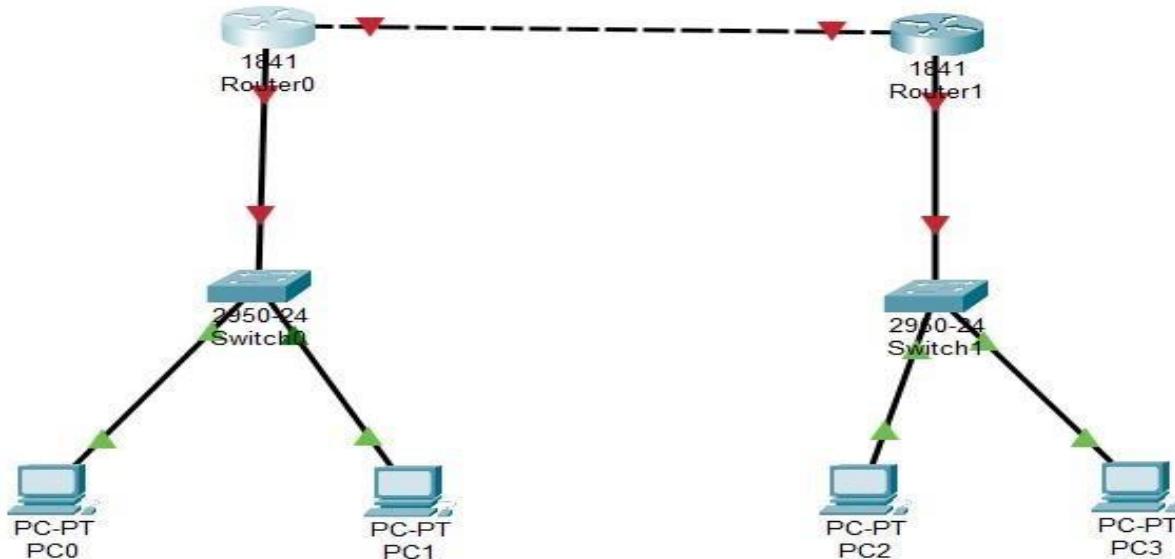
AIM: To implement the static routing using Cisco Packet Tracer.

Static routing:

Static routing is a form of routing that occurs when a router uses a manually-configured routing entry, rather than information from dynamic routing traffic.

Steps:

Develop the network using two routers (1841) from networking devices, two switches (2950-24) from networking devices and 4 PCs from end devices.





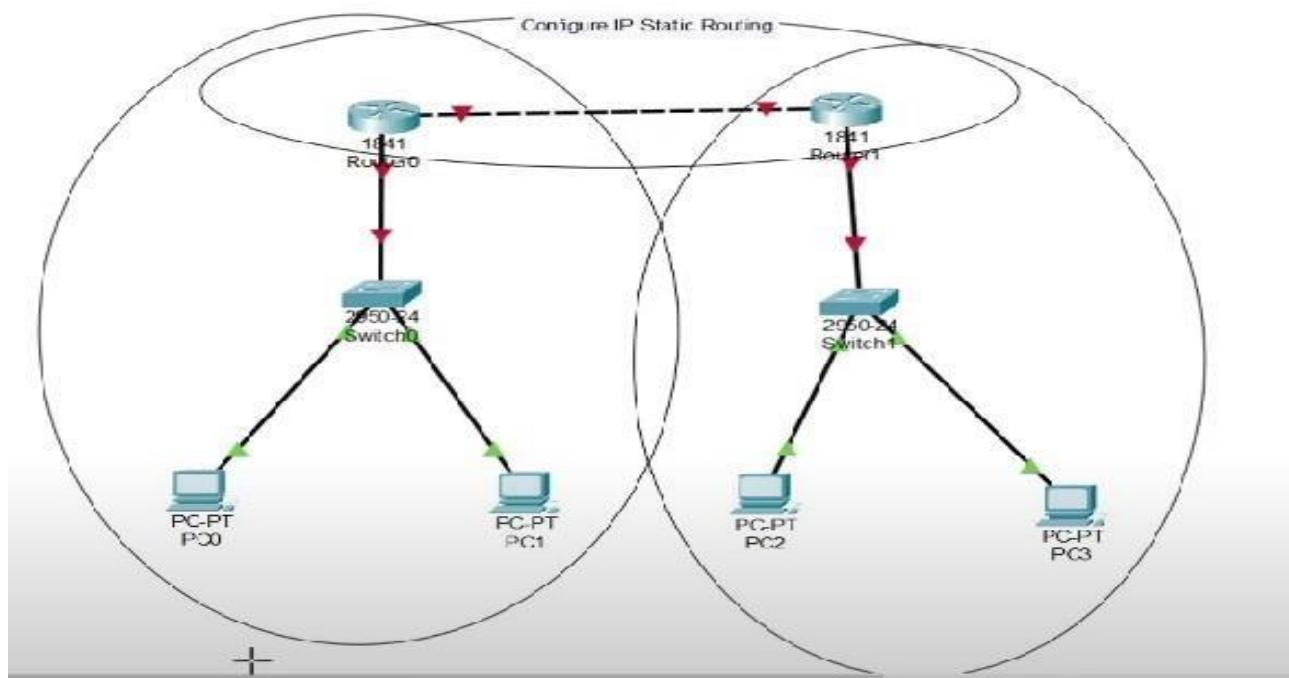
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Here in total three networks are there





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Next step is configuration

In all the four PC IP addresses are set. Two in one network and two is another (Desktop-IP configuration)

The screenshot shows a software interface for configuring network interfaces. The tab "Desktop" is selected. The main window title is "IP Configuration". The interface is for "FastEthernet0".

IP Configuration

Interface: FastEthernet0

IP Configuration

DHCP Static

IPv4 Address: 192.168.1.1

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.3

DNS Server: 0.0.0.0

IPv6 Configuration

Automatic Static

IPv6 Address: [Empty] / [Empty]

Link Local Address: FE80::201:42FF:FED9:E9B5

Default Gateway: [Empty]

DNS Server: [Empty]

802.1X

Use 802.1X Security

Authentication: MD5

Username: [Empty]

Password: [Empty]



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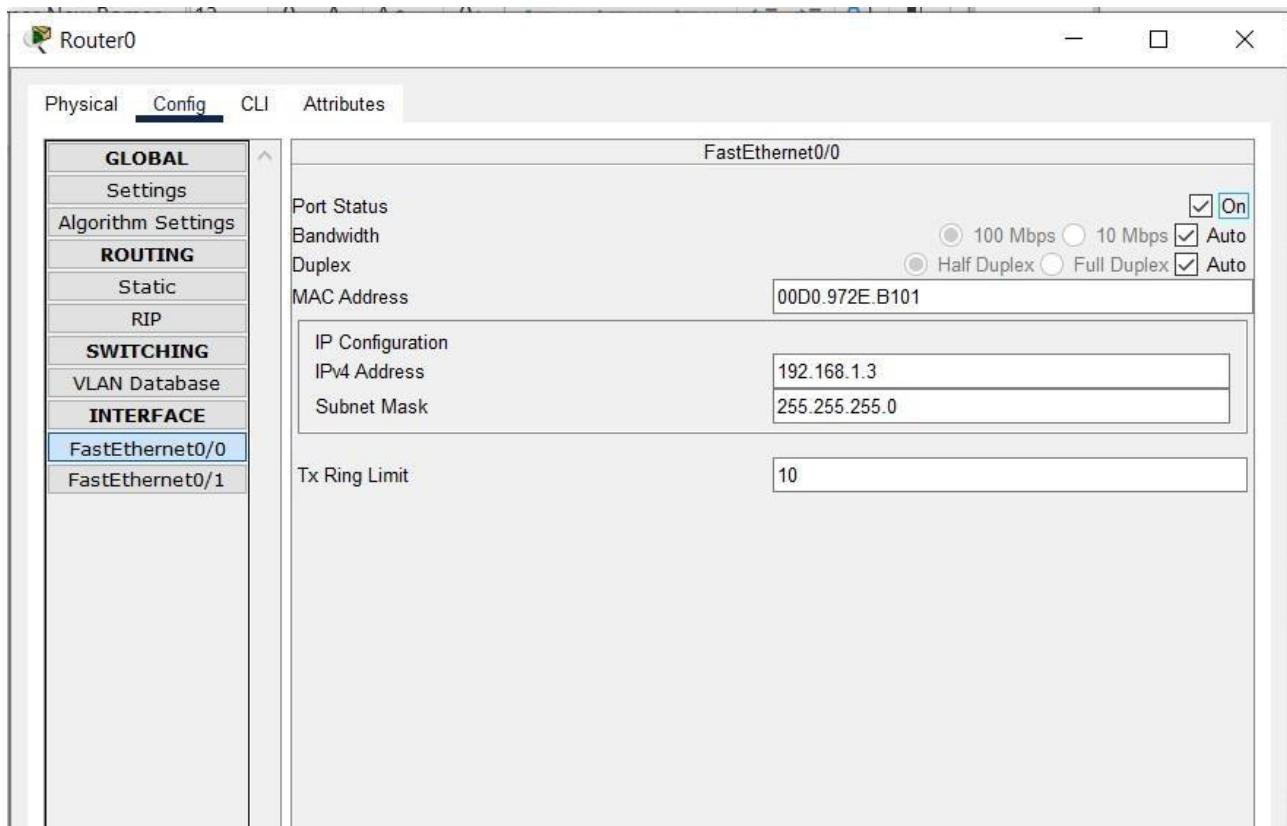
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Similarly setting for router

(config-fastethernet 0/0 for the networks connected pcs)





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Set Ip address. Subnet mask will appear automatically. Click on “on” on the top.

For router to router connecting network ((config-fastethernet 0/1)

The screenshot shows a network configuration interface with the following details:

- Physical**, **Config** (selected), **CLI**, **Attributes** tabs.
- GLOBAL** section: Settings, Algorithm Settings.
- ROUTING** section: Static, RIP.
- SWITCHING** section: VLAN Database.
- INTERFACE** section: FastEthernet0/0, **FastEthernet0/1** (selected).
- FastEthernet0/1** configuration:
 - Port Status: On (unchecked)
 - Bandwidth: 100 Mbps (radio button selected), 10 Mbps (radio button unselected), Auto (checkbox checked).
 - Duplex: Half Duplex (radio button selected), Full Duplex (radio button unselected), Auto (checkbox checked).
 - MAC Address: 00D0.972E.B102
 - IP Configuration:
 - IPv4 Address: 192.168.3.1
 - Subnet Mask: 255.255.255.0
 - Tx Ring Limit: 10



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Set Ip address. Subnet mask will appear automatically. Click on “on” on the top.

Now the router-to-router connection is required.

For this for the router in network 1, set the following from config then static

The image shows a screenshot of a network configuration interface for a router. The title bar says "Router0". The top menu bar has tabs: Physical, Config (which is selected), CLI, and Attributes. On the left, a sidebar menu lists: GLOBAL, Settings, Algorithm Settings, ROUTING (selected), Static, RIP, SWITCHING, VLAN Database, INTERFACE, FastEthernet0/0, and FastEthernet0/1. The main panel shows "Static Routes" with three input fields: Network (192.168.2.0), Mask (255.255.255.0), and Next Hop (192.168.3.2). There is a large empty area below labeled "Network Address". A "Add" button is located to the right of the input fields.



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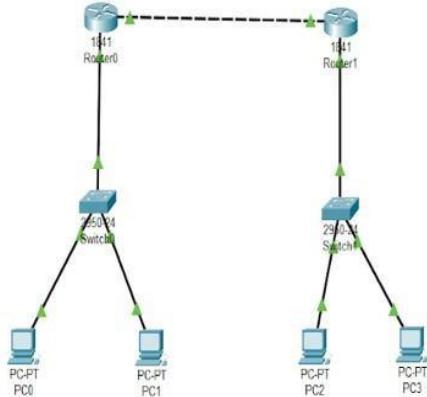


Click on add

For the router in network 2, set the following from

Click on add

Now check message passing from pc no 3 to pc no 0. It is successful



EXPERIMENT NO. 7

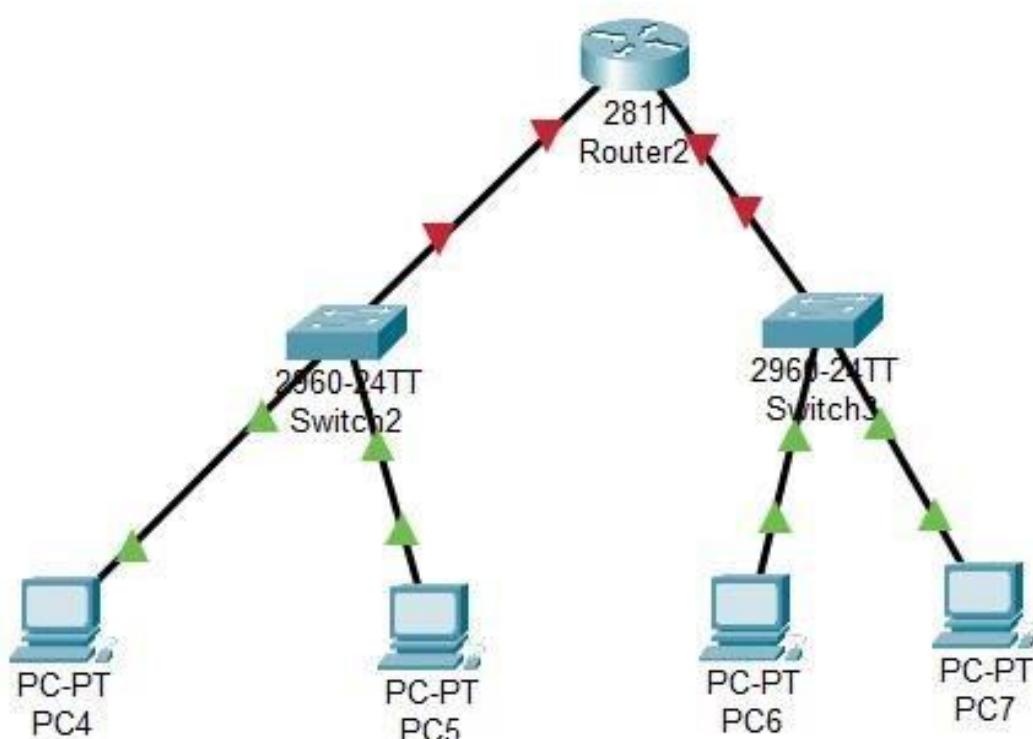
AIM: To implement an IP Addressing Scheme and Subnetting in small networks using Cisco Packet Tracer.

Subnetting:

The practice of dividing a network into two or more networks is called subnetting. Creating a subnet by dividing the host identifier. Computers that belong to the same subnet are addressed with an identical group of its most-significant bits of their IP addresses.

Steps:

Develop a network using a router (2811), two switches (2960-24TT) and four PCs





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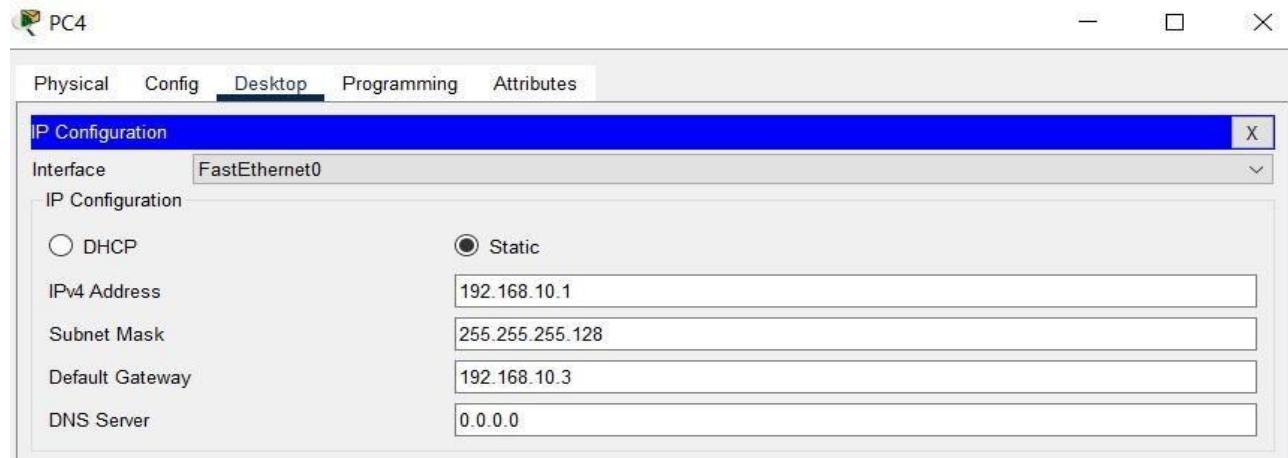
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Then configure the IP addresses in each pc

Here subnet mask will be divided in to two parts so instead of 255 we have to take 128

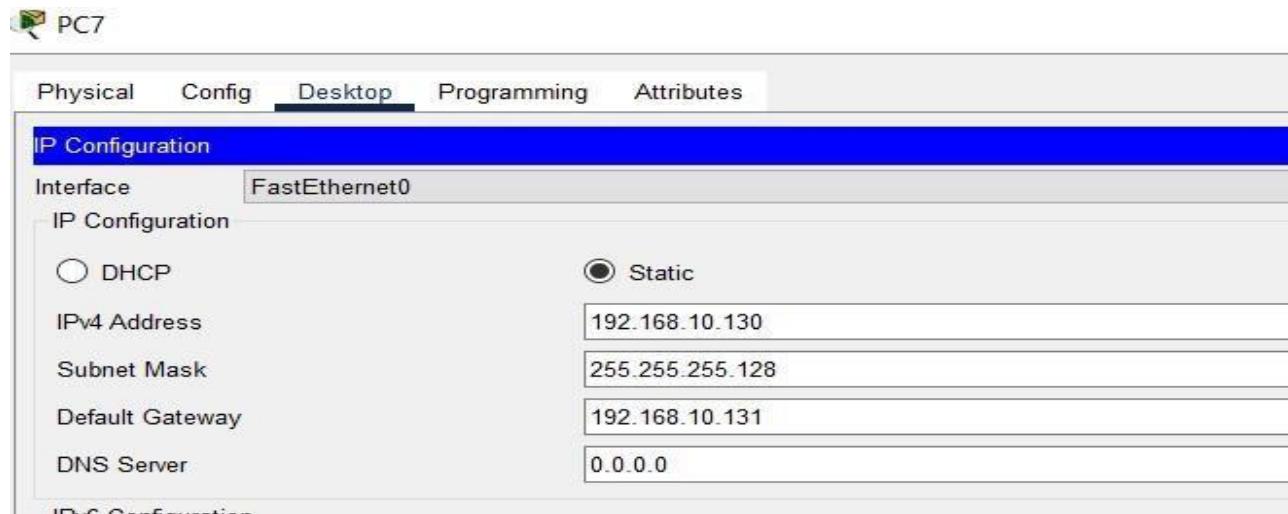
In one side



Screenshot of the IP Configuration window for PC4. The interface is FastEthernet0. The configuration is set to Static with the following details:

| Setting | Value |
|-----------------|-----------------|
| IPv4 Address | 192.168.10.1 |
| Subnet Mask | 255.255.255.128 |
| Default Gateway | 192.168.10.3 |
| DNS Server | 0.0.0.0 |

In the other side



Screenshot of the IP Configuration window for PC7. The interface is FastEthernet0. The configuration is set to Static with the following details:

| Setting | Value |
|-----------------|-----------------|
| IPv4 Address | 192.168.10.130 |
| Subnet Mask | 255.255.255.128 |
| Default Gateway | 192.168.10.131 |
| DNS Server | 0.0.0.0 |



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Then configuration for the router for both fastethernet 0/0 and fastethernet 0/1

Physical Config CLI Attributes

| | |
|--------------------|--|
| GLOBAL | |
| Settings | |
| Algorithm Settings | |
| ROUTING | |
| Static | |
| RIP | |
| SWITCHING | |
| VLAN Database | |
| INTERFACE | |
| FastEthernet0/0 | |
| FastEthernet0/1 | |

FastEthernet0/0

| | |
|------------------|---|
| Port Status | <input checked="" type="checkbox"/> On |
| Bandwidth | <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto |
| Duplex | <input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto |
| MAC Address | 0001.9630.7101 |
| IP Configuration | |
| IPv4 Address | 192.168.10.3 |
| Subnet Mask | 255.255.255.128 |
| Tx Ring Limit | 10 |

And

Router2

Physical Config CLI Attributes

| | |
|--------------------|--|
| GLOBAL | |
| Settings | |
| Algorithm Settings | |
| ROUTING | |
| Static | |
| RIP | |
| SWITCHING | |
| VLAN Database | |
| INTERFACE | |
| FastEthernet0/0 | |
| FastEthernet0/1 | |

FastEthernet0/1

| | |
|------------------|---|
| Port Status | <input checked="" type="checkbox"/> On |
| Bandwidth | <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto |
| Duplex | <input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto |
| MAC Address | 0001.9630.7102 |
| IP Configuration | |
| IPv4 Address | 192.168.10.131 |
| Subnet Mask | 255.255.255.128 |
| Tx Ring Limit | 10 |



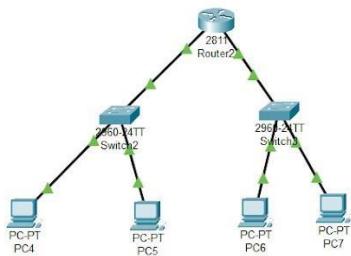
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Then check the message passing is successful





EXPERIMENT NO. 8

AIM: To Connect two LAN networks through Router.

Introduction to the packet tracer interface using a LAN network

Step 1: Start packet tracer

Step 2: Choose switch then select generic

Step 3: After selecting generic click on the main area.

Step 4: Select end devices and then click on generic.

Step 5: click at workspace to see the PC.

Step 6: select connections from power cycle devices and click on automatically choose connection type.

Step 7: Draw connections from switch to PC.

Step 8: Double click on a PC, a box will appear, click on the Desktop tab.

Step 9: Then select IP configuration.

Step 10: Write the IP address of your network and click at the Subnet mask filed.

Subnet mask will appear automatically.

Step 11: Repeat step 10 to set the IPs for all the PCs.

Step 12: Now add a router and repeat the above step for connecting second LAN.

Step 13: The second LAN would be configured with different class of IP.

Step 14: Configure the router's fast ethernet ports to the IP of both classes and green light will blink.

Step 15: Now to connect both LAN, we need a gateway which is set by configuring the gateway of each device in the LAN with its router IP address for that particular class.

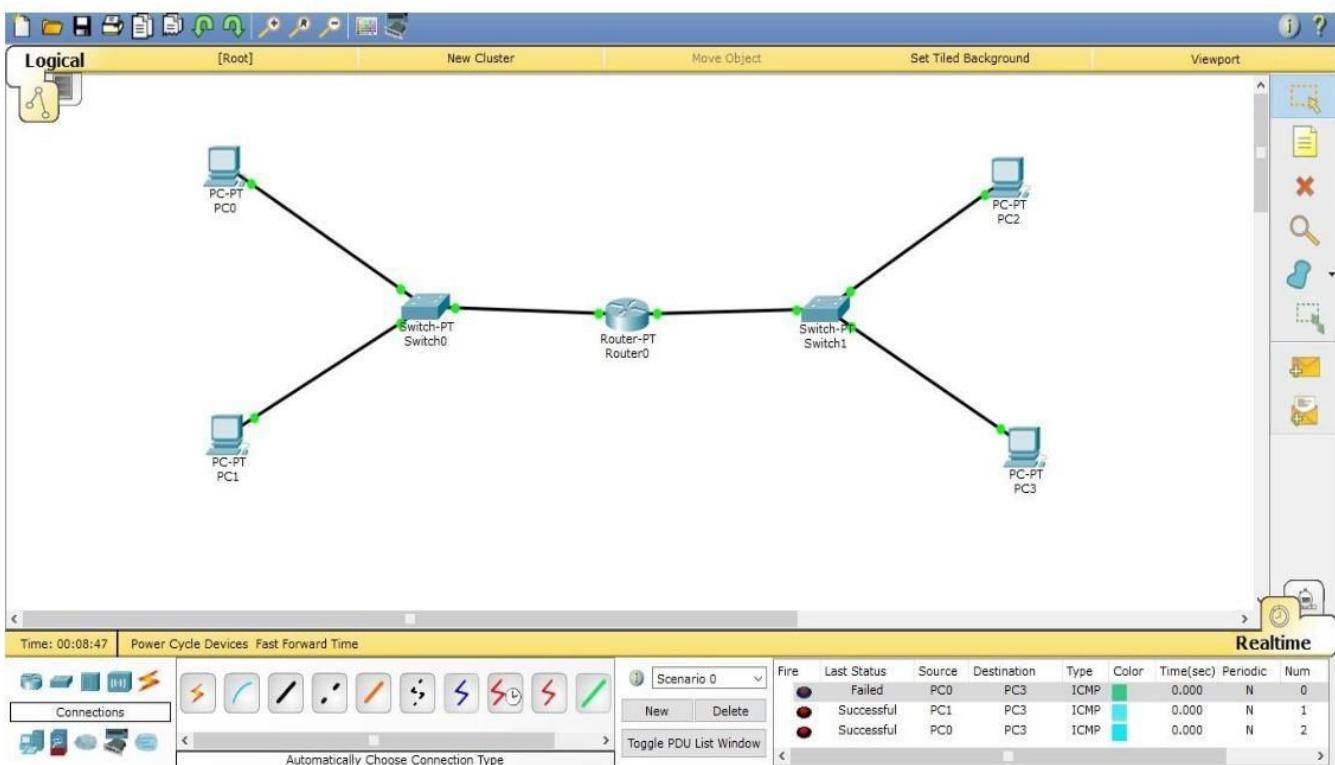
All the lights turn green and both the LAN would be connected.

Step 16: Select "Add simple message".

Step 17: Drag and drop the message to the source device and then to the destination device.

Step 18: Observe the path of the message from source to switch. Then to all devices and then move to the destination.

Step 19: Finally observe the marks. If the source PC is marked correct it means you have successfully established connection.



EXPERIMENT NO. 9

AIM: To implement the DHCP onto the Network Topology using Cisco Packet Tracer.

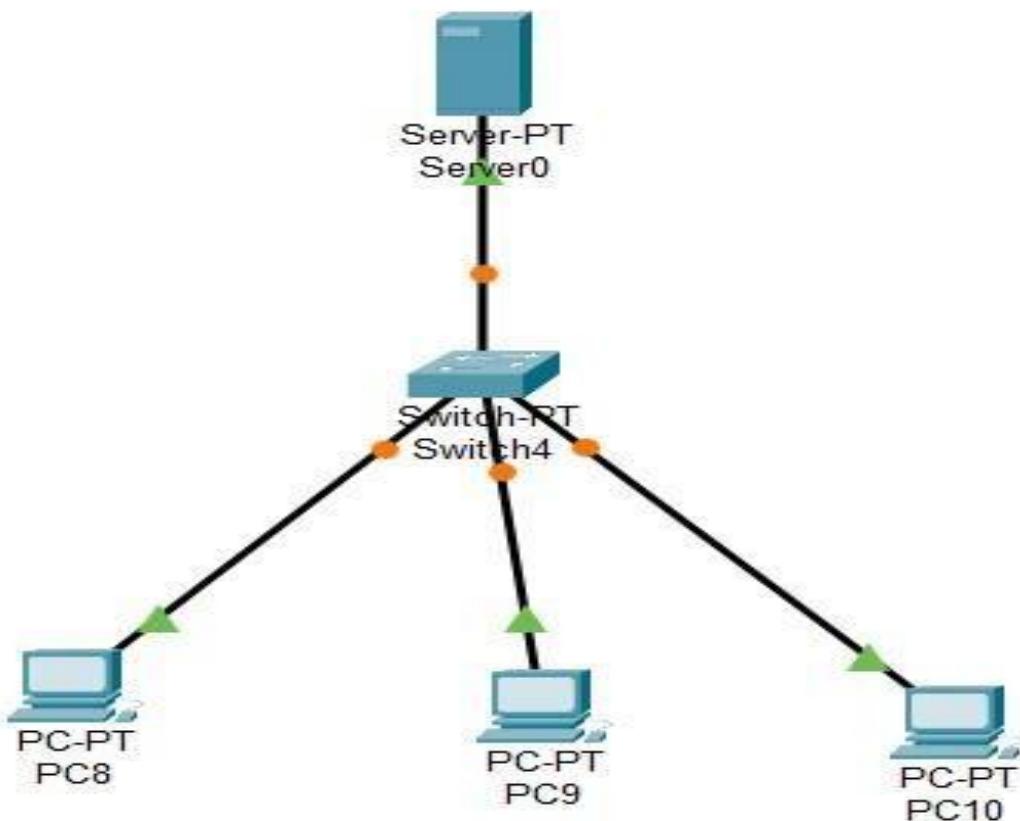
DHCP:

Dynamic Host Configuration Protocol (DHCP) is a network protocol used to automate the process of configuring devices on IP networks. It's the standard mechanism to dynamically assign IP addresses within a network.

Steps:

Develop a network using a server (Server-PT), a switch (Switch-PT) and few no. of PCs.

Here three PCs are taken





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Set the configuration in server

First from desktop – Ip configuration, set the following

Server0

Physical Config Services Desktop Programming Attributes

IP Configuration

IP Configuration

DHCP Static

IPv4 Address: 192.168.0.1

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

Then go to services click on DHCP then set the following

Server0

Physical Config Services Desktop Programming Attributes

SERVICES

- HTTP
- DHCP**
- DHCIPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

DHCP

Interface: FastEthernet0 Service: On Off

Pool Name: serverPool

Default Gateway: 192.168.0.1

DNS Server: 10.0.0.1

Start IP Address: 192 168 0 0

Subnet Mask: 255 255 255 0

Maximum Number of Users: 256

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Add Save Remove

| Pool Name | Default Gateway | DNS Server | Start IP Address | Subnet Mask | Max User | TFTP Server | WLC Address |
|------------|-----------------|------------|------------------|---------------|----------|-------------|-------------|
| serverPool | 192.168.0.1 | 10.0.0.1 | 192.168.0.0 | 255.255.255.0 | 256 | 0.0.0.0 | 0.0.0.0 |



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Click on “on”

Set default gateway, DNS server then click on “save”

Back to the end devices

Set the following in PCs Desktop- Ip configuration

The screenshot shows a network configuration interface for a device named "PC8". The tabs at the top are "Physical", "Config", "Desktop" (which is selected), "Programming", and "Attributes". Below the tabs, a blue header bar says "IP Configuration". Under this, it shows the "Interface" as "FastEthernet0". There are two radio buttons: "DHCP" (selected) and "Static". To the right of the "Static" button, the message "DHCP request successful." is displayed. Below these, there are fields for "IPv4 Address" (192.168.0.2), "Subnet Mask" (255.255.255.0), "Default Gateway" (192.168.0.1), and "DNS Server" (10.0.0.1).

Click on DHCP, The Ip address will appear automatically.



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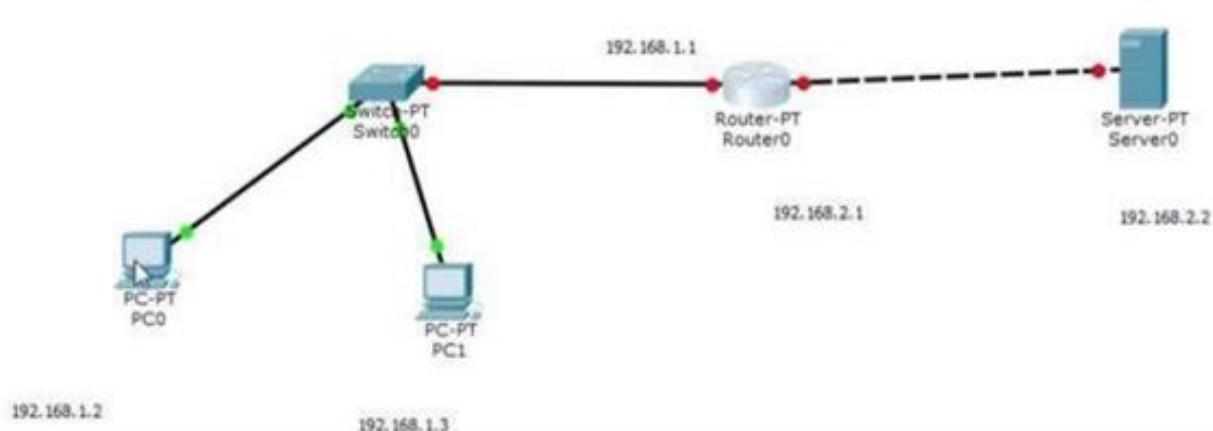
EXPERIMENT NO. 10

AIM: To implement the Email Services in the Network using Cisco Packet Tracer.

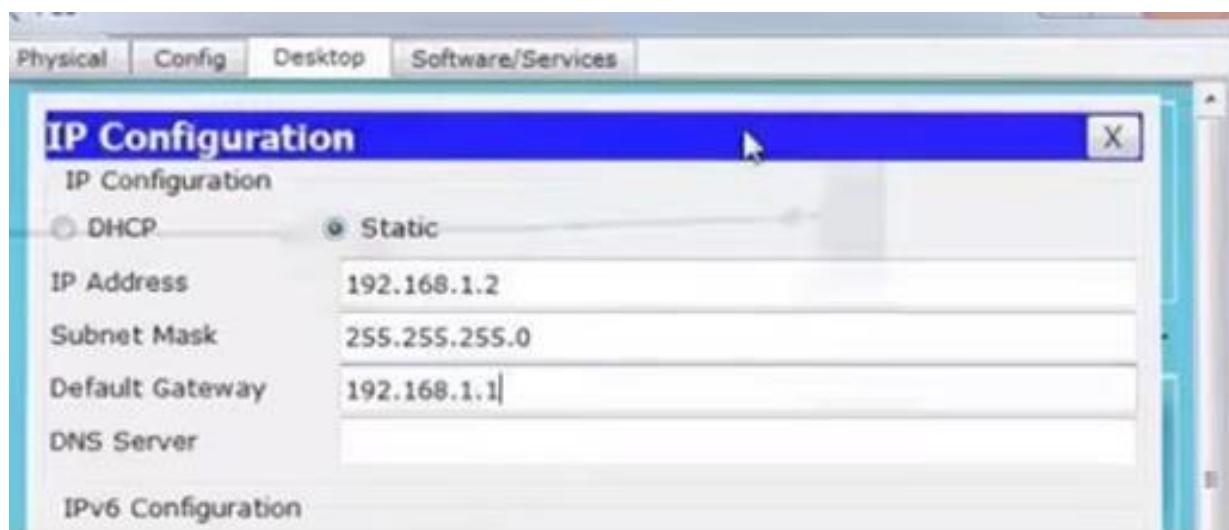
A mail server (sometimes called an email server) is a software program that sends and receives email

Steps:

1. Make the network



2. Set all the Ip config as shown from Desktop-Ip config in end devices





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- Set the router ip address also.

The image displays two side-by-side windows of a network configuration application, both titled "Router0".

Top Window (FastEthernet0/0):

- Port Status:** On (checked)
- Bandwidth:** 100 Mbps (radio button selected)
- Duplex:** Half Duplex (radio button selected)
- MAC Address:** 00E0.B021.C8E6
- IP Configuration:**
 - IP Address:** 192.168.1.1
 - Subnet Mask:** 255.255.255.0
- Tx Ring Limit:** 10

Bottom Window (FastEthernet1/0):

- Port Status:** On (checked)
- Bandwidth:** 100 Mbps (radio button selected)
- Duplex:** Half Duplex (radio button selected)
- MAC Address:** 000C.854B.2A34
- IP Configuration:**
 - IP Address:** 192.168.2.1
 - Subnet Mask:** 255.255.255.0
- Tx Ring Limit:** 10



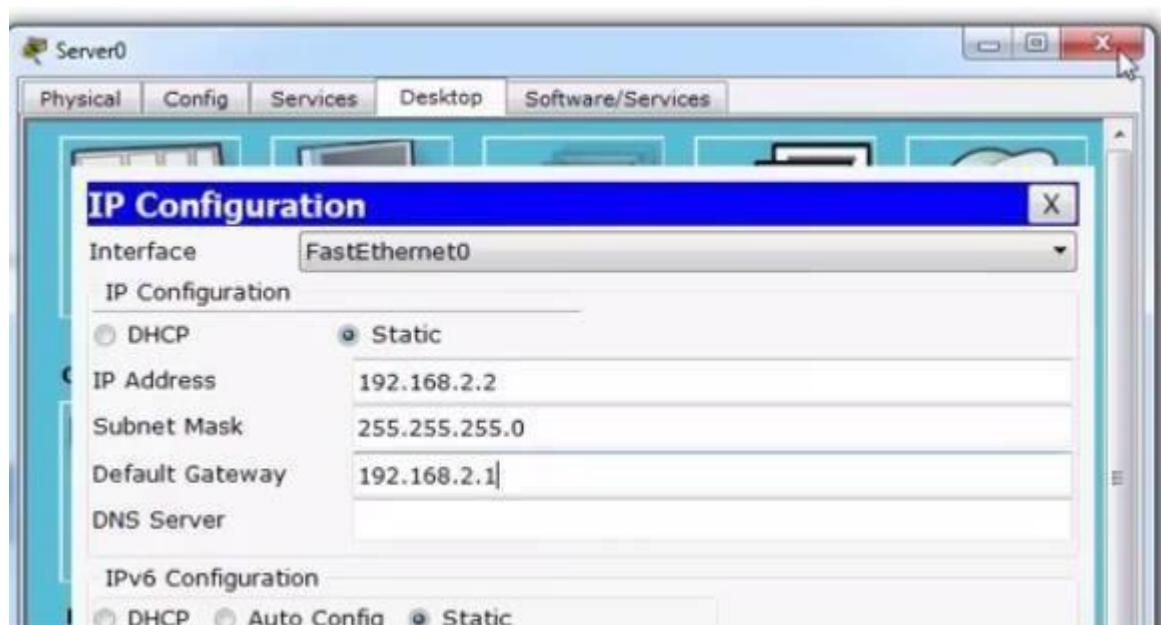
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4. Set the IP Config in server





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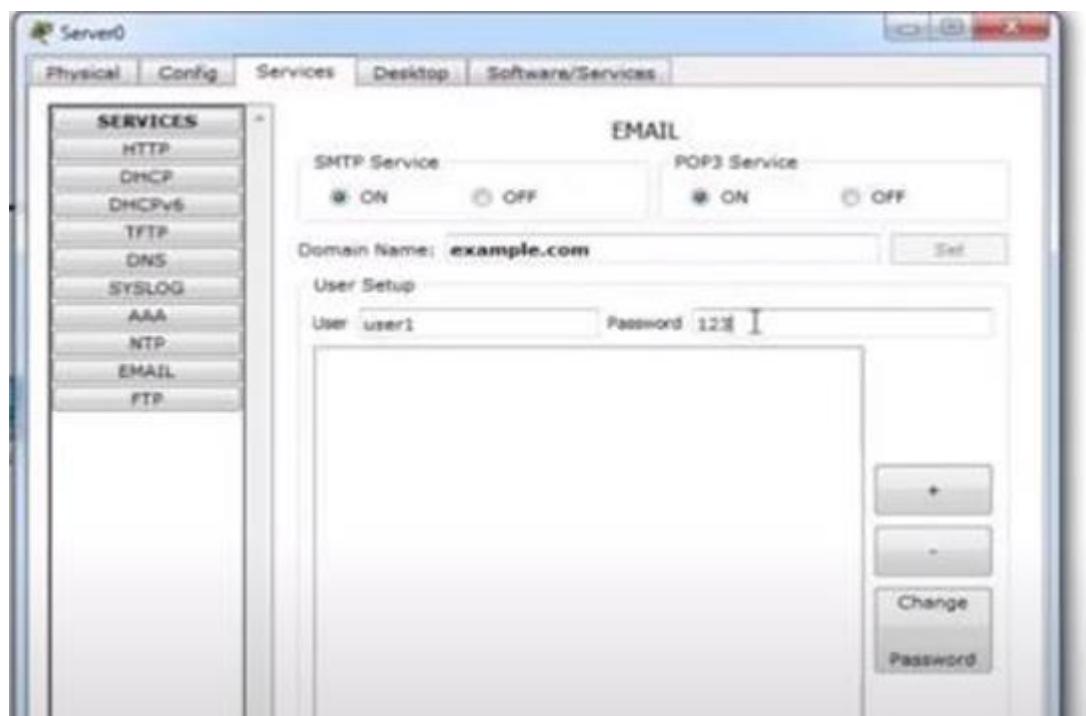
5. Set the service in server

Click on services then to setup Email, click on EMAIL

Then set the Domain name and click on set. Here we set Email as example.com

Then User and password are need to be added. Here we set user as user1 and password 123.

Then click on + . We can create a number of users by adding this way.





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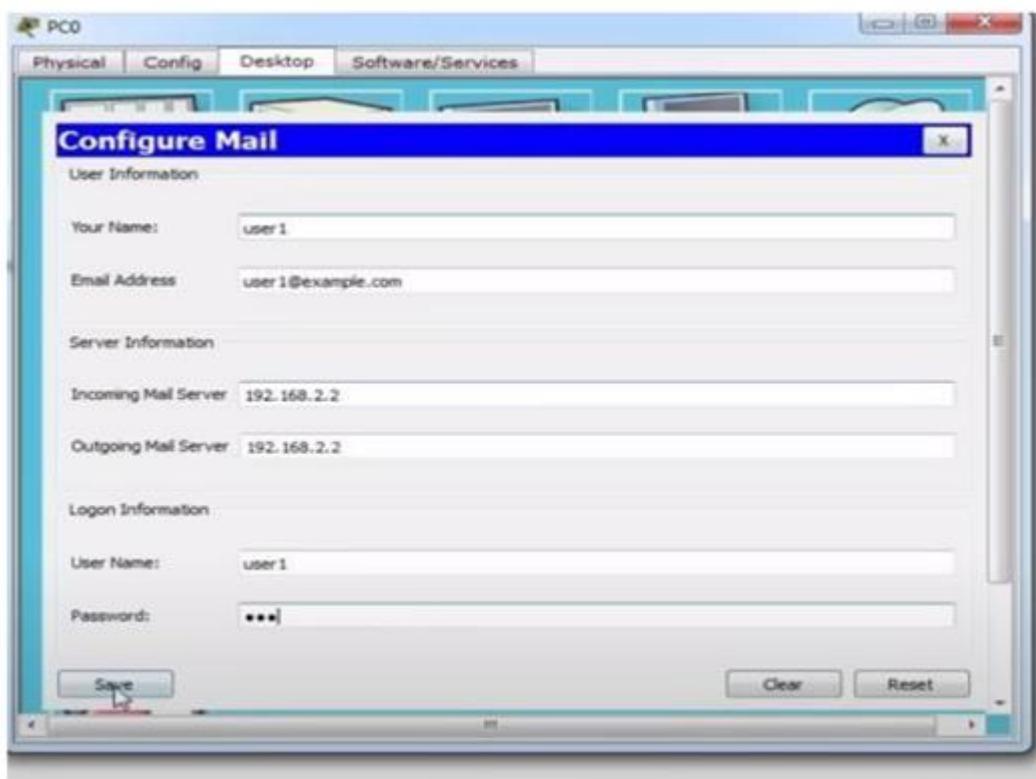
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6. Then go to the end device and set the following

From desktop choose configure mail. Then set the details as follow and save.





7. Then from desktop click on Mail browser then compose mail.

In that compose mail fill the details like to, subject and then message. At last click on send



8. Then from the other pc click on desktop then mail browser.

Then click on receive, it will show the received message. Click on the message, the message will appear below.



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EXPERIMENT NO. 11

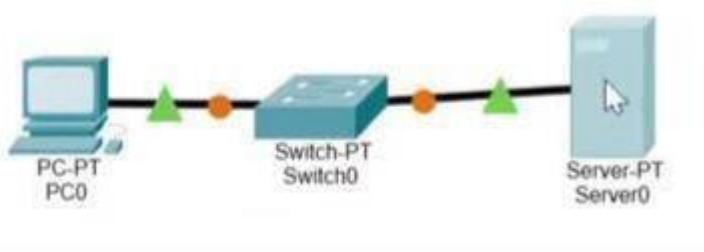
AIM: To implement the DNS server in the Network using Cisco Packet Tracer.

DNS servers translate domain names into IP addresses, enabling DNS clients to reach the origin server.

Learn about the different types of DNS servers.

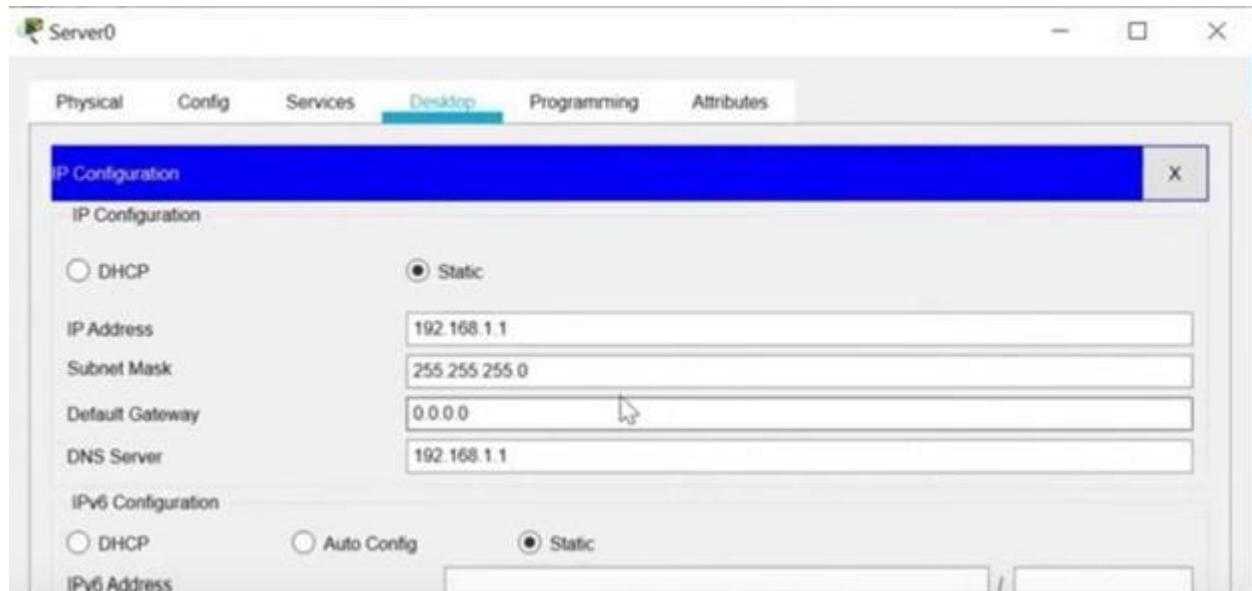
Steps:

1. Design the network first



2. Set the server ip.

Choose Ip configuration from desktop. Fill IP address and DNS server. Make sure both are same.





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- Then click on services. To make a website click on HTTP

The screenshot shows the "Services" tab selected in a software interface. On the left, a sidebar lists various services: HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, and Radius EAP. The "HTTP" service is currently selected. The main panel displays two sections: "HTTP" and "HTTPS". Under "HTTP", there are two radio buttons: "On" (selected) and "Off". Under "HTTPS", there are also two radio buttons: "On" (selected) and "Off". Below these sections is a "File Manager" table:

| File Name | Edit | Delete |
|-----------------------|--------|----------|
| 1 copyrights.html | (edit) | (delete) |
| 2 cscologo177x111.jpg | | (delete) |
| 3 helloworld.html | (edit) | (delete) |
| 4 image.html | (edit) | (delete) |
| 5 index.html | (edit) | (delete) |

- Go to any website name, for example last one index.html click on edit button. Change the codes as per your choice and then click on save. It will ask about overwriting, click yes

The screenshot shows the "Services" tab selected in the same software interface. The "HTTP" service is selected in the sidebar. In the main panel, the "index.html" file is selected in the "File Manager" table. An "Edit" button is clicked, opening a text editor window with the following HTML code:

```
<html>
<h1>Hello Cisco</h1>
</html>
```

A "File Edit Warning" dialog box is displayed in the foreground, asking "There is already a file with the same name, overwrite?". There are "Yes" and "No" buttons. The "Yes" button is highlighted with a cursor.



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5. Second setup in server only.

Click on DNS from left side then click on the DNS radio button. Fill the web site name and address.

A screenshot of a software interface titled "Server0". The top navigation bar includes tabs for Physical, Config, Services, Desktop, Programming, and Attributes. The "Services" tab is selected, indicated by a blue underline. On the left, a vertical sidebar lists various services: HTTP, DHCP, DHCPv6, TFTP, DNS (which is selected and highlighted in blue), SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, and Radius EAP. The main right-hand panel is titled "DNS". It contains a section for "DNS Service" with two radio buttons: "On" (selected) and "Off". Below this is a "Resource Records" section. In the "Name" field, "mywebsite" is entered, and the "Type" dropdown is set to "A Record". The "Address" field contains "192.168.1.1". At the bottom of this section are three buttons: "Add", "Save", and "Remove". Below this is a table with columns "No.", "Name", "Type", and "Detail". The table currently has one row where the "Name" column contains "mywebsite" and the "Type" column contains "A Record".

The address is the Ip address of the server only. Click on add. The name reflect below.



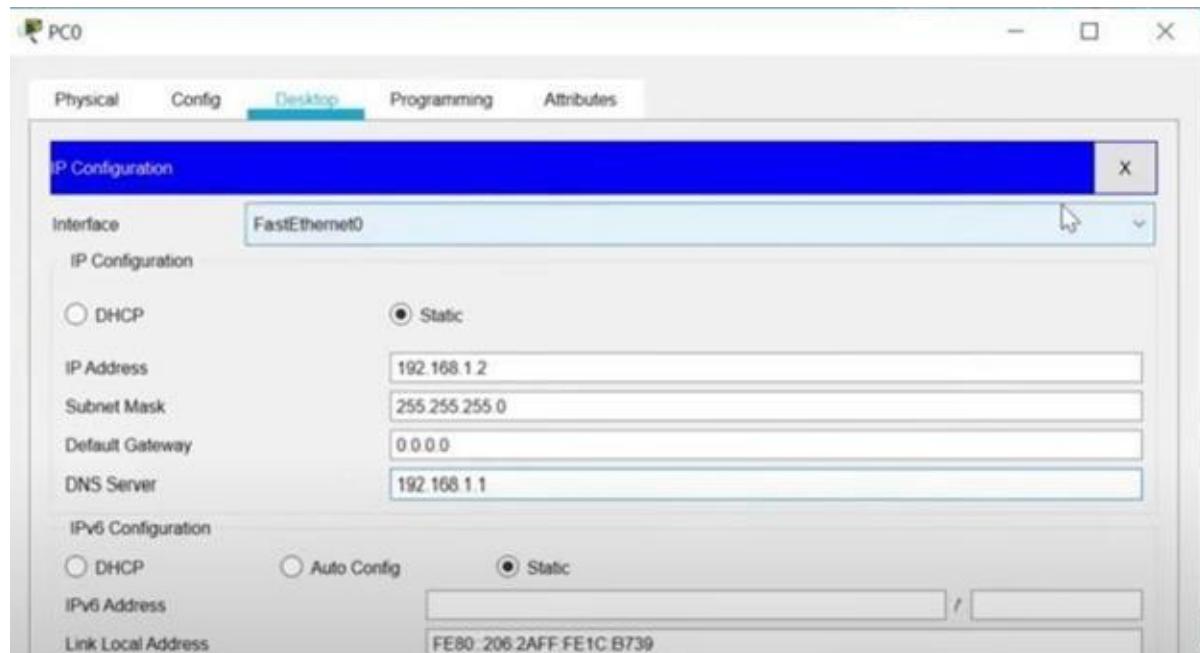
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- In the end device assign the IP address and DNS server. DNS server is the ip address of the server only.



- From desktop only select web browser. Write the website name and click on go button then the web page is visible.

