AMITY
UNIVERSITY
PUNJAB

CLOUD COMPUTING

Experiments:

Serial Number	Experiments	Page No	Remarks
1	Introduction to Cloud Computing		
2	Installation of virtual box		
3	Installation of ubuntu on virtual box		
4	Configuration of DHCP Server in Cisco Packet Tracer		
5	Configuration of Web Server and DNS server in Cisco Packet Tracer		
6	Configuration of WAN network in Cisco Packet Tracer		
7	Configuration of email server		
8	Configuration of FTP Server		
9			
10			
11			

Experiment 1- Introduction to Cloud Computing

Cloud Computing

Cloud Computing means storing and accessing data and programs on remote servers on the internet instead of local storage (i.e our computer).

Cloud Computing is also referred to as Internet- based computing. In this data is stored over the internet. The data that is stored can be files, images, documents etc.

The following are some of the operations that can be performed with Cloud Computing-

Storage, backup, and recovery of data

Delivery of software on demand

Development of new applications and services

Streaming videos and audio

Types of Cloud Computing

1. Infrastructure as a Service (IaaS)- It is a cloud computing model that provides virtualized hardware like servers, storage, and networks over the internet. It allows businesses to rent infrastructure on a pay-as-you-go basis, eliminating the need to buy and maintain physical hardware. IaaS is highly scalable, flexible, and cost-effective, making it ideal for hosting websites, running applications, and creating development environments.

2. Platform as a Service (PaaS)- It is a cloud computing model that provides a platform for developers to build, deploy, and manage applications without worrying about the underlying infrastructure. It includes tools, frameworks, and services for application development, databases, and testing, all accessible over the internet. PaaS is scalable, cost-efficient, and simplifies the development process.

3. SaaS (software as a service)- It is a cloud computing model that delivers software applications over the internet. Users can access these applications through a web browser without needing to install or maintain them. SaaS is subscription-based, scalable, and managed by the provider, making it easy for businesses and individuals to use.

4. Function as a Service (FaaS)- It is a cloud computing model where developers run individual functions or pieces of code in response to events without managing servers. It enables a serverless architecture, automatically scaling resources based on demand and charging only for the execution time of the code. FaaS simplifies development, reduces costs, and is ideal for microservices or event-driven applications.

IP Addresses

An IP address (Internet Protocol address) is a unique numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication. It acts as an identifier, enabling devices to locate and communicate with each other over the internet.

Types of IP Addresses:

1. IPv4: A 32-bit address format (e.g., 192.168.1.1).
2. IPv6: A 128-bit address format designed to replace IPv4 (e.g., 2001:0db8:85a3:0000:0000:8a2e:0370:7334).

Classes

Class A-	1-126	//Big Companies
Class B-	128-191	//Mid Companies
Class C-	192-223	//Small Companies
Class D-	224-239	//Reserved
Class E-	240-255	//Reserved

Subnet mask

A subnet mask is used in conjunction with an IP address to divide a network into subnets and identify the network and host portions of the address. It helps routers and devices understand how to route data within a network or across networks.

Class	Default Subnet Mask	CIDR Notation	Network/Host Bits
Class A	255.0.0.0	/8	8 bits network, 24 bits host
Class B	255.255.0.0	/16	16 bits network, 16 bits host
Class C	255.255.255.0	/24	24 bits network, 8 bits host

Gateway

A gateway is a device that connects different networks, allowing data to flow between them. It routes data from a local network to an external one, like the internet. In home networks, a router often acts as the gateway, forwarding data requests from devices to the internet. Gateways help manage traffic and ensure secure communication between networks.

DNS (Domain Name System)

DNS is a system that translates human-readable domain names into IP addresses that computers use to identify each other on the internet. It acts like a phonebook for the internet, allowing users to access websites using easy-to-remember names instead of numerical IP addresses. When you enter a website's domain name, DNS servers find the corresponding IP address and direct your browser to the correct site.

DHCP (Dynamic Host Configuration Protocol)

DHCP is a network protocol used to automatically assign IP addresses and other network configuration settings (like subnet mask, gateway, and DNS) to devices on a network. This eliminates the need for manual configuration of IP addresses on each device. When a device connects to the network, the DHCP server assigns it an available IP address from a predefined range, making network management easier and more efficient.

Cmd commands

1. To find IP Address

   Window +r ---> tracert www.google.com

2. Check IP Address of system

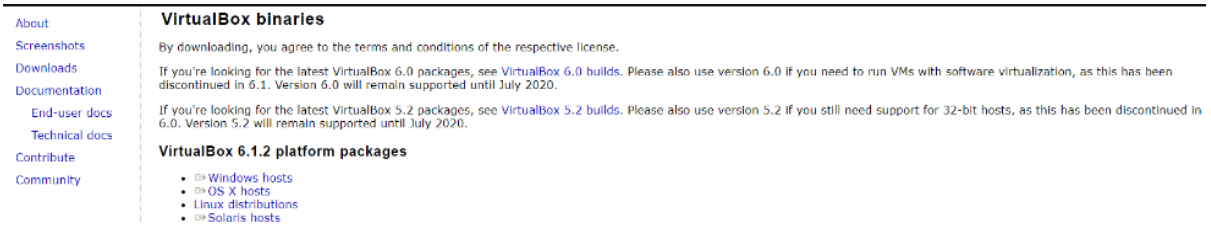
   IPconfig/all

3. Open pen drive and find data on the drive

   Attrib –s –h –r /s ./d

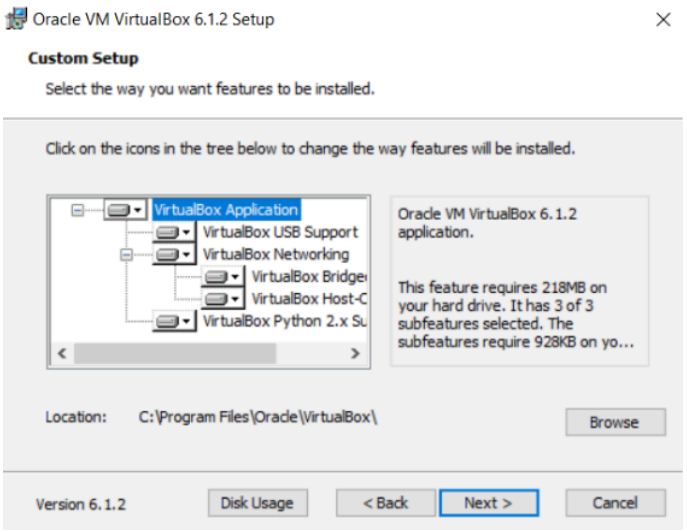
Experiment 2- Installation of Virtual Box

Step 1: Go to the official site virtualbox.org and download the latest version for windows.

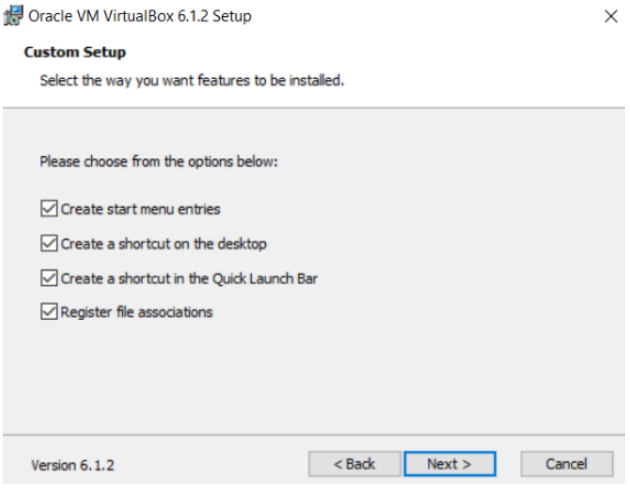


Step 2: After downloading open the file

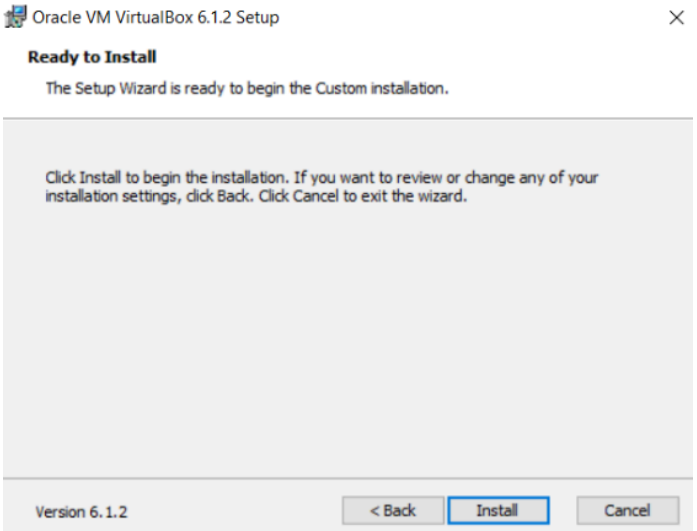
Step 3: Select Installation Location



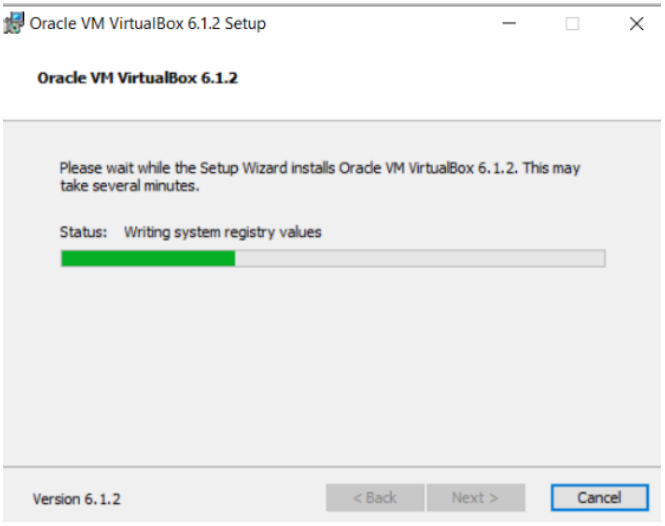
Step 4: Creating Entries and Shortcuts



Step 5: Click on install

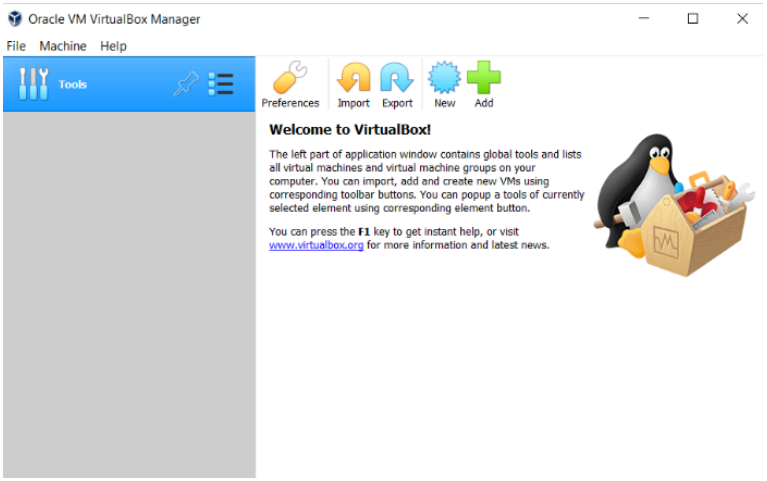


Step 6: Installing Files and packages



Step 7: Finish installation

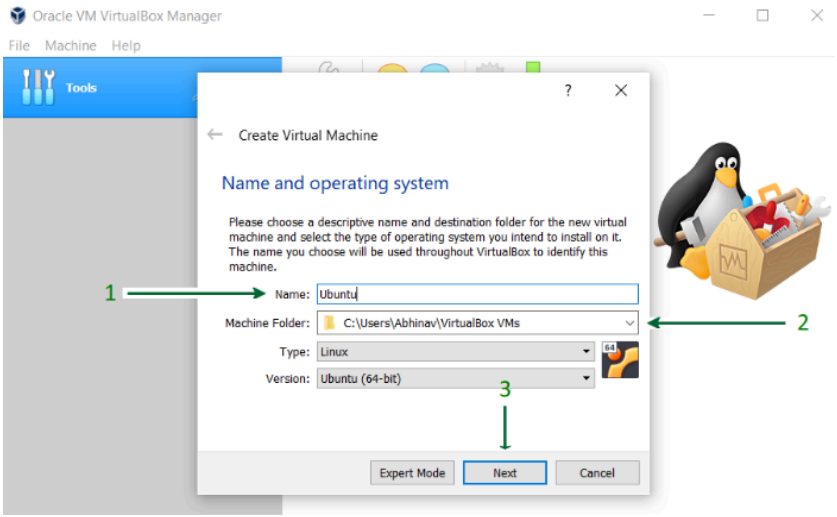
Step 8: Open virtual box


Oracle VM VirtualBox Manager
File Machine Help
Tools
Preferences
Import
Export
New
Add
Welcome to VirtualBox!
The left part of application window contains global tools and lists all virtual machines and virtual machine groups on your computer. You can import, add and create new VMs using corresponding toolbar buttons. You can popup a tools of currently selected element using corresponding element button.
You can press the F1 key to get instant help, or visit www.virtualbox.org for more information and latest news.

Experiment 3- Installation of Ubuntu on Virtual Box

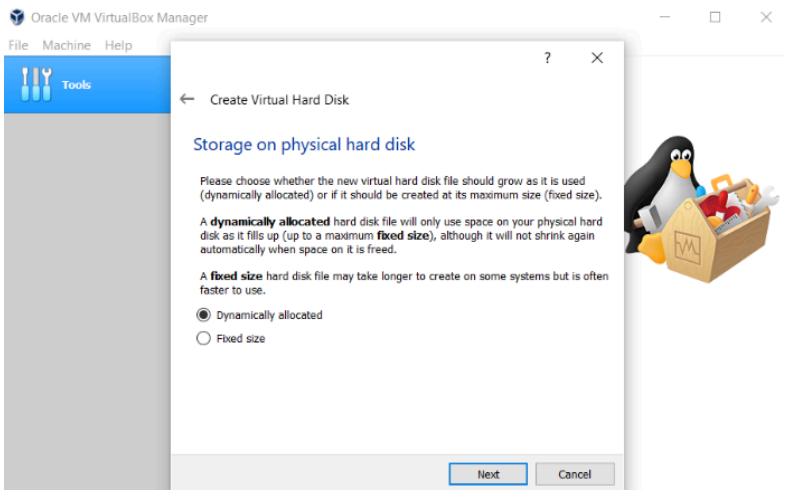
Step 1: Download ISO for Ubuntu which are available on the ubuntu.com.

Step 2: Open VirtualBox and click on the New button. Give a Name to your Virtual Machine and select the Location for it to install.

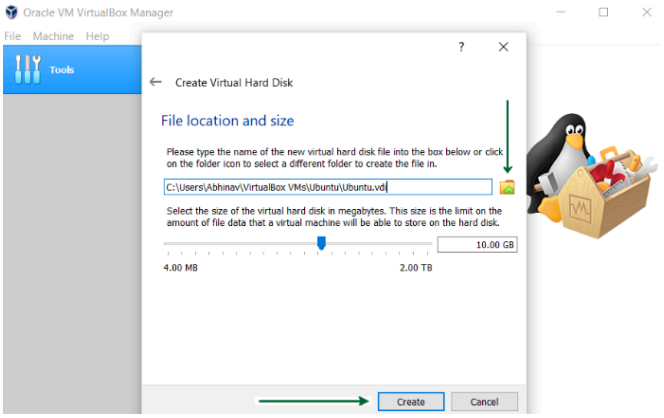


Step 3: Assign RAM size, create virtual hard disk and select the type of hard disk to be used.

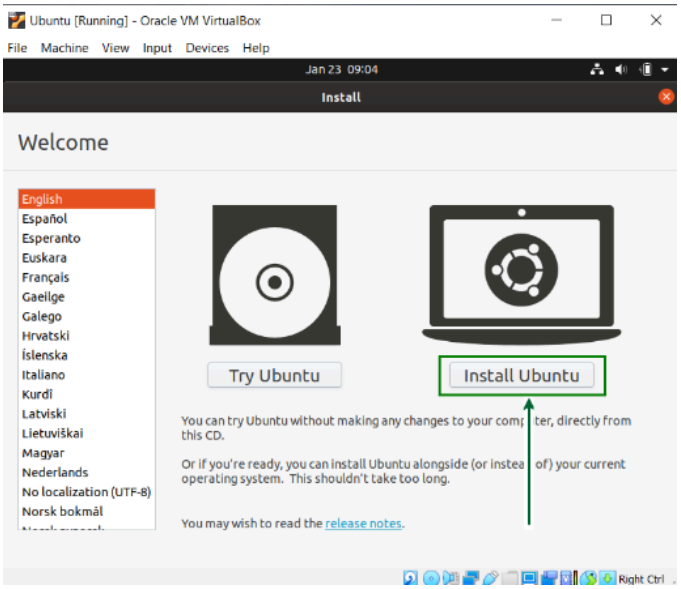
Step 4: Either of the Physical Storage types can be selected. Using a Dynamically Allocated Disk is by default recommended.



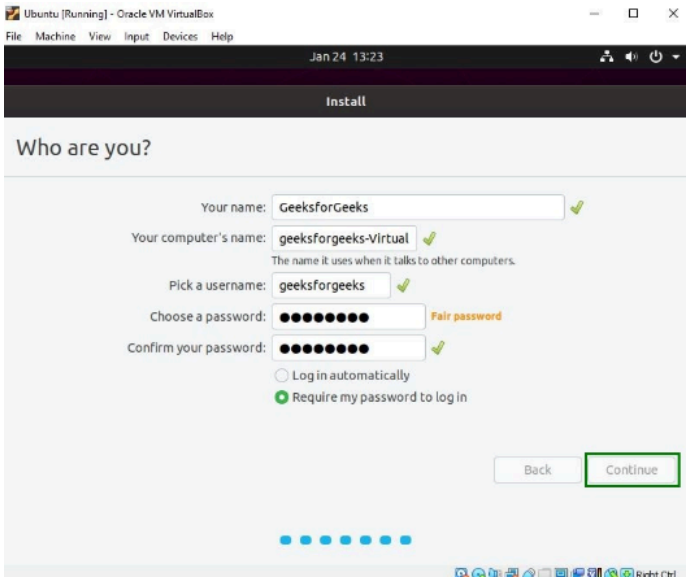
Step 5: Select Disk Size and provide the Destination Folder to install.



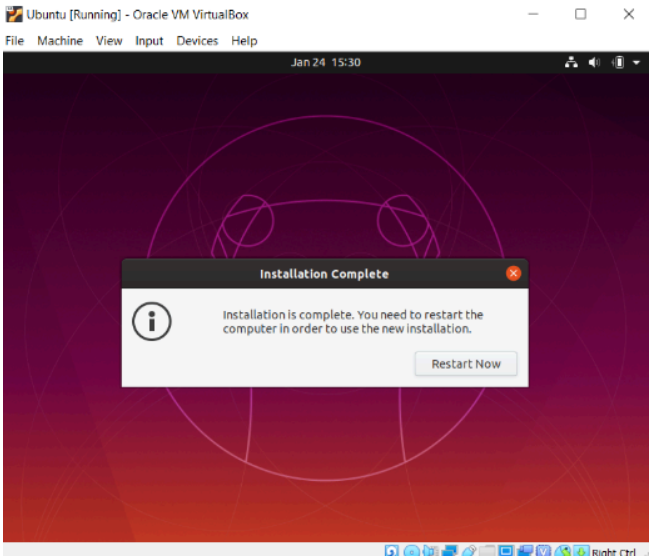
Step 6: Begin installing ubuntu. Click on the Install Ubuntu option



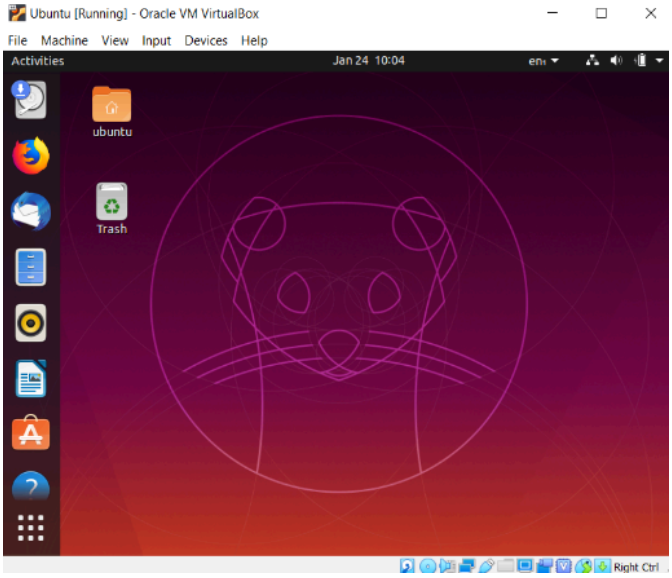
Step 7: Select the keyboard, time zone, name of the computer and password and other login information.



Step 8: Once the installation process is over, reboot your Virtual Machine.



Step 9: The installation process is complete.



Experiment 4- Configuration of DHCP Server in Cisco Packet Tracer

STEPS: -

Step 1: Open Cisco packet tracer

Step 2: From the bottom left corner select Network devices

Fig 1

Step 3: Select a router and a switch and place them on the screen

Fig 2

Step 4: From the bottom left corner select end devices and add PC0, PC1, PC2 and Server on the screen

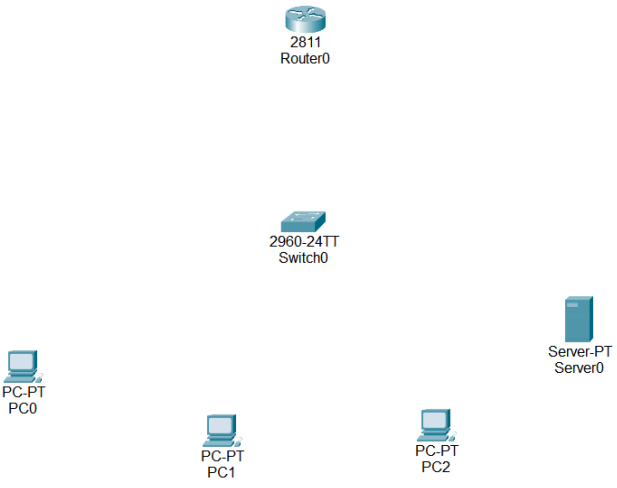


Fig 3

Step 5: Click on the connections option to connect the devices using copper straight wire.

1) Click on the device
2) Choose fastethernet0
3) Click on the switch
4) Choose fastetherner0/1
5) The two devices are connected

Repeat the same step for all the other devices as shown-

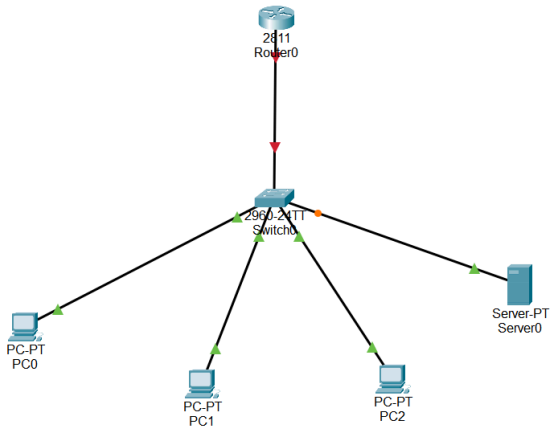


Fig 4

Step 6: Colour of cable interface between switch and router is red because router is not turned on. In CPT router is by default switched off.

Now to turn on router-

- Click on router
- Go to CLI section
- In last type,

```
no
enable
configure terminal
interface Fa0/0
ip add 10.0.0.1 255.0.0.0
no shutdown
```

We will observe that the status of the router changes from red to green.

```
        --- System Configuration Dialog ---

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


Press RETURN to get started!


Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Fa0/0
Router(config-if)#ip add 10.0.0.1 255.0.0.0
Router(config-if)#no shutdown

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
```

Fig 5

Step 7: Provide gateway and DNS server to Server (Static).

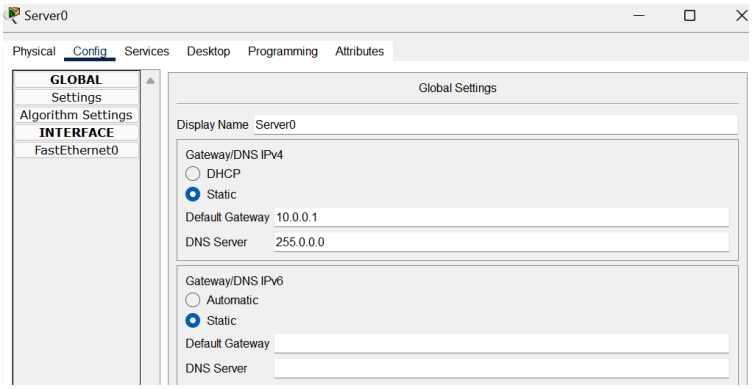


Fig 6

Step 8: Give IP address to the pc's via DHCP

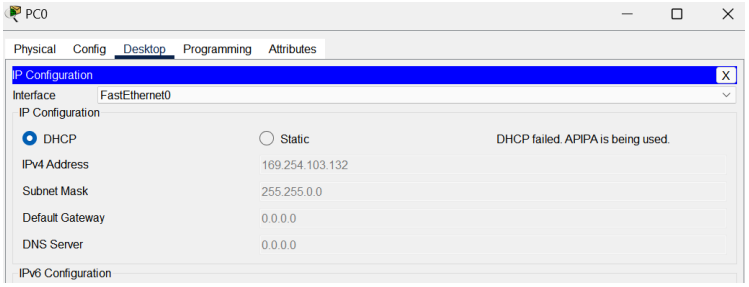


Fig 7

Step 9: Click on router

- Go to CLI section
- ip dhcp pool amity
- network 10.0.0.0 255.0.0.0
- default-router 10.0.0.1
- dns-server 10.0.0.2

```
Router(config-if)#
Router(config-if)#ip dhcp pool amity
Router(dhcp-config)#network 10.0.0.0 255.0.0.0
Router(dhcp-config)#default-router 10.0.0.1
Router(dhcp-config)#dns-server 10.0.0.2
Router(dhcp-config)#
```

Fig 8

Step 10: Check the status to see if the connection is successful

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC1	PC2	ICMP		0.000	N	0	(edit)	(delete)

Fig 9

Experiment 5- Configuration of Web Server and DNS server in Cisco Packet Tracer

STEPS: -

Step 1: Open Cisco packet tracer

Step 2: From the bottom left corner select Network devices

Fig 1

Step 3: Select a switch, a few pcs and some servers and place them on the screen

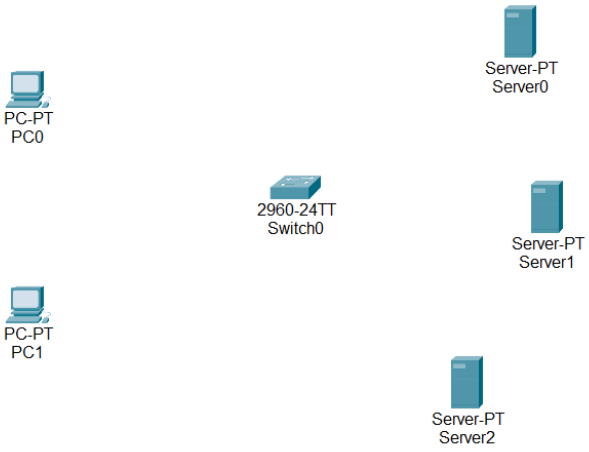


Fig 2

Step 4: Click on the connections option to connect the devices using copper straight wire.

1) Click on the device
2) Choose fastethernet0
3) Click on the switch
4) Choose fastetherner0/1
5) The two devices are connected

Repeat the same step for all the other devices as shown-

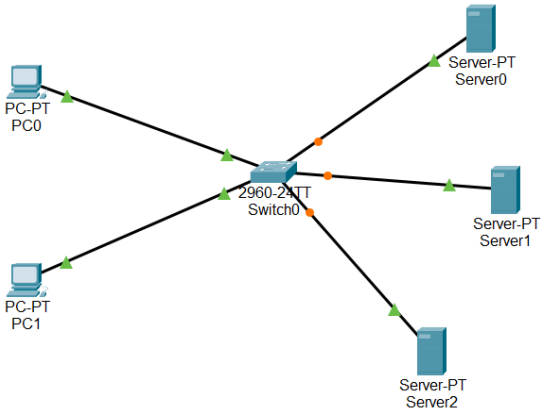


Fig 3

Step 5: Give Ip addresses to the devices

Click on the device

Desktop

Ip configuration

Give Ip address, subnet mask, default gateway and DNS server

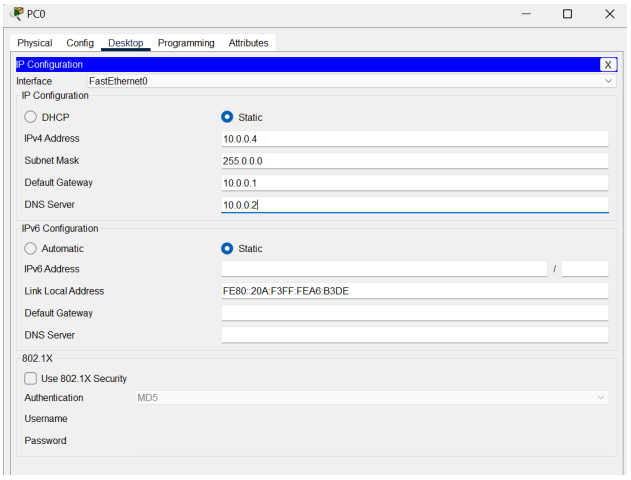


Fig 4

Step 6: The IP addresses assigned are as below

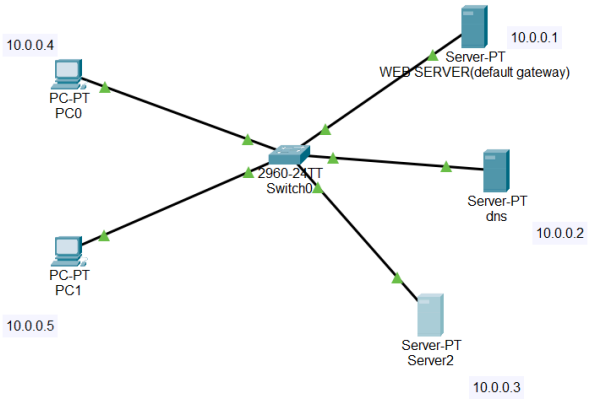


Fig 5

Step 7: As Server0 is the web server, we have to configure http services

Click on the device

Services

Index.html – edit

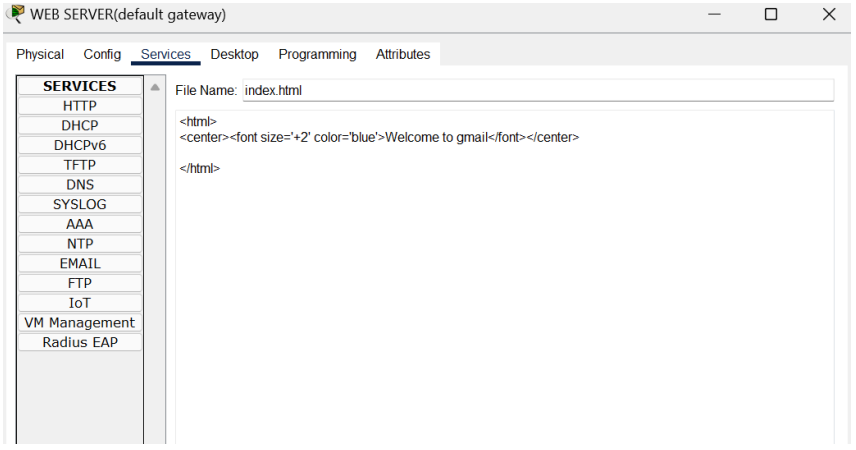


Fig 6

Repeat the same step for server2 and write ‘Welcome to snapchat’.

Step 8: Click on any Pc

desktop

Web browser

In the URL section write the ip of the server which you want to see

Eg- 10.0.0.1

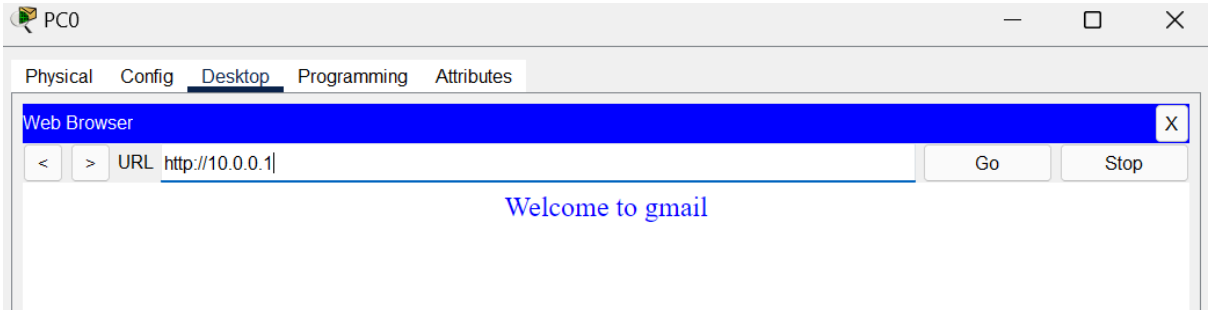


Fig 7

Step 9: Next, we will connect DNS server

Services

DNS

Turn it on

Write the name and the corresponding Ip address

Add the corresponding address

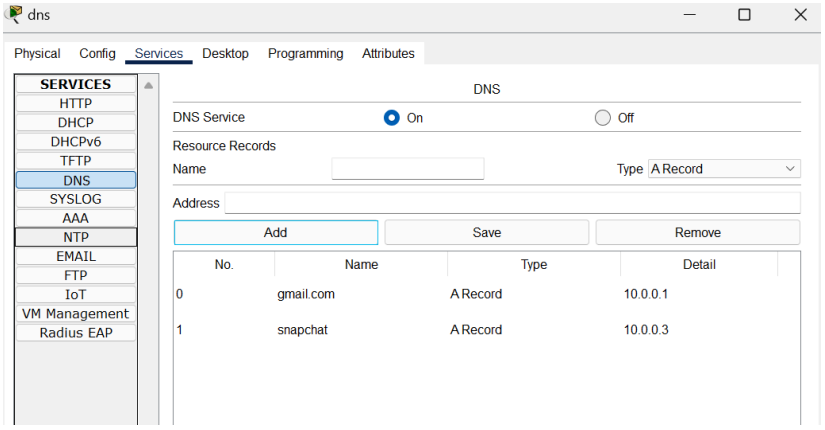


Fig 8

Step 10: Click on any Pc

desktop

Web browser

Instead of IP address we can use the name of the website.

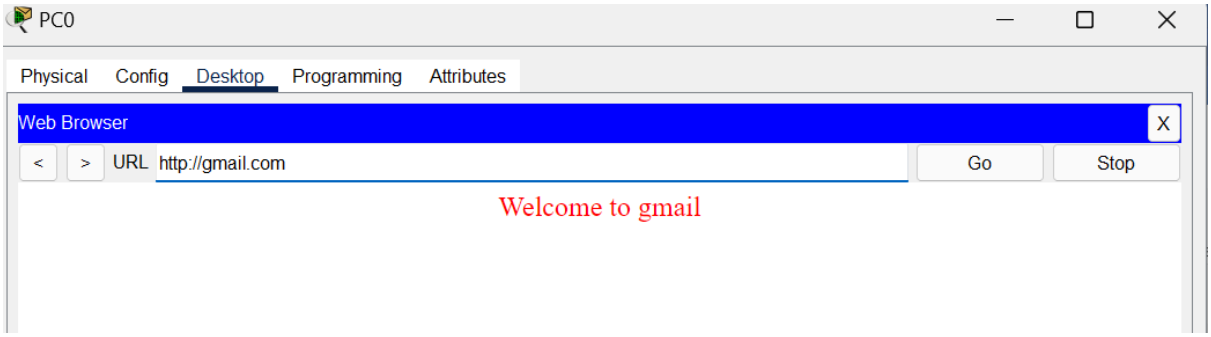


Fig 9

Experiment 6- Configuration of WAN network in Cisco Packet Tracer

STEPS: -

Step 1: Continue from the previous experiment and make another network and configure Ip addresses as done before.

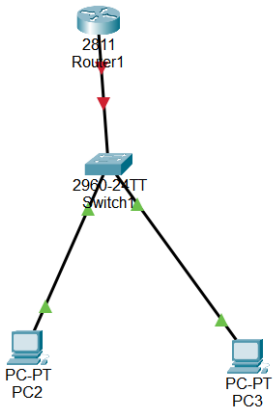


Fig 1

Step 2: Give the IP address as 30.0.0.1 and default gateway as the same which you would give to the router.

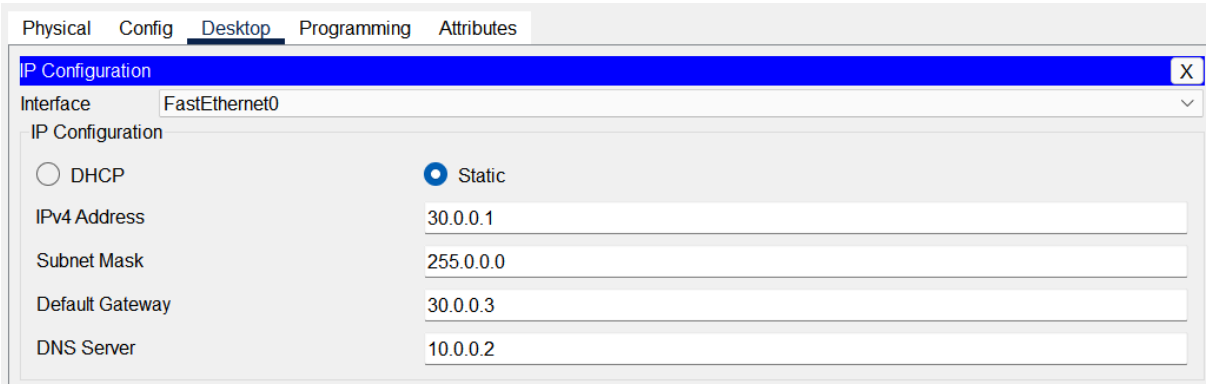


Fig 2

Step 3: Click on the router

Power off the Router

Select HWIC-2T

Drag and drop to the routers empty slot

Turn on the router

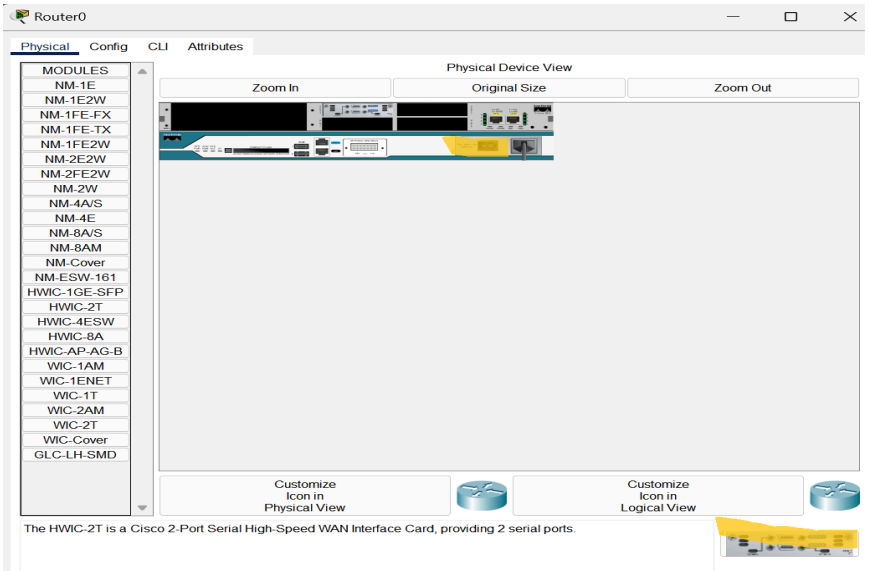


Fig 3

Step 4: Repeat the same for the next router

Step 5: Click on the router

no

enable

configure terminal

interface Fa0/1

ip address 10.0.0.6 255.0.0.0

no shutdown

```
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Fa0/1
Router(config-if)#ip add 10.0.0.6 255.0.0.0
                          ^
% Invalid input detected at '^' marker.

Router(config-if)#ip address 10.0.0.6 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
```

Fig 4

Step 6: Repeat the same steps for 2nd router

no

enable

configure terminal

interface Fa0/1

ip address 30.0.0.3 255.0.0.0

no shutdown

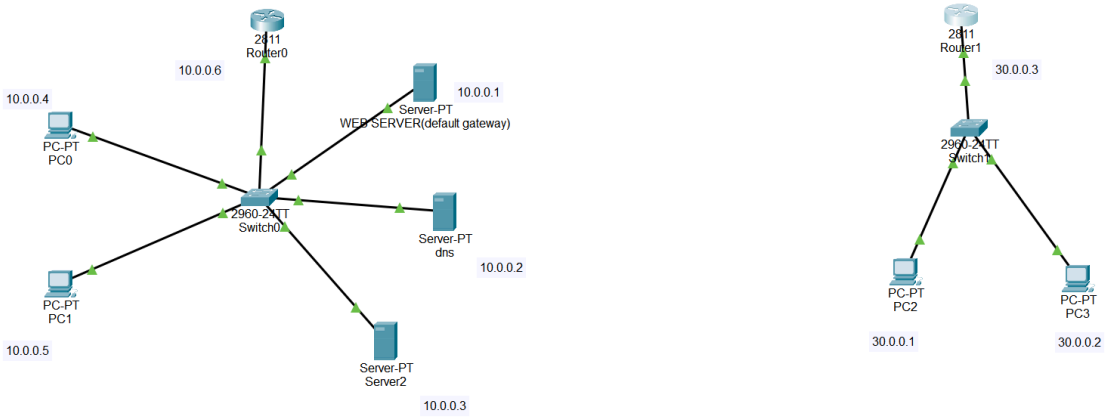


Fig 5

Step 7: Select serial port for WAN Static Routing

Fig 6

Step 8: Click on router

En

config terminal

interface Se0/3/0

ip address 20.0.0.2 255.0.0.0

no shutdown

```
Router>en
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Se0/3/0
Router(config-if)#ip address 20.0.0.2 255.0.0.0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/3/0, changed state to down
Router(config-if)#
```

Fig 7

repeat the same for 2nd router

Step 9: As there is a clock sign so we use the following commands-

Clock rate 64000

Step 10: Now we are to perform rip(routing information protocol) routing

For router0 we have network 10.0.0.0 and 20.0.0.0. We will use the following commands-

router rip

net 10.0.0.0

net 20.0.0.0

```
Router(config)#interface Se0/0/0
Router(config-if)#clock rate 64000
Router(config-if)#router rip
Router(config-router)#net 10.0.0.0
Router(config-router)#net 20.0.0.0
Router(config-router)#
```

Fig 8

Repeat the same step for the other network.

Step 11: Check the status to see if the connection is successful

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC1	PC2	ICMP		0.000	N	0	(edit)	(delete)

Fig 9

Experiment 7- Configuration of email server

STEPS: -

Step 1: Open Cisco packet tracer

Step 2: From the bottom left corner select Network devices

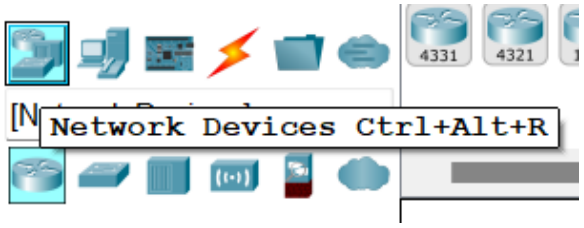


Fig 1

Step 3: Select a switch, a few pcs and some servers and place them on the screen

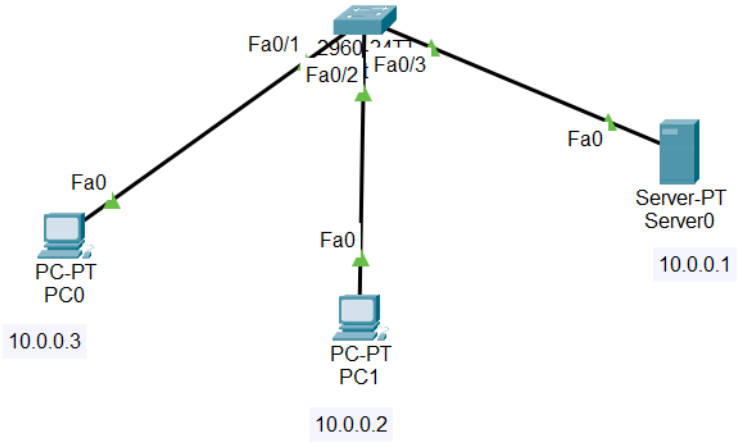


Fig 2

Step 4: Go to server, to service, email, set the domain, add emails to it with user and password.

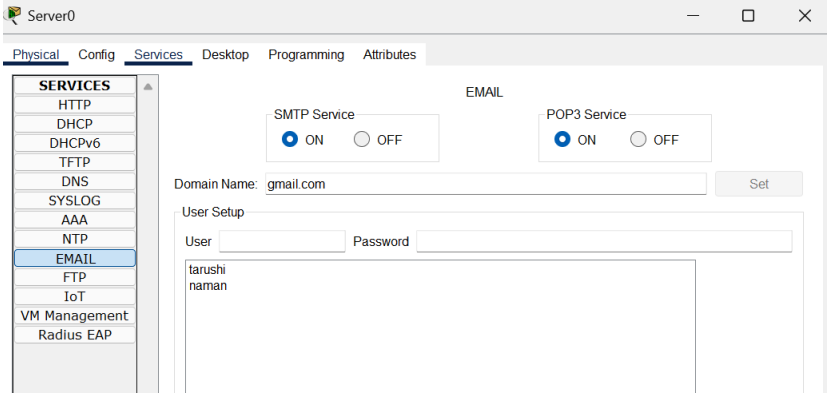


Fig 3

Step 5: Go to any pc, desktop and email configure.

Add the username and email address created.

Add server information and logon information.

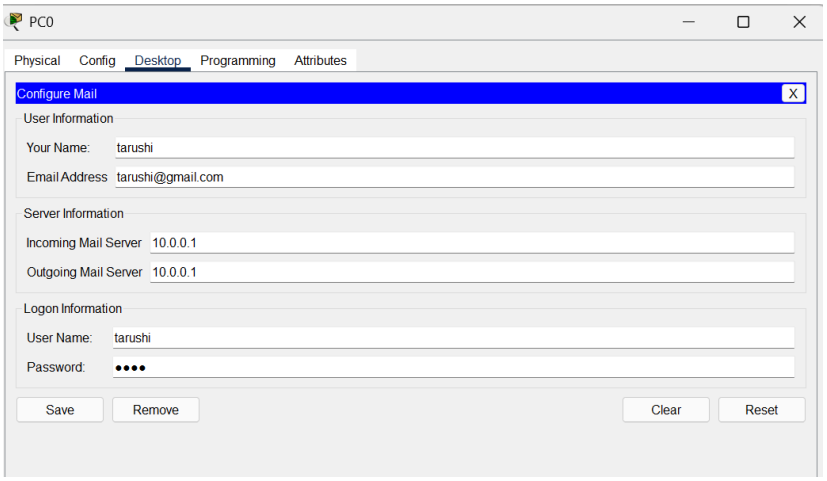


Fig 4

Repeat the same step for pc1 and make another username.

Step 6: Compose the mail and send to the other user

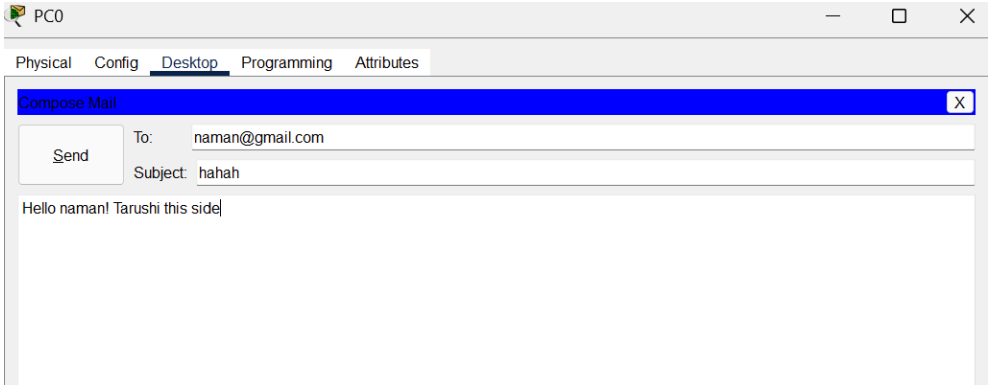


Fig 5

Step 7: Now click on pc1, desktop, email, receive.

We will observe that the email is there.

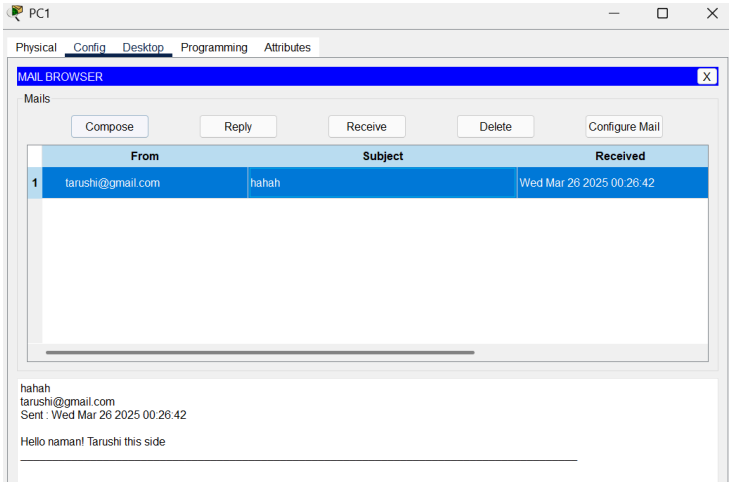


Fig 6

Experiment 8- Configuration of FTP server

STEPS: -

Step 1: Open Cisco packet tracer

Step 2: From the bottom left corner select Network devices

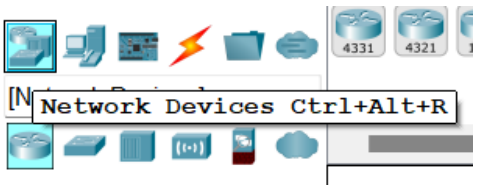


Fig 1

Step 3: Select a switch, a few pcs and some servers and place them on the screen

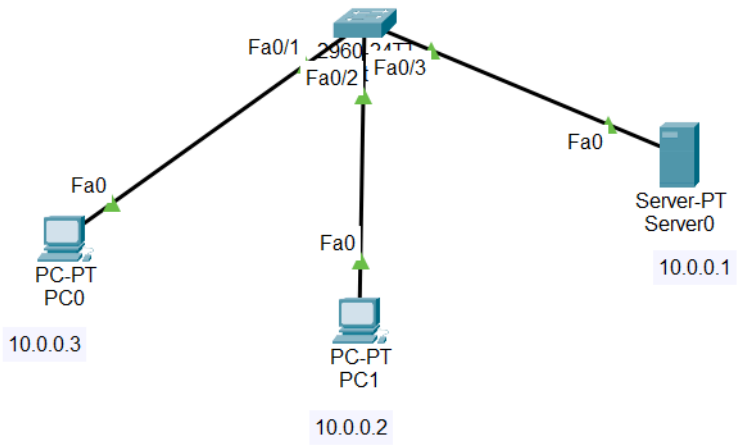


Fig 2

Step 4: Go to server, Service, ftp and add User name , password , add

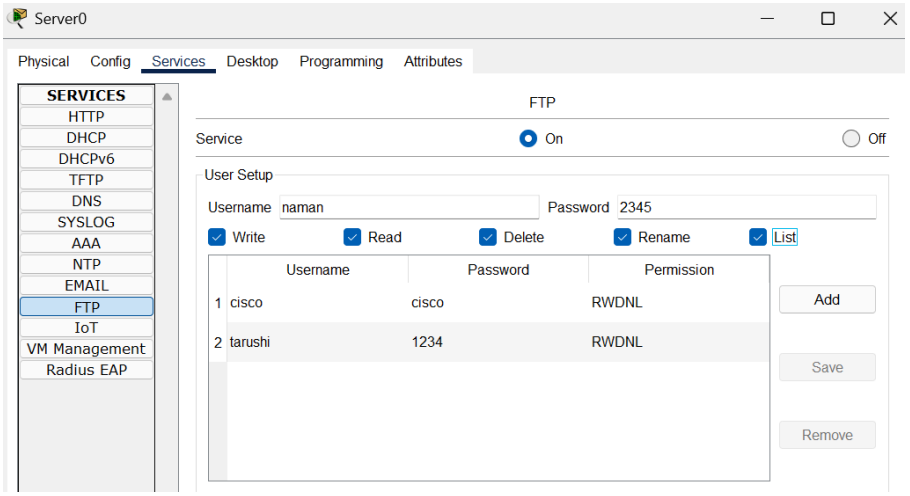


Fig 3

Step 5: go to pc

- Text editor
- File save
- Command prompt
- Ping 10.0.0.4
- ftp 10.0.0.4
- Login
- Put file name

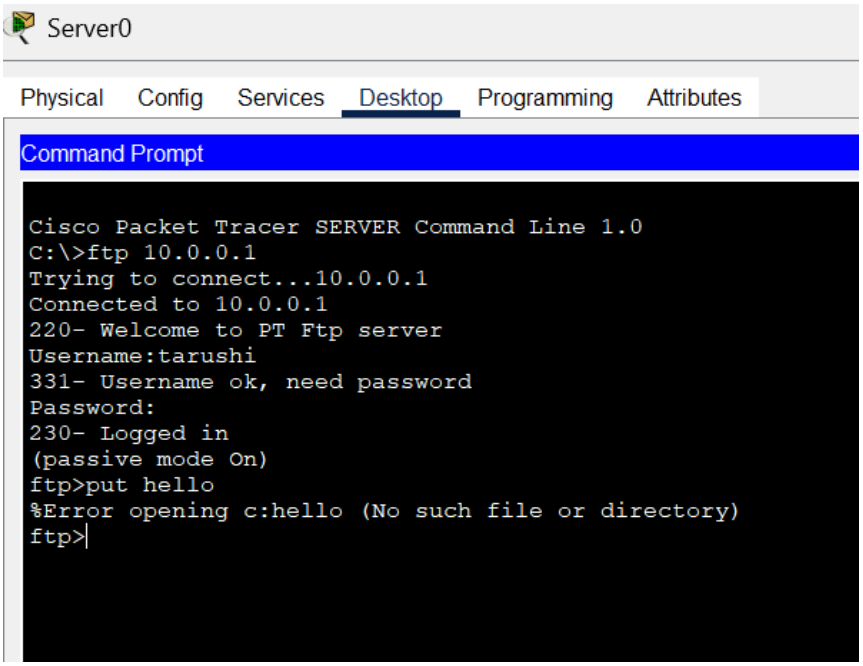


Fig 4