

Contents

Task 1: Implementation of LAN.....	1
Task 2: Implementation of DHCP.....	4
Task 3: Implementation of DNS.....	6
Task 4: Implementation of HTTP.....	12
Task 5: Implementation of Email Server.....	15

Task 1: Implementation of LAN

Objective:

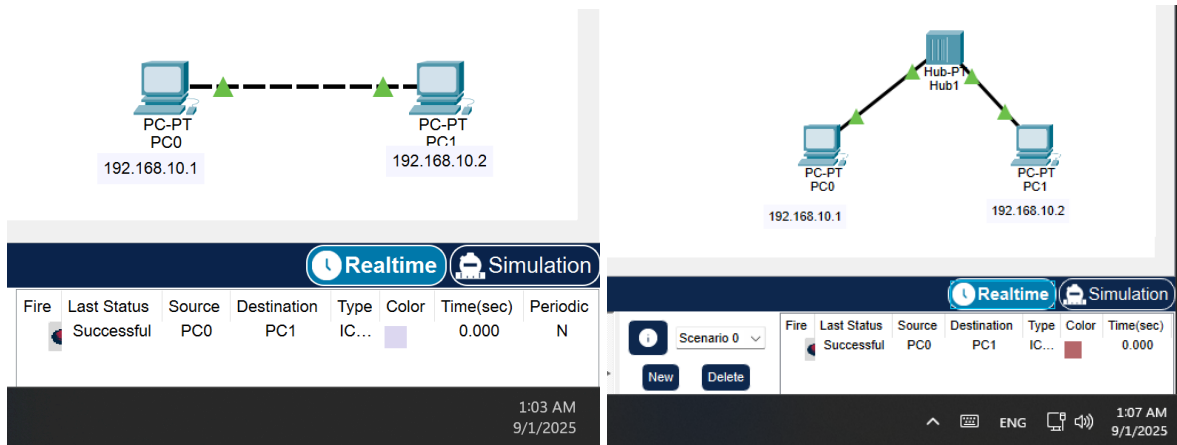
To know the implementation of Local Area Network

Theory:

A local area network (LAN) is a collection of device connections together in one physical location, such as a building, office, or home. A LAN can be smaller or large, ranging from a home network with thousands of users to an enterprise network with thousands of users and devices in an office or school. A LAN comprises cables, access points switches, routers, and other components that enable devices to connect to internal servers, web servers, and other LAN via wide area networks.

Implementation:

In the packet tracer, computers are connected to a switch and the switch is connected to a router through wires. IP Address is assigned to the router and the computers. Computers must use the IP Address of the router as their default gateway. After assigning IP addresses and gateways the computer should be able to communicate with the router and also with each other. Each computer must be assigned with a unique IP Address.



(a) (b)
Fig: Connections (a) PC to PC (b) Hub to PC

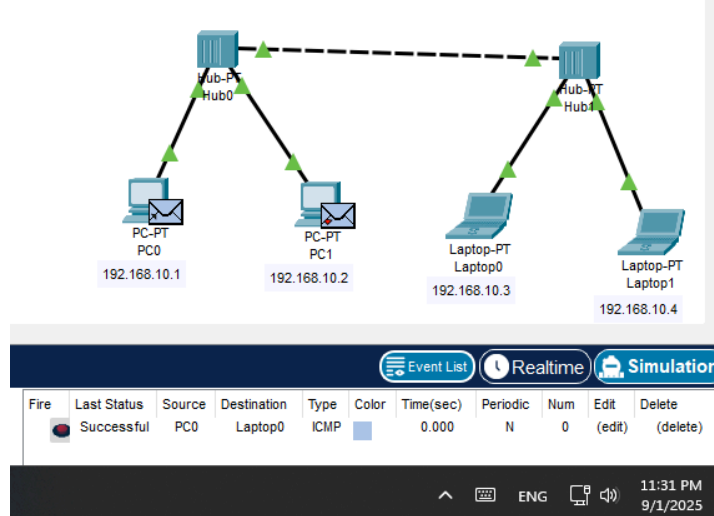
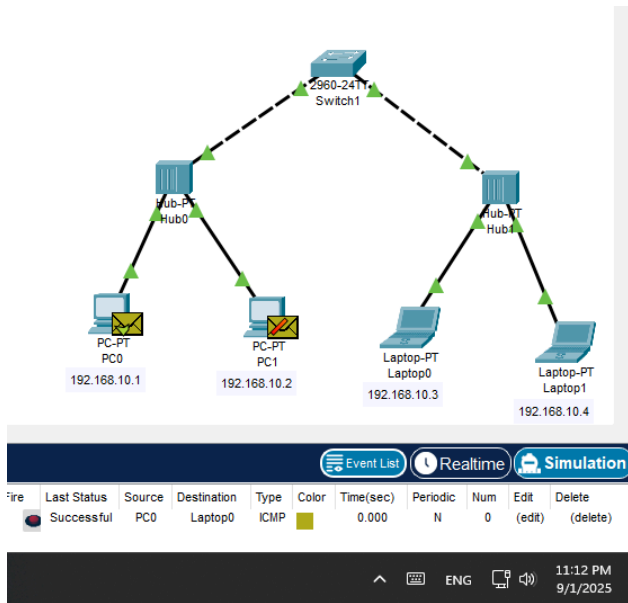
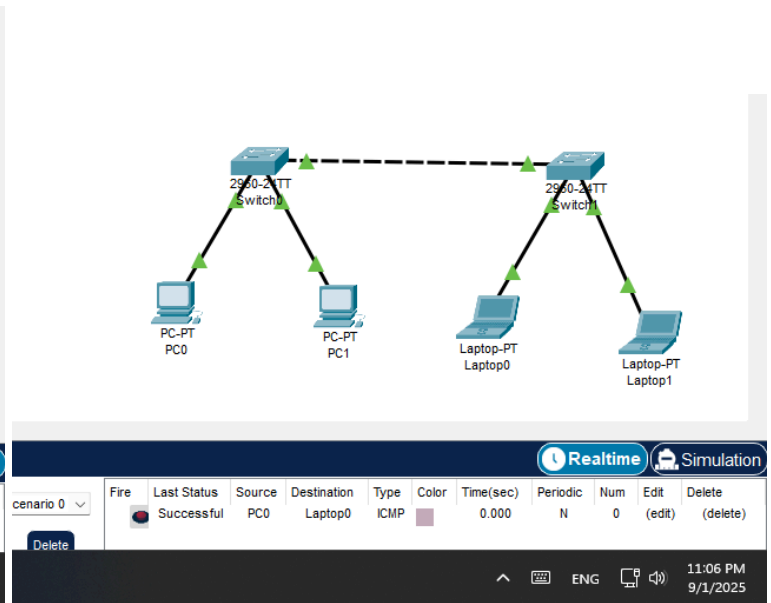


Fig: Hub to Hub Connection



(a)



(b)

Fig: Connections (a) Switch to Hub (b) Switch to Switch

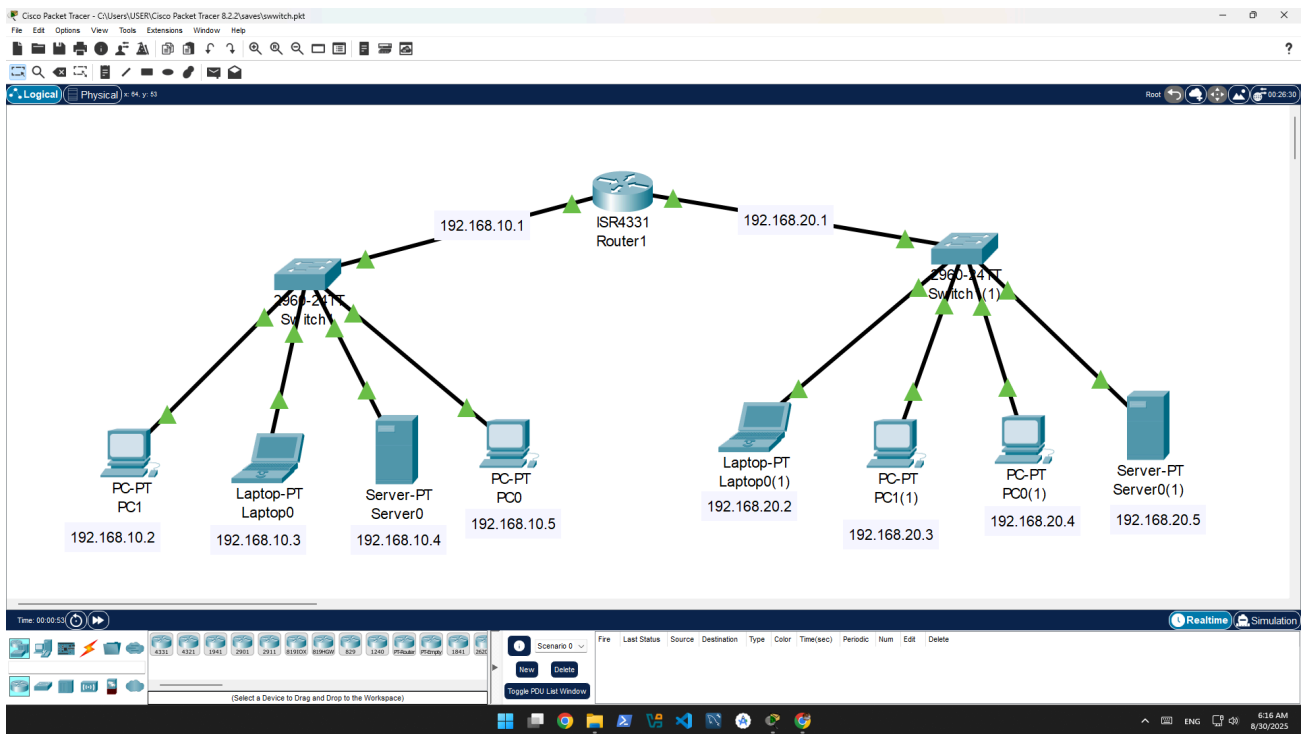
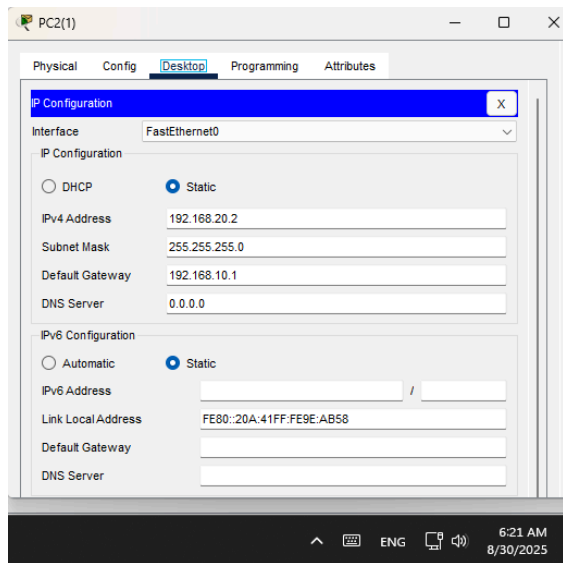
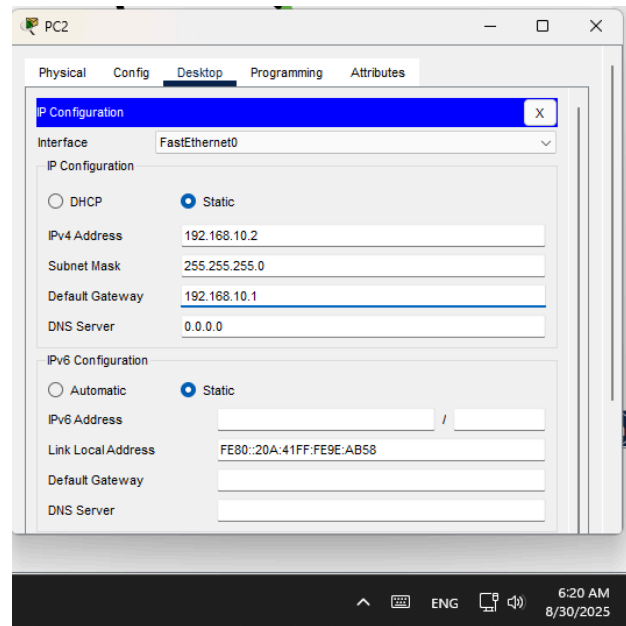


Fig 1 : LAN Network



(a)



(b)

Fig 2: Network Configuration (a) 1st Network (b) 2nd Network

Task 2: Implementation of DHCP

Objective:

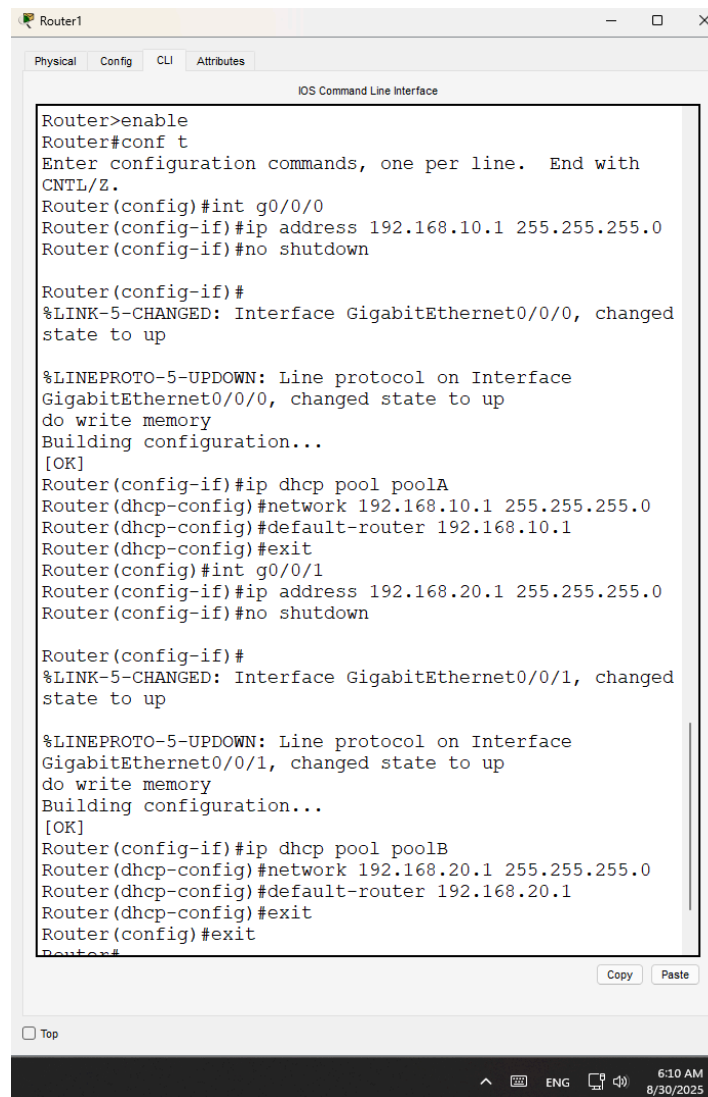
To know about implementation of Dynamic Host Configuration Protocol

Theory:

DHCP is a network protocol used on IP networks where a DHCP server automatically assigns an IP address and other information to each host on the network so they can communicate efficiently with other endpoints. In addition to the IP address, DHCP also assigns the subnet mask, default gateways address, domain name server (DNS) address and other pertinent configuration parameters.

Implementation:

1. Set a router with one server and set a desktop as required.
2. Enable ports of the router and set an IP address for both server and router.
3. Go to services on the server and on the services and assign the IP address of the router in the server and set the start IP address.
4. Enable the DHCP in the IP configuration section of the desktop.



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

Router>enable
Router#conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Router(config)#int g0/0/0
Router(config-if)#ip address 192.168.10.1 255.255.255.0
Router(config-if)#no shutdown

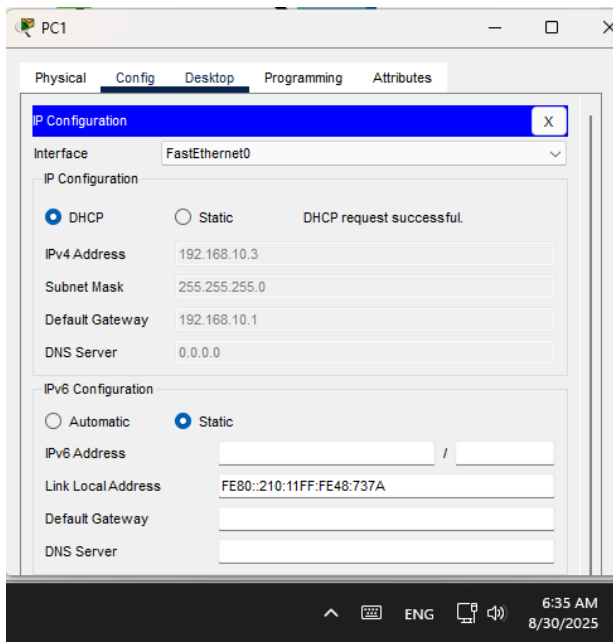
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed
state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/0/0, changed state to up
do write memory
Building configuration...
[OK]
Router(config-if)#ip dhcp pool poolA
Router(dhcp-config)#network 192.168.10.1 255.255.255.0
Router(dhcp-config)#default-router 192.168.10.1
Router(dhcp-config)#exit
Router(config)#int g0/0/1
Router(config-if)#ip address 192.168.20.1 255.255.255.0
Router(config-if)#no shutdown

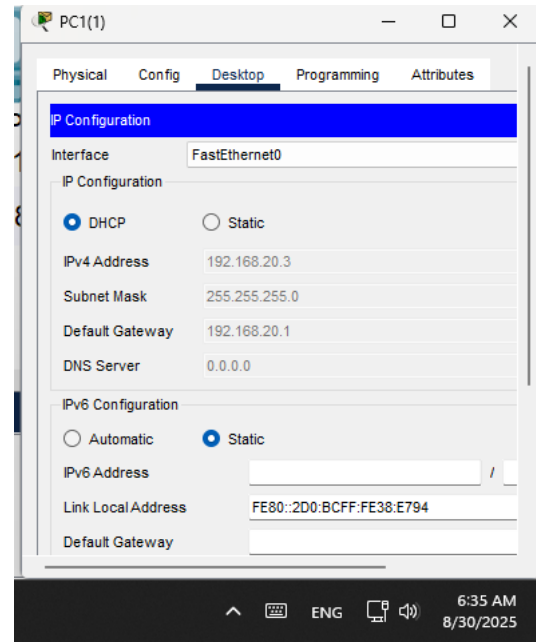
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed
state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/0/1, changed state to up
do write memory
Building configuration...
[OK]
Router(config-if)#ip dhcp pool poolB
Router(dhcp-config)#network 192.168.20.1 255.255.255.0
Router(dhcp-config)#default-router 192.168.20.1
Router(dhcp-config)#exit
Router(config)#exit
Router#
```

Fig 3: Router Configuration (DHCP)



(a)



(b)

Fig 4: IP Assignment Dynamically (DHCP) (a) Network 1 (b) Network 2

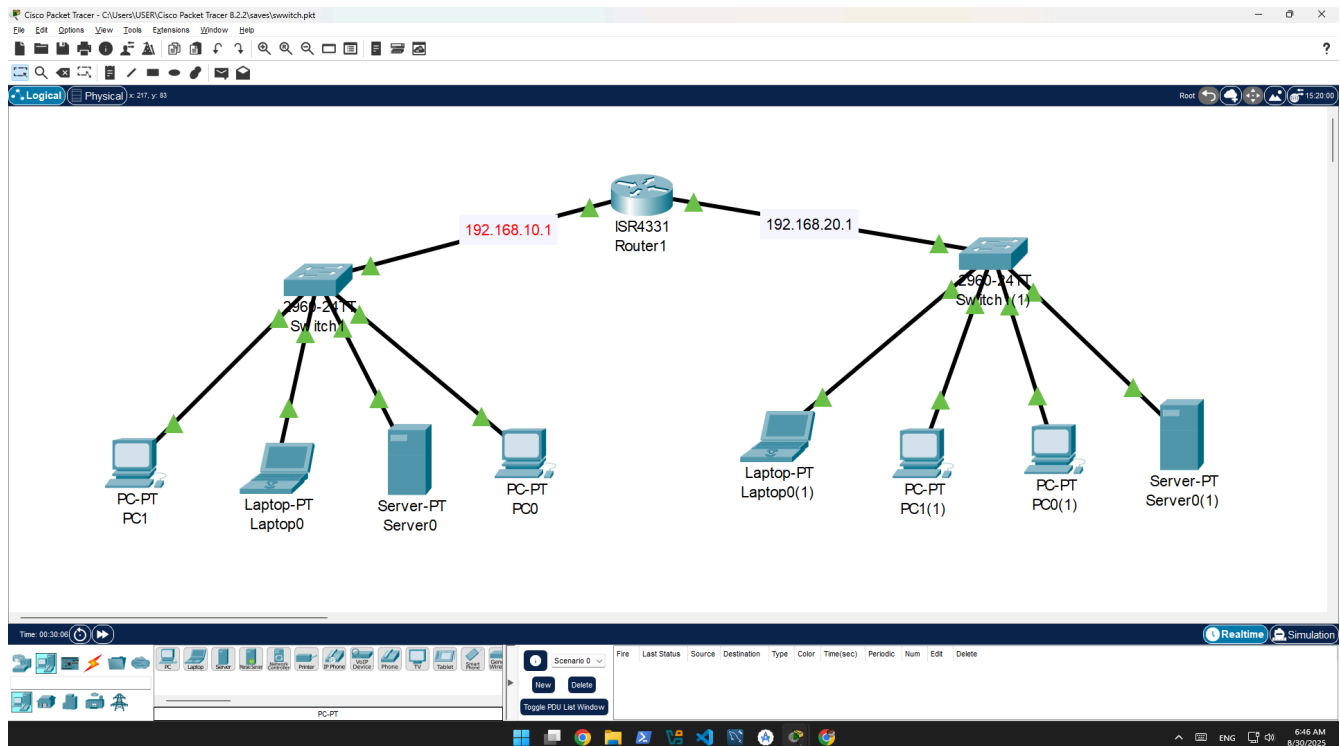


Fig 5 : Network Connection

Conclusion:

Hence, DHCP Configuration is implemented using packet tracer

Task 3: Implementation of DNS

Objective:

To understand the function and importance of DNS service in a network environment. Configuration a DNS server to manage domain name resolution

DNS server:

The purpose of a DNS server is to translate what a user types into their browser into something a computer can understand and use to locate a website. In other words, its purpose is to convert a domain name such as www.example.com into an IP address such as 71.232.101.120.

Thanks to DNS servers, people don't have to memorize complex IP addresses like 142.251.222.132, which is Google's IP address. They just have to memorize www.google.com. This translation process formally known as DNS resolution requires multiple hardware components. The most important is known as the primary DNS server.

Configuring a DNS server:

To configure a DNS server. We follow the steps below:

- Create a network with end devices, switch, and DNS server.

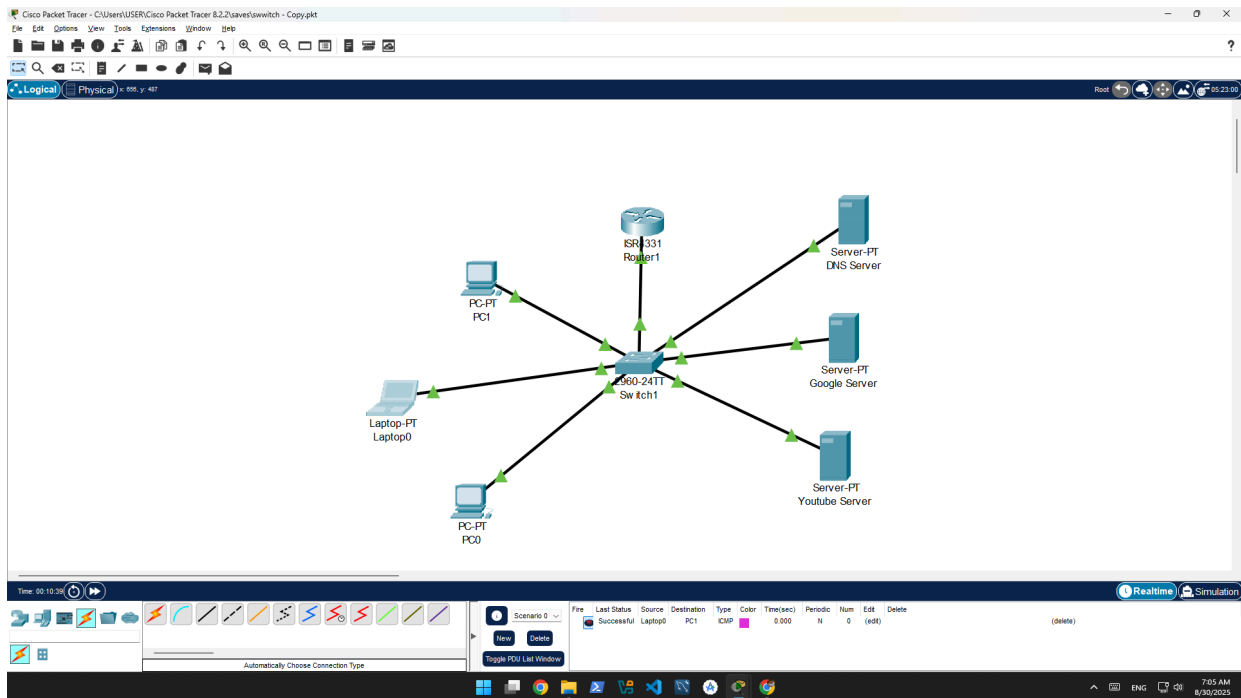
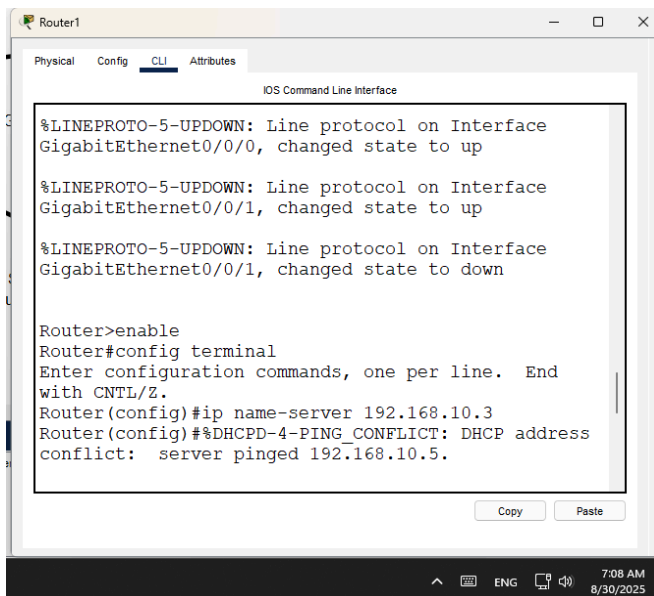
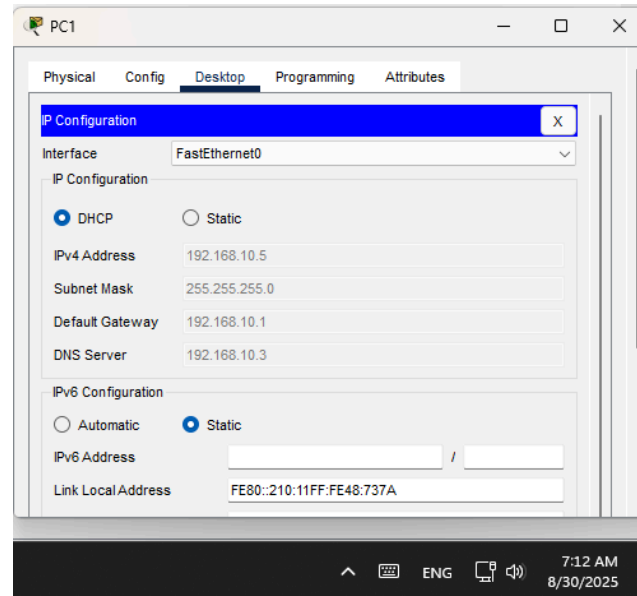


Fig 6: DNS System Network

- Configure the IP addresses to all devices and add the DNS server's ip to the 'DNS server' section of ip configuration menu.



(a)



(b)

Fig 7: devices configuration (a) Router Configuration (b) End devices Configuration

- Open the DNS server, go to services and turn on DNS. add website address and add.

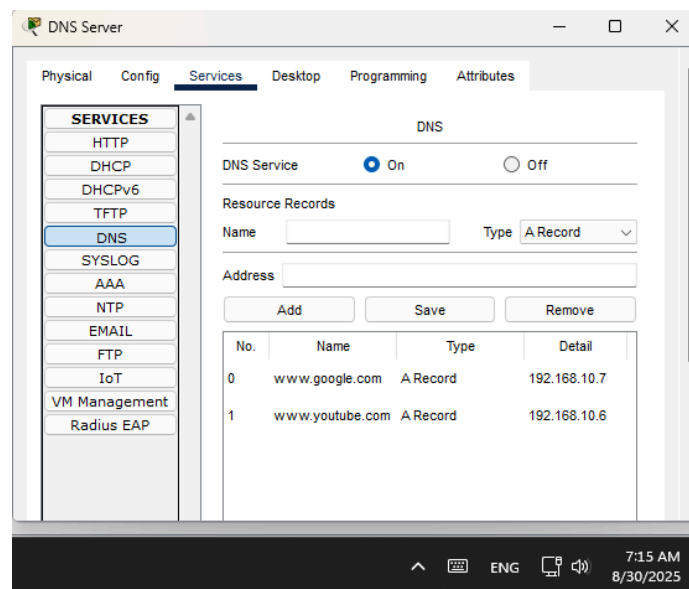
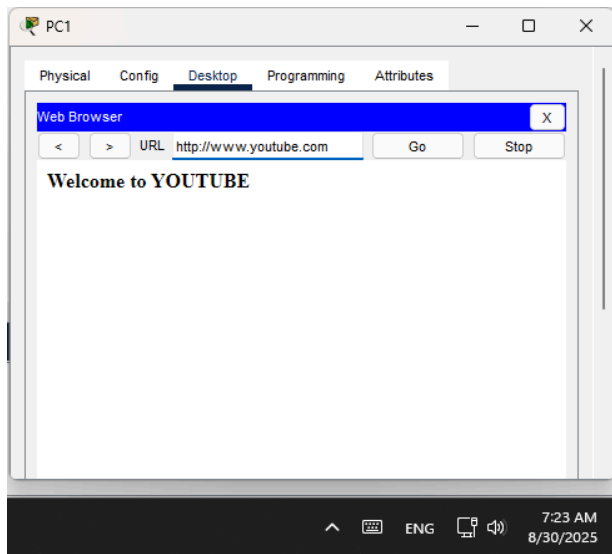
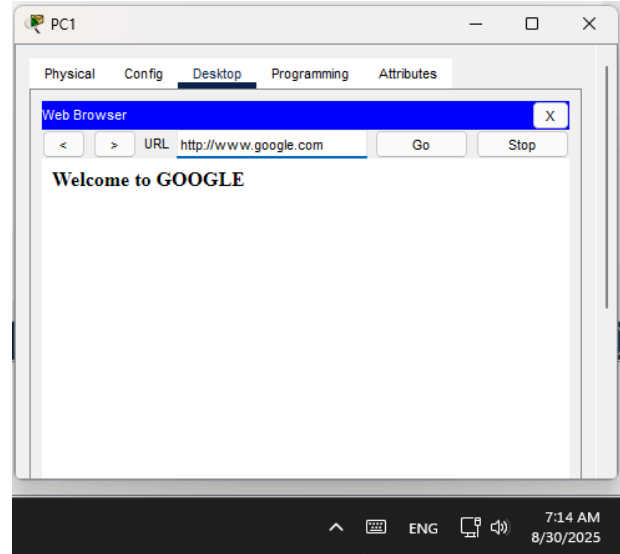


Fig 9: Mapped web address with IP address

- Open a web browser on any end device and type in the website address and the website should appear.



(a)



(b)

Fig 9: Web Browser (a) Google (b) Youtube

Lab 4: Implementation of FTP

Objective:

Enable an FTP server to facilitate file transfers

Theory:

The File Transfer Protocol (FTP) is a standard communication protocol used for the transfer of computer files from a server to a client on a computer network. FTP is built on a client– server model architecture using separate control and data connections between the client and the server. FTP users may authenticate themselves with a clear-text sign-in protocol, normally in the form of a username and password, but can connect anonymously if the server is configured to allow it. For secure transmission that protects the username and password, and encrypts the content, FTP is often secured with SSL/TLS (FTPS) or replaced with SSH File Transfer Protocol (SFTP).

Implementation of FTP server:

To implement FTP server, we follow the steps below:

- Create a network with a server, a switch and end devices.

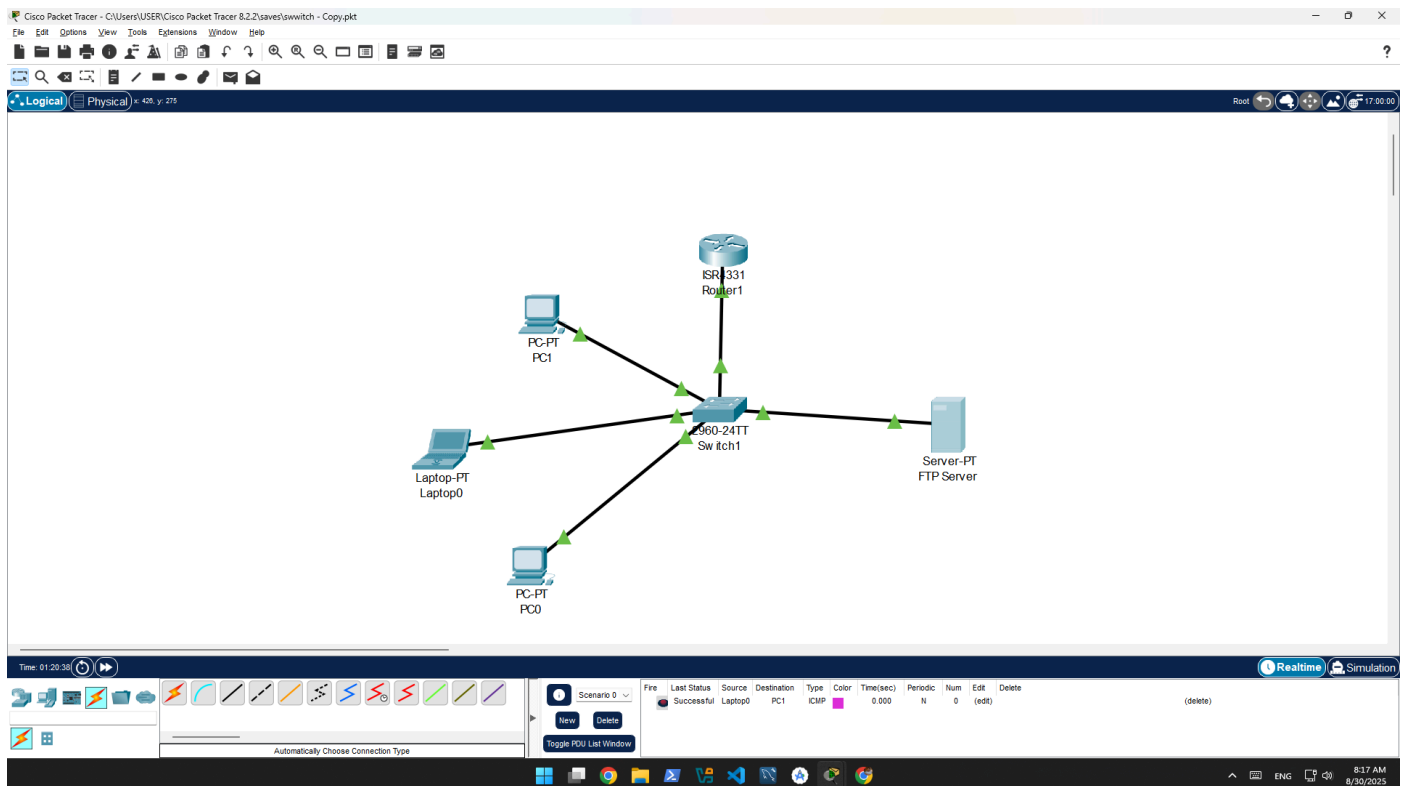


Fig 10 : FTP server Network System

- Assign IP to all devices and server

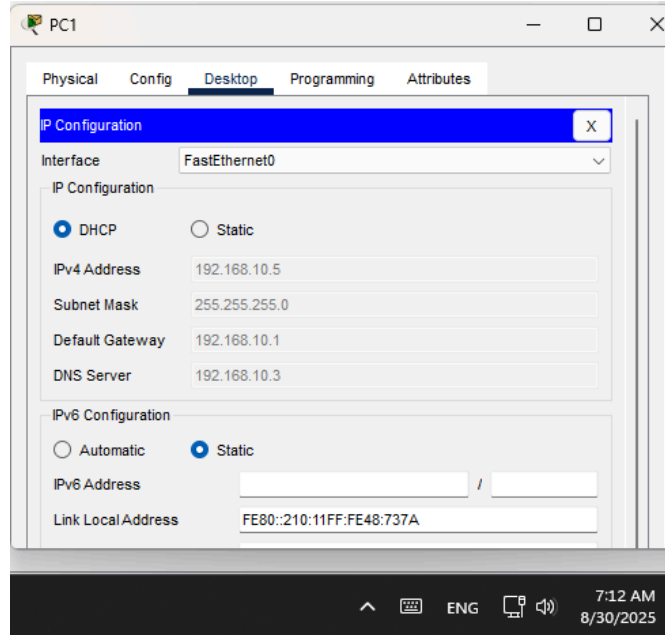


Fig 11: IP Assigned to all devices

- Open server and enable FTP service. Create a username and password and assign the r/w privileges and click add.

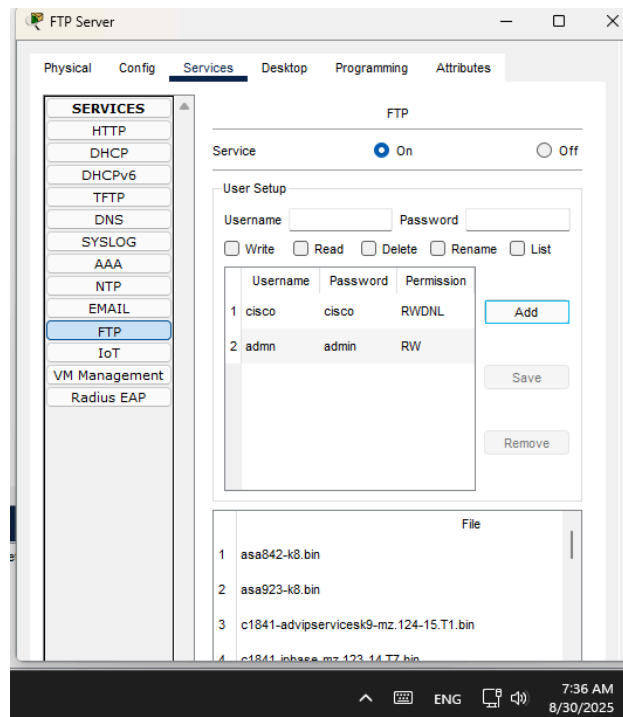


Fig 12: FTP configuration

- Open the end device and go to the command prompt and type ftp [server ip].use the previously created username and password and log in.

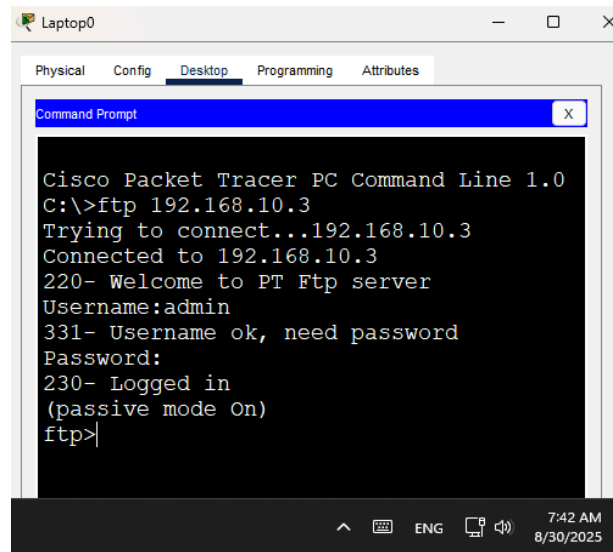


Fig 13: FTP login

- We can now perform file operations on the ftp server using commands like delete, rename etc

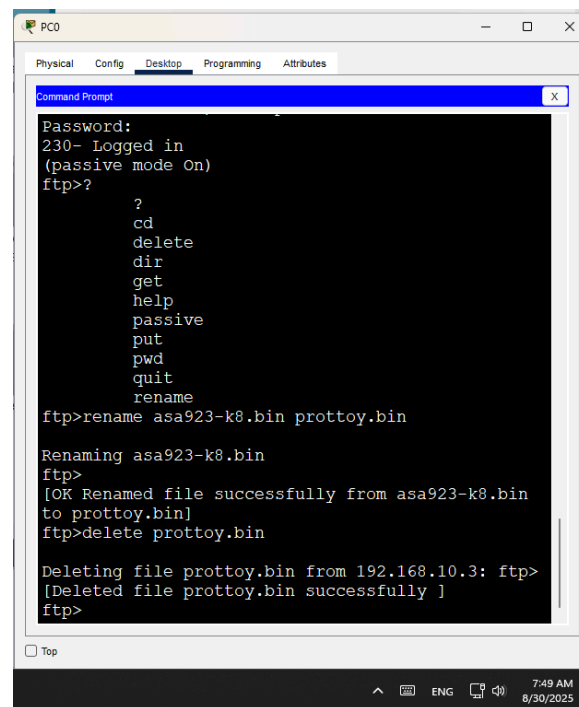


Fig 14 : Rename and delete command on FTP server

Task 4: Implementation of HTTP

Objective:

1. To know about the HTTP
2. To know about the web server, and perform http operation Theory

Implementation:

The implementation of HTTP, or Hypertext Transfer Protocol, involves the creation of software systems that enable communication between clients, such as web browsers, and servers, such as web servers. HTTP operates on a request-response model, where clients send requests to servers, and servers respond with the requested resources or information. The implementation process typically includes developing HTTP servers capable of handling incoming requests, parsing request headers, processing data, and generating appropriate responses. Additionally, HTTP clients are designed to send requests, interpret responses, and handle various status codes. Implementation efforts focus on adhering to HTTP specifications, optimizing performance, ensuring reliability, and incorporating security measures to create robust and efficient systems for web communication.

HTTP working:

Http respond to the client request in either of the following two ways:

1. Sending the file to the client associated with the requested URL.
2. Generating response by invoking a script and communicating with the database.

Configuring a HTTP:

To configure a web server, we follow the steps below:

- Create a network with a switch, a server and end devices.

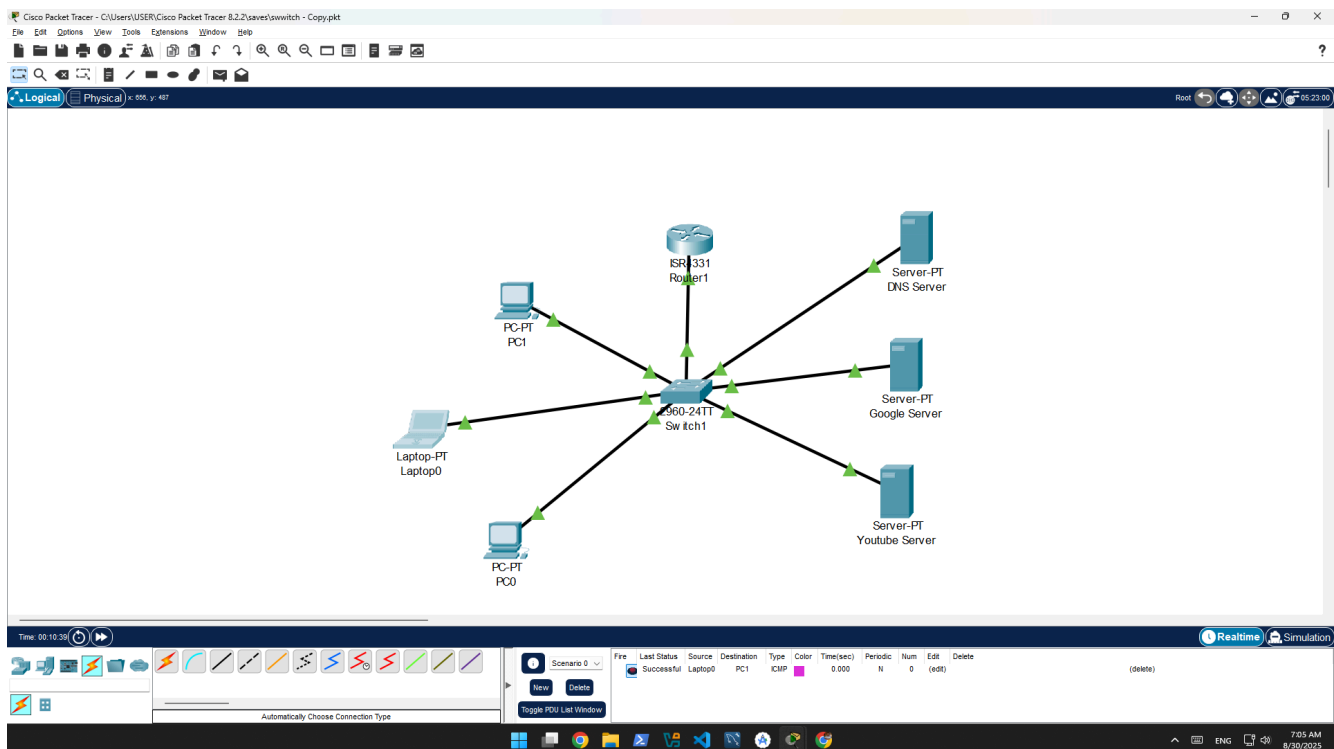
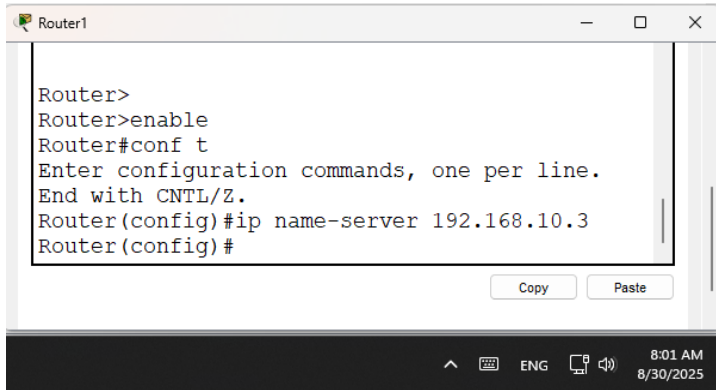
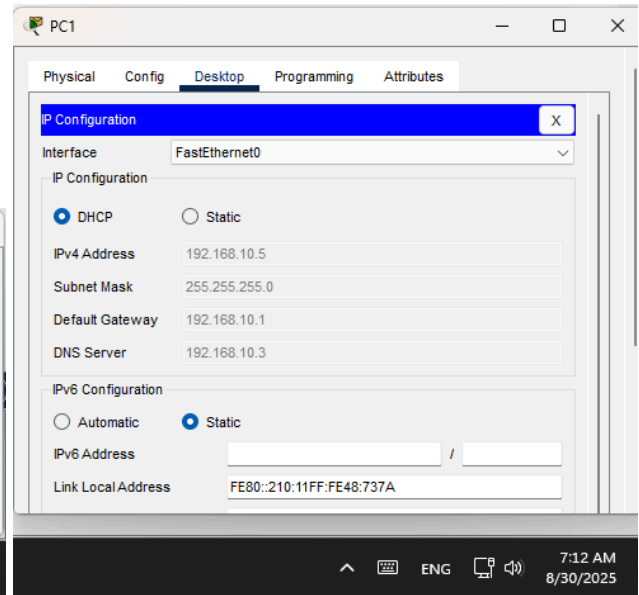


Fig 15 : HTTP Network

- Configure IP's of switch server and end device



(a)



(b)

Fig 16 : IP Configuration (a) Router Configuration (b) End Devices Configuration

- Open server. Go to the services tab. Click https and turn http and https on.

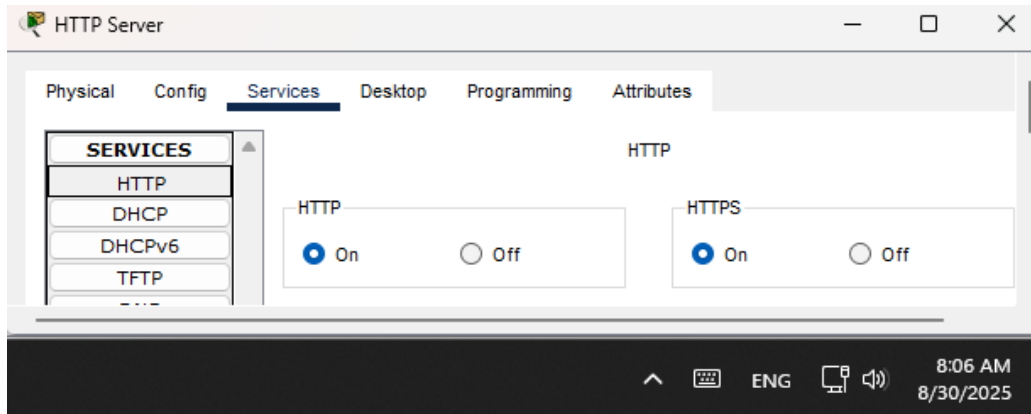


Fig 17: Turn on HTTP service

- Edit the index.html file and save

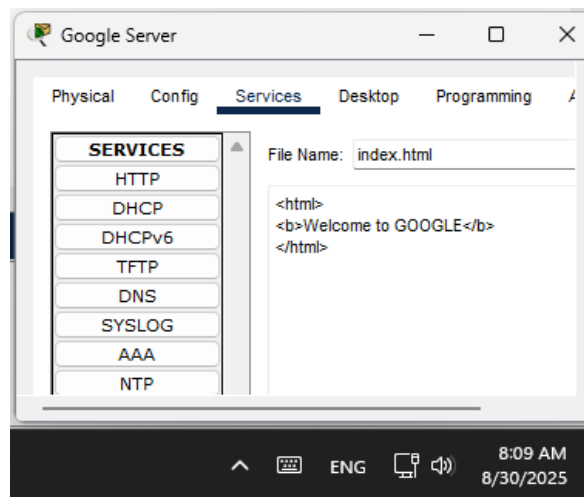
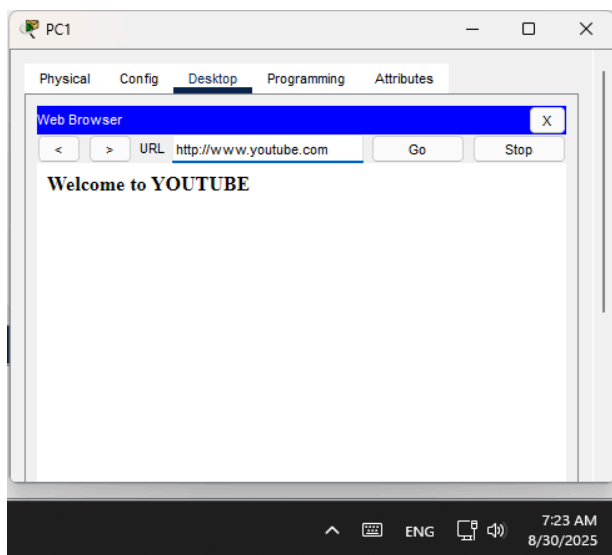
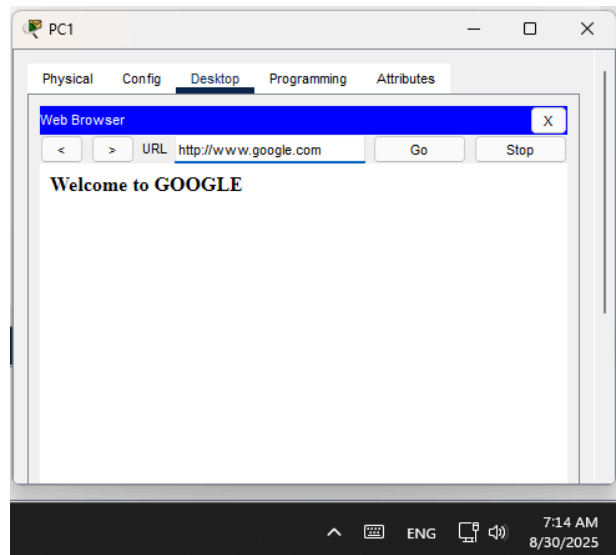


Fig 18 : Index.html file of google server

- Open up browser and type IP of the webserver and the website will open up



(a)



(b)

Fig 19: Web Browser (a) Google (b) Youtube

Task 5: Implementation of Email Server

Objective:

To configure an email server

Theory:

An email server implementation involves configuring software systems to manage the sending, receiving, and storage of email messages. This process includes setting up mail transfer agents (MTAs) to route messages between servers, configuring mail delivery agents (MDAs) for storing messages in user mailboxes, and establishing domain name system (DNS) records for proper mail routing. Security measures such as encryption protocols and authentication mechanisms are implemented to protect email communications, while additional features like spam filtering and antivirus scanning enhance reliability and security. Support for email protocols like SMTP, IMAP, and POP3 enables clients to access their emails securely, contributing to the overall goal of providing reliable and efficient email communication services.

Configuring an Email Server

To configure a web server, we follow the steps below:

- Create a network with a Switch, a Router, a Server and End Devices

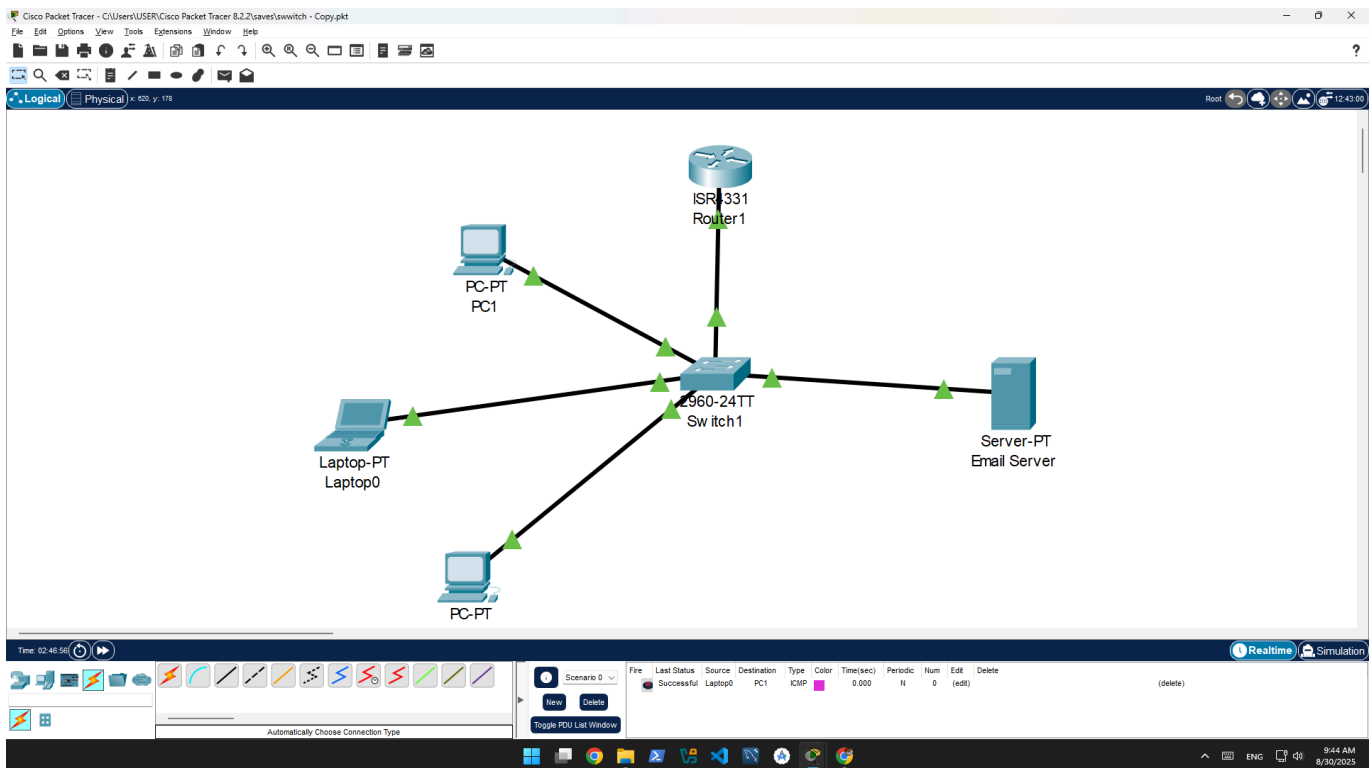


Fig 20 : Email Server Network

- Open server. Go to the services tab. Click Email and turn SMTP and POP3 service on And Fill Create a Domain name as well as user setup.

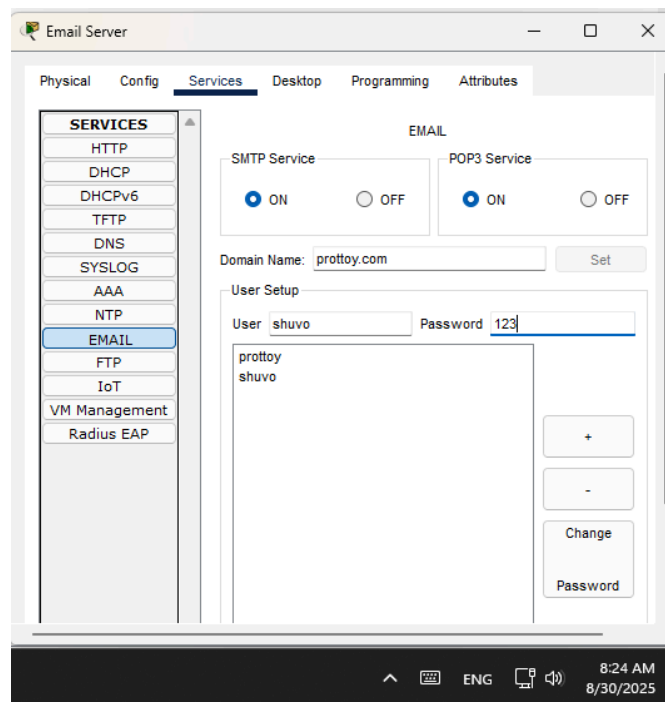


Fig 21 : Mail Server Configuration

- Click on Prottoy's desktop, navigate to the Desktop tab, open the Email application, and compose the email.

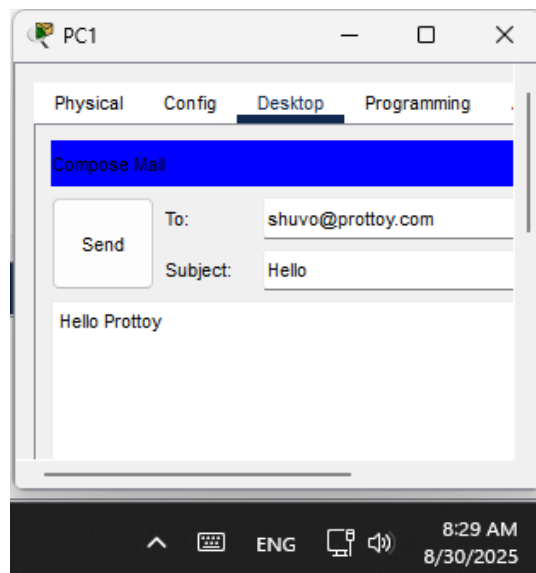


Fig 22 : Mail Composed

- Click on Shuvos PC, navigate to the Desktop tab, open the Email application, and Receive the email.

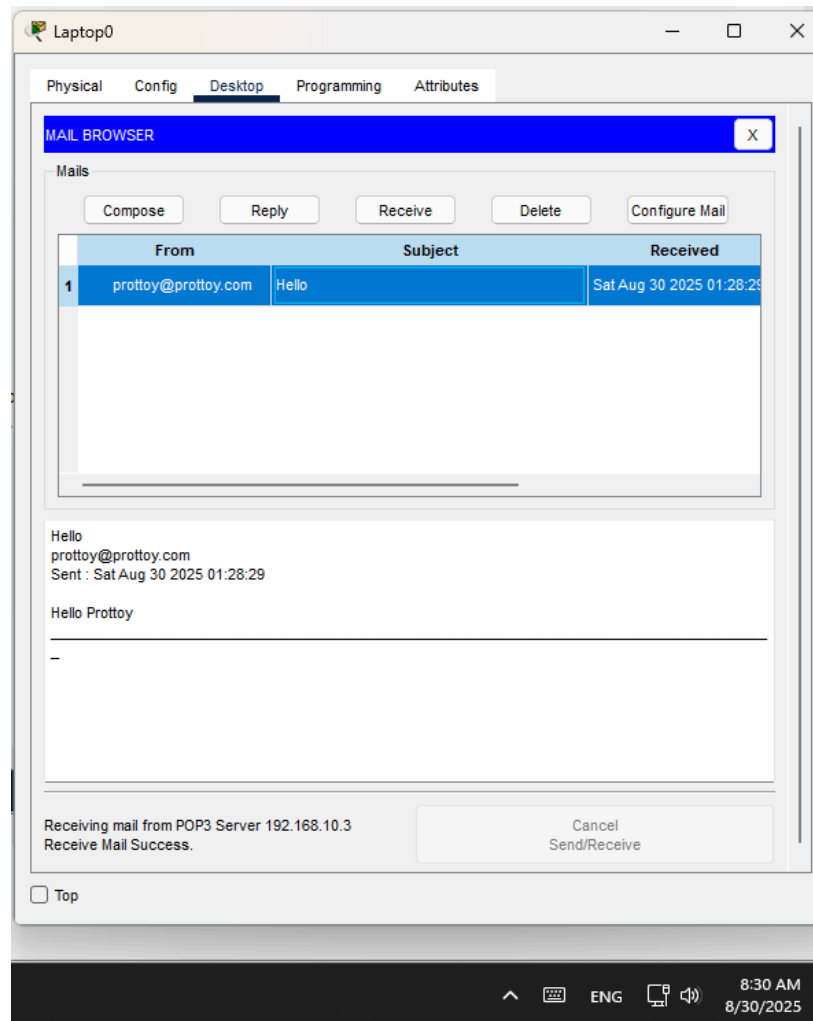


Fig 23 : Mail Received