NAME: B.V.S.Bhuvan UGID: 21WU0102038 CN lab Report

LAB – 5

AIM: Using socket programming establish communication between two end users and IP addresses by exchanging words:

Components Required:

1. Computer with C compiler
2. Two terminals and a network connection

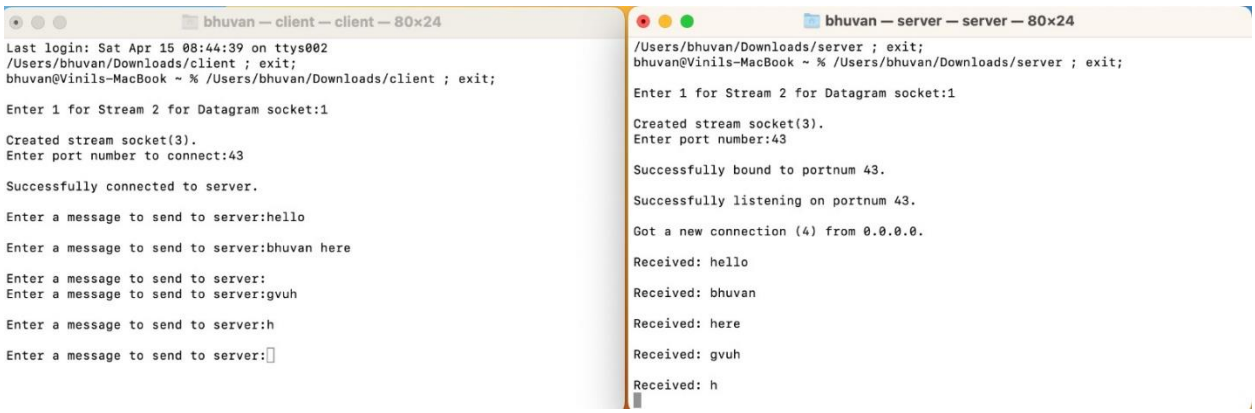
Theory:

Socket programming is a way of communication between processes, applications, and computers on a network using sockets. A socket is a software endpoint that allows a computer to communicate with another computer or device over a network. In socket programming, the applications running on different computers communicate with each other by sending data through sockets. TCP (Transmission Control Protocol) is a connection-oriented protocol that provides reliable, ordered, and error-checked delivery of data between applications. UDP (User Datagram Protocol) is a connectionless protocol that sends packets of data, but without a guarantee of delivery.

Procedure:

1. Give PC the ip addresses and port numbers for sender and receiver.
2. Create a socket object for the sender using the socket () method and specify using ipv4 addresses.
3. Bind the socket to sender's IP address and port number using the bind () method
4. Create a socket object for the receiver.
5. Connect the receiver's socket to the sender's Ip address and port number using the connect () method
6. Send a message from the sender to receiver using send () method
7. Receive the message on the receiver's end using the recv() method.
8. Print the received message on the receiver's end.

Observation:



Result:

Now by this we have successfully established the communication between sender and receiver using socket programming by exchanging words.

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LAB-6

AIM: Using socket programming establish communication between two end users by using their Ip addresses by exchanging files:

Components required:

1. Computer with C compiler
2. Two terminals and a network connection

Theory:

Socket programming is a way of communication between processes, applications, and computers on a network using sockets. A socket is a software endpoint that allows a computer to communicate with another computer or device over a network. In socket programming, the applications running on different computers communicate with each other by sending data through sockets. TCP (Transmission Control Protocol) is a connection-oriented protocol that provides reliable, ordered, and error-checked delivery of data between applications. UDP (User Datagram Protocol) is a connectionless protocol that sends packets of data, but without a guarantee of delivery

Procedure:

1. Define the port numbers for the sender and receiver terminal

2. Create a socket object for the sender using the socket() method

3. Bind the socket to sender's port number using the bind() method

4. Create a socket object for the receiver.

5. Connect the receiver's socket to the sender's port number using the connect() method

6. Send the file from the sender to receiver using send() method

7. Receive the file on the receiver's end using the recv() method.

8. Print the received file on the receiver's end

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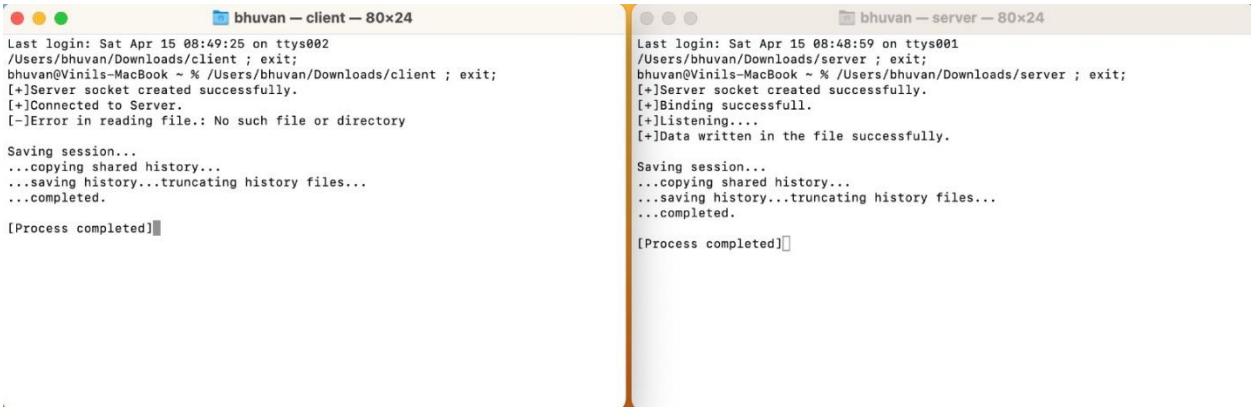
Obseration:



Result: We have successfully demonstrated the communication between sender and receiver using socket programming by exchanging words.

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LAB-7

Aim:

Automatically update the IPv4 address of the Host devices using the DHCP server which is connected through DSL/cable modem using CISCO packet tracer.

Components required:

1. DSL Modem
2. Switches
3. Servers
4. Connecting Cables
5. End Devices
6. Cisco Packet Tracer Software

Theory:

DHCP:

Dynamic Host Configuration Protocol (DHCP) is a network protocol used to automatically assign IP addresses and other network configuration parameters to devices on a network. DHCP works by having a DHCP server maintain a pool of available IP addresses, which it can assign to devices that request an address. DHCP is an important protocol for managing IP address allocation and network configuration in a modern computer network.

DSL modem:

Digital Subscriber Line (DSL) is a technology that allows high-speed internet access over traditional copper telephone lines. The DSL model involves the use of a modem at both the customer's premises and the service provider's central office. The DSL model provides a cost-effective and reliable option for highspeed internet access, particularly in areas where cable and fiber-optic internet infrastructure is not available.

Server:

A server is a computer program or device that provides functionality for other programs or devices, known as clients. Servers can be physical machines, virtual machines, or software applications running on a computer.Servers typically provide services such as file sharing, printing, email, web hosting, database management, and application hosting. In a client-server model, clients make requests to the server for resources or services, and the server responds to those requests.

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Procedure:

1. Create a network topology using dsl modem and connect end devices to it

2. Configure the modem to connect to the Internet

3. Configure the DHCP server

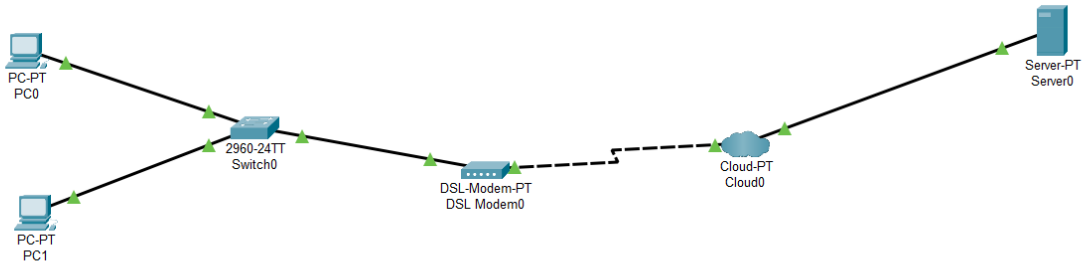
4. Create a new pool for the ip address using Add option

5. Enter the starting and ending ip address for the pool, subnet mask, default gateway and DNS server address.

6. Save the DHCP pool configuration and enable DHCP service

7. Configuring end devices to automatically obtain an IP address from DHCP server by selecting the IP Configuration setting and selecting DHCP.

Observation:



Result:

By this I can conclude that we can observe IPv4 address of the end devices is automatically updated using the DHCP server.

LAB -8

AIM:

DHCP, HTTP, and DNS server configuration and communication with the Host devices through DSL/cable model using CISCO packet tracer.

Components required:

1. Router
2. Switch
3. Servers
4. End Devices
5. Cables

Theory:

DHCP:

Dynamic Host Configuration Protocol (DHCP) is a network protocol used to automatically assign IP addresses and other network configuration parameters to devices on a network. DHCP works by having a DHCP server maintain a pool of available IP addresses, which it can assign to devices that request an address. DHCP is an important protocol for managing IP address allocation and network configuration in a modern computer network.

Server:

A server is a computer program or device that provides functionality for other programs or devices, known as clients. Servers can be physical machines, virtual machines, or software applications running on a computer. Servers typically provide services such as file sharing, printing, email, web hosting, database management, and application hosting. In a client-server model, clients make requests to the server for resources or services, and the server responds to those requests.

HTTPS:

Hypertext Transfer Protocol Secure (HTTPS) is an extension of the Hypertext Transfer Protocol (HTTP) used for secure communication over the internet. HTTPS provides a secure connection between a web browser and a web server, ensuring that the data exchanged between the two is encrypted and cannot be intercepted or tampered with by third parties. HTTPS works by using a Secure Sockets Layer (SSL) or

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Transport Layer Security (TLS) encryption protocol to encrypt data transmitted between the web browser and the web server.

DNS:

The Domain Name System (DNS) is a hierarchical naming system that translates human-readable domain names into IP addresses that machines can understand. DNS serves as the internet's phone book, allowing users to easily access websites by typing in their domain names instead of having to remember complex IP addresses. When a user enters a domain name into their web browser, DNS servers use a series of queries to locate the IP address associated with that domain name and return it to the user's machine, allowing the web page to be accessed. DNS is critical to the functioning of the internet and plays a crucial role in the routing of internet traffic.

Procedure:

1. Connecting the routers and servers in architecture as shown below

2. Configure the DHCP server by setting the IP range, sub netmask and default gateway. Assign a DNS server address

3. Configure the Web server by setting up the IP address and port number

4. Configure the DNS server by setting up the IP address and domain name

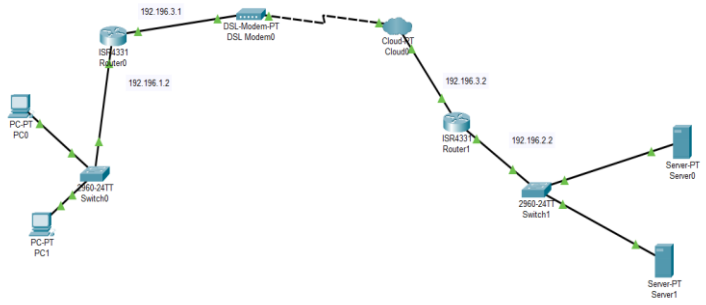
5. Test communication between the host devices and servers using ping commands.

6. Test the DHCP server by connecting host device to network and verify that it obtains IP address automatically

7. Test the HTTP server by opening a web browser on a host device and accessing the server's IP address and port number.

8. Test the DNS server by opening a command prompt on a host device and performing a DNS lookup on the server's domain name.

Observation:



Result:

By this we can conclude that we have successfully configured the DHCP, HTTP and DNS servers to communicate with the end devices.

LAB- 9

AIM:

A small institution is spread over 3 floors in a building where each floor contains three departments. The LAN details and departments of each floor are given as; 1 st floor: 192.156.1.0/24 (reception), 192.156.2.0/24 (admissions), 192.156.3.0/24 (career connect); 2 nd floor: 192.156.4.0/24 (technology), 192.156.5.0/24 (business), 192.156.6.0/24 (architecture); 3 rd floor: 192.156.7.0/24 (administration), 192.156.8.0/24 (operations), 192.156.9.0/24 (IT support);

a. There should be three routers connecting each floor through RIP (all placed in the server room in the third floor and the ISP is given out a base address of 192.156.9.0/24).

b. All routers should be connected through DCE/DTE cables.

c. Each floor should have access points for wireless devices and each department is expected to have at least one printer.

d. All the devices in the network are expected to obtain the IP address dynamically through configured DHCP server and communicate with the DNS server for mapping the domain name with an IP address. e. All the devices are expected to communicate with each other.

Components required:

1. Servers

2. DSL Modem

3. Routers

4. End Devices

5. Swtich

6. Connecting Cables

Theory:

DHCP:

DHCP, or Dynamic Host Configuration Protocol, is a network protocol that automatically assigns IP addresses and network configuration parameters to devices within a network. This is done through a DHCP server, which keeps a pool of available IP addresses to be assigned upon request. DHCP is a crucial protocol for effectively managing IP address allocation and network configuration in contemporary computer networks.

Server:

A server is a program or device that offers functionality to other devices or programs, which are referred to as clients. Servers can come in the form of physical or virtual machines, as well as software applications running on a computer. Some common services provided by servers include file sharing, printing, email, web hosting, database management, and application hosting. In a client-server model, clients request resources or services from the server, which then responds to those requests.

DNS:

The Domain Name System (DNS) is a hierarchical naming system that converts user-friendly domain names into IP addresses that machines can interpret. It acts as the internet's directory, simplifying the process of accessing websites by allowing users to enter domain names instead of complicated IP addresses. To locate the IP address linked with a domain name, DNS servers perform a series of inquiries when a user inputs a domain name into their web browser. Once the IP address is retrieved, the web page can be accessed. DNS is indispensable to the internet's operation and has a vital function in directing internet traffic.

Procedure:

1. Setup the network topology as shown below. Place all the routers in Server Room, 3rd floor

2. Configure the routers using RIP to enable communication between the different floors.

3. Each Router was connected to each other using DCE/DTE cables and the ISP was given a base address of 192.156.9.0/24

4. Access points were set up on each floor to enable wireless connectivity for devices.

5. Each department was expected to have at least one printer, and these were set up on each floor and connected to the respective routers.

6. Setup the DHCP server to allocate IP addresses dynamically to all devices in the network. The IP address range for each floor was set up to match the respective subnet masks.

7. The DNS server was there to map the domain to Ip addresses for all the devices in the network.

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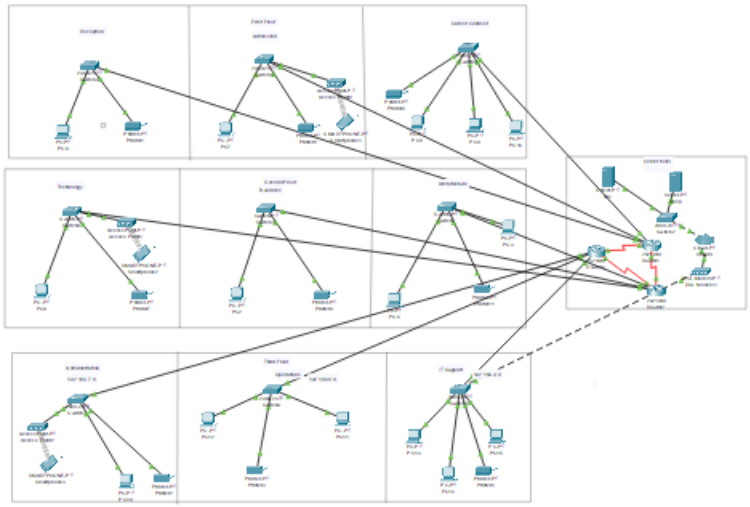
Obseration:



Result:

The successful implementation of this network setup demonstrated the effective use of RIP for routing information exchange, DCE/DTE cables for connecting routers, access points for enabling wireless connectivity, and DHCP/DNS servers for IP address allocation and domain name mapping. The network met all requirements and provided effective communication between devices in different departments and floors.