# Lab Report - 04

**Course Title** **:** Computer Networks Lab
**Course Code** **:** CSE 320
**Report Name** **:** DNS, HTTP, SMTP, DHCP, Email Server Configuration.

## Submitted By :

Name :  Md. Mursalin Hasan Nirob

ID No : 21225103423

Intake : 49

Section : 10

Program : B.Sc. Engg. in CSE

## Submitted To :

Name : Mr. Shamim Ahmed

Assistant Professor
Department of : CSE

Bangladesh University of Business &
Technology

**Date of Submission: 19/09/2024**

## 1. Objectives

The main objective of this lab is to simulate and analyze a network topology consisting of both wired and wireless devices. This lab demonstrates the interaction between client devices (such as laptops, PCs, smartphones, and tablets) and various servers providing services such as HTTP, DNS, DHCP, and email. Key tasks include understanding how network devices communicate within a local area network (LAN) and how services are provided to both wired and wireless devices.

## 2. Necessary Tools

### 2.1 Software:

**Cisco Packet Tracer**: A network simulation tool used to design and simulate networking environments.

### 2.2 Hardware:

- **Servers**: For providing HTTP, DNS, DHCP, and Email services.
- **Switch**: A central network device that connects multiple devices on the network.
- **Access Point**: A wireless access point for enabling wireless connectivity for mobile devices.
- **Client Devices**: Laptops, PCs, Smartphones, and Tablets.

## 3. Theory/Background

A **Local Area Network (LAN)** is a network that connects devices within a small geographical area, such as an office or home. The LAN setup in this lab involves both wired and wireless connections, which allow different types of devices to access common services like email, web browsing, and domain name resolution.

- **Switch**: Central device that directs traffic among all connected wired devices.
- **Access Point**: Provides wireless connectivity, allowing mobile devices (smartphones, tablets) to connect to the network.
- **Servers**: Offer various services such as:

  - ➤ **HTTP Server**: Delivers web content via the HTTP protocol.
  - ➤ **DNS Server**: Resolves domain names into IP addresses.
  - ➤ **DHCP Server**: Dynamically assigns IP addresses to devices.
  - ➤ **Email Servers (Gmail and Yahoo)**: Provide email services to clients.

Networking involves both **wired** connections for devices like PCs and **wireless** connections through an access point for mobile devices.
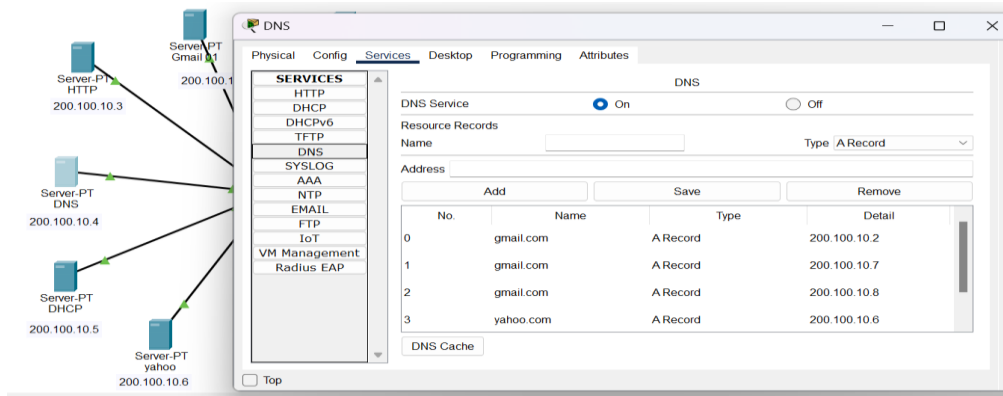
## 4. Figures
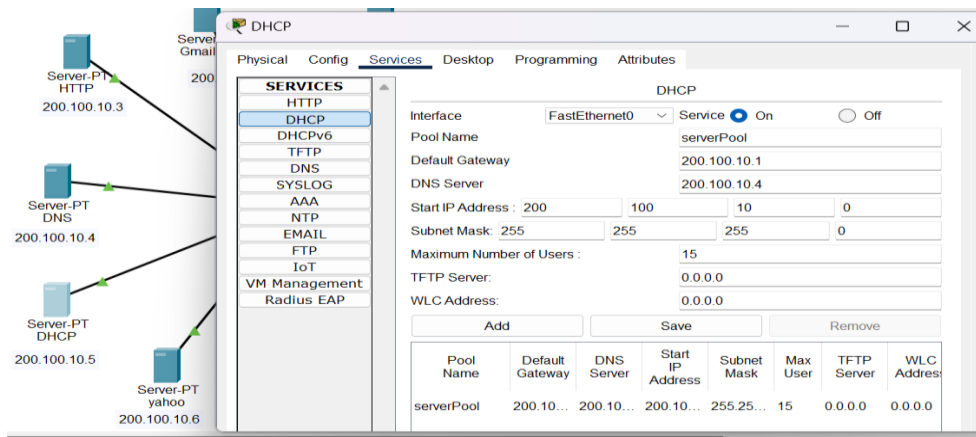


**Figure 4.1:** DNS Server.



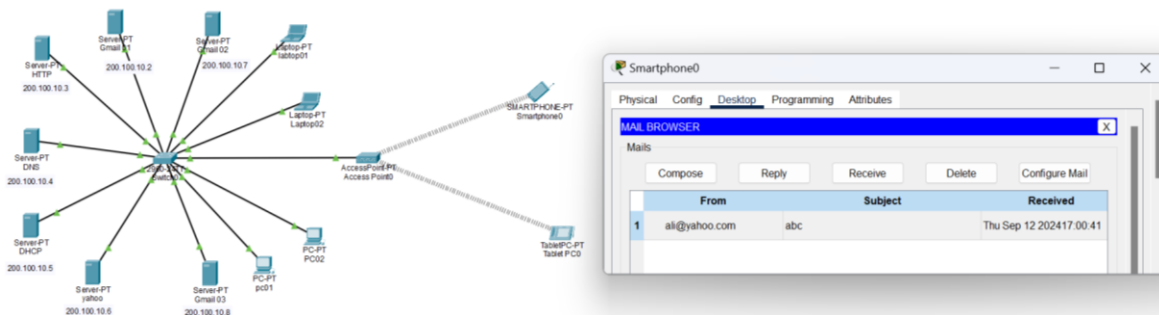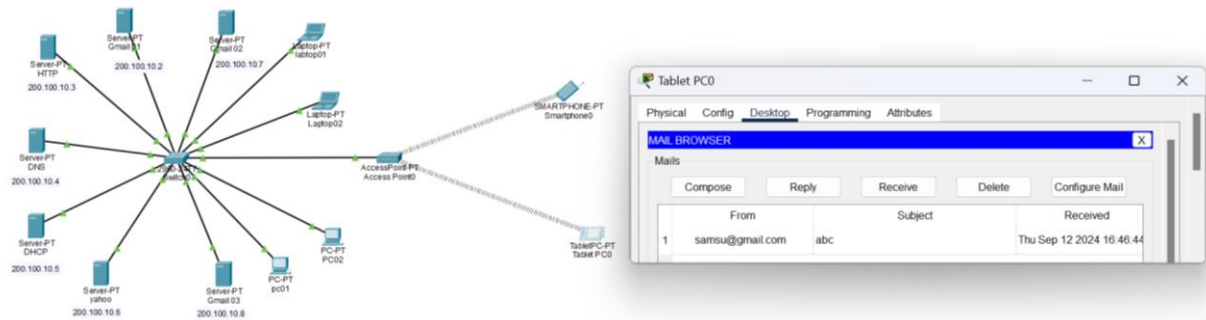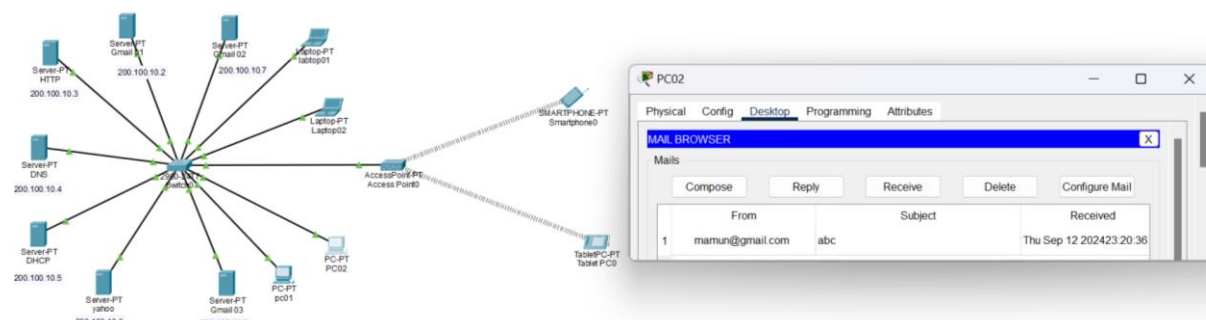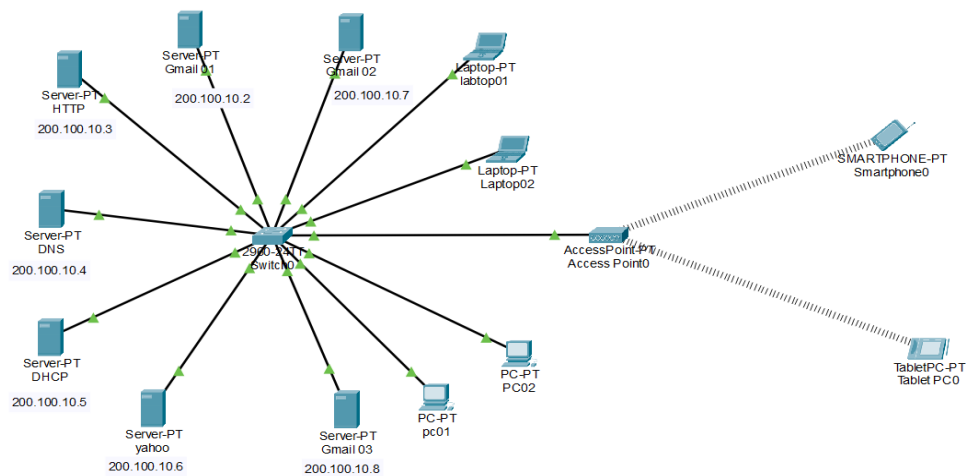**Figure 4.2:** DHCP Server.



**Figure 4.3:** Smartphone to Yahoo Server.

**Figure 4.4:** Tablet to Gmail Server.



**Figure 4.5:** PC 02 to Gmail Server 03.



**Figure 4.6:** DNS, HTTP, and SMTP servers interact within the network.

## 5. Programs or Procedure

### 5.1: Open Cisco Packet Tracer

- Launch **Cisco Packet Tracer** and create a new project by selecting the **New** option from the File menu.

### 5.2: Setup the Network Devices

- **Switch:** Add a **2960-24TT** switch to the workspace.
- **Servers:** Add the following servers with their respective IPs:
  - HTTP (200.100.10.3)
  - DNS (200.100.10.4)
  - DHCP (200.100.10.5)
  - Gmail (200.100.10.2, 200.100.10.7, 200.100.10.8)
  - Yahoo (200.100.10.6)
- **PCs and Laptops:** Add two PCs (**PC01, PC02**) and two laptops (**Laptop01, Laptop02**).
- **Wireless Devices:** Add **Tablet PC0** and **Smartphone0**.
- **Access Point:** Add an **Access Point-PT** for wireless connectivity.

### 5.3: Connect the Devices

- **Wired Connections:** Use **Copper Straight-Through** cables to connect servers, PCs, and laptops to the switch.
- **Wireless Connections:** Connect **Tablet PC0** and **Smartphone0** to the **Access Point**.

### 5.4: Configure the Servers

- **HTTP Server:** Enable the **HTTP service** on the HTTP server.
- **DNS Server:** Enable the **DNS service** and map domain names to IPs (gmail.com to 200.100.10.2, 200.100.10.7, 200.100.10.8 and yahoo.com to 200.100.10.6).
- **DHCP Server:** Enable **DHCP** and set the IP address pool.
- **Email Servers:** Configure **SMTP/POP3 services** for Gmail and Yahoo servers.

### 5.5: Configure the Wireless Access Point

- Set the **SSID** and security password for the Access Point, then connect it to the switch.

### 5.6: Configure Client Devices

- **Wired Clients:** Configure network adapters on **PC01, PC02, Laptop01, and Laptop02** for dynamic DHCP.
- **Wireless Clients:** Connect **Smartphone0** and **Tablet PC0** to the wireless network and ensure they receive IP addresses via DHCP.

## 6. Inputs and Outputs

**Inputs:**

- **Device Configurations:** Assign IP addresses, configure DHCP and DNS services.
- **Server Addresses:** Set static IP addresses for servers (HTTP, DNS, Email).
- **Wireless Configuration:** Set SSID and password for the access point.
- **Client Device Actions:**
    - **PC and Laptop:** Access web pages, send and receive emails.
    - **Smartphone and Tablet:** Connect to the network wirelessly and perform similar tasks.

**Outputs:**

- **Successful DHCP Assignment:** PCs, Laptops, Smartphones, and Tablets receive IP addresses automatically from the DHCP server.
- **DNS Resolution:** Devices can resolve domain names to their corresponding IP addresses.
- **HTTP Browsing:** Users can access the web page hosted on the HTTP server.
- **Email Access:** Devices successfully send and receive emails using the configured Gmail and Yahoo servers**.**

## 7. Remarks/Comments

- **Network Security**: Implement firewalls and security protocols to protect servers and client devices.
- **Scalability**: The network can be expanded by adding more devices or integrating cloud services.
- **Performance Monitoring**: Tools should be used to monitor traffic, especially on critical servers like HTTP, DNS, and DHCP.