UNIVERSITY OF CHITTAGONG

Department of Computer Science and Engineering

Program: **B.Sc (Engineering)**

Session: 2022-2023

5th Semester

Lab Report - 2

Topic: Router-Based Two Network Communication with DHCP, DNS and Email Server

Course Title: Data Communication Lab

Course Code: CSE - 514

Group - D

Submitted to:

Dr. Iqbal Ahmed
Professor
Dept. of Computer Science and Engineering
University of Chittagong

Submitted by:

Group Members:
ID: 23701003
ID: 23701007
ID: 23701011
ID: 23701013
ID: 23701017

Date of submission: December 06, 2025

Contents

Server Configuration

How to Configure the DHCP Server

We added a DHCP server in Network A to automatically assign IP addresses to all PCs. The server was given a static IP (**192.168.10.3**) and the DHCP service was enabled. Two pools are created for the networks with the following settings:

- For Network-A:

- **Default Gateway:** 192.168.10.2
- **DNS Server:** 172.16.0.3
- **Starting IP:** 192.168.10.10
- **Maximum Users:** 200

- For Network-B:

- **Default Gateway:** 172.16.0.2
- **DNS Server:** 172.16.0.3
- **Starting IP:** 172.16.0.10
- **Maximum Users:** 150

All PCs were set to obtain IP addresses automatically. Each device received its IP, subnet mask, gateway, and DNS. We verified the configuration using `ipconfig` and by pinging devices across the networks.

How to Configure the DNS Server

In this project, we set up a DNS server in Network B so that devices from both networks could access a website using a domain name. We assigned the server a static IP from the Class B network (**172.16.0.3**). In the DNS settings, we enabled the service and created a new record:

- **Name:** csecu.com
- **Address:** 172.16.0.3 (IP of the DNS Server in Network B)

After setting each PC to use this DNS server, we tested it by pinging . Successful replies confirmed that the DNS was functioning properly.

How to Configure the Email Server

We also added an Email server to Network B using a Class B IP address (**172.16.0.5**) and set its domain name to **gmail.com**. After that, we created user accounts for all seven PCs across both networks so they can send and receive emails. To make the email server reachable by name, we added a new DNS record to the DNS server called **mail** and pointed it to the email server's IP address, **172.16.0.5**.

Once the server and DNS were ready, we went through each PC and configured its email settings by entering the correct email address for the user and setting both the incoming and outgoing mail server fields to mail. After this configuration all PCs can send and receive email.

Two-Network Interconnection Diagram

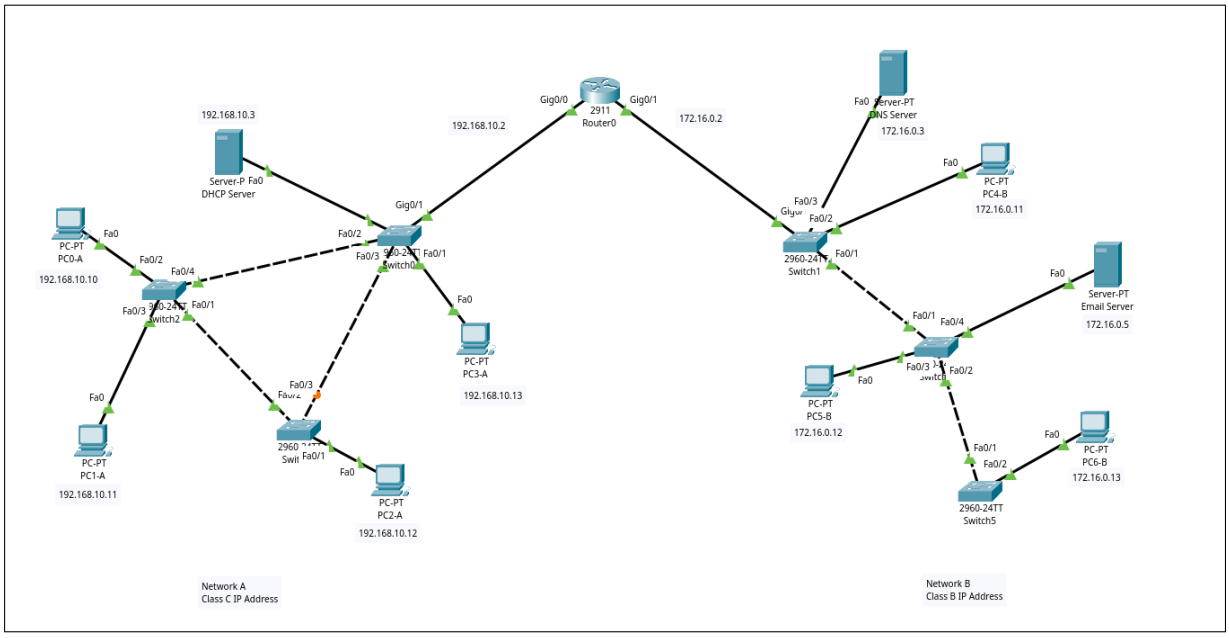

Figure 1: Router-Based Two Network Communication with DHCP, DNS and Email Server

Accessing Website through PC

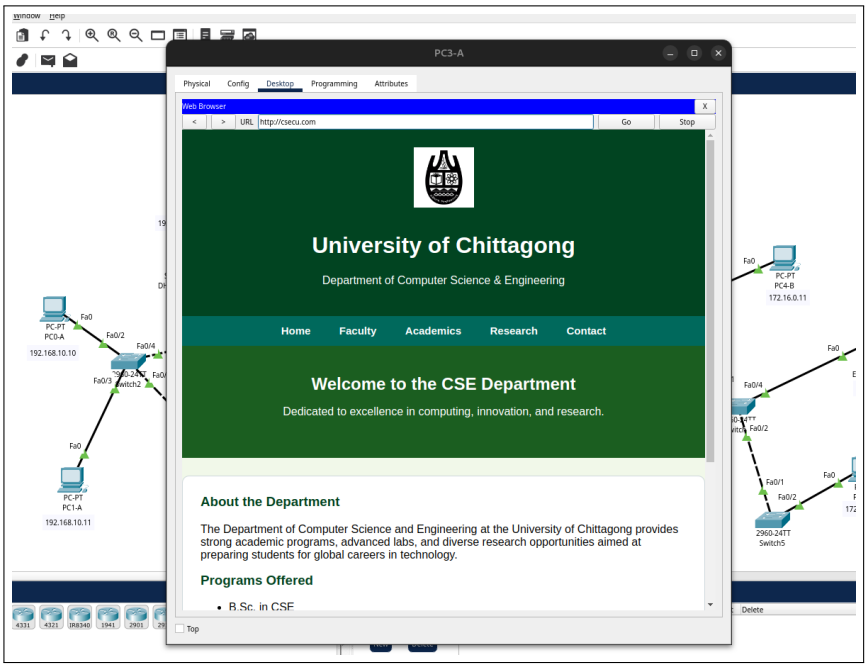

Figure 2: Accessing Website through PC

Sending Email from PC2-A to PC5-B

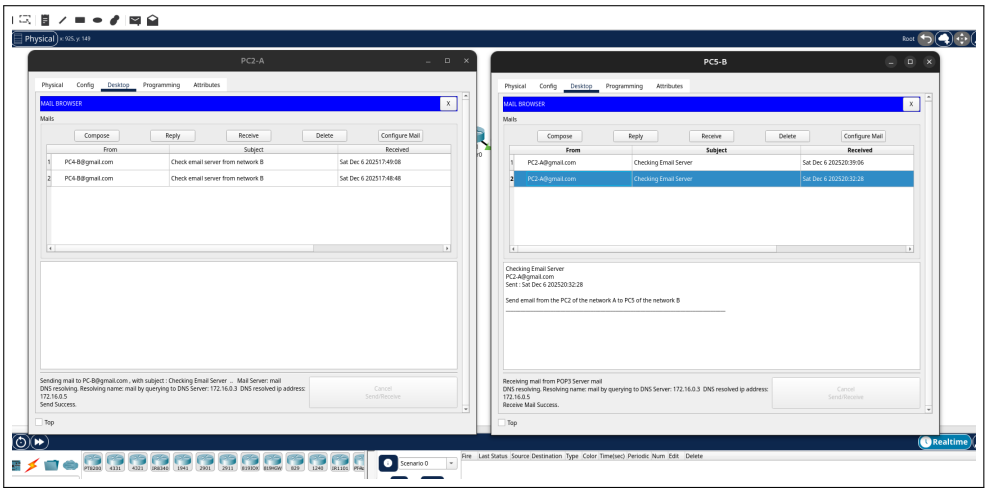

Figure 3: Sending Email from PC2-A to PC5-B

What we learned

- How to build up DHCP, DNS and Email server.
- How to connect and enable them with a router. Also how to configure the interfaces of the router using CLI which works as gateways for networks which connected to the router.
- The importance of SMTP and POP3 services in Email server and why these need to be on. SMTP(Simple Mail Transfer Protocol) is acts as a outgoing mail protocol who carries mail from client to mail server or between mail servers.

  And POP3(Post Office Protocol version 3) is acts as a incoming mail protocol who downloads emails from the mail server to the client's device.(**reference:** Geeks-forgeeks)
- On the DHCP server, there must be a pool named **serverPool** which cannot be removed, but the default gateway and the DNS server IP address can be changed.
- If the DHCP server is in the same network then we do not need to configure `ip hepler-address` from the router interface to that Network. But if it is in different network we need to configure it cause router blocks DHCP's requests coming from the PC's in the network.
- On a DNS server, we can change the default website by editing the **index.html** file in the HTTP service. Since we have basic knowledge of HTML and CSS, we customized it to look like a real website. However, a DNS server itself can host only one website. To host multiple websites, we would need an additional web server.