



Green University of Bangladesh
Department of Computer Science and Engineering (CSE)
Faculty of Sciences and Engineering
Semester: (Summer, Year: 2025), B.Sc. in CSE (Day)

Lab Report: 01

Lab Experiment Name: Configuration of SMTP Server

Course Title : Computer Networking Lab
Course Code : CSE-318 Section : D2

Student Details

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Lab Date : 01-07-25
Submission Date : 08-07-25
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Lab Report Status

[For Teachers use only: **Don't Write Anything inside this box**]

<u>Lab Report</u>	
<u>Status Marks:</u>	Signature:
Comments:	Date:

1. TITLE OF THE LAB EXPERIMENT:

Configuration of SMTP (Simple Mail Transfer Protocol) Server

2. OBJECTIVES:

Design a structured network layout to link Building A and Building B of Green University of Bangladesh. Establish a router connection to bridge the communication between the two buildings. Use switches to interconnect computers and devices within each individual building. Deploy and configure mail servers to facilitate email messaging across both buildings. Integrate DNS servers to enable smooth email routing and domain resolution. Verify proper email functionality by sending messages between devices in each building. Apply essential security measures to protect the mail exchange system.

3. PROCEDURE:

- **Network Architecture Design:**

Start by crafting a network topology that displays how Building A and Building B are interconnected using a central router. Add switches and endpoint devices in each building and show their connectivity paths clearly in the diagram.

- **Hardware Configuration:**

 - Router Setup:**

 - Mount the router at a suitable location where it can serve both buildings efficiently. Link it to the ISP via the WAN port and configure the admin credentials, SSID, and enable WPA2/WPA3 encryption.

 - Switch Installation:**

 - Install one switch in each building and connect them to the router using Ethernet cables. Ensure both switches are capable of internet access and inter-device communication.

- **Device Connectivity:**

 - In Building A:**

 - Link PCs, printers, and other devices to the switch via Ethernet cables. Check all devices for proper power and connection status.

 - In Building B:**

 - Similarly, connect all networked devices to the second switch, allowing local access and communication with Building A.

- **IP Allocation Strategy:**

 - Assign IP address blocks to each building. For instance, 192.168.10.0/24 for Building A and 192.168.20.0/24 for Building B.

 - Use static IPs for critical devices like servers. Let the router's DHCP service handle dynamic IP assignment for client devices within the range.

- **Router Customization:**

Access the router settings using a browser. Configure routing features to ensure both subnets (Building A & B) can communicate. Use either static or dynamic routing depending on the network design.

- **Installing and Setting Up Mail Servers:**

Choose appropriate software like Postfix or Microsoft Exchange. Install them on selected machines in each building. Configure SMTP for sending mail and IMAP/POP3 for receiving. Create user email accounts for staff and students.

- **DNS Server Configuration:**

If not already present, set up DNS services on a separate machine. Add DNS records (such as A and MX records) to resolve domain names to mail server IPs, ensuring smooth message delivery.

- **Email Functionality Testing:**

Try sending test emails from a user in Building A to another in Building B, and vice versa. Observe the mail servers for proper email routing, logging, and delivery success. Resolve any issues like non-delivery or delays.

4. IMPLEMENTATION:

a. Network Design:

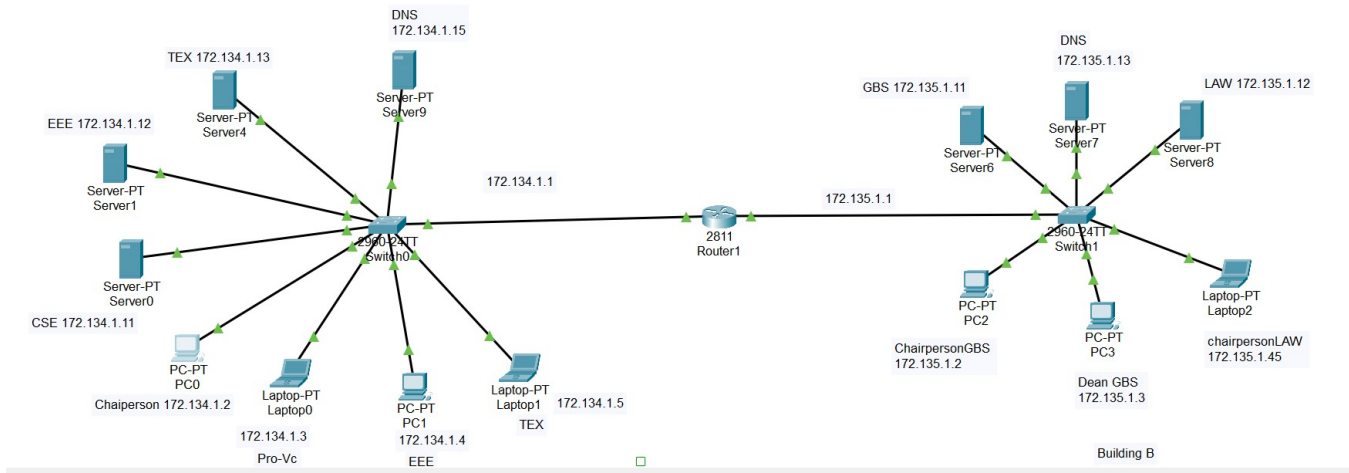
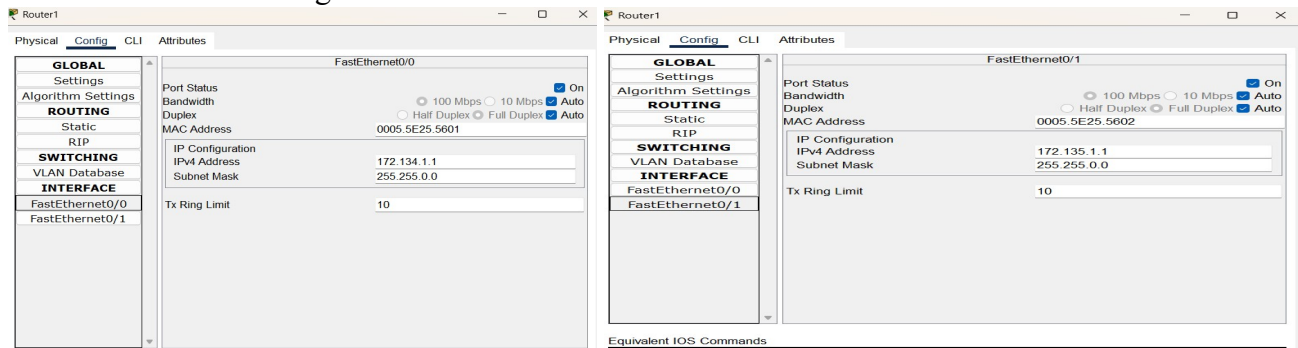


Figure1: Build the network



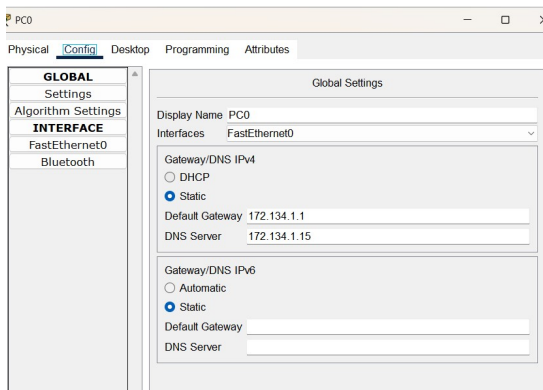
Building A:

- a. Departments: CSE, EEE, tTextile.
- b. Devices:
 - i. CSE: 1 PC (ChairpersonCSE), 1 Laptop (ProVC).
 - ii. EEE: 1 PC (ChairpersonEEE).
 - iii. Textile: 1 Laptop (ChairpersonTEX).
- c. Connects the CSE, EEE, and Textile devices.

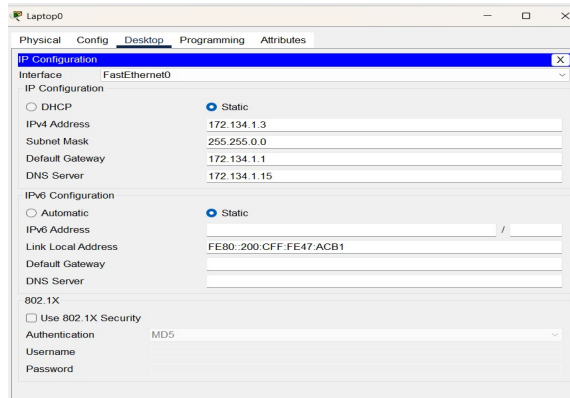
Building B:

- c. Departments: GBS, Law.
- d. Devices:
 - i. GBS: 2 PCs (ChairpersonGBS, DeanGBS).
 - ii. Law: 1 Laptop (ChairpersonLAW).
- e. Connects the GBS and Law devices.

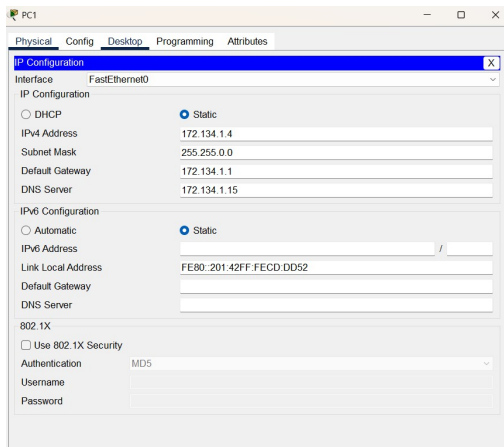
Router: Connects both Building A and Building B for inter-building communication.



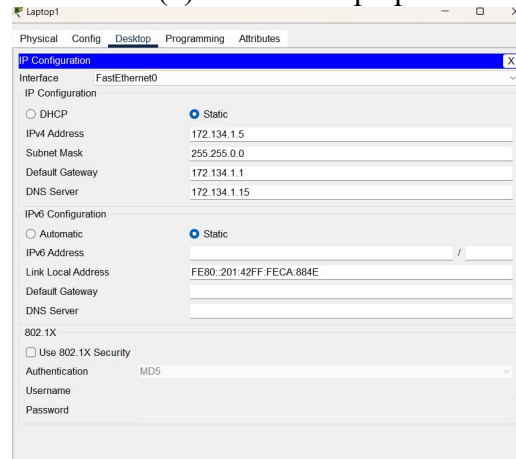
(a) ChairpersonCSE's PC



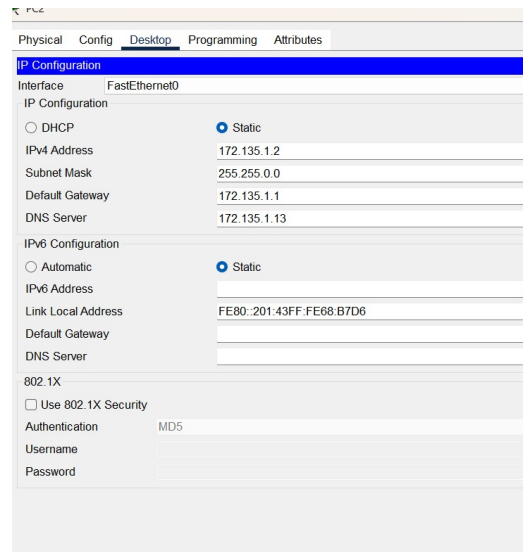
(b) ProVC's Laptop



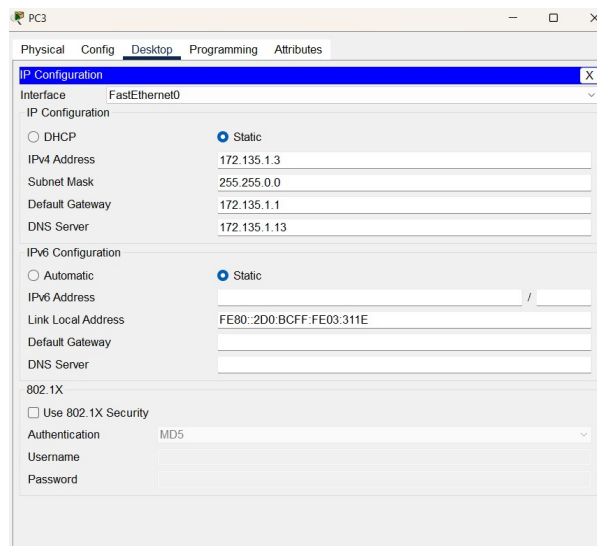
(b) ChairpersonEEE's PC



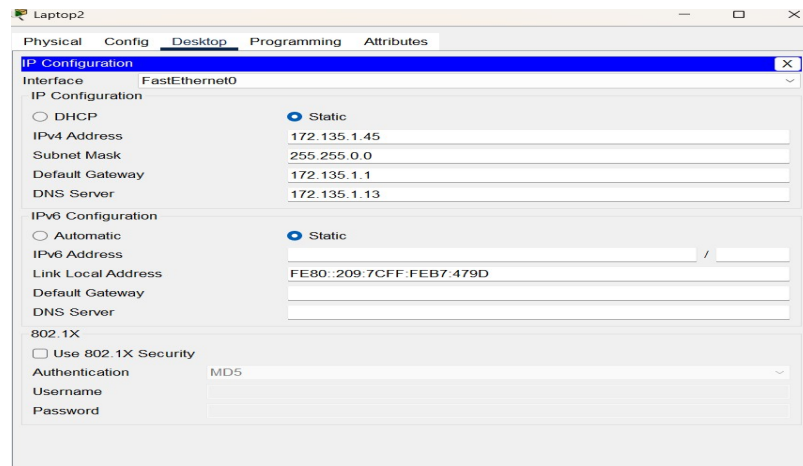
(d) ChairpersonTEX's PC



(e) ChairpersonGBS's PC

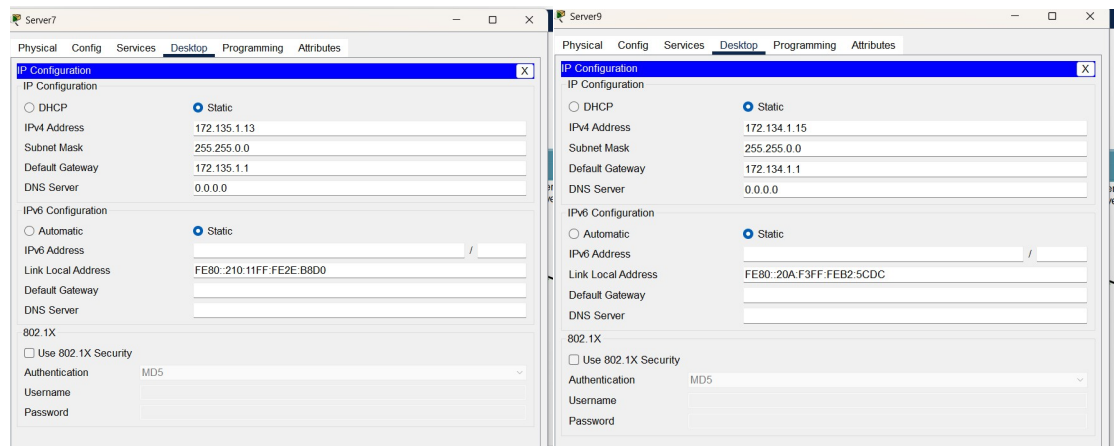


(f) DeanGBS's PC



g) ChairpersonLAW's Laptop

Figure 2: IP Configuration of End Devices



Device IP Configuration:

Figure3: DNS Configuration of End Devices

5. TEST RESULT / OUTPUT

6. ANALYSIS AND DISCUSSION:

While setting up the network infrastructure for Buildings A and B at Green University of Bangladesh, I faced a series of technical challenges that required careful problem-solving:

IP Address Overlap:

At first, some devices showed connectivity errors due to overlapping IP assignments. To resolve this, I allocated unique IP ranges for each building, ensuring no conflicts occurred.

Inter-building Communication Failures:

There were problems where devices from one building couldn't connect to the other. This was traced to incorrect routing configurations. I modified the router's settings and updated the routing table to allow smooth data flow between both networks.

DNS Resolution Errors:

Users were unable to connect to the mail servers using domain names. The issue was with incorrectly configured DNS entries. After updating the DNS records, hostname resolution worked correctly.

Email Delivery Problems:

The email servers were initially unable to send or receive messages reliably. I reviewed the SMTP and IMAP/POP3 configurations, identified the errors, and reconfigured them for stable operation.

Weak Security Configuration:

At the beginning, the email system lacked proper security protocols. To fix this, I enabled SSL/TLS encryption and applied firewall rules to block unauthorized access, improving overall security.

By addressing each issue in a step-by-step manner, I was able to deploy a stable and secure network that supports email communication between the two buildings effectively.

7. SUMMARY:

The implementation of a campus-wide email communication system between two buildings at Green University of Bangladesh was completed successfully. Key outcomes of the project include:

- Developed a reliable and conflict-free IP addressing strategy for both buildings.

- Established accurate routing paths to enable seamless communication between all connected devices.

- Corrected DNS configurations, allowing mail servers to be easily located and accessed.

- Installed and fine-tuned mail server settings to ensure consistent and reliable message delivery.

- Strengthened the system's security by applying encryption standards and protective firewall measures.

This lab not only enhanced my understanding of SMTP and DNS but also provided practical experience in real-world network troubleshooting and security implementation.