Department of
Computer Science and Engineering

University of Dhaka

Title: Configuration of SMTP Server using Cisco Packet Tracer

CSE 3111: Computer Networking Lab

Batch: 28/3rd Year 1st Semester 2024

Course Instructors

Dr. Ismat Rahman (IsR)
Mr. Jargis Ahmed (JA)
Mr. Palash Roy (PR)

1 Objective(s)

- To build and design a network using Cisco Packet Tracer
- To learn about the step-by-step configuration of the SMTP Server using Cisco Packet Tracer
- To learn how to transfer mail from one client to another under different networks.

2 Problem analysis

The Simple Mail Transfer Protocol (SMTP) is an Internet standard communication protocol for electronic mail transmission. Mail servers and other message transfer agents use SMTP to send and receive mail messages. Without an SMTP server, your email wouldn't reach its destination. Additionally, the SMTP server verifies that the outgoing email is from an active account, acting as the first safeguard in protecting your inbox from illegitimate email. It will also send the email back to the sender if it can't be delivered. This informs the sender that they have the wrong email address or that their email is being blocked by the receiving server. Packet Tracer provides Email Server Service to allow composing, sending, and receiving of email. To begin with, SMTP and POP3 (Post Office Protocol 3) services should be enabled to ON first. SMTP is a protocol for sending an email, while POP3 is the 3rd version protocol for holding and receiving an email.

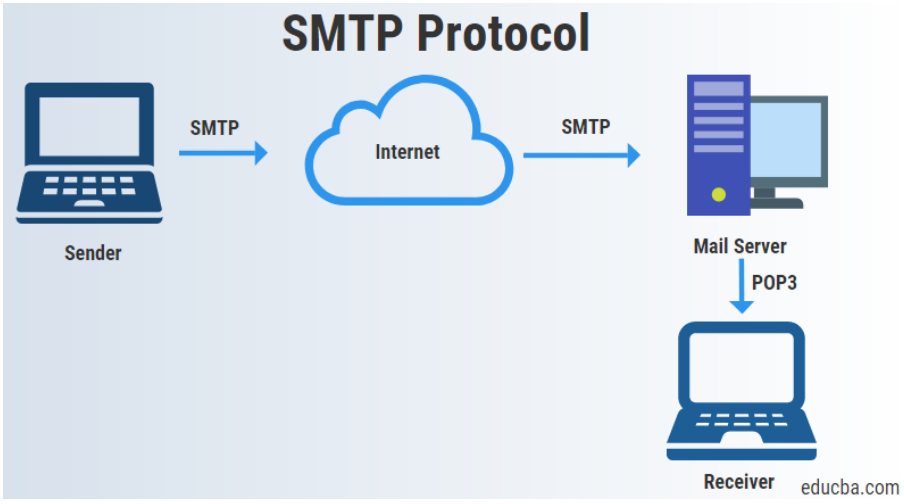


Figure 1: Mail Transfer

3 Procedure

1. Create a network topology by setting up all the necessary devices in Cisco Packet Tracer.
2. Configure static **IP addresses** on the PC, Laptop, Mail server, DNS Server, and other devices.
3. For SMTP Server Configuration, click on the Server and go to the EMAIL option, then on the right side click On to enable the SMTP and POP3. Then, set the domain name and create a user with a password.
4. Notice that a domain name is set for the mail server. For that reason, a DNS server is required for resolving this domain name to an IP address. For DNS server configuration, click on the Server. Then select the DNS option and on the right side, turn on the DNS. After that, set the domain name and IP address. Finally, add them to the server.
5. Now, configure the mail client on the PCs. Click PC and click the Desktop tab > Email. Enter your Name, Email address, incoming Mail Server, outgoing Mail Server, user Name, and Password. Finally, save the information. After completing the process, the Mail Browser window displays. Now, the client can compose, reply, delete, and receive email.

4 Configuration

1. Build the network topology

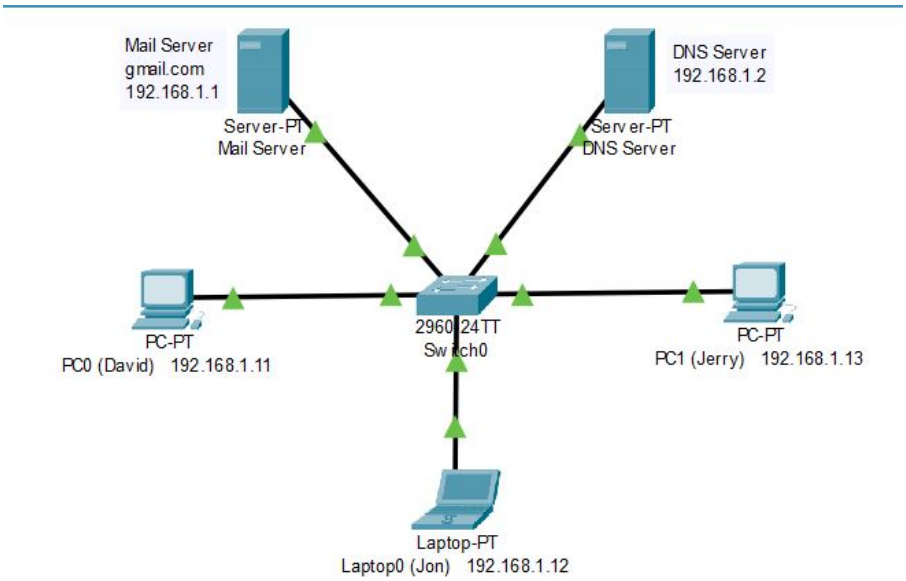
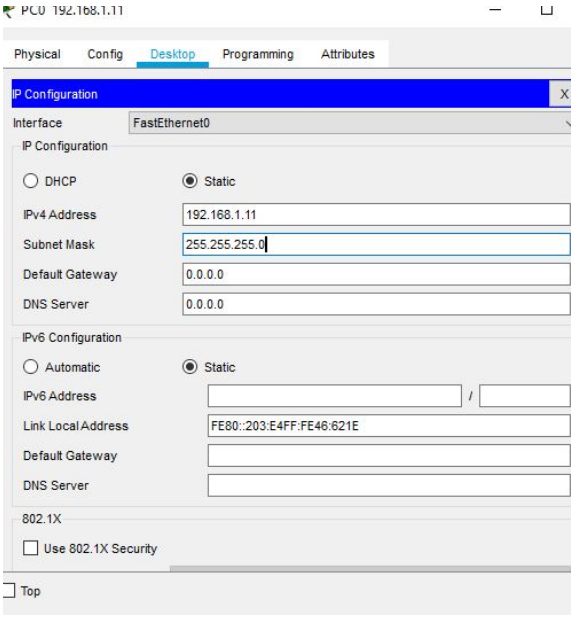


Figure 2: Build the network

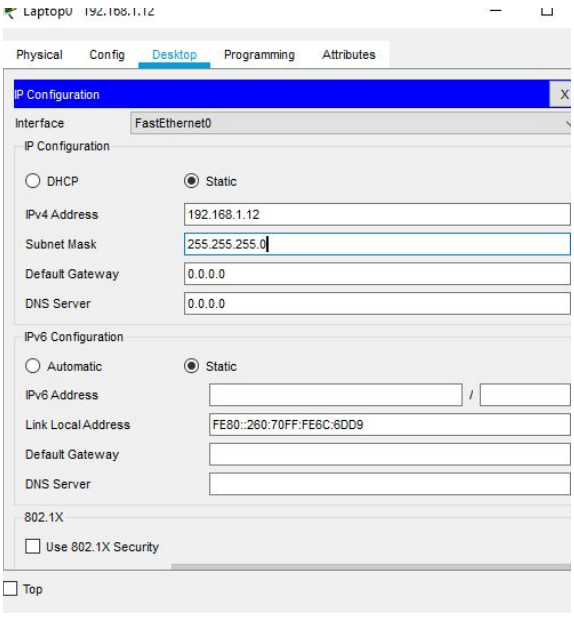
2. Configure static **IP addresses** on the PC, Laptop, Mail server, and DNS server (Figure 3).
   a) Click the device and go to the **Desktop tab** > **IP Configuration**.
   For PC0 (David): Set 192.168.1.11 as IP address and 255.255.255.0 as Subnet Mask.
   For Laptop0 (Jon): Set 192.168.1.12 as IP address and 255.255.255.0 as Subnet Mask.
   For PC1 (Jerry): Set 192.168.1.13 as IP address and 255.255.255.0 as Subnet Mask.
   For Mail Server (gmail.com): Set 192.168.1.1 as IP address and 255.255.255.0 as Subnet Mask.
   For DNS Server: Set 192.168.1.2 as IP address and 255.255.255.0 as Subnet Mask.

3. Click on the **Server** and then clicking on the **"Services"** option to mail server configuration (Figure 4(a)).
   (a) Click on the **EMAIL** option then at the right side click **On** to enable the SMTP and POP3.
   (b) Set the domain name to **gmail.com** and click **Set**.
   (c) Create **users** with **password**. Click **"+"** to add the user.

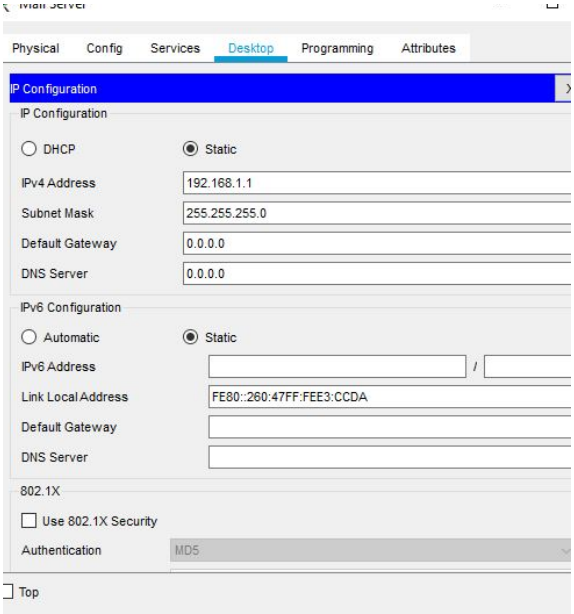
4. For **DNS** server configuration, click on the **Server** and then select the **"Services"** tap.
   (a) Click on the **DNS** option then at the right side turn **On** the DNS.
   (b) Set **name** to **gmail.com** and **address** to **192.168.1.1** (IP address of mail server). Finally, **add** them to the server (Figure 4(b)).



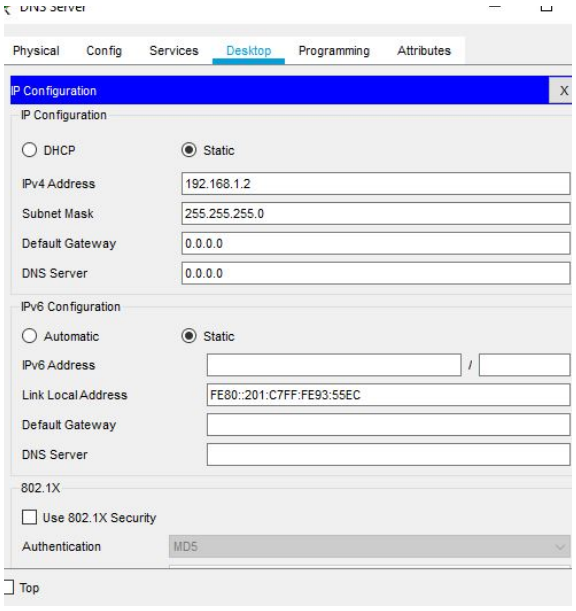
(a) IP Configuration of David's PC



(b) IP configuration of Jon's Laptop



(c) IP Configuration of Mail Server



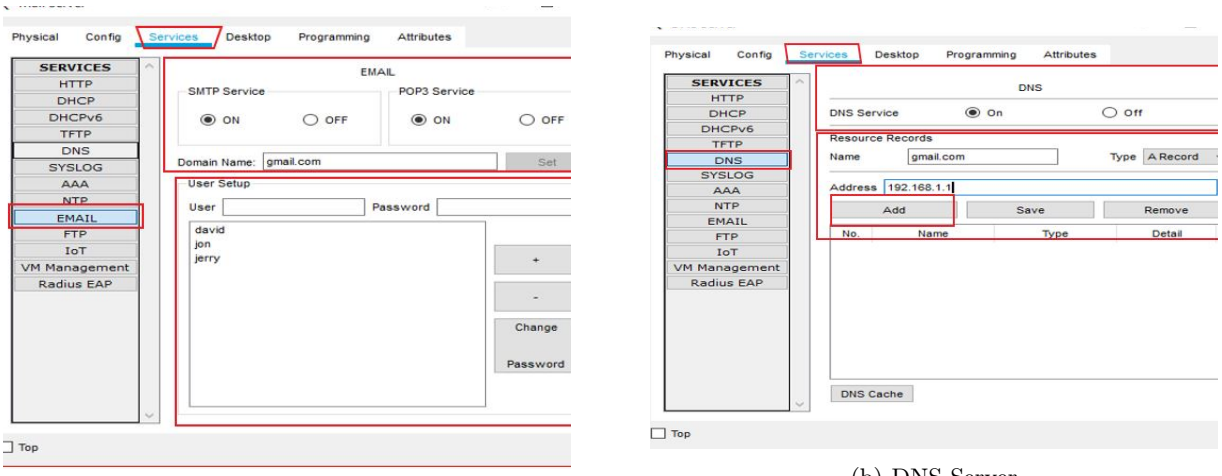
(d) IP configuration of DNS Server

Figure 3: IP Configuration of End Devices

5 Input/Output

Part 1: Send an Email from David to Jon

1. Configure **PC0 (David)** to use the Email service of the Mail server
   (a) Click **PC0 (David)** and click the **Desktop tab > Email**.
   (b) Enter the following values into their respective fields:
      i. Your Name: **David**
      ii. Email Address: **david@gmail.com**
      iii. Incoming Mail Server: **192.168.1.1**
      iv. Outgoing Mail Server: **192.168.1.1**
      v. User Name: **david**
      vi. Password: **12**



(a) Mail Server

(b) DNS Server

Figure 4: Configuration of Mail Server and DNS Server

(c) Click **Save**.

2. From David Mail Browser window, click **Compose** for sending an email.

   (a) Enter the following values into their respective fields:

      i. To: **jon@gmail.com**

      ii. Subject: **Greeting**

      iii. Email Body: **Personalize the email**.

   (b) Click **Send**.

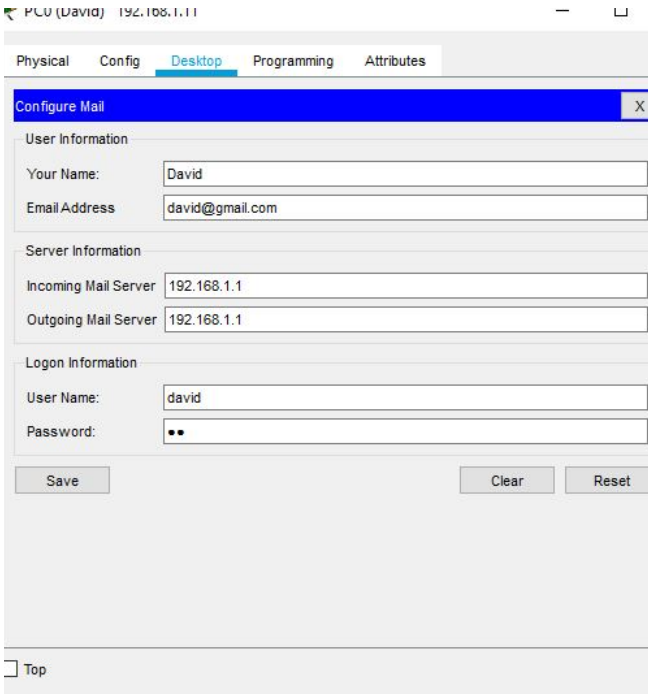
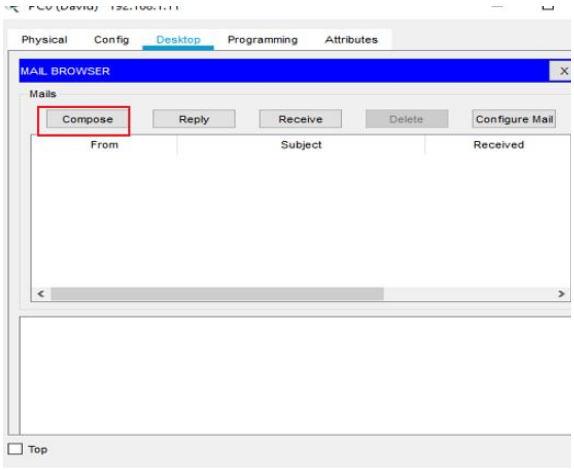
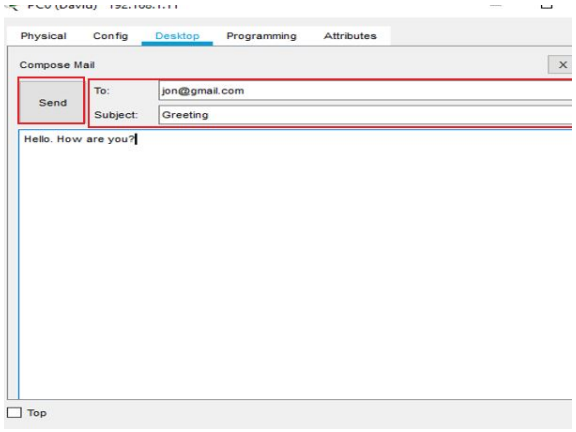


Figure 5: Sending an Email from David to Jon, Step 1: Configuration of PC0 (David) to use the Email service of the Mail server



(a) Step 2: Compose for sending an email

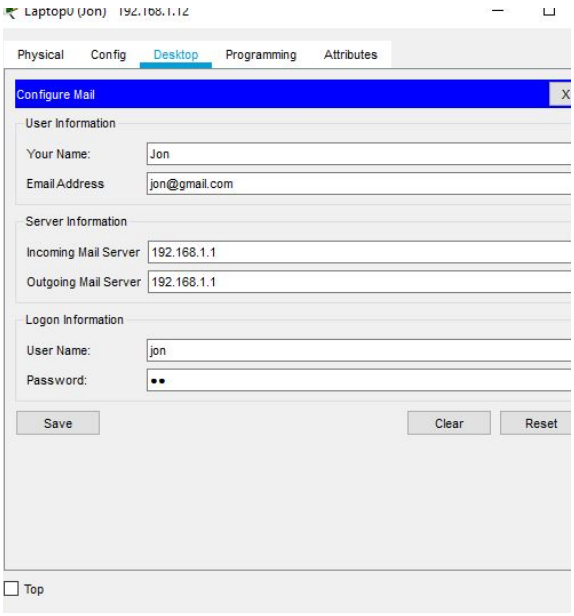


(b) Step 3: Sending an email

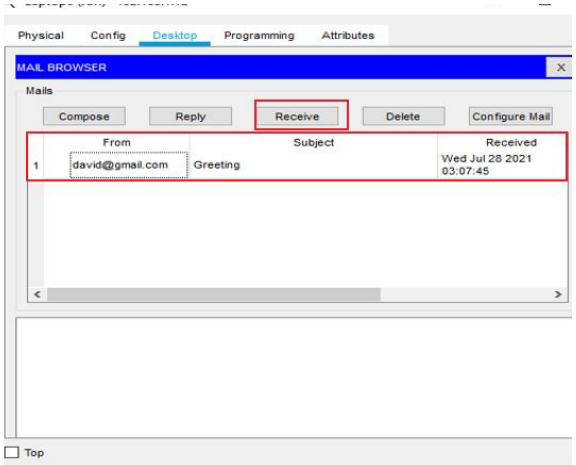
Figure 6: Sending an Email from David to Jon (a) Step 2 (b) Step 3

Part 2: Check whether Jon received the email or not

1. Configure **Laptop0 (David)** to check the received email.
   (a) Click **Laptop0 (Jon)**. If the Mail Browser window is closed, click **Desktop tab** > **Email**.
   (b) Enter the following values into their respective fields:
      i. Your Name: **Jon**
      ii. Email Address: **jon@gmail.com**
      iii. Incoming Mail Server: **192.168.1.1**
      iv. Outgoing Mail Server: **192.168.1.1**
      v. User Name: **jon**
      vi. Password: **23**
   (c) Click **Save**.
2. From Jon Mail Browser window, click **Receive**. An email from David displays.

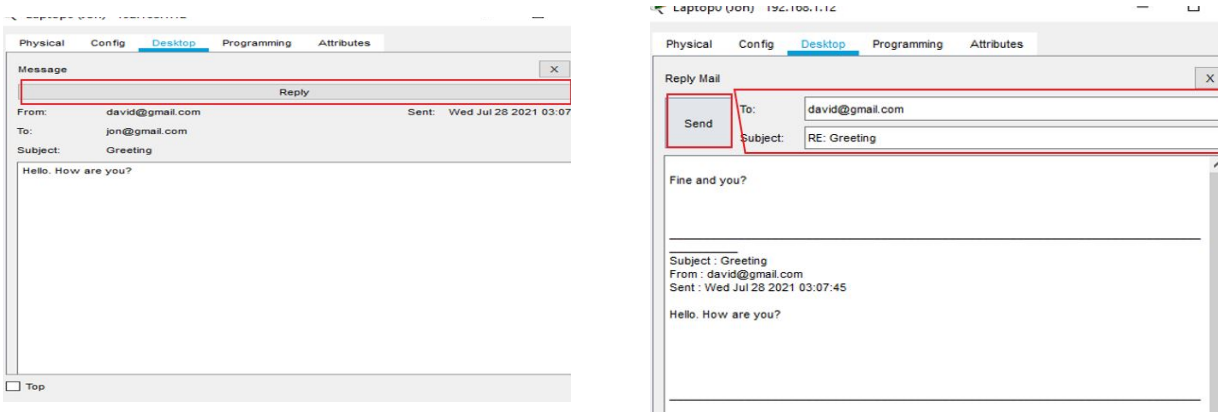


(a) Configuration of Laptop0 (David) to check the received email.



(b) Receiving the email

Figure 7: Checking whether Jon received the email or not



(a) Step 1

(b) Step 2

Figure 8: Replying to the Email

Part 3: For replying to the Email

1. If Jon wants to reply to the email to David. Double-click the email.
2. Click **Reply**, personalize a response and click **Send**.

6 Discussion & Conclusion

Based on the focused objective(s) to learn the step-by-step configuration of an SMTP server. This task will help students learn the principles of networking with hands-on experience as well as develop Cisco technology-specific skills. The additional lab exercise will help them to practice SMTP network configuration and also help them to be confident in the fulfillment of the objective (s).

7 Lab Task (Please implement yourself and show the output to the instructor)

Suppose, you are tasked with designing and configuring an internal email system for GreenTech Global Inc., a multinational company with two regional headquarters located in New York (HQ-A) and London (HQ-B). Each headquarter occupies multiple departments spread across two floors. The company relies on an internal SMTP email system for secure communication between executives and department heads across locations.

Network Infrastructure of Headquarter A (New York)

- Floor 3 & Floor 4
- Departments: Engineering, Finance, and Marketing
- All departments on both floors are connected via a local switch.

Devices are assigned IPs and email IDs as follows:

Headquarter A (New York)

Device	Device Name	IP Address	Email Address
PC (Engineering)	EngManager	192.168.10.2	eng.manager@eng.ny.greentech.com
Laptop (Engineering)	CTO	192.168.10.3	cto@eng.ny.greentech.com
PC (Finance)	FinDirector	192.168.10.4	director@fin.ny.greentech.com
Laptop (Marketing)	CMO	192.168.10.5	cmo@mark.ny.greentech.com

Network Infrastructure of Headquarter B (London)

- Floor 1 & Floor 2
- Departments: Legal and Business Development
- Connected through another switch, similar to HQ-A.

Devices are assigned IPs and email IDs as follows:

Headquarter B (London)

Device	Device Name	IP Address	Email Address
PC1 (Business Dev)	BDHead	192.168.20.2	head@bd.ldn.greentech.com
PC2 (Business Dev)	CEO	192.168.20.3	ceo@bd.ldn.greentech.com
Laptop (Legal)	LegalAdvisor	192.168.20.45	advisor@legal.ldn.greentech.com

Additional Requirements:

- Both HQs are connected via a router for inter-branch communication.
- In each HQ add necessary mail servers and DNS servers and configure them as per requirements. A Mail Server (SMTP) needs to be added to handle sending and receiving emails. A DNS Server to resolve internal email domains and IP mappings.
- Devices must use correct domain formats (@<dept>.<city>.greentech.com) for routing emails.
- Configure the mail servers with DNS support so that devices from any department can send and receive emails between HQ-A and HQ-B using SMTP protocol.

You step-by-step task will be as follows

1. Design a network topology that includes: a) Workstations b) Switches c) Routers d) Mail servers e) DNS servers
2. Configure each device with its: a) Static IP address b) Hostname
3. Set up DNS servers in each HQ building to resolve domain names like:
   - eng.ny.greentech.com → 192.168.10.x
   - bd.ldn.greentech.com → 192.168.20.x
4. Test Email Exchange:
   - Send an email from cto@eng.ny.greentech.com to ceo@bd.ldn.greentech.com
   - Send a reply from ceo@bd.ldn.greentech.com to cto@eng.ny.greentech.com

8 Policy

Copying from the Internet, classmates, seniors, or any other source is strongly prohibited. 100% marks will be *deducted* if any such copying is detected.