Experiment 10: Implement Email Client-Server in Cisco Packet Tracer

Aim
To implement and simulate an Email Client-Server system in Cisco Packet Tracer and demonstrate sending/receiving emails between clients using a Mail Server.

Objectives
1. To understand the working of email communication in computer networks.
2. To configure DNS and Mail (SMTP/POP3) servers in Packet Tracer.
3. To establish connectivity between clients and mail server.
4. To test the process of sending and receiving emails between users.

Background Theory
Email (Electronic Mail) is one of the most common applications of computer networks. In networking, SMTP (Simple Mail Transfer Protocol) is used to send mail, while POP3 (Post Office Protocol) or IMAP is used by the client to receive mail.

In Packet Tracer, we simulate an email service using:
- DNS Server: To resolve domain names (e.g., mail.com).
- Mail Server: To host email services using SMTP & POP3.
- Clients (PCs/Laptops): Configured with email accounts to send/receive messages.

Workflow:
1. Client composes mail → Mail sent via SMTP → Stored on Mail Server.
2. Recipient downloads mail from Mail Server via POP3.

Software Required
Cisco Packet Tracer (latest version).

Algorithm
1. Open Cisco Packet Tracer.
2. Place devices: 1 Server (Mail & DNS), 2 PCs (Client A & Client B), and 1 Switch.
3. Connect devices using Copper Straight-Through cables.

4. Configure the server with IP address and enable DNS, SMTP, and POP3 services.
5. Create email accounts for the clients on the server.
6. Configure IP and DNS settings on each client.
7. Configure Email client settings on PC0 and PC1 with their respective accounts.
8. Send an email from PC0 to PC1 and verify delivery.
9. Reply back from PC1 to PC0 to confirm communication.

Step-by-Step Procedure

1. Create the Topology
- Place 1 Server, 2 PCs, and 1 Switch in Packet Tracer.
- Connect using Copper Straight-Through cables.

2. Configure the Server
- Assign IP address: 192.168.1.1 /24, Gateway: 192.168.1.1.
- Enable Services → DNS: Add a record → Name: mail.com, Address: 192.168.1.1.
- Enable Services → EMAIL:
  • Add User1 → Username: alice, Password: 123, Domain: mail.com.
  • Add User2 → Username: bob, Password: 123, Domain: mail.com.

3. Configure Client PCs
- PC0: IP: 192.168.1.2 /24, Gateway: 192.168.1.1, DNS: 192.168.1.1.
- PC1: IP: 192.168.1.3 /24, Gateway: 192.168.1.1, DNS: 192.168.1.1.

4. Set up Email Accounts on Clients
- On PC0 → Desktop → Email:
  • Account Name: alice@mail.com
  • Incoming/Outgoing Mail Server: mail.com
  • Username: alice, Password: 123
- On PC1 → Desktop → Email:
  • Account Name: bob@mail.com
  • Incoming/Outgoing Mail Server: mail.com
  • Username: bob, Password: 123

5. Test Email Communication
- On PC0 → Email → Compose → To: bob@mail.com, Subject: Hello,

Message: “Hi Bob!”.
- On PC1 → Email → Inbox → Receive → Verify message.
- Reply from PC1 to PC0 with “Hi Alice!”.

Expected Output
• PC0 successfully sends an email to PC1.
• PC1 receives the email in its inbox.
• PC1 replies back and PC0 receives the message.
• Thus, email communication is established.

Result
The Email Client-Server system was successfully simulated in Packet Tracer. The clients were able to send and receive messages using SMTP and POP3 protocols.

Pre-Viva Questions
1. What is the role of SMTP in email communication?
2. How does POP3 differ from IMAP?
3. Why is DNS required for email communication?
4. Can multiple users share the same domain in a mail server?

Post-Viva Questions
1. Explain how email is transmitted over the internet.
2. What are the limitations of simulating email in Packet Tracer?
3. How can you configure authentication and encryption for emails in real networks?
4. Compare email simulation in Packet Tracer vs real-world mail servers (e.g., Gmail, Outlook).