



Mail Server

Learning Outcomes

- Explain the architecture of electronic mail using four scenarios.
- Explain the mechanism of sending and receiving e-mails.
- Introduce the role of a message transfer agent (MTA) and Simple Mail Transfer Protocol (SMTP) as the formal protocol that handles MTA.
- Discuss two Message Access Agents (MAAs): POP and IMAP.

What is Electronic Mail?

- is a computer-based program that allows users to send and receive messages.
- E-mail is the electronic version of a letter, but with time and flexibility advantages.
- While a letter can take anywhere from a week to a couple of months to reach its intended destination, an e-mail is sent virtually almost instantly.
- Email information is transmitted via email servers and uses a variety of TCP/IP protocols.
 - For example, the simple mail transfer protocol (SMTP) is a protocol that is used to send messages. Similarly, IMAP or POP receives messages from a mail server.

Features

- **Spontaneity:** In a couple of seconds, you may send a message to anybody on the globe.
- **Asynchronous:** You may send the e-mail and let the recipient view it at their leisure.
- Attachments of data, pictures, or music, frequently in compressed forms, can be delivered as an e-mail to a person anywhere in the world.
- Addresses can be stored in an address book and retrieved instantly.
- Through an e-mail, a user can transfer multiple copies of a message to various individuals.

Components Of Electronic Mail

- The following are the essential components of an e-mail system:
 - User Agent (UA)
 - Message Transfer Agent (MTA)
 - Mail Delivery Agent (MDA)
 - Message Access Agent (MAA)

User Agent (UA)

- The User-Agent is a simple software that sends and receives mail. It is also known as a mail reader.
- It supports a wide range of instructions for sending, receiving, and replying to messages and manipulating mailboxes.
- It provides service to the user to make the process of sending and receiving a message easier.
- Example:
 - Character-based: mail
 - Menu-driven program: elm, mutt, pine, mh
 - GUI-based: emacs, Netscape, Eudora and Outlook

Mail Transfer Agent (MTA)

- The Message Transfer Agent manages the actual e-mail transfer operation (MTA).
 - Client MTA – to send mail.
 - Server MTA – to receive mail.
- Delivering mail to its final destination is the responsibility of MTAs.
- The formal protocol that define MTA in the Internet is Simple Mail Transfer Protocol (SMTP)
- A system must have a client MTA and a system MTA to send an e-mail. If the recipients are connected to the same computer, it sends mail to their mailboxes.

Mail Access Agent (MAA)

- The Simple Mail Transfer Protocol is used for the first and second stages of e-mail delivery.
- The pull protocol is mainly required at the third stage of e-mail delivery, and the message access agent is used at this point. The SMTP hands is off.
- The third stage uses a message access agent (MAA)
- The message retrieval processes uses for communication are:
 - Post Office Protocol (POP3) and Internet Message Access Protocol (IMAP4)

Electronic Mail Flow

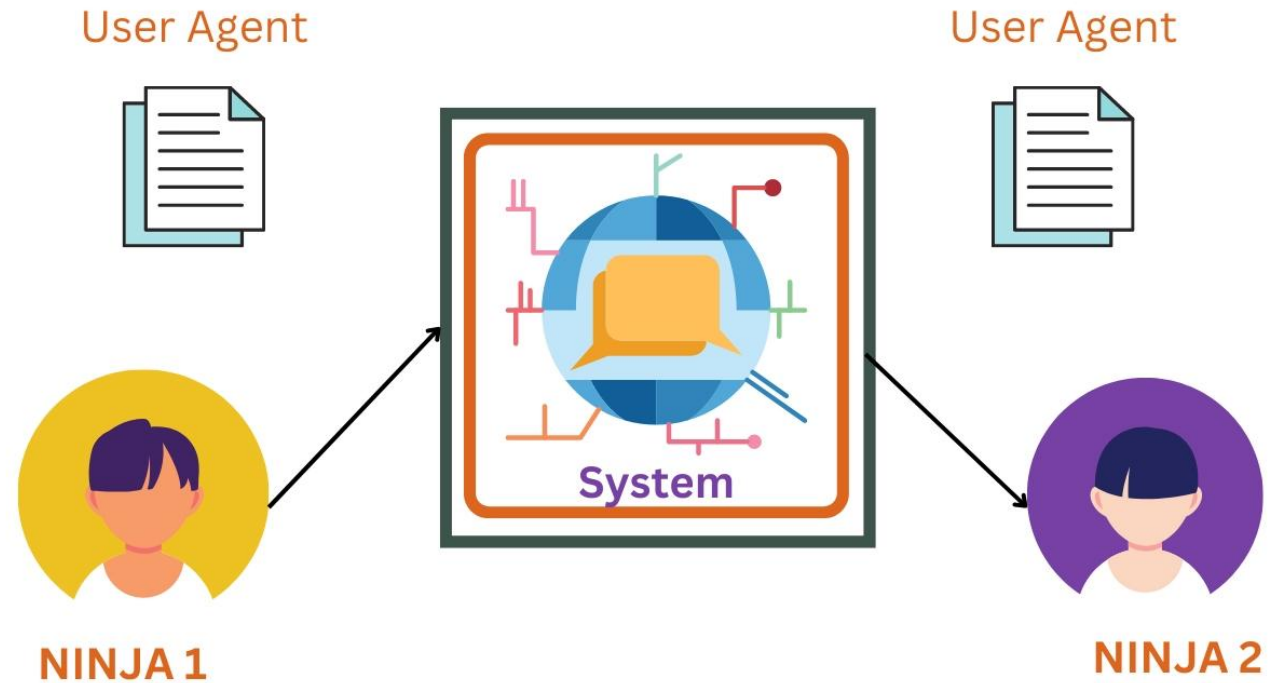


Architecture

- The architecture of e-mail system in following scenarios:
 - **First scenario**
 - **Second scenario**
 - **Third scenario**
 - **Four scenario**

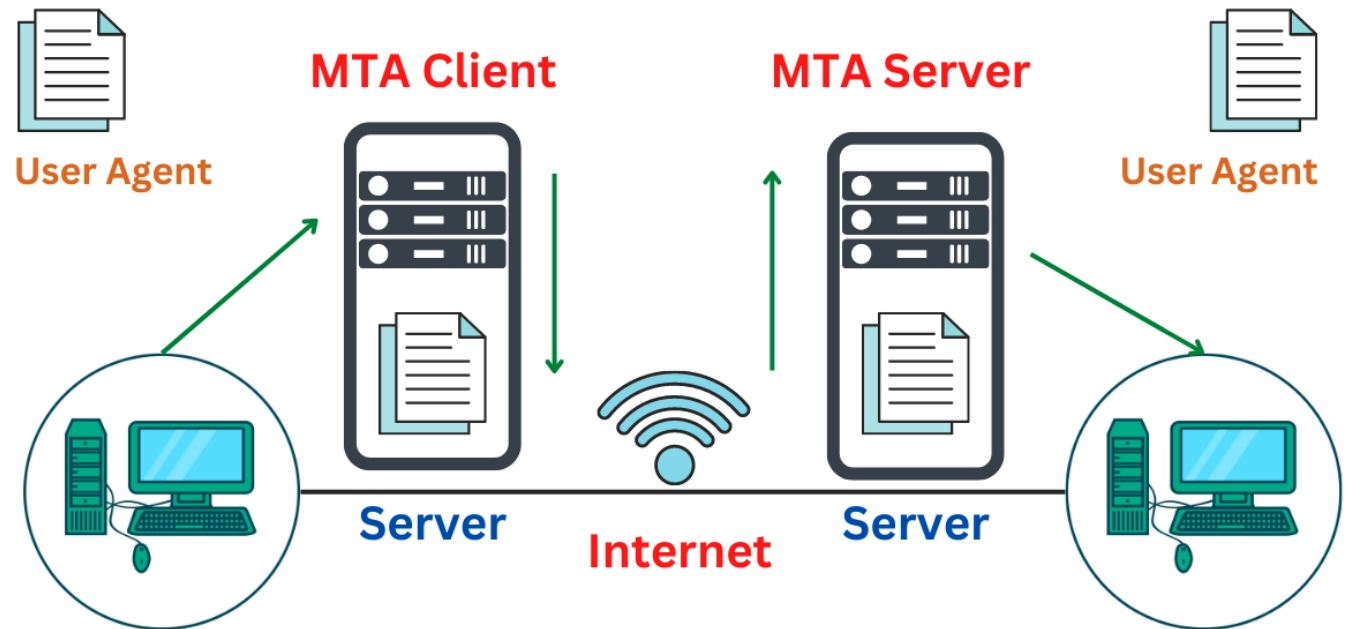
Mail Server: First scenario

- When the sender and the receiver of an e-mail are on the same mail server, we need only two user agents.



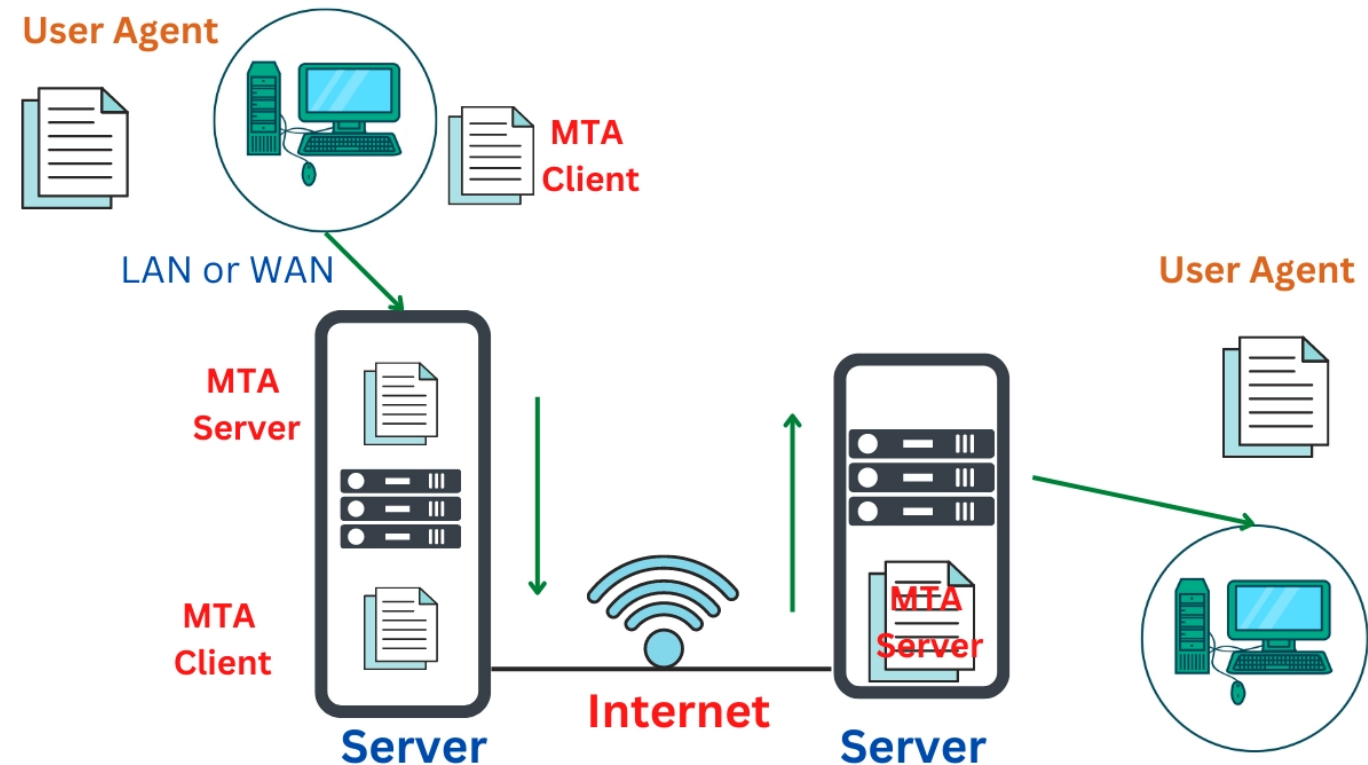
Mail Server: Second scenario

- When the sender and the receiver of an e-mail are on different mail servers, we need two UAs and a pair of MTAs (client and server).



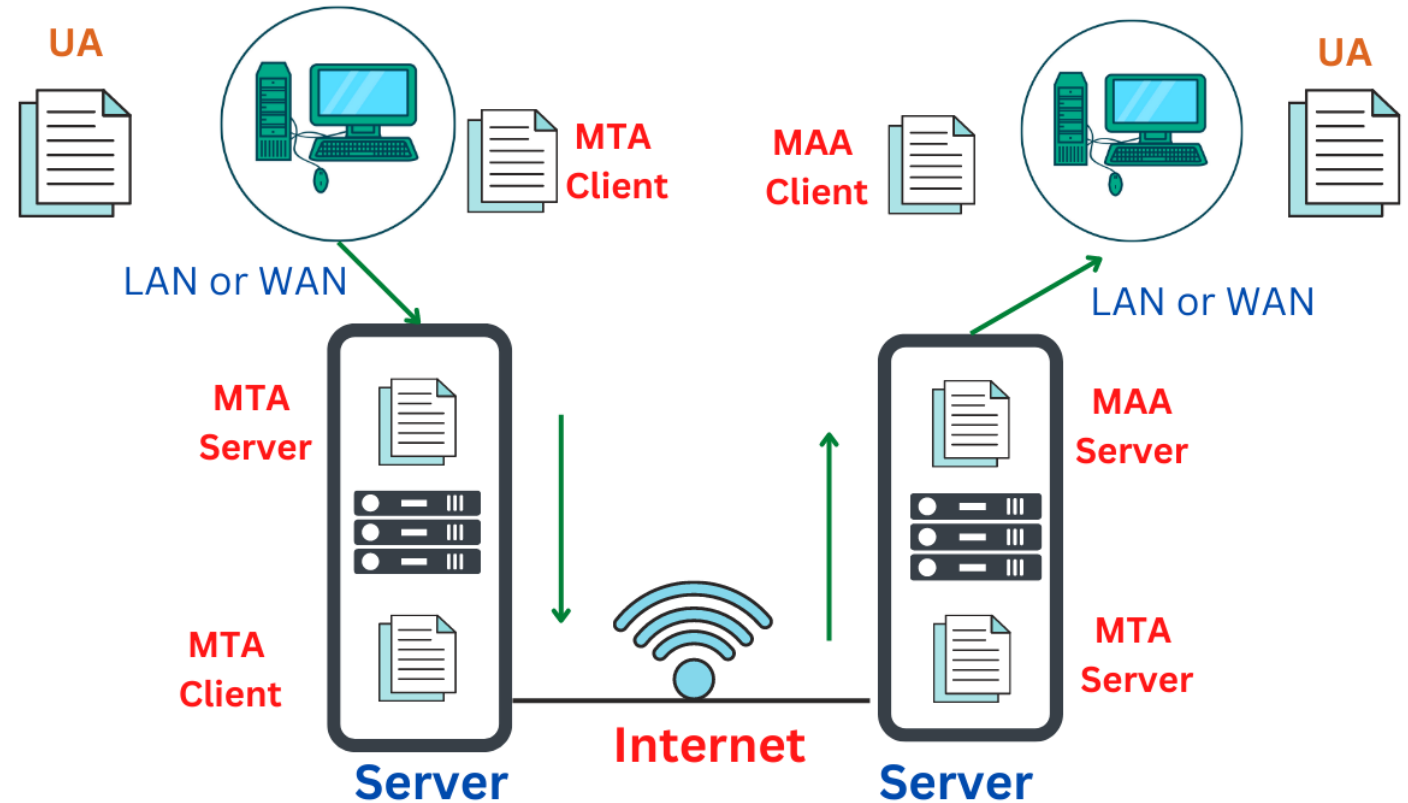
Mail Server: Third scenario

- When the sender is connected to the mail server via a LAN or a WAN, we need two UAs and two pairs of MTAs (client and server).



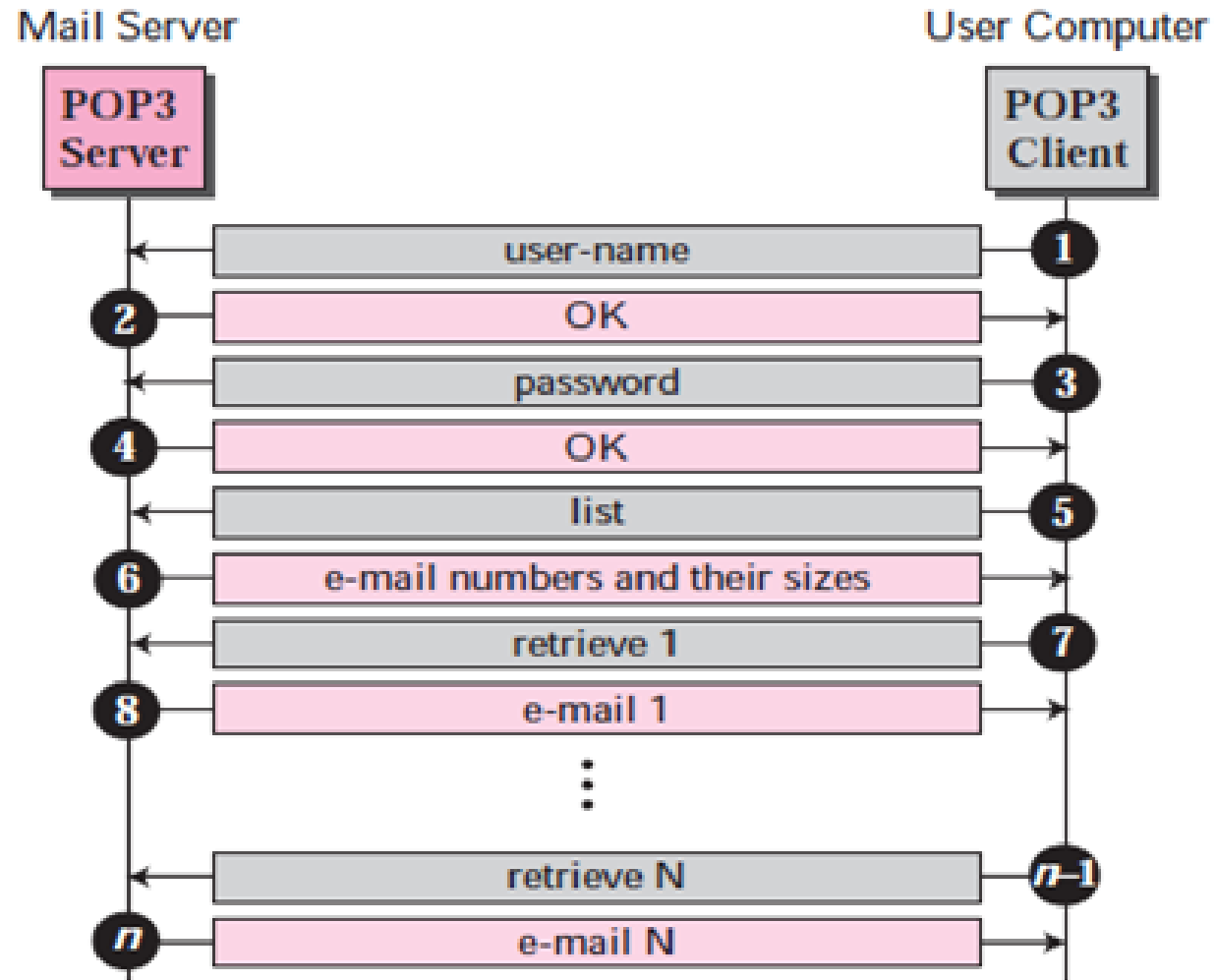
Mail Server: Fourth scenario

- When both sender and receiver are connected to the mail server via a LAN or a WAN, we need two UAs, two pairs of MTAs (client and server), and a pair of MAAs (client and server). This is the most common situation today



Mail Server

POP3



Relevant Mail Server Packages

- On any Linux computer, you can configure a MTA such as Postfix or sendmail.
- Other MTAs such as Dovecot, are designed to handle only incoming e-mail services, based on the protocols it serves (POP3 & IMAP4)
- The packages associated with sendmail and Postfix are both part of the “E-mail server”

NFS: Installation Guide

- **Installation on Ubuntu 24.04 LTS process:** [Link here](#)