ELECTRONIC MAIL AND IT'S ARCHITECTURE

By

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What is an Electronic Mail

- Electronic mail, commonly known as email, is a method of exchanging messages over the internet
- It allows people to send and receive digital messages between computers, smartphones, or other electronic devices over a network.
- E-mail was introduced to provide a **fast, reliable, and cost-effective** method of communication compared to traditional postal mail. Instead of waiting days for a letter to be delivered, e-mails can be sent across the world within **seconds**.
- Through e-mail, users can send **text messages, images, documents, audio, video, and other attachments**. Email supports both **one-to-one communication** and **one-to-many communication.**

One-to-One Communication:

This happens when **one sender sends an email to only one receiver**.

One-to-Many Communication:

Email also supports sending one message to **many people at the same time**.

ARCHITECTURE :

Components of E-Mail System :

The basic components of an email system are : 1.User Agent (UA)

2.Message Transfer Agent(MTA)

3.Message Access Agent(MAA)

3. Mail Box, and Spool file. Etc..

MAIN COMPONENTS IN EMAIL ARCHITECTURE

1.User Agent (UA):

User Agent provides service to the user.

The UA is normally a program which is used to send and receive mail. Sometimes, it is called as mail reader.

2. **MessageTransferAgent(MTA):**

An MTA is a software application responsible for sending , receiving , and routing emails between computers on a network .

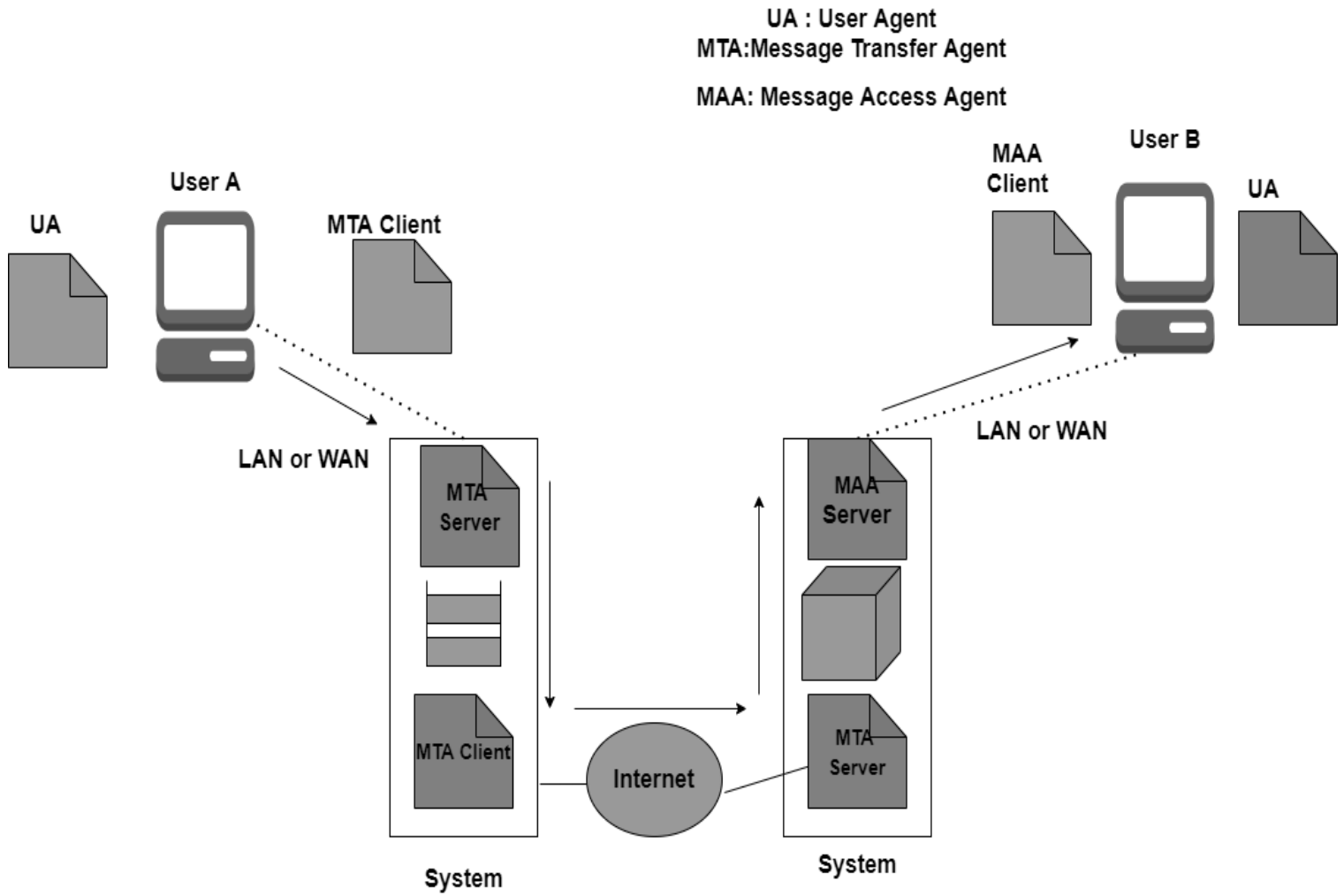
It uses protocols like SMTP(Simple Mail TransferProtocol)

3.**MessageAccessAgent(MAA):**

It helps user to access and retrieve emails from a mail server

It works with protocols like POP3

It is used after MTA stores the mail on the receiver server


UA : User Agent
MTA:Message Transfer Agent
MAA: Message Access Agent
User A
UA
MTA Client
MAA Client
User B
UA
LAN or WAN
LAN or WAN
MTA Server
MAA Server
MTA Client
Internet
MTA Server
System
System

HOW IT WORKS :

Sending Process (Left Side):

➤ User Agent (UA):This is the application used by the sender to compose, send, and read mails .

Examples : Gmail, Outlook.

The user writes a message and sends it.

➤ MTA Client (Message Transfer Agent – Client)

The UA sends the message to the MTA client.The MTA is responsible for transferring the mail between mail servers.Protocol used: SMTP (Simple Mail Transfer Protocol).

➤ MTA Server

The MTA client passes the message to the MTA server of the sender's mail server.The message is stored temporarily in a spool (storage) if it can't be sent immediately.

➤ The MTA server of the sender's mail server connects to the MTA server of the receiver's mail server over the Internet using SMTP.

Receiving Process (Right Side)

➤ MTA Server (Receiver side)The receiver’s mail server receives the message and stores it in the mailbox.

➤ MAA Server (Message Access Agent – Server)

This part allows the receiver to access the mail from the mail server.Protocols used: POP3 (Post Office Protocol) or IMAP (Internet Message Access Protocol).

➤ MAA ClientRetrieves the mail from the mail server and delivers it to the receiver’s User Agent.

➤ User Agent (UA)

The receiver uses their email client (like Gmail, Outlook, etc.) to open and read the message.

PROTOCOLS USED IN EMAIL ARCHITECTURE :

1.SMTP (Simple Mail Transfer Protocol):

Sends mail from sender to mail server or between servers.

PORT : 25

Used by MTA

2.POP3(Post Office Protocol):

Downloads mail from server to device.

PORT : 110

3.IMAP(Internet Message Access Protocol):

Reads mail directly from server & syncs across devices.

PORT :143

Advantages:

- Fast communication
- Low cost
- Supports attachments (files, images, etc.)
- Easily stored and organized Accessible from anywhere (via POP3/IMAP)
- We Can send to multiple users at the same time.
- **Disadvantages of Email Architecture :**
- Spam and phishing attacks.
- Limited file attachment size.
- Lack of guaranteed acknowledgement/read confirmation

THANK YOU