CS & IT ENGINEERING

COMPUTER NETWORKS

Application layer protocol

Lecture No-01

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APPLICATION LAYER PROTOCOL

SMTP , FTP , DNS , HTTP , POP-3 & IMAP-4
(email) (File transfer) ⇓ ⇓ ⇓
Domain Name Web Downloading
to Pages the mail
Ip Address

E-MAIL ,SMTP,POP,IMAP

Physical mail From Delhi to Mumbai

Delhi
Sender

Mumbai
Receiver

Delhi Post Office

Mumbai Post Post
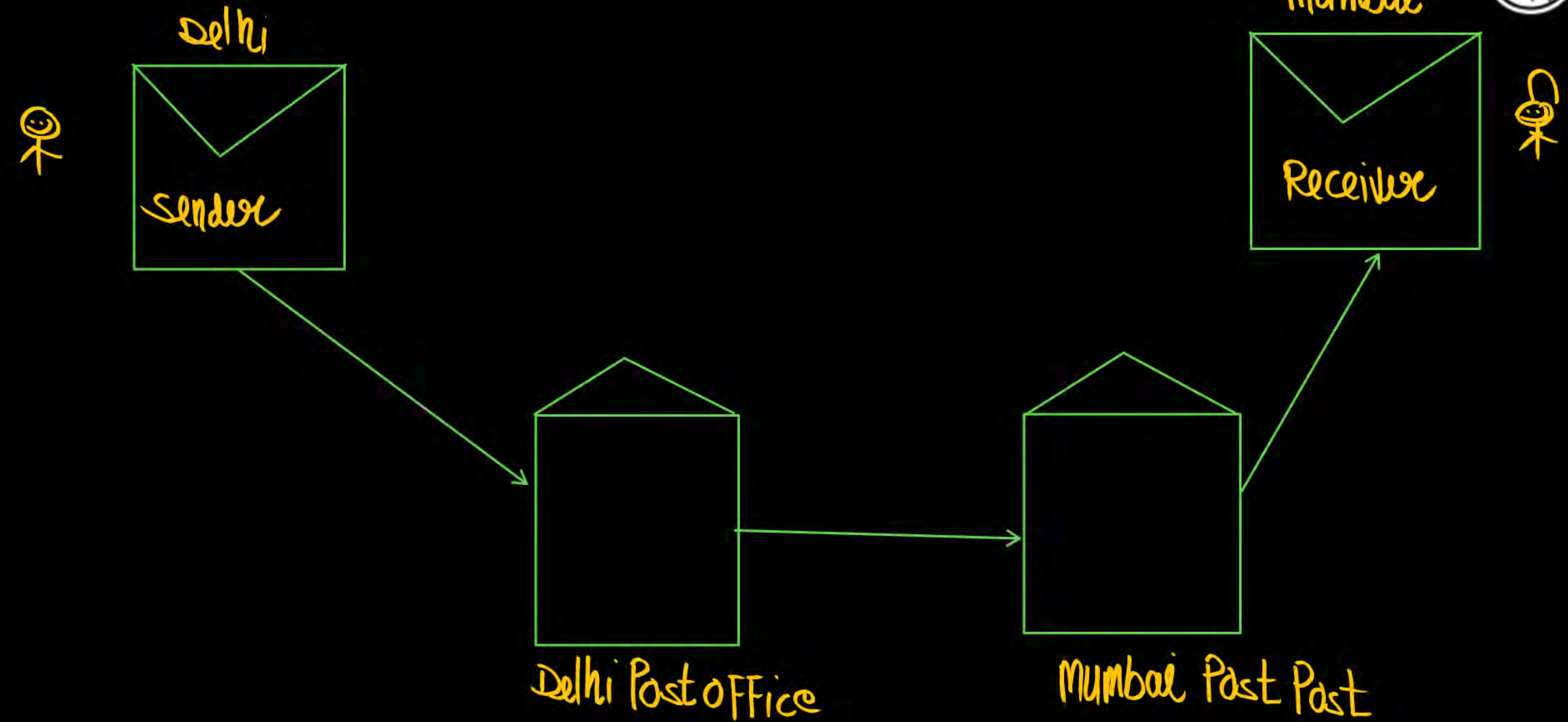
E-mail

Email[Electronic Mail]

Sender

Receiver

(SMTP) Push

Sender Mail Server

Reciever Mail Server

Pull (POP-3 &IMAP-4)

Push (SMTP)

Internet

Gmail

Yahoo

E-mail

SMTP transfer the mail from sender's mail server to receiver's mail server.

While sending the mail ,SMTP is used two times-.

I. Between the sender and sender's mail server

II. Between the sender's mail server and receiver's mail server

## To receive or download the email

Another protocol is needed between the receiver mail server and receiver.

The most commonly used protocols are POP3 and IMAP4.

SMTP(Simple mail transfer protocol)

1. The objective of SMTP is to transfer the email reliably and efficiently.
2. It uses port number-25 at TCP.
3. In SMTP there are two components:
   (i) User Agent (UA)
   (ii) Mail transfer Agent (MTA)
4. User Agent prepares the message, creates the envelope and put the message in the envelope.
5. Mail transfer Agent transfer the mail across the internet i.e. Actual mail transfer is done through MTA.
6. To send mail, system must have a client MTA and to receive the mail. it must have a server MTA.
7. SMTP is text based protocol.
8. With the help of SMTP & POP we can send only text messages.
9. SMTP can only handle the message containing 7 bit ASCII text.

User-A → User Agent → MTA client → Internet → MTA server → User Agent → User-B
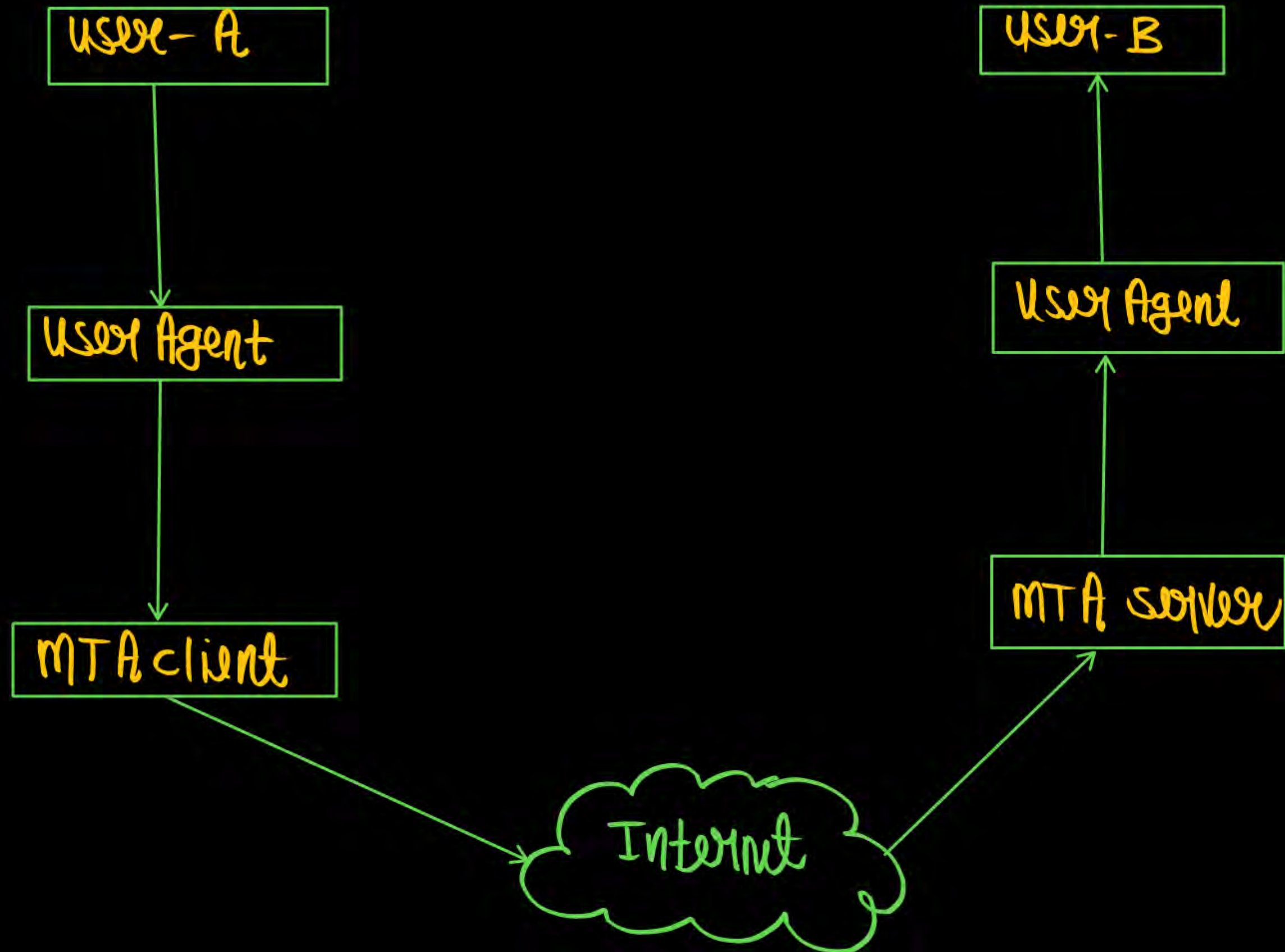
10. SMTP cannot transfer other types of data like images, video, audio, etc.
11. SMTP cannot transfer binary files or executable files.
12. SMTP cannot transfer the text data for the language other than English (such as French, Japanese, and Chinese etc.).
13. Only SMTP is not sufficient to send binary files or to send videos or audio so we require MIME (Multipurpose Internet mail extension).
14. MIME is a supplementary protocol that allows non-ASCII data to send through SMTP.
15. MIME is a set of software function that transforms non-ASCII data to ASCII data or vice versa.
16. MIME is used to convert non text data to text data and text data to non text data.

17. SMTP is stateless protocol. It does not maintain any information of user. If an e-mail is asked to be sent twice, then server resends it without saying that e-mail has already been sent.
18. SMTP is a connection-oriented protocol.
19. SMTP uses persistent TCP connections, so it can send multiple e-mail at once.
20. SMTP is an "In-Band" protocol.
21. SMTP is used for Push the e-mail.
22. SMTP Push the mail from client to server on other hand, It needs a pull protocol(Download).
23. PoP3 and IMAP4 are used for Pulling the e-mail.

POP3(Post office protocol version 3)

IMAP4(Internet Mail Access Protocol version 4)

Transfer the message from sending mail server to receiving mail server is done through SMTP. Finally the message from receiving server to web browser is done through HTTP only