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Chapter 2.3 Electronic Mail

SMTP, POP3, IMAP

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2.3.1 Overview

- Electronic mail has 3 major components:
  - User agents
  - Mail servers
  - Simple mail transfer protocol: SMTP

2.3.1.1 User Agent

- Also known as *"mail reader"*.
- Used for *composing, editing, and reading mail messages*.
- **Ex.** Outlook, thunderbird, iPhone mail client...
- Incoming and outgoing messages are stored on the server.

2.3.1.2 Mail Servers

- The **mail server** is the *mailbox* contains incoming messages for the user.
- It contains a **message queue** of outgoing messages that are ready to be sent.
- *SMTP protocols* between mail servers in order to send email messages. The client sends mail servers while the server receives it.

2.3.1.3 SMTP

- TCP is used to reliably transfer email messages from client to server. **Port 25** is used.
- A **direct transfer** is when mail is transferred from the *sending server* to the *receiving server*.
- There are 3 phases of a transfer:
  - Handshaking
  - Transfer of messages
  - Closure
- Command and response interaction is similar to HTTP. Commands are in ASCII text, and the response consists of a *status code* and a *phrase*.
- The message (header and body) must be in 7-bit ASCII.
- SMTP uses persistent connections.
- SMTP servers use CRLF.CRLF to determine the end of a message.

2.3.1.4 Example Scenarios

- See slide 2-52 for an example scenario.
- See slide 2-53 for example SMTP interaction.

2.3.2 Mail Access Protocols

- **SMTP** Delivers mail to the receiver's server and stores it.
- There are several mail access protocols for mail retrieval from a server:
  - **POP**, or *Post Office Protocol*, where mail can be downloaded after authorization.
    - POP3 is *stateless* across different sessions.
    - **Download and delete** mode ensures that mail *cannot be re-read* if the client is changed.
    - **Download and keep** mode keeps *copies* of messages across different clients. They will still exist in the mail server after download.
  - **IMAP**, or *Internet Mail Access Protocol*. It has more features, such as manipulating messages stored on the server.
    - All messages are kept on the server.
    - Users can organize messages in folders.
    - The user state is kept across sessions (such as the names of folders, and mapping between message ID and folder name).
  - **HTTP**. Messages can be viewed and modified on an internet browser. *gmail, Hotmail, and Yahoo! Mail* are examples.
- See slide 2-58 for an example usage of POP3 protocol.