Module-2: Application Layer – 3

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HTTP: information/resource is transferred from server to client (PULL technology)

SMTP: information (email) is transferred from client (Sender's mail server) to server (recipient's mail server). (PUSH technology)

Components of SMTP protocol
1. Sender's user agent
2. Sender's mail server (mail box)
3. Receiver's user agent
4. Receiver's mail server (mail box)

Protocols that helps in well-defined applications
- HTTP → 80 || Web
- HTTPS – 443. || Web
- FTP → 23 / TELNET → 21 || Remote file transfer.
- SMTP → 25 || electronic mail
- SSH → 22 || Remote access.

MIME: Multipurpose Internet Mail Extensions

- Internet standard that extends the format of email messages to support text in character sets other the the ASCII, as well as attachments of audio, video, images, and application programs.
- Message body may consists of multiple parts specified by the 'Content-Type' header
- MIME header fields are inserted by HTTP servers before any Web transmission
- Clients use the 'Content-Type' header to select an appropriate viewer application for the type of data

— Clients use appropriate viewer application for the type of data indicated.

Webmail: The user agents (both at Sender and receiver side) are replaced by Web browsers.

DNS — Domain Name System:

Hostname — mnemonics that are appreciated by humans.
- provide little information about the location within the Internet of the host.
- Can consist of variable-length alphanumeric characters that would be difficult to process by routers.

IP Address — Consists of 4 bytes and has a rigid hierarchical structure (IPv4)
- Gives specific information — where the host is located in the Internet, who is the ISP, ...
- Preferred by intermediate routers

Services provided by DNS

(1) Directory service:
- translates user-supplied hostname to IP address —

- translates user-supplied hostname to IP address — Commonly employed by other application layer protocols (HTTP, SMTP, and FTP)
- distributed directory service — resolves the IP address of websites that are not present locally.

(2) host aliasing: mapping between hostname (alias) and canonical host name.

Mail Server aliasing

- Canonical hostname of a mail server can be much more complicated and less mnemonic than its alias hostname.
- DNS can be invoked by a mail application to obtain the canonical hostname for a supplied alias hostname as well as the IP address of the host.
- MX record permits a company's mail server and Web server to have identical (aliases) hostnames.

For e.g: a company's Web server and mail server can be both called enterprise.com.