E-mail

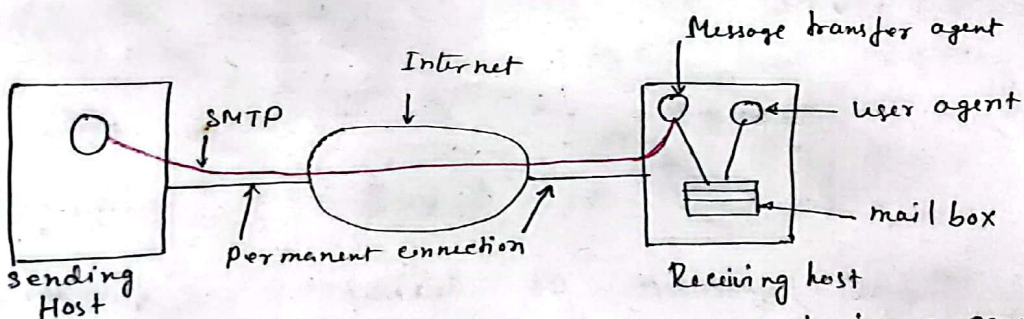
E-mail system normally consists of two subsystems: the user agents, which allow people to read and send e-mail, and the message transfer agents, which move the messages from the source to the destination.

The user agents are local programs that provide a command-based, menu-based, or graphical method for interfacing with the e-mail system. The message transfer agents are typically system daemons, that is, processes that run in the background.

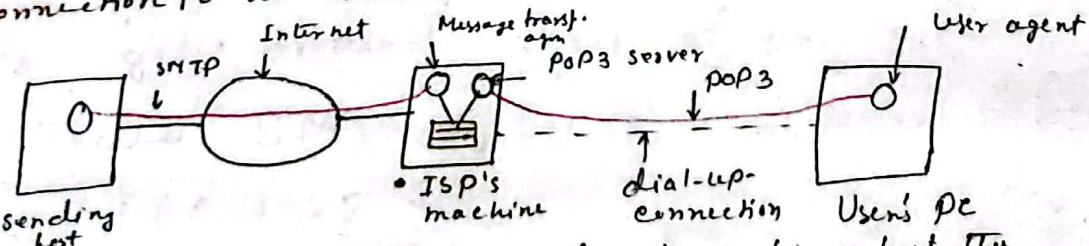
Typically, e-mail systems support five basic functions: Composition, transfer, Reporting, Displaying, Disposition.

SMTP (Simple mail transfer protocol) is the protocol to transfer mail.

POP3 (Post Office Protocol Version 3): Allows e-mail to be copied from the ISP to the user.



Situation1: Both sender & receiver having a permanent connection to the internet.



Situation2: The sender is on-line but the receiver is not.

SMTP – Simple mail transfer Protocol

Within the Internet, e mail is delivered by having the source machine establishment a TCP connection to port 25 of the destination machine. The messag from there is copied into the appropriate mailboxes. If a message cannot be delivered, an error report containing the first part of the deliverable message is returned to the sende

SMTP is a simple ASCII protocol. After establishing the TCP connection to port 25, the sending machine (client) waits for the receiving machine (server) to talk first. The server starts by sending a line of text giving its identity and telling whether or not it is prepared to receive mail. If it is not, the client releases the connection and tries again later.

If the server is willing to accept email, the client announces whome the email is coming from and whome it is going to. The server gives the client the go-ahead to send the message. Then the client sends the message and the server acknowledg it. When all the email has been exch-o in both directions, the connection is released.

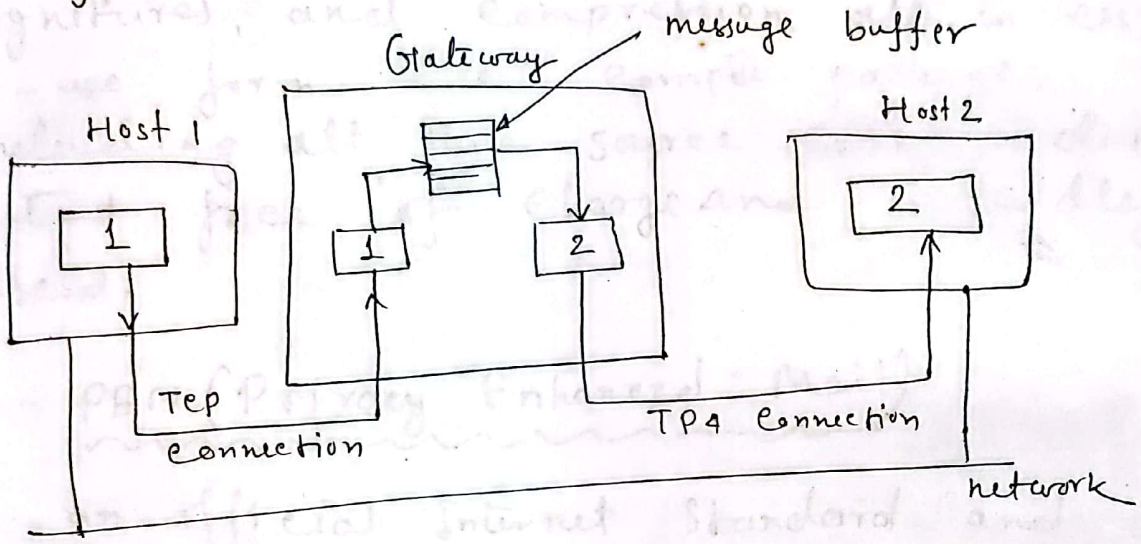
SMTP is defined in RFC-821

Problems : i) related to message length
ii) " " time outs.

to get arround some of the problems, extended SMTP (ESMTP) has been defined in RFC 1425.

E-mail Gateways

When Sender & Reciver talks in different protocols than application layer email gateways is used to connect and transfer messages between them.



* Host 1 establish a TCP conn. to the Gateway
* Using SMTP transfers the message(s) there.
* The daemon on the gateway puts the message in a buffer.
* Then TP4 conne. is establishe with Host 2.
* Using OSI equivlent of SMTP mess. is transfered to Host 2.

Email delivery

* POP3 (Post office protocol) RFC-1225
* IMAP (Interactive mail Access Protocol) RFC-1064
* DMSP (Distributed mail system Protocol) RFC-1056

E-mail Privacy

* PGP (Pretty Good Privacy) : It is a complete email security package that provides privacy, authentication, digital signatures, and compression, all in easy-to-use form. The complete package, including all the source code, is distributed free of charge and is widely used.

* PEM (Privacy Enhanced Mail)

Is an official Internet Standard and described in four RFCs : 1421 — 1424.

The World Wide Web

The WWW is an architectural framework for accessing linked documents spread out over ~~thousands~~ millions of Machines all over the internet.

The web began in 1981 at CERN (~~Europ~~ European Centre for nuclear Research)

* In March 1989 : The initial proposal for a web of linked documents from CERN
* In december 1991 : Public demonstration in a conference
* In February 1993 : The first graphical Interface, "Mosaic" was released in "National Centre for Supercomputing Applications"

* 1994, CERN and MIT signed an agreement setting up the WWW Consortium. to further developing the Web, Standerdizing protocols, and encouraging interoperability between sites. http://www.w3.org.

* The web is basically a client-server system.

* Language in which Web pages are written : HTML, PHP (Hiper text preprocessor)
YML, XSL
Extensible Markup & Extensible Style Language

The Architectural overview

* The web consists of a vast, world wide collection of documents, called pages.
* Pages that point to other pages are said to use hypertext.
* Pages are viewed with a program called a browser. MS expl. Netscape, Google, Mozi
* Strings of text that are links to other pages, called hyperlinks.
* Voice-based browsers are also being developed.
* In addition to having ordinary text and hypertext Web pages can also contain icons, line drawings, maps, and photographs.
* When hypertext pages are mixed with other media (audio, video or both), the result is called hyper media

The server Side

Every Web site has a server process listening to TCP port 80 for incoming connections from clients (normally browsers). After a connection has been established, the client sends one request and the server sends one reply. Then the connection is released. The protocol that defines the legal requests and replies is called HTTP.

Example A URL (Uniform Resource Locator)

http://www.w3.org/hypertext/WWW/The project.html

- http: The name of the protocol
- www.w3.org: The name of the machine where the page is located
- hypertext/WWW/The project.html: The name of the file containing the page.

The steps that occur between the user's click and the page being displayed are as follows:

1) The browser determine the URL
2) " " asks DNS for the IP address of www.w3.org (Server)
3) DNS replies with 18.23.0.23. (IP address)
4) The browser makes a TCP connection to port 80 on 18.23.0.23
5) It then sends a GET /hyper.... html Command
6) The www.w3.org server sends the file "project.html

GET - HTTP request Method (Command)

7. The TCP connection is released.

8. The browser displays all the texts in the pro.. html.

9. " " " " images in the file.

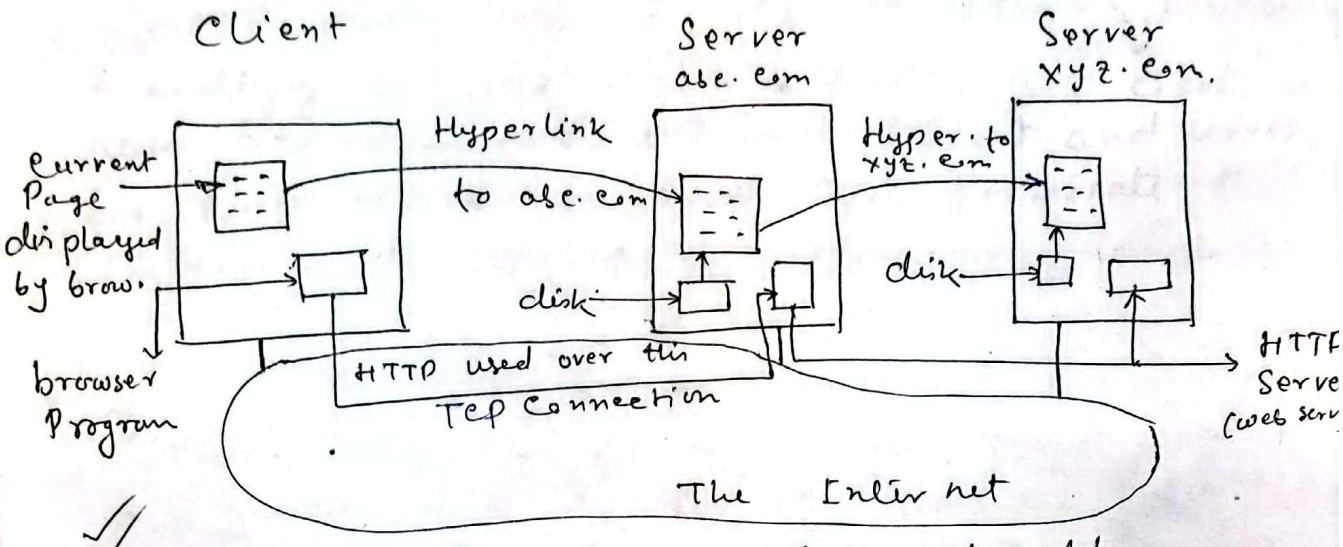
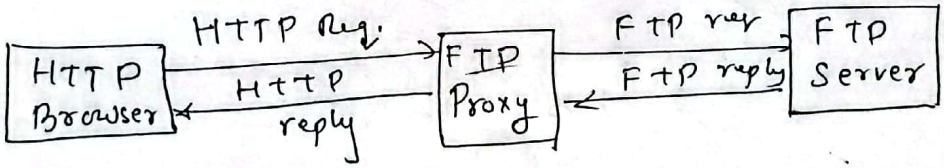


Fig: The parts of the web model.

* Not all servers speaks HTTP. In particular, many older servers use the FTP, Gopher or other protocols.

✓ A proxy server is a kind of gateway that speaks HTTP to the browser but FTP, Gopher, or some other protocols to the server.

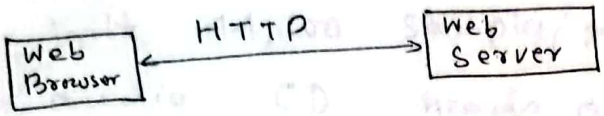


The proxy server can be a program running on the same machine as the browser, but it can also be on a free-standing machine somewhere in the network serving many browsers.

HTTP

is the foundation protocol of the WWW.

RFC – 2068 (most recent version)



HTTP makes use of TCP to provide reliability. Accordingly, a typical implementation will create a new TCP connection between client and server for each transaction and then terminate the connection as soon as the transaction completes.

The HTTP protocol consists of two fairly distinct items: the set of requests from browsers to servers and the set of responses going back the other way.

HTTP request Methods (Commands)

GET, HEAD, PUT, POST, DELETE, LINK, UNLINK

xml (eXtensible Markup lang.) XSL (ext. Style language)

Multimedia

The combination of two or more continuous media, that is, media that have to be played during some well-defined time interval, usually with some user interaction. In practice, the two media are normally audio & video, that is, sound plus moving pictures.

① Audio – Telephone & audio compact discs.

PCM – is used for Telephone. (8 bits/samples)

8000 samples/sec → The system give data rate: 56,000 bps or 64 000 bps.

fr: 4 kHz.

messages and

* (2) VIDEO

If a sequence of images is flashed at 50 or more images/sec, the eye does not notice that it is looking at discrete images. All video systems exploit this principle to produce moving pictures.

Video
- analog
- digital

* 3. Data compression

Transmitting multimedia material in uncom

pressed form is completely out of the question

All compression systems require two algorithms: one for compressing the data at the source, and other for decompressing at the destination (encoding & decoding)

Compression schemes can be divided into two general catagories: entropy encoding and source encoding.

Entropy encoding just manipulates bit streams without regard to what the bits mean:

*run-length encoding

3150100000382133333330102222222 65

31501A$^{0}_{5}$3821A$^{3}_{7}$010A$^{2}_{6}$65

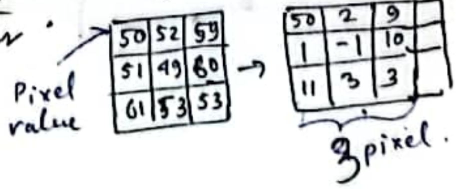
(Huffman coding) — *Statistical encoding

* Source ~~end~~ encoding:

- Differential encoding — in which a sequence of values are encoded by representing each one as the difference from the previous value.

Exampl. Diff-al pulse code modulation.

* Transformation: Transforming signals from one domain to another.



* ~~vector quantization~~

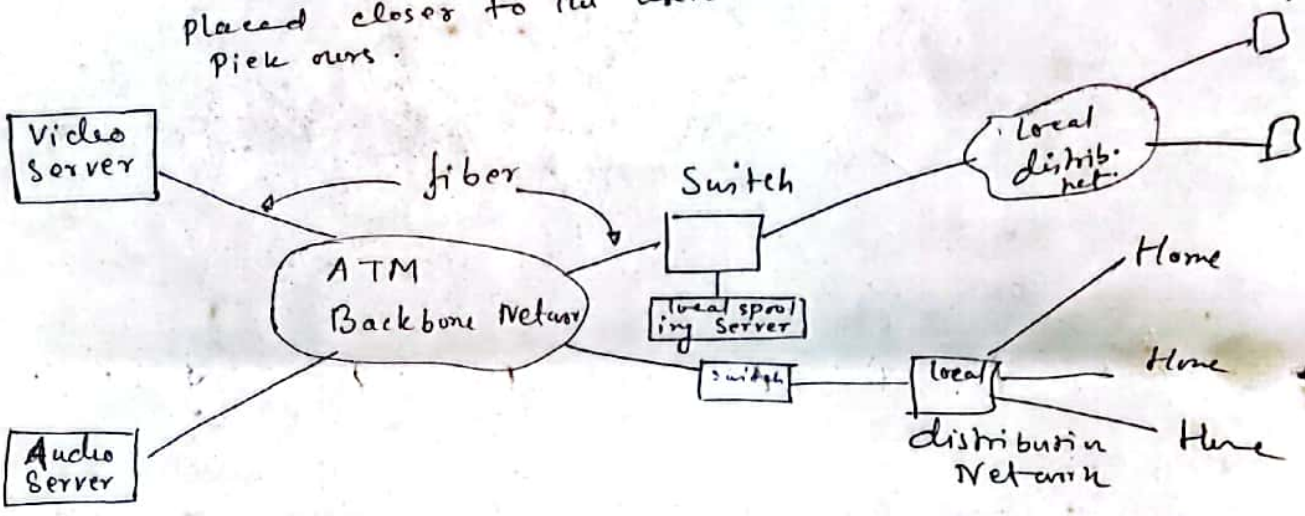
Scanned with CamScanner

Compressing Standard

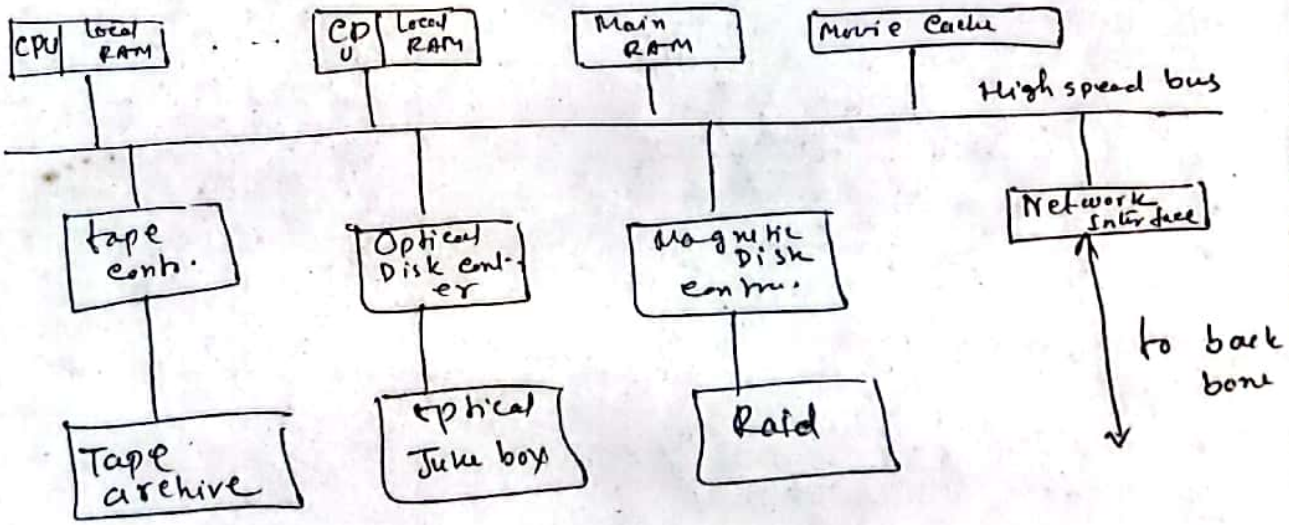
* JPEG (Joint Photographic Experts Group) – for Compressing continuous-tone still pictures (photographs)
* MPEG (Motion Picture Experts Group)

* (4) Video on demand

local spooling servers that allow videos to be placed closer to its users to save bandwidth during Pick ours.



* Video Server:



RAM
Mag. disk