

3/12/2016

Unit - I Internet and World Wide Web

** Internet - :

ARPANET

TCP IP

WWW

LAN - Local Area Network

MAN - Metropolitan Area Network

WAN - Wide Area network

Telnet - To connect one machine with another

Pull Protocol - Pull information from server to eg. POP3 - Post Office Protocol 3

IMAP4

MTA - Mail Transfer Agent

from sender to server

SMTP - Simple Mail Transfer Protocol

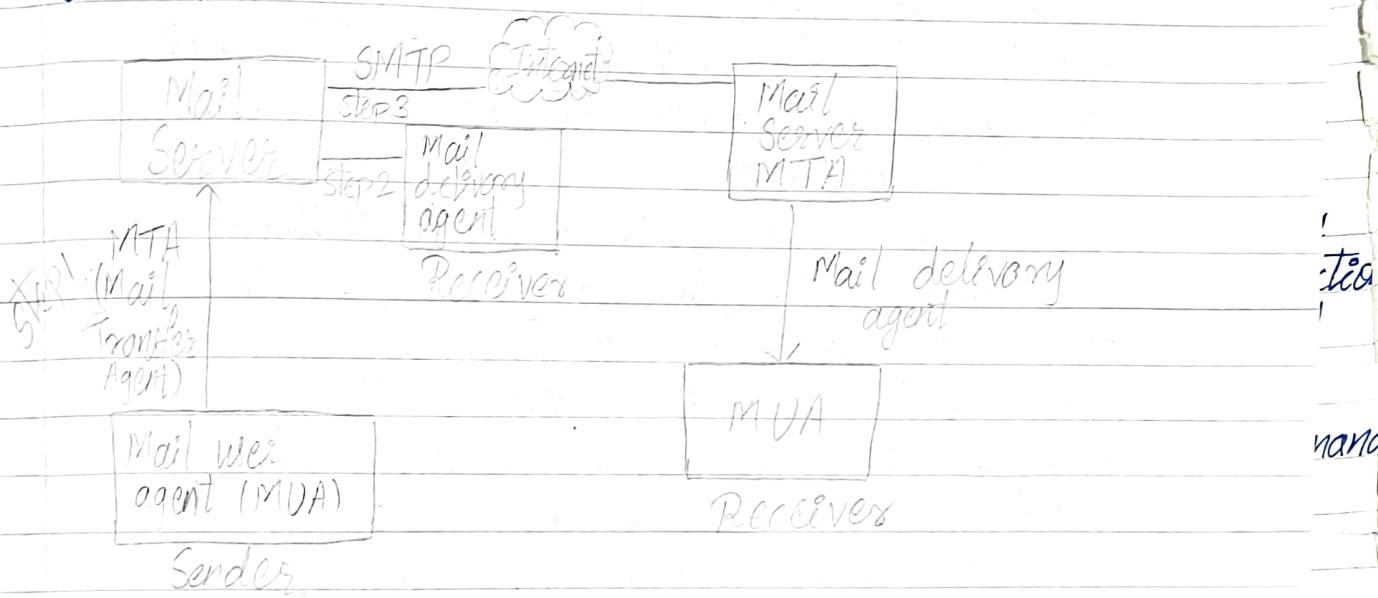
* Internet and its applications - :

The evolution of internet was done at US department of defence for using it in defence purpose. It was developed by Advance Research Project Agency Network (ARPANET). In 1982, the Internet Protocol suit (TCP/IP) was standardised and the concept of world wide network of fully interconnected computers called internet was introduced. During early 1990's commercial use of internet began. Internet can be defined as network of networks that connect millions of private, public networks spread across the world using wireless or wired technology. The user can browse millions of documents.

on different computers around the world. Internet also services like electronic mail and FTP for downloading information from servers around the world. It has become a big market place for buying and selling of goods and services. It is used for shopping, booking tickets, stock market trading, conducting business, social networking etc.

Common applications of internet are -
email, telnet, FTP, e-commerce, e-business, video conferencing

* E-mail :-



13/12/2016

Electronic mail is the most popular use of internet. For using e-mail, an e-mail account has to be created. Once the account is created, a message can be sent to anyone who has an e-mail ID. The destination place is not an issue in this case within few seconds, the receiver can receive the e-mail.

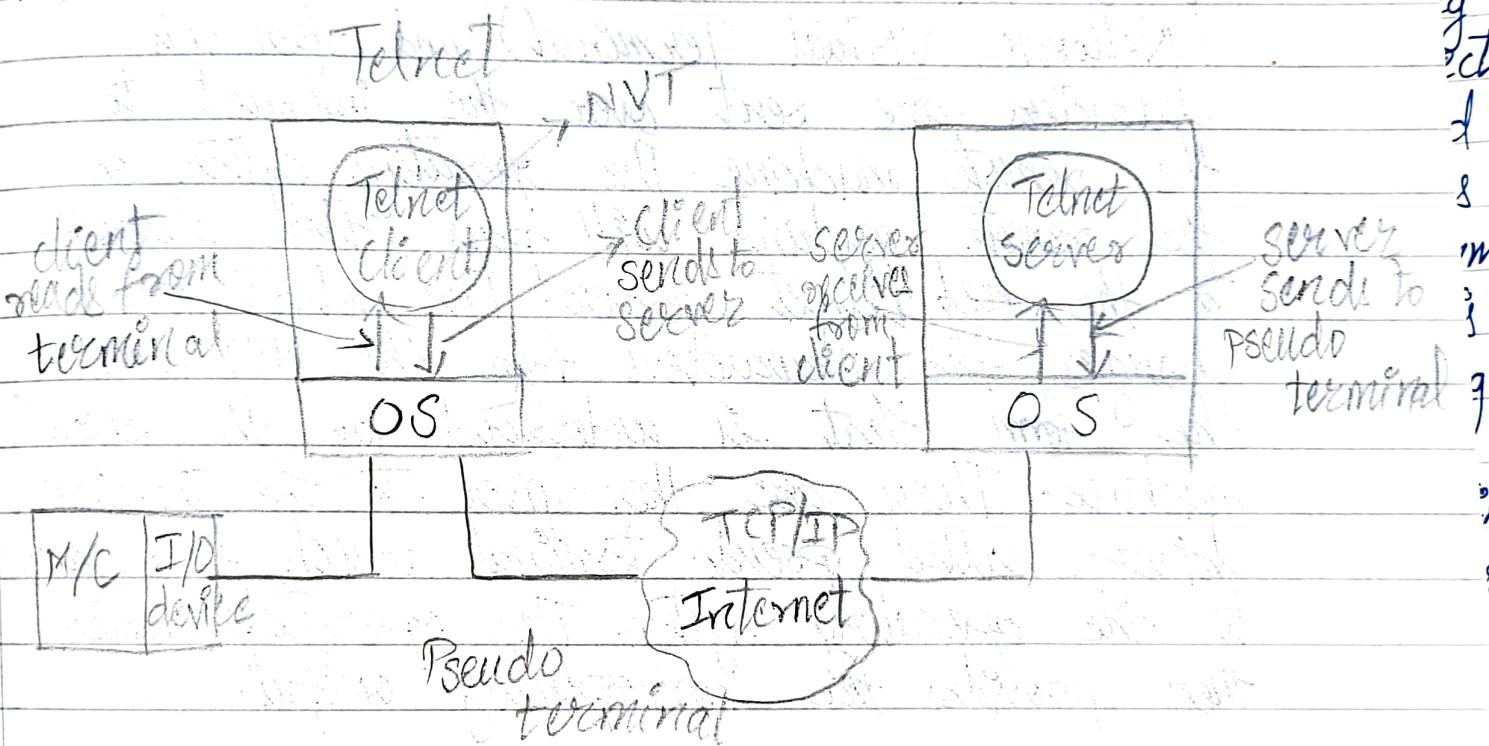
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E-mail is delivered using server architecture. An e-mail client program called user-agent is used for sending and storing of e-mails. The inbox is the area on the server which is allocated for each user.

When a mail is sent, a push program is used to send this e-mail to the server. The server will transfer the mail to other mail servers at the other end using the mail transfer agent. The server will receive the mail and store it in the inbox of the receiver.

The user can receive retrieve the mail from the server using the pull program. The protocol for pulling messages are post office protocol or internet message access protocol. The protocol used in between the mail servers is simple mail transfer protocol.

* Telnet :-

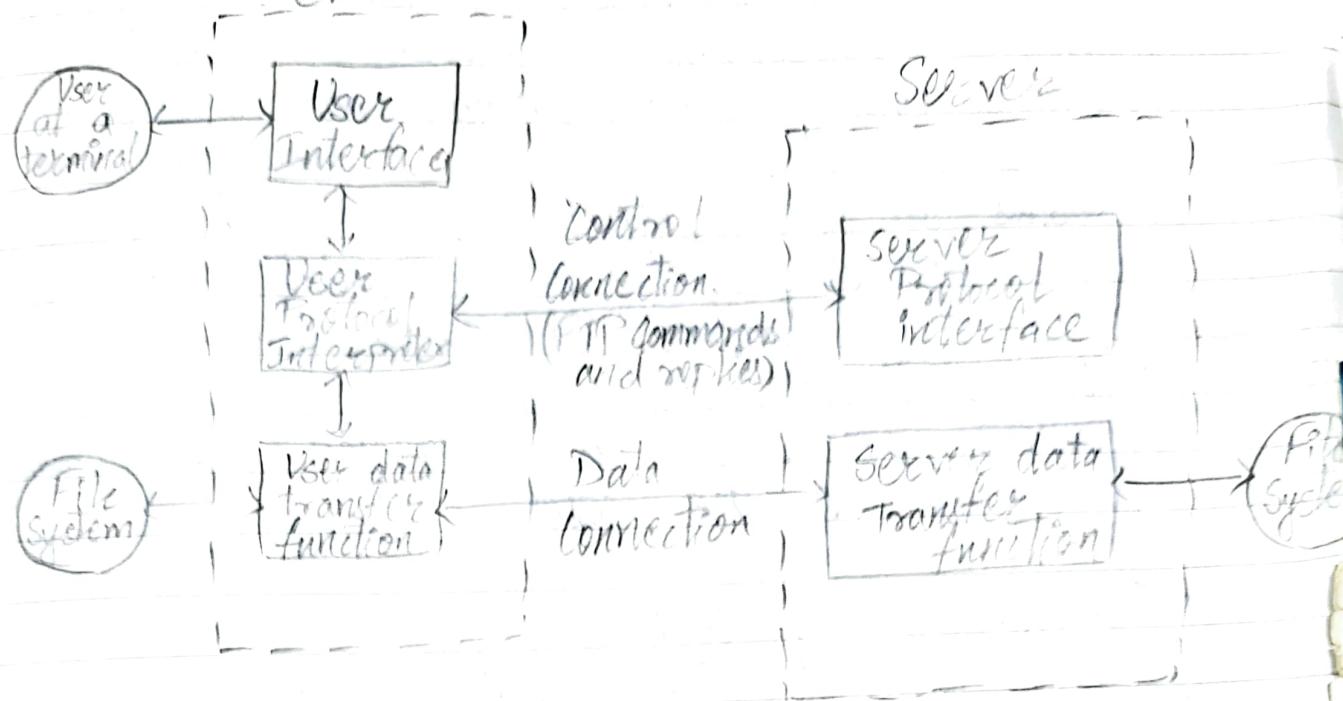


NVT - Network Virtual Terminal
Character format

Terminal Network (Telnet) is an application that allows users to log on to a remote computer system and work on it as if it is a local system. A user can perform a login or a remote login. If the login is local, the key strokes are sent to the terminal driver which gives it to operating system which interprets it and produces the output.

When remote login is performed, the key strokes are sent to the terminal driver which sends it to local operating system. The operating system in turn sends it to telnet client program which will convert the characters to a universal character set called NVT (Network Virtual Terminal) and then this characters are sent over the internet to the remote machine. The operating system on the remote machine will pass these characters to the telnet server. The telnet server changes the characters from the NVT form to the form that is understood by the remote machine. They are then given to the terminal driver called pseudo terminal which gives them to the operating system. The operating system then provides the corresponding output.

* File Transfer Protocol (FTP) —:



FTP is the standard method used for transfer of files from one machine to another using internet. It uses two separate connections, control connection and data connection. The control connection is used for sending commands and receiving responses. It uses seven bit ASCII character set for this. Each command and response is send as one short line and is independent of file format. It remains open during entire session.

Data connection is open and close every time the file is transferred. It uses the port number 2 for this.

without the need

14/12/2016

* E-commerce -

Facilitating business on internet is called E-commerce / Electronic-commerce. It involves businesses and consumers, buying and selling products online. Most of the E-commerce websites on the internet are retail stores, selling products directly to the public. Some online stores conduct Business to Business sales. E-commerce also sells services online. The transfer of funds is completed electronically for most of the cases.

* Benefits of E-commerce -

- 1) Reduced cost - The cost is reduced as no labour, paper work and other overheads are involved.
- 2) Reduced time - The time for going from one place to another place and time for advertisement is reduced.
- 3) Flexibility of purchase - Multiple products and multiple consumer profiles can be maintained.
- 4) Market expansion - Global consumers can access the goods as there is no physical boundary.
- 5) Improved relationship in trading - Communication between traders leads to long term relationship.

* Categories of E-commerce -

- 1) Business to Consumers (B2C) -

Business reaching out to consumers using shopping cart software.

2) Business to Business (B2B) -

Companies doing business with each other such as manufacturer selling to retailer.

3) Consumer to Business (C2B) -

The consumers post their project with a set budget. Companies review it and bid for the project. The consumer can select the company with the lowest bid.

4) Consumer to Consumer (C2C) -

Consumers are selling goods to other consumers. e.g. ebay and paypal

There are other categories such as Government to Government, Government to Employee, Government to Citizen, Citizen to Government, Business to Government, Business to Employee.

At Video Conferencing - :

Video conferencing is a communication technology that integrates audio and video to connect users anywhere in the world in real time as if they were in the same room. Each user or group of users who are participating in video conferencing must have a computer, a camera, a microphone and sound system along with internet connection.

Uses -

Video conferencing is used by business organizations to conduct meetings or hold conferences without the need

- 2) for participants to travel to a single location.
- 3) It can be used by students to learn in a virtual classroom.
- 4) Universities can conduct lectures and seminars by subject experts and faculties from all over the world.
- 5) It is also used in medical field for real time telemedicine.
- 6) It can be used by patients in rural areas for consulting doctors in cities.
- 7) It can also be used for conducting interviews and distance learning.

* Benefits -

- 1) Reduction in travel expenditure.
- 2) Increase in productivity.
- 3) Increase in collaboration.
- 4) Improved communication.
- 5) Time saving.
- 6) Timings and international boundaries does not have any restriction.

** E-Business - :

E-Business is the transformation of business process through the use of internet technology. E-Business is conducted for serving the customers and collaborating with business partners.

etc. It are integrated together to improve efficiency of the business.

Domain Name Server -:

The Domain Name Server (DNS) is a client-server application program which is used by other programs such as e-mail or FTP to find the IP address of a host on the internet. To uniquely identify an entity on the internet it needs an IP address but IP addresses are not used by us as it is difficult to remember. Instead of that we remember names. The DNS does the mapping by converting the names to the corresponding IP addresses. It returns the IP address to the program which has requested the information.

* Internet Service Providers (ISP) -:

ISPs are the companies which provides internet connections to the general public. They connect the personal computer to the internet. They provide internet access through some specific digital data transmission technologies. According to the method of data transmission, the internet access that the ISPs provide can be divided into following types.

1) Dial-up internet access -

It is the oldest method of providing access to internet. It uses a regular telephone line to perform a connection to the internet. It is also the least expensive internet access service and has a low speed connection of about 40-50 kbps.

2) ISDN (Integrated Services Digital Network)
It uses a telephone system network integrating a high quality digital transmission of voice and data over the ordinary phone line.

** Internet Addresses :-

These are also called as IP addresses. Internet address helps to identify a node in a network. It follows a TCP/IP suite. It is a numeric string that identifies a computer system and helps in locating it. Initially, the internet protocol addresses were defined as 32-bit number and are known as IPv4 addresses. They can be represented in dotted decimal notation in 4 octets separated by periods.

Example - 192.168.10.4

These decimal numbers range between 0-255. IP V4 addresses can also be represented in binary format.

As the use of internet is growing rapidly, the IPv4 addresses were exhausted and a new addressing system IPv6 was developed. It uses 128 bits for addressing. These bits are represented as hexadecimal numbers, separated by colons. If the IP addresses are assigned permanently, they are called as static IP addresses, if they change everytime the system is booting then they are called as dynamic IP addresses.

URL (Uniform Resource Locator) :-

URL specifies the address of an online resource and the mechanism to retrieve it. The format of the URL is `http://www.google.com`. The 1st part is the protocol which is used for transferring the information. It is followed by a colon after that the remaining part identifies the domain name of the destination location. Port numbers can also be used to identify a particular application. Whatever information is sent in URL to the server consist of a name value pair separated by "&". If a secured website is visited then the URL does not display the information that is sent to the sever.

1/2017

* Browser :-

A web browser is a client-side software application used for retrieving, displaying and navigating through the online resources available on www. It is used for accessing information from the web servers in the network. The same information can be saved into the file system. It identifies the URL and fetches the requested information to the user.

Common functions offered by web browsers

are

- ① The user enters the URL on the address bar of the browser. The information of the URL is then fetched.
- ② HTML script is passed to the browser for interpretation. Interactive scripts like javascript and VB script are also

- interpreted by the browser.
- ③ The browser allows to open multiple tabs windows at the same time.
 - ④ Browsers may include pop-up blockers which not allow windows to open without user permission.
 - ⑤ They provide backward and forward button, navigation, refresh button for reloading the page, stop button for cancelling the action, home button to return to home page.
 - ⑥ The search bar is used to allow users to input terms into the search engine.
 - ⑦ History of the previously visited pages is maintained by the browser.

* Different Browsers :-

• Internet Explorer -

It is commonly called as IE. It was developed by Microsoft and comes as part of windows operating system since 1995. Internet Explorer 11 features in windows 8. and was released in year 2013. It uses component based architecture. It offers zone based security. It provides tabbed browsing, pop-up blocking and user interface for FTP.

• Netscape Navigator -

It is a proprietary browser based on Mosaic web browser developed by Netscape. It was based on Mozilla application suite which

known as Seamonkey.

Chrome —

It is a web browser by Google. It is one of the first browser to incorporate machine translation with the browser itself. It includes all the features like arranging tabs, managing windows. It is designed with built-in safety and security features. It supports high speed when accessing web pages.

* Web Servers — :

A web server is a computer where the web contents are stored. Web server is mostly used to host the websites. But web servers can also be used for storage, e-mails, etc. Different websites can be placed on a single server and the web server responds to the request that is made by the browser. When the user enters a URL, the browser sends the http request to the server computer mostly on port number 80. HTTP is the internet standard data transfer protocol for web pages. The server will handle the request and return the requested web page after processing it. Some of the popular web servers are Apache server and Internet Information Server (IIS).

Apache server supports multi-tasking and multi-threading concepts. It supports different scripting languages like PHP, JSP, Python or Perl.

The Internet Information Server was developed by Microsoft and can be used on windows machines. It supports ASP.NET technology.

* Proxy Server :-

A proxy server is a dedicated computer or a software system running on a computer that acts as an intermediary between endpoint devices such as the client and the server. The advantage of proxy server is that it stores the information that is frequently requested/ accessed by the client and thus increases the response time.

When a proxy server receives a request for some webpage, it looks into its cache. If it finds the page, the page is retrieved without forwarding the request to the internet. If the page is not present in the cache, the proxy server uses its own IP address to request the page from the server on the internet. When the page is retrieved, the proxy server stores that page and also forwards it. The proxy server is invisible to the user and the user thinks he is directly getting the information from the web server.