CHAPTER 1
INTRODUCING INTERNET

INTERNET

Internet is the largest network of different National and International networks consisting of computers and information. It is the name given to a vast and worldwide system consisting of people, computers & information.

HISTORY OF INTERNET

The roots of the Internet lie in a project called the ARPANET (Advanced Research Projects Network) which was sponsored by the United States Department of Defence Advanced Research Projects Agency (ARPA). The Department of Defence was interested in building a network that could maintain itself under adverse conditions.

(**A Network is simply two or more computers connected together)**

The original idea was to build a network capable of carrying military & government information during a "Nuclear Event".

The project was developed in 1968 and soon evolved into a more general goal of developing techniques to build a large scale network including different universities, US Defence, Engineers, Scientists, Students and Researchers who were part of this system. Apart from sending and receiving messages, people at long distances were able to play games & socialize with the people who shared their interests.

In 1980 another federal agency the National Science Foundation created a new, high – capacity network called NSFNET which was more capable than ARPANET.

NSFNET could allow only academic research on its network & not any kind of private business on it. So many companies built their own networks which were later inter connected along with ARPANET & NSFNET to form **Internet**.

HOW DOES INTERNET WORK?

The Internet is a network connecting thousands of other computer networks. Each network on the internet has a unique address and the computer systems making up a network have an address based on the networks address. At a basic level, the addresses are numeric, a sequence of four numbers. This address can be specified as names such as sage.myu.edu. Each piece of information passed around the internet contains the sender address & the delivery address. As information is passed around the internet, each network decides whether to accept it or to pass it on. Once the information is accepted within network, it's the network's job to get it to a specific computer system.

The rules that govern this type of communication are called PROTOCOLS.

By Using the same protocol different types of networks & computer systems can communicate with each other. Each needs to have hardware & software in place so it can deal with the information in the form, specified by protocols. This means the system must transfer & receive the information into its own form of designated protocols. The communication protocol used by Internet is TCP/IP.

IP (Internet Protocol) – IP is responsible for handling the address of destination computer so that each packet is sent to its proper destination. A packet is a message consisting of more than 1500 bytes or character. Each packet has the address of the sender and the address of the destination. These addresses are called IP addresses.

TCP (Transmission Control Protocol) – TCP is responsible for dividing the file/message into packets on the source computer, it is also responsible for reassembling the received packets at the destination computer, i.e. a single large message is divided into packets and each packet is assigned an IP address.

The Network on the Internet use hardware device called router to communicate with other networks. The router on a network accepts packets addressed to it and passes on packets addressed to other Networks. All computer networks are part of Internet, but use different technology. These can, exchange information with the Internet through a device called **GATEWAY**, which allows different networks to communicate with each other.

Precisely the Internet functions as:

1. At source computer, the message to be sent to another computer is firstly divided into very small parts called packets. A packets generally contains upto 1500 character.
2. Each packet is given a number-serial wise e.g. 1, 2, 3.
3. All these packets are then sent to the address of destination computer.
4. The destination computer receives the packets in random manner. If a packet is lost, it is demanded again.
5. The packets are reassembled in order of their number and the original message is obtained.

WHO GOVERNS THE INTERNET?

Internet is not governed by any particular body. It is coordinated (not governed) by many volunteer organizations. There is no single authoritative organization. Various volunteer organizations are responsible for different types of activities as listed below:

(i) The *Internet Architecture Board* (**IAB)** is responsible for approving standards and allocating resources.
(ii) The *Internet Engineering Task Force* (**IETF)** is responsible for discussing and investing the operational and technical problems of Internet.
(iii) The InterNIC is responsible for providing registration services to Internet community.

USES OF INTERNET

Tens of millions of people throughout the world have access to the internet. They use it to communicate with one another, to send and receive messages, some for personal use and some for business purpose. An individual on internet can communicate with one another. Each user has an email address and all users can access it regardless of where they are.

People can communicate in many ways – Example:-

- EMAIL
- Discussions in a group using email– Internet users can join, contribute and read messages to the entire group through email/conferencing.
- Group discussions, asking questions, & sharing information through Usenet. The articles (messages) are grouped into categories called **Newsgroups**.
- Chat

Different people who communicate by internet include individual, companies and institutions. These communities use the internet in many ways as given below:

1. **Business** – To access complex databases e.g. financial database.
2. **Companies** – carrying out electronics commerce including advertising, selling, buying, distributing products and providing after sales services.
3. **Business & Institution** – for voice & video conferencing, emails.
4. **Media & Entertainment Co.** - use the Internet to broadcast audio & video, online chat, online newsgroup.
5. **Scientist & Scholars** – to communicate with colleagues, for research, to distribute lecture notes, to publish papers & articles.
6. **Individuals** use the Internet for entertainment, communication, finding information and to buy and sell goods and services.

HOW TO BE PART OF INTERNET?

To be a part of Internet, one has to get connected to a server on Internet which is a computer that serves the requests made by other computers.

To access Internet, many methods can be used:-

(i) **Through Dial-up Connection:**- A dial up connection, is a temporary connection set up between the user computer and ISP server. A dial up connection is established using a modem which uses telephone line to dial up the number of ISP server. It is economic but not very fast.

(ii) **Through Leased Lines:** Through leased lines one can get connected to Internet. Leased lines are direct cables laid to connect the user computer to an ISP's server. ISP's are companies that provides access to the Internet. Leased lines are like direct connection.

Another very popular, connection is DSL(Digital Subscriber Line) where data is transmitted directly as digital data.

In India, some of the popular ISP's are VSNL, Mantra Online, MTNL, Satyam Online, Dishnet DSL, Net 4U, NOW, Netkracker etc.

WORLD WIDE WEB

It is a large system of servers which offers all kinds of information to anyone on the Net. The information can be in the form of regular text, pictures sounds and other types of data. To access this information, a client program called Browser is used. Within web, information is stored in pages. Each page can hold information & links to other pages.

Apart from accessing, the pages can be created using Multimedia, & Hypertext files.

Hypertext file can incorporate text, graphics, images and video tracks and dynamic links to related files. Multimedia files are the documents that contain a combination of text, photographs, graphics, video and audio.

So www is a set of programs, standards & protocols that allow the multimedia and hypertext files to be created, displayed and linked on the Internet.

WWW Attributes

There are various elements / attributes that make the www. These are discussed as follows:

1) User Friendly – WWW resources can work effectively and easily with any Internet browsers.

2) Multimedia documents – A web page contains different forms of information– text, graphics , audio, video, animation etc. All these elements are Multimedia elements & make a multimedia document when combined together.

3) **Hypertext & Hyperlinks** – Hypertext refers to the combination of text, graphic images, audio and video tracks, and hyperlinks. Hyperlink refers to a dynamic link upon clicking at which a new web page or program opens.

4) **Interactive** – Here Interaction means communication between users & servers through one or more of following ways – (i) Hyperlink (ii) Controls – Radio buttons, Check boxes, Text boxes, Command button or any clickable button.

5) **Frames** – Frame is a container that contains one or more than one control of same or different types on a single web page. It can divide, subdivide a page into horizontal, vertical or both as required.

WEB BROWSERS AND WEB SERVER

Web Browser- Web browser is a client program for World Wide Web, where www is a client-server architecture. The different users are the clients, who need software to communicate with the server and access the internet. It displays HTML and other documents and allows the users to follow hypertext links. A www client is called a web browser.

Web Server- Web server is a www server. It is an application that stores web pages and associated files, databases, and scripts. It responds to the requests made by Web browsers.

The Client-Server Computing

The client/server computing involves three components viz. clients, servers and the network.

The **Clients** are usually PCs or a software or workstations, (A computer attached to a network is called *workstation)*. The clients request different types of services from the server.

The **Server** is usually a powerful PC and can provide services like printing files, or sharing data or sending information to other computer(s) etc.

The **Network** connects various clients to each other and to the server.

WEB SITES, WEB ADDRESSES AND WEB PAGES

Web Sites- A location on a net server is called a web site. It is a group of related web pages, maintained by a person or organization. Each website has a name which when stored in a specific directory on a net server is called a location. This name is also called URL (Uniform Resource Locator) which has a unique address. E.g. http:/www.microsoft.com

Here http is Hyper text Transfer Protocol, a set of rules on which Internet structure is established. HTTP is the root of the complete www tree. It uses internet addresses in a specific format i.e. URL.

Web Addresses- In general , it is **type ://address/path**

Where **type** : specifies the type of server in which the file is located; **address** : is the address of server, and **path** tells the location of file on the server.

e.g. http://encycle.msn.com/getinfo/styles.asp (active server pages).
http: specifies the **type** of server, *encycle.msn.com* is the **address** of server and *getinfo/styles.asp* is the **path** of the file style.asp.

The other examples of URLs are ftp://ftp.prenhall.com, http://www.yahoo.com, news://alt.tennis etc.

Syntax Elements of URL-

1. Server type or Protocol
2. Address or name of server of Internet.
3. Location / path of file on server.

Different Server types are-

Server	Protocol	Information it provides
ftp	File Transfer Protocol	Text and binary files organized in a hierarchical structure much like a family tree.
Gopher	TCP/IP	Text and binary files that are organized in a menu structure.
http	Hypertext Transfer Protocol	Hypertext / hypermedia file (i.e., multimedia documents that holds links, images, sound etc.
Mail	Post Office Protocols(POP) and Simple Mail Transfer Protocol	Messages sent by E-mail
News	Network News Transfer Protocol	Newsgroup organized in a hierarchical structure.

Some Most Common Domains

Server name has many components . It starts with "www" & ends with a suffix called a domain which specifies the type of organization e.g. education institution, commercial firm, govt./ngo, military, company, non-profit organization etc. It can be any of the following given below:

S.No	Domain ID	Affiliation	Remarks
1.	com	Commercial	for commercial firms
2.	edu	Education	for educational firms
3.	gov	Government	for government organizations/ bodies
4.	mil	Military	for Military
5.	net	Network resources	for ISPs/networks
6.	org	Non-profit organization	for NGOs and other no-profit
7.	co	Company	for listed companies

This naming scheme, an alternate to IP address is called DNS (Domain Name system) by which Servers are identified.

Web Page- A single page of website is called a Web page which uses HTTP.

Home Page – The very first page of the Web Site is called Home Page.

Web Portal – It is a web site, which hosts other web sites. In other words, a web portal has hyperlinks to many other web sites. By clicking upon these links, the corresponding web sites can be opened. www.yahoo.com is an example of a web portal. Other examples are www.indiatimes.com, www.khoj.com,etc.

Hypertext Transfer Protocol (HTTP)

The hypertext transfer protocol is an access method on Internet. It is the primary access method for interacting with Internet. The http is responsible for accessing hypertext documents on **World Wide Web.** Since World Wide Web is a system governing the use of multimedia files on the net and the hypertext files support multimedia, the http (hypertext transfer protocol) generally works in combination with www.

INTRANET – A network specifically that exists exclusively within an organization and based on Internet technology.

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Important Note:

Read Chapter 1 from the Text Book and the exercises after the Chapter along with this note.