Class X
Computer Applications
Chapter 1 & 2 Notes

HISTORY OF INTERNET

In 1969, the University of California at Los Angeles and the University of Utah were connected with the beginning of the ARPANET (Advanced Research Projects Agency NETwork) using 56 kbit/s circuits, which is sponsored by U.S. (United States) Department of Defense (DoD). The goal of this project was to connect computers at different Universities and U.S. (United States) defense.

In mid 80's another federal agency, the National Science Foundation (NSF) created a new high capacity network called NSFnet (National Science Foundation Network), which was more capable than ARPANET. The only drawback of NSFnet was that it allowed only academic research on its network and not any kind of private business on it. Now, several private organisations and people started working to build their own networks, named private networks, which were later (in 1990's) connected with ARPANET and NSFnet to form the Internet. The Internet really became popular in 1990's after the development of World Wide Web (WWW).

WORKING OF INTERNET

The computers on the Internet are connected to each other through small networks. These networks are connected through the gateways to the Internet backbone.

All computers on the Internet, communicate with one another using TCP/IP, which is a basic protocol (i.e. set of rules) of the Internet. TCP/IP (Transmission Control Protocol/Internet Protocol) manages the transmission of data/file/document on the Internet by breaking the data/file/document into small pieces or parts called packets or datagrams.

Each packet contains actual data and address part, i.e. addresses of destination and source upto 1500 characters. Functioning of TCP and IP are as follows:

- TCP It breaks message into smaller packets that are transmitted over the Internet and also reassembles these smaller packets into the original message that are received from the Internet.
- IP It handles the address part of each packet, so that the data is sent to the correct address. Each gateway on the network check this address to see where to forward the message.

USES OF INTERNET

Internet has been the most useful technology of the modern time, which helps us not only in our daily lives, but also in our personal and professional lives developments.

Thus, some uses of Internet are as follows:

- E-Commerce (auction, buying, selling products etc.)
- Research (online journals, magazines, information etc.)
- Education (E-learning, distance learning etc.)
- E-Governance (online filling of application, Income Tax, Sales Tax etc.)
- E-Reservation (online reservation, online ticket booking etc.)
- Online Payments (credit and debit card payments etc.)
- Video Conferencing
- Exchange of Views (files, music, folders etc.)
- Social Networking Sites (facebook, twitter etc.)
- Entertainment (play music, videos, games etc.)

Advantages of Internet

1. Greater access to information reduces research time.
2. Allows you to easily communicate with other people.
3. Global reach enables one to connect everyone on the Internet.
4. Publishing documents on the Internet saves paper.
5. A valuable resource for companies to advertise and conduct business.

Disadvantages of Internet

1. Cyber frauds may take place involving credit/ debit card numbers and details.
2. Unsuitable and undesirable material is available that sometimes can be used by notorious people such as terrorists.
3. It is a major source of computer viruses.
4. Messages sent across the Internet can be easily intercepted and are open to abuse by others.
5. It is difficult to check the accuracy of information available on the Internet.

Who Governs the Internet?
Internet is not governed by any single organisation. Some volunteer groups had been formed to help, co-ordinate and wrist with the development of the Internet.
These organisations are as follows:

- Internet Architecture Board (IAB) It is a technical advisory group of the Internet society and is chartered to provide oversight of the architecture of the Internet, its protocols and resources.
- Internet Engineering Task Force (IETF) It develops and maintains the Internet's communication protocols.
- Internet Research Task Force (IRTF) It looks into long-term research problems that could be critical in five or ten years.
- Internet Network Information Center (InterNIC)
  It provides various registry services needed for the Internet to operate effectively.
- World Wide Web Consortium (W3C) It develops standards for the evolution of the Web.
- Internet Society (ISOC) It concerns with the growth and evolution of the Internet and the way in which the Internet can be used.

CONNECTING TO THE INTERNET

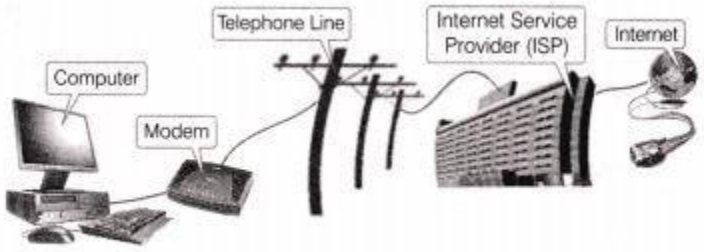
There are mainly three ways of connecting to the Internet, which are as follows:

1. Dial-up Connection

It is a temporary connection, set-up between your computer and ISP server.

Dial-up connection uses the telephone line (Public Switched Telephone Network-PSTN) and modem to connect to the Internet. The modem connects the computer through the standard phone lines, which serves as the data transfer medium. When a user initiates a dial-up connection, user need to enter the password and specify a username and modem dials a phone number of an Internet Service Provider (ISP) that is designated to receive dial-up calls.

The ISP then establishes the connection, which usually takes about 10 sec and is accompanied by several beeping and buzzing sounds.



Dial-up connection

2. Broadband Connection

The term broadband commonly refers to high speed Internet access that is always ON and faster than the traditional dial-up access. It is the short form of broadband width, that uses a telephone line to connect to the Internet. Speed of broadband connection is measured in Mbps (Megabits per second).

Broadband access allows users to connect to the Internet at greater speed than a standard 256 Kbps (Kilobits per second) modem or dial-up access. Broadband access requires the use of a broadband modem.

Broadband includes several high speed transmission technologies, which are as follows:

Digital Subscriber Line (DSL)

It is a popular broadband connection which provides Internet access by transmitting digital data over the wires of a local telephone network. It uses the existing copper telephone lines for Internet access.

A special modem is necessary in order to be able to use a DSL service over a standard phone line.

Faster forms of DSL, typically available to businesses are as follows:

- High Data Rate Digital Subscriber Line (HDSL)
- Very High Data Rate Digital Subscriber Line (VHDSL)
- Asymmetrical Digital Subscriber Line (ADSL)
- Symmetrical Digital Subscriber Line (SDSL)

Cable Modem

This service enables cable operators to provide broadband using the same co-axial cables, that deliver pictures and sound to your TV set.

A cable modem can be added to or integrated with a set-top box that provides your TV set for Internet access. They provide transmission speed of 1.5 Mbps or more.

Broadband over Power Line (BPL)

It is the delivery of broadband over the existing low and medium voltage electric power distribution network. Its speed is comparable to DSL and cable modem speeds.

BPL can be provided to homes using existing electrical connections and outlets. It is

also known as power-band. BPL is good for those areas, where there are no broadband connections, but power infrastructure exists, e.g. in rural areas.

- ARPANET was the world's first operational packet switching network.
- An Internet backbone is a point, where one or more networks are connected.
- ISP refers to the company that provides Internet connections to the users.
- A modem changes the digital data into analog data and vice-versa at source computer in a format that can be carried by telephone lines. Modem stands for Modulator and Demodulator.
- Bandwidth is the amount of data that a circuit or a signal can carry.
- TCP/IP was designed in 1973, which in 1983 became the standard for communicating between computers over the Internet.
- Some popular ISPs of India are:
    - Data Communication Ltd.
    - Mahanagar Telephone Nigam Ltd. (MTNL)
    - Airtel
    - Reliance

3. Wireless Connection

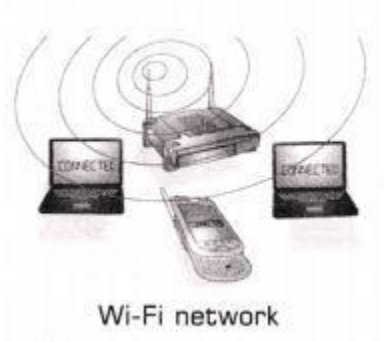
Wireless broadband connects a home or business to the Internet using a radio link between the customer's location and the service provider's facility. Wireless broadband can be mobile or fixed. Unlike DSL and cable, wireless broadband requires neither a modem nor cables.

The distance between the' devices connected to each other through a wireless Internet connection does not affect the rate of data transfer between them.

Some ways to connect the Internet wirelessly are as follows:

Wireless Fidelity (Wi-Fi)

It is a universal wireless networking technology that utilises radio frequencies to transfer data. Wi-Fi allows high speed Internet connections without the use of cables or wires. Wi-Fi networks can be designed for private access within a home or business. It can be used for public Internet access at 'hot spots' that offers Wi-Fi access such as restaurants, coffee shops, hotels, airports, convention centres and city parks.



Wi-Fi network

Worldwide Interoperability for Microwave Access (WiMAX)

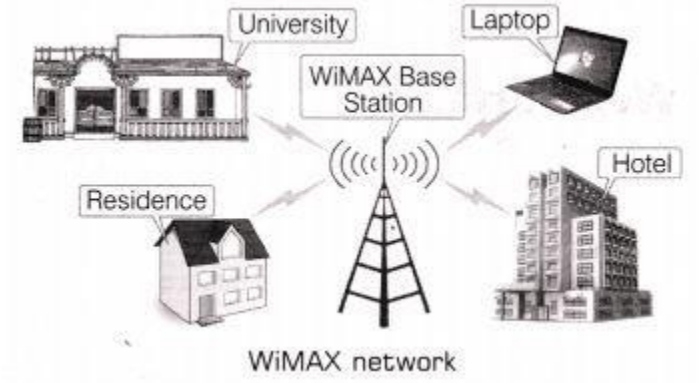
Today, it is one of the hottest broadband wireless technology. These systems are expected to deliver Broadband Wireless Access (BWA) services upto 31 miles (45 km) for fixed stations and 3-10 miles (5-15 km) for mobile stations.

WiMAX It would operate similar to Wi-Fi but at higher speed, over greater distances and for a greater number of users. It has the ability to provide services even in areas that are difficult for wired infrastructure to reach. Also, it has the ability to overcome the

Connection

Types	Advantages	Disadvantages

physical limitations of traditional wired infrastructure.



Mobile Wireless Broadband Services

These services are also becoming available from mobile telephone service providers and others. These services are generally appropriate for mobile customers and require a special PC card with a built-in antenna that plugs into a user's laptop computer. Generally, they provide lower speeds in the range of several 100 Kbps.

Some advantages and disadvantages of different connection types are as follows:

Dial-up	(a) Easily available. (b) Available at low cost. (c) Can be used through fixed or cellular phone.	(a) Slower than broadband. (b) Needs expensive set-up. (c) Phone remains busy.
Broadband	(a) Telephone can be used with Internet connection. (b) Faster than a dial-up connection. (c) Always on type of connection.	(a) Expensive than dial-up. (b) Not available in all areas. (c) Needs expensive set-up.
Wireless	(a) No phone line required. (b) Easy and inexpensive to set-up. (c) No limitation of location. (d) Connectivity is never a problem.	(a) Vulnerable (b) Not much secured. (c) Limited security mechanisms. (d) Medical disadvantage can cause one cancer.

Satellites which are orbiting around the earth, provide necessary links for telephone and television service. They can also provide links for broadband. Satellite broadband is another form of wireless broadband and is also useful for serving remote or sparsely populated areas.

CHECK POINT

1. The ARPANET was released in:
   (a) 1969 **(b)** 1995 **(c)** 1981 **(d)** 1990
2. Name the organisations that govern the Internet.
3. Internet provides three ways of connection. Name them.
4. What do you mean by the ability of WiMAX?

WORLD WIDE WEB (WWW)

It is a system of Internet servers that supports hypertext and multimedia to access several Internet protocols on a single interface. It is often abbreviated as the Web or WWW. It is a way of exchanging information between computers on the Internet, trying to tie them together into a vast collection of interactive multimedia resources. It is only a portion of what makes up the Internet, but it is the fastest growing part of the Internet. The Web lets people, organisations and companies publish information for other people to see. This makes the Web a very useful tool for finding information about any topic.

Protocol
It refers to a set of rules that co-ordinates the exchange of information. Both the sender and the receiver should follow the same protocol to communicate data.

Protocols of the Web

- **HTTP** (HyperText Transfer Protocol) A protocol that transmits hypertext over networks. It is the stateless protocol of the Web.
- **SMTP** (Simple Mail Transfer Protocol) It distributes E-mail messages and attached files to one or more electronic mail boxes, e g. atmail
- **FTP** (File Transfer Protocol) It transfers files between a server and a computer, e.g. Filezilla.
- **VoIP** (Voice over Internet Protocol) It allows delivery of voice communications over IP networks, e.g. Skype.
- **POP** (Post Office Protocol) It is the primary protocol behind E-mail communication e.g. Outlook.
- **IMAP** (Internet Message Access Protocol) It is a standard protocol for accessing E-mail from your local server, e.g. broadband mechanisms.

WWW Attributes
WWW provides various attributes, which are as follows:

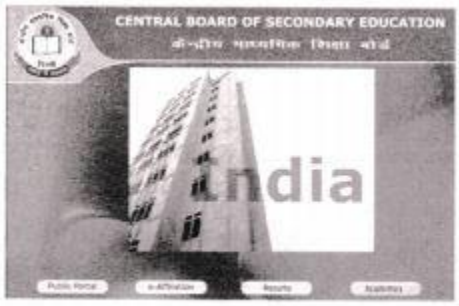
- User-friendly The WWW resource works smoothly with most Web browsers, such as Internet Explorer, Firefox etc.
- Multimedia documents WWW allows users to create and display Web pages that contains various graphics, audio, video, animation and text.
- Interactive WWW provides interactivity using hyperlinks and input boxes (i.e. textboxes and checkboxes).
- Frames WWW supports frames that allow users to display more than one independent section on a single Web page.

HyperText and Hyperlinks
Hypertext is the text that appears on the page, on which we can click and reach to another page with which it is linked. Hypertext is also a combination of hyperlinks and multimedia. Hyperlink or dynamic link i simply called a link, may be an icon, graphic or text in a document that links to another document.

WEB PAGE

The backbone of the World Wide Web is made up of files or documents called pages or Web pages, that contain information and links to resources both text and multimedia. It is created using HTML (HyperText Markup Language). The Web is a collection of large

number of computer documents or Web pages that are stored on computers around the world which are connected to one another using hyperlinks.



CBSE Web page

WEBSITE

A group of related Web pages that follow the same theme and are connected together with hyperlinks is called a Website. In other terms, “A Website is a collection of digital documents, primarily HTML files, that are linked together and that exist on the Web under the same domain”.
A Website displays related information on a specific topic. Each Website is accessed by its own address known as URL (Uniform Resource Locator).
e.g. http://www.carwale.com is a Website, while http:// www. carwale.com/new/ is a Web page.
Two terms that are associated with a Website are as follows:

Home Page
The main or first page of a Website is known as home page.
Advantages of Home Page

- It helps viewers to find out what they can find on that particular site.
- It helps in the Publicity of on individual or community.
- It makes the visitors more comfortable with the website.

Web Portal
It is a Web page that combines useful information and links.
Advantages of Web Portal

- Easy for users to customize personal places.
- It provides communication between portals (i.e. between different applications).
- It provides flexible content and layout.

WEB BROWSER

It is a software application that is used to locate, retrieve and display some content on the World Wide Web, including Web pages. These are programs used to explore the Internet. It is an interface that helps a computer user to gain access over all the content on the Internet.
We can install more than one Web browser on a single computer. The user can navigate files, folders and Websites with the help of a browser.
There are two types of Web browsers, which are as follows:

Text Web Browser
A Web browser that displays only text-based information is known as text Web browser, e.g. Lynx.

Graphical Web Browser
A Web browser that supports both text anu graphic information is known as graphical Web browser. e.g. Internet Explorer, Firefox, Netscape, Safari, Google Chrome, Opera.

Some Popular Graphical Web Browsers

NETSCAPE – It was introduced in 1994. Netscape comprises the major portion of the browser's market.
INTERNET EXPLORER (IE) – It is a product of Microsoft. This is the most commonly used browser in the world. This was introduced in 1995 alongwith Windows 95 launch and it has passed Netscape popularity in 1998.
SAFARI – It is a Web browser developed by Apple Incorporation and included in Mac OS X. It was first released as a public beta in January 2003. Safari provides good support for latest technologies like XHTML, CSS2 etc.
FIREFOX – It is a new browser derived from Mozilla. It was released in 2004 and has grown to be the second most popular browser on the Internet.
GOOGLE CHROME – This Web browser was developed by Google. Its beta and commercial versions was released in September 2008 for Microsoft Windows.
OPERA – It is smaller and faster than most other browsers, yet it is fully featured. It is the most popular mobile Web browser.

- WWW was introduced on 13th March, 1989.
- The first graphical Web browser was NCSA Mosaic.
- Web portal is a Website that has hyperlinks to many other Websites.
- Intranet is a collection of private computer networks within an organisation. It is also known as corporate portal or private business network.

WEB SERVER

It is a computer program that serves requested HTML pages or files from the Web client. A Web client is the requesting program associated with the user. The Web browser is a client that requests. HTML files from Web servers.

Every Web server that is connected to the Internet is associated with a unique address, i.e. IP address which is made up of a series of four numbers between 0 to 255 separated by periods!.), e.g. 68.178.157.132 or 68.122.35.127.

Web server software generally requires a fairly robust operating system like Unix, Windows NT. Every Website need to be stored on a computer called the Web server from which it can be accessed. Currently, there are five major Web servers commonly used for hosting Websites as follows:

Apache HTTP Server
It was developed by Apache Software Foundation. The Apache HTTP server is the most popular Web hosting server in the world. This software can be installed virtually on all operating systems including Windows, Linux, Mac OS X, UNIX etc. At present, 60% of server machines run on the Apache Web server.

Internet Information Server (IIS)
It is a product of Microsoft and is considered to be a very high performance Web hosting server. It is easily administrable and integrated with the Windows platforms.

Lighttpd
This is a free Web hosting server distributed under the BSD license. It is considered fast, reliable, secure and power efficient CPU. Lighttpd, Web servers are compatible with Windows, Linux, Mac OS X, Unix and Solaris operating systems.

Sun Java System Web Server
It is developed by Sun Microsystems. It is not an open source server. It supports Windows, Linux and Unix operating systems.
Sun Java also supports many different technologies, scripts and languages including PHP, PERL (Practical Extraction and Report Language), ASP, Coldfusion, Python etc.

Jigsaw Server
This is a free open source server for Website hosting that comes straight from the W3C. The Jigsaw Web hosting server is written in Java and supports both PHP (Personal Home Page) programs and CGI (Common Gateway Interface) scripts. It supports different platforms like Linux, Mac OS X, Windows, Unix, FreeBSD etc.

CHECK POINT

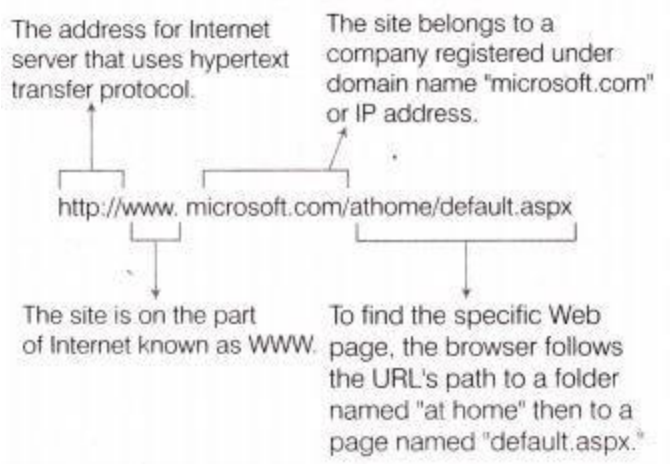
1. What is the relation between Hyperlink and Hypertext?
2. Name few popular graphical Web browsers.
3. Which Web server was developed by Sun Microsystems?

WEB ADDRESS AND URL

Web is a collection of documents (Web pages) stored on computers around the world. Each Web page has an address describing where it can be found. This address is known as Web address or domain name. A Web address identifies the location of a specific Web page on the Internet, such as http://www.1earnyoga.com .
On the Web, Web addresses are called URLs. It is the Web address for a Website or a Web page. The URL specifies the Internet address of a file stored on a host computer connected to the Internet.

Parts of URL
The URL contains three parts, which are as follows:

1. The name of the protocol to be used to access the file resource.
2. A domain name that identifies a specific computer on the Internet.
3. A path name with hierarchical description that specifies the location of a file in that computer, e.g.



Types of URL
Common types of URL are as follows:

- Absolute URL It specifies the exact location of a file/directory on the Internet. Absolute URL identifies that each absolute URL is unique, which means that if two URLs are identical then they point to the same file. It uses the following format: scheme://server/path/resource.

info	Informational organisation
com	Commercial
gov	Government
edu	Education
mil	Military
net	Network resources
org	Usually non-profit organisation

- Relative URL It points to a file/directory in relation to the present file/directory. It locates a resource using an absolute URL as a starting point. It typically consists of the path and optionally, the resource but no scheme or no server.

DOMAIN NAME

It is the text name corresponding to the numeric IP address of a computer on the Internet. Internet users access your Website using your domain name. It is a way to identify and locate computers connected to the Internet. It must be unique. Domain name always have two or more parts, separated by periods (dots).
e.g: google.com, yahoo.com etc.

Domain Abbreviation
Domain are organised by the type of organisation and by the country. A three letter abbreviation indicating the organisation and usually two letter abbreviation indicating the country name. Most common domain abbreviations for organisation are as follows:

Some domain abbreviations for country are as follows:

in	India
au	Australia
fr	France
nz	New Zealand
uk	United Kingdom

Domain Name System (DNS)
It translates domain names (computers host names) into IP addresses. It also stores and associates many types of information with domain names. It provides world wide keyword based redirection service.
DNS can be quickly updated and specifies the technical functionality of database service. The naming scheme by which servers are identified is known as the domain name system. e.g. the domain name www.example.com might translate to 198.105.232.4.

Numeric Computer IP Address
IP addresses are in aaa.aaa.aaa.aaa format, where each aaa is a number from 0 to 255. The length of IP address is 4 bytes. IP addresses identify the host computers, so

that packets of information reached to the correct computer, e.g. 162.192.1.89
The IP address has the following characteristics:

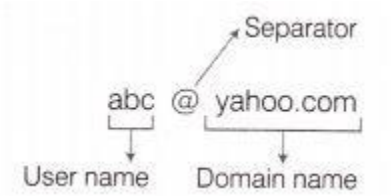
- IP addresses are unique.
- No two machines can have the same IP address.
- IP addresses are also global and standardised.
- All machines connected to the Internet agree to use the same scheme for establishing an address.

E-MAIL ADDRESS

E-mail stands for 'Electronic Mail'. It is a paperless method of sending messages, notes, pictures and even sound files from one place to another using the Internet as a medium. It is an individual name, which is used to send and receive E-mail on the Internet. It is used to specify the source or destination of an E-mail message.

The format of an E-mail address is user@domain. Where,

- the first part (user) identifies a unique user name.
- "@" separates the user from the domain, which identifies the mail server.
  e.g.



Some sites which provide the E-mail services are Gmail, Yahoo! mail, Rediffmail etc.

BLOGS

A blog is a Website or a Web page, in which an individual records opinion links to other sites on regular basis. A blog content is written frequently and added in a chronological order. It is written online and visible to everyone.
A typical blog combines text, images and links to other blogs, Web page? and other media related to its topic. In education, blogs can be used as instructional resources. These blogs are referred to as edublogs. The entries of blog are also known as posts. A person who writes a blog or a Weblog is known as blogger. Blogging is the act of posting content on a blog.

Advantages of Blogs

1. You can work at any time of the day and work with your ease.
2. Blogger does not require more efforts to write articles for his/her blog.
3. Easy and quick to update or add new posts.
4. People can leave comments on your blog.
5. It increases blog revenue.
6. Blogs can be set-up quickly.
7. It is all about being social. You (blogger) need to answer to peoples' queries and for that, reading should be a part of day-to-day tasks.

Disadvantages of Blogs

1. The common problem of full time blogger is isolation from society.
2. Mostly people love blogging but they don't have a fix source of income. Some choose freelance writing job for earning money and few chooses to depend on their parents to fulfil the need of money.
3. If the blogger get ill, then they don't get time to update their blog and it ultimately results in loss of blog income and traffic.

NEWSGROUP

An area on a computer network especially the Internet, devoted to the discussion of a specified topic is known as Newsgroup.
Newsgroup is an online discussion group that allows interaction through electronic bulletin board system (Usenet) and chat sessions.
To simplify the selection of suitable newsgroup, they are divided into subject classification which are as follows:

- **rec –** Recreation and entertainment topics.
- **news –** Matter related to the functionality of Usenet itself.
- **sci –** Science related topics.
- **soc –** Discussion related to society and social subcultures.
- **comp –** Computer related topics.

A newsgroup is a world wide platform for exchanging its content, ideas and information by common minded people. Newsgroup and contents are stored on special servers called Network News Transfer Protocol (NNTP) servers. The groups can be either "moderated", where a person or group decides which postings will become part of the discussion "unmoderated", where everything posted is included in the discussion.
e.g. alt.tennis, alt.astrology, comp.lang. C++ etc.

Advantages of Newsgroup

1. Newsgroup is similar in some ways to mailing lists, but it has a better structure.
2. It is also easier to access a newsgroup.
3. Usually, you will be able to find a FAQ (Frequently Asked Questio) section on a newsgroup, which is always helpful tor those who are not sure of certain things.
4. Free to subscribe and post.

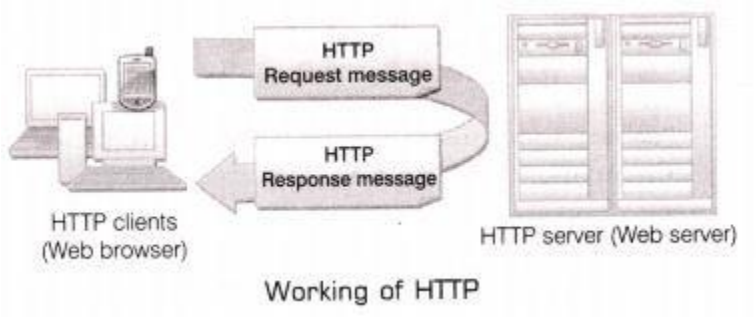
Disadvantages of Newsgroup

1. A newsgroup is not as quick as an E-mail or even a mailing list.
2. The information on newsgroup is submitted by people who may have no real idea of what they are talking about.
3. It is not user friendly and the risk of viruses is high.

HYPERTEXT TRANSFER PROTOCOL (HTTP)

It is the protocol used to transfer data over the World Wide Web. It defines how messages are formatted and transmitted and what actions should be taken by the Web servers and browsers in response to various commands.
e.g. when you enter a URL in your browser, this actually sends a HTTP command to the

Web server directing it to fetch and transmit the requested Web page. The other main standard that controls how the World Wide Web works is HTML, which covers how Web pages are formatted and displayed. HTTP is a stateless protocol because each command is executed independently without any knowledge of the commands that came before it.



Working of HTTP

HYPERTEXT MARKUP LANGUAGE (HTML)

It is used for designing Web pages. A markup language is a set of markup (angular bracket, <>) tags, which tells the Web browser, how to display a Web page's words and images for the user. Each individual markup code is referred to as an element or a tag. The text placed between a pair of angular brackets (<>) defines an HTML element.

HTML elements have two basic properties, i.e. attributes and content.
Attributes are used to apply the desired style on the text and content refers to the text that you want to display on the browser. When a Web page is opened in a Web browser, then the formatted content is displayed.

CHECK POINT

1. What are Web addresses called on the Web?
2. How many parts URL can be divided?
3. State whether statement is True or False. The first part of E-mail address is domain name.
4. Which protocol is known as stateless protocol?
5. How user can select a suitable newsgroup for a discussion on a valuable topic?