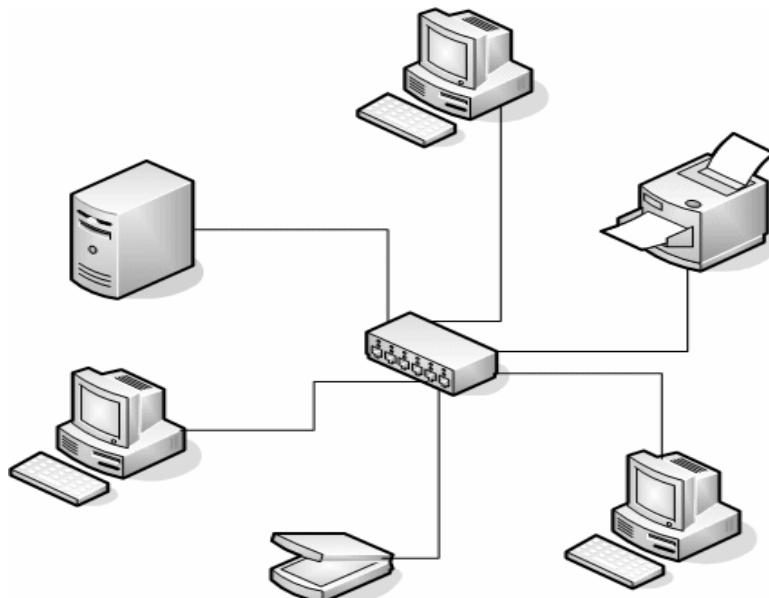


Computer Networks and Internet working

By completing this module you will be able to understand and learn the following:

- Computer Networking, Types of Networks and network Services
- Different Cables used in networking and Internet
- Working of Internet and it's services
- Domain naming system
- Advantages & disadvantages of Internet
- What is a Website, Web portal ,Web browsers
- Important Internet service providers in India
- Types of Internet connections
- Search engines

Computer networking is the connectivity among computers to allow communication between computer systems or devices. A computer network is any set of computers or devices connected to each other with the ability to exchange data.



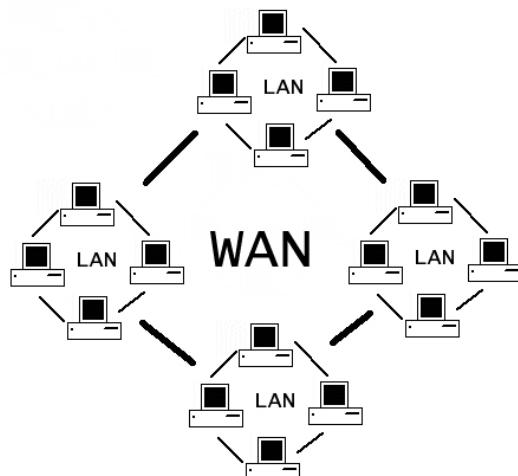
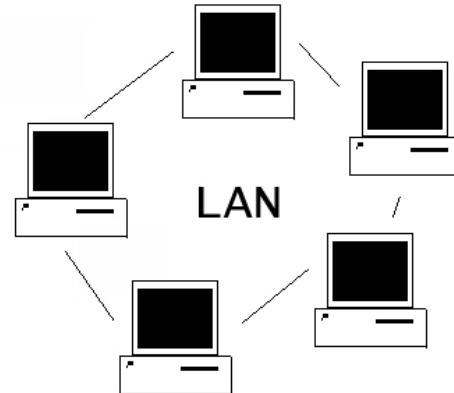
Network Services

- Email service
- File service - Allows users to use and share file space on a computer with a lot of file space.
- Print service - Allows printing to printers connected on the network.

- Web surfing - Allowing someone to open web pages and see web sites on the internet.
- Filtering out undesired sites on the internet.
- Allowing someone to access the network from the outside (from home).
- Updating virus definitions on workstations.
- Allowing someone to log onto the network.
- Even giving a workstation an address on the network is a service. If your computer does not have an address, it cannot access the internet or any other resource on the network

Examples of important networks are:

Local Area Network (LAN), which is usually a small network constrained to a small geographic area like a home, office, or group of buildings e.g. a school.



Wide Area Network (WAN) is usually a larger network that covers a large geographic area. WANs are used to connect LANs and other types of networks together, so that users and computers in one location can communicate with users and computers in other locations.

Metropolitan Area Network: A Metropolitan Area Network is a network that connects two or more Local Area Networks or Campus Area Networks together but does not extend beyond the boundaries of the immediate town, city, or metropolitan area. Multiple routers, switches & hubs are connected to create a MAN.

Wireless LANs and WANs (WLAN & WWAN) is the wireless equivalent of the LAN and WAN. Wireless telecommunications networks are generally implemented with some type of remote information transmission system that uses electromagnetic waves, such as radio waves, for the carrier and this implementation usually takes place at the physical level or "layer" of the network.

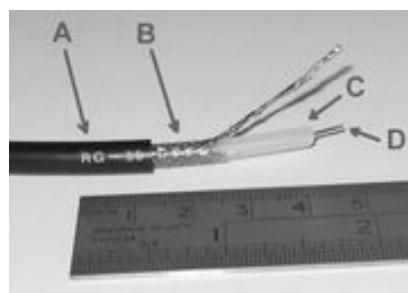


Different kinds of cables:

All networks are interconnected to allow communication with a variety of different kinds of media. This includes, twisted-pair copper wire cable, coaxial cable, optical fiber, and various wireless technologies. The devices can be separated by a few meters (e.g. via Bluetooth) or nearly unlimited distances (e.g. via the interconnections of the Internet).

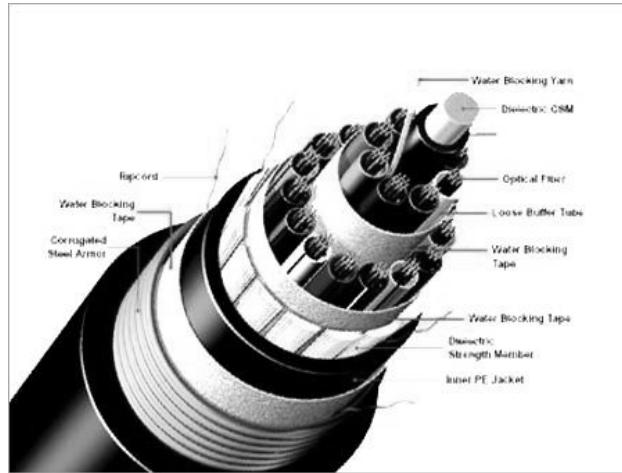


Copper wire cable



Flexible coaxial cable

- A:** outer plastic sheath
- B:** copper screen
- C:** inner dielectric insulator
- D:** copper core



Fiber Optic Cable

Internetwork

Two or more networks or network segments connected using devices as a router. Any interconnection among or between public, private, commercial, industrial, or governmental networks may also be defined as an internetwork.

In modern practice, the interconnected networks use the Internet Protocol. There are at least three variants of internetwork, depending on who administers and who participates in them:

- **Intranet**
- **Extranet**
- **Internet**

Intranets and extranets may or may not have connections to the Internet. If connected to the Internet, the intranet or extranet is normally protected from being accessed from the Internet without proper authorization.

An **intranet** is a set of interconnected networks, using the Internet Protocol and uses IP-based tools such as web browsers, that is under the control of a single administrative entity. That administrative entity closes the intranet to the rest of the world, and allows

only specific users. Most commonly, an intranet is the internal network of a company or other enterprise.

An **extranet** is a network or internetwork that is limited in scope to a single organization or entity but which also has limited connections to the networks of one or more other usually, but not necessarily, trusted organizations or entities.

Internet : A specific internetwork, consisting of a worldwide interconnection of governmental, academic, public, and private networks. It is based upon the Advanced Research Projects Agency Network (ARPANET) developed by ARPA of the U.S. Department of Defense. Its also responsible for the World Wide Web (WWW).

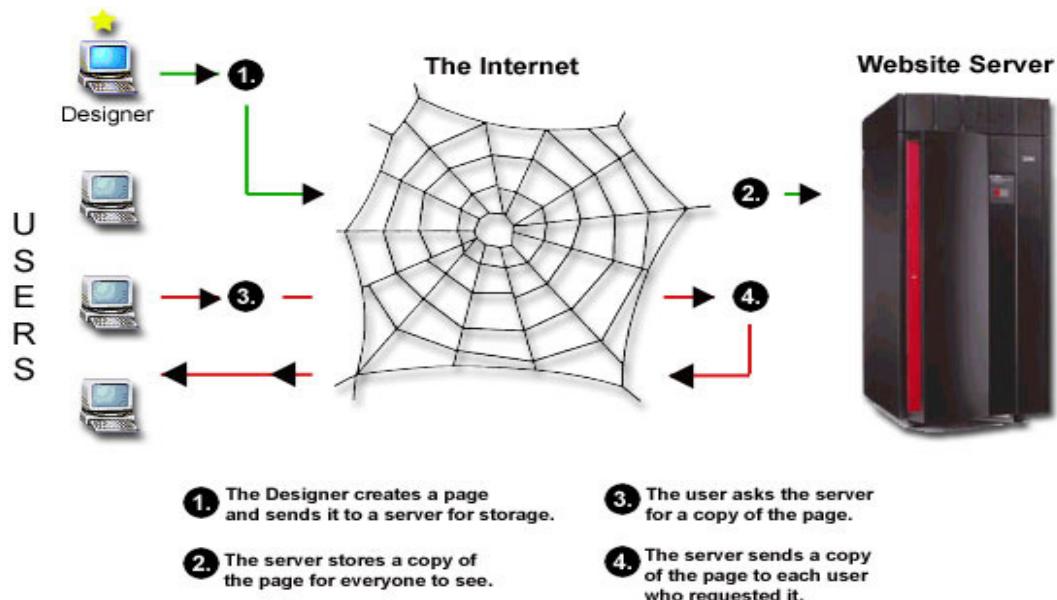
World Wide Web:

The **World Wide Web** (commonly shortened to **the Web**) is a system of interlinked hypertext documents accessed via the Internet. With a Web browser, a user views Web pages that may contain text, images, videos, and other multimedia and navigates between them using hyperlinks. The World Wide Web was created in 1989 by Sir Tim Berners-Lee, working at CERN in Geneva, Switzerland.

Internet working:

The Internet is a group of computers connected to share the information they hold. The connected computers belong to various agencies - government, universities, companies, individuals etc.

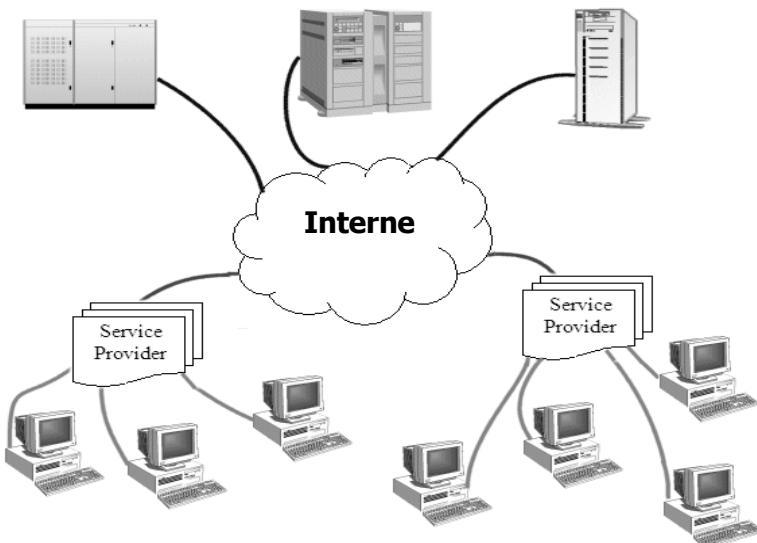
Internet- working Diagram:



Internet Services

Most of the Internet Services operate on the client/server model or concept. A computer is a client if it is receiving files, and is a server if it is sending files.

To gain access to the Internet most people open an account with an Internet Service Provider (ISP) in their area. To connect they "dial-up" to their ISP's server and "log-in" with their account name and password. Some of the services accessed through the internet are as follows



Electronic Mail (E-mail)

E-mail, is the most popular service of the Internet. It is preferred as the messages get transmitted in seconds. A person also has the option to read and respond to the

messages at one's convenience. People can send and receive e-mail wherever they go, when they travel as long as they have access to a connected computer. People can send forms, documents, colored pictures, etc. through email as attachments

Mailing List

An electronic mailing list is used when somebody wants to send a message or newsletter, for example, to many people at once.

Newsgroups

This is the Internet equivalent of a discussion group or an electronic bulletin board. It's a feature using which people discuss on specific areas of interest via the internet. Some newsgroups are moderated, others are not. If it is moderated a human moderator screens all messages and decides if these are worth posting. Discussions can be "threaded." For example, in a newsgroup for agriculture, one member might ask about suitable crops that can be grown in his land. But another member may start discussing how to storage methods for grains. More than one threaded discussion can occur at the same time with different members posting their opinions and reactions to either one or more threads.

Chat

This is another popular form of communication over the Internet. Unlike e-mail, mailing list and newsgroups, chat allows people to converse in "real time." People may actually see you type your questions and responses.

File Transfer Protocol (FTP)

File Transfer Protocol is the standard method for transferring files, whether downloading or uploading, to and from your computer with another computer on the Internet. It is simple to use and is the most popular way to download software and other files from the Internet.

Telnet is short for "Terminal Emulation." It is a feature of the Internet that lets you use the resources of another computer in another part of the world. This is done by remotely logging to the distant computer which is called the host. Once you are connected, it is possible to operate a remote computer using one's keyboard. The telnet is most useful to access the databases of public services like government directories.

An Internet Address: Messages are transmitted from one computer to another; every computer in the Internet must have a unique and specific address. An Internet or IP address, as it is sometimes called, consists of four numbers separated by periods. The smallest address would be 0.0.0.0 while the biggest would be 1234.5678.9101.1121. Only computers are expected to remember all these numbers without getting confused.

Domain Name System

The Domain Name System (DNS) helps users to find their way around the Internet. Every computer on the Internet has a unique address, called the "IP address". But it is hard to remember everyone's IP address. The DNS makes it easier by allowing a familiar string of letters (the "domain name") to be used instead of the IP address. So instead of typing 192.0.34.65, you can type **www.indg.in**, which is easier to remember.

Domain names have the format: **hostname.subdomain.top-level-domain. Eg. www.indg.gov.in.** The third set of letters of an address are intended to indicate the type of organization hosting the computer.

Domain name	Meaning
COM	Commercial organizations
GOV	Government institutions
NET	Major Network support centers
ORG	Organizations other than those above

- **Two letter codes** - The final two letter codes indicate the country of origin.
Eg: 'in' is used for **India**

Advantages and disadvantages of Internet

Advantages

There are many advantages of using the internet such as:

Communication:

The foremost target of internet has always been the communication. By the advent of computer's Internet, our earth has reduced and has attained the form of a global village. Now we can communicate in a fraction of second with a person who is sitting in the other part of the world. Today, for better communication, we can avail the facilities of e-mail; we can chat for hours with our loved ones.

Information

Information is probably the biggest advantage that internet offers. The Internet is a virtual treasure trove of information. Any kind of information on any topic under the sun is available on the Internet. The search engines like Google, yahoo is at your service on the Internet.

Entertainment

Entertainment is another popular area why many people prefer to surf the Internet. Downloading games, songs, movies are certain examples.

Services

Many services are now provided on the internet such as online banking, job seeking, booking railway tickets, etc.

E-Commerce

Ecommerce is the concept used for any type of business deals that involves the transfer of information across the globe via Internet. Eg. Shopping online for books, household goods etc.

Theft of Personal information

While using the internet, there is the danger of personal information such as name, address, and credit card number etc. being accessed and misused by culprits.

Spamming

Spamming refers to sending unwanted e-mails in bulk, which are useless and obstruct the entire system.

Virus threat

Virus is nothing but a program which disrupts the normal functioning of the computer systems. Computers attached to internet are more prone to virus attacks and they can end up into crashing the whole hard disk.

Pornography

This is a serious issue concerning the Internet. There are thousands of sites on the Internet that provide bad/obscene images/content that affect the users' mental health.

Web site / Web Page

A **web page** is an area of text and other visual effects that can be seen when we get on the internet.

Address Bar

Ex: www.indg.in

A **web site** is a group of web pages that belong to one section of the internet, such as one person, one company, one school, or one government agency, etc.



Web Portal

Web portals provide a single point of access to a variety of content and core services. Eg. www.indg.in

Web browser

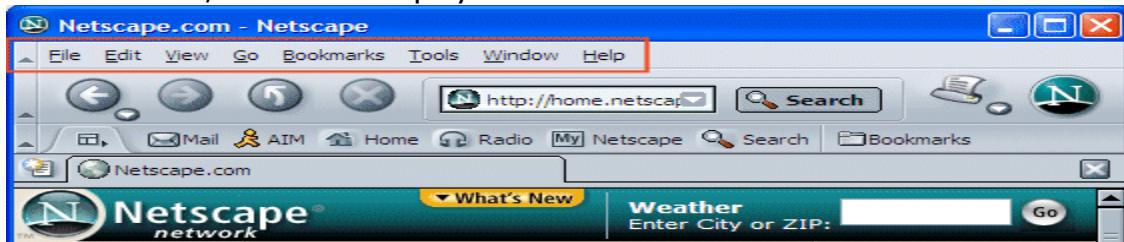
A **web browser** is a software application that enables a user to display and interact with text, images, videos, music and other information typically located on a Web page at a website on the World Wide Web or a local area network.

Important web browsers:

- Mosaic, April 22, 1993
- Netscape Navigator and Netscape Communicators, October 13, 1994
- Internet Explorer, August 1995
- Opera, 1996
- Mozilla Firefox, 2004

The most popular browser is **Internet Explorer** and is published by Microsoft and the second most popular browser is **Netscape** (or Netscape Navigator). It is also freely available.

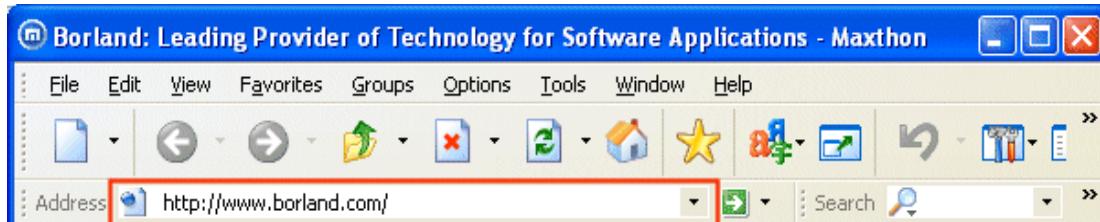
Under the title bar, a browser displays its **main menu**.



The Toolbar: Under the main menu, a browser is equipped with small pictures called buttons. Microsoft Internet Explorer usually displays these buttons on their own range (called a toolbar).



The Address bar : the space where the address of a particular website is to be typed to view the site



Internet Service Providers in India

An **Internet service provider** (abbr. **ISP**, also called **Internet access provider** or **IAP**) is a business or organization that provides consumers or businesses access to the Internet and related services.

Main ISP's in India:

- BSNL Broadband
- Bharti Airtel
- Iqara
- Mahanagar Telephone Nigam Limited
- Reliance Communications
- Sancharnet
- Spice Telecom
- Tata Teleservices
- Railtel

Types of Internet Connections

I. Home user connection

i. Dial-up

Dial-up access is a form of Internet access via telephone line. The client uses a modem connected to a computer and a telephone line, to dial an Internet service provider's (ISP) node to establish a modem-to-modem link, which is then routed to the Internet.

Modem : **Modem** (from **modulator-demodulator**) is a device that modulates an analog carrier signal to encode digital information, and also demodulates such a carrier signal to decode the transmitted information. The goal is to produce a signal that can be transmitted easily and decoded to reproduce the original digital data. Modems can be used over any means of transmitting analog signals, from driven diodes to radio.



ii. DSL (Digital subscriber line): **DSL** or **xDSL**, is a technology that provides digital data transmission over the wires of a local telephone network.



iii. Broadband wireless access: Wireless Broadband is a technology that provides high-speed wireless internet and data network access over a wide area.

iv. Cable modem: A cable modem is a type of modem that provides access to a data signal sent over the cable television infrastructure. Cable modems are primarily used to deliver



broadband Internet access in the form of cable internet.

v. ISDN: Integrated Services refers to ISDN's ability to deliver at minimum two simultaneous connections, in any combination of data, voice, video, and fax, over a single line. Multiple devices can be attached to the line, and used as needed. That means an ISDN line can take care of most people's complete communications needs at a much higher transmission rate, without forcing the purchase of multiple analog phone lines.

In a videoconference, ISDN provides simultaneous voice, video, and text transmission between individual desktop videoconferencing systems and group (room) videoconferencing system.

II. Business connections

- i. DSL
- ii. SHDSL

Search Engines

Although the internet is highly rich with information, the information is not always organized in a way that a person expects. When "browsing", it is hard to get to the particular information one is looking for. To provide an alternative, there are some specialized sites that can perform the search for users, with more or less same accuracy. These sites are referred to as search engines. Some of the most popular of them are:

Examples : Google, Yahoo, MSN, Netscape, Alta Vista Search

Steps to do a search

- To do a search, first access a search engine site.
Eg. www.search.com
- Each one of them provides you with a convenient box in which you can type the word

or sentence to search and press Enter. Eg.
Types of roses

- The results are displayed in a list.
 - You can then click each link and check it. If a link doesn't provide the type of information you are looking for, you can click Back (the shortcut to go back on most browsers is Alt + left arrow key) and click the next link in the list.
- If you still don't find what you are looking for, you can change the word or sentence that you typed and start searching again. You can also try another search engine site.



Most of the search engine sites provide more services than searching the web. For example, both Yahoo and MSN provide free email services.