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Basics of Computer

1.1 INTRODUCTION

In this lesson we present an overview of the basic design of a computer system: how the different parts of a computer system are organized and various operations performed to perform a specific task. You would have observed that instructions have to be fed into the computer in a systematic order to perform a specific task. Computer components are divided into two major categories, namely, hardware and software. In this lesson we will discuss about hardware, i.e., the machine itself and its connected devices such as monitor, keyboard, mouse etc., as well as software that makes use of hardware for performing various functions.

1.2 OBJECTIVES

After going through this lesson you would be able to:

- explain basic organization of computer system
 - explain different types of input and output devices
 - define Software and its classification
 - distinguish between system software and application software
 - describe computer language and its classification
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1.3 WHAT IS A COMPUTER?

Computer is a device that transforms data into meaningful information. Data can be anything like marks obtained by you in various subjects. It can also be name, age, sex, weight, height, etc. of all the students in a class.

Computer can also be defined in terms of functions it can perform. A computer can i) accept data, ii) store data, iii) process data as desired, and iv) retrieve the stored data as and when required and v) print the result in desired format.

The major characteristics of a computer are high speed, accuracy, diligence, versatility and storage.

1.3.1 Computer Organisation

The block diagram of computer is shown in Fig. 1.1.

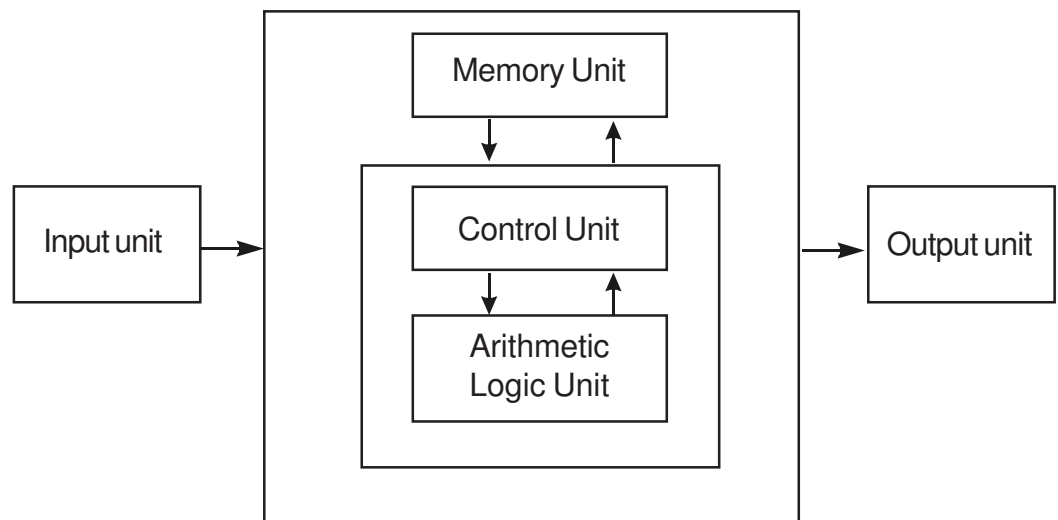


Fig. 1.1 Block diagram of Computer Organisation

The computer performs basically five major operations of functions irrespective of their size and make. These are 1) it accepts data or instruction by way of input, 2) it stores data, 3) it can process data as required by the user, 4) it gives results in the form of output, and 5) it controls all operations inside a computer. We discuss below each of these operations.

1. **Input:** this is the process of entering data and programs into the computer system.
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2. **Control Unit (CU):** The process of input, output, processing and storage is performed under the supervision of a unit called 'Control Unit'. It decides when to start receiving data, when to stop it, where to store data, etc. It takes care of step-by-step processing of all operations inside the computer.
3. **Memory Unit:** Computer is used to store data and instructions.
4. **Arithmetic Logic Unit (ALU):** The major operations performed by the ALU are addition, subtraction, multiplication, division, logic and comparison.
5. **Output:** This is the process of producing results from the data for getting useful information.

The ALU and the CU of a computer system are jointly known as the central processing unit (CPU). You may call CPU as the brain of any computer system.

INTEXT QUESTIONS

1. What are the five basic operations performed by the computer?
2. Define ALU, CU and CPU.
3. Choose the correct answer.
 - (a) The task of performing arithmetic and logical operations is called:
(i) ALU (ii) editing (iii) storage (iv) Output
 - (b) The ALU and CU jointly are known as
(i) RAM (ii) ROM (iii) CPU (iv) None of above
 - (c) The process of producing results from the data for getting useful information is called:
(i) output (ii) input (iii) processing (iv) storage

1.4 PERIPHERAL DEVICES

Peripheral devices are connected to the computer externally. These devices are used for performing some specific functions. Peripheral devices are as follows:

1. Input Devices
 2. Output Devices
 3. Other Peripherals
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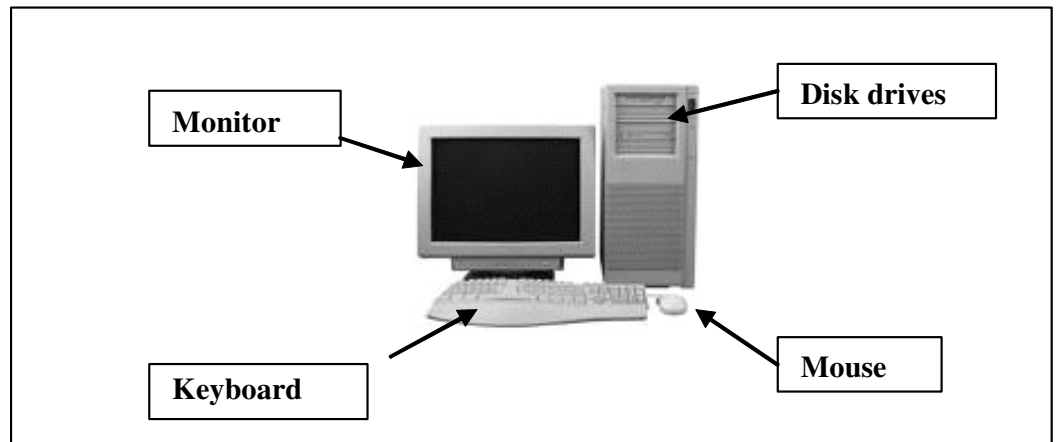


Fig. 1.2 Different peripheral devices of Computer

1.5 INPUT DEVICES

Input devices accept data and instructions from the user. Following are the examples of various input devices, which are connected to the computer for this purpose.

1. Keyboard
2. Mouse
3. Light Pen
4. Optical/magnetic Scanner
5. Touch Screen
6. Microphone for voice as input
7. Track Ball

1.5.1 Keyboard

A keyboard (as shown in figure 1.3) is the most common input device. Several kinds of keyboards are available, but they resemble each other with minor variations. The keyboard in most common use is the QWERTY board. Generally standard keyboard has 104 keys. In these keyboards, the cursor control keys are duplicated to allow easier use of the numeric pad.



Fig. 1.3 Keyboard

1.5.2 Mouse

A mouse is an electro-mechanical, hand-held device (as shown in figure 1. 4). It is used as a pointer. It can perform functions like selecting menu commands, moving icons, resizing windows, starting programs, and choosing options.



Fig. 1.4 Mouse

The most common mouse uses an internal, magnetically coated ball, to detect the movement of the mouse across a flat surface, usually a desktop. Now a days Optical or laser mouse is used to detect the movement. All windows based applications today are designed to work with a mouse. A mouse is used to replace hard-to-remember key combinations with easier "Point and Click" actions. However, it cannot substitute all keyboard operations. It can be alternative for commands based operations.

1.5.3 Light pen

An input device that utilizes a light-sensitive detector to select objects on a display screen. A light pen is similar to a mouse (as shown in figure 1.5), except that with a light pen you can move the pointer and select objects on the display screen by directly pointing to the objects with the pen.



Fig. 1.5 Light Pen

1.5.4 Optical Scanner

These devices are used for automatic data collection. The devices of this category completely eliminate manual input of data. For example, the bar-code reader is actually just a special type of image scanner. An image scanner translates printed

images into an electronic format that can be stored in a computer's memory, and with the right kind of software, one can alter a stored image. Another example of scanner is optical character recognition (OCR) device, used by banks to convert the scanned image of a typed or printed page into text that can be edited on the computer.



Fig. 1.6 Scanner

1.5.5 Touch Screen

Touch panel displays and pads are now being offered as alternatives to keyboard. Here the input can be given through the computer screen, that accepts the input through monitor; users touch electronic buttons displayed on the screen or they may use light pen.



Fig. 1.7 Touch Screen Monitor

1.5.6 Microphone

Microphone is an input device, which takes voice as input. The voice communication is more error-prone than information through keyboard. There are two types of microphones available (as shown in figure 1.8):

1. Desktop Microphone
2. Hand held Microphone



Fig. 1.8 Desktop microphone and Hand-held Microphone

1.5.7 Track Ball

Trackball, a pointing device, is a mouse lying on its back (as shown in figure 1. 9). To move the pointer, you rotate the ball with your thumb, your fingers, or the palm of your hand. There are usually one to three buttons next to the ball, which you use just like mouse buttons.



Fig. 1.9 Track Ball

The advantage of trackballs over mouse is that the trackball is stationary so it does not require much space to use it. In addition, you can place a trackball on any type of surface, including your lap. For both these reasons, trackballs are popular pointing devices for portable computers.

1.6 OUTPUT DEVICES

Output devices return processed data that is information, back to the user. Some of the commonly used output devices are:

1. Monitor (Visual Display Unit)
2. Printers
3. Plotter
4. Speakers

1.6.1 Monitor

Out of all the output devices, monitor (as shown in figure 1.10) is perhaps the most important output device because people interact with this device most intensively than others. Computer information is displayed, visually with a video adapter card and monitor. Information processed within the CPU, that needs to be visually displayed, is sent to video adapter. The video adapter converts information from the format used, in the same manner as a television displays information sent to it by a cable service.



Fig. 1.10 CRT and LCD Monitor

Two basic types of monitors are used with microcomputers, which are as follows:

1. CRT
2. LCD

Cathode Ray Tube (CRT): CRT or Cathode Ray Tube Monitor is the typical monitor that you see on a desktop computer. It looks a lot like a television screen, and works the same way. This type uses a large vacuum tube, called **cathode ray tube (CRT)**.

Liquid Crystal Displays (LCD): This type of monitors are also known as flat panel monitor. Most of these employ **liquid crystal displays (LCDs)** to render images. These days LCD monitor are very popular.

When people talk about the capabilities of various monitors, one critical statistic is the resolution of the monitor. Most monitors have a resolution of at least 800 x 600 pixels. High-end monitors can have resolutions of 1024 x 768 pixels or even 1280 x 1024 pixels. Thus monitors are available either in low resolution or in high resolution.

1.6.2 Printer

After a document is created on the computer, it can be sent to a printer for a hard copy (printout). Some printers offer special features such as colored and large page formats. Some of the most commonly used printers are:

1. Laser Printer
2. Ink Jet Printer
3. Dot Matrix Printer
4. Line Printer

Laser Printer: A laser printer produces high quality print that one normally finds in publishing. It is extremely fast and quiet. Moreover, the operation of a laser printer is easy with automatic paper loading and no smudging or messing up of ink ribbons. The fastest laser printer



Fig. 1.11 Laser Printer

can print up to 200 pages per minute in monochrome (black and white) and up to 100 pages per minute in colour.

Ink-Jet Printer: An ink-jet printer creates an image directly on paper by spraying ink through as many as 64 tiny nozzles. Although the image it produces is not generally quite as sharp as the output of a laser printer, the quality of ink-jet images is still high.



Fig. 1.12 Ink-Jet Printer

In general, ink-jet printer offers an excellent middle ground between dot matrix and laser printer. Like laser printer, an ink-jet printer is quiet and convenient, but not particularly fast.

Typically, an ink-jet printer is more expensive than a dot-matrix printer, but costs only half as much as a laser printer.

Dot Matrix Printer: The dot matrix printer was very popular at one point of time. It is a very versatile and inexpensive output device. In dot matrix printer the print head physically "hits" the paper through the ribbon and produces text (or images) by combinations of dots; hence the name dot matrix printer. Its speed is measured in **characters per second** (CPS). Although it is less expensive, it is louder, slower and produces lower print quality.



Fig. 1.13 Dot Matrix Printer

Line Printer: A line printer is generally used with large computer systems to produce text based data processing reports. Line printers are high-speed printers with speeds ranging anywhere from 100 to about 3800 lines per minute. In the past, print quality on line printers was not high. Developments in technology are improving the print quality on line printers. These are in the cost range of lacs of Rupees.



Fig. 1.14 Line Printer

1.6.3 Plotter

A plotter is a special kind of output device that, like a printer, produces images on paper, but does so in a different way. Plotters are designed to produce large drawings or images, such as construction plans for buildings or blueprints for mechanical objects. A plotter can be connected to the port normally used by a printer.

An array of different colored pens in a clip rack and a robotic arm is part of plotter. The instructions that a plotter receives from a computer consist of a color, and beginning and ending coordinates for a line. With that information, the plotter picks up the appropriate pen through its arm, positions it at the beginning coordinates drops the pen down to the surface of the paper and draws to the ending coordinates. Plotters draw curves by creating a sequence of very short straight lines.

Plotters usually come in two designs:

1. Flat Bed: Plotters of small size to be kept on table with restriction of paper size.
2. Drum: These plotters are of big size using rolls of paper of unlimited length.

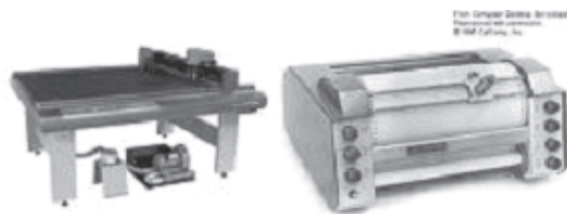


Fig. 1.15 Flat bed and Drum Plotter

1.6.4 Speaker

Speakers (as shown in figure 1.16) are another type of output device, which allow you to listen to voice like music, and conversation with people.



Fig. 1.16 Speaker

INTEXT QUESTION

4. Write True or False for the following:
- (a) Mouse is an output device.
 - (b) OCR stands for Optical Content Reader.
 - (c) LCD Monitor is used in notebook computer.
 - (d) Speed of DOT Matrix Printer is measured in Characters Per Second.
 - (e) Plotters are used to produce high quality drawings and images, such as construction plans for buildings or blueprints for mechanical objects.
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1.7 SOFTWARE

As you are aware, computer cannot do anything on its own. It is the user who instructs computer; what to do, how to do and when to do. In order to perform any task, you have to give a set of instructions in a particular sequence to the computer. These sets of instructions are called **Programs**. Software refers to a set of programs that makes the hardware perform a particular set of tasks in particular order. Software can be classified mainly into following categories and sub-categories are shown in Figure 1.17.

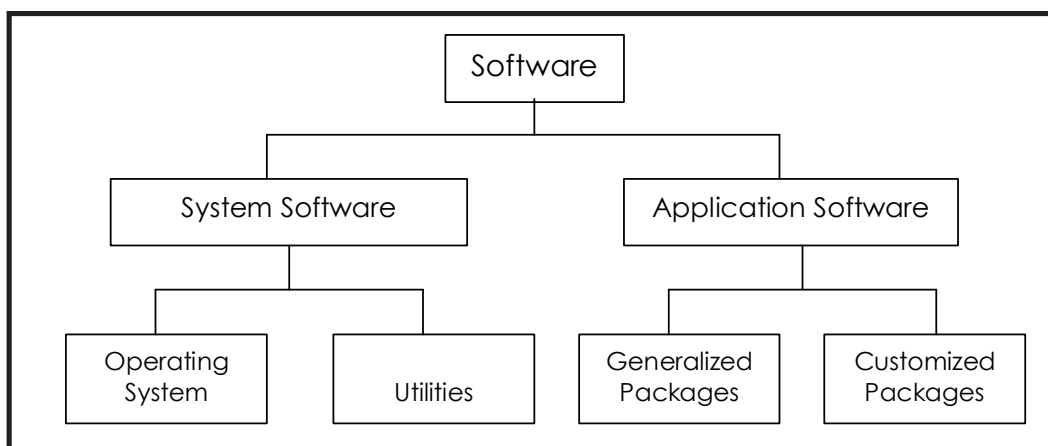


Fig. 1.17 Classification of Software

1.7.1 System Software

When you switch on the computer the programs stored in ROM are executed which activates different units of your computer and makes it ready for you to work on it. This set of programs can be called system software.

System softwares are sets of programs, responsible for running the computer, controlling various operations of computer systems and management of computer resources. **Operating System** (OS) falls under this category.

An **operating system** is a system software that provides an interface for a user to communicate with the computer, manages hardware devices (disk drives, keyboard, monitor, etc), manages and maintains disk file systems and supports application programs. Some popular Operating systems are UNIX, Windows and Linux.

Although operating system provides all the features users need to use and maintain their systems, inevitably, they still do not meet everyone's expectations. This has led to another type of system software called "**Utilities**". These are programs that bridge the gap between the functionality of an OS and the needs of users. Utility programs are a broad category of software such as compress (zip)/uncompress (unzip) files software, anti virus software, split and join files software, etc.

1.7.2 Application Software

Application software is a set of programs, which are written to perform specific tasks, for example: An application package for managing library known as **library information system** is used to manage information of library such as: keeping book details, account holder details, book issue details, book return details etc. Another application package for managing student details is called **student's information system**, manages student's roll no, name, parents name, address, class, section, processing of examination results etc. Application software can be broadly classified into two types:

- (a) Generalized packages
 - (b) Customized packages
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Generalized Packages

These are user friendly softwares written to cater to user's very general needs such as preparing documents, drawing pictures, database to manage data/information, preparing presentations, play games etc.

It is a group of programs that provide general purpose tools to solve specific problems. Some of the generalized packages are listed below:

- **Word Processing Software**(for preparing documents): Word Perfect, MS-Word, OpenOffice.org Writer
- **Spreadsheets** (Data Analysis): Lotus Smart suites, MS-Excel, OpenOffice.org Calc, Apple Numbers
- **Presentations** : Presentation Graphics, MS-PowerPoint, OpenOffice.org Impress
- **Database Management System**: MS-Access, OpenOffice.org Base, MS-SQL Server, ORACLE
- **Graphics Tools**: Paint shop pro, Adobe Photoshop

Customized Packages

These are the applications that are customized (or developed) to meet the specific requirements of an organization/institution. For Example: Student information details, Payroll packages, inventory control etc.

These packages are developed using high-level computer language.

1.8 COMPUTER LANGUAGES

Languages are a means of communication. Normally people interact with each other through a language. On the same pattern, communication with computers is carried out through a language. This language is understood both by user and the machine. Just as every language like English, Hindi has its grammatical rules; every computer language is bound by rules known as SYNTAX of that language. The user is bound by that syntax while communicating with the computer system.

Computer languages are broadly classified as:

1. Low Level Language:

The term low level means closeness to the way in which machine understand. The low level languages are:

a. Machine Language:

This is the language (in the form of 0's and 1's, called binary numbers) understood directly by the computer. It is machine dependent. It is difficult to learn and even more difficult to write programs.

b. Assembly Language:

This is the language where the machine codes comprising of 0's and 1's are substituted by symbolic codes (called **mnemonics**) to improve their understanding. It is the first step to improve programming structure.

Assembly language programming is simpler and less time consuming than machine level programming, it is easier to locate and correct errors in assembly language than in machine language programs. It is also machine dependent. Programmers must have knowledge of the machine on which the program will run.

2. High Level Language

You know that low level language requires extensive knowledge of the hardware since it is machine dependent. To overcome the limitation, high level language has been evolved which uses normal English like, easy to understand statements to solve any problem. Higher level languages are computer independent and programming becomes quite easy and simple.

Various high level languages are given below:

- **BASIC** (Beginners All Purpose Symbolic Instruction Code): It is widely used, easy to learn general purpose language. Mainly used in microcomputers in earlier days.
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- **COBOL** (Common Business Oriented language): A standardized language used for commercial applications.
- **FORTRAN** (Formula Translation): Developed for solving mathematical and scientific problems. One of the most popular languages among scientific community.
- **C**: Structured Programming Language used for all purpose such as scientific application, commercial application, developing games etc.
- **C++**: Popular object oriented programming language, used for general purpose.

1.9 COMPILER AND ASSEMBLER

As you know that High Level language is machine independent and assembly language though it is machine dependent yet **mnemonics** that are being used to represent instructions are not directly understandable by machine. Hence to make the machine understand the instructions provided by both the languages, Compiler and Assembler are required to convert these instructions into machine language.

The software (set of programs) that reads a program written in high level language and translates it into an equivalent program in machine language is called as **Compiler**.

The program written by the programmer in high level language is called **source program** and the program generated by the compiler after translation is called as **object program**.

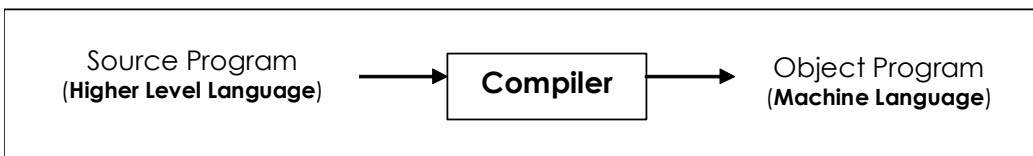


Fig. 1.18 Compiler

The software (set of programs) that reads a program written in assembly language and translates it into an equivalent program in machine language is called as **Assembler**.

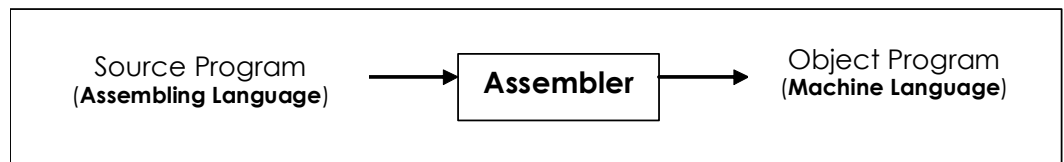


Fig. 1.19 Assembler

INTEXT QUESTION

5. Write True or False for the following:
- (a) Operating System (OS) is an Application Software.
 - (b) High level languages are easy to program than low level language.
 - (c) Computer language FORTRAN is used to solve Scientific and Mathematical problems.
 - (d) C is an object oriented programming language.
 - (e) Compiler converts high level languages into machine language.
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1.10 WHAT YOU HAVE LEARNT

A computer is useful only when it interacts with the external devices such as keyboard, mouse, monitor, speaker, which are called as peripheral devices. In this lesson we have discussed in details about major peripheral devices of a computer system. You have learnt that only hardware does not do anything of its own without the help of software. Hence we have explained in details about software, its types and the computer languages used to prepare the software.

1.11 TERMINAL QUESTIONS

- 1. What is a computer? Draw a block diagram to illustrate the basic organisation of a computer system and explain the functions of various units.
 - 2. What is an input device? Briefly describe various important input devices.
 - 3. Discuss two basic types of monitors CRT and LCD.
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4. What is a software? Discuss its various categories with the help of diagram.
5. Distinguish between system and application software.
6. Write short notes on:
 - (a) Laser Printer
 - (b) High level language
 - (c) Compiler
 - (d) Plotter
7. Write a note on Computer language and its classification.

1.12 FEEDBACK TO INTEXT QUESTIONS

1. The five basic operations that a computer performs are input, storage, processing, output and control.
 2. ALU : Arithmetic Logic Unit
CU : Control Unit
CPU : Central Processing Unit
 3. (a) i (b) iii (c) i
 4. (a) False (b) False (c) True (d) True (e) True
 5. (a) False (b) True (c) True (d) False (e) True
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10

Introduction to Internet

10.1 INTRODUCTION

In the present age of information Technology, use of Internet is becoming quite popular for accessing information on any topic of your interest. It also provides tremendous opportunities to students; researchers and professionals for getting information on matters related to academic and professional topics and lot more. In the present world, most of the people who have computers around themselves use Internet to access information from the World Wide Web, exchange messages & documents and e-services.

10.2 OBJECTIVES

After going through this lesson you would be able to:

- define Internet
 - list different types of Internet connections
 - explain various services provided by Internet
 - download files
 - send and receive e-mail
 - be acquainted with the terminologies used in Internet
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10.3 WHAT IS INTERNET?

The Internet or simply the Net is a worldwide network of computer networks. It is an interconnection of large and small networks around the globe.

10.4 APPLICATIONS OF INTERNET

With the help of Internet you can:

- Exchange messages using e-mail (Electronic mail).
- Transfer files as well as software.
- Browse through information on any topic on web.
- Communicate in real time (chat) with others connected to the Internet.
- Search databases of government, individuals and organizations.
- Read news available from leading news groups.
- Send or receive animation and picture files from distant places.
- Set up a site with information about your company's products and services.

10.5 GETTING INTERNET CONNECTION ON YOUR COMPUTER

Any terminal to activate internet services on it require a internet connection from a Internet Service Provider. To have a connection one needs to contact the Internet Service Providers. There are several Internet Service Providers (ISP) in each locality. There are some nominal charges that you need to pay to the ISP for the installation of the connection and for the rent (either monthly or annually). Depending on the requirement you can

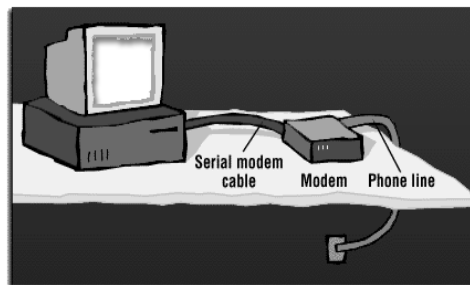


Fig. 10.1

choose any one of the available options. If you need a high speed dedicated network then you can opt for a high bandwidth broadband or leased line connection.

If you need to have connection on a single PC then you choose a low bandwidth or dialup connection . For small services at your hand you can even have mobile phones connected to your Internet. There are many ways to get connected to the Internet. You can get internet connection in any of the following ways:-

1. through dial-up connection : user is supposed to get connected to the internet after dialing up the number used for connection. This is useful if your network is either confined to small group of computers or for a single PC.
2. through leased lines: in this a dedicated line is laid specifically for connection.
3. though broadband: in this you can get a broadband connection which provides a high bandwidth for the internet connection. This also provides a good speed.

These days even wireless connections are available. For this you need to have a *Wi Fi* card attached to your computer which can be useful if you do not have proper place to lay down the wires.

To connect to the Internet you need a PC (personal computer) with requisite software including a browser, a telephone connection or a leased line, and a modem, which allows the PC to communicate with other computers.

10.5.1 Types of Internet Connections

(a) Dial-up

This is the most common basic type of connection available from ISPs (Internet Server Providers). In Dial-up connection, you use your computer, dial a phone number (provider by ISP) to get connected to server at Providers end through which you access Internet. It means you are not directly connected to Internet; you access the Internet through an Internet Service Provider.

(b) ISDN (Integrated Services Digital Network)

The process of connecting to server to access Internet is almost same as Dial-up, but it offers connectivity through the use of

digital phone lines instead of Analog. It offers Internet connectivity at *speeds of up to 128 Kbps*, allows the user to receive or make calls simultaneously on the same line. ISDN comes through a regular telephone wire from the telephone pole on the street. The line combines two 64 Kbps channels to offer 128 Kbps bandwidth broken into three bands: One band for the ringing signal of your phone, one band for your telephone conversation, and one band for data transfer.

(c) Leased Line Connection (Direct Internet Access)

A “permanent connection” between a computer system (single CPU or LAN, and the Internet). It is generally used by larger institutions, corporate and government agencies. It involves establishing your own Internet gateway (connection) and payment to have a direct full time line with the network. Your computers, in effect, become part of the Net. The main advantage of this connection is that: it is *on line – 24 hrs a day, seven days a week, (24x7)* and provides faster access.

Dedicated links are established through an internet service provider who places a computer-controlled router (message director) at your site. A router is used to connect your local network to the Internet, allow all the members of network to have complete access to Internet.

(d) DSL (Digital Subscriber Line or Dedicated Service Line) Broadband Connection

DSL, an “always-on’ data connection is becoming widely available these days. It can provide an excellent Internet connection. It connects your home or office to the Internet through the same telephone wire that comes from telephone pole on the street. Like ISDN, with DSL, user can *make and receive telephone calls* while connected to the Internet. The difference between DSL and dial-up / ISDN is that a DSL Internet connection uses a high-speed dedicated circuit filtering out standard phone calls and Internet signals.

10.6 HOW DOES INTERNET WORK?

The thing that characterizes the Internet is how data are transferred from one computer to another. Did you ever wonder

what magical things go on behind the scenes that results in a web page being displayed on your screen seconds after you request it? How does the data moves from one side of the world to the other?



Fig. 10.2

Here is what happens to a piece of data (e.g. a Web page) when it is transferred over the Internet:

- It is broken into a lot of **same-sized pieces** (called **packets**).
- A **header** is added to each packet that explains where it came from, where it should end up and how it fits in with the rest of the packets.
- Each packet is **sent from computer to computer** until it finds its way to its destination. Each computer along the way decides where next to send the packet. This could depend on things like how busy the other computers are when the packet was received. The packets may not all take the same route.
- At the destination, the **packets are examined**. If there is any packet missing or damaged, a message is sent asking for that packet to be resent. This continues until all the packets have been received intact.
- The packets are **reassembled** into their original form.

Each computer connected up to the Internet has a software called **TCP/IP** (Transmission Control Protocol/Internet Protocol), which is responsible for receiving, sending and checking packets. TCP/IP is the '**glue**' of the Internet.

10.7 FREQUENTLY USED TERMS IN INTERNET

In this section we will discuss common internet terms to help you understand the relationship of various Internet technologies.

World Wide Web (WWW): The World Wide Web (“WWW” or simply the “**web**”) is a collection of electronic documents (called web pages) that are linked together like a spider web. These documents are stored on computers called servers located around the world.

Web Server: A Web Server is a computer that stores web pages. It is responsible for accepting request(s) from users and serves them with web pages. Two important web server programs are: **IIS** (Internet Information server) and Apache, etc. Web servers are connected to the Internet 24 hours a day, seven days a week.

Hyperlink: It is an element in an electronic document that links to another place in the same document or to an entirely different document or other resource. Hyperlinks usually appear as underlined text and in a different color, but they may also appear as graphics, such as buttons to click. Hyperlinks may be used to link another place in the same page, or another page, to play an audio or video file, to download a file, to set up a message to an e-mail address, and to link to other Internet resources.

HTML (Hypertext Markup Language): It is a language that consists of certain key words called ‘**Tags**’, used for writing the documents on the web.

Web Page: A web page (such as the one you are looking at now) is an electronic document written in a computer language called **HTML** (Hypertext Markup Language). Web pages can contain text, graphics, video, animation, and sound, as well as **interactive features**, such as data entry forms. Each page has a unique address known as a **URL** (Uniform Resource Locator) that identifies its location on the server. Web pages usually contain hyperlinks to other web pages.

Website: A website (often shortened to just **site**) is one or more web pages, belonging to a particular company, institute, government or an individual. The first page is called the **home page**, which acts like an index, indicating the content on the site.

By default the home page is named as **index.htm**. From the home page, you can click **hyperlinks** to access other web pages.

URL (Uniform Resource Locator): Every page on the web has a unique address, called Uniform Resource Locator, URL. A **URL** indicates where the web page is stored on the Internet. A sample URL might look like the following:

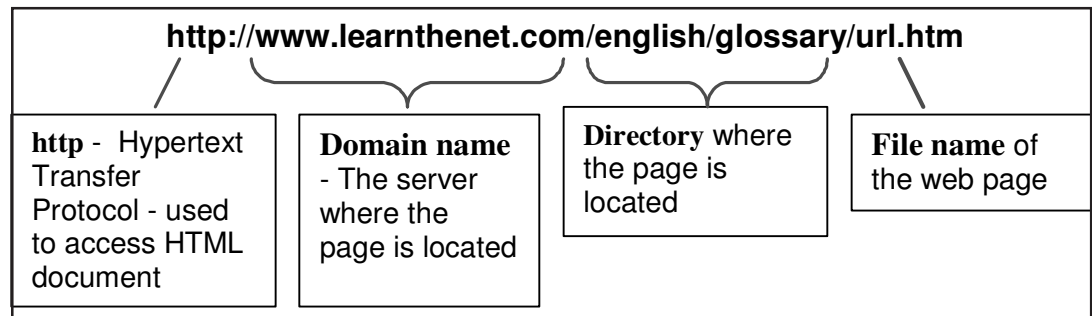


Fig. 10.3

IP (Internet Protocol) Address: Computers do not understand letters or symbols that humans use to communicate effectively. Computers understand numbers—specifically, 1s and 0s. Thus every *host* (a computer linked to the Internet) on the Internet has a unique host number. This number is called the *Internet Protocol address*, or *IP address*.

The IP address is a unique address, generally written in the format **xxx.xxx.xxx.xxx**, where **xxx** represents a **3 digit number** that varies between **0** and **255**. For Example: **192.100.8.56**

DNS (Domain Name System): Every host (computer linked to Internet) has a unique host number called *IP address*. You can connect to any host through IP address only, but it is difficult to remember the 4-digit number of hosts. To resolve this, domain-name is the only solution. **Domain name, a unique name of the individual host computer on the Internet.** Every computer on the Internet now have both a **domain name** and an **IP address**. To connect to any host through domain name requires some mechanism that will convert the domain name IP address. DNS, Domain Name System is the standard for resolving names to addresses. It is used mostly to translate between domain names and IP addresses.

10.8 UNDERSTANDING INTERNET ADDRESS

Addresses are just what they sound like a way to identify uniquely an area of the Net or an individual on the Net. The most accurate analogy would be to your home address. This address, when provide fully, uniquely identifies where you live. If someone wants to either send you something or visit you, they must know your address. It is the same way on the Internet. If someone wants to send you something, such as e-mail, they must know your address. If someone wants to retrieve something from a computer on the Internet, they must know the **Domain name** (unique name to identify a host on the Internet) or the **IP address** of the computer.

For instance **www.nios.ac.in** is the domain name of a host computer named **nios** in the academic area (**.ac**) belongs to geographical domain India (**.in**).

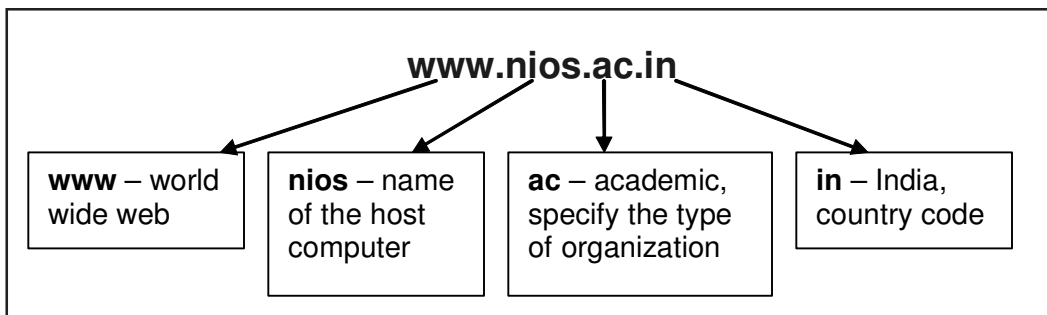


Fig. 10.4

As you read in from the right, the name gets more specific until you reach the name of the individual host computer. The right most (in the above example **.in** - country code) represents either a type of organization or a country.

Example: **www.yahoo.com** (**.com** - commercial organization)

Various Organizational and Geographical domains are as follows:

Organizational Domains

Typically, the highest level (**rightmost**) part of the full domain is a code indicating the *type of organization* to which domain belongs. There are different organizational domains indicated below:

| <u>Domain</u> | <u>Purpose</u> |
|---------------|--------------------------|
| ac | academic institutions |
| com | Commercial entities |
| edu | Educational institutions |
| gov | Government institutions |
| net | Network resources |
| org | Non-profit organizations |

Fig. 10.5

Geographic domains

This represents to which country the domain belongs. This code consists of only two characters, which represent the international country codes. A few common ones are:

| <u>Domain</u> | <u>Country</u> |
|---------------|----------------|
| au | Australia |
| in | India |
| jp | Japan |
| uk | United Kingdom |
| us | United States |

Fig. 10.6

10.9 WEB BROWSER

10.9.1 What is a Browser?

A **web browser** is the software program, used to access the World Wide Web. A browser (also known as client software) retrieves data from remote web servers and displays a web page. Through this tool the *user send their request* to Internet server to access the information, *Server process the request and responds with required information as a web page* to the user.

The most popular browsers are Internet Explorer and Netscape Navigator.

The steps for connecting to a website are shown in Fig. 10.1 and explained further.

1. Types a URL for a website in browser say `www.nios.ac.in`.
-

2. Your browser attempts to make a connection and sends the request to Web Server.
3. The Web Server receives and processes the request.
4. The Web Server responds to the request with the home page of the website.
5. The webpage is displayed by your browser and the connection between the server and your browser is closed

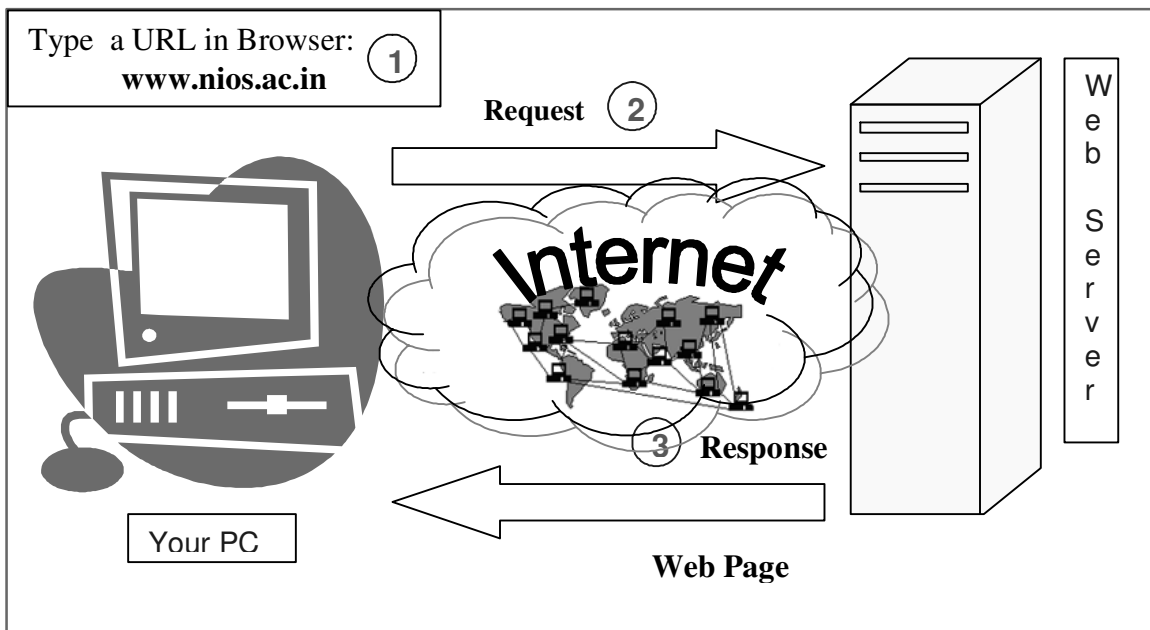


Fig. 10.7 Interaction between a Web browser and a Web Server

10.9.2 Microsoft Internet Explorer

To open browser Internet Explorer: click on *start*→*All Programs*
→*Internet Explorer*

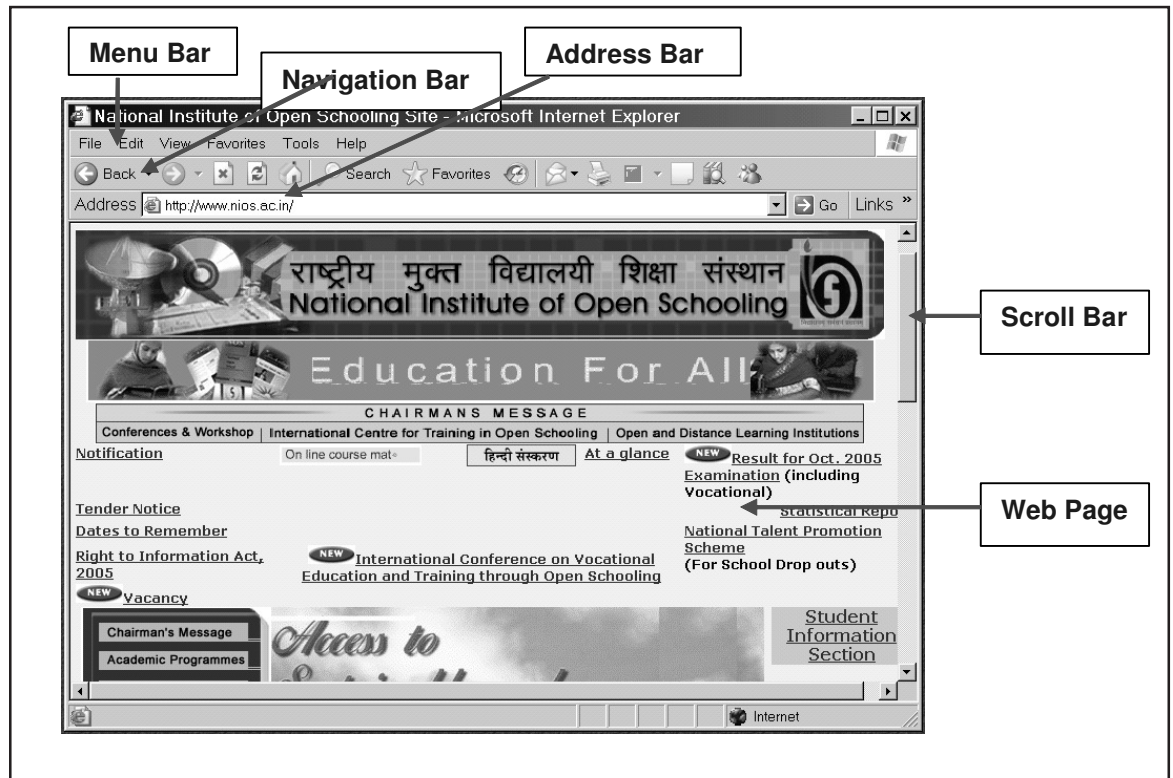


Fig. 10.8

10.9.3 Saving a Web Page

When saving a local copy of a webpage, the web browser usually allows a choice to **Save file as type**:

- Text File: Saving the rendered text without formatting or images, and without indicating which words are links or what their destination is.
- Webpage, HTML only: Saving the HTML-file, changing relative links to absolute ones, without images.
- Webpage, Complete: Saving the HTML-file, changing relative links to absolute ones, saving the images and adjusting the references to them accordingly; a separate folder is made in the case of Internet Explorer.
- Web Archive, Single file: Saving the HTML-file including all images, stylesheets, scripts etc. to a single .MHT file. This is supported by **Internet Explorer**.

10.10 DOWNLOADING FILES

Follow the steps given below for downloading applications, plug-ins, games or any other software from the Internet.

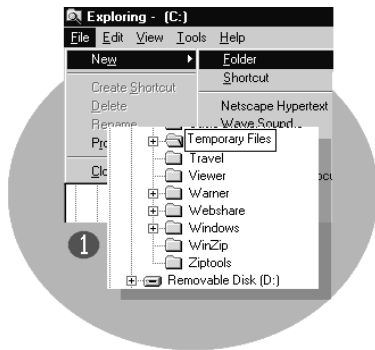


Fig. 10.9

If you do not already have one, create a **Temporary Files** folder by opening Windows Explorer, highlighting your hard drive (typically the c: drive), then selecting *File*→*New*→*Folder*.

When the folder appears, name it **Temporary Files**.

Once you locate the software you want to download, **click on the link** to begin the download process.



Fig. 10.10

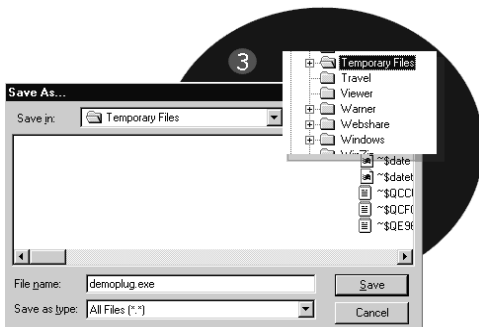


Fig. 10.11

You will be asked where to save the file. Locate the Temporary Files folder on your hard drive and double click on it to open it.

Click **SAVE**

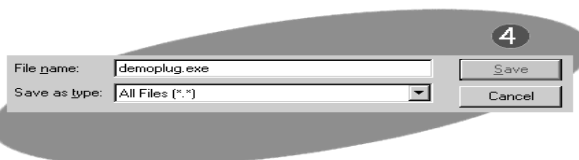


Fig. 10.12

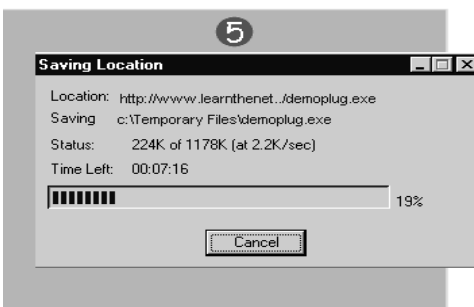


Fig. 10.13

If you are really bored, you can watch the file as it downloads.

After the download is finished, you have to install the software. Close all programs that are running, except Windows Explorer. Find the file you downloaded and double click on it.

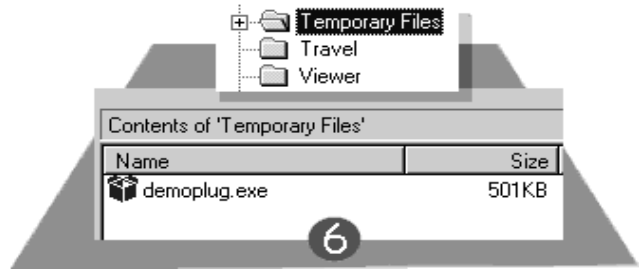


Fig. 10.14

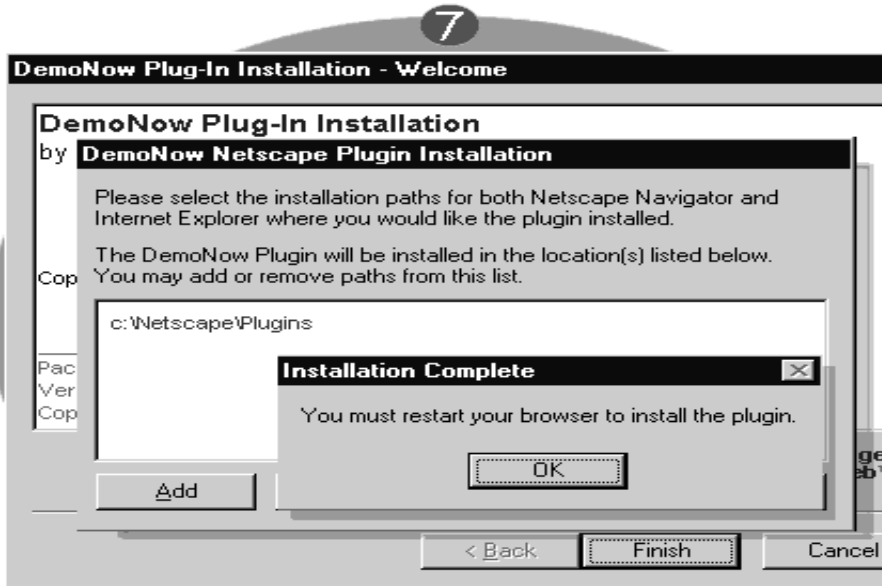


Fig. 10.15

After the software is installed you can delete the file in your Temporary Files folder to free up space on your hard drive.

A series of installation screens direct you through the process.

New application programs are usually installed in the **Program files** folder. Plugins are usually installed in the appropriate browser folder.



Fig. 10.16

10.11 INTERNET SERVICES

Search Engine

The Internet is an amazing resource that provides quick access to all sorts of information. The amount of information, however,

is so vast that being able to find what you are looking for is a daunting task. **Search engines are the answer.**

A search engine is a program designed to help find information stored on a computer system such as the World Wide Web, or a personal computer. The search engine allows one to ask for content meeting specific criteria (typically those containing a given word or phrase) and retrieving a list of references that match those criteria.

Some of the important search engines are:

Google (<http://www.google.com>), **Yahoo** (<http://www.yahoo.com>), **MSN Search** (<http://search.msn.com>), **Ask Jeeves** (<http://www.askjeeves.com>), **AltaVista** (<http://www.altavista.com>)

E-Mail (Electronic Mail)

E-Mail or Electronic Mail is a paperless method of sending messages, letters, video and graphics from one person to another or many people at the same time via Internet. E-mail is very fast, easy and much cheaper than the using the post office, takes only few seconds to arrive at the destination. It works 24 hours a day and seven days a week. There are many free web-based e-mail services available on the Internet.



Fig. 10.17

A few among them are:

YAHOO! Mail (<http://www.mail.yahoo.com>), **Hotmail** (<http://www.hotmail.com>) , **Gmail** (<http://www.gmail.com>) , **Rediffmail** (<http://www.rediffmail.com>) , etc.

How does the E-Mail work?

Just as a letter makes stops at different postal stations along the way to its final destination, e-mail passes from one computer, known as a **mail server**, to another as it travels over the Internet. Once it arrives at the destination mail server, it is stored in an electronic mailbox until the

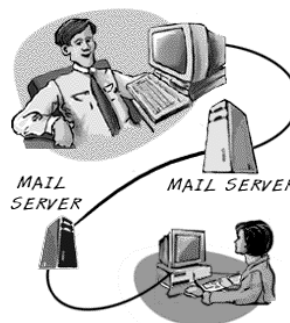


Fig. 10.18

recipient retrieves it. This whole process can take seconds, allowing you to quickly communicate with people around the world at any time of the day or night.

Sending and Receiving Messages

To receive e-mail, you need an account on a mail server. This is similar to having a street address where you receive letters. One advantage over regular mail is that you can retrieve your e-mail from any location in the world, provided that you have Internet access. Once you connect to your mail server, just download your messages to your computer or wireless device.

To send e-mail, you need a connection to the Internet and access to a mail server that forwards your mail. The standard protocol used for sending Internet e-mail is called **SMTP**, short for **Simple Mail Transfer Protocol**. It works in conjunction with **POP** servers. POP stands for **Post Office Protocol**.

When you send an e-mail message, your computer routes it to an SMTP server. The server looks at the e-mail address (similar to the address on an envelope), and then forwards it to the recipient's mail server, where it is stored until the addressee retrieves it. You can send e-mail anywhere in the world to anyone who has an e-mail address.

Components of an E-Mail Address

Internet e-mail addresses typically have two main parts:

sksharma@yahoo.com

First part is the **User ID** (sksharma) that refers to the recipient's mailbox. Then there is an **at sign** (@). Next comes the **host name** (yahoo), also called the **domain name**. This refers to the **mail server**, the computer where the recipient has an electronic mailbox. It is usually the name of a company or organization.

The end of the **domain name** consists of a dot (".") followed by three or more letters (such as **.com** and **.gov**) that indicate the **top-level domain** (TLD). This part of the domain name indicates the type of organization or the country where the host server is located.

Setting up an E-mail account

Creating a new e-mail account takes only a few minutes. You have to provide information about yourself and choose an account name and password. Your account name or ID becomes part of your e-mail address. If you open a Yahoo account and choose “sksharma” as your ID, your address becomes “sksharma@yahoo.com.” Account names can use letters and numbers, such as “pkp2006,” It does not contain any spaces in between.

How to send, read and reply to E-Mails

- *Type in the web address of your mail provider e.g. www.mail.yahoo.com - then login by using your user ID and password.*

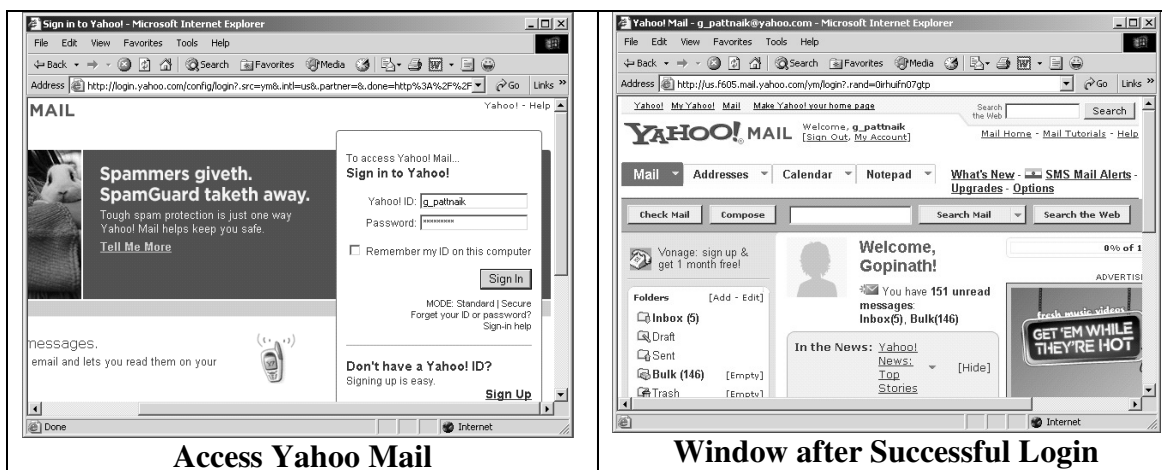


Fig. 10.19

Sending a message:

- *Click on **Compose** button, it follows the screen:*

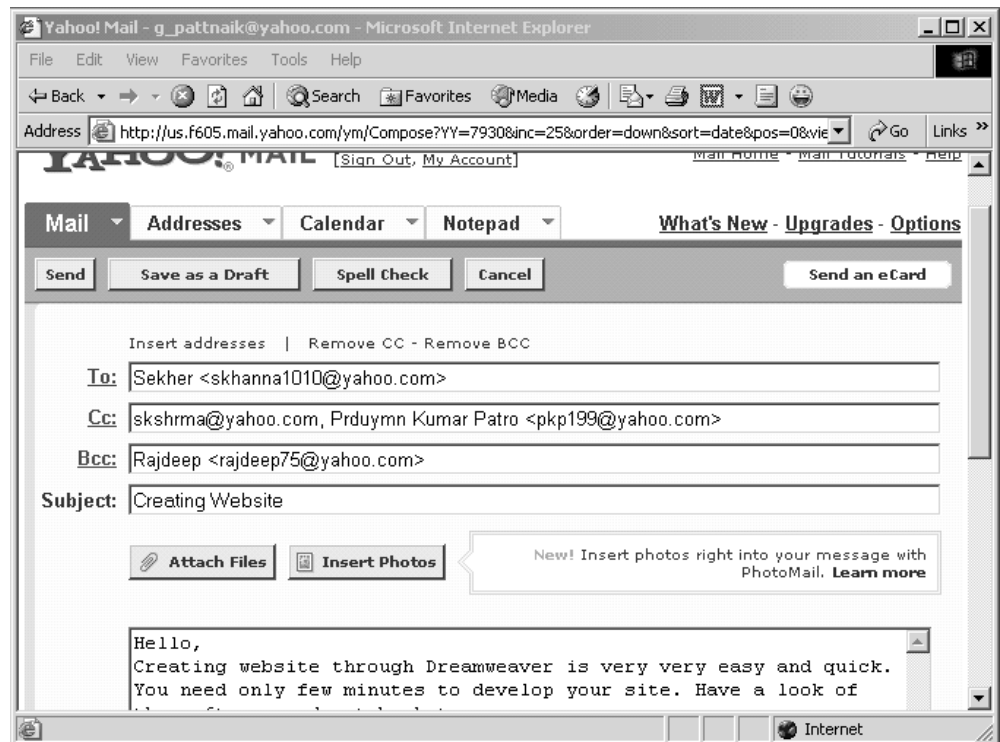
E-mail messages are similar to letters, with two main parts:

The **header** contains the name and address of the recipient, the address of anyone who is being sent a copy (cc) and the subject of the message.

The **body** contains the message itself.

In header section:

- Type the **e-mail address** of the recipient in the **“To:”** field. For more than one person, e-mail id should be separated by commas. At least one e-mail ID is a must.



Send message

Fig. 10.20

- Type **subject of your message** in the **“Subject:”** field.
- Use the **large text box** to enter the **contents of your message**.
- In the **“Cc:”** field, enter the email address of those to whom you would like to send a **“carbon copy”** of your message. All recipients of the message will be able to see that the person you designated as a “Cc:” has received a copy of the message.
- In the **“Bcc:”** field, enter the e-mail address of those to whom you would like to send a **“blind carbon copy”** of your message. This is nearly identical to the “Cc:” feature, except

that “Bcc:” recipients are invisible to the “To:” and “Cc:” recipients of the message as well as to each other.

- Click on **Attach files** to **attaching file(s)** and **Insert Photos** to **attach Photos** if required.
- Click on send button to send the message.

Reading, Replying/ Forwarding a message

- Click on **Check Mail or Inbox** to Read/Reply a message, it follows the screen

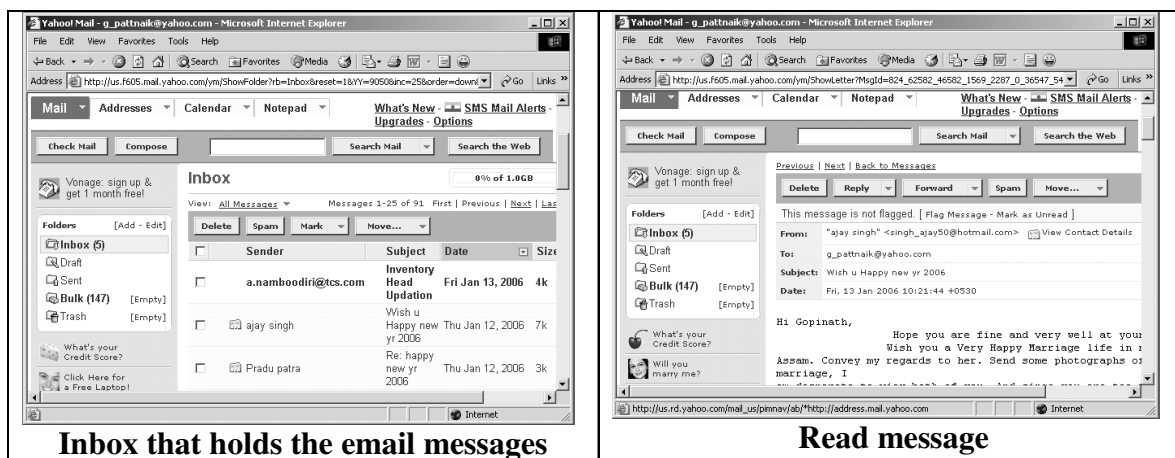


Fig. 10.21

- Click on the subject of the message to read.
- One can Reply/ Forward the message by clicking appropriate button.

Telnet

Telnet is a **network protocol** used on the **Internet** or local area network **LAN** connections.

The Telnet program runs on your computer and connects your PC to a server on the network. You can then enter commands through the Telnet program and they will be executed as if you are entering them directly on the server console. This enables you to control the server and communicate with other servers on the network. To start a Telnet session, you must log in to a server by entering a valid username and password. Telnet is a common way to remotely controlled Web servers.

FTP (File Transfer Protocol)

FTP or **File Transfer Protocol** is a commonly used protocol for exchanging files over any network that supports the TCP/IP protocol (such as the Internet or an Intranet).

There are two computers involved in an FTP transfer. The first computer is an FTP server (*host computer*). This computer listens on the network for connection requests from other computers. Another computer (called the client) can make a connection to the FTP server by using FTP client software. Once connected, the client can do a number of file manipulation operations such as uploading files to the server, download files from the server, rename or delete files on the server and so on.

FTP is used

- To promote **sharing of files** (computer programs and/or data).
- To encourage indirect or implicit use of **remote computers**.
- To transfer **data** reliably and efficiently.

INTEXT QUESTIONS

1. Write True or False for the following:
 - (a) The World Wide Web is a collection of electronic documents called web pages .
 - (b) Web server is an electronic document that links to another place in the same document or to an entirely different document.
 - (c) POP stands for Post Office Protocol.
 - (d) Electronic Mail is a paperless method of sending messages.
 - (e) File Transfer Procedure is a commonly used protocol for exchanging files over any network.
 2. Fill in the blanks:
 - (a) FTP is used to promote _____ files.
 - (b) _____-is a network protocol used on the Internet.
-

- (c) _____refers to the mail server.
 - (d) A search engine is a program designed to _____
_____ stored on a computer.
 - (e) _____is the standard for resolving names to
addresses.
-

10.12 WHAT YOU HAVE LEARNT

In this lesson you learnt about different types of internet connections and applications of internet. Here you got acquainted with different terminologies used in Internet. You also learnt about search engine, E-mail, Telnet and FTP.

10.13 TERMINAL QUESTIONS

1. Explain the different types of connections available to get connect to Internet.
2. Explain Internet Addressing Schemes and Domain Name System.
3. Define the following terminologies used in Internet; WWW, Hyperlink, Web page, Website and URL.
4. Yahoo and Hotmail offer free-email registration. Go to any of these sites and open an e-mail account in your name. Send an e-mail to a friend whose address you know.
5. What do you mean by a search engine? Mention two important search engines available on the Internet? What are basic tips to use to get the best results while searching?

10.14 FEEDBACK TO INTEXT QUESTIONS

1. (a) True (b) False
(c) True (d) True
(e) False
 2. (a) sharing of files (b) Telnet
(c) domain name (d) find information
(e) DNS
-