

## CHAPTER 10 Fundamental of the Internet

### Overview

In 1969, Advanced Research Project Agency (ARPA) established a small computer network among different universities and defense organizations. The goal was to establish a large computer network that could survive in war times. Initially **ARPANET** was a wide area network connecting a small number of users. There were only four hosts (A host is a computer that provide services to other computers of the network). But the network grew rapidly and spanned over countries.

Meanwhile another research organization, National science foundation, joined the project. NSF established five supercomputing centers which were available to all researchers for academic purposes. To provide high speed access to its supercomputers, NSF established a separate high speed network called **NSFnet**.

During this period, some other small networks had also been established among various universities and organizations. The authorities decided to link ARPANET, NSFnet and other small networks so that they can communicate each other. This link among different networks is referred to as the **Internet**.

### 10.1 How the Internet Works?

The **Internet** is a huge collection of millions of computers, all linked together on a computer network. The network allows all of the computers to communicate with one another. A home computer may be linked to the Internet using a phone-line modem, DSL or cable modem that communicates to an Internet service provider (**ISP**). A computer in a business or university will usually have a network interface card (**NIC**) that directly connects it to a Local Area Network (**LAN**) inside the business. The business can then connect its LAN to an ISP using a high-speed phone line like a **T1 line**. A T1 line can handle approximately 1.5 million bits per second, while a normal phone line using a modem can typically handle 30,000 to 50,000 bits per second.

ISPs then connect to larger ISPs, and the largest ISPs maintain fiber-optic "backbones" for an entire region. Backbones around the world are connected through fiber-optic lines, undersea cables or satellite links. In this way, every computer on the Internet is connected to every other computer on the Internet.

## 10.2 Addressing Schemes

The purpose of the Internet is to establish communication between widely spread computers. Computers can send and receive data to each other. Any computer may initiate a transaction at any time. For this reason the source machine (computer) must have a unique identification of the destination computer. On the Internet every computer has a unique address and can be contacted on this address.

There are two types of addressing schemes recognized on the Internet, these are:

- (i) IP Addressing
- (ii) DNS Addressing

### 10.2.1 IP Addressing

To keep all of these machines straight, each machine on the Internet is assigned a unique address called an IP address. IP stands for Internet protocol, and these addresses are 32-bit numbers, normally expressed as four "octets" in a "dotted decimal number." A typical IP address looks like this:

216.27.61.137

The four numbers in an IP address are called octets because they can have values between 0 and 255, which are  $2^8$  possibilities per octet. Every machine on the Internet has a unique IP address. A server has a static IP address that does not change very often. A home machine that is dialing up through a modem often has an IP address that is assigned by the ISP when the machine dials in. That IP address is unique for that session; it may be different the next time the machine dials in. This way, an ISP only needs one IP address for each modem it supports, rather than for each customer.

As far as the Internet's machines are concerned, an IP address is all you need to talk to a server. For example, in your browser, you can type the URL [http:// 216.27.61.137](http://216.27.61.137) and arrive at the machine that contains the Web server for the specified IP-Address.

### 10.2.2 DNS Addressing

Because most people have trouble remembering the strings of numbers that make up IP addresses, and because IP addresses sometimes need to change, all servers on the Internet also have human-readable names, called **domain names**. For example, [www.hotmail.com](http://www.hotmail.com) is a permanent, human-readable name. It is easier for most of us to remember it than it is to remember an IP Address. The name [www.hotmail.com](http://www.hotmail.com) actually has two parts

a host name and domain. The domain represents the institution which uses the address. These domain names are called top-level domain. Following is a list of top level domains:

Domain	Type of Institution
.com	Business (Commercial)
.edu	Educational institutes
.gov	Government organizations
.mil	Military organizations
.org	other organizations (non profitable)

Some large organizations divide their top level domain into sub domains. This let you organize their web references.

## 10.3 Web Browsing

Searching information on the World Wide Web is referred to as Web Browsing. A software known as **Web browser** is used to search and view web pages. Hundreds of thousands of web pages are available on the World Wide Web that covers information on almost every topic. Here we shall discuss important terminology regarding World Wide Web.

### 10.3.1 World Wide Web (WWW)

The World Wide Web was launched in 1989 at the European Particle Physics Laboratory in Geneva, for adding footnote, and cross references in hypertext documents. The www uses http (hyper text transfer protocol) to link hypertext documents (**web pages**) on the World Wide Web.

A web page is a document that is written in HTML (Hypertext Markup Language), in addition to simple text certain tags of HTML are included in the document. The language allows embedding **hyperlinks** (or simply link) in the document. A hypertext document is also called a **Web Page**. A collection of related web pages is called a **Web site**. Web sites are hosted on server computers on the internet. These computers are called **Web Servers**. The process of launching web page is called **publishing the page**.

### 10.3.2 URL (Uniform Resource Locator)

Every page has a unique address on World Wide Web. This is called Uniform Resource Locator (URL). If you want to access a web page on the

World Wide Web, you will have to specify the URL of the required page in the web browser. The general format of the URL is as follows:

type://address/path/

The **type** specifies the type of the server on which the page is hosted, **address** specifies the address of the server and **path** is the path of the page on the disk of the server e.g. <http://www.yahoo.com/>

### 10.3.3 Search Engine

A website that uses powerful data searching techniques to help the user locate web sites containing specific types of contents or information is known as a Search Engine e.g. [google.com](http://google.com), [ask.com](http://ask.com), [altavista.com](http://altavista.com) etc. are very popular search engines. Search engines have become very popular all over the world. Millions of people use Search Engines to find out information on various topics. Search Engines maintain a list of billions of web pages containing information on variety of topics. Search engines ask you to enter some key words about the data or information you want to search on the Internet. On the basis of your provided information, search engine traverse the list of web pages it maintain, and finally display the links of the web pages containing required information.

## 10.4 Email

**Email** is a system for delivering messages over the Internet. An e-mail sender or recipient can be anywhere in the world.

E-mail is the first really popular Internet application; it allows people to hold discussions over great distances

- E-Mail can take as little as *few seconds* to go across a country, or even around the world.
- It leaves a written record. You can keep copies of e-mail messages you send and receive, for your record.

To create, send and receive email you need email-program, also called **email client**. Once you send the message, your computer connects to your **email server** and transmits a copy of your message. Email Server is a host computer on the Internet which keeps track of information about millions of email account holders. The server checks the address you have typed and figures out where the recipient email server is. It connects to that server and transmits another copy of the message. Once the

receiving email server has received the message, the recipient is able to retrieve the message when connected to the server.

**Attachment** is a powerful feature of email, which enables you to enclosed additional files with your email. You can attach word processing documents, spreadsheets, programs, images, even audio, to your email messages when using email programs that support the Internet protocol for multimedia attachments i.e. MIME (Multipurpose Internet Mail Extension). Most email clients allow you attach files to the message. In this way you can send and receive data as well as program files. Attachment size varies from one email service provider to the other e.g. for free email accounts, **Yahoo** allows a file of size up to 10MB to be attached. This limit varies for paid accounts.

### 10.4.1 Limitations on Email

- **Email is not necessarily private:** Since messages are passed from one system to another, and sometimes through several systems or networks, there are many opportunities for someone to intercept or read email. Many types of computer systems have protections built in to stop users from reading others' email, but it is still possible for a system administrator to read the email on a system or for someone to bypass the security of a computer system.
- **Some email systems can send or receive text files only:** Even though you can send and receive images, programs, files produced by word processing programs, or multimedia messages, some individuals may not be able to properly view your message.
- **It is possible to forge email:** This is not common, but it is possible to forge the address of the sender. You may want to take steps to confirm the source of some email you receive.
- **It is difficult to express emotion using email:** The recipient does not have the benefit of viewing your facial expressions or hearing your voice. You have to be careful with humor or irony, since it is easy for someone to take your message the wrong way.
- **You can receive too much or unwanted emails:** You can receive "junk" email in the same way you receive other types of junk mail. On the Internet, junk mail is called **spam**. You may have to take active

steps to delete the email you receive and try to stop it from being sent to you in the first place

- **You may not know about the person with whom you are communicating:** The communication is often in text and it is possible for us to get an incorrect impression of the person sending us email. Also, some people misrepresent themselves.

### 10.4.2 Email Address

To send and receive an email, you must have an email account on an email server. When you open an email account, you are assigned a unique email address. You receive all incoming emails on this account address and send email to others by specifying their email addresses. The general format of an email address is:

User name @ DNS Address

For example, pakCrick@hotmail.com, gsm@yahoo.com, info@ptcl.com.pk etc. In these examples pakCrick, gsm and info specify the user name whereas the second part after @ symbol specify the DNS address.

### 10.5 Newsgroups

These are discussion groups on the Internet (not on the Web, which is only one area of the Internet). Newsgroups are classified by subject and do not necessarily deal with journalism or "news". Health, hobbies, celebrities, and cultural events are the subjects of many newsgroups. Participants in a newsgroup conduct discussions by posting messages for others to read, and responding to the messages posted by others. Because you have time to think of what to write in a newsgroup posting, the discussions in newsgroups tend to be of a more serious nature, though not necessarily less amusing.

You need a software to obtain articles from the **news server**. A news server is a host computer that exchanges articles with other servers on the Internet. These servers use Network News Transfer Protocol (NNTP) to communicate. To view articles on a specific topic, you need to be subscribed on a news group.

**Exercise 10C****1. Fill in the blanks:**

- (i) Collection of related web pages is called \_\_\_\_\_
- (ii) Initially ARPANET was a \_\_\_\_\_ connecting small number of users.
- (iii) News server use \_\_\_\_\_ protocol to transfer articles among them
- (iv) NSF established a separate high speed network called \_\_\_\_\_
- (v) The LAN can be connected to ISP using a high-speed phone line called a \_\_\_\_\_
- (vi) World Wide Web was established in \_\_\_\_\_
- (vii) MIME stands for \_\_\_\_\_
- (viii) The four numbers in an IP address are called \_\_\_\_\_
- (ix) \_\_\_\_\_ address is easy to remember
- (x) HTML stands for \_\_\_\_\_

**2. Choose the correct option:**

- (i) A computer can be linked to the Internet through
  - (a) A phone-line modem
  - (b) DSL
  - (c) Cable modem
  - (d) All of the above
- (ii) Which of the following is an email client?
  - (a) Internet Explorer
  - (b) Outlook Express
  - (c) Google
  - (d) None of the above
- (iii) Which of the following protocol is used to access web pages on World Wide Web.
  - (a) TCP/IP
  - (b) Gopher
  - (c) HTTP
  - (d) HTML
- (iv) Which of the following is used to find information on World Wide Web?
  - (a) Web Browser
  - (b) Web Site
  - (c) Search Engine
  - (d) Web Server
- (v) The length of IP Address is
  - (a) 8 bit
  - (b) 16 bit
  - (c) 32 bit
  - (d) 64 bit

3. Write T for true and F for false statement:
- IP address is a 16-bit addressing scheme
  - Every computer on a network has a Network Interface Card that directly connects it to the other computers.
  - URL is used to locate a computer on the Internet
  - A hypertext document is also called web page
  - email server is a software used to create, send and receive emails
  - Each computer on the Internet must have HTTP Server configured to connect to the Internet
  - NNTP stands for National News Transmission Protocol
  - On Internet, Junk mails are also called spam
  - News Server is used to streamline the news transmission of the local radio stations
  - You can not attached a file larger than 20MB to an email
4. Briefly describe the history of the Internet.
5. Write a not on World Wide Web.
6. What do we mean by Addressing schemes? How many types of addressing is used on the Internet? Discuss briefly.
7. What do you know about Email? Discuss briefly.
8. Write a note on the following:
- Newsgroups
  - Search Engine
  - TCP/IP
9. Discuss limitations on email.
10. How the use of Internet is affecting our society? Give your comments.

## Answers

- |    |               |                        |  |             |
|----|---------------|------------------------|--|-------------|
| 1. | (i) Web Site  | (ii) Wide Area Network | (iii) NNTP                                 | (iv) NSFnet |
|    | (v) T1 line   | (vi) 1989              | (vii) Multipurpose Internet Mail Extension |             |
|    | (viii) octets | (ix) DNS               | (x) Hyper Text Markup Language             |             |
| 2. | (i) d         | (ii) b                 | (iii) c                                    | (iv) c      |
|    |               |                        |  | (v) c       |
| 3. | (i) F         | (ii) T                 | (iii) F                                    | (iv) T      |
|    | (vi) F        | (vii) F                | (viii) T                                   | (ix) F      |
|    |               |                        |  | (x) F       |



## GLOSSARY

### A

**Absolute referencing:** Absolutely referring to a particular cell's contents is known as *absolute referencing*

**Address Bus:** It is the part of System bus. It carries the addresses of various memory locations to perform read or write operation

**ALU:** Arithmetic and Logic Unit – This unit performs arithmetic and logical operations within the CPU

**Amplitude:** It is the height of wave within a given period of time

**Analog Signal:** Analog signals are continuous electrical signals in the form of wave

**Antivirus:** It is a software which is used to detect and remove a virus from the computer

**Application Software:** Application software is developed to solve a specific problem.

**ARPANET:** ARPANET was a wide area network connecting a small number of users. There were only four hosts (A host is a computer that provide services to other computers of the network).

**ASCII:** American Standard Code for Information Interchange – a 7-bit coding scheme

**Asynchronous Transmission:** In this type of transmission the data is sent using flow control rather than a clock to synchronize data between the source and destination

### B

**Bandwidth:** Bandwidth is a measure of the transmission rate of communication channel

**Baseband:** It is a communication technique in which digital signals are placed onto the transmission line without change in modulation

**BCD:** Binary Coded Decimal – a four bit coding scheme

**Bit:** The smallest unit of data representation with in the computer

**Bridge:** A device that recognizes the messages on a network and passes on those addresses to nodes in other network.

**Broadband:** It is a technique of transmitting a large amount of data, voice, and video over long distances simultaneously by modulation each signal onto a different frequency

**Bus:** It is also called System Bus. It is an electronic pathway to connect different parts of the computer together

**Bus Interconnection:** This unit is used to connect different part of the computer together

**Bus Topology:** In this topology, computers are connected in a series. A special device called terminator is connected on both ends of the series (bus) to absorb the signals.

**Byte:** Collection of eight bytes is referred to a byte

### C

**CAD:** Computer Aided Design

**CAM:** Computer Aided Manufacturing

**Client/Server Network:** In this type of network, one or more computers are dedicated servers and the remaining computers work as clients. The server can't play the role of the client and vice versa.

**Command line operating system:** A *command line operating system* provides a command prompt to the user for typing different commands to interact with the computer.

**Communication Channel:** The communication channel is the physical path by which a data travels from sender to receiver

**Computer:** A computer is a machine that can be programmed to accept data (input), process it into useful information (output), and store it away (in a secondary storage device) for safekeeping or later use.

**Control Bus:** It is the part of system bus. It is used to transmit control signals to different parts of the computer from the CPU

**Control Unit:** Control Unit reads the instructions from main memory and decodes these instructions

**CPU:** Central Processing Unit – also known as brain of the computer. It controls the overall functioning of the computer.

**CRT:** Cathode-Ray Tube – it is a vacuum tube used as a display screen in a computer or video display terminal

**Custom-built Software:** This software is developed for a particular customer

## D

**Data Bus:** It is the part of overall system bus structure. It carries the actual data from the CPU to memory and I/O devices and vice versa

**Data Communication:** It is the exchange of data between two devices via some form of transmission media such as a wire cable

**Decoder:** Decoder converts the encoded signal to digital form

**Desktop:** The on-screen work area on which windows, icons, menus, and dialog boxes appear is called *desktop*.

**Digital Signal:** A digital signal uses on-off electrical pulses in discontinuous or discreet form

**DMA:** Direct Memory Access – This is a technique of performing an I/O operation in which I/O operation is completed without involving the CPU. The CPU just issues an I/O command and the rest of the work is completed with help of a special DMA module

**Domain names:** All servers on the Internet also have human-readable names, called *domain names*.

**DOS:** Disk operating system

**DRAM:** Dynamic RAM – Contents of this type of RAM need to be refreshed periodically

**DSL:** Digital Subscriber Line

## E

**EBCDIC:** Extended Binary Coded Decimal Interchange Code – an 8-bit coding scheme

**Email:** *Email* is a system for delivering messages over the Internet.

**E-mail:** it is the process of sending messages electronically from one computer to the other on a computer network

**Email client:** It is software used to create, send and receive.

**Email Server:** This is the server computer on the Internet which is used to maintain email accounts and to streamline the email system.

**Encoder:** The encoder converts digital signals to a form, which can pass through transmission medium

**Ethernet:** It is a LAN protocol. It uses high speed network cable and bus topology, so it is relatively simple and cheaper.

**Extended partition:** Extended partition refers to a portion of a disk that can contain other partitions.

**Extranet:** Two or more intranet connected together in such a way that they enable collaboration among the companies that own the separate intranets.

## F

**Fetch-Decode-Execute Cycle:** This cycle describes the process of execution of an instruction within the computer

**Frequency:** Frequency is the number of times a wave repeats during a specific time interval

**FTP:** File Transfer Protocol – it is a protocol to transfer files from one computer to the other on a computer network

**Full Duplex:** It is a mode of data communication in which data can travel in both directions i.e. from sender to receiver and vice versa, simultaneously

**Functions:** In a spreadsheet, *Functions* are built-in formulas used to perform complex operations.

**G**

**Gateway:** Gateway is a collection of hardware and software resources that let a node (Computer) communicate with a computer on another network

**Gopher:** It is an access and retrieval system covering a wide range of information, from reference materials to magazine articles to government documents and speeches

**Groupware:** Software which is used for workgroup computing

**GUI operating system:** A *GUI operating system* provides a graphical user interface to establish the user communication with the computer e.g. Windows 95, Windows 98, Windows NT, Windows 2000, and Windows XP

**Guided Media:** It refers to channels that allow the transmission of data through a physical media such as twisted pair wires, coaxial cable, or fiber optic cable

**H**

**Half Duplex:** It is a mode of data communication in which data can travel in both directions i.e. from sender to receiver and vice versa, but in one direction at a time

**Hardcopy:** Hardcopy refers to the printed output.

**Hardware:** Physical components of computer are called hardware

**Hyperlink:** A word, icon, or other object that when clicked jumps to another location on the document or another web page is called *hyperlink* or *link*

**I**

**I/O Unit:** Input/Output Unit – This unit handles the processor's communication with its peripherals.

**Impact Printers:** The printers which use a striking mechanism to print on the paper

**Information Technology:** Information Technology is the technology that merges computing with high speed communication links carrying data in the form of text, sound, image, video etc., from place to place.

**Input devices:** The devices which are used to give input to the computer are called input devices

**Internet:** The *Internet* is a huge collection of millions of computers, all linked together on a computer network. It is also called network of networks.

**Interrupt:** Interrupts are the signals, normally generated by I/O devices. These signals inform the CPU of the occurrence of a certain event such as completion of an I/O operation

**Intranet:** it is a privately-owned, secure, business network based on Internet Technology (use TCP/IP), although not necessarily connected to the Internet

**IP Address:** IP stands for Internet protocol, IP address is used to uniquely identify every computer on a computer network. These addresses are 32-bit numbers, normally expressed as four "octets" in a "dotted decimal number."

**ISP:** Internet service provider – A company that provides internet services

**L**

**LAN:** Local area network that spans a small geographical area such as a building or a campus consisting of few buildings in a small area.

**LAN:** Local Area Network – It spans a small geographical area such as an office or a group of buildings

**LCD:** Liquid Crystal Display – As compared to CRT, it uses a different technology to display text and graphics

**M**

**Macro:** A *macro* is a character or word that represents a series of keystrokes

**MAN:** Metropolitan Area Network – A Metropolitan Area Network connects an area larger than a LAN but smaller than a WAN, such as a city, with dedicated or high-performance hardware.

**Mesh Topology:** In this topology every computer is directly connected to every other computer on the network.

**Modem:** It is a device that converts digital signals into analog signals and vice versa. It is used to connect to the Internet.

**Multiprocessing:** By multiprocessing, we mean having more than one processors in a single computer. The phenomenon of executing a process on two or more processors is called multiprocessing.

**Multitasking:** The capability of an operating system to load multiple programs into memory at one time and to perform two or more processes concurrently is called *multitasking*.

**Multi-user Operating System:** A *multi-user Operating System* allows for multiple users to use the same computer at the same time and/or different times.

## N

**Network:** A group of computers connected together to communicate, exchange information, and pool their resources amongst each other

**Network Topology:** Arrangement of nodes in a computer network is referred to as network topology

**News server:** A news server is a host computer that exchanges articles with other servers on the Internet.

**Newsgroups:** These are discussion groups on the Internet

**NIC:** Network Interface Card – A card used in every computer on a network, it enable computers to establish a computer network.

**Non-Impact Printers:** The printers which do not use a striking mechanism to print on the paper

## O

**Operating system:** An *operating system* is collection of operative programs that provide an interface for the user to interact with the computer.

**Output devices:** The devices which are used to get output from the computer are called output devices

## P

**Parallel Transmission:** This transmission involves the concurrent flow of bits of data through separate communication lines

**Partition:** A *partition* is a portion of physical disk that functions as though it were a physically separate disk.

**Peer-to-Peer Network:** In this type of network, every computer can play the role of server or client depending on the nature of communication. There is no clear distinction between the server and client machines.

**Pixel:** Short for picture element, one spot in a rectilinear grid of thousands of such spots that form an image produced on the screen by a computer or on paper by a printer. A pixel is also called a pel.

**Plug and Play:** *Plug and Play* refers to a set of specifications that allow a computer to automatically detect and configure a device, and install the appropriate device drivers.

**Primary partition:** A primary partition is one that can be used as the system partition.

**Program:** Set of instructions given to the computer to solve a particular problem

**Protocol:** A protocol is a set of rules and procedures that defines how computer receive and transmit data over the network

**Publishing the page:** The process of launching web page is called *publishing the page*.

## R

**RAM:** Random Access Memory – It is also called the main memory, program's instruction and data are stored temporarily in RAM

**Recycle bin:** Windows maintain a storage area on the hard disk for storing deleted items, this storage area is called *recycle bin*.

**Register:** These are the high speed memory locations built into the microprocessor. The CPU uses these memory locations to store data and instructions temporarily, to accomplish certain operations

**Relative referencing:** Calling cells by just their addresses (such as "A1") is called *relative referencing*

**Resolution:** Pixels per inch on the screen (display screen) defines the resolution

**Ring topology:** In this topology, computers are connected in a ring shape.

**ROM:** Read Only Memory – It is permanent memory and contains the instructions required in booting process

**Router:** Router is a device that keep track of all possible routes (from source to the destination) that a message can follow to be delivered to the destination

## S

**Sans-serif fonts:** *Sans-serif fonts* do not have curls or extra decorative lines at the ends of the strokes that make up each character e.g. Arial

**Search Engine:** A website that uses powerful data searching techniques to help the user locate web sites containing specific types of contents or information is known as a *Search Engine* e.g. google.com, ask.com, altavista.com etc.

**Serial Transmission:** In this transmission, each individual bit of information travels along its own communication path; the bits flow in a continuous stream along the communication channel

**Serif fonts:** *Serif fonts* have curls or extra decorative lines at the ends of the strokes that make up each character e.g. Times New Roman

**Signal:** The electromagnetic or light wave representation of data is called signal

**Simplex:** It is a mode of data communication in which data travels in one direction i.e. from sender to receiver. Receiver is not capable of sending data e.g. T.V. and Radio transmission

**Simulation:** It is a special type of computer model, which recreates a system that might exist outside the computer

**Softcopy:** Softcopy refers to the data stored electronically on a storage device.

**Software:** A computer program or a collection of computer programs combined together to perform certain tasks, is referred to as software

**Software Packages:** These software are off-the-shelf programs developed for potential users.

**Spreadsheet:** A *Spreadsheet program* is a software tool for entering, calculating, manipulating and analyzing sets of numbers.

**SRAM:** Static RAM – Contents of this type of RAM do not need to be refreshed

**Star Topology:** In this topology, all computers are connected to a central devices called hub.

**SVGA:** Super Video Graphic Array – it supports 256 colors at higher resolution than VGA

**Synchronous Transmission:** In this type of transmission, a clock is used to control the timing of bits being sent

**System:** A system can be defined as a combination of some related components that interact with each other to perform some specific tasks

**System Bus:** see bus

**System Software:** System Software is used to control the usage an allocation of different hardware components and enables the other application programs to execute.

## T

**T1 line:** A *T1 line* can handle approximately 1.5 million bits per second

**TCP/IP:** Transmission Control Protocol/Internet Protocol – It is the protocol used by every computer on the Internet

**Telnet:** It is a protocol that allows you to remotely logging onto a computer

**Token Ring:** This protocol is designed by IBM for its mainframe computers to communicate with the terminals, in a ring topology network.

**Tree Topology:** Tree Topology integrate multiple star topologies together onto a bus

**Unguided Media:** It refers to those channels that transmit data and information in the form of wave such as microwave and satellites

## U

**Unicode:** Universal Code – a 16-bit coding scheme widely used in today's computers. It is capable of representing characters of many languages such as Japanese, Arabic, and French

**URL:** Uniform Resource Locator – This is actually the address of every web page on the World Wide Web. It uniquely identifies every web page on WWW.

## V

**VGA:** Video Graphic Array – it supports 16 to 256 colors, depending upon the screen resolution

**Video Conferencing:** It is a type of conferencing in which video cameras and microphones capture sight and sound transmission over networks

**Video Display Adapter:** A card fixed into motherboard and controls the display on the monitor.

**Virus:** A virus is a program or a set of programs that can cause extensive damage to your computer system.

## W

**WAN:** Wide Area Network – It spans a large geographical area such as among cities, countries or continents

**Web browser:** It is a software that is used to view web pages.

**Web Page:** A hypertext document is also called a *Web Page*.

**Web Servers:** The server computers on the Internet where the websites are hosted are called web servers

**Web Site:** A collection of related web pages is called a *Web site*.

**Word:** A group of bytes that constitutes a common unit of data as defined by the computer system

**Word Art:** *Word Art* is a feature of Microsoft Word's drawing program. It transforms an ordinary text headline, word or phrase in a work of art.

**Word processor:** *Word processor* is an application (software) that provides extensive tools for creating all kinds of text-based documents.

**Workbook:** Collection of related worksheets forms a *workbook*.

**Workgroup computing:** It is also known as *collaborative computing* and enables the individuals and teams of certain projects to use computer networks for the purpose of cooperation, consultation, and information sharing.

**Worksheet:** In a spreadsheet, you actually work in a grid of rows and columns called a *worksheet*.

**WWW:** World Wide Web – It is a collection of millions of linked web pages

**WYSIWYG:** A graphical user interface style stands for *What You See Is What You Get*

## X

**XGA:** Extended Graphic Array – it supports 16.7 million colors at resolution of 1024 × 768 pixels

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