

COMPUTER NETWORKS AND INTERNET APPLICATION

UNIT-1

- ❖ **Meaning of Networking**
- ❖ **Types of Networking**
- ❖ **Importance of Networking**
- ❖ **Components of Networking**
- ❖ **Networking Protocol**
- ❖ **TCP/IP**
- ❖ **ISP**
- ❖ **Dialer programs and internet Programs**
- ❖ **Internet Explorer**
- ❖ **Netscape**
- ❖ **Network Topology**

1.1 Meaning of Networking:

Networking is a process of connecting computer by means of wire or wireless. The main objective is to share information and resources among computers.

A networking is a group interconnected computers and associated peripheral device connected by a communication channel, which capable of sharing the resources and information among the users.

Advantages of Networks:

1. File sharing

The major advantage of a computer network is that it allows file sharing and remote file access. A person sitting at one workstation that is connected to a network can easily see files present on another workstation, provided he is authorized to do so.

2. Resource sharing

All computers in the network can share resources such as printers, fax machines, modems, and scanners.

3. Better connectivity and communications

It allows users to connect and communicate with each other easily. Various communication applications included e-mail and groupware are used. Through e-mail, members of a network can

send message and ensure safe delivery of data to other members, even in their absence.

4. Internet access

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Computer networks provide internet service over the entire network. Every single computer attached to the network can experience the high speed internet.

5. Entertainment

Many games and other means of entertainment are easily available on the internet. Furthermore, Local Area Networks (LANs) offers and facilitates other ways of enjoyments, such as many players are connected through LAN and play a particular game with each other from remote location.

6. Flexible access

A user can log on to a computer anywhere on the network and access his files. This offers flexibility to the user as to where he should be during the course of his routine.

Disadvantages of Networks:

1. Lack of data security and privacy

Because there would be a huge number of people who would be using a computer network to get and share some of their files and resources, a certain user's security would be always at risk. There might even be illegal activities that would occur, which you need to be careful about and aware of.

2. Presence of computer viruses and malwares

If even one computer on a network gets affected by a virus, there is a possible threat for the other systems getting affected too. Viruses can spread on a network easily, because of the inter-connectivity of workstations. Moreover, multiple systems with common resources are the perfect breeding ground for viruses that multiply.

3. Lack of Independence

Since most networks have a centralized server and dependent clients, the client users lack any freedom whatsoever. Centralized decision making can sometimes hinder how a client user wants to use his own computer.

1.2 Types of Network:

- 1. LAN (Local Area Network)**
- 2. WAN (Wide Area Network)**
- 3. MAN (Metropolitan Area Network)**
- 4. CAN (Campus Area Network)**
- 5. HAN(Home Area Network)**
- 6. SAN(Storage Area Network)**
- 7. PAN (Personal Area Network)**

8. Internet
9. Intranet

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10. Extranet

1. Local Area Network (LAN)

Local area network is the when computers are connected by continuous wires or by wireless link and housed in a single building or in nearby building.

The networks used for accessing the computer located in the small area. The number of computers connected may be less than one hundred and the area is limited.

2. Wide Area Network (WAN)

It is the combination of two or more LAN and in a specific geographical area. It may be for some local divisions or for definite geographical location.

WAN spans a large geographical area, often a country or region. WAN links different metropolitan's countries and national boundaries there by enabling easy communication.

It may be located entirely within a state or a country or it may be interconnected around the world. It contains a collection of machines intended for running user (i.e. application) programs. We will follow traditional usage and call these machines hosts.

3. MAN (Metropolitan Area Network)

MAN is a larger version of LAN which covers an area that is larger than the covered by LAN but smaller than the area covered by WAN. A metropolitan area network or MAN covers a city. The best-known example of a MAN is the cable television network available in many cities. MAN connects two or more LANs.

At first, the companies began jumping into the business, getting contracts from city Governments to wire up an entire city. The next step was television programming and even entire channels designed for cable only.

4. CAN (Campus Area Network)

A campus area networks is a computer network interconnecting a few local area networks within a university campus or corporate campus network.

Campus area network may link a variety of campus buildings. A campus area network is larger than a local area network but smaller than a metropolitan area network or wide area network.

5. HAN (Home Area Network)

A home area networks is a network contained within a users home connects a persons digital devices, from multiple computers and their peripheral devices, such as a printer to telephones, DVDs, Video games, between LAN, MANs.

6. SAN (Storage Area Network)

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It provides high speed infrastructure. Data are move from file server to storage device. It is speed oriented network. Mainly used for storing the information.

7. PAN (Personal Area Network)

A personal area network or PAN is a computer network organized around a single individual person within a single building. This could be inside a small office or residence. A typical personal area network would include one or more computer, telephones, peripheral devices, video game consoles and other personal entertainment device.

8. Internet

Internet has been an integral part of the business and social system. It is generating a number of entrepreneurs, opportunities and many skilled jobs. It has become a part of business system in all the advanced counters.

It is the interconnected network in information distribution system. Internet does many computer- based facilities such as e-mail, electronic data interchange, information publishing, information retrieval, etc. Internet provides all types of services. Transactions take place in seconds.

9. Intranet

An Intranet is a private network that is contained within an enterprise. It may consist of many interlinked local area networks and also use leased line in the wide area network.

The main purpose of an intranet is to share company information and computing resources among employees. An intranet can also be used to facilitate working in groups and for teleconferences.

Examples: A business may create an intranet to allow employees to securely share message and files with each other.

10. Extranet

An extranet is a controlled private network allowing customers, partners, vendors, suppliers and other businesses to gain information, typically about a specific company or educational institution and do so without granting access to the organization entire network.

1.3 Importance of Networking

1. File Sharing

Computers connected to a network can share files and documents with each other. Personal computers connected to a business network can choose which files and folders are available to share on the network.

2. Printers

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Computers can print pages to another computer with a printer on the network. Additionally, printers can be connected using a print server, which allows direct printing from all computer.

3. Sharing media

Sharing media between computers is easy when connected to a network. Like files sharing, computers can stream music, videos and movies from one computer to the next.

4. A media center server

A media center server can store your entire entertainment library on a centralized hub to give quick access to your media from every computer on your network.

5. Video games

Console and PC games benefit from networking also. You can easily set up multiplayer death matches and even host your own game server.

1.4 Components of Networking

- Network Interface Card (NIC)
- Hub
- Switches
- Cables and connectors
- Router
- Modem

1. Network Interface Card

Network adapter is a device that enables a computer to talk with other computer/network. Using unique **hardware addresses (MAC address)** encoded on the card chip, the data-link protocol employs these addresses to discover other systems on the network so that it can transfer data to the right destination.

There are **two types of network cards: wired and wireless**. The wired NIC uses cables and connectors as a medium to transfer data, whereas in the wireless card, the connection is made using antenna that employs radio wave technology. All modern laptop computers incorporated wireless NIC in addition to the wired adapter.

Network Card Speed

Network Interface card, one of the main computer network components, comes with different speeds, 10Mbps, 100Mbps, and 1000Mbps, so on. Recent standard **network cards built with Gigabit** (1000Mbps) connection speed. It also supports to connect slower speeds such as 10Mbps and 100Mbps. However, the speed of the card depends on your LAN speed.

For example, if you have a switch that supports up to 100Mbps, your NIC will also transfer a data with this same speed even though your computer NIC has still the capability to transfer data at 1000Mbps (1Gbps). In modern computers, network adapter is integrated with a computer motherboard. However if you want advanced and fast Ethernet card, you may buy and install on your computer using the **PCI slot** found on the motherboard (desktop) and **Express Card slots** on laptop.

2. Hub

Hub is a device that splits a network connection into multiple computers. It is like a distribution center. When a computer request information from a network or a specific computer, it sends the request to the hub through a cable. The hub will receive the request and transmit it to the entire network. Each computer in the network should then figure out whether the broadcast data is for them or not.

Currently Hubs are becoming obsolete and replaced by more advanced communication devices such as **Switches and Routers**.

3. Switch

Switch is a telecommunication device grouped as one of computer network components. Switch is like a Hub but built in with advanced features. It uses **physical device addresses** in each incoming messages so that it can deliver the message to the right destination or port. Like Hub, switch don't broadcast the received message to entire network, rather before sending it checks to which system or port should the message be sent. In other words switch connects the source and destination directly which increases the speed of the network. Both switch and hub have common features: Multiple RJ-45 ports, power supply and connection lights.

4. Cables and connectors

Cable is one way of transmission media which can transmit communication signals. The wired network typology uses special type of cable to connect computers on a network.

There are a number of solid transmission Media types, which are listed below. - **Twisted pair wire**

It is classified as Category 1, 2, 3, 4, 5, 5E, 6 and 7. Category 5E, 6 and 7 are high-speed

cables that can transmit 1Gbps or more.

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Coaxial cable

Coaxial cable more resembles like TV installation cable. It is more expensive than twisted-pair cable but provide high data transmission speed.

Fiber-optic cable

It is a high-speed cable which transmits data using light beams through a glass bound fibers. Fiber-optic cable is high data transmission cable comparing to the other cable types. But the cost of fiber optics is very expensive which can only be purchased and installed on governmental level.

5. Router

When we talk about computer network components, the other device that used to **connect a LAN with an internet connection is called Router**. When you have **two distinct networks** (LANs) or want to share a single internet connection to multiple computers, we use a Router.

In most cases, recent routers also include a switch which in other words can be used as a switch. You don't need to buy both switch and router, particularly if you are installing small business and home networks.

There are two types of Router: **wired and wireless**. The choice depends on your physical office/home setting, **speed and cost**.

6. Modems

A modem enables you to connect your computer to the available internet connection over **the existing telephone line**. Like NIC, **Modem is not integrated with a computer motherboard**. It comes as separate part which can be installed on the PCI slots found on motherboard. A modem is not necessary for LAN, but required for internet connection such as dial-up and DSL.

There are some types of modems, which differs in **speed and transmission rate**. Standard PC modem or Dial-up modems (56Kb data transmission speed), Cellular modem (used in a laptop that enables to connect while on the go), **cable modem (500 times faster than standard modem)** and DSL Modems are the most popular.

1.5 Networking Protocol

A network protocol defines rules and conventions for communication between network devices. Protocols for computer networking all generally use packet switching techniques to send and receive messages in the form of packets.

Network protocols include mechanisms for devices to identify and make connections with each other, as well as formatting rules that specify how data is packaged into messages send and received.

Types of Protocol

- 1. HTTP**
- 2. FTP**
- 3. TCP/IP**
- 4. URL**
- 5. SMTP**

1.6 Transmission Control Protocol/Internet protocol (TCP/IP)

Transmission Control Protocol/Internet protocol is the basic communication language or protocol of the Internet. TCP/IP is a two-layer program.

The higher layer, Transmission Control Protocol, manages the assembling of a message or file into smaller packets that are transmitted over the Internet received by a TCP layer that reassembles the packets into the original message.

The lower layer, Internet Protocol, handles the address part of each packet so that it gets to the right destination. Each gateway computer on the network checks this address to see where to forward the message. Even though some packets from the same message are routed differently than others, they will be reassembled at the destination.

Many Internet users are familiar with the even higher layer application protocols that use TCP/IP to get to the Internet. These include the World Wide Web's Hypertext Transfer Protocol (HTTP), the File Transfer Protocol (FTP), Telnet which lets u logon to remote computers, and the simple Mail Transfer Protocol (SMTP). These and other protocols are often packaged together with TCP/IP as a set.

1.7 ISP (Internet Service Providers)

E-commerce requires various technological equipments and infrastructure for implementation and development. Information superhighway is the high capacity interactive electronic pipeline connecting the home, office, business houses, government organizations etc.

that is supporting commercial applicants. I-way connects the client and client, business and business, and client and business.

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The present-day equipments in developing countries are now providing integrated video, information, text, and voice services. Earlier the voice network depended upon circuit switching and data network depended as packet switching technology.

1. A voice network
2. A data network, and
3. A video conferencing network.

1.8 Dialer programs and Internet programs

A Dialer is an electronic device that is connected to a telephone line to monitor the dialed numbers and alter them to seamlessly provide services that otherwise require lengthy access codes to be dialed.

A dialer automatically inserts and modifies the numbers depending on the time of day, country or area code dialed, allowing the user to subscribe to the service providers who offer the best rates.

Another type of dialer is a computer program which creates a connection to the Internet or another computer network over the analog telephone or Integrated Services Digital Network (ISDN) Network.

Many operating systems already contain such a program for connections through the point-to-point protocol (PPP).

In recent years, the term “dialer” often refers specifically to dialers that connect without the user’s full knowledge as to cost, with the creator of the dialer intending to commit fraud.

1.9 Internet Explorer

Internet Explorer was first introduced in August 16, 1995 by Microsoft as Internet Explorer 1.0 and included with Microsoft windows 1995. Internet Explorer has been included with all versions of windows since then with the latest and last version being IE 11.

Internet browsing software manufactured by Microsoft corp and included on computers with their windows operating system.

This software allows users to view and navigate a web pages on the internet. IE is most widely used browser in the world.

Internet explorer is one of the most widely used web browsers, attaining a peak of about 95% usage share during 2002 and 2003. It was share has since declined with the launch of Firefox (2004) and Google Chrome (2008), as well as with the growing popularity of operating systems such as OS X, Linux and Android that do not run Internet explorer. Estimates for internet explorer’s overall market share range from 27.4% to 54.13% as of October 2012.

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1.10 Netscape

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Netscape was the general name for a series of web browsers originally produced by Netscape Communications Corporation, now a subsidiary of AOL.

The original browser was once the dominant browser in terms of usage share, but as a result of the first browser war, it lost virtually all of its share to Internet Explorer.

Netscape was discontinued and support for all Netscape browsers and client products was terminated on March 1, 2008.

Netscape Browser is the name of a proprietary windows web browser published by AOL, but developed by Mercurial Communications.

It is the eighth major release in name of the Netscape series of browsers, originally produced by the defunct Netscape communications corporation.

Netscape Browser's version number star at 8, it is based on Mozilla Firefox, whereas Netscape 6 and 7 were based on Mozilla Application Suite, itself a complete rewrite of the codebase developed in versions 1 through 4-Netscape Navigator and Netscape communicator.

1.11 Network Topology

Network topology refers to the layout of the connected devices on a network. Computer

Network topology is the way various components of a network (like nodes, links, peripherals, etc) are arranged.

Network topologies define the layout, virtual shape or structure of network, not only physically but also logically. The way in which different systems and nodes are connected and communicate with each other is determined by topology of the network.

Types Topologies

1. Bus Topology
2. Star Topology
3. Ring Topology
4. Hierarchical Network

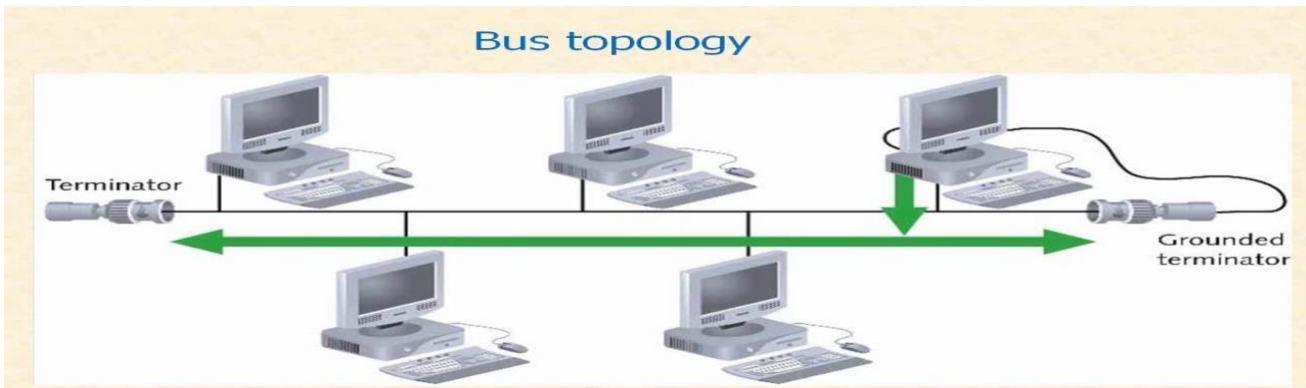
1. Bus topology

It is the simplest of network topologies. In this type of topology, all the nodes (computers as well as servers) are connected to the single cable (called bus), by the help of interface connectors. This is central cable is the backbone of the network and is known as bus (thus the

name). Every workstation communicates with the other device through this bus.

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Bus topology



Advantages of Bus topology

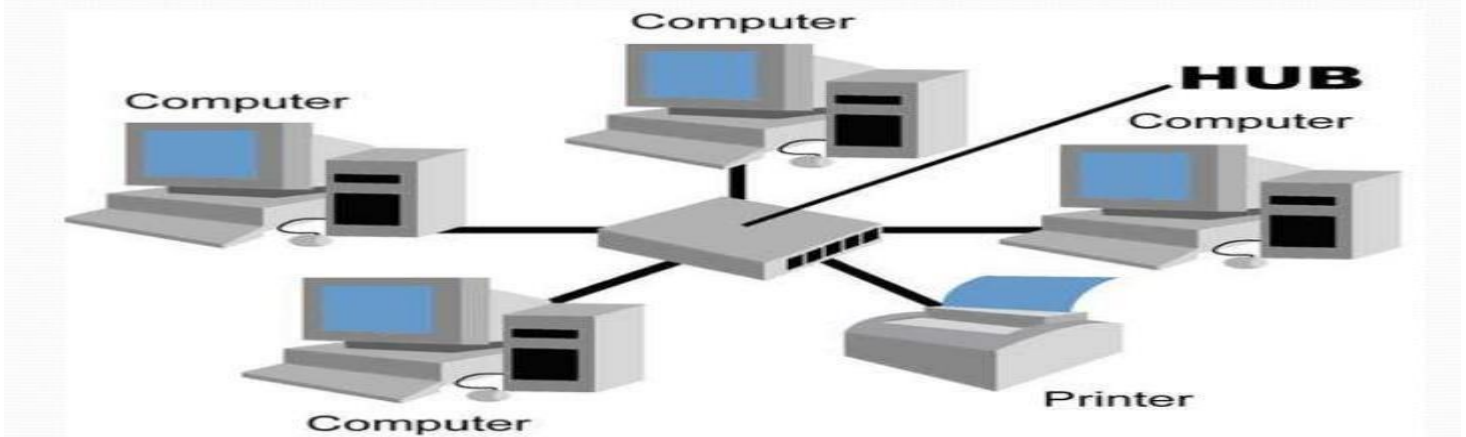
1. This is simple, reliable in very small network.
2. It is easy to use and understand.
3. It requires least amount of cable to connect to computer.

Disadvantages of Bus topology

1. Heavy network slows down the speed of the network considerably.
2. Each barrel connector weakens the electrical signal.

2. Star topology

Star Topology



It is a local area network in which each device (node) is connected to central computer in a

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star-shaped configuration (topology); commonly, a network consisting of a center computer (the

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hub) surrounded by terminals. In star network, messages pass directly from a node to the central computer, which handles any further routing (as to another node) that might be necessary.

A star network is reliable in the sense that a node can fail without affecting any other node on the network. Its weakness, however, is that failure of the central computer results in a shutdown of the entire network. And because each node is individually wired to the hub, cabling costs can be high.

For example: a star network may be used in banking for centralized record keeping in an on-line branch environment.

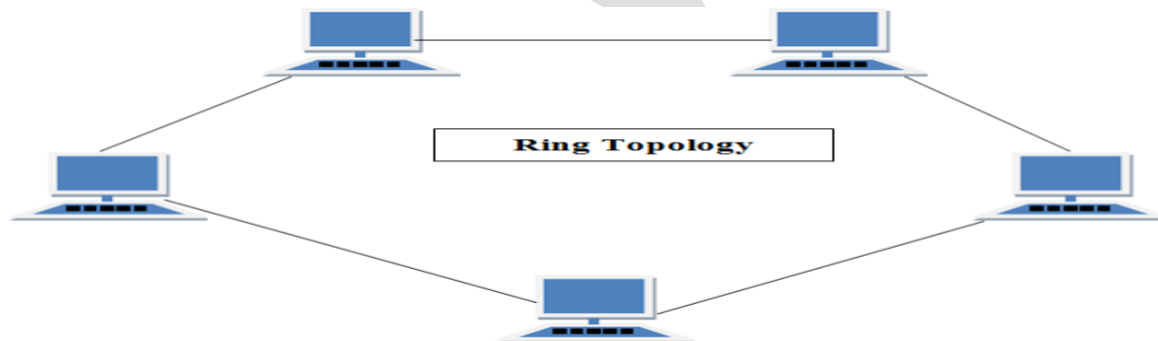
Advantages of Star topology

1. It is easy to modify and add new computers without disturbing the existing network.
2. It is intelligent hub provides central monitoring and management of network.
3. The single computer failure does not affect the whole network.
4. There are several types of cables in the same network, which can be used.

Disadvantages of Star topology

1. In case if central hub fails, the whole network fails to operate.
2. Many star networks require a device at central point to rebroadcast or switch network traffic.
3. The cable is costly.

3. Ring Topology



It is a local area network in which devices (nodes) are connected in a closed loop, or ring. Messages in a ring network pass in one direction, from node to node. As a message travels around the ring, each node examines the destination address attached to the message.

If the address is the same as the address assigned to the node, the node accepts the message otherwise, it regenerates the signal and passes the message along to the next node in the circle.

It can also be designed to bypass any malfunctioning or failed node. Because of the closed loop, however, new nodes can be difficult to add.

Advantages of Ring topology

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1. Every computers has equal access.
2. In this, with every addition of a computer on the network it degrades slowly rather than failure.

Disadvantages of Bus topology

1. The failure to one computer on the ring can affect the whole network.
2. By adding or removing computers disturbs the whole network.

4. Hierarchical Network

They are configured to have multiple levels of systems interconnected with the one another. A large system interconnection with several other systems.

Each lower level interconnects additional systems terminals. They in turn are connected with still other systems.

UNIT-2

- ❖ **Introduction to Internet**
- ❖ **History of Internet**
- ❖ **Uses of Internet**
- ❖ **Connection to the Internet**

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- ❖ **Simple HTML tags**
- ❖ **Web pages**
- ❖ **Web Pages come from the web server**
- ❖ **Web Sites**
- ❖ **The Normal modem**
- ❖ **ISDN, ADSL, CABLE Modems**
- ❖ **Animation**
- ❖ **Frames**
- ❖ **Several windows simultaneously**
- ❖ **Printing**

2.1 Meaning of Internet

Internet has been an integral part of the business and social system. It is generating a number of entrepreneurs, opportunities and many skilled jobs. It has become a part of business system in all the advanced countries.

Internet is the interconnected network in information distribution system. Internet does many computer-based facilities such as E-mail, Electronic Data Interchange, information publishing, information retrieval, etc.

Internet is a combination of postal telephone, telegraph, library, super market and a cinema hall. Internet provides all type of services. Transactions take place in seconds.

2.2 History of Internet

In 1960, RAND Corporation in reports by Paul Baran has the networking report. Models were tried for networks conceptually.

In 1965, First networking experiment took place. TX-2 computer at M.I.T. Lincoln laboratory was connected to scientific, Data system Q.23 computer in Santa Monica at California.

In 1965 the US Defence departments financed for designing of a computer network link. The financial assistance was given to universities and research laboratories.

In 1968 ARPANET (Advanced Research Project Agency) was floated and contracts were given. The first ARPANET node was installed in UCLA in September 1969.

In 1972 two programmers accidentally invented E-mail. In 1973-74 TCP/IP protocols were developed.

In 1979 the users network came into existence. The National Science Foundation of United States funded for development of a network using IP and named it as NSF Net. It has the intention to connect super computer centres in United States. Universities and colleges were given the

connections in the network.

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In 1983, ARPANET changed the protocol to TCP. During 1986 National Science Foundation started a new networking for super computing centres and launched NSF NET.

During 1987 CSNET merged with BITNET, which connect IBM mainframes. In 1988 the threat of virus was found and security aspects are introduced.

In 1991 Commercial networks are connected with NSFNET. In 1995 the old NSFNET backbone was changed and new network access points are commissioned.

The Growth of Internet can be divided into six stages:

I stage Experimental networking	1965-80
II stage Discipline-specific research	1980-85
III stage General research networking	1985-91
IV stage Privatization and commercial networking	1991- to present
V stage Restricted data networks for research and education	1991- to Present
VI stage National information infrastructure	future

First Stage experimental networking are designed and carried out by agencies such as APANET.

Second stage network as a specific design was considered and agencies such as CSNET, MILNET, HEPNET, MFENET, etc. carried out the research

Third stage research on networking were conducted in a general manner by NSFNET and BITNET.

Fourth stage privatization and commercialization took place and NSFNET was responsible for these activities.

Fifth stage restricted public network for research and education was followed by NREN (National Research and Education Network).

Sixth stage I-way concept is being seriously considered.

2.3 Uses of Internet

- ✚ Entertainment such as cartoon, games, video, movies.
- ✚ TV production, Games show, documentation.
- ✚ Book printing, references collection, directories, and catalogue,
- ✚ Software animation.

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- ✚ Buying-selling process
- ✚ Managing and information distribution

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- ✚ E-commerce Transaction
- ✚ Home shopping and home banking
- ✚ online marketing and advertisements
- ✚ Video on demand
- ✚ Remote banking
- ✚ Supply chain management
- ✚ Educational features

2.6 Web Page

A web page is the representation of a document, which resides at a remote site. This is a means to understanding what the web itself is and its implications. It is a single unit of information. Often called a document that is available via the World Wide Web (WWW).

A web page can be longer than one computer screen and can use more than one piece of paper when it is printed out. If a “web” document resides on the machine we are working from, the document is called an HTML document. A web page becomes a document that is accessible over the internet because it is written in HTML (Hypertext Markup Language).

A web page is “an electronic document created using HTML, which conveys information through a browser, in the form of text, graphics, video and sound. It is stored on server that is connected to the internet.

In other words, it is written in a particular format called HTML and is readable by any other computer also connected to the internet by using a web browser.

1. Anatomy of a web page:

A web page is an electronic document written in a computer language called HTML, short for Hypertext markup Language. Each web page has a unique address, called a URL or Uniform Resource Locator that identifies its location on the network. A website has one or more related web pages, depending on how it is designed. Web pages on a site are linked together through a system of hyperlinks, enabling us to jump between them by clicking on a link. Web pages vary wildly in design and content. On the web, we can navigate through pages of information according to our interests.

2. Hypertext:

A web page is created using HTML. HTML consists of standardized codes, or tags, that are used to define the structure of a web page. These codes enable web pages to have many features including bold text, italic text, headings, paragraph breaks and numbered or bulleted lists.

Web pages can contain text, images, sound files, video files and hypertext links to other Internet resources. All of these features are indicated by using HTML codes.

Web pages is transferred to a users computer via the hypertext transfer protocol. HTTP is the method through which hypertext files, such as web pages are transferred over the internet.

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HTTP is a client/server based Internet protocol, or set of rules. Web pages generally reside on HTTP servers.

The server then sends the requested information to the users computer. The browsers software interprets the HTML codes and presents the information contained in the web page in a readable format on the users computer.

3. HTML

HTML (Hypertext markup Language) is the language of the internet. Hypertext means that some text in the HTML document carries a link to a different location, which can be on the same page or another page. On clicking this 'hot spot', the viewer is transferred to that location. Markup means that specific portions of a document are marked up to indicate how they should be displayed in the browser.

4. URL

URL stands for Uniform Resource Locator. An URL is similar to our street address for our home. Just as our street address is used to find our home, a web pages URL helps it to be found by any other computer connected to the internet. The URL of a web page takes a particular form.

The URL of a particular page is

<http://www.bharathi.edu/>

5. Web server

Web server is an advanced application which runs on a server and does the following

1. It provides connections to remote computers.
2. It sends web remote computers via internet or intranet.

2.8 Web Sites

A Web site is collections of related web pages are web sites. Associated item-document and picture stored on web server. Web server-computer that delivers requested web pages to your computer. Some web server-store multiple website. How to browse the web, use web address, search for information on the web etc.

Each website has a specific address called URL (Uniform Resource Locator) address. The pages of websites can usually be accessed from a common root URL called the homepage, and usually reside on the same physical server. Some websites require a subscription to access some or all of their content.

Examples of subscription sites include many business sites, parts of many news sites, sites, gaming sites, message boards, web-based, services, social networking websites, and sites

providing real-time stock market data.

2.9 Meaning of Modem

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Computer can be stand alone computers or can be connected with other computers in LAN or WAN or MAN. They are connected to form networks. The computers are connected with others in the network by telephone wires.

In the telephone system the sound is converted into electrical signals and passed through telephone wires. The receiving telephone converts the electrical signals into sound signals. The flow of signals and converting sound into signals is called as modulation and signals into sound are called as demodulation. MODEM is the Modulator Demodulator device.

The computers work on digital aspects and can send and receive only digital signals that is 0 and 1's. The MODEM is used to convert the strings of 0 and 1 into electrical signals and can be sent in telephone lines. When the analog signals are received, they are converted into digital signal.

2.10 The Normal modem

Modem is an equipment for Modulating and Demodulating. It is a Modulator as well as Demodulator. The digital signals are converted into analog in the modulator and in the receiving end the analog signals are reconverted into digital signals. It is used to send data through telephone lines.

The telephone lines cannot handle binary data and hence modem converts binary data into analog signals by coding. Then they are decoded and sent to computers as binary data in the receiving end. Access is not possible to internet without Modem as telephone wires are used in Internet connectivity in some areas.

2.11 ISDN

ISDN is the Integrated Service Digital Network. Internet is developing fast by ISDN provision. Many ISDN networks are used by Internet Services. These lines are used to send voice as well as data. It is digital in nature. Voice in telephone cannot be sent directly in these lines.

Special ISDN phones are required. Sometimes conventional phones can be used with some special equipments. Data are very easily sent in ISDN lines by using ISDN cards in a computer. The PC card will connect the computer to the ISDN line to various.

ISDN is very useful in modern. Internet and E-commerce fields. They are applied in various areas such as:

1. Internet access
2. Data transfer
3. Desktop conferencing
4. LAN connections
5. High Quality Audio

6. Group 4 Fax

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7. Home banking
8. Remote banking
9. Fax facility
10. Video conferencing

2.12 ADSL

ADSL- Asymmetrical Digital Subscriber Line (ADSL) is made of copper wires and many telephone companies are using these lines. ADSL allows to use a single copper wire to simultaneously transmit video and audio signals by increasing the downstream transmission speed from 64kbps to 1.5 mbps.

Digital Compression Techniques permit a video signal to be transmitted over a bandwidth of 1.5 mbps. Signals can be sent to various distant areas through twisted pair telephone wire of ADSL.

It is a type of digital subscriber line (DSL) technology, a data communications technology that enables faster data transmission over copper telephone lines than a conventional voice band modem can provide .

ADSL differs from the less common symmetric digital subscriber line (SDSL). In ADSL, Bandwidth and bit rate are said to be asymmetric, meaning greater toward the customer premises than the reverse. Providers usually market ADSL as a service for consumers for internet access for primarily downloading content from the internet, but not serving content accessed by others.

Fiber

Fiber to the curb architecture provides high capacity switched digital network services to various residences. Video programming is provided through switched digital fiber to curb system. The data are digitally compressed in MPEG format. In this case, the service provider transmits only programs requested by the users.

2.13 CABLE MODEMS

Cable Modems are the modems used in Cable Television-based wires. Cable networks are used to transmit data to the users. The networks use coaxial cables. Hence High Capacity of transmission can be seen in Cable Model Modems.

The cable system users coaxial cables and a series of amplifiers are used in the distribution channel. In some areas, fiber optics is used to minimize illegal signal tapping. Many service providers are using cable TV Network to provide Internet Connection.

UNIT-3

- ❖ Evolution of internet
- ❖ Basic Terminology
- ❖ Getting into the net

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- ❖ Browsers
- ❖ Applications of Internet
- ❖ Internet Protocols
- ❖ Language of Internet
- ❖ E-mail and Voice mail
- ❖ Creating mail address
- ❖ Net meeting and Chatting
- ❖ Tool bar

3.1 Meaning of Internet:

The internet is a global system of interconnected computer networks that interchange data by packet switching using the standardized Internet Protocol Suite (TCP/IP).

The Internet carries various information resources and services, such as electronic mail, online chat, file transfer and file sharing, online gaming, and the inter-linked hypertext documents and other resources of the World Wide Web (WWW).

Internet is the cheapest and fastest means to get, provide and compile information. An IP (Internet Protocol) address is an identifier for a particular machine on a particular network; it is part of a scheme to identify computers on the internet.

A domain name is a way to identify and locate computers connected to the internet. Like the IP address no two computers can have the same domain name.

3.2 Evolution of internet:

In 1969, the U.S Defense Department funded a project to develop a network, which can withstand the bombing. Basically the idea was to develop a very secure network which can work even after a nuclear attack. This project was known as ARPANET.

The proposed network was not supposed to have a central control- which would be an obvious target. Ten years of research brought Local Area Ethernet Networks (LANs) and workstations were developed to get connected to LAN. These workstations and LANs were then connected to the ARPANET.

The ARPANET grew and its decentralized features helped its rapid expansion. Computers connected to ARPANET used a standard or rule to communicate with each other. This standard used by ARPANET is known as NCP (National Control Protocol).

Protocol is a network term used to indicate the standard used by a network for communication. But the passing time and rapid change in information technology suppressed NCP and brought TCP/IP (Transmission Control Protocol/Internet Protocol) in to the world of networking.

TCP converts messages into streams of packets at the source, and they are reassembled back

into messages at the destination. IP handles the dispatch of these packets. It handles the

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addressing, and makes sure that a packet reaches its destination through multiple nodes and even across multiple networks with multiple standards.

This flexibility of TCP/IP to handle multiple networks with multiple protocols encourages other networks to get connected to ARPANET.

Slowly the ARPANET became a massive network of networks and now it is known as 'Internet'. Internet is termed by some people as the world of largest democracy with no government. It has no state of head to control it.

In 1980's Usenet newsgroups and electronic mail (e mail) were launched. To keep track of information, indices such as Archie and WAIS (Wide Area Information Service) were also created in this decade. A menu based system called Gopher was also created to access internet files. Internet became popular after the development of WWW (World Wide Web) in 1990.

In early 1990 a protocol HTTP (Hypertext Transfer Protocol) was developed, this allowed the use of hyperlinks to connect pages in the internet. A GUI (Graphical user Interface) was also developed making the internet user friendly. Now Websites provide all multimedia facilities (like pictures, sound, video). Internet now serves as repository for information and available for global access.

3.3 Basic Terminology:

- ❖ **Webpage**
- ❖ **Website**
- ❖ **Homepage**
- ❖ **Web Browser**
- ❖ **URL**
- ❖ **Hypertext**
- ❖ **ISP**
- ❖ **Web server**
- ❖ **WWW**
- ❖ **Download and Upload**

1. Webpage

A Web page or web page is a document commonly written in Hyper Text Markup Language (HTML) that is accessible through the internet or other network using an internet browser. A web page is accessed by entering a URL address and may contain text, graphics, and Hyperlinks to other web pages and files. The page you are reading now is an example of a web Page.

2. Website

A Web site is collections of related web pages are web sites. Associated item-document and

picture stored on web server. Web server-computer that delivers requested web pages to your

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computer. Some web server-store multiple website. How to browse the web, use web address, search for information on the web etc.

Each website has a specific address called URL (Uniform Resource Locator) address. The pages of websites can usually be accessed from a common root URL called the homepage, and usually reside on the same physical server. Some websites require a subscription to access some or all of their content.

Examples of subscription sites include many business sites, parts of many news sites, sites, gaming sites, message boards, web-based, services, social networking websites, and sites providing real-time stock market data.

3. Homepage

The homepage or main page is the front page or local file that automatically loads when a web browser starts and when the browsers “home” button is pressed. Default setting, or the page that opens up when you start your Browser.

A homepage can also be the entry point for people viewing information that is provided. The term is also used to refer to the front page, web server directory index, or main web page of a website of a group, company, organization, or individual. Nowadays most of the internet users are trained to access web pages directly and hence they access to home page is not required to them.

For example: <http://www.boutell.com/newfaq/basic/url.html>

http - **Protocol Part**

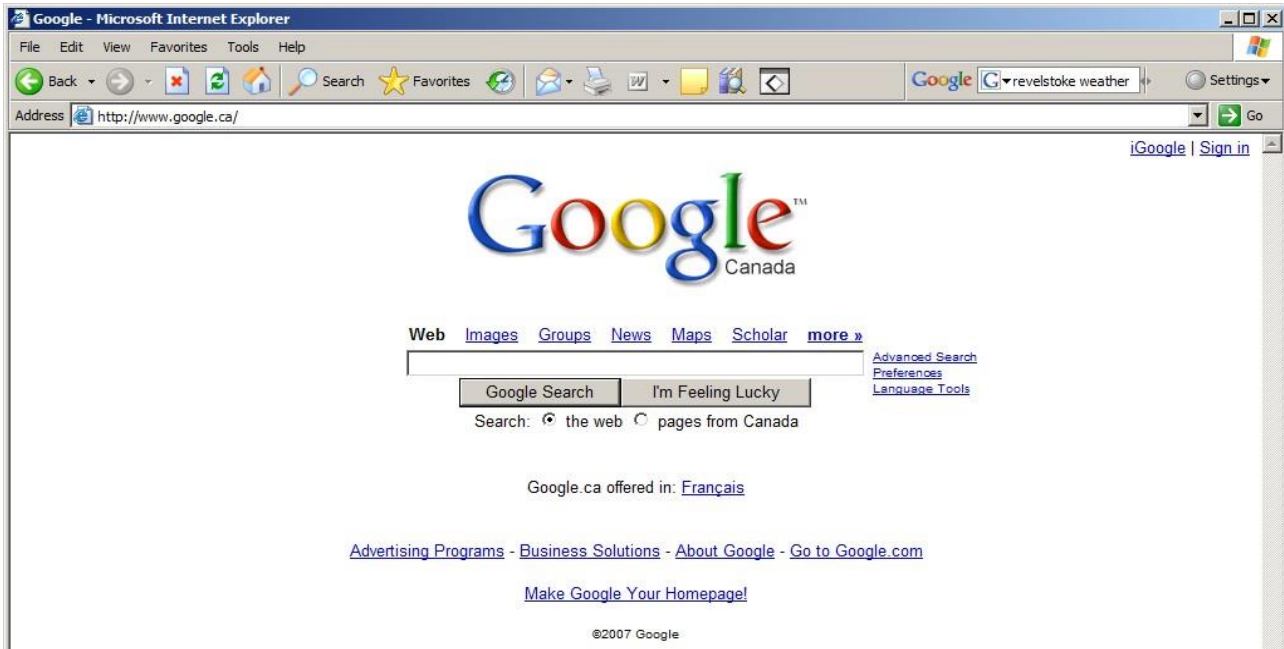
www.boutell.com - **domain name**

basic/url.html – **Path**

4. Web Browser

Web browser is an interface that helps a computer user gain access to all the content that is on the internet and the hard disk of the computer. It is client software that allows the user to display and inter act with a hypertext document.

Browser is a piece of software that acts as an interface between the user and the inner working of the interne the World Wide Web. Web browsers currently available are: Internet Explorer, Mozilla Firefox, and Opera.



5. URL (Uniform Resource Locator)

Each web page has a unique address that is called URL. URL is the abbreviation of Uniform Resource Locator, the global address of documents and other resource on the world wide web. The URL is used to retrieve a webpage from the computer in which it resides.

A URL is made up of several parts. The first part is the Protocol, which tells the web browser what sort of server it will be talking to in order to fetch the URL. Example: http.

The second part of the URL is the fully qualified domain name of the web site to connect to.

The third is the path at which this particular web page is located on the web server.

6. Hypertext

It is text which contains links to other texts. The term was coined by Ted Nelson around 1965. Hypertext is a method of instant cross referencing. It is used for organizing information and to link related documents together using words and graphics. Usually hypertext links appear in a different colour typically in blue and underlined. When the hyperlink is clicked the hyperlink usually changes colour.

7. Web server

A web server is a program that uses HTTP (Hypertext Transfer Protocol) to serve the files that form web pages to users, in response to their requests, which are forwarded by their computers HTTP clients. Dedicated computers and appliances may be referred to as web servers as well.

8. ISP (Internet Service Provider)

An internet service Provider (ISP) is a company that provides a telecommunication connection to the internet that allows a user to “be online”. The connection may be provided in many different forms.

It could use existing telephone lines, existing cable TV lines, new fiber optic cable may be strung or the user has to use a modem and dial a phone number.

Example of ISPs are: AOL, EarthLink, MSN, Time Warner cable, Verizon etc.

9. World Wide Web (WWW)

World Wide Web is the collection of information on different subjects and contains pages that include text, images, sounds and videos. It is a specific kind of internet interface. The web document contains links that lead to other web pages.

WWW provides various types of information. The web always has some sites of the particular topic. It is a source of information for companies, business firms, institutions, governments, and for individual users.

Features of www

- Quick application development
- Simple to create GVI application
- Quick information retrieval
- Large number of users
- Global availability

10. Download and Upload

Download refers to the activity of moving or a copying a data, document or a program from the internet into your own computer. The downloaded program is stored in the user’s hard drive. The term is often used to describe the process of copying a file from an online service or bulletin board service (BBS) to one’s own computer. Downloading can also refer to copying a file from a network file server to a computer on the network.

Upload refers to copying of a program from the remote computer to the internet. Example a software company may upload a demonstration of its new software onto the web so that users

can then download the software onto their individual computer. The upload feature describes the way of importing files into the system.

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3.5 Browsers:

A Web Browser is a software application for retrieving, presenting and traversing information resources on the World Wide Web. An information resource is identified by a Uniform Resource Identifier (URI/URL) that may be a web page, image, video or other piece of content.

A hyperlink present in resources enables users easily to navigate their browsers to related resources. Although browsers are primarily intended to use the World Wide Web, they can also be used to access information provided by web servers in private networks or files in file systems.



The most popular web browsers are Chrome, Edge (preceded by Internet Explorer), Safari, Opera and Firefox.

Internet Explorer:

Internet Explorer is the default web browser for windows operating system.

Firefox:

It is a browser derived from Mozilla. It was released in 2004 and has grown to be the second

most popular browser on the internet.

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It is the first web browser and was developed by NCSA in 1993.

Netscape Navigator:

Netscape Navigator was released in 1994 and is one of the fastest web browsers currently available in the market.

Opera:

Opera is smallest and fastest than most other browser.

Google Chrome:

This web browser was developed by Google. Its beta and commercial version were released in September 2008 for Microsoft windows.

Safari:

Safari is a web browser developed by Apple Inc and included in Mac OS X.

3.6 Application of internet:

- ❖ Email
- ❖ FTP
- ❖ Telnet
- ❖ IRC
- ❖ Chatting and instant messaging
- ❖ Internet telephony
- ❖ Video Conferencing
- ❖ E-commerce
- ❖ Newsgroups(Usenet)

1. Email

E-mail or Electronic mail is a paperless method of sending messages, notes or letters from one person to another or even many people at the same time via the internet. E-mail is very fast compared to the normal post.

E-mail messages usually take only few seconds to arrive at their destination. One can send messages anytime of the day or night and it will get delivered immediately. A copy of the message you have send will be available whenever you want to look at it. One has the privilege of sending

something extra even such as a file, graphics, images etc. along with e-mail. The biggest

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advantage to using e-mail is that it is cheap, especially when sending messages to other states or countries and at the same time it can be delivered to a number of people around the world.

Features of E-mail:

- + One-to-one or one-to-many communication
- + Instant communication
- + Physical presence of recipient is not required
- + Most inexpensive mail service, 24-hours a day and seven days a week
- + Encourages informal communication

Components of an E-mail Address:

E-mail is also based upon the concept of a recipient address. The email address provides all of the information required to get a message to the recipient from anywhere in the world.

Consider the e-mail ID: **john@hotmail.com**

Example “john” is the local part, which is the name of a mailbox on the destination computer, where finally the mail will be delivered. Hotmail is the mail server where the mailbox “john” exists, com is the type of organization on net, which is hosting the mail server. There are six main categories of internet addresses;

com – Commercial institutions or organization

edu – Educational institutions

gov – Government site

mil – Military site

net – Gateways and administrative hosts

org – private organizations

2. FTP (File Transfer Protocol)

FTP stands for File Transfer Protocol, and is part of the TCP/IP protocol suite. It is the protocol, or set of rules, which enables files to be transferred between computers. FTP is a powerful tool which allows files to be transferred from “computer A” to “computer B” or vice versa.

FTP works on the client/server principle. A client program enables the user to interact with a server in order to access information and services on the server computer. Files that can be transferred are stored on computers called FTP servers. To access these files, an FTP client

program is used. This is an interface that allows the user to locate the files to be transferred and initiate the transfer process.

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Objectives of FTP

To give flexibility and promote sharing of computer programs, files and data

To transfer data reliably and more efficiently over network

To encourage implicit or indirect use of remote computers using internet

To shield a user from variations in file storage systems among hosts.

3. Telnet (Remote Computing)

Telnet or remote computing is telecommunication utility software, which uses available telecommunication facility and allows you to become a user on a remote computer. The term telnet also refers to software which implements the client part of the protocol. Once you gain access to the remote computer, you can use it for the intended purpose. The TELNET works in a very step by step procedure.

The commands typed on the client computer are sent to the local Internet service provider (ISP), and then from the ISP to the remote computer that you have gained access. Most of the ISP provides facility to facility to TELNET into your own account from another city and check email while you are traveling or away on business.

4. IRC (Internet Relay Chat)

IRC is a service on the internet that allows people to communicate in real time and carry on conversations via the computer with one or more people. Chat is instant communication; both parties must be connected to the internet and the right software to participate in chat.

5. Chatting and instant messaging

Chat programs allow users on the internet to communicate with each other by typing in **real time**. Chatting is popular with all kind of internet users. It is quite cheap and real time communication is guaranteed.

A variation of chat is instant messaging where the user on the web can contact another user currently logged in and type a conversation. To avail this internet service installed on the system instant messaging software such as yahoo messenger or msn messenger has to be installed.

6. Internet telephony

It involves using the internet to exchange telephonic information. This consists of hardware and software that enable the users to use internet as a transmission medium for telephone calls.

There are many internet applications such as Net meeting to serve this purpose. Internet telephony products are sometimes called IP telephony, Voice over the internet (VOI) or voice over IP (VOIP) Products.

7. Video Conferencing

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Conducting a conference between two or more participants at different sites by using computer networks to transmit audio and video data. For example, a point-to-point (two-person) video conferencing system works much like a video telephone.

Each participant has a video camera, microphone, and speakers mounted on his or her computer. As the two participants speak to one another, their voices are carried over the network and delivered to the others speakers, and whatever images appear in front of the video camera appear in a window on the other participants monitor.

Multipoint videoconferencing allows three or more participants to sit in a virtual conference room and communicate as if they were sitting right next to each other.

Video conferencing has many benefits in the areas of teaching and learning. A key factor is that it provides real time visual communication, unlike other communication methods such as email. The major limitation is this application is the bandwidth available on the internet.

8. E-Commerce

Electronic commerce is the buying and selling of products over electronic systems such as the internet and other computer networks. The amount of trade conducted electronically has grown dramatically since the wide introduction of the internet.

A wide variety of commerce is conducted this way, including things such as Electronic Funds Transfer (EFT), supply chain management, e-marketing, online marketing, online transaction processing, Electronic Data Interchange (EDI), automated inventory management systems and automated data collections systems. Some of the well known e-commerce websites are www.amazon.com, www.ebay.com.

9. Newsgroups (Usenet)

Newsgroups are international discussion groups that focus on a particular topic and help in gathering information about the topic. Most newsgroups exist on a network known as “Usenet” which contains thousands of newsgroups.

To simplify the selection of suitable newsgroups they are divided into subject wise top level categories. These top-level categories are then divided further in a hierarchical manner.

Mailing list is a collection of names and addresses used by an individual or an organization to send material to multiple recipients. The mailing list groups are administered by a software program known as list server.

A list server watches for incoming mail on a certain mailbox continuously and forwards any message to a list of other address. When a user subscribes to a list server messages from the other subscribers are automatically sent to the electronic mailbox.

3.7 Meaning of Internet Protocols

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Internet protocols is the principal set (or communications protocol) of digital message formats and rules for exchanging message between computers across a single network or a series of interconnected networks, using the Internet protocol suite. Messages are exchange as datagram's, also known as data packets or just packets.

The various Internet protocols

- ✚ **Transmission control protocol/Internet protocol (TCP/IP)**
- ✚ **File Transfer Protocol (FTP)**
- ✚ **Hypertext Transfer protocol (HTTP)**
- ✚ **Telnet**
- ✚ **Gopher**
- ✚ **Wide Area Information Service (WAIS)**

1. Transmission control protocol/Internet protocol (TCP/IP)

TCP/IP stands for Transmission control Protocol/Internet Protocol. TCP/IP is actually a collection of protocols or rules that govern the way data travels from one machine to another across networks. The Internet is based on TCP/IP. TCP/IP has two major components-TCP and IP. The IP component does the following:

Envelopes and address the data

Enables the network to read the envelope and forward the data to its destination.

Defines how much data can fit in a single “envelop” (a packet)

3.9 Meaning of E-mail

E-mail is an electronic message sent from one computer to another. You can send or receive personal and business-related messages with attachments like pictures or other documents.

An e-mail address identifies a person and the computer for purposes of exchanging electronic mail messages.

E-mail messages are a lot like letters. Simplicity, directness and brevity will make people read your messages. Our e-mail says a lot about our values, our attention to detail, and the reputation of the organization we present. Like any form of communication, there are certain manners that you should follow when using the e-mail.

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E-mail-Name and addresses

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Electronic mail or e-mail allows information to be sent between computers and people on the internet. It is the most widely used internet resource. Just as a written letter can be sent to multiple recipients an electronic mail message can be sent to one or more e-mail addresses. An E-mail address identifies a person and the computer for purposes of exchanging electronic mail messages. The based structure of an e-mail address is; username@host.subdomain.

Applications of E-mail

1. E-mail is generally used for sending proposals and quoting rates for tenders on the Internet.
2. E-mail can be used for personal communication among friends and family members, especially if they are situated at the other end of the world.
3. E-mails are being popularly used for sending greetings, not only between business houses and customers but to individuals also.
4. E-mail on the Internet is very popular among office goers and jobs seekers for sending resumes for various types of jobs.

Advantages of E-mail

1. Email is cheap

E-mails turn to be a cheaper alternative to telephone conversation because it is a person to person communication system. It offers low cost.

2. Email is fast

It eliminates the time spent in establishing telephone calls. It is faster compared to traditional mail.

3. Failure notification

For some reason, if your email can not be sent to receiver a failure notification sends to you so that you can understand that your mail is not sent.

4. Attachment

One of the most important advantages of email is attachment facility. Email gives you a facility of attachment so that you can attach anything like the picture, audio file, video file, document file, PDF etc.

5. Paperless communication

Communication through email is paperless communication. So, email saves our environment because traditional communication needs paper and paper is produced form from a tree. So, we should increase use of email to save our environment.

6. Remained address

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Email automatically remained email address of both receiving and sending so, there is no hazard to mind email address.

7. Privacy is maintained

Privacy of communication is ensured because the mail is delivered to video individual mailbox which can be opened by the intended recipients only.

8. Flexibility

It provides flexibility. A message can be sent to more than one person at a time.

9. More convenient

Email is more convenient than any other mode of communication. The sender can send multiple copies of an email message.

10. Storage

Most people now use email as safe storage for their important document or data. For example most people scan their important documents like academic document, passport, CV, photo, and many more official document and attach with an email so that, they can find it anytime in anywhere. This is one of the most important advantages of email.

Disadvantages of E-mail

1. Absence of Privacy:

There is a change of leakage of information through email if a mail server is hacked.

2. Lost password:

You may lose or forgot your email login password. Though there is an option to recover password but that also need another email address. And last option is security question that also should be reminded.

Suppose if you lose both password and security question it is very difficult to recover your email address though it is vastly important to you.

3. Virus

An email may carry the virus to you. So, all the time you should careful about it. It is one of the greatest disadvantages of email.

4. No alter

Email does not give any alter like phone or mobile so, sometimes we can late to see the important message.

5. Lack of personal touch

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It cannot convey emotion or personal touch the way a face-to-face conversation or even a phone call can.

6. Unwanted email

Email can spread mail containing virus or spam contents which can damage computer systems totally.

Voice mail

Voicemail is a feature with new telephone systems, especially VoIP. It is a voice message that a caller leaves when the person called is absent or is taken up with another conversation. The voicemail feature acts in a way similar to the old answering machine, but with the main difference that instead of the voice message being stored on your answering machine, it is stored on the service provider's server, in a space reserved for the user called a mailbox.

Voice mail is centralized system of managing telephone messages for a large group of people. Any system of conveying voice message, including the answering machine.

Features of Voicemail:

- ✓ Answer many phones at the same time.
- ✓ Enable users to forward receive messages to another voice mailbox.
- ✓ Send messages to one or more other user voice mailboxes.
- ✓ Add a voice introduction to a forwarded message.
- ✓ Storage voices message for future delivery.
- ✓ Send, forward and reply to messages.

Meaning of Net meeting and chatting

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