

5.NETWORKING AND INTERNET

INTRODUCTION

The use of computers is becoming an essential part of life. A user works at different places on different computers, then the data to be used may have to be taken on floppy and used at other places. Sometimes it is not possible to use floppies, as the computer does not have floppy drive. Then, it will be difficult to use the data at other place. To solve such problem, if computers are connected to each other through some transmission media, then the information can be transferred from one computer to other. This concept is called as networking.

The computer networks are available everywhere nowadays. So, it is important to understand the concept of computer network and its usage. Along with computer network, Internet also is very popular network. This chapter explains computer networks and Internet concepts and its applications.

5.1 NETWORKING TERMS AND CONCEPTS

Interconnecting a set of computers with each other using transmission media is called a **network**. With the help of network, the resources and services can be shared. The shared resources can be data, printer, floppy drive, CD drive, fax, modem, etc. The shared services can be a database, a file, a software etc. All interconnected computer must follow a set of communication rules for transmitting and receiving the data. The rules governing computer communication are called protocols.

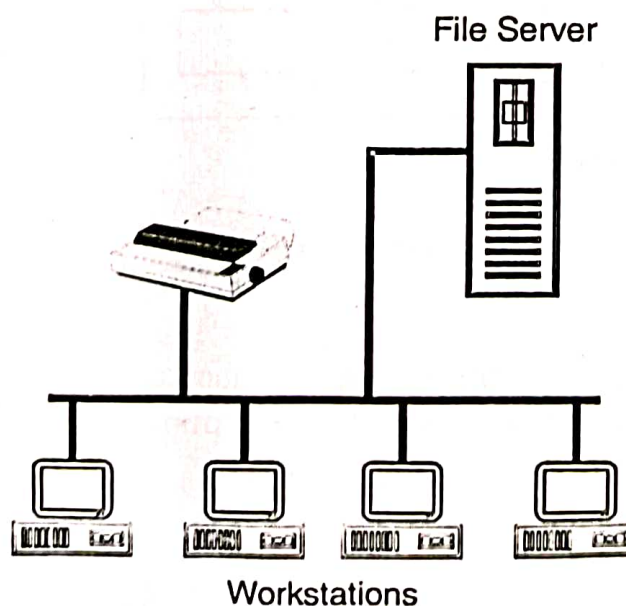


Fig.(5.1)A simple Network

Networking allows us to do the following:

- Exchanging information
- Sharing hardware resources
- Preserving information
- Protecting information

- Exchanging Information:** When computers are connected to each other, then the information of one computer can be transferred to another in a fast and easy way.
- Sharing hardware resources:** A network allows the user to share the hardware i.e. printer, floppy drive, CD drive can be shared instead of using separate resources and thus cost of hardware can be reduced.
- Preserving information:** The information stored is preserved in a network on a specific storage device. This information can be made available on demand for the authenticated person.
- Protecting information:** The information is protected from unauthenticated sources. This way, the privacy is maintained for the stored information i.e. the information will not be made available for the unauthenticated person.

There are three types of network installations:

- Centralized installation
- Distributed installation
- Collaborative installation

a) Centralized Network Installation

These types of networks have a central computer (server) connected to all other computers. The central computer known as mainframe computer does the entire work. The other computers are called as dumb terminals or nodes and work as only input/output devices.

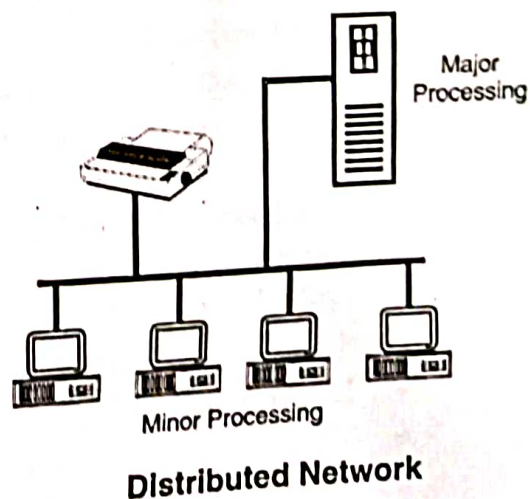
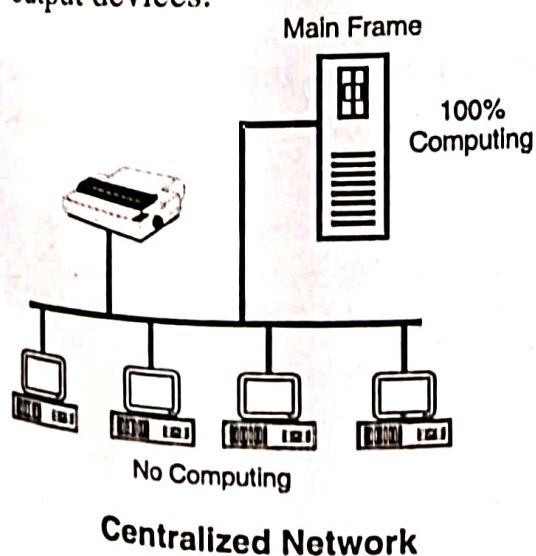


Fig. (5.2)

b) Distributed Network Installation

In a distributed network, the processing is done on each node in individual way. This is because the new PCs (Personal Computers) are with higher processing capacity and higher memory. Using the distributed processing concept, more amount of data gets processed in less amount of time increasing the efficiency.

c) Collaborative Network Installation

This is also called as co-operative processing. This type of processing enables the computer in a collaborative manner to share data, resources and services. The computers work in collaboration with each other i.e. depending upon the available resources to share, the application gets executed in the network in a more better way. An example of Collaborative network is Internet browsing.

5.2 TYPES OF NETWORKS

A Network is an interconnected system that provides communication links among the two or more stations. Each station in a network is known as node. Fig. (5.3) shows a simple communications network with four nodes A, B, C and D each node is connected with other three.

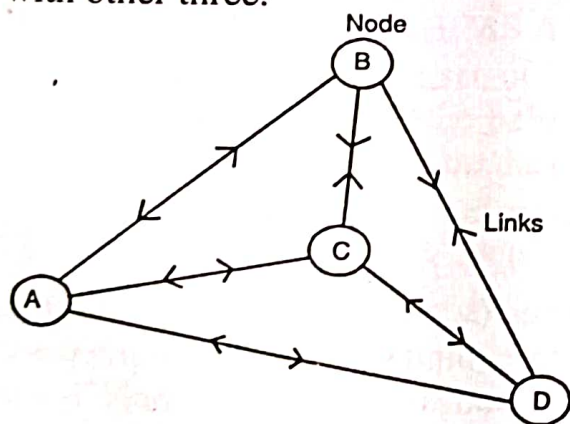


Fig. (5.3)

There are different electronic communication networks, which can be broadly classified according to their coverage area, and their facilities provision. these are :

- (a) LAN (Local Area Network)
- (b) MAN (Metropolitan Area Network)
- (c) WAN (Wide Area Network)

As we know that today there are very common networks which are very popular and we are much familiar with those systems but we can understand their techniques by just comparing one with other as explained below

(a) Local Area Network (LAN)

A local area network is a group of computers connected to each other in a small area. The LANs are situated in a building or a campus.

LAN has following characteristics:

- Data transfer at high rate.
- The geographical area covered by network is limited.
- The resources are connected with different techniques.

A LAN system consists of many PC terminals but a common control terminal is controlling this network known as Server. The Server can be a minicomputer or a mainframe.

(b) Metropolitan Area Network (MAN)

The network smaller than WAN and bigger than LAN is also established hence known as MAN it is a medium size network. An example of MAN is a cable network within a city. Cable network is receiving TV programs from the satellite and it connects many (user). TV sets in the network to watch these programs by such a network containing so many nodes located at different locations in the network. Of course, the communication link is through a cable and one way but it is a network known as Metropolitan Area Network. Another common communication system is pager system; it is a network like MAN.

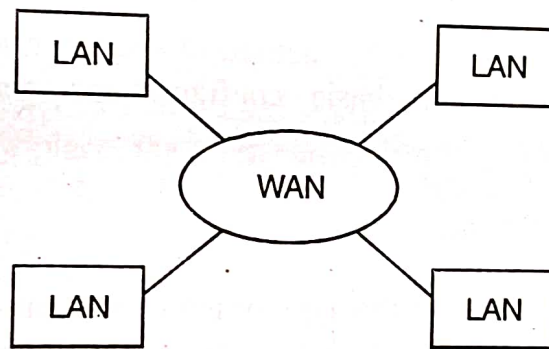


Fig.(5.4) Wide Area Network

(c) Wide Area Network (WAN)

As name itself implies the coverage area is very wide, stations are very high in number hence named as WAN - Wide Area Network. As shown in fig.(5.4) WAN is interconnecting LANs. A very common example is national telephone system, cellular mobile phones, pager etc. WAN is a wide network, which is capable of covering the whole country or state for communications. In WAN, the links may be established by using cables, microwave towers or may be satellite link or it can be combination of two or many links. For example, a telephone system uses all the three media cables, microwave and satellite links for the communications. The railway reservation system, Airline reservation system these are also computer networks treated as WAN.

WAN have following characteristics:

- The area covered is very big.
- The data transfer is slow as compared to LAN.
- The connection media is normally a telephone line to interconnect LANs.

5.3 NETWORK SECURITY

The term network security arises a lot of issues. Some issues are related to software whereas others are related to hardware.

Software security refers to unauthenticated access of programs. Sometimes multiple programs are accessed by different users. When the programs are not stored in memory in a proper way, then the programs can be damaged or data can be lost. Such issues are to be thought in network operating system in such a way that the data should not be lost or programs should be maintained in a proper way. The better technique should be thought and adopted to solve such software security problems.

In the hardware security, the unauthenticated person should not be allowed to access any network resources like floppy drive, hard disk, CD drive etc. The operating system should adopt proper policy regarding such problems.

5.4 NETWORK CONFIGURATIONS

Network configuration means the method of operating a network by deciding the node authorities. There are two basic configurations generally found in many organization

- i) Client-Server configuration
- ii) Peer to Peer configuration

i) Client-Server configuration: In this type of network many users use a network but a master PC called '**Server**' controls and provides services to these users. The user is making interactions by requesting server to share resources, to access programs data etc. The server is a high performance PC in the group and has highest operating speed, a large memory and a big hard disk size. Each user behaves as a client with server hence known as Client-Server configuration. E.g. Novell Netware

ii) Peer to Peer configuration: In this type of network there is no such relation like server-client but each PC is having equal rights. Each node or Peer is communicating with other Peer directly there is no server hence known as Peer to Peer configuration. The hardware of each peer is almost standard and equal. E.g. Windows-95, Windows-NT workstations.

5.5 NETWORK APPLICATIONS

In the network, the work can be done in different ways i.e. collaborative, server based etc. As the scope of network is increased and the entire set of network can be accessed by different access methods, it has become possible to collect the information from any place of the world. This is called as Internet. Internet is a worldwide collection of networks. The Internet has different applications

- E-mail
- Voice mail
- FTP
- WWW
- E-commerce
- Chat
- BBS
- User groups

E-mail

E-mail is an electronic mail. The messages can be sent electronically over a network or Internet. For sending or receiving an email, the user must have an email address, email address are given as:

username@location

- Username: it is the recipient's email name.
- @: It is a character, which is used to separate the email name and location.
- Location: it is a place, the electronic post office, where the recipient's mail is delivered and stored.

Nowadays, email services are provided free of cost by a lot of web sites. For example www.hotmail.com, www.rediff.com, etc. The user needs to register with the company. The company gives the user an email account, which indicates the user name with the server name or company name. Using such email addresses, the user can communicate with anybody. The mails can be sent to any person. Only the requirement is the destination person must have an email address. The user can send a text, voice or picture on an email as an attachment.

Voice mail

Initially only text mails were been sent. If the voice information is to be sent or received, then the user has to send it as an attachment file. But nowadays-new technology has come into picture and it is possible to send and receive the voice data directly through Internet as a voicemail. The user need not have to read the messages; a voice output is given on the computer. Only the requirement is that the computer should have multimedia facility and a voice mail software.

FTP (File Transfer Protocol)

It is a fast application level TCP/IP protocol widely used for transferring both text-based and binary files to and from remote systems, especially over the Internet. Most of the people use FTP program for downloading the software on the Internet.

The World Wide Web (WWW)

In the Internet, different types of computers are connected to each other. These computers may have different operating systems. When the data is to be transferred from one computer to other computer, and the operating system of both the computers are different, then both operating systems should understand the data format, which is to be transferred. The www provides an interactive document and the software to access the data on any computer. The document has pages, which can combine text, picture, form, sound, animation and hyperlinks.

E-commerce

Web technologies are playing very important role in business. The web sites are created to perform the business. Online trading is nowadays very important feature of the Internet. It is also called as E-commerce i.e. Electronic Commerce. The businesses are set up on the web. The traditional concept of setting up the business in a place has become an outdated concept. The web sites are created to set a business. People do the merchandile as well as retailing business on the web. So the geographical boundaries have become faint due to Internet and e-commerce.

BBS (Bulletin Board Service)

It is called as Bulletin Board Service. This is also an Internet application. Anyone can set BBS using special software loaded on the machine. The basic use of BBS is that any one can send his/her information on the BBS. The BBS user can get all the information, which is sent by all the other users. The information send on BBS service get broadcasted. So, any one can get the information. People send their requirements on BBS, someone in the world have the information, that person sends the information to the required person. This way anyone can get the information with less effort and in less amount of time.

Chat

It is an Internet application. People used to talk on telephone from distant places. But the cost of talking on a telephone line is very high. Using program the user need to get connected in a chat – session and can communicate to anybody in the world. Here the web site have chat program, the chat program have different chat rooms. The user have to log in the chat room, get access in a particular chat room; find other user connected in a chat room and start chatting with the users connected in that room. Simply typing messages for the users can do the chatting.

As this application is very cheap as compared to talk on a telephone line, it has become more popular. People decide a particular time and log into the Internet a start chatting. The cost of chatting as same as a local telephone call.

User Group

User groups are becoming popular service in the Internet. Certain web sites allow the user groups to be created, and communicate with each other independently in a group. In the user group program the user have to register with him by giving his requirement to the group. The groups are created with some specific aim. So, the information related to that a person who belongs to it distributes particular activity in a group. In BBS the information is sent to everybody whereas in user group, the information is given to specific people. So the non-related information can be avoided by using user groups.

QUESTIONS

1. Select the correct alternatives:
 - a) The medium size network is.....
i) LAN ii) MAN iii) WAN
 - b) FTP stands for
i) File Transfer Program ii) File Transfer Protocol iii) File Transfer Peer
 - c) Interconnecting a set of computers with each other using transmission media is called as
i) Network ii) Intra-network iii) Workstation
 - d) In Configuration server is absent
i) Client-server ii) peer to peer iii) none of these
 - e) WWW stands for
i) World Wide Web ii) World Wise Web iii) World Web Web

Ans: a) MAN b) File Transfer Protocol c) Network d) peer to peer e) World Wide Web

2. Define a network and explain in brief.
3. What are the applications of networking?
4. What is the difference between LAN and WAN?
5. What is the basic difference between Client-Server configuration and Peer to Peer configuration?
5. List various network installations and explain.
6. List different applications of Networking and explain any two.
7. Write a note on:
 - a) Chat
 - b) E-mail
 - c) E-commerce

