Computer World



Written by :

Anuj Gupta


8

New Edition

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Preface

Computer education is an essential part of educational curriculum today. Computer have become an important source of information and are being used for studying other subjects as well.

The present series of books 'Computer World' starts from class 1 to 8. The books describe this electronic device in detail, step by step. The young learners will find it easy to study and understand these books. The books have been made attractive by the introduction of coloured illustrations and diagrams related to a computer, and also to make it easy for the child to understand the subject.

The concept of the computer system has been selected very carefully. To test the child’s skill after every few chapters, well designed exercises have been provided. Suggestions to improve the series in the interest of the children will be gratefully accepted and acknowledged. Feel free to send your suggestions.

—Author

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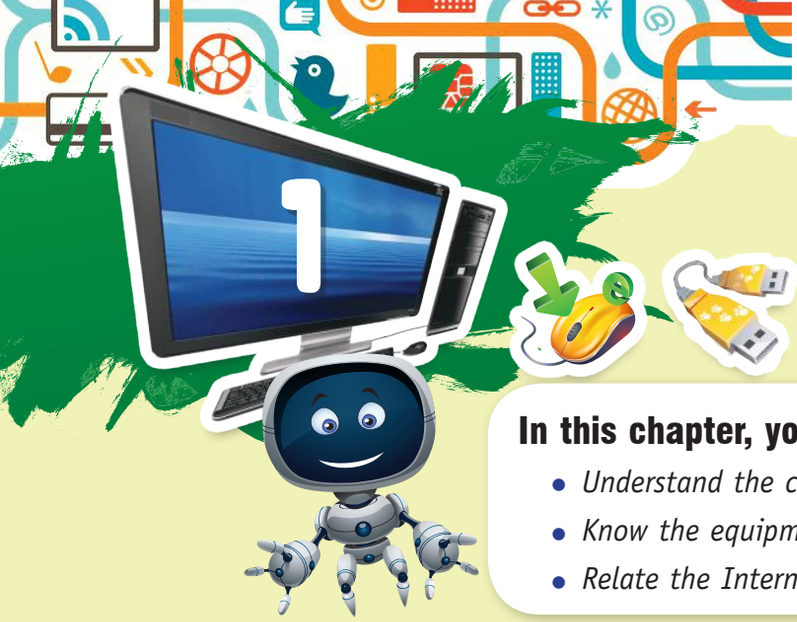


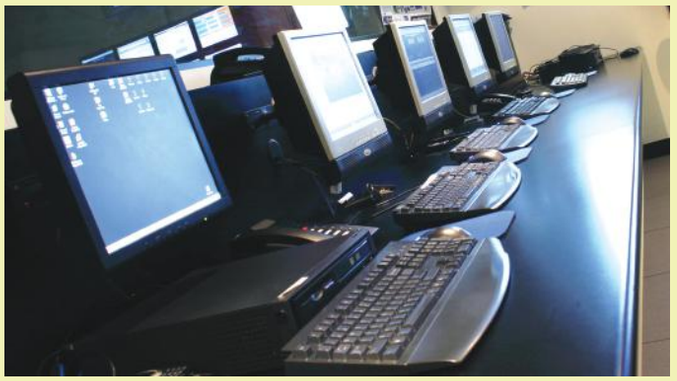
1 Network

In this chapter, you will learn about :

- *Understand the concept of network*
- *Know the equipment used in network*
- *Relate the Internet to network*
- *Know the various types of network*
- *Understand the types of network*

NETWORKING

Networking, in general, refers to the creation of network. Network is a group of devices linked to one another. For example, network of telephones, or radio network or cable network etc.



So networking makes sharing of information and resources easier. In the same way, if we interconnect computers, it will form a networks of computers.

NEED FOR NETWORKING

The need for networking lies mainly to break the barriers of distance, time and cost. This is because the communication via computers can be done to any distance in very short amount of time and in very cost effective manner. In fact, communicating via computers proves cheaper and much economical as compared to communicating via telephone lines. This is because a normal telephone call ties up an expensive, dedicated circuit for the duration of the call, whereas access via a network ties up long distance lives only while data are actually being transmitted.

Data in any form, be it in the form, of a text, picture, sound, video, graphics etc. can be transmitted via computer networks; on the other hand, the telephone lines are mainly used for sound and sometimes text transmission through a fax machine.

Thus, it can be summarized in these lines, the networking is needed because —

(i) It breaks the barriers of distance, cost and time,

(ii) It is very cost effective as compared to telephone networks,

(iii) All types of data viz. text, audio, video, pictures, graphics etc. can be transmitted through it.

Now we have learnt about importance of networks, let us now learn more about them *i.e.* what all components make a network etc. So, Let us proceed on to our next section, which deals with the same.

COMPONENTS OF NETWORK

Before we start discussing the components of a computer network, Let us first visualize two persons talking to each another.

Components in this network :

1. Sender
2. Communication channel (air)
3. Receiver

When two persons talk to each other, one speaks and the other listens. The one who is speaking, is the sender of information, and the one, who is listening, is the receiver of the information. And one more thing, have you ever wondered that how does the voice originating from sender's mouth reach the ears of receiver? That is because, the air present there carries the sound from sender to receiver. Therefore, the communication channel is air.

Thus, we see that when two persons are talking to each other in air, there are 3 components playing their roles—

(i) The Sender, **(ii)** Communication Channel–the air, **(iii)** The Receiver.

COMPONENTS OF A COMPUTER NETWORK

Now you can understand the components of a computer network easily as they are similar to the one's mentioned above. Since a network refers to interlinked devices, a computer network means interlinked computers. Computers can be interlinked directly also with the help of cables. In such a network, there would be three components playing their roles (on the similar lines as in figure).

(i) The Sender—Computer

(ii) The Communication Channel

(iii) The Receiver—Computer

Know More

Communication channel is the medium, which carries the message/information/sound etc. sent by the sender, and takes it to receiver's end.

Computers can also be connected via telephone so that telephone lines can work as communication channel for them. When computers are connected via telephones, an additional equipment called modem is used. This is because the data signal generated by computers (digital signal) is in a form which is different from the signal form that can be carried by telephone lines (analog signal). The modem converts the computer generated signal (digital signal) into a form that can be carried by telephone cables (analog signal).

On the receiver's end, the modem first converts the received signal into computer's understandable form and then passes to the computer.

In a network, there are five components playing their roles :

1. Sender—computer
2. Sender equipment—modem
3. Communication channel—telephone line
4. Receiver equipment—modem
5. Receiver—computer

By communication channels of network, it is meant that the connecting cables are being talked about. The cable that connect two or more workstations are the communication channels.

MODEM

Modem is a device attached to computer that can convert digital signals to analog signal and vice-versa. Digital signal is a group of discrete electronic unit that is transmitted in rapid succession, and an Analog signal consists of continuous electronically waves. Modem is short name for modulator + De-modulator where modulator converts digital signals to analog signal and Demodulator does the opposite.

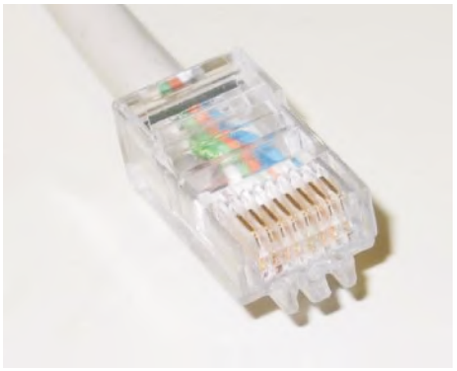
Modem is a device that enables computers, facsimile machines and other equipments to communicate with each other across telephone lines or over cable television network cables. In the most strict sense, a modem is a device that converts analog signals, such as sound waves, and digital signals which are used by computers.

Know More

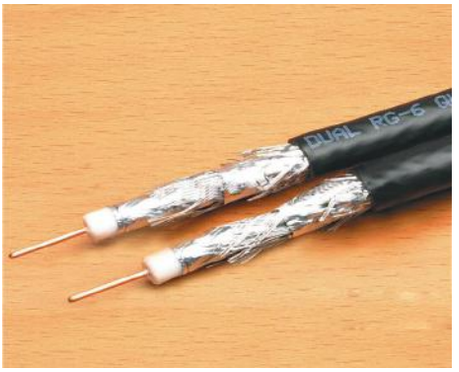
Modem is a device attached to computer that can convert digital signal to analog signals and vice versa.

Since telephone cables can carry analog signals, the computer generated digital signal is first converted into analog form, so that it can be carried by telephone lines. Upon receiving it, the modem at receiver end reconverts it into digital form so that receiver computer can understand it.

In network many different types of media are in use. Copper conductors in the form of twisted pair or coaxial are by far the most common. More recently, very serious consideration has been given to the use of optical fiber technology in LANs. Other media *e.g.* microwave transmission, infrared, telephone lines etc. are also used.



Twisted Pair Cable



Co-axial Cable

Microwave Transmission

TYPES OF NETWORKS

A computer network means a group of networked computer *i.e.* computers that are linked by means of a communication system. A network can mean a small group of linked computer to a chain of a few hundred computers of different types (*e.g.* PCs, minis, mainframes etc.) spread around the world. Thus, networks vary in size , complexity and geographical spread. Mostly, computers are classified on the basis of geographical spread and on this basis, there can be three types of networks :

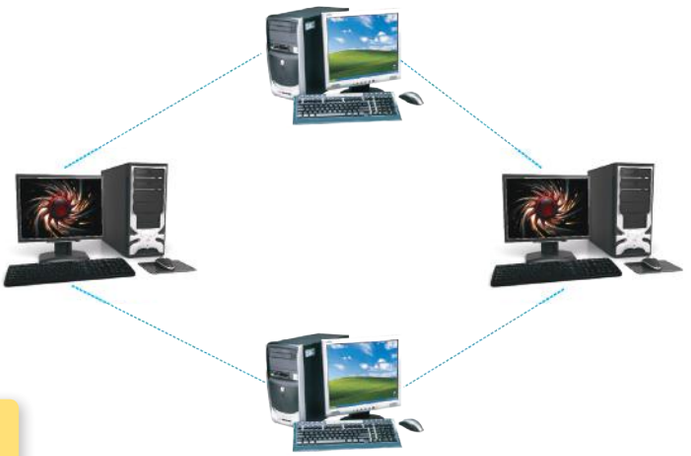
(i) Local Area network (LAN)

(ii) Metropolitan Area network (MAN)

(iii) Wide Area Network (WAN)

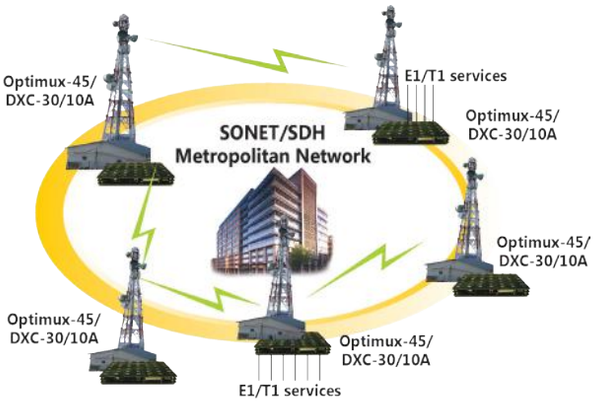
LOCAL AREA NETWORK (LAN)

A LAN is a computer network that covers a relatively small area. Most LAN's are confined to a single building or a group of building LAN users can share data, information, program, printer, hard disks, modems etc.



LAN
Network

Know More LAN is a local area network in a building or small area.

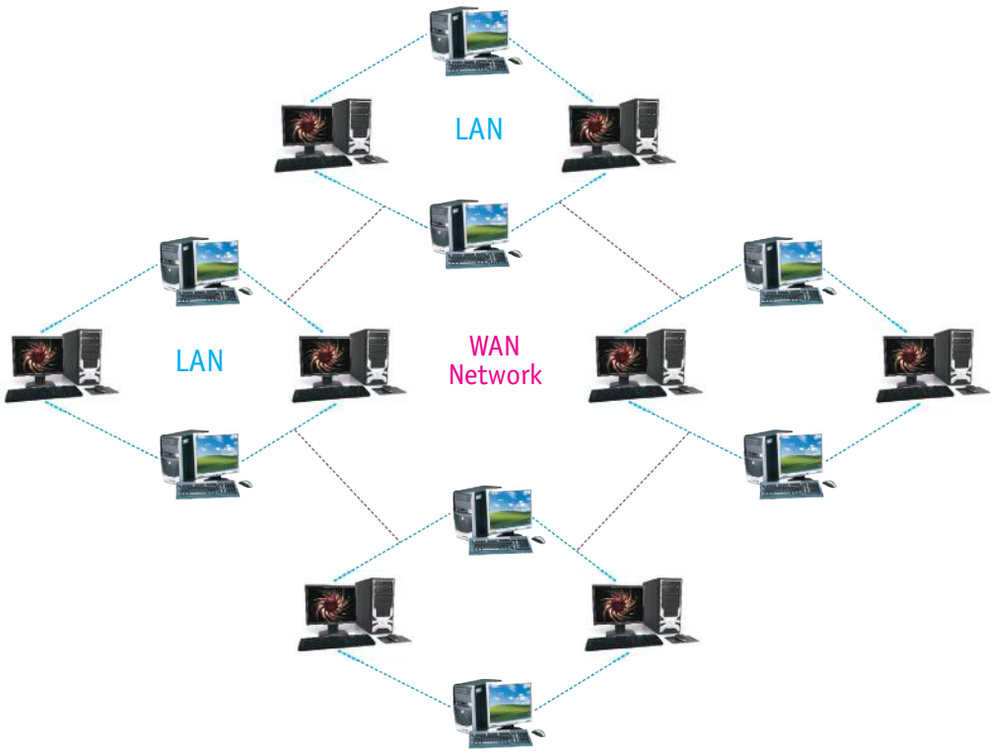


METROPOLITAN AREA NETWORK (MAN)

Metropolitan Area Networks are the networks spread over a city. For example, cable TV network spread over a city can be termed as metropolitan area network. The purpose of a MAN is also the sharing of hardware and software resources among its users.

WIDE AREA NETWORK (WAN)

The network spread across countries are known as WAN. A wide Area Network (WAN) is a group of computers that are separated by large distances and tied together. It can even be a group of LAN that are spread across several locality and connected together to look like one big LAN. The WAN links computers to facilitate fast and efficient exchange of information at lesser costs and higher speeds.



INTRODUCTION OF INTERNET

Internet is a computer based world wide information network. It can be assumed as an example of WAN (Wide area network). The Internet is composed of a large number of smaller interconnected networks. These networks may link tens, hundreds or thousands of computers, enabling them to share information with one another and to share various resources, such as powerful supercomputers and databases (collection of data) of information. The Internet has made it possible for people all over the world to work effectively and communicate easily with one another. Unlike traditional broadcasting medium such as radio and television, the Internet is a decentralized system. Each connected individual can communicate with anyone else on the Internet, can publish ideas and can sell products with a minimum overhead cost. The Internet has brought new opportunity for business to offer goods and services online.

Points to Remember

- Network is a group of devices linked to one another e.g. telephone network, radio network or cable network.
- A Network can have three to five components in general. In a directly connected network, there are three components—sender, communication channel and the receiver.
- Communication channel is the medium which carries the message/information/sound etc. sent by the sender and takes it to the receiver's end. In case of computer network, it can be a cable, radio wave, microwave or even satellite.
- Modem (Modulator-Demodulator) is a device attached to computer that converts digital signal to analog form at the sender's end and does the opposite i.e. analog signal to digital at the receiver's end.
- There can be three types of networks—(i) LAN (ii) WAN (iii) MAN.
- Internet is a computer based world wide information network. It is composed of a large number of smaller interconnected networks. It is very cost effective.

A. Tick (✓) the correct option :

1. _____ can convert digital signals to analog and vice-versa.

   (a) Telephone ☐ (b) ISP ☐ (c) Modem ☐

2. How many computer are there in a directly connected network?

   (a) Two ☐ (b) Three ☐ (c) Four ☐

3. Which of the following is not an example of communication?

   (a) Cable ☐ (b) Radio waves ☐ (c) Microsoft ☐

4. LAN stands for

   (a) Local Area Network ☐ (b) Large Area Network ☐

   (c) Long Area Network ☐

5. _____ networks spread over the city.

   (a) LAN ☐ (b) MAN ☐ (c) WAN ☐

B. Fill in the blanks :

1. _____ in general, refers to the creation of networks.
2. _____ channel is the medium which carries message.
3. Modem stands for _____.
4. Modem is a device attached to computer that can convert _____ to _____ and vice versa.
5. LAN stands for _____.

6. WAN stands for _____.

7. MAN stands for _____.

8. A _____ is a group of computers that is separated by large distance and tied together.

C. Write (T) for true and (F) for false :

1. Transmission of computerized data from one location to another is called data flow.
2. Twisted cable is used in LAN.
3. A group of computers is connected together in a small area without the help of some cables. It is called WAN.
4. Internet may be termed as an example of MAN.
5. Modem is used to connect Internet.
6. Analog signal consists of continuous signals.

D. Answer the following questions :

1. What is a network?
2. What are different components of a computer network?
3. What do you understand by a communication channel?
4. What is a modem? How does it work?
5. What are different types of network?
6. Distinguish between WAN and MAN.
7. Write short notes on :

   (i) Internet (ii) LAN

ACTIVITY

1. Create a chart of Internet (Network) :

2. Write the full form of following :

1. Modem _____
2. LAN _____
3. MAN _____
4. WAN _____