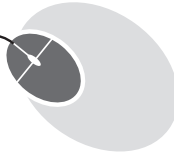# 1 Networking

LEARNING OUTCOMES

After the lesson, students will be able to:

- » Define a network.
- » List the advantages of a network.
- » Classify networks into different types.
- » Define LAN, PAN, MAN, WAN.
- » Describe the characteristics of each network.
- » List the advantages and disadvantages of each type of network.
- » List the components of a network.
- » Define network security.

WARM UP

- » You already know that the Internet is a worldwide network of computers. Make a list of tasks for which people use the Internet.

Ans. Do it yourself.

CHAPTER NOTES

- » A computer network is a group of computers linked to each other in such a way that one computer is able to communicate with the other computer and share its resources, data, and applications with each other.
- » Advantages of a network: Resource sharing, file sharing, flexible access, cost effectiveness, storage capacity, Internet sharing, security.
- » Network types can be defined on the basis of network size, their capabilities and the geographical regions they cover.

» We can classify the computer network on the basis of the following: PAN (Personal Area Network), LAN (Local Area Network), WAN (Wide Area Network) and MAN (Metropolitan Area Network).

» PAN is a computer network that enables communication between computer devices within the range of a particular person, often covering an area of 10 meters.

» Characteristics of PAN: Short-range communication, low power consumption, low cost, communication of devices within a personal space.

» Advantages PAN: No extra space required, can connect to multiple devices at a time, is cost effective, easy to use, secure, can synchronise data between different devices, portable.

» Disadvantages of PAN: Short-range, interference with radio signals, slow data transfer, can create health problems.

» LAN is a computer network that spans over a relatively small area.

» Characteristics of LAN: Larger coverage area as compared to PAN, runs multiple devices to share a transmission medium, better communication quality, supports a variety of communications transmission mediums, low cost of installation, expansion and maintenance.

» Advantages of LAN are sharing of resources, client and server relationship, sharing of the Internet, software program sharing, securing of data, easy, fast, and time-saving communication.

» Disadvantages of LAN: Data security problem, limitation of range, server breakdown, expensive.

» MAN is similar to LAN but spans an entire city or campus. MANs are formed by connecting multiple LANs.

» Characteristics of MAN: Network size ranges from 5 to 50 km, either owned by a user group or by a network provider who sells service to users, rather than a single organisation as in LAN; provides links for connecting LANs to WANs and the Internet.

» Advantages of MAN: Less expensive, can send local e-mails, has high speed, sharing of the Internet, high security.

» Disadvantages MAN: Difficult to manage, high cost, prone to hackers, requires a lot of wire.

» WAN is a network that exists over a large geographical area.

» Characteristics of WAN: Multiple computers over a very large area are connected together; connects devices separated by a broader geographical area; interconnects multiple LANs, communication links between computers are provided by telephone networks, public data networks, satellites, etc.

» Advantages of WAN: Covers a large geographical area; centralised data enable users to get updated files and data: Software companies work over the live server to exchange updated files; sharing of software and resources, high bandwidth; distributed workload and decreased travel charges.

» Disadvantages of a WAN: Security issues, needs firewall and antivirus software, high setup cost, troubleshooting problems.

» Components of a network include cable, hub, switch, Network Interface Card (NIC), modem and router.

» There are two types of network cards: wired and wireless.

» Hub/Switch is a device that splits a network connection among multiple computers.

» Cable is one of the transmission mediums which can transmit communication signals.

» A device used to connect a LAN with an Internet connection is called a router.

» When we have two distinct networks (LANs) or want to share a single Internet connection with multiple computers, we use a router.

» A modem enables you to connect your computer to the available Internet connection over the existing telephone line.

» In order to gain access to data and resources of a network, it is important to get connected to the network. This process is called Logging On.

» A password is a secret word that is known to the user and the network only. User authentication is complete only after entering the correct login ID and password.

DEMONSTRATION

» The students can be taken to a place in the school where networking is being used and can be shown how the resources are being shared by different nodes.

LAB ACTIVITIES

1. Find out the type of computer network used in your school.

   (a) Find out about how computers in a network are protected in your school.

   (b) What type of network is used?

2. A multinational company has offices in different countries.

   (a) What should it use as a type of network?

   (b) Describe the type of network architecture best suited.

   (c) How can these computers be protected from unauthorised access?

3. Use a hub and a switch in your lab and see how they function.

4. Ask your teacher to take you to a field trip to a computer company where servers are kept and show you their functioning.

5. Create a user name and password on your school network for your safe access.

ASSESSMENT

Teacher can assess the students by asking them about the following:

1. Definition and uses of a computer network.

2. Different types of networks.

3. Network security and its use.