

## Computer Networks

The word 'network' may be defined as a collection of computers connected together for the purpose of sharing information and resources. For example, sharing one printer among ten computers through a network is an example of resource sharing. These interconnected computers may be within a local area or may cross different cities or countries.



*Networking concept*

Computers cannot communicate with each other locally or remotely without computer networking. Just imagine a bank or an office without computer networking! How difficult it would be for the employees to communicate and share data.

In today's world, networking is essential in bank transactions through ATMs, online ticketing and reservations, online shopping, etc.

### Advantages of networking

Computer networking is needed for the following reasons.

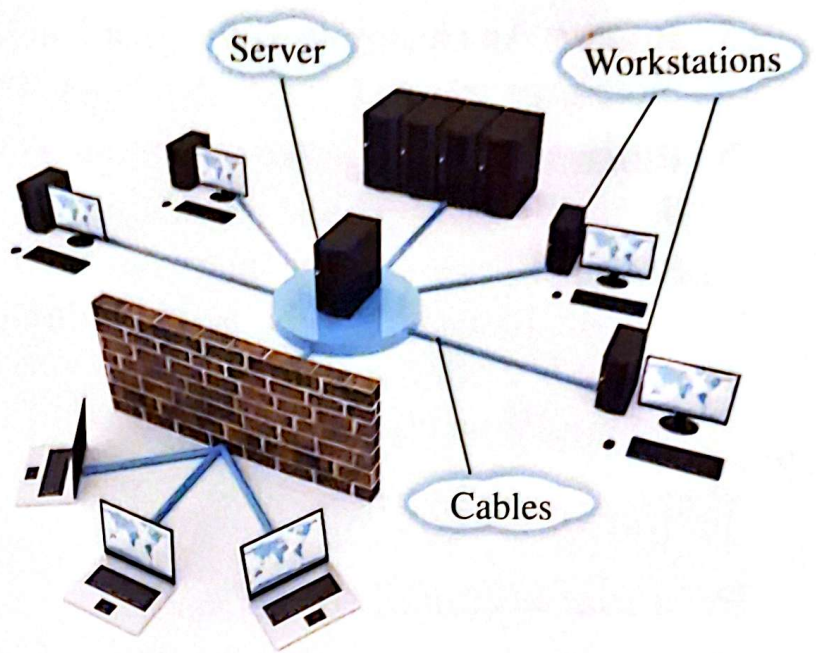
1. **Limited resources:** Instead of connecting a printer to all the computers separately, you can connect it to the main network. In this way, every computer can share the printer.
2. **Sharing information:** Information is centralised and can be made available to all the computers connected to a network.
3. **Lower costs:** It reduces cost, as an input device like a scanner and an output device like a printer can be easily shared.

### Components of a computer network

The different parts of a computer network are shown on a diagram on the next page.

1. **Workstations:** The individual computers connected to a network to share data and information are called **workstations** or **terminals**. They can be compared to professionals working together in a group or in a department to do a specific job.

2. **Server:** The main computer that controls the functioning of the entire network is called the **server**. It can be compared to a manager of a company who manages all the work and communicates with the executives.

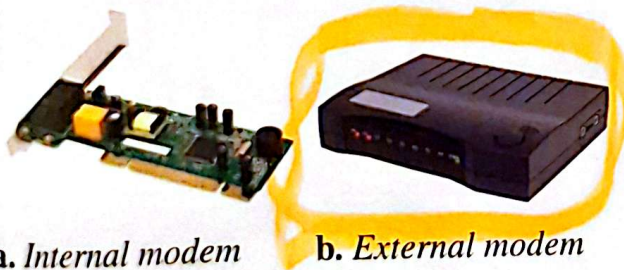


Parts of a computer network

3. **Communication channels:** These are used to connect the computers in the network to allow the computers to communicate with each other. **These channels**

can be cables, fiber optics, radio → wireless waves or satellites.

4. **Modem:** This stands for **modulator demodulator**. A modem is an electronic device which allows one computer to send information to another through standard telephone wires and over long distances. It is required because computers are digital devices and the telephone system is analogue. The modem converts digital (binary) data to analogue (continuous) data and vice versa for effective transmission. They can be fitted inside the computer (**internal modem**) or placed outside the computer (**external modem**).



a. Internal modem

b. External modem

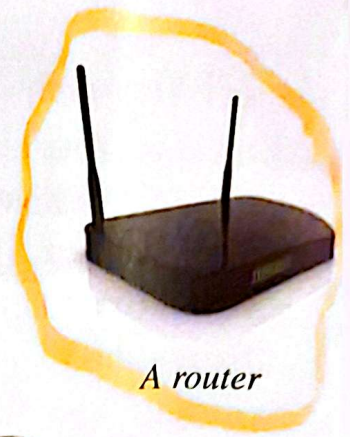
Types of modem

### FACT FILE

The speed of a modem is calculated in bits per second (bps).



5. **Router**: An electronic device that connects two or more networks and directs the data between them.
6. **Bluetooth**: A system for connecting electronic devices, such as mobile phones and computers, to each other and to the internet using radio signals. To use this technology, a **Bluetooth** device is used. For example, Bluetooth mobile phone headsets.



*A router*



*A Bluetooth mobile phone headset*

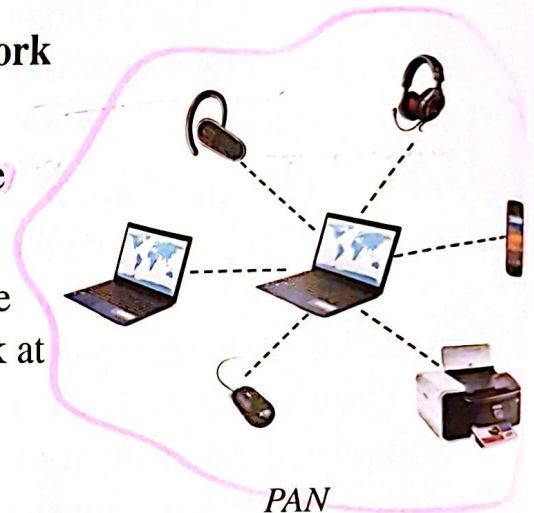
## Types of Network

### Personal Area Network (PAN)

When the computers and devices that belong to the same user are interconnected over a short range, it forms a **Personal Area Network (PAN)**.

The communication channels in this case are mainly Bluetooth and Wi-Fi devices.

For example, your desktop PC, mobile phone and laptop connected to the wireless network at your home is an example of a PAN.

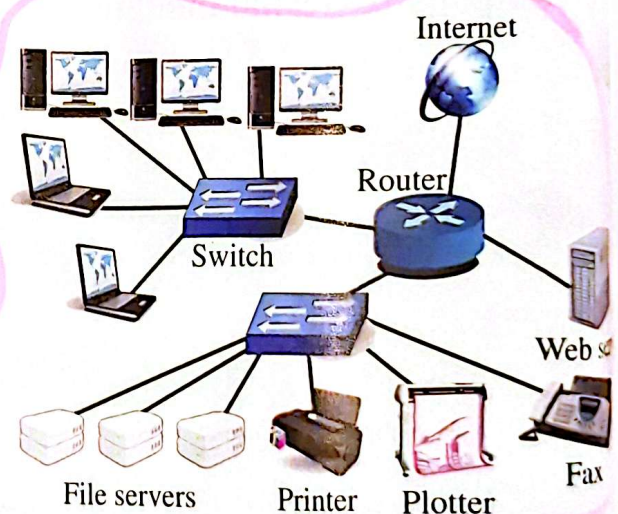


*PAN*

### Local Area Network (LAN)

When the computers are interconnected in the same office building, school or home for sharing information, then it forms a **Local Area Network (LAN)**.

A LAN connects computers over a relatively short distance. It generally uses cables as a communication channel.



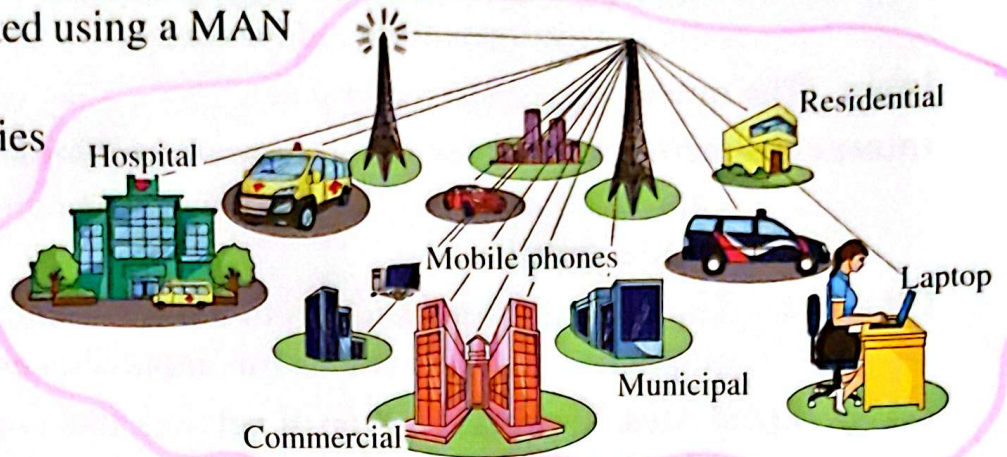
*LAN*

## Metropolitan Area Network (MAN)

When the computers are interconnected over an entire city, this forms a **Metropolitan Area Network (MAN)**. For example, all the branches of a company are interconnected using a MAN within the same city.

The cable operator supplies the cable television network using a MAN.

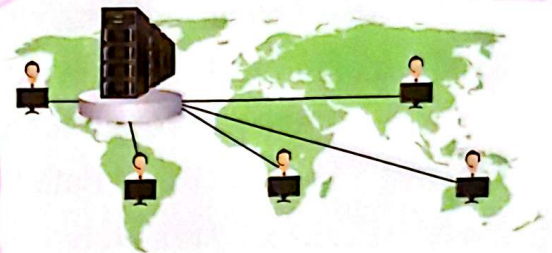
The communication channel in this case is either cables or satellites.



*Metropolitan Area Network*

## Wide Area Network (WAN)

When computers are interconnected for transmitting information over a large geographical area such as a country, a continent or even the whole world, it forms a **Wide Area Network (WAN)**. The internet is the best example of a WAN. Satellite is generally used as a communication channel.



*Wide Area Network*

### ACTIVITY



- A. Find out which category of network is used in your computer lab.
- B. With the help of your teacher, prepare a PowerPoint presentation on the parts of a computer network.
- C. Double-click on the Network icon on the desktop of your computer. It will give you a list of the computers connected to your network. Discuss the types of network available in your school and the terminals connected to it.