

# Communication Technologies - Networking Concepts

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# 1. What is a Network?

Source: Wikipedia

A computer network is a digital telecommunications network for sharing resources between nodes, which are computing devices that use a telecommunications technology.

Data transmission between nodes is supported over data links consisting of physical cable media, such as twisted pair or fibre-optic cables, or by wireless methods, such as Wi-Fi, microwave transmission, or free-space optical communication.

Source: CBSE

A network is any collection of independent computers that communicate with one another over a shared network medium. In simple terms, a computer network is a collection of two or more computers linked together for the purpose of sharing information and resources.

## 1.1. Need for Networking

1. Resource sharing - files and peripherals
  - i. Sharing of files and software - data files
  - ii. Sharing Peripherals - printers, fax systems, audio/video
  - iii. Sharing storage
2. Improving Communication - powerful, fast and reliable communication medium among the users via email, instant messaging, chat rooms, telephone
3. Access to Remote database

## 1.2. Requirements of a Network

1. At least two computers - Server or Client workstation
2. Network Interface Cards (NIC)
3. A connection medium, usually a wire or cable, although wireless communication between networked computers and peripherals is also possible
4. Network Operating system software

## 1.3. Network Terminologies

1. **Nodes (Workstations):** A computer becomes a node (also called a workstation) as soon as it is attached to a network. Each user on a network works on a workstation. If there are no nodes there would be no network.
2. **Server:** A computer that facilitates sharing of data, software and hardware resources on the network is known as the server. A network can have more than one server. Each server has a unique name by which it is identified by all the nodes on the network.  
Servers can be of two types:
  - i. *Dedicated Servers:* One computer is reserved for server's job. It helps all nodes access data, software and hardware resources.
  - ii. *Non Dedicated Servers:* A workstation can double up as a server.
3. **Network Interface Unit (NIU):** A network interface unit is a device that is attached to each of the workstations and the server which helps to establish communication between the server and workstations.

## 1.4. Switching Techniques

Switching techniques are used to efficiently transmit data across the network.