

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.