NIELIT GORAKHPUR

Course Name: O Level (2nd Sem) **Subject:** Introduction to ICT Resources
Topic: Computer Network - Types (Part 3) **Date:** 28-05-2020

Computer Network

Types of Computer Network

Comparisons among LAN, MAN and WAN

	LAN	MAN	WAN
Full form	Local Area Network	Metropolitan Area Network	Wide Area Network
Range	100 meter within a building or room	5Km -40 Km in city	Thousands Km - Geographical coverage
Devices	Switch	Router	High Speed Router , Satellite
Communication	Fast	Medium	Slow
Troubleshooting	Easy	Default	More Default
Installation cost	low	Medium	High
Communication Cost	low	Medium	High
Application	Office , School, Home Network	Cable Network, City Branch Networking	Internet , Entranet , Extranet

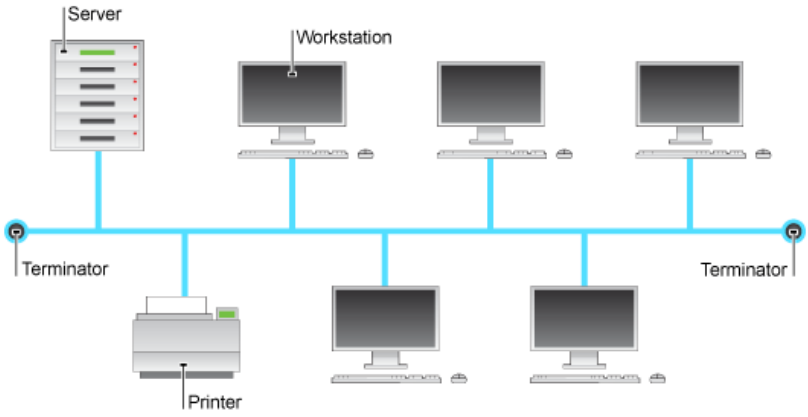
Network Topologies

Topology is the method in which networks are physically connected together. Topology determines the complexity of connecting computers and the cost of network cable installation. Cable installation can often be a major cost factor for network systems. Topology also determines the strategy for physically expanding the network in future. There are following topologies are –

- Bus
- Ring
- Star
- Tree
- Mesh

- **Bus Topology**

In linear bus topology, all computers are connected by a single length of cable with a terminator at each end. The bus topology is the simplest and most widely used LAN design. It is a passive topology which means only one computer at a time can send a message. Hence, the number of computers attached to a bus network can significantly affect the



speed of the network. A computer must wait until the bus is free before it can transmit. Each node is connected to two others except the machines at either end of the cable, which are connected only to one other node.

Ethernet 10Base2 (also known as thinnet) is an inexpensive network based on the bus topology. The network operating system keeps track of a unique electronic address for each node, and also manages the flow of data based on this addressing scheme. This topology has the advantage of not requiring every computer to be up and running in order for the network to function. But because a single cable is dedicated to all the information traffic, performance can be slow at times. This topology is often found in client/server systems, where one of the machines on the network is designated as a file server, meaning that it is dedicated solely to the distribution of data files, and is not usually used for information processing.

Advantages of the Bus Topology

(a) The bus topology is simple, reliable, and easy to use and understand in small sized LANs.
(b) The bus requires the least amount of cable to connect the computers together and is, therefore, less expensive than other cabling arrangements.
(c) It is easy to extend a bus. Two cables can be joined into one long cable with a connector, making a longer cable and allowing more computers to join the network.

Disadvantages of the Bus Topology

(a) Heavy network traffic can slow down a bus considerably. This is because any computer can transmit at any time, and computers on most bus networks do not coordinate with each other to reserve time slots to transmit. A bus network with many computers can spend a lot of its bandwidth (capacity for transmitting information) with the computers interrupting each other instead of communicating. Tire problem only gets worse as more computers are added to the network.
(b) It is difficult to troubleshoot a bus. A cable break or malfunctioning computer anywhere between two computers can cause them not to be able to communicate with each other. Cable break or loose connector can also cause reflections and bring down the whole network, causing all network activity to stop.

Exercise:

1: Compare LAN, MAN and WAN?
2: What is topology in computer network?
3: What is bus topology?
4: What are the advantages of bus topology?