Q. What is Computer Network? Explain Different types of computer Networks.

A network consists of two or more computers that are linked in order to share resources (such as printers and hardware and software etc.), exchange files, or electronic communications. The computers on a network may be linked through cables, telephone lines, radio waves, satellites or infrared light beams. In addition to the hardware a network also required special software to enable communication.

Benefits/Advantage of Computer Network:

- Information sharing
- Printer sharing
- Hard Disk Sharing
- Modem Sharing
- Hardware Sharing
- Software Sharing
- Security
- Centralized Administration and support

Different types of Computer Networks:-

LAN (Local Area Network):-

1. Local Area Network is used to connect computer devices which are located within small geographical area like home, offices, schools and small group of buildings. Such as a school or an airport.
2. The range of LAN is few hundred meters but not more than a mile (i.e.1609 Meters).
3. LANs can be either wired or wireless. For wired connection, twisted pair or coaxial cable or fiber optic can be used.

MAN (Metropolitan Area Network):-

1. A metropolitan area network (MAN) is a large geographical area network than a LAN. It can cover entire city, several blocks of buildings.
2. It range of metropolitan area network is approx 5 to 50 KM.
3. Examples of MAN: Telephone company network that provides a high speed DSL to customers and cable TV network.

WAN (Wide Area Network):-

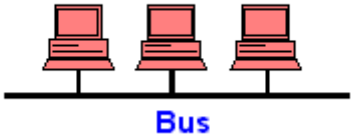
1. WAN covers a large geographic area such as country, continent or even whole of the world. For example, offices located at New Delhi , Mumbai and New York are connected by WAN
2. To cover great distances, WANs may transmit data over leased high - speed phone lines or wireless links such as satellites.
3. Multiple LANs can be connected together using devices such as bridges, routers, or gateways, which enable them to share data.
4. Example of WAN is Internet.

Q. **What is Topology? Discuss the various topologies with diagram.**

Network topology is the physical arrangement of the various elements (like nodes, links, switch, router, wires and any other peripherals etc) of a computer network to connect computers in a network.

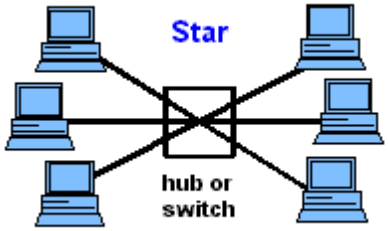
Different types of Network Topology:

Bus Topology/Linear Topology:



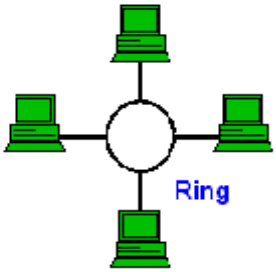
In Bus Topology every computer and network devices is connected to single cable (i.e. co-axial cable based). It has exactly two endpoints and it is also called **Linear Bus Topology.** If network traffic is heavy or nodes are more the performance of the network decreases.

Star Topology:



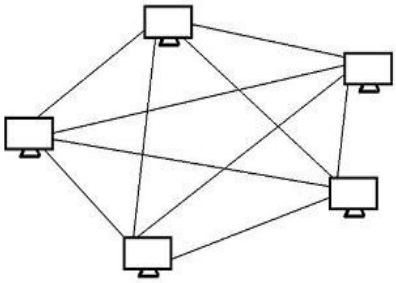
Star topology is one of the most commonly used topologies in construction of local area networks. In this topology all the computers are connected to a single switch through a cable or . The star topology ensures that if one terminal goes down, all the rest are operational due to direct linking with the central switch. It is easy to setup, modify and troubleshoot.

Ring Topology:



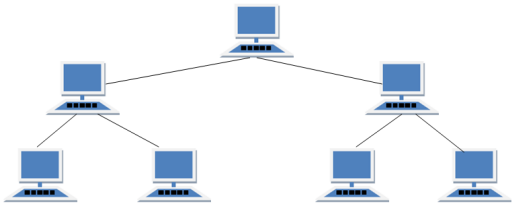
It forms a ring, as each computer is connected to another computer (i.e. the last one connected to the first computer) so it is called ring topology. When a node sends a message, the message is processed by each computer in the ring. If a computer is not the destination node, it will pass the message to the next node, until the message arrives at its destination. Troubleshooting is difficult in this topology. Failure of one computer disturbs the whole network.

Mesh Topology:



It is a point-to-point connection to other nodes or devices. All the network nodes are connected to each other and cross-connected so the best path can be chosen at any given moment. When data is traveling in a mesh network, the network is automatically configured to take the shortest route to reach the destination. Installation and configuration is difficult.

Tree Topology:



It has a root node and all other nodes are connected to it forming a hierarchy. It is also called hierarchical topology. It should at least have three levels to the hierarchy.

What is protocol?

It is a program that enables two devices to connect and transmit data from one computer to another computer. Protocols determine how data are transmitted between computing devices and over networks. They define issues such as error control and data compression methods.

Example: TCP/IP (Transfer Control Protocol/Internet Protocol), HTTP (Hypertext Transfer Protocol), FTP (File Transfer Protocol), SMTP (Simple Mail Transfer Protocol), PPP (Point to Point Protocol) etc.