TOPOLOGY

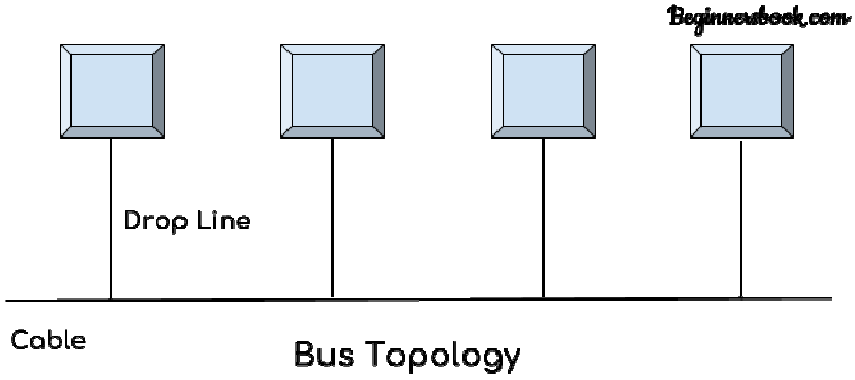
Geometric representation of how the computers are connected to each other is known as topology. The arrangement of a network which comprises of nodes and connecting lines via sender and receiver is referred as network topology. Topology can be physical or logical. Physical topology means the physical design of a network including the devices, location and cable installation. Logical topology refers to the fact that how data actually transfers in a network as opposed to its design.

Types of Topologies:

There are different types of the topologies are- Bus, Star, Ring, Mesh Topology.

Bus Topology:

In bus topology there is a main cable and all the devices are connected to this main cable through drop lines. There is a device called tap that connects the drop line to the main cable. It transmits the data from one end to another in single direction. Since all the data is transmitted over the main cable, there is a limit of drop lines and the distance a main cable can have. Ethernet and Local talk networks use a linear bus topology.



Features of Bus Topology

1. It transmits data only in one direction.
2. Every device is connected to a single cable

Advantages of Bus Topology

1. It is cost effective.
2. Cable required is least compared to other network topology.
3. Used in small networks.
4. It is easy to understand.
5. Easy to expand joining two cables together.

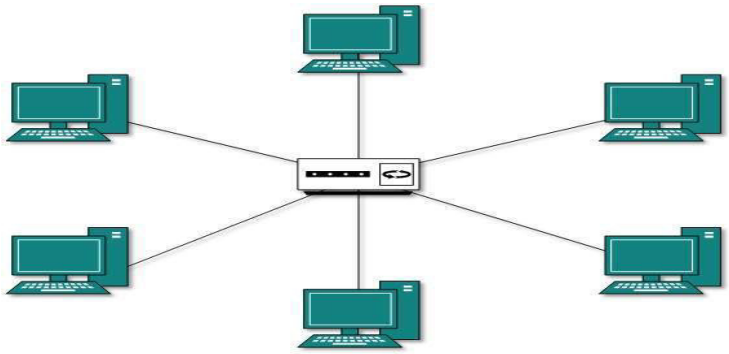
Disadvantages of Bus Topology

1. Cables fails then whole network fails.
2. Terminators are required at both ends of the cable.

3. If network traffic is heavy or nodes are more the performance of the network decreases.
4. Cable has a limited length.
5. It is slower than the ring topology.
6. Difficultly in fault detection.

STAR Topology

In this type of topology all the computers are connected to a single hub through a cable. This hub is the central node and all others nodes are connected to the central node. Unlike Mesh topology, star topology doesn't allow direct communication between devices; a device must have to communicate through hub. If one device wants to send data to other device, it has to first send the data to hub and then the hub transmit that data to the designated device.



Features of Star Topology

1. Every node has its own dedicated connection to the hub.
2. Hub acts as a repeater for data flow.
3. Can be used with twisted pair, Optical Fibre or coaxial cable.

Advantages of Star Topology

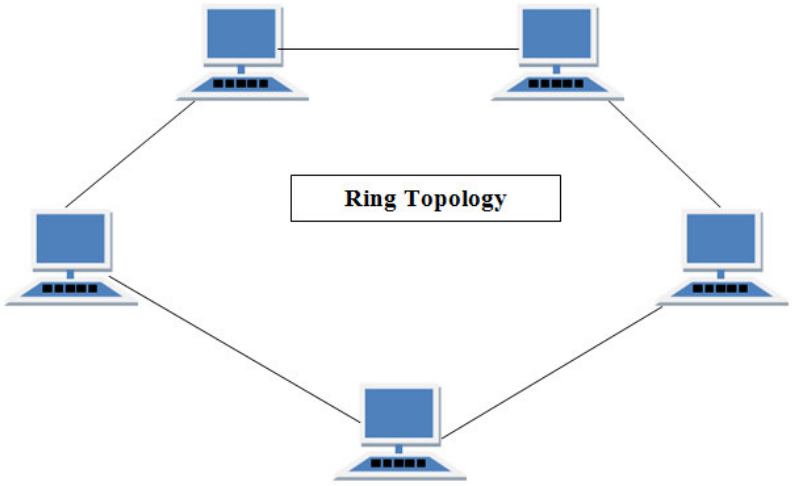
1. Fast performance with few nodes and low network traffic.
2. Hub can be upgraded easily.
3. Easy to troubleshoot.
4. Easy to setup and modify.
5. Only that node is affected which has failed, rest of the nodes can work smoothly.

Disadvantages of Star Topology

1. Cost of installation is high.
2. Expensive to use.
3. If the hub fails then the whole network is stopped because all the nodes depend on the hub.
4. Performance is based on the hub that is it depends on its capacity.
5. Hub requires more resources and regular maintenance because it is the central system of star topology.

RING Topology

It is called ring topology because it forms a ring as each computer is connected to another computer, with the last one connected to the first. Exactly two neighbours for each device. There are two dedicated point to point links a device has with the devices on the either side of it. If a device wants to send data to another device then it sends the data in one direction, each device in ring topology has a repeater, if the received data is intended for other device then repeater forwards this data until the intended device receives it.



Advantages of Ring Topology

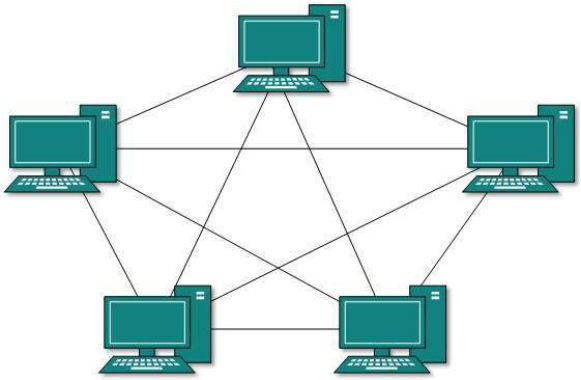
1. Transmitting network is not affected by high traffic or by adding more nodes, as only the nodes having tokens can transmit data.
2. Cheap to install and expand

Disadvantages of Ring Topology

1. Troubleshooting is difficult in ring topology.
2. Adding or deleting the computers disturbs the network activity.
3. Failure of one computer disturbs the whole network.

MESH Topology:

In mesh topology each device is connected to every other device on the network through a dedicated point-to-point link. When we say dedicated it means that the link only carries data for the two connected devices only. Lets say we have n devices in the network then each device must be connected with (n-1) devices of the network. Number of links in a mesh topology of n devices would be n(n-1)/2.



Features of Mesh Topology

1. Fully connected.
2. Robust.
3. Not flexible**.**

Advantages of Mesh Topology

1. Each connection can carry its own data load.
2. It is robust.
3. Fault is diagnosed easily.
4. Provides security and privacy.

Disadvantages of Mesh Topology

1. Installation and configuration is difficult.
2. Cabling cost is more.
3. Bulk wiring is required.