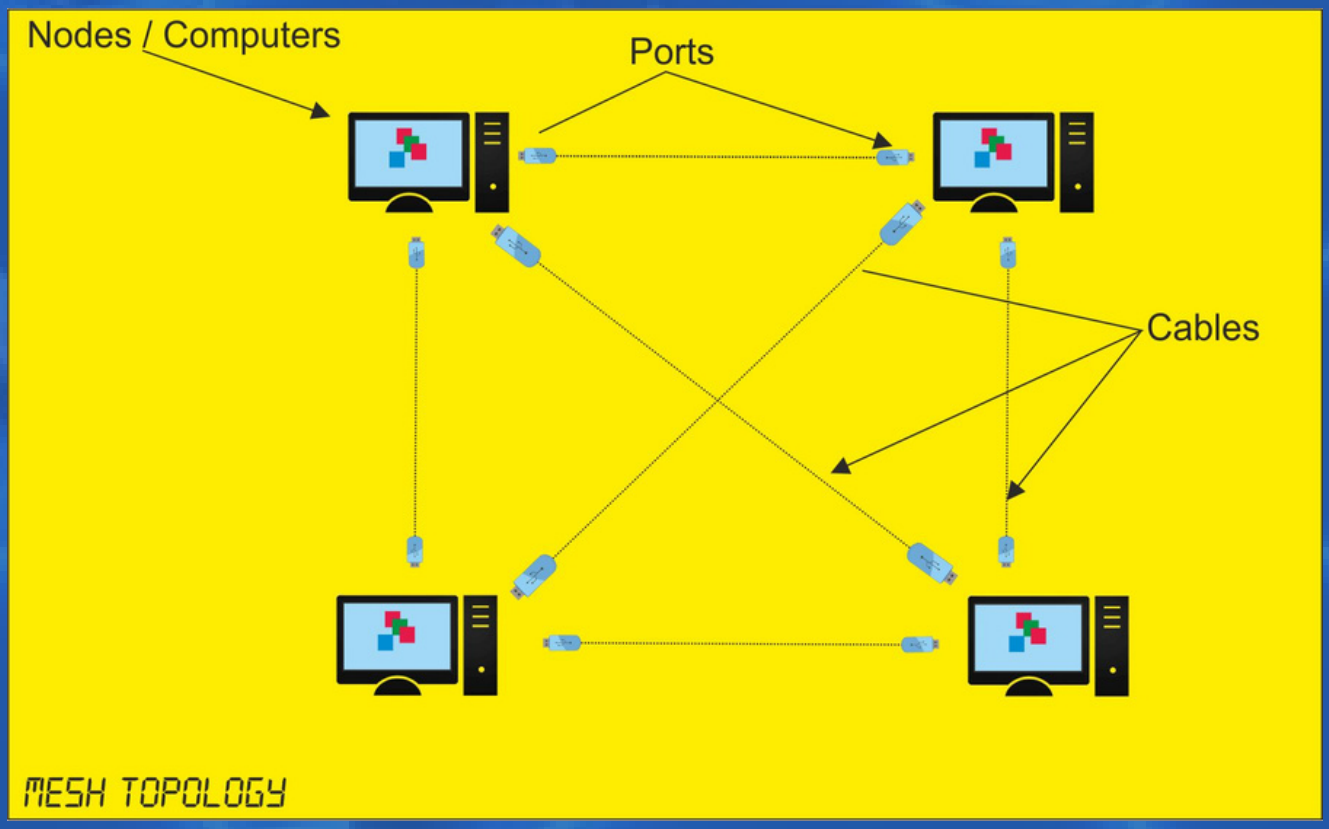
TOPOLOGY

The arrangement of a network that comprises nodes and connecting lines via sender and receiver is referred to as network topology. The various network topologies are:

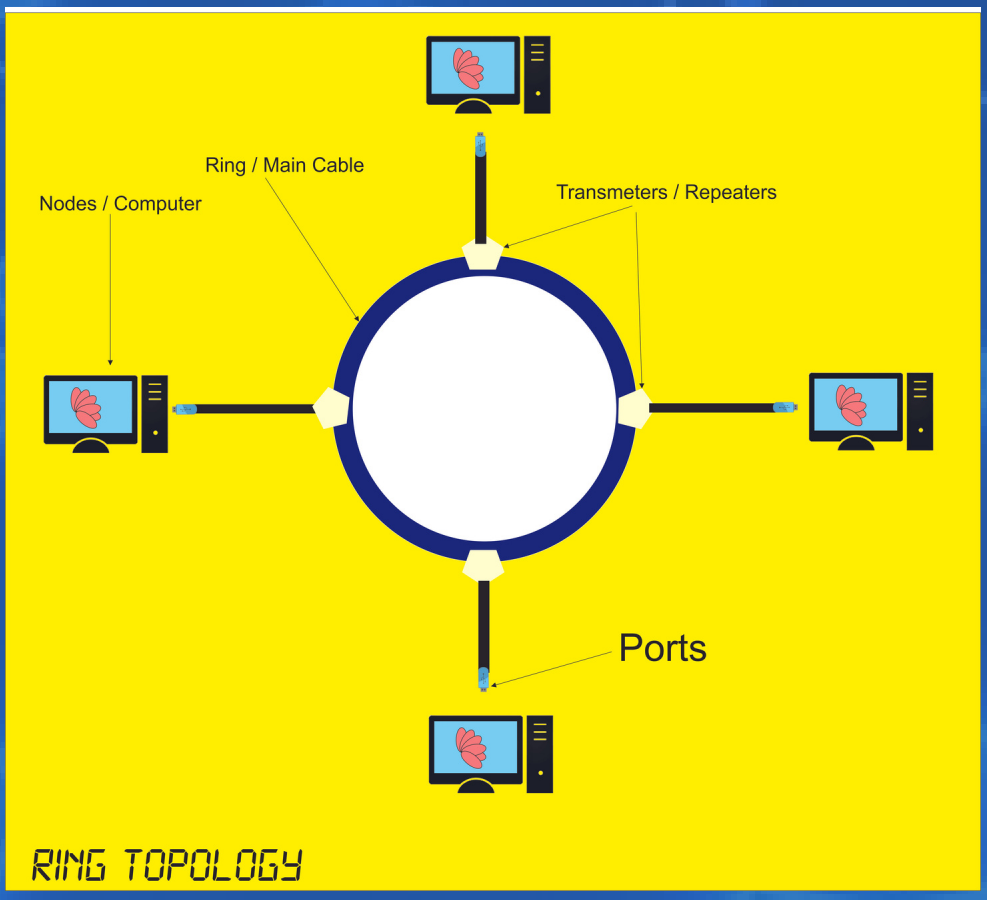
1.Mesh Topology



In a mesh topology, every device is connected to another device via a particular channel. In Mesh Topology, the protocols used are AHCP (Ad Hoc Configuration Protocols), DHCP (Dynamic Host Configuration Protocol), etc.

Advantages	Disadvantages
It can manage a high level of traffic when the setup is complete	the cost for implementing Mesh Topology is comparatively higher
Almost impossible to take down	Complex structure
Easy to add new devices	Difficult to set up initially
Scalability is simple	Costly compared to others
Adding new devices does not affect the network	the risk of redundant connections

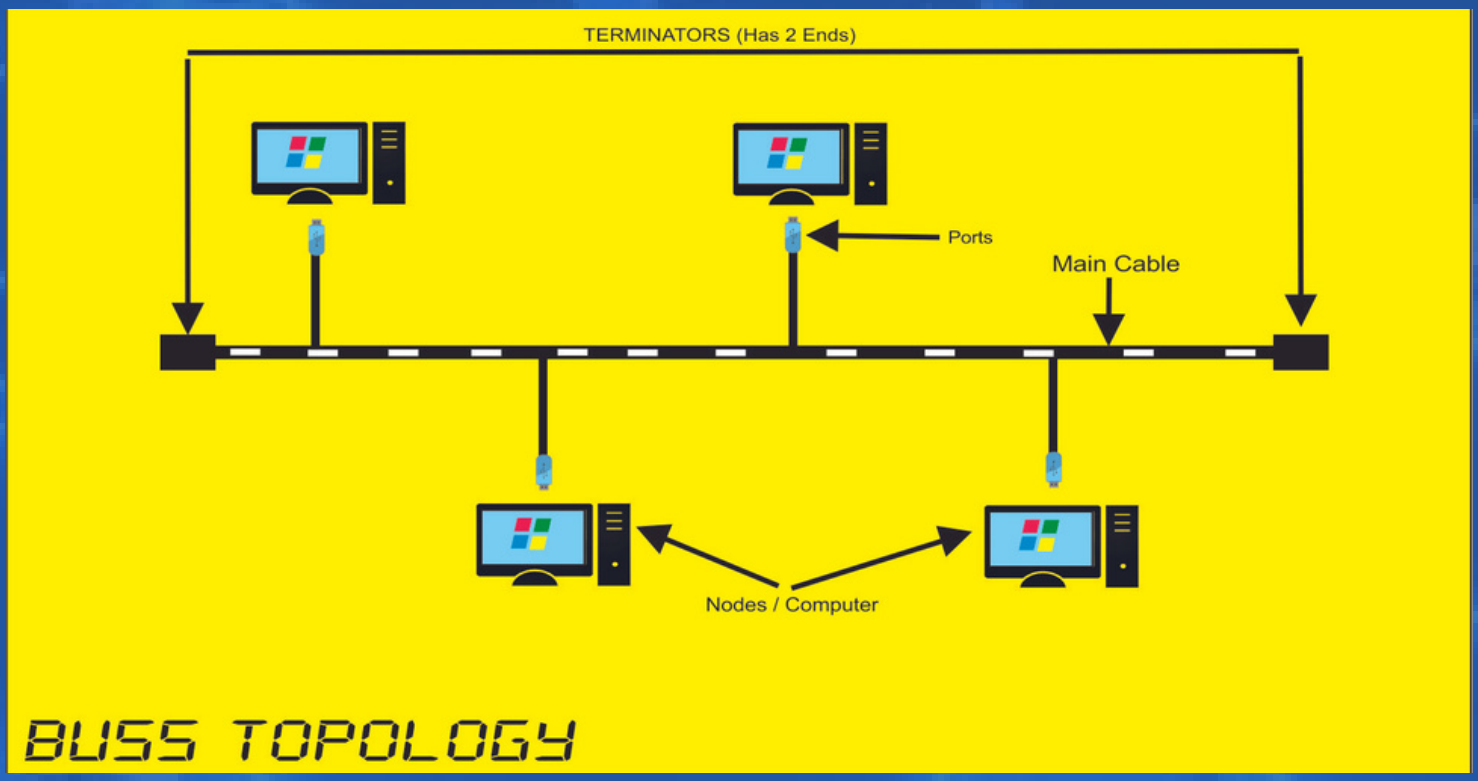
2.Ring Topology



In this topology, it forms a ring connecting devices with exactly two neighboring devices.
A number of repeaters are used for Ring topology with a large number of nodes, because if someone wants to send some data to the last node in the ring topology with 100 nodes, then the data will have to pass through 99 nodes to reach the 100th node. Hence to prevent data loss repeaters are used in the network.
The data flows in one direction, i.e.., it is unidirectional, but it can be made bidirectional by having 2 connections between each Network Node, it is called Dual Ring Topology. In-Ring Topology, the Token Ring Passing protocol is used by the workstations to transmit the data.

Advantages	Disadvantages
Fast Execution	Quite Expensive
Better Administration	Slow Activity Rate
Straightforward Adaptability	Unprotected use
Fidelity of network	Need for Hardiness
One-directional flow of data	Poor device Attachment
Unique Connectivity	Cable Breakdowns
Good Troubleshooting feature	Bandwidth Deficiencies

3.Buss Topology

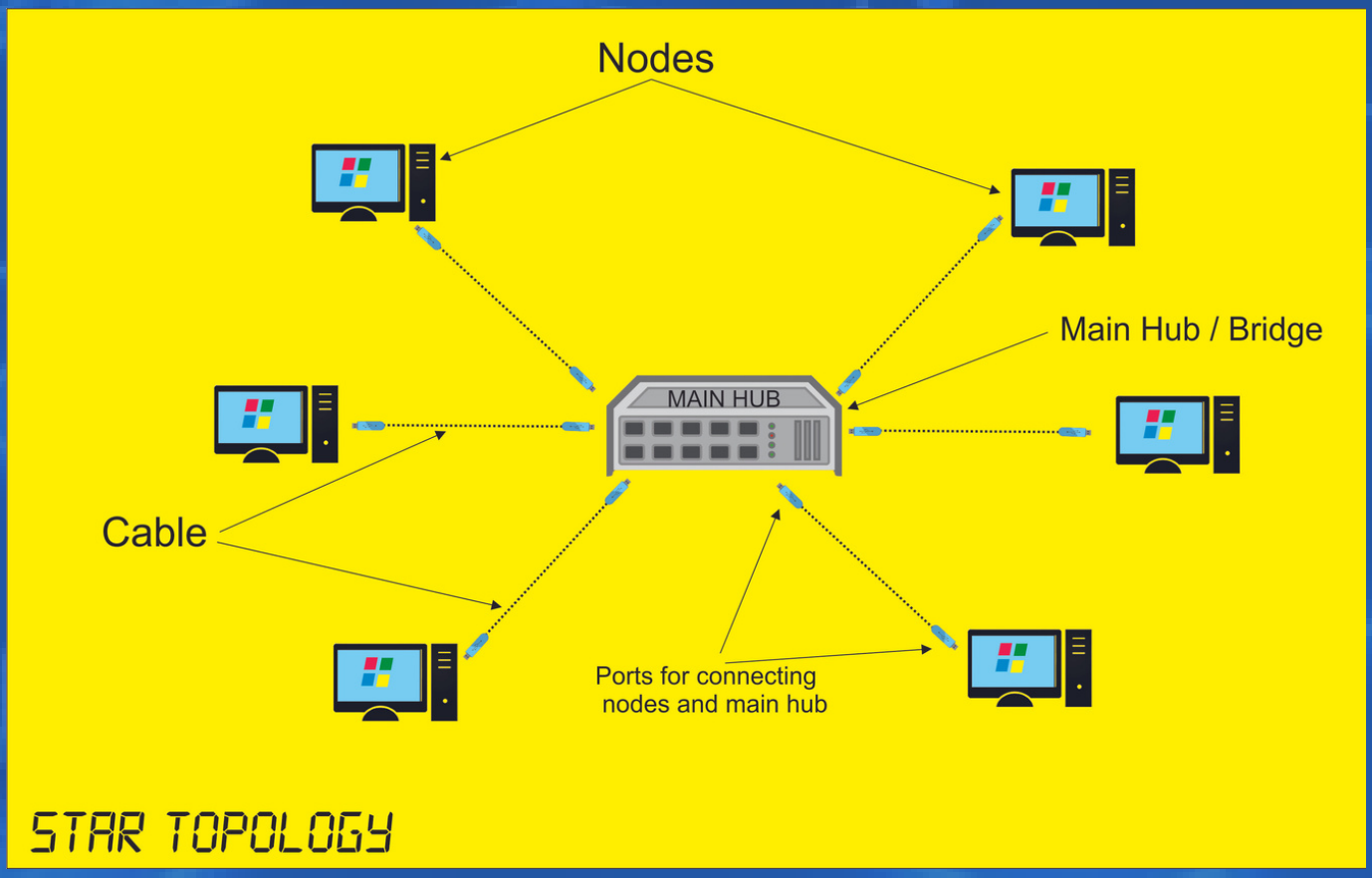


Bus topology is a network type in which every computer and network device is connected to a single cable. It is bi-directional. It is a multi-point connection and a non-robust topology because if the backbone fails the topology crashes. In Bus Topology, various MAC (Media Access Control) protocols are followed by LAN ethernet connections like TDMA, Pure Aloha, CDMA, Slotted Aloha, etc.

Bus Topology

Advantages	Disadvantages
Cheap and easy to implement	Network disruption when computers are added or removed
Require less cable	A break in the cable will prevent all systems from accessing the network.
Does not use any specialized network equipment.	Difficult to troubleshoot.

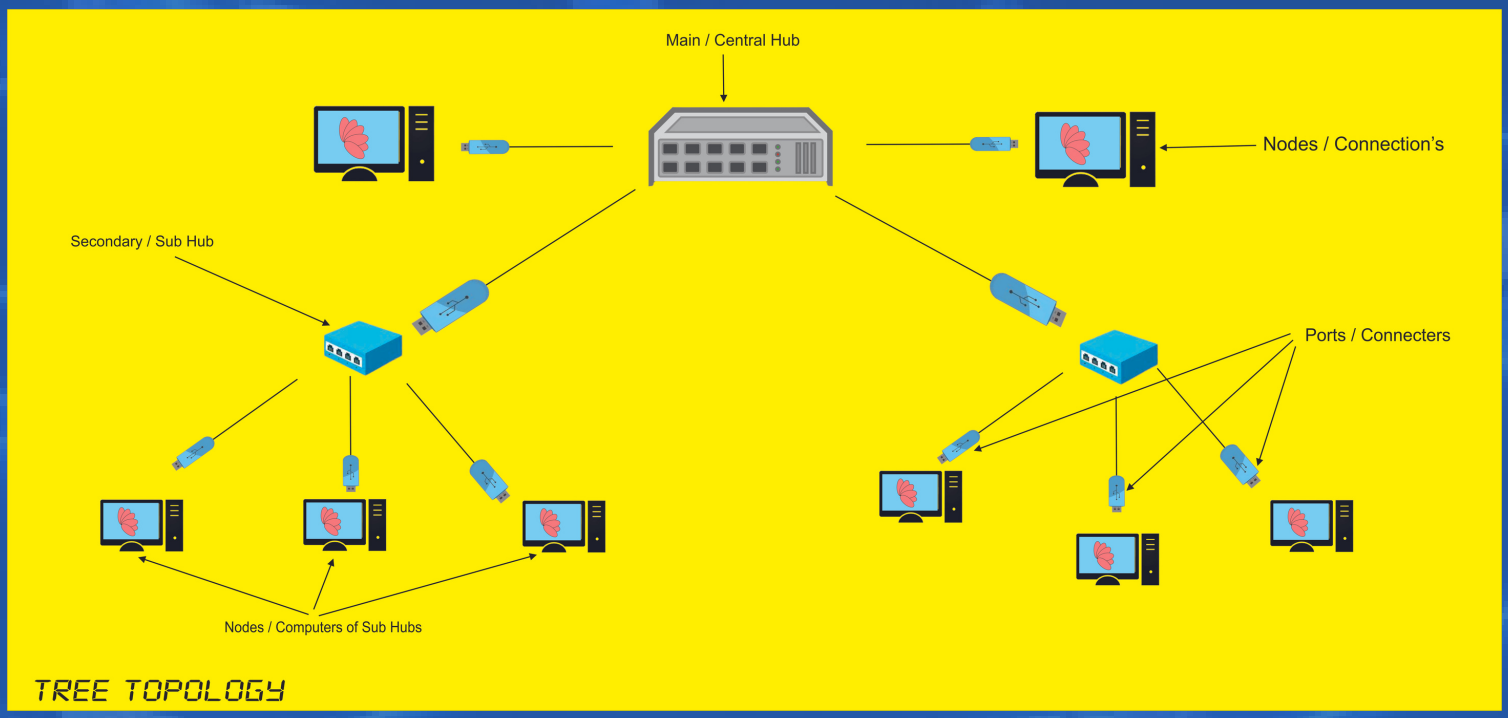
4.Star Topology



In star topology, all the devices are connected to a single hub through a cable. This hub is the central node and all other nodes are connected to the central node. The hub can be passive in nature i.e., not an intelligent hub such as broadcasting devices, at the same time the hub can be intelligent known as an active hub. Active hubs have repeaters in them. Coaxial cables or RJ-45 cables are used to connect the computers. In Star Topology, many popular Ethernet LAN protocols are used as CD(Collision Detection), CSMA (Carrier Sense Multiple Access), etc.

Advantages	Disadvantages
High speed	High maintenance
Highly scalable network	High dependency on the central device
Highly efficient	Expensive
Centralized network management	Requires additional equipment
Safe to use	Immobile systems
No point-to-point connections	Wires or cables used in the network get damaged easily
Highly reliable	Wireless star topology systems have low data transfer rates

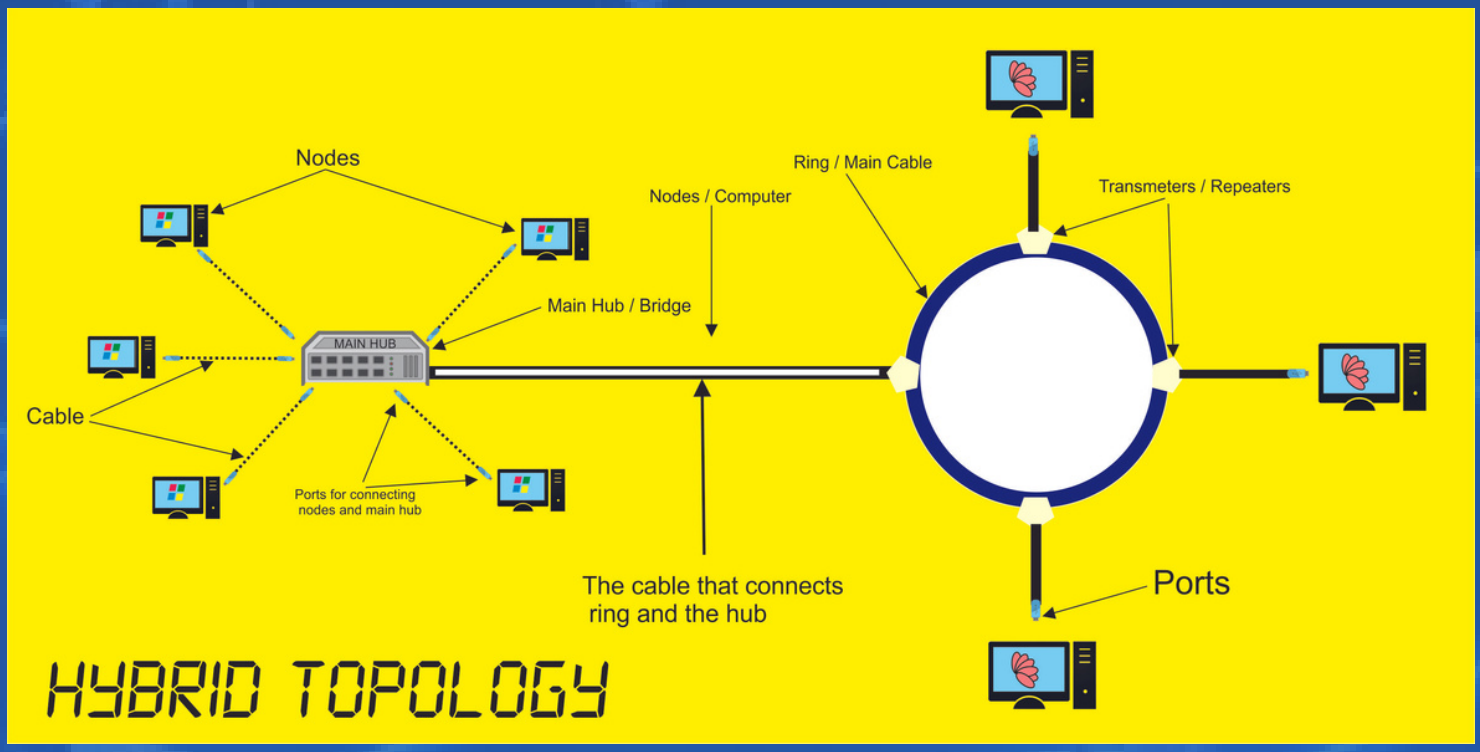
5.Tree Topology



This topology is the variation of the Star topology. This topology has a hierarchical flow of data. In Tree Topology, protocols like DHCP and SAC (Standard Automatic Configuration) are used.

Advantages	Disadvantages
Easier detection of error	Difficulty in maintenance and configuration
Failure of a solo node will not disturb the other nodes.	Difficulty in installing a tree topology network
Tree topology does not require any cables.	The cable length of a tree topology is minimal, and hence when expanding the topology, the excess cable is required, which results in increasing overall expense.
We can expand tree topology easily	Tree topology poses high-security threats
Tree topology is one of the finest choices while adding new devices due to its hybrid approach.	If the main cable of the topology collapses, the whole network will also collapse

6.Hybrid Topology



This topological technology is the combination of all the various types of topologies we have studied above. It is used when the nodes are free to take any form. It means these can be individuals such as Ring or Star topology or can be a combination of various types of topologies seen above. Each individual topology uses the protocol that has been discussed earlier.