Network Topology refers to the logical arrangements of computers / nodes are connected and communicate with each other.

In a computer network, there are 6 different types of network topology.

Bus topology
Ring topology
Star topology
Mesh topology
Tree topology
Hybrid topology.

Bus topology is a network, all the computer nodes and network system are connected to a single transmission channel.

**Features**

It transfers the data in a single direction.
There is a single connection between the node/system and the channel.

**Advantages**

It is easy to connect a device and handle
Take less time to set up
It is best-suited for small networks.
Easy to expand.

**Disadvantages**

If the backbone cable fails, then the whole network will be down.
No bi-directional communication.
Not suitable for heavy traffic data transmission as it increases the chance of collision.

In a Ring topology, the device forms the ring shape, each device is connected exactly to its neighbour on both sides and the first and last nodes are connected to each other.

**Features**

To prevent the loss of the transmission data from the first node to the last node, number of repeaters are deployed in the network.
Dual Ring Topology: Bidirectional connections between each network node.
Data is transmitted in a sequential manner it can't skip device in between.

**Advantages**

Chance of collision is less.
Cheap to set up and expand.

**Disadvantages**

Difficult to troubleshoot.
Failure in a single computer can lead to disturbing the whole network.
Adding or removing a computer will disturb the transmission of the data in the network.

In star topology, all the computers are connected to a single central node called a hub through a cable. All the transmission of data is through the hub.

**Features**

Every computer is connected to the hub through a dedicated connection/cable.
Hub also acts as a repeater.

**Advantages**

Failure of one computer will not affect other computers in a network.
Easy to add or remove the computer in a network.
Hub can be easily replaced.

**Disadvantages**

Performance of transmission depends on the hub.
Installation cost is high.
Failure of the hub will stop the transmission.

In a mesh topology, every computer is connected to each other computer via dedicated channels.

**Advantages**

It is robust
A fault is diagnosed easily.
Provides privacy and security.

**Disadvantages**

The cost of implementation and maintenance is higher.
Configuration and installation are difficult.
Suitable for less number of devices, as cable cost is high.

Tree topology has a root node and other two nodes are connected to the root node. There is only one connection between any two connected nodes. It has a parent-child hierarchy.

**Features**

Usually implemented in WAN

**Advantages**

Adding a computer to a node is easy.
Easier fault finding and maintenance.
Features of star and bus topology.

**Disadvantages**

Require huge cable.
Costly to implement.
If the root node fails then the whole network will fail and will stop its processing.

A hybrid topology is a combination of two or more types of network topology.
This types of network topology are usually implemented by the organisation

## Features

Collection of two or more topology.

## Advantages

Scalable: easy to increase the size of the network by adding new components
Effective: design in such a way that the strength of constituent topologies is maximized.
Flexible: It can be designed according to the requirement of the organisation.
Reliable: fault detection and troubleshooting is easy.

## Disadvantages

Costly to implement: Cost of Infrastructure, hub and expertise increases.
Difficult to manage as it is complex in design.