

### PEER-TO-PEER NETWORK:

- No Centralized administration.
- All peers are equal.
- Simple sharing applications ( Nodes have slower and limited performance compared to a server )
- Not scalable.( Because every node has a limited number of ports for devices to connect to it )

### CLIENT SERVER NETWORK:

- Centralized administration.
- Request-Response model.
- Scalable.
- Server may be overloaded.

### CLASSIFICATION OF COMPUTER NETWORK:

Computer networks are classified into:

#### 1. PAN : Personal Area Network:

This network uses technology like Bluetooth.  
These are for short ranges like in a room.  
Range can be upto 50 meters.

#### 2. LAN : Local Area Network:

This network uses technology like Ethernet or WiFi.  
These are for like homes or offices or any place compared to that size.

Range can be upto 2 kilometers.

We can setup LAN in a wired way using Ethernet cable connection to a hub or switch or in a wireless way using WiFi.

### 3. CAN : Campus Area Network:

This network uses technology of Ethernet.

These are for places like universities, or within a company like Microsoft etc.

Can range upto like 5 kilometers.

### 4. MAN : Metropolitan Area Network:

This network uses technology FDDI (Fibre distributed Data interface), CDDI (distributed Data interface), ATM (Asynchronous Transfer mode ) etc.

These network are for connecting different buildings having LAN or in a city.

Range can be upto 50 kilometers.

Devices used for making a MAN are mainly bridges and routers.

### 5. WAN : Wide Area Network:

It is a telecommunication network ( Communication at a distance is called telecommunication ).

It is composed of end devices and intermediary devices.

These are for above 50 kilometers whether that may be between cities, buildings, or countries above 50 kilometers.

## NEW TRENDS IN COMPUTER NETWORKS:

### ★ BYOD (Bring your own device):

Nowadays employees are encouraged and allowed to bring their own device and connect it to the office network and do their work on their own devices.

### ★ ONLINE COLLABORATION:

Meeting through the computer network without the need to be necessary there. All the participants can have the meeting from different parts of the world

### ★ CLOUD COMPUTING:

It is the on demand availability of computer system resources like data storage and computing power. e.g: Google drive

### NETWORK TOPOLOGY:

Arrangement of nodes in a computer network to make the communication possible. Network topology is physical and logical.

### ★ LOGICAL TOPOLOGY:

Deals with the data flow between the nodes in the network.

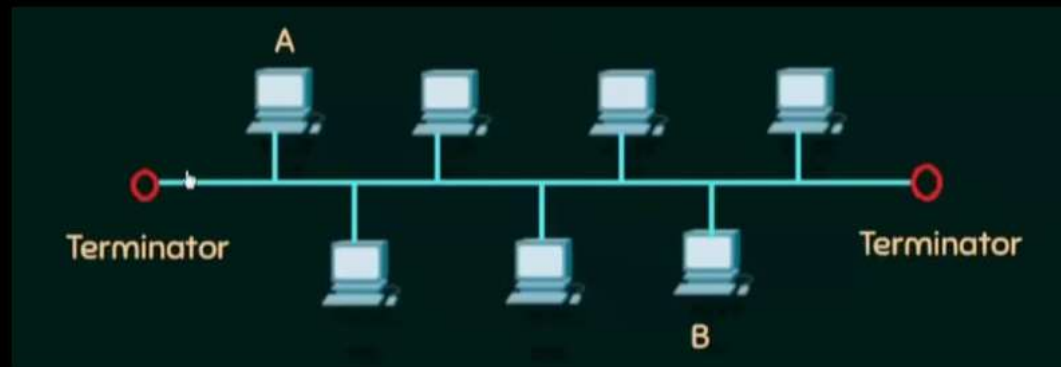
### ★ PHYSICAL TOPOLOGY:

Physical placement of various nodes in a computer network.  
The main physical topologies are :

- ☐ Star Topology
- ☐ Mesh Topology
- ☐ Bus Topology
- ☐ Ring Topology
- ☐ Hybrid Topology

## BUS TOPOLOGY:

- ★ All data transmitted between nodes in the network is transmitted over this common transmission medium called the backbone cable and is able to be received by all nodes in the network simultaneously.
- ★ A signal containing the address of the intended receiving machine travels from a source machine in both directions to all machines connected to the bus until it finds the intended recipient.



## Advantages:

- Only one wire - Less expensive.
- Suited for temporary network.
- Node failures does not affect others.

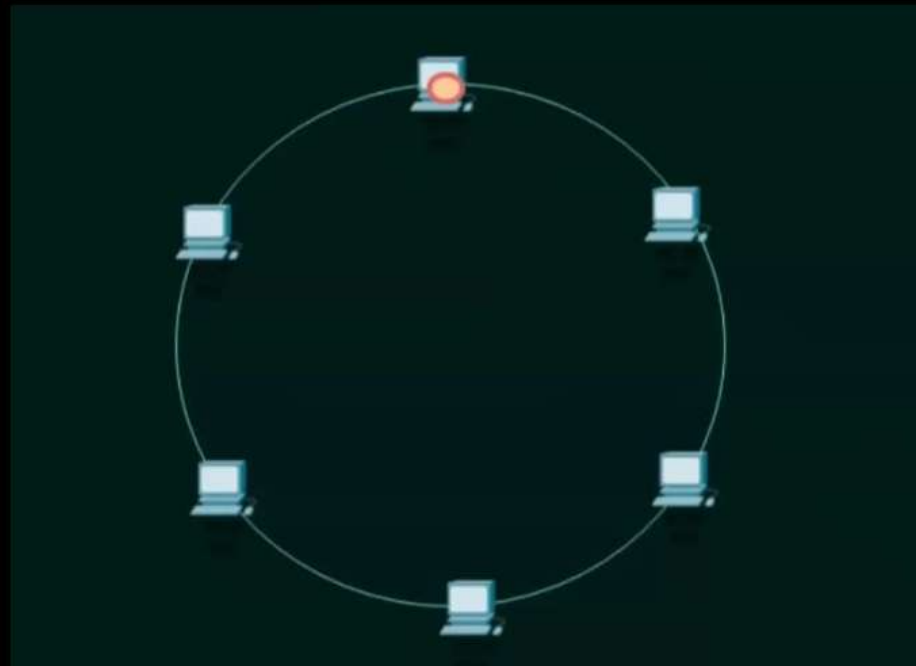
## Disadvantages:

- Not fault tolerant (No redundancy).

- Limited cable length.
- No security because when the sender sends the packet, it is received by all the nodes. The node which need the packet accepts it while the other denies it.

### RING TOPOLOGY:

- ★ A topology in which devices are connected in a loop.
- ★ Peer-to-Peer LAN topology.
- ★ Two connections: one to each of its nearest neighbors.
- ★ Unidirectional.
- ★ Sending and receiving data takes place with the help of a TOKEN.



### Advantages:

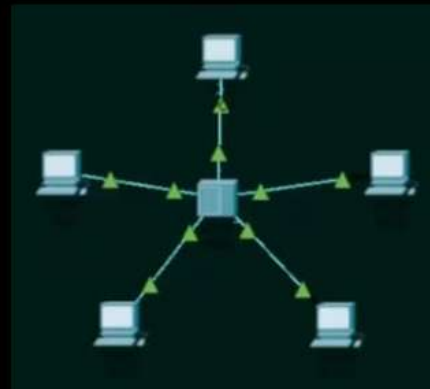
- Performance better than Bus topology.
- All nodes with equal access.

### Disadvantages:

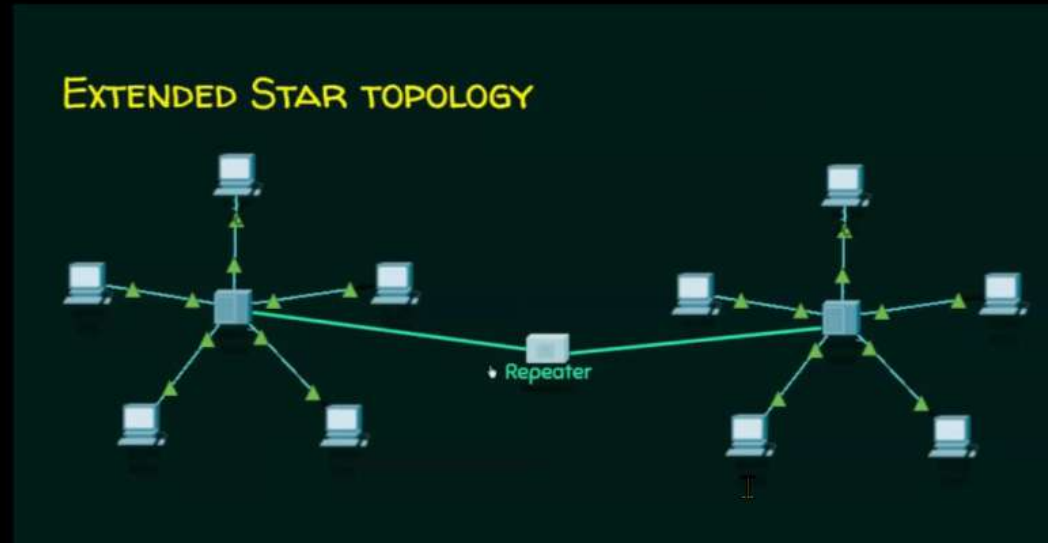
- Unidirectional. Single point of failure will affect the whole network.
- Increase in load decrease the performance.
- No security.

### STAR TOPOLOGY:

- ★ Every node is connected to a central node called a hub or switch.
- ★ Centralized Management.
- ★ All traffic must pass through the hub or switch.



- ★ We can combine two or more star topologies using repeater or switch or any other device making it extended star topology.



#### Advantages:

- Easy to design and implement.
- Centralized administration.
- Scalable.

#### Disadvantages:

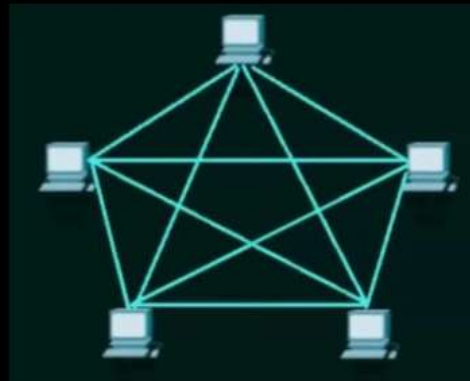
- Single point of failure affects the whole network.
- Bottlenecks due to overloaded switch/Hub. ( In context of computer networks, a bottleneck refers to a point of congestion or slowdown that limits the overall performance of the network. )



- Increased cost due to switch/hub.

#### MESH TOPOLOGY:

- ★ Each node is directly connected to every other nodes in the network.
- ★ Fault tolerant and reliable.



#### Advantages:

- Fault Tolerant
- Reliable ( Data loss is almost impossible )

#### Disadvantages:

- Expensive

#### HYBRID TOPOLOGY:



Combination of two or more topologies.

