

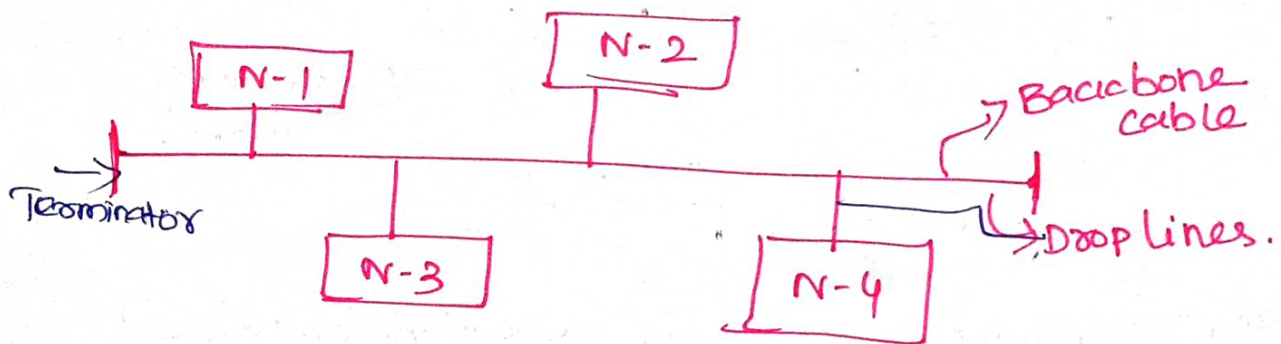
# Network Topologies

Structure of the network of how all the components are interconnected to each other.

## 5 types

### 1) Bus Topology:-

All nodes are connected through a single cable known as backbone cable.



Data transmission from one end to the other is in single direction. [unidirectional]

### Advantages:-

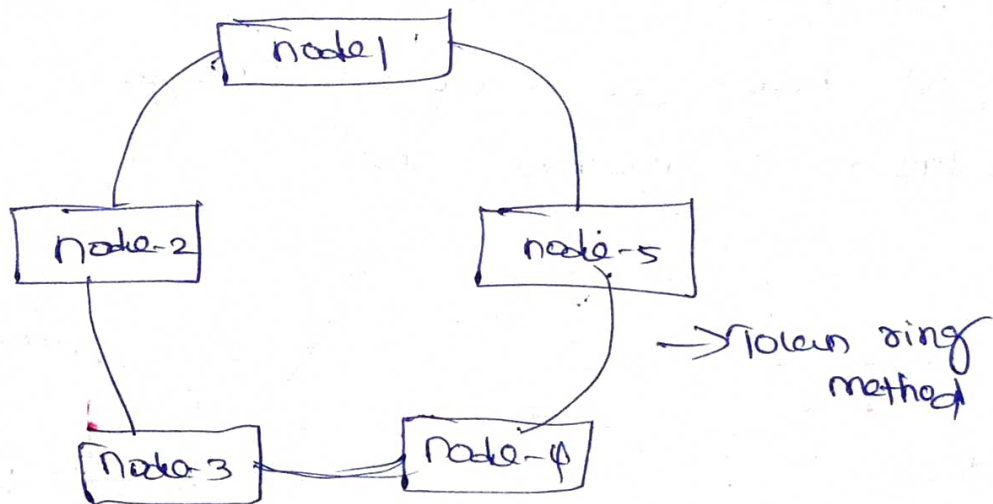
- ↳ Installation is easy
- ↳ cables required is less compared to star & mesh topologies.
- ↳ Failure of one node does not affect other nodes.

### Disadvantages:-

- \* If backbone cable fails, it affects the whole system.
- \* Fault detection is difficult

## Ring Topology:-

- Each device is connected to exactly two other devices and forms a ring.



↳ Data transmission is one direction. [clockwise]

### Advantages:-

- Easy to install & Expand
- possibility of collision is less.

### Disadvantages:-

- Damage in one node affects overall network
- Troubleshooting is difficult.

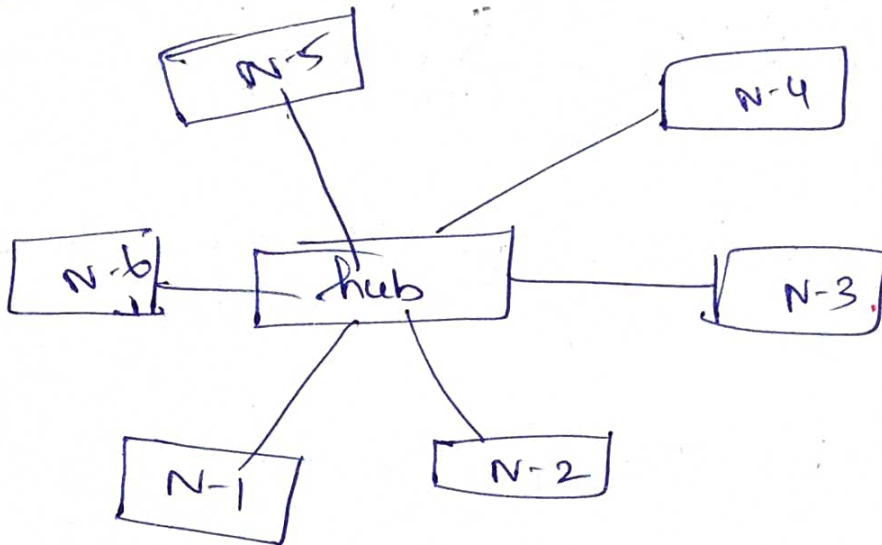
## Star Topology

All devices are connected to a central controller [switch, hub].

↳ Data Transmission is done from central hub.

## Advantages:-

- \* Trouble shooting is very easy
- \* If a node fails, it doesn't affect other network
- \* Addition, deletion & moving of devices are easy.

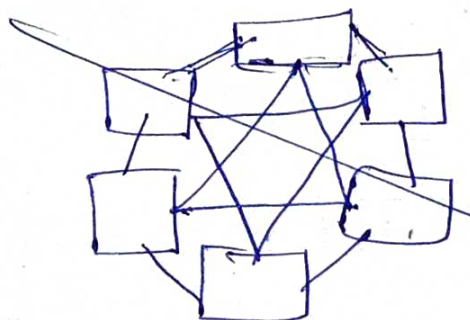


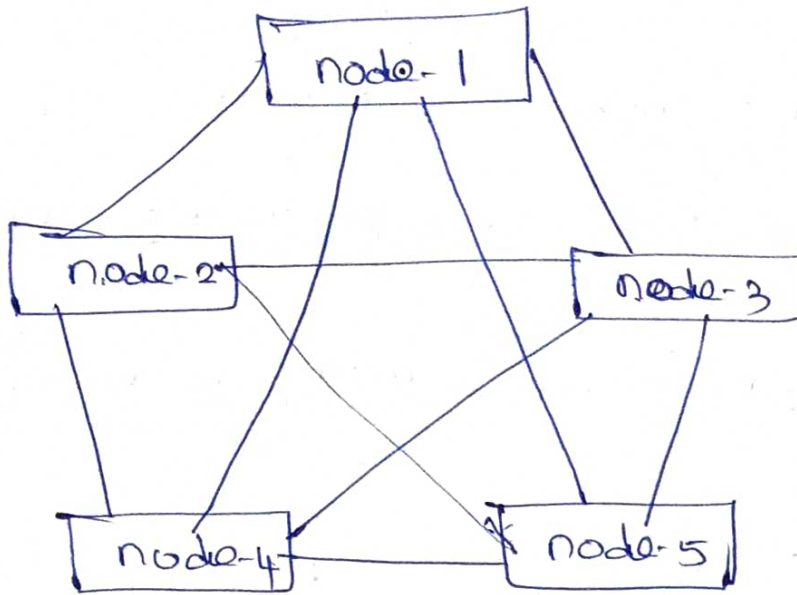
## Disadvantages:-

- Failure in hub affects the overall network
- Performance of network based on hub's capacity
- Installation cost is very high.

## Mesh topology:-

Each device is connected to every other device through a dedicated link.





### Advantages:-

→ Breakdown in one link is not affects communication.

→ Provides Privacy & Security

→ Fault is diagnosed easy.

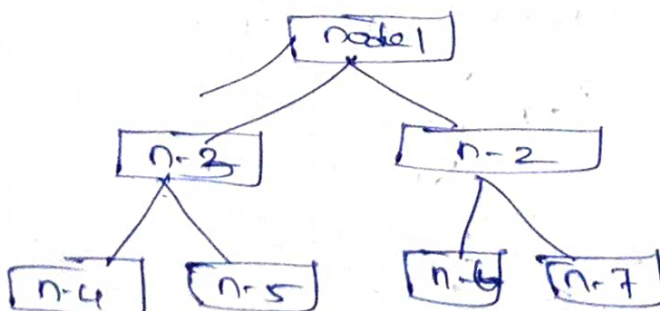
### Disadvantages:-

→ Installation & Configuration is difficult.

→ Cost of maintenance is high.

### Tree Topology:-

- Hierarchical topology



## Advantages:-

→ Expand, manageable, ~~Error~~ Error detection & correction is easy.

→ Breakdown of one node doesn't affect others.

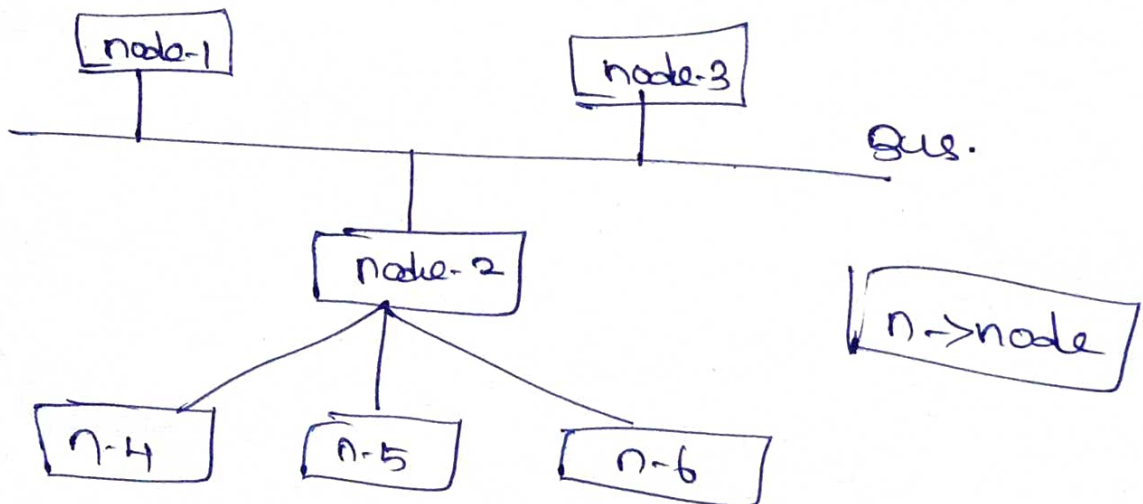
## Disadvantages:-

→ If root node fails, over all network will fail.

→ Cost of installation is high.

## Hybrid topology:-

Combination of two or more topologies



## Advantages:-

- Flexible

→ Size can be increased easily.

## Disadvantages:-

↳ design is very complex

↳ Installation & maintenance cost is high

↳ Fault detection is difficult.

## Applications:-

Ring → MAN, LAN, Education Institutions,

Star → in college "computer lab" & bank sectors

Bus → Small & temporary network is required.   
 ↓   
 connect different banking users

Ex:- office @ lab

Tree → Data base systems MySQL

Hybrid → automated industry