NEW HORIZON COLLEGE

SUBJECT: DATA COMMUNICATION AND NETWORK

SEMESTER: V SEMESTER

COURSE: BCA

SUBJECT TEACHER: Dr.K.Chitra

Assistant Professor,

Department of Computer Science

Network criteria

Performance

Reliability

Security.

Performance

Performance can be measured in many ways, including

- **Transmit time**

    Transmit time is the amount of time required for a message to travel from one device to another.

- **Response time**

    Response time is the total amount of time it takes to respond to a request for service.

- **Throughput**

    Throughput is the amount of data moved successfully from one place to another in a given time period, and typically measured in bits per second (bps), as in megabits per second (Mbps) or gigabits per second (Gbps).

Performance of a network depends on a number of factors,

- Number of users
- Type of transmission medium
- Capabilities of the connected hardware
- Efficiency of the software.

- **Reliability**

 Network reliability is measured by the frequency of failure, the time it takes a link to recover from a failure.

- **Security**

 Network security issues include protecting data from unauthorized access, protecting data from damage and development, and implementing policies and procedures for recovery from data losses.

Network Topology

- A network topology is the arrangement of a network, including its nodes and connecting lines.

There are two ways of defining network geometry

- **physical topology**

It specifies the location of the computers and how the cables runs between them

- **logical topology**

    It is a method used to pass information between the computers

Most common Topologies

- Bus
- Star
- Ring
- Mesh
- Hybrid

Bus Topology

- All the computers are connected to a single cable called bus or backbone of the network.

- Bus topology is multi-point.

- This topology requires terminator for both side of backbone to avoid signal reflection.

- When one computer sends information using cable , all the computers in the network receive the information, but only one accepts it.The rest discards the message. This topology operates in broadcast mode.
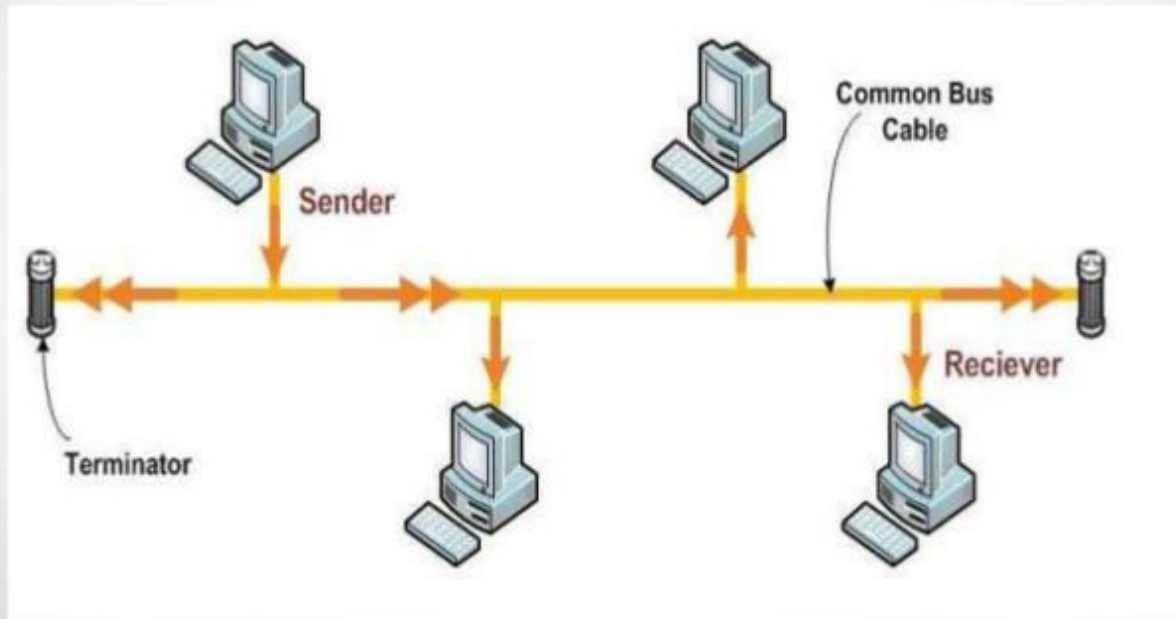
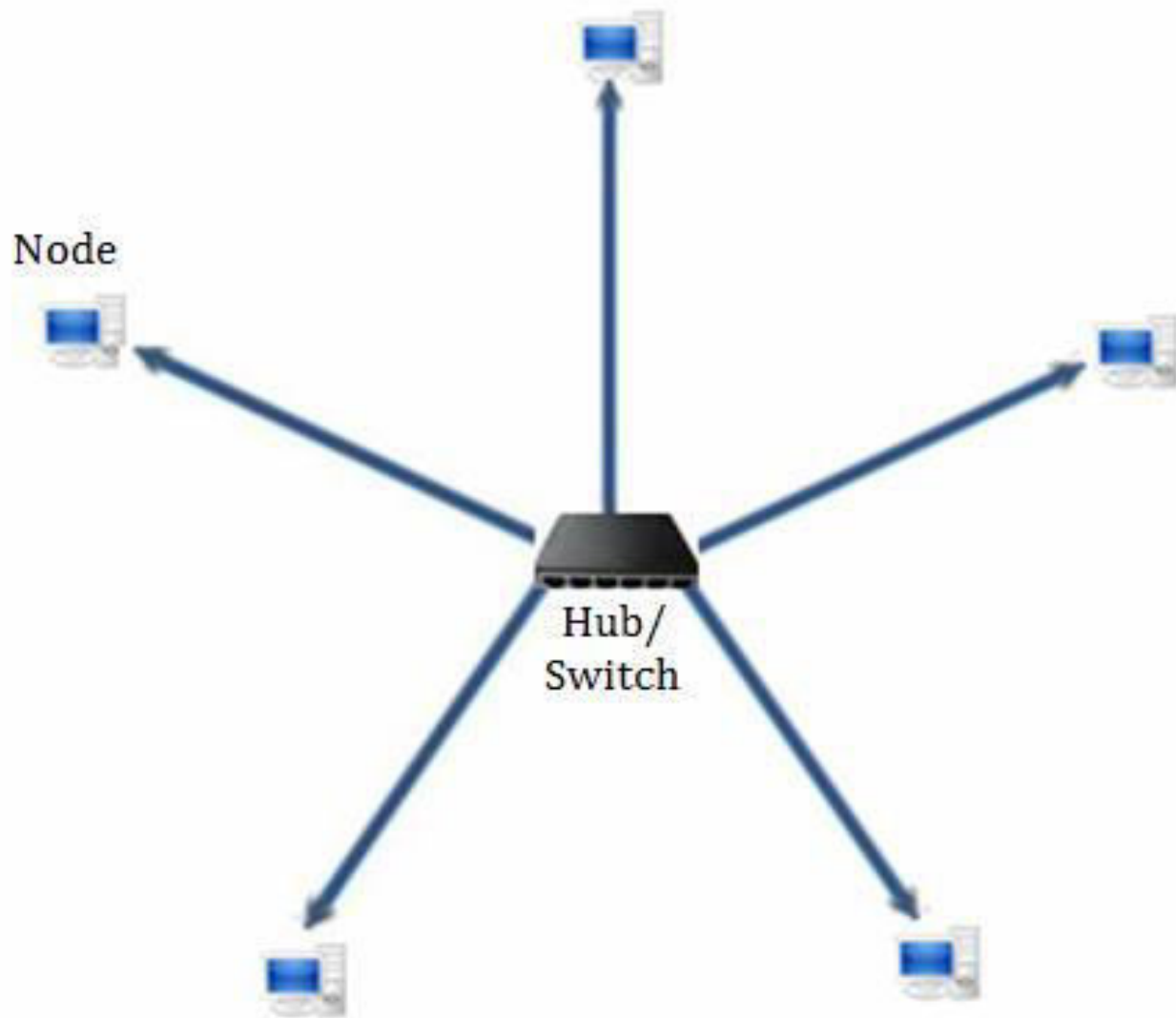# Bus Topology
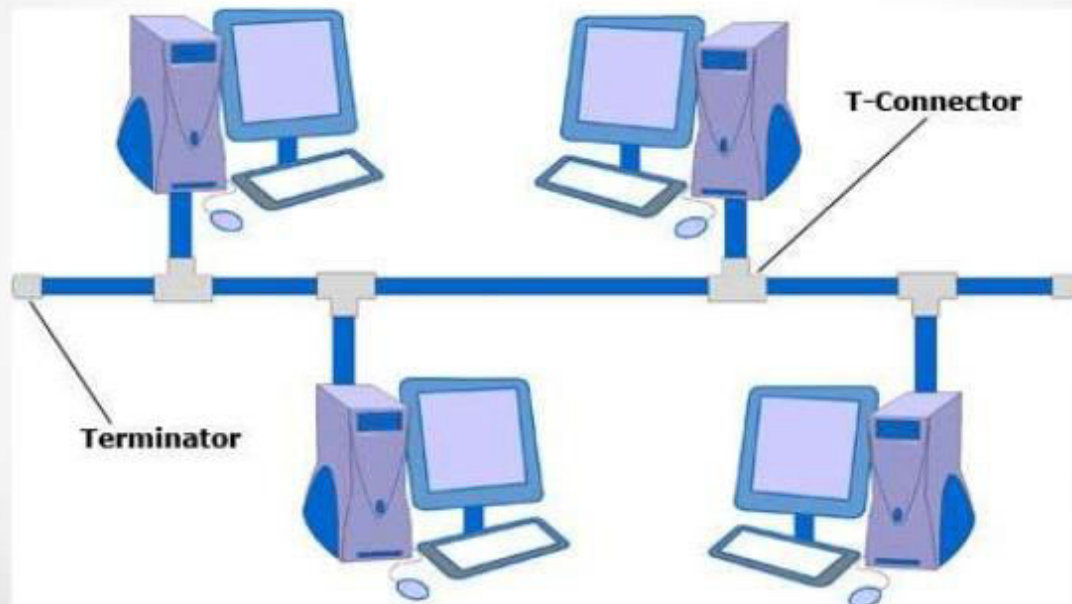
Advantages of Bus topology

- Easy to understand and implement
- Low cost
- Easy to install
- Requires less cable
- Failure of one node does not affect the rest of network
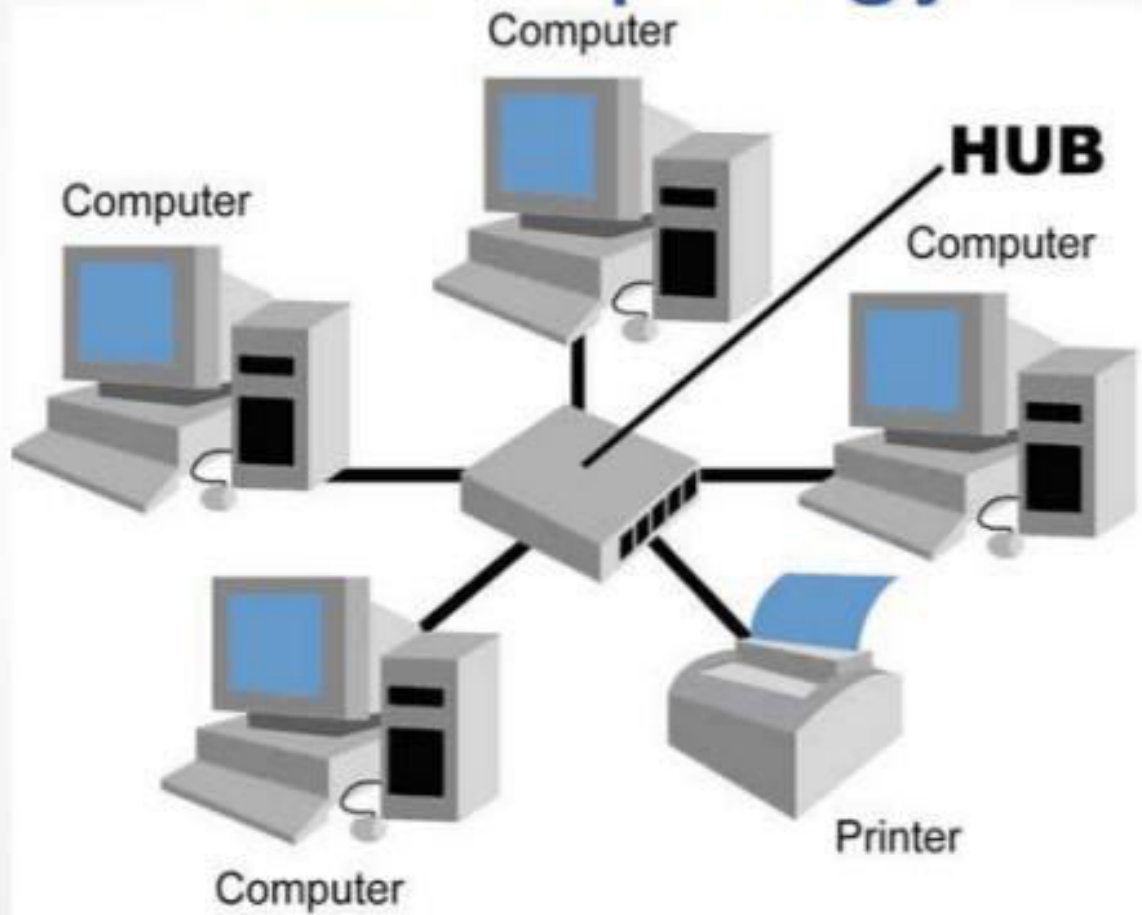
Disadvantages of Bus topology

- Entire network shut down if there is a break in the bus cable

- Terminator is required on both sides.

- Heavy network traffic slow down the bus topology

Star topology

- All the computers are connected to a central device called hub.

- Each device requires a single cable to connect to hub

- If any device wants to send data to another ,it sends to the hub ,which then relays the data to the destination device.

Node

Hub/
Switch

Advantages of Star topology

- Easy to install and configure
- Easy to modify and add more new computers.
- Failure in single computer does not affect the network.
- Security can be implemented in hub.

Disadvantages of star topology

- If the central hub fails, the whole network fails to operate.

- Since each node must be linked to a central hub, more cabling is required.

- Heavy network traffic.

Ring Topology

- Each computer is connected directly to the next computer.
- Every computer in this ring network retransmits whatever it receives from previous computer.
- The message flows in the ring in one direction only.
- A small packet, called the token passed around the ring to each computer.
- Token consists of information and destination address
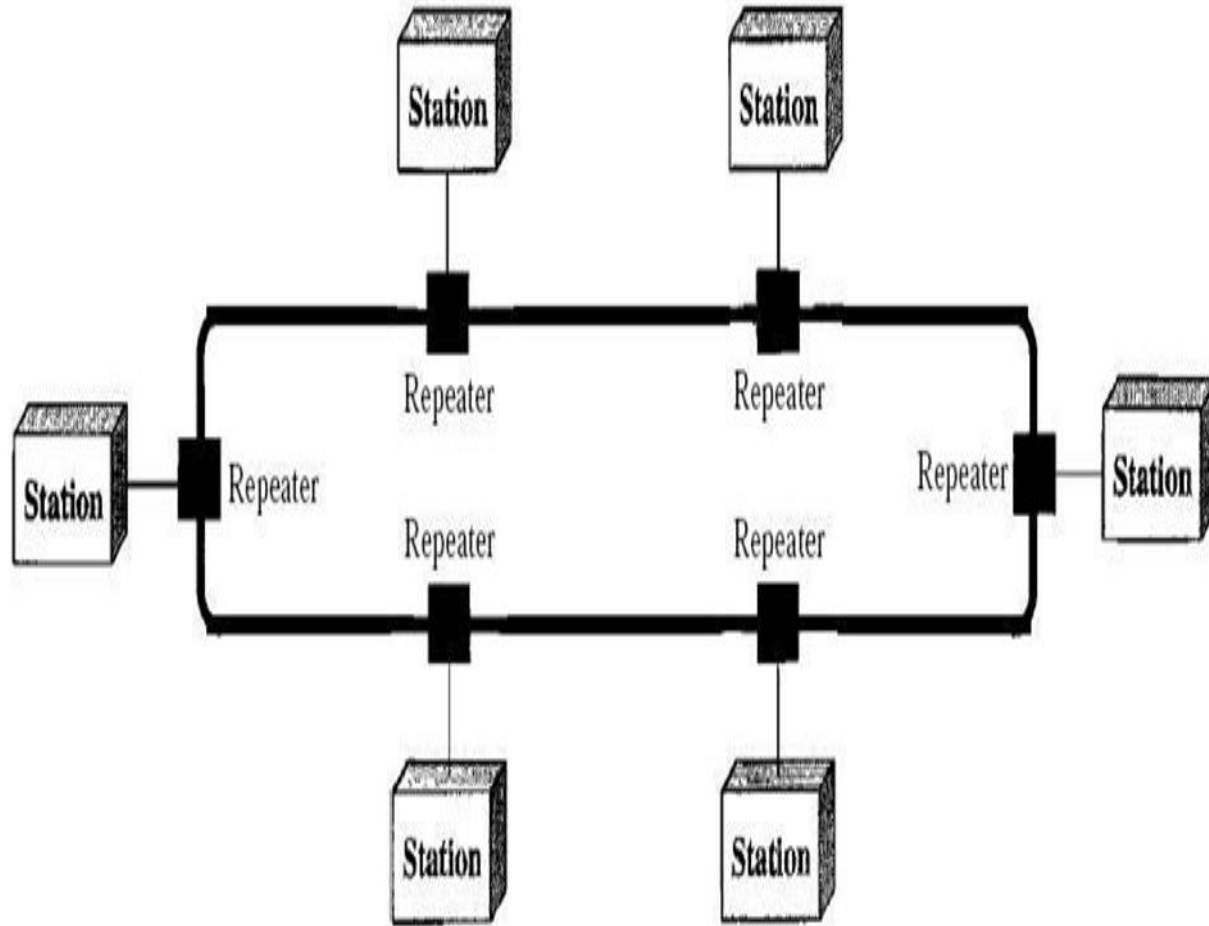
Advantages of Ring Topology

- All the computer have equal access to the network.

- It is easy to install and reconfigure.

- Adding/deleting requires moving only two connections.

Disadvantages

- The signal is passed in one direction.
- A break in the ring can disable the entire network.
- Heavy network traffic.
- It is difficult to troubleshoot the ring network.

Mesh Topology

- Every device has a dedicated point-to-point link to every other device.

- The direct link carries the data only between two devices.

- For n devices, n(n-1)/2 links.

Mesh topology
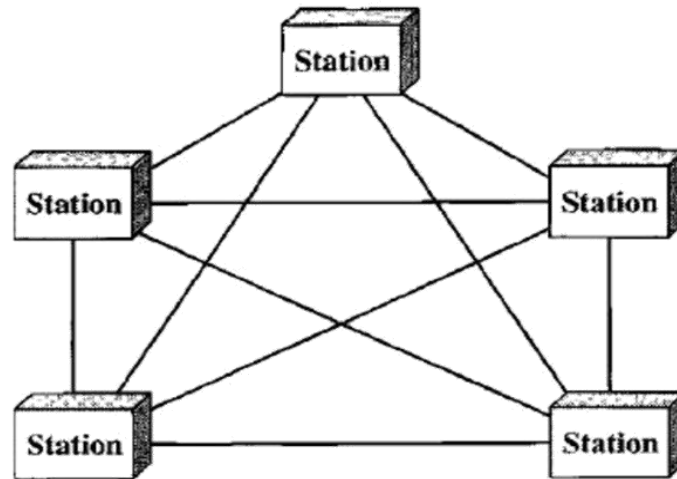
Advantages

- Because of dedicated link, no traffic between computers.

- Failure of one node does not affect the rest of the network.

- Because of the dedicated link, privacy and security are guaranteed.

- Easy to troubleshoot the network.

Disadvantages

- It is very expensive due to amount of cabling.
- Large space is required to run the cables.

Hybrid Topology

- When two or more topologies are connected together forms hybrid topology.