Network Topology
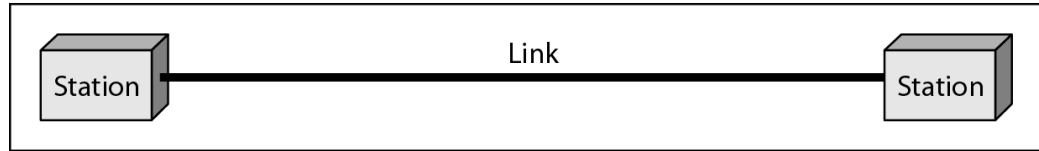
by
Mr. Naveen Chauhan
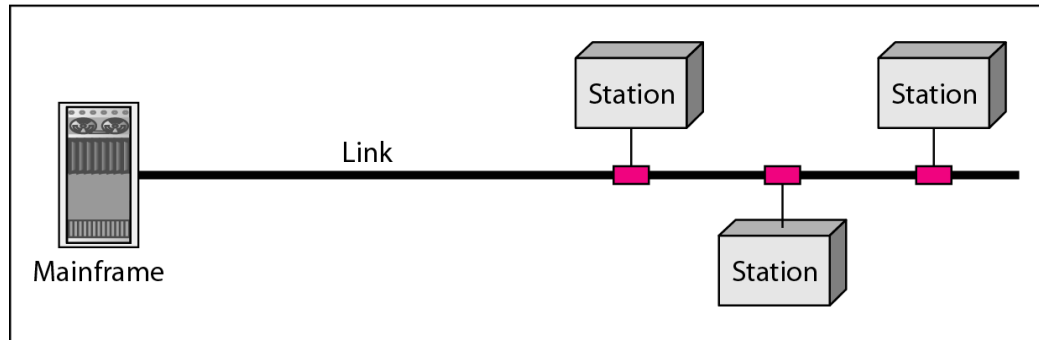### (M. Tech.)
KIET Group of Institutions

Contents

- **Type of Connection**
    - **Point to Point - single transmitter and receiver**
    - **Multipoint - multiple recipients of single transmission**
- **Physical Topology**
    - **Connection of devices**
    - **Type of transmission - unicast, mulitcast, broadcast**

Types of connections: point-to-point and multipoint

❑ **Mainly two types of connections are existing in the network.**
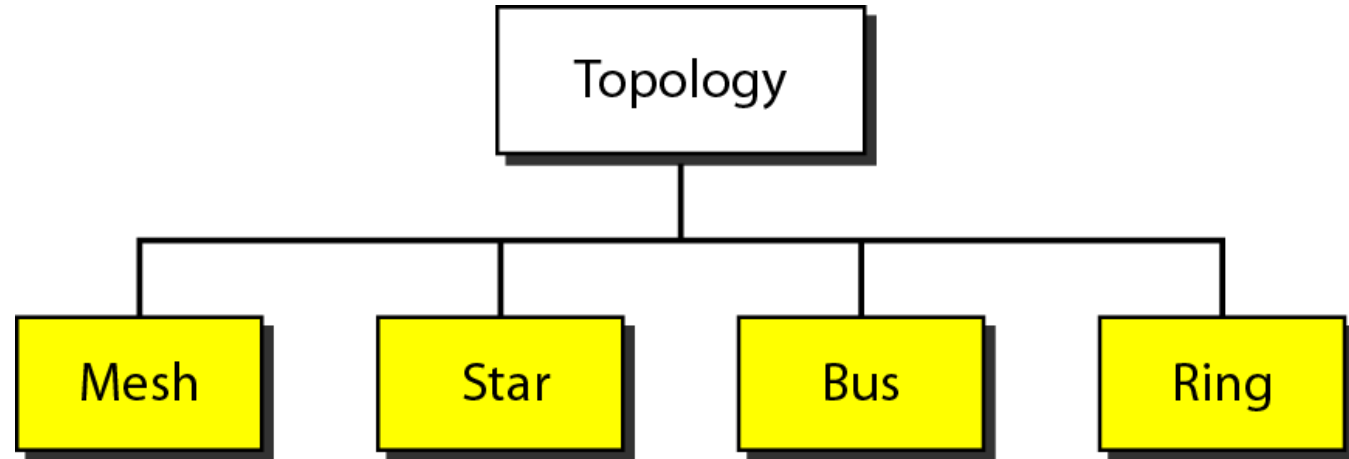❑ **Point-to-Point**
❑ **Multipoint**
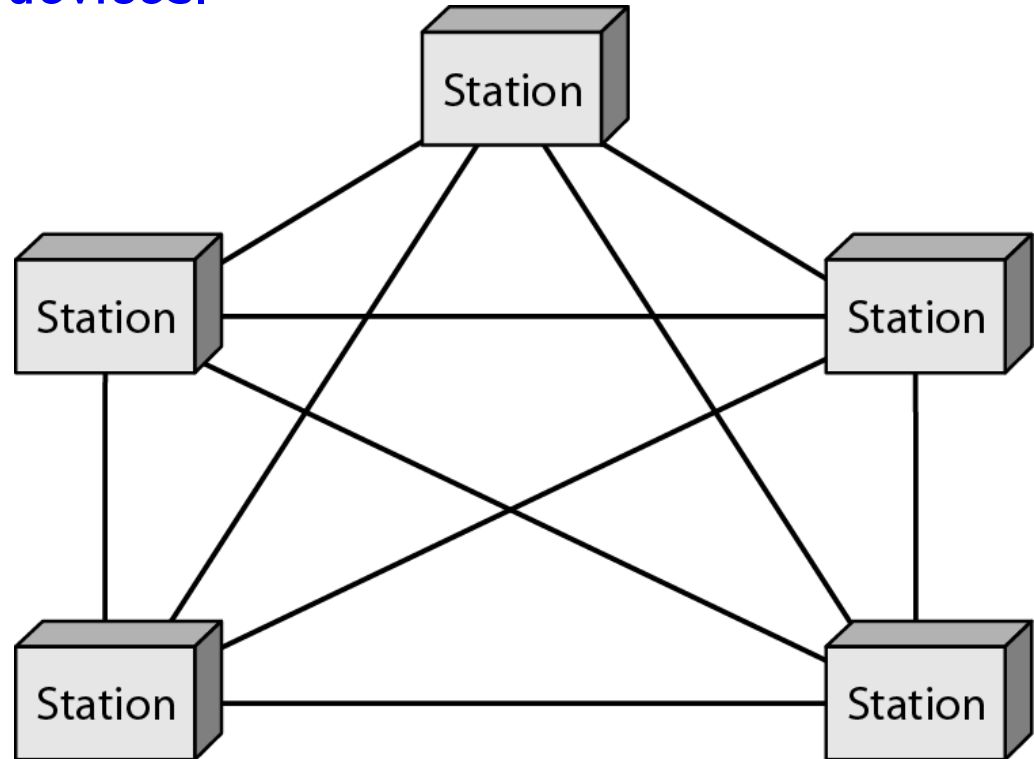

a. Point-to-point

b. Multipoint

Categories of topology

- ❑ **Four types of physical topologies**
- ❑ **Mesh**
- ❑ **Star**
- ❑ **Bus**
- ❑ **Ring**

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                    ┌─────────────┐
                    │  Topology   │
                    └──────┬──────┘
          ┌────────────┬───┴──────┬────────────┐
      ┌───────┐   ┌───────┐   ┌───────┐   ┌───────┐
      │ Mesh  │   │ Star  │   │  Bus  │   │ Ring  │
      └───────┘   └───────┘   └───────┘   └───────┘
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A fully connected mesh topology (five devices)

❑ **Mesh topology with five devices.**

Advantage and disadvantage of mesh topology

❑Advantage

- Eliminating extra traffic.
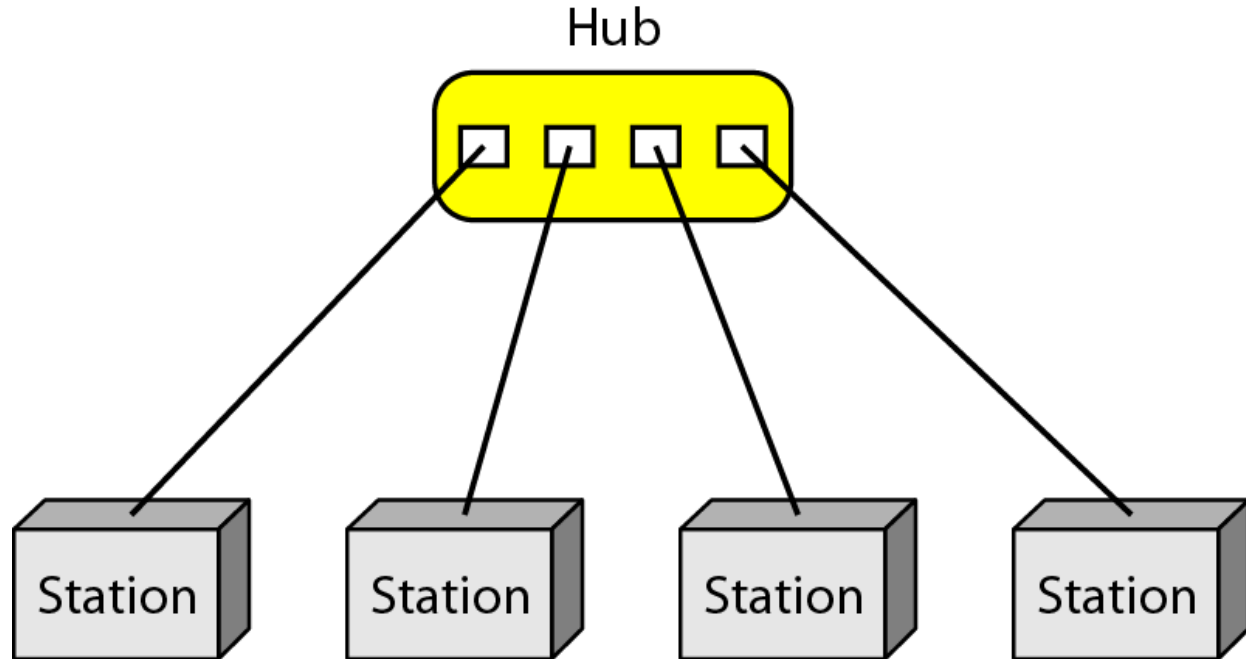
- Robust

- Privacy or security

❑Disadvantage

- No. of cables and I/O ports required.

- Installation and reconnection are difficult.
  - Physical space.
  - Hardware expenses.

Mesh topology

❑n(n-1) physical links required, if each supports communication in both directions.

❑(n-1) I/O ports required.

A star topology connecting four stations

❑ **Star topology must have 1 hub and n I/O ports.**

Hub

Station   Station   Station   Station

Advantage and disadvantage of star topology

❑**Advantage**

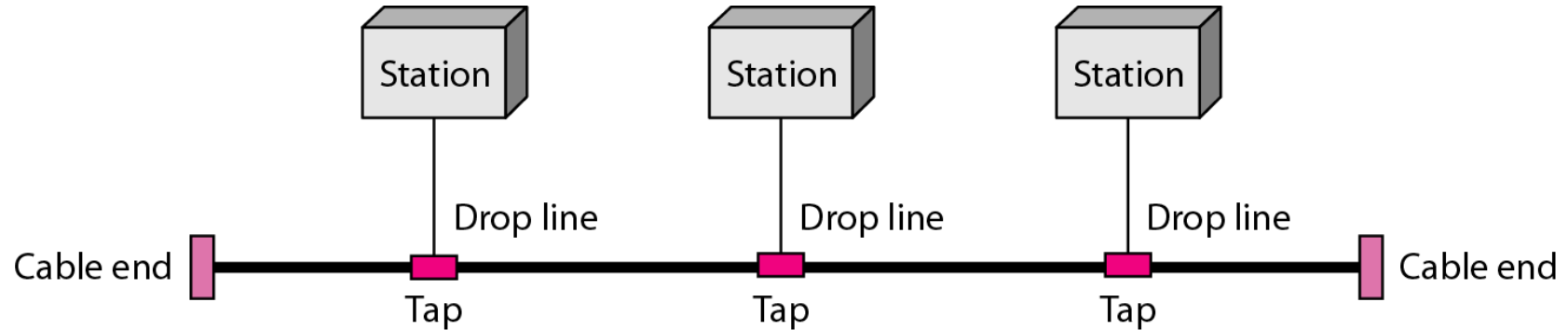▪ Easy to install and reconfiguration.

▪ Less cabling

❑**Disadvantage**

▪ Not robust, one link failed no other way to communication.

▪ If the hub goes down, whole system is dead.

Star topology

❑Each device needs 1 link and 1 I/O port.

A bus topology connecting three stations

❑ **A bus topology arrangement needs 1 backbone cable, n taps, n drop lines to connect devices.**

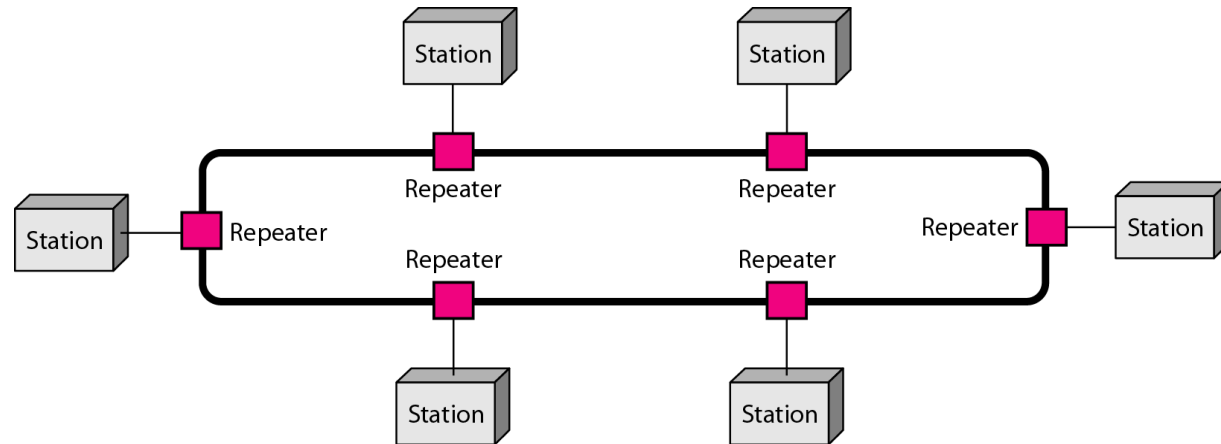# Advantage and disadvantage of bus topology

❑**Advantage**

▪ Ease of installation.

▪ Less cabling.

▪ Each drop line has to reach only as far as the nearest point on the backbone.

❑**Disadvantage**

▪ Difficult reconnection and fault isolation.

▪ Difficult to add new devices.

▪ A fault or break in cable may stops all transmission, and creating noise.

❑ n repeaters are required to connect n devices in the ring topology arrangement.

Advantage and disadvantage of ring topology
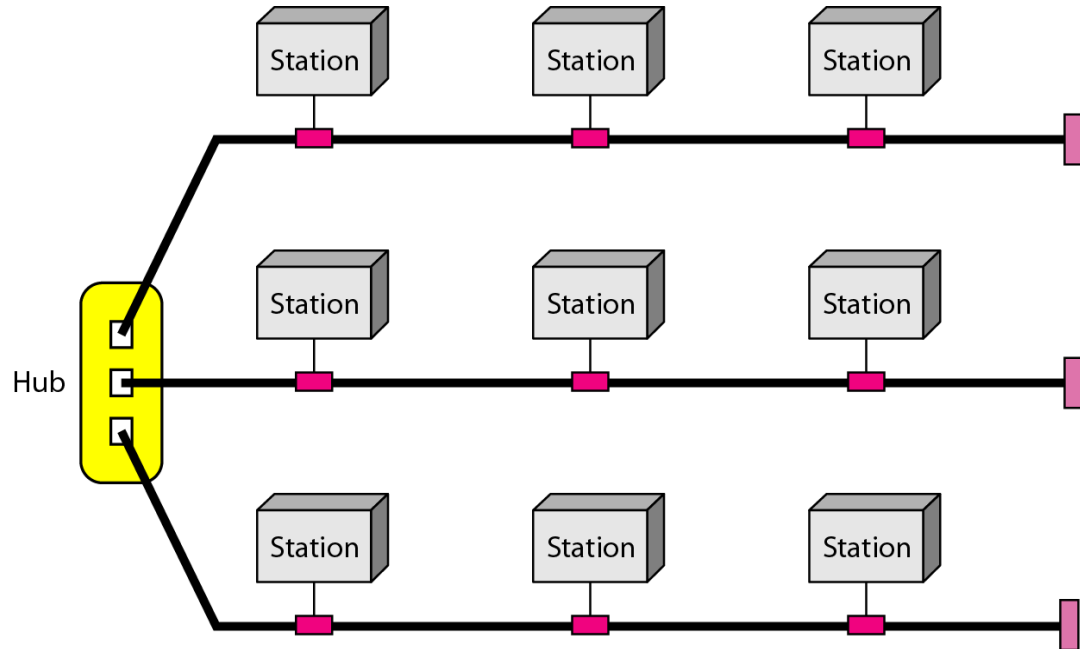
❑**Advantage**

▪ Easy to install and reconfiguration.

▪ Adding and deleting devices is easy.

▪ Fault isolation is easy.

❑**Disadvantage**

▪ Unidirectional traffic is disadvantage.
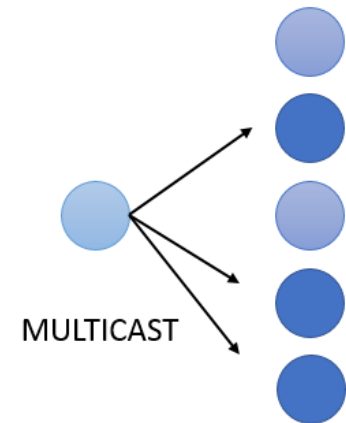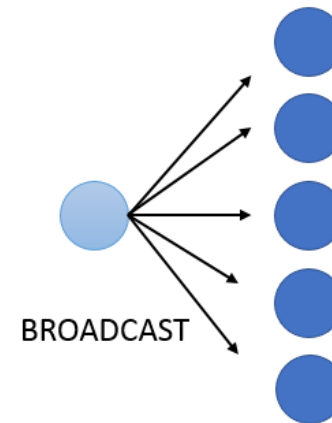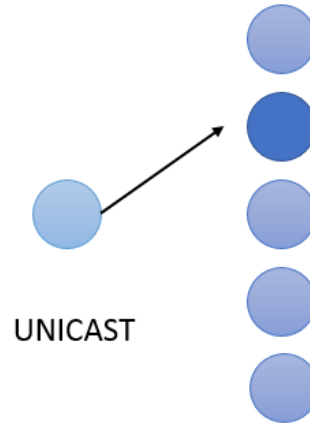
▪ Break in the ring, can disable the transmission.

❑ It is an arrangement of star and bus topology.

Type of transmission

❑ **Transmission types.**

❑ **Unicast**

❑ **Multicast**

❑ **Broadcast**

UNICAST

BROADCAST

MULTICAST

References

❑ B. Forouzan, **"Data Communications and Networking"**, 5th ed., Mcgraw hill.

Thank You