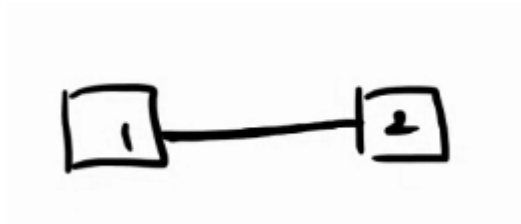


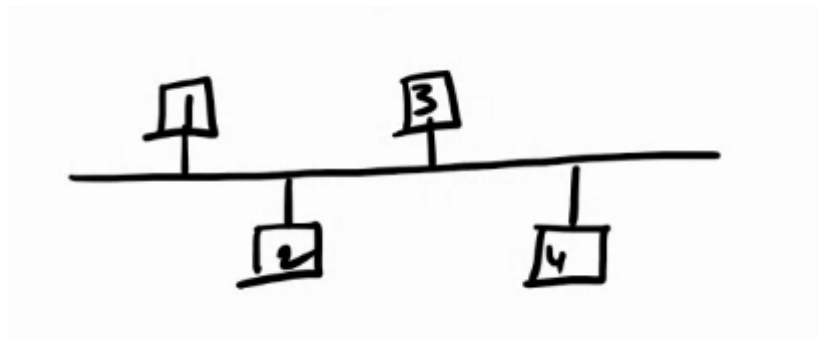
Class 2 - 12/01/2021

Types of Network Connections:

1. Point to Point (Peer-to-Peer) : dedicated line



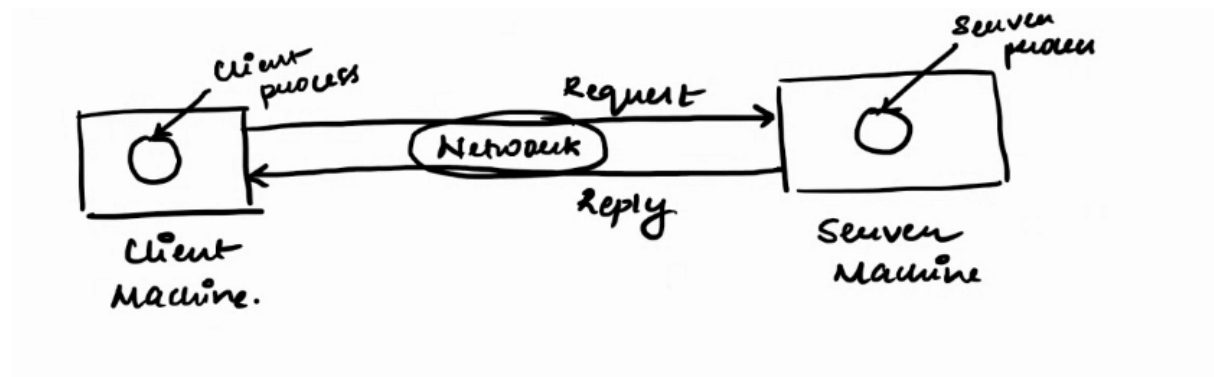
2. Multi point: common link for multiple users



Transmission

1. Unicast - one to one communication, point to point (one sender, one receiver)
2. Multicast - one to many communication (e.g. close friends on Instagram)
3. Broadcast - one to all communication

Client Server Model



Network Topologies

Physical configuration of the network. How the users are connected to form the network

Robust Property

If some link on network doesn't work then it should not affect the entire communication.

Mesh Topology

1. Every device is connected to every
2. Robust
3. Point to point

Advantages:

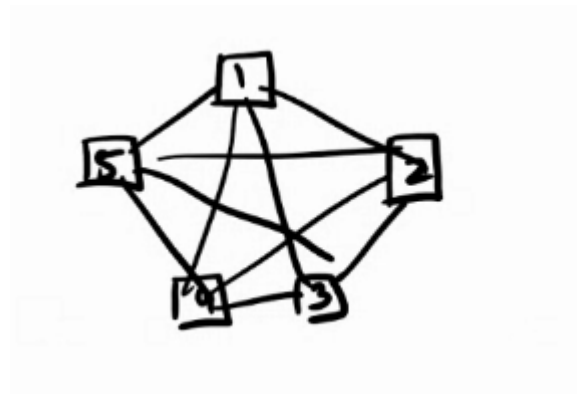
1. Robust
2. Privacy and security since point to point
3. Easy fault diagnosis

Disadvantages:

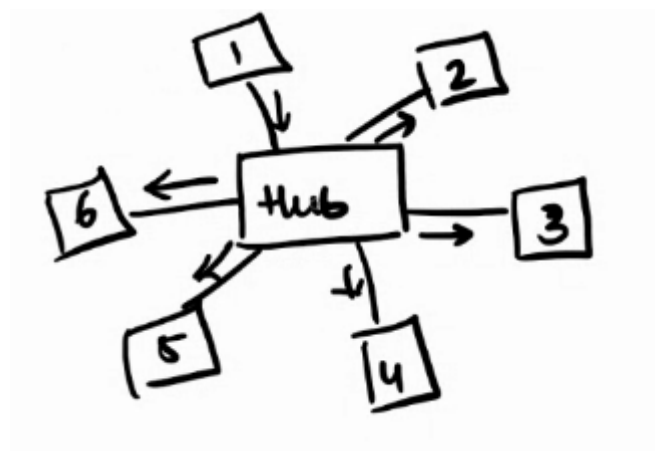
1. Complex network if the number of devices is more
2. Costly and high maintenance

Number of i/o posts at each node to connect n devices = n-1 ports

Number of links required = $n(n-1)/2$



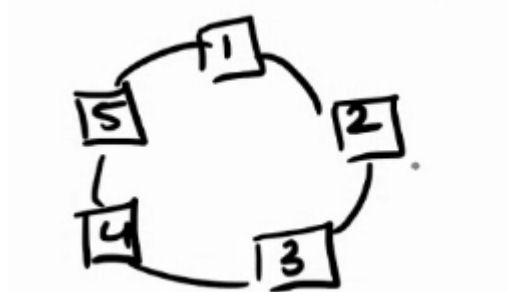
Star Topology



1. Robust
2. If the central hub fails then the whole network fails
3. Point to point connection
4. Number of i/o ports = 1 ports
5. Number of links required = n links

Note: Mesh is more robust than star topology

Ring Topology

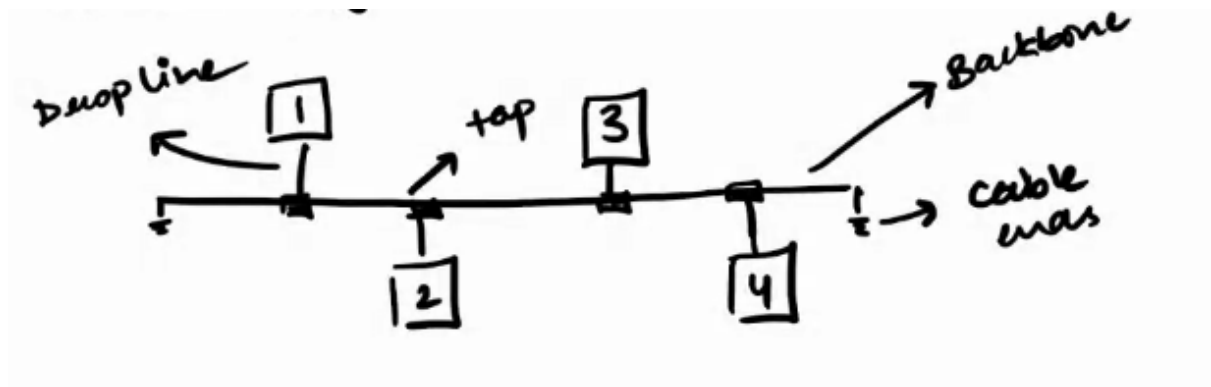


1. Point to point communication
2. Unidirectional (clockwise or anti-clockwise)
3. Non-Robust
4. i/o ports at each node = 2 ports
5. Number of links = n links

Disadvantages:

- Non-Robust
- Adding or removing nodes is difficult. We need to disrupt other nodes.
- fault diagnosis is difficult

Bus Topology



1. Multi point network
2. Non-Robust (Backbone is also a link so if it fails the network fails)
3. i/o port at each node = 1 port
4. Number of links = $n+1$ (backbone is also a link)

Disadvantages:

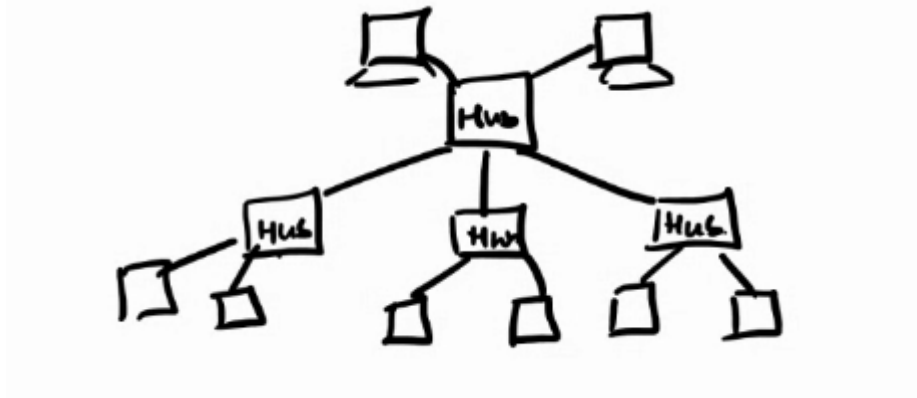
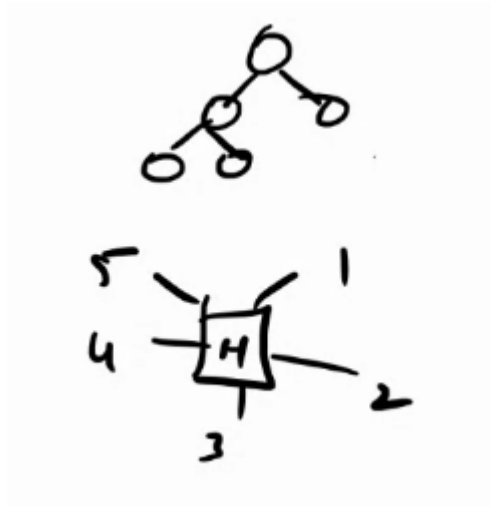
1. Data transmission is slow
2. Non-Robust

Hybrid Topology

Combination of two or more topologies

Tree Topology

1. Hierarchical Topology
2. Variation of star topology



Categories of Network

- PAN (Personal Area Network) - one person. Example: Interacting with mouse
- LAN (Local Area Network) - Traditionally speed was 10 Mbps to 100 Mbps but newer LANs have speed up to 10 Gbps.

Example:

1. IEEE 802.3 - Ethernet (Bus based broadcast network)
 2. IEEE 802.3 (IBM token ring) - 4-16 Mbps
- MAN (Metropolitan Area Network) - restricted to a city.

Example:

1. Cable Television Network

2. IEEE 802.16

- WAN (Wide Area Network) - a country

- Wireless network

Example: Phone calls, Bluetooth, Internet

- Home network
- Inter network or internet - router, hub

Note: internet and Internet (www) are different

Connection oriented service

- Establish a connection between source and receiver
- Send the data
- Release the connection

Example: Telephone Service

Connectionless service

Example: Postal Service

Quality of Service:

1. Reliable

- Data is acknowledged
- No data loss
- Connection oriented service

2. Unreliable

- Connectionless service
- No acknowledgement - don't know if receiver received it

Request-Reply Service