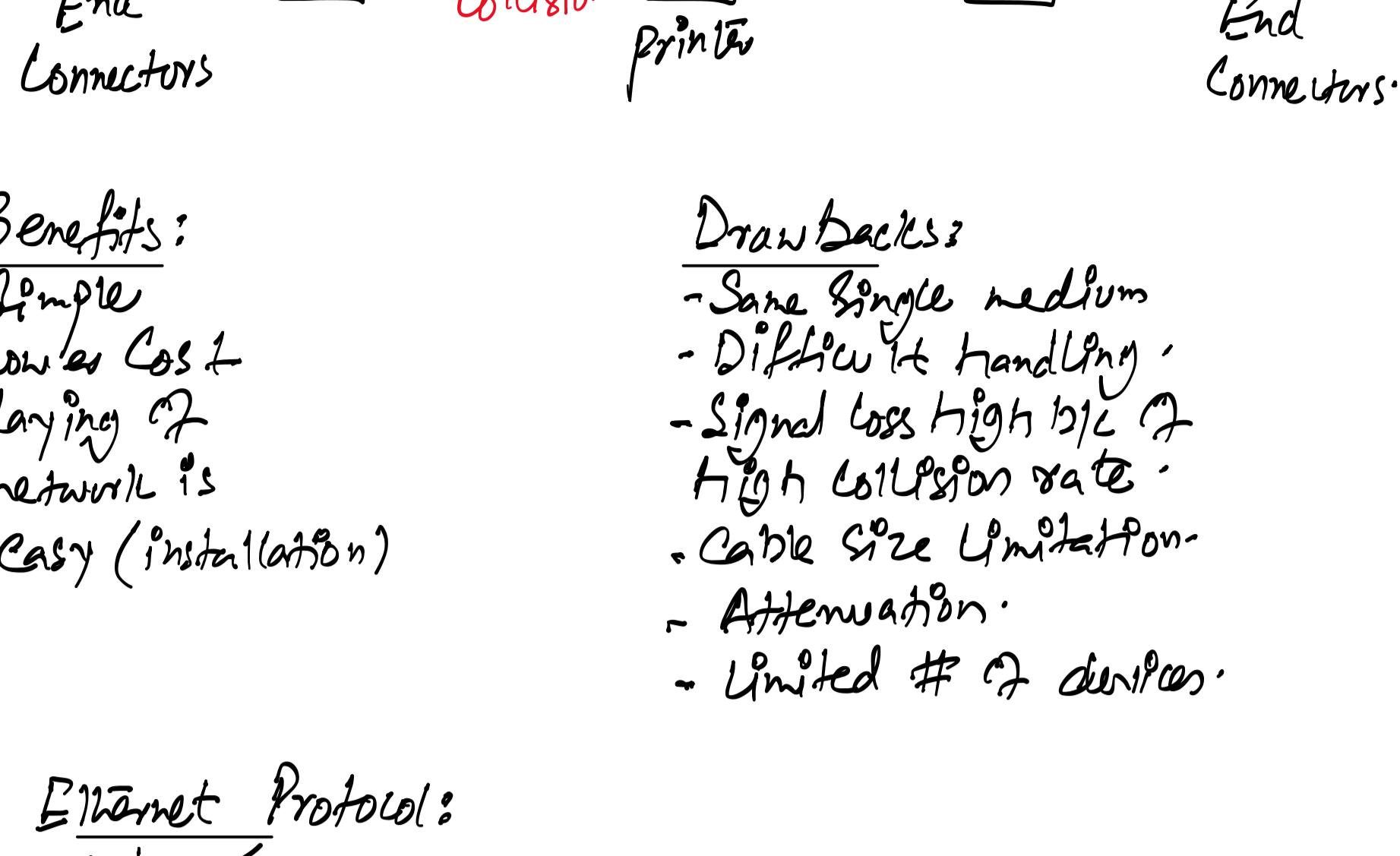


# Network Topology n CSMA/CD

Wednesday, 29 September 2021 6:36 PM

Topology: Arrangement of nodes in a network.  
Network Devices  
Like computers.

## BUS:



### Benefits:

- Simple
- Lower Cost
- Laying of network is easy (installation)

### Drawbacks:

- Same Single medium
- Difficult handling.
- Signal loss high b/c of high collision rate.
- Cable size limitation.
- Attenuation.
- Limited # of devices.

## Ethernet Protocol:

Nodes ✓

frames = packets

medium = wires; single shared medium for bus topology.

segment = Network.

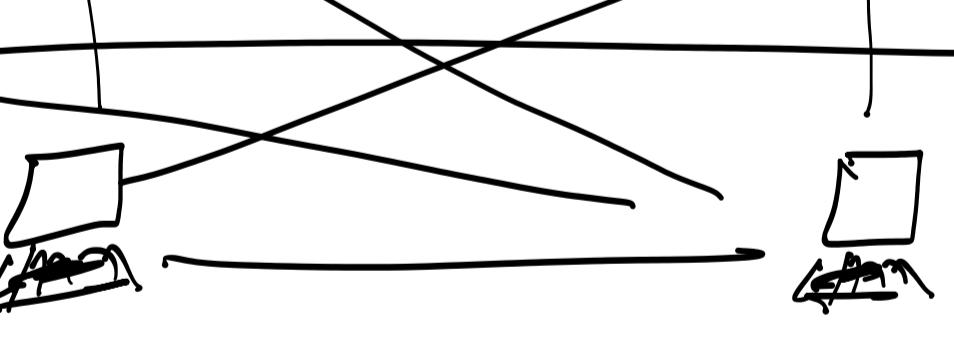
Address: MAC address.

## CSMA/CD and Ethernet:

Carrier Sense Multiple Access w/o Collision Detection

1. Nodes sense the medium for the purpose of frames transfer.
2. If there are no frames already on the medium then the node drops its frames over the medium.
3. If frames (data) is dropped by multiple nodes together then it collides; collision occurs.
4. When the collision occurs all nodes will give up (throw) their frames (data) packets; including the destination node.
5. Sender nodes will then use random timers to send frames at different random timings to avoid the collision.

## STAR TOPOLOGY:



Wireless Access Point (WAP)

### Devices (node types) over the star topology:

- NIC
- WNIC
- WAP
- Hub
- Switch
- Router
- Bridge
- Repeater
- Modem
- Gateway

Sender / Receiver

### Advantages:

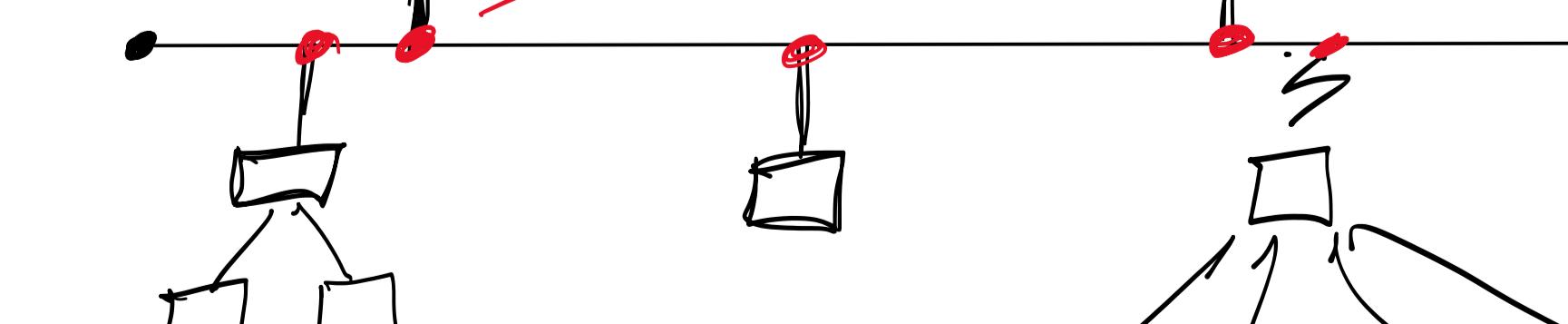
- Collision rate is reduced.
- More secure
- Easy to improve
- When a connection is broken, others remain working.

### Disadvantages:

- Initial Installation cost.
- If central device is broken then whole network goes down.

## MESH TOPOLOGY:

Types: 1) routing  
2) flooding.



### Applications:

- Wide Area Network
- Car sensors network
- Industrial Monitoring and Control.

### Disadvantages:

- Large amount of cables for wired network.
- Expensive Layout.
- Maintenance is time consuming.

## Hybrid Network Topology:

It is a mixture of two or more topologies.



### Advantages:

- Existing networks are connected together.
- No upgradation is required.

Gateway's are used to connect.

Large amount of data is handled seamlessly.

Easy network faults discovery.

### Disadvantages:

- Very complex to put the whole network together.