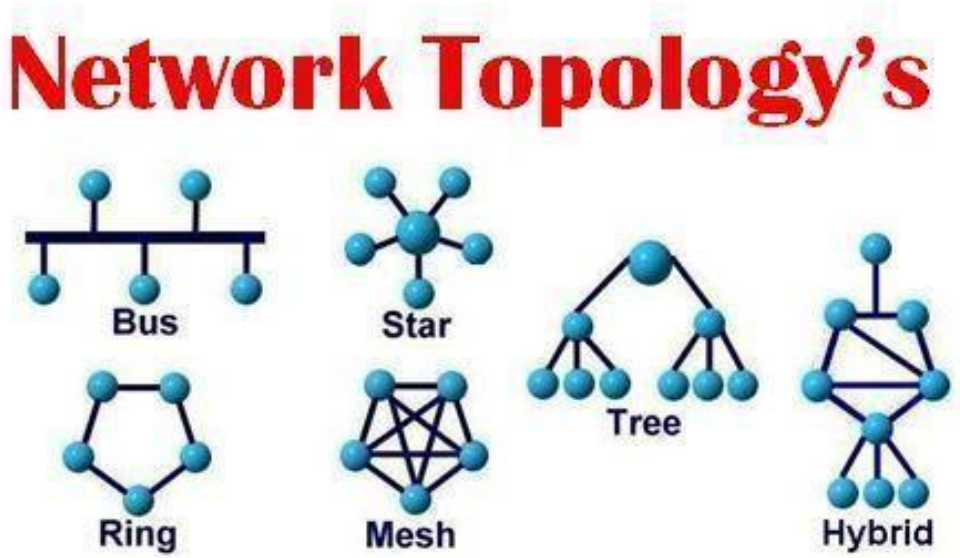
Network Topologies

- Geometric representation of how the computers are connected to each other is known as topology.
- There are five types of topology –
  - Mesh
  - Star
  - Bus
  - Ring
  - Hybrid.



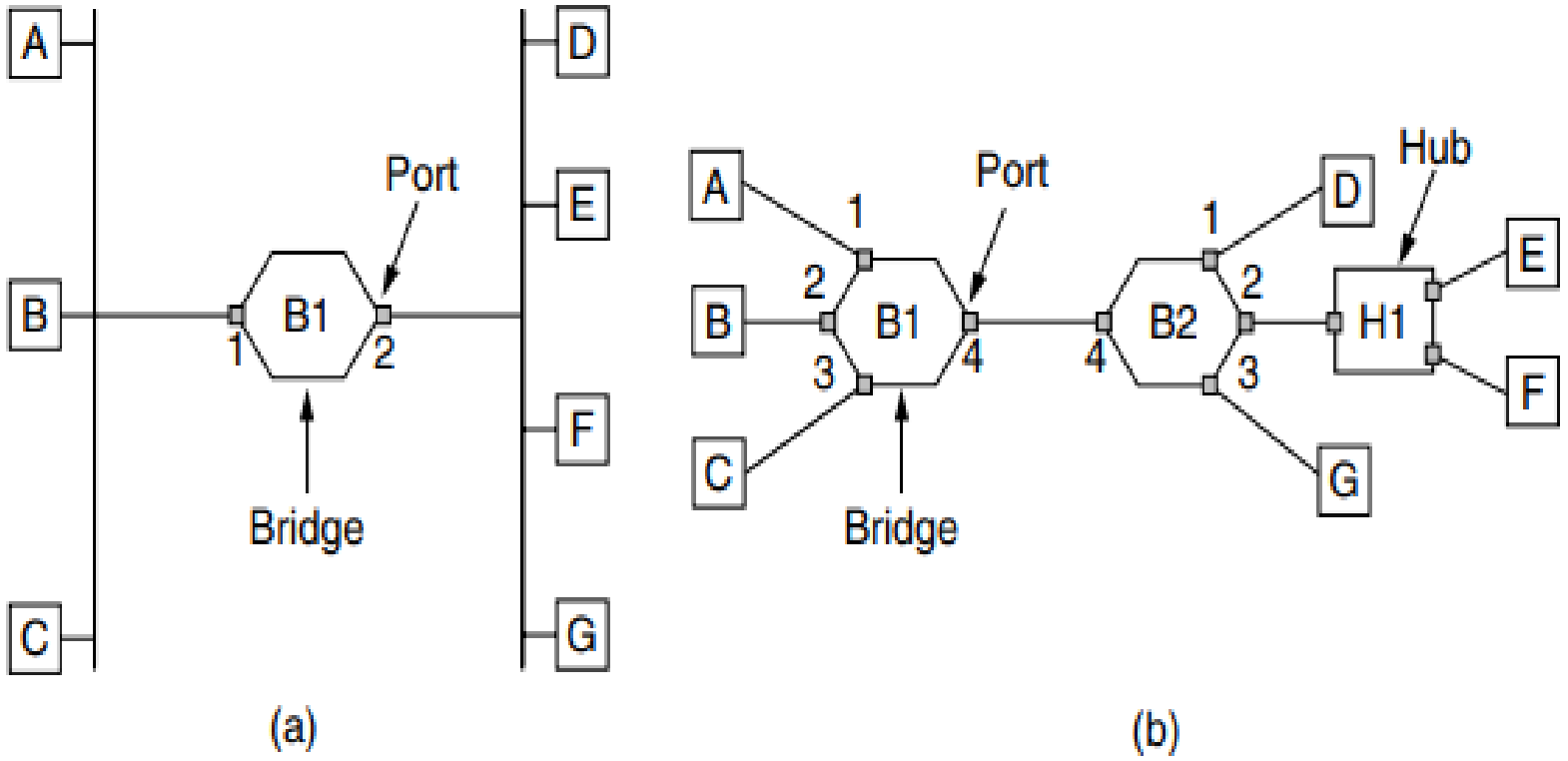


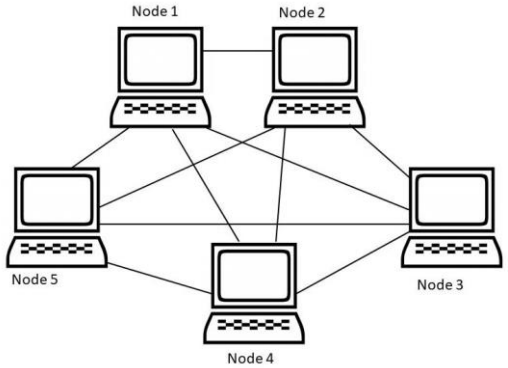
Figure 4-41. (a) Bridge connecting two multidrop LANs. (b) Bridges (and a hub) connecting seven point-to-point stations.

Mesh Topology

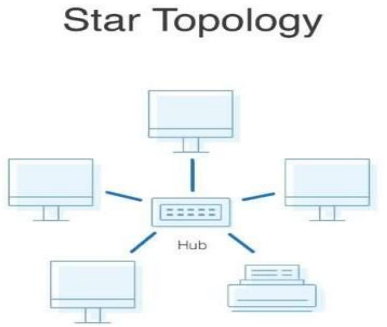
- In mesh topology each device is connected to every other device on the network through a dedicated point-to-point link.
- The link only carries data for the two connected devices only.

Advantages of Mesh topology

1. No data traffic issues as there is a dedicated link between two devices
2. Mesh topology is reliable and robust as failure of one link doesn’t affect other links.
3. Fault detection is easy.



Star Topology

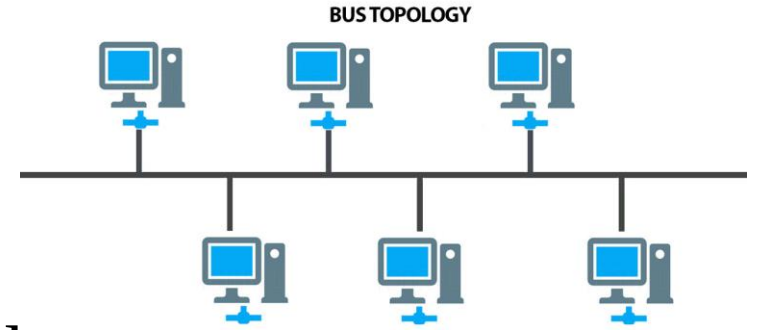


- In star topology each device in the network is connected to a central device called hub.
- Unlike Mesh topology, star topology doesn’t allow direct communication between devices, a device must have to communicate through hub.

Advantages of Star topology

1. Less expensive because each device only need one I/O port and needs to be connected with hub with one link.
2. Easier to install Less amount of cables required because each device needs to be connected with the hub only.

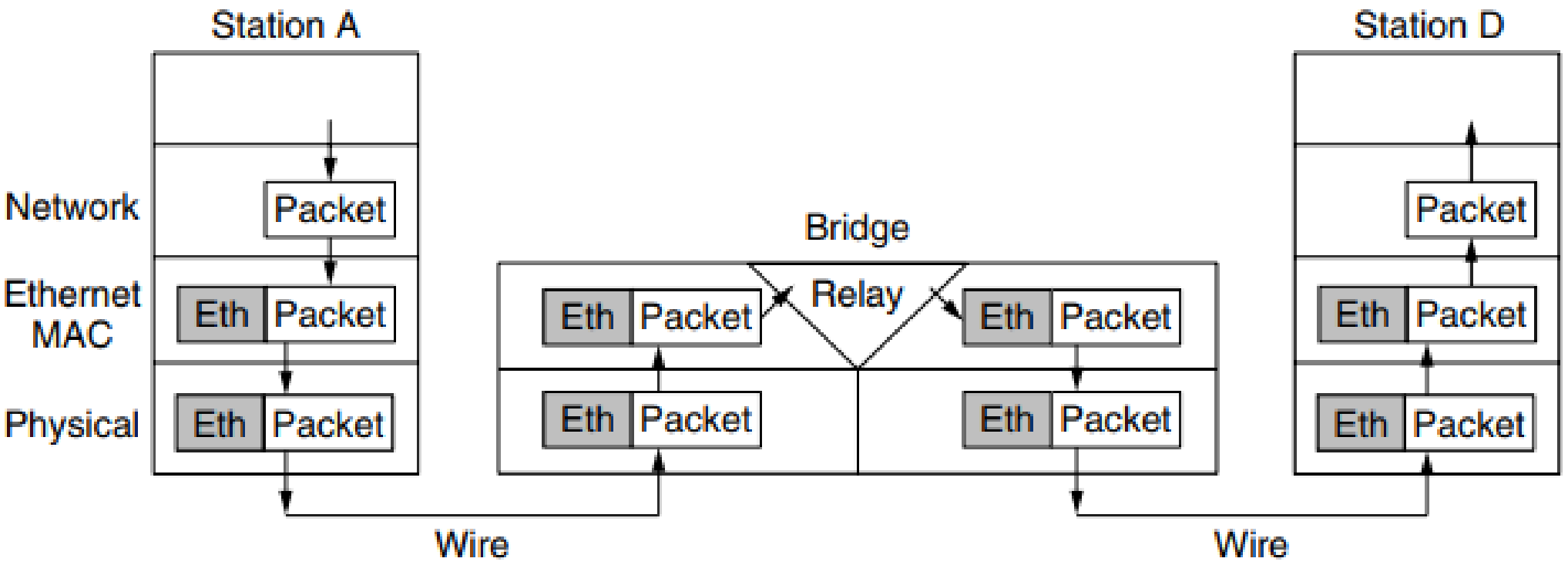
Bus Topology



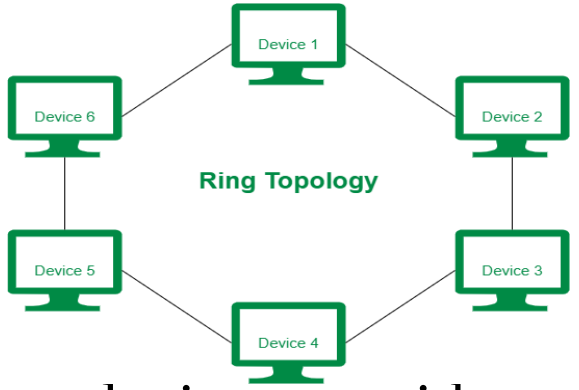
- In bus topology there is a main cable and all the devices are connected to this main cable through drop lines.
- There is a device called tap that connects the drop line to the main cable.
- Since all the data is transmitted over the main cable, there is a limit of drop lines and the distance a main cable can have.

Advantages of bus topology

1. Easy installation, each cable needs to be connected with backbone cable.
2. Less cables required than Mesh and star topology


Station A
Station D
Network
Ethernet MAC
Physical
Packet
Eth
Bridge
Relay
Wire
Wire

Ring Topology



- In ring topology each device is connected with the two devices on either side of it.
- This structure forms a ring thus it is known as ring topology.
- If a device wants to send data to another device then it sends the data in one direction, each device in ring topology has a repeater, if the received data is intended for other device then repeater forwards this data until the intended device receives it.

Advantages of Ring Topology

1. Easy to install.
2. Managing is easier as to add or remove a device from the topology only two links are required to be changed.

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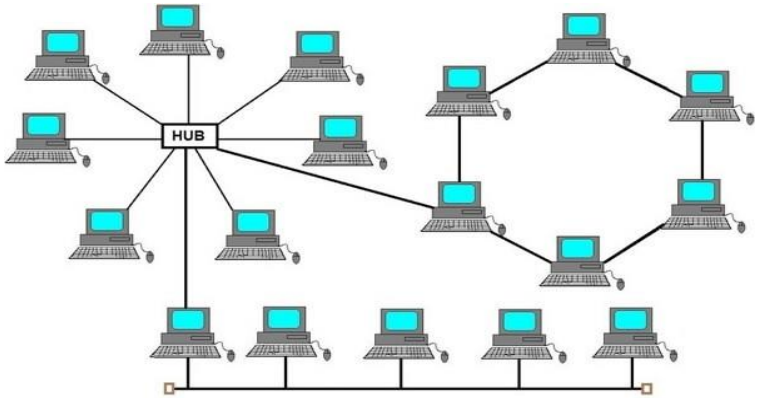
Hybrid Topology



- A combination of two or more topology is known as hybrid topology. For example a comb

Advantages of Hybrid topology

1. We can choose the topology based on the requirement for example, scalability is our concern then we can use star topology instead of bus technology.
2. Scalable as we can further connect other computer networks with the existing networks with different topologies.