NETWORK TOPOLOGY
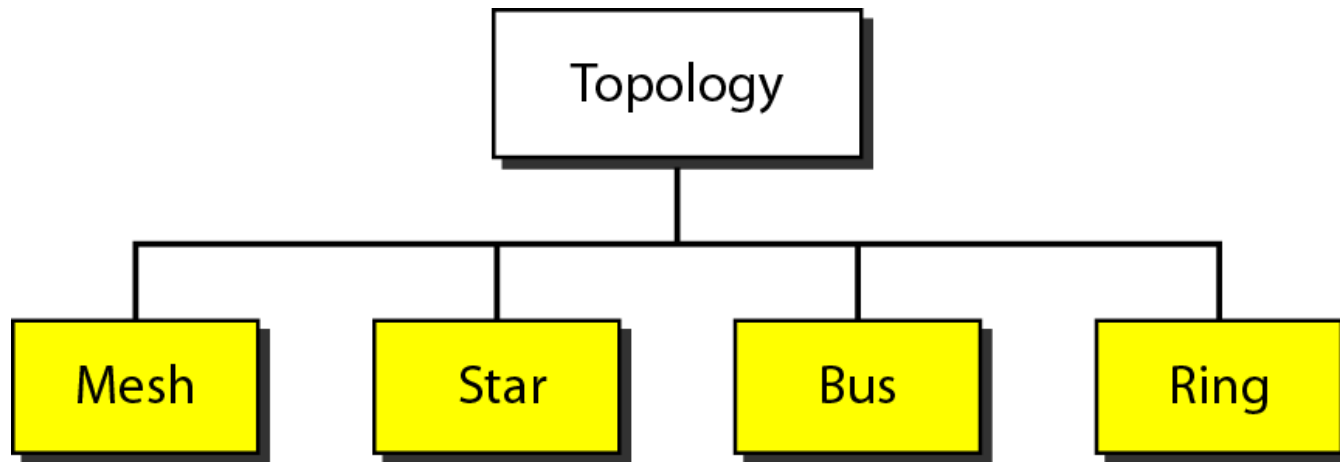
- *A Network Topology is the way computer systems or network equipment connected to each other.*

- *Topologies may define both physical and logical aspect of the network.*

- *Two or more links form a topology.*

There are four basic topologies possible:

- *Mesh*

- *Star*

- *Bus and*

- *Ring*

1.1

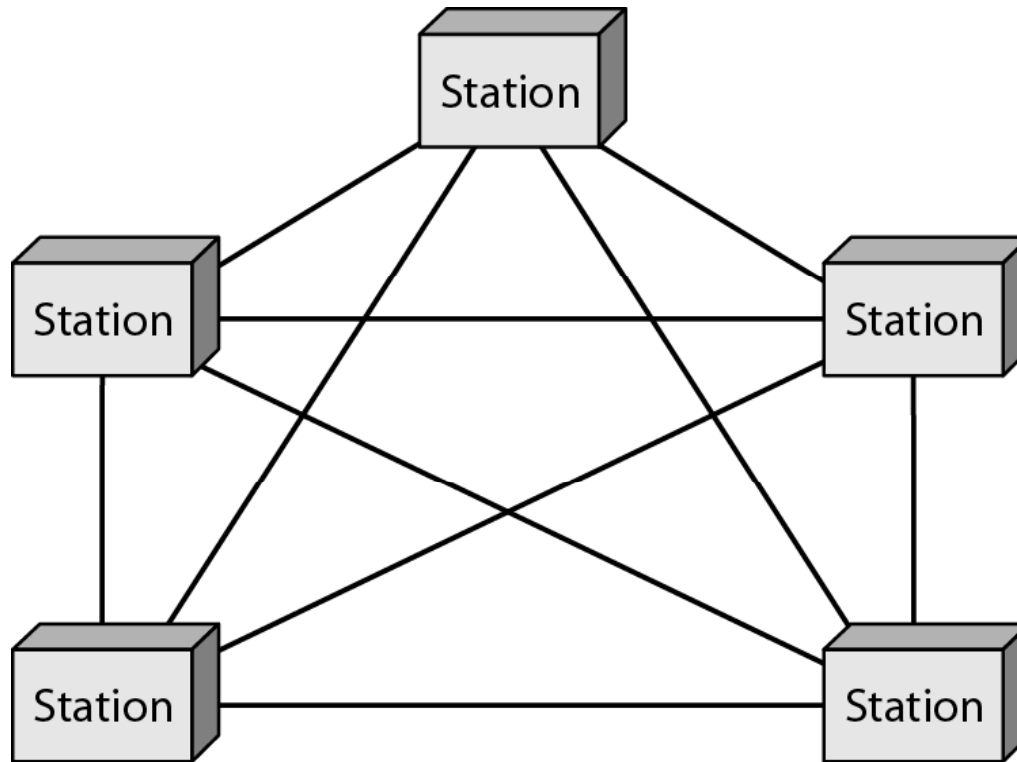# **Figure 1.4** *Categories of topology*

MESH TOPOLOGY

In a mesh topology, every device has a dedicated point-to-point link to every other device.

The term dedicated means that the link carries traffic only between the two devices it connects.

Figure 1.5 *A fully connected mesh topology (five devices)*

Advantages

•*The use of dedicated links guarantees that each connection can carry its own data load, thus* eliminating the traffic problems *that can occur when links must be shared by multiple devices.*

•*A mesh topology is* robust*. If one link becomes unusable, it does not incapacitate the entire system.*

•*There is the advantage of privacy or* security*. When every message travels along a dedicated   line, only the intended recipient sees it.*

•*Point-to-point links make* fault identification and fault isolation *easy.*

Disadvantages

•Amount of cabling and the number of I/O ports required.

•The bulk of the wiring can be greater than the Available space (in walls, ceilings, or floors) can accommodate.

•The hardware required to connect each link (I/O ports and cable) can be prohibitively expensive.

STAR Topology

*In a star topology, each device has a dedicated point-to-point link only to a central controller, usually called a hub.*

The devices are not directly linked to one another.

Unlike a mesh topology, a star topology does not allow direct traffic between devices.

The controller acts as an exchange: If one device wants to send data to another, it sends the data to the controller, which then relays the data to the other connected device.

1.7

Figure 1.6 *A star topology connecting four stations*
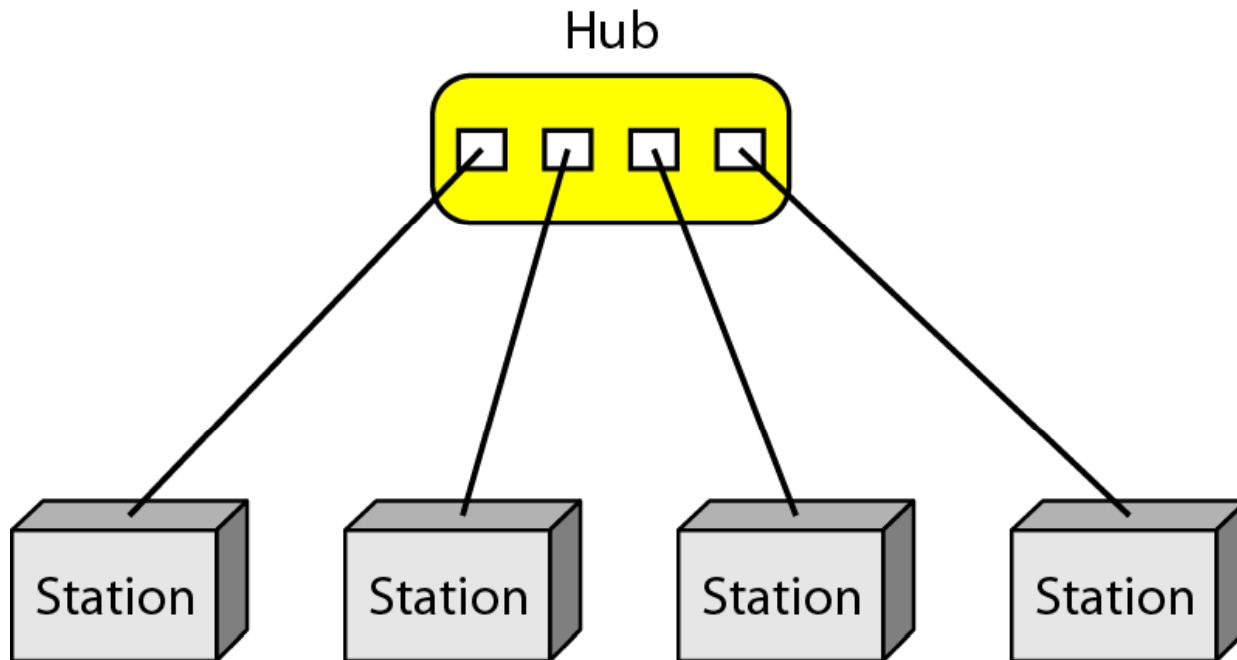
Advantages

•*A star topology is less expensive than a mesh topology.*

•*In a star, each device needs only one link and one I/O port to connect it to any number of others. This factor also makes it easy to install and reconfigure.*

•*Far less cabling needs to be housed, and additions, moves, and deletions involve only one connection: between that device and the hub.*

•*Other advantages include robustness. If one link fails, only that link is affected. All other links remain active.*

Disadvantages

- *The dependency of the whole topology be on one single point, the hub. If the hub goes down, the whole system is dead.*

BUS TOPOLOGY

- *The preceding examples all describe point-to-point connections.*

- *A bus topology, on the other hand, is multipoint.*

- *One long cable acts as a Backbone to link all the devices in a network.*

- *Nodes are connected to the bus cable by drop lines and taps.*

Figure 1.7 *A bus topology connecting three stations*
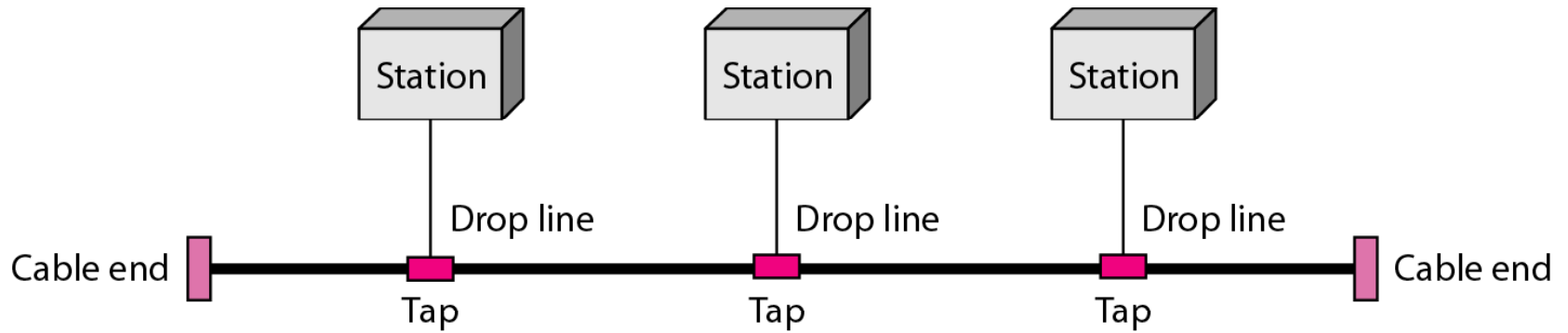
Advantages

- *Bus topology includes ease of installation.*

- *A bus uses less cabling than mesh or star topologies.*

Disadvantages

- *Difficult reconnection and fault isolation.*

- *A fault or break in the bus cable stops all transmission, even between devices on the same side of the problem.*

RING TOPOLOGY

- *In a ring topology, each device has a dedicated point-to-point connection with only the two devices on either side of it.*

- *A signal is passed along the ring in one direction, from device to device, until it reaches its destination.*

Figure 1.8 *A ring topology connecting six stations*