# Network Topologies

• Topology - Physical and logical network layout – Physical – actual layout of the computer cables and other network devices – Logical – the way in which the network appears to the devices that use it.

• Common topologies: – Bus, ring, star, mesh and wireless

Bus topology

- Uses a trunk or backbone to which all of the computers on the network connect.

- Systems connect to this backbone using T connectors or taps.

- Coaxial cablings (10Base-2, 10Base5) were popular options years ago.
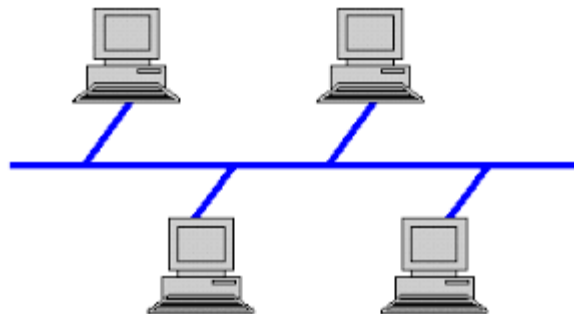
Bus Topology

| Advantages	Disadvantages
Cheap and easy to implement	Network disruption when computers are added or removed
Require less cable	A break in the cable will prevent all systems from accessing the network
Does not use any specialized network equipment.	Difficult to troubleshoot

Ring Topology

- Logical ring
  – Meaning that data travels in circular fashion from one computer to another on the network.
  – Typically FDDI, SONET or Token Ring technology are used to implement a ring network
  – Ring networks are most commonly wired in a star configuration
- Token Ring has multi-station access unit (MSAU),equivalent to hub or switch. MSAU performs the token circulation internally.

Ring Topology

| Advantages	Disadvantages
Cable faults are easily located, making troubleshooting easier	Expansion to the network can cause network disruption
Ring networks are moderately easy to instal	A single break in the cable can disrupt the entire network.

Ring Topology

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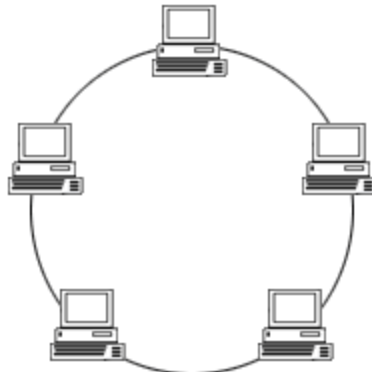
Star Topology

- All computers/devices connect to a central device called hub or switch.

- Each device requires a single cable

- point-to-point connection between the device and hub.

- Most widely implemented

- Hub is the single point of failure

Star Topology

Advantages	Disadvantages
Easily expanded without disruption to the network	Requires more cable
Cable failure affects only a single user	A central connecting device allows for a single point of failure
Easy to troubleshoot and isolate problems	More difficult to implement

Star Topology

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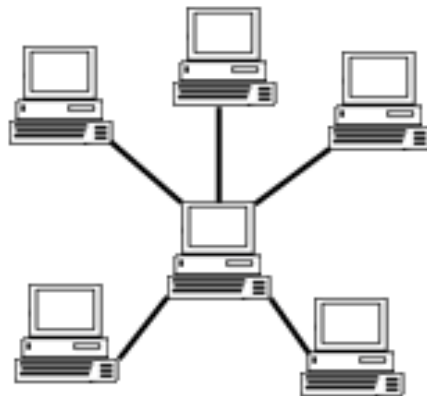
Mesh Topology

- Each computer connects to every other.
- High level of redundancy.
- Rarely used.
  - Wiring is very complicated
  - Cabling cost is high
  - Troubleshooting a failed cable is tricky
  - A variation hybrid mesh
  - create point to point connection between specific network devices, often seen in WAN implementation.

Mesh Topology

Advantages	Disadvantages
Provides redundant paths between devices	Requires more cable than the other LAN topologies
The network can be expanded without disruption to current uses	Complicated implementation

Mesh Topology

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