Network Types

> Tags: Corporate Network, PAN, LAN, MAN, WAN, Network Types, Network Topology, Ring Network, Bus Network, Star Network, Mesh Network,

Corporate Network Infrastructure

- Large companies with many different locations and thousands of employees have several **local networks** (per office) and these networks can be tied together into a **corporate-wide infrastructure**.
- Alongside with network elements, these companies store **applications**, **web pages** in local and external resources

Network Types

A personal area network (PAN)

*supports the interconnection of information technology close to **one person**.*

A local area network(LAN)

*connects computer systems and devices within a **small area** (like an office or a home)*

- designed to connect personal computers and other digital devices within **500-meter** radius
- typically connect a few computers in a small office, all the computers in one building, or all the computers in several buildings in close proximity

A metropolitan area network(MAN)

connects users and their devices in a metropolitan area

- usually an area that spans a campus or a city and its major suburbs

A wide area network (WAN)

*connects **large geographic regions***

- span broad distances - entire **regions**, **states**, **continents**, or **the entire globe**, may involve **trans-border** data flow
- the most universal and powerful **WAN** is ***the Internet***
- computers connect to a **WAN** through public networks, such as the **telephone system** or **private cable systems**, or through **leased lines or satellites**. ~*Might be in the final*

- computer equipment owned by the user and data communications equipment and telecommunication links provided by various **carriers** and **service providers**

Network Topology

*A diagram that indicates how the **communications links** and **hardware devices of the network** are arranged*

*Most common **Network Topologies:***

- Ring network
- Bus network
- Star network
- Mesh network

Ring Network

*In **ring network*** each node connects to **exactly two other nodes**, forming a single continuous pathway for signals through each node - a **ring**.

- Data travels from **node to node** with each node along the way handling **every packet**

Pros

- One computer cannot **monopolize** the network.(Every computer is treated as the same).

Cons

- Failure of one computer can affect the **whole network**.
- It is difficult to **troubleshoot**.
- **Adding and removing computers** disrupts the network.
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IMPORTANT NOTE: JUST BECAUSE IT IS CALLED A "RING NETWORK" DOES NOT MEAN IT SHOULD BE SHAPED LIKE A RING(THIS ALSO APPLIES TO OTHER FORMS OF NETWORKS)

Bus Network

A **Bus network** is an arrangement in a **local area network(LAN)** in which each node(workstation or other device) is connected to a **main** cable or link called the **bus**.

- In a bus network, every station will receive all network traffic and the traffic generated by each station has equal transmission priority.

Pros

- **Easy** to install
- **Cheap**

Cons

- Depend on **bus cable**
- Not **secure** - information is sent to every node
- Slower due to collisions
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Star Network

A **Star Network** is one of the most **common** computer network topologies

- In **star topology**, every host is connected to a **central hub**.
- Sender sends a frame with some information about the **source** and **destination** addresses along with the data itself to the switch it is connected to.
- Switch accepts the package.
- If **Source** is **not** in the switch table then...
  - Add this address to the table
  - Compare the **DEST** address of the frame with the addresses in the table.
    - If there is a match, then
      - Send the frame through the port associated with the **DEST**
    - else
      - Send the frame through **all the ports** except the one associated with the SOURCE.

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Star Network Explanation ExcaliDraw

Mesh Network

In **Mesh Network** the infrastructure nodes(switched) connect **directly**, **dynamically** and **non-hierarchically** to as many other nodes as possible and cooperate with one another to efficiently route data from/to clients

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