**What is Computer Networking?**

Computer networking is the practice of connecting multiple computing devices—such as computers, servers, and routers—so they can share data, resources, and services. These interconnected systems form a network that enables communication and collaboration across various platforms.

**Types of Networks**

Networks are categorized based on their size, range, and purpose:

* **PAN (Personal Area Network)**: A small network typically used for connecting devices like smartphones, tablets, and laptops within a short range (usually within 10 meters).
* **LAN (Local Area Network)**: Covers a limited area such as a home, office, or building. It enables high-speed data transfer among connected devices.
* **MAN (Metropolitan Area Network)**: Spans a city or a large campus, connecting multiple LANs to form a larger network.
* **WAN (Wide Area Network)**: Covers a broad area, such as multiple cities or countries. The Internet is the largest example of a WAN.
* **CAN (Campus Area Network)**: Connects multiple LANs within a limited geographical area, like a university or corporate campus.
* **SAN (Storage Area Network)**: A specialized network that provides access to consolidated, block-level data storage.
* **VPN (Virtual Private Network)**: Extends a private network across a public network, allowing users to send and receive data securely.

**Network Topology**

Network topology refers to the arrangement of different elements (links, nodes, etc.) in a computer network. It defines how devices are interconnected and how data flows within the network.

**Common Types of Network Topologies:**

1. **Bus Topology**: All devices are connected to a single central cable, called the bus. Data sent from a device travels in both directions to all devices until it finds the intended recipient.
2. **Star Topology**: All devices are connected to a central hub or switch. Data passes through the central hub before reaching its destination.
3. **Ring Topology**: Each device is connected to two other devices, forming a circular pathway for signals. Data travels in one direction around the ring until it reaches its destination.
4. **Mesh Topology**: Every device is connected to every other device in the network, providing multiple paths for data to travel. This topology offers high redundancy and reliability.
5. **Tree Topology**: A hybrid topology that combines characteristics of star and bus topologies. It consists of groups of star-configured networks connected to a linear bus backbone.
6. **Hybrid Topology**: A combination of two or more different types of topologies to form a resultant topology that inherits the advantages (and disadvantages) of the included topologies.

