

# Computer Science

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Computer Networking



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# Computer Networking

Computer networking involves the interconnection of multiple computing devices to share resources, information, and services. It enables communication between devices and facilitates data exchange



# Key Components in Network

- **Nodes:** Devices such as computers, servers, routers, and switches.
- **Links:** Communication pathways that connect nodes, which can be wired (e.g., Ethernet) or wireless (e.g., Wi-Fi).
- **Networking Devices:** Routers, switches, hubs, and modems that manage and direct data traffic.





# Types of Networks

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- **Local Area Network (LAN):** Connects devices within a limited geographical area, such as a home, office, or campus.
- **Wide Area Network (WAN):** Spans larger distances, connecting LANs across cities, countries, or continents.
- **Wireless Networks:** Use radio waves for communication, including Wi-Fi and cellular networks.





# Network Topologies:

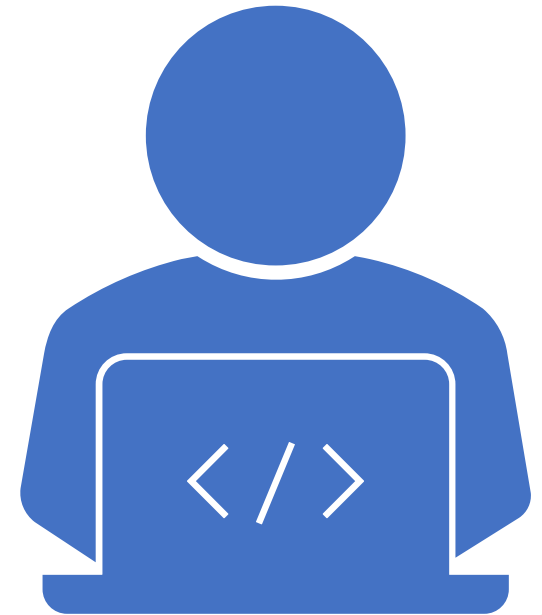
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- **Bus:** All devices share a common communication line.
- **Star:** All devices connect to a central hub or switch.
- **Ring:** Devices are connected in a circular fashion.
- **Mesh:** Devices are interconnected, providing redundancy and multiple paths for data.



# Protocols

- **TCP/IP (Transmission Control Protocol/Internet Protocol):** Fundamental suite of protocols for internet communication.
- **HTTP/HTTPS (Hypertext Transfer Protocol/Secure):** Used for web communication.
- **SMTP (Simple Mail Transfer Protocol):** Handles email transmission.
- **FTP (File Transfer Protocol):** Facilitates file transfers over a network.





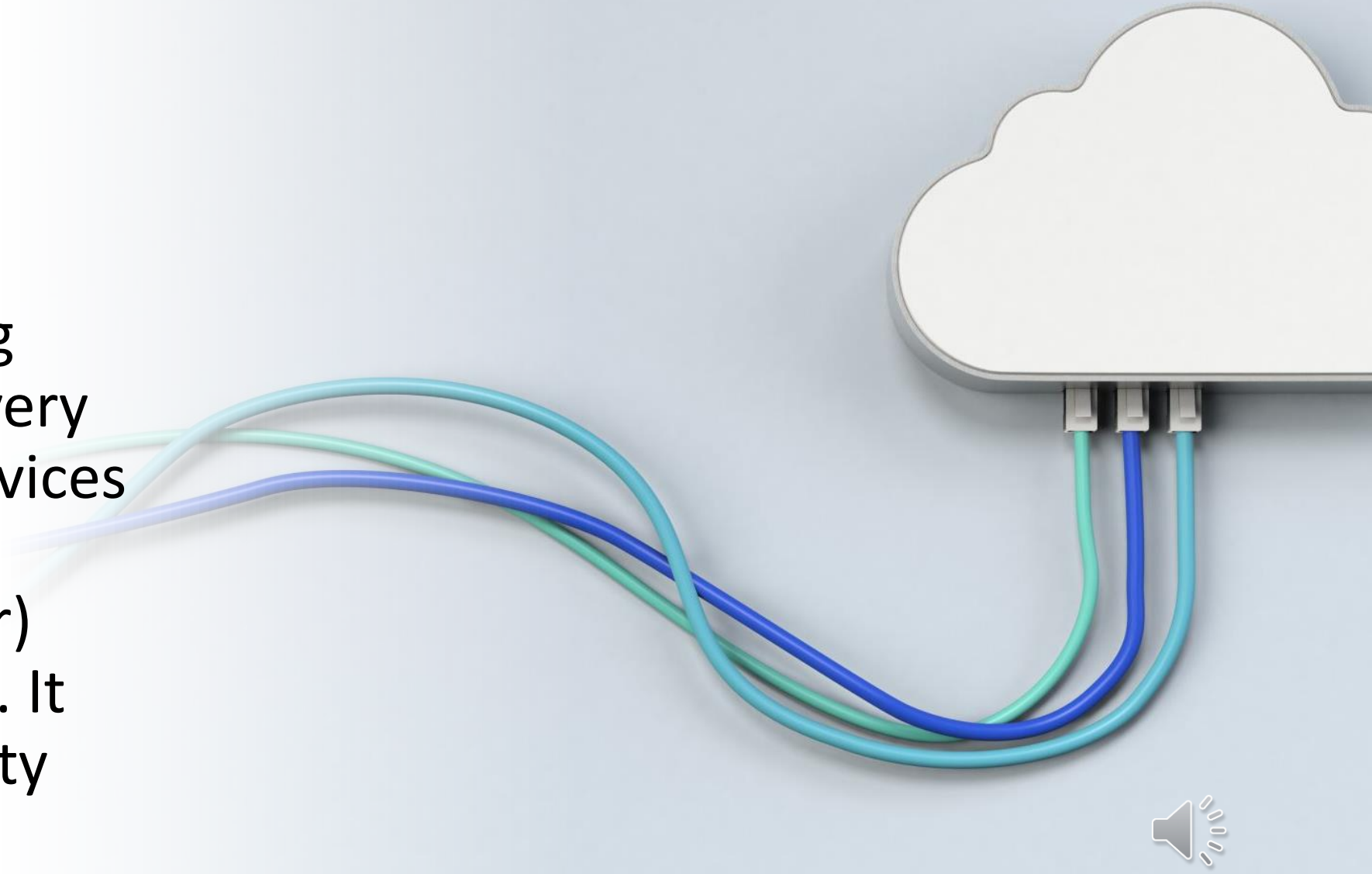
# IP Addressing

IP addresses uniquely identify devices on a network. IPv4 (32-bit) and IPv6 (128-bit) are the two main address formats.



# Cloud Computing

Cloud networking involves the delivery of computing services (e.g., storage, processing power) over the internet. It provides scalability and accessibility.





# Covered Points:

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- Definition of Computer Networking
- Key Components in Networking
- Types of Networks
- Network Topologies
- Protocols
- IP Addressing
- Cloud Computing



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