

1) What is computer network?

Ans. A computer network is a set of interconnected computers that communicate with each other and share resources.

The purpose of a computer network is to enable the sharing of information, resources, and services among multiple devices.

Networks can be classified based on their size, geographical scope, and the technologies used to connect the devices.

Key components and concepts related to computer networks

1) Nodes: These are the devices connected to the network, such as computers, servers, routers, and printers.

2) Links: Link refers to the communication channels or pathway that connect nodes in a network.

These links can be wired (e.g. Ethernet)

cables) or wireless (e.g. wifi)

3) Topologies: Network topology defines the layout or structure of the network.

Common topologies include bus, ring, star, mesh and hybrid configurations.

4) Protocols: Network protocols are set of rules and conventions that govern communication between devices on a network.

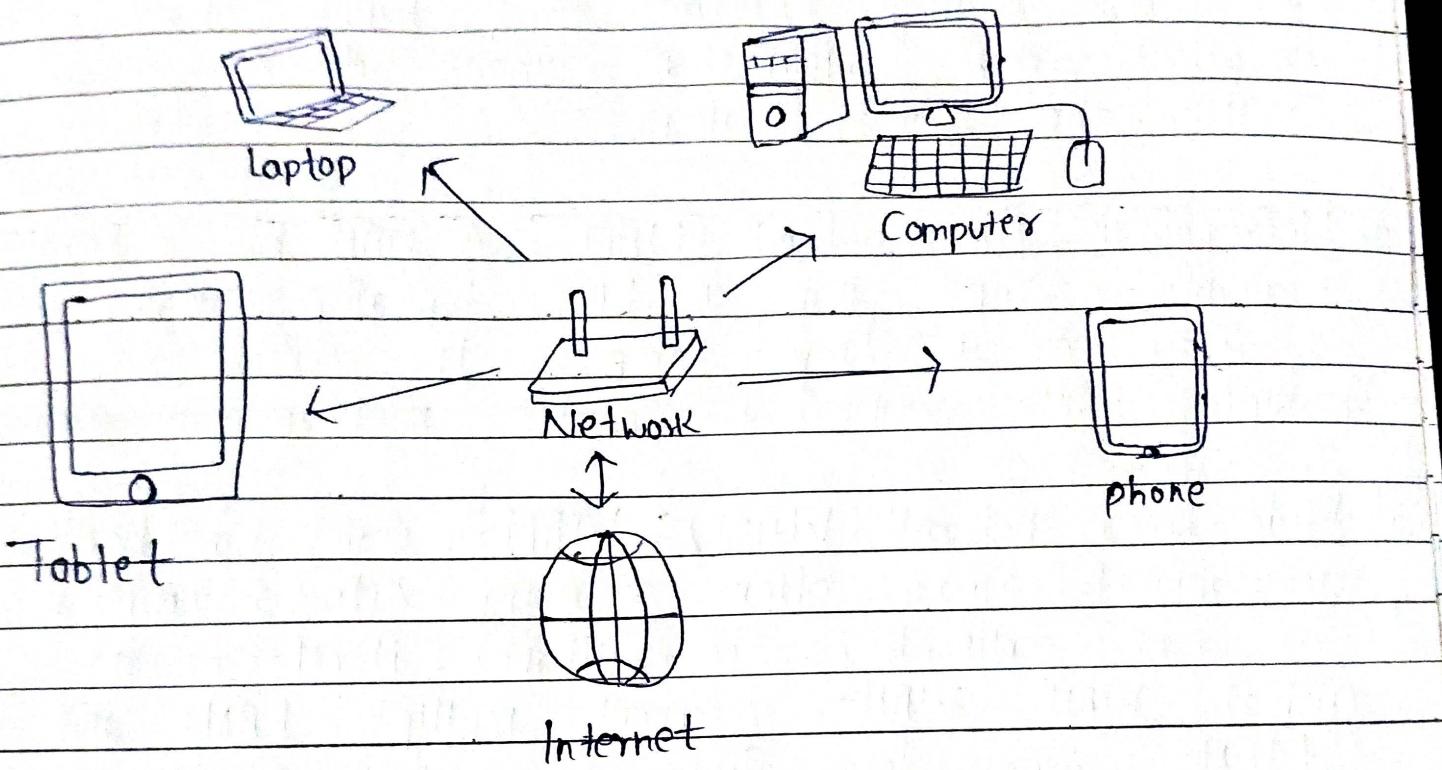
Example include TCP/IP for the internet and HTTP for World Wide Web.

5) Internet: The internet is a massive global network that connects millions of computers and networks worldwide, allowing for the exchange of information and services.

6) Intranet: An intranet is a private network within an organisation that uses internet technologies to share information and resources among its members.

7) Extranet: An extranet extends the capabilities of an intranet to include external users, such as customers, suppliers or partners.

Computer networks play a crucial role in facilitating communication, resource sharing, and collaboration among individuals and organizations. They are fundamental to the functioning of the modern digital world.



(Q2) Types of Networks? Explain some of these

Ans: Computer networks come in various types, classified based on their size, geographical scope, and purpose.

Here are some common types of computer network

1) Personal Area Network: A PAN is the smallest type of network, typically covering a range

of a few meters. It is used for connecting devices like smartphones, laptops and tablets for personal use.

2) Local Area network: LAN covers a relatively small geographic area such as single building, office or campus. They facilitate the sharing of resources and information among devices within the same location.

3) Metropoliton Area network (MAN): A MAN has a larger geographic scope than a LAN, typically covering a city or a large campus. It connects multiple LANs within a specific metropoliton area.

4) Wide area network (WAN): WANs cover a broad geographical area, often spanning cities, countries or even continents. The internet itself is a global WAN. WANs connect multiple LANs and MANs over long distances.

5) Campus area network (CAN): A CAN is a network that connects multiple LANs within a specific academic or corporate campus. It falls between LAN and a MAN in terms of geographic scope.

6) Virtual private network: A VPN is a secure network that uses the internet to connect remote users or offices securely. It provides a private and encrypted communication channel.

over the public internet

These types of networks can be combined or configured in various ways to meet specific requirements, and they play a crucial role in supporting communication and data exchange in diverse settings.

### Q3) Difference between LAN, MAN and WAN

Sol:

Characteristic	LAN	MAN	WAN
Geographical Coverage	Small (e.g. building, campus)	Large (e.g. city, large campus)	Broad (e.g. country, continent)
Size and Scale	Small numbers of devices	Moderate to large number of devices	Vast number of devices
Transmission Speed	High (e.g. 1gbps or more)	Moderate to high (varies)	Varies (can be lower than LAN or MAN)
Ownership and control	Often owned and controlled by a single organization or individual	Ownership may be shared among multiple organizations or service providers	Ownership and control often distributed among multiple organizations, service providers or countries

Cost of implementation	Relatively lower costs per user	Moderate costs, shared among multiple users	High costs due to extensive infrastructure and long distance connectivity
Reliability and latency	High reliability with low latency	Reliability depends on network design and technologies used; latency can vary	Reliability may be affected by factors such as long distance communication and diverse infrastructure leading to higher latency
Privacy and Security	Easier to maintain privacy and security within a confined area.	Security challenges may arise due to the larger scale, requiring robust measures	Security is a significant concern due to the vast coverage and potential exposure to various threats on a global scale
Examples of protocols	TCP/IP, Ethernet	Ethernet, SONET, ATM	TCP/IP, MPLS, Frame relay, ATM

Q4) History of ARPANET and Internet?

Ans:

ARPANET

The arpanet was the precursor to the modern internet and played a crucial role in its development.

- 1) Origins (1960s): ARPANET was conceived by the U.S Department of Defense's Advanced Research projects Agency in the early 1960s. The goal was to create a robust and decentralized communication network that could withstand a nuclear attack.
- 2) Initial Design and implementation (1969): ARPANET was launched on October 29, 1969, connecting four major research universities ULCA, SRI, UC Santa Barbara, and the University of Utah. The first message sent over ARPANET was "LOGIN".
- 3) Packet Switching Technology: ARPANET pioneered the use of packet switching, a method of breaking down data into packets for more efficient transmission. This technology is fundamental to the functioning of the Internet today.
- 4) Growth and Expansion (1970s): ARPANET continued to expand, connecting more research institutions and becoming a testbed for various networking technologies. Email became one of the first applications to emerge on ARPANET.

# INTERNET

- 1) ARPANET's Evolution (1970s): As ARPANET continued to grow, it laid the foundation for the development of the broader Internet. The adoption of TCP/IP in the late 1970s and early 1980s played a key role in the Internet's expansion.
- 2) Emergence of the World Wide Web (1990s): The introduction of the World Wide Web by Sir Tim Berners-Lee in 1991 marked a significant turning point. The Web made information more accessible and user-friendly, leading to a surge in internet usage.
- 3) Commercialization and Global Expansion (1990s): The 1990s witnessed the commercialization of internet. Companies like AOL provided dial-up internet access to a broader audience. The Internet rapidly expanded globally reaching millions of users.
- 4) Current Trends (2020s): As of my last knowledge update in January 2022, the internet continues to evolve. Emerging technologies like 5G, artificial intelligence, and augmented reality are expected to shape the internet future.