COMPUTER NETWORKING

WHAT is computer networking ?

Computer Networking is the practice of connecting computers together to enable communication and data exchange between them. In general, Computer Network is a collection of two or more computers. It helps users to communicate more easily

->Each device has an IP Address, that helps in identifying a device.

Basic terminology

NETWORK – group ofcomputers connected together for exchange of data

NODES – devices connected over network

PROTOCOL – rules for data to be transmitted over internet , ex – TCP/IP , HTTP , FTP

TOPOLOGY – physical or logical arrangement of data over network

Service Provider Networks: These types of Networks give permission to take Network

Capacity and Functionality on lease from the Provider.

IP – unique numerical identifier assigned to every system over internet

DNS: The [**Domain Name System (DNS)**](https://www.geeksforgeeks.org/domain-name-system-dns-in-application-layer/) is a protocol that is used to translate human-readable domain names (such as www.google.com) into IP addresses that computers can understand.

Firewall: A [firewall](https://www.geeksforgeeks.org/introduction-of-firewall-in-computer-network/) is a security device that is used to monitor and control incoming and outgoing network traffic.

## Types of Enterprise Computer Networks

* LAN: A [**Local Area Network (LAN)**](https://www.geeksforgeeks.org/types-of-area-networks-lan-man-and-wan/)is a network that covers a small area, such as an office or a home. LANs are typically used to connect computers and other devices within a building or a campus.
* WAN: A [**Wide Area Network (WAN)**](https://www.geeksforgeeks.org/wan-full-form/) is a network that covers a large geographic area, such as a city, country, or even the entire world. WANs are used to connect LANs together and are typically used for long-distance communication.
* Cloud Networks: [**Cloud Networks**](https://www.geeksforgeeks.org/cloud-networking/) can be visualized with a Wide Area Network (WAN) as they can be hosted on public or private cloud service providers and cloud networks are available if there is a demand. Cloud Networks consist of Virtual Routers, Firewalls, etc.

TYPES OF COMPUTER SYSTEM ARCHITECTURE

1 – Client – server architecture

2 – peer to peer architecture

NETWORK TOPOLOGY

1 - Star

2 – Mesh

3 – Point – to - Point

4 – Ring

5 – Tree

6 – Hybrid

7 – Daisy

OSI layer

1 – Application layer – end user layer like FTP , HTTPS ...etc

2 – Presentation layer – syntax layer FTP , IMAP ...etc

3 – Session layer – sync and send to port , API’s , Sockets

4 – Transport layer – end to end connection like , TCP , UDP ...etc (data sent in segments)

5 – Network layer – packets , IP , IGMP ...etc ( data sent in packet)

6 – Data – link layer – frmaes -> Ethernet , switch ,bridge ...etc ( data sent in frame )

7- Physical layer – physical structure wireless , hubs , repeaters (data present in bits )

Types of Protocols

1 – TCP/IP (transmission control protocol / Internet protocol ) - The [TCP/IP model](https://www.geeksforgeeks.org/tcp-ip-model/) is a concise version of the OSI model. It contains four layers, unlike the seven layers in the OSI model.The [Physical Layer](https://www.geeksforgeeks.org/physical-layer-in-osi-model/) and [Data Link Layer](https://www.geeksforgeeks.org/data-link-layer/) are referred to as one single layer as the ‘Physical Layer’ or ‘Network Interface Layer’ in the 4-layer reference.

2 – SMTP (simple mail transfer protocol) – listens at PORT NO. 25 , it is a push protocol and is used to send the mail

3 – POP(post office protocol) - is a pull protocol and is used to receive the mails

4 – Point-to-Point Protocol - It is also required to connect the Home PC to server of ISP through a modem.

5 – FTP (file transfer protocol) - is an application layer protocol that moves files between local and remote file systems.

6- SFTP (Secure File Transfer Protocol) - is the advanced version of FTP(file transfer protocol) which ensures security while transferring files between the organizations/computer. It is also known as [SSH(Secure Shell)](https://www.geeksforgeeks.org/introduction-to-sshsecure-shell-keys/). It works on port no. 22 and uses the [client-server model](https://www.geeksforgeeks.org/client-server-model/).

7 - HTTP stands for HyperText Transfer Protocol - It is a set of rules for transferring data from one computer to another. Data such as text, images, and other multimedia files are shared on the World Wide Web. Whenever a web user opens their web browser, the user indirectly uses HTTP. It is an application protocol that is used for distributed, collaborative, hypermedia information systems. PORT NO - 80

8 - Hypertext Transfer Protocol Secure - is a protocol that is used to communicate between the user browser and the website. It also helps in the transfer of data. It is the secure variant of HTTP. To make the data transfer more secure, it is encrypted. PORT NO – 443

9 - TELNET stands for Teletype Network. It is a type of protocol that enables one computer to connect to the local computer.

10 – Ipv4 - IP stands for Internet Protocol and v4 stands for Version Four (IPv4). IP version four addresses are 32-bit integers which will be expressed in decimal notation.

11 - This new IP address version is being deployed to fulfil the need for more Internet addresses. With 128-bit address space, it allows 340 undecillion unique address space.

12 – ICMP (Internet Control Message Protocol) - The protocol is at the network layer. It is mostly utilized on network equipment like routers and is utilized for error handling at the network layer. Since there are various kinds of network layer faults, ICMP can be utilized to report and troubleshoot these errors.