Computer Networks

- A computer network is a group of computing systems connected together to allow **electronic communication**
- It allows users to **communicate** and **share** information between various resources such as computers, mobile phones, printers, scanners, and other devices
- The network model lays the foundation for the successful establishment of communication between two **computing systems**, irrespective of their underlying internal structure and technology
- Standard **Network Models**:
  - Open System Interconnection (OSI) Model
  - TCP/IP Model

Open System Interconnection (OSI) Model

- The OSI model is the **standard reference model** for communication between two **end users** in a network
- The OSI model comprises **seven** layers, of which the top four layers are used when a message transfers to or from a user and the lower three layers are used when a message passes through the host computer

OSI MODEL			
	Data Unit	**Layer**	**Function**
Host Layers	Data	7. Application	Network process to application
		6. Presentation	Data representation, encryption, and decryption; convert data to machine understandable format
		5. Session	Interhost communication, managing sessions between applications
	Segments	4. Transport	End-to-end connections, reliability, and flow control
Media Layers	Packet/Datagram	3. Network	Path determination and logical addressing
	Frame	2. Data Link	Physical addressing
	Bit	1. Physical	Media, signal, and binary transmission

Notes:

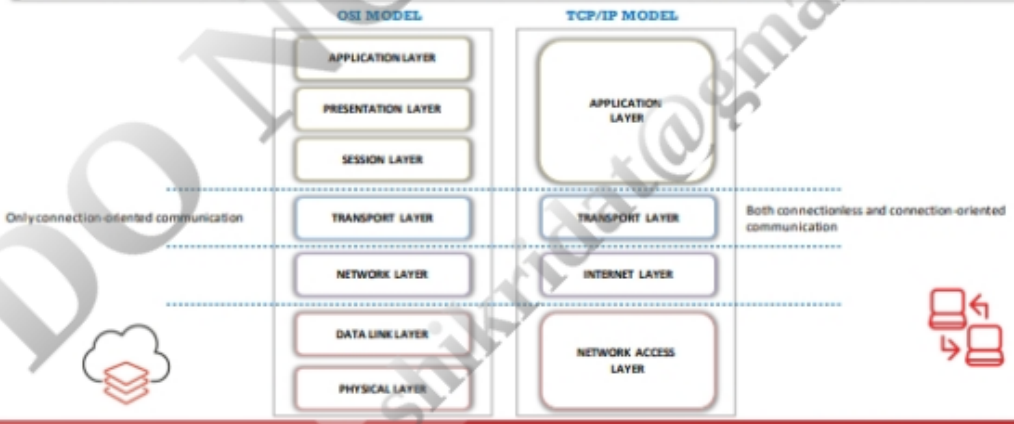
TCP/IP Model

- The TCP/IP model is a framework for the Internet Protocol suite of computer network protocols that defines the **communication in an IP-based network**

Functions	Layers	Protocols
Handles high-level protocols, representation issues, encoding, and dialog control	Application Layer	File Transfer (TFTP, FTP), Email (SMTP), Remote Login (Telnet, rlogin), Network Management (SNMP), Name Management (DNS)
Constitutes a logical connection between the endpoints and provides transport services from the source to the destination host	Transport Layer	Transmission Control Protocol (TCP) and User Datagram Protocol (UDP)
Selects the best path through the network for packets to travel	Internet Layer	Internet Protocol (IP), Internet Control Message Protocol (ICMP), Address Resolution Protocol (ARP)
Defines how to transmit an IP datagram to other devices on a directly attached network	Network Access Layer	FDDI, Token Ring, CDP, VTP, PPP

Comparing OSI and TCP/IP

- The TCP/IP model is based on the **practical implementation of protocols** around which the Internet has developed, whereas the OSI model, often referred to as a reference model, is a generic protocol-independent standard
- OSI model defines **services, intervals, and protocols**, whereas TCP/IP does not provide a clear distinction between these



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