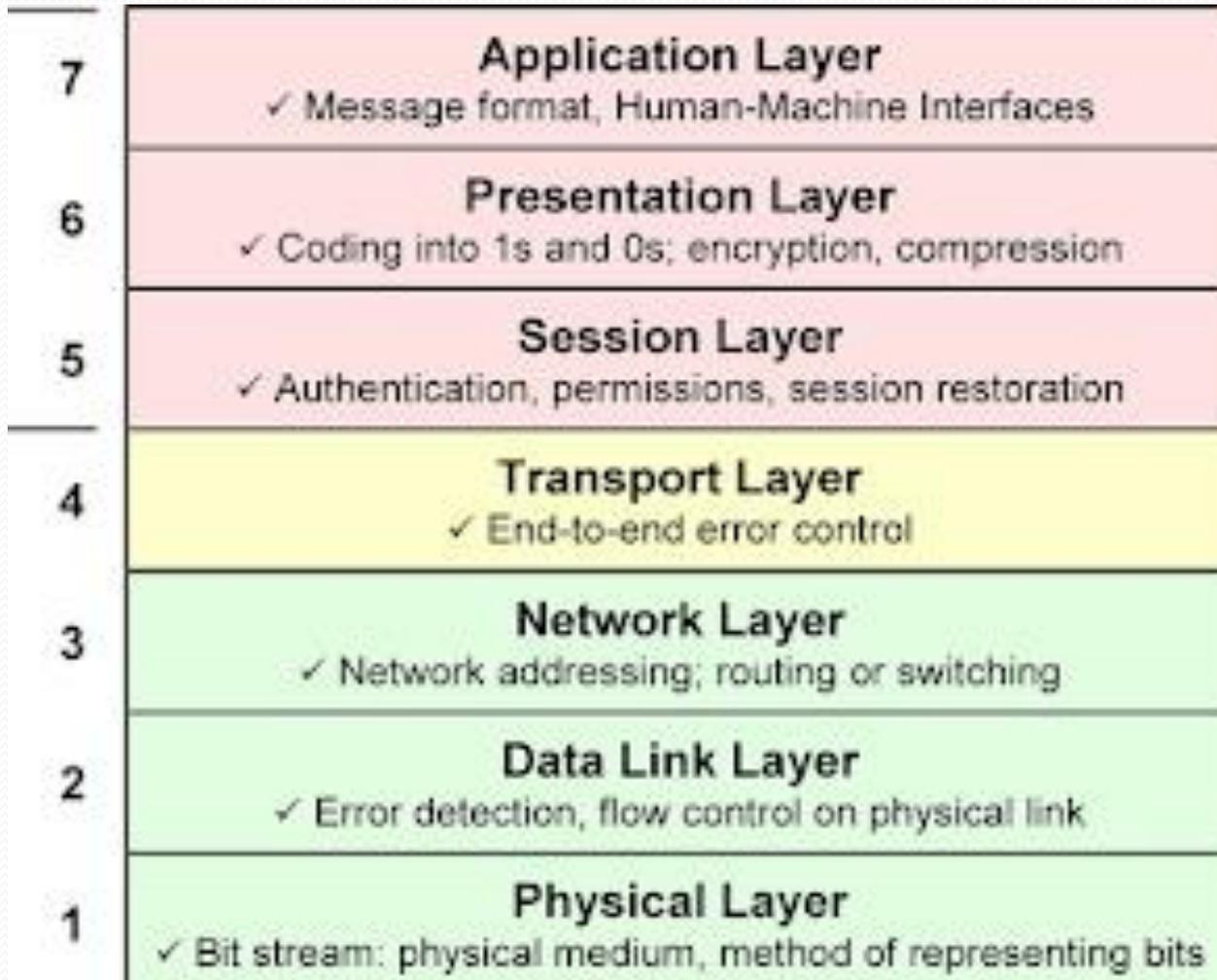


OSI MODEL

- ❑ A networking framework to implement protocols in seven layers
- ❑ Each layer has a protocol data unit that refers to a group of information added or removed by a layer
 - ❑ Have specific protocols which are a set of rules that governs the communications between computers on a network.

Layers in OSI Model



FUNCTIONS OF LAYERS

- ***Application layer*** - provides access to available network resources
- ***Presentation layer*** - translates, encrypts, and compresses data
- ***Session layer*** - establishes, manages, and terminates communicative sessions
- ***Transport layer*** - provides reliable process-to-process message delivery and error recovery
- ***Network layer*** - moves packets from source to destination providing inter networking capabilities
- ***Data link layer*** - organizes bits into frames providing node-to-node delivery
- ***Physical layer*** - transmits bits over a medium establishing mechanical and electrical specifications

TCP/IP MODEL

- It includes two protocols - Transmission Control Protocol/ Internet Protocol
- It is composed of four layers- host to network, internet, transport and application layer.
- TCP/IP is the most widely used protocol suite in networking these days.

Functions of layers

TCP/IP Layer	Function
Application	Represents data to the user and controls dialogue
Transport	Supports communication between diverse devices across diverse networks
Internet	Determines the best path through the network
Network access	Controls the hardware devices and media that make up the network

FEATURES

- TCP/IP can span to wide areas and is very flexible.
- It provides cross-platform support, routing capabilities
 - It provides support for the Simple Network Management Protocol (SNMP), the Dynamic Host Configuration Protocol (DHCP), the Windows Internet Name Service (WINS), the Domain Name Service (DNS), and a host of other useful protocols.

Protocols used in TCP/IP

- ***Telnet (Remote Login)*** : logging on to someone else's system such that it seems to the user as he is working on his own system.
-
- ***FTP (File Transfer Protocol)*** : responsible for transmitting the files from the source node to the destination node.
-
- ***SMTP (Simple Mail Transfer Protocol)*** : It processes the mails.
-
- ***DNS (Domain Naming Service)*** : It maps IP addresses to simple node addresses e.g., 192.192.190.25 to node 15.
-
- ***RIP (Routing Important Protocol)*** : It is responsible for routing the packets from source to destination.
-
- ***SNMP (Single Network Management Protocol)*** : A protocol that is used to collect the management information from network devices.

Similarities of TCP/IP and OSI model

- ***Similar architecture:*** Both of them are constructed with layers.
- ***Share common Application layer:*** Both models share a common 'application layer', though it provides different services for both.
- ***Comparable 'transport' & 'network' layers:*** The functions performed between the presentation layer and network layer of OSI model is similar to the function performed by the transport layer of the TCP/IP model.

- *Both are protocol stack.*
- *Both are reference models.*
- **TCP/IP inspired by the OSI model** - The Internet is based on the 'TCP/IP' model, that is a simplified implementation of the **OSI model**.
- The **TCP/IP** are protocols of Internet that are in the fourth layer of OSI model.

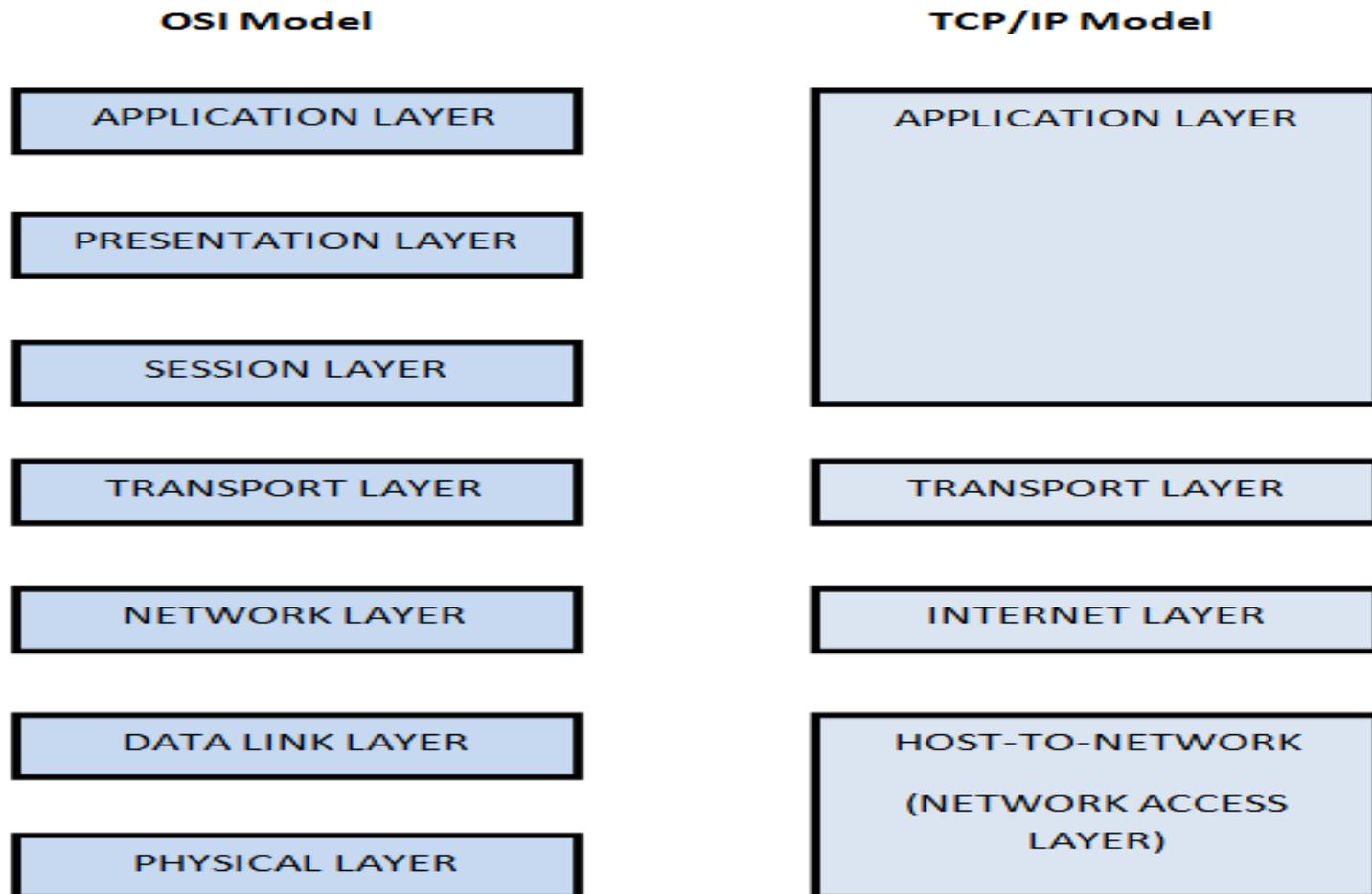
Difference between OSI and TCP/IP Reference Model

OSI	TCP/IP
It has seven layers	It has four layers
Follows vertical approach	Follows horizontal approach
Protocol independent standard, that acts as a communication gateway between the network and end user.	Communication protocol, which allows connection of hosts over a network.
Transport layer guarantees the delivery of packets.	Transport layer does not guarantees delivery of packets.

OSI	TCP/IP
Transport Layer is Connection Oriented.	Transport Layer is both Connection Oriented and Connection less
Network Layer is both Connection Oriented and Connection less.	Network Layer is Connection less.
OSI is a reference model around which the networks are built.	TCP/IP model is, in a way is the implementation of OSI model.
problem of fitting the protocols into the model.	does not fit any protocol

OSI	TCP/IP
Protocols are hidden in OSI model and can be easily replaced whenever the technology changes.	Replacing a protocol is not easy.
Protocol independent, It defines services, interfaces and protocols very clearly and makes clear distinction between them.	Protocol dependent. The services, interfaces and protocols are not clearly separated.

Diagrammatic Comparison between OSI Reference Model and TCP/IP Reference Model



Protocols used in OSI and TCP/IP model

TCP/IP	OSI Model	Protocols
Application Layer	Application Layer	DNS, DHCP, FTP, HTTPS, IMAP, LDAP, NTP, POP3, RTP, RTSP, SSH, SIP, SMTP, SNMP, Telnet, TFTP
	Presentation Layer	JPEG, MIDI, MPEG, PICT, TIFF
	Session Layer	NetBIOS, NFS, PAP, SCP, SQL, ZIP
Transport Layer	Transport Layer	TCP, UDP
Internet Layer	Network Layer	ICMP, IGMP, IPsec, IPv4, IPv6, IPX, RIP
Link Layer	Data Link Layer	ARP, ATM, CDP, FDDI, Frame Relay, HDLC, MPLS, PPP, STP, Token Ring
	Physical Layer	Bluetooth, Ethernet, DSL, ISDN, 802.11 Wi-Fi