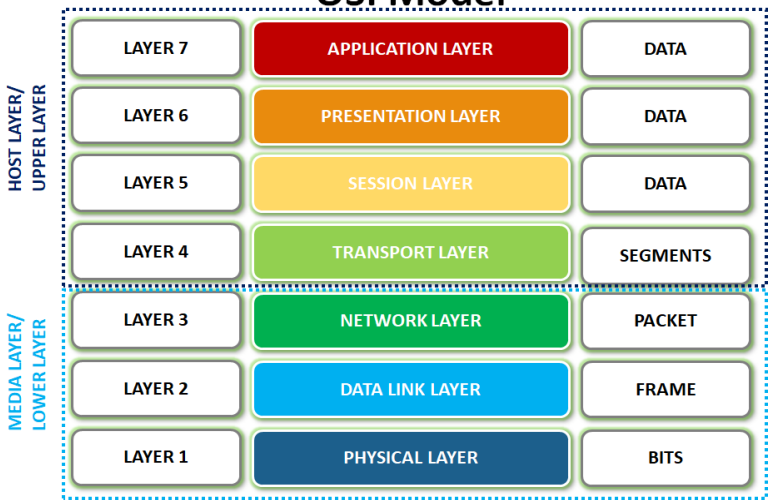
The 7 Layers of OSI Model

OSI Model



Definition

- The OSI Model is a conceptual and logical framework that outlines network communication protocols for systems that are open to interconnect and communicate with other systems. Data is transferred over a network through the 7 layers of Open Systems Interconnection (OSI) Model.

History

- The OSI Model was first suggested during the 1970s and later, in 1984, it was officially published by the International Organization of Standardization (ISO).
- Charles Bachman at Honeywell Information Systems proposed that the OSI Model should be a seven-layer structure.

Features & Importance

- The structure is composed of seven layers that are categorized into two parts: the host layer (upper layer) and the media layer (lower layer).
- The OSI model is a useful tool for comprehending how the hardware and software of a computer network interact and operate together.
- This model has simplified the troubleshooting process by enabling the detection of errors at various levels.

LAYER	DESCRIPTION	SUPPORTED PROTOCOLS
PHYSICAL LAYER	This layer consists of network equipment i.e., cables, switches, routers, fibers, etc. It deals with the transformation of digital data content into signals that can be transmitted down into the wire. The signals are in the form of electricity in the case of fiber optics and non-electrical. The physical layer provides an architecture for the data to be received and sent. This layer majorly consists of the hardware infrastructure of the network.	**RS232, 100BaseTX, ISDN, 11**
DATA LINK LAYER	This layer converts the information in data packets and frames. It unpacks the data from the physical layer and then translates the information to the upper layers where data is to be sent. Deals with error detection and catching.	**RAPA, PPP, Frame Relay, ATM, Fiber Cable, etc.**
NETWORK LAYER	It set the incoming and destination address of the data. It deals with addressing of the data to be sent to the other layers. It helps to determine the best and quickest route for the data to use. By adding an address header, it's able to track the data as it passes through the various layers. This layer deals with packet switching and managing the network congestion of the routers.	**IPV5, IPV6, ICMP, IPSEC, ARP, MPLS**
TRANSPORT LAYER	This deals with the streaming of data across the network. It works by checking the transmissions of packets from source to destination address. It also corrects the errors and retransmission of packets that have errors. It works in conjunction with the network layer. The transport layer sorts and groups the data packets that have a similar address.	**TCP, UDP**
SESSION LAYER	It deals with connections of data and packets. It deals with establishing, managing, and controlling of the session between the hosts. It sends information about the programs and applications to other layers. It synchronizes the data for secure transmission and connection.	**NetBIOS, SAP**
PRESENTATION LAYER	It deals with the formatting and structuring of data that is to be set to the network. It allows an application to read and understand the message. This layer deals with encryption and decryption of message, formatting and translation and compression of the message for smooth transmission.	**MPEG, ASCH, SSL, TLS**
APPLICATION LAYER	It provides an interface for the user. It works by coordinating the network access of the device. The protocols in this layer work by handling the requests from various software applications. It deals with file transfers, electronic mail, and browsing.	**SMTP, HTTP, FTP, POP3, SNMP**