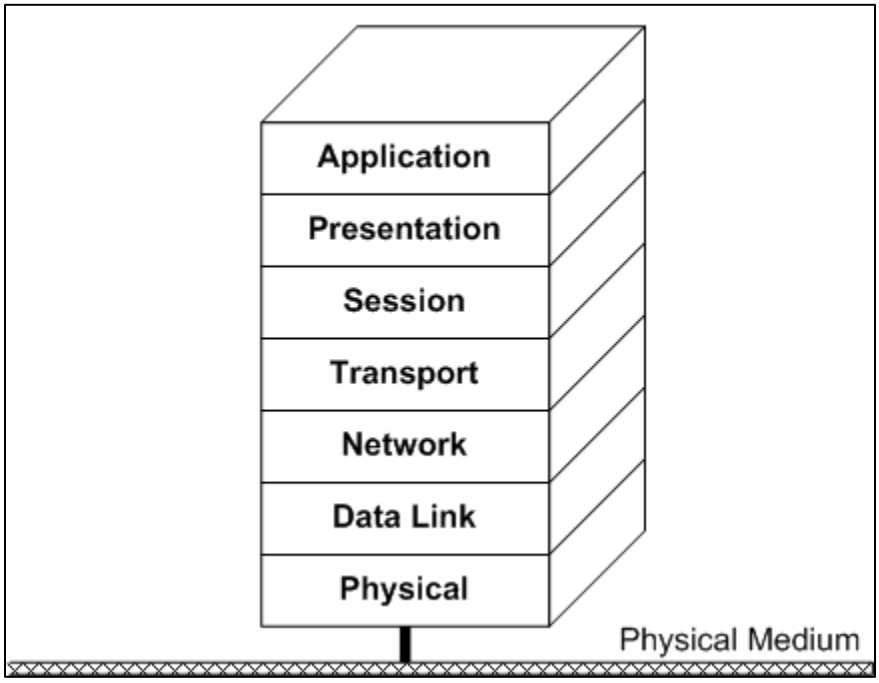
OSI Reference Model

In 1977, International standard organization (ISO) established a committee to develop an architecture for computer communication. Open Systems Interconnection (OSI) reference model is the result of this effort. In 1984, the Open Systems Interconnection (OSI) reference model was approved as an international standard for communications architecture. Term "open" denotes the ability to connect any two systems which conform to the reference model and associated standards. The OSI model has seven layers.



Physical Layer: The physical layer is concerned with the transmission of raw data bits over communication lines. Physical layer standards and protocols are concerned with issues such as the following:

- The physical form in which data bits are represented.
- Whether transmission of data can take place in one or both directions over the same physical connection.
- Characteristics of the physical media that carry the signals.
- Characteristics of the connectors used for connecting the physical media.
- How data from a number of sources should be multiplexed.

Data Link Layer: The data link layer is concerned with the reliable transfer of data over the communication channel provided by the physical layer. For this, the data link layer breaks the data into data frames, transmits the frames sequentially over the channel. Data link protocols are concerned with the following issues:

- How to divide the data into frames.
- How to delimit frames by adding special bit patterns to the beginning and end of each frame.

- Some form of error detection is included in the frame header.
- When a frame arrives corrupted or is for any reason lost in the network, retransmission or correction is done.
- Flow control provides a means of avoiding a slow receiver from being swamped by data from a fast transmitter. It also brings forth arrangements for data reassembling if necessary.

Network Layer: The network layer is concerned with the routing of data across the network from one end to another. The protocols of this layer are concerned with different issues such as defining the most optimum path the packet should take from the source to the destination, defining logical addressing so that any endpoint can be identified, handling congestion in the network etc.

Transport Layer: The network layer provides services to the transport layer. Segments are the name for the data in the transport layer. It is in charge of ensuring that the entire message is delivered from beginning to end. Additionally, the transport layer offers confirmation of a successful data transmission and retransmits the data if an error is discovered. The sender must be aware of the receiver's application's port number. Usually, either manually or by default, this destination port number is specified. For instance, a web application normally uses port 80 when requesting a web server because this is the standard port given to web applications. Numerous apps have set default ports.

Session Layer: The session layer establishes sessions, or channels of communication, between devices. It is in charge of starting sessions, making sure they are active and open while data is being exchanged, and shutting them down once communication is complete. The session layer can also establish checkpoints during a data transmission, allowing devices to pick up where they left off in the event that the session is terminated.

Presentation Layer: Data is prepared for the application layer by the presentation layer. In order for data to be correctly received on the other end, it specifies how two devices should encode, encrypt, and compress data. Any data transmitted by the application layer is processed by the presentation layer before being delivered via the session layer.

Application Layer: End-user applications like web browsers and email clients operate at the application layer. It offers protocols that let computer programs transmit and receive data and give consumers useful information. The Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP) are examples of application layer protocols.