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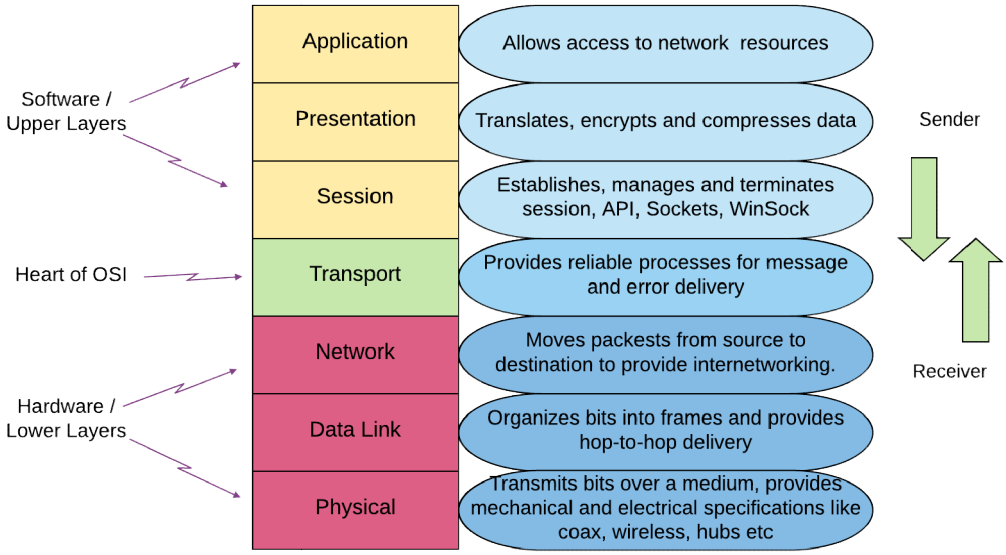
OSI Model

The OSI model which stands for Open Systems Interconnection Model is a framework for describing the functions of a networking system. The OSI Model can be thought of as a universal computer networking language. The OSI model defines seven layers through which computer systems communicate over a network, dividing a communication system into seven abstract layers, each of which is stacked on top of the previous one. The seven layers of the OSI model are described below:



1. **Physical Layer**
   This layer is the lowest layer of the OSI Model which is concerned with electrically, optically or the wireless technology passing raw unstructured data bits, which is just a series of 0s and 1s, while also controlling the bit rate over the network from the sending device's physical layer to the receiving device's physical layer. Voltages, pin arrangement, cabling, and radio frequencies are examples of specifications.

2. **Data link layer**
   A connection between two physically connected nodes on a network is established and terminated via the data link layer. It divides packets into frames and sends them from one location to another. Directly connected nodes are utilized at the data connection layer to

perform node-to-node data transfer in which data is bundled into frames. Errors that may have happened at the physical layer are also corrected by the data link layer. This layer is divided into two sections: LLC, which detects network protocols, does error checking, and synchronizes frames, and MAC, which connects devices and defines permissions to transmit and receive data using MAC addresses.

3. **Network layer**
   Receiving frames from the data link layer and delivering them to their intended destinations based on the addresses contained within the frame is the responsibility of the network layer. The network layer has two purposes. One is to split segments into network packets and then reassemble them on the receiving end and the other is to route packets across a physical network by determining the optimum path. To route packets to a destination node, the network layer utilizes network addresses (usually Internet Protocol addresses).

4. **Transport layer**
   The OSI model's heart is the Transport layer. The transport layer is in charge of data packet delivery and error checking. On the receiving end, the transport layer receives the data transferred in the session layer and divides it into "segments." It's in charge of reassembling the segments on the receiving end and converting them back into data that the session layer can use. It controls the size, sequencing, and, ultimately, decides which route to choose for the data transmit between systems and hosts. TCP, or Transmission Control Protocol, is one of the most frequent transport layer instances.

5. **Session layer**
   The session layer establishes communication channels between devices, known as sessions. The session layer is in charge of coordinating conversations between computers. At layer 5, a session or connection between machines is established, managed, and terminated. Authentication and reconnections are also part of the session layer services. The session layer can also specify checkpoints during a data transfer, allowing devices to resume data transfer from the latest checkpoint if the session is stopped.

6. **Presentation layer**
   Data is prepared for the application layer (layer 7) by the presentation layer. It specifies how data should be encoded, encrypted, and compressed between two devices so that it is correctly received on the other end. This layer can also handle the application layer's encryption and decryption needs.

7. **Application layer**
   Both the end user and the application layer interact with the software application directly at this layer. End-user applications such as web browsers and email programmes employ

the application layer. It defines protocols that allow software to communicate and receive data and present it to users in a meaningful way. HTTP, FTP, POP, SMTP, and DNS are all examples of application layer protocols.

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