FUNCTIONS OF OSI MODEL'S LAYERS

- What is OSI model?

  OSI is short for Open Systems Interconnection. The OSI model represents the seven layers that computer systems use to communicate over a network.

  In simple terms, it specifies how a network functions and standardizes how systems send information to each other. It describes how information is transmitted from a network device to its destination through a physical medium, as well as how it interacts with the application.

- Layers of the OSI model

  The Open System Interconnection splits into seven distinct layers, each one playing a specific role within the overall operation.

  1. Physical Layer

  2. Data Link Layer

  3. Network Layer

  4. Transport Layer

  5. Session Layer

  6. Presentation Layer

  7. Application Layer

LAYER 1: PHYSICAL LAYER

It is the lowest layer of the OSI Model that is responsible for the physical cable or wireless connection between network nodes. It transmits unstructured raw data bits from the physical layer of the sending device to the physical layer of the receiving device. The physical layer may contain network devices, such as cables, modems, hubs, switches, repeaters, and network adapters.

LAYER 2: DATALINK LAYER

The data link layer ensures error-free node-to-node data transfer. It helps in data transfer between two devices on the same network. This layer takes packets from the network layer and converts them into smaller pieces called frames. It ensures flow control and error control in intra-network communication. This layer consists of two sub-layers:

- Media Access Control (MAC)
- Logical Link Control (LLC)

LAYER 3: NETWORK LAYER

The network layer receives frames from the data link layer and sends them to their intended destinations according to the addresses in the frame. It uses logical addresses, such as IP (internet protocol) to find the best physical path

for the data to reach its destination. Routers are an important component in this layer as they route information where it needs to go between networks.

LAYER 4: TRANSPORT LAYER

It manages the delivery, error checking, flow control, and sequencing of data packets. It regulates the size and transfer of data between systems and hosts. For example -TCP (Transmission Control Protocol) and UDP (User Datagram Protocol).

LAYER 5: SESSION LAYER

The session layer facilitates establishing connections, maintaining sessions, and authenticating. It creates communication channels between different devices, called sessions. It opens sessions, ensures they are functional during data transfer, and terminates communication sessions with the lower layers with the presentation and application layer.

LAYER 6: PRESENTATION LAYER

Also known as the translation layer, the presentation layer translates data so that it can be used by the application layer. This layer addresses the syntax and semantics of the information exchanged between the two systems. It performs translation, encryption, and compression of data.

LAYER 7: APPLICATION LAYER

The application layer is the topmost layer od the OSI Model it includes protocols designed for end-users. For example, HTTP is a Layer 7 protocol designed to transmit data between a web server and a client.