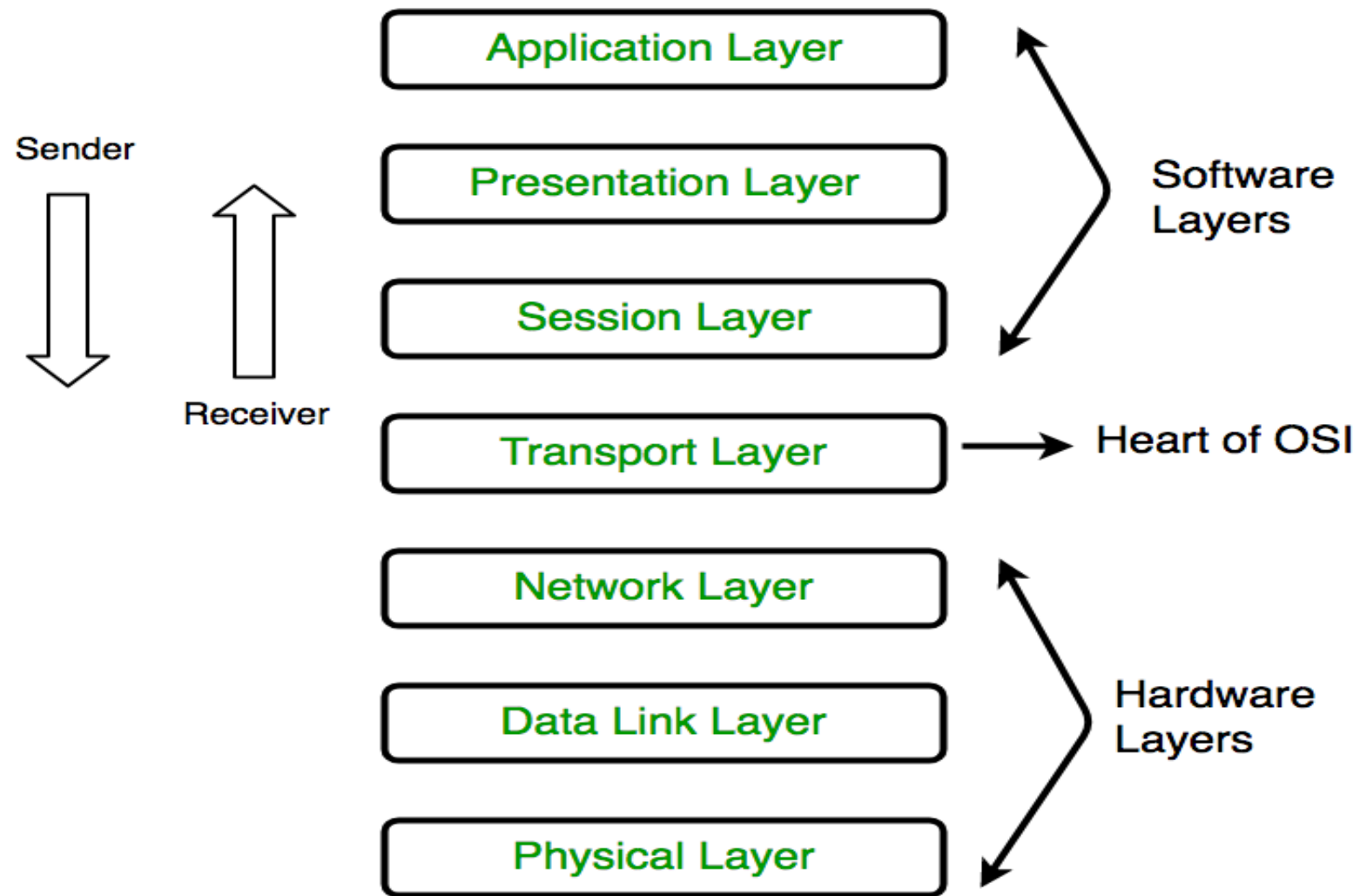# OSI Model
Layers of OSI Model

OSI stands for Open Systems Interconnection. It has been developed by ISO – 'International Organization of Standardization', in the year 1984. It is a 7 layer architecture with each layer having specific functionality to perform. All these 7 layers work collaboratively to transmit the data from one person to another across the globe.

Physical Layer (Layer 1) :

- The lowest layer of the OSI reference model is the physical layer.

- It is responsible for the actual physical connection between the devices.

- The physical layer contains information in the form of **bits.**

- It is responsible for transmitting individual bits from one node to the next.

- When receiving data, this layer will get the signal received and convert it into 0s and 1s and send them to the Data Link layer, which will put the frame back together.

Data Link Layer

- The protocol layer in a program that handles the moving of data into and out of a physical link in a network.

- This layer handles problems that occur as a result of bit transmission errors.

- It ensures that the pace of the data flow doesn't flow the sending and receiving devices.

Important Functions of Datalink Layer:

- Framing which divides the data from Network layer into frames.

(In networking, a frame is a unit of data. A frame works to help identify data packets used in networking and telecommunications structures)

- Adds Logical addresses of the sender and receivers

- It is also responsible for the sourcing process to the destination process delivery of the entire message.

- It also offers a system for error control in which it detects retransmits damage or lost frames.

Transport Layer:

- The transport layer builds on the network layer to provide data transport from a process on a source machine to a process on a destination machine. It is hosted using single or multiple networks, and also maintains the quality of service functions.

- It determines how much data should be sent where and at what rate. This layer builds on the message which are received from the application layer. It helps ensure that data units are delivered error-free and in sequence.

Important functions of Transport Layers:

- It divides the message received from the session layer into segments and numbers them to make a sequence.

- Transport layer makes sure that the message is delivered to the correct process on the destination machine.

- It also makes sure that the entire message arrives without any error else it should be retransmitted.

Network Layer:

- Primary function is to move data into and through other networks.

- Network layer protocols accomplish this by packaging data with correct network address information, selecting the appropriate network routes and forwarding the packaged data up the stack to the transport layer.

Session Layer

- It helps you to establish starting and terminating the connections between the local and remote application.

- This layer request for a logical connection which should be established on end user's requirement. This layer handles all the important log-on or password validation.

- Session layer offers services like dialog discipline, which can be duplex or half-duplex. It is mostly implemented in application environments that use remote procedure calls

- *Remote Procedure Call (RPC) is a protocol that one program can use to request a service from a program located in another computer on a network without having to understand the network's details*

Presentation Layer

- Presentation layer allows you to define the form in which the data is to exchange between the two communicating entities.

- It also helps you to handles data compression and data encryption.

- This layer transforms data into the form which is accepted by the application.

- It also formats and encrypts data which should be sent across all the networks. This layer is also known as a **syntax layer**.

The function of Presentation Layers:

- Character code translation from ASCII to EBCDIC.

- Data compression: Allows to reduce the number of bits that needs to be transmitted on the network.

- Data encryption: Helps you to encrypt data for security purposes — for example, password encryption.

- It provides a user interface and support for services like email and file transfer.

Application Layer

- Application layer interacts with an application program, which is the highest level of OSI model.

- The application layer is the OSI layer, which is closest to the end-user. It means OSI application layer allows users to interact with other software application.

- Application layer interacts with software applications to implement a communicating component. The interpretation of data by the application program is always outside the scope of the OSI model.

- Example of the application layer is an application such as file transfer, email, remote login, etc.

The function of the Application Layers are:

- Application-layer helps you to identify communication partners, determining resource availability, and synchronizing communication.

- It allows users to log on to a remote host

- This layer provides various e-mail services

- This application offers distributed database sources and access for global information about various objects and services.

Protocols supported at various levels

Layer	Name	Protocols
Layer 7	Application	SMTP, HTTP, FTP, POP3, SNMP
Layer 6	Presentation	MPEG, ASCH, SSL, TLS
Layer 5	Session	NetBIOS, SAP
Layer 4	Transport	TCP, UDP
Layer 3	Network	IPV5, IPV6, ICMP, IPSEC, ARP, MPLS.
Layer 2	Data Link	RAPA, PPP, Frame Relay, ATM, Fiber Cable, etc.
Layer 1	Physical	RS232, 100BaseTX, ISDN, 11.

- https://www.youtube.com/watch?v=vv4y_uOneC0