

## OSI Reference Model

There are n numbers of users who use computer network and are located over the world. Therefore, national and worldwide data communication systems must be developed which are compatible to communicate with each other. ISO has developed a standard Model of Network Data Communication . ISO stands for **International organization of Standardization**. This is called a model for **Open System Interconnection** (OSI) and is commonly known as OSI model.

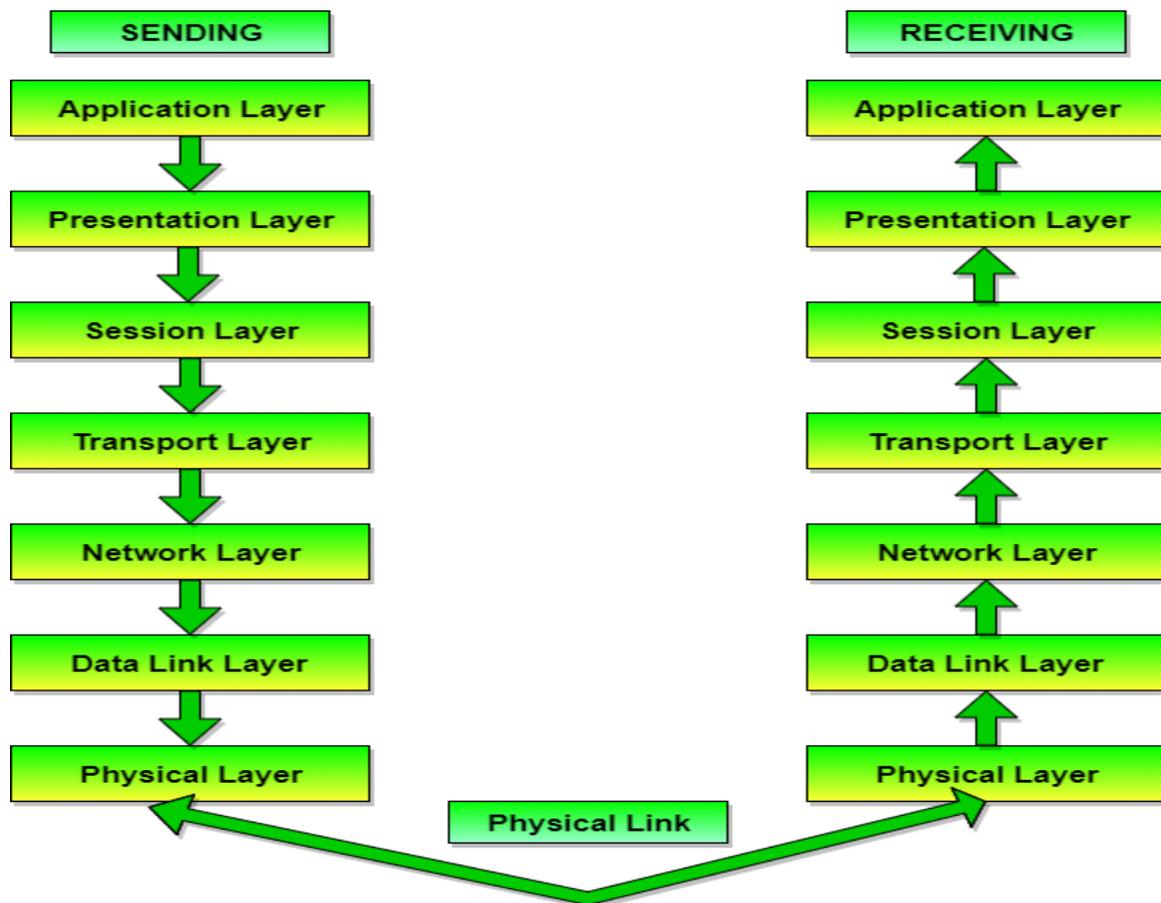
The ISO-OSI model is a seven layer architecture. It defines seven layers or levels in a complete communication system. They are:

1. Application Layer
2. Presentation Layer
3. Session Layer
4. Transport Layer
5. Network Layer
6. Datalink Layer
7. Physical Layer

The Important principles to design the model

1. A layer should be created where a different abstraction is needed.
2. Each layer should perform a well-defined function.
3. The function of each layer should be chosen with an eye toward defining internationally standardized protocols.
4. The layer boundaries should be chosen to minimize the information flow across the interfaces.

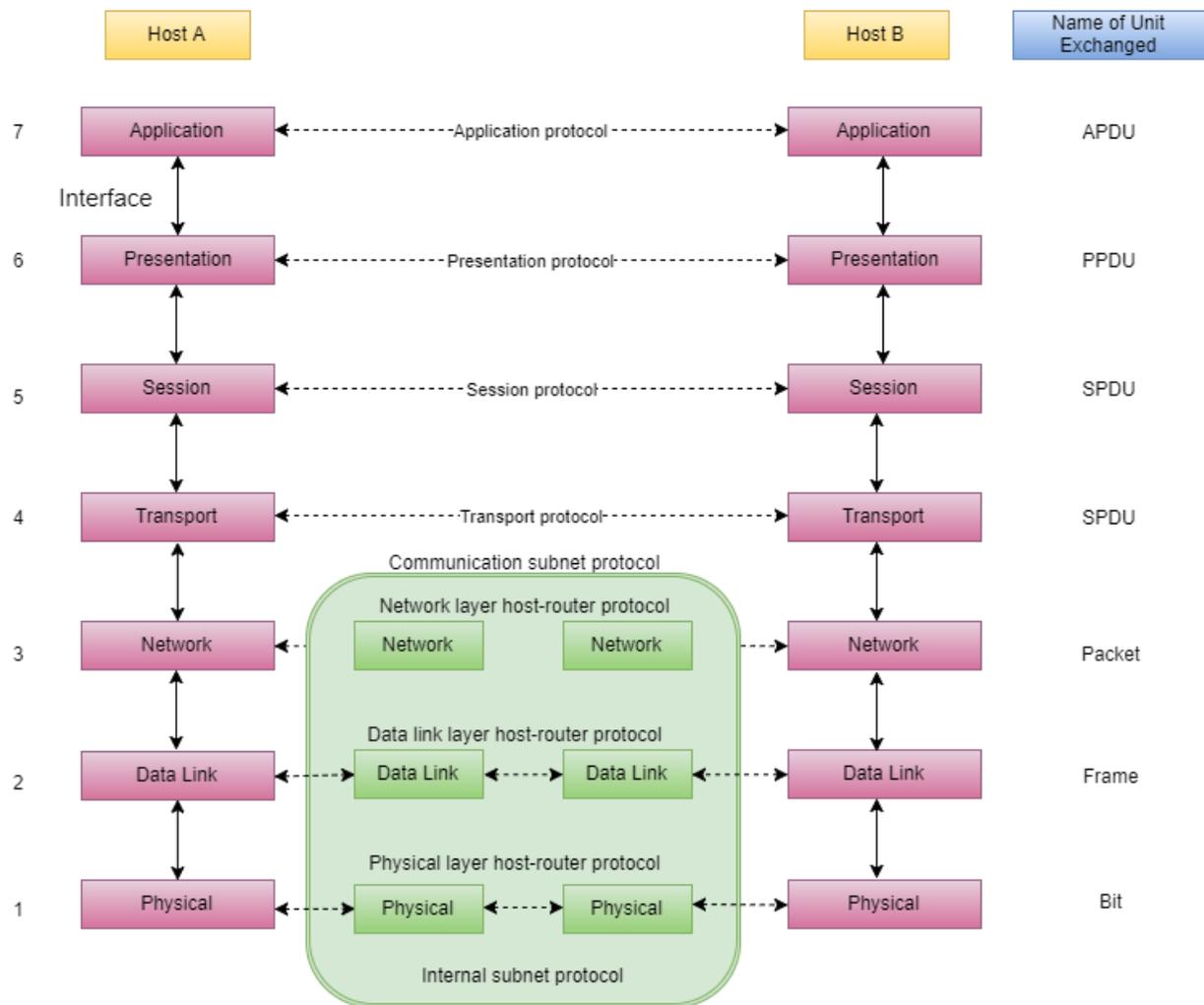
Model can be shown as :



Communication Between Layer and Protocol :

Layer	Name of Protocol	Name of Unit exchanged
Application	Application Protocol	APDU - Application Protocol Data Unit
Presentation	Presentation Protocol	PPDU - Presentation Protocol Data Unit
Session	Session Protocol	SPDU - Session Protocol Data Unit
Transport	Transport Protocol	TPDU - Transport Protocol Data Unit
Network	Network layer host-router Protocol	Packet
Data Link	Data link layer host-router Protocol	Frame
Physical	Physical layer host-router Protocol	Bit

## OSI Model with Protocol Used :



**Q. Define the working principle of different layer in OSI model with their protocol used ?**

## Physical Layer

The lowest layer of the OSI Model is concerned with electrically or optically transmitting raw unstructured data bits across the network from the physical layer of the sending device to the physical layer of the receiving device. It can include specifications such as voltages, pin layout, cabling, and radio frequencies. At the physical layer, one might find “physical” resources such as network hubs, cabling, repeaters, network adapters or modems.

## Data Link Layer

At the data link layer, directly connected nodes are used to perform node-to-node data transfer where data is packaged into frames. The data link layer also corrects errors that may have occurred at the physical layer.

## Network Layer

The network layer is responsible for receiving frames from the data link layer, and delivering them to their intended destinations among based on the addresses contained inside the frame. The network layer finds the destination by using logical addresses, such as IP (internet protocol). At this layer, routers are a crucial component used to quite literally route information where it needs to go between networks.

## Transport Layer

The transport layer manages the delivery and error checking of data packets. It regulates the size, sequencing, and ultimately the transfer of data between systems and hosts. One of the most common examples of the transport layer is TCP or the Transmission Control Protocol.

## Session Layer

The session layer controls the conversations between different computers. A session or connection between machines is set up, managed, and terminated at layer 5. Session layer services also include authentication and reconnections.

## Presentation Layer

The presentation layer formats or translates data for the application layer based on the syntax or semantics that the application accepts. Because of this, it at times also

called the syntax layer. This layer can also handle the encryption and decryption required by the application layer.

### Application Layer

At this layer, both the end user and the application layer interact directly with the software application. This layer sees network services provided to end-user applications such as a web browser or Office 365. The application layer identifies communication partners, resource availability, and synchronizes communication.

## **Merits of OSI reference model**

1. OSI model distinguishes well between the services, interfaces and protocols.
  2. Protocols of OSI model are very well hidden.
  3. Protocols can be replaced by new protocols as technology changes.
  4. Supports connection oriented services as well as connectionless service.
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## **Demerits of OSI reference model**

1. Model was devised before the invention of protocols.
2. Fitting of protocols is tedious task.
3. It is just used as a reference model.