

# Structure Of Network

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- In this section we will learn the models that are used in today's networking technology and their layers.

### OSI Model

- It stands for Open Systems Interconnection Model.
- There are 7 layers in this model:

- Application Layer
- Presentation Layer
- Session Layer
- Transport Layer
- Network Layer
- Data Link Layer
- Physical Layer

#### Application Layer

- It is implemented in the application itself.
- This is the only layer the user directly interacts with.
- Some protocols used are HTTP, FTP, etc.
- The application layer will give data to next layer which is Presentation Layer.

#### Presentation Layer

- This layer handles encryption, encoding, translation, etc of the data received by the application layer.
- This layer assumes that the next layer which is Session Layer will convert the data by itself for further processing.
- SSL (Secure Socket Layer) is used for encryption and encoding in this layer.

#### Session Layer

- This layer focuses on setting up the connection and managing it and then enabling processing of data followed by termination of the connected sessions.
- This layer assumes that the next layer which is transport layer will send the data once the connection is established.

#### Transport Layer

- This layer divides the data into segments which have a sequence number attached to them to align them sequentially in the received device.
- This layer has **Flow Control** which manages the upload speed of the sending device according to the receiving device so we do not lose any data packet during the data sending process.

## Network Layer

- This layer takes data segments from transport layer and then transports it from uploading device to the downloading device.
- Router is a part of network layer.
- The function of this layer is logical addressing.

## Data Link Layer

- This takes data packet from network layer and does logical address and physical addressing.
- MAC Address is used for physical addressing.
- A frame is the data unit that has the MAC Address to it added by the data link layer.
- After creating these data frames, all the above layers can access these frames and control how they are placed and received.
- Adds MAC Address to frames or data segments received from network layer.

## Flowchart

- This flow shows how a packet goes layer by layer from uploading device to downloading device.
- Application => Message formed by the user and this layer sends it to presentation layer.
- Presentation => Transports the message by modifying it (encoding, encrypting, decrypting, etc).
- Session => Creates a connection between devices and sends the message to transport layer.
- Transport => Makes the message into packets and segments and sends it to network layer.
- Network => Bundles and assigns IP Addresses to packets and sends it to Data Link layer.
- Data Link => Adds MAC Address to the received frames and sends it to physical layer.
- Physical => Sends the data to physical router.

## Real World Example

- ME => A => P => S => T => N => D => P => Router => P => D => N => T => S => P => A => MY FRIEND.

## TCP/IP Model

- Internet Protocol Suite.
- This model has 5 layers: - Application Layer - Transport Layer - Network Layer - Data Link Layer - Physical Layer
- The working of the layers is same as OSI Model but with few exceptions.

- OSI model's Application, Presentation, Session are merged together into Application.
- This is used practically and OSI is used for theory and concepts.