# OSI MODEL

OSI model stands for the Open System Interconnection Reference model.OSI is Reference model.OSI model dont reflect the actual network model like TCP/IP model architecture .It is used as a Reference model for organization for creating new proticol to make sure that the architecture they create will fit the overall architecture .The OSI model has 7 layers

from top to bottom

1) Application Layer
2) Presentation Layer
3) Session Layer
4) Transport Layer
5) Network Layer
6) Data Link Layer
7) Physical Layer

OSI model actually came in two parts.first part is the abstract model itself and he second part for the different protocols that was designed to fit in the abstract model that is created and work togather. This protocols structure are also used for the reference

purpose .they are not created to be used as an actual protocol they are used for reference purpose for making protocols

## 7 layer of the OSI model

1) physical layer:

    physical layer is the Bottom layer.and it is responsible for transferring raw data across the network. Data is transmitted in the form of binary.the Physical layer also define the method of encoding to transmit the data with binary method. For this purpose it also define how the bits are going to placed on media depending on the type of the media. physical layer also define the media type and their specifications. And what kind of media is allowed and how the physical connection should be made.it also define the frequency of the waves that are allowed to be used.The physical layer apply standard to different types of media. Different media have different standards

2) Data Link Layer

    data link layer is responsible for error free data transfer from one node to another over the physical media.Data link layer is also responsible for the traffic control like establishing and terminating links between nodes.it ensures that the frames are sending

and receiving sequentially. the data link layer is also responsible for the frame acknowledgment that means if it receive a data from a node it will send an acknowledgment signal to the corresponding node. And if any error is happened then the data link layer detect the error and try to recover this error by sending a  sending a request for the re transmitting the signal to the node it is coming from.and it can also handle the duplicate frame .that means if any node send a data frame twice the receiving end will automatically reject one of the frames.

Another important job of the data link layer is the frame delimiting .means it creates and recognize the frame boundaries it means data link layer isresponsible when the frame stops and when it starts. Data link layer is also do error checking , it check the data integrity and make sure the received frame is intact

data link layer also control the access to the physical media. That means it determine which node is permitted to send data at a certain amount of time. Thats how it prevents the packet collision

3) Network Layer

Network layer Doing this following job

Routing:
routing traffic from one network to another network, and to do so it also responsible for finding the best possible path. The best possible path is determined using the number of hops,number of steps between the sender and the receiver, bandwidth,throughput and other metrics that are used in the data communication .

Subnet Traffic Control:
subnet traffic control means the router communicate with each other to know the status of each other .if any too much transmission is going on a router the router sends the adjacent router to slow down the process or "throttle back" because the buffer are getting overloaded.

Frame Fragmentation:

Network layer is responsible for setting the frame size for transmission .frame size is the maximum  transmission unit . And it also breaks down the frame to match the MTU. And if the frame size is

smaller than the MTU then it reassemble the frame to match the MTU

ADDRESS MAPPING :

network layer map the logical address (ip address) into physical address (MAC address)

Subnet Usages accounting:

Network layer is also responsible for keeping track of frames forwarded by subnet . This information is used to produce billing information

Transport Layer:

1) It ensure error free message delivery
2) Ensure the correct sequence of the message
3) Ensure no loss and no duplication of the message
4) The job responsibility of the transport layer is highly dependent of the network layer .if the network layer does more functionality the Transport layer does the less job
5) it receives the data from  the session layer and then splits into smaller parts.

The size of the message parts is dependent on the network layer . It divide the data based on the specification .so the network layer do not have to fragment the data again

6) once the data is fragmented then header is added with data,header contains the start flag  the end flag and the sequence information of the packet

7) one the message is sent to the receiving end then the transport layer reassemble the data and send it to the session layer

8) Transport layer is also do data acknowledgment

9) one of the main job of the transport layer is the session multiplexing

it breaks all the data coming in one link and then separate the data from the different protocol it is intended to. those higher level protocol is known is session.

# Session Layer:

Session layer is responsible for establishing connection between different process running on the computers
session layer is responsible allowing different process for establishing maintaining and terminate connection.
Security for that connection
also responsible for recognizing different session
logging out from the connection if the job is done

# Presentation Layer:

1) It Formats the data for the application layer
2) it works like a translator .cause translate the data from the network and then format it for application layer and vice versa
3) responsible Character encoding
4) Data conversion
5) presentation layer use data compression so we can send more data using less bits needed
5) data encryption is done for security purpose

Application layer:

application layer gives the user the opportunity to access the network services through different application

application layer provides

1) resources sharing
2) Remote Access
3) Remote File management
4) Network management
5) Email messagin and  a lot more