The OSI Reference Model (Part 3)

Transport Layer:

1. It is responsible for process to process delivery of the entire message.
2. Services provided:
   1. Port addressing: When a data comes back from the server it needs to be sent to the right process. This layer assigns the process port number and reads it back when data comes back.
   2. Segmentation and reassembly:
      1. Big data to smaller messages.
      2. Assign smaller numbers
      3. With numbers reconstruct the message
   3. Connection control
      1. Whether communication will be made with connection or connectionless.
   4. End to end flow control
      1. Speed matching mechanism
   5. Error control
      1. Will check for errors in transmission.

Network Layer

1. It is responsible for delivery of data from the original source to the destination network.
2. Services provided:
   1. Logical addressing:
      1. IP addressing
      2. It helps the router to make decisions so when a packet is received by the router, it will have source IP address and destination IP address.
   2. Routing
      1. Finding the best route to deliver the packet (uses IP addresses)

Data link layer

1. It is responsible for moving data(frames) from one node to another node
2. Services provided:
   1. Framing
      1. group s the 0s and 1s into groups
   2. Physical Addressing
      1. MAC addressing (source – destination)
   3. Flow control
      1. Same logic as transport layer
   4. Error control
      1. If data is corrupted or lost or damaged it can be identified with this error control
   5. Access control
      1. If 2 or more devices connected through a common link, access control determines which device is using the link actively.

Physical Layer

1. It is responsible for transmitting bits over a medium.
   1. Layer know which medium it has and send the data over that medium(wired or wireless)
2. It also provides electrical and mechanical specifications.
   1. Ex. If the medium is wire, it knows it will turn data to electrical waves.
3. Services provided:
   1. Physical characteristics of the media:
      1. Defines the king of media. (wired or wireless)
   2. Representation of bits
      1. Encoding: how 0s and 1s converted into signals
   3. Data rate
      1. Also called transmission rate
      2. Number of bits sent each second
   4. Synchronization of bits
      1. Clock between sender and receiver also needs to be synchronized
   5. Line configuration:
      1. Point to point(2 nodes 1 channel), point to multipoint (multiple nodes sharing channel) decided by line configurations
   6. Physical topology
      1. Defines how devices are connected to make a network
   7. Transmission mode
      1. Whether it is simplex, half duplex or full duplex.