34. Data - Link Layer Services

Data-link layer is responsible for moving data (bits into the frames) from one end device to another end device. The data is present in the form of bits (0 and 1).

The data link layer should add the physical source address and physical destination address to the data `.

This data is collectively called as ‘Frames’.

The Services offered by the Data-Link layer are –

1. Framing.
2. Physical Addressing.
3. Flow Control.
4. Error control.
5. Access Control.

Framing –

* The data link layer packs the bits into frames which are easily distinguishable and understandable.
* Example - While giving a speech, the speaker gives a pause between each sentence, this makes us distinguish between each sentence and understandability increases. Full stops in written format as well.
* Same works if there are bits collectively packed into frames by the data link layer.
* If the receiver cannot encrypt the data packet, the whole point of communication collapses and data transfer is not possible.
* Hence, framing is the most important function of Data link layer.
* Another example of framing is inserting a letter into an envelope where the letter (data in bits) is put into the envelope for identification and understanding. The envelope acts as the delimiter like pause in speech or full-stop in a written information.

Physical Addressing –

* The physical addressing is adding header and the trailer info to the data frames.
* In the header, the source and destination MAC address are added.

Flow Control –

* Flow control is one of the duties of the data link control sublayer (next lecture).
* The flow control in data link layer is end to end flow control (one end device to another end device).
* Flow control is the speed matching mechanism.
* For instance, if one end point can transfer 100 data packets per second while the other end device can only receive 10 data packets per second, a network collision may occur resulting in loss of data.
* Hence flow control is very important in network communication.
* Flow control co-ordinates the amount of data sent before receiving an acknowledgement.
* It basically tells the end device that it can receive 10 data packets to the other end device, so that the other end device can send the limited data packets.

Access Control –

* Access control is also known as Media Access Control.
* In Access control, the medium through which all the devices/end nodes are going to transfer the data is being controlled to prevent collision during data transmission.

Error Control –

* When there is an error, it is not in the hands of the source to protect the data. Here data link layer functions to do the following tasks -
  + Error detection.
  + Error correction.