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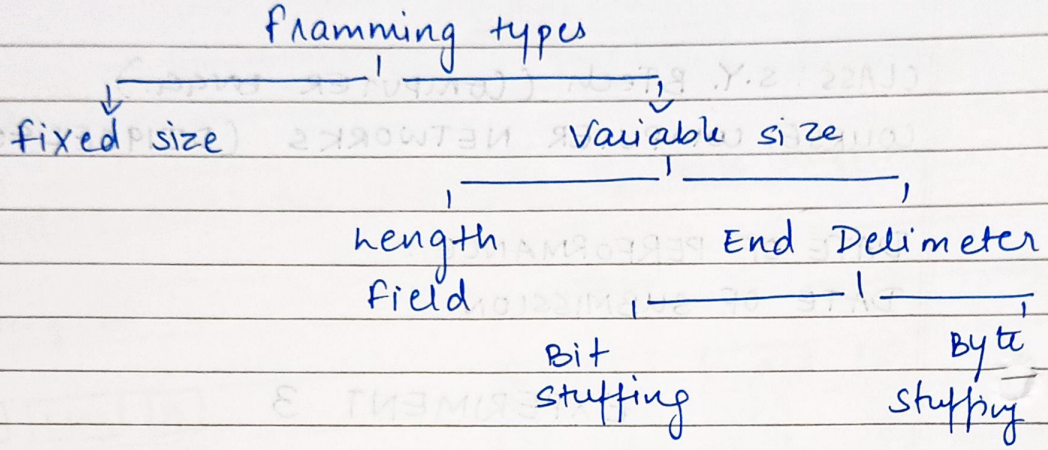
EXPERIMENT 3

AIM: To study the Framing Mechanism in Data Link layer

THEORY:

- Data link layer takes the packets from the Network layer and encapsulates them into frames
- If the frame size becomes too large, then the Packet may be divided into small sized frames. Smaller sized frames makes the flow control and error control more efficient
- Then, it sends each frame bit-by-bit At receiver's end, data link layer picks up signals from hardware & assembles them into frames.

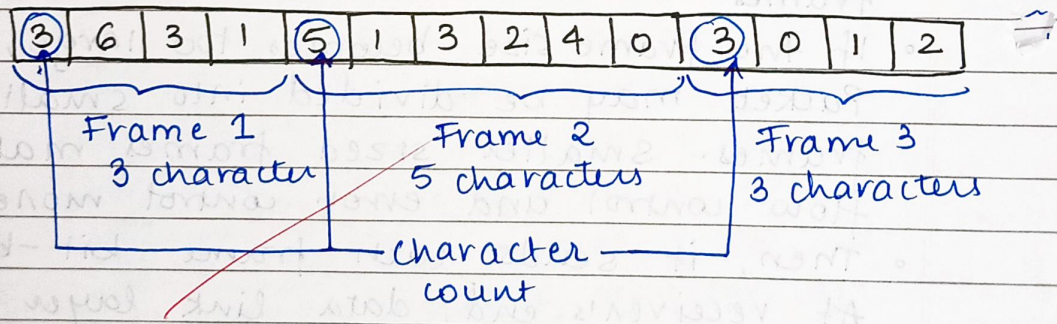
TYPES OF FRAMING:



METHODS OF FRAMING:

1. CHARACTER COUNT

- This method ensures data link layer at the receivers end about the total no. of characters that follow, and about cohere the frame ends.



- Disadvantage: If anyhow the character count is disturbed or distorted by an error occuring during transmission, they receiver might not be able to locate or identify the beginning of next frame.

2. BIT STUFFING

- This method is also known as bit-oriented framing in which extra bits are being added by network protocol designers to the data stream.
- Most protocols use a special 8-bit pattern flag 01111110 as a result of the delimiter to stipulate the beginning and so the end of the frame.

Data → 000111111100111110100

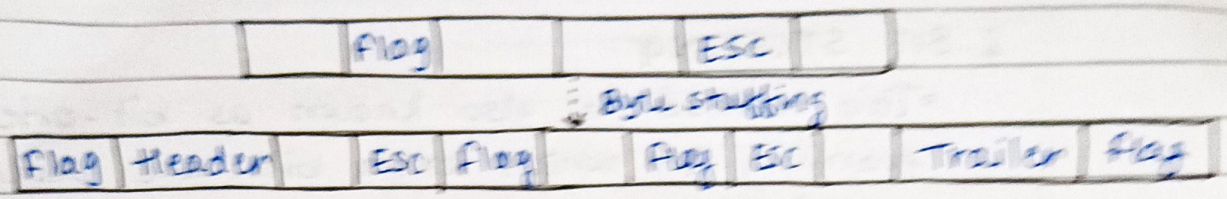
Stuffed ↓

Flag	Header	0001111111000111110001000	Trailer	Flag

- Disadvantage: This technique doesnt ensure that the sent data is intact at the receiver side. It is merely a way to ensure that transmission starts and ends at the correct places.

3. BYTE STUFFING

- In this method we add an additional byte once there is a flag or escape character within the text
- The sender sends the frame by adding three additional ESC bits and therefore the destination machine receives the frame and it removes the extra bits to convert the frame into an identical message



Following are the examples of byte stuffing:

Original	After
A Flag B	A ESC FLAG B
A ESC B	A ESC ESC B
A ESC Flag B	A ESC ESC ESC FLAG B
A ESC Flag B	A ESC ESC ESC ESC B

- Disadvantage: Size of frame varies unpredictably due to byte insertion

CONCLUSION:

- Framing facilitates two of the primary functionalities
  i. It provides a mechanism for flow control that manages the frame flow such that the congestion of data is not there on slow receivers because of the fast sender
  ii. It provides reliable transfer services of bits between two layers of the peer nations.

Ans