

The image features a dark gray background with a large, abstract, colorful pattern at the top. The pattern consists of various shades of red, orange, yellow, and green, creating a textured, almost pixelated appearance. The text "Data Link Layer" is centered in the dark gray area.

Data Link Layer

Data Link Layer Design Issues

- Access control
 - Framing
 - Error Control
 - Flow Control
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- Transmission Time
 - Propagation Time

Functions of the Data Link Layer

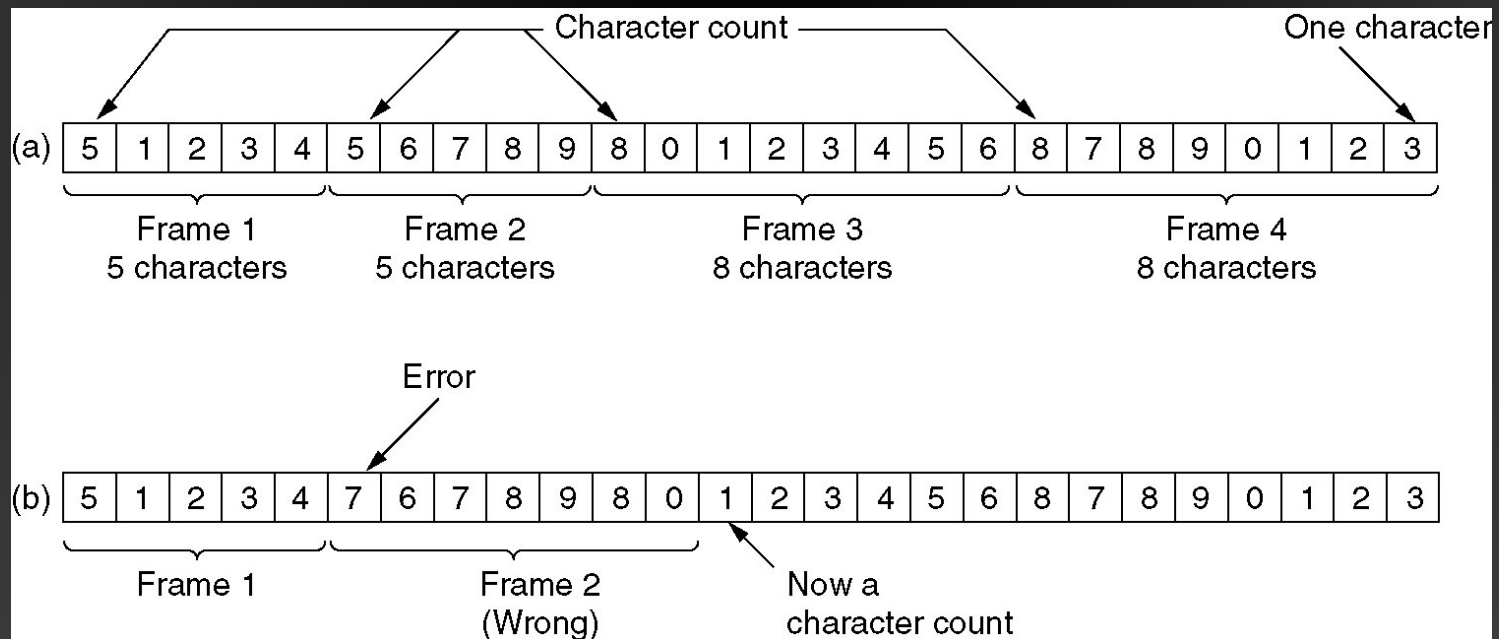
- Error Control
 - Framing
 - Flow control
 - Access control
 - Providing physical address
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Framing

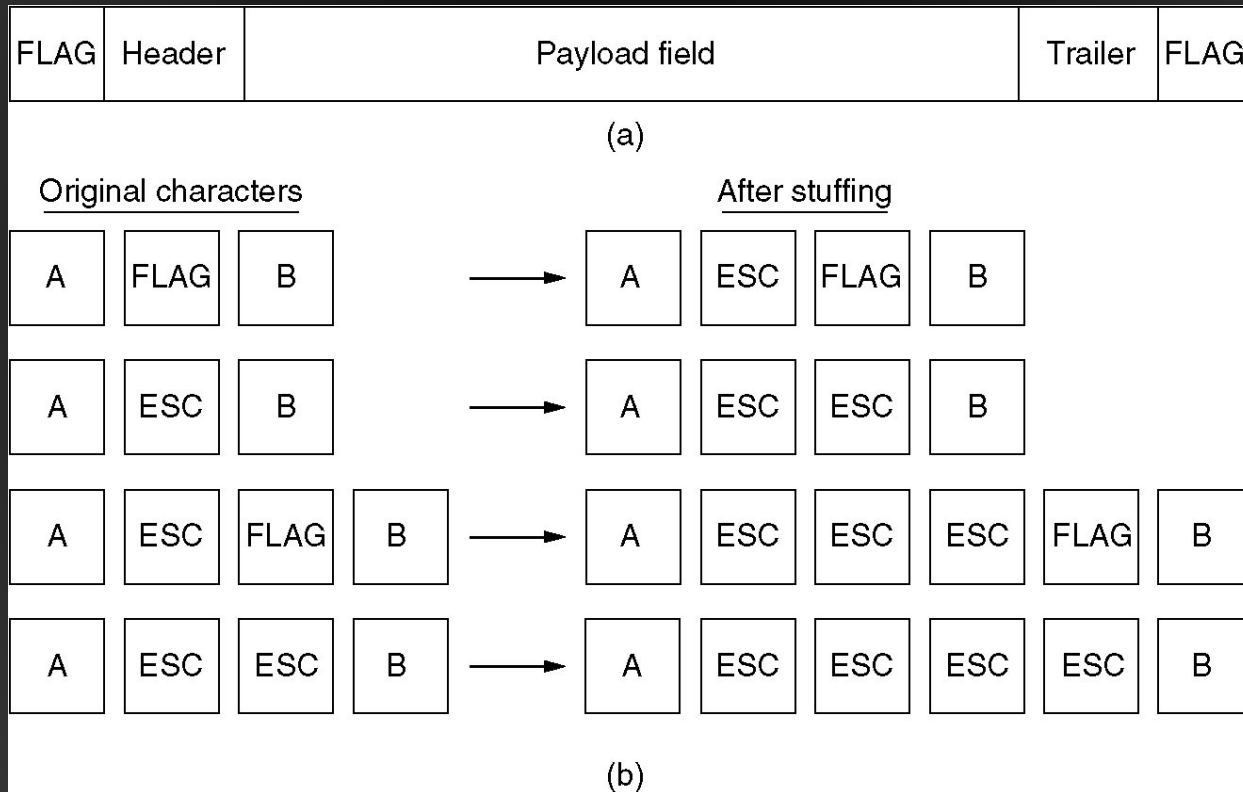
- Character Count
 - Flag bytes with byte stuffing
 - Flag bytes with bit stuffing
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Framing with Character Count

A character stream. (a) Without errors. (b) With one error.



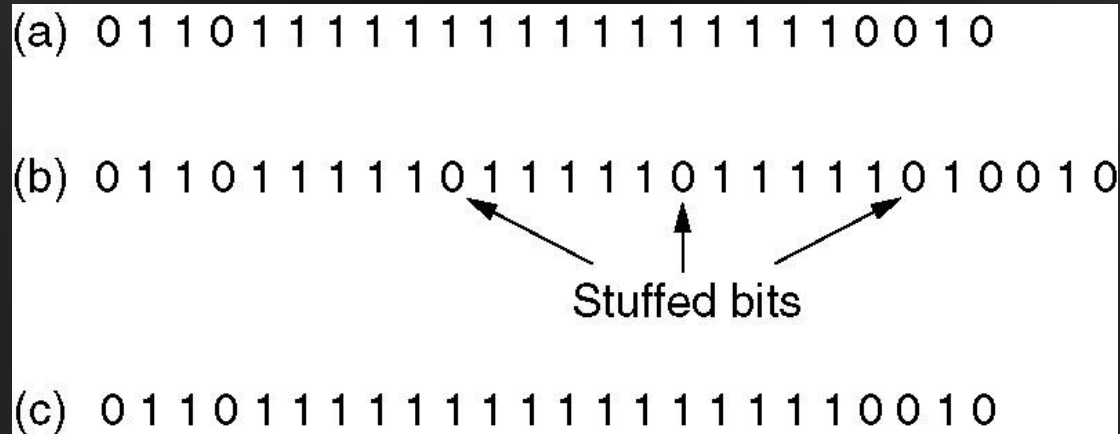
Framing with byte stuffing



Framing with byte stuffing

- Problem : fixed character size : assumes character size to be 8 bits : can't handle heterogeneous environment.

Framing with bit stuffing



Bit stuffing

(a) The original data.

(b) The data as they appear on the line.

(c) The data as they are stored in receiver's memory after destuffing.

Error Control

- Positive and Negative feedback
 - Timers : what happens when a frame completely vanishes : receiver neither sends a +ack nor -ack ... then timer comes to help.
 - It may result in a frame being sent more than once and received more than once :
 - solution : assign sequence numbers to frames
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