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Data Link Layer

FRAMING

Data Link Layer

The two main functions of the data link layer are data link control and media access control.

- **Data link control** functions include framing, flow and error control, and software implemented protocols that provide smooth and reliable transmission of frames between nodes.
- The second function of the data link layer is media access control, or how to share the link.

Data Link Layer	Data Link Control (DLC)
	Media Access Control (MAC)

FRAMING

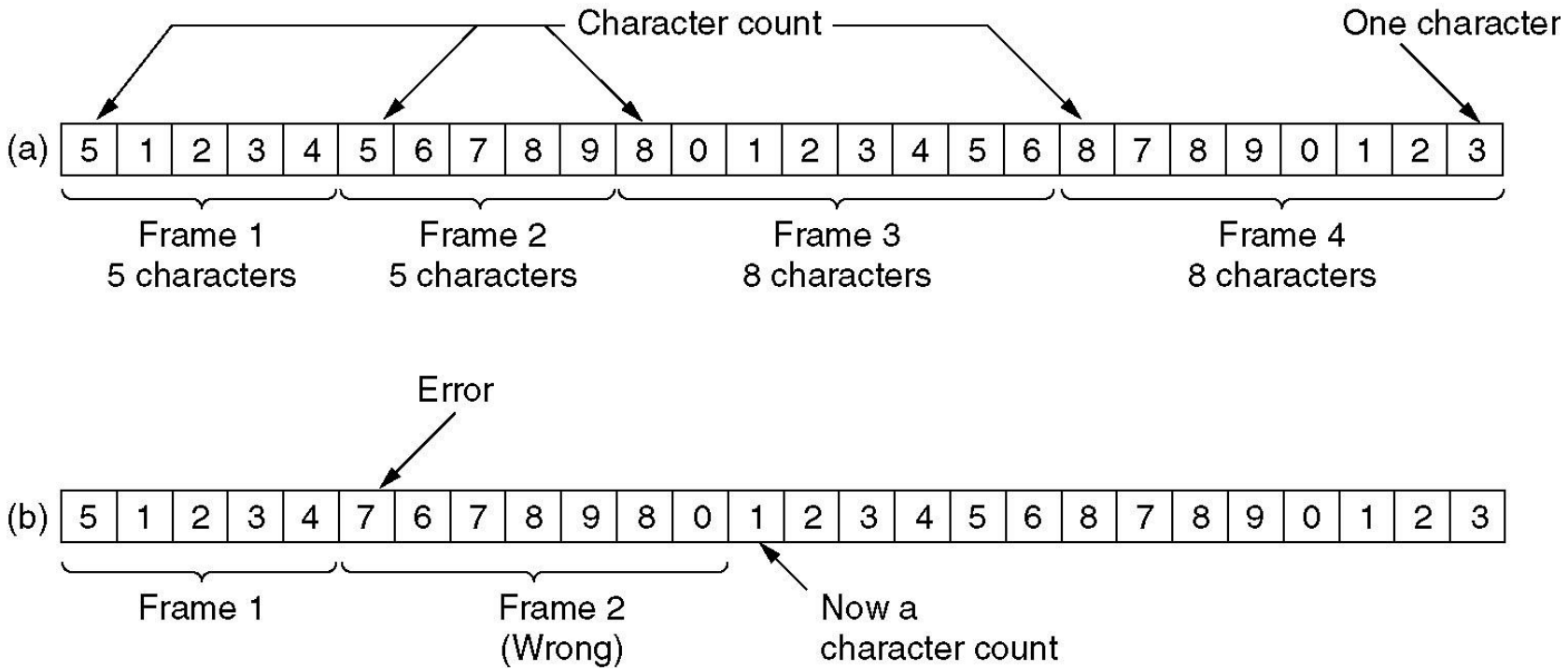
- *The data link layer needs to pack bits into frames, so that each frame is distinguishable from another.*

- *The postal system practices are a type of framing. The simple act of inserting a letter into an envelope separates one piece of information from another; the envelope serves as the delimiter.*

TYPES OF FRAMING

- *Character Count*
- *Flag byte with byte stuffing*
- *Start and End flag with bit stuffing*
- *Physical Coding Violation*

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



Flag byte with byte stuffing

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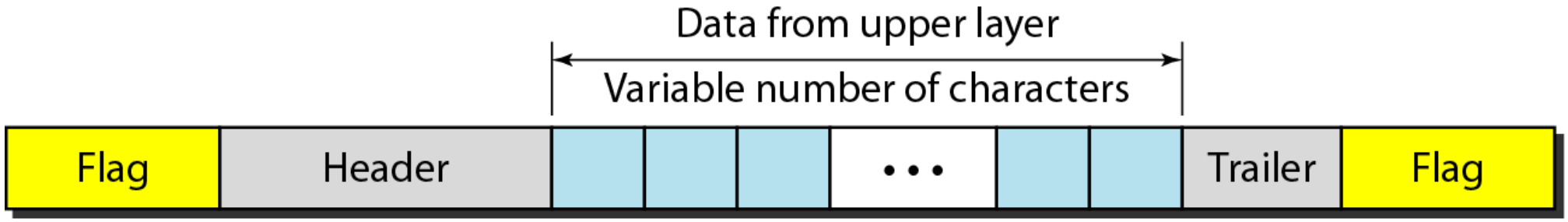
A frame in a character-oriented protocol



Flag byte with byte stuffing

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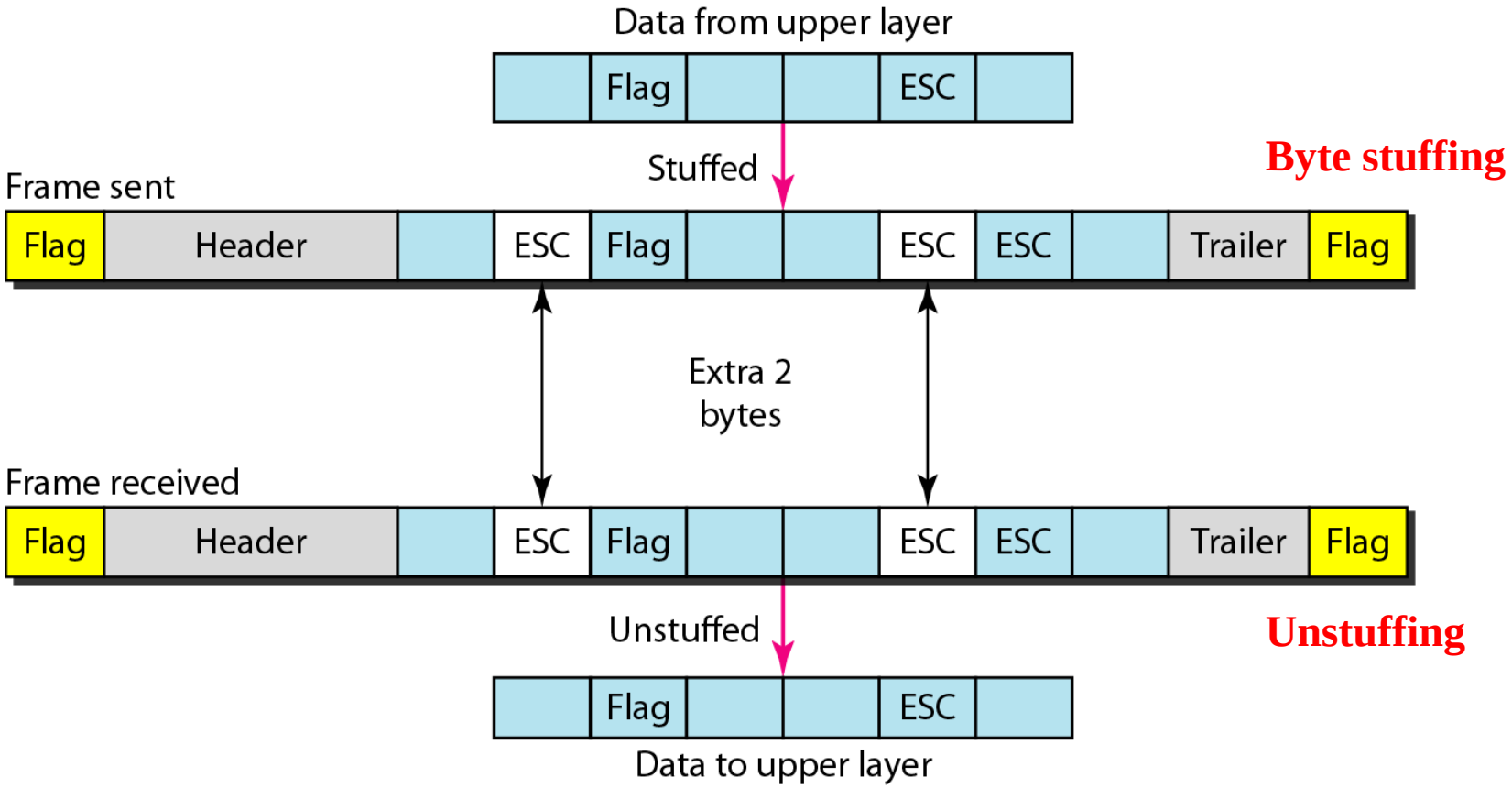
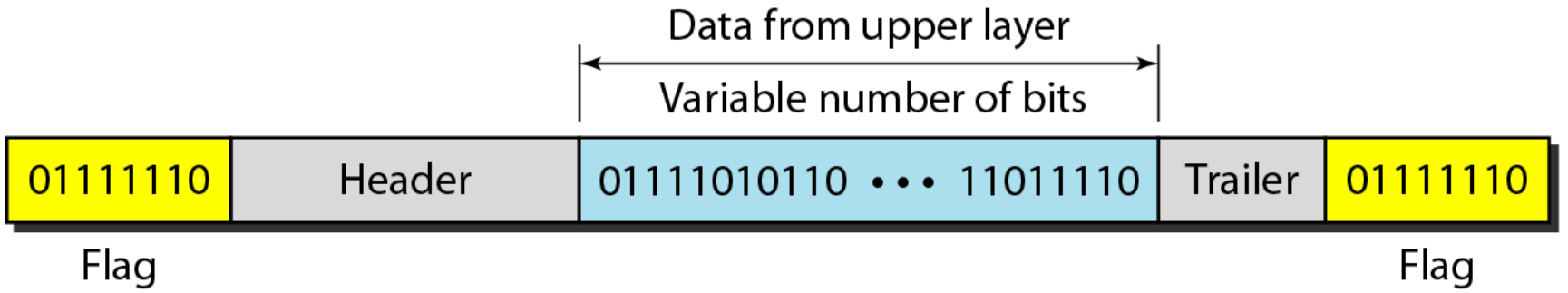
- Byte stuffing is the process of adding 1 extra byte whenever there is a flag or escape character in the text.

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

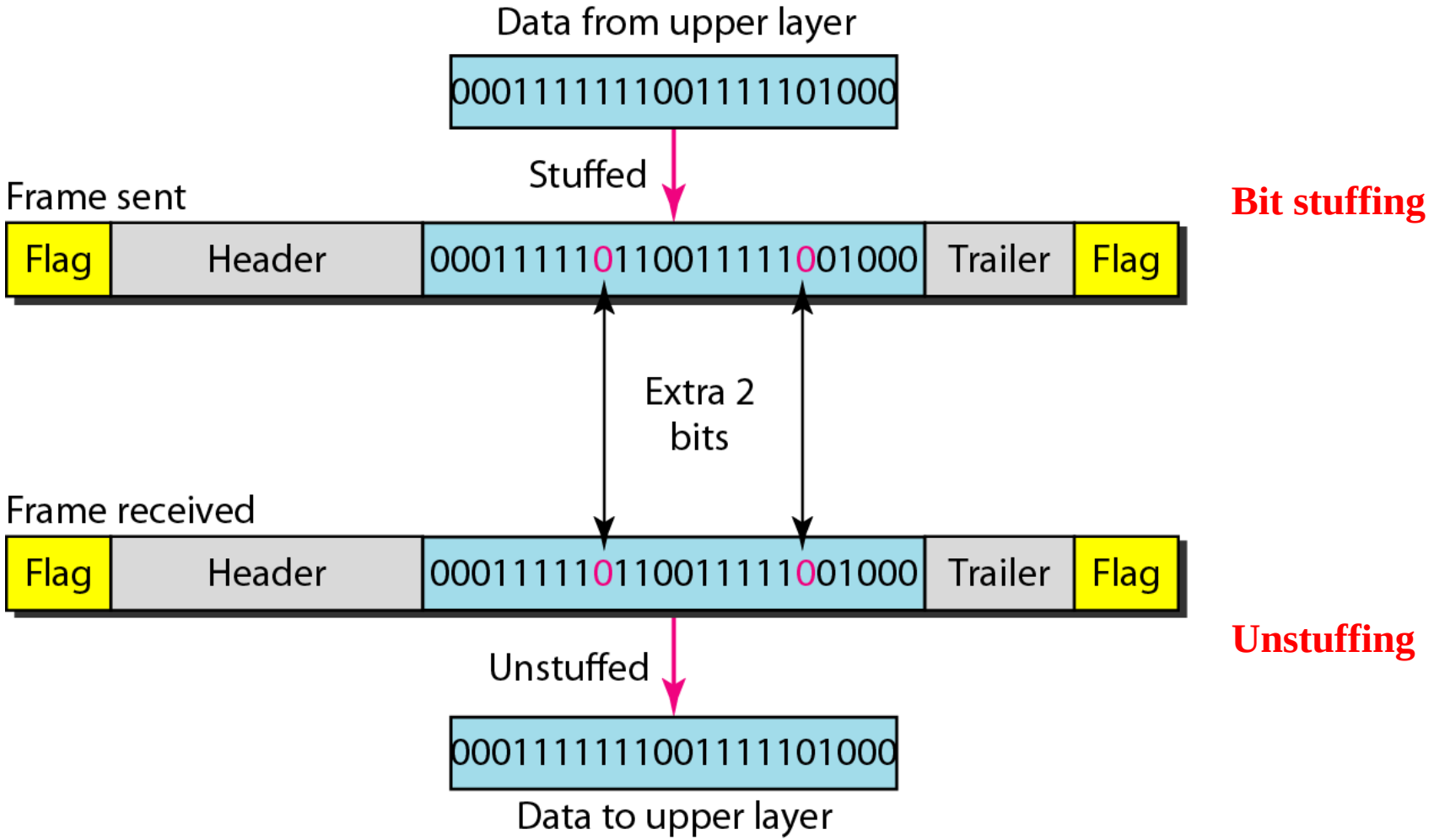


Start and End flag with bit stuffing

- In Bit stuffing, Each frame begins and ends with a special bit pattern 01111110
- Bit stuffing is the process of adding one extra 0 whenever five consecutive 1s follow a 0 in the data, so that the receiver does not mistake the pattern 0111110 for a flag.



Start and End flag with bit stuffing



Physical Layer Coding Violation

- Physical layer coding violations is applicable to networks in which the encoding on the physical medium contains some redundancy.
- In such cases normally, a 1 bit is a high-low pair and a 0 bit is a low-high pair.
- The combinations of low-low and high-high which are not used for data may be used for marking frame boundaries.