Ve489 Computer Networks

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Homework Set 2

Due date: June 13, 2023

1. Explain the reason for framing in the logical link control layer? Also, list the key approaches for framing?

2. Considering an example of bit stuffing,

    1) If the bit stream of a service data unit (SDU) is 01101111 11101011 10110100 00101111 11011011 10111111 11010111 11111110 (totally 64 bits, i.e., 8 bytes). If bit stuffing is used, and the flag is 01111110, what would be the bit stream after stuffing? Mark the stuffed bits.

    2) Explain the procedures of how to de-stuff the stuffed bit stream and get the original bit stream at the receiver? If the bit stuffed bit stream is 0111111001111100011111110101001101111110 (totally 40 bits). In this problem, there is at most one bit error and the bit error can only occur at a stuffed bit.

3. Study the key mechanisms of three ARQ protocols.

    1) Use a table to list the key elements of these ARQ protocols (e.g., timeout, ack/nak, sequence number, receiving window, sending windows, etc.), and also explain the relationship of these elements (if there is any).

    2) Derive the efficiency of these three ARQ protocols considering both error-free and erroneous environments.