Problems
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Also, the following two problems:

Problem A:
Suppose the distance between two ends of an Ethernet LAN is \( d \). Can you derive a formula to find the minimum frame size needed for an Ethernet packet? Using this formula, what is the minimum required packet size for an Ethernet that spans 3 kilometers?

Problem B:
Suppose two nodes, A and B, are attached to opposite ends of an 800 m cable, and that they each have one frame of 1,500 bits (including all headers and preambles) to send to each other. Both nodes attempt to transmit at time \( t=0 \). Suppose there are four repeaters between A and B, each inserting a 20-bit delay. Assume the transmission rate is 100 Mbps, and CSMA/CD with backoff intervals of multiples of 512 bits is used. After the first collision, A draws \( K=0 \) and B draws \( K=1 \) in the exponential backoff protocol. Ignore the jam signal and the 96-bit time delay.

1) What is the one-way propagation delay (including repeater delays) between A and B in seconds? Assume that the signal propagation speed is \( 2.10^8 \) m/sec.
2) At what time (in seconds) is A’s packet completely delivered at B?
3) Now suppose that only A has a packet to send and that the repeaters are replaced with switches. Suppose that each switch has a 20-bit processing delay in addition to a store-and-forward delay. At what time, in seconds, is A’s packet delivered at B?