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Answer p28

The link capacity is only 100 Mbps, so host A’s sending rate can be at most 100Mbps. Still, host A sends data into the receive buffer faster than Host B can remove data from the buffer. The receive buffer fills up at a rate of roughly 40Mbps. When the buffer is full, Host B signals to Host A to stop sending data by setting RcvWindow = 0. Host A then stops sending until it receives a TCP segment with RcvWindow > 0. Host A will thus repeatedly stop and start sending as a function of the RcvWindow values it receives from Host B. On average, the long-term rate at which Host A sends data to Host B as part of this connection is no more than 60Mbps.

Answer P36

Suppose packets n, n+1, and n+2 are sent, and that packet n is received and ACKed. If packets n+1 and n+2 are reordered along the end-to-end-path (i.e., are received in the order n+2, n+1) then the receipt of packet n+2 will generate a duplicate ack for n and would trigger a retransmission under a policy of waiting only for second duplicate ACK for retransmission. By waiting for a triple duplicate ACK, it must be the case that two packets after packet are correctly received, while n+1 was not received. The designers of the triple duplicate ACK scheme probably felt that waiting for two packets was the right tradeoff between triggering a quick retransmission when needed, but not retransmitting prematurely in the face of packet reordering.

Answer P42

If TCP were a stop-and-wait protocol, then the doubling of the time out interval would Suffice as a congestion control mechanism. However, TCP uses pipelining, which allows the sender to have multiple Outstanding unacknowledged segments. The doubling of the timeout interval does not Prevent a TCP sender from sending a large number of first-time-transmitted packets into The network, even when the end-to-end path is highly congested. Therefore a congest on control Mechanism is needed to stem the flow of “data received from the application above” when there are signs of network congestion.