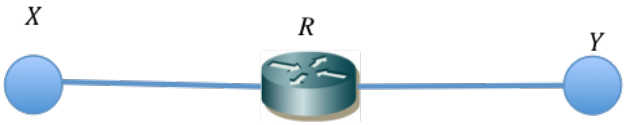
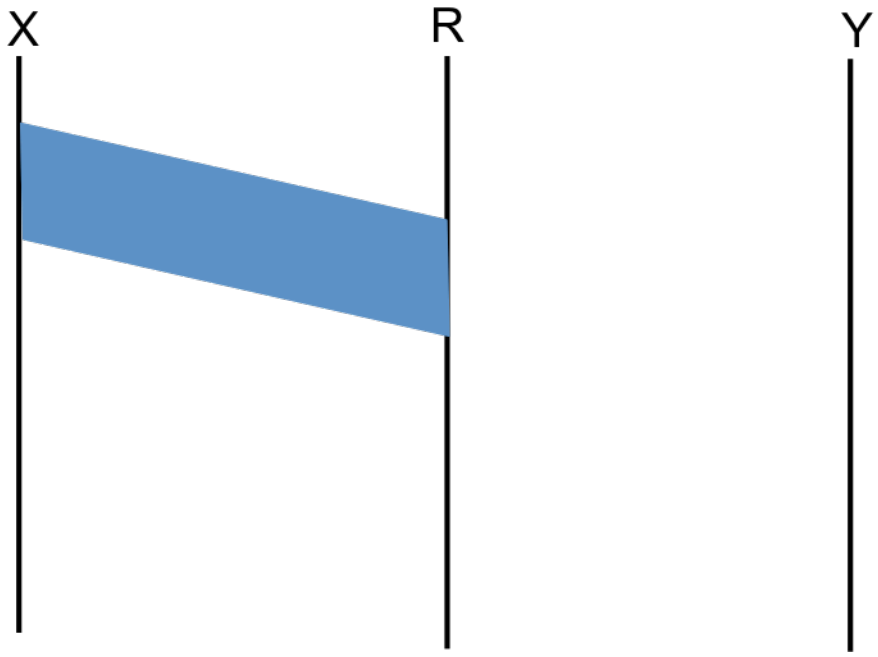
EECS 325/425.
HW 1
41 points
Due Sept. 14 before 11:59pm.

Problem 1 (6 points). Time diagrams are often used to illustrate protocol operation. When exchanged messages are considered as single indivisible ("atomic") units of communication (such as in the "Got Time?" protocol we discussed in class), they are depicted on a time diagram as single lines that extend from the sender to the receiver. When it is important to indicate that a message is actually a sequence of bits and it takes time to transmit this sequence, the message is sometimes depicted as a set of parallel lines, one for each bit, and sometimes as a "ribbon" that has a certain width, as in the figure below. Consider sender host X connected to receiver host Y through a router R:



Let X send a packet to Y through R. The transfer of the packet from X to R is shown in the figure below.



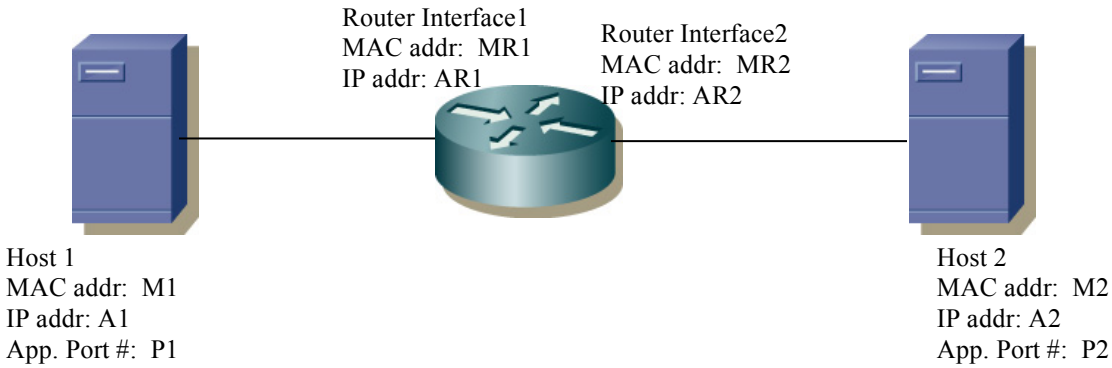
(a) Mark where the first and last bit of the message is in the ribbon that represents the message (2 point)
(b) Mark on the diagram the transmission delay and propagation delay incurred by this transmission (2 points)
(c) Assume the node processing delay at router R is negligible. Complete the time diagram by drawing the transfer of this packet from R to Y (2 points)

Problem 2 (8 points). Textbook, 6th edition, Ch. 1 Problem 18. Please submit listings of your traceroute outputs with your homework. Note: if your traceroute experiences too many stars, try to use a different destination, or perform the traceroute from home, from Case network, and from some external wifi hotspot (e.g., café, bookstore, etc.).

Problem 3. 6th Edition, Chapter 1, Problem 6. (14 points).

Problem 4. 6th Edition, Chapter 1, problem 31. (10 point) Hint for problem (d): think what happens when a bit is corrupted, or a segment is lost.

Problem 5 (Do not do this problem until after the class on Friday). Consider the following network (Notice that the router has different addresses at different interfaces):



Assume application on host 1 sends message (application-level data content) D to application on host 2. Assume the message and all added headers fit into one data chunk at every layer. Draw data chunks at each layer (you only need to show addressing information in the headers) as they flow between layers and between machines in the figure above **(3 points)**