

CS447 – Networks and Data Communications

Spring 2024

Exercise Questions on January 23rd, 2024

EXERCISE #1:

- A 100-Mbps connection between A and B
- Packet size = 120 bytes
- Signal propagation delay is $20\mu\text{s}$

What is the link-utilization, if stop-and-wait flow-control is used?
Should your work.

EXERCISE #2:

In the figure below, frames (packets) are generated at node A and sent to node C through node B. Determine the sliding window size so that the buffer at node B will not overflow, based on the following conditions:

- The data rate between A and B is 100 Mbps ($M = 10^6$)
- The data rate between B and C is 200 Mbps
- The propagation delay is $20\mu\text{s}$ and $5\mu\text{s}$ for link A-B and B-C, respectively.
- The links are both full-duplex links.
- All data frames are 400 bits long; ACK messages are separate frames of negligible length (frame transmission delay = 0).
- For link A-B, sliding window flow control is used.
- For link B-C, stop-and-wait flow control is used.
- Assume no error.

