

Midterm #2 -- open book section

The entire exam is to be turned in at 10:40AM. Work the closed book section first and turn it in before you consult your books and notes to work on the open book section. For the closed book section, write your answers on the exam itself.

Problem 1. (25 points)

Two computers, one in California and one in North Carolina, are connected via a duplex T3 circuit that transmits 45Mbps (45,000,000 bits per second). The two computers exchange packets 10,000 bytes long, *and* a delay of about 20 milliseconds is encountered in transmitting a single bit between the two computers.

[Your answers to this problem need be precise to only one decimal place.]

- 1(a). How long does it take to transmit one 10,000 byte packet at 45Mbps?
- 1(b). If piggybacking were used, how long would it for the two machines to exchange 1000 packets (500 from each machine) using a sliding window protocol with a window size of one *if* no packets were lost?
- 1(c). If the sliding window size was increased to ten, how long would it take?
- 1(d). What would be a good choice for a window size and time out period for this transcontinental computer network?

Problem 2. (15 points)

Your boss at Acme Sports gives you \$20,020 to interconnect five LANs owned by different departments, all located in own building, of Acme. Repeaters cost \$1,000, bridges cost \$2,500, routers cost \$4,000, and footballs cost \$20. Because Acme Sports is a division of Acme Wiring, all the wires and connectors will be free.

Come up with a two paragraph plan for spending Acme's money.

Be sure to point out the advantages of your design!

By the way, you could use some of the excess money for next's years travel budget. (If you still have a job next year.)