

HOME WORK ASSIGNMENT#4

Due Date Nov 22, 2007 (10x100=1000 points)

CS 4/55201 COMPUTER NETWORKS

Fall 2007, Department of Computer Science, Kent State University

1. (Chapter 5, Problem 2) Are there any circumstances when a virtual circuit service will (or at least should) deliver packets out of order? Explain.
2. (Chapter 5, Problem 7) Give a simple heuristic for finding two paths through a network from a given source to a given destination that can survive the loss of any communication line (assuming two such paths exist). The routers are considered reliable enough, so it is not necessary to worry about the possibility of router crashes.
3. (Chapter 5, Problem 9) If delays are recorded as 8-bit numbers in a 50-router network, and delay vectors are exchanged twice a second, how much bandwidth per (full-duplex) line is chewed up by the distributed routing algorithm? Assume that each router has three lines to other routers.
4. (Chapter 5, Problem 18) The byte-counting variant of the leaky bucket algorithm is used in a particular system. The rule is that one 1024-byte packet, two 512-byte packets, etc. may be sent on each tick. Give a serious restriction of this system that was not mentioned in the text.
5. (Chapter 5, Problem 20) A computer on a 6-Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 1Mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the full 6 Mbps?
6. (Chapter 5, Problem 23) Is fragmentation needed in concatenated virtual circuit internets, or only in datagram systems? Explain your answer.
7. (Chapter 5, Problem 28) A class B network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts per subnet?
8. (Chapter 5, Problem 34) In both IP and ATM, the check sum covers only the header and not the data. Why do you suppose this design was chosen?
9. (Chapter 5, Problem 37) IPv6 uses 16-byte addresses. If a block of 1 million addresses is allocated every picoseconds, how long will the address last?
10. (Chapter 5, Problem 43) What is the maximum burst length on an 155.52 Mbps ATM ABR connection whose PCR value is 200,000 and whose L value is 25usec.

All problems are from Computer Networks, Andrew S Tanenbaum, Third Edition. If there is any inconsistency please email TA (ydrabu@cs.kent.edu)