HOME WORK ASSIGNMENT#4

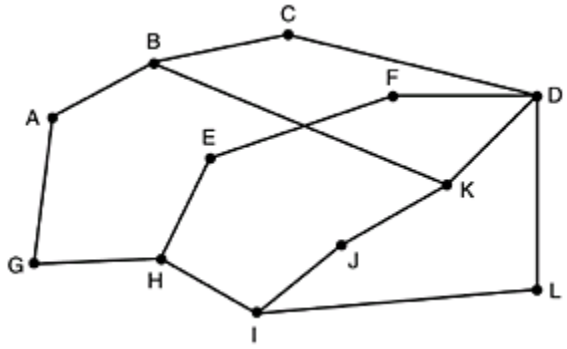
Due Date April 05, 2008 (10x100=1000 points)
CS 4/55201 COMPUTER NETWORKS
Spring 2008, Department of Computer Science, Kent State University

1. (Chapter 5, Problem 4) Give three examples of protocol parameters that might be negotiated when a connection is set up.

2. (Chapter 5, Problem 5) Consider the following design problem concerning implementation of virtual-circuit service. If virtual circuits are used internal to the subnet, each data packet must have a 3-byte header and each router must tie up 8 bytes of storage for circuit identification. If datagrams are used internally, 15-byte headers are needed but no router table space is required. Transmission capacity costs 1 cent per 10^6 bytes, per hop. Very fast router memory can be purchased for 1 cent per byte and is depreciated over two years, assuming a 40-hour business week. The statistically average session runs for 1000 sec, in which time 200 packets are transmitted. The mean packet requires four hops. Which implementation is cheaper, and by how much?

3. (Chapter 5, Problem 13) In the text it was stated that when a mobile host is not at home, packets sent to its home LAN are intercepted by its home agent on that LAN. For an IP network on an 802.3 LAN, how does the home agent accomplish this interception?

4. (Chapter 5, Problem 16) Compute a multicast spanning tree for router C in the following subnet for a group with members at routers A, B, C, D, E, F, I, and K.



5. (Chapter 5, Problem 19) In the simplest version of the Chord algorithm for peer-to-peer lookup, searches do not use the finger table. Instead, they are linear around the circle, in either direction. Can a node accurately predict which direction it should search? Discuss your answer.

6. (Chapter 5, Problem 23) Describe two major differences between the warning bit method and the RED method.

7. (Chapter 5, Problem 27) A computer on a 6-Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 1 Mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the full 6 Mbps?

8. (Chapter 5, Problem 41) A router has just received the following new IP addresses: 57.6.96.0/21, 57.6.104.0/21, 57.6.112.0/21, and 57.6.120.0/21. If all of them use the same outgoing line, can they be aggregated? If so, to what? If not, why not?

9. (Chapter 5, Problem 43) A router has the following (CIDR) entries in its routing table:

Address/mask	Next hop
135.46.56.0/22	Interface 0
135.46.60.0/22	Interface 1
192.53.40.0/23	Router 1
default	Router 2

   For each of the following IP addresses, what does the router do if a packet with that address arrives?

   (a) 135.46.63.10
   (b) 135.46.57.14
   (c) 135.46.52.2
   (d) 192.53.40.7
   (e) 192.53.56.7

10. (Chapter 5, Problem 53) When the IPv6 protocol is introduced, does the ARP protocol have to be changed? If so, are the changes conceptual or technical?

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