

Introduction to Computer Networks

Final Examination

June 11, 2004

Important Note: Do not copy directly from the textbook. Use your own words in stating your answers.

1. Explain why there is the LCFS (Last Come First Serve) phenomenon in the CSMA/CD protocol (7%) and there is limitation on the length of coaxial cable in the original 10 Mbps Ethernet. (8%)
2. For the LAN on the right, assuming all are initially empty, give the forwarding tables for each of the bridges B1-B4 after the following transmissions: A sends to C, C sends to A, and D sends to C. Identify ports with the unique neighbor reached directly from that port; that is, the ports for B1 are "A" and "B2". (10%)
3. In wireless LAN, (a) show by example that exchanging RTS/CTS messages between communicating mobile stations can solve the hidden terminal problem. (10%) (b) Explain why the WEP security protocol used in IEEE 802.11 can be easily broken. (10%)
4. State two advantages and two disadvantages of the public-key cryptography in comparison with the symmetric-key cryptography and briefly explain. (10%)
5. What is the main purpose of a key distribution center? (7%) Suppose a KDC goes down. What is the impact on the ability of parties to communicate securely; that is, who can, and cannot communicate? Justify your answer. (8%)
6. Describe two occasions that a message digest is used? (6%) What are the properties that the message digest should have in these two occasions? (6%)
7. What is the difference between end-to-end delay and packet jitter? (6%) Consider the adaptive playout strategy in the Internet phone implementation described in Section 6.3 of the textbook. How can two successive packets received at the destination have timestamps that differ by more than 20 msec when the two packets belong to the same talkspurt? (6%) How can the receiver use sequence numbers to determine whether a packet is the first packet in a talkspurt? (6%)