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CS 6/73201

Exam #1

Advanced OS

Monday 3 October 2005

1. Consider the “workstation” distributed system model, where there are many workstations on a network, but one workstation per user, and where the system automatically migrates processes to idle workstations. In what ways does this fit the definition of distributed system? In what ways is it not a distributed system? (20 points)

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2. Ethernet uses an access control protocol called CSMA/CD (Carrier Sense Multiple Access with Collision Detection). Briefly describe how this protocol works. (15 points)

3. In Cristian's algorithm for synchronizing physical clocks, a computer sends a request to a time server, and measures the time delay D taken to receive a time reply T , and then sets its local time to $T + D/2$. What assumptions are this algorithm making? (10 points)

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6. Consider Chang and Roberts' Ring algorithm for election.
 - a. There are two types of messages sent in this algorithm — “election” messages and “elected” messages. What is the purpose of each type of message? (10 points)

 - b. At various points in the algorithm a node is marked as a “participant” or a “non-participant”. Would the algorithm still work without marking nodes in this manner? Explain. (5 points)

7. Compare the Byzantine agreement problem to the Consensus problem. In what ways are these two problems similar? In what ways are they different? (15 points)