Homework 8
Due: 3:50 PM, Tuesday, November 26, 2002

Your answers should be submitted as a nicely-formatted plain text file `hw08.txt`. Please use this filename!

1. Suppose you are asked to construct a terabyte storage system. Magnetic disks each hold 25 GB, cost $250, and transfer 5 MB/s, with an average access latency of 15 ms. A tape library costs $1,000 for a tape robot and drive, plus $1 per GB for media, transfers 10 MB/s, and has an average access latency of 20 s. (2 points)

   (a) Compute the total cost, the maximum total data rate, and average waiting time for a pure disk system. State and justify any assumptions you make.

   (b) Suppose you construct a system where 5% of the data resides on disk, but these files account for 95% of the accesses. The remaining 95% of files, accounting for just 5% of accesses, are stored on tapes. What is the total cost, maximum total data rate, and average waiting time for this hierarchical storage system?

2. Tanenbaum, p. 667, Question 7. (1 point)

3. Tanenbaum, p. 668, Question 16. (1 point)

4. Tanenbaum, p. 668, Question 17. (1 point)

5. Tanenbaum, p. 670, Question 35. (1 point)

6. Suppose you are discussing computer security with a classmate. The classmate makes the claim that "open source software is hopelessly insecure, and that only closed-source software should be used on a system where security is a concern." Convince your classmate that he or she is wrong – present your argument in favor of open-source software as a part of a good security system. (2 points)

7. Later that same day, you have another discussion with another classmate. This person says that "open source software is the only way to go, especially when security is an important issue." Being in a disagreeable mood, with all of these OS homework assignments and a final project and three other courses, you decide to disagree with this classmate, as well. Present your best arguments in favor of security using only closed-source software. (2 points)