

CS 550 HW#2

Name (please print) _____

Instructions:

- *Due date: 11:25AM on Thursday, 03/24/11*
- *This is individual written assignment; any information outside the lecture notes and text book should be cited.*
- *Both hardcopy and softcopy are required (India students and remote students only need to submit softcopy). Please drop your hardcopy to TA's mailbox (2nd floor of computer science department), and submit the softcopy to "Digital Drop Box" on the Blackboard.*
- *Name your file as this rule: "LastName_FirstName_[HW or PA number]". E.g. "John_Doe_HW2". (HW for Written Assignment, PA for Programming Assignment).*
- *For all programming assignments and projects, please submit the hardcopy of your documentation only. You don't need to submit the hardcopy of your source code. In the meantime, please zip all files (source code, documentation and etc.) and submit it to BB.*
- *Late submission will be penalized at 10% per day.*

3.1. Q: In this problem you are to compare reading a file using a single-threaded file server and a multithreaded server. It takes 15 msec to get a request for work, dispatch it, and do the rest of the necessary processing, assuming that the data needed are in a cache in main memory. If a disk operation is needed, as is the case one-third of the time, an additional 75 msec is required, during which time the thread sleeps. How many requests/sec can the server handle if it is single threaded? If it is multithreaded?

3.11. Q: Sketch the design of a multithreaded server that supports multiple protocols using sockets as its transport-level interface to the underlying operating system.

5.5. Q: Outline an efficient implementation of globally unique identifiers.

5.21. Q: Consider a distributed file system that uses per-user name spaces. In other words, each user has his own, private name space. Can names from such name spaces be used to share resources between two different users?

6.4. Q: When a node synchronizes its clock to that of another node, it is generally a good idea to take previous measurements into account as well. Why? Also, give an example of how such past readings could be taken into account.

6.7. Q: Consider a communication layer in which messages are delivered only in the order that they were sent. Give an example in which even this ordering is unnecessarily restrictive.

6.9. Q: In the centralized approach to mutual exclusion (Fig. 6-0), upon receiving a message from a process releasing its exclusive access to the resources it was using, the coordinator normally grants permission to the first process on the queue. Give another possible algorithm for the coordinator.

7.13. Q: When using a lease, is it necessary that the clocks of a client and the server, respectively, are tightly synchronized?

7.14. Q: We have stated that totally ordered multicasting using Lamport's logical clocks does not scale. Explain why.

7.18. Q: For active replication to work in general, it is necessary that all operations be carried out in the same order at each replica. Is this ordering always necessary?