

Homework Assignment 2

ECE 151 / CMPSC 171 - Spring 2013

Due Monday, April 15

1. Compare the reading of a file using (a) a single-threaded file server and (b) a multi-threaded file server given the following measurements. It takes 25 msec for the server to get a request from a client, dispatch it, and do the rest of the processing. The data needed are in a cache in main memory. In one-half of the requests, a disk operation is needed, which requires an additional 85 msec, during which time the thread sleeps.

In case (a) how many requests/sec can the server handle?

In case (b) how many requests/sec can the server handle?

2. Read about Bit Torrent in the text or on the Web. (a) Summarize what you have learned about Bit Torrent in one or two paragraphs. (b) Explain why Bit Torrent uses a distributed server (as shown on Slide 24, Lecture 3).

3. Explain why object (process) migration is so difficult in heterogeneous distributed systems.

4. In terms of transparency, openness and scalability, explain why services provided by transport-level protocols such as TCP and UDP are often inappropriate for implementing distributed applications?

5. A client calls an asynchronous RPC to a server, and subsequently waits until the server returns a result using another asynchronous RPC.

Is this the same as having the client execute a conventional synchronous RPC? Explain why or why not.

6. Explain how Message Oriented Middleware (MOM), such as IBM's MQ-Series, uses message queues to provide high-level asynchronous communication.