

CS 677 Distributed Operating Systems  
Homework 1

1. What is the role of middleware in a distributed system?
2. Explain what is meant by distribution transparency. The text book lists seven forms of transparency, give one example for each of them.
3. Use one example to show how to organize a web site into a three-tiered architecture. What is each tier expected to do?
4. We know replication and caching are two important scaling approaches. However, they bring us with another scalability problem. What is that problem? How can it be solved?
5. What is the main scalability problem with a video conference application?
6. Give a technical argument why the tit-for-tat policy as used in BitTorrent is far from optimal for file sharing on the Internet.
7. Not every node in a peer-to-peer network should become superpeer. What are reasonable requirements that a superpeer should meet?
8. Having only a single lightweight process per process is not such a good idea. Why not?
9. Discuss the issues involved with migration a process from one machine to another.
10. Virtual machines are useful in migrating applications between different servers. Why is this easier than general solutions for strong mobility?
11. Explain why a type 1 hypervisor can not be built on older Intel machines.