

Homework Assignment 1

ECE 151 / CMPSC 171 - Spring 2013

Due Monday, April 8

1. Discuss the difference between a Distributed Operating System (DOS), a Network Operating System (NOS), and Middleware.
2. (a) Explain the difference between portability and interoperability. (b) How do they together achieve openness in distributed systems?
3. (a) Define scalability as it is used in distributed systems. (b) Scalability can be achieved by several different techniques. Describe three different techniques that are used to achieve scalability.
4. Most enterprise computing systems are implemented as three-tier distributed systems, with a user interface in the first tier, processing in the second tier, and databases in the third tier. Why do you think they are designed in this way?
5. The client-server model and the peer-to-peer model are quite different models of distributed computing. (a) Give an example application where it is more appropriate to use the client-server model than the peer-to-peer model and explain why. (b) Give an example application where it is more appropriate to use the peer-to-peer model than the client-server model and explain why.
6. Sketch a high-level architectural design for a home multimedia center that is capable of connecting various sources (such as Internet, wireless broadcast, cable, or disc), various presentation devices (such as television, radio, or stereo), and various storage devices (such as a hard drive, DVD, or CD). Note that some devices are analog and some devices are digital and, thus, conversion of media streams is necessary. Think about how the end user would control the multimedia center. Think also about how the user would find the material of interest. Strive for minimal latency and jitter.