COMPSCI 677: Distributed and Operating Systems
Homework 2

Due Date: March 10, 2017

Instructions: In most cases, the lecture materials, lecture notes, additional readings, and text-book should suffice for answer these questions. We do not recommend using Internet sources to answer these question. If you end up using an Internet source, you *must* acknowledge and cite it in your answer. There is no need to cite class lectures slides or lecture notes. Keep your answers brief and to-the-point. There is no need to write long essays to answer these questions.

1. Why is a micro-kernel OS architecture considered more secure than traditional OS kernels.

2. What are the advantages and disadvantages of constructing a concurrent server by spawning processes (i.e., multiprocess servers) when compared to multithreaded servers?

3. Consider an unstructured overlay network in which every node randomly chooses c neighbors. To search for a file, a node floods a request to its neighbors and requests those to flood the request once more. How many nodes will be reached? Please justify your answer.

4. What are the advantages of OS-level virtualization over hardware virtualization?

5 What are the two types of hypervisors discussed in class and what are their differences?

6. What is a lightweight process? Explain briefly the two-level scheduling of threads in a system with lightweight processes.

7. What is code migration?Describe its benefits and provide a few real-world examples of code migration. (10 pts)

8. Explain the advantages and disadvantages of using a centralized ready queue for multiprocessor CPU scheduling. Next, describe the advantages and disadvantages of using distributed ready queues for scheduling multiprocessors.

9. Explain why a sender-initiated distributed scheduling policy may not be the best choice when the overall system utilization is high.

10. Why is passing arguments by reference not supported in a typical RPC system?