Final Exam

Final Exam covers:

- 50% of the exam is on the recent material (segmented paging, virtual memory, page replacement, I/O systems and distributed file systems).
- 50% of the exam is comprehensive (mostly material covered in exams 1 and 2).

The exam is closed book, closed electronic device, closed notes. Except – you are allowed 1 sheet of paper for notes.

General Skills

- You should have a good sense of how the pieces fit together and how changes in one part of the OS might impact another.

- You will **not** be asked detailed questions about any specific operating system such as Unix, Windows NT.

Memory Management

1. What is virtual memory and why do we use it?
2. What is paging? what is the difference between a page and a frame?
3. What does the OS store in the page table?
4. What is a TLB? How is one used?
5. What is Segmentation? Why is it useful?
6. How do we get the best of both worlds? Segmented paging. How does it work?

⇒ Make sure you understand how to translate between virtual and physical addresses.

Memory Management: Virtual Memory

1. Why does virtual memory work?

2. What is a page fault, how does the OS know it when a page has faulted, and what does the OS do when a page fault occurs?

3. Page replacement algorithms: FIFO, MIN, LRU, Second chance. For each: understand how they work, and their advantages and disadvantages.

I/O Management

1. How does the OS communicate with I/O devices?

   Polling vs interrupts vs DMA

2. What are I/O buffers used for?

3. What are I/O caches used for? How do they affect reading and writing to I/O devices?

4. What are the primary delays in accessing a disk? How do we improve this access time?

5. Disk scheduling algorithms: FIFO, SSTF, SCAN, C-SCAN. How do they work, advantages and disadvantages.

6. What I/O abstractions are implemented by the OS?

Distributed file systems

(we will touch on this material today)

1. What are location transparent names?

2. What are location independent names?

3. What does it mean to say that a distributed file system has a single (global) namespace?

4. What is a cache?

5. What are the advantages of using a cache in a distributed file system? What are the disadvantages?

6. What are the advantages and disadvantages of write-back and write-through caches?