Memory

Sunday, November 8, 2015 10:51 PM

1. Describe how a program is compiled, linked, and loaded into memory, and what sort of addresses can be generated at each stage.

2. What are base and limit registers? How do they work and what are they used for?

3. What is a physical memory address?
   What is a logical memory address, and how does the CPU's Memory Management Unit make this possible?

4. What is the objective of process swapping?

5. How does 'contiguous allocation' place processes into memory?

6. Make sure that you're able to recall, list, and explain the allocation strategies that we discuss in class.

7. What is fragmentation? Explain both types; be sure to explain both how the OS could fix external fragmentation, and why is pretty much never does.

8. What is paging?
   How does this address the problem of fragmentation?

9. Explain how the MMU converts a logical address into a physical address when using paging.
   Make sure to explain both how the address itself is formatted, and how the hardware converts that to a physical address.

10. What does TLB stand for, and what is it?
    What problem does the TLB solve?

11. How does the TLB perform a constant-time search on all of its entries?

12. How can you share pages between processes using paging?
13. Explain how the MMU converts a logical address into a physical address when using paging.
    Make sure to explain both how the address itself is formatted, and how the hardware converts that to a physical address.
    Make sure that you can do this for a multi-level (hierarchical) page table. For example, given a 2 level table with 2048 entries in the inner table, 4 KB pages, and a 32 bit address space make sure that you can calculate things like the size of the outer table, the total number of pages that you can track, and the size of the overall page table.

14. Explain what a 'hashed page table' is, and how it works (generally)

15. Explain what an 'inverted page table' is, and how it works (generally)

16. What is segmentation? How is it similar to the base+limit approach? How is it different?

17. Given a picture of the Pentium architecture for segmentation and paging with all the components NOT labeled, you should be able to label (name) all the parts and explain what each part does.