CC418 - Operating Systems
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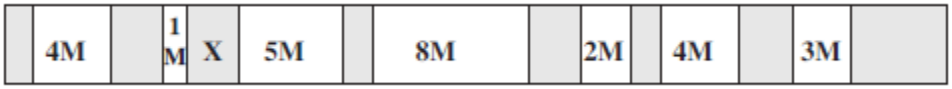
Term: Spring 2012

BONUS: Section Assignment #6

Date Assigned: Week of Sunday, May 6th (Week 12)
Date Due: Week of Sunday, May 13th (Week 13). Late assignments will not be accepted. Submissions should be typed. Be sure to write your name, registration number, assignment number, and lecturer and TA name in the header.

The following excerpt is taken from Chapter 7 of "Operating Systems: Internals and Design Principles" by William Stallings (7th Edition).

7.6) This diagram shows an example of memory configuration under dynamic partitioning, after a number of placement and swapping-out operations have been carried out. Addresses go from left to right; gray areas indicate blocks occupied by processes; white areas indicate free memory blocks. The last process placed is 2-Mbyte and is marked with an X. Only one process was swapped out after that.



a) What was the maximum size of the swapped out process?
b) What was the size of the free block just before it was partitioned by X?
c) A new 3-Mbyte allocation request must be satisfied next. Indicate the intervals of memory where a partition will be created for the new process under the following four placement algorithms: best-fist, first-fit, next-fit, worst-fit. For each algorithm, draw a horizontal segment under the memory strip and label it clearly.

7.12) Consider a simple paging system with the following parameters: 2^{32} bytes of physical memory; page size of 2^{10} bytes; 2^{16} pages of logical address space.

a) How many bits are in the logical address?
b) How many bytes in a frame?
c) How many bits in the physical address specify the frame?
d) How many entries in the page table?
e) How many bits in each page table entry? Assume each page table entry contains a valid/invalid bit.

7.14) Consider a simple segmentation system that has the following segment table:

Starting Address	Length (bytes)
660	248
1754	422
232	194
996	506

For each of the following logical address, determine the physical address or indicate if a segment fault occurs:

a) 0, 196
b) 2, 258
c) 1, 420
d) 3, 462
e) 0, 352