COS3 lektion 8

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8 Memory Management

8.1 Background

- Registers are fast
- Memory is not fast
- Each process needs a separate memory space set by a base and limiter register
- Attempting to write to memory outside the process own space is denied
- An address for a memory segment from the CPU: logical address
- An address for a memory segment from the memory unit: physical address
- Dynamic loading: ONly load what's needed

8.2 Swapping

- Inactive processes are not kept in memory, but relocated to other storage. Fast disk, etc.
- Swapping is rather slow.

8.3 Contiguous Memory Allocation

- Each process is contained in a single contiguous section of memory.
- Multiple partition method: Memory is partitioned into fixed width segments. Each process gets a segment.
- Variable Partition: A table of "holes"in the memory are maintained. A new process gets a ssigned to a matching hole.
  - First Fit: First hole that's big enough.
  - Best Fit: Smallest hole that's big enough.

  - Worst Fit: Largest hole is selected.

- 50-percent rule: Given N allocated blocks, another 0.5 N blocks is lost to fragmentation.
- Compaction: Shuffle memory contents to make one big hole.

8.4 Paging

- Paging permits the physical address space of a process to be non-contiguous.
- Paging can be implemented in hardware and in software.
- Logical memory is split into pages
- Physical memory is split into frames
- The page table holds which page resides on which frame
- Pages can be shared between processes.

8.5 Structure of the Page Table

- Large Page tables can be page tabled.