CMSC 412

Memory Management:
Paging and Virtual Memory

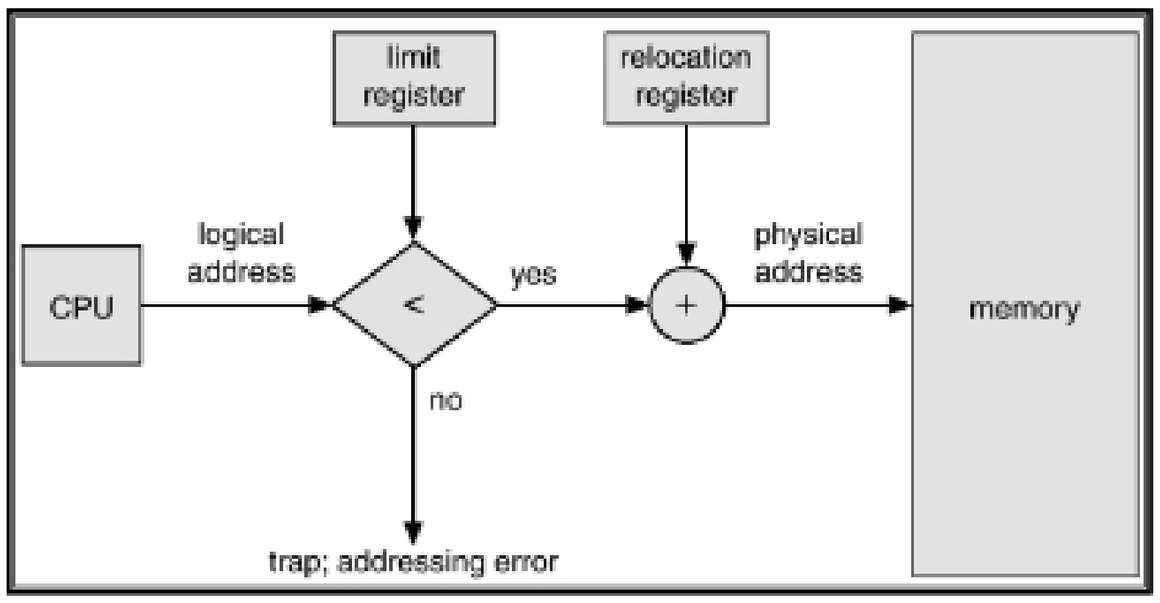
Announcements

- Reading:
  - Today: Chapter 9.2-9.4
  - Next time: Chapter 9.5-9.6, 10

Logical vs. Physical Addresses

- The concept of a logical *address space* that is bound to a separate *physical address space* is central to proper memory management.
  - *Logical address* - generated by the CPU; also referred to as *virtual address*.
  - *Physical address* - address seen by the memory unit.
- Just as in Project 2.

Basic Relocation Hardware



Swapping

- Main memory is big, but what if we run out?
- A process can be *swapped* temporarily out of memory to a *backing store*, and then brought back into memory for continued execution.
  - Backing store (disk) bigger than main memory
- Major part of swap time is transfer time; total transfer time is directly proportional to the *amount* of memory swapped.
  - But disk is slower than main memory
- Swapping used on UNIX, Linux, Windows, …

Schematic View of Swapping