

Week 1 (Jan 4 - 8)

Monday

Door code is: 8896

Notable software: VMware, VirtualBox, lldb, dtrace

See git2.soe.ucsc.edu

Wednesday

Get a feeling for estimating numbers. E.g. Time to perform disc operation, # of disc operations per second

Operating System

- Provides useful abstractions
- Standardizes interface to use across different hardware
- Manages resources
 - Each program gets time and space
- Conflicting goals
 - Use hardware efficiently
 - Max performance per user

Hardware Generations

First gen

- One job at a time
 - Enter program (by rewiring)
 - Run it
 - Record result
- Problem: Wasted time
 - Idle during first and last step
 - Very expensive

Second gen - Batch System

- Batch system using cards and tape
- Input card -> input tape -> output tape -> printer
 - Allowed expensive machine to be used more efficiently
 - Inexpensive machines produced tapes and printed
- Later used discs

Third gen - Multiprogramming

- Multiple jobs in memory
 - Processor switched between them when slow IO was required
- Timesharing
 - Allowed multiple jobs to be active at once

Friday

Storage speeds

Storage Type	Time
Register	.4 ns
On-chip cache	4 ns
Cache	10 ns
DRAM	50 ns
Flash	100 micros
Disk	5 ms
Tape	50 s

Disk Drive Structure

- Data stored on surfaces
 - Up to two surfaces per platter
 - One or more platters per disk
- Data in concentric tracks
 - Broken into sectors
 - * 256B - 1KB
- Data read by heads moved by actuator

Flash Memory

- Divided into Erase Blocks
 - Erased before written
 - Erase blocks 256KB - 1MB+
- Written in Pages
 - 64 - 256 pages per erase block
- Flash Translation Layer (FTL)
 - Manages device
 - Makes it look like Disk

Memory

- Single base/Limit Pair: Set for each process
- Two base/limit registers: One for program, one for Data