CSE 451: Operating Systems
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Module XXX
Little Bit o' History

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OS's Aren't New

- First conceptions were early-50's
  - Started out as a library of punched cards that everyone included in their "jobs"
- Serious work didn't start until mid-50's resulted in a flurry of ideas/implementations/publications through 1968
- Development both in academia and industry
  - ManchesterU, UMichigan, MIT, Harvard, Berkeley, Dartmouth, Stanford
  - IBM, Burroughs, General Motors, Control Data, Honeywell, GE

Foundational Ideas are >old<

- Multiprogramming
  - Interrupts
    - Univac 1103 (1953) for interrupt service, allowed overlapped program execution and device activity
    - IBM 650 (1954) masking of interrupts (enable/disable)
  - Context switching
    - Paper by Strachey in 1959
    - ATLAS (ManchesterU) in 1961 for batch operation
    - CTSS (IBM) in 1962 for timesharing
  - Multiprocessing
    - Burroughs B5500 (1961) asymmetric
    - Burroughs D825 (1962), IBM 360/67 (1965), UNIVAC 1108 (1965), GE-635 (1965) symmetric

Foundational Ideas are >old<

- Virtual memory
  - Segmentation
    - B5500 (1961), GE-645 (1964)
  - Paging
    - ATLAS (1963), GE-645 (1964), IBM 360/67 (1965)
- Hierarchical file system
  - ERMA (1958), Multics (1965), IBM IMS (1966)
- Networking
  - Many dedicated systems (small number of nodes, fixed topology) dating to early 50s. Radar (Mil and ATC),
  - ATT telephone switch (1965), ARPANET (1960)

Some OS's were gold mines for ideas

- ATLAS (ManchesterU)
  - Paging, secondary storage, large number of registers, wide registers (48 bit)
- MULTICS (GE/MIT/Honeywell)
  - Paging/segmentation
  - Virtual memory
  - Single address space
  - Hierarchical file system
  - Dynamic loading of code (including OS)
  - Symmetric multiprocessing

Some OS's were gold mines for ideas

- MCP/CANDE (Burroughs)
  - Paging/segmentation/stack architecture
  - Single high-level implementation language
  - Symmetric multiprocessing
  - Fault-tolerance
- OS/360 (IBM)
  - Full demand paging
  - Virtual machines (including microcode)
  - Heterogenous multiprocessing