CSE 3320 Class Notes 9/11/19

CP/M: single user-single tasking OS

Palm: single user- single task/processor OS

Mac: PC- simple tasking to multitasking

Unix: multiple user- multiple task

a.out incapable on different machine, binary incapability (Different op)

Because of the different monitor programs, application programs would need to be specially written for each manufaturer's computers, this lead to the development of CP/M.

Control Program/Monitor]

$$\begin{tikzcd}
\text{- Myprog.c} \arrow[r] & \text{Compile} \arrow[r] & \text{Myprog.o/obj (must be in the o/obj)} \arrow[d] \\
& \text{C.lib} \arrow[d] & \text{-.obj} \arrow[dl] \\
& \text{Link} \arrow[d] \arrow[dr] & \\
& \text{a.out (Linux)} & \text{myprog.exe (widows)}
\end{tikzcd}$$

- Clib- one of C Library, includes a prototype.
  - Machine Instruction is for specific CPU
  - API: Source Code, Windows want to make API/ABI compatible (not mac)
  - ABI: Object Code
  - .lib contains collections of .obj files contained together with an index, treated same by linkers
  - Most Popular CPU: Intel 8080, developed by Intel
    - Zilog z80: not running….

<u>Software Crisis:</u>

- Hardware without Software (Operator with Editor)
- CP/M introduced, sponsored by intel
  - Shrink things down

Intel 8080 (Cpu)→CPM→ OS and Utility (edit, shell,asm)

Before CPM: (First Disaster of SW): Behind Schedule, Wasted Money

- IBM 360 (Microkernel)
    - OS
- Mini computers (Monolithic)
- To know the type of OS Model you have
    - Windows: Changes
    - Linux: Mono→Micro
    - Same Api does not matter the type (mono or micro)

Basics:

- Separate Disk OS (BSOD)
- Application to BDOS
    - Appl may bypass BDOS
        - Discouraged but might take time at BDOS
        - Some by pass all the way to HW (can damaging HW, corrupt memory and disk)
        - Doable but more difficult for Windows

Basis of CPM: Single User- Single Process/Task

- Processes
    - Be able to put OS in memory somewhere
- Memory
    - Be able to put OS in memory somewhere
    - If size change, need to know the location (should start from low memory)
        - OS
            - Bios at High memory (ROM Flash)
                - HW device isolate d from the OS by a layer of SW. Written to allow SW manufacture,developer, user to have one single, simple standard interface.
            - Bdos at lower memory
                - Core of OS, the Kernel.
        - CCP/Shell/Util/RAM/ROM/CPU/BIOS/HDD/SSD [lower-lower]
            - Last Part of OS, User Interface to the OS
        - TPA (Application): 100Hex- CCP
        - 0-100Hex: Reserved Area
            - Where the OS exe is placed

- Disk (Files)

TPA(Application):

1. Code/Binary Instruction that don't change (Low Memory)
2. Constant Static (0-5 No change) Function call/ Change
3. Stack (Function Call…) Changeable at High Memory go to lower memory/middle
4. Heap Grows from Low to High
    a. Run out of memory if Stack and Heap collide
    b. Many PL does not have the Heap

Floppy Dusk lower density

Hard Disk higher density

- Sector
- Tracks (Numbers of Track important)
- Few dozen/Few hundred bytes in Sector (Sector Size)
- Issue: Sector Size/Track Size: want many as possible, sector as big as possible
    - Waste Space between Sectors (finish read one, reset, then the other side)
    - Minimum read/write is a sector
        - Big sector small space:waste
        - Avg size of files: Not too large of sector, not to small to overwhelm the gap

Parameter of Floppy Disk CPM:

1. Standard Size = 128 bytes
2. # Sectors/Track = 26
3. # of tracks = 77
4. # of Sides =2
   512 Bytes Total

   Booting (OS Loading): copy image on OS to memory (BDOS/Kernel)
   Starts by a combination of Boot Sector of Disk and BIOS (Raw)
    - When a computer is turned on or rebooted, a small program in Read Only Memory is run that couples the OS exe image from disk to memory and starts to executing this program (the OS).

- From Boot Sector, tells where the disk starts/size
- Locate by the directory to access data

CPM Model:

5. **Application**
6. **BDOS**
7. **BIOS**
8. Hardware
    a. Monitor
    b. Graphic Card
    c. Disk
    d. Memory [minimum]
    e. Take apart of very important component into BIOS, and BDOS

[Nexxt Palm and Mac]