CSE 3320 Note 9.16.2019

Moore’s Law: Observation, over time component speed double during time (1980-2005)

* Processor/Chip/CPU/Memory: Moore’s Law ended around 2005: Chips might not be bigger…
  + When you make chips, slice in to Waffer with some defects in the chips in patterns
  + Yield: bigger chip, bigger defect
  + Need to piut a lot of power into the chip to get signal from one to the other end.
  + Temperature/Size: extreme hard to dissipate heat
  + Chip lots of power, affect battery life
* Chip Scaling: currently around 8-10nm (1000x more dense in packing)- 1000^2 in transistor/active alternator
  + More developed than the 1980 (6-8micrometers)
  + 1975- Inter 12K 🡪 now- 5Billion Chips
    - Chips got bigger
    - 1975: 4 mm x 3 mm
    - 2019(Now) 3-5 cm^2 (smaller transistor)

Indirect: faster CPu and flocs

* Power consumption, heat
* Instead of faster CPU
  + Speed not only depend on FLOC, but number of instructions and CC. May be reduced (Super Scaling), cool up cores
    - Calm down start processes: from beginning of system
      * Multiprocesses: more security
    - Threads: lightweight processes (no overheader of regular processes)
      * Multithreading : more performance
    - OS need to know the thread or during run time

**CPM Continued**

Successful Mini Computer OS

* Easy to understand the utilization of memory
* ABET Processor
* System Call 1 OP, SC 2, IP

**CPM Memory:**

* RAM (0-low: min 256)
  + Reserved Space
  + Buffer
  + To keep track of
  + Process Block (PCB)
* Code/Instruction [fixed]
* Static Data[fixed]
* Heap/Stack
  + Heap is fixed memory- not all program have one
* Transit Program Area
  + User testable space
  + Shell
  + Reusable
* BDOS
* BIOS (High)
* Program
* Main Routine
  + Main and dir aee important
  + May Split up/delete certain components to fit into the memory space
  + Core: main+ Edit+E+c+p
  + Overlay
    - Break down of large programs into sections and replace one section in memory wirth another as needed to use limited memory space

Microsoft Discovery System: Similar to CPM

* SC 1 same, SC2, SCe3, same as CPM
* Built into Windows
* CPM influcenced tremendously

Disk System:

* #tracks
* #Sectors/Track
* Secctor Siaze (128bytes)
* #Surfaces

May waste space with big gaps

**Multiple everything to get the size**

Sectors stretch out to be files

* Changes all the time: be careful with the planning
* Cant easily change
* Hard to reuse when deleted

Go to Directory (32bytes: 64 entries): Fast, Small

* 32bytes
* 64 entries
  + Disk Capacity: not too large (limited), 64 entired for to fit small size)
  + Information about files on the disk
    - Most important:
      * Name
      * Size
      * Permissions (Read/Write: single user- easy)
      * Location (# of block on the disk)

**` File Directory Area**

* **User Name: 1**
* **File Name: 8**
* **File Type: 3**
* **Extend Counter: 2**
* **Reserved;1**
* **Number of Records: 1**
* **Allocation: 16**

Start 1

Extends 2

Extend counter: portion of a file controlled by one directory entry

* + - * for first part of file and then sequentially numbered for each of the remaining part
      * More extend in large files
      * Limitation
        1. Smallest file to have: 0
        2. Smallest space taken: 128 bytes (1 sector): number of records
        3. (64xsector)

Sectors groups together into allocation blocks

User number:group number from 0-15, allow users to share disk and collect files into a group.

File names

Char (uppd/lower): Not all characters are allowed in the file name, period is to separate file name and tpe but not stored in directory (using space and period not allowed).

* Space (recent)
* Size 8.3🡪 11char
  + 1-8 characters of file name
  + 0-3 characters of file type