

# CSC369 Week 5 Notes

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## 1 Memory Management

- Physical Memory vs Virtual Memory <sup>[1]</sup>
  - Physical Memory
    - \* Is RAM :)!!
    - \* Is the first memory used when computer requires memory such as loading application or OS
  - Virtual Memory
    - \* Is stored on hard drive
    - \* Is used when RAM is filled
    - \* Is slower than RAM

### Refernces:

- 1) Tech Walla: What Is the Difference Between Virtual Memory & Physical Memory?, [link](#)

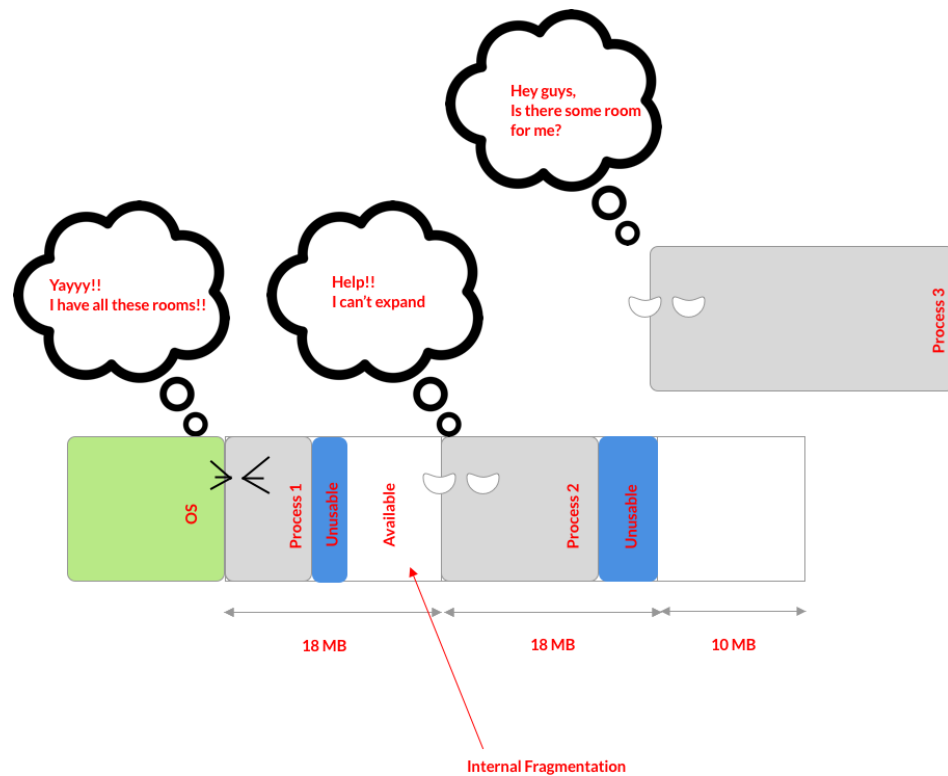
- Memory Management
  - Is the process of controlling and coordinating computer memory
  - Assings portions known as **blocks** to various programs <sup>[1]</sup>

### Refernces:

- 1) Guru 99: Memory Management in OS: Contiguous, Swapping, Fragmentation & Physical Memory?, [link](#)

- Fixed Partitioning

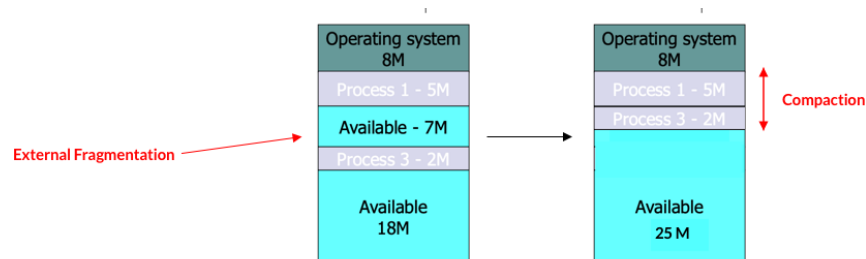
- Is the oldest and simplest technique to put more than one processes in the main memory. <sup>[1]</sup>
- Divides memory into regions with fixed boundaries.
  - \* Can be of equal size
  - \* Or unequal size
- Advantages: <sup>[1]</sup>
  - \* Is easy to implement
  - \* Requires lesser indirect computational power
- Disadvantages: <sup>[1]</sup>
  - \* Creates a gap if process is smaller than partition (**Internal Fragmentation**)
  - \* Programmer must deal with programs larger than partition



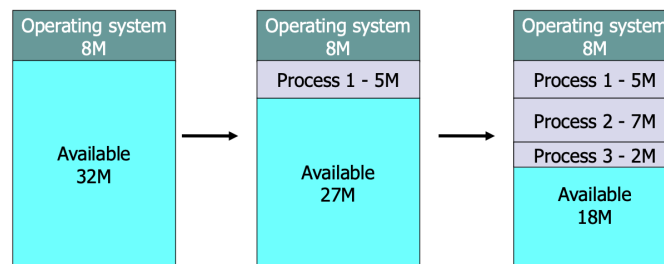
## References:

- 1) Chegg Study: Fixed Partitions, link
- Dynamic Partitioning
    - Allevates problems caused by fixed partitioning <sup>[1]</sup>
    - A partition of exact the right size is created for a process

- OS may move processes around to create larger chunks of space
  - \* I.e. moving process 3 right beneath process 1
  - \* Is called **compaction**
  - \* Processes must be **relocatable**



- Advantages <sup>[1]</sup>
  - \* No **internal fragmentation**
    - There will be no unused space left in the partition



- \* No restriction on degree of multiprogramming <sup>[1]</sup>
  - More processes in memory due to absence of internal fragmentation
  - Processes can be loaded until RAM is empty
- \* No limitation on the size of process
  - Process size not limited to the size of partition
- Disadvantages
  - \* As processes come and go ‘holes’ are created
    - Is called **external fragmentation**

### References:

1) GeeksForGeeks: Variable (or dynamic) Partitioning in Operating System, link

### • Paging

- Solves **internal fragmentation** and **external fragmentation**
- Stores and retrieves data from **secondary storage** for use in **main memory** <sup>[1]</sup>
  - \* Secondary storage → Hard Drive

- \* Main memory  $\rightarrow$  RAM
- Is an important part of **virtual memory** management in modern OS <sup>[1]</sup>
- Partitions memory into equal, fixed-size chunks
  - \* Are called **page frames** or **frames**

### Refernces:

- 1) Wikipedia: Paging, link
- Address Translation
  - TLBS