

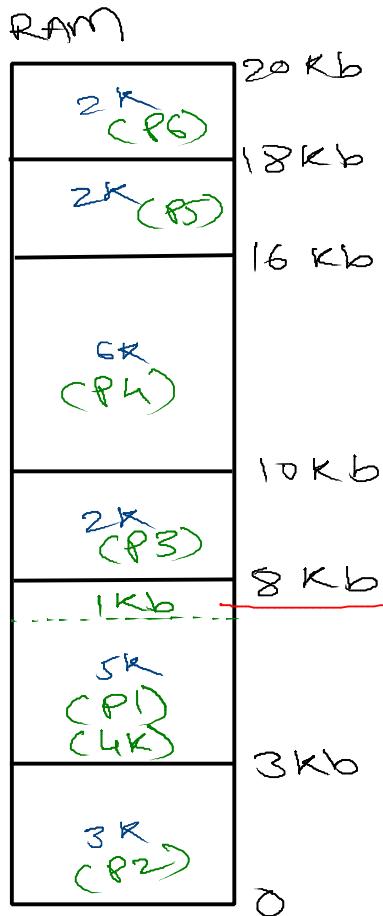
Memory Management

- ① Simple MMU - Contiguous memory allocation
- ② Segmentation MMU - Segment allocation
- ③ Paging MMU - Page allocation

fixed partition

Dynamic Partition

Contiguous Fixed Partition



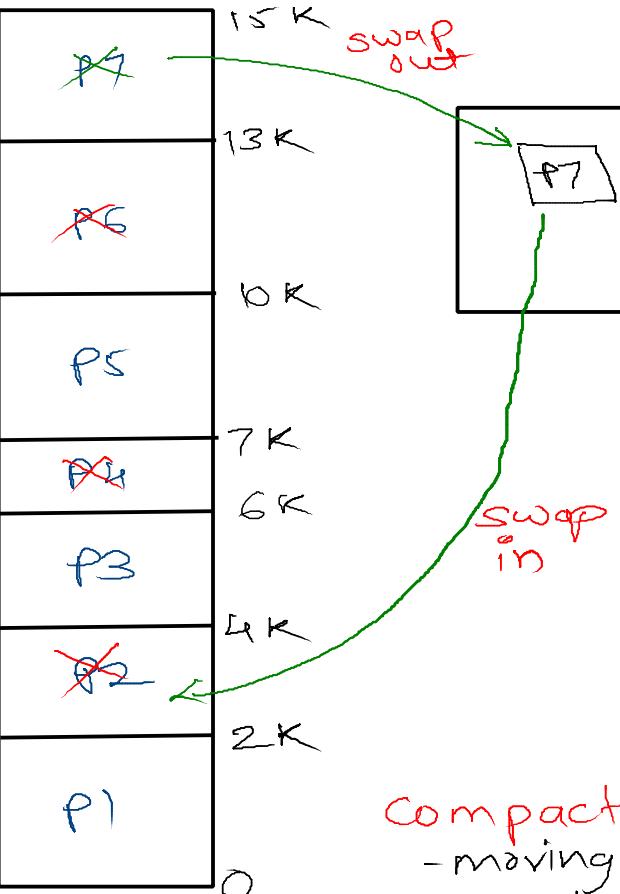
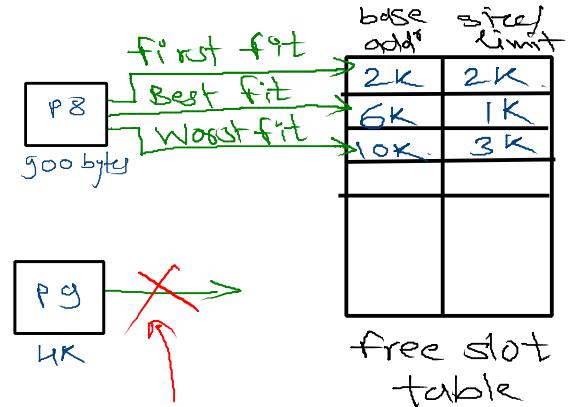
- RAM is divided into fixed size partitions
- no. of processes are fixed, is equal to no. of partitions
- size/limit of process is also depends on maximum size of partition

Internal Fragmentation

- The process is not utilizing whole partition which assigned to it.
- remaining space of partition is wasted

Contiguous dynamic Partition

RAM



swap = $2 \times \frac{\text{RAM size}}{\text{size}}$

(Linux)
Partition

(Windows)
file

virtual Memory

- it is some part of hard disk which is not actual RAM but treated as RAM to keep inactive processes

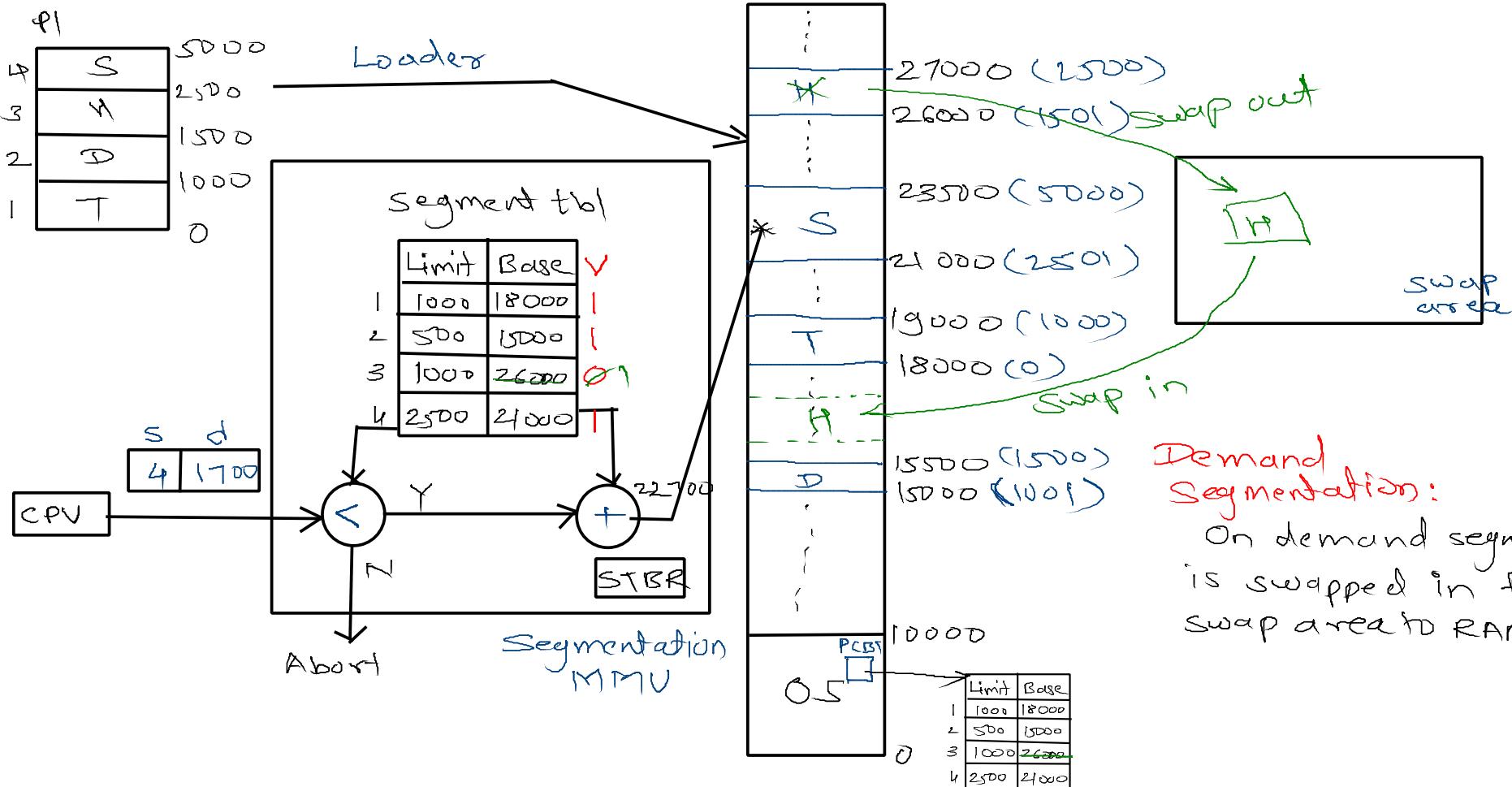
External fragmentation

- if partition of new process size is not available then we can not load process into memory.

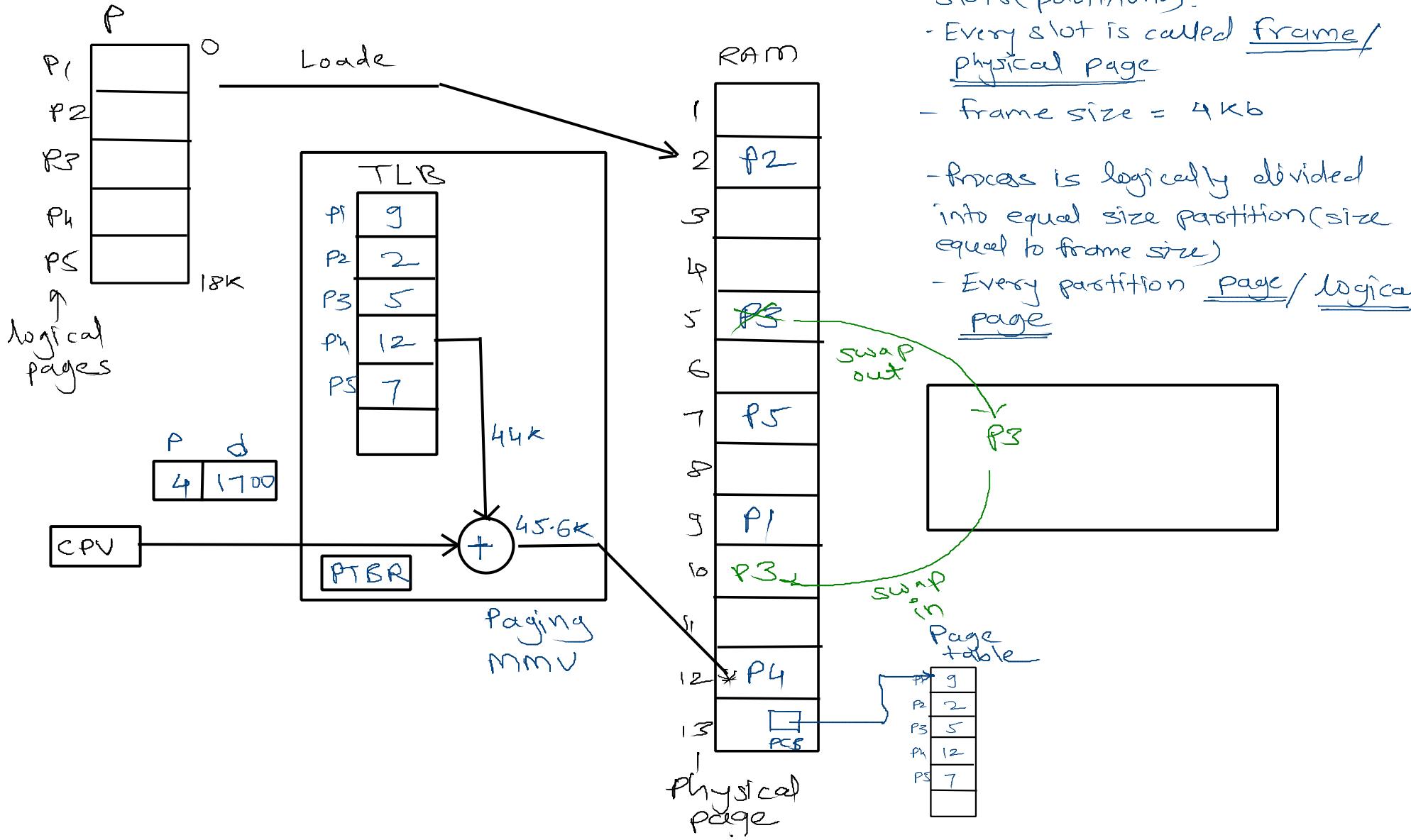
Compaction

- moving processes into memory (RAM) to get more contiguous free space

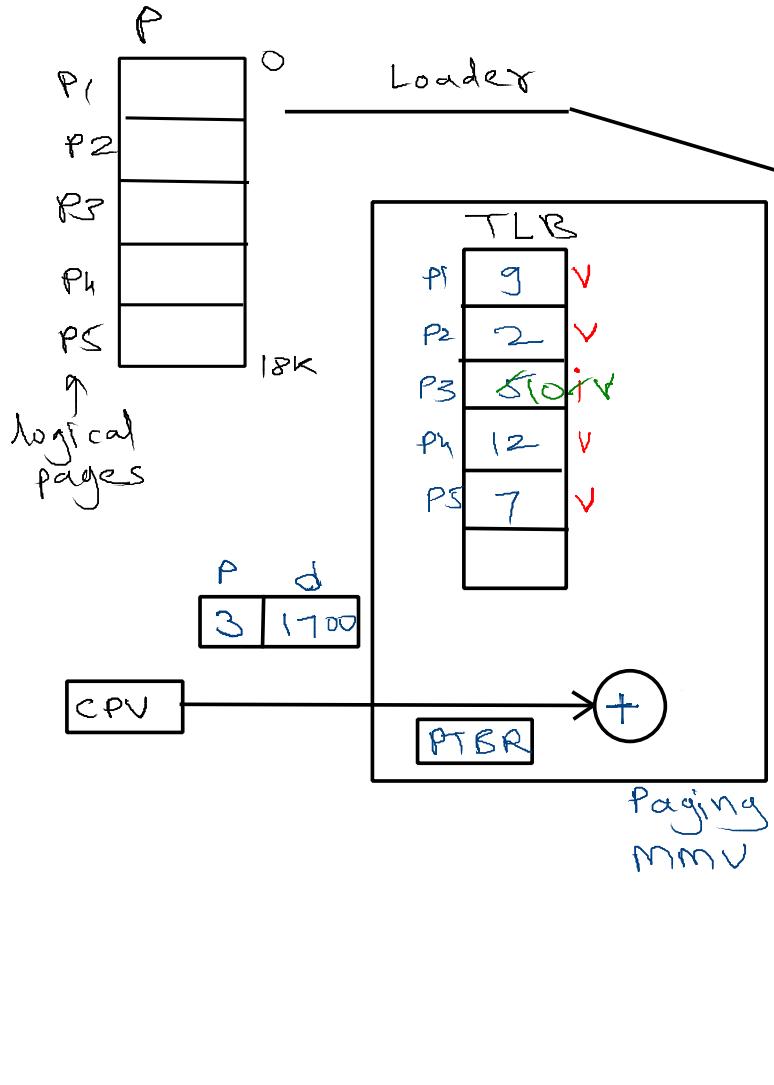
Segmentation MMU



Paging mmu

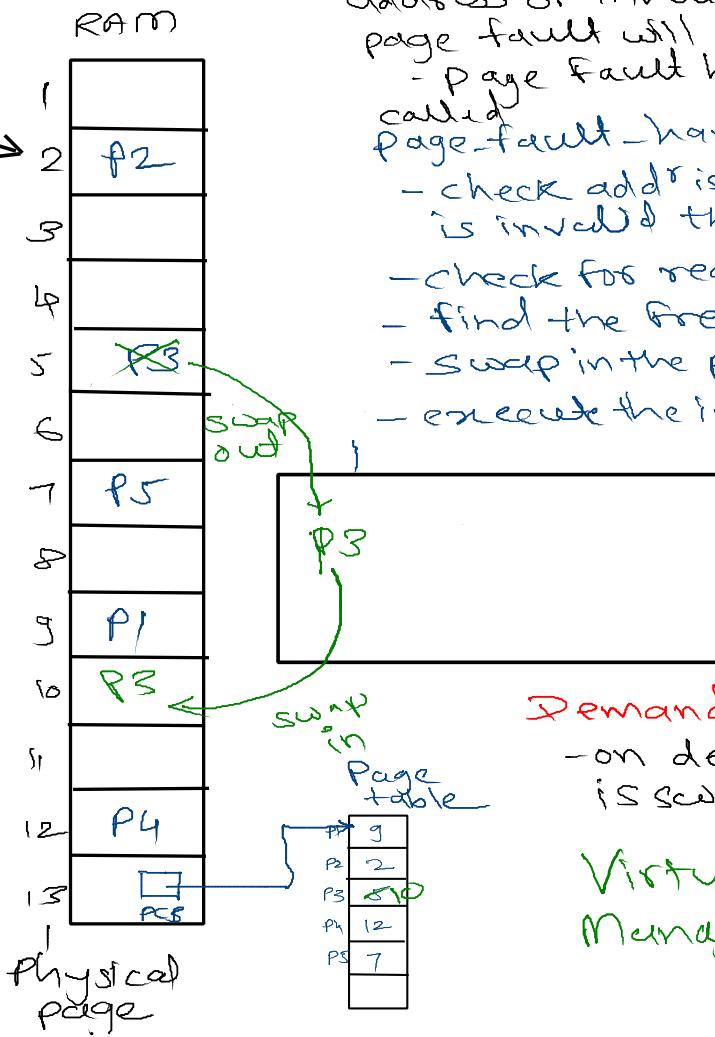


Paging MMU



Page fault

- when CPU request for address of invalid page then page fault will occur
- Page Fault handler will be called
- `Page-fault-handler() {`
- check addr is valid/not, if add^o is invalid then terminate the process
- check for read/write access
- find the free slot(frame)
- swap in the page into free slot
- execute the instruction again



Demand paging

- on demand page is swapped in into RAM

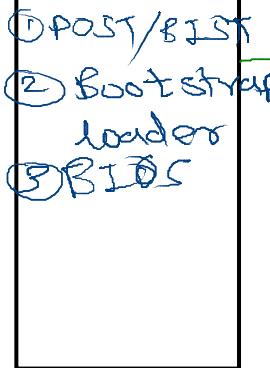
Virtual Memory Management

Booting Process

Gry VB

- ① Power ON

ROM



RAM



Harddisk

