

COA

Chapter 08: | OS Support – Paging

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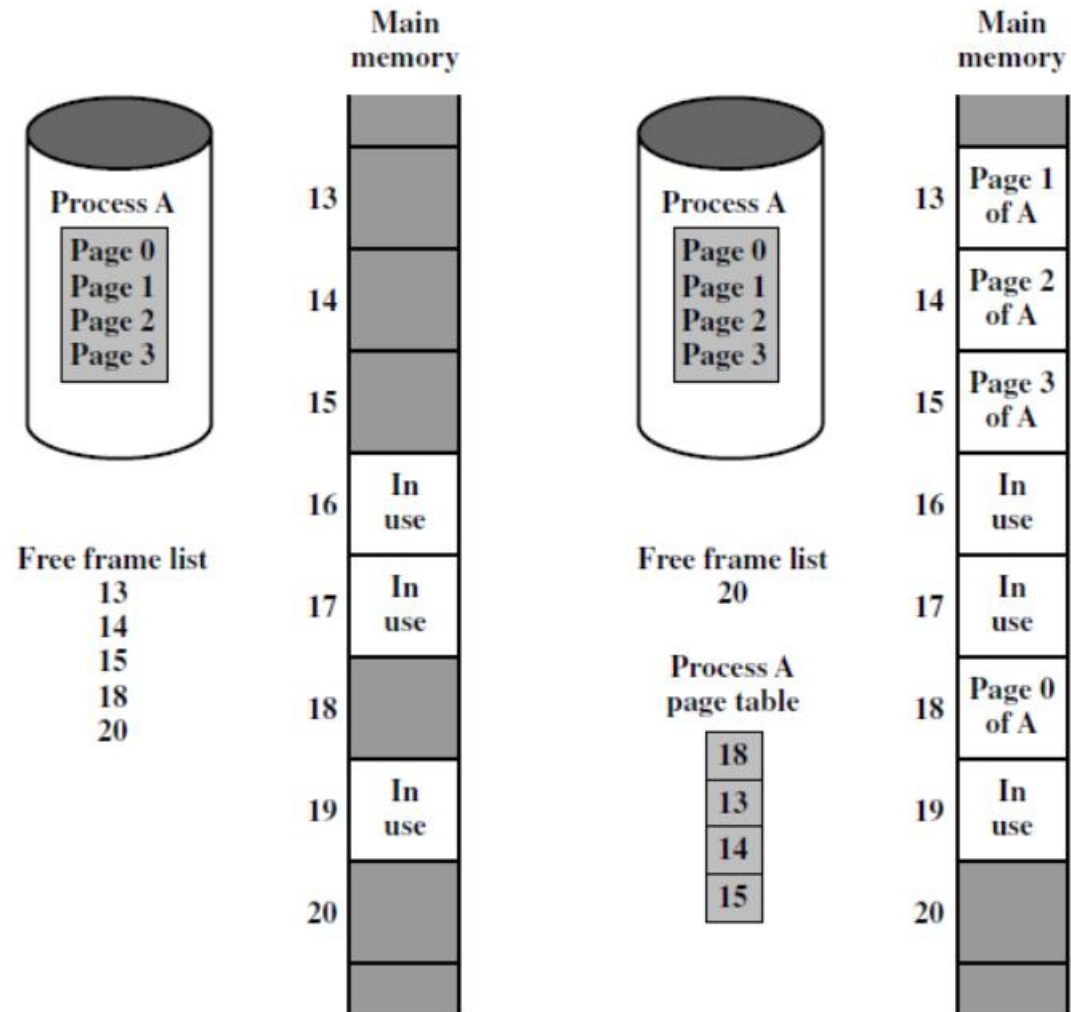
| AGENDA

- Paging

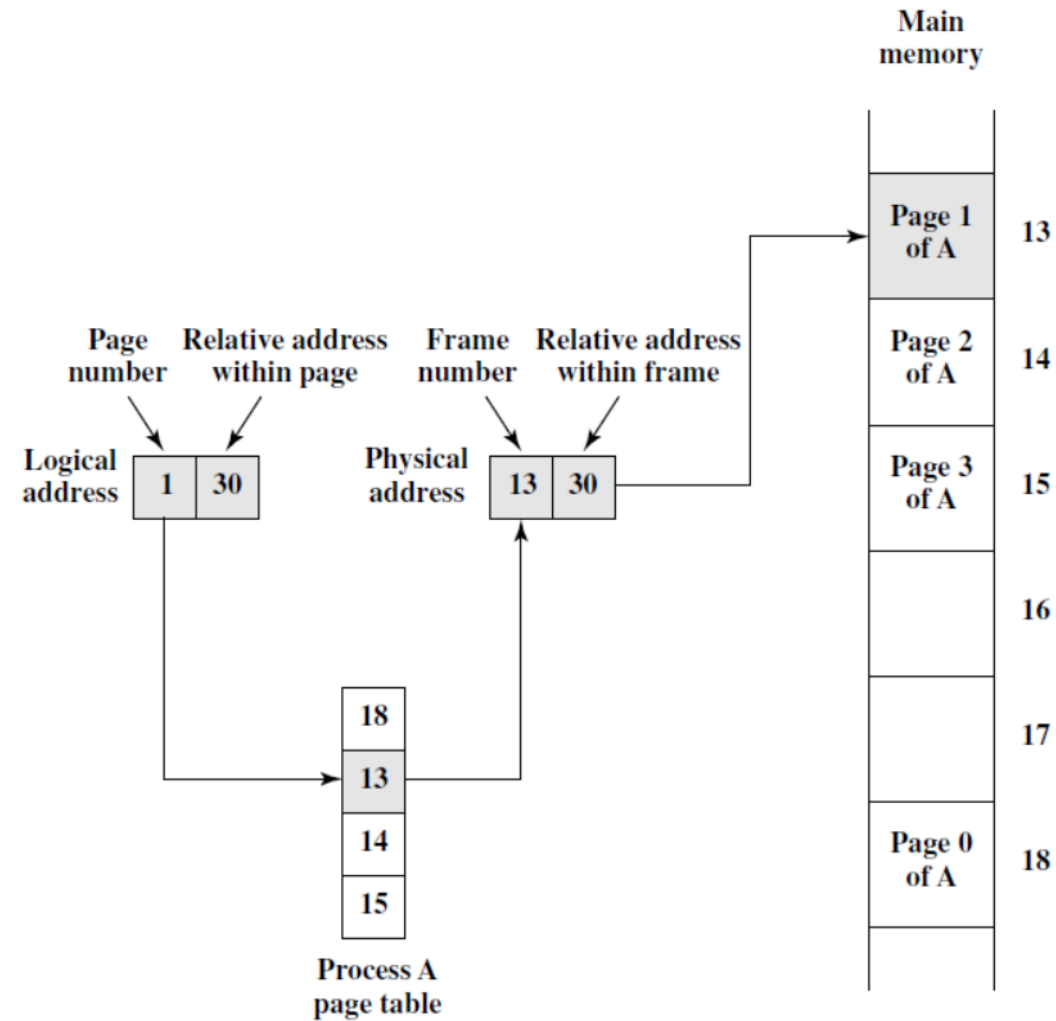
| Paging

- Split memory into equal sized, **small** chunks - **frames**
- Split programs (processes) into equal sized small chunks – **pages**
 - wasted space at most is a fraction of the last page
- Allocate the required number of frames to a process
- Operating System maintains list of **free frames**
- A process **does not require contiguous** page frames
- Use **page table** to keep track

| Paging



| Logical and Physical Address



| Virtual Memory

- Demand paging
 - Do not require all pages of a process in memory
 - Bring in pages as required (in demand)
- Page fault
 - Required page is not in memory
 - Operating System must swap in required page
 - May need to swap out a page to make space
 - Select page to throw out based on recent history

| Thrashing

- Too many processes in too little memory
- Operating System spends all its time swapping pages rather than executing instructions
 - Little or no real work is done
- Solutions
 - Good page replacement algorithms
 - Reduce number of processes running
 - Fit more memory

| Virtual Memory in Brief

- We do not need all of a process in memory for it to run
- We can swap in pages as required
- So - we can now run processes that are bigger than total memory available!
- Main memory is called **real memory**
- **User/programmer** sees much bigger memory - **virtual memory**