

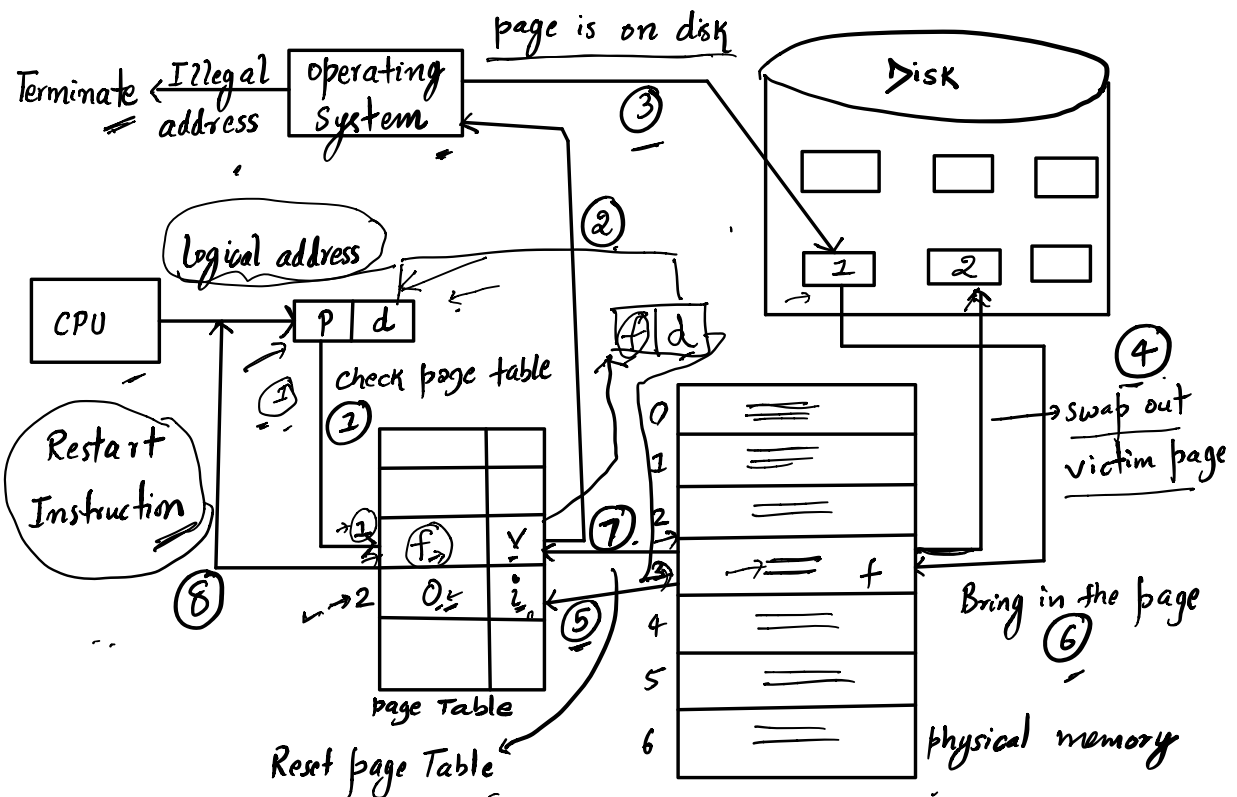
PAGE REPLACEMENT IN DEMAND PAGING

NEED FOR PAGE REPLACEMENT

- What happens when page fault happens?
 - The kernel tries to bring in the page from the disk and provides a frame to this page
 - What if all the frames are already occupied by pages?
 - Note that some frames are provided to I/O buffers
- What are the options with the kernel now?
 - Terminate the user process - not the best choice
 - Swap out an entire process from memory - good option
 - Page replacement

PAGE REPLACEMENT TECHNIQUE

- Find the location of the desired page on the disk
- Find a free frame:
 - If there is free frame, use it
 - If there is no free frame, use a page-replacement algorithm to select a victim frame
 - Write the victim frame to the disk and change the page and frame tables accordingly
- Read the desired page from the disk into the newly freed frame and change the frame and page tables
- Restart the user process



- Notice that if no frames are free, two page transfers are required.
- By using a dirty bit or modify bit with each page table entry, we can reduce this overhead
- Dirty bit is set means the page has been modified since it was last read from the disk. In this case, we need to write back page to the disk
- If dirty bit is not set, it means the page has not been modified. We don't need to write back this page as a copy already exists on the disk
- If the pages are read only(text section), we still don't need to write these back
- This scheme reduces the total time taken for servicing page fault