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Design:

For the page table class, I left all the functions and variables as they were originally in the source code.

For the page table I implemented the init paging function to first, make sure the kernel mem pool and process mem pool passed in aren't null. Then I set the kernel mem pool, process mem pool and shared size to what was passed into the function.

For the page table constructor I start by allocating the page directory in the kernel mem pool and then creating a page table in the kernel mem pool for the first page directory entry. Then I mapped the first 4MB into the page table that was created and set the attributes to supervisor, read and write, and present. Then I filled the rest of the page directory with zeroed addresses and set the attributes for them to supervisor level, read and write, and non present.

For the page table load function I set the current page table to this, the page table which called load, and then wrote the page directory address into CR3.

For the page table enable paging function, I just read CR0, or it with the enable paging bit and write the result back into CR0. Then I set paging_enabled to 1, true.

For handling page faults in the page table, I started by getting the last 3 bits of the error code from the passed in REGS struct and the indexes of the page directory and page table where the fault occurred from CR2. Then I check the error to see if something is missing from either the page table or page directory. Then I check if the page directory is the one missing an entry. If so then I create a page table in the kernel mem pool and assign it into the page directory at the given index with attributes for user, read and write, and present. Then I give the page table a frame for its entry at the index I got from CR2 with attributes user, read and write, and present. Otherwise, if the page fault was in the page table, then I create a frame and put it into the page table entry at the index read from CR2 with attributes user, read and write, and present.

Online Participation:

I posted about the program crashing when writing the CR0 to enable paging (@114). I also posted about my CR3 not saving after I wrote the page directory address to it (@130). I also wrote the followup to the question summarizing that the real issue lied elsewhere in my code (@130_f1).