

CSCE 410

MP2

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Design:

MP2 consists of implementing a frame pool manager. The designated machine is of 32MB with kernel process memory from 0 to 4MB and user process memory is from 4MB to 32MB i.e., 28MB. Apart from this there is 1MB inaccessible memory starting at 15MB. The kernel memory is used to directly map the physical address. The frame size is 4KB.

Cont_Frame_Pool:

The cont_frame pool manager manages contiguous frames of memory. The memory below 4MB is managed by kernel frame pool and memory above 4MB is managed by process frame pool.

The constructor initializes the cont_frame pool, starting from the base frame number that is of length nframes. The info frame number is the frame that will store the management information of the frame pool. If the info frame number is 0 the frame pool will store the pool info in the first available frame of the pool. We choose a bitmap boolean pointer which toggles between 0 and 1. And each two bits in the first frame maps to frames in the memory frame pool.

11 → It's free

00 → It is head of sequence

01 → It is allocated

Bitmap keeps track of all these information in the frame pool.

The Get frame function searches through the frame pool bitmaps to find a frame that has 11 as the first two bits and then it will traverse through _n_frames frames and if that many number of frames are free then it will make first frame as head of sequence and remaining frames to be allocated. And it finally returns the head of sequence frame number.

The mark inaccessible function, takes a base frame number and nframes argument that will mark the corresponding frames in the bitmap as inaccessible by making the first two bits of bitmap to 00.

The release frames function, takes a frame number to mark as free. The release frame function is static, so we must first find the correct frame pool to release from our static list of frame pools.

Then implement release frame function to release the number of frames requested. In the release

frame function first we have to mark the head of frame sequence as free and then traverse through next frames and free the frames until we get a free frame or a head of sequence frame.