Linux device driver assignments - 4

Kernel memory management interfaces / system APIs related

- create a dynamic module that will allocate 'n' contiguous page frames in low memory zone via buddy system allocator – 'n' must be a module parameter – you must allocate 'n' page frames in the init() method of the module and release appropriately in the exit() method of the module - start with n=1 and keep increasing – verify that the allocation is as per request using appropriate utilities and proc interfaces that you are aware of - also print the virtual addresses of the allocated page frames !!!

- repeat the above problem by allocating page frames in the highmem zone instead of lowmem zone – repeat the rest of the steps as in the previous case – in this case, you must use kmap() and kunmap() for dynamic mapping of highmem zone page frames

Linux Device Driver Assignment - 4

- use proc_seq_example3.c to create our own slab cache and allocate required objects – use /proc/slabinfo interface to verify the characteristics of our slab cache – meaning, name of the slab cache, no. of slabs, page frames per slab, objects per slab, no of objects and many more – refer to man 5 slabinfo or man 5 proc for more details !!

Linux Device Driver Assignment - 4

- before doing the above assignments, you must read the following:
  - KMA pdf and related text file that is provided
  - refer to memory management chapter of LKD/3
  - understand the buddy allocator, non-contiguous memory allocator and Slab allocators using tools discussed in the class room :
    - /proc/buddyinfo
    - /proc/slabinfo
    - /proc/meminfo
    - /proc/vmallocinfo