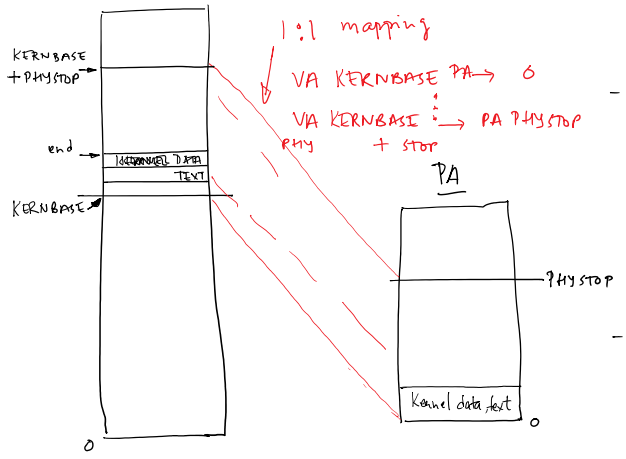
Lab 6

24 August 2018 10:51

① Mapping of address space of each process



notes

- 0 : KERNBASE is usable VA range for user processes.
- KERNBASE : KERNBASE + PHYSTOP is VA range used by kernel for kernel text, data and to manage PA allocations to user processes.
- All free pages initially part of a free list, which is referred using VA in kernel space.

- the kernel refers to all its 1:1 mapped pages using virtual address for action related to allocations, setting up page tables, updating free list etc.

following are sample functions (which may also use the V2P & P2V macros)

check interesting usage of struct run to maintain free list.

- kalloc — returns one free page. returns VA from kernel VA mappings.
- kfree — takes a VA in kernel space & adds to free list.
- growproc — grow process memory. uses allocuvm
- allocuvm — allocates a page & adds to page table (kalloc, mappages, walkpgdir)
- mappages — update page table with new VA to PA mappings
- walkpgdir — page table to find mapping of a VA to return PTE.

* check last parameter of 0/1 for different actions.

* files of xv6 with memory related functions,

vm.c kalloc.c proc.c memlayout.h mmu.h

* macros of interest (and #defines)

V2P P2V PTE_...

(*) macros ... (what it defines)

V2P P2V PTE_ADDR

PGROUNDUP PDX PTX

PGROUNDDOWN

PTE_P PGSIZE

PTE_W