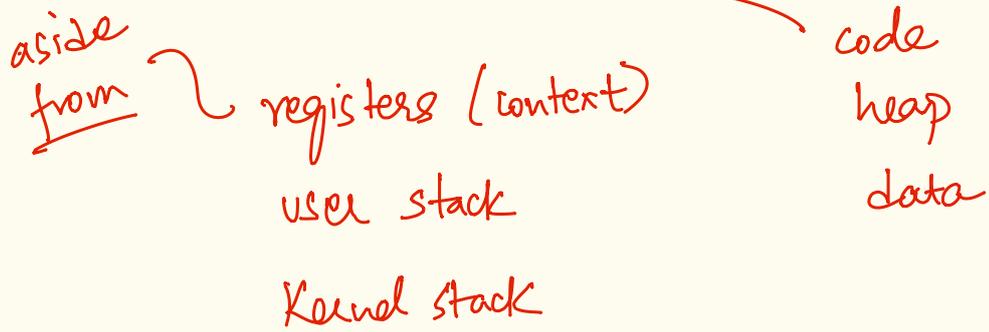


① threads vs processes

- instances of execution of a program

- threads: share the a common address space



process: — 1:1

process - PCB - page table - address space
- user stack - context

struct proc

threads

e.g with xV6

struct proc {

int pid;

int tgid; — thread group

uint 64 pgdir; —

uint 64 vstack;

}

PCB₀

PCB₁

pid = 63

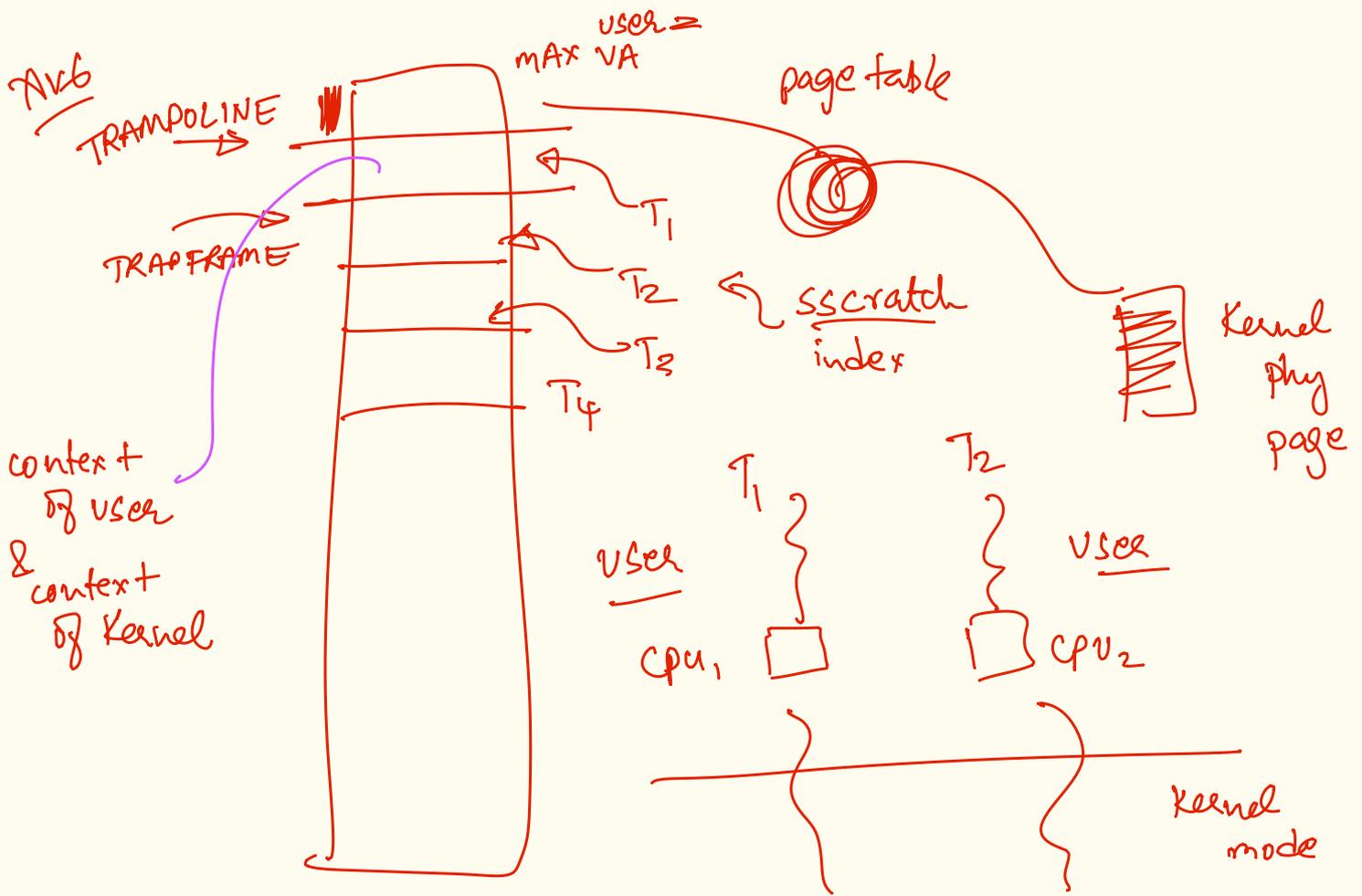
pid = 64

tgid = 1

tgid = 1

pgdir = 0xabcd

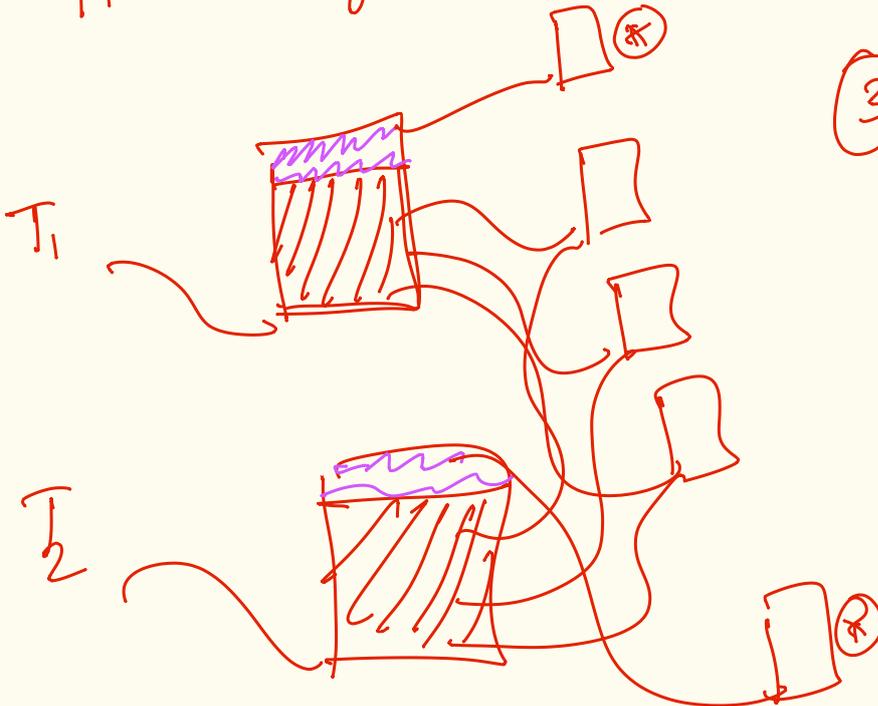
pgdir = 0xabcd;



Solutions

① trapframe register — needs h/w changes.

②



③ allocate user stack + trapframe & identify trapframe based on userstack

eg:

$$\frac{PG(\text{userstack}) - 1}{\text{XV6: sscratch}}$$

④ on slw to use store trapframe index for current thread/process in a non-user register.