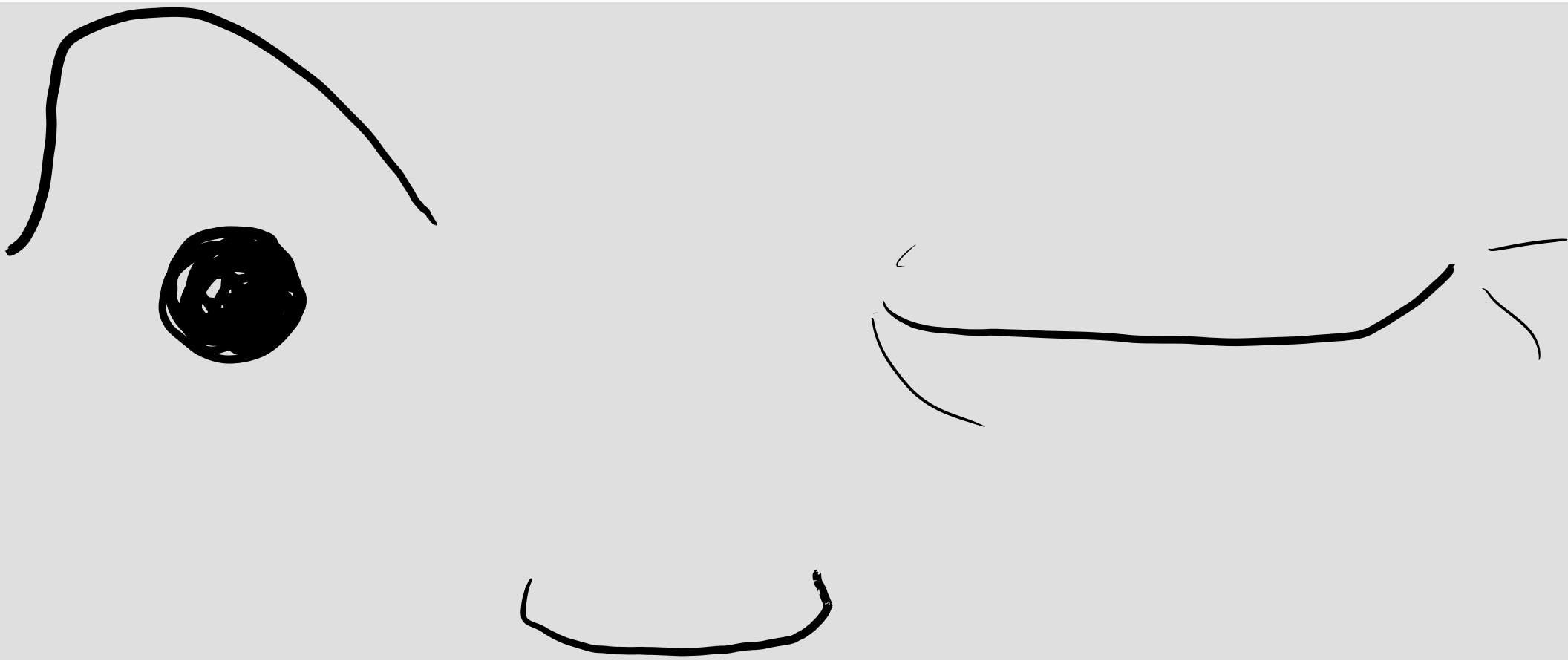
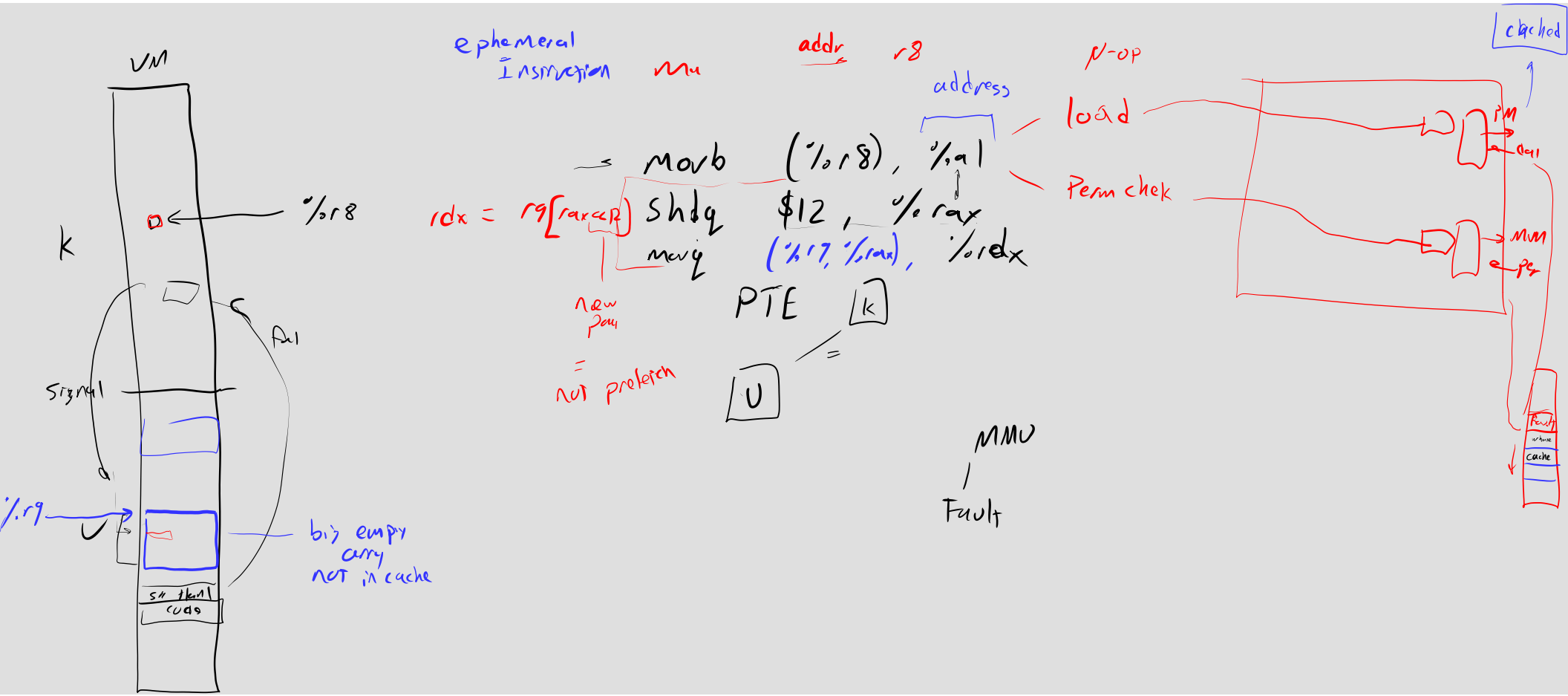


Timer
ISR
Mon
Mon
Mon


VM
%r8
k
Fail
signal
%rq
U
bit empty
carry
not in cache
ephemeral
instruction
addr
r8
address
movb (%r8), %al
rdx = rq[rax<<12] shlq $12, %rax
movq (%rq, %rax), %rdx
new perm
not present
PTE
k
U
MMU
Fault
N-op
load
Perm chek
cached
PM
MM
cache

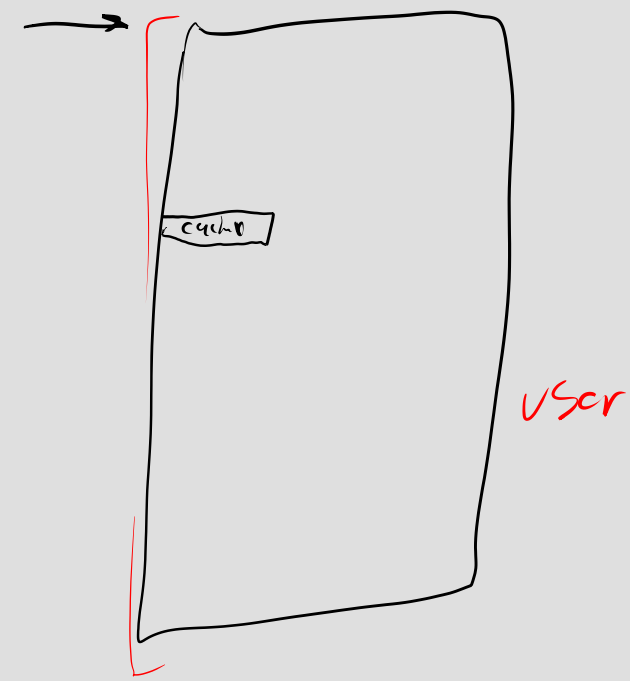
Meltdown

$2^9 \; 2^{12} = 2^{20}$

$= 1MB$

Sig handle

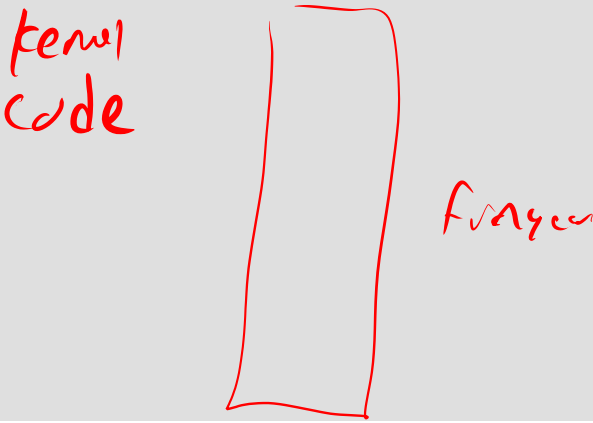
```
for (a = 0; a<256; a++)
    time
    read rg[a<<12]
    time
    if fast,
        ret a
```

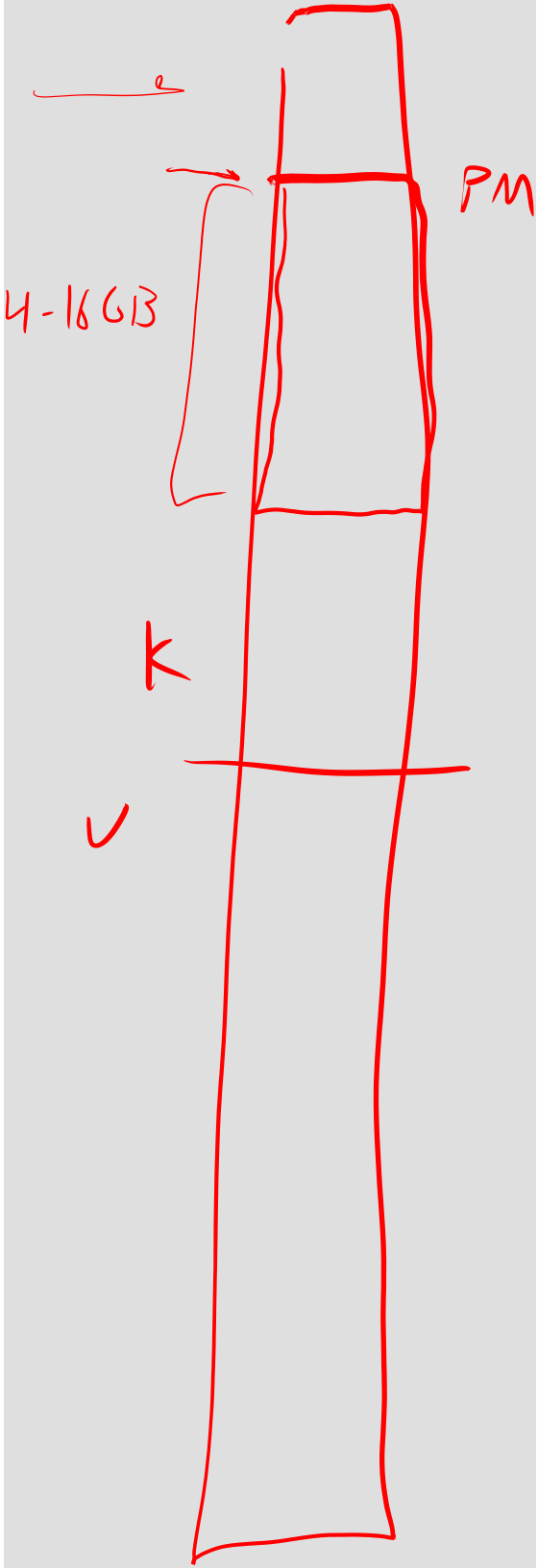



```
render (add)
    x = *addr
    y = rg[x<<12]
```

KASLR

addr space layout randomize




PM
4-16 GB
K
V