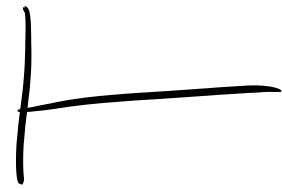


2 PM



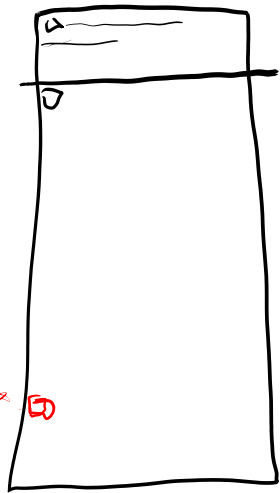
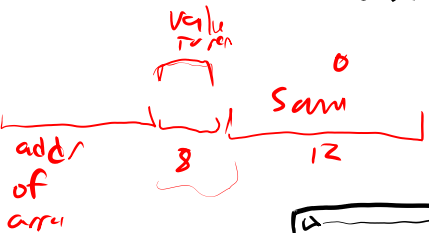
not midnight

ephemeral ²⁵⁶

read byte for kernel mem

use those to index virt addr in user mem

↳ cache



$$2^{28}$$

pages

$$\rightarrow 2^{20} = 1 \text{ MB}$$

↳ prefetch in cache

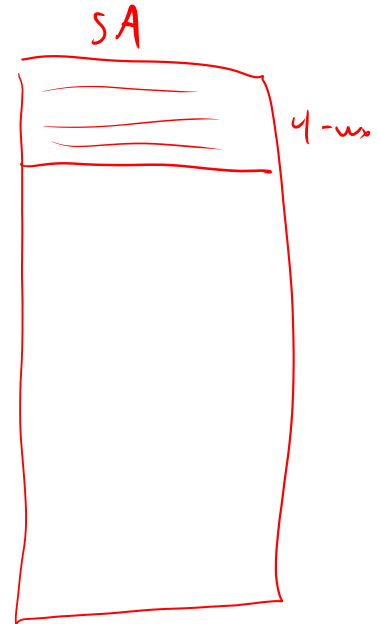
$$2^{16} \cdot 2^{12} = 2^{28} = 256 \text{ MB}$$

check the cache

access a line

Time it - fast → cache
- slow → not

slow read → new cached line



0x

0x
0x
0x

0x

k

used

read

get my

check perm

which

cached?

None

fix Meltdown

annoying → kill many pre faults — HTX.M

ser
PT

big
no arrays
spec

→ fragmenting memory

• not cache ~~kernel~~ ^{user} — very slow

• erase cache on proc vidur consider HW

• not use fast processes ✓ ☹

→ mark memory check fast

HW
Mem aces skip
(2-3 cycles?)



HW
reg



0 - nothing
1 - address w/
h=0 1 bit
are kernel

SW

KAISER

PT

- user - just executable
- kernel - all kernel mem

Timing

|
Threading

$y = x$
↙ run

$z = x$

Time = 2-7

while (true) {

$x += 1$

}