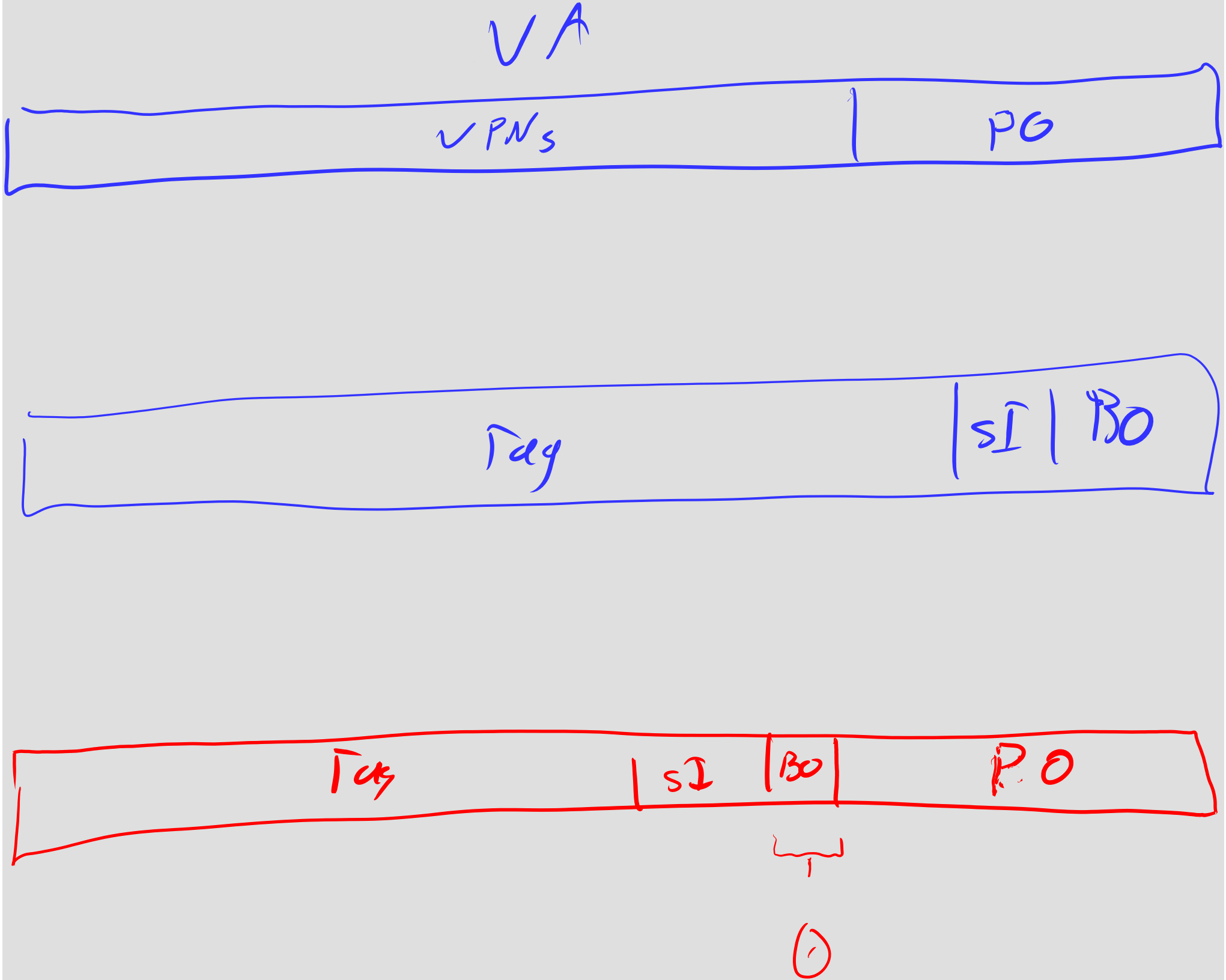

VA
VPNs
PG
Tag
sI
BO
Tag
sI
BO
PO
6

Mutex

atomic operation

```
lock() {
    while (locked) { }
    locked = 1
}
```

→ system call (Old)

↳ stop all but 1

atomically set lock if lock == 0

↳ oper → mutex

CAS

TAS

+=

-=

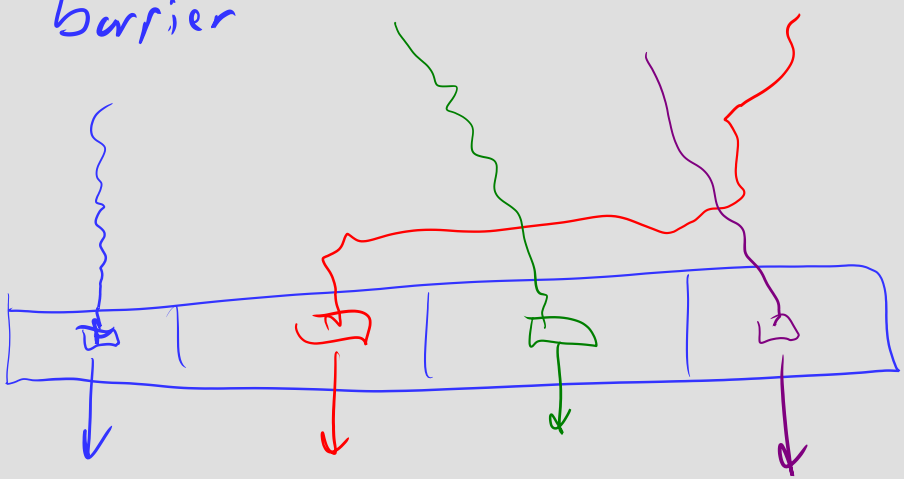
Syscall (new)

wait productively

any of my threads

mutex

barrier



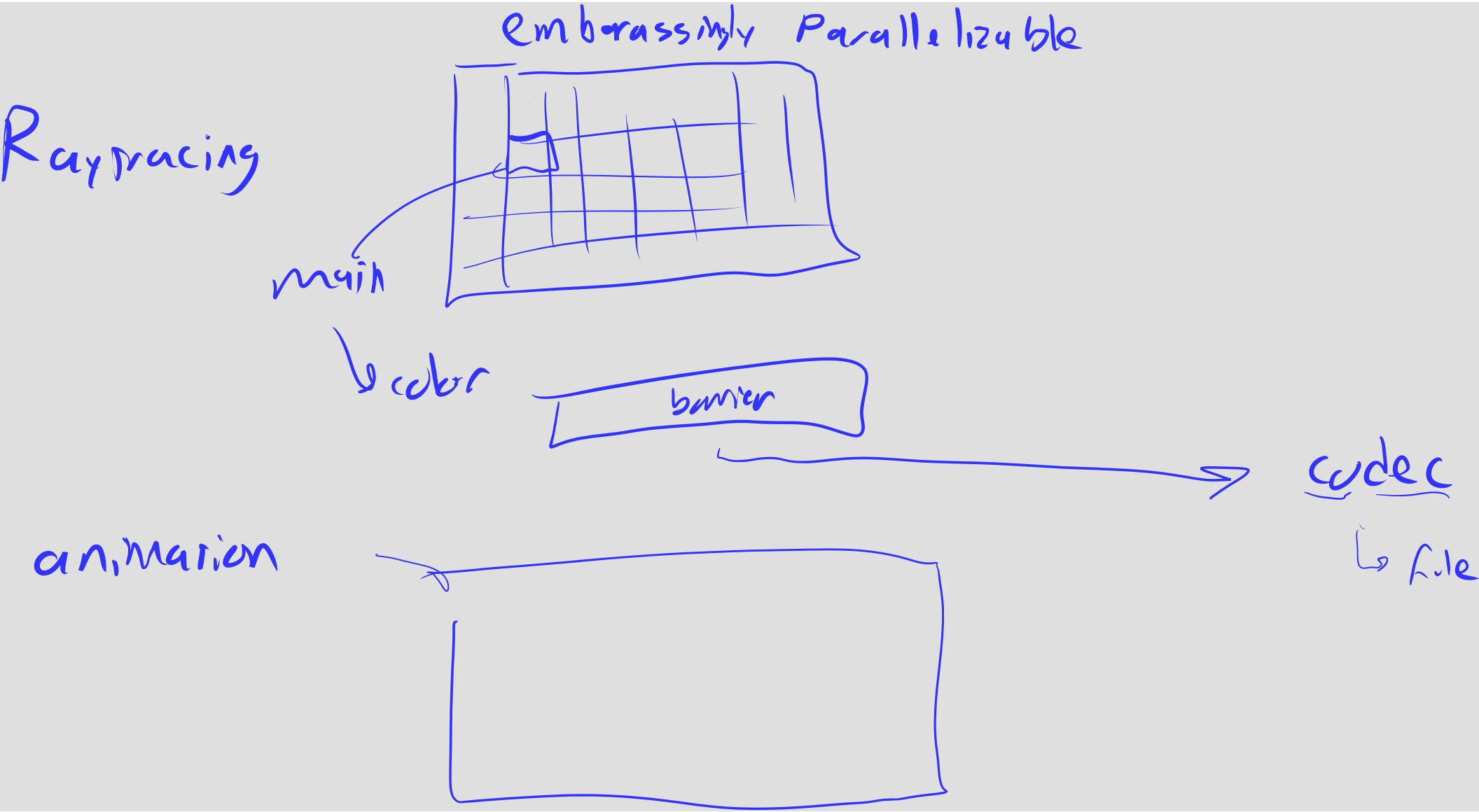
number

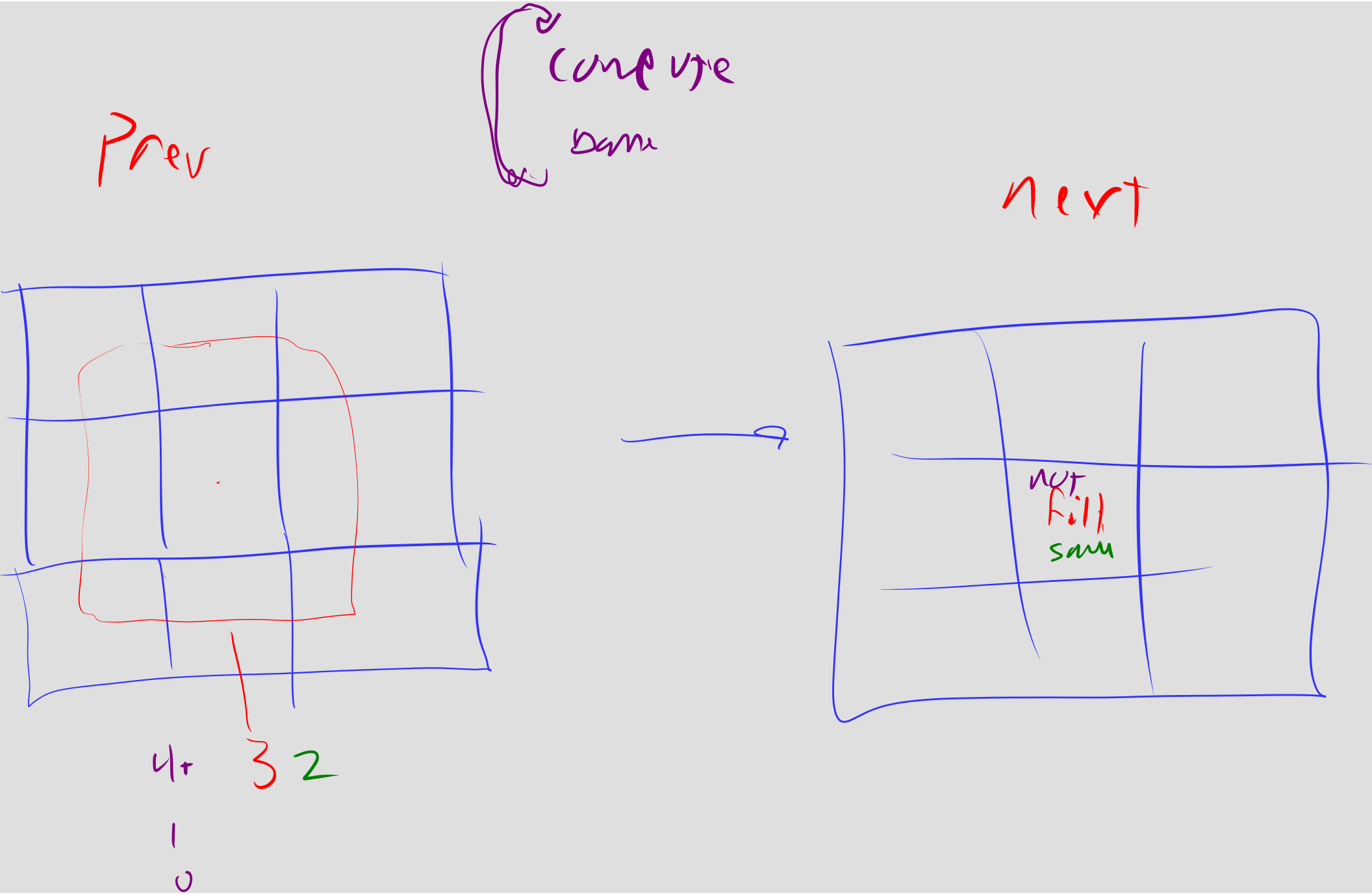
usually =
threads

part 1 in parallel

wait until done part 1 barrier

part 2 in parallel


Embarassingly Parallelizable
Raytracing
main
tcder
barrier
codec
animation
file

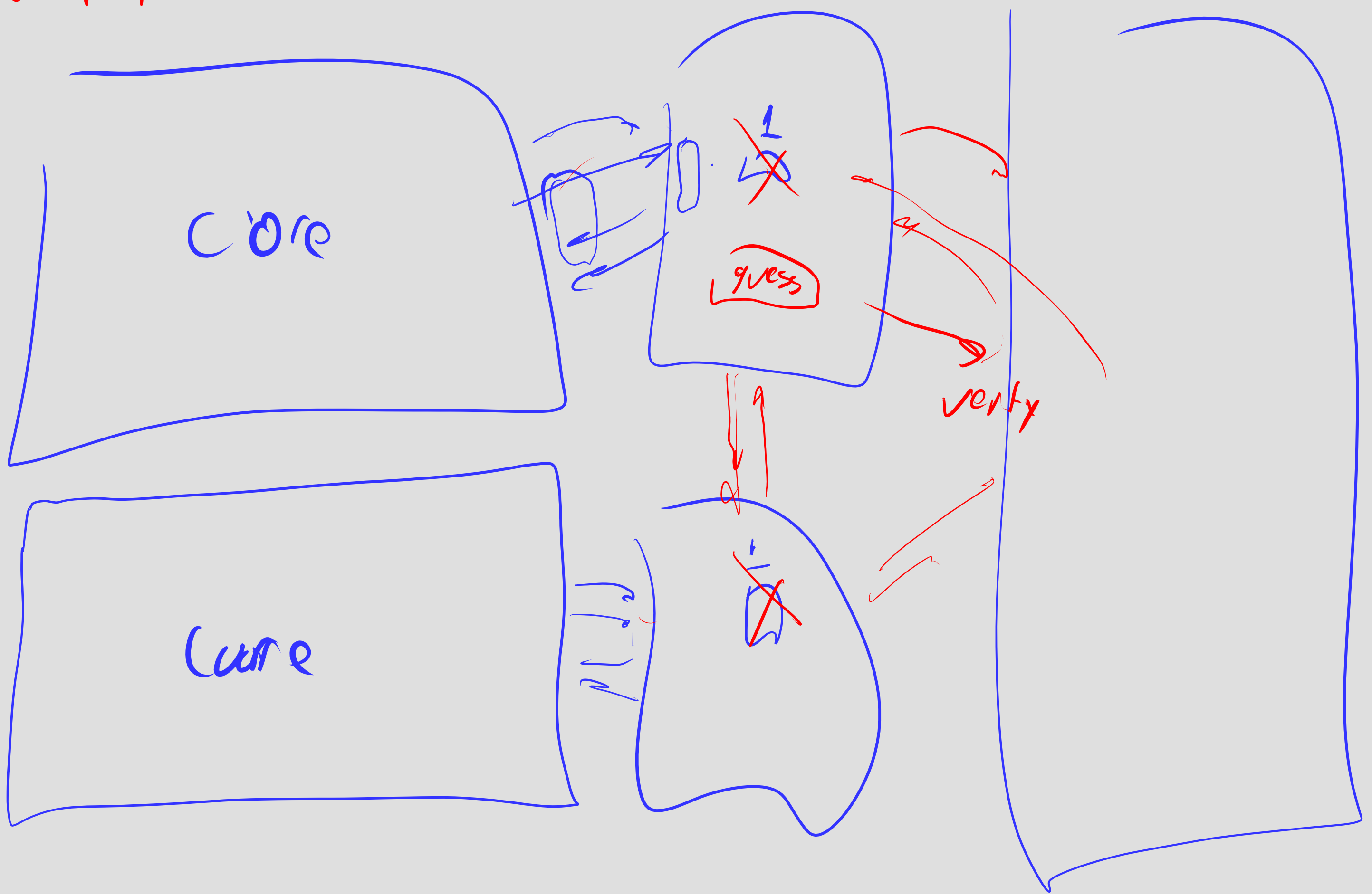

Prev
Compute
same
next
not
fill
same
4
3
2
1
0

So add to x if it's y now

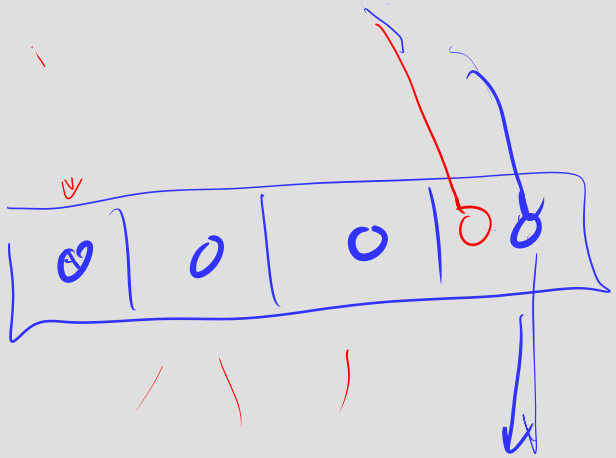
regn

not cachable

only 1 cache own



use_barrier(b)



use_barrier(b) {
lock ; if sem ≠ 0
b.count += 1
if (b.count == target) {
b.count = 0;
set sem = 3
return
} else {
while(b.count) { }
dec sem
} loop:
test num
jne loop
}

Cumin Semufore

set 3