

The hardware to the rescue

- test-and-set (TAS x86 CPU instruction)
atomically writes to the memory location
and returns its old value in a **single indivisible step**
- ➔ the caller is responsible for testing if the operation has succeeded or not

```
bool test_and_set(bool *flag) {  
    bool old = *flag;  
    *flag = True;  
    return old;  
}
```

This is pseudo-code!
The hardware execute this atomically

(good) implementation of a spin lock

```
struct lock {  
    int held = 0;  
}  
  
void acquire (lock) {  
    while test-and-set (&lock->held);  
}  
  
void release (lock) {  
    lock->held = 0;  
}
```