Real-time Quiz Question 8:

Is this contended mutex unlock real-time safe?

69

```
std::mutex m;

std::thread t1 ([&]
                {
                    std::unique_lock l (m);
                    // Do something real-time safe…
                });

std::thread t2 ([&]
                {
                    std::unique_lock l (m);
                    // Do something else real-time safe…
                });
t1.join();
t2.join();
```

Quiz

Real-time

8:

Question

this

real-time

Is

safe?

mutex

unlock

contended

t1

m ;

std::unique_lock

std::mutex

(m) ;

/ /

{

std::thread

([&]

}) ;

1

```
t1.join();
```

Do

safe…

something

real-time

safe…

real-time

```
else
```

t2

```
t2.join();
```

Sin #4a

You may never take a lock in real-time code

Normal lock: `std::mutex::lock()`

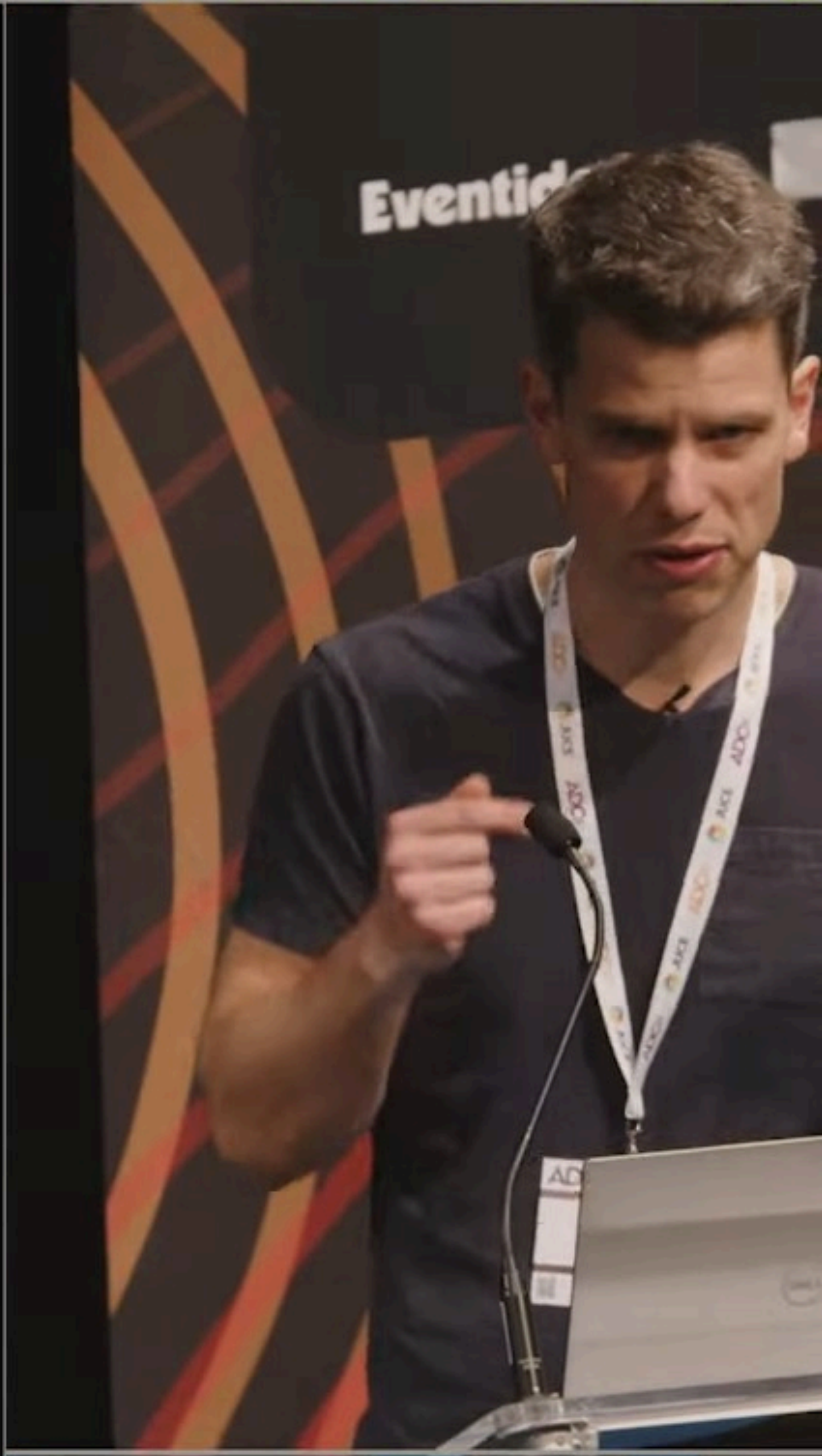
std::mutex::lock is wrapper around `pthread_mutex_lock` (linux source code) - edited for brevity

```
while (1) {
   /* Try to acquire the lock through a CAS from 0 (not acquired) to our TID  */
   oldval = atomic_compare_and_exchange_val_acq (&mutex->__data.__lock,
                                                tid, 0);
   if (__glibc_likely (oldval == 0))
       break;

    ...

    /* Block using the futex and reload current lock value.  */
     futex_wait ((unsigned int *) &mutex->__data.__lock, oldval,
             PTHREAD_ROBUST_MUTEX_PSHARED (mutex));
     oldval = mutex->__data.__lock;
}
return;
```

Real-time safe

OS call which can block thread

→ Lock is real-time safe as long as it's never contended



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