The Caveats of Condition Variables

In this lesson, we discuss the lost wakeup and spurious wakeup pitfall of condition variables with concurrency in C++

WE'LL COVER THE FOLLOWING

Lost Wakeup

The phenomenon of the lost wakeup is that the sender sends its notification before the receiver gets to a wait state. The consequence is that the notification is lost. The C++ standard describes condition variables as a simultaneous synchronization mechanism: “The condition_variable class is a synchronization primitive that can be used to block a thread, or multiple threads *at the same time*, …”. So, the notification gets lost and the receiver is waiting, and waiting, and…

Spurious Wakeup

It can happen that the receiver wakes up, although no notification happened. At a minimum, POSIX Threads and the Windows API can be victims of these phenomena.

In most of the use-cases, tasks are the less error-prone way to synchronize threads.