

Does tokio TcpStream require special cancellation handling?

help

jgreswell-eos July 15, 2025, 9:52pm 1

I've got a tokio::net::TcpStream working inside the future given to a tokio::time::timeout() as follows:

```
async fn stream_comm(url: String, data: &Vec<u8>) -> Result<[u8; 512]> {
    let mut stream = TcpStream::connect(url).await?;
    stream.write_all(data).await?;
    let buf: &mut [u8; 512] = &mut [0; 512];
    stream.read(buf).await?;
    ...
    Ok(*buf)
}

async fn monitored_comms(url: String, data: &Vec<u8>) {
    match tokio::time::timeout(Duration::from_secs(5), stream_comm(url, data)).await {
        Ok(_) => {dbg!("Completed on time");},
        Err(elapsed) => {dbg!("Timed out! Elapsed says {:?}", elapsed);},
    }
    // TODO: cleanup?
}
```

The timeout docs say that when a future times out it is cancelled for you, but I'm worried about the AsyncWriteExt shutdown function -- do I need to call it explicitly someplace to fully release the stream resources (for a cancelled future or otherwise)? Would I need to do explicit cleanup work if I cancelled the future myself?

kpreid July 15, 2025, 11:01pm 2

You only need to do something extra if you are concerned with exactly how much data was written to the socket. If stopping any time is okay, then since **the connection is owned by the cancelled future**, there is no problem. All necessary cleanup to avoid resource leaks happens via implicit drops.

You would have a big problem if you wanted to cancel a write_all() and then continue using the connection, because you would not know how much of a partial message had been written.

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Since you ask about the async shutdown function, let me add a bit about that. Overall, what @kpreid tells you is correct; you don't have to call it explicitly. In the case of TcpStream it doesn't give you anything additional over just dropping it.

The case where TcpStream::shutdown is useful is for gracefully closing a connection. This is because it only closes it in one direction. I.e., the other end of the connection will get an EOF when they read data, indicating that you will never send any more data. It doesn't prevent the other peer from writing data, and you can still read (but not write) after shutdown. A fully graceful shutdown happens when both peers have called shutdown.

In short, dropping the TcpStream does everything that shutdown does (closing read direction), and in fact it does *more* than what shutdown does (it closes the write direction too).

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