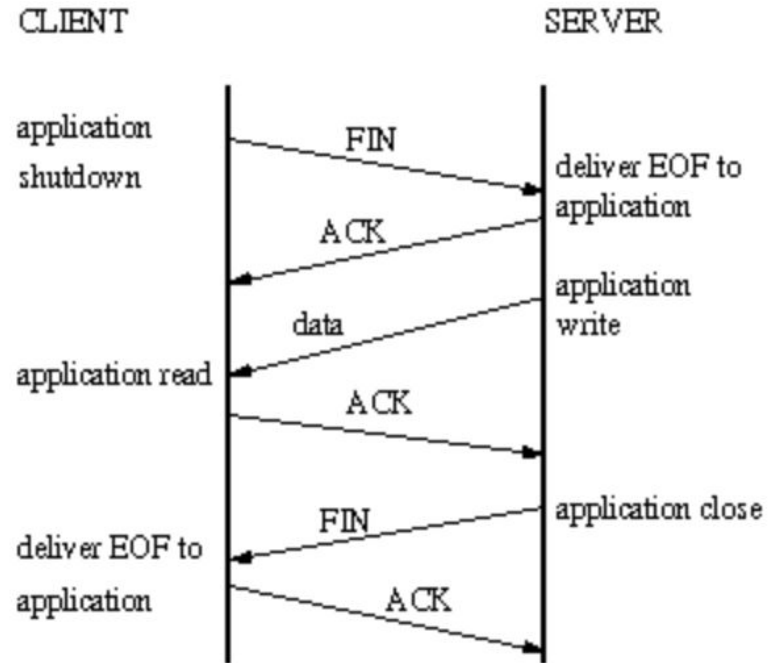


# ATS and Half Closed TCP Connections

ATS Euro Tour  
Cork  
May 2018

# Half Closed TCP Connection

- Sending FIN just means that endpoint will send no more data.
- The other end could keep sending data
- ATS has (somewhat buggy) logic in HttpSM to keep reading off of “half-closed” connections
- Image thanks to <http://www.vorlesungen.uni-osnabrueck.de/informatik/networking-programming/notes/22Nov96/3.html>



# When is this a issue

- Case 1: HTTP/1.x over TCP (no TLS)
  - Yes, can happen. Generally in a test case like if you are using file redirection to get data into netcat
  - Maybe some really old poorly written clients. Would be interesting to get measurements on how often this really happens. My guess is not often.
- Case 2: HTTP/1.x over TLS
  - Maybe, but I doubt it. Some of my searches claimed this could happen, but reading the referred section of the spec seemed to contradict the claim.  
<https://tools.ietf.org/html/rfc5246#section-7.2.1>
- Case 3: HTTP/2 always over TLS
  - No, cannot happen.
  - The TCP FIN is processed at the Http2Session level, not the Http2Stream/HttpSM level.
  - In fact we have a flag on Http2Stream to indicate that it is not capable of TCP-level half open connections, so we bypass all of that logic in that case.

# What are the downsides of supporting half closed?

- Must assume that any FIN we receive still has an active endpoint waiting to read data.
  - Errors in logic could leave that socket open until the timeout period hits
  - Possibly running the system out of sockets
  - Leaving data structures hanging around for extra seconds.
- If they really did shut down, the peer will send RSTs in response to the additional data ATS will send.

# Opt out?

- Zizhong has a PR to make honoring the TCP half-close connection configurable
  - <https://github.com/apache/trafficserver/pull/3325>
- Could we turn off the `allow_half_closed` for TLS connections too?
- Can we get rid of `pipeline_possible` support?
  - One of the cases where we keep a connection in half closed state when we would otherwise close it is when `client_info.pipeline_possible` is true.