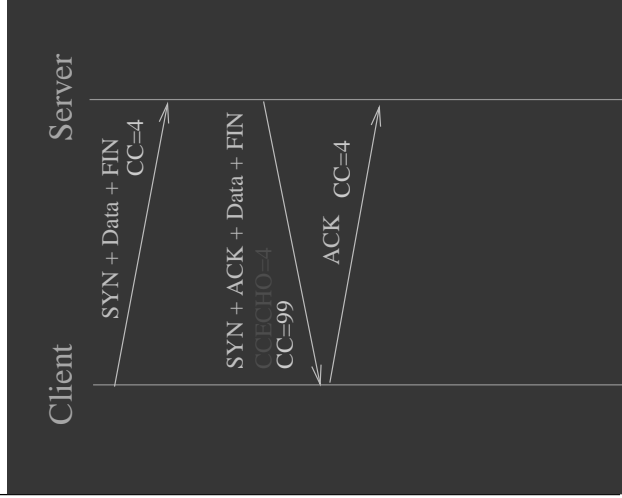


T/TCP Packet exchange



minimal T/TCP 3 packet transaction

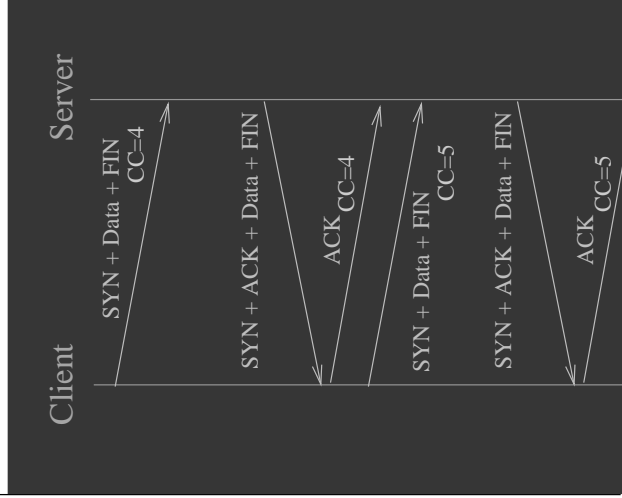
RTT + Server Delay

option added to SYN
old segment protection
carried in all packets

return SYN has its own CC

ACK also carries echo of received CC from SYN

T/TCP transactions



second incarnation of connection
start as soon as desired after old
transaction ends - the CC option allows
duplicates to be detected.

and SYN also serves (if needed) as
echo of the FIN

T/TCP Server choices

- ◊ Server can perform 3 way handshake whenever it needs to
 - Received lower CC than expected
 - Didn't know what CC to expect
 - ...
 - (And if doesn't implement T/TCP)

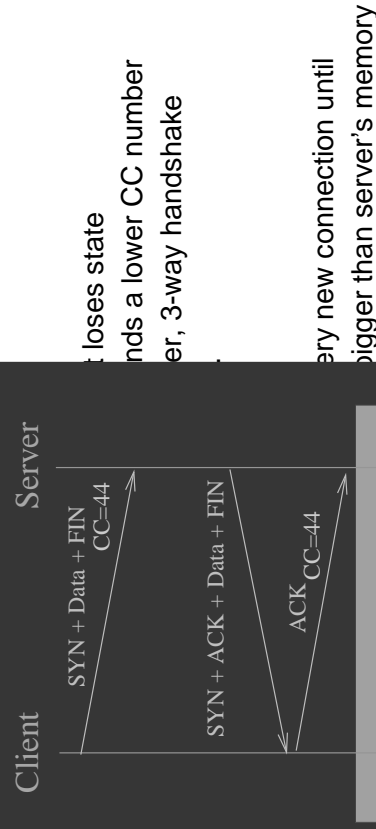
T/TCP Client choices

- ◇ Client needs to be able to force 3 way handshake
 - Could just omit CC option
 - But that tells server that T/TCP is not supported
 - Could deliberately send lower CC
 - Hard to know what is low enough, not too low
 - Could just not send data in SYN packet
 - That could mean slightly increased delays

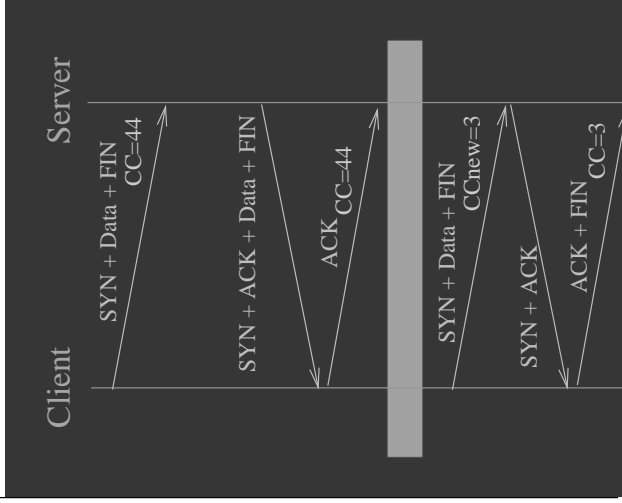
T/TCP Client choices (2)

- ◇ Also need a way to resynchronise
 - server with client's CC
- ◇ New option CC_{new} added
 - Replaces CC option in initial SYN packet (only)
 - Forces 3-way handshake to establish connection
 - (before data handed to server application)
 - Informs server of clients CC value
 - once 3 way handshake is complete

T/TCP Client Lost State

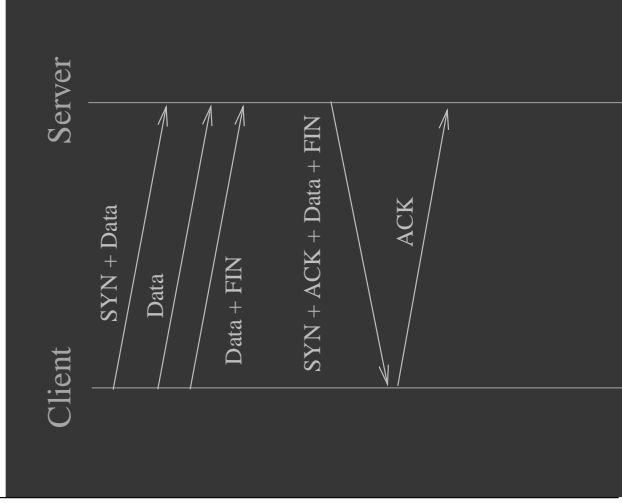


T/TCP CCnew



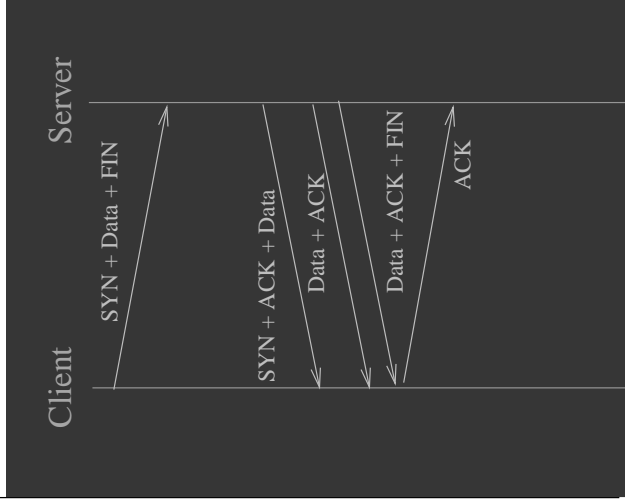
Client sends a new option whenever it has no server
always does 3 way handshake
Verifies CCnew is valid sets its memory to CCnew value
the initial SYN packet uses CCnew

T/TCP Large Requests



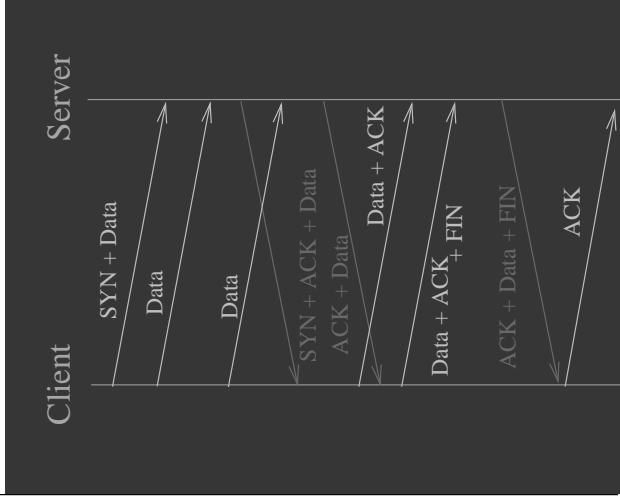
Will use T/TCP for large requests
y, nothing new from TCP here
one of initial packets from server carry ACK
t ACK anything until ISN received server in its SYN+ACK packet

T/TCP Large Replies



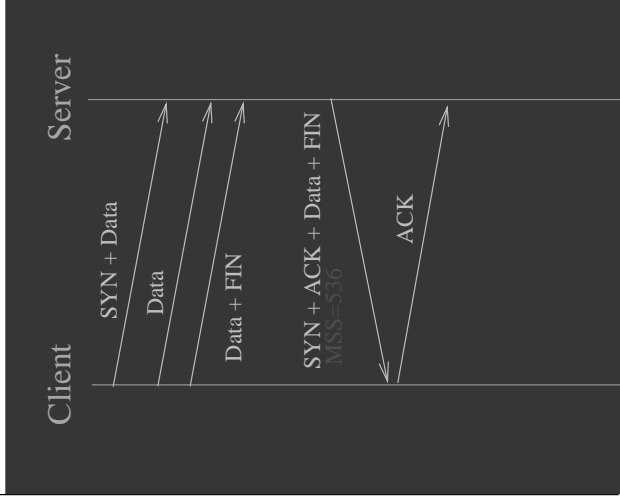
so handle large replies
nothing different from TCP

T/TCP Large Request & Reply



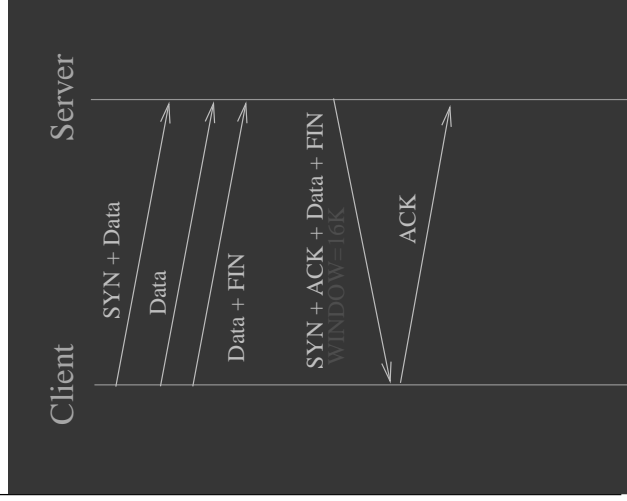
course, both apart from CC options (not shown) almost just the same as TCP

T/TCP Large Requests Revisited



ere a problem here? Does client know the MSS? rmal transmitted with ng SYN has server info cached ludes server's CC from PMTUD to server d MSS from previous xition to cache

T/TCP Large Requests Again



ere another problem here? out the window size all packets ates only to one connection as received no packets onnection when it is g data window before known = 4K