

(A call for)
Congestion Defense in
Depth

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Removal of the Gatekeepers



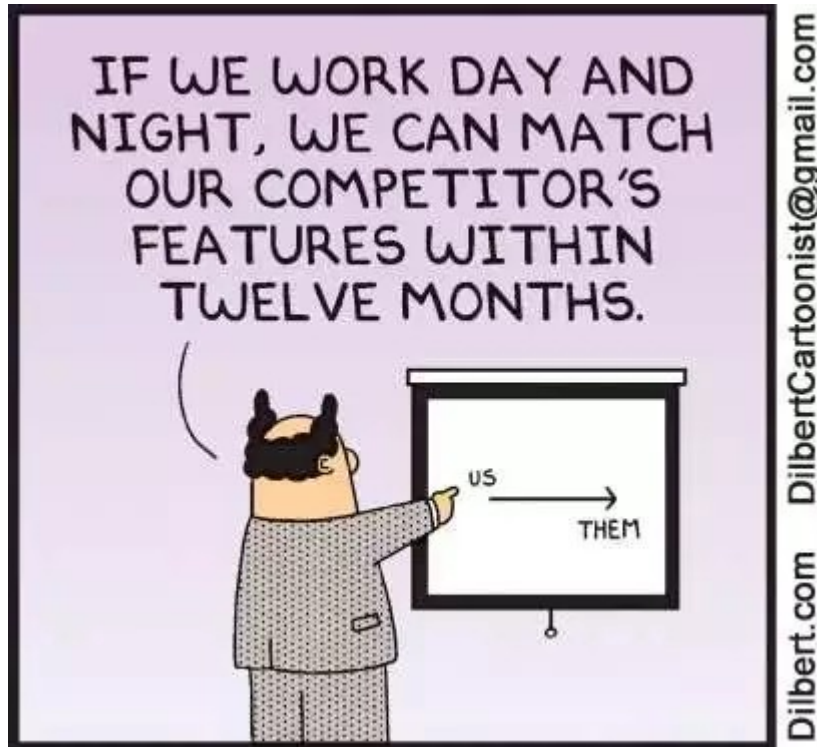
- Transport innovation used to be hard
 - Transport in the kernel
 - Only OS developers can play
- Kernel managers as gatekeepers
 - Show me the RFC
 - Or at least show me a long study (Cubic)
- Application Level Transport solve that
 - QUIC
 - Before QUIC, Bit Torrent, etc.

Transport Innovation is Good



- Application level transport is the new sandbox
- There are many problems to be solved
 - Multipath, migration, real time, lossy links, radio links
- Including for congestion control
 - Slow start, fading links, etc
- Many PhD theses to be written!

Innovation could go wrong



- Competitive congestion control
 - Run N parallel connections
 - Run Cubic as NxReno
 - Invent very own “no brakes” CC
- Adversarial congestion control
 - Detect and spike Cubic
 - Detect and spike BBR
 - Etc.

The Internet sorcerer apprentice?



- Winning local congestion
 - Support calls from nearby users
- Winning global congestion
 - Breaking someone else
- With a little luck, collapsing the Internet
 - Software update gone wrong?

A Call for Congestion Defense in Depth



- Stop depending on the kindness of stack developers
- Isolate users from each others
 - At network access
 - At bottlenecks
- Think of AQM as enforcement, not just signalling