(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