Towards Deployment of Experimental Congestion Control

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Where are we?

- lots and lots of promising congestion control research
  - for fat paths, but also other scenarios
  - some schemes useful on an Internet-wide scale
- potential for benefit is usually demonstrated
  - papers, etc.
- potential for bad interactions is less well investigated
  - because it’s hard & boring :-)
- metrics & scenarios for comparing schemes are unclear
  - which TCP variant is “the best” and what does that mean?
Where do we want to go?

• we’d all like to evolve TCP forward
  • TCP = Internet-wide congestion control standard
  • safe in all environments, performs OK in many
• standard ≈ agreed-upon social contract for CC
  • “how we all use the shared resource we communicate over”
• safe ≈ prevents congestion collapse, some fairness
• a “new TCP” needs to be a safe standard
  • not safe → Internet melts down
  • not standard → interactions between different CC (safe?)
    potential for arms race
    hard enough to get one variant right
Why is there an issue?

• interest to enable new CC features in major stacks exists
• some new CC has already leaked out onto the Internet
  • some stacks move beyond RFC mechanisms
• we don’t know what is safe
  • optimistic view: “well, the Internet hasn’t melted yet”
  • pessimistic view: “but we don’t know if it will stay this way”
• we might want to proceed with caution here
  • CC being one one of the cornerstones of the Internet
Questions

• what is “safe” for global deployment?
  • metrics, scenarios, behavior?
  • global ≠ fat wired paths - there are crazy links out there
  • if “safe” includes “fair”, what is fair?

• a single standard vs. many different mechanisms?
  • evolve a single standard forward?
  • or: everything that backs off under congestion is OK?
  • something in between? what are the requirements?

• how & what to move from research to standardization?
  • there is IETF interest in an initial effort for Informational/Experimental purposes

• (your question here)
The panelists

- Ted Faber, USC/ISI
  - IETF TCPM WG co-chair
- Murari Sridharan, Microsoft
  - C-TCP and Windows TCP/IP Networking
- Injong Rhee, NCSU
  - BIC/CUBIC TCP
- Stephen Hemminger, Linux Foundation
  - Linux TCP
- Bob Briscoe, BT
  - flow-rate fairness: dismantling a religion