A Survey of Lower-than-Best Effort Transport Protocols

draft-welzl-ledbat-survey-00

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Introduction

• Intention: Avoid reinventing the wheel

• Classification
  – delay-based (react early to queue growth)
  – non-delay-based (different CA behavior)
  – application layer (may be delay-based or not)
  – orthogonal (other stuff worth mentioning)
    • But maybe not worth discussing in this presentation
Delay-based approaches

• TCP Vegas: was not designed to be LBE,
  – less aggressive then Reno when sharing a link
  – performs better than Reno in its absence
  – nice example case: LBE ≠ worse performance

• Several others exist
  – TCP Nice, TCP-LP
Non-delay-based approaches

• Different window updates with no “delay growth = queue growth” considerations
  – e.g. consider going cwnd = cwnd/4 instead of cwnd = cwnd/2, and growing with 1/(2*cwnd): you’d be less aggressive than Reno

• Examples: 4CP and MulTFRC (our own, work in progress), which is as TCP-friendly as \( n \) TCPs, including the possibility of \( 0 < n < 1 \)
Application layer approaches

- Covered so far: rwnd tuning
  - Quite sophisticated approaches exist, e.g. Key, Massoulie, Wang, "Emulating Low-Priority Transport at the Application Layer: a Background Service“, SIGMETRICS ’04.
  - Is this used in Microsoft’s Background Intelligent Transfer Service (BITS)?

- Probably a lot still missing here.
Questions derived from the survey

• Application layer approach could mean that we don’t need several per-transport-protocol specs
  – Quote from the SIGMETRICS paper: “encouraging simulation results suggest that such an application level mechanism can work almost as well as a transport layer scheme like TCP-LP.”
  – Is “almost as well” good enough for LEDBAT?

• For the mechanism itself, will it be good enough to immediately give way, or do we want to quantify “aggression”?
Thank you!