Pacing in Transport Protocols

draft-welzl-iccrg-pacing-02

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ICCRG
IETF 122

Context and history

- Document gives guidance to implementers via:
  - Discussion of general considerations and consequences
  - An overview of how others do it

- -00 draft described Linux TCP and QUIC BBR
  - Linux TCP based on: https://tinyurl.com/26698df9
    - **Update: replaced with a citable reference in this (-02) version**
  - QUIC BBR based on open source implementations:
    Google's *quiche* and Meta's *mvfst*

- -01 draft added Vidhi Goel and Michael Tüxen
  - …. who added text on pacing Apple OSes and FreeBSD

News in -02

- Extended discussion text based on list feedback from Ingemar Johannson and Eduard Vasilenko

- Queue dynamics
  - Also, brief mention of AQM interactions

- RTT calculation: 5G related discussion of handshake RTT sample
  - Future: to be extended with client- / server-side discussion

- Mini-bursts and their trade-offs
  - A burst that's tiny (in units of time) near a server can become large near a client
    - E.g.: 50 Kbyte: 100 Gbps 4.1 us, 15 Mbps 27.3 ms
  - But aggregation benefits from having data
  - We don't take a side, we just document the trade-off

Main next steps (open issues in github)

- More detail on Apple OSes and FreeBSD
- Application control (e.g. Interactions with streaming media, cf. SCReAM and "Sammy" paper from SIGCOMM 2023)
- Are there more general consequences of pacing to consider?
  - E.g. There's some material in papers… still need to check.

A question

- At IETF-120, IETF-121, and the mailing list, we saw significant interest in this document

- Could it be ready for adoption?

Thank you!

Your feedback is very welcome:
https://github.com/mwelzl/draft-iccrg-pacing

Questions?