Increase of the Congestion Window When the Sender Is Rate-Limited

draft-welzl-ccwg-ratelimited-increase-02
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CCWG
IETF 120
Reminder of what this is

- **Current TCP specifications allow this**, when app is just not producing more data, or rwnd is limited!

- ns-3 & ns-2 try to follow the specs; and implement this
  - We hope no one else does...

=> Primary motivation: fix this with a PS.

("clean up": RFCs a bit messy)
Specifying the increase (unchanged)

• Our proposed rules: senders (..)
  1. **MUST** include a limit to the growth of cwnd when FlightSize < cwnd.
  2. **SHOULD** limit the growth of cwnd when FlightSize < cwnd with inc(maxFS).

• **maxFS**: max. FlightSize so far, since last increase (or beginning)
• **inc**: the CC's increase if the sender were not rate-limited

• In slow start, Linux (kernel >= 3.16, 2024) implements our rule #2
What happened since -01?

- **New subsections on rate-based controls and pacing** *(feedback from IETF-119)*

  "The guiding principle behind the rules (..) applies to all congestion control algorithms: in the absence of a congestion indication, a sender should be allowed to increase its rate from the amount of data that it has transmitted during the previous RTT. This holds irrespective of whether the sender is rate-limited or not"

- Pacing typically operates on sub-RTT timescales, so nothing special needs to be done; our rules don't constrain it
What happened since -01? /2

- Trimmed the list of RFCs to update (feedback from IETF-119)
- TCP "Reno" congestion control: RFC 5681
- QUIC: RFC 9002
- SCTP: RFC 9260
- Cubic congestion control: RFC 9438
Thank you !