TCP ACK Rate Request (TARR) option

draft-ietf-tcpm-ack-rate-request-05

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Intro: motivation

• Delayed ACKs
  • Intended to reduce protocol overhead
  • But may also contribute to suboptimal performance

• “Large” cwnd scenarios (i.e. cwnd >> MSS):
  – Saving more than 1 of every 2 ACKs may improve performance

• “Small” cwnd scenarios (i.e. cwnd up to ~1 MSS):
  – Delayed ACKs may incur delay, limit cwnd growth...
Intro: main TARR option format

- R carries binary encoding of ACK rate
- Maximum value of R: 127

• “R” is the ACK rate requested by the sender
  • R = 0: request an immediate ACK (but keep steady state R)
Status

• WG adoption
  • draft-ietf-tcpm-ack-rate-request-00
    – Same content as draft-gomez-tcpm-ack-rate-request-06
  • February 2023

• Version -05
  • Aims to address comments from IETF 119
  • Main comment:
    – Are we going to make something in the network very unhappy (due to TARR)?
    – In the presence of elements that aim to modify the ACK rate
Updates (I/III)

• Appendix C. Impact of TARR in the presence of elements that modify the ACK rate
  • ACK filtering
    – Several ACKs stored in the queue, older ones may be removed
    – Despite TARR, there will still be one ACK per cwnd of data
  • ACK decimation
    – ACKs are dropped (less control of which ones)
    – May drop all ACKs that correspond to a cwnd of data, producing retransmission timer expiration
    – TARR (with R > 2) may contribute to this problem
    – Proposed solution: upon retransmission timer expiration, sender requests the receiver to revert to Delayed ACKs in that case
Updates (II/II)

• Appendix C. Impact of TARR in the presence of elements that modify the ACK rate
  • Receiver-side aggregation (e.g., LRO) may reduce the number of ACKs
  • In this case, TARR ($R > 2$) may
    – Further reduce the number of ACKs
    – Contribute to the same problem of not eliciting at least one ACK per cwnd of data, leading to retransmission timer expiration
  • Same proposed solution: sender requests the receiver to revert to Delayed ACKs in that case
Updates (III/III)

• Section 3.1. Sender behavior:
  • When the sender knows that the receiver is TARR-capable
  • And the last ACK rate requested is $R > 2$
  • Upon RTO expiration, the segment carrying retransmitted data MUST carry a TARR option with $R=2$
  • This measure requests the receiver to revert to Delayed ACKs
Thanks!

Questions? Comments?

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