TCP ACK Rate Request (TARR) option

draft-gomez-tcpm-ack-rate-request-00

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Context and related documents

• draft-gomez-tcpm-ack-pull
  • Allowing a sender to trigger immediate ACKs from a receiver
  • Presented at IETF 105 (-00) and IETF 106 (-01)

• draft-gomez-tcpm-delack-suppr-reqs
  • Focus on requirements, instead of solutions
  • Considered also sender ability to request ACK frequency
  • Presented at TCPM interim (virtual for IETF 107)

• Discussion on the mailing list
  • Converged to defining a new TCP option serving two purposes
    – Requesting an ACK frequency
    – Requesting an immediate ACK
  • Led to this document
Introduction (I/II)

• Delayed ACKs: intended to reduce protocol overhead

• Delayed ACKs may also contribute to suboptimal performance (I/II):
  – Large cwnd scenarios (i.e. cwnd >> MSS)
    • Saving up to 1 of every 2 ACKs may be insufficient
    • Goal: mitigating performance limitations due to asymmetric path capacity
      – E.g. reverse path significantly limited
    • Goal: reducing computational cost (sender, receiver) and network load by reducing the amount of ACKs
Introduction (II/II)

• Delayed ACKs may also contribute to suboptimal performance (II/II):
  – *Small* cwnd scenarios (i.e. cwnd up to ~1 MSS)
    • Data centers: BDP up to ~1 MSS
      – Delayed ACKs will incur a delay several orders of magnitude greater than the RTT
    • Transactional data exchanges, or when cwnd has been reduced
      – Eliciting an immediate ACK may avoid idle times or allow faster cwnd growth
TARR option functionality

• TCP ACK Rate Request (TARR) option

• Sender behavior
  • A sender MAY request a receiver to modify the ACK rate of the latter
    – 1 ACK every R full-sized data segments
    – Value of R carried in a TARR option field
  • A sender is allowed to request an immediate ACK
    – TARR option field carrying R=0

• Receiver behavior
  • When R ≠ 0, the receiver MUST modify its ACK rate to 1 ACK per R full-sized data segments
  • When R = 0, the receiver MUST send an immediate ACK
TARR option format

- Shared experimental options format (RFC 6994):

  - Kind: experimental codepoints 253 or 254 (TBD)
  - Length: 5 bytes
  - Experiment Identifier (ExID): 0x00AC (to be requested)
  - R: binary encoding of the R value

- NOTE: intent to pursue a 3-byte format in the long term
Thanks!
Questions? Comments?

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