

# TCP ACK Rate Request (TARR) option

draft-ietf-tcpm-ack-rate-request-06

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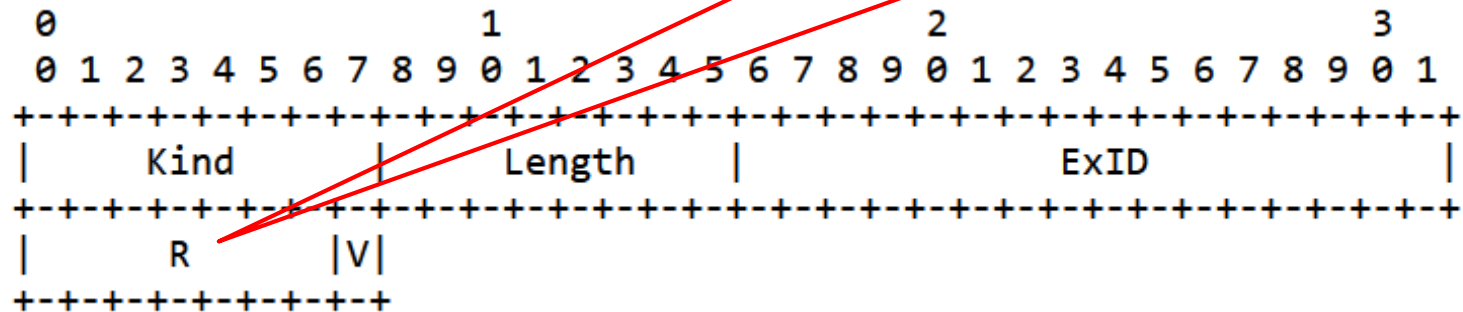
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# Intro: motivation

- Delayed ACKs
  - Intended to reduce protocol overhead
  - But may also contribute to suboptimal performance
- “Large” cwnd scenarios (i.e.  $cwnd \gg MSS$ ):
  - Saving more than 1 of every 2 ACKs may improve performance
- “Small” cwnd scenarios (i.e. cwnd up to  $\sim 1$  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 -06
  - Aims to address comments from IETF 120

# Problem

- Avoid performance degradation induced by TARR in the presence of, e.g., ACK decimation or receiver-side aggregation
  - ACKs may be dropped or less ACKs may be sent
  - Risk: no ACKs received corresponding 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 default Delayed ACKs (RFC 1122)

# Updates (I/II)

- 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  $R=1$ 
    - It was  $R=2$  in -05
  - Avoid incurring a delayed first ACK, request an immediate ACK

# Updates (II/II)

- Section 3.1. Sender behavior:
  - When all retransmitted data has been acknowledged, **and if  $cwnd > 1 \text{ MSS}$  (\*)**, the first segment carrying only new data **MUST** carry a TARR option with  $R=2$
  - The receiver is requested to revert to default Delayed ACKs operation [RFC 1122]
- Terminology:
  - “Default Delayed ACKs operation [RFC 1122]” instead of “Delayed ACKs”
    - Avoid possible confusion, since TARR may also delay ACKs

# Thanks!

## Questions? Comments?

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