

TCP ACK Rate Request (TARR) option

draft-ietf-tcpm-ack-rate-request-11

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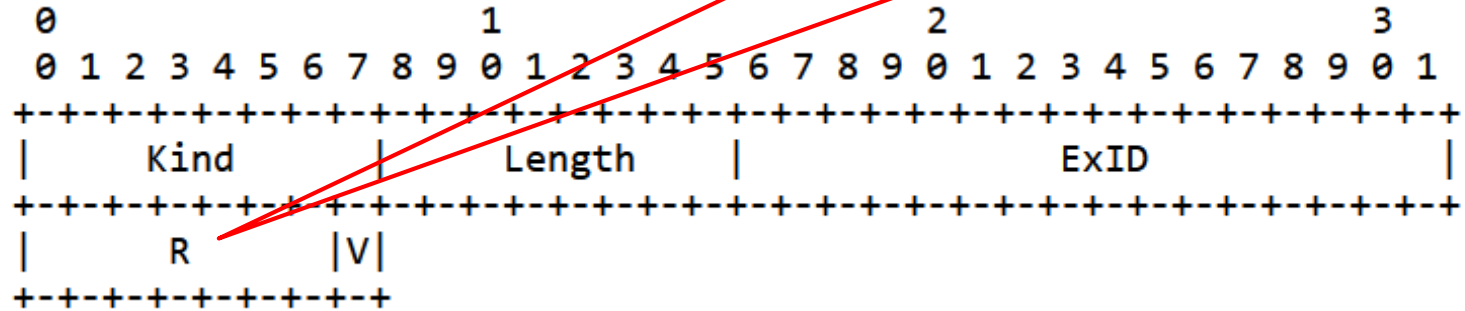
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Intro: motivation

- 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 ~ 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 -11
 - New section 7 on “Socket API Considerations”
 - Informational
 - Show how the socket API can be extended to allow an application to use TARR
 - Initial version

7.1. Socket options

- IPPROTO_TCP-level socket options defined:

Option Name	Data Type	Set	Get
TCP_ACK_RATE_REQ_ENABLE	int	X	X
TCP_ACK_RATE_REQ_PROCESS	int	X	
TCP_ACK_RATE_REQ_SET	uint32_t	X	

7.1.1. TCP_ACK_RATE_REQ_ENABLE

- Enable TARR:
 - setsockopt() with TCP_ACK_RATE_REQ_ENABLE
 - For a TCP socket in state CLOSED or LISTEN
 - Negotiation of TARR can be:
 - » Disabled by providing a zero option_value
 - » Enabled with a non-zero option_value
 - getsockopt() with TCP_ACK_RATE_REQ_ENABLE
 - For a connected TCP socket
 - option_value returned:
 - » Zero, if TARR support has not been negotiated for the TCP connection
 - » Non-zero if TARR support has been negotiated

7.1.2. TCP_ACK_RATE_REQ_PROCESS

- `setsockopt()` with `TCP_ACK_RATE_REQ_PROCESS`
 - For a TCP socket
 - Processing of incoming TARR options is:
 - Enabled by providing a non-zero `option_value`
 - Disabled with a zero `option_value`
- Default value of this socket option:
 - Incoming options are processed
- For accepted sockets, this socket option is inherited from the listening socket

7.1.3. TCP_ACK_RATE_REQ_SET

- `setsockopt()` with `TCP_ACK_RATE_REQ_SET`
 - For a connected TCP socket
 - A TARR request for the rate specified in the `option_value` will be sent with the next TCP segment

New work, in progress

- Initial implementation work:
 - Linux
 - Does not yet cover the Socket API
- Simulation code:
 - ns-3
 - <https://github.com/ahmed-aljabri/ns3-tarr-prototype/tree/main>

Thanks!

Questions? Comments?

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