TCP Usage Guidance in the Internet of Things

draft-ietf-lwig-tcp-constrained-node-networks-02

Carles Gomez
Universitat Politècnica de Catalunya
Jon Crowcroft
University of Cambridge
Michael Scharf
Nokia

Status

- WG document after IETF 99

- Since IETF 100
  - draft-ietf-lwig-tcp-constrained-...-02
  - Feedback from IETF 100
  - Better organize guidance sections
    - Current sections 4 and 5

Updates (I/IV)

- Section 1. Introduction
  - Reasons for TCP criticism in IoT scenarios
    - Plus a reference
  - Valid reasons
    - Relatively long header size
    - Not suitable for multicast
    - Always-confirmed data delivery
  - Invalid reasons
    - Complexity
    - Connection-oriented approach incompatible with RDC
    - Spurious congestion control activation in high BER links

Updates (II/IV)

- Former section 4 (TCP over CNNs)
  - Now reorganized (comments?)

New

Updates (III/IV)

- 8.5. Annex: TinyOS
  - Provides a subset of the socket interface
  - Multiple TCP connections possible

- 8.6. Annex: FreeRTOS
  - Real-time OS for embedded devices
  - Supported by 16- and 32-bit microprocessors
  - Multiple-MSS window
    - TinyTCP single-MSS option available
  - Delayed ACKs
    - 20-ms delay

- 8.7. Annex: uC/OS
  - Real-time OS for embedded devices
  - Supported by 8-, 16- and 32-bit microprocessors
  - Multiple-MSS window

Updates (IV/IV)

More details welcome!

		uIP	lwIP orig	lwIP 2.0	RIOT	OpenWSN	TinyOS	FreeRTOS	uC/OS	
Memory	Data size (kB)	*	*	*	*	*	*	*	*	
	Code size (kB)	<5 (a)	~9 to ~14 (T1)	~40 (b)	*	*	*	<9.2 (T2)	*	
TCP features	Win size (MSS)	1	Mult.	Mult.	1	1	Mult.	Mult.	Mult.	
	Slow start	No	Yes	Yes	No	No	Yes	*	Yes	
	Fast rec/retx	No	Yes	Yes	No	No	Yes	*	Yes	
	Keep-alive	No	No	Yes	No	No	No	Yes	Yes	
	Win. Scale	No	No	Yes	No	No	No	Yes	No	
	TCP timest.	No	No	Yes	No	No	No	Yes	No	
	SACK	No	No	Yes	No	No	No	Yes	No	
	Del. ACKs	No	Yes	Yes	No	No	No	Yes	Yes	
	Socket	No	No	Optional	(I)	*	Subset	Yes	Yes	New
	Concur. Conn.	Yes	Yes	Yes	Yes	Yes	Yes	*	*	New

New New

(T1) = TCP-only, on x86 and AVR platforms
(T2) = TCP-only, on ARM Cortex-M platform
(a) = includes IP, ICMP and TCP on x86 and AVR platforms
(b) = the whole protocol stack on mbed
(I) = interface inspired by POSIX
Mult. = Multiple

Potential changes for -03

- 4.1.2. Discuss ECN support in the Internet
- 6. Security considerations
  - Known code vulnerabilities?
- Annex: separate currently used TCP implementations from older work
- Annex: complete the summary table
  - Data and code size details: input welcome!

Thanks!

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