

TCP Usage Guidance in the Internet of Things

draft-ietf-lwig-tcp-constrained-
node-networks-04

Carles Gomez

Universitat Politècnica de Catalunya

Jon Crowcroft

University of Cambridge

Michael Scharf

Hochschule Esslingen

Status

- Since IETF 102
 - draft-ietf-lwig-tcp-constrained-...-04
 - Feedback from IETF 102
 - Addressed remaining TODOs
- At IETF 103
 - Longer presentation at TCPM
 - WGLC request

Updates (I/III)

- Section 4.2.3. Delayed ACKs for single-MSS
 - The peer that a constrained device communicates with may be a general purpose system
 - Not specific for talking to constrained devices only
 - Delayed ACKs typically configured through system-wide parameters
 - Such a peer will typically have delayed ACKs enabled

Updates (II/III)

- Section 5
 - Reorganized content

4.3.3. Delayed Acknowledgments	11	4.3.3. Delayed Acknowledgments	
5. TCP usage recommendations in CNNs	11	5. TCP usage recommendations in CNNs	
5.1. TCP connection initiation	12	5.1. TCP connection initiation	
5.2. TCP connection lifetime	12	5.2. Number of concurrent connections	
5.2.1. Long TCP connection lifetime	12	5.3. TCP connection lifetime	
5.2.2. Short TCP connection lifetime	12	6. Security Considerations	
5.3. Number of parallel connections	13		
6. Security Considerations	13		

– 5.2. Concurrent connections

- May help avoid head-of-line blocking problems
- May be harmful in congested networks
- Being conservative is recommended

Updates (III/III)

- 8. Annex

Removed
OpenWSN

	uIP	lwIP orig	lwIP 2.0	RIOT	TinyOS	FreeRTOS	uC/OS	
Memory	Code size (kB)	<5 (a)	~9 to ~14 (T1)	~40 (b)	<7 (T3)	N/A	<9.2 (T2)	N/A
	Win size (MSS)	1	Mult.	Mult.	1	Mult.	Mult.	Mult.
	Slow start	No	Yes	Yes	No	Yes	No	Yes
T	Fast rec/retx	No	Yes	Yes	No	Yes	No	Yes
C	Keep-alive	No	No	Yes	No	No	Yes	Yes
P	Win. Scale	No	No	Yes	No	No	Yes	No
f	TCP timest.	No	No	Yes	No	No	Yes	No
e	SACK	No	No	Yes	No	No	Yes	No
a	Del. ACKs	No	Yes	Yes	No	No	Yes	Yes
t	Socket	No	No	Optional	(I)	Subset	Yes	Yes
u	Concur. Conn.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- (T1) = TCP-only, on x86 and AVR platforms
- (T2) = TCP-only, on ARM Cortex-M platform
- (T3) = TCP-only, on ARM Cortex-M0+ platform (NOTE: RAM usage for the same platform is ~2.5 kB for one TCP connection plus ~1.2 kB for each additional connection)
- (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
- N/A = Not Available

Post-cutoff comments

- Yoshifumi Nishida (TCPM co-chair)
 - “... the draft looks fine and mostly ready...”
 - Comments:
 - Section 4.2.4. Cite draft-ietf-tcpm-rto-consider
 - Section 4.3.1. Need to clarify need of window size of 5 MSS to get 3 duplicate ACKs
 - Section 5.3. A typo
 - Section 5.3. TFO deviation from TCP semantics
 - Section 5.3. Discuss reducing TCP keep-alive interval

WG LC ?