

TCP Usage Guidance in the Internet of Things

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

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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?)

<u>4.</u>	TCP implementation and configuration in CNNs	<u>6</u>
<u>4.1.</u>	Path properties	<u>6</u>
<u>4.1.1.</u>	Maximum Segment Size (MSS)	<u>7</u>
<u>4.1.2.</u>	Explicit Congestion Notification (ECN)	<u>7</u>
<u>4.1.3.</u>	Explicit loss notifications	<u>8</u>
<u>4.2.</u>	TCP guidance for small windows and buffers	<u>8</u>
<u>4.2.1.</u>	Single-MSS stacks - benefits and issues	<u>8</u>
<u>4.2.2.</u>	TCP options for single-MSS stacks	<u>9</u>
<u>4.2.3.</u>	Delayed Acknowledgments for single-MSS stacks	<u>9</u>
<u>4.2.4.</u>	RTO estimation for single-MSS stacks	<u>10</u>
<u>4.3.</u>	General recommendations for TCP in CNNs	<u>10</u>
<u>4.3.1.</u>	Error recovery and congestion/flow control	<u>10</u>
<u>4.3.2.</u>	Selective Acknowledgments (SACK)	<u>11</u>
<u>4.3.3.</u>	Delayed Acknowledgments	<u>11</u>
<u>5.</u>	TCP usage recommendations in CNNs	<u>11</u>
<u>5.1.</u>	TCP connection initiation	<u>12</u>
<u>5.2.</u>	TCP connection lifetime	<u>12</u>
<u>5.2.1.</u>	Long TCP connection lifetime	<u>12</u>
<u>5.2.2.</u>	Short TCP connection lifetime	<u>12</u>
<u>5.3.</u>	Number of parallel connections	<u>13</u>



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	~9 to ~14	~40	*	*	<9.2	*
		(a)	(T1)	(b)			(T2)	
	Win size (MSS)	1	Mult.	Mult.	1	1	Mult.	Mult.
	Slow start	No	Yes	Yes	No	No	Yes	*
T	Fast rec/retx	No	Yes	Yes	No	No	Yes	*
C	Keep-alive	No	No	Yes	No	No	No	Yes
P	Win. Scale	No	No	Yes	No	No	No	Yes
f	TCP timest.	No	No	Yes	No	No	No	Yes
e	SACK	No	No	Yes	No	No	No	Yes
a	Del. ACKs	No	Yes	Yes	No	No	No	Yes
t	Socket	No	No	Optional	(I)	*	Subset	Yes
u	Concur. Conn.	Yes	Yes	Yes	Yes	Yes	Yes	*
r								*
e								*
s								*

New

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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