

Terminology for Constrained-Node Networks

# RFC 7228 bis

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# Updating RFC 7228 (May 2014)

- Has the world moved?
- Is terminology missing?

# Power constrainedness

- Terminology such as E0 or P0 was added late to RFC 7228 — how successful is that?
- Are there “classes” for Ps and Et?

# Terminology for networks

- MTU-constrainedness (1500+, 500, 128, 27, 12, 8)
- millibit characteristics
- asymmetry (e.g., powerful base stations vs. constrained devices; powered mesh routers; ...)
- mobility (building networks vs. BANs vs. Logistics)?

# Terminology for platforms



- A-class (L-class?) vs. M-class
- Higher classes within M-class (Class 3, 4, 5)?  
Subclasses (1a/b/c = 128/8, 128/16, 256/16)?
- Crypto capabilities?
- Protection capabilities (MPU, MMU, ...; Kernel/User; TrustZone/Secure Element; tamper-proof...)?

Group	Name	data size (e.g., RAM)	code size (e.g., Flash)	Examples
M	Class 0, C0	<< 10 KiB	<< 100 KiB	ATtiny
M	Class 1, C1	~ 10 KiB	~ 100 KiB	STM32F103CB
M	Class 2, C2	~ 50 KiB	~ 250 KiB	STM32F103RC
M	Class 3, C3	~ 100 KiB	~ 500..1000 KiB	STM32F103RG
M	Class 4, C4	~ 300..500..1000 KiB	~ 1000...2000 KiB	"Luxury"
J	Class 10, C10	4-8 MiB	(?)	OpenWRT routers
J	Class 13, C13	0.5..1 GiB	(lots)	Raspberry Pi
J	Class 15, C15	1..2 GiB	(lots)	Smartphones
J	Class 16, C16	4..32 GiB	(lots)	Laptops
J	Class 19, C19	(lots)	(lots)	Servers

# New M-group classes

- C3: recognizable cluster above C2
- C4: pretty fuzzy

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M	Class 4, C4	~ 300..500..1000 KiB	~ 1000...2000 KiB	“Luxury”

# New M-group classes

- All M-group classes now mostly define execute-in-place (XIP) architectures
- Load-from-Flash architectures more difficult to describe:
  - RAM size (e.g., ~ 512 KiB)
    - partitioned into code/data/cache RAM?
  - Flash size — often 2..8 MiB (more than code)

# J-group classes (all new)

- Recognizable classes per product; gaps left (right gaps?)
- Code size vs. demand-paging (MMU!); XIP rare

J	Class 10, C10	4-8 MiB	(?)	Limited Flash	OpenWRT routers
J	Class 13, C13	0.5..1 GiB	(lots)	Large Flash, SSD	Raspberry Pi
J	Class 15, C15	1..2 GiB	(lots)		Smartphones
J	Class 16, C16	4..32 GiB	(lots)		Laptops
J	Class 19, C19	(lots)	(lots)		Servers

# Criteria for class terminology

- Classes should exist in actual products
- Class boundaries should be indicative of capability boundaries
  - Laptop vs. Server? Hmm.
- Can we collect **examples of speech** that employs classes?