

draft-bormann-iotops- ietf-lwig-7228bis-00

IETF 119 iotops 2024-03-20

Carsten Bormann

Mehmet Ersue

Ari Keränen

Carles Gomez

LWIG WWG

Created 2011-03-27

| Charter: ~ [Informational](#) Documents about [implementing](#)
| constrained node networks

| Heyday:

- | • 2014 [RFC 7228](#) (terminology)
- | • 2016–2018: various RFCs on energy efficiency etc.
- | • 2021 RFC 9006 (Using TCP in IoT)

Closed down 2024-01-22

RFC 7228 bis

RFC 7228 (2014) Terminology:

- constrained node network
- "Class 1", "Class 2" devices

draft-...-7228bis expands:

- set of classes offered
- range of some classes

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..1000 KiB	~ 1000..2000 KiB	"Luxury"
J	Class 10, C10	(16..)32..64..128 MiB	4..8..16 MiB	OpenWRT routers
J	Class 15, C15	0.5..1 GiB	(lots)	Raspberry PI
J	Class 16, C16	1..4 GiB	(lots)	Smartphones

Name	Type of energy limitation	Example Power Source
E0	Event energy-limited	Event-based harvesting
E1	Period energy-limited	Battery that is periodically recharged or replaced
E2	Lifetime energy-limited	Non-replaceable primary battery
E9	No direct quantitative limitations to available energy	Mains-powered

Table 6: Classes of Energy Limitation

More Recent Class-Sets

E.g.:

- Ability to accept upgrades
- On-device Isolation
- Secret shielding classes

P0	Normally-off	Reattach when required
P1	Low-power	Appears connected, perhaps with high latency
P9	Always-on	Always connected

Table 7: Strategies of Using Power for Communication

F0	no (discard for upgrade)
F1	replaceable, out of service during replacement, reboot
F2	patchable during operation, reboot required
F3	patchable during operation, restart not visible externally
F9	app-level upgradability, no reboot required ("hitless")

Table 2: Levels of Software Update Capabilities

Is0	no isolation
Is2	MPU (memory protection unit), at least boundary registers
Is5	MMU with Linux-style kernel/user
Is7	Virtualization-style isolation
Is8	Secure enclave isolation

Table 3: Levels of Isolation Capabilities

Completing 7228bis in iotops

Concluded WGs don't accept document updates

Update got stuck: now [draft-bormann-iotops-ietf-lwig-7228bis-00](#)

Ready for WG adoption...

- Do we want to have an update for 7228bis?
- Is the general direction right?

(Detail work should be in WG.)

We will miss May 2024 tenth anniversary of RFC 7228...

Could still finish 7228bis this year