IETF Activities
IoT and Edge

Making the Internet work better

IETF
About

Lars Eggert, IETF Chair

The mission of the IETF *is to make the Internet work better by producing high quality, relevant technical documents that influence the way people design, use, and manage the Internet.*

… a properly networked world … could be safer, greener, more efficient and more productive … But in order for that to emerge, the **system has to be designed in the way that the Internet was designed** in the 1970s – **by engineers who know what they're doing**, setting the protocols and technical standards that will bring some kind of order and security into the chaos of a technological stampede.

John Naughton. *The internet of things needs better-made things.* The Guardian, 2016-7-10.

IETF Approach
Pushing the Internet to Lowest-Capability Devices

No Internet

No direct Internet connectivity:
proprietary local protocols

Runs limited Internet stack

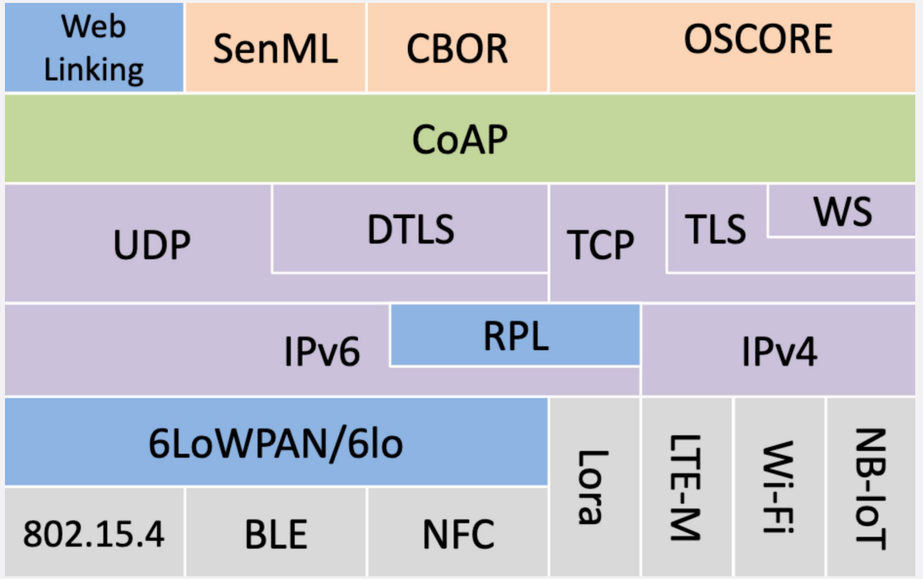
IETF IoT protocols supported:
IPv6, RPL, COAP, CBOR

Runs full Internet stack

Full IETF protocol suite supported:
IPv4, IPv6, DNS, TCP, TLS, QUIC, etc.

IETF Approach
Chartered Work on IoT and Edge

WG	Area	Technology
LWIG	Internet	Light-Weight Implementation Guidance
6LoWPAN	Internet	IPv6 over Low-Power WPAN (IEEE 802.15.4)
6TiSCH	Internet	Deterministic IPv6 over IEEE 802.15.4e Timeslotted Channel Hopping
6Lo	Internet	IPv6 over Networks of Resource-Constrained Nodes (other link layers)
LPWAN	Internet	IPv6 over Low Power Wide-Area Networks
ROLL	Routing	Routing Over Low-Power and Lossy Networks (RPL)
CORE	Applications	Constrained RESTful Environments (REST, CoAP, Ops)
CBOR	Applications	Concise Binary Object Representation (CBOR & CDDL)
ASDF	Applications	A Semantic Definition Format for Data and Interactions of Things
DICE	Security	DTLS In Constrained Environments
ACE	Security	Authentication and Authorization for Constrained Environments
COSE	Security	CBOR Object Signing and Encryption (Object Security)
SUIT	Security	Software Updates for Internet of Things
RATS	Security	Remote Attestation
IoTOPS	Operations	IoT Operational Considerations
T2TRG	Research	Emerging Research Topics



R. Morabito and J. Jimenez, "IETF Protocol Suite for the Internet of Things: Overview and Recent Advancements," in IEEE Communications Standards Magazine, vol. 4, no. 2, pp. 41-49, June 2020.

IETF
Identified Challenges

01 Silos

Large IoT/edge deployments still use proprietary protocols. Verticals compound the effect. Cloud/edge business model is entrenched.

02 Security & Privacy

DDoS resistance, bootstrapping, software updates, user control, ...

03 Sustainability

Device/service EOL controlled by vendors/market. Support for evolution and reuse/upcycling.

04 Beyond Building Blocks

IETF provides key building blocks with broad applicability. Should we get more involved with defining solutions?
Example: Thread

thank you.