RIOT: Networking from the friendly OS perspective

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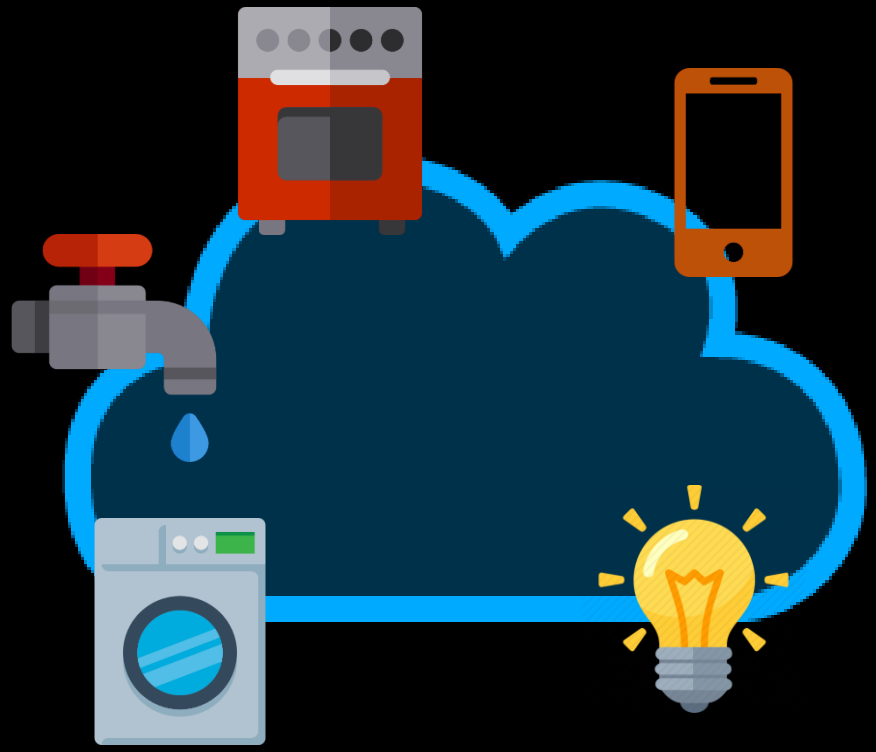
 @RIOT_OS

 riot-os.org

 https://github.com/RIOT-OS/RIOT

50 Billions



50 Billions

To load 100 Gbit/s?

666k BLE devices, 476k 15.4 devices

You should know which systems are connecting to your network in the future!

50 Billions

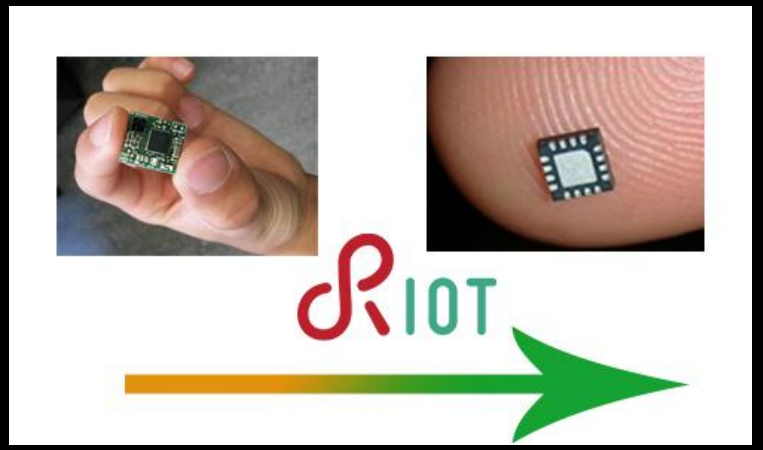
(mainly microcontrollers)

The many faces of IoT

High-end IoT

Processor: GHz, 32/64 Bit
Memory: M/Gbytes
Energy: Watt
Network access: 5G, WLAN

Low-end (or constrained) IoT



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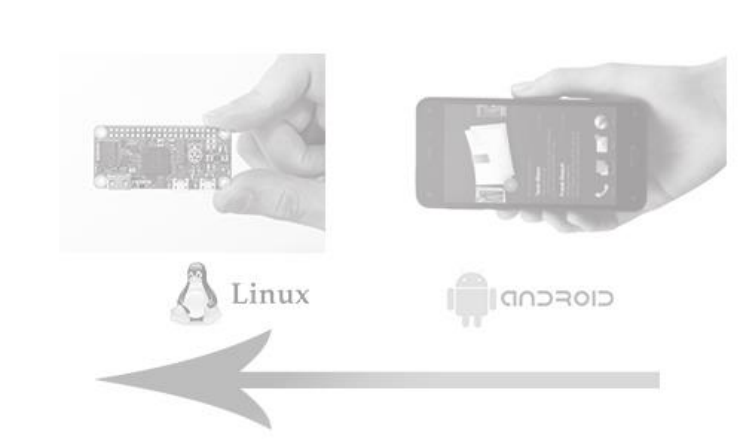

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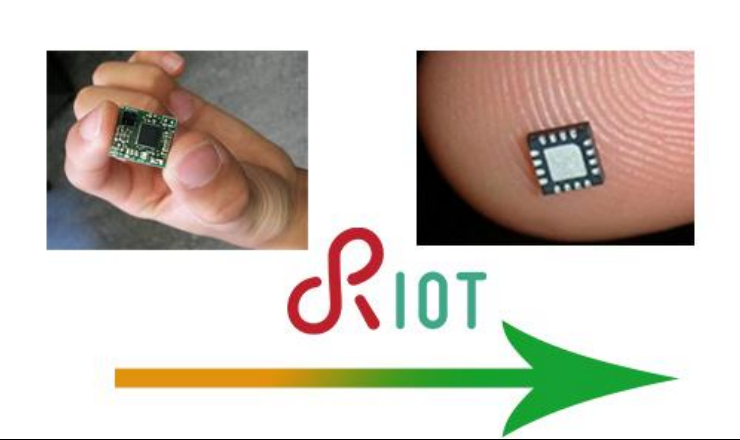

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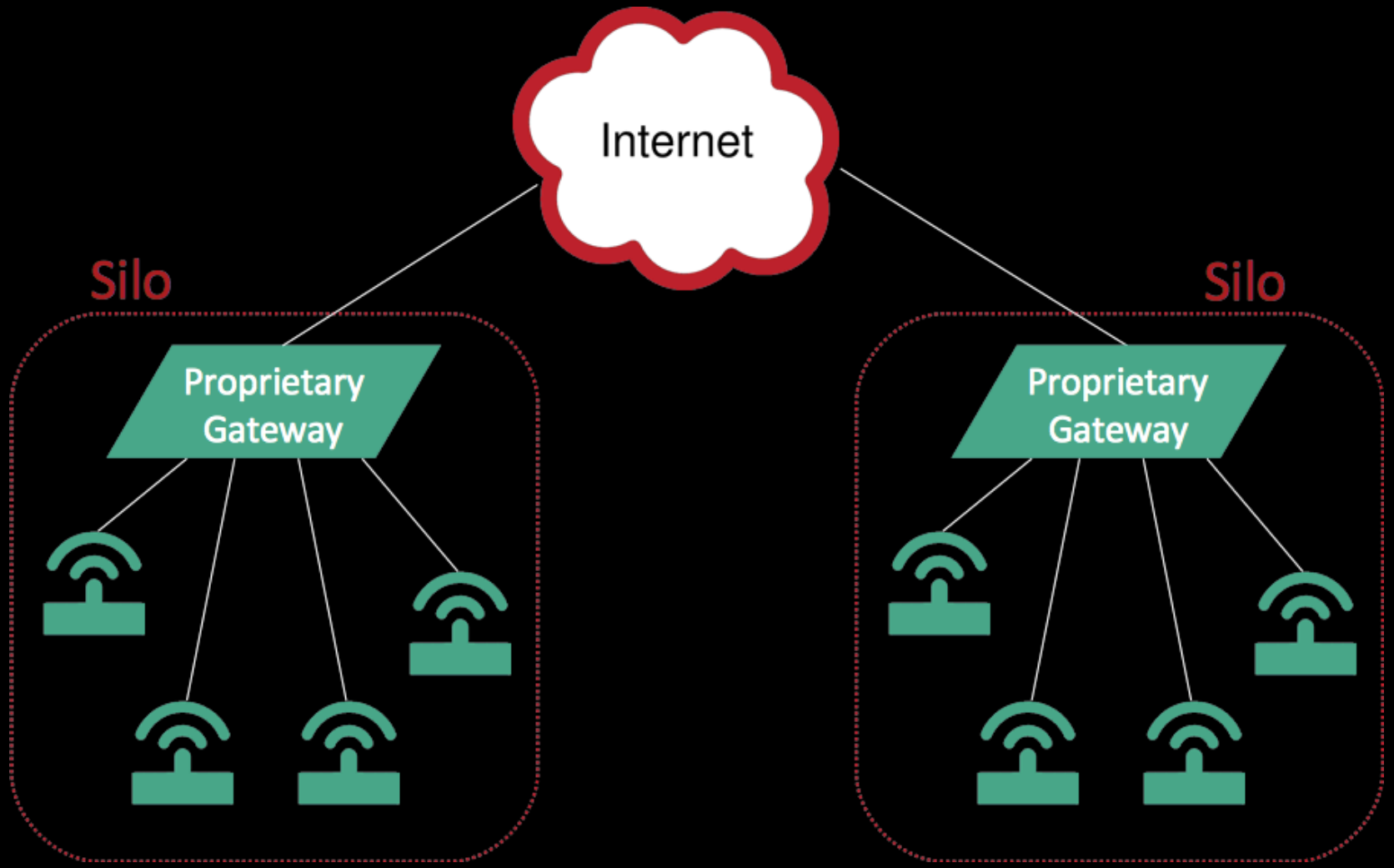
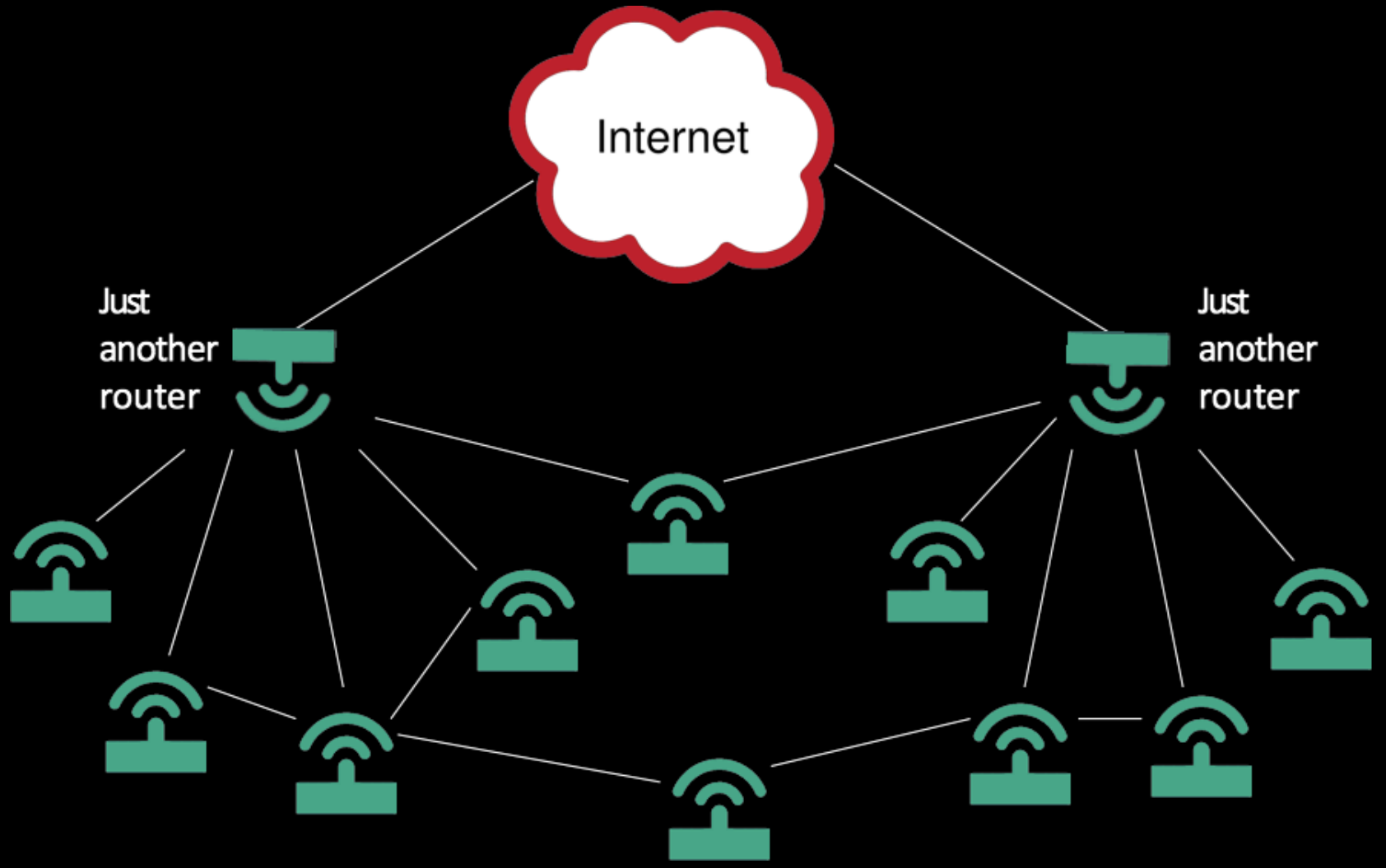
Problem: Constrained IoT looks mostly like this



The IoT we want looks more like that



To be successful in the IoT, we need

IoT operating system supporting:

- Low resource footprint
- Interoperability
- Interconnection
- Vendor independence


IOT

RIOT community is a grassroots community

- 2008 – Project roots
  The kernel was started as part of the FireWhere project
- 2010 – Towards the IoT
  Implementation of 6LoWPAN and RPL was initiated (GLAB)
- 2013 – RIOT goes public
  Branding of RIOT, source code moved to GitHub

Founding institutions

RIOT community grows continuously

RIOT in a nutshell:
If your IoT device cannot run Linux, run RIOT!

Some key features

- Open source LGPL 2.1 (easy to keep open)
  - This does NOT conflict w/ proprietary software!
- Hardware abstraction layer & common APIs (easy to use)
- Modular structure (easy to extend)
- Full IETF network stack (easy to interconnect)
  - e.g., 6LowPAN, IPv6, CoAP, …
- App store (easy to share)

Supported network capabilities

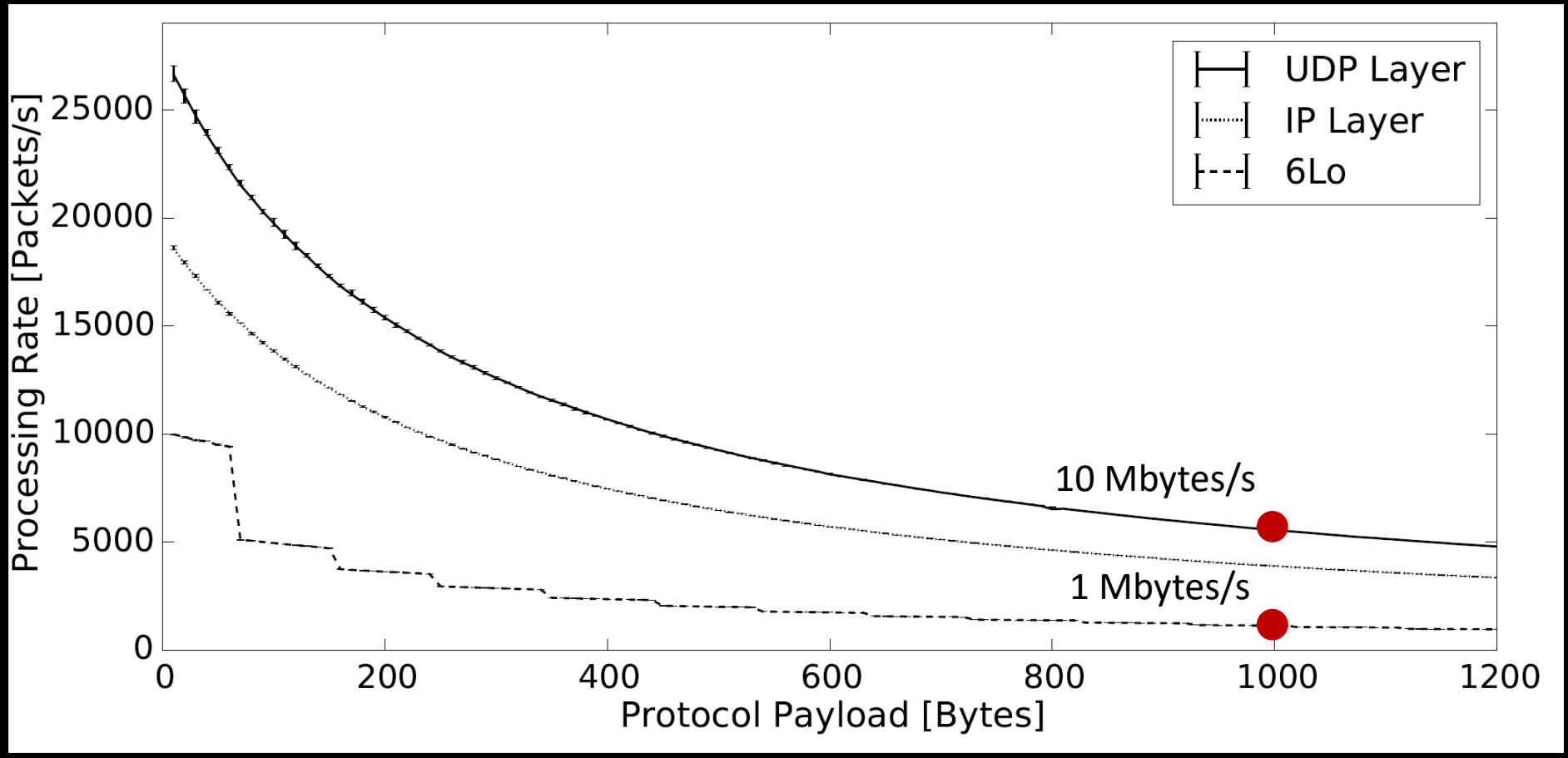
Full Stacks

- GNRC
- LwIP
- Emb6
- OpenWSN
- CCN-Lite
- NDN-RIOT
- LoRA-WAN
- (Nimbel BLE)

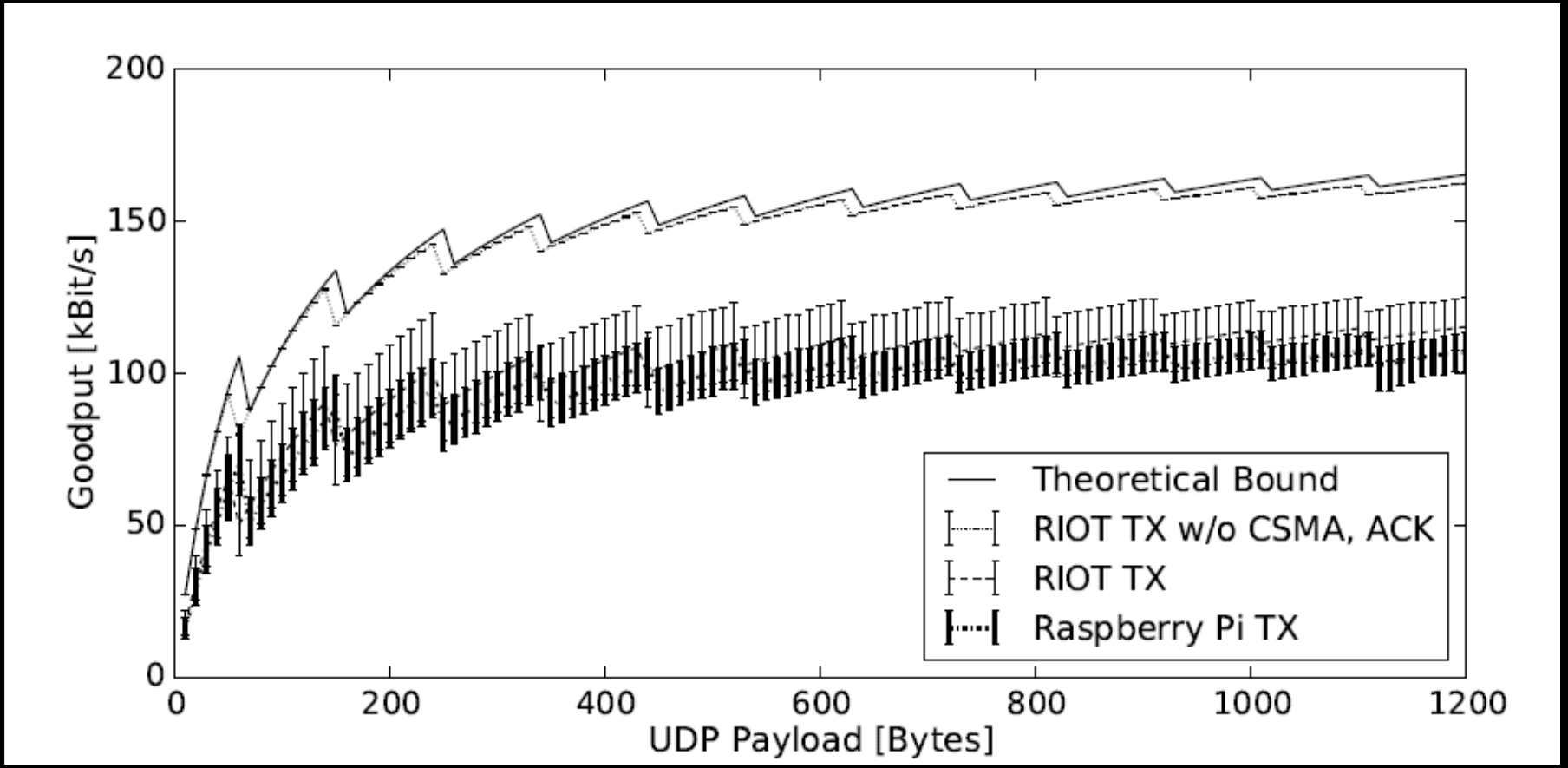
Network Access

- 802.15.4 (various radios)
- 802.15.4 CSMA
- 802.15.4 TSCH
- 802.3 Ethernet
- LoRA
- (BLE)

RIOT network stack: Packet processing rates



IoT stacks in the Wild: RIOT versus RasPi



RIOT Summit

September 13 - 14, 2018

Meet in Amsterdam!

We already support the Summit!

RIPE NCC
RIPE NETWORK COORDINATION CENTRE

wolfSSL

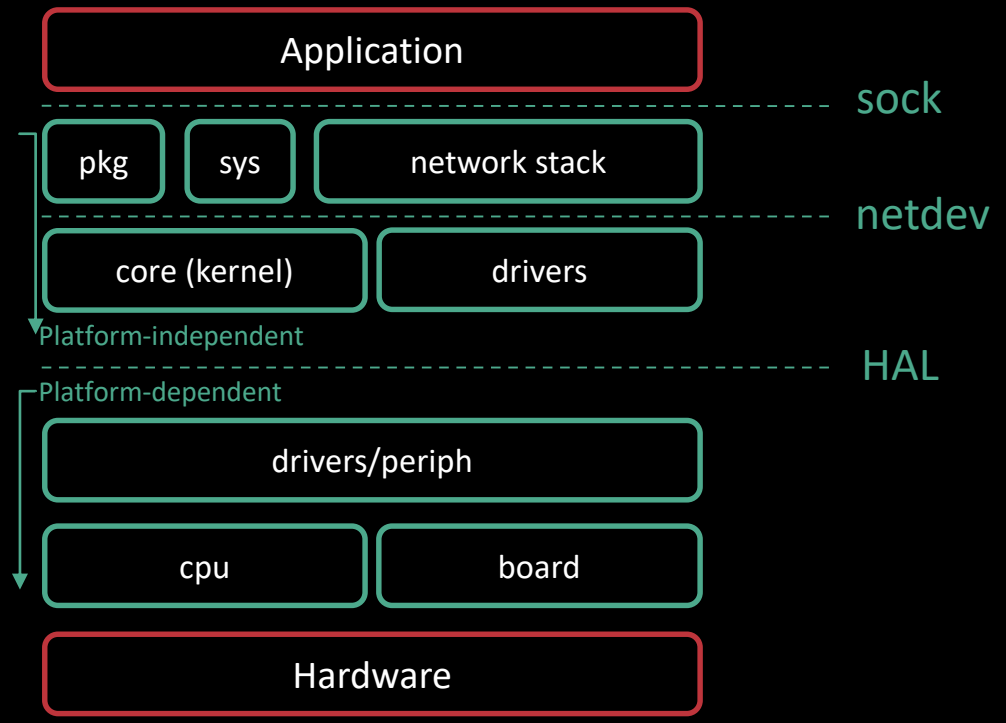
SDN LABS

Get involved too!

https://summit.riot-os.org/

Backup

RIOT software components



SW-module

non-OS

RIOT software components