Integrating LoRaWAN Sensors into the OGC SensorWeb

Geospatial SensorWebs Conf 2017

29.08.2017

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Background

- IoT applications: new requirements!
  - Low energy impact, high connectivity @ low bandwidth
- LPWAN technologies for data transmission
  - High range @ low power usage @ low cost
  - Enable new class of autonomous sensing devices
    - Self-sufficient in terms of energy
    - Very remote locations / highly mobile

What is LoRaWAN?

- New radio communications protocol (2015)
  - Low energy impact
  - Low bandwidth (3 – 300 Kb/s)
  - High range (up to 20 km)
  - Unlicensed frequency bands (433 MhZ, 868 MhZ)

https://www.lora-alliance.org/

What is LoRaWAN?

- Requires backend infrastructure
  - Deduplication & decoding of messages
  - Translation from & to TCP/IP network
    - Device mapping
    - Delivery to applications on the web

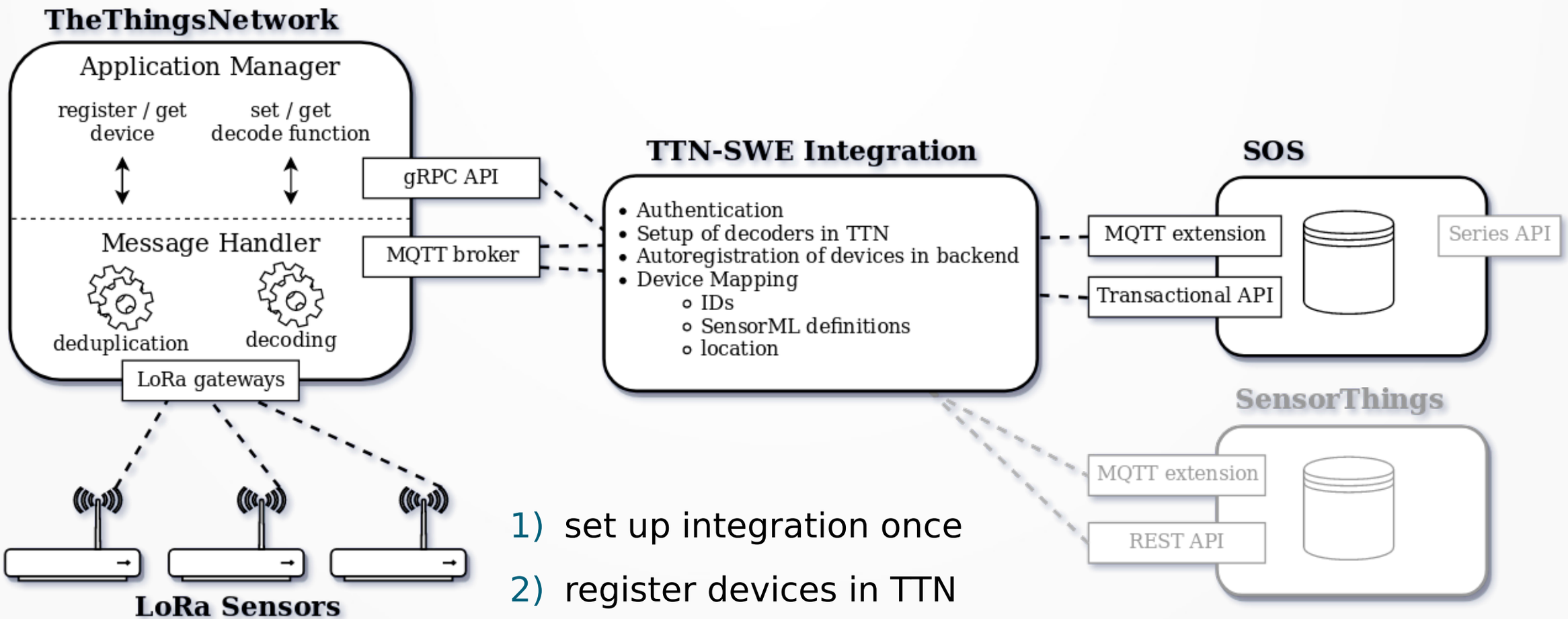
→ TheThingsNetwork.org (TTN)

TheThingsNetwork

- LoRaWAN Backend
- Open Source
- Community-driven gateway deployments
  - Arbitrary coverage!

← http://ttnmapper.org
https://thethingsnetwork.org

Integration into OGC SWE



1) set up integration once
2) register devices in TTN
3) done!

ttn-ogcswe-integration

Features

- Message uplink from LoRa sensors into OGC SOS
  - Decoding & device mapping
- Unified device administration
  - Register once in TTN, backend registration is automated
- Scales up to multiple backends & sensor types
- Simple configuration & Docker deployment

Outlook

- Own use: PM10 sensor deployments in Muenster
- Looking forward to adopters & feedback
- Roadmap
  - SensorThings API backend
  - Mobile sensors

Thank you!

slides @ https://nroo.de/talks/sensorweb17.pdf
code @ https://github.com/noerw/ttn-ogcswe-integration