eurac research

The open LoRaWAN network for developing IoT apps inside the NOI Techpark

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Background

- **Beacon Südtirol - Alto Adige**
  - Experimental LoRaWAN network infrastructure at the NOI technology park of Bolzano

- **DPS4ESLAB - Data platform and Sensing Technologies for Environmental Sensing Lab**
  - Test and benchmark of IoT technologies and wired/wireless communication protocols

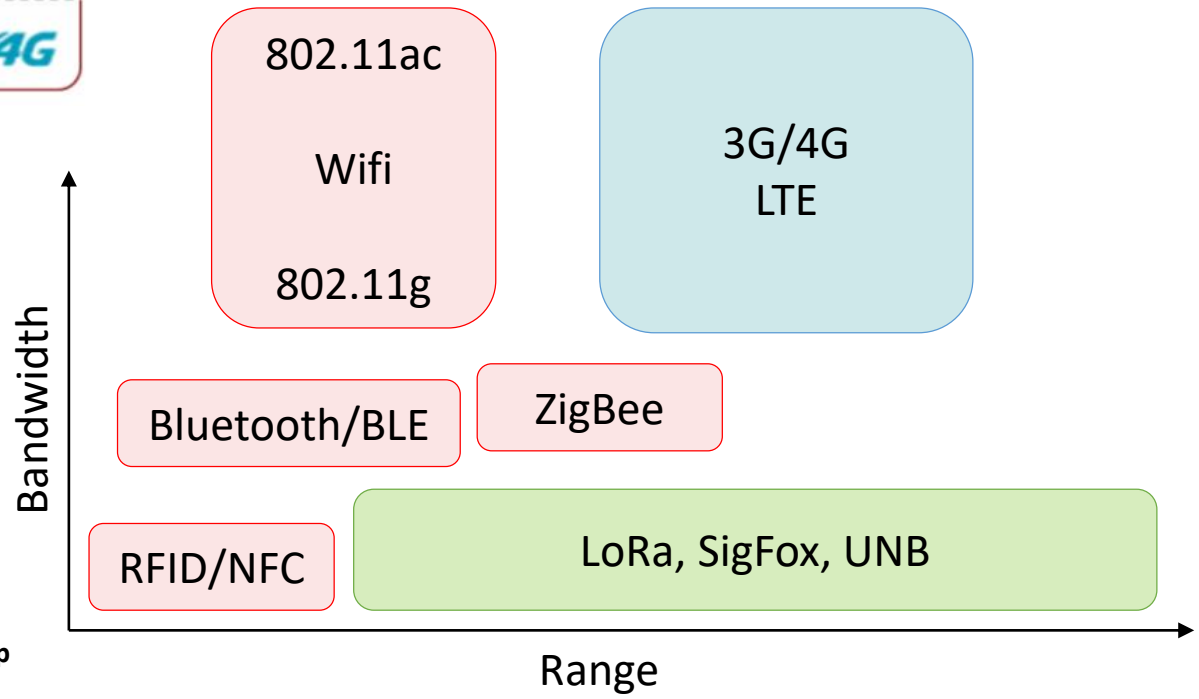
Where does LPWAN fit?

	Local Area Network Short Range Communication	Low Power Wide Area (LPWAN) Internet of Things	Cellular Network Traditional M2M
	40%	**45%**	**15%**
☺	Well established standards In building	Low power consumption Low cost Positioning	Existing coverage High data rate
☹	Battery Live Provisioning Network cost & dependencies	High data rate Emerging standards	Autonomy Total cost of ownership
	Bluetooth 4.0 · ZigBee · Wi Fi	LoRa	GSM · 3G+ / H+ · 4G

- **Long Distance**
- **High Speed**
- **Low Power**

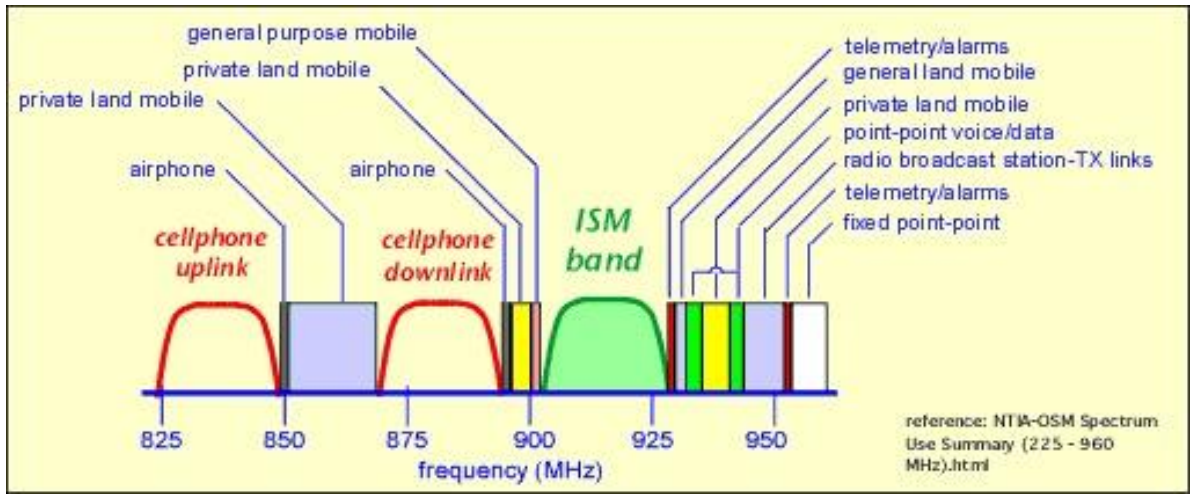
Pick 2…

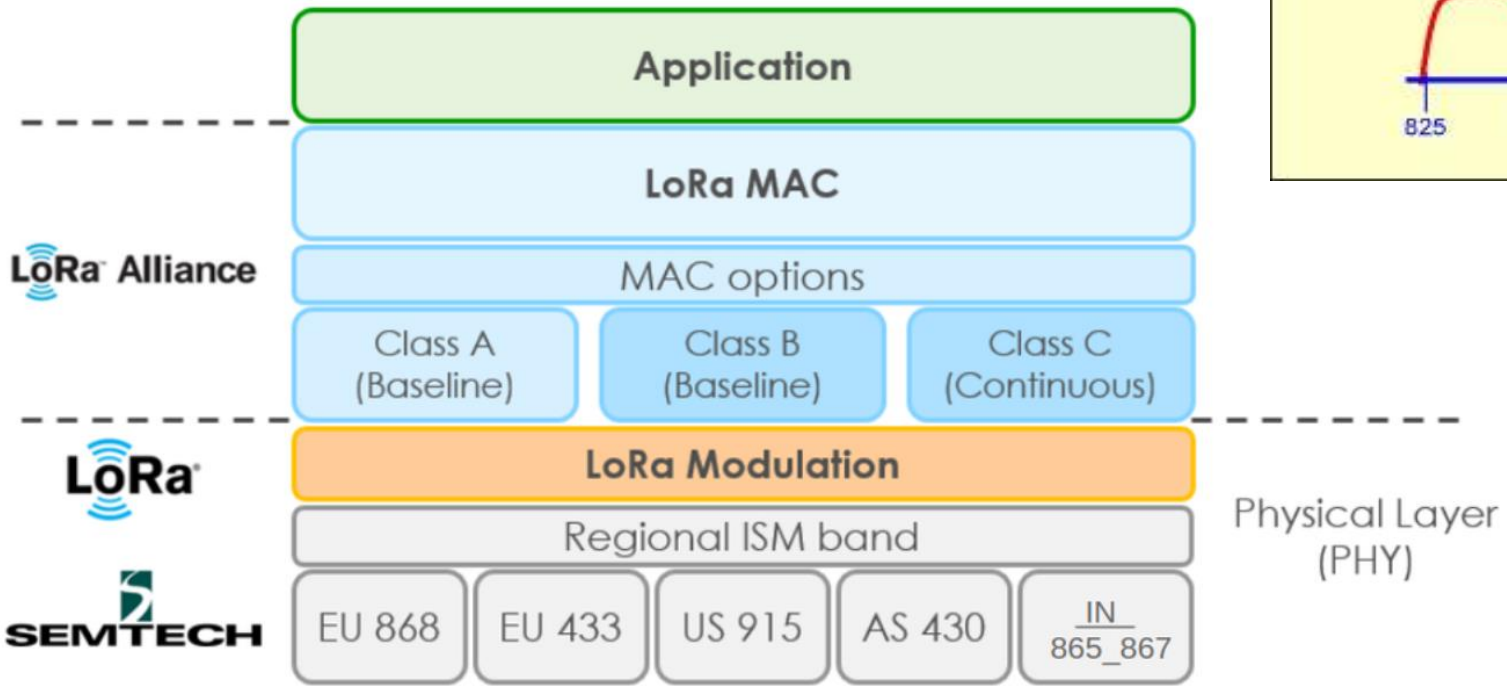
A technical overview of LoRa® and LoRaWAN™: Technical Marketing Workgroup 1.0 – **LoRa Alliance**



LoRa, LoRaWAN, and the challenges of long-range networking in shared spectrum – **CRP NL Thomas Telkamp**

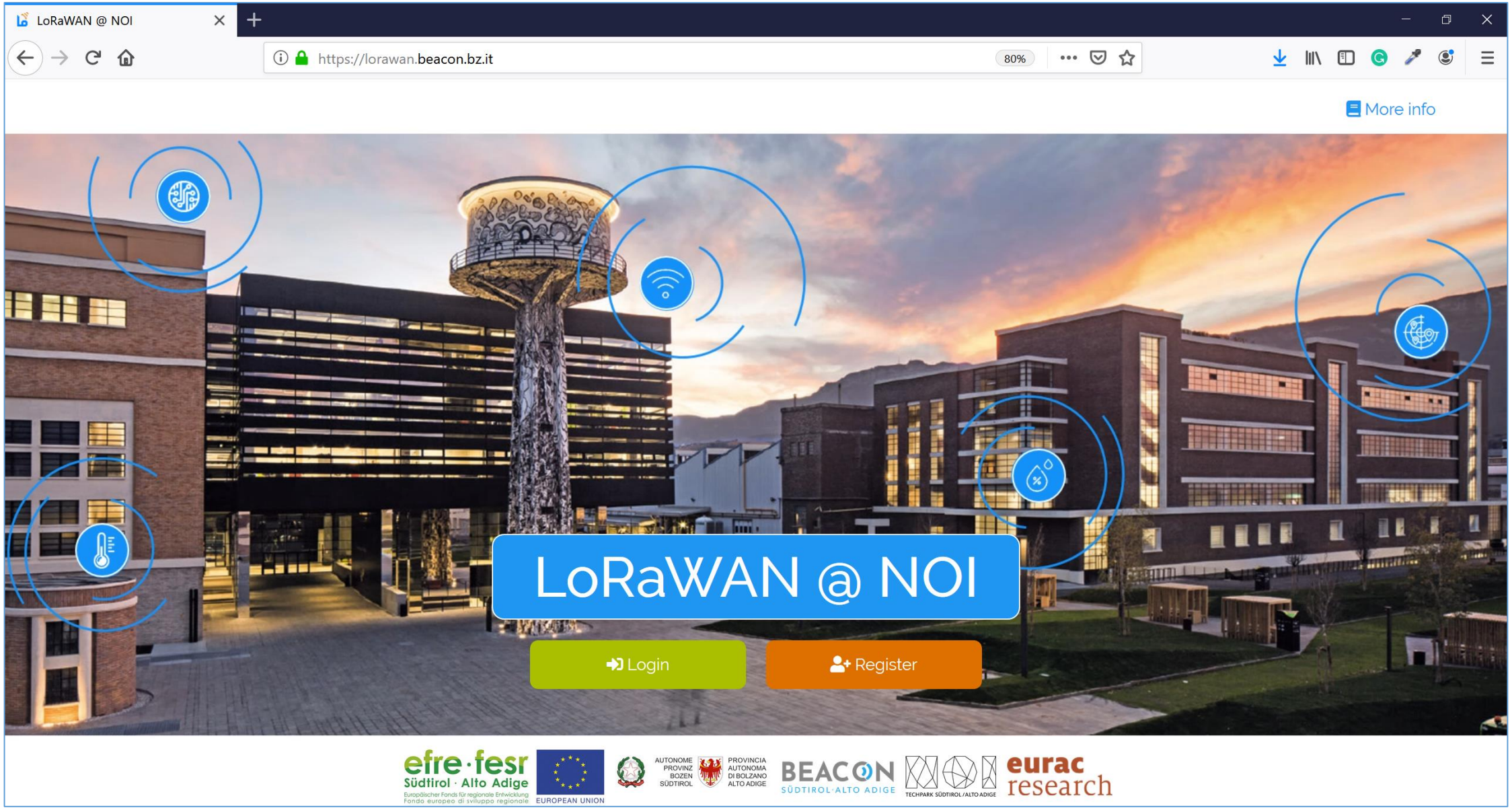
LoRaWAN stack



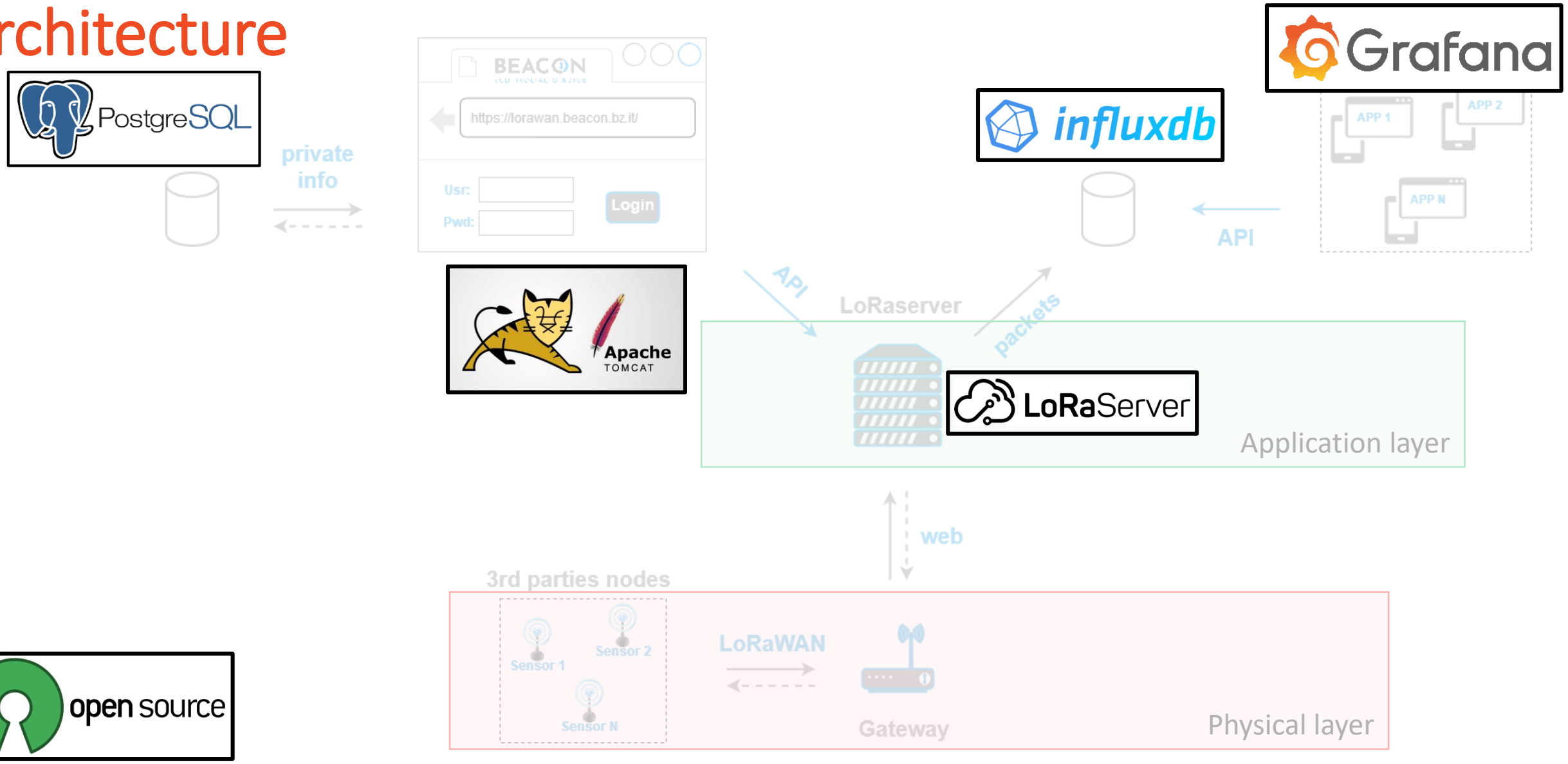


https://medium.com/coinmonks/lpwan-lora-lorawan-and-the-internet-of-things-aed7d5975d5d

https://lorawan.beacon.bz.it/



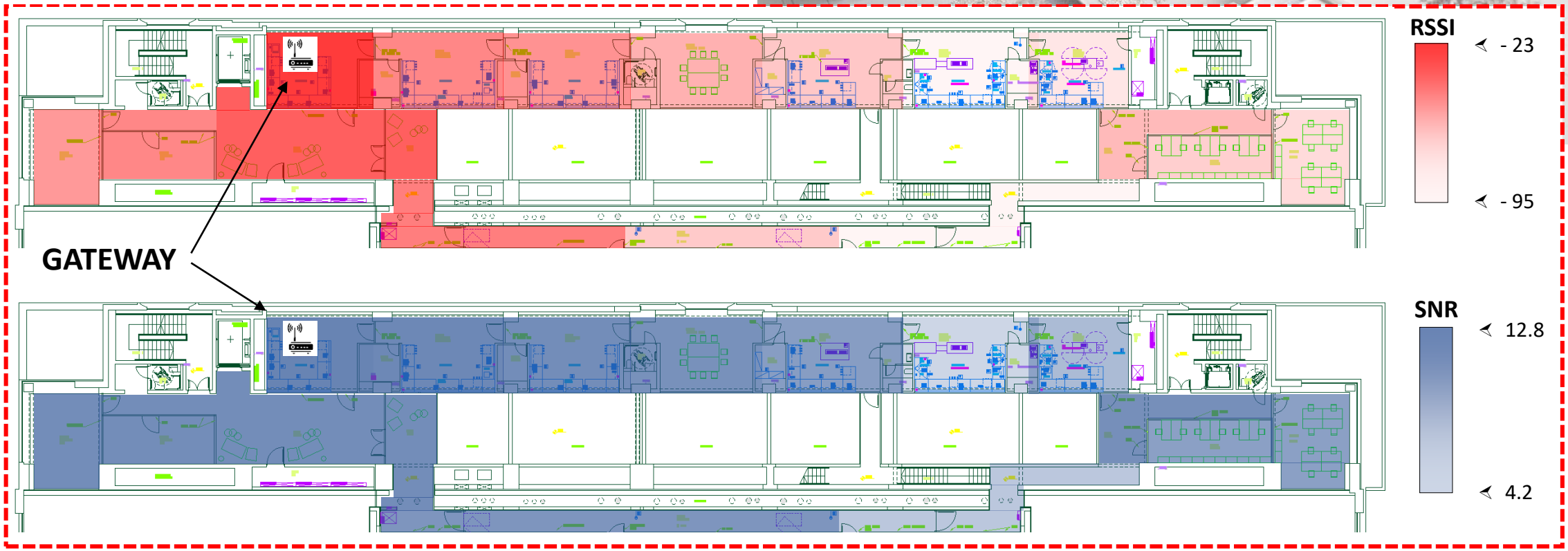
Architecture



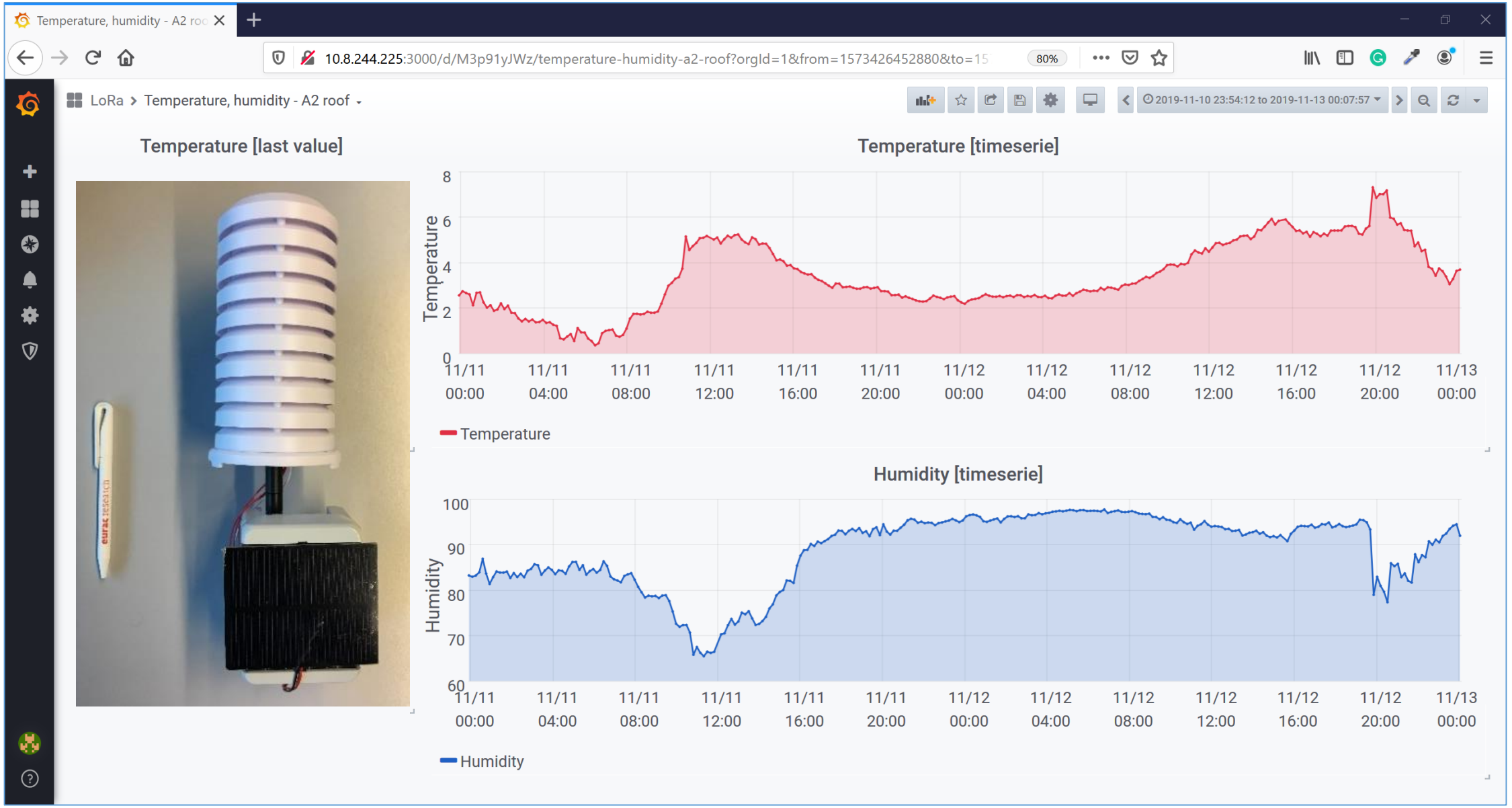
https://gitlab.inf.unibz.it/css-public/lorawan-noi-web-portal
https://docs.lorawan.beacon.bz.it/lorawan/#add-new-application

NOI Techpark coverage

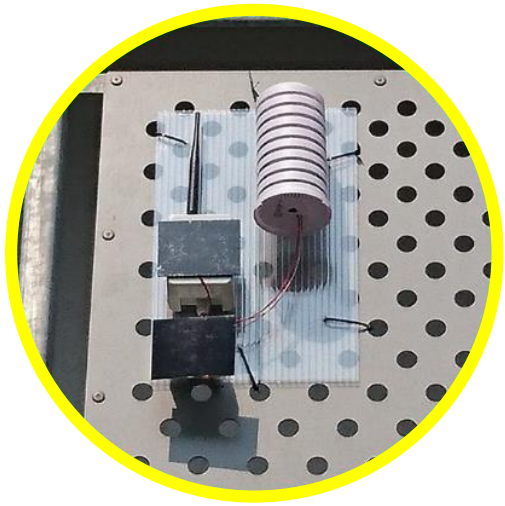
https://gitlab.inf.unibz.it/CSS-DEV/projects/lorawan-gateway-setup

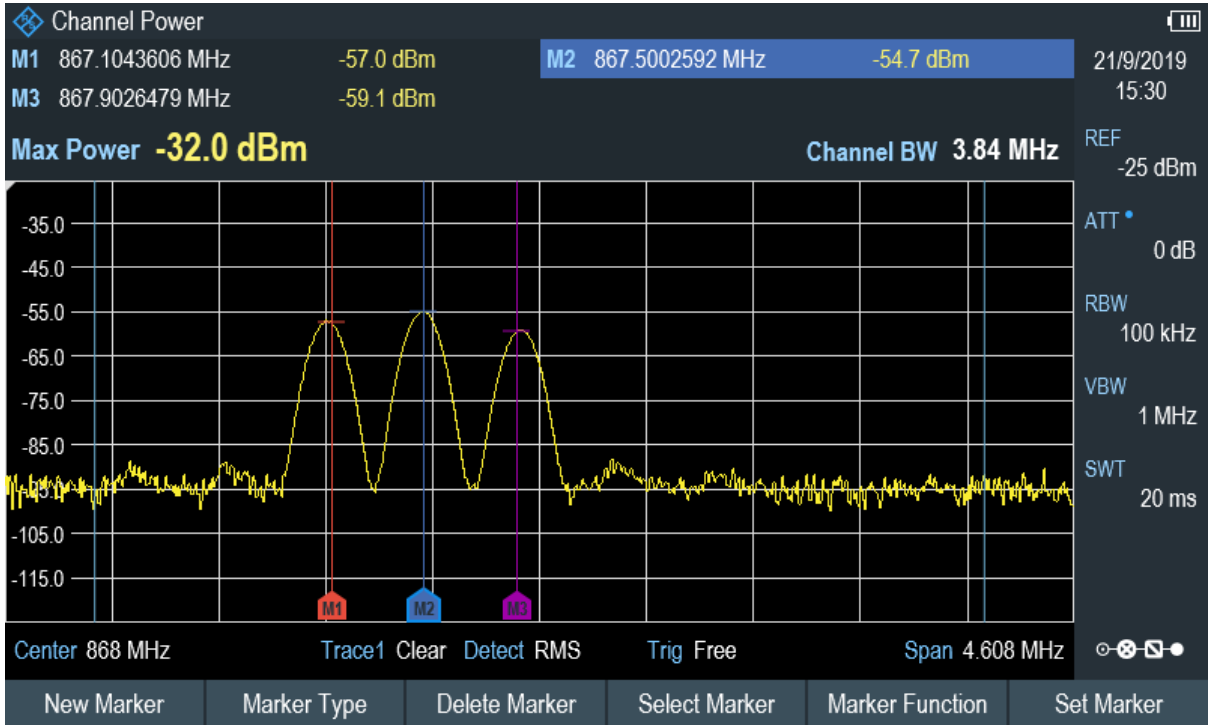


Grafana dashboard



Urban monitoring





Sinfonia

SEVENTH FRAMEWORK PROGRAMME

Sinfonia study case

IFSA
www.sensorsportal.com

Sensors & Transducers

Published by IFSA Publishing, S. L., 2019
http://www.sensorsportal.com

LoRa-based wireless sensor network architectures for urban scenarios using an open-source approach

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Conclusions and outlook

- **Figures analysis**
  - data traffic and exploitation
  - coverage map within NOI Techpark
- **Performances analysis**
  - permissible frequency deviation
  - strength of unwanted emission
  - RF waves emitted by the secondary
  - adjacent channel leakage power
- **Comparison/hybridization with other networks**
  - Sigfox, Symphony link, Dash7, Nb-IoT

Thank you!

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