

LPWAN-VPN

Context

LPWAN stands for “Low-Power Wide-Area Network”. In short, LPWAN technologies are wireless (radio) technologies that have the following characteristics:

- Require little power (“low power”) for end devices, thus extending battery life
- Transmission of information over large distance (“long range”)
- Limited data transmission speed and volume
- Low cost hardware

LPWAN is a hot topic in 2018, due to the emerging “Internet of Things” (IoT) trend. LPWAN technologies unlock new markets and offer many IoT applications. With the support of the NPR, the iSIS institute and its industrial partners aim to choose a LPWAN technology to setup a private LPWAN network.

Results





The selected LPWAN technology for this project is LoRa/LoRaWAN. A functional private LoRaWAN network prototype has been developed and tested in the HEIA-FR. To test this private LoRa infrastructure in a realistic environment, the energy supplier “Sierre-Energie” agreed to take part to a pilot phase. Their use case is to cover their serving area.

Three LoRa gateways have been installed across Sierre and its surroundings. During one month, three LoRa end devices have been placed in service vehicles to evaluate the radio coverage offered by the three gateways. Each end device were configured to send their current GPS location as well as radio characteristics every 10 minutes. The resulting data were stored in a database to perform coverage mapping. The results show that most of the serving area is covered, with only three gateways.

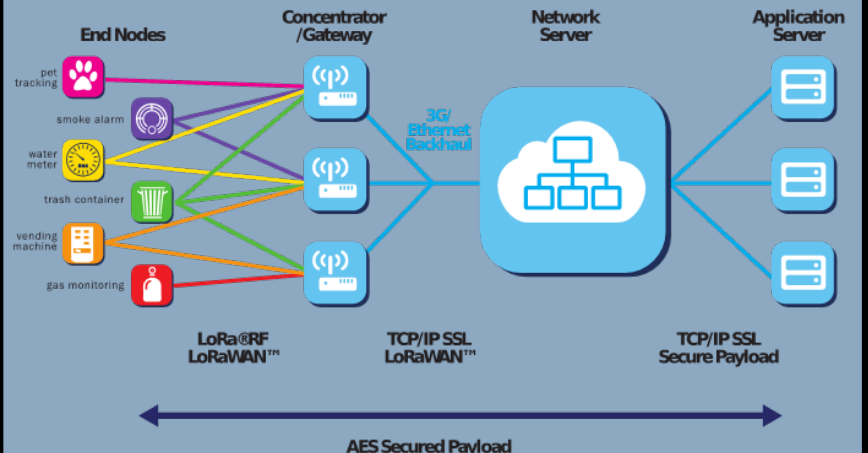
Outcome

- A whitepaper on LoRa/LoRaWAN technology has been written. This document may be used for promotional and information purposes by all project partners.
- The results of the project were presented at the Linux seminar in Fribourg (Thursday 24th May 2018), organized by the iSIS institute of HEIA-FR. The theme of the seminar was “Wireless Networks for the IoT (Technologies, Experiments and Perspectives)”
- Infoteam is currently developing a specific project for the industrial world. This project uses the results of the work carried out under the LPWAN-VPN project. Infoteam plans to carry the results of this project as a product in 2019.
- For MC-Monitoring, the operation of an own network as developed under LPWAN-VPN is not envisaged, but the integration of some of the components into the company's product range (the gateway) could be considered.
- Pronoò's situation is similar, in that the operation of a clean network could be too complicated to implement for the size of the company.
- In all cases, the project will have served to better understand the advantages and disadvantages of LoRaWAN technology and to understand the issues related to the deployment of such technologies in each company's fields.

Partners

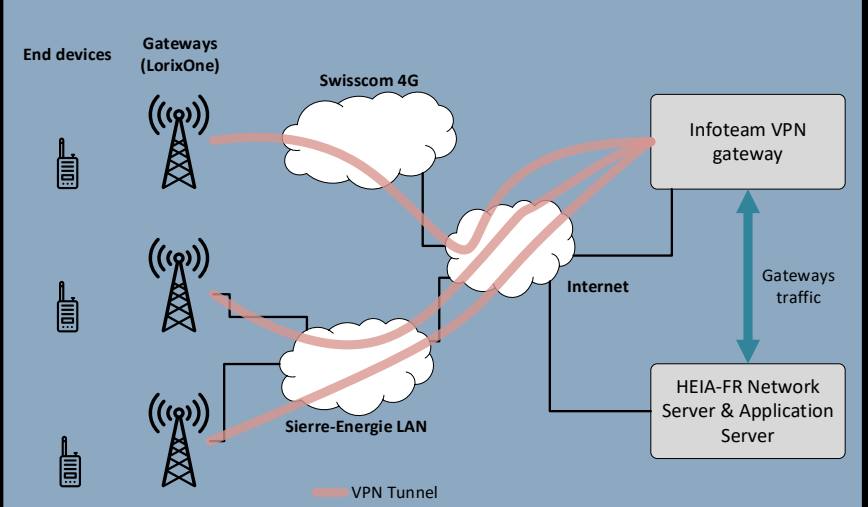
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LoRaWAN infrastructure




Source : What is LoRaWAN (LoRa-Alliance Whitepaper)

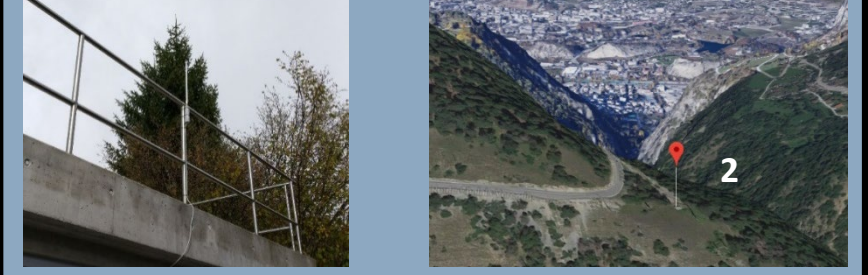
Prototype network architecture




Pilot gateways positioning



1 - Chermoran



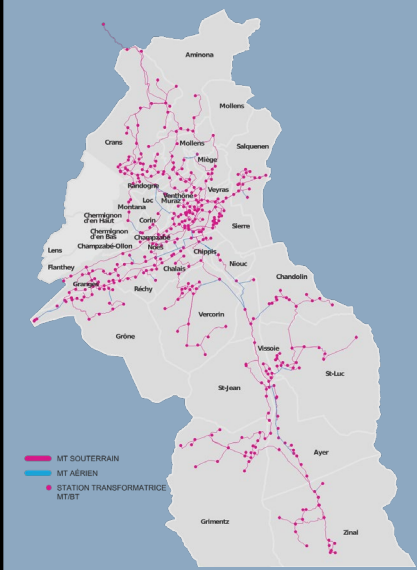
2 - Itagne



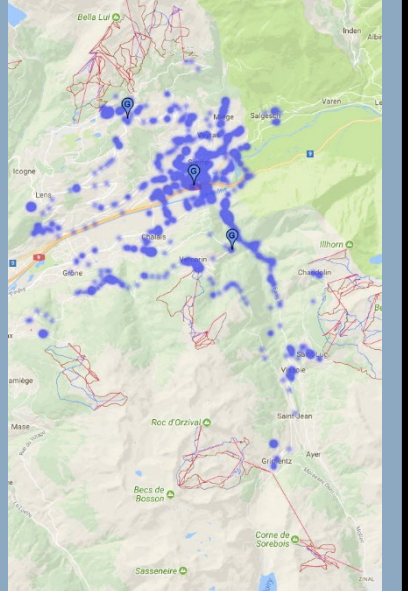
3 - Courja

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Coverage mapping



Serving area



Coverage map

Research domain

Low power area networks, Internet of Things

Project leader

Serge Ayer

NPR project duration

18 months

Amount allocated

CHF 107'000 (NPR) + CHF 27'000 (Partners)