FMH606 Master's Thesis

Title: Using Relays for Utilizing and Extending LoRaWAN Networks with the use of Altibox LoRaWAN Infrastructure for Internet of Things

USN supervisor: Hans-Petter Halvorsen

External partner: Altibox, Porsgrunn kommune, Odfjell Drilling

Task background:
Since the autumn of 2018, the Altibox and Altibox partnership has expanded the LoRaWAN Sensor Network in Norway and currently has coverage for more than 1,000,000 households in 100 municipalities. The LoRaWAN Sensor Network is a natural extension of the fiber network with major synergies of established infrastructure and the development continues. Altibox and Partners now offer IoT Access as a commercial service, so that more people can use the Sensor Network for their own sensors. https://www.altibox.no/iot/

LoRa Alliance has announced the new Relay feature that extends LoRaWAN coverage for metering, utilities, Smart Cities, and Industrial Applications. LoRaWAN networks offer great range and penetration, but there may be cases where devices fall outside of the network's coverage or optimal signal strength. For these instances, relays utilizing LoRaWAN can be used to extend the coverage of the network.
References:
- https://lora-alliance.org/lora-alliance-press-release/lora-alliance-announces-new-relay-feature-that-extends-lorawan-coverage-for-metering-utilities-smart-cities-and-industrial-applications/
- https://blog.semtech.com/the-new-lorawan-relay-feature

Task description:
Examples of activities that should be performed:
- Get an overview of LoRaWan and the Altibox LoRaWan Infrastructure in general and in context of this work.
- Explore the new Relay feature that LoRa Alliance has announced that extends LoRaWAN coverage for metering, utilities, Smart Cities, and Industrial Applications.
- Explore the "Relay Demo Kit" that will be provided by Altibox. The "Relay Demo Kit" consists of different sensors and equipment that can be used to explore the Relay feature.
- Explore and find proper User cases for LoRaWan and the new Relay feature within these areas. Examples: Explore use of the Relay features as a use case within Porsgrunn kommune. Does Altibox has other relevant suggestions for use cases? Explore use cases within Odfjell Drilling (the company where the student is working).
- Plan, Design, Implement and Test one or more selected User Case(s) for utilizing and extending LoRaWAN networks in the Altibox LoRaWan infrastructure using the new Relay feature. Use cases within Porsgrunn kommune or use cases within Odfjell Drilling.

- Collaboration with other ongoing LoRaWAN project.
- Microsoft Teams and GitHub should be used during project planning and development.
- The system should be properly documented in form of a technical report.

More project details and activities will be discussed when the project starts. You will have great opportunities to influence the content of the project in collaboration with Altibox.

Student category: IIA

Is the task suitable for online students (not present at the campus)? Yes

Practical arrangements: None

Supervision:
As a general rule, the student is entitled to 15-20 hours of supervision. This includes necessary time for the supervisor to prepare for supervision meetings (reading material to be discussed, etc).

Signatures:

Supervisor (date and signature):

Hans-Petter Halvorsen

2024.02.02

Student (date and signature):

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Even Hope

2024.02.02