VRIJE
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Engineering technology: Electronics-ICT

LORAWAN FOR SOUND POLLUTION

ICT DESIGN

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Table of contents

Introduction

- **Goal**: Designing an Low Power Wide Area Network
- **Research findings**: LoRa/LoRaWAN and tools
- **Work**: Designing architecture and underlying software
- **Tests**: signal, latency, range and power-profile

Timeline

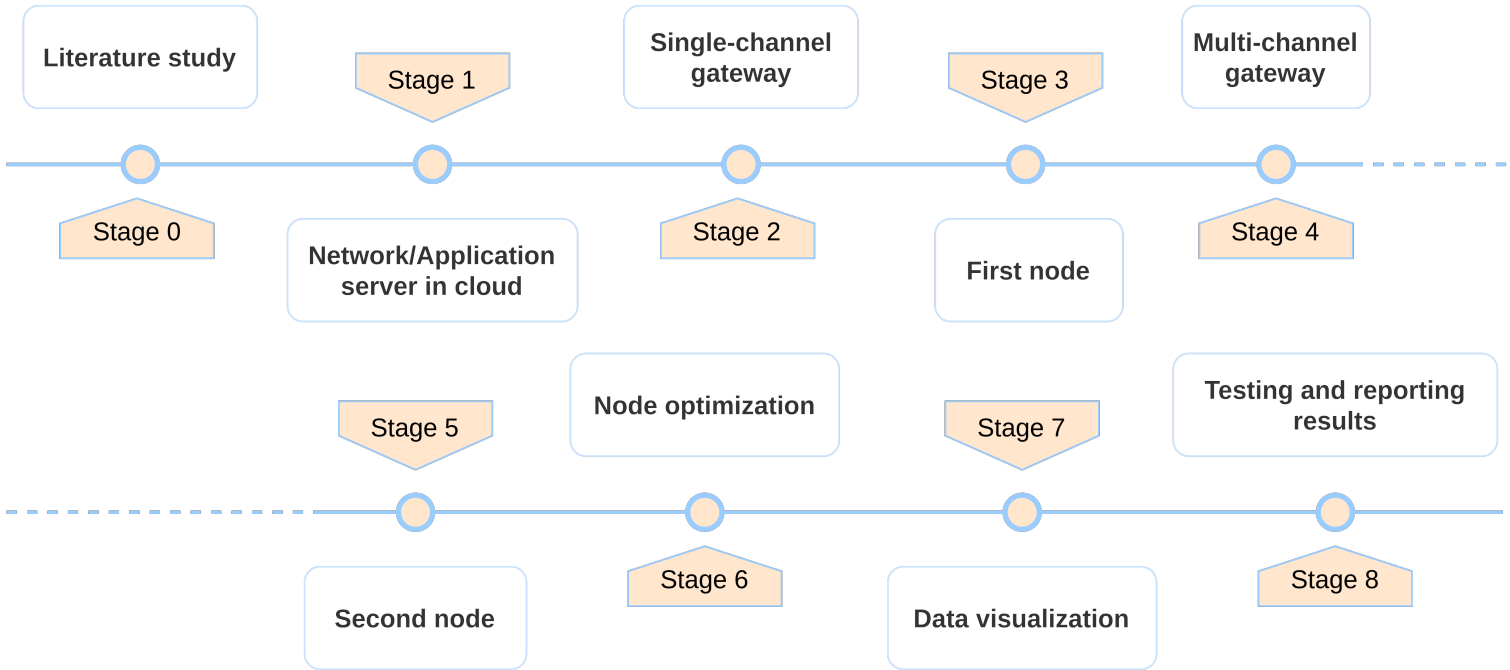

Figure 1: Bachelor Proof timeline

Our network architecture

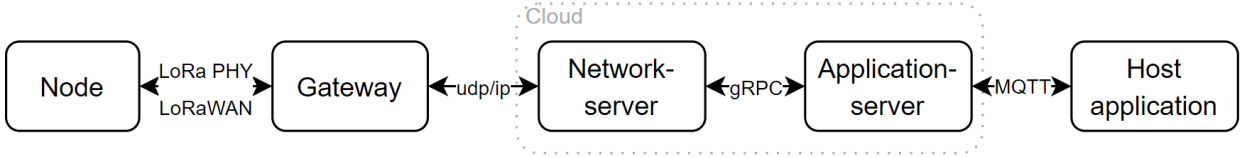

Figure 2: Network architecture and data-flow of our setup

Figure 3: Main components of our network

IoT end-device: NoiseNode

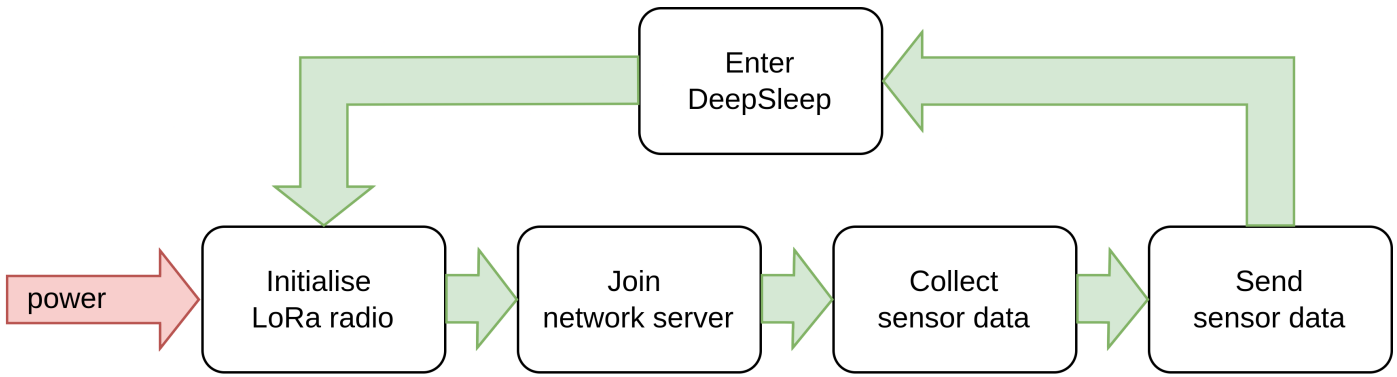

Figure 4: NoiseNode life-cycle

IoT: Monitoring

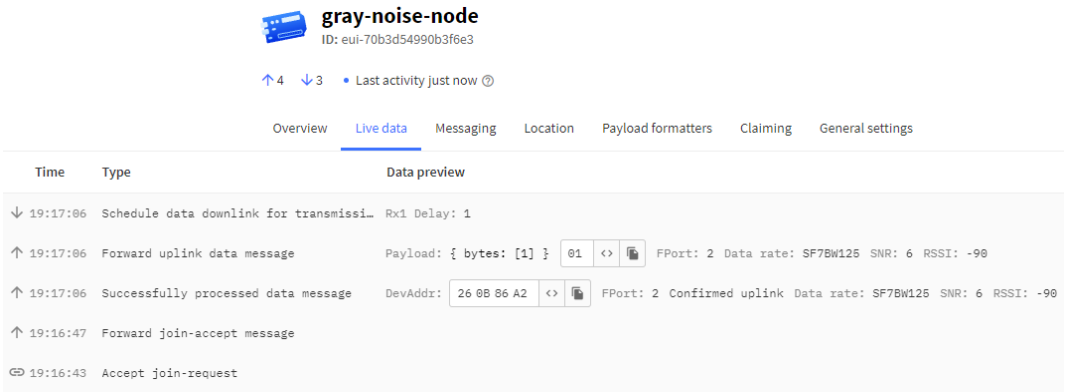

Figure 5: Live activity of our node on TTN

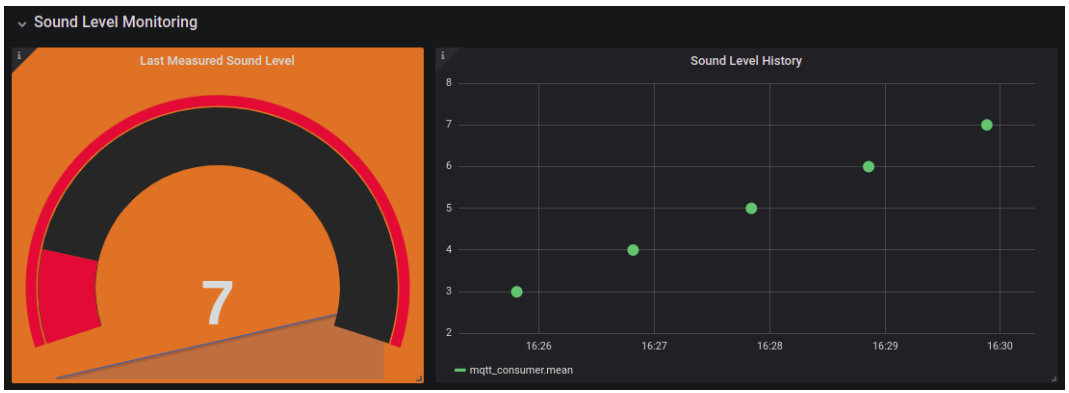

Figure 6: Sound Level Monitoring of our node in Grafana

Results

Signal

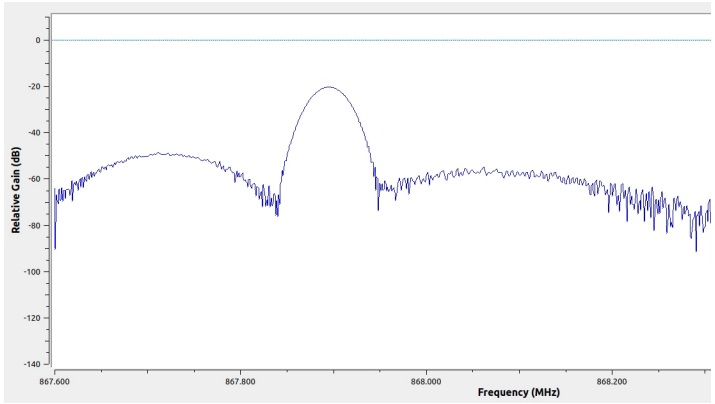

Figure 7: LoRa Signal Analysis with Software Defined Radio , GNU-radio

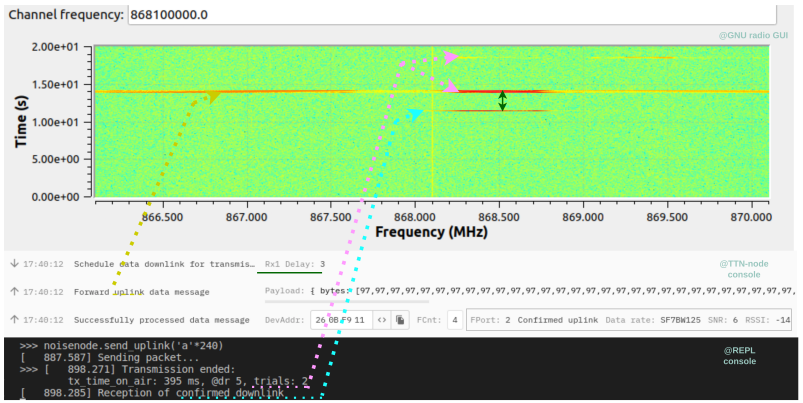

Figure 8: Confirmed uplink message tracing with GNU Radio, REPL- and TTN console

Results

Range

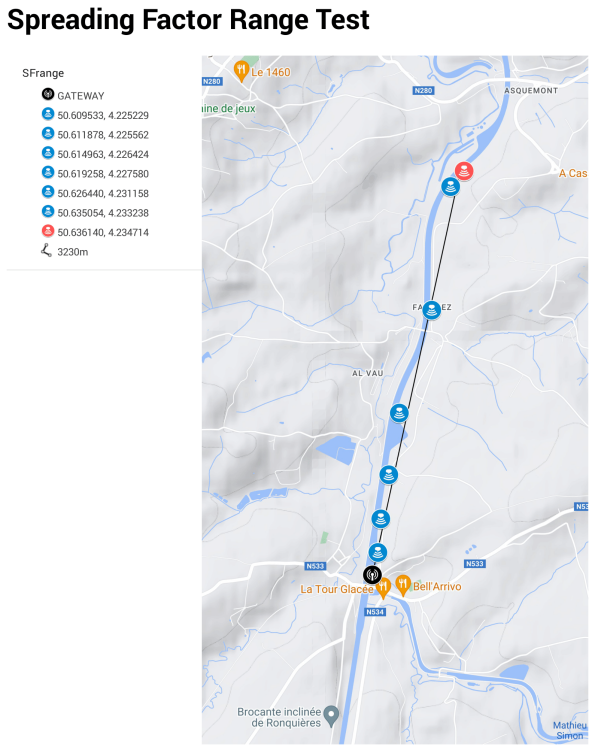

Figure 9: Map illustrating 7 measurement points testing out SF7-12 on different distances

Power-profile

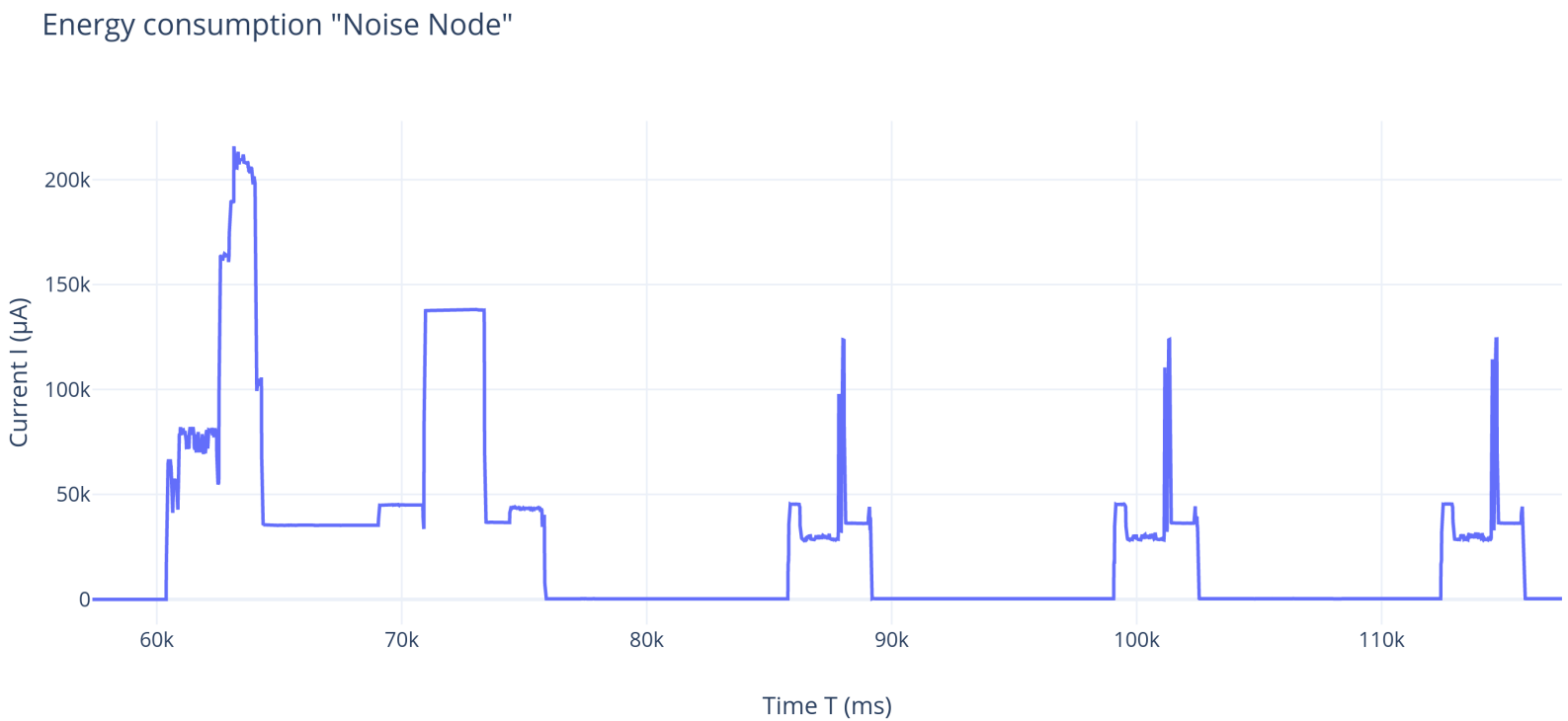

Figure 10: NoiseNode Power consumption

Power-profile

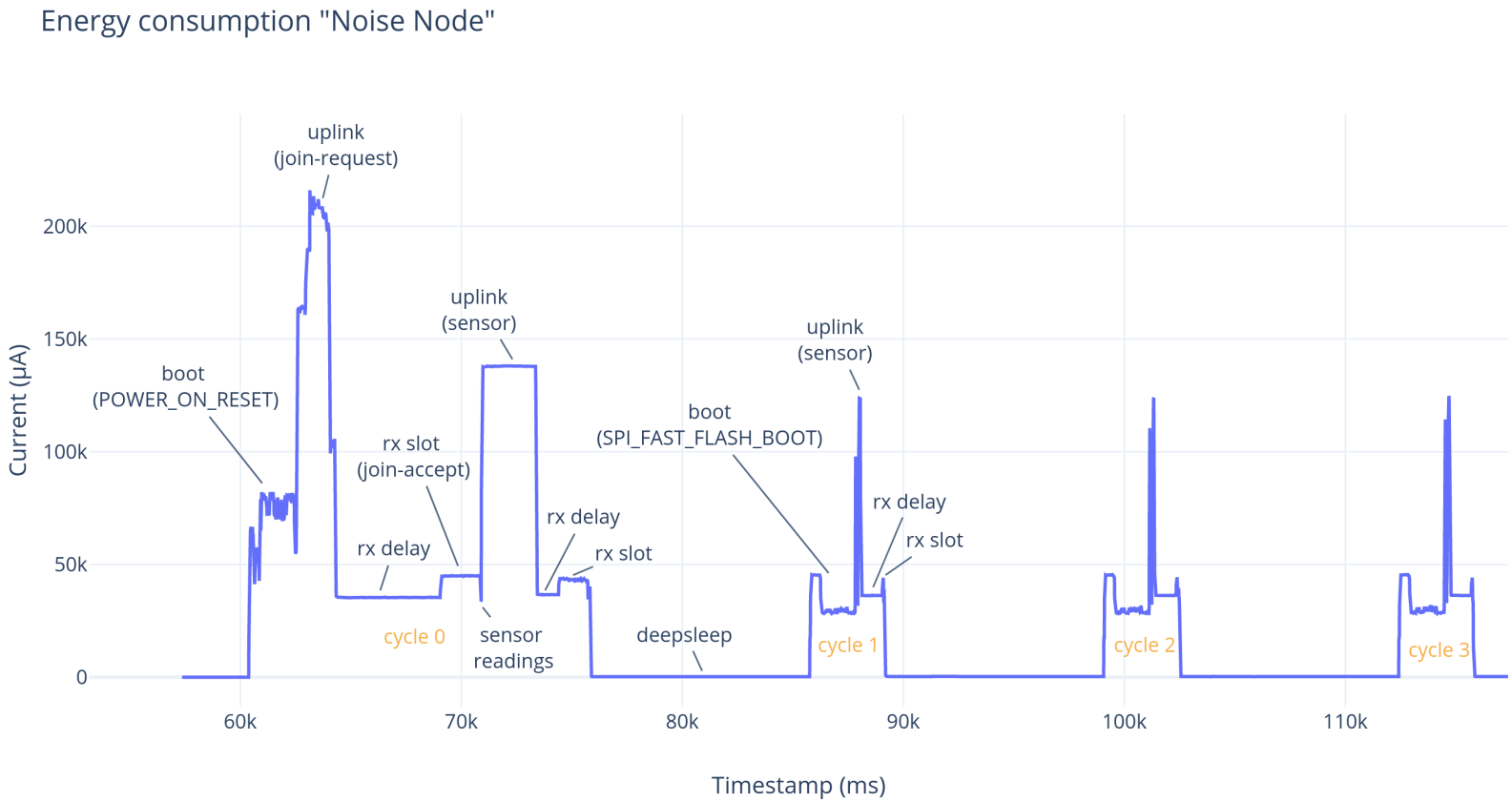

Figure 11: NoiseNode Power consumption, annotated

Discussion

- LoRaWAN
- Pycom
- TTN
- GNU radio
- Range test
- Power-profile

Thank you

Thank you for your attention!

I hope you enjoyed my presentation.

For remarks, suggestions or questions: contact me at valentin.dominique.quevy@vub.be