Cyber Security research essay – research intro LoRa

Contents

[Introduction 2](#_Toc93008088)

[What is LoRa? 2](#_Toc93008089)

[Group project implementation 2](#_Toc93008090)

# Introduction

After the conclusion of phase 1 of the project, me and my teammates have received a task for phase 2, completely unrelated to our work prior to that and to anything we have learned. More than two thirds in the semester we found ourselves having to work with something we have not even heard of: a LoRa device. Naturally, we started doing research about it in order to be able to work with it.

# What is LoRa?

LoRa (short for long range) is a spread spectrum modulation technique derived from chirp spread spectrum (CSS) technology. LoRa is a long range, low power wireless platform that has become the de facto wireless platform of Internet of Things (IoT). Designed for IoT communications, LoRa devices enable the connection between remote end nodes and low power wide area networks (LPWANs) for delivery to analytics applications. LoRa is the physical (PHY) silicon layer, or wireless modulation, used to create the long range communicatio­n link. Transceivers configured with LoRa devices are embedded into end nodes, or sensor devices, designed for a multitude of industry applications. Sensors capture and transmit data to gateways over distances near and far, indoor, and outdoor, with minimal power requirement. Gateways send information via Wi-Fi, Ethernet or Cellular to the network server, which is responsible for network management functions like over-the-air activation, data de-duplication, dynamic frame routing, adaptive rate control, traffic management, and administration. Applications interpret the data collected by sensors, applying techniques like machine learning and artificial intelligence to solve business problems for a smarter planet.

# Group project implementation

Group project task: a LoRa sensor network communicates sensor data via a gateway to a cloud environment, to be used in applications. What are the options, alternatives, and challenges to monitor the security of such an IoT application?

The task of the group was to develop further on that research question and create a proof of concept.

Work was done using Node-Red, a platform on which we have also created the user interface.

# Resources:

* <https://www.semtech.com/lora/what-is-lora>