Università degli Studi di Padova

Dipartimento di Ingegneria dell'Informazione

University of Padova

Department of Information Engineering

Bachelor thesis in
Computer Engineering

INSERT TITLE HERE

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Abstract

Inserire abstract. I margini nell'abstract sono stati ridotti di un centimetro. In caso non si volesse questa riduzione rimuovere *changemargin*.

Glossary

GSM Acronym for Global System for Mobile Communications, it's a 2nd generation mobile communication standard, see [1] for more information. 3

latex Is a markup language specially suited for scientific documents. 4

LTE Acronym for Long Term Evolution, it's a 4th generation mobile communication standard, see [] for more information. 3

Contents

Chapter 1

Introduction

Place introduction here

Chapter 2

Bacco protocol

The goal of this chapter is to give a detailed description of the *Bacco* protocol and to discuss the implementation choices that were taken in order to deploy it. This is achieved using a top-down ordering for the level of detail, meaning that an overview of the network is to be presented before going into the specifics.

2.1 Overview

The network is built upon 3 fundamental categories of devices:

- Sender node - collects data and sends it to the gateway using LoRa
- Repeater node - listens to the incoming LoRa messages and repeates them
- Gateway node - collects data coming from the sender nodes and sends it to the web server using the FTP protocol over a mobile network such as GSM or LTE [1]
- Web server - receives data coming from the gateways through FTP, elaborates it and makes it available to consult through a self-hosted web application platform

[1] A gateway can be configured to optionally perform some operation or elaboration (e.g.: filtering, smoothing, pre-processing, ...) of the incoming data and can even collect relevant data on-site.

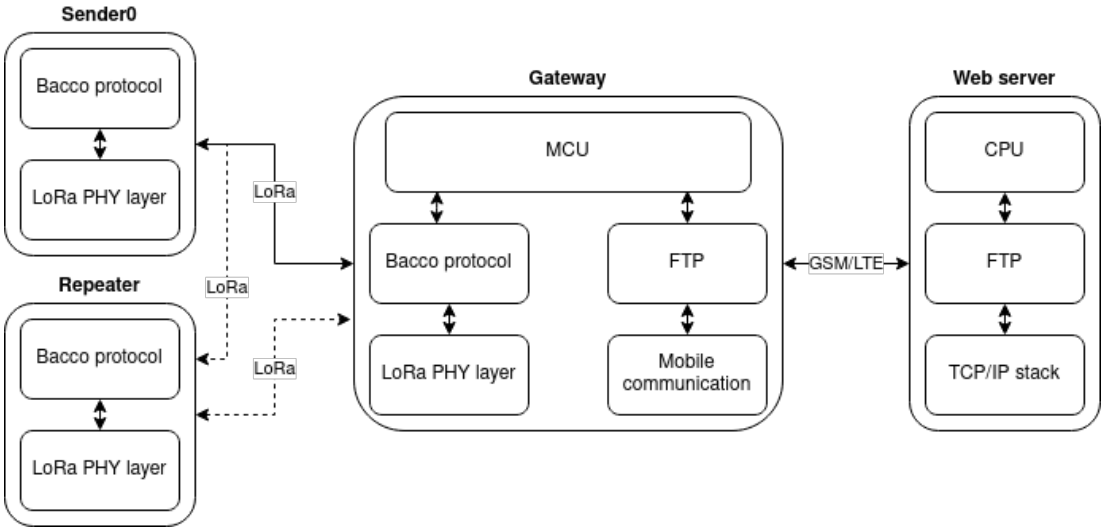

Figure 2.1: Schematic representation of the used protocols

2.1.1 Topology

The network has a 2 layered star-of-stars topology, and can make use of LoRa repeaters where physical obstacles or range compromise the integrity of the communication channel (e.g.: hills, thick brick walls, ...). Figure 2.2 shows the type of devices that are involved and their communication schema.

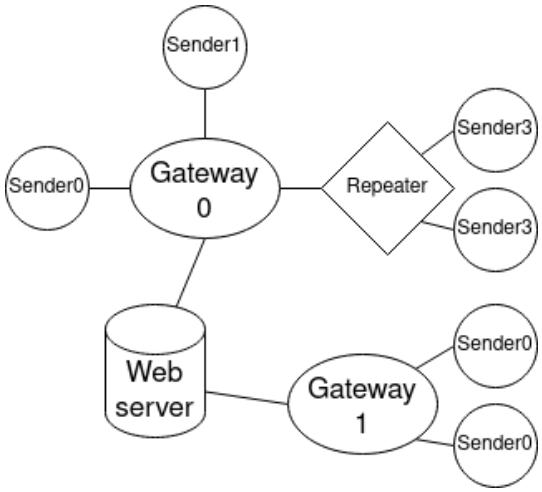

Figure 2.2: Network topology

2.1.2 TODO: REMOVE

latex

Bibliography

[1] "Principles and Applications of GSM" by
`https://dl.acm.org/doi/abs/10.5555/552293`

[2] FTP request for comments specification
`https://www.rfc-editor.org/rfc/rfc959.html`

refs.bib