Final thesis

Utilizing Preloaded Signal maps to send Mobile data Energy Efficient over Cellular Networks

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LITH-IDA-EX-PUBYEAR/THESISNUMBER

DATEOFPUBLICATION

Supervisor: SUPERVISOR

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Abstract

ABSTRACT

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1. Introduction

1.1 Background and Motivation

In the last decade the development of mobile devices has grown massively and with an increasing amount of mobile applications. Most of these applications rely on data exchanges between the mobile device and a service provider. Sending these packets of data consumes energy, especially when done over the cellular network and even more so when the reception is bad [**?** **?**]. Since mobile devices usually have a limited energy reserve there is a need for sending data energy efficient.

1.2 Problem Definition

1.3 Goal and Methodology

First a signal map of the designated area must be generated by collecting connection type, GPS data, RSS and bit rate. Research on if there are any other relevant parameters to collect will also be done.The collection will be done on a mobile device.

Secondly, network traces are collected on the android device, estimate the base energy consumption with Energy Box [**?**] and then apply scaling based on RSS. Some research and testing of what scaling works well in practice is needed.

Last a simple application for toggling the energy mapping with RSS on and off will be created for android. The application will contain at least one algorithm for doing energy efficient routing based on RSS. New traces will be collected with energy mapping on and off, these will then be compared with each other to provide an indication of how large energy savings could be expected.

1.4 Limitations

Energy estimation of the mobile device only considers the 3G module.

The algorithm for scheduling when to send is simple since the main focus has been on getting good data for the signal map.

1.5 Previous Works

?] shows that when transmitting over cellular networks energy per bit increases drastically when the RSS is low. In order to save energy the mobile

device needs to schedule for transmit when the device has a better reception. By implementing a algorithm (Bartendr) that calculates the energy cost based on RSS and location, applications can reduce their energy footprint. This thesis extends this by utilizing a cached signal map.

1.6 Structure of the Report

2. Background

3. Theory

Avdelning, Institution
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581 83 Linköping

Datum
Date

DATEOFPUBLICATION

Språk
Language
☐ Svenska/Swedish
☒ Engelska/English
☐ _____

Rapporttyp
Report category
☐ Licentiatavhandling
☒ Examensarbete
☐ C-uppsats
☐ D-uppsats
☐ övrig rapport
☐ _____

ISBN
-

ISRN
LiU-Tek-Lic–PUBYEAR:THESISYEARNUMBER

Serietitel och serienummer **ISSN**
Title of series, numbering -

Linköping Studies in Science and Technology

Thesis No. THESISNUMBER

URL för elektronisk version

http://XXX

Titel
Title

TITLEBIBPAGE

Författare
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Sammanfattning
Abstract

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Nyckelord
Keywords KEYWORDS