KTH ROYAL INSTITUTE
OF TECHNOLOGY

Degree Project in

Second cycle, credits

This is the title in the language of the thesis

An subtitle in the language of the thesis

GLENN OLSSON

San Luis Obispo, California, USA, 2022

This is the title in the language of the thesis

An subtitle in the language of the thesis

GLENN OLSSON

Master's Programme, Computer Science, 120 credits
Date: January 26, 2022

Supervisors: Hamid Ghasemirahni, Zachory Peterson
Examiner: Gerald Quentin Maguire Jr

Host company: Cal Poly
Swedish title: Detta är den svenska översättningen av titeln
Swedish subtitle: Detta är den svenska översättningen av undertiteln

Abstract

Write an abstract that is about 250 and 350 words (1/2 A4-page) with the following components::

- What is the topic area? (optional) Introduces the subject area for the project.
- Short problem statement
- Why was this problem worth a Bachelor's/Master's thesis project? (*i.e.*, why is the problem both significant and of a suitable degree of difficulty for a Bachelor's/Master's thesis project? Why has no one else solved it yet?)
- How did you solve the problem? What was your method/insight?
- Results/Conclusions/Consequences/Impact: What are your key results/ conclusions? What will others do based upon your results? What can be done now that you have finished - that could not be done before your thesis project was completed?

Keywords

Canvas Learning Management System, Docker containers, Performance tuning Choose the most specific keyword from those used in your domain, see for example: the ACM Computing Classification System (https://www.acm.org/publications/computing-classification-system/how-to-use), the IEEE Taxonomy (https://www.ieee.org/publications/services/thesaurus-thank-you.html), PhySH (Physics Subject Headings) (https://physh.aps.org/), ...or keyword selection tools such as the National Library of Medicine's Medical Subject Headings (MeSH) (https://www.nlm.nih.gov/mesh/authors.html) or Google's Keyword Tool (https://keywordtool.io/)

Mechanics:

- The first letter of a keyword should be set with a capital letter and proper names should be capitalized as usual.
- Spell out acronyms and abbreviations.

- Avoid "stop words" - as they generally carry little or no information.
- List your keywords separated by commas (",").

Since you should have both English and Swedish keywords - you might think of ordering them in corresponding order (*i.e.*, so that the n^{th} word in each list correspond) - this makes it easier to mechanically find matching keywords.

Sammanfattning

Sammanfattning på svenska

Nyckelord

Canvas Lärplattform, Dockerbehållare, Prestandajustering

Acknowledgments

Thanks to:

- Andrew Guenther, for uploading this template
- I would like to thank xxxx for having yyyy.

I would like to thank xxxx for having yyyy.

San Luis Obispo, January 2022
Glenn Olsson

Contents

List of Figures

List of Tables

Listings

List of acronyms and abbreviations

OS	operating system
SDG	Sustainable Development Goal
UN	United Nations

Chapter 1

Introduction

1.1 Background

As one can find in RFC 1235 [1] multicast is useful for xxxx. A number of different operating systems (OSes) have been used in this work, such as the following OSes: UNIX, Linux, Windows, etc. The main focus will be on one OS, namely Linux.

1.2 Problem

Longer problem statement
If possible, end this section with a question as a problem statement.

1.2.1 Original problem and definition

Some text

1.2.2 Scientific and engineering issues

some text

1.3 Purpose

1.4 Goals

The goal of this project is XXX. This has been divided into the following three sub-goals:

1. Subgoal 1
2. Subgoal 2
3. Subgoal 3

1.5 Research Methodology

1.6 Delimitations

1.7 Structure of the thesis

Chapter 2 presents relevant background information about xxx. Chapter 3 presents the methodology and method used to solve the problem. ...

Chapter 2

Background

This chapter provides basic background information about xxx. Additionally, this chapter describes xxx. The chapter also describes related work xxxx.

2.1 Major background area 1

There are xxx characteristics that distinguish yyy from other information and communication technology (ICT) system, as shown in Figure 2.1. Table 2.1 summarizes these characteristics.

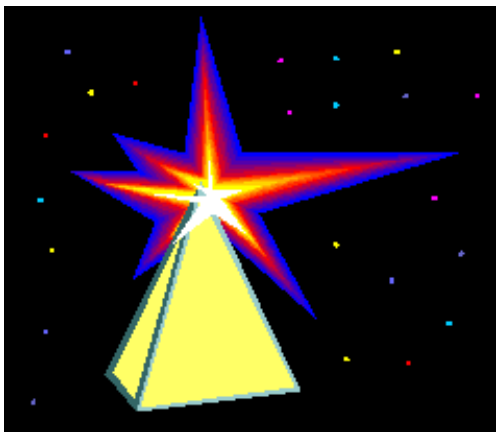

Figure 2.1: Lots of stars (Inspired by Figure x.y on page z of [xxx])

Table 2.1: xxx characteristics

Characteristics	**Description**
α	β
1	1110.1
2	10.1
3	23.113 231

2.1.1 Subarea 1.1

Entangled states are an important part of quantum cryptography, but also relevant in other domains. This concept might be relevant for neutrinos, see for example [2].

2.1.2 Subarea 1.1.2

Computational methods are increasingly used as a third method of carrying out scientific investigations. For example, computational experiments were used to find the amount of wear in a polyethylene liner of a hip prosthesis in [3]. ...

2.1.3 Subarea 1.1.2

Using the nearest data center may improve performance, see [4]

2.1.4 Link layer Encapsulation

2.1.5 IP packet headers

2.1.6 Test for accessibility of formulas

As can be seen in these equations: $c = 2 \cdot \pi \cdot r$ or

$$\int_a^b x^2 \, dx$$

a chemical formula: $(C_5O_2H_8)_n$ ...

2.2 Major background area 2

...

2.2.1 WLAN Security

2.3 Related work area

2.3.1 Major related work 1

Carrier clouds have been suggested as a way to reduce the delay between the users and the cloud server that is providing them with content. However, there is a question of how to find the available resources in such a carrier cloud. One approach has been to disseminate resource information using an extension to OSPF-TE, see Roozbeh, Sefidcon, and Maguire [5].

2.3.2 Major related work

2.3.3 Minor related work 1

...

2.3.4 Minor related work n

2.4 Summary

Chapter 3

Method or Methods

Chapter 4

What you did

Chapter 5

Results and Analysis

Chapter 6

Discussion

Chapter 7

Conclusions and Future work

7.1 Conclusions

7.2 Limitations

7.3 Future work

Due to the breadth of the problem, only some of the initial goals have been met. In these section we will focus on some of the remaining issues that should be addressed in future work. ...

7.3.1 What has been left undone?

The prototype does not address the third requirment, i.e., a yearly unavailability of less than 3 minutes, this remains an open problem. ...

7.3.1.1 Cost analysis

The current prototype works, but the performance from a cost perspective makes this an impractical solution. Future work must reduce the cost of this solution, to do so a cost analysis needs to first be done. ...

7.3.1.2 Security

A future research effort is needed to address the security holes that results from using a self-signed certificate. Page filling text mass. Page filling text mass. ...

7.3.2 Next obvious things to be done

In particular, the author of this thesis wishes to point out xxxxxx remains as a problem to be solved. Solving this problem is the next thing that should be done. ...

7.4 Reflections

One of the most important results is the reduction in the amount of energy required to process each packet while at the same time reducing the time required to process each packet.

The thesis contributes to the UN SDGs numbers 1 and 9 by xxxx.

References

[1] J. Ioannidis and G. Maguire, "Coherent File Distribution Protocol," *Internet Request for Comments*, vol. RFC 1235 (Experimental), Jun. 1991. doi: 10.17487/RFC1235. [Online]. Available: http://www.rfc-editor.org/rfc/rfc1235.txt [Page 1.]

[2] Y. S. Kim, G. Q. Maguire, and M. E. Noz, "Do Small-Mass Neutrinos Participate in Gauge Transformations?" *Advances in High Energy Physics*, vol. 2016, pp. 1–7, 2016. doi: 10.1155/2016/1847620. [Online]. Available: http://www.hindawi.com/journals/ahep/2016/1847620/ [Page 4.]

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[5] A. Roozbeh, A. Sefidcon, and G. Q. Maguire, "Resource Monitoring in a Network Embedded Cloud: An Extension to OSPF-TE," in *2013 IEEE/ACM 6th International Conference on Utility and Cloud Computing*. Dresden, Germany: IEEE, Dec. 2013. doi: 10.1109/UCC.2013.36. ISBN 978-0-7695-5152-4 pp. 139–146. [Online]. Available: http://ieeexplore.ieee.org/document/6809350/ [Page 5.]

Appendix A

Something Extra

A.1 Just for testing KTH colors

This will be an appendix

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Sammanfattning på svenska €€€€,
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