



#### Thesis of the end-of-study project

TO OBTAIN THE STATE ENGINEERING DIPLOMA

Major: XXXXXXXXXXXXX

## Project Title



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Agence National de Réglementation des Télécommunications Institut National des Postes et Télécommunications Class of : 20XX/20XX

## Dedicated to

Friends and family (1st paragraph)

Friends and family (2nd paragraph)

Your name.

# Acknowledgments

Thank your supervisors (INPT and company), the managers and HR, the teachers at INPT and the jury.

Résumé

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vulputate ante sed porttitor. Suspendisse sit amet nisl massa. Curabitur nec nisl condimentum, egestas

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et condimentum augue massa non turpis. Proin commodo enim fermentum suscipit condimentum.

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tempus. Nunc posuere euismod est, nec tristique augue lobortis non. Sed sodales sem ut metus tempus

ullamcorper.

Mots clés: xxx, xxx, xxx, xxx.

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Summary

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent nec dapibus justo. Donec sagittis

vulputate ante sed porttitor. Suspendisse sit amet nisl massa. Curabitur nec nisl condimentum, egestas

ex vitae, dapibus enim. Etiam iaculis, erat faucibus pellentesque sagittis, nisi justo sollicitudin nibh,

et condimentum augue massa non turpis. Proin commodo enim fermentum suscipit condimentum.

Maecenas molestie, dui nec vestibulum rhoncus, arcu nisl faucibus neque, a ornare nisi massa ac eros.

Aenean id velit sit amet lacus mattis varius. Donec fringilla massa sed nisi eleifend, a aliquet mi

tempus. Nunc posuere euismod est, nec tristique augue lobortis non. Sed sodales sem ut metus tempus

ullamcorper.

**Key Words:** xxxx, xxxx, xxx, xxx.

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## Chapter 1

## General Project Context

### Introduction

Use this template as you wish, change what you want to change, the section titles are only examples, you don't have to follow them to the letter.

This is an example of me citing the 1st reference in the bibliography at the end of this report [1]. Use it well!

The next section contains the README text that's also found in the left part along with the other files.

1.1. READ ME 2

### 1.1 READ ME

Hi!

This template is a combination of multiple student and teacher PFE report templates that I have compiled into one that hopefully will satisfy your needs.

It is in English, but I have included the french "Page de garde" if you want to use it, and the rest of the paper is easily translatable.

This document is compiled using pdfLatex Compiler, so make sure you select it in the menu on the top left of the page. You can change the font size there along with other things.

Some table, figure, list or formatting codes can be found in the "Codes\_needed.tex" file in this same folder, use them well.

The organisation of this template is as follows:

The main compilation file is main.tex, any file you want to add, should be added there using,

Remember to change the PDF Title and author name before the begin document command.

Packages.tex is where you import packages and could modify their options.

The frontmatter folder contains unnumbered chapters that come before the actual chapters, so the resumes and acknowledgments are there. The pages are numbered in Roman numbers.

The chapters folder obviously contains the main chapters of the report, usually the first one is an intro, of both the project and the company, the last one is a conclusion chapter, I made it unnumbered here but you do you.

The endmatter folder contains the appendices, acronyms, glossary, and Complementary figures, tables and codes. Consider checking this link <a href="https://libguides.usc.edu/writingguide/appendices">https://libguides.usc.edu/writingguide/appendices</a> for more info. Usually you add an appendix for each subject you'll talk about it, each with its own codes, tables, figures and text.

1.1. READ ME 3

The bibliography can be found at the end of main.tex file.

And to organise your figures better, upload the logos to the logos folder, and content related figures should go in the figures folder, where you can add sub folders.

Along the template, make sure to read my comments, they can be helpful to understand the purpose of a command or option.

When you finish writing your thesis, make sure to verify that you didn't leave any generic line or link. Revise it well.

There are 10 warnings that show up in this template, some I couldn't manage to solve (or understand), and some I left since they are necessary for what I intend of this template.

Obviously this template is only a suggestion, it is not perfect in any sense, you can improve it in the way that suits you, so search away, and get used to reading the documentation.

Also consult with your supervisor, as each teacher has their own opinion on what constitutes the ideal report.

Finally, I hope you have enjoyed your time at INPT as much as I did, and Good Luck:D

-Mery

#### 1.1.1 Codes\_Needed

This subsection includes codes for different elements you will need: figures, tables, lists...

Copy the codes you want and test them in the chapter files.

if you want symbols and other text styles, visit this link:

Symbols

Read the comments!!

1.1. READ\_ME

#### 1.1.1.1 Text formatting

#### This text is bold

This text is italic

This text is underlined.

This text is struck out.

This text is capitalized.

Some characters like "%", "\$" and "&" are significant in Latex code, so to include them in normal text, use the backslash character before them. To print out backslash, use  $\setminus$ 

Documentation: Italics and underlining

#### 1.1.1.2 Figures



Figure 1.1: Caption

Documentation: Images

#### 1.1.1.3 Tables

Simple table without borders:

First Second

Third Fourth

More complex table with borders:

Left aligned column	Centered column	Right aligned column
Text	Text	Text

Example of a short table

1.1. READ\_ME

Column1	Column2
Element11	Element21
Element12	Element22
Element13	Element23

Table 1.1: Table Example

Example of a long table (that spans 2 pages or more), Latex will automatically split the table when it reaches the end of the page:

Table 1.2: Long table

Cell	Description
Element11	Element21
Element12	Element22
Element13	Element23
Element14	Element24
Element15	Element25
Element16	Element26
Element17	Element27
Element18	Element28
Element19	Element29
Element110	Element210
Element111	Element211
Element112	Element212
Element113	Element213
Element114	Element214

Documentation: Tables

#### 1.1.1.4 Lists

To start an unnumbered list, use:

•

•

1.1. READ\_ME

•

To start a numbered list, use:

1.

2.

3.

Documentation: Lists

#### 1.1.1.5 Code scripts or terminal

Say you have a script or terminal command you want to include, you use the following code:

```
root@eve-ng:~# mkdir -p /opt/unetlab/addons/qemu/timos-20.10.R12

3
```

Listing 1.1: Code caption

Documentation: Code Listing

#### 1.1.1.6 Math

Some math formulas for you, test them in your chapters:

These are inline formulas: x,  $a_i^2 + b_i^2 \le a_{i+1}^2$ . Afterwards...

These are centered formulas:

x,

$$a_i^2 + b_i^2 \le a_{i+1}^2$$
.

Afterwards...

Some complex formula:

$$P(|S - E[S]| \ge t) \le 2 \exp\left(-\frac{2t^2n^2}{\sum_{i=1}^n (b_i - a_i)^2}\right).$$

Also you can use the first link for math symbols and other useful stuff:

Documentation: Symbols file again

## 1.2 Presentation of host organization

### 1.2.1 Company Overview



Figure 1.2: Company logo

### 1.2.2 Organizational Chart

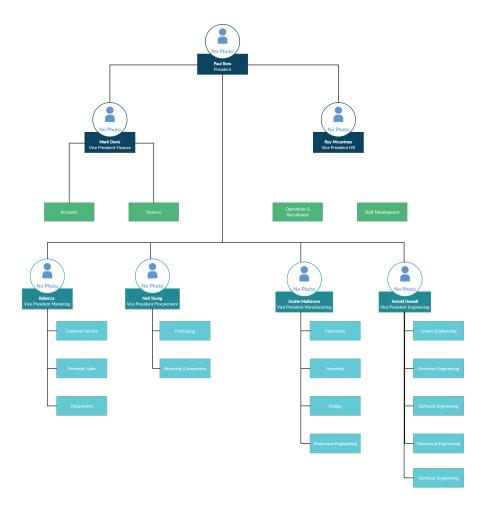


Figure 1.3: Organizational Chart

## 1.3 Presentation of the project

- 1.3.1 Project Framework
- 1.3.2 Project objectives
- 1.3.3 Project Planning

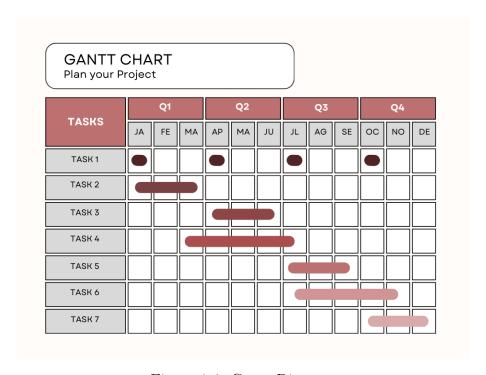


Figure 1.4: Gantt Diagram

### Conclusion

## Chapter 2

## Chapter 2 title

#### Introduction

2.1. Section1 11

### 2.1 Section1

### 2.1.1 Subsection1

Table 2.1: Long table 1

Cell	Description
Element11	Element21
Element12	Element22
Element13	Element23
Element14	Element24
Element15	Element25
Element16	Element26
Element17	Element27
Element18	Element28
Element19	Element29
Element110	Element210
Element111	Element211
Element112	Element212
Element113	Element213
Element114	Element214

### 2.1.2 Subsection2

- 2.1.2.1 Subsubsection1
- 2.1.2.2 Subsubsection2
- 2.1.2.2.1 Paragraph a
- 2.1.2.2.2 Paragraph b

2.2. Section2 12

### 2.2 Section2

- 2.2.1 Subsection1
- 2.2.2 Subsection2
- 2.2.2.1 Subsubsection1
- 2.2.2.2 Subsubsection2
- 2.2.2.2.1 Paragraph a
- 2.2.2.2 Paragraph b

2.2. Section2

### Conclusion

## Chapter 3

## Chapter 3 title

#### Introduction

3.1. Section1 15

### 3.1 Section1

#### 3.1.1 Subsection1

Column1	Column2
Element11	Element21
Element12	Element22
Element13	Element23

Table 3.1: Table 1

#### 3.1.2 Subsection2

- 3.1.2.1 Subsubsection1
- 3.1.2.2 Subsubsection2
- 3.1.2.2.1 Paragraph a
- 3.1.2.2.2 Paragraph b

### 3.2 Section2

#### 3.2.1 Subsection1

#### 3.2.2 Subsection2

- 3.2.2.1 Subsubsection1
- 3.2.2.2 Subsubsection2
- 3.2.2.2.1 Paragraph a
- 3.2.2.2. Paragraph b

3.2. Section2 16

### Conclusion

## Chapter 4

## Chapter 4 title

#### Introduction

4.1. Section1 18

### 4.1 Section1

- 4.1.1 Subsection1
- 4.1.2 Subsection2
- 4.1.2.1 Subsubsection1
- 4.1.2.2 Subsubsection2
- 4.1.2.2.1 Paragraph a
- 4.1.2.2.2 Paragraph b

### 4.2 Section2

- 4.2.1 Subsection1
- 4.2.2 Subsection2
- 4.2.2.1 Subsubsection1
- 4.2.2.2 Subsubsection2
- 4.2.2.2.1 Paragraph a
- 4.2.2.2. Paragraph b

4.2. Section2 19

### Conclusion

## Chapter 5

## Chapter 5 title

#### Introduction

5.1. Section1 21

### 5.1 Section1

### 5.1.1 Subsection1

#### 5.1.2 Subsection2

- 5.1.2.1 Subsubsection1
- 5.1.2.2 Subsubsection2
- 5.1.2.2.1 Paragraph a
- 5.1.2.2.2 Paragraph b

### 5.2 Section2

#### 5.2.1 Subsection1

#### 5.2.2 Subsection2

- 5.2.2.1 Subsubsection1
- 5.2.2.2 Subsubsection2
- 5.2.2.2.1 Paragraph a
- 5.2.2.2. Paragraph b

5.2. Section2 22

### Conclusion

## General Conclusion and Perspectives

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent nec dapibus justo. Donec sagittis vulputate ante sed porttitor. Suspendisse sit amet nisl massa. Curabitur nec nisl condimentum, egestas ex vitae, dapibus enim. Etiam iaculis, erat faucibus pellentesque sagittis, nisi justo sollicitudin nibh, et condimentum augue massa non turpis. Proin commodo enim fermentum suscipit condimentum. Maecenas molestie, dui nec vestibulum rhoncus, arcu nisl faucibus neque, a ornare nisi massa ac eros. Aenean id velit sit amet lacus mattis varius. Donec fringilla massa sed nisi eleifend, a aliquet mi tempus. Nunc posuere euismod est, nec tristique augue lobortis non. Sed sodales sem ut metus tempus ullamcorper.

Nullam fermentum id mauris suscipit varius. Quisque tristique tempor fringilla. Nam porta tincidunt orci in consectetur. Suspendisse nec sem nisi. Suspendisse potenti. Sed sodales aliquam libero, at dapibus ligula accumsan non. Quisque congue et urna a consectetur. Nullam maximus venenatis ornare. Donec in luctus urna, vel rhoncus lectus. Etiam lobortis, lacus nec gravida iaculis, magna nulla iaculis leo, quis congue nunc tortor pellentesque lorem. Sed fermentum vulputate dui, ac malesuada eros molestie sit amet. Proin fringilla elit justo, in posuere urna porttitor et. Curabitur dictum justo vitae metus pellentesque, eget feugiat sem feugiat.

Curabitur in mauris eu felis cursus auctor eget ut massa. Curabitur eleifend consectetur magna in ultrices. Etiam ut semper turpis. Morbi sed ipsum nec sem rutrum blandit sit amet vitae felis. Vestibulum vitae hendrerit diam. Aliquam pellentesque est mi, et tempus nisl laoreet in. Maecenas consequat augue a ante congue dignissim. In condimentum erat in volutpat tempus. Mauris vulputate, enim ut dignissim varius, lorem purus tristique sapien, lobortis accumsan dolor lorem quis eros. Duis vel imperdiet metus, non suscipit tortor.

## Appendix A

## Glossary

**Telnet:** Telnet is a network protocol that allows users to establish a remote terminal connection to a computer or network device over a network.

**SSH** (Secure Shell): SSH is a network protocol used for secure remote administration and secure file transfers.

SNMP (Simple Network Management Protocol): SNMP is a network protocol designed for managing and monitoring network devices and systems.

## Appendix B

## Acronyms

IP Internet Protocol

**CNS** Cloud and Network Services

MN Mobile Networks

**NI** Network Infrastructure

**IoT** Internet of Things

**NFV** Network Functions Virtualization

**SDN** Software-Defined Network

TCP Transmission Control Protocol

7750 SR Nokia 7750 Service Router

**OSPF** Open short Path First

**BGP** Border Gateway Protocol

VPN Virtual Private Network

MPLS Multiprotocol Label Switching

**EVE-NG** Emulated Virtual Environment - Next Generation

VM Virtual Machine

**SSH** Secure Shell

WinSCP Windows Secure Copy

FTP File Transfer Protocol

SSL Secure Sockets Layer

TLS Transport Layer Security

FTPS FTP over SSL/TLS

**SFTP** Secure File Transfer Protocol

SCP Secure Copy Protocol

**CLI** Command-line interface

MD-CLI Model-Driven Command Line

**API** Application Programming Interface

re Regular Expression

IGP Internal Gateway Protocol

IS-IS Intermediate-System Intermediate-System

**SPF** Shortest Path First

SF Switch Fabric

**CPM** Control Processing Module

IOM Input/Output Modules

MDA Media Dependent Adapters

QoS Quality of Service

**IPsec** Internet Protocol Security

VSR Virtual Services Router

**DDoS** Distributed Denial-of-Service

SROS Service Router Operating System

**NETCONF** Network Configuration Protocol

YANG Yet Another Next Generation

MP-BGP Multiprotocol Border Gateway Protocol

IPv6 Internet Protocol Version 6

**AS** Autonomous Systems

iBGP Internal Border Gateway Protocol

eBGP External Border Gateway Protocol

LAG Link Aggregation Group

VPRN Virtual Private Routed Network

SNMP Simple Network Management Protocol

**Telnet** Telecommunication Network

YAML Yet Another Markup Language

XML eXtensible Markup Language

## Appendix C

## Some subject you want to expand on

You can add more appendices depending on the subjects.

```
[root@host ~] # You can change the language and caption.
```

Listing C.1: Bash example

```
# Solve the quadratic equation ax**2 + bx + c = 0
      # import complex math module
      import cmath
      a = 1
      b = 5
      c = 6
10
      # calculate the discriminant
11
      d = (b**2) - (4*a*c)
12
13
      # find two solutions
      sol1 = (-b-cmath.sqrt(d))/(2*a)
      sol2 = (-b+cmath.sqrt(d))/(2*a)
16
17
      print('The solution are {0} and {1}'.format(sol1,sol2))
19
```

Listing C.2: Python example

Column1	Column2
Element11	Element21
Element12	Element22
Element13	Element23

Table C.1: Table Example

Table C.2: Long table Example

Cell	Description
Element11	Element21
Element12	Element22
Element13	Element23
Element14	Element24
Element15	Element25
Element16	Element26
Element17	Element27
Element18	Element28
Element19	Element29
Element110	Element210
Element111	Element211
Element112	Element212
Element113	Element213
Element114	Element214

# Bibliography

- [1] Author name, Book name.
- [2] *Title 1*, **Title 2**