Security in Internet of Things Devices

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**By**

**Kai Christopher Michael Tindall**

**Student number 201700000**

**Word count: XXXX**

This document is a template for your guidance. You don’t have to stick to it precisely. It may not suit your particular project. Modify it if you need to – but please discuss with your supervisor before making substantial changes to the organisation and content.

Paragraphs in red, like this one, are instructions and extra information. You must delete them before submitting your report.

This template document has a number of paragraph styles predefined. If you use them (‘Heading 1’, ‘Heading 2’ and ‘Heading 3’) and don’t alter them, then your report will automatically have properly numbered paragraphs and your table of contents will be automatically generated with the right page numbers. Use ‘Normal’ as the style for general text paragraphs in your document.

On this page (and I hope this is obvious) you must replace the words “The Title Of Your Project”, “Your Full Name Here” and “201700000” with the correct information. You’d be surprised how often people forget to do this. Don’t be one of them.

You must also replace “XXXX” with the actual word count (excluding acknowledgements, abstract, table of contents, references and appendices) of your document.

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# Project background and purpose

## Objectives

Why is this a useful project? What does it seek to achieve? What is the motivation for it (not your motivation for doing the project)? What are the primary objectives, and what secondary objectives may be achieved if there is time?

The project will seek to achieve in creating a quick and easy to use environment that will allow users to manage their IoT (Internet of Things) devices securely.

Primary Objective

To create a secure environment to retrieve data from IoT devices and to be able to deploy workloads. The environment will use one method of encryption with no option to be able to change the method used.

Secondary Objective

To create three interchangeable secure communication methods that the user can choose from and access the speeds of each of the methods to determine which is the fastest.

## Scope

What is included in the project, and just as importantly, what is not?

I will not be producing my own new encryption method, I will be using well known, widely used encryption methods as it will be a lot more secure than trying to create my own.

I will also not be writing my own implementation of the encryption methods, instead using reputable libraries, this is for a similar reason to my previous point, as I may make mistakes in my implementation that leaves my encryptions either broken or vulnerable.

I will be creating a standalone command and control server program that will expose an API for clients to connect with.

I will only be creating one client; however, I will design the environment so that the server does not care or even know what the client is. This means that any number of different clients for different platforms could be written.

I will initially only be allowing one kind of encryption to be used, but if I complete my primary objective I will be writing two more that can be interchangeably used to encrypt traffic at the user’s discretion.

## Deliverables

What artefacts or results will the project deliver? How will you decide whether the project has met its objectives?

I will be delivering three pieces of code:

IoT Driver

This is the code that will be running on the IoT devices, the main purposes of this code will be to transmit and receive communications with the command and control server, and then act upon commands received, such as gather data and transmit it, or to receive and deploy a new workload.

Command and Control Server

The command and control server will act as a manager of the IoT devices and will issue commands to them based on what input it gets from the API.

End user client application

The client application can will be the main interface between the user and the system. It will get all its data from the command and control server using the API to poll the command and control server in a set interval. Given the intended application of the environment isn’t that many devices, bandwidth should not be an issue for the command and control server to send all the data at once every so often.

Documentation

I will also be delivering two pieces of documentation as well. These consist of a user guide, detailing how to set up and use the environment, and an API guide which will outline all of the API calls for the user to be able to create their own client program if they want to.

## Constraints

Are there externally-imposed requirements which you must comply with? What are they, and how will they impact on the project?

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).

## Assumptions

If there are unknown elements or missing information relevant to the project, what assumptions will you make to account for these? How are these assumptions justified?

I will be assuming that the end user would be competent enough to set up the environment with some instructions. This may include some command line use or using secure shell (SSH) to remotely access a device. I think this assumption is justified because most people interesting in setting up an IoT network have usually had some experience in this already. There would also be instructions too to further eliminate this factor.

I will be assuming every packet sent over a network is being listened too by someone who is competent and would want to use data gained for malicious purposes, even if such an entity doesn’t exist. This is because it will constantly hold the encryption to the highest standard.

# Project rationale and operation

## Project benefits

What benefits will a successful project bring, and to whom?

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).

## Project operation

How will you operate the project? Will you use a particular methodology for it and for any software development? How will you measure the success of your choice?

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).

## Options

What options are available to you for the tools, techniques and design parameters of your project? How will you evaluate them and make the best selection?

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).

## Risk analysis

What risks might affect the outcome of your project or its stakeholders? How severe are they, and what steps will you take to mitigate against them?

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).

## Resources required

What resources will you need for the project? Are any non-standard? Are they already available? What effect will it have if they are not available or are delayed, and how would you manage that?

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).

# Project methodology and outcomes

## Initial project plan

## Tasks and milestones

Present a realistic task list for the entire project, broken down to a suitable level of detail. Indicate milestones against which progress can be monitored.

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).

## Schedule Gantt chart

Present a Gantt chart showing a schedule for all tasks, milestones and deliverables. Show dependencies amongst tasks.

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).

## Project control

How will you manage the project day-to-day? How will its performance be monitored? How will you judge if it has been successful?

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).

## Project evaluation

How will you evaluate the project’s artefacts and overall outcomes? What user evaluation will you do?

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).

# Appendix a

You may use one or more appendices to add useful reference information which may be relevant to other sections of the report. Do not use appendices simply as a way of writing more than will fit into the main document word count.

Delete the red paragraphs and replace this one with your content (use the “Normal” paragraph style).