IoTa Improvements Vision

# Introduction

The IoTa platform handles is a set of microservices to process the messaging of IoT (Internet of Things) devices managed by the NSW Department of Primary Industries (DPI). DPI has commissioned the project to improve the implementation and deployment of IoTa based on its first 12 months of operation.

# Positioning

The IoTa platform currently runs on Docker Compose, which makes it difficult to rebuild and restart individual containers, implement service replications, and manage performance and fault tolerance.

Additionally, the current MQTT front end processor is not easily extensible for new services that are expected to be implemented in the future.

## 2.1 Problem Statement

The problem of inflexibility in the cu

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| The problem of | inflexibility in the current platform |
| affects | NSW DPI IoT device management and maintenance personnel |
| The impact of which | provides difficulty in rebuilding and restarting services |
| A successful solution would be | to move the system to one that prioritises performance and fault tolerance |

## 2.2 Product Position Statement

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| --- | --- |
| For | IoTa platform administrators |
| Who | want to manage IoT devices and process device data |
| The | implementation of a Kubernetes based system |
| That | provides a flexible, extensible, and reliable system |
| Unlike | the current system that relies on Docker Compose |
| Our product | will provide a more scalable and maintainable system, capable of handling future needs. |

# Stakeholder Descriptions

## 3.1 Stakeholder Summary

The stakeholders in this project include the IoTa platform sponsors from NSW DPI, their developers and end-users. The sponsors are interested in improving the platform’s maintenance and extensibility as well as providing a system that can handle additional devices in the future and their increased data processing.

## 3.2 User Environment

NSW DPI IoTa developers and end-users to manage their IoT devices, connecting them to a network and controlling them remotely. They need an infrastructure that is flexible and efficient, allowing them to manage and monitor their devices effectively.

In addition to the improvements of the IoTa messaging platform, another project is being run in parallel developing a timeseries database for the IoTa platform. The improvements to the platform need to be compatible with the timeseries project.

# Product Overview

## 4.1 Needs and Features

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| --- | --- | --- | --- |
| Need | Priority | Features | Planned Release |
| Kubernetes migration | Highest | Move IoTa to Kubernetes | Cycle 1 |
| MQTT front end processor refactoring | Highest | Dynamic discovery and execution of message parser plugins | Cycle 1 |
| Prometheus metrics | Highly desirable | Integration into IoTa set of containers | Cycle 2 |
| Management application improvements | Highly desirable | Device filtering and checkbox selection | Cycle 2 |
| Front end processors to run stand-alone | Desirable | Process messages from database and transform using logical mapping lookup | Cycle 3 |
| RabbitMQ async code fixes | Desirable | Debug and fix async classes | Cycle 3 |
| Unit test improvements | Desirable | Reduce runtime and disable retry mechanism | Cycle 3 |

# Other Product Requirements

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| Requirement | Priority | Planned Release |
| Timeseries team compatibility | High | Cycle 1 |
| Documentation | High | Cycle 1 |