

# WindMill System of systems

## System Description

### Abstract

This is the template for System of Systems Description (SoSD document) according to the Eclipse Arrowhead documentation structure.

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## 1 Overview

This document describes the WindMill system of systems (SoS), which provides points of connections of different windmills where they can be monitored by a machine algorithm. The HQ local cloud will provide each windmill with trained models and the Windmills will provide data and maintenance request.

## 1.1 How This SoS Is Meant to Be Used

This network of system is used with a gatekeeper and a gatetunnel to ensure secure safe connections between the local clouds. The wind mills provide the services datasets and maintenance request. The HQ provides the service trained models, which is used to update the model in the windmills.

## 1.2 SoS functionalities and properties

### 1.2.1 Functional properties of the SoS

- Uses all the mandatory Arrowhead core services for security and an orchestrated operation.
- Uses gate keeping for secure connections between local clouds
- Uses Gate tunnel for secure data transfer.

### 1.2.2 Configuration of SoS properties

### 1.2.3 Data stored by the individual microsystem

The micro system uses MySQL.

### 1.2.4 Non functional properties

- security, Gatekeeper, Gatetunnel, Authentication
- safety,
- energy consumption, unknown
- latency, unknown
- Power saving properties, unknown

### 1.2.5 Stateful or stateless

- states preserved, functional and non-functional

## 1.3 Important Delimitations

The windmill sos solve the problem of regular check ups on the each windmill. Now each windmill can have an machine learning model the predicts maintenance and send a request to the HQ, and also powers down the windmill to ensure no future damage.



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## 2 Services

### 2.1 Produced service

- processed data
- Maintenance request

### 2.2 Consumed services

- Trained models

### 3 Security

The security of Eclipse Arrowhead - and therefore the security of Database - is relying on X.509 certificate trust chains. The Arrowhead trust chain consists of three level:

- Master certificate: `arrowhead.eu`
- Cloud certificate: `my-cloud.my-company.arrowhead.eu`
- Client certificate: `my-client.my-cloud.my-company.arrowhead.eu`

### 4 References

## 5 Revision History

### 5.1 Amendments

No.	Date	Version	Subject of Amendments	Author
1	2023-08- 10	4.6.0		Jerker Delsing
2				
3				

### 5.2 Quality Assurance

No.	Date	Version	Approved by
1	2022-01-10	4.6.0	