Street Lighting

System Description

Abstract
This is the System Description (SysD document) for the ”AI Tool” System according to the Eclipse Arrowehad documentation structure.

Contents

1 Overview

This document describes the Street Lighting system which is responsible for requesting the updated lamps statuses stored in the controller in order to turn on or off the system lamps more efficiently since this decision considers the visibility of the zone of the lamp.

The rest of this document is organized as follows. In Section 1.1, we describe the intended usage of the system. In Section 1.2, we describe fundamental properties provided by the system. In Section 1.3, we describe delimitations of capabilities of the system. In Section 2, we describe the abstract service functions consumed or produced by the system. In Section 3, we describe the security capabilities of the system.

1.1 How This System Is Meant to Be Used

This system is used to periodically request the status of lamps that changed from the Controller System.

1.2 System functionalities and properties

1.2.1 Functional properties of the system

- The system can turn on or off the lamps of specific IDs.

1.2.2 Configuration of system properties

1.2.3 Data stored by the system

Data coming from the Controller is stored in a local variable and overwritten with every answer from the Controller systems.

1.2.4 Stateful or stateless

Stateless: the data about the status of the lamps (on or off) is not kept in memory.

1.3 Important Delimitations

- The system relies entirely on the data provided by the Controller system. If the Controller fails or provides incorrect information, the system cannot validate or recover from such errors autonomously.
- The system does not store historical data about lamp statuses. This limits its ability to perform advanced analytics or historical comparisons.
- The decision-making process for turning lamps on or off is based solely on visibility data. Other factors, such as energy savings or maintenance schedules, are not considered.

2 Services

2.1 Produced service

- ”getWeatherSensors”: The service receives the data from the Weather Sensors system as List¡WeatherSensorResponse
- ”getLightSensors”: The service receives the data from the Light Sensors system as List¡LightSensorResponseDTO¿.

2.2 Consumed services

- ”UpdateLamps”: The service sends the information and states of only the lamps that should change state to the Street Lighting system in order to turn on or off these lamps.
- ”getAllLamps”: The service sends the information and states of all lamps to the Street Lighting system in order to compare if the controller has an incoherence with the actual status of the lamps.
- ”ServiceDiscovery”: Essential for communication with the registry.
- ”ServiceOrchestration”: Coordinates the system.

3 Security

- The Street Lighting system utilizes secure protocols such as:
  - HTTP/HTTPS: For web-based communication, with HTTPS ensuring secure communication via encryption.
- The system performs strict authorization checks before providing services, based on:
  - Arrowhead Authorisation System: This checks the legitimacy of service requests within the Arrowhead ecosystem, ensuring that services are only consumed by authorized actors.

For Arrowhead certificate profile see github.com/eclipse-arrowhead/documentation

4 References

5 Revision History

5.1 Amendments

Revision history and Quality assurance as per examples below

No.	Date	Version	Subject of Amendments	Author
1	2020-12-05	X.Y.Z		Tanyi Szvetlin
2	2021-07-14	X.Y.Z	Minor updates	Jerker Delsing
3	2022-01-12	X.Y.Z	Minor updates	Jerker Delsing

5.2 Quality Assurance

No.	Date	Version	Approved by
1	2022-01-10	X.Y.Z	