D6.14 Joint use-case with FIWARE Context Broker

Grant agreement no.	780785
Project acronym	OFERA (micro-ROS)
Project full title	Open Framework for Embedded Robot Applications
Deliverable number	D6.14
Deliverable name	Joint Use Case with FIWARE Context Broker
Date	December 2021
Dissemination level	Public
Work package and task	6.14
Author	FIWARE
Keywords	micro-ROS, robotics, ROS, microcontrollers, collaboration
Abstract	(…)

1 Introduction to the Joint Use Case

1.1 Core Ideas

1.2 Architecture Overview

1.3 Setup Description

2 Context Broker Integration (The ROS2 IoT Agent)

2.1 NGSI Concepts
- Entities
- Attributes (Properties and Relationships)
- CRUD and Batch Operations
- Subscriptions, Notifications, Registrations

2.2 Identified Use Cases for FIWARE<>ROS Interoperability
- Standard FIWARE IoT Agent Interfaces
- Selected ROS Interfaces
- Agent Requirements for FIWARE<>ROS Integration

2.3 ROS2 IoT Agent Features
- North Port
- South Port
- FIWARE<>ROS2 Bridge

3 Joint Use Case: Enhancing micro-ROS Use Cases with Historical Data Management and Online Supervision GUIs

3.1 Bosch Use Case Integration

3.1.1 Brief Description

3.1.2 Interfaces for Historical Data Management
- Continuous Values
    - ROS messages
    - NGSI Model
- Discrete Values
    - ROS messages
    - NGSI Model
- Multi-Dimensional Values ??
    - ROS messages
    - NGSI Model
- Actionable Values ??
    - ROS messages
    - NGSI Model

3.1.3 Interfaces for Online Supervision
- Continuous Values
    - ROS messages
    - NGSI Model
- Discrete Values
    - ROS messages
    - NGSI Model
- Multi-Dimensional Values ??
    - ROS messages
    - NGSI Model
- Actionable Values ??
    - ROS messages
    - NGSI Model

3.1.4 Historical Data Visualization and Online Supervision GUI
- History Visualization Features
    - Continuous Values
    - Discrete Values
- Supervision GUI Features
    - Monitoring Features
    - Actuation Features

3.2 PIAP Use Case Integration

3.2.1 Brief Description
Warehouse:

- Monitoring:
    - Environmental values: Humidity, temperature
- Actionable Systems:
    - opener_cmd → 0-stop,1- open,2- close
    - final_effector cmd → 0-switched_off, 1-switched_on
- Robot Values:

3.2.2 Interfaces for Historical Data Management
- Continuous Values
    - ROS messages
    - NGSI Model
- Discrete Values
    - ROS messages
    - NGSI Model
- Multi-Dimensional Values ??
    - ROS messages
    - NGSI Model
- Actionable Values ??
    - ROS messages
    - NGSI Model

3.2.3 Interfaces for Online Supervision
- Continuous Values
    - ROS messages
    - NGSI Model
- Discrete Values
    - ROS messages
    - NGSI Model
- Multi-Dimensional Values ??
    - ROS messages
    - NGSI Model
- Actionable Values ??
    - ROS messages
    - NGSI Model

3.2.4 Historical Data Visualization and Online Supervision GUI
- History Visualization Features
    - Continuous Values

- Discrete Values
- Supervision GUI Features
    - Monitoring Features
    - Actuation Features

3.3 eProsima Use Case Integration

3.3.1 Brief Description

3.3.2 Interfaces for Historical Data Management
- Continuous Values
    - ROS messages
    - NGSI Model
- Discrete Values
    - ROS messages
    - NGSI Model
- Multi-Dimensional Values ??
    - ROS messages
    - NGSI Model
- Actionable Values ??
    - ROS messages
    - NGSI Model

3.3.3 Interfaces for Online Supervision
- Continuous Values
    - ROS messages
    - NGSI Model
- Discrete Values
    - ROS messages
    - NGSI Model
- Multi-Dimensional Values ??
    - ROS messages
    - NGSI Model
- Actionable Values ??
    - ROS messages
    - NGSI Model

3.3.4 Historical Data Visualization and Online Supervision GUI
- History Visualization Features
    - Continuous Values
    - Discrete Values
- Supervision GUI Features
    - Monitoring Features
    - Actuation Features

4 Conclusions and Future Work