HOW THE OSGI-STANDARDS BASED GATEWAY MIDDLEWARE CAN BE USED WITH IQRF

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Software components
Strategic impact on IoT applications

Technological, commercial, and user angles covered through Bosch
Our open standards approach
Leading industry standards make IoT work

Bosch Software Innovations is actively involved in open standards organizations and open source communities. Additionally, our products support many additional industry standards.
OSGi Alliance
Background

Founded in 1999

Proven, Mature Software Architecture

Transparent Development Process

Strategic Partnerships/Collaboration

Global Ecosystem

Best Practices

Industry & End User Adoption
OSGi Alliance
Modularity and Services

Modular Software architecture
• Execution environment, APIs, device abstraction
• Application development framework
• Common architecture is applicable to Cloud, Enterprise, M2M & IoT architecture
• Can run locally on one device, all the way through to distributed across 1,000’s of servers

Dynamic Service lifecycle enables:
• True 24/7 remote maintenance
• Remote software updates
• Aftermarket sales of upgrades and extensions

Portable and re-usable software modules enable
• Faster time-to-market
• Increased agility and reduced development effort and project risk
• Reduction in maintenance costs
• Ecosystem based solutions
How to visualize, evaluate and manage machine data
Prosys end-to-end open standard IoT middleware

- Provides connectivity to the edge devices and machines
- Runs apps and automation logic
- Enables device management
- Remote monitoring and support
- Easy and quick access to machine data from anywhere in the world
- Reporting and performance tracking

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**Bosch IoT Remote Manager**

**Bosch IoT Cloud**

or on-premise

Infrastructure
Demo: Connecting Bosch XDK & gateway to Bosch IoT Cloud
Mastering the variety of protocols

**SENSORS & DEVICES**
- XDK from Bosch Connected Devices and Solutions

**PROTOCOLS**
- UPnP
- dlna
- Modbus
- BACnet
- ProSyst mBS
- OSGi
- Java / REST API

**GATEWAY**
- Automation engine
- OSGi middleware
- Device abstraction
- ProSyst mBS

**BACKEND**
- Bosch IoT Remote Manager
- Bosch IoT Cloud or on-premise
- Device management
- Software management
- M2M server
- Service platform

**Management protocols**
- TR-069
- OMA-DM
- Messaging
- Push Messaging
- ...

**ProSyst mBS SDK**
- Eclipse plug-ins
- OSGi runtime
- OSGi validator

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How could this work with IQRF?
Application 1

Application 2

FIM Client Library

OSGi Framework

JSON-RPC

FIM Remote API

REST

Application 3

Functional Item 1

Functional Item 2

Functional Item 3

Functional Item 4

Functional Item 5

Device

Device

Automation

Groups

Cloud Services

App Logic
BinarySwitch

- properties
  - state (RE)
- operations
  - turnOn
  - turnOff
  - toggle

FI Classes

- BSImpl1
  - Device
- BSImpl2
  - Autom. logic
- BSImpl3
  - UI button

FI Interfaces

- FI Interface
  - Defines the functionality
  - Implement the functionality
  - Registered FI services with attributes

OSGi Service Registry

Event Admin

- Register Event Handler (topic, filter)
- Dispatch events (topic, filter)

Client Bundle

- Access FI services

FI Factory

- property
  - supportedClasses
- operations
  - create
  - remove

FI Provider Bundles

- Define new FI interface
- Provide FI implementation
- Define new FI implementation
- Register new FI instance
- Provide FI Factory
- Register new FI implementation
Possible Liaison with OSGi Alliance

- **Joint Marketing Activities**
  - Cross Promotion of Events
  - Joint Webinars
  - etc.

- **Joint Technical Activities**
  - Standardized IQRF interface for OSGi
    - Incl. RFP, RFC, Reference Implementation and Compliance Tests

- **OSGi already liaises with other IoT organizations**
  - HGI, oneM2M, EnOcean Alliance
Bosch ConnectedWorld 2017 will take place March 15-16 at Station Berlin

Save the Date!
THANK YOU FOR YOUR ATTENTION!

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