Open source IoT gateway
Tale of Eclipse Kura, Apache Camel and Rhiot

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- open source contributor
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This talk

Running Apache Camel in the Eclipse Kura server.
This talk

- Eclipse Kura
- Apache Camel
- Why Camel+Kura?
- How Camel+Kura?
Eclipse Kura
What is Eclipse Kura?

OSGi-based IoT gateway for field devices.
What is Eclipse Kura?

**OSGi**

- modularity system for Java
- provides modules classpath separation
- promotes hot runtime redeployments

**OSGi Application Container** (Eclipse Equinox, Concierge)

Java SE 7 / 8 (OpenJDK)

**OSGi-based** IoT gateway for the field devices.
What is Eclipse Kura?

IoT gateway

- collects messages from the edge devices (like sensors)
- performs messages processing/aggregation/forwarding

OSGi-based IoT gateway for the field devices.
What is Eclipse Kura?

OSGi-based IoT gateway for the field devices.
Gateway TL;DR;

A proxy between field devices and a data center
Who’s behind Kura?

Apache Camel
What is Apache Camel?

A message routing framework.
What is message routing?

- Apache Camel
- Spring Integration
- Mule

How to orchestrate messages flow.
Crash course to the Apache Camel

```java
from('jms:invoices').
    transform { new Invoice(uuid(), it.in.body) }.
    marshal().json(Jackson).
    multicast().parallelProcessing().
    to('ftp:myftp.com/invoices',
        'mongodb:myDb?collection=invoices&operation=save')
```

- read message from JMS queue
- transform to JSON
- save to FTP and MongoDB
Why Camel and Kura?
How can Kura benefit from Camel?

Camel provides ~200 OSGi-ready connectors (JMS, REST, CoAP, AMQP, MQTT...).
How can Kura benefit from Camel?

Enterprise Integration Patterns (EIP)
EIP - throttler

Prevents messages overflow.
EIP - throttler

Provides SLA for the different channels.
EIP - content based router

Dynamically decide where to route the message.
EIP - load balancer

Client side load balancing. Useful for field devices connectivity.
How can I control which parts of a field device should be running at the given moment?
How Camel and Kura?
Kura + Camel: architecture

Camel OSGi bundle is started from the Kura.
Invoke REST method every second.
Concerned about the lifecycle?

Just deploy the route as the OSGi bundle and enjoy Camel running the Kura.
Fancy example #1

```java
public class MyKuraRouter extends KuraRouter {

    @Override
    public void configure() throws Exception {
        from("netty4-http:http://0.0.0.0:18080").
            to("bean:org.eclipse.kura.net.NetworkService?method=getAllWifiAccessPoints");
    }
}
```

Display WiFi networks accessible near the field device using the web browser.
Start syncing cached data only when WiFi is accessible.
Loading XML Camel routes at runtime using web UI.
Camel will be soon a 1st class citizen in Kura.

Camel as a core part of the Kura platform

Added base Apache Camel dependencies to Kura platform
#69

hekONSEK wants to merge 1 commit into eclipse:master from hekonsek:camel-jars

hekONSEK commented on Nov 18, 2015

Hi,

I have created Camel Kura integration module [1] some time ago and I’ve been promoting [2][3] using Kura as a target gateway for Camel deployments. Kura and Camel are really nice fit and I’d love to see more of our Camel users using Kura in a field.

Can you consider including Apache Camel jars into the Kura distribution? That would simplify setup required to get Camel running in Kura and help with Kura adoption among the Camel users.

Cheers!

Rhiot - the messaging platform for the Internet Of Things

Rhiot is a messaging platform for the Internet Of Things. We are focused on an adoption of the Red Hat JBoss middleware portfolio to provide solutions to the common IoT-related challenges.

Documentation

Here you can find the reference documentation for the Rhiot.

Current release

The latest and the greatest version of the Rhiot is **0.1.4**. Wondering what’s new there? Here are the release notes.

Community

You’re more than welcome to join our Rhiot mailing list. We are also present on the #rhiot IRC channel at Freenode and twitter @rhiot_io

http://rhiot.io
Rhiot Kura quickstarts

git clone git@github.com:rhiot/quickstarts.git
cp -r quickstarts/kura-camel kura-camel
cd kura-camel
mvn install

Soon to be converted to Maven archetype :)
CloudService user doesn’t know that payload is dispatched to Camel.
Use CloudService to publish message to any endpoint supported by Camel.

```java
CloudService cloudService = new DefaultCamelCloudService();
CloudClient client = cloudService.newCloudClient("appId");

client.publish("amqp:topic", "foo".getBytes(), 0, true, 0);
```
Thank you!

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