OSGI Best practices shown on Apache Karaf
Speaker

Christian Schneider
Open Source Architect at Talend

Working on
- Apache Karaf
- Apache CXF
- Apache Camel
- OPS4j pax url, pax exam

Blog:
http://www.liquid-reality.de
Agenda

- OSGi features and motivation
- Karaf container
- OSGi application best practices
- Demo Tasklist application
OSGi Features

- Bundle Classloader (explicit Imports / Exports)
- Bundle Lifecycle
- Service Registry
- Configuration Admin Service
OSGi Best Practices - Motivation

OSGi is hard
OSGi Best Practices - Motivation

Follow Best Practices

OSGi → Fun
Container ?  Framework ?

Apache  **Karaf**

Extras ?
OSGi Best Practices

Karaf

OSGi Applikation

Config

Bundle creation

Blueprint

Services
Tasklist Example

UI-Vaadin

ExampleApplication

Persistence

TaskServiceImpl

Model

TaskService

Task

Uses

Implements
Creating Bundles with maven

maven-bundle-plugin

↓

bnd

↓

jar File with OSGi Manifest
Dynamic Wiring

OSGi is dynamic in nature
Bundles, Services, Config

Isn't that complicated?
Dynamic Wiring

Yes ... if you fight it

- Startlevel tuning
- Import Services by Hand
- Update configs by hand
Blueprint

Aries Blueprint
(Spring like dependency injection for OSGi)

declarative dynamic wiring
OSGi Services

Bundle A connects to Service S with the action register. Service S then connects to Bundle B with the action get listen. Service S contains a Java Object which is a Java Interface + Properties + priority.
OSGi Services in Blueprint

Provider

```xml
<bean id="taskService" class="net.lr...TaskServiceImpl" />
<service ref="taskService" interface="net.lr.tasklist.model.TaskService"/>
```

Consumer

```xml
<reference id="taskService" availability="mandatory" interface="net.lr.tasklist.model.TaskService"/>
```

mandatory:  Context only starts when service is available
ConfigAdmin Service

```
ConfigurationAdmin
Configuration getConfiguration(String pid)
Configuration[] listConfigurations(String filter)
```

```
Configuration
pid=net.lr.myconfig
key1=value1
key2=value2
```

```
Service Registry
register
```

```
ManagedService
update(Properties)
update()
triggert
```

```
```
ConfigAdmin Service in Blueprint

Context Kontext Restart on config changes

```xml
<cm:property-placeholder persistent-id="ConfigApp" update-strategy="reload">
    <cm:default-properties>
        <cm:property name="title" value="Default Title"/>
    </cm:default-properties>
</cm:property-placeholder>

<bean id="myApp" class="net.lr...MyApp" init-method="refresh">
    <property name="title" value="${title}"/>
</bean>
```

Keys available as placeholders
ConfigAdmin in Apache Karaf

- etc
- pid.cfg
- Felix Fileinstall
- Create / Update
- ConfigAdmin
- Managed Service

Property files → dynamic updates

Polls

Change

Create / Update
Deployment

features:addurl mvn:net.lr.tasklist/tasklist-features/1.0.0-SNAPSHOT/xml
features:install example-tasklist
Advanced Topics

- CDI on OSGi (Weld-OSGi, Karaf EE, Glassfish)
- DOSGi (CXF-DOSGi)
- Aries JPA and JTA
Questions?
Links

Christian Schneider
   http://www.liquid-reality.de
   @schneider_chris
   https://github.com/cschneider

Apache Karaf Tutorials: http://liquid-reality.de/display/liquid/Karaf+Tutorials
OSGi - Alliance http://www.osgi.org
Apache Karaf http://karaf.apache.org/
Apache Felix http://felix.apache.org/
Apache Aries Blueprint http://aries.apache.org/modules/blueprint.html
Talend ESB (based on Apache Karaf): http://www.talend.com/products/esb