

OSGi

Yet another framework?



Jiří Harazim
FI MU 2012

Agenda

- Introduction
- Motivation
- OSGi Framework
- Demo
- Conclusion
- Discussion

Agenda

- Introduction
- Motivation
- OSGi Framework
- Demo
- Conclusion
- Discussion

Introduction

- Survey: Who has never heard of OSGi?

OSGi = former Open Services Gateway initiative



- Who are members of this initiative?

Adobe Systems, IBM, Oracle, Red Hat, Vmware, Siemens AG, TIBCO, Hitachi, Mitsubishi Electric, Telefonica S.A., Credit Suisse, Eclipse Foundation Inc. and many others

Agenda

- Introduction
- **Motivation**
- OSGi Framework
- Demo
- Conclusion
- Discussion

Beyond Java Modularity

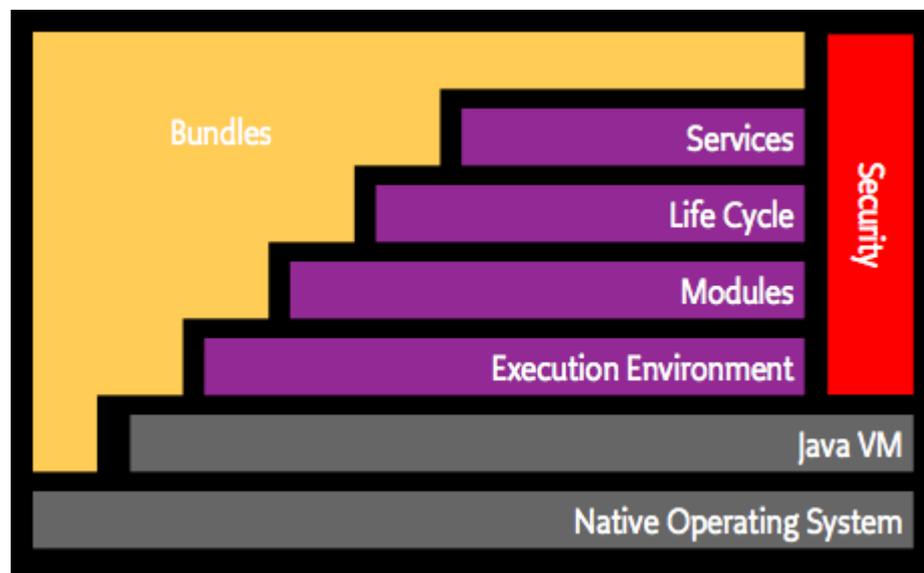
- Java (1995) is cool, but:
 - Lacks modularity support (jar hell)
 - Hardly follows proved trends (dependency injection, services)
 - Is only a tool actually
- Thus a bunch of proprietary solutions had emerged (JBoss, NetBeans, servers and others)
- Why? They address major pitfalls:
 - Different unit of assembly (NetBeans Modules)
 - Services support (Spring, Guice)
 - Runtime/environment support

Agenda

- Introduction
- Motivation
- **OSGi Framework**
- Demo
- Conclusion
- Discussion

OSGi Framework

- OSGi is a **specification**
- Defines runtime environment called OSGi Framework
 - Examples: Apache Felix, Equinox, Knopflerfish
- Runs on top of Java Virtual Machine



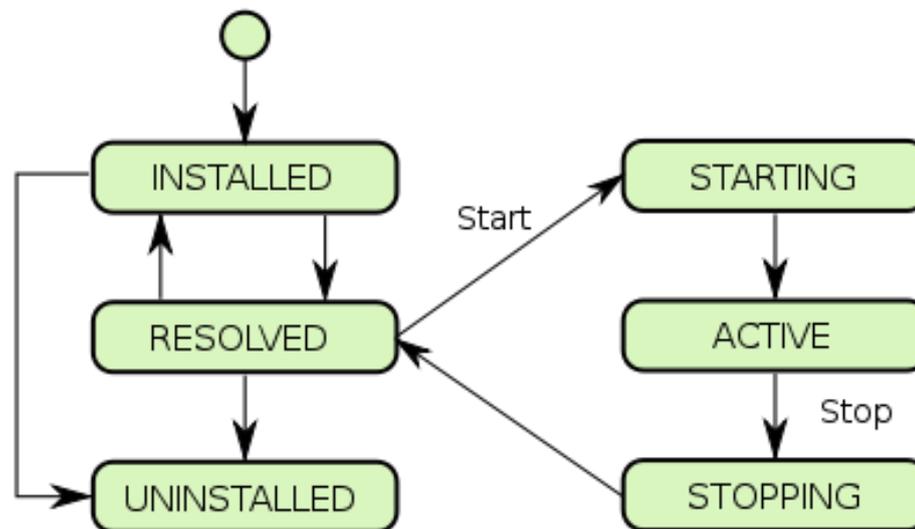
Modules

- Bundle = unit of deployment, ordinary JAR file with META-INF/MANIFEST.MF
- Example of manifest file:

```
Manifest-Version: 1
Built-By: Alexandra
Bundle-Name: iCASA :: Services :: Context
Bundle-Vendor: Adèle Team
Bundle-Version: 0.0.1.SNAPSHOT
Bnd-LastModified: 1338364965415
Bundle-ManifestVersion: 2
Bundle-Description: This bundle contains the implementation of the con
text service.
Bundle-License: Apache License - Version 2.0; link=http://www.apache.o
rg/licenses/LICENSE-2.0.txt
Import-Package: org.osgi.service.log;version=1.3, org.ow2.chameleon.ha
ndies.log;version="[0.0,1)", org.apache.felix.ipojto.architecture;vers
ion= 1.8.0, fr.liglab.adele.icasa.context;version="[0.0,1)", org.apac
he.felix.ipojto;version= 1.8.0, org.osgi.service.cm;version=1.2
Bundle-DocURL: http://wikiadele.imag.fr/index.php/iCASA
Bundle-SymbolicName: fr.liglab.adele.icasa.service.context
```

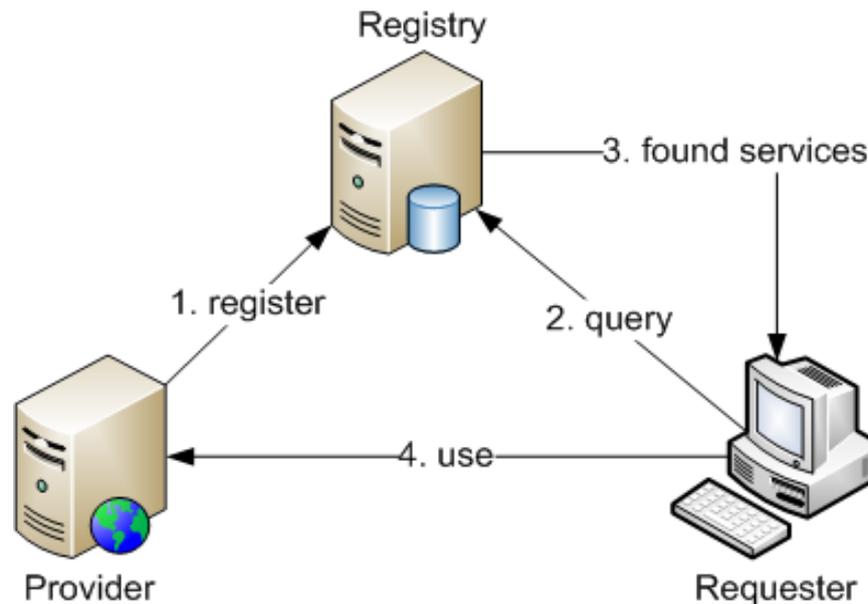
Life-cycle

- Each bundle deployed into framework has its own lifecycle
- Header Bundle-Activator acts as Main-Class
- Lifecycle scheme:



Services

- Service = element of interaction between bundles
- Binding is performed at runtime
- In R4 and R5 specs much easier (Declarative Service)



Services and Dynamism

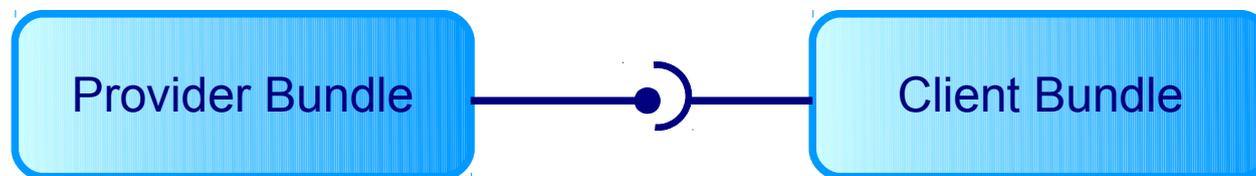
- Handling dynamic services is difficult
 - They can appear or leave anytime
- ServiceTracker was introduced to reduce the burden
 - Event-based approach with listeners
 - Much better but still a lot of effort required
- IPOJO
 - Service-Oriented component framework, not specification
 - Tackles dynamism as non-functional aspect – much easier!
 - Predecessor of DS
- Declarative Services
 - Service-Oriented component framework in R4.0 specification

Agenda

- Introduction
- Motivation
- OSGi Framework
- **Demo**
- Conclusion
- Discussion

Demo

- Let's have a look at two bundles:
 - Provider bundle – this one provides service into service registry
 - Client bundle – this one queries registry for the service and uses it
- We use iPOJO to facilitate development
 - Annotations are translated to manifest-headers by bnd tool
 - We can also specify iPOJO components in XML
- We launch example in Apache Felix Framework
 - Open Source, felix.apache.org



Agenda

- Introduction
- Motivation
- OSGi Framework
- Demo
- **Conclusion**
- Discussion

Conclusion

- OSGi provides solid platform for developing pervasive applications
- Current release R5 introduces next benefits
 - Provide-Capability header
 - Replacement of OBR (Osgi Bundle Repository) rfc
- Used heavily in a lot of projects
 - All of us know at least Eclipse and GlassFish
- Good support of tools
 - Ant, Maven, Eclipse, WebConsole

Agenda

- Introduction
- Motivation
- OSGi Framework
- Demo
- Conclusion
- Discussion

Discussion

- Questions? Suggestions? Opinions?

The End

Thank you for your attention!