



JUDCon

JBoss Users & Developers Conference

Boston:2010

About me

- Jesper Pedersen
 - Core developer, JBoss by Red Hat
- Project lead for
 - JBoss JCA – JCA container
 - Tattletale – software quality tool
 - JBoss Profiler 2 – profiler suite
 - Papaki – high-performance annotation scanner
- Chairman for Boston JBoss User Group

Overview

- What is JCA ?
- JCA 1.6
- JBoss JCA



What is JCA ?

What is JCA ?

- The Java Connector Architecture (JCA) standard specifies how the Java Enterprise Edition platform connects to Enterprise Information Systems (EIS)
 - Database systems
 - Messaging system
 - Mainframe transaction processing
- Standard is created in JCP

What is JCA ?


- JCA defines the contract between the JCA container and the EIS
 - Scalable, Transactional, Secure, Client API
- Resource Adapter (EIS vendors)
 - Protocol specific communication
 - Multiple AS vendors
- Resource Adapter (AS vendors)
 - Support multiple EISs

What is JCA ?

- Resource adapters can be divided into
 - Outbound, Inbound and Bidirectional
 - Transactions
 - NoTransaction, LocalTransaction, XATransaction
 - Security
 - `javax.security.auth.Subject`

What is JCA ?

- Examples
 - JDBC resource adapter (outbound)
 - Wraps JDBC API and adds connection pooling
 - Timer resource adapter (inbound)
 - Enables Quartz to invoke MessageEndpoints
 - JMS resource adapter (bidirectional)
 - Wraps JMS API (outbound part)
 - Enables message invocation on MDBs (inbound)



Java Connector Architecture 1.6

JSR-322

JCA 1.6

- Developed in JCP
 - Sun (Spec lead), Red Hat, Oracle, IBM
 - Ericsson, SAP, Tmax
- Focus on 4 key areas
 - Ease of Development
 - Generic Work context
 - Security Inflow
 - Misc enhancements

JCA 1.6

- Ease of Development
 - Make use of annotations
 - @Connector
 - @ConnectionDefinitions
 - ...
 - Make META-INF/ra.xml optional
 - Sparse metadata
 - Better defaults

@Connector

```
public class MyResourceAdapterImpl implements ResourceAdapter
```

JCA 1.6

- Generic Work Context (Message delivery / Work submission)
 - WorkContextProvider
 - TransactionContext, SecurityContext, HintsContext

```
interface WorkContextProvider
    List<WorkContext> getWorkContextProviders();
```

```
interface WorkContext
    String getName();
    String getDescription();
```

JCA 1.6

- Security Inflow
 - End-to-end security model
 - Message delivery
 - Work processing
 - Uses JSR-196: Java Authentication Service Provider Interface for Containers
 - JSR-196 Callback's used for establish caller identity

JCA 1.6

- Misc enhancements
 - Transaction support at run-time
 - Distributed work
 - Message endpoint timeouts
 - Retryable exceptions
 - Classloading
 - Bean validation (JSR-303)

```
public class MyResourceAdapterImpl implements ResourceAdapter
    @ConfigProperty @NotNull @Size(min=5, max=5)
    private String myProperty;
```

JCA 1.6

- Standalone environment
 - Defines a JCA environment outside of an application server
 - Focus on outbound communication – inbound is optional
 - Includes transactions, security and bean validation
 - Up to vendor to choose the rest, like application component model



JBoss JCA

JBoss JCA

- The JBoss JCA project aims to implement the JCA 1.6 specification
- Three modes of operation
 - Standalone (JCA 1.6 Chapter 3.5)
 - Embedded
 - Inside JBoss Application Server

JBoss JCA

- POJO based architecture
 - Light-weight
 - Fast
- Depends on frameworks also used in JBoss Application Server
- Supports two POJO kernels
 - Fungal
 - JBoss Microcontainer

JBoss JCA

- Configuration done through XML files
 - Thread pools
 - WorkManager
 - BootstrapContext
 - Deployer chain
- Setup different environments for the resource adapters
 - Bind a RA to a BootstrapContext through `jboss-ra.xml`

JBoss JCA

```
<!-- RA deployer -->
<bean name="RADeployer"
      interface="com.github.fungal.spi.deployers.Deployer"
      class="org.jboss.jca.deployers.fungal.RADeployer">
  <property name="ArchiveValidation">true</property>
  <property name="ArchiveValidationFailOnWarn">false</property>
  <property name="ArchiveValidationFailOnError">true</property>
  <property name="BeanValidation">true</property>
  <property name="PrintStream">
    <inject bean="JBossStdioContext" property="Out"/>
  </property>
  <property name="DefaultBootstrapContext">
    <inject bean="DefaultBootstrapContext"/>
  </property>
  <property name="TransactionManager">
    <inject bean="RealTransactionManager"/>
  </property>
  <depends>BeanValidation</depends>
  <depends>JBossStdioContextSelector</depends>
</bean>
```

JBoss JCA

- Standalone environment
 - Kernel: Fungal / JBoss MC
 - Logging: JBoss Logging + JBoss Stdio
 - Naming: JBoss Naming
 - Threads: JBoss Threads
 - Bean validation: Hibernate Validator
 - Transactions: JBoss TS
 - Security: JBoss Security
 - Web: Jetty

JBoss JCA

- Embedded use-cases
 - Embed a JCA container inside an application
 - Easy unit testing of resource adapters
- Embedded container
 - Running In-VM
 - Built on standalone functionality
 - As easy as possible
 - Integration with ShrinkWrap and Arquillian

JBoss JCA

- Tools: Validator
 - Help resource adapter developers make their implementation spec compliant
 - Validates resource adapter against rules defined in the specification
 - ResourceAdapter, ManagedConnectionFactory, ManagedConnection, ...
 - Deployer, Standalone, Ant, Maven

JBoss JCA

- Tools: Code Generator
 - Help resource adapter developers get started
 - Generates code skeleton for
 - JCA 1.0, JCA 1.5, JCA 1.6
 - Based on user input / configuration
 - Provide implementation hints



Enough already !

DEMO TIME

The future

- Enterprise level features
- Optional parts of the specification
 - f.ex. DistributedWorkManager
- OSGi/JCA
- More focus on usability
 - especially embedded
- Tools / Samples

Last thoughts

- JCA 1.6 adds key areas to the specification
- Included in the full profile of Java Enterprise Edition 6
- The JBoss JCA standalone / embedded distribution provides a way to get started today

Join our hackfest !

- Application Server hackfest
 - 7.30 PM -> 2.00 AM
 - Meet core JBoss developers and follow hackers
 - Get a quick introduction to several projects
 - Start hacking on your issue of interest :)

Links

- JCA 1.6 (JSR-322)
 - <http://www.jcp.org/en/jsr/details?id=322>
- JBoss JCA
 - <http://www.jboss.org/jca>
- Fungal
 - <http://jesperpedersen.github.com/fungal/>
- JBoss MC
 - <http://www.jboss.org/jbossmc>

Links

- ShrinkWrap
 - <http://community.jboss.org/wiki/shrinkwrap>
- Arquillian
 - <http://www.jboss.org/arquillian>