JSR 342: Java EE 7 Platform

Linda DeMichiel
Java EE 7 Platform Specification Lead
The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle’s products remains at the sole discretion of Oracle.
Agenda

• Java EE 7 goals
• Main features
• Component JSRs
• Transparency
• Status and Schedule
Java EE 7 Goals

• Support for latest Web standards
• Ease of development, simplification
• Managed bean alignment
• Infrastructure, including in preparation for cloud support
Java EE 7 Goals

- Support for latest Web standards
  - HTML 5
  - WebSocket
  - JSON
  - JAX-RS
  - Servlet NIO, async
- Ease of development, simplification
- Managed bean alignment
- Infrastructure, including in preparation for cloud support
Java EE 7 Goals

• Support for latest Web standards
• Ease of development, simplification
  • JMS 2.0
  • Expanded use of injection
  • Bean Validation integration
  • Default resources
  • Pruning (JAX-RPC; EJB 2.X BMP, CMP Entity Beans; JAXR; Deployment API (JSR 88))
• Managed bean alignment
• Infrastructure, including in preparation for cloud support
Java EE 7 Goals

- Support for latest Web standards
- Ease of development, simplification
- Managed bean alignment
  - CDI enabled by default
  - Generalized use of CDI injection and interceptors across Java EE managed classes
  - Transactional interceptors
  - Method validation
- Infrastructure, including in preparation for cloud support
Java EE 7 Goals

- Support for latest Web standards
- Ease of development, simplification
- Managed bean alignment
- Infrastructure, including in preparation for cloud support
  - Resource definition metadata
  - Default DataSource and JMS ConnectionFactory resources
  - Improved security configuration
  - Schema generation
Java EE 7 JSRs

New or Updated

- JPA 2.1
- JAX-RS 2.0
- EJB 3.2
- JMS 2.0
- Servlet 3.1
- EL 3.0
- JSF 2.2

- CDI 1.1
- Bean Validation 1.1
- WebSocket 1.0
- JSON 1.0
- Batch Processing 1.0
- Concurrency Utilities 1.0 (?)
- JCache 1.0 (?)
Java EE 7 Maintenance Releases

- Common Annotations 1.2
- JTA 1.2
- Interceptors 1.2
- Connector 1.7
- JSP 2.3
- JASPI 1.2
- JACC 1.4
- JavaMail 1.5
Java EE 7 Web Profile

New or Updated

- JPA 2.1
- JAX-RS 2.0
- EJB 3.2 Lite
- JMS 2.0
- Servlet 3.1
- EL 3.0
- JSF 2.2
- CDI 1.1
- Bean Validation 1.1
- WebSocket 1.0
- JSON 1.0
- JSP 2.3 (MR)
- Common Annotations 1.2 (MR)
- JTA 1.2 (MR)
- Interceptors 1.2 (MR)
Managed Bean Alignment

- Enabling CDI by default
- Expanded Use of CDI Interceptors
- Transactional Interceptors
- TransactionScope
- On the roadmap (Java EE 8)
  - Expanded use of Stereotype-like functionality
  - Implicit Producers
CDI Enablement by Default

• CDI enabled by default in Java EE 7
  • Previously, CDI had to be enabled on per-archive basis with beans.xml

• CDI bean-defining annotations and beans.xml descriptor used to determine which classes are CDI beans

• CDI injection *and* interceptors apply to all Java EE components and related managed classes when CDI is enabled
Transactional Interceptors

Generalization of EJB ease-of-use-facility

- Annotations and semantics defined in JTA 1.2 MR

```java
@Inherited
@InterceptorBinding
@Target({TYPE, METHOD}) @Retention(RUNTIME)
public @interface Transactional {
    TxType value() default TxType.REQUIRED;
    Class[] rollbackOn() default {};
    Class[] dontRollbackOn() default {};
}

@Transactional(rollbackOn={SQLException.class},
               dontRollbackOn={SQLWarning.class})
public class ShoppingCart {...}
```
Transactional Scope

Standard scope for beans whose lifecycle is same as JTA transaction
• Annotations and semantics defined in JTA 1.2 MR
• Used for JMSContext objects

@NormalScope(passivating=true)
@Target({TYPE, METHOD, FIELD})
@Retention(RUNTIME)
public @interface TransactionScoped {}
Bean Validation

Method-level validation via CDI interceptors

```java
@Stateless
public class OrderService {
    ...
    public void shipOrder(
        @NotNull String productName,
        @Max(10) int quantity,
        String customerName,
        @Address String customerAddress) {
        ...
    }
}
```
Expanded Use of CDI Stereotype-like Functionality (Roadmap)

Proposal for creating annotations as combinations of existing ones

@RolesAllowed("Administrator")
@Metatype // NOTE: annotation name subject to change
@Target({TYPE, METHOD}) @Retention(RUNTIME)
public @interface Admin {}

@Stateless
@Metatype
@Target({TYPE}) @Retention(RUNTIME)
@admin
public @interface AdminBean {}

@adminBean
public class AdminEJB {...}
Implicit Producers (Roadmap)

Producer methods/fields currently needed for CDI injection of Java EE resources

• Instead of

```java
@Produces @Resource(lookup="java:comp/DefaultDataSource")
DataSource myDS;
```

• Proposed that we consider

```java
@Inject DataSource myDS;
```
Resource Definition Metadata

- Java EE 6 introduced DataSourceDefinition metadata
- Specifies resource needed by application
  ```java
  @DataSourceDefinition(
      name="java:app/jdbc/myDB",
      className="oracle.jdbc.pool.OracleDataSource",
      isolationLevel=TRANSACTION_REPEATABLE_READ,
      initialPoolSize=5
  )
  ```
- Referenced by @Resource via lookup element
  ```java
  @Stateless
  public class MySessionBean { 
    @Resource(lookup = "java:app/jdbc/myDB")
    DataSource myDB;
    ...
  }
  ```
Resource Definition Metadata

• Java EE 7 adds:
  • JMSC Connection Factory Definition
  • JMS Destination Definition
  • Connector Resource Definition
  • Administered Object Definition
  • Mail Session Definition

• Enhanced configurability in Java EE 7 apps
• Facilitates provisioning in cloud environments
“Default” Resources

• Default DataSource
  • Preconfigured resource for use by application in accessing provider-supplied database
    
    java:comp/DefaultDataSource

    @Resource(lookup="java:comp/DefaultDataSource")
    DataSource myDS;

    @Resource DataSource myDS;

• Default JMSConnectionFactory
  • Preconfigured resource for access to JMS Provider
    
    java:comp/DefaultJMSConnectionFactory
Improved Security Configuration

• Clarified requirements for support for security managers and required/expected permissions

• permissions.xml descriptors

```xml
<?xml version="1.0" encoding="UTF-8"?>
<permissions>
  <permission>
    <classname>java.io.FilePermission</classname>
    <name>/tmp/abc</name>
    <actions>read,write</actions>
  </permission>
  <permission>
    <classname>java.lang.RuntimePermission</classname>
    <name>createClassLoader</name>
  </permission>
</permissions>
```
JPA Schema Generation

- Generation of database tables, indexes, constraints, etc.
- Ease of development facility
- Needed for cloud support
- Designed for flexibility
  - Scenarios: (iterative) prototyping; production; provisioning environments
  - Generate from object/relational metadata
  - Generate from bundled SQL DDL scripts; also SQL load scripts
  - Generate directly into database
  - Generate into SQL DDL scripts
## EG Membership

<table>
<thead>
<tr>
<th>Companies</th>
<th>Expert Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle</td>
<td>Linda DeMichiel Bill Shannon</td>
</tr>
<tr>
<td>Red Hat</td>
<td>Jason Greene Pete Muir</td>
</tr>
<tr>
<td>IBM</td>
<td>Jim Knutson</td>
</tr>
<tr>
<td>Pramati</td>
<td>Deepak Anupalli</td>
</tr>
<tr>
<td>TongTech</td>
<td>Ming Li</td>
</tr>
<tr>
<td>TmaxSoft</td>
<td>Kyung Koo Yoon</td>
</tr>
<tr>
<td>OW2</td>
<td>Florent Benoit</td>
</tr>
<tr>
<td>Fujitsu</td>
<td>Minehiko Iida Minoru Nitta</td>
</tr>
<tr>
<td>ZeroTurnaround</td>
<td>Anton Arhipov</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adam Bien</td>
</tr>
<tr>
<td>Jeff Genender</td>
</tr>
<tr>
<td>Antonio Goncalves</td>
</tr>
<tr>
<td>Alex Heneveld</td>
</tr>
<tr>
<td>Jevgeni Kabanov</td>
</tr>
<tr>
<td>Werner Keil</td>
</tr>
<tr>
<td>Spike Washburn</td>
</tr>
<tr>
<td>Markus Eisele</td>
</tr>
</tbody>
</table>
Transparency

• High level of transparency for all Java EE JSRs
  • http://java.net/projects/javaee-spec/pages/Home
• Using java.net projects to run our JSRs in the open
  • One java.net project per specification
  • E.g., javaee-spec, jpa-spec, jax-rs-spec, ejb-spec,…
• Publicly viewable Expert Group mailing list archives
• Users observer lists get copies of all emails to the EG
• Public download areas, JIRAs
• Wikis, source repositories, etc. at the group discretion
• JCP.org private mailing lists for administrative / confidential info only
• Commitment to JCP 2.8 / 2.9 processes
Status and Schedule

- Target schedule publicly viewable at http://java.net/projects/javaee-spec/pages/Home#Java_EE_7_Schedule
- Nearly all JSRs now at Public Review Draft or later
- Final release target: April 2013
- Date-driven release: anything not ready will be deferred to Java EE 8
The preceding is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle’s products remains at the sole discretion of Oracle.