

Seam - #####

# ##### Java #####

## 2.2.2-SNAPSHOT

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## JBoss Seam ###

Seam ##### Java #####

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Seam #####Seam
#####
##### Web ##### (conversation
context) #####
```

Seam

```
#####
```

Unlike plain Java EE or J2EE components, Seam components may *simultaneously* access state associated with the web request and state held in transactional resources (without the need to propagate web request state manually via method parameters). You might object that the application layering imposed upon you by the old J2EE platform was a Good Thing. Well, nothing stops you creating an equivalent layered architecture using Seam — the difference is that *you* get to architect your own application and decide what the layers are and how they work together.

### JSF # EJB 3.0 ###

```
JSF # EJB 3.0 ##Java EE 5 #####EJB3
#####JSF
#####
# EJB3 #####Java EE 5
#####
```

```
Seam # JSF# EJB3 ##### (glue code)
#####
```

It is possible to write Seam applications where "everything" is an EJB. This may come as a surprise if you're used to thinking of EJBs as coarse-grained, so-called "heavyweight" objects. However, version 3.0 has completely changed the nature of EJB from the point of view of the developer. An EJB is a fine-grained object — nothing more complex than an annotated JavaBean. Seam even encourages you to use session beans as JSF action listeners!

```
##### EJB 3.0 #####EJB 3.0 ##### Java
#####Seam ##### Seam ##EJB #####
(lightweight)#####
```

### ## AJAX

```
Seam##### JSF ### AJAX #####JBoss RichFaces #
ICEfaces ##### JavaScript ##### AJAX
#####
```

```
#####Seam ##### JavaScript
##### JavaScript
```

```
##### JMS #####AJAX
#####
```

```
#####Seam
#####
AJAX #####
```

```
#####
#####Seam # jBPM #####jBPM # Seam
#####
```

```
Seam ##jBPM ##### (jPDL)
#####
```

```
JSF#####Seam
#####Seam ##### jBPM
#####
```

```
#####
EJB #####EJB 3.0
#####
##### (set) ##### (get)
#####
#####
```

Declarative application state management is made possible by the richness of the *context model* defined by Seam. Seam extends the context model defined by the servlet spec — request, session, application — with two new contexts — conversation and business process — that are more meaningful from the point of view of the business logic.

```
#####Hibernate #### JPA #### ORM
##### Seam #####
LazyInitializationException
#####
#####post-then-redirect
#####Seam
#####Web
#####
```

```
#####
##### (IoC: Inversion of Control) ##### (DI: Dependency Injection)
#####JSF # EJB3 #####
#####
(### JSF
#####)
```

```

##### (bijection) ##### (dynamic) ##### (contextual)
##### (bidirectional) ##### IoC
#####(#####)#####

#####
Seam
#####
(#####) #####Seam
#####

XML#####
####Java#####J2EE #####
#####XML #####Java
#####Java 5 #####

EJB 3.0 ## ##### (configuration by
exception)##### JSF ##### XML ##### Seam ## EJB
3.0 #####
##### JSF ##Bean##### XML ##### XML ##### (JSF
#####) #####

#####
Seam ##### Java
#####Java #
Web #####Seam #####Seam
##### (JSP ##### Facelets
###)##### JUnit ##### TestNG
##### IDE #####Seam # ##### JBoss
##### EJB #####

#####
Java
EE#####(####GET
##### JSF #####)Seam #####Seam #####JCP
#####

Web#####HTML#####
### Web #####Web #####Java
##### Web
#####E#####PDF#####wiki
#####Web ##### Seam
#####...

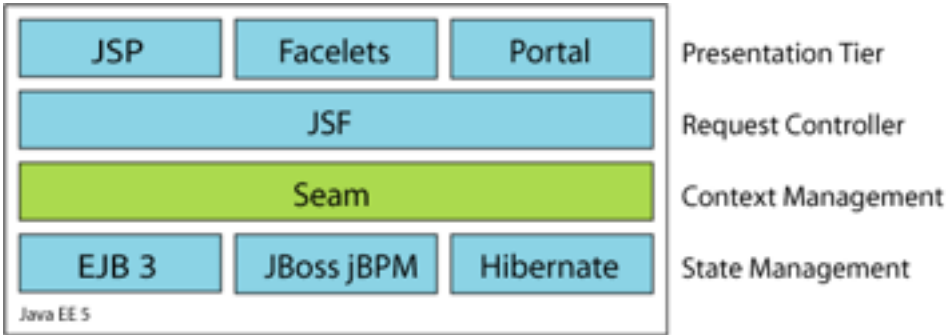
Seam##### JPA # Hibernate3 ##### EJB
##### Quartz##### jBPM##### JBoss Rules#E#####
Meldware Mail# ##### Hibernate Search # Lucene#####
JMS##### JBoss Cache #####Seam ##JAAS #JBoss Rules

```

#####PDF #####wiki ####  
#### JSF #####Seam #####Web #####  
JavaScript #### Google Web Toolkit ##### JSF #####

##### !

Seam #### Java EE #####Tomcat ##### EJB 3.0  
##### JPA #### Hibernate3 #  
Seam #####Tomcat ##### JBoss #####EJB 3.0  
#####



Seam # JSF # EJB3 ##### Java #### Web  
#####

## 1. Seam #####

Seam ##### [SeamFramework.org](http://www.seamframework.org) [http://www.seamframework.org/Community/Contribute] #####

---

## Seam #####

### 1.1. Seam #####

```
Seam      #      Seam      #####
##### Seam ##### Seam ##### Seam #####
examples ##### #####examples/registration #####
#####
```

- The view #####Web#####
- resources #####
- src #####

```
##### JBoss AS # Tomcat ##### ##### Ant
build.xml ##### Ant #####
```

#### 1.1.1. JBoss AS #####

The examples are configured for use on JBoss AS 4.2 or 5.0. You'll need to set `jboss.home`, in the shared `build.properties` file in the root folder of your Seam installation, to the location of your JBoss AS installation.

Once you've set the location of JBoss AS and started the application server, you can build and deploy any example by typing `ant explode` in the the directory for that example. Any example that is packaged as an EAR deploys to a URL like `/seam-example`, where `example` is the name of the example folder, with one exception. If the example folder begins with `seam`, the prefix "seam" is omitted. For instance, if JBoss AS is running on port 8080, the URL for the registration example is <http://localhost:8080/seam-registration/> [<http://localhost:8080/seam-registration/>], whereas the URL for the seam-space example is <http://localhost:8080/seam-space/> [<http://localhost:8080/seam-space/>].

If, on the other hand, the example gets packaged as a WAR, then it deploys to a URL like `/jboss-seam-example`. Most of the examples can be deployed as a WAR to Tomcat with Embedded JBoss by typing `ant tomcat.deploy`. Several of the examples can only be deployed as a WAR. Those examples are `groovybooking`, `hibernate`, `jpa`, and `spring`.

#### 1.1.2. Tomcat #####

```
##### Tomcat 6.0 #####Tomcat 6.0 ##### JBoss##### #30.6.1. #Embedded JBoss
##### ##### JBoss # Tomcat ## EJB3##### Seam
##### JBoss ##### Tomcat ##### non-EJB3 #####
```

```
Seam ##### build.properties ##### tomcat.home # Tomcat
##### Tomcat #####
```

## #1# Seam #####

Tomcat ##### Ant ##### Tomcat ##### example  
##### ant tomcat.deploy #####

On Tomcat, the examples deploy to URLs like `/jboss-seam-example`, so for the registration example the URL would be `http://localhost:8080/jboss-seam-registration/` [`http://localhost:8080/jboss-seam-registration/`]. The same is true for examples that deploy as a WAR, as mentioned in the previous section.

### 1.1.3. #####

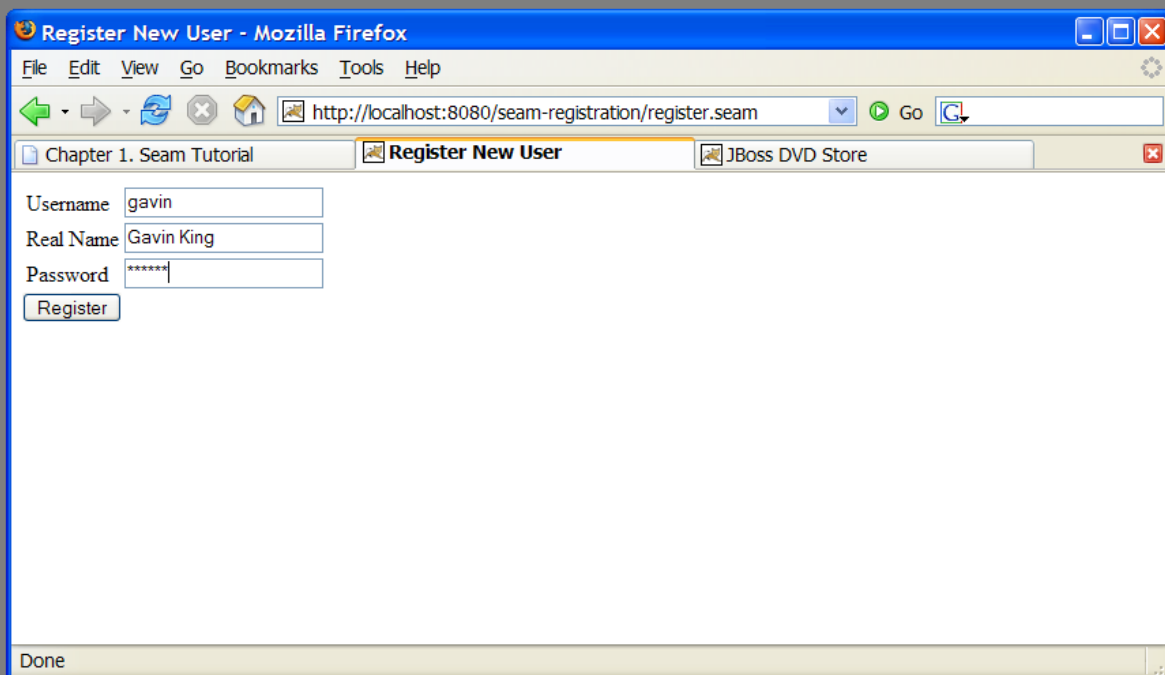
Most of the examples come with a suite of TestNG integration tests. The easiest way to run the tests is to run `ant test`. It is also possible to run the tests inside your IDE using the TestNG plugin. Consult the `readme.txt` in the examples directory of the Seam distribution for more information.

## 1.2. ##### Seam #####: #####

#####  
Seam ##### JSF ##### EJB3 ##### Bean #####  
Seam #####

EJB 3.0 #####

#####  
#####



## 1.2.1. #####

##### Facelets ##### Bean ##### Bean #####  
 "bottom" #####

### 1.2.1.1. ##### Bean: `User.java`

#####EJB##### Bean##### ##### # #####  
 ##### Seam #####

#### # 1.1. `User.java`

```

@Entity
@Name("user")
@Scope(SESSION)
@Table(name="users")
public class User implements Serializable
{
    private static final long serialVersionUID = 1881413500711441951L;

    private String username;
    private String password;
    private String name;

    public User(String name, String password, String username)
    {
        this.name = name;
        this.password = password;
        this.username = username;
    }

    public User() {}

    @NotNull @Length(min=5, max=15)
    public String getPassword()
    {
        return password;
    }

    public void setPassword(String password)
  
```

```
{
    this.password = password;
}

@NotNull
public String getName()
{
    return name;
}

public void setName(String name)
{
    this.name = name;
}

@Id @NotNull @Length(min=5, max=15)
public String getUsername()
{
    return username;
}

public void setUsername(String username)
{
    this.username = username;
}
}
```

8

- ① EJB3 ## @Entity ##### User ##### Bean #####
- ② Seam ##### @Name ##### #####  
##### Seam ##### JSF # Seam #  
Seam ##### (null) #### Seam  
##### JSF #### user  
##### Seam # User #####
- ③ Seam ##### @Scope  
#####  
##### User #####
- ④ EJB ## @Table ##### User #### users #####
- ⑤ name#password# username ## ##### Bean #####  
##### JSF #####
- ⑥ #####EJB # Seam #####



```

7 @NotNull # @Length ##### Hibernate Validator ##### Seam #
  Hibernate Validator ##### (### Hiberenate
  #####)#

```

```

8 EJB ## @Id ##### Bean #####

```

```

##### @Name # @Scope ##### Seam
#####

```

```

#####User ##### ## JSF ##### JSF #####
JSP ##### Bean #####

```

```

#### ##### Bean ##### JSF
##### ## Bean #####

```

### 1.2.1.2. ##### Bean ###: RegisterAction.java

```

##### Seam ##### Bean # JSF ##### (##### JavaBean
#####)

```

```

##### JSF ##### ##Bean #####
##### User Bean ##### Bean #####

```

```

#####

```

### # 1.2. RegisterAction.java

```

@Stateless                               1
@Name("register")
public class RegisterAction implements Register
{
    @In
    private User user;                       2

    @PersistenceContext
    private EntityManager em;                3

    @Logger
    private Log log;                          4

    public String register()
    {                                         5
        List existing = em.createQuery(
            "select username from User where username = #{user.username}")

```

```
.getResultList();

if (existing.size()==0)
{
    em.persist(user);
    log.info("Registered new user #{user.username}");

    return "/registered.xhtml";
}
else
{
    FacesMessages.instance().add("User #{user.username} already exists");

    return null;
}
}
```

- 1 EJB @Stateless ##### Bean #####
- 2 @In ##### Seam ##### Bean #####user (#####) #####
- 3 EJB ## @PersistenceContext ##### EJB3 ##### Entity Manager #####
- 4 Seam @Logger ##### Log #####
- 5 ##### ## EJB3 EntityManager API #####JSF ## (outcome) ##### Bean ### register() #####
- 6 Seam ## EJB-QL ## JSF EL ##### JPA setParameter() ### JPA Query #####?
- 7 The Log API lets us easily display templated log messages which can also make use of JSF EL expressions.
- 8 JSF ##### (outcome) ##### null ## (outcome) (#####void #####) ## ##### JSF ### ## (outcome) ## JSF ### id ##### JSF ##### Seam #### (outcome) ### JSF ### id ##### ## (outcome) ##### id ##### Seam #####
- 9 Seam provides a number of *built-in components* to help solve common problems. The `FacesMessages` component makes it easy to display templated error or success messages. (As of Seam 2.1, you can use `StatusMessages` instead to remove the semantic dependency on JSF). Built-in Seam components may be obtained by injection, or by calling the `instance()` method on the class of the built-in component.

```

#####@Scope          #####                               #           Seam
#####                               #####           Bean
#####

#####      Bean      #####
#####      Seam#####      #####      Web
#####                               Seam
#####

#####                               Seam
#####
#####

```

### 1.2.1.3. ##### Bean ##### : Register.java

```
##### Bean #####
```

### # 1.3. Register.java

```

@Local
public interface Register
{
    public String register();
}

```

```
Java ##### ## #####
```

### 1.2.1.4. ### : register.xhtml # registered.xhtml

```
Seam ##### JSF ##### #####JSP
##### Facelets #####
```

### # 1.4. register.xhtml

```

<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
    "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
    xmlns:s="http://jboss.com/products/seam/taglib"
    xmlns:h="http://java.sun.com/jsf/html"
    xmlns:f="http://java.sun.com/jsf/core">

    <head>
        <title>Register New User</title>

```

## #1# Seam #####

---

```
</head>
<body>
  <f:view>
    <h:form>
      <s:validateAll>
        <h:panelGrid columns="2">
          Username: <h:inputText value="#{user.username}" required="true"/>
          Real Name: <h:inputText value="#{user.name}" required="true"/>
          Password: <h:inputSecret value="#{user.password}" required="true"/>
        </h:panelGrid>
      </s:validateAll>
      <h:messages/>
      <h:commandButton value="Register" action="#{register.register}"/>
    </h:form>
  </f:view>
</body>

</html>
```

```
### Seam ##### <s:validateAll> ##### ## JSF ##### #####
Bean ##### Hibernate Validator ##### JSF #####
```

### # 1.5. registered.xhtml

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
  xmlns:f="http://java.sun.com/jsf/core">

  <head>
    <title>Successfully Registered New User</title>
  </head>
  <body>
    <f:view>
      Welcome, #{user.name}, you are successfully registered as #{user.username}.
    </f:view>
  </body>

</html>
```

This is a simple Facelets page using some inline EL. There's nothing specific to Seam here.

### 1.2.1.5. Seam ##### : components.xml

```
#### Seam ##### Seam #####
#####Seam#####
#####
```

```
##### Java ##### XML
##### Seam ##### XML
##### Seam ##### XML #####
## XML#####
```

```
##### (###Seam #####)#
##### WEB-INF ##### components.xml
##### Seam # JNDI # EJB ##### components.xml
#####
```

## # 1.6. components.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:core="http://jboss.com/products/seam/core"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="
    http://jboss.com/products/seam/core
    http://jboss.com/products/seam/core-2.2.xsd
    http://jboss.com/products/seam/components
    http://jboss.com/products/seam/components-2.2.xsd">

  <core:init jndi-pattern="@jndiPattern@"/>

</components>
```

This code configures a property named `jndiPattern` of a built-in Seam component named `org.jboss.seam.core.init`. The funny `@` symbols are there because our Ant build script puts the correct JNDI pattern in when we deploy the application, which it reads from the `components.properties` file. You learn more about how this process works in [#5.2. #components.xml#####](#).

### 1.2.1.6. WEB ##### : web.xml

```
##### WAR #####Web#####
```

## # 1.7. web.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns="http://java.sun.com/xml/ns/javaee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="
    http://java.sun.com/xml/ns/javaee
    http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
  version="2.5">

  <listener>
    <listener-class>org.jboss.seam.servlet.SeamListener</listener-class>
  </listener>

  <context-param>
    <param-name>javax.faces.DEFAULT_SUFFIX</param-name>
    <param-value>.xhtml</param-value>
  </context-param>

  <servlet>
    <servlet-name>Faces Servlet</servlet-name>
    <servlet-class>javax.faces.webapp.FacesServlet</servlet-class>
    <load-on-startup>1</load-on-startup>
  </servlet>

  <servlet-mapping>
    <servlet-name>Faces Servlet</servlet-name>
    <url-pattern>*.seam</url-pattern>
  </servlet-mapping>

  <session-config>
    <session-timeout>10</session-timeout>
  </session-config>

</web-app>
```

```
## web.xml ##### Seam # JSF ##### ##### Seam #####
```

### 1.2.1.7. JSF ## : faces-config.xml

```
##### Seam ##### JSF ##### ##### faces-config.xml #####
##### Facelets ##### JSF ##### Faceles #####
```

## # 1.8. faces-config.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<faces-config xmlns="http://java.sun.com/xml/ns/javaee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="
    http://java.sun.com/xml/ns/javaee
    http://java.sun.com/xml/ns/javaee/web-facesconfig_1_2.xsd"
  version="1.2">

  <application>
    <view-handler>com.sun.facelets.FaceletViewHandler</view-handler>
  </application>

</faces-config>
```

Note that we don't need any JSF managed bean declarations! Our managed beans are annotated Seam components. In Seam applications, the `faces-config.xml` is used much less often than in plain JSF. Here, we are simply using it to enable Facelets as the view handler instead of JSP.

In fact, once you have all the basic descriptors set up, the *only* XML you need to write as you add new functionality to a Seam application is orchestration: navigation rules or jBPM process definitions. Seam's stand is that *process flow* and *configuration data* are the only things that truly belong in XML.

```
##### ### id #####
```

### 1.2.1.8. EJB ##### : `ejb-jar.xml`

```
ejb-jar.xml ##### Bean # SeamInterceptor ##### EJB3
#####
```

```
<?xml version="1.0" encoding="UTF-8"?>
<ejb-jar xmlns="http://java.sun.com/xml/ns/javaee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="
    http://java.sun.com/xml/ns/javaee
    http://java.sun.com/xml/ns/javaee/ejb-jar_3_0.xsd"
  version="3.0">

  <interceptors>
    <interceptor>
      <interceptor-class>org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
    </interceptor>

  </interceptors>
```

## #1# Seam #####

---

```
</interceptors>

<assembly-descriptor>
  <interceptor-binding>
    <ejb-name>*</ejb-name>
    <interceptor-class>org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
  </interceptor-binding>
</assembly-descriptor>

</ejb-jar>
```

### 1.2.1.9. EJB ##### : persistence.xml

```
persistence.xml #####EJB #####
#####
```

```
<?xml version="1.0" encoding="UTF-8"?>
<persistence xmlns="http://java.sun.com/xml/ns/persistence"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="
    http://java.sun.com/xml/ns/persistence
    http://java.sun.com/xml/ns/persistence/persistence_1_0.xsd"
  version="1.0">

  <persistence-unit name="userDatabase">
    <provider>org.hibernate.ejb.HibernatePersistence</provider>
    <jta-data-source>java:/DefaultDS</jta-data-source>
    <properties>
      <property name="hibernate.hbm2ddl.auto" value="create-drop"/>
    </properties>
  </persistence-unit>

</persistence>
```

### 1.2.1.10. EAR ##### : application.xml

```
####EAR### #####
```

### # 1.9. #####

```
<?xml version="1.0" encoding="UTF-8"?>
<application xmlns="http://java.sun.com/xml/ns/javaee"
```



```

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="
    http://java.sun.com/xml/ns/javaee
    http://java.sun.com/xml/ns/javaee/application_5.xsd"
version="5">

<display-name>Seam Registration</display-name>

<module>
  <web>
    <web-uri>jboss-seam-registration.war</web-uri>
    <context-root>/seam-registration</context-root>
  </web>
</module>
<module>
  <ejb>jboss-seam-registration.jar</ejb>
</module>
<module>
  <ejb>jboss-seam.jar</ejb>
</module>
<module>
  <java>jboss-el.jar</java>
</module>

</application>

```

```

##### WEB##### /seam-
registration #####

```

```
#####
```

## 1.2.2. ####

```

##### JSF ##Seam # user #####
(## Seam #####)# Seam ##user ##### ## Seam #####
User ##### Bean ##### JSF #####

```

```

##### User ##### Hibernate Validator #####
##### JSF ##### ##### User ##### Bean #####

```

Next, JSF asks Seam to resolve the variable named `register`. Seam uses the JNDI pattern mentioned earlier to locate the stateless session bean, wraps it as a Seam component, and returns it. Seam then presents this component to JSF and JSF invokes the `register()` action listener method.

## #1# Seam #####

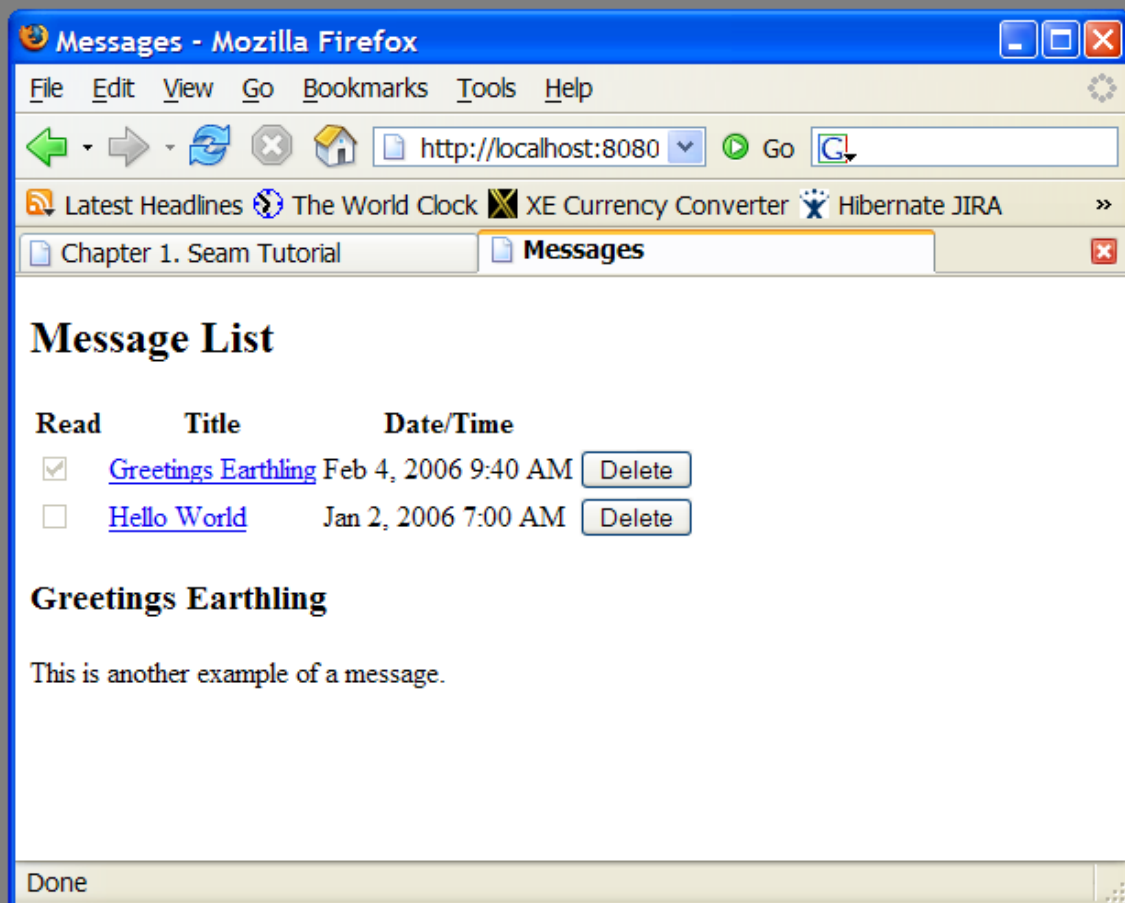
But Seam is not done yet. Seam intercepts the method call and injects the `User` entity from the Seam session context, before allowing the invocation to continue.

```
register() ##### FacesMessages
##### null ## (outcome) ##### FacesMessages
##### JSF ##### JSF FacesMessage #####

#####"/registered.xhtml" ## (outcome) ### registered.xhtml
##### JSF ##### Seam # user ##### Seam
##### User #####
```

## 1.3. Seam #####: #####

```
##### Seam ##EJB-
QL ###HQL ##### JSF <h:dataTable>
##### JSF #####
```



### 1.3.1. #####

##### Bean ### Message# ##### Bean ### MessageListBean# #####  
JSP #####

#### 1.3.1.1. ##### Bean : Message.java

Message ##### Bean ## #####

### # 1.10. Message.java

```
@Entity
@Name("message")
@Scope(EVENT)
public class Message implements Serializable
{
    private Long id;
    private String title;
    private String text;
    private boolean read;
    private Date datetime;

    @Id @GeneratedValue
    public Long getId()
    {
        return id;
    }
    public void setId(Long id)
    {
        this.id = id;
    }

    @NotNull @Length(max=100)
    public String getTitle()
    {
        return title;
    }
    public void setTitle(String title)
    {
        this.title = title;
    }

    @NotNull @Lob
    public String getText()
```

```
{
    return text;
}
public void setText(String text)
{
    this.text = text;
}

@NotNull
public boolean isRead()
{
    return read;
}
public void setRead(boolean read)
{
    this.read = read;
}

@NotNull
@Basic @Temporal(TemporalType.TIMESTAMP)
public Date getDatetime()
{
    return datetime;
}
public void setDatetime(Date datetime)
{
    this.datetime = datetime;
}
}
```

### 1.3.1.2. ##### Bean : `MessageManagerBean.java`

```
#####          #####          Bean          MessageManagerBean          #####
#####
#####
```

But `MessageManagerBean` is also responsible for fetching the list of messages the first time we navigate to the message list page. There are various ways the user could navigate to the page, and not all of them are preceded by a JSF action — the user might have bookmarked the page, for example. So the job of fetching the message list takes place in a Seam *factory method*, instead of in an action listener method.

```
#####          #####          Bean          #####
```

## # 1.11. MessageManagerBean.java

```
@Stateful
@Scope(SESSION)
@Name("messageManager")
public class MessageManagerBean implements Serializable, MessageManager
{
    @DataModel
    private List<Message> messageList; ①

    @DataModelSelection
    @Out(required=false) ②
    private Message message; ③

    @PersistenceContext(type=EXTENDED)
    private EntityManager em; ④

    @Factory("messageList")
    public void findMessages() ⑤
    {
        messageList = em.createQuery("select msg from Message msg order by msg.datetime desc")
            .getResultList();
    }

    public void select()
    {
        message.setRead(true); ⑥
    }

    public void delete()
    {
        messageList.remove(message); ⑦
        em.remove(message);
        message=null;
    }

    @Remove
    public void destroy() {} ⑧
}
```

## #1# Seam #####

```
}
```

```
① @DataModel ##### java.util.List ##### javax.faces.model.DataModel
##### JSF ##### ##### JSF <h:dataTable>
##### ##### DataModel ## messageList
#####

② @DataModelSelection ##### Seam ##### List
#####

③ The @Out annotation then exposes the selected value directly to the page. So every time
a row of the clickable list is selected, the Message is injected to the attribute of the stateful
bean, and the subsequently outjected to the event context variable named message.

④ ##### Bean ##EJB3 ##### ## Bean ##### messages
##### ##### Bean ##### EntityManager
#####

⑤ ### JSP ##### messageList ##### @Factory
#####Seam # MessageManagerBean ##### findMessages()
##### findMessages() # messages # #####

⑥ select() ##### Message# ## #####

⑦ delete() ##### Message #####

⑧ ##### Bean # Seam #####@Remove
##### #####Seam
##### Seam ##### Bean #####

##### Seam #####
##### (Seam
#####)
```

### 1.3.1.3. ##### Bean ##### : MessageManager.java

```
##### Bean #####
```

## # 1.12. MessageManager.java

```
@Local
public interface MessageManager
{
    public void findMessages();
    public void select();
    public void delete();
    public void destroy();
}
```

#####

```
components.xml#persistence.xml#web.xml#ejb-jar.xml#faces-config.xml      ###
application.xml ##### JSP #####
```

### 1.3.1.4. ###: messages.jsp

```
##JSP#### JSF <h:dataTable> ##### Seam #####
```

## # 1.13. messages.jsp

```
<%@ taglib uri="http://java.sun.com/jsf/html" prefix="h" %>
<%@ taglib uri="http://java.sun.com/jsf/core" prefix="f" %>
<html>
<head>
<title>
>Messages</title>
</head>
<body>
<f:view>
<h:form>
<h2>
>Message List</h2>
<h:outputText value="No messages to display"
rendered="#{messageList.rowCount==0}"/>
<h:dataTable var="msg" value="#{messageList}"
rendered="#{messageList.rowCount
>0}">
<h:column>
<f:facet name="header">
<h:outputText value="Read"/>
</f:facet>
<h:selectBooleanCheckbox value="#{msg.read}" disabled="true"/>
</h:column>
<h:column>
<f:facet name="header">
<h:outputText value="Title"/>
</f:facet>
<h:commandLink value="#{msg.title}" action="#{messageManager.select}"/>
</h:column>
<h:column>
<f:facet name="header">
<h:outputText value="Date/Time"/>
</f:facet>
<h:outputText value="#{msg.datetime}"/>
```

## #1# Seam #####

---

```
        <f:convertDateTime type="both" dateStyle="medium" timeStyle="short"/>
    </h:outputText>
</h:column>
<h:column>
    <h:commandButton value="Delete" action="#{messageManager.delete}"/>
</h:column>
</h:dataTable>
<h3
><h:outputText value="#{message.title}"/></h3>
    <div
><h:outputText value="#{message.text}"/></div>
    </h:form>
</f:view>
</body>
</html
>
```

### 1.3.2. #####

```
### messages.jsp ##### messageList #####
##### Seam ##### findMessages()#####
##### (outject) ### DataModel ##### ## DataModel #
<h:dataTable> #####

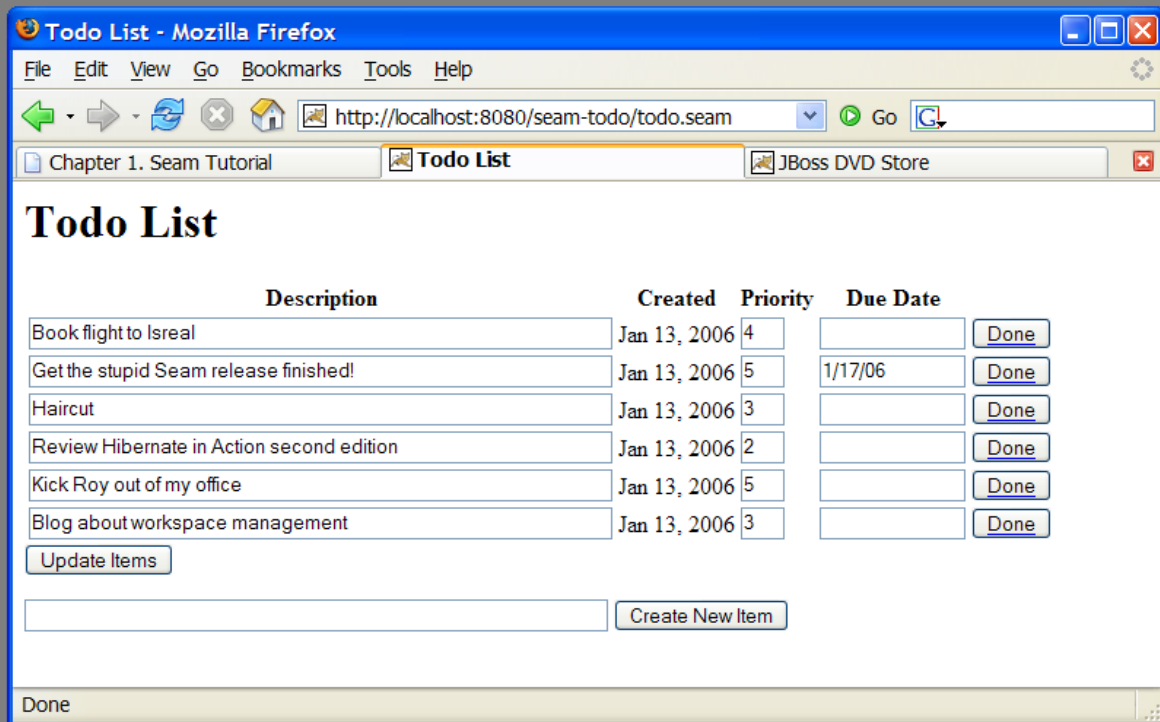
##### <h:commandLink> ##### JSF # select() ##### Seam
##### messageManager ##### message #####
##### ## Message ##### Seam #### Message
# message ##### ### EJB #####
Message ##### #### #####
#####

##### <h:commandButton> ##### JSF ##delete() ##### Seam
##### messageList ##### message #####
##### ## Message ##### EntityManager # remove() #####
##### Seam # messageList ##### message #####
EJB # ##### Message ##### #### #####
#####
```

### 1.4. Seam # jBPM : TO-DO #####

```
jBPM ##### jBPM # Seam ##### ##
To-Do #####jBPM ##### Java
#####
```





### 1.4.1. #####

#####jBPM ##### ### JSP ##### JavaBean #####  
 (##### Bean #####) #####

#### # 1.14. todo.jpdl.xml

```

<process-definition name="todo">

    <start-state name="start">                                ①
        <transition to="todo"/>
    </start-state>

    <task-node name="todo">                                  ②
        <task name="todo" description="#{todoList.description}"> ③
            <assignment actor-id="#{actor.id}"/>                ④
        </task>
        <transition to="done"/>
    </task-node>
  
```

## #1# Seam #####

```
<end-state name="done"/>
```

5

```
</process-definition
```

```
>
```

```
① <start-state> ##### todo #####
② <task-node> #####
③ <task> #####
##### todoList ##### Seam #####
(JavaBean # ##) ## description #####
④ #####
##### actor ##### Seam
##### Seam #####
⑤ <end-state>#####
```

JBossIDE #####



```
#####  
#####
```

---

```
### JavaBean ##### login.jsp ##### ##### actor ##### jBPM actor id
#####
```

## # 1.15. Login.java

```
@Name("login")
public class Login
{
    @In
    private Actor actor;

    private String user;

    public String getUser()
    {
        return user;
    }

    public void setUser(String user)
    {
        this.user = user;
    }

    public String login()
    {
        actor.setld(user);
        return "/todo.jsp";
    }
}
```

```
##### Actor ##### @In #####
```

```
## JSP #####
```

## # 1.16. login.jsp

```
<%@ taglib uri="http://java.sun.com/jsf/html" prefix="h"%>
<%@ taglib uri="http://java.sun.com/jsf/core" prefix="f"%>
<html>
<head>
<title
>Login</title>
</head>
```

```
<body>
<h1
>Login</h1>
<f:view>
  <h:form>
    <div>
      <h:inputText value="#{login.user}"/>
      <h:commandButton value="Login" action="#{login.login}"/>
    </div>
  </h:form>
</f:view>
</body>
</html
>
```

#### JavaBean #####

### # 1.17. TodoList.java

```
@Name("todoList")
public class TodoList
{
  private String description;

  public String getDescription() 1
  {
    return description;
  }

  public void setDescription(String description)
  {
    this.description = description;
  } 2

  @CreateProcess(definition="todo")
  public void createTodo() {} 3

  @StartTask @EndTask
  public void done() {}
```

}

① The description property accepts user input from the JSP page, and exposes it to the process definition, allowing the task description to be set.

② Seam @CreateProcess ##### jBPM #####

③ Seam @StartTask ##### @EndTask  
#####

##### @StartTask # @EndTask #####  
#####

##### todo.jsp #####

## # 1.18. todo.jsp

```
<%@ taglib uri="http://java.sun.com/jsf/html" prefix="h" %>
<%@ taglib uri="http://java.sun.com/jsf/core" prefix="f" %>
<%@ taglib uri="http://jboss.com/products/seam/taglib" prefix="s" %>
<html>
<head>
<title>
>Todo List</title>
</head>
<body>
<h1>
>Todo List</h1>
<f:view>
<h:form id="list">
<div>
<h:outputText value="There are no todo items."
rendered="#{empty taskInstanceList}"/>
<h:dataTable value="#{taskInstanceList}" var="task"
rendered="#{not empty taskInstanceList}">
<h:column>
<f:facet name="header">
<h:outputText value="Description"/>
</f:facet>
<h:inputText value="#{task.description}"/>
</h:column>
<h:column>
<f:facet name="header">
<h:outputText value="Created"/>
</f:facet>
<h:outputText value="#{task.taskMgmtInstance.processInstance.start}">
```

```
<f:convertDateTime type="date"/>
</h:outputText>
</h:column>
<h:column>
  <f:facet name="header">
    <h:outputText value="Priority"/>
  </f:facet>
  <h:inputText value="#{task.priority}" style="width: 30"/>
</h:column>
<h:column>
  <f:facet name="header">
    <h:outputText value="Due Date"/>
  </f:facet>
  <h:inputText value="#{task.dueDate}" style="width: 100">
    <f:convertDateTime type="date" dateStyle="short"/>
  </h:inputText>
</h:column>
<h:column>
  <s:button value="Done" action="#{todoList.done}" taskInstance="#{task}"/>
</h:column>
</h:dataTable>
</div>
<div>
<h:messages/>
</div>
<div>
  <h:commandButton value="Update Items" action="update"/>
</div>
</h:form>
<h:form id="new">
  <div>
    <h:inputText value="#{todoList.description}"/>
    <h:commandButton value="Create New Item" action="#{todoList.createTodo}"/>
  </div>
</h:form>
</f:view>
</body>
</html>
>
```

#####

##### taskInstanceList ##### Seam #####  
#####JSF#####

**# 1.19. todo.jsp**

```

<h:form id="list">
  <div>
    <h:outputText value="There are no todo items." rendered="#{empty taskInstanceList}"/>
    <h:dataTable value="#{taskInstanceList}" var="task"
      rendered="#{not empty taskInstanceList}">
      ...
    </h:dataTable>
  </div>
</h:form
>

```

```

##### jBPM ### TaskInstance #####
#### (Description) # ### (Priority) ## #### (Due Date) #####
#####

```

```

<h:column>
  <f:facet name="header">
    <h:outputText value="Description"/>
  </f:facet>
  <h:inputText value="#{task.description}"/>
</h:column>
<h:column>
  <f:facet name="header">
    <h:outputText value="Created"/>
  </f:facet>
  <h:outputText value="#{task.taskMgmtInstance.processInstance.start}">
    <f:convertDateTime type="date"/>
  </h:outputText>
</h:column>
<h:column>
  <f:facet name="header">
    <h:outputText value="Priority"/>
  </f:facet>
  <h:inputText value="#{task.priority}" style="width: 30"/>
</h:column>
<h:column>
  <f:facet name="header">
    <h:outputText value="Due Date"/>
  </f:facet>
  <h:inputText value="#{task.dueDate}" style="width: 100">

```

## #1# Seam #####

---

```
<f:convertDateTime type="date" dateStyle="short"/>
</h:inputText>
</h:column
>
```



##

Seam provides a default JSF date converter for converting a string to a date (no time). Thus, the converter is not necessary for the field bound to `#{task.dueDate}`.

```
##### @StartTask @EndTask ##### task id
##### Seam #####
```

```
<h:column>
  <s:button value="Done" action="#{todoList.done}" taskInstance="#{task}"/>
</h:column
>
```

```
### seam-ui.jar ##### Seam <s:button> JSF #####
##### Seam # jBPM #####
#####
```

```
<h:commandButton value="Update Items" action="update"/>
```

```
#####
@CreateProcess#####
```

```
<h:form id="new">
  <div>
    <h:inputText value="#{todoList.description}"/>
    <h:commandButton value="Create New Item" action="#{todoList.createTodo}"/>
  </div>
</h:form
>
```



## 1.4.2. ####

```
#####todo.jsp ##### To-Do ##### taskInstanceList
##### todo #####"Create New Item"
######{todoList.createTodo} ##### todo.jpdl.xml #####
```

```
#####start ##### todo #####
######{todoList.description} #####
##### Seam # actor #####
#####
#####
```

```
todo.jsp #####taskInstanceList ##### h:dataTable
######{task.description}# #{task.priority}# #{task.dueDate}
#####
```

```
#To-Do### "Done" ######{todoList.done} ##### todoList
##### s:button # taskInstance="#{task}"
##### @StartTast # @EndTask
##### done
#####
```

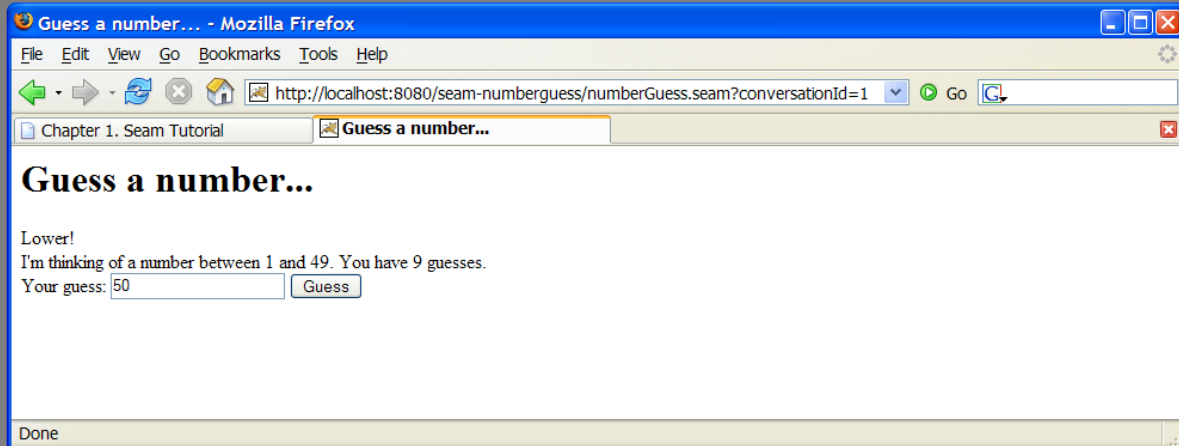
```
todo.jsp ##### taskInstanceList #####
#####
```

## 1.5. Seam #####: #####

```
##### (#####) ##### Seam ##### JSF/Seam
#####
#####
#####
```

```
Seam #####jPDL #####
#####
```

## #1# Seam #####



### 1.5.1. #####

##### ##JavaBean##### JSP ##### jPDL #####

## # 1.20. pageflow.jpdl.xml

```
<pageflow-definition
  xmlns="http://jboss.com/products/seam/pageflow"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://jboss.com/products/seam/pageflow
    http://jboss.com/products/seam/pageflow-2.2.xsd"
  name="numberGuess">

  <start-page name="displayGuess" view-id="/numberGuess.jspx">           1
    <redirect/>

    <transition name="guess" to="evaluateGuess">                         2
      <action expression="#{numberGuess.guess}"/>                         3
    </transition>
    <transition name="giveup" to="giveup"/>
    <transition name="cheat" to="cheat"/>
  </start-page>

  <decision name="evaluateGuess" expression="#{numberGuess.correctGuess}"> 4
    <transition name="true" to="win"/>
    <transition name="false" to="evaluateRemainingGuesses"/>
  </decision>
```

```

<decision name="evaluateRemainingGuesses" expression="#{numberGuess.lastGuess}">
  <transition name="true" to="lose"/>
  <transition name="false" to="displayGuess"/>
</decision>

<page name="giveup" view-id="/giveup.jspx">
  <redirect/>
  <transition name="yes" to="lose"/>
  <transition name="no" to="displayGuess"/>
</page>

<process-state name="cheat">
  <sub-process name="cheat"/>
  <transition to="displayGuess"/>
</process-state>

<page name="win" view-id="/win.jspx">
  <redirect/>
  <end-conversation/>
</page>

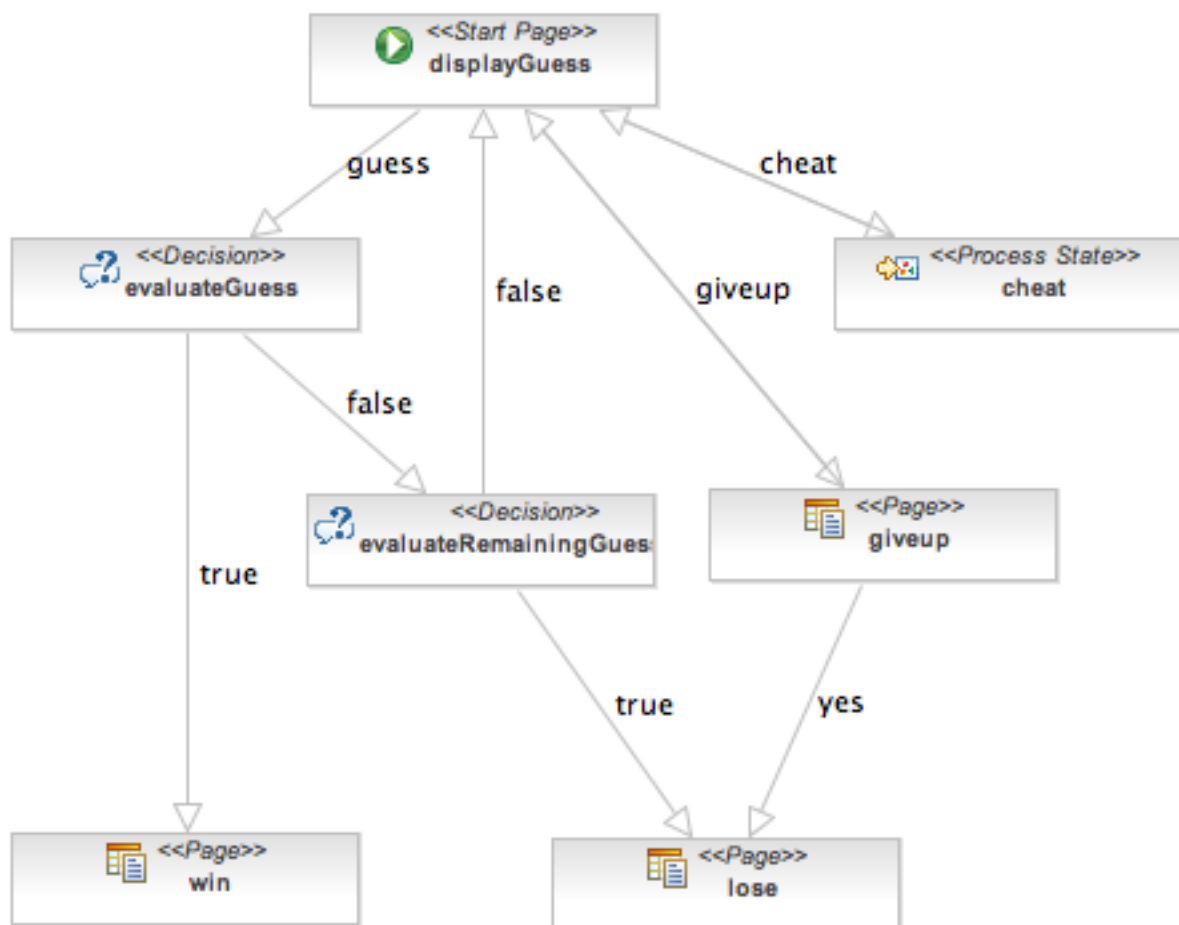
<page name="lose" view-id="/lose.jspx">
  <redirect/>
  <end-conversation/>
</page>

</pageflow-definition>

```

- ① <page> ##### JSF ##### view-id  
#### JSF ##### JSF ### ##### redirect ####Seam  
# post-then-redirect ##### (##### URL #####)
- ② <transition> ### JSF ## (outcome) ##### JSF ##### (outcome) #####  
transition ##### jBPM #####
- ③ transition # <action> ## jBPM # transition##### JSF #####  
##### Seam #####
- ④ <decision> ##### JSF EL #####

### JBoss Developer Studio #####



#####

##### numberGuess . jsp# ###

### # 1.21. numberGuess.jsp#

```
<<?xml version="1.0"?>
<jsp:root xmlns:jsp="http://java.sun.com/JSP/Page"
  xmlns:h="http://java.sun.com/jsf/html"
  xmlns:f="http://java.sun.com/jsf/core"
  xmlns:s="http://jboss.com/products/seam/taglib"
  xmlns="http://www.w3.org/1999/xhtml"
  version="2.0">
<jsp:output doctype-root-element="html"
  doctype-public="-//W3C//DTD XHTML 1.0 Transitional//EN"
  doctype-system="http://www.w3c.org/TR/xhtml1/DTD/xhtml1-transitional.dtd"/>
<jsp:directive.page contentType="text/html"/>
```

```
<html>
<head>
  <title>Guess a number...</title>
  <link href="niceforms.css" rel="stylesheet" type="text/css" />
  <script language="javascript" type="text/javascript" src="niceforms.js" />
</head>
<body>
  <h1>Guess a number...</h1>
  <f:view>
    <h:form styleClass="niceform">

      <div>
        <h:messages globalOnly="true"/>
        <h:outputText value="Higher!"
          rendered="#{numberGuess.randomNumber gt numberGuess.currentGuess}"/>
        <h:outputText value="Lower!"
          rendered="#{numberGuess.randomNumber lt numberGuess.currentGuess}"/>
      </div>

      <div>
        I'm thinking of a number between
        <h:outputText value="#{numberGuess.smallest}"/> and
        <h:outputText value="#{numberGuess.biggest}"/>. You have
        <h:outputText value="#{numberGuess.remainingGuesses}"/> guesses.
      </div>

      <div>
        Your guess:
        <h:inputText value="#{numberGuess.currentGuess}" id="inputGuess"
          required="true" size="3"
          rendered="#{(numberGuess.biggest-numberGuess.smallest) gt 20}">
        <f:validateLongRange maximum="#{numberGuess.biggest}"
          minimum="#{numberGuess.smallest}"/>
      </h:inputText>
        <h:selectOneMenu value="#{numberGuess.currentGuess}"
          id="selectGuessMenu" required="true"
          rendered="#{(numberGuess.biggest-numberGuess.smallest) le 20 and
            (numberGuess.biggest-numberGuess.smallest) gt 4}">
          <s:selectItems value="#{numberGuess.possibilities}" var="i" label="#{i}"/>
        </h:selectOneMenu>
        <h:selectOneRadio value="#{numberGuess.currentGuess}" id="selectGuessRadio"
          required="true"
          rendered="#{(numberGuess.biggest-numberGuess.smallest) le 4}">
          <s:selectItems value="#{numberGuess.possibilities}" var="i" label="#{i}"/>
      </div>
    </h:form>
  </f:view>
</body>
</html>
```

## #1# Seam #####

---

```
</h:selectOneRadio>
<h:commandButton value="Guess" action="guess"/>
<s:button value="Cheat" view="/confirm.jspx"/>
<s:button value="Give up" action="giveup"/>
</div>

<div>
<h:message for="inputGuess" style="color: red"/>
</div>

</h:form>
</f:view>
</body>
</html>
</jsp:root>
```

```
##### guess transition#####
```

```
win.jspx #####
```

## # 1.22. win.jspx

```
<jsp:root xmlns:jsp="http://java.sun.com/JSP/Page"
  xmlns:h="http://java.sun.com/jsf/html"
  xmlns:f="http://java.sun.com/jsf/core"
  xmlns="http://www.w3.org/1999/xhtml"
  version="2.0">
  <jsp:output doctype-root-element="html"
    doctype-public="-//W3C//DTD XHTML 1.0 Transitional//EN"
    doctype-system="http://www.w3c.org/TR/xhtml1/DTD/xhtml1-transitional.dtd"/>
  <jsp:directive.page contentType="text/html"/>
  <html>
  <head>
  <title
  >You won!</title>
  <link href="niceforms.css" rel="stylesheet" type="text/css" />
  </head>
  <body>
  <h1
  >You won!</h1>
  <f:view>
  Yes, the answer was <h:outputText value="#{numberGuess.currentGuess}" />.
  It took you <h:outputText value="#{numberGuess.guessCount}" /> guesses.
  <h:outputText value="But you cheated, so it doesn't count!"
```

```

        rendered="#{numberGuess.cheat}"/>
        Would you like to <a href="numberGuess.seam"
>play again</a
>?
    </f:view>
</body>
</html>
</jsp:root>

```

lose.jspx #####

#####

### # 1.23. NumberGuess.java

```

@Name("numberGuess")
@Scope(ScopeType.CONVERSATION)
public class NumberGuess implements Serializable {

    private int randomNumber;
    private Integer currentGuess;
    private int biggest;
    private int smallest;
    private int guessCount;
    private int maxGuesses;
    private boolean cheated;

    @Create
    public void begin()
    {
        randomNumber = new Random().nextInt(100);
        guessCount = 0;
        biggest = 100;
        smallest = 1;
    }

    public void setCurrentGuess(Integer guess)
    {
        this.currentGuess = guess;
    }

    public Integer getCurrentGuess()
    {

```

1

```
    return currentGuess;
}

public void guess()
{
    if (currentGuess
>randomNumber)
    {
        biggest = currentGuess - 1;
    }
    if (currentGuess<randomNumber)
    {
        smallest = currentGuess + 1;
    }
    guessCount ++;
}

public boolean isCorrectGuess()
{
    return currentGuess==randomNumber;
}

public int getBiggest()
{
    return biggest;
}

public int getSmallest()
{
    return smallest;
}

public int getGuessCount()
{
    return guessCount;
}

public boolean isLastGuess()
{
    return guessCount==maxGuesses;
}

public int getRemainingGuesses() {
    return maxGuesses-guessCount;
```



```

}

public void setMaxGuesses(int maxGuesses) {
    this.maxGuesses = maxGuesses;
}

public int getMaxGuesses() {
    return maxGuesses;
}

public int getRandomNumber() {
    return randomNumber;
}

public void cheated()
{
    cheated = true;
}

public boolean isCheat() {
    return cheated;
}

public List<Integer
> getPossibilities()
{
    List<Integer
> result = new ArrayList<Integer
>();
    for(int i=smallest; i<=biggest; i++) result.add(i);
    return result;
}
}

```

① #####JSP ##### numberGuess ##### Seam ##### @Create  
#####

pages.xml ##### Seam ## (conversation) ##### ( #####  
)#####

## # 1.24. pages.xml

```
<?xml version="1.0" encoding="UTF-8"?>
```

## #1# Seam #####

---

```
<pages xmlns="http://jboss.com/products/seam/pages"
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xsi:schemaLocation="http://jboss.com/products/seam/pages http://jboss.com/products/seam/pages-2.2.xsd">

  <page view-id="/numberGuess.jspx">
    <begin-conversation join="true" pageflow="numberGuess"/>
  </page>

</pages>
```

```
##### Seam #####! #####
#####
```

### 1.5.2. ####

```
#####          #####          numberGuess.jspx          #####
#####pages.xml #####          numberGuess #####          #####
#####start-page #####          numberGuess.xhtml #####
```

```
#####          numberGuess          #####          #####          @Create
#####          #####          #{numberGuess.currentGuess}          #####          h:form
#####
```

```
"Guess" #####          guess          #####          Seam          #####
evaluateGuess          #####          #####          #{numberGuess.guess}          #          guess          count          #
numberGuess          #####          highest/lowest suggestions          #####
```

```
evaluateGuess          ###          #{numberGuess.correctGuess}          #####          win          ###
evaluatingRemainingGuesses          #####          #####
evaluatingRemainingGuesses          #####          ###          decision          #####          #####
#{numberGuess.lastGuess}          #####          #####          (          lastGuess          #          false          )#####
displayGuess          #####          #####page          #####          /numberGuess.jspx          #####
redirect          #####Seam          #####
```

```
#####          win          ###          lose          #####          #####          /
win.jspx          ###          /lose.jspx          #####          #####          Seam
#####
```

The numberguess example also contains Giveup and Cheat buttons. You should be able to trace the pageflow state for both actions relatively easily. Pay particular attention to the `cheat` transition, which loads a sub-process to handle that flow. Although it's overkill for this application, it does demonstrate how complex pageflows can be broken down into smaller parts to make them easier to understand.

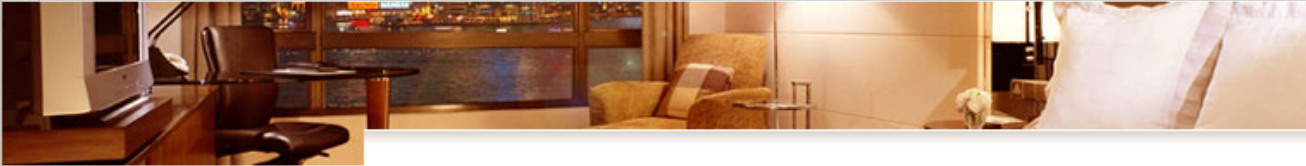
## 1.6. ### Seam #####: #####

### 1.6.1. ###

#####

- #####
- #####
- #####
- #####
- #####
- #####
- #####
- #####
- #####

jboss suites   seam framework demo
Welcome Gavin King | Search | Settings | Logout



### State management in Seam

State in Seam is *contextual*. When you click "Find Hotels", the application retrieves a list of hotels from the database and caches it in the session context. When you navigate to one of the hotel records by clicking the "View Hotel" link, a *conversation* begins. The conversation is attached to a particular tab, in a particular browser window. You can navigate to multiple hotels using "open in new tab" or "open in new window" in your web browser. Each window will execute in the context of a different conversation. The application keeps state associated with your hotel booking in the conversation context, which ensures that the concurrent conversations do not interfere with each other.

[How does the search page work?](#)

**Thank you, Gavin King, your confirmation number for Doubletree is 1**

### Search Hotels

Find Hotels

Maximum results:  ▼

Name	Address	City, State	Zip	Action
Marriott Courtyard	Tower Place, Buckhead	Atlanta, GA, USA	30305	<a href="#">View Hotel</a>
Doubletree	Tower Place, Buckhead	Atlanta, GA, USA	30305	<a href="#">View Hotel</a>
Ritz Carlton	Peachtree Rd, Buckhead	Atlanta, GA, USA	30326	<a href="#">View Hotel</a>

### Current Hotel Bookings

Name	Address	City, State	Check in date	Check out date	Confirmation number	Action
Doubletree	Tower Place, Buckhead	Atlanta, GA	Apr 16, 2006	Apr 17, 2006	1	<a href="#">Cancel</a>

Created with JBoss EJB 3.0, Seam, MyFaces, and Facelets

##### JSF#EJB 3.0#Seam ##### Facelet #####  
 JSF#Facelets#Seam#JavaBeans ####Hibernate3 #####

#####  
 #####  
 ##### Seam #####

WEB ##### Seam  
#####

#####  
#####

### 1.6.2. #####

##### #1.1. #Seam #####  
##### <http://localhost:8080/seam-booking/> [http://localhost:8080/seam-booking/]#####

##### 6 ##### Bean #####

- AuthenticatorAction #####
- BookingListAction #####
- ChangePasswordAction #####
- HotelBookingAction ##### ## #####  
#####
- HotelSearchingAction #####
- RegisterAction #####

##### Bean #####

- Hotel ##### Bean ###
- Booking ##### Bean ###
- User ##### Bean ###

### 1.6.3. Seam #####

#####  
#####  
#####

##### WEB #####  
#####Java WEB #####  
URL ##### HttpSession  
#####

#####  
#####Java  
##### (2 ###) #####  
#####  
LRU #####  
#####

## #1# Seam #####

```
## HttpSession ##### HttpSession #####
#####
#####
#####HTTP #####HTTP
#####
#####
#### Seam #####
```

```
Seam ##### (conversation context) #####
#####
#####
#####
```

```
##### Bean ##### Java #####
Bean ##### Java
##### Bean
##### JBoss AS ##### bean
##### Bean ##### HttpSession #####
##### Bean ## Web
##### Bean
#####
#####Seam ##### Bean ##### POJO
##### Seam #####
```

```
#####
#####
#####Seam #####
#####
```

```
#### JavaScript ##### RichFaces Ajax
#####
```

```
##### Bean #####
```

### # 1.25. HotelSearchingAction.java

```
@Stateful 1
@Name("hotelSearch")
@Scope(ScopeType.SESSION)

@Restrict("#{identity.loggedIn}") 2
public class HotelSearchingAction implements HotelSearching
{

    @PersistenceContext
    private EntityManager em;
```

```
private String searchString;
private int pageSize = 10;
private int page;

@DataModel
private List<Hotel
> hotels;

public void find()
{
    page = 0;
    queryHotels();
}
public void nextPage()
{
    page++;
    queryHotels();
}

private void queryHotels()
{
    hotels =
        em.createQuery("select h from Hotel h where lower(h.name) like #{pattern} " +
            "or lower(h.city) like #{pattern} " +
            "or lower(h.zip) like #{pattern} " +
            "or lower(h.address) like #{pattern}")
        .setMaxResults(pageSize)
        .setFirstResult( page * pageSize )
        .getResultList();
}

public boolean isNextPageAvailable()
{
    return hotels!=null && hotels.size()==pageSize;
}

public int getPageSize() {
    return pageSize;
}

public void setPageSize(int pageSize) {
    this.pageSize = pageSize;
}
}
```

3

```
@Factory(value="pattern", scope=ScopeType.EVENT)
public String getSearchPattern()
{
    return searchString==null ?
        "%" : '%' + searchString.toLowerCase().replace('*', '%') + '%';
}

public String getSearchString()
{
    return searchString;
}

public void setSearchString(String searchString)
{
    this.searchString = searchString;
}

@Remove
public void destroy() {}
}
```



```
① EJB ## @Stateful ##### Bean #####
Bean ## #####

② @Restrict #####
##### Seam
#####

③ @DataModel ##### JSF ListDataModel ### List
##### hotels #####
ListDataModel #####

④ EJB ### @Remove ##### Bean
##### Seam ##### Bean ##### @Remove
##### Seam #####

##### Facelets #####
```

### # 1.26. main.xhtml

```
<div class="section">

    <span class="errors">
        <h:messages globalOnly="true"/>
    </span>
</div>
```



```

<h1>Search Hotels</h1>

<h:form id="searchCriteria">
<fieldset>
  <h:inputText id="searchString" value="#{hotelSearch.searchString}"
    style="width: 165px;">
    <a:support event="onkeyup" actionListener="#{hotelSearch.find}"
      reRender="searchResults" /> 1
  </h:inputText>
  &#160;
  <a:commandButton id="findHotels" value="Find Hotels" action="#{hotelSearch.find}"
    reRender="searchResults"/>
  &#160;
  <a:status> 2
    <f:facet name="start">
      <h:graphicImage value="/img/spinner.gif"/>
    </f:facet>
  </a:status>
  <br/>
  <h:outputLabel for="pageSize">Maximum results:</h:outputLabel>&#160;
  <h:selectOneMenu value="#{hotelSearch.pageSize}" id="pageSize">
    <f:selectItem itemLabel="5" itemValue="5"/>
    <f:selectItem itemLabel="10" itemValue="10"/>
    <f:selectItem itemLabel="20" itemValue="20"/>
  </h:selectOneMenu>
</fieldset>
</h:form>

</div>

<a:outputPanel id="searchResults"> 3
<div class="section">
  <h:outputText value="No Hotels Found"
    rendered="#{hotels != null and hotels.rowCount==0}"/>
  <h:dataTable id="hotels" value="#{hotels}" var="hot"
    rendered="#{hotels.rowCount>0}">
    <h:column>
      <f:facet name="header">Name</f:facet>
      #{hot.name}
    </h:column>
    <h:column>

```

```
<f:facet name="header">Address</f:facet>
#{hot.address}
</h:column>
<h:column>
  <f:facet name="header">City, State</f:facet>
  #{hot.city}, #{hot.state}, #{hot.country}
</h:column>
<h:column>
  <f:facet name="header">Zip</f:facet>
  #{hot.zip}
</h:column>
<h:column>
  <f:facet name="header">Action</f:facet>

  <s:link id="viewHotel" value="View Hotel"
    action="#{hotelBooking.selectHotel(hot)}"/>
</h:column>
</h:dataTable>
<s:link value="More results" action="#{hotelSearch.nextPage}"
  rendered="#{hotelSearch.nextPageAvailable}"/>
</div>
</a:outputPanel>
```

4

```
① RichFaces Ajax <a:support> ### onkeyup #### JavaScript ##### JSF
##### XMLHttpRequest #####reRender
### JSF #####
② RichFaces Ajax <a:status> #####
③ RichFaces Ajax <a:outputPanel> #####
④ Seam <s:link> #### JSF ##### (# JavaScript) HTML #####
## <h:commandLink> ##### "#####" # "#####"#####
##### #{hotelBooking.selectHotel(hot)} #####
##### EL# ##### Seam ## ##### EL#
#####

#####WEB-INF/pages.xml #####
##### #6.7. #####

##### HotelBookingAction # selectHotel()
#####

##### Bean
#####
#####
```

## # 1.27. HotelBookingAction.java

```
@Stateful
@Name("hotelBooking")
@Restrict("#{identity.loggedIn}")
public class HotelBookingAction implements HotelBooking
{

    @PersistenceContext(type=EXTENDED)           1
    private EntityManager em;

    @In
    private User user;

    @In(required=false) @Out
    private Hotel hotel;

    @In(required=false)
    @Out(required=false)                          2
    private Booking booking;

    @In
    private FacesMessages facesMessages;

    @In
    private Events events;

    @Logger
    private Log log;

    private boolean bookingValid;

    @Begin                                       3
    public void selectHotel(Hotel selectedHotel)
    {
        hotel = em.merge(selectedHotel);
    }

    public void bookHotel()
    {
        booking = new Booking(hotel, user);
    }
}
```

```
Calendar calendar = Calendar.getInstance();
booking.setCheckinDate( calendar.getTime() );
calendar.add(Calendar.DAY_OF_MONTH, 1);
booking.setCheckoutDate( calendar.getTime() );
}

public void setBookingDetails()
{
    Calendar calendar = Calendar.getInstance();
    calendar.add(Calendar.DAY_OF_MONTH, -1);
    if ( booking.getCheckinDate().before( calendar.getTime() ) )
    {
        facesMessages.addToControl("checkinDate", "Check in date must be a future date");
        bookingValid=false;
    }
    else if ( !booking.getCheckinDate().before( booking.getCheckoutDate() ) )
    {
        facesMessages.addToControl("checkoutDate",
            "Check out date must be later than check in date");
        bookingValid=false;
    }
    else
    {
        bookingValid=true;
    }
}

public boolean isBookingValid()
{
    return bookingValid;
}

@End
public void confirm()
{
    em.persist(booking);
    facesMessages.add("Thank you, #{user.name}, your confirmation number " +
        " for #{hotel.name} is #{booki g.id}");
    log.info("New booking: #{booking.id} for #{user.username}");
    events.raiseTransactionSuccessEvent("bookingConfirmed");
}

@End
public void cancel() {}
```

```
@Remove
public void destroy() {}
```

5

```
1 ## Bean ##EJB3 ##### ##### ##### ##### Bean
#####
2 @Out ##### (outject) #####
##### hotel ##### hotel
#####
3 @Begin ##### (long-running conversation)
##### #####
##### @End
4 @End #####
#####
5 Seam ##### EJB remove #####
#####
```

```
HotelBookingAction #####
##### ##### HttpSession #### get/set
#####

#####
##### #####
##### Seam #####
##### Seam #####
```

### 1.6.4. Seam #####

```
WAR # seam-debug.jar ##### Seam ##### WEB-INF/lib # Facelets ##### jar
#####init ##### debug #####
```

```
<core:init jndi-pattern="@jndiPattern@" debug="true"/>
```

```
##### Seam ##### Seam #####
##### http://localhost:8080/seam-booking/debug.seam [http://localhost:8080/
seam-booking/debug.seam] #####
```

## JBoss Seam Debug Page

This page allows you to view and inspect any component in any Seam context associated with the current session.

### Conversations

conversation id	activity	description	view id	
4	1:51:34 AM - 1:51:34 AM	Search hotels: M	/main.xhtml	<a href="#">Select conversation context</a>
6	1:51:40 AM - 1:52:23 AM	Book hotel: Marriott Courtyard	/book.xhtml	<a href="#">Select conversation context</a>

#### - Component (booking)

checkinDate	Fri Jan 20 20:52:20 EST 2006
checkoutDate	Sat Jan 21 20:52:20 EST 2006
class	class org.jboss.seam.example.booking.Booking
creditCard	
description	Marriott Courtyard, Jan 20, 2006 to Jan 21, 2006
hotel	Hotel(Tower Place, Buckhead,Atlanta,30305)
id	
user	User(gavin)

#### - Conversation Context (6)

<a href="#">booking</a>
<a href="#">conversation</a>
<a href="#">hotel</a>
<a href="#">hotelBooking</a>
<a href="#">hotels</a>

#### - Business Process Context

Empty business process context

#### + Session Context

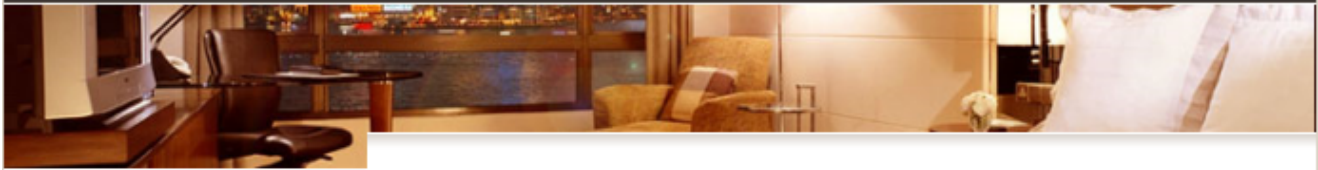
#### + Application Context

## 1.7. ##### : #####

### 1.7.1. ####

```
#####
#####
#####

#####
#####
#####
```



**Nesting conversations**

Nested conversations allow the application to capture a consistent continuable state at various points in a user interaction, thus insuring truly correct behavior in the face of backbuttoning and workspace management.

**How Seam manages continuable state**

Seam provides a container for context state for each nested conversation. Any contextual variable in the outer conversations context will not be overwritten by a new value, the value will simply be stored in the new context container. This allows each nested conversation to maintain its own unique state.

Room Preference

Rooms available for the dates selected: Tue Oct 14 00:00:00 CDT 2008 -Wed Oct 15 00:00:00 CDT 2008

Name	Description	Per Night	Action
Wonderful Room	One king bed. Desk. Cable/satellite TV with pay movies and DVD player. CD player. Coffee/tea maker and minibar. Hair dryer. Iron/ironing board. In-room safe. Complimentary newspaper.	\$450.00	<a href="#">Select</a>
Spectacular Room	One king bed. Desk. Cable/satellite TV with pay movies and DVD player. CD player. Coffee/tea maker and minibar. Hair dryer. Iron/ironing board. In-room safe. Complimentary newspaper.	\$600.00	<a href="#">Select</a>
Fantastic Suite	One king bed. Desk. Cable/satellite TV with pay movies and DVD player. CD player. Coffee/tea maker and minibar. Hair dryer. Iron/ironing board. In-room safe. Complimentary newspaper.	\$1,000.00	<a href="#">Select</a>

[Revise Dates](#)

Workspaces

<a href="#">Room Preference: W Hotel</a> [current]	08:28 -08:28
--	--------------

Created with JBoss EJB 3.0, Seam, MyFaces, and Facelets

```
#####
##### HTTPSession
#####

##### Wonderful Room
##### Fantastic
Suite ##### Wonderful Room
#####
```

#####  
#####

### 1.7.2. #####

#####  
#####

## # 1.28. RoomPreferenceAction.java

```
@Stateful
@Name("roomPreference")
@Restrict("#{identity.loggedIn}")
public class RoomPreferenceAction implements RoomPreference
{

    @Logger
    private Log log;

    @In private Hotel hotel;

    @In private Booking booking;

    @DataModel(value="availableRooms")
    private List<Room> availableRooms;

    @DataModelSelection(value="availableRooms")
    private Room roomSelection;

    @In(required=false, value="roomSelection")
    @Out(required=false, value="roomSelection")
    private Room room;

    @Factory("availableRooms")

    public void loadAvailableRooms()
    {
        availableRooms = hotel.getAvailableRooms(booking.getCheckinDate(),
        booking.getCheckoutDate());
        log.info("Retrieved #0 available rooms", availableRooms.size());
    }

    public BigDecimal getExpectedPrice()
    {
        log.info("Retrieving price for room #0", roomSelection.getName());
    }
}
```



```

    return booking.getTotal(roomSelection);
}

@Begin(nested=true)
public String selectPreference()
{
    log.info("Room selected");

    this.room = this.roomSelection;

    return "payment";
}

public String requestConfirmation()
{
    // all validations are performed through the s:validateAll, so checks are already
    // performed
    log.info("Request confirmation from user");

    return "confirm";
}

@end(beforeRedirect=true)
public String cancel()
{
    log.info("ending conversation");

    return "cancel";
}

@Destroy @Remove
public void destroy() {}
}

```

- ① The `hotel` instance is injected from the conversation context. The hotel is loaded through an *extended persistence context* so that the entity remains managed throughout the conversation. This allows us to lazily load the `availableRooms` through an `@Factory` method by simply walking the association.

② `@Begin(nested=true)` #####  
#####  
#####

## #1# Seam #####

---

```
③ roomSelection      #      @DataModelSelection      #####
#####roomSelection #####
#####
④ @End ##### roomSelection #####
```

When we begin a nested conversation it is pushed onto the conversation stack. In the `nestedbooking` example, the conversation stack consists of the outer long-running conversation (the booking) and each of the nested conversations (room selections).

### # 1.29. rooms.xhtml

```
<div class="section">
  <h1>Room Preference</h1>
</div>

<div class="section">
  <h:form id="room_selections_form">
    <div class="section">
      <h:outputText styleClass="output"
        value="No rooms available for the dates selected: "
        rendered="{availableRooms != null and availableRooms.rowCount == 0}"/>
      <h:outputText styleClass="output"
        value="Rooms available for the dates selected: "
        rendered="{availableRooms != null and availableRooms.rowCount > 0}"/>

      <h:outputText styleClass="output" value="{booking.checkinDate}"/> -
      <h:outputText styleClass="output" value="{booking.checkoutDate}"/>

      <br/><br/>
      ①
      <h:dataTable value="{availableRooms}" var="room"
        rendered="{availableRooms.rowCount > 0}">
        <h:column>
          <f:facet name="header">Name</f:facet>
          #{room.name}
        </h:column>
        <h:column>
          <f:facet name="header">Description</f:facet>
          #{room.description}
        </h:column>
        <h:column>
          <f:facet name="header">Per Night</f:facet>
          <h:outputText value="{room.price}">

```

```

        <f:convertNumber type="currency" currencySymbol="$"/>
    </h:outputText>
</h:column>

    <h:column>
        <f:facet name="header">Action</f:facet>
        <h:commandLink id="selectRoomPreference"
            action="#{roomPreference.selectPreference}">Select</h:commandLink>
    </h:column>
</h:dataTable>
</div>
<div class="entry">
    <div class="label">&#160;</div>

    <div class="input">
        <s:button id="cancel" value="Revise Dates" view="/book.xhtml"/>
    </div>
</div>
</h:form>
</div>

```

```

① EL #####RoomPreferenceAction ##### @Factory ##### #{availableRooms}
##### @Factory ##### @DataModel ##### 1
#####

② #{roomPreference.selectPreference} #####
@DataModelSelection #####

③ ##### /book.xhtml ##### # room preference #####
##### <s:button > ##### /book.xhtml
#####

#####
HotelBookingAction.#####

```

### # 1.30. HotelBookingAction.java

```

@Stateful
@Name("hotelBooking")
@Restrict("#{identity.loggedIn}")
public class HotelBookingAction implements HotelBooking
{

    @PersistenceContext(type=EXTENDED)
    private EntityManager em;

```

```
@In
private User user;

@In(required=false) @Out
private Hotel hotel;

@In(required=false)
@Out(required=false)
private Booking booking;

@In(required=false)
private Room roomSelection;

@In
private FacesMessages facesMessages;

@In
private Events events;

@Logger
private Log log;

@Begin
public void selectHotel(Hotel selectedHotel)
{
    log.info("Selected hotel #0", selectedHotel.getName());
    hotel = em.merge(selectedHotel);
}

public String setBookingDates()
{
    // the result will indicate whether or not to begin the nested conversation
    // as well as the navigation. if a null result is returned, the nested
    // conversation will not begin, and the user will be returned to the current
    // page to fix validation issues
    String result = null;

    Calendar calendar = Calendar.getInstance();
    calendar.add(Calendar.DAY_OF_MONTH, -1);

    // validate what we have received from the user so far
    if ( booking.getCheckinDate().before( calendar.getTime() ) )
    {
        facesMessages.addToControl("checkinDate", "Check in date must be a future date");
    }
}
```

```
}
else if ( !booking.getCheckinDate().before( booking.getCheckoutDate() ) )
{
    facesMessages.addToControl("checkoutDate", "Check out date must be later than check
in date");
}
else
{
    result = "rooms";
}

return result;
}

public void bookHotel()
{
    booking = new Booking(hotel, user);
    Calendar calendar = Calendar.getInstance();
    booking.setCheckinDate( calendar.getTime() );
    calendar.add(Calendar.DAY_OF_MONTH, 1);
    booking.setCheckoutDate( calendar.getTime() );
}

@End(root=true)

public void confirm() 1
{
    // on confirmation we set the room preference in the booking. the room preference
    // will be injected based on the nested conversation we are in.
    booking.setRoomPreference(roomSelection);

    em.persist(booking); 2
    facesMessages.add("Thank you, #{user.name}, your confirmation number for #{hotel.name}
is #{booking.id}");
    log.info("New booking: #{booking.id} for #{user.username}");
    events.raiseTransactionSuccessEvent("bookingConfirmed");
}

@End(root=true, beforeRedirect=true) 3
public void cancel() {}

@Destroy @Remove
public void destroy() {}
```

```
}  
}
```

- 1 Annotating an action with `@End(root=true)` ends the root conversation which effectively destroys the entire conversation stack. When any conversation is ended, its nested conversations are ended as well. As the root is the conversation that started it all, this is a simple way to destroy and release all state associated with a workspace once the booking is confirmed.

```
2 roomSelection ##### booking #####  
#####  
#####
```

```
3 @End(root=true, beforeRedirect=true)  
#####  
#####  
#####
```

## 1.8. Seam # jBPM #####: DVD #####

DVD ##### jBPM #####

##### jPDL #####

# JBoss Seam DVD Store Demo

Search for Movies

My Orders

## Search Results



Add to cart	Title	Actor	Price
<input type="checkbox"/>	Life is Beautiful	Roberto Benini	\$12.00
<input type="checkbox"/>	Finding Nemo	Albert Brooks	\$22.49
<input type="checkbox"/>	March of the Penguins	Morgan Freeman	\$16.98
<input type="checkbox"/>	Indiana Jones and the Temple of Doom	Harrison Ford	\$19.99
<input type="checkbox"/>	Clear and Present Danger	Harrison Ford	\$19.99
<input type="checkbox"/>	Roman Holiday	Audrey Hepburn	\$12.99
<input type="checkbox"/>	Breakfast at Tiffany's	Audrey Hepburn	\$12.99
<input type="checkbox"/>	Sabrina	Audrey Hepburn	\$12.99
<input type="checkbox"/>	Sabrina	Harrison Ford	\$19.99
<input type="checkbox"/>	Kill Bill Vol. 1	Uma Thurman	\$19.99
<input type="checkbox"/>	Kill Bill Vol. 2	Uma Thurman	\$19.99
<input type="checkbox"/>	Lost in Translation	Bill Murray	\$19.99
<input type="checkbox"/>	Broken Flowers	Bill Murray	\$19.99
<input type="checkbox"/>	Better Off Dead	John Cusak	\$8.99
<input type="checkbox"/>	Grosse Pointe Blank	John Cusak	\$11.99
<input type="checkbox"/>	High Fidelity	John Cusak	\$14.99
<input type="checkbox"/>	Somewhere in Time	Christopher Reeve	\$11.24
<input type="checkbox"/>	Superman - The Movie	Christopher Reeve	\$14.99
<input type="checkbox"/>	Superman II	Christopher Reeve	\$14.99
<input type="checkbox"/>	Superman III	Christopher Reeve	\$14.99

Update Shopping Cart

Welcome, Harry

Thank you for choosing the DVD Store

Logout

Search for DVDs:

Title:

Actor:

Category:

Any

Results Per Page:

20

Search

Shopping Cart

1 Napoleon Dynamite

Total:\$14.06

Checkout

Done

#####

jBPM

#####

#####

# JBoss Seam DVD Store Demo

Manage Orders

## Order Management

Pending orders are shown here on the order management screen for the store manager to process. Rather than being data-driven, order management is process-driven. A JBoss jBPM process assigns fulfillment tasks to the manager based on the version of the process loaded. The manager can change the version of the process at any time using the admin options box to the right.

- Order process 1 sends orders immediately to shipping, where the manager should ship the order and record the tracking number for the user to see.
- Order process 2 adds an approval step where the manager is first given the chance to approve the order before sending it to shipping. In each case, the status of the order is shown in the customer's order list.
- Order process 3 introduces a decision node. Only orders over \$100.00 need to be accepted. Smaller orders are automatically approved for shipping.

### Task Assignment

Order Id	Order Amount	Customer	Task	
5	\$12.99	user1	ship	<input type="button" value="Assign"/>
7	\$77.70	user2	ship	<input type="button" value="Assign"/>

### Order Acceptance

There are no orders to be accepted.

### Shipping

Order Id	Order Amount	Customer	
6	\$94.95	user1	<input type="button" value="Ship"/>

Done

Welcome, Albus

Thank you for choosing the DVD Store

---

Statistics

**Inventory**  
28 sold, 2473 in stock

**Sales**  
\$437.63 from 7 orders

---

Admin Options

**Process Management**

ordermanagement3 ▼

Seam DVD ##### dvdstore #####

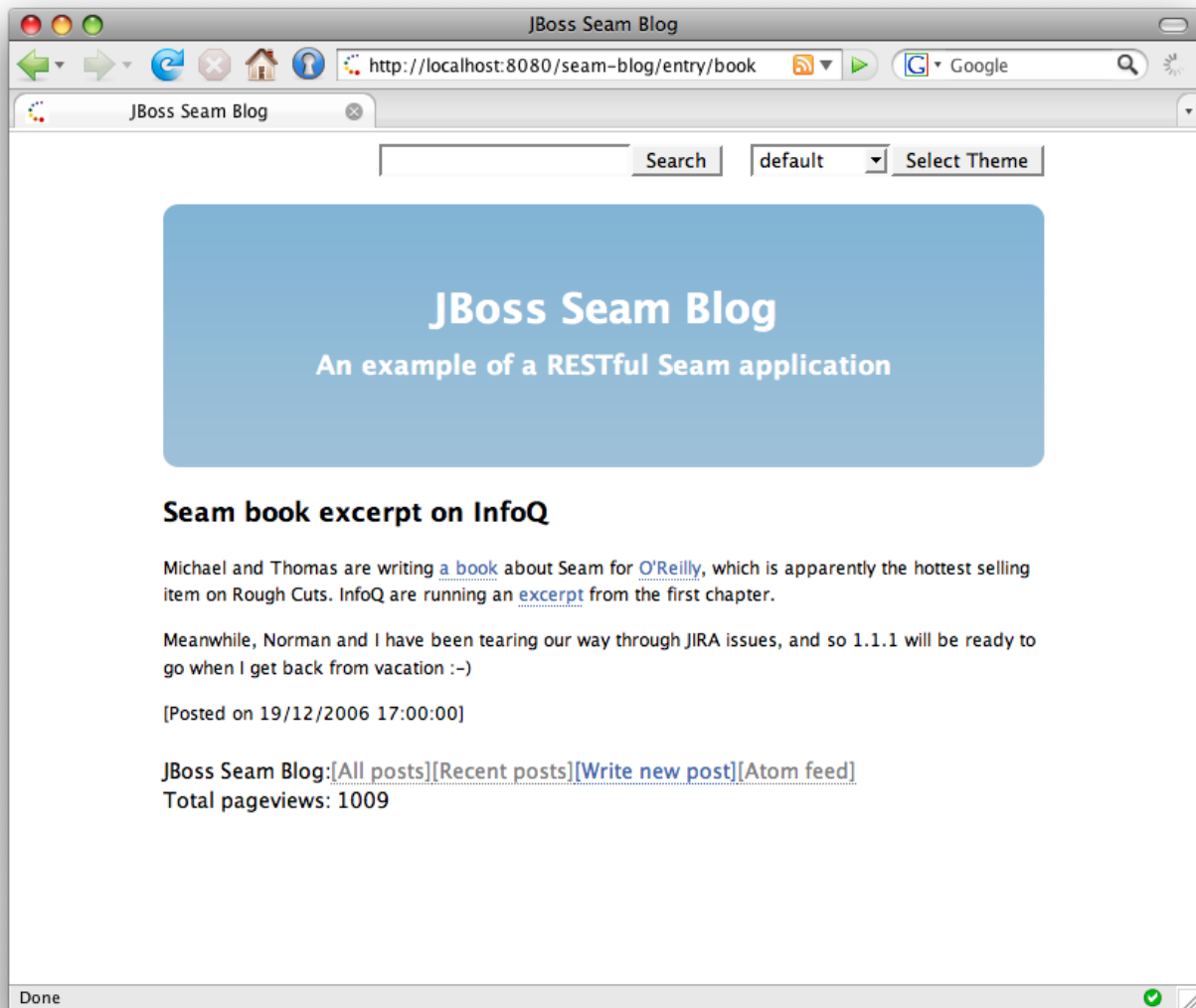
## 1.9. Blog ##### URL

```

Seam #####
(##### (content) ##### ) #####
#####
## Blog ##### Seam ##### RESTful #####
#####

```





```
## Blog ##### (PULL) " - ##### MVC #####  
#####  
##### (PULL) #
```

### 1.9.1. "PULL" # MVC ###

```
index.xhtml facelets #####
```

#### # 1.31.

```
<h:dataTable value="#{blog.recentBlogEntries}" var="blogEntry" rows="3">  
<h:column>  
  <div class="blogEntry">  
    <h3  
>#{blogEntry.title}</h3>
```

```
<div>
  <s:formattedText value="#{blogEntry.excerpt==null ? blogEntry.body : blogEntry.excerpt}"/>
</div>
<p>
  <s:link view="/entry.xhtml" rendered="#{blogEntry.excerpt!=null}" propagation="none"
    value="Read more...">
    <f:param name="blogEntryId" value="#{blogEntry.id}"/>
  </s:link>
</p>
<p>
  [Posted on#{160;
  <h:outputText value="#{blogEntry.date}">
    <f:convertDateTime timeZone="#{blog.timeZone}" locale="#{blog.locale}" type="both"/>
  </h:outputText
>]
  &#{160;
  <s:link view="/entry.xhtml" propagation="none" value="[Link]">
    <f:param name="blogEntryId" value="#{blogEntry.id}"/>
  </s:link>
</p>
</div>
</h:column>
</h:dataTable
>
```

If we navigate to this page from a bookmark, how does the `#{blog.recentBlogEntries}` data used by the `<h:dataTable>` actually get initialized? The `Blog` is retrieved lazily — "pulled" — when needed, by a Seam component named `blog`. This is the opposite flow of control to what is used in traditional action-based web frameworks like Struts.

### # 1.32.

```
@Name("blog")
@Scope(ScopeType.STATELESS)
@AutoCreate
public class BlogService
{

  @In EntityManager entityManager; 1

  @Unwrap 2
  public Blog getBlog()
```

```

{
    return (Blog) entityManager.createQuery("select distinct b from Blog b left join fetch
b.blogEntries")
        .setHint("org.hibernate.cacheable", true)
        .getSingleResult();
}
}

```

- ① ##### Seam ##### (seam-managed persistence context) #####  
#####EJB3 ##### Seam #####  
Web #####
- ② The `@Unwrap` annotation tells Seam to provide the return value of the method — the `Blog` — instead of the actual `BlogService` component to clients. This is the Seam *manager component pattern*.

#####

## 1.9.2. #####

```

## Blog ##### Blog ##### ##facelet
#####template.xhtml ##### menu.xhtml #####

```

### # 1.33.

```

<div id="search">
  <h:form>
    <h:inputText value="#{searchAction.searchPattern}"/>
    <h:commandButton value="Search" action="/search.xhtml"/>
  </h:form>
</div>
>

```

```

#####
(outcome) ## JSF ## ID ##### Seam ##### ID #####
#####

```

```

<navigation-rule>
  <navigation-case>
    <from-outcome
>searchResults</from-outcome>
    <to-view-id
>/search.xhtml</to-view-id>

```

## #1# Seam #####

---

```
<redirect/>
</navigation-case>
</navigation-rule
>
```

#####

```
<div id="search">
  <h:form>
    <h:inputText value="#{searchAction.searchPattern}"/>
    <h:commandButton value="Search" action="searchResults"/>
  </h:form>
</div
>
```

But when we redirect, we need to include the values submitted with the form in the URL to get a bookmarkable URL like `http://localhost:8080/seam-blog/search/`. JSF does not provide an easy way to do this, but Seam does. We use two Seam features to accomplish this: *page parameters* and *URL rewriting*. Both are defined in `WEB-INF/pages.xml`:

### # 1.34.

```
<pages>
  <page view-id="/search.xhtml">
    <rewrite pattern="/search/{searchPattern}"/>
    <rewrite pattern="/search"/>

    <param name="searchPattern" value="#{searchService.searchPattern}"/>

  </page>
  ...
</pages
>
```

```
##### Seam # searchPattern
##### #{searchService.searchPattern} ##### Seam # URL
#####
```

Without URL rewriting, the URL for a search on the term `book` would be `http://localhost:8080/seam-blog/seam/search.xhtml?searchPattern=book`. This is nice, but Seam can make the URL even simpler using a rewrite rule. The first rewrite rule, for the pattern `/search/{searchPattern}`, says that any time we have a URL for `search.xhtml` with a `searchPattern`

request parameter, we can fold that URL into the simpler URL. So, the URL we saw earlier, `http://localhost:8080/seam-blog/seam/search.xhtml?searchPattern=book` can be written instead as `http://localhost:8080/seam-blog/search/book`.

```
#####URL          #####          Seam          #####          URL
#####
##### components.xml #####
```

```
<web:rewrite-filter view-mapping="/seam/*" />
```

```
##### search.xhtml #####
```

```
<h:dataTable value="#{searchResults}" var="blogEntry">
  <h:column>
    <div>
      <s:link view="/entry.xhtml" propagation="none" value="#{blogEntry.title}">
        <f:param name="blogEntryId" value="#{blogEntry.id}"/>
      </s:link>
      posted on
      <h:outputText value="#{blogEntry.date}">
        <f:convertDateTime timeZone="#{blog.timeZone}" locale="#{blog.locale}" type="both"/>
      </h:outputText>
    </div>
  </h:column>
</h:dataTable>
>
```

```
##### Hibernate ##### "PULL" # MVC #####
```

```
@Name("searchService")
public class SearchService
{

  @In
  private FullTextEntityManager entityManager;

  private String searchPattern;

  @Factory("searchResults")
  public List<BlogEntry
  > getSearchResults()
```

```
{
    if (searchPattern==null || "".equals(searchPattern) ) {
        searchPattern = null;
        return entityManager.createQuery("select be from BlogEntry be order by date
desc").getResultList();
    }
    else
    {
        Map<String,Float
> boostPerField = new HashMap<String,Float
>();
        boostPerField.put( "title", 4f );
        boostPerField.put( "body", 1f );
        String[] productFields = {"title", "body"};
        QueryParser parser = new MultiFieldQueryParser(productFields, new StandardAnalyzer(),
boostPerField);
        parser.setAllowLeadingWildcard(true);
        org.apache.lucene.search.Query luceneQuery;
        try
        {
            luceneQuery = parser.parse(searchPattern);
        }
        catch (ParseException e)
        {
            return null;
        }

        return entityManager.createFullTextQuery(luceneQuery, BlogEntry.class)
            .setMaxResults(100)
            .getResultList();
    }
}

public String getSearchPattern()
{
    return searchPattern;
}

public void setSearchPattern(String searchPattern)
{
    this.searchPattern = searchPattern;
}
}
```

}

### 1.9.3. RESTful ##### "PUSH" # MVC ###

```
#####RESTful ##### PUSH # MVC ##### Seam
##### Blog ##### Blog ##### entry.xhtml #####
#####PULL # MVC #####
```

```
entryAction ##### Struts ##### PUSH # MVC #####
```

```
@Name("entryAction")
@Scope(STATELESS)
public class EntryAction
{
    @In Blog blog;

    @Out BlogEntry blogEntry;

    public void loadBlogEntry(String id) throws EntryNotFoundException
    {
        blogEntry = blog.getBlogEntry(id);
        if (blogEntry==null) throw new EntryNotFoundException(id);
    }
}
```

```
#####pages.xml #####
```

```
<pages>
...

<page view-id="/entry.xhtml"
>
    <rewrite pattern="/entry/{blogEntryId}" />
    <rewrite pattern="/entry" />

    <param name="blogEntryId"
        value="#{blogEntry.id}"/>

    <action execute="#{entryAction.loadBlogEntry(blogEntry.id)}/>
</page>
```

```
<page view-id="/post.xhtml" login-required="true">
  <rewrite pattern="/post" />

  <action execute="#{postAction.post}"
    if="#{validation.succeeded}"/>

  <action execute="#{postAction.invalid}"
    if="#{validation.failed}"/>

  <navigation from-action="#{postAction.post}">
    <redirect view-id="/index.xhtml"/>
  </navigation>
</page>

<page view-id="*">
  <action execute="#{blog.hitCount.hit}"/>
</page>

</pages
>
```

```
#####
##### JSF EL #####Seam
##### JSF #####
```

When the `entry.xhtml` page is requested, Seam first binds the page parameter `blogEntryId` to the model. Keep in mind that because of the URL rewriting, the `blogEntryId` parameter name won't show up in the URL. Seam then runs the page action, which retrieves the needed data — the `blogEntry` — and places it in the Seam event context. Finally, the following is rendered:

```
<div class="blogEntry">
  <h3
>#{blogEntry.title}</h3>
  <div>
    <s:formattedText value="#{blogEntry.body}"/>
  </div>
  <p>
    [Posted on&#160;
  <h:outputText value="#{blogEntry.date}">
    <f:convertDateTime timeZone="#{blog.timeZone}" locale="#{blog.locale}" type="both"/>
  </h:outputText
>]
</p>
```



```
</div>
>
```

```
blog ##### EntryNotFoundException ##### exception is thrown.
##### 505 ##### 404 ##### #####
```

```
@ApplicationException(rollback=true)
@HttpError(errorCode=HttpServletResponse.SC_NOT_FOUND)
public class EntryNotFoundException extends Exception
{
    EntryNotFoundException(String id)
    {
        super("entry not found: " + id);
    }
}
```

```
#####
```

```
@Name("entryAction")
@Scope(STATELESS)
public class EntryAction
{
    @In(create=true)
    private Blog blog;

    @In @Out
    private BlogEntry blogEntry;

    public void loadBlogEntry() throws EntryNotFoundException
    {
        blogEntry = blog.getBlogEntry( blogEntry.getId() );
        if (blogEntry==null) throw new EntryNotFoundException(id);
    }
}
```

```
<pages>
...

<page view-id="/entry.xhtml" action="#{entryAction.loadBlogEntry}">
    <param name="blogEntryId" value="#{blogEntry.id}"/>
```

```
</page>

...
</pages
>
```

#####

##### atom #####

---

## seam-gen ##### Seam #####

```
Seam ##### Eclipse ##### Seam
#####
```

```
####Seam #####
##### Ruby #####
#####
```

```
#####seam-gen # JBoss AS #####
##### J2EE # Java 5 #####
```

```
Eclipse ##### seam-gen ##### Eclipse
##### Eclipse ##### —
#####
```

seam-gen is basically just an intricate Ant script wrapped around Hibernate Tools, together with some templates. That makes it easy to customize if you need to.

### 2.1. #####

Make sure you have JDK 5 or JDK 6 (see [#42.1. #JDK #####](#) for details), JBoss AS 4.2 or 5.0 and Ant 1.7.0, along with recent versions of Eclipse, the JBoss IDE plugin for Eclipse and the TestNG plugin for Eclipse correctly installed before starting. Add your JBoss installation to the JBoss Server View in Eclipse. Start JBoss in debug mode. Finally, start a command prompt in the directory where you unzipped the Seam distribution.

```
JBoss # WAR # EAR ##### JVM ##### —
##### — EAR ##### JVM # perm gen #####
##### perm gen space ##### JVM # JBoss ##### JBoss IDE ##
JBoss ##### #VM #####
```

```
-Xms512m -Xmx1024m -XX:PermSize=256m -XX:MaxPermSize=512m
```

```
#####
```

```
-Xms256m -Xmx512m -XX:PermSize=128m -XX:MaxPermSize=256m
```

```
##### JBoss ##### bin/run.conf # JVM #####
```

```
##### — OutOfMemoryException #####
```

## 2.2. Setting up a new project

The first thing we need to do is configure seam-gen for your environment: JBoss AS installation directory, project workspace, and database connection. It's easy, just type:

```
cd jboss-seam-2.2.x
seam setup
```

#####

```
~/workspace/jboss-seam$ ./seam setup
Buildfile: build.xml

init:

setup:
  [echo] Welcome to seam-gen :-)
  [input] Enter your project workspace (the directory that contains your Seam projects) [C:/
Projects] [C:/Projects]
/Users/pmuir/workspace
  [input] Enter your JBoss home directory [C:/Program Files/jboss-4.2.3.GA] [C:/Program Files/
jboss-4.2.3.GA]
/Applications/jboss-4.2.3.GA
  [input] Enter the project name [myproject] [myproject]
helloworld
  [echo] Accepted project name as: helloworld
  [input] Select a RichFaces skin (not applicable if using ICEFaces) [blueSky] ([blueSky], classic,
ruby, wine, deepMarine, emeraldTown, sakura, DEFAULT)

  [input] Is this project deployed as an EAR (with EJB components) or a WAR (with no EJB
support) [ear] ([ear], war, )

  [input] Enter the Java package name for your session beans [com.mydomain.helloworld]
[com.mydomain.helloworld]
org.jboss.helloworld
  [input] Enter the Java package name for your entity beans [org.jboss.helloworld]
[org.jboss.helloworld]

  [input] Enter the Java package name for your test cases [org.jboss.helloworld.test]
[org.jboss.helloworld.test]
```

```

[input] What kind of database are you using? [hsq] ([hsq], mysql, oracle, postgres, mssql,
db2, sybase, enterprisedb, h2)
mysql
[input] Enter the Hibernate dialect for your database [org.hibernate.dialect.MySQLDialect]
[org.hibernate.dialect.MySQLDialect]

[input] Enter the filesystem path to the JDBC driver jar [lib/hsqldb.jar] [lib/hsqldb.jar]
/Users/pmuir/java/mysql.jar
[input] Enter JDBC driver class for your database [com.mysql.jdbc.Driver]
[com.mysql.jdbc.Driver]

[input] Enter the JDBC URL for your database [jdbc:mysql:///test] [jdbc:mysql:///test]
jdbc:mysql:///helloworld
[input] Enter database username [sa] [sa]
pmuir
[input] Enter database password [] []

[input] skipping input as property hibernate.default_schema.new has already been set.
[input] Enter the database catalog name (it is OK to leave this blank) [] []

[input] Are you working with tables that already exist in the database? [n] (y, [n], )
y
[input] Do you want to drop and recreate the database tables and data in import.sql each time
you deploy? [n] (y, [n], )
n
[input] Enter your ICEfaces home directory (leave blank to omit ICEfaces) [] []

[propertyfile] Creating new property file: /Users/pmuir/workspace/jboss-seam/seam-gen/
build.properties
[echo] Installing JDBC driver jar to JBoss server
[echo] Type 'seam create-project' to create the new project

BUILD SUCCESSFUL
Total time: 1 minute 32 seconds
~/workspace/jboss-seam $

```

```
##### enter #####
```

```
##### EAR ##### WAR ##### EAR ##### EJB 3.0
#### Java EE 5 ##### WAR ##### EJB 3.0 ##### J2EE ##### WAR #
EAR ##### JBoss #### EJB3 ##### ear
##### war ##### EAR ##### WAR
#####
```

```
##### seam-gen #####
```

## #2# seam-gen #### Seam #####

---

```
### seam-gen/build.properties ##### seam setup #####  
#####Eclipse #####
```

```
seam new-project
```

```
C:\Projects\jboss-seam>seam new-project  
Buildfile: build.xml  
  
...  
  
new-project:  
  [echo] A new Seam project named 'helloworld' was created in the C:\Projects directory  
  [echo] Type 'seam explode' and go to http://localhost:8080/helloworld  
  [echo] Eclipse Users: Add the project into Eclipse using File > New > Project and select General  
> Project (not Java Project)  
  [echo] NetBeans Users: Open the project in NetBeans  
  
BUILD SUCCESSFUL  
Total time: 7 seconds  
C:\Projects\jboss-seam>
```

```
Seam jar##### jar ### JDBC #### jar ##### Eclipse ##### Eclipse #####  
Ant ##### facelets ##### ## ->  
#####... -> ## -> ##### -> ## ##### (##### helloworld) #####  
## ##### Eclipse ##### JBoss AS #####  
Java #####
```

```
Eclipse ##### JDK # Java SE 5 #### Java SE 6 # JDK ##### ##### -> ##### -> Java  
##### Java SE 5 ### JDK #####
```

```
#####Eclipse ##### seam explode #####
```

Go to <http://localhost:8080/helloworld> to see a welcome page. This is a facelets page, view/home.xhtml, using the template view/layout/template.xhtml. You can edit this page, or the template, in Eclipse, and see the results *immediately*, by clicking refresh in your browser.

```
##### XML ##### Java EE  
##### # Seam ##### 90% ##### (seam-gen  
#####)
```

```
##### HSQLDB #### TestNG #####  
persistence-test.xml # import-test.sql ##### import-test.sql  
##### myproject-dev-
```

```
ds.xml#persistence-dev.xml # import-dev.sql #####
seam-gen #####
myproject-prod-ds.xml# persistence-prod.xml # import-prod.sql #####
#####
```

## 2.3. #####

```
##### Web ##### Java ##### Web
#####
```

```
seam new-action
```

```
Seam ##### facelets page # Seam #####
```

```
C:\Projects\jboss-seam>seam new-action
Buildfile: build.xml

validate-workspace:

validate-project:

action-input:
  [input] Enter the Seam component name
ping
  [input] Enter the local interface name [Ping]

  [input] Enter the bean class name [PingBean]

  [input] Enter the action method name [ping]

  [input] Enter the page name [ping]

setup-filters:

new-action:
  [echo] Creating a new stateless session bean component with an action method
  [copy] Copying 1 file to C:\Projects\helloworld\src\hot\org\jboss\helloworld
  [copy] Copying 1 file to C:\Projects\helloworld\src\hot\org\jboss\helloworld
  [copy] Copying 1 file to C:\Projects\helloworld\src\hot\org\jboss\helloworld\test
  [copy] Copying 1 file to C:\Projects\helloworld\src\hot\org\jboss\helloworld\test
  [copy] Copying 1 file to C:\Projects\helloworld\view
  [echo] Type 'seam restart' and go to http://localhost:8080/helloworld/ping.seam
```

```
BUILD SUCCESSFUL
Total time: 13 seconds
C:\Projects\jboss-seam>
```

```
### Seam ##### seam restart
##### Eclipse ##### build.xml #### # restart #####
##### Eclipse # resources/META-INF/application.xml #####
##### JBoss #####

###http://localhost:8080/helloworld/ping.seam #####
src directory ##### ping() #####
#####

####PingTest.xml ##### test ##### Eclipse # TestNG #####
##### seam test ##### test #####
```

## 2.4. #####

```
#####
```

```
seam new-form
```

```
C:\Projects\jboss-seam>seam new-form
Buildfile: C:\Projects\jboss-seam\seam-gen\build.xml

validate-workspace:

validate-project:

action-input:
  [input] Enter the Seam component name
hello
  [input] Enter the local interface name [Hello]

  [input] Enter the bean class name [HelloBean]

  [input] Enter the action method name [hello]

  [input] Enter the page name [hello]

setup-filters:
```



new-form:

```
[echo] Creating a new stateful session bean component with an action method
[copy] Copying 1 file to C:\Projects\hello\src\hot\com\hello
[copy] Copying 1 file to C:\Projects\hello\src\hot\com\hello
[copy] Copying 1 file to C:\Projects\hello\src\hot\com\hello\test
[copy] Copying 1 file to C:\Projects\hello\view
[copy] Copying 1 file to C:\Projects\hello\src\hot\com\hello\test
[echo] Type 'seam restart' and go to http://localhost:8080/hello/hello.seam
```

BUILD SUCCESSFUL

Total time: 5 seconds

C:\Projects\jboss-seam>

```
##### http://localhost:8080/helloworld/hello.seam #####
##### Seam ##### (Java
#####)
```

## 2.5. #####

```
##### (##### seam setup #####)
#####
```

seam generate-entities

```
##### http://localhost:8080/helloworld #####
##### Seam
##### ## seam-gen #####
```

## 2.6. ### JPA/EJB3 #####

```
##### src/main #####
```

seam generate-ui

```
#####http://localhost:8080/helloworld #####
```

## 2.7. EAR #####

```
#### ## Java EE 5 ##### ## seam unexplode
##### EAR ##### seam deploy #####
```

## #2# seam-gen #### Seam #####

```
##### build ##### deploy ##### seam undeploy ### undeploy
#####
```

```
##### dev profile ##### EAR # persistence-dev.xml ##### import-
dev.sql ##### myproject-dev-ds.xml ##### #####
prod profile #####
```

```
seam -Dprofile=prod deploy
```

```
##### —
####persistence-staging.xml#import-staging.sql #myproject-staging-ds.xml#### -
Dprofile=staging #####
```

## 2.8. Seam #####

```
##### Seam #####
components.xml ##### Seam # Facelets #####
```

```
<core:init debug="true"
>
```

```
##### Web#####
```

- facelets ###
- pages.xml ####

```
#### #### Java ##### (JBoss
##### EAR ##### application.xml# WAR
##### web.xml ###)
```

```
#####/##### Seam # JavaBean
##### JavaBean ##### WEB-INF/dev
##### WAR #### EAR ##### Seam
#####
```

```
#####
```

- ##### JavaBean ##### EJB3 Bean ##### (#####)
- #####
- components.xml #####
- ##### WEB-INF/dev #####

- Seam ##### jboss-seam-debug.jar # WEB-INF/lib #####
- web.xml # Seam #####
- #####

```
seam-gen      #####      WAR      #####      #####src/hot
#####      #####      seam-gen      #      EAR
#####
```

## 2.9. JBoss 4.0 # Seam #####

Seam 2 was developed for JavaServer Faces 1.2. When using JBoss AS, we recommend using JBoss 4.2 or JBoss 5.0, both of which bundle the JSF 1.2 reference implementation. However, it is still possible to use Seam 2 on the JBoss 4.0 platform. There are two basic steps required to do this: install an EJB3-enabled version of JBoss 4.0 and replace MyFaces with the JSF 1.2 reference implementation. Once you complete these steps, Seam 2 applications can be deployed to JBoss 4.0.

### 2.9.1. JBoss 4.0 #####

JBoss 4.0 does not ship a default configuration compatible with Seam. To run Seam, you must install JBoss 4.0.5 using the JEMS 1.2 installer with the ejb3 profile selected. Seam will not run with an installation that doesn't include EJB3 support. The JEMS installer can be downloaded from <http://www.jboss.org/jbossas/downloads>.

### 2.9.2. JSF 1.2 RI #####

```
JBoss 4.0 # Web ### server/default/deploy/jbossweb-tomcat55.sar ##### jsf-
libs ##### myfaces-api.jar # myfaces-impl.jar ##### ##### jsf-
api.jar#jsf-impl.jar#el-api.jar # el-ri.jar ##### JSF # JAR # Seam lib
##### el # JAR # Seam 1.2 #####
```

```
### conf/web.xml ##### myfaces-impl.jar # jsf-impl.jar #####
```



---

## JBoss Tools ##### Seam #####

JBoss Tools # Eclipse ##### JBoss Tools # Seam #####facelets  
# Java ##### Unified Expression Language (EL) #####jPDL#####Seam  
#####Eclipse ## Seam #####

#####Eclipse #####JBoss Tools #####

seam-gen ## JBoss Tools # JBoss AS  
#####  
seam-gen #####

### 3.1. #####

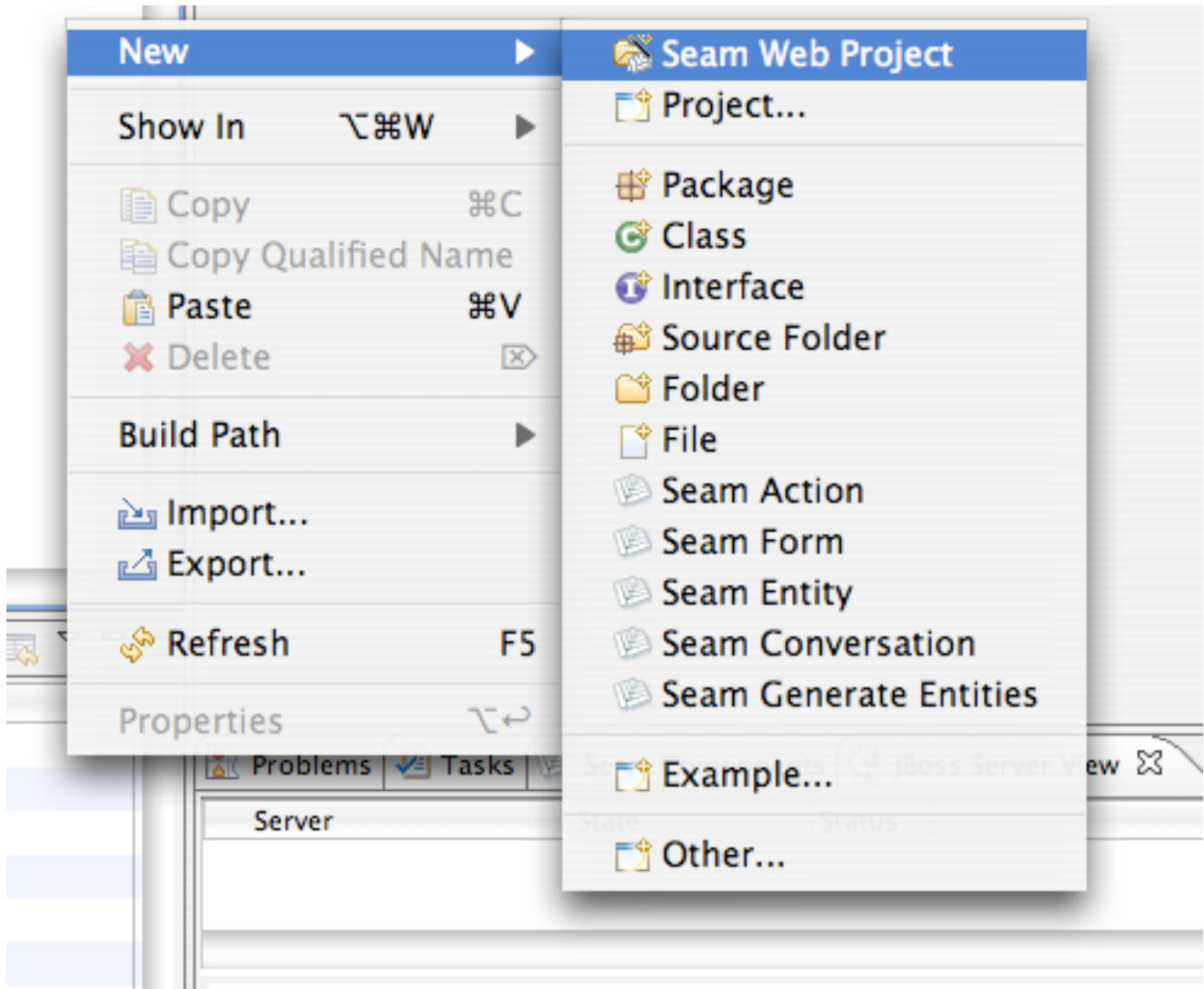
Make sure you have JDK 5, JBoss AS 4.2 or 5.0, Eclipse 3.3, the JBoss Tools plugins (at least Seam Tools, the Visual Page Editor, jBPM Tools and JBoss AS Tools) and the TestNG plugin for Eclipse correctly installed before starting.

Please see the official [JBoss Tools installation](http://www.jboss.org/tools/download/installation) [http://www.jboss.org/tools/download/installation] page for the quickest way to get JBoss Tools setup in Eclipse. You can also check out the [Installing JBoss Tools](http://www.jboss.org/community/wiki/InstallingJBossTools) [http://www.jboss.org/community/wiki/InstallingJBossTools] page on the JBoss community wiki for the gory details and a set of alternative installation approaches.

### 3.2. ### Eclipse #####

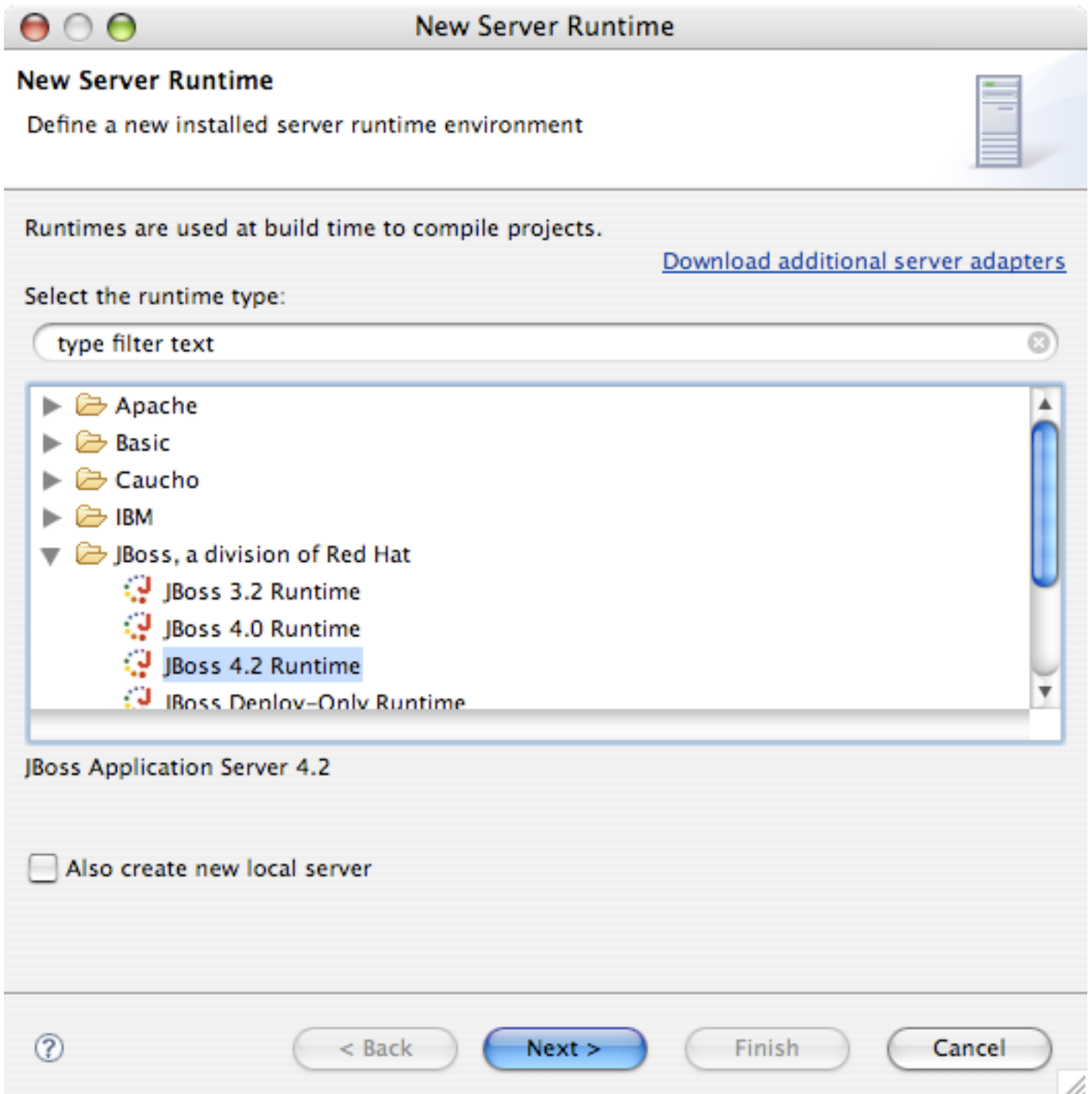
Eclipse ##### Seam #####

File -> New -> Seam Web Project #####

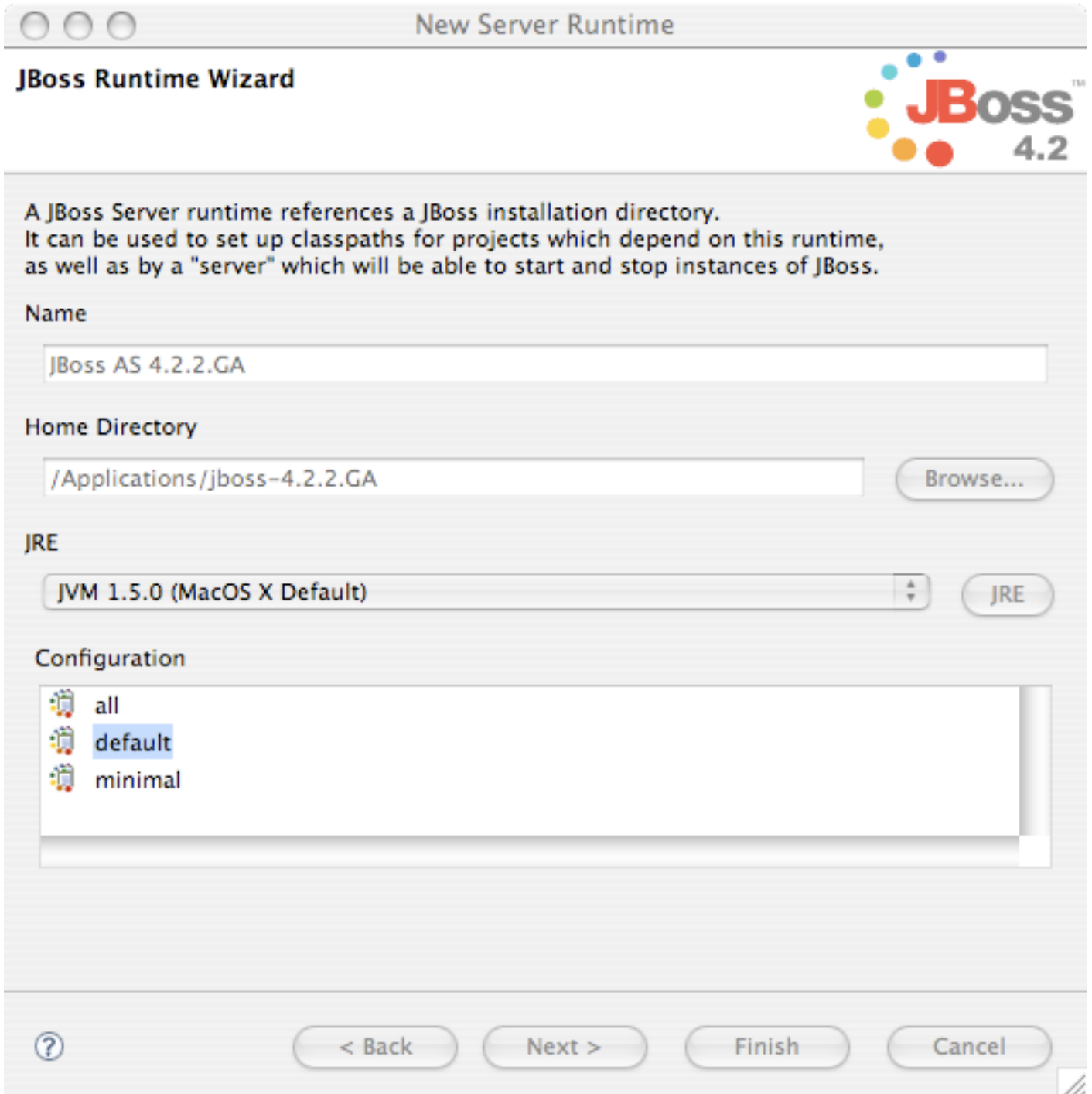


```
##### helloworld #####
```

Now, we need to tell JBoss Tools about JBoss AS. In this example we are using JBoss AS 4.2, though you can certainly use JBoss AS 5.0 as well. Selecting JBoss AS is a two step process. First we need to define a runtime. Again, we'll choose JBoss AS 4.2 in this case:

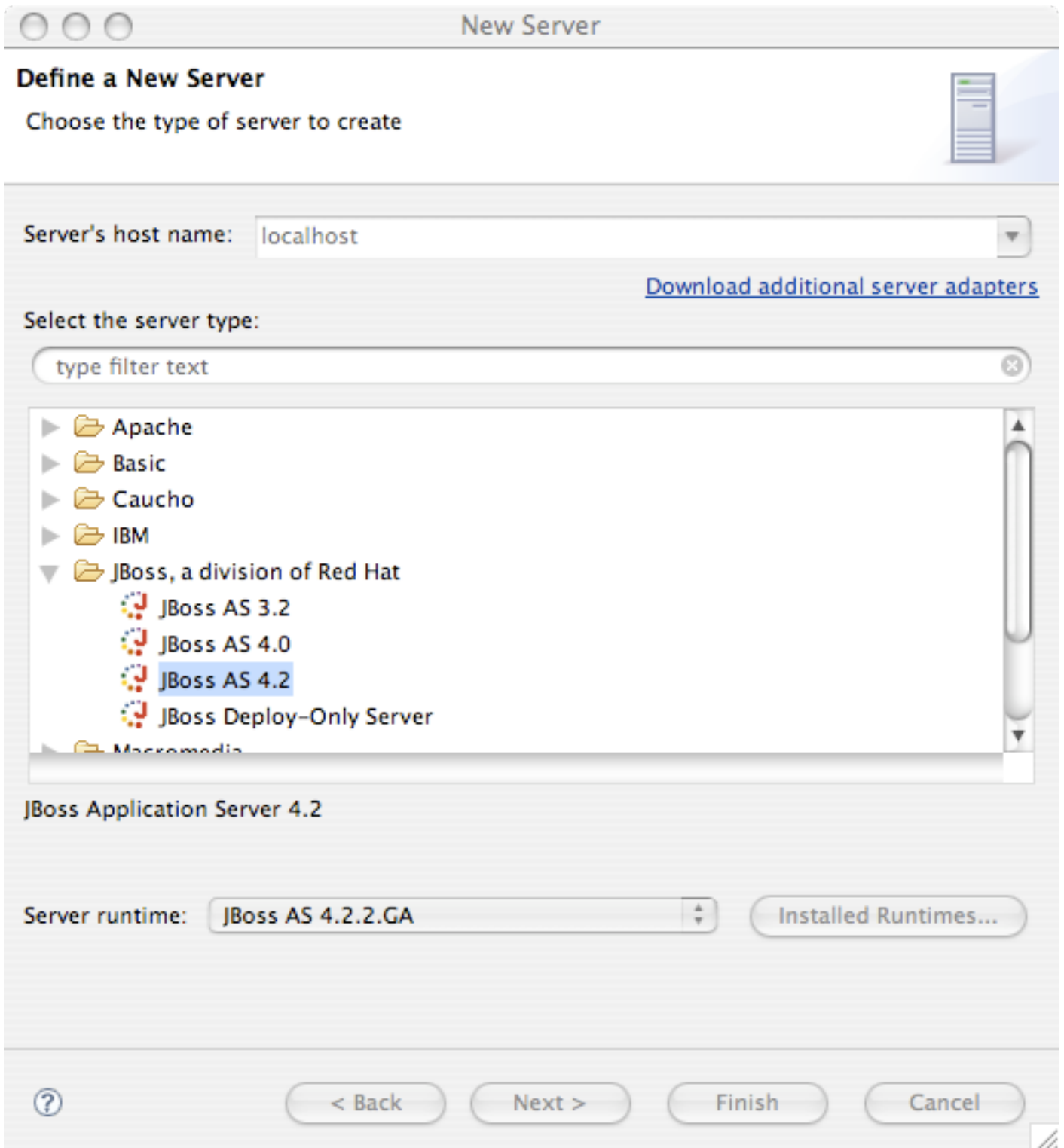


#####

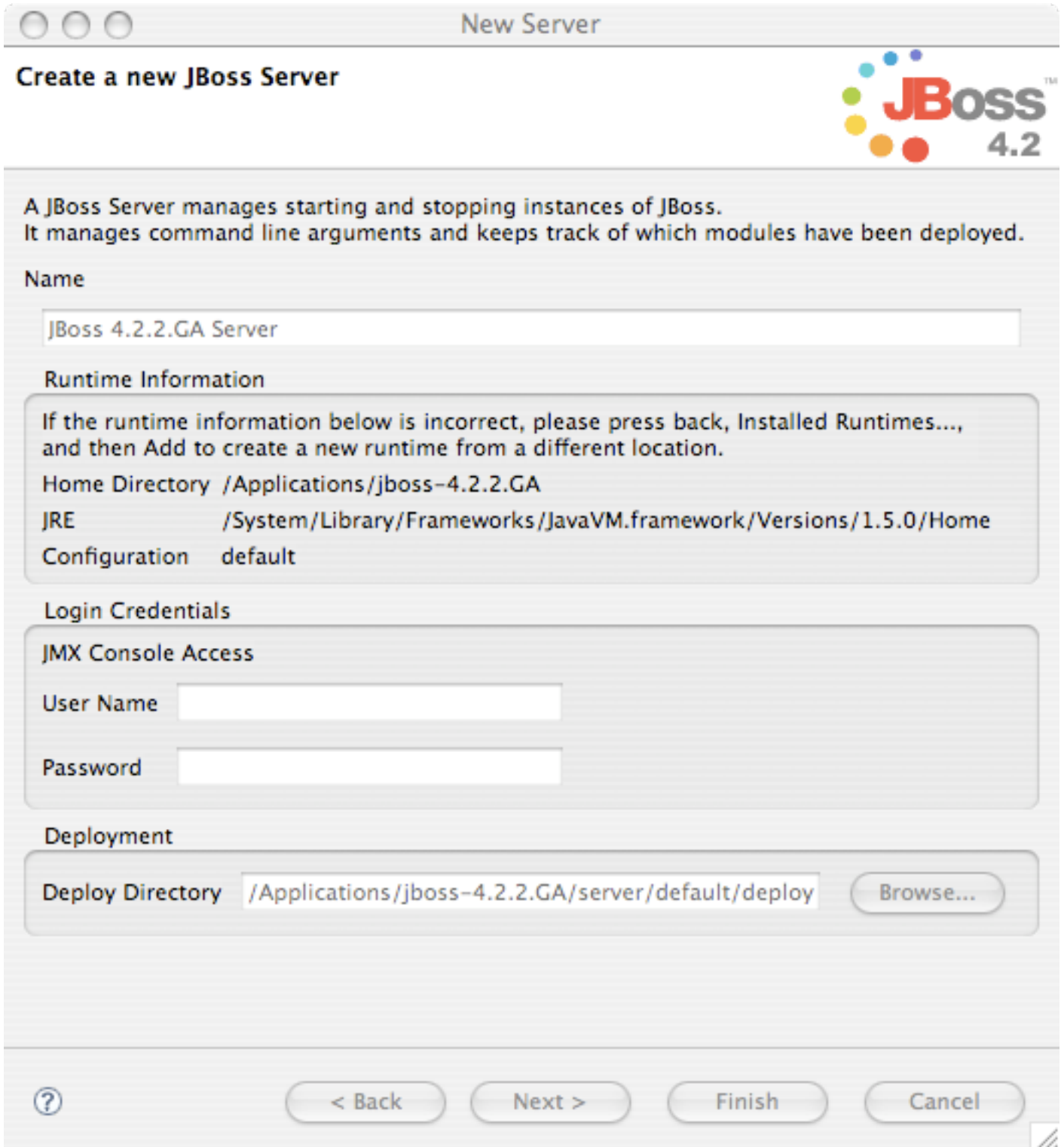


####JBoss Tools ##### JBoss AS 4.2  
#####

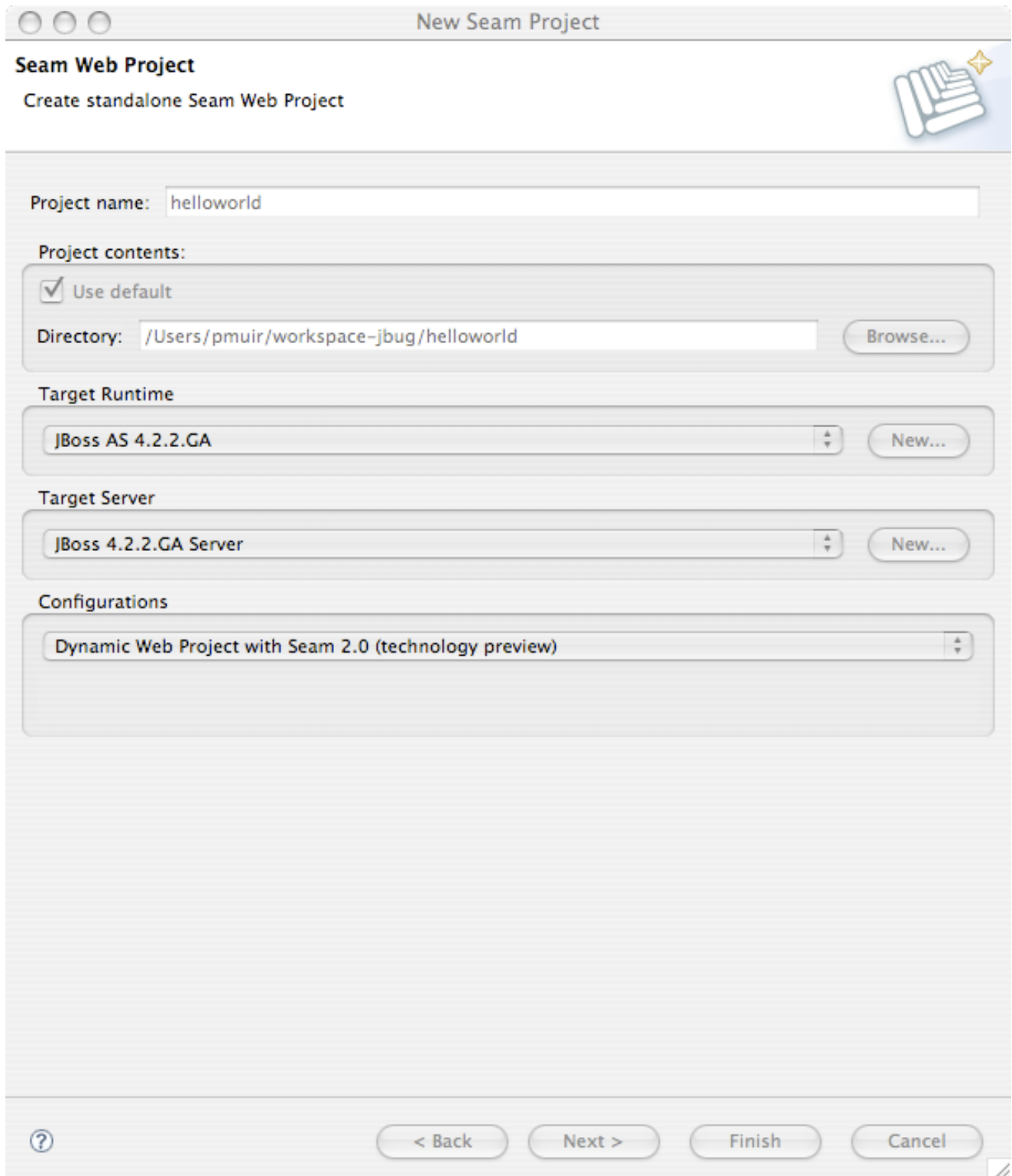




#####Finish#####

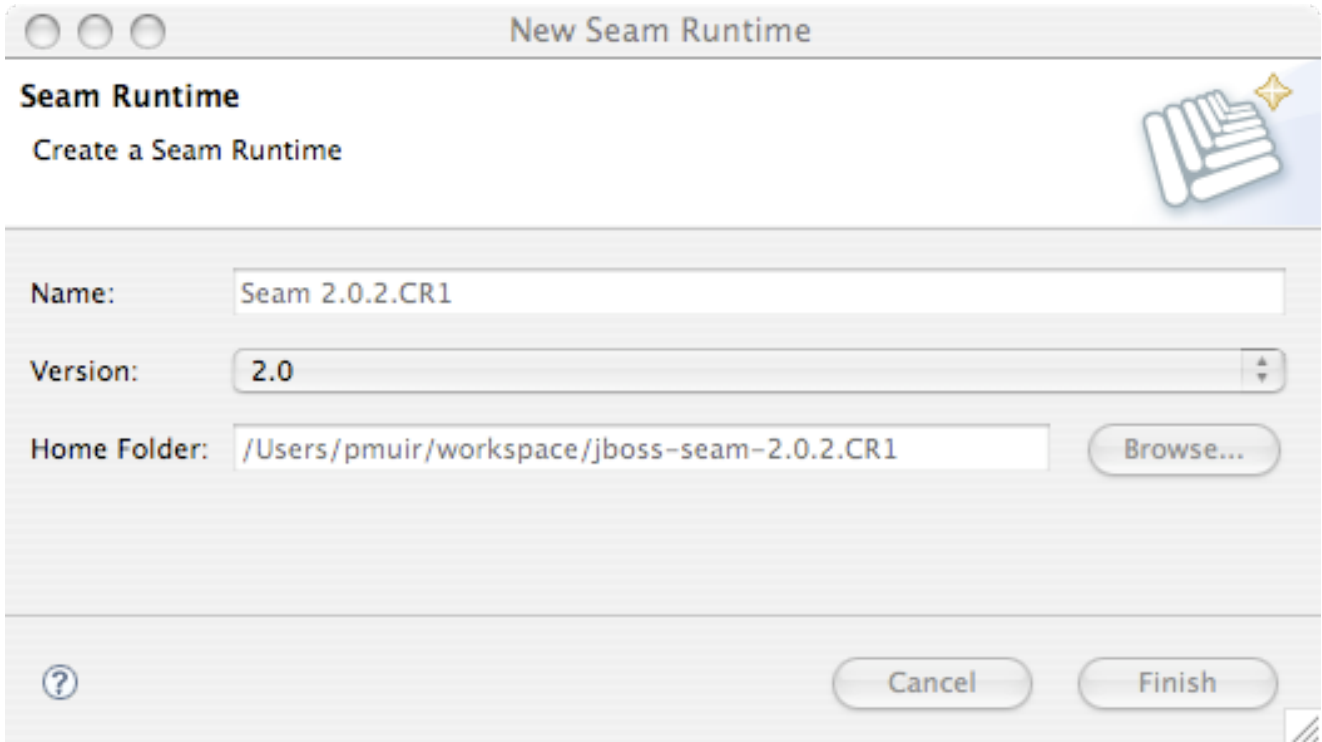


#####Dynamic Web Project with Seam 2.0 (technology preview) #####  
Next #####



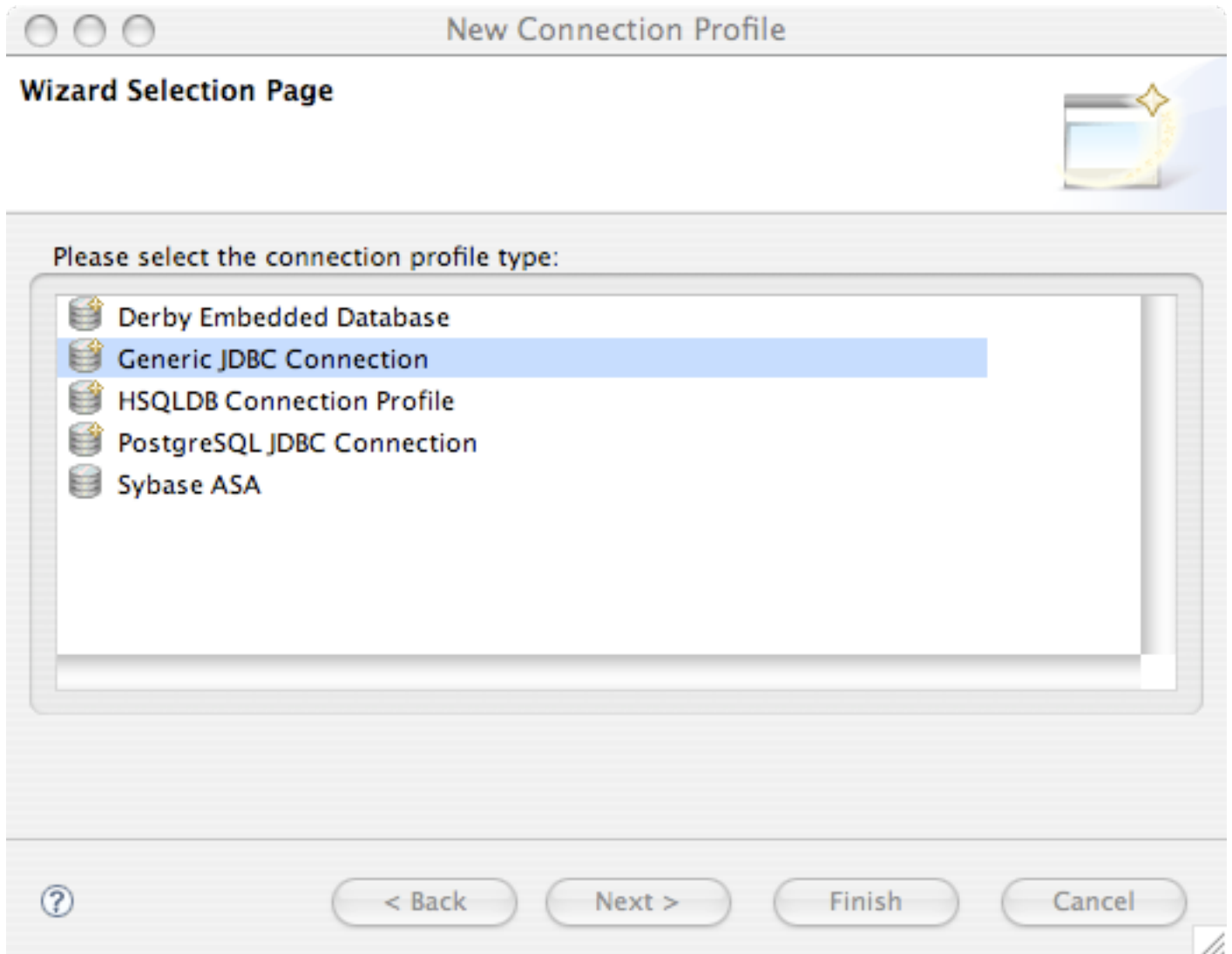
The next 3 screens allow you to further customize your new project, but for us the defaults are fine. So just hit *Next* until you reach the final screen.

##### JBoss Tools ##### Seam ##### ### Seam Runtime ##### -  
##### 2.0 #####




##### EAR ##### WAR ##### EAR ##### EJB 3.0  
#### Java EE 5 ##### WAR ##### EJB 3.0 ##### J2EE ##### WAR #  
EAR ##### JBoss #### EJB3 ##### EAR  
##### WAR ##### ## ##### WAR ##### EAR  
#####

##### MySQL ##### JBoss Tools  
##### MySQL ##### Generic  
JDBC Connection #####



#####


New JDBC Connection Profile

**Create connection profile**  
Please enter detailed information 

Name:

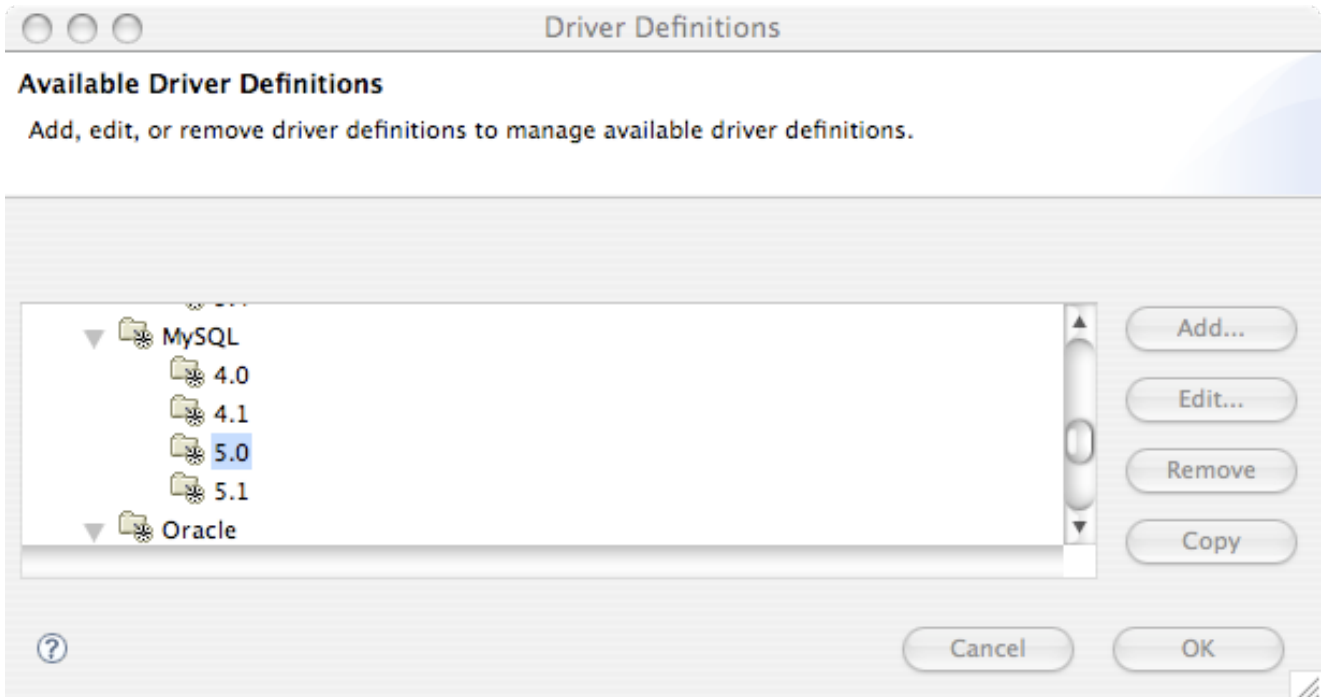
Description(optional):

Auto-connect at startup.

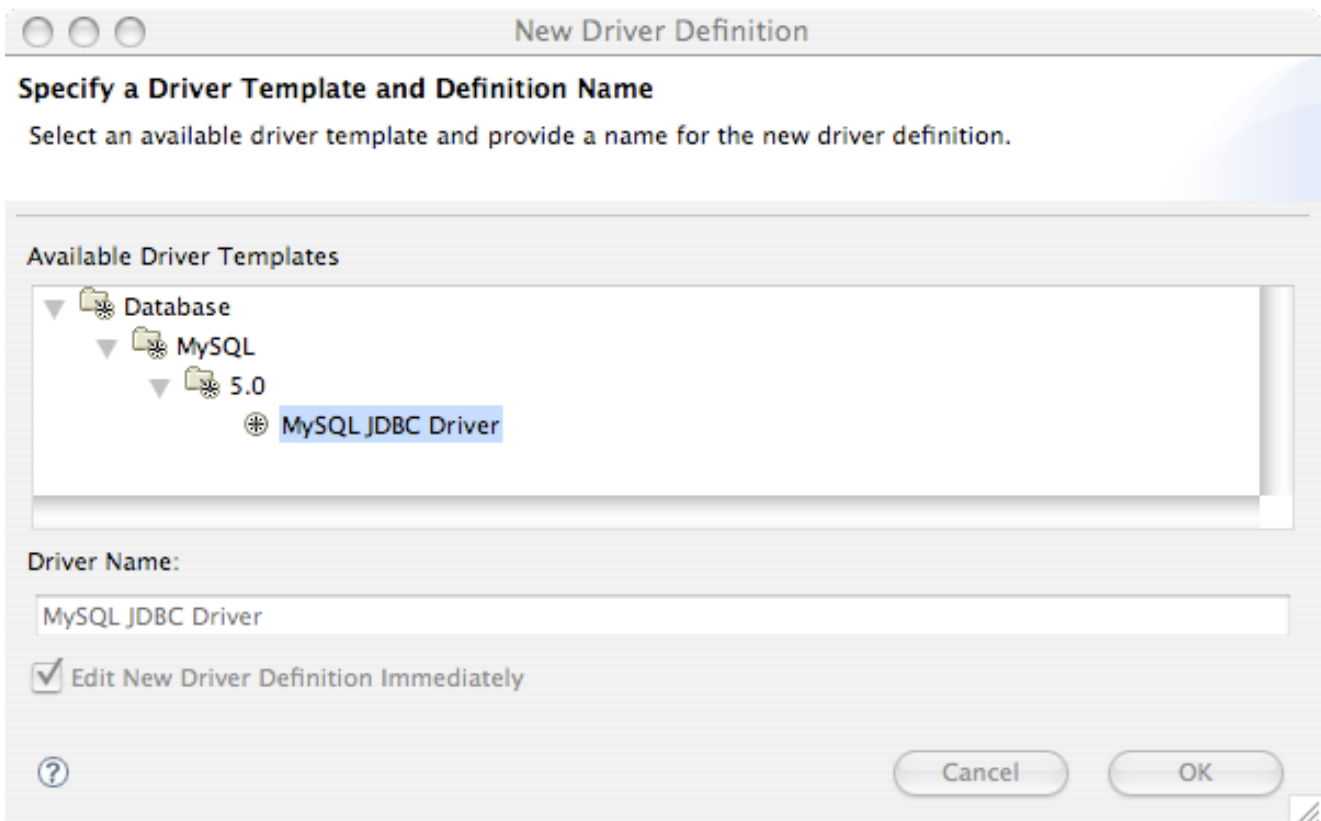


JBoss Tools ##### JBoss Tools #### MySQL JDBC #####  
#####

MySQL 5 #####Add... #####



MySQL JDBC Driver #####



### #3# JBoss Tools #### Seam #####

Edit Jar/Zip ##### jar #####

**Provide Driver Details**  
Modify details in the fields below to provide a unique name, a list of required jars, and set any available and applicable property values.

Driver Name  
MySQL JDBC Driver

Driver Type:  
MySQL JDBC Driver

Driver File(s):  
/Users/pmuir/java/mysql.jar

Buttons: Add Jar/Zip, Edit Jar/Zip, Remove Jar/Zip, Clear All

Properties:

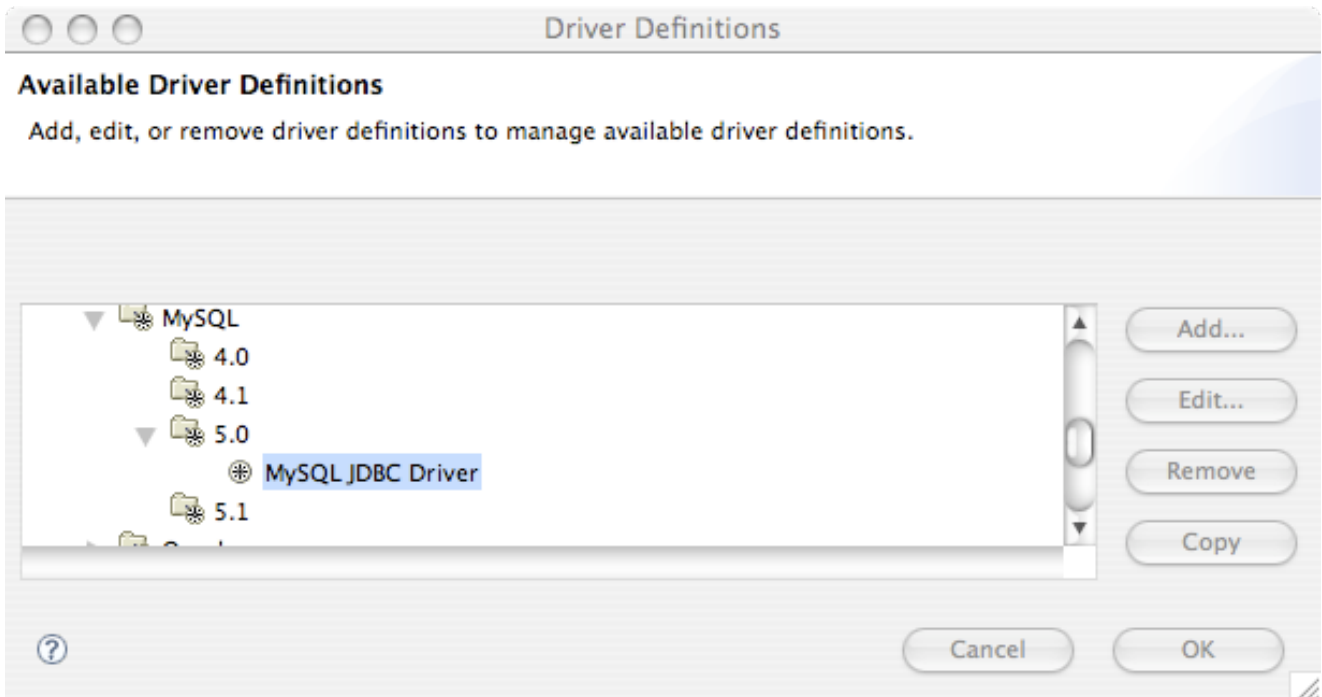
Property	Value
General	
Connection URL	jdbc:mysql://localhost:3306/database
Database Name	database
Driver Class	com.mysql.jdbc.Driver
Password	
User ID	root

Buttons: Cancel, OK

##### Ok #####

#####

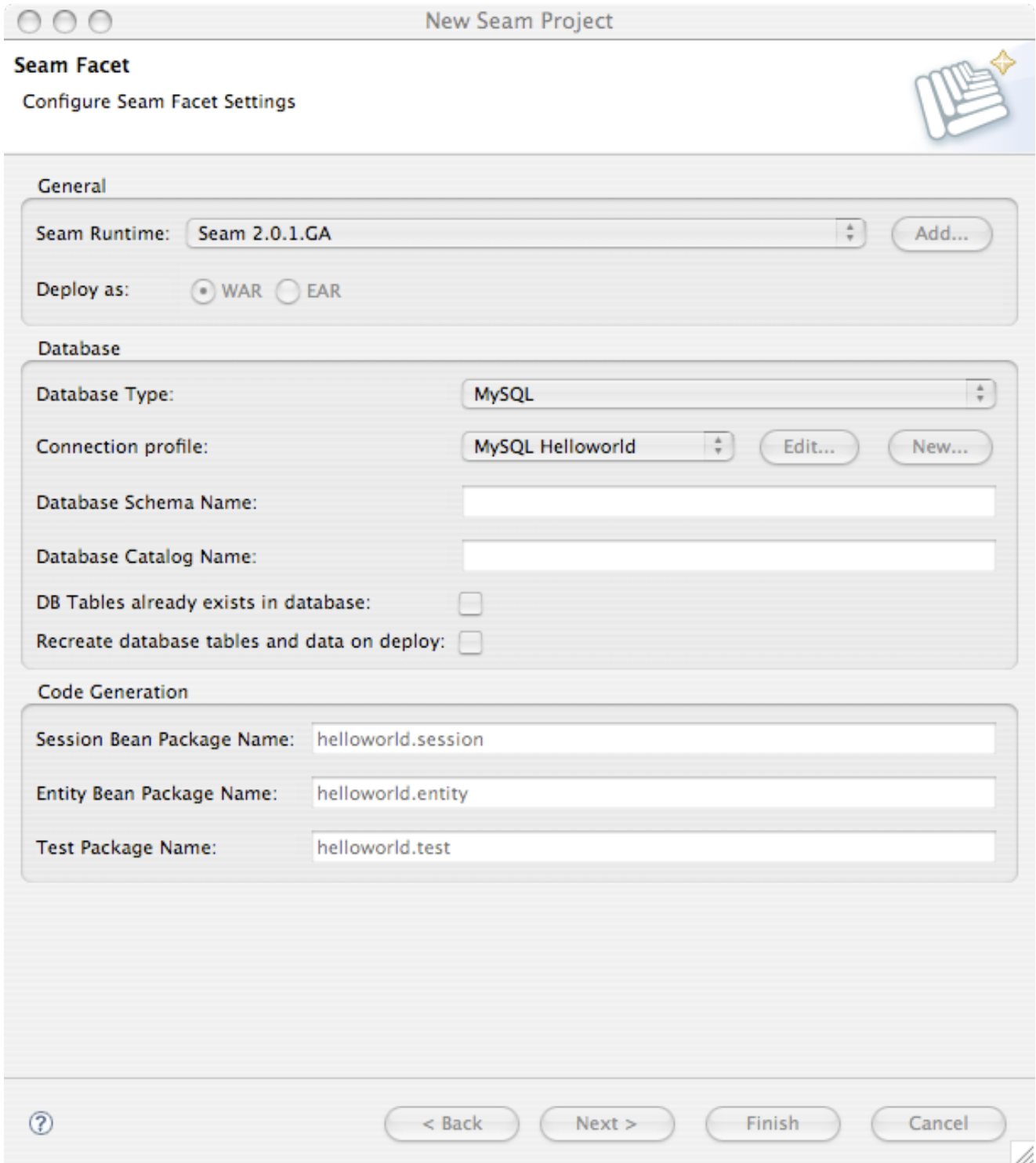




##### JBoss Tools #####

##### Test Connection ##### Finish #####

##### Bean ##### Finish #####



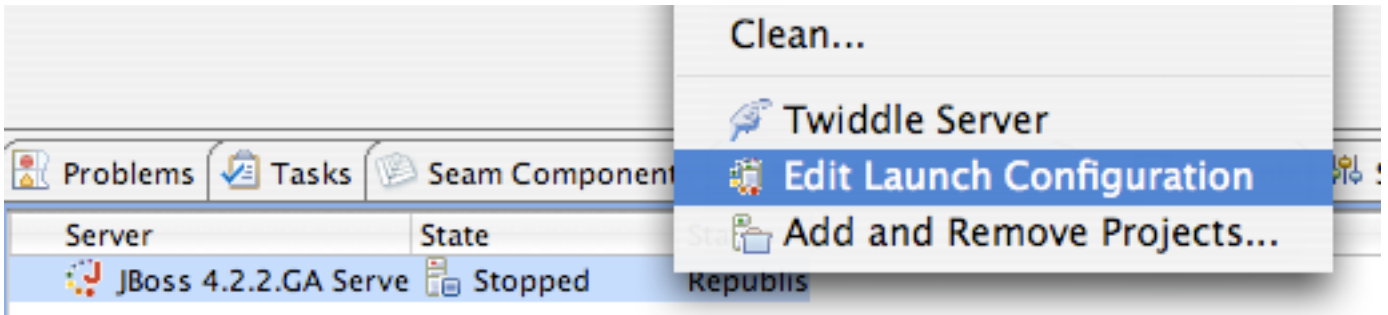
```
JBoss # WAR # EAR ##### JVM ##### —  
##### — EAR ##### JVM # perm gen #####  
##### perm gen space ##### JVM # JBoss #####  
#####
```

```
-Xms512m -Xmx1024m -XX:PermSize=256m -XX:MaxPermSize=512
```

#####

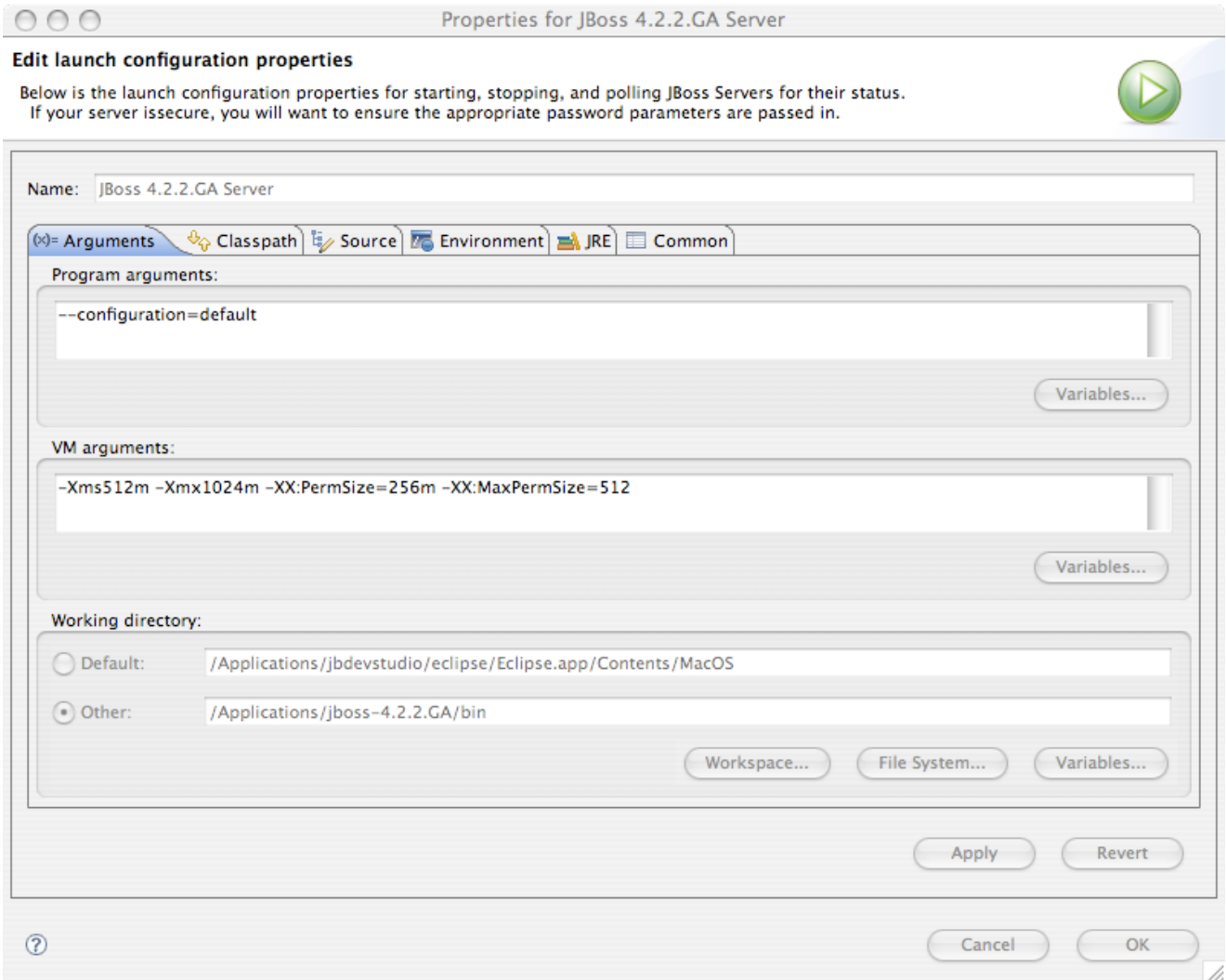
-Xms256m -Xmx512m -XX:PermSize=128m -XX:MaxPermSize=256

*JBoss Server View ##### Edit Launch Configuration #####*



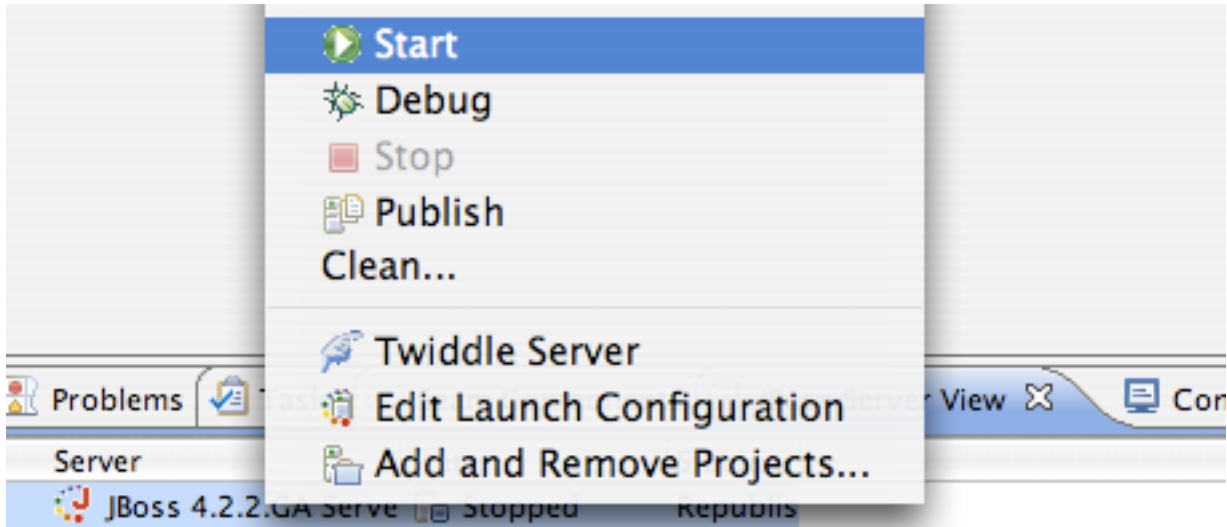
####VM #####

### #3# JBoss Tools #### Seam #####



##### — OutOfMemoryException #####

JBoss ##### Start #####  
##### Debug #####

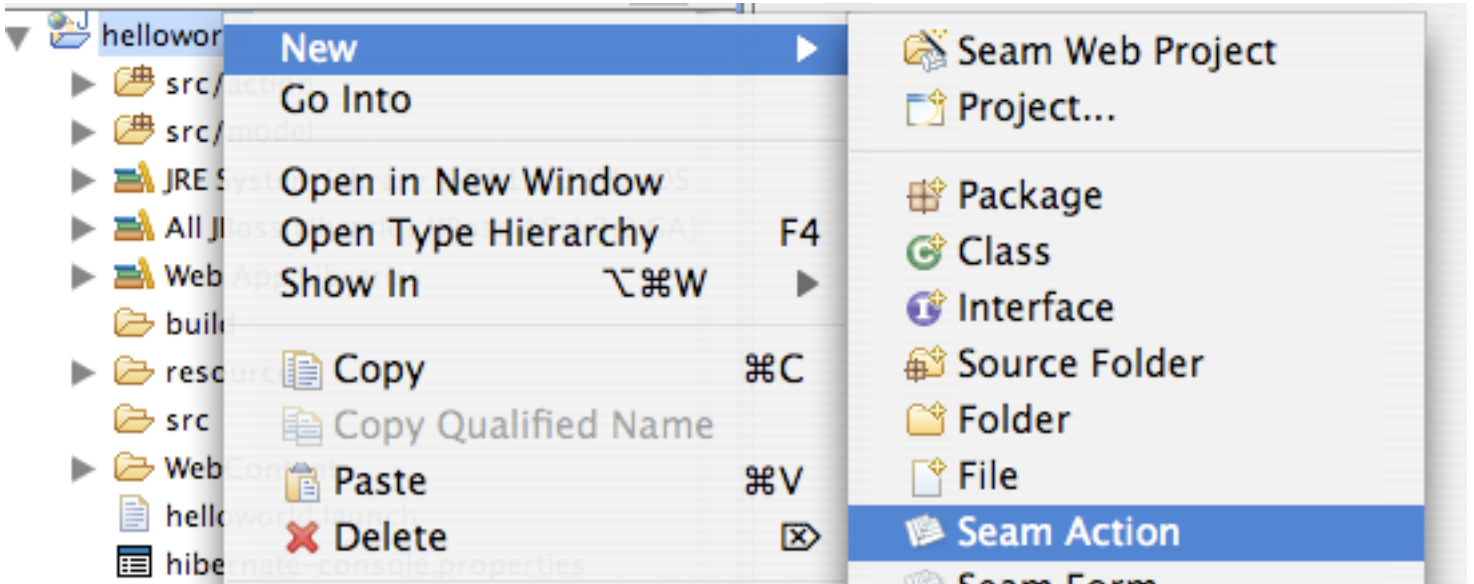


##### XML ##### Java EE #####  
 ##### ##### Seam ##### 90% #####

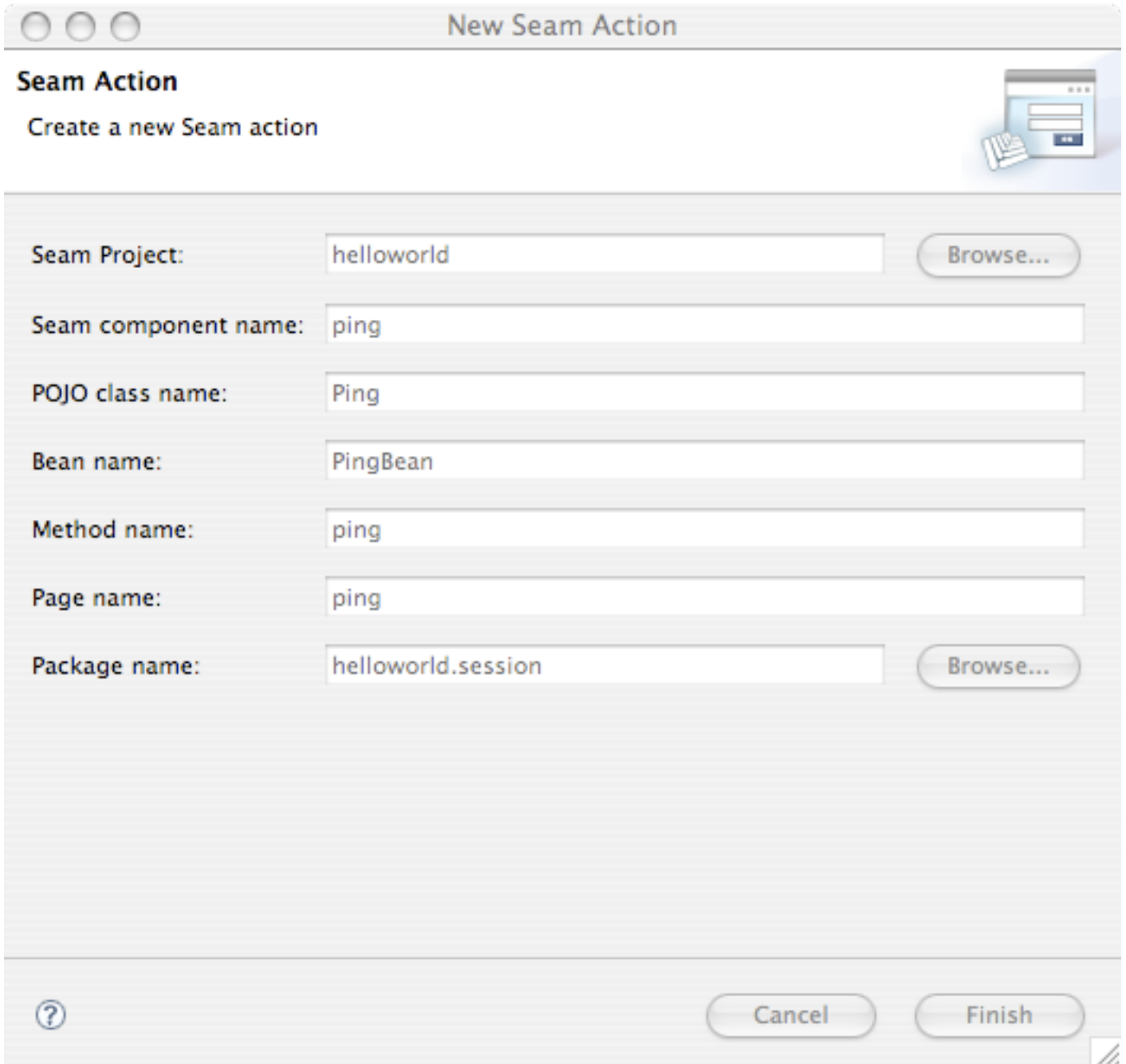
### 3.3. #####

##### Web ##### Java ##### Web  
 #####

####New -> Seam Action #####



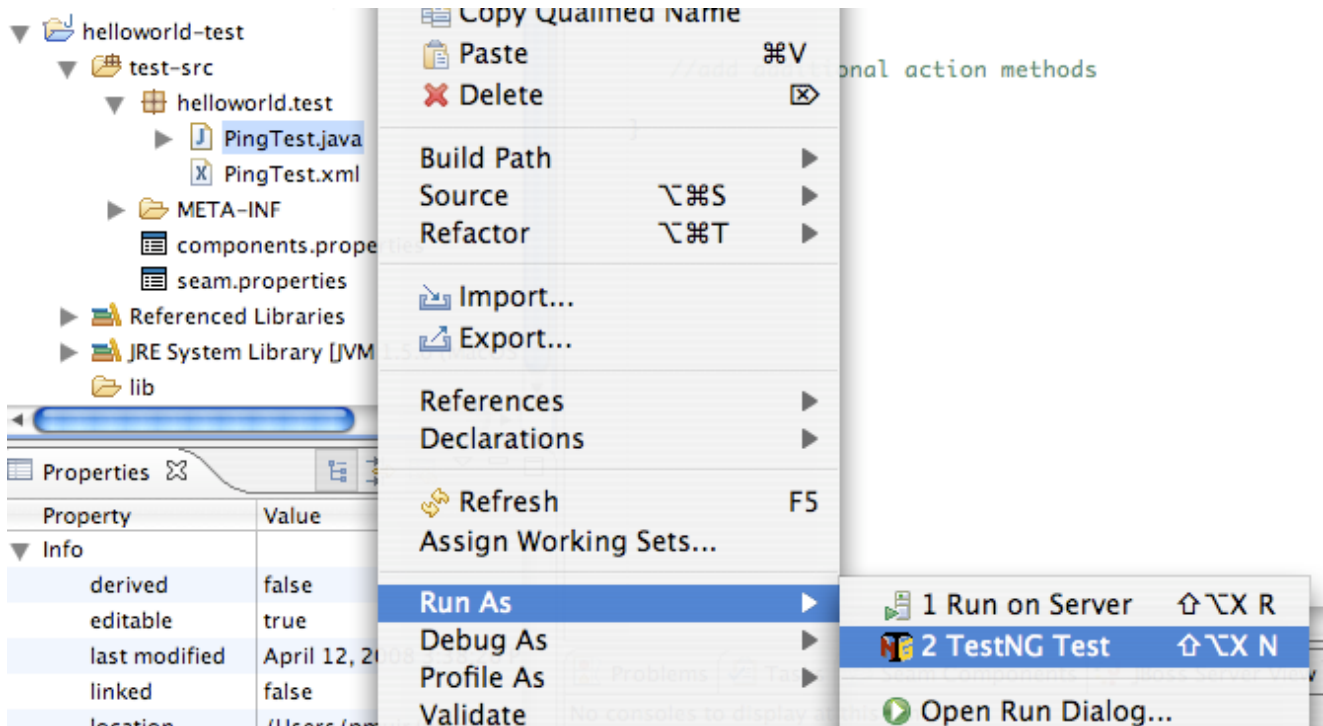
#####Seam ##### JBoss Tools #####



### Finish #####

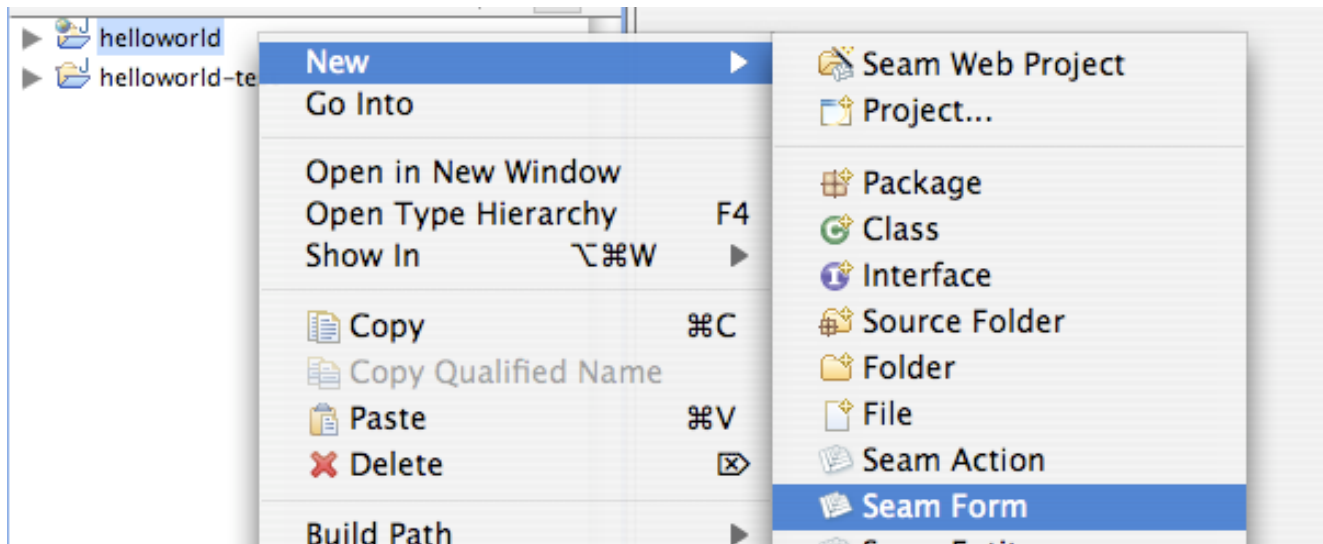
```
###http://localhost:8080/helloworld/ping.seam #####  
src directory ##### ping() #####  
#####
```

```
#####helloworld-test #####PingTest #####Run As-> TestNG Test  
#####
```

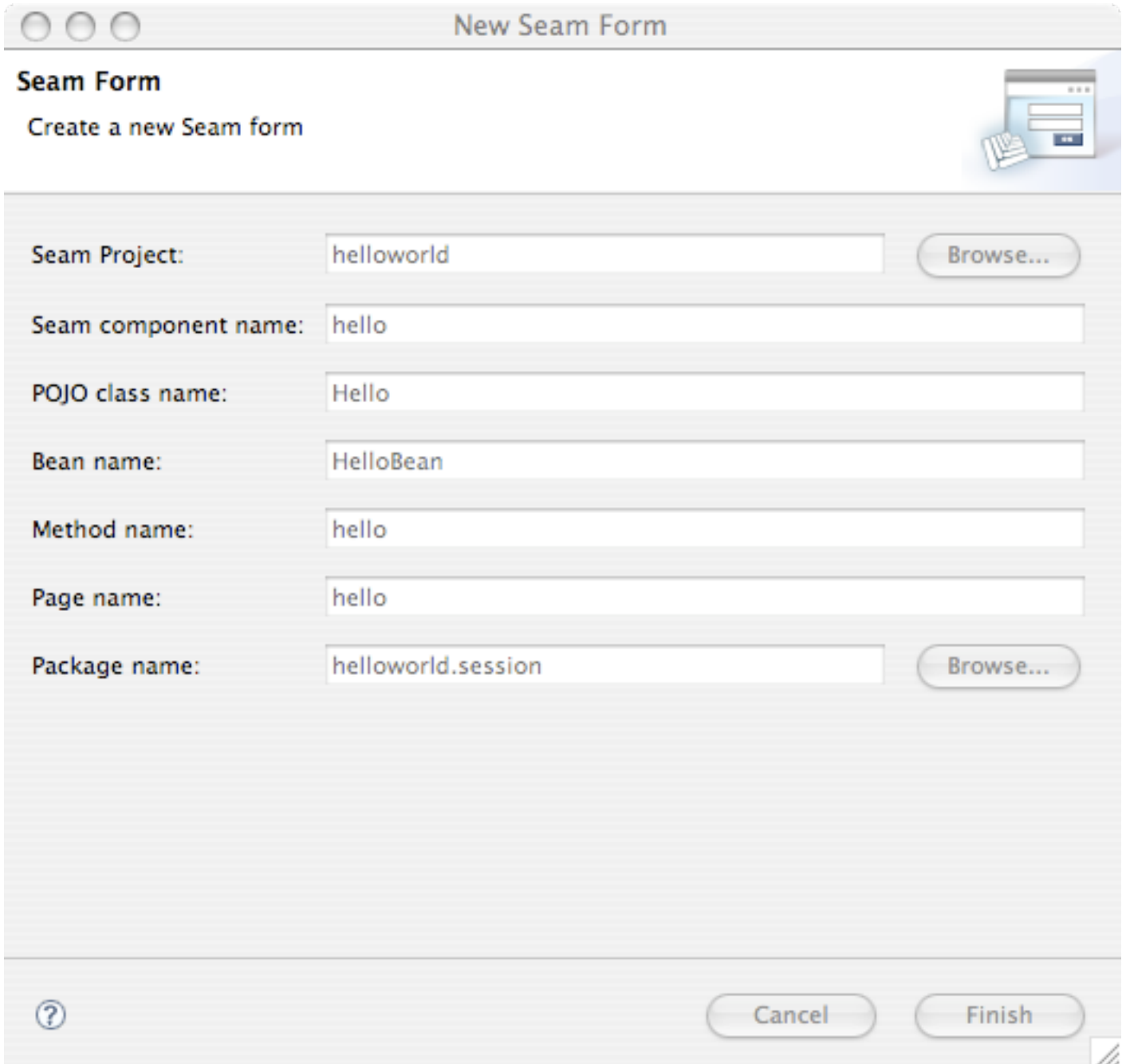


### 3.4. #####

##### New -> Seam Form #####



#####Seam ##### JBoss Tools #####

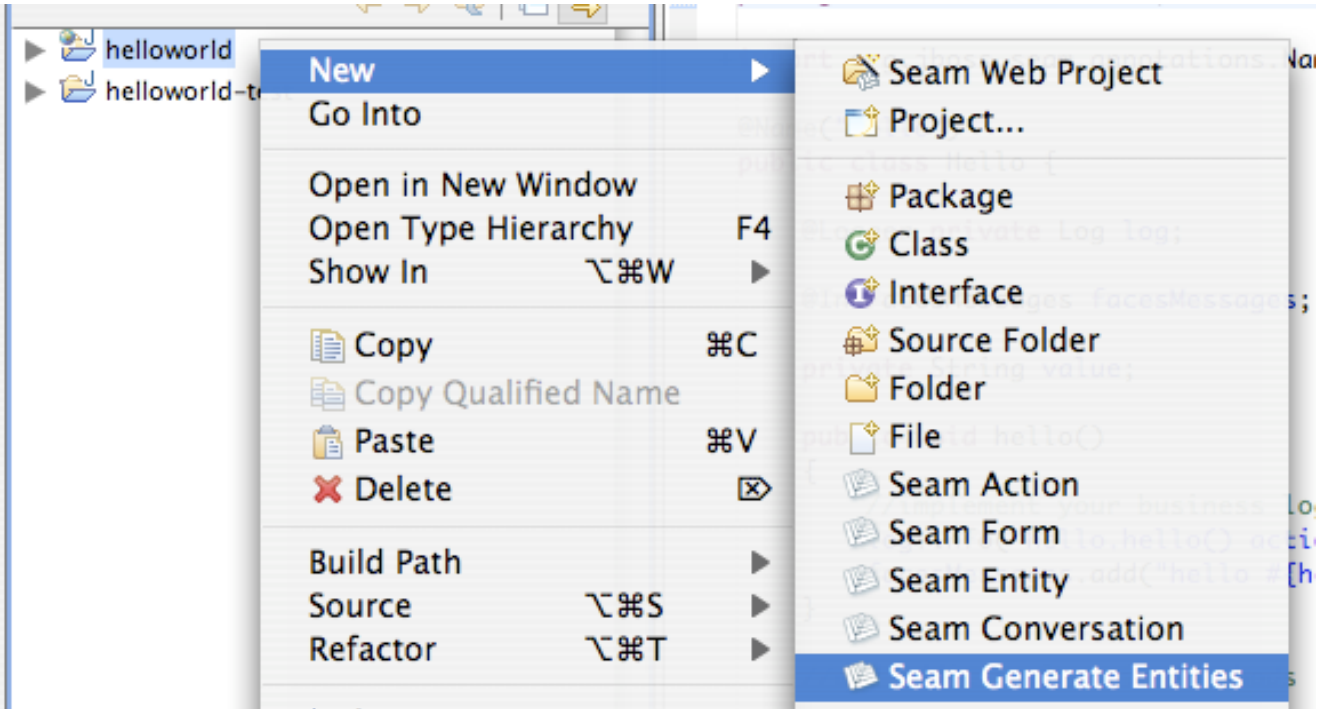


```
http://localhost:8080/helloworld/hello.seam #####  
##### Seam #####(Seam #####  
#3.6. #Seam # JBoss Tools ##### src/hot  
#####)
```

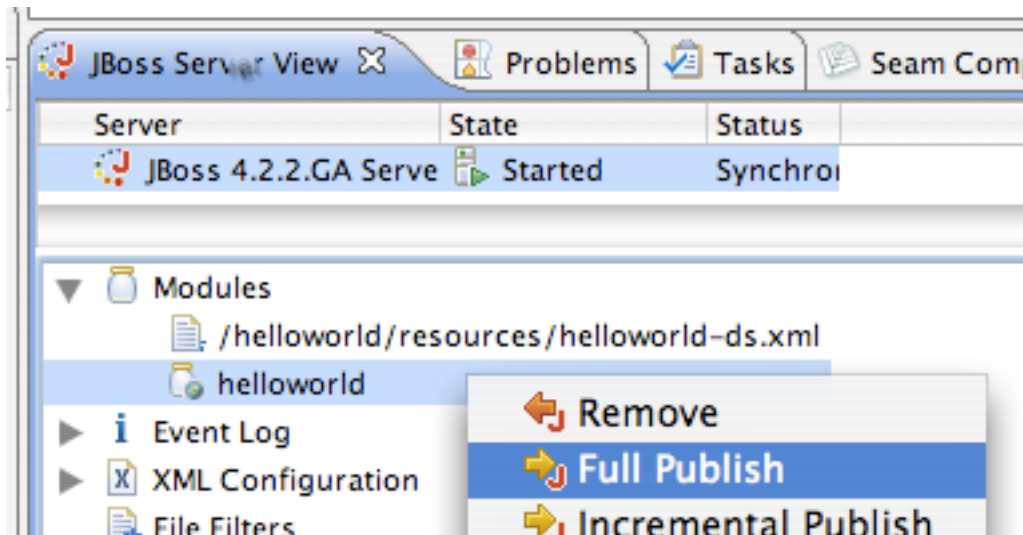
### 3.5. #####

```
#####  
(#####) ####New -> Seam  
Generate Entities #####
```





JBoss Tools #####  
 JPA #####  
 #####  
 #####



http://localhost:8080/helloworld #####  
 #####  
 Seam #####

### 3.6. Seam # JBoss Tools #####

JBoss Tools #####

### #3# JBoss Tools #### Seam #####

---

- facelets ###
- pages.xml ####

out of the box.

### Java ##### Full Publish #####

```
#####/#####/##### Seam # JavaBean
##### JavaBean ##### WEB-INF/dev
##### WAR #### EAR ##### Seam
#####
```

#####

- ##### JavaBean ##### EJB3 Bean ##### (#####)
- #####
- components.xml #####
- ##### WEB-INF/dev #####
- Seam ##### jboss-seam-debug.jar # WEB-INF/lib #####
- web.xml # Seam #####
- #####

```
JBoss Tools #### WAR #####src/hot
##### JBoss Tools # EAR #####
```

---

## #####

Seam #### 2 #####  
EJB ### #####  
(Bijection) ##### (#####) ##### Seam  
#####

Seam #####

### 4.1. Seam #####

Seam ##### Java API #####  
(demarcation) #####  
#####

### Seam #####

- #####
- Event (i.e., request) context
- #####
- #####
- #####
- #####
- #####
- #####

##### 2 #####  
##### (conversation context) ##### Web  
##### 1 ##### 3 ##### (#####)  
#####  
##### Seam  
#####  
#####

#####

#### 4.1.1. #####

Components which are truly stateless (stateless session beans, primarily) always live in the stateless context (which is basically the absence of a context since the instance Seam resolves is not stored). Stateless components are not very interesting, and are arguably not very object-

#4# #####

---

oriented. Nevertheless, they do get developed and used and are thus an important part of any Seam application.

4.1.2. #####

```
##### Web #####
#####JSF #####
#####
#####

RMI ##### Seam Remoting ### Seam #####
#####
```

4.1.3. #####

```
#####
#####
#####
#####
```

4.1.4. #####

```
##### Seam ##### ## (conversation) #####
#####1
##### 1
#####

##### 1
#####
#####

#####
#####

##### Seam
#####

##### ## #####
##### Seam #####

##### "##" ##### ## #####

##### Seam ##### Seam #####
##### (conversation timeout) #####

Seam #####
#####Seam #####
```

### 4.1.5. #####

#####  
#####

JSR-168 #####

### 4.1.6. #####

##### BPM ### (JBoss  
jBPM) #####  
#####  
##### (process definition language) #####  
#####

### 4.1.7. #####

#####  
##### Seam  
##### Seam #####

### 4.1.8. #####

#####  
##### Seam #####  
##### (#####) #####  
Contexts ##### Context  
#####

```
User user = (User) Contexts.getSessionContext().get("user");
```

#####

```
Contexts.getSessionContext().set("user", user);
```

#####  
#####

### 4.1.9. #####

#####  
#####

#### #4# #####

---

- #####
- #####
- #####
- #####
- #####
- #####
- #####

Contexts.lookupInStatefulContexts() ##### JSF  
#####

#### 4.1.10. #####

##### EJB #####  
##### EJB  
##### Bean  
#####

##### Web #####  
##### (AJAX) #####  
##### Seam  
#####

Seam ##### Seam  
#####  
#####  
##### Seam #####  
#####

##### Seam#####Seam  
#####  
#####Seam #####  
##### Bean # JavaBean ##### ( #####)  
#####  
#####  
##### @Synchronized ##### Bean ### JavaBean  
#####

##### ##### AJAX  
#####

#### 4.2. Seam #####

Seam ##### POJO (Plain Old Java Objects) ### #####Seam ##### JavaBean  
#### EJB 3.0 ##### Bean ### Seam # ##### EJB ##### EJB 3.0

##### Seam # EJB 3.0 #####EJB 3.0 ##### Seam ####  
#####

- EJB 3.0 ##### Bean
- EJB 3.0 ##### Bean
- EJB 3.0 entity beans (i.e., JPA entity classes)
- JavaBeans
- EJB 3.0 ##### Bean
- Spring beans (see # 27. Spring Framework #)

#### 4.2.1. ##### Bean

##### Bean ##### Seam  
##### JSF #####  
JSF #####

##### Bean #####

##### Bean #####  
##### EJB3 ##### ( ##### Bean  
#####)

##### Bean ##### Seam #####

Seam ##### Bean ##### Component.getInstance() ### @In(create=true)  
##### JNDI ##### ## new #####

#### 4.2.2. ##### Bean

##### Bean ##### Bean #####  
##### Bean  
##### Seam ##### Web #####  
HttpSession ##### Bean #####  
##### Seam #####

##### Bean ##### JSF ##### JSF  
##### Bean #####

##### Bean #####

##### Bean ##### ##Bean##Seam##### Seam  
#####

Seam ##### Bean ##### Component.getInstance() ### @In(create=true)  
##### JNDI ##### ## new #####

### 4.2.3. ##### Bean

```
##### Bean #####Seam#####  
##### Seam #####  
### Java #####  
  
##### Bean ##### Bean  
#####  
  
##### Bean ### JSF #####  
JSF ##### Bean ##### Bean ##### Bean  
##### # / # / ##### Bean #####  
  
##### Bean ##### Bean #####  
  
##### Bean ##### Bean #####  
Bean ##### Seam #####  
##### Seam ##### Seam ##### Bean #####  
  
Seam ##### Bean ##### Component.getInstance() ### @In(create=true)  
##### new #####
```

### 4.2.4. JavaBeans

```
JavaBean ##### Bean ##### Bean  
##### (##### ##### EJB 3.0 ###  
#####)  
  
#####EJB ##### Seam # Hibernate ##### Bean  
##### JavaBean ### ##### Bean #####  
##### Seam JavaBean #####  
  
#####JavaBean #####  
  
##### JavaBean ##### Seam #####  
  
Seam JavaBean ##### Component.getInstance() ### @In(create=true)  
##### new #####
```

### 4.2.5. ##### Bean

```
##### Bean # Seam ##### Bean  
##### Seam ##### JMS ###  
#####  
  
##### Bean ##Seam #####  
##### Bean ##### Seam #####  
  
##### Bean ##### EJB  
#####
```



#### 4.2.6. #####

```
Seam##### (#####) ##### Seam
##### JavaBean ###Seam
##### ##### Bean
##### Bean ###EJB #####
Bean #####
```

```
@Stateless
@Interceptors(SeamInterceptor.class)
public class LoginAction implements Login {
    ...
}
```

```
#####ejb-jar.xml #####
```

```
<interceptors>
  <interceptor>
    <interceptor-class
>org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
    </interceptor>
</interceptors>

<assembly-descriptor>
  <interceptor-binding>
    <ejb-name
>*/</ejb-name>
    <interceptor-class
>org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
    </interceptor-binding>
</assembly-descriptor>
>
```

#### 4.2.7. #####

```
#### Seam ##### @Name #####
```

```
@Name("loginAction")
@Stateless
public class LoginAction implements Login {
    ...
}
```

#### #4# #####

```
}
```

```
##### Seam ##### ## EJB ##### ##### Seam ##### JSF  
## Bean ##### 2 #####
```

```
@Name ##### Seam  
#####
```

Whenever Seam instantiates a component, it binds the new instance to a variable in the scope configured for the component that matches the component name. This behavior is identical to how JSF managed beans work, except that Seam allows you to configure this mapping using annotations rather than XML. You can also programmatically bind a component to a context variable. This is useful if a particular component serves more than one role in the system. For example, the currently logged in `User` might be bound to the `currentUser` session context variable, while a `User` that is the subject of some administration functionality might be bound to the `user` conversation context variable. Be careful, though, because through a programmatic assignment, it's possible to overwrite a context variable that has a reference to a Seam component, potentially confusing matters.

For very large applications, and for built-in seam components, qualified component names are often used to avoid naming conflicts.

```
@Name("com.jboss.myapp.loginAction")  
@Stateless  
public class LoginAction implements Login {  
    ...  
}
```

```
Java ##### JSF #####
```

```
<h:commandButton type="submit" value="Login"  
    action="#{com.jboss.myapp.loginAction.login}"/>
```

```
##### Seam ##### components.xml  
#####
```

```
<factory name="loginAction" scope="STATELESS" value="#{com.jboss.myapp.loginAction}"/>
```

```
##### Seam #####  
Seam#####Seam JAR##### components.xml  
#####
```

```

<components xmlns="http://jboss.com/products/seam/components">

  <import>org.jboss.seam.core</import>
  <import>org.jboss.seam.cache</import>
  <import>org.jboss.seam.transaction</import>
  <import>org.jboss.seam.framework</import>
  <import>org.jboss.seam.web</import>
  <import>org.jboss.seam.faces</import>
  <import>org.jboss.seam.international</import>
  <import>org.jboss.seam.theme</import>
  <import>org.jboss.seam.pageflow</import>
  <import>org.jboss.seam.bpm</import>
  <import>org.jboss.seam.jms</import>
  <import>org.jboss.seam.mail</import>
  <import>org.jboss.seam.security</import>
  <import>org.jboss.seam.security.management</import>
  <import>org.jboss.seam.security.permission</import>
  <import>org.jboss.seam.captcha</import>
  <import>org.jboss.seam.excel.exporter</import>
  <!-- ... --->
</components>

```

```
#####Seam#####components.xml#####
```

#### 4.2.8. #####

```

@Scope##### (#####) ##### Seam
#####

```

```

@Name("user")
@Entity
@Scope(SESSION)
public class User {
  ...
}

```

```
org.jboss.seam.ScopeType #####
```

#### 4.2.9. #####

Some Seam component classes can fulfill more than one role in the system. For example, we often have a `User` class which is usually used as a session-scoped component representing the current user but is used in user administration screens as a conversation-scoped component. The

#### #4# #####

`@Role` annotation lets us define an additional named role for a component, with a different scope — it lets us bind the same component class to different context variables. (Any Seam component *instance* may be bound to multiple context variables, but this lets us do it at the class level, and take advantage of auto-instantiation.)

```
@Name("user")
@Entity
@Scope(CONVERSATION)
@Role(name="currentUser", scope=SESSION)
public class User {
    ...
}
```

`@Roles #####`

```
@Name("user")
@Entity
@Scope(CONVERSATION)
@Roles({@Role(name="currentUser", scope=SESSION),
        @Role(name="tempUser", scope=EVENT)})
public class User {
    ...
}
```

#### 4.2.10. #####

```
##### Seam ##### (Eat Your
Own Dog Food) # ##### Seam ##### (##) #
Seam#####
##### Seam #####
##### Seam ##### org.jboss.seam.core # ##### Java #####
#####Seam ##### instance()
#####
```

```
FacesMessages.instance().add("Welcome back, #{user.name}!");
```

#### 4.3. #####

```
##### (dependency injection) #### # ##### (inversion of control) ##### Java
##### ##### ##### setter
```

```
##### (#####) #####
#####
#####
#####
###Seam##### Seam
##### (bijection) #####
#####
```

- ##### (contextual) - #####  
 (##### (wider) ##### (narrow) #####)
- ##### (bidirectional) - #####  
 ##### (outject) #####  
 #####
- ## (dynamic) - ##### Seam  
 #####

```
#####
#####
#####
```

@In #####

```
@Name("loginAction")
@Stateless
public class LoginAction implements Login {
    @In User user;
    ...
}
```

#####setter #####

```
@Name("loginAction")
@Stateless
public class LoginAction implements Login {
    User user;

    @In
    public void setUser(User user) {
        this.user=user;
    }

    ...
}
```

#### #4# #####

```
}
```

```
##### Seam #####  
@In("currentUser") #####
```

```
##### Seam #####  
@In(create=true) ##### (null ####) #####@In(required=false)  
#####
```

```
##### @In(create=true) #####  
##### @AutoCreate ##### create=true #####  
#####
```

```
#####
```

```
@Name("loginAction")  
@Stateless  
public class LoginAction implements Login {  
    @In("#{user.username}") String username;  
    ...  
}
```

Injected values are disinjected (i.e., set to `null`) immediately after method completion and outjection.

```
(#####)
```

```
@Out#####
```

```
@Name("loginAction")  
@Stateless  
public class LoginAction implements Login {  
    @Out User user;  
    ...  
}
```

```
#### getter #####
```

```
@Name("loginAction")  
@Stateless  
public class LoginAction implements Login {  
    User user;
```

```

@Out
public User getUser() {
    return user;
}

...
}

```

#####

```

@Name("loginAction")
@Stateless
public class LoginAction implements Login {
    @In @Out User user;

    ...
}

```

####

```

@Name("loginAction")
@Stateless
public class LoginAction implements Login {
    User user;

    @In
    public void setUser(User user) {
        this.user=user;
    }

    @Out
    public User getUser() {
        return user;
    }

    ...
}

```

#### 4.4. #####

```

##### Bean ##### Bean Seam ##### EJB 3.0 #####
(@PostConstruct#@PreDestroy ##) ##### ##Seam # JavaBean #####

```

#### #4# #####

```
##### J2EE #####Seam #
@PostConstruct # @PreDestroy ##### 2 #####

@Create ##### Seam ##### ##### 1 ## @Create#####

@Destroy ##### Seam ##### ##### 1 ## @Destroy
#####

##### Bean #####@Remove#####
Seam #####

##### @Startup #####
@Startup ##### Seam
##### @Startup(depends={...}) #####
#####
```

### 4.5. #####

```
@Install #####
#####
```

- #####
- #####
- ##### (#####)#

```
@Install # ##### # #####
```

```
##### Seam ##### Seam ##### (##)#
```

1. BUILT\_IN — Seam #####

2. FRAMEWORK —  
#####

3. APPLICATION — #####

4. DEPLOYMENT — #####

5. MOCK — #####

JMS ##### messageSender #####

```
@Name("messageSender")
public class MessageSender {
    public void sendMessage() {
        //do something with JMS
    }
}
```



}

```
#####          ###JMS          #####
##### mock #####
```

```
@Name("messageSender")
@Install(precedence=MOCK)
public class MockMessageSender extends MessageSender {
    public void sendMessage() {
        //do nothing!
    }
}
```

```
#### ##### Seam #####
```

```
#####
##### Jar #####
#####
##### @Install ##### Seam
#####
#####
```

## 4.6. ####

```
#####
```

```
private static final Log log = LoggerFactory.getLog(CreateOrderAction.class);

public Order createOrder(User user, Product product, int quantity) {
    if ( log.isDebugEnabled() ) {
        log.debug("Creating new order for user: " + user.username() +
            " product: " + product.name()
            + " quantity: " + quantity);
    }
    return new Order(user, product, quantity);
}
```

```
#####
##### Java ##### 10
#####
```

```
Seam ##### API #####
```

#### #4# #####

---

```
@Logger private Log log;

public Order createOrder(User user, Product product, int quantity) {
    log.debug("Creating new order for user: #0 product: #1 quantity: #2", user.username(),
product.name(), quantity);
    return new Order(user, product, quantity);
}
```

It doesn't matter if you declare the `log` variable static or not — it will work either way, except for entity bean components which require the `log` variable to be static.

```
#####debug() ##### ## ##### ##### if ( log.isDebugEnabled()
) ##### Seam ##### Log #####
#####
```

```
User # Product ## ##### Seam #####
```

```
@Logger private Log log;

public Order createOrder(User user, Product product, int quantity) {
    log.debug("Creating new order for user: #{user.username} product: #{product.name} quantity:
#0", quantity);
    return new Order(user, product, quantity);
}
```

```
Seam ##### log4j #### JDK logging ##### log4j #####Seam
##### #####Seam # JDK logging #####
```

#### 4.7. Mutable ##### @ReadOnly

```
##### setAttribute() #####
##### HttpSession #####
##### #####
#####
```

```
#####EJB ##### Bean #####
EJB ##### Seam ##### EJB 3.0
##### JavaBean ##### Bean
##### Seam # Web #####
```

```
##### JavaBean #####Seam ## #####
setAttribute() #####
##### org.jboss.seam.core.Mutable #####
```

```
org.jboss.seam.core.AbstractMutable #####
#####
```

```
@Name("account")
public class Account extends AbstractMutable
{
    private BigDecimal balance;

    public void setBalance(BigDecimal balance)
    {
        setDirty(this.balance, balance);
        this.balance = balance;
    }

    public BigDecimal getBalance()
    {
        return balance;
    }

    ...
}
```

```
##### @ReadOnly #####
```

```
@Name("account")
public class Account
{
    private BigDecimal balance;

    public void setBalance(BigDecimal balance)
    {
        this.balance = balance;
    }

    @ReadOnly
    public BigDecimal getBalance()
    {
        return balance;
    }

    ...
}
```

#### #4# #####

```
}
```

```
##### Bean ##### Seam # (#####) #####  
Seam ##### ##### setAttribute()  
##### ##### ##### Bean  
##### Bean ##### Bean # JavaBean  
#####
```

```
@Stateful  
@Name("account")  
public class AccountManager extends AbstractMutable  
{  
    private Account account; // an entity bean  
  
    @Unwrap  
    public Account getAccount()  
    {  
        return account;  
    }  
  
    ...  
}
```

```
Seam ##### EntityHome #### Seam ##### Bean  
#####
```

#### 4.8. #####

```
Seam ##### @In ##### Seam  
##### Seam  
##### (### @Destroy)# ####Seam ##### Seam  
##### Seam ##### 2#3  
#####
```

```
##### ## Seam #####  
##### ## ##### @Factory  
#####  
#####Seam #####
```

```
@Factory(scope=CONVERSATION)
```

```

public List<Customer
> getCustomerList() {
    return ... ;
}

```

```
##### void #####
```

```

@DataModel List<Customer
> customerList;

@Factory("customerList")
public void initCustomerList() {
    customerList = ... ;
}

```

```
##### customerList ##### null #### #####
##### ##### ##### ## ##### Seam
##### #####
```

```
##### @Unwrap ##### ##
#####
```

```

@Name("customerList")
@Scope(CONVERSATION)
public class CustomerListManager
{
    ...

    @Unwrap
    public List<Customer
> getCustomerList() {
    return ... ;
}
}

```

```
#####
##### @Unwrap #####
@Destroy #####
```

```

@Name("hens")
@Scope(APPLICATION)

```

```
public class HenHouse
{
    Set<Hen> hens;

    @In(required=false) Hen hen;

    @Unwrap
    public List<Hen> getHens()
    {
        if (hens == null)
        {
            // Setup our hens
        }
        return hens;
    }

    @Observer({"chickBorn", "chickenBoughtAtMarket"})
    public addHen()
    {
        hens.add(hen);
    }

    @Observer("chickenSoldAtMarket")
    public removeHen()
    {
        hens.remove(hen);
    }

    @Observer("foxGetsIn")
    public removeAllHens()
    {
        hens.clear();
    }
    ...
}
```

```
#####
#####
```

---

## Seam#####

```
XML#####Seam#####XML####Seam#####  
Java##### Seam#####  
Seam##### web.xml #####  
components.xml #####
```

### 5.1. #####

Seam components may be provided with configuration properties either via servlet context parameters, via system properties, or via a properties file named `seam.properties` in the root of the classpath.

The configurable Seam component must expose JavaBeans-style property setter methods for the configurable attributes. If a Seam component named `com.jboss.myapp.settings` has a setter method named `setLocale()`, we can provide a property named `com.jboss.myapp.settings.locale` in the `seam.properties` file, a system property named `org.jboss.seam.properties.com.jboss.myapp.settings.locale` via `-D` at startup, or as a servlet context parameter, and Seam will set the value of the `locale` attribute whenever it instantiates the component.

The same mechanism is used to configure Seam itself. For example, to set the conversation timeout, we provide a value for `org.jboss.seam.core.manager.conversationTimeout` in `web.xml`, `seam.properties`, or via a system property prefixed with `org.jboss.seam.properties`. (There is a built-in Seam component named `org.jboss.seam.core.manager` with a setter method named `setConversationTimeout()`.)

### 5.2. components.xml#####

```
components.xml#####
```

- Configure components that have been installed automatically — including both built-in components, and application components that have been annotated with the `@Name` annotation and picked up by Seam's deployment scanner.
- Install classes with no `@Name` annotation as Seam components — this is most useful for certain kinds of infrastructural components which can be installed multiple times with different names (for example Seam-managed persistence contexts).

```
• @Name#####@Install#####
```

```
• ##### (override) #####
```

```
components.xml#####
```

```
• war#WEB-INF#####
```

```
• jar#META-INF#####
```

## #5# Seam#####

---

- @Name#####jar

```
#####seam.properties #####META-INF/  
components.xml##### @Name##### (#####@Install  
#####) # components.xml#####  
#####  
##### components.xml #####jBPM#####
```

```
<components xmlns="http://jboss.com/products/seam/components"  
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
  xmlns:bpm="http://jboss.com/products/seam/bpm">  
  <bpm:jbpm/>  
</components  
>
```

#####

```
<components>  
  <component class="org.jboss.seam.bpm.Jbpm"/>  
</components  
>
```

###2#####Seam#####

```
<components xmlns="http://jboss.com/products/seam/components"  
  xmlns:persistence="http://jboss.com/products/seam/persistence"  
  
  <persistence:managed-persistence-context name="customerDatabase"  
    persistence-unit-jndi-name="java:/customerEntityManagerFactory"/>  
  
  <persistence:managed-persistence-context name="accountingDatabase"  
    persistence-unit-jndi-name="java:/accountingEntityManagerFactory"/>  
  
</components  
>
```

#####

```
<components>  
  <component name="customerDatabase"
```



```

        class="org.jboss.seam.persistence.ManagedPersistenceContext">
        <property name="persistenceUnitJndiName"
>java:/customerEntityManagerFactory</property>
    </component>

    <component name="accountingDatabase"
        class="org.jboss.seam.persistence.ManagedPersistenceContext">
        <property name="persistenceUnitJndiName"
>java:/accountingEntityManagerFactory</property>
    </component>
</components
>

```

#####Seam#####

```

<components xmlns="http://jboss.com/products/seam/components"
    xmlns:persistence="http://jboss.com/products/seam/persistence"

    <persistence:managed-persistence-context name="productDatabase"
        scope="session"
        persistence-unit-jndi-name="java:/productEntityManagerFactory"/>

</components
>

```

```

<components>

    <component name="productDatabase"
        scope="session"
        class="org.jboss.seam.persistence.ManagedPersistenceContext">
        <property name="persistenceUnitJndiName"
>java:/productEntityManagerFactory</property>
    </component>

</components
>

```

#####auto-create #####@In  
#####create=true#####

## #5# Seam#####

---

```
<components xmlns="http://jboss.com/products/seam/components"
             xmlns:persistence="http://jboss.com/products/seam/persistence"

  <persistence:managed-persistence-context name="productDatabase"
             auto-create="true"
             persistence-unit-jndi-name="java:/productEntityManagerFactory"/>

</components
>
```

```
<components>

  <component name="productDatabase"
             auto-create="true"
             class="org.jboss.seam.persistence.ManagedPersistenceContext">
    <property name="persistenceUnitJndiName"
>java:/productEntityManagerFactory</property>
  </component>

</components
>
```

```
<factory>#####
```

```
<components>

  <factory name="contact" method="#{contactManager.loadContact}"
             scope="CONVERSATION"/>

</components
>
```

```
Seam##### (##) #####
```

```
<components>

  <factory name="user" value="#{actor}" scope="STATELESS"/>

</components
```

&gt;

#####

```
<components>
  <factory name="contact" value="#{contactManager.contact}" scope="STATELESS"/>
</components>
>
```

```
<factory>###auto-create="true"#####
```

```
<components>
  <factory name="session" value="#{entityManager.delegate}" scope="STATELESS" auto-
create="true"/>
</components>
>
```

```
##### components.xml #####
Seam# components.xml #####@wildcard@ #####Ant#####
(#####) ##### components.properties ##### (###)
#####Seam#####
```

### 5.3. #####

```
###XML#####components.xml
##### Seam##### com.helloworld.Hello### com/
helloworld/Hello.component.xml#####
(##### Hibernate#####)
#####<components> ### <component>#####
#####
```

```
<components>
  <component class="com.helloworld.Hello" name="hello">
    <property name="name"
>#{user.name}</property>
  </component>
```

## #5# Seam#####

---

```
<factory name="message" value="#{hello.message}"/>
</components
>
```

#####

```
<component name="hello">
  <property name="name"
>#{user.name}</property>
</component
>
```

#####

#####com/helloworld/components.xml# com.helloworld#####

### 5.4. #####

#####

```
org.jboss.seam.core.manager.conversationTimeout 60000
```

```
<core:manager conversation-timeout="60000"/>
```

```
<component name="org.jboss.seam.core.manager">
  <property name="conversationTimeout"
>60000</property>
</component
>
```

#####

```
org.jboss.seam.bpm.jpdm.processDefinitions order.jpdl.xml, return.jpdl.xml, inventory.jpdl.xml
```

```
<bpm:jbpm>
  <bpm:process-definitions>
    <value
```

```
>order.jpdl.xml</value>
  <value
>return.jpdl.xml</value>
  <value
>inventory.jpdl.xml</value>
  </bpm:process-definitions>
</bpm:jbpm
>
```

```
<component name="org.jboss.seam.bpm.jbpm">
  <property name="processDefinitions">
    <value
>order.jpdl.xml</value>
    <value
>return.jpdl.xml</value>
    <value
>inventory.jpdl.xml</value>
  </property>
</component
>
```

#####

```
<component name="issueEditor">
  <property name="issueStatuses">
    <key
>open</key
  > <value
>open issue</value>
    <key
>resolved</key
  > <value
>issue resolved by developer</value>
    <key
>closed</key
  > <value
>resolution accepted by user</value>
  </property>
</component
>
```

## #5# Seam#####

When configuring multi-valued properties, by default, Seam will preserve the order in which you place the attributes in `components.xml` (unless you use a `SortedSet/SortedMap` then Seam will use `TreeMap/TreeSet`). If the property has a concrete type (for example `LinkedList`) Seam will use that type.

#####

```
<component name="issueEditor">
  <property name="issueStatusOptions" type="java.util.LinkedHashMap">
    <key
>open</key
> <value
>open issue</value>
    <key
>resolved</key
> <value
>issue resolved by developer</value>
    <key
>closed</key
> <value
>resolution accepted by user</value>
  </property>
</component>
>
```

```
##### (value-binding expression) #####
###@In#####
#####JSF#Spring#####loC#####
```

```
<drools:managed-working-memory name="policyPricingWorkingMemory"
  rule-base="#{policyPricingRules}"/>
```

```
<component name="policyPricingWorkingMemory"
  class="org.jboss.seam.drools.ManagedWorkingMemory">
  <property name="ruleBase"
>#{policyPricingRules}</property>
</component>
>
```

Seam#####Bean#####EL#####

```
<component name="greeter" class="com.example.action.Greeter">
  <property name="message"
>Nice to see you, #{identity.username}!</property>
</component>
>
```

```
#####Seam#ValueExpression      ###
MethodExpression#####EL#####Seam#####
```

```
<framework:entity-home name="myEntityHome"
  class="com.example.action.MyEntityHome" entity-class="com.example.model.MyEntity"
  created-message="{myEntityHome.instance.name}' has been successfully added."/>
```

```
##### ValueExpression ### MethodExpression ## getExpressionString()
##### ValueExpression##### getValue()
#####MethodExpression##### invoke(Object
args...)#####MethodExpression#####
#####EL#####
```

## 5.5. XML#####

```
#####XML#####components.xml###
```

```
<?xml version="1.0" encoding="UTF-8"?>
<components xmlns="http://jboss.com/products/seam/components"
  xsi:schemaLocation="http://jboss.com/products/seam/components http://jboss.com/
products/seam/components-2.2.xsd">

  <component class="org.jboss.seam.core.init">
    <property name="debug">true</property>
    <property name="jndiPattern">@jndiPattern@</property>
  </component>

</components>
```

```
#####
```

```
#####
```

```
<?xml version="1.0" encoding="UTF-8"?>
```

## #5# Seam#####

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:core="http://jboss.com/products/seam/core"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation=
    "http://jboss.com/products/seam/core http://jboss.com/products/seam/core-2.2.xsd
    http://jboss.com/products/seam/components http://jboss.com/products/seam/
components-2.2.xsd">

  <core:init debug="true" jndi-pattern="@jndiPattern@" />

</components>
```

```
#####XML#####
##### XML#####
#####components.xml#####

#####Seam#####
####Seam#####<component> ###
#####
Seam#####

####Java#####@Namespace#####XML#####
(#####package-info.java#####)
####seapay#####
```

```
@Namespace(value="http://jboss.com/products/seam/examples/seampay")
package org.jboss.seam.example.seampay;

import org.jboss.seam.annotations.Namespace;
```

```
#####components.xml#####
```

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:pay="http://jboss.com/products/seam/examples/seampay"
  ... >

  <pay:payment-home new-instance="#{newPayment}"
    created-message="Created a new payment to #{newPayment.payee}" />

  <pay:payment name="newPayment"
    payee="Somebody"
    account="#{selectedAccount}"
    payment-date="#{currentDatetime}"
```



```

        created-date="#{currentDatetime}" />
        ...
    </components>
    >

```

####

```

<components xmlns="http://jboss.com/products/seam/components"
    xmlns:pay="http://jboss.com/products/seam/examples/seampay"
    ... >

    <pay:payment-home>
        <pay:new-instance>
        >#{newPayment}</pay:new-instance>
        <pay:created-message>
        >Created a new payment to #{newPayment.payee}</pay:created-message>
        </pay:payment-home>

        <pay:payment name="newPayment">
            <pay:payee>
            >Somebody</pay:payee>
            <pay:account>
            >#{selectedAccount}</pay:account>
            <pay:payment-date>
            >#{currentDatetime}</pay:payment-date>
            <pay:created-date>
            >#{currentDatetime}</pay:created-date>
            </pay:payment>
        ...
    </components>
    >

```

```

#####
paymentHome#####

```

```
#####<pay:payment-home>#
```

```

package org.jboss.seam.example.seampay;
...
@Name("paymentHome")
public class PaymentController
    extends EntityHome<Payment>
{
    ...
}

```

## #5# Seam#####

---

```
}
```

```
#####
```

```
#####<pay:payment>###org.jboss.seam.example.seampay#####Payment#####  
Payment #####Seam#####
```

```
package org.jboss.seam.example.seampay;
```

```
...
```

```
@Entity
```

```
public class Payment
```

```
    implements Serializable
```

```
{
```

```
    ...
```

```
}
```

```
#####
```

```
#####Seam#####Seam#####
```

```
##Seam#####
```

- **components** — <http://jboss.com/products/seam/components>
- **core** — <http://jboss.com/products/seam/core>
- **drools** — <http://jboss.com/products/seam/drools>
- **framework** — <http://jboss.com/products/seam/framework>
- **jms** — <http://jboss.com/products/seam/jms>
- **remoting** — <http://jboss.com/products/seam/remoting>
- **theme** — <http://jboss.com/products/seam/theme>
- **security** — <http://jboss.com/products/seam/security>
- **mail** — <http://jboss.com/products/seam/mail>
- **web** — <http://jboss.com/products/seam/web>
- **pdf** — <http://jboss.com/products/seam/pdf>
- **spring** — <http://jboss.com/products/seam/spring>

---

## #####

```
#####Seam#####  
#####JSF#####method          binding          expression)  
#####  
(cross-cutting concerns) #####
```

## 6.1. Seam####

```
Seam##### (fine-grained eventing  
model) ##### Seam#####
```

- JSF####
- jBPM#####
- Seam#####
- Seam#####
- Seam#####

```
#####JSF  
EL#####Seam#####JSF#####JSF#####
```

```
<h:commandButton value="Click me!" action="#{helloWorld.sayHello}"/>
```

```
jBPM#####jBPM#####
```

```
<start-page name="hello" view-id="/hello.jsp">  
  <transition to="hello">  
    <action expression="#{helloWorld.sayHello}"/>  
  </transition>  
</start-page  
>
```

```
JSF ##### jBPM ##### Seam  
#####
```

## 6.2. #####

```
Seam##### WEB-INF/pages.xml#####  
###JSF###id#####
```

```
<pages>
  <page view-id="/hello.jsp" action="#{helloWorld.sayHello}"/>
</pages>
>
```

```
##### * ##### ID#####
```

```
<pages>
  <page view-id="/hello/*" action="#{helloWorld.sayHello}"/>
</pages>
>
```

Keep in mind that if the `<page>` element is defined in a fine-grained page descriptor, the `view-id` attribute can be left off since it is implied.

```
#####id##### Seam##### (least-specific to
most-specific) ## #####
```

```
#####JSF outcome#####outcome
#null#####Seam#####
```

Furthermore, the view id mentioned in the `<page>` element need not correspond to a real JSP or Facelets page! So, we can reproduce the functionality of a traditional action-oriented framework like Struts or WebWork using page actions. This is quite useful if you want to do complex things in response to non-faces requests (for example, HTTP GET requests).

```
#####<action>#####
```

```
<pages>
  <page view-id="/hello.jsp">
    <action execute="#{helloWorld.sayHello}" if="#{not validation.failed}"/>
    <action execute="#{hitCount.increment}"/>
  </page>
</pages>
>
```

Page actions are executed on both an initial (non-faces) request and a postback (faces) request. If you are using the page action to load data, this operation may conflict with the standard JSF action(s) being executed on a postback. One way to disable the page action is to setup a condition that resolves to true only on an initial request.

```

<pages>
  <page view-id="/dashboard.xhtml">
    <action execute="#{dashboard.loadData}"
      if="#{not facesContext.renderKit.responseStateManager.isPostback(facesContext)}/>
  </page>
</pages>

```

This condition consults the `ResponseStateManager#isPostback(FacesContext)` to determine if the request is a postback. The `ResponseStateManager` is accessed using `FacesContext.getCurrentInstance().getRenderKit().getResponseStateManager()`.

To save you from the verbosity of JSF's API, Seam offers a built-in condition that allows you to accomplish the same result with a heck of a lot less typing. You can disable a page action on postback by simply setting the `on-postback` to `false`:

```

<pages>
  <page view-id="/dashboard.xhtml">
    <action execute="#{dashboard.loadData}" on-postback="false"/>
  </page>
</pages>

```

For backwards compatibility reasons, the default value of the `on-postback` attribute is `true`, though likely you will end up using the opposite setting more often.

### 6.3. #####

JSF faces ## (#####) ##### (#####) ##### (#####) #####  
#####

GET ##### (JSF #####)#

#####

#### 6.3.1. #####

Seam#####

```

<pages>
  <page view-id="/hello.jsp" action="#{helloWorld.sayHello}">
    <param name="firstName" value="#{person.firstName}"/>
    <param name="lastName" value="#{person.lastName}"/>
  </page>
</pages>

```

## #6# #####

>

```
<param>#####JSF#####

• #####id####non-faces (GET) #####
  Seam#####

• ### <s:link> # <s:button> ##### (<s:link>
  #####) #####

• ##id###<redirect/
  >#####

• #####id#####JSF#####
  #####faces#####PAGE#####

##### /hello.jsp ## (### /hello.jsp ## /hello.jsp #####)
##### (#####) #####
```

## 6.4. #####

```
## name ##### PAGE #####
```

```
<pages>
  <page view-id="/hello.jsp" action="#{helloWorld.sayHello}">
    <param name="firstName" />
    <param name="lastName" />
  </page>
</pages>
>
```

```
#####CRUD#####
```

```
• ### <s:link> # <s:button> #####

• #####id#####JSF#####
  #####faces#####PAGE#####
```

```
#####
faces#####
```

## 6.5. #####URL###

```
#####pages.xml#####Seam#URL#####URL#####
```

```
<page view-id="/home.xhtml">
  <rewrite pattern="/home" />
</page>
```

```
##### /home ##### /home.xhtml ##### /home.seam
##### /home #####URL##### /
home.seam?conversationId=13 # /home.seam?color=red #####
#####
```

```
<page view-id="/home.xhtml">
  <rewrite pattern="/home/{color}" />
  <rewrite pattern="/home" />
</page>
```

```
##### /home/red ##### /home.seam?color=red #####color
##### /home.seam?color=blue #####URL##### /home/blue #####
```

```
Seam#####Seam#####URL#####/
search.seam?conversationId=13#/search-13#####
```

```
<page view-id="/search.xhtml">
  <rewrite pattern="/search-{conversationId}" />
  <rewrite pattern="/search" />
</page>
```

Seam

```
URL#####Seam#####Seam#####
org.tuckey URLRewriteFilter #####Web#####
```

```
URL#####Seam#####30.1.4.3. #URL
#####
```

## 6.6. #####

```
#####JSF#####
```

```
<pages>
```

## #6# #####

---

```
<page view-id="/calculator.jsp" action="#{calculator.calculate}">
  <param name="x" value="#{calculator.lhs}"/>
  <param name="y" value="#{calculator.rhs}"/>
    <param name="op" converterId="com.my.calculator.OperatorConverter"
value="#{calculator.op}"/>
  </page>
</pages>
>
```

#####

```
<pages>
  <page view-id="/calculator.jsp" action="#{calculator.calculate}">
    <param name="x" value="#{calculator.lhs}"/>
    <param name="y" value="#{calculator.rhs}"/>
    <param name="op" converter="#{operatorConverter}" value="#{calculator.op}"/>
  </page>
</pages>
>
```

#####JSF##### required="true" #####

```
<pages>
  <page view-id="/blog.xhtml">
    <param name="date"
value="#{blog.date}"
validatorId="com.my.blog.PastDate"
required="true"/>
  </page>
</pages>
>
```

#####

```
<pages>
  <page view-id="/blog.xhtml">
    <param name="date"
value="#{blog.date}"
validator="#{pastDateValidator}"
required="true"/>
  </page>
</pages>
```



```

    </page>
  </pages>
>

```

Even better, model-based Hibernate validator annotations are automatically recognized and validated. Seam also provides a default date converter to convert a string parameter value to a date and back.

```
##### FacesMessage #FacesContext#####
```

## 6.7. #####

```
Seam#####faces-
config.xml#####JSF#####JSF#####
```

- #####
- ##### (conversation) #####
- ##### EL#####

```
###pages.xml # faces-config.xml #####
pages.xml #####
```

```
##JSF#####
```

```

<navigation-rule>
  <from-view-id
>/editDocument.xhtml</from-view-id>

  <navigation-case>
    <from-action
>#{documentEditor.update}</from-action>
    <from-outcome
>success</from-outcome>
    <to-view-id
>/viewDocument.xhtml</to-view-id>
    <redirect/>
  </navigation-case>

</navigation-rule>
>

```

```
#####
```

```
<page view-id="/editDocument.xhtml">

  <navigation from-action="#{documentEditor.update}">
    <rule if-outcome="success">
      <redirect view-id="/viewDocument.xhtml"/>
    </rule>
  </navigation>

</page>
>
```

####DocumentEditor

#####JSF#####Seam#####

```
<page view-id="/editDocument.xhtml">

  <navigation from-action="#{documentEditor.update}"
    evaluate="#{documentEditor.errors.size}">
    <rule if-outcome="0">
      <redirect view-id="/viewDocument.xhtml"/>
    </rule>
  </navigation>

</page>
>
```

#####

```
<page view-id="/editDocument.xhtml">

  <navigation from-action="#{documentEditor.update}">
    <rule if="#{documentEditor.errors.empty}">
      <redirect view-id="/viewDocument.xhtml"/>
    </rule>
  </navigation>

</page>
>
```

#####outcome#####

#####outcome#####

##### (conversation) #####

```

<page view-id="/editDocument.xhtml">

  <navigation from-action="{documentEditor.update}">
    <rule if="{documentEditor.errors.empty}">
      <end-conversation/>
      <redirect view-id="/viewDocument.xhtml"/>
    </rule>
  </navigation>

</page>
>

```

#####ID#####

```

<page view-id="/editDocument.xhtml">

  <navigation from-action="{documentEditor.update}">
    <rule if="{documentEditor.errors.empty}">
      <end-conversation/>
      <redirect view-id="/viewDocument.xhtml">
        <param name="documentId" value="{documentEditor.documentId}"/>
      </redirect>
    </rule>
  </navigation>

</page>
>

```

outcome#null#####JSF#####coucome#null#####

#####null#####outcome#####outcome#null#####

```

<page view-id="/editDocument.xhtml">

  <navigation from-action="{documentEditor.update}">
    <rule>
      <render view-id="/viewDocument.xhtml"/>
    </rule>
  </navigation>

</page>
>

```

## #6# #####

---

```
</rule>
</navigation>

</page
>
```

outcome#null#####

```
<page view-id="/editDocument.xhtml">

  <navigation from-action="{documentEditor.update}">
    <render view-id="/viewDocument.xhtml"/>
  </navigation>

</page
>
```



### ##

In case you are using JSF RI 2, you have to define navigation rule for each of the possible non-null outcome values from a page action, or else implicit navigation is going to render. It is annoying, hopefully will be fixed in the next maintenance version release of JSF 2.

###id#JSF EL#####

```
<page view-id="/editDocument.xhtml">

  <navigation>
    <rule if-outcome="success">
      <redirect view-id="{userAgent}/displayDocument.xhtml"/>
    </rule>
  </navigation>

</page
>
```

## 6.8. #####

```
##### ##id#/  
calc/calculator.jsp##### calc/calculator.page.xml #####  
#####<page>#####id#####
```

```
<page action="#{calculator.calculate}">  
  <param name="x" value="#{calculator.lhs}" />  
  <param name="y" value="#{calculator.rhs}" />  
  <param name="op" converter="{operatorConverter}" value="#{calculator.op}" />  
</page>  
>
```

## 6.9. #####

```
Seam##### observer/  
observable#####  
#####Seam#####  
##### (observers) #components.xml#####
```

```
<components>  
  <event type="hello">  
    <action execute="#{helloListener.sayHelloBack}" />  
    <action execute="#{logger.logHello}" />  
  </event>  
</components>  
>
```

```
###event type #####
```

```
#####components.xml  
#####Seam#####
```

```
@Name("helloWorld")  
public class HelloWorld {  
  public void sayHello() {  
    FacesMessages.instance().add("Hello World!");  
    Events.instance().raiseEvent("hello");  
  }  
}
```

#6# #####

---

#####

```
@Name("helloWorld")
public class HelloWorld {
    @RaiseEvent("hello")
    public void sayHello() {
        FacesMessages.instance().add("Hello World!");
    }
}
```

#####  
#####

```
@Name("helloListener")
public class HelloListener {
    public void sayHelloBack() {
        FacesMessages.instance().add("Hello to you too!");
    }
}
```

### components.xml ##### components.xml  
#####

```
@Name("helloListener")
public class HelloListener {
    @Observer("hello")
    public void sayHelloBack() {
        FacesMessages.instance().add("Hello to you too!");
    }
}
```

#####Seam#####

```
@Name("helloWorld")
public class HelloWorld {
    private String name;
    public void sayHello() {
        FacesMessages.instance().add("Hello World, my name is #0.", name);
        Events.instance().raiseEvent("hello", name);
    }
}
```

}

```

@Name("helloListener")
public class HelloListener {
    @Observer("hello")
    public void sayHelloBack(String name) {
        FacesMessages.instance().add("Hello #0!", name);
    }
}

```

## 6.10. #####

Seam#####

- org.jboss.seam.validationFailed — JSF#####
- org.jboss.seam.noConversation — #####
- org.jboss.seam.preSetVariable.<name> — ##### <name> #####
- org.jboss.seam.postSetVariable.<name> — ##### <name> #####
- org.jboss.seam.preRemoveVariable.<name> — ##### <name> #####
- org.jboss.seam.postRemoveVariable.<name> — ##### <name> #####
- org.jboss.seam.preDestroyContext.<SCOPE> — <SCOPE> #####
- org.jboss.seam.postDestroyContext.<SCOPE> — <SCOPE> #####
- org.jboss.seam.beginConversation — called whenever a long-running conversation begins
- org.jboss.seam.endConversation — called whenever a long-running conversation ends
- org.jboss.seam.conversationTimeout — called when a conversation timeout occurs. The conversation id is passed as a parameter.
- org.jboss.seam.beginPageflow — called when a pageflow begins
- org.jboss.seam.beginPageflow.<name> — called when the pageflow <name> begins
- org.jboss.seam.endPageflow — called when a pageflow ends
- org.jboss.seam.endPageflow.<name> — called when the pageflow <name> ends

## #6# #####

---

- `org.jboss.seam.createProcess.<name>` — called when the process `<name>` is created
- `org.jboss.seam.endProcess.<name>` — called when the process `<name>` ends
- `org.jboss.seam.initProcess.<name>` — called when the process `<name>` is associated with the conversation
- `org.jboss.seam.initTask.<name>` — called when the task `<name>` is associated with the conversation
- `org.jboss.seam.startTask.<name>` — called when the task `<name>` is started
- `org.jboss.seam.endTask.<name>` — called when the task `<name>` is ended
- `org.jboss.seam.postCreate.<name>` — called when the component `<name>` is created
- `org.jboss.seam.preDestroy.<name>` — called when the component `<name>` is destroyed
- `org.jboss.seam.beforePhase` — called before the start of a JSF phase
- `org.jboss.seam.afterPhase` — called after the end of a JSF phase
- `org.jboss.seam.postInitialization` — called when Seam has initialized and started up all components
- `org.jboss.seam.postReInitialization` — called when Seam has re-initialized and started up all components after a redeploy
- `org.jboss.seam.exceptionHandled.<type>` — #####Seam#####
- `org.jboss.seam.exceptionHandled` — #####Seam#####
- `org.jboss.seam.exceptionNotHandled` — #####
- `org.jboss.seam.afterTransactionSuccess` —  
Seam#####
- `org.jboss.seam.afterTransactionSuccess.<name>` —  
<name>#####
- `org.jboss.seam.security.loggedOut` — called when a user logs out
- `org.jboss.seam.security.loginFailed` — called when a user authentication attempt fails
- `org.jboss.seam.security.loginSuccessful` — called when a user is successfully authenticated
- `org.jboss.seam.security.notAuthorized` — called when an authorization check fails
- `org.jboss.seam.security.notLoggedIn` — called there is no authenticated user and authentication is required



- `org.jboss.seam.security.postAuthenticate`. — called after a user is authenticated
- `org.jboss.seam.security.preAuthenticate` — called before attempting to authenticate a user

Seam##### (observe) #####

## 6.11. Seam#####

EJB 3.0 ##### Bean ##### Bean #####  
 @AroundInvoke ##### ## Bean #####  
 @Interceptors #####

```
public class LoggedInInterceptor {

    @AroundInvoke
    public Object checkLoggedIn(InvocationContext invocation) throws Exception {

        boolean isLoggedIn = Contexts.getSessionContext().get("loggedIn")!=null;
        if (isLoggedIn) {
            //the user is already logged in
            return invocation.proceed();
        }
        else {
            //the user is not logged in, fwd to login page
            return "login";
        }
    }
}
```

```
#####Bean#####Bean#
@Interceptors(LoggedInInterceptor.class)
#####Seam#####
@Interceptors      #####EJB3#####      @LoggedIn
#####
```

```
@Target(TYPE)
@Retention(RUNTIME)
@Interceptors(LoggedInInterceptor.class)
public @interface LoggedIn {}
```

##### Bean #@LoggedIn #####

```

@Stateless
@Name("changePasswordAction")
@LoggedIn
@Interceptors(SeamInterceptor.class)
public class ChangePasswordAction implements ChangePassword {

    ...

    public String changePassword() { ... }

}

```

```

##### (#####)# ##### @Interceptor
#####

```

```

@Interceptor(around={BijectionInterceptor.class,
    ValidationInterceptor.class,
    ConversationInterceptor.class},
    within=RemoveInterceptor.class)
public class LoggedInInterceptor
{
    ...
}

```

```

##### EJB3 #####

```

```

@Interceptor(type=CLIENT)
public class LoggedInInterceptor
{
    ...
}

```

```

EJB #####
##### Seam ## @Interceptor(stateless=true)
#####

```

```

Seam#####Seam#####

```

```

Seam ##### EJB3 Bean ##### JavaBean #####

```

```

EJB ## ##### (@AroundInvoke ####) #####
@PostConstruct# @PreDestroy# @PrePassivate ### @PostActive #####

```

```
Seam ## ##### EJB3 Bean ##### JavaBean
##### (JavaBean ##### @PreDestroy #####)#
```

## 6.12. #####

```
JSF ##### Seam #####
XML #####
##### EJB 3.0 ### @ApplicationException
#####
```

### 6.12.1. #####

```
Bean #####
##### EJB #####
#####
@ApplicationException(rollback=true) ##### (#####
##### ### @ApplicationException #####
@ApplicationException #####)

#####
#####
#####
```

```
Seam # EJB 3.0 ##### Seam JavaBean #####
```

```
#### ##### Seam ##### ### ##### Seam #####
### JSF ##### ##### Seam
##### Seam #####
```

### 6.12.2. Seam #####

```
Seam#####web.xml#####
```

```
<filter>
  <filter-name
>Seam Filter</filter-name>
  <filter-class
>org.jboss.seam.servlet.SeamFilter</filter-class>
</filter>

<filter-mapping>
  <filter-name
>Seam Filter</filter-name>
  <url-pattern
>*.seam</url-pattern>
</filter-mapping>
```

>

##### web.xml # Facelets ##### components.xml # Seam  
#####


### 6.12.3. #####

##### Seam ##### HTTP 404 #####  
##### ## Seam  
#####

```
@HttpError(errorCode=404)
public class ApplicationException extends Exception { ... }
```

##### Seam ##### ## #####  
#####

```
@Redirect(viewId="/failure.xhtml", end=true)
@ApplicationException(rollback=true)
public class UnrecoverableApplicationException extends RuntimeException { ... }
```

 ##  
Seam#JSF#####

EL##### ##id #####

##### Seam ##### ##  
#####

```
@Redirect(viewId="/error.xhtml", message="Unexpected error")
public class SystemException extends RuntimeException { ... }
```

### 6.12.4. ##### XML #####

#####Seam##### pages.xml #####

<pages>

```

<exception class="javax.persistence.EntityNotFoundException">
  <http-error error-code="404"/>
</exception>

<exception class="javax.persistence.PersistenceException">
  <end-conversation/>
  <redirect view-id="/error.xhtml">
    <message
>Database access failed</message>
  </redirect>
</exception>

<exception>
  <end-conversation/>
  <redirect view-id="/error.xhtml">
    <message
>Unexpected failure</message>
  </redirect>
</exception>

</pages
>

```

```

###      <exception>      #####      #####      pages.xml
#####
EL##### view-id #####
EL      #####
Seam#####

```

```

...
throw new AuthorizationException("You are not allowed to do this!");

<pages>

  <exception class="org.jboss.seam.security.AuthorizationException">
    <end-conversation/>
    <redirect view-id="/error.xhtml">
      <message severity="WARN"
>#{org.jboss.seam.handledException.message}</message>
    </redirect>
  </exception>

```

```
</pages  
>
```

```
org.jboss.seam.handledException  
#####org.jboss.seam.caughtException#####
```

#### 6.12.4.1. #####

For the exception handlers defined in `pages.xml`, it is possible to declare the logging level at which the exception will be logged, or to even suppress the exception being logged altogether. The attributes `log` and `log-level` can be used to control exception logging. By setting `log="false"` as per the following example, then no log message will be generated when the specified exception occurs:

```
<exception class="org.jboss.seam.security.NotLoggedInException" log="false">  
  <redirect view-id="/register.xhtml">  
    <message severity="warn"  
>You must be a member to use this feature</message>  
  </redirect>  
</exception  
>
```

If the `log` attribute is not specified, then it defaults to `true` (i.e. the exception will be logged). Alternatively, you can specify the `log-level` to control at which log level the exception will be logged:

```
<exception class="org.jboss.seam.security.NotLoggedInException" log-level="info">  
  <redirect view-id="/register.xhtml">  
    <message severity="warn">You must be a member to use this feature</message>  
  </redirect>  
</exception>
```

The acceptable values for `log-level` are: `fatal`, `error`, `warn`, `info`, `debug` or `trace`. If the `log-level` is not specified, or if an invalid value is configured, then it will default to `error`.

#### 6.12.5. #####

##JPA#####

```
<exception class="javax.persistence.EntityNotFoundException">  
  <redirect view-id="/error.xhtml">  
    <message
```

```
>Not found</message>
  </redirect>
</exception>

<exception class="javax.persistence.OptimisticLockException">
  <end-conversation/>
  <redirect view-id="/error.xhtml">
    <message
>Another user changed the same data, please try again</message>
  </redirect>
</exception
>
```

##Seam#####

```
<exception class="org.jboss.seam.framework.EntityNotFoundException">
  <redirect view-id="/error.xhtml">
    <message
>Not found</message>
  </redirect>
</exception
>
```

##Seam#####

```
<exception class="org.jboss.seam.security.AuthorizationException">
  <redirect>
    <message
>You don't have permission to do this</message>
  </redirect>
</exception>

<exception class="org.jboss.seam.security.NotLoggedInException">
  <redirect view-id="/login.xhtml">
    <message
>Please log in first</message>
  </redirect>
</exception
>
```

####JSF###

```
<exception class="javax.faces.application.ViewExpiredException">
  <redirect view-id="/error.xhtml">
    <message
  >Your session has timed out, please try again</message>
  </redirect>
</exception
>
```

A `ViewExpiredException` occurs if the user posts back to a page once their session has expired. The `conversation-required` and `no-conversation-view-id` settings in the Seam page descriptor, discussed in [#7.4. #Requiring a long-running conversation#](#), give you finer-grained control over session expiration if you are accessing a page used within a conversation.



---

## #####

##### Seam #####

##### 3 ##### Seam #####

- ##### 2002 ##### (#####) #####  
Struts #####2 #####

- #####  
#####  
(Hibernate ##### LazyInitializationException ##### Hibernate  
##### Spring ##### J2EE ##### *stateless session facade* (anti)  
#####)

- #####

#####

#####

## 7.1. Seam #####

#####

- JSF ##### ##### ##### ##### #####  
#####

- JSF ##### Seam #####  
Seam #####

- @Begin #####

- @End #####

- JSF ##### Seam #####  
#####

- ##### faces ## (JSF #####) ##### non-faces ## (### GET ##)  
#####

- If the JSF request lifecycle is foreshortened by a redirect, Seam transparently stores and restores the current conversation context — unless the conversation was already ended via @End(beforeRedirect=true).

Seam ##### (#####) # JSF #####  
# faces ## (### GET ###) #####  
#####

non-faces ##### Seam ##### Seam ## ID (conversation id)  
#####

**#7# #####**

---

```
<a href="main.jsf?#{manager.conversationIdParameter}=#{conversation.id}"
>Continue</a
>
```

JSF #####

```
<h:outputLink value="main.jsf">
  <f:param name="#{manager.conversationIdParameter}" value="#{conversation.id}"/>
  <h:outputText value="Continue"/>
</h:outputLink
>
```

Seam #####

```
<h:outputLink value="main.jsf">
  <s:conversationId/>
  <h:outputText value="Continue"/>
</h:outputLink
>
```

#####

```
<h:commandLink action="main" value="Exit">
  <f:param name="conversationPropagation" value="none"/>
</h:commandLink
>
```

Seam #####

```
<h:commandLink action="main" value="Exit">
  <s:conversationPropagation type="none"/>
</h:commandLink
>
```

#####

The `conversationPropagation` request parameter, or the `<s:conversationPropagation>` tag may even be used to begin a conversation, end the current conversation, destroy the entire conversation stack, or begin a nested conversation.

```
<h:commandLink action="main" value="Exit">
  <s:conversationPropagation type="end"/>
</h:commandLink
>
```

```
<h:commandLink action="main" value="Exit">
  <s:conversationPropagation type="endRoot"/>
</h:commandLink>
```

```
<h:commandLink action="main" value="Select Child">
  <s:conversationPropagation type="nested"/>
</h:commandLink
>
```

```
<h:commandLink action="main" value="Select Hotel">
  <s:conversationPropagation type="begin"/>
</h:commandLink
>
```

```
<h:commandLink action="main" value="Select Hotel">
  <s:conversationPropagation type="join"/>
</h:commandLink
>
```

#####  
#####

- ##### (nested conversation) #####
- #####

## 7.2. #####

```
##### @Begin(nested=true) #####
#####
#####
#####
```

- #####
- #####
- #####
  - #####

```
## @End ##### #####(Pop)#####
```

```
##### (#####) #### #####
##### ##### Seam
#####
```

```
##### @End(root=true)
#####
```

```
##### #####
##### #####
#####
```

```
##### #####
#####
##### @PerNestedConversation
#####
```

## 7.3. GET #####

```
#### non-faces ## (## HTTP GET ##) ##### JSF #####
##### <h:outputLink> #####
```

```
##### JSF ##### @Begin
#####
```

```
##### ##### ##2 ##### Seam
##### @Create #####
@Factory #####
```

```
##### Seam ## pages.xml #####
```

```
<pages>
  <page view-id="/messageList.jsp" action="#{messageManager.list}"/>
```

```
...
</pages
>
```

```
#####
null ##### Seam #### JSF ### Seam #####
#####

#####
```

```
<pages>
  <page view-id="/messageList.jsp" action="#{conversation.begin}"/>
  ...
</pages
>
```

```
### ##### JSF ##### ## #{conversation.end}
#####

##### <begin-
conversation> #####
```

```
<pages>
  <page view-id="/messageList.jsp">
    <begin-conversation nested="true" pageflow="AddItem"/>
  </page>
  ...
</pages
>
```

```
### <end-conversation> #####
```

```
<pages>
  <page view-id="/home.jsp">
    <end-conversation/>
  </page>
  ...
</pages
>
```

```
1 ##### ## 5 #####
```

- @Create ##### @Begin #####
- @Factory ##### @Begin #####
- Seam ##### @Begin #####
- pages.xml # <begin-conversation> #####
- #{conversation.begin} # Seam #####

## 7.4. Requiring a long-running conversation

Certain pages are only relevant in the context of a long-running conversation. One way to "protect" such a page is to require a long-running conversation as a prerequisite to rendering the page. Fortunately, Seam has a built-in mechanism for enforcing this requirement.

In the Seam page descriptor, you can indicate that the current conversation must be long-running (or nested) in order for a page to be rendered using the `conversation-required` attribute as follows:

```
<page view-id="/book.xhtml" conversation-required="true"/>
```



##

The only downside is there's no built-in way to indicate *which* long-running conversation is required. You can build on this basic authorization by dually checking if a specific value is present in the conversation within a page action.

When Seam determines that this page is requested outside of a long-running conversation, the following actions are taken:

- A contextual event named `org.jboss.seam.noConversation` is raised
- A warning status message is registered using the bundle key `org.jboss.seam.NoConversation`
- The user is redirected to an alternate page, if defined

The alternate page is defined in the `no-conversation-view-id` attribute on a `<pages>` element in the Seam page descriptor as follows:

```
<pages no-conversation-view-id="/main.xhtml"/>
```

At the moment, you can only define one such page for the entire application.

## 7.5. <s:link> # <s:button> #####

```

JSF ##### JavaScript #####
##### ##### JFS
##### <h:outputLink> ##### <h:outputLink> ##### 2 #####

```

- JSF ##### <h:outputLink> #####
- ##### JSF ##### DataModel #####

Seam provides the notion of a *page action* to help solve the first problem, but this does nothing to help us with the second problem. We *could* work around this by using the RESTful approach of passing a request parameter and requerying for the selected object on the server side. In some cases — such as the Seam blog example application — this is indeed the best approach. The RESTful style supports bookmarking, since it does not require server-side state. In other cases, where we don't care about bookmarks, the use of `@DataModel` and `@DataModelSelection` is just so convenient and transparent!

```
##### Seam # <s:link> JSF #####
```

```
##### JSF ## ID #####
```

```
<s:link view="/login.xhtml" value="Login"/>
```

```
##### ##### (#####)#
```

```
<s:link action="#{login.logout}" value="Logout"/>
```

```
JSF ## ID ##### null #####
```

```
<s:link view="/loggedOut.xhtml" action="#{login.logout}" value="Logout"/>
```

```
#### <h:dataTable> ##### DataModel #####
```

```
<s:link view="/hotel.xhtml" action="#{hotelSearch.selectHotel}" value="#{hotel.name}"/>
```

```
#####
```

```
<s:link view="/main.xhtml" propagation="none"/>
```

## #7# #####

---

#####

```
<s:link action="#{issueEditor.viewComment}" propagation="nested"/>
```

#####

```
<s:link action="#{documentEditor.getDocument}" propagation="begin"
pageflow="EditDocument"/>
```

The `taskInstance` attribute is for use in jBPM task lists:

```
<s:link action="#{documentApproval.approveOrReject}" taskInstance="#{task}"/>
```

(##### DVD #####)

##### <s:button> #####

```
<s:button action="#{login.logout}" value="Logout"/>
```

## 7.6. #####

##### JSF `FacesMessage` #####  
##### JSF ##### `faces` #####  
##### JSF #####

##### `Seam` ##### `facesMessages` ##### (`Seam`  
#####)

```
@Name("editDocumentAction")
@Stateless
public class EditDocumentBean implements EditDocument {
    @In EntityManager em;
    @In Document document;
    @In FacesMessages facesMessages;

    public String update() {
        em.merge(document);
        facesMessages.add("Document updated");
    }
}
```



}

```
facesMessages ##### ## Seam
#####
```

```
JSF EL ## faces #####
```

```
facesMessages.add("Document #{document.title} was updated");
```

```
#####
```

```
<h:messages globalOnly="true"/>
```

## 7.7. ##### ID

```
##### ID #####
```

```
#####
```

```
##### 2 ##### #
#ebay #####
#####
##### #
```

With a natural conversation it's really easy to have the user rejoin the existing conversation, and pick up where they left off - just have them to rejoin the payForItem conversation with the itemId as the conversation id.

```
##### URL
```

```
##### (URL #####) ##### URL (## Wiki ##### ID #####)
##### URL #####
```

With a natural conversation, when you are building your hotel booking system (or, of course, whatever your app is) you can generate a URL like `http://seam-hotels/book.seam?hotel=BestWesternAntwerpen` (of course, whatever parameter `hotel` maps to on your domain model must be unique) and with `URLRewrite` easily transform this to `http://seam-hotels/book/BestWesternAntwerpen`.

```
#####
```

## 7.8. #####

```
##### pages.xml #####
```

## #7# #####

```
<conversation name="PlaceBid"
  parameter-name="auctionId"
  parameter-value="{auction.auctionId}"/>
```

```
##### PlaceBid ##### page
#####
```

```
#### parameter-name ##### ID ##### ID #####
parameter-name # auctionId ##### URL ##### cid=123 #####
auctionId=765432 #####
```

```
##### parameter-value ### ID ##### EL #####
##### ID ##### auction #####
```

```
##### page ### conversation #####
```

```
<page view-id="/bid.xhtml" conversation="PlaceBid" login-required="true">
  <navigation from-action="{bidAction.confirmBid}"
  >
    <rule if-outcome="success">
      <redirect view-id="/auction.xhtml">
        <param name="id" value="{bidAction.bid.auction.auctionId}"/>
      </redirect>
    </rule>
  >
  </navigation>
</page>
>
```

## 7.9. #####

```
#####
```

```
<page view-id="/auction.xhtml">
  <param name="id" value="{auctionDetail.selectedAuctionId}"/>

  <navigation from-action="{bidAction.placeBid}">
    <redirect view-id="/bid.xhtml"/>
  </navigation>
</page>
>
```

```

auction ##### #{bidAction.placeBid} ##### (##### Seam ###
seamBay #####)# ##### PlaceBid ##### /bid.xhtml #####
#####

```

```

@Begin(join = true)
public void placeBid()

```

```

##### <page/> #####
#####
#####
##### s:conversationName
#####

```

```

<h:commandButton id="placeBidWithAmount" styleClass="placeBid"
action="#{bidAction.placeBid}">
<s:conversationName value="PlaceBid"/>
</h:commandButton
>

```

```

##### s:link ### s:button ##### conversationName #####

```

```

<s:link value="Place Bid" action="#{bidAction.placeBid}" conversationName="PlaceBid"/>

```

## 7.10. #####

```

#####1 ##### Seam ##### Java
#####

```

- ##### ID (JSF ### Seam #####) ##### (jPDL #####) #####
- ##### 1 ##### JSP ### facelets ##### (breadcrumbs) #####

### 7.10.1. ##### JSF #####

```

JSF ### Seam ##### Seam ##### view-id #####
##### pages.xml ##### Seam ##### WEB-INF ##### faces-
config.xml #####

```

```

<pages>

```

```
<page view-id="/main.xhtml">
  <description
>Search hotels: #{hotelBooking.searchString}</description>
</page>
<page view-id="/hotel.xhtml">
  <description
>View hotel: #{hotel.name}</description>
</page>
<page view-id="/book.xhtml">
  <description
>Book hotel: #{hotel.name}</description>
</page>
<page view-id="/confirm.xhtml">
  <description
>Confirm: #{booking.description}</description>
</page>
</pages>
>
```

##### Seam #####

### 7.10.2. ##### jPDL #####

jPDL ##### Seam #### jBPM ##### ## view-id ####  
<page> ##### </page> #####

```
<pageflow-definition name="shopping">

  <start-state name="start">
    <transition to="browse"/>
  </start-state>

  <page name="browse" view-id="/browse.xhtml">
    <description
>DVD Search: #{search.searchPattern}</description>
    <transition to="browse"/>
    <transition name="checkout" to="checkout"/>
  </page>

  <page name="checkout" view-id="/checkout.xhtml">
    <description
>Purchase: $#{cart.total}</description>
    <transition to="checkout"/>
    <transition name="complete" to="complete"/>
  </page>
</pageflow-definition>
```

```

</page>

<page name="complete" view-id="/complete.xhtml">
  <end-conversation />
</page>

</pageflow-definition
>

```

### 7.10.3. #####

```

#####          JSP          ###          facelets          #####
#####

```

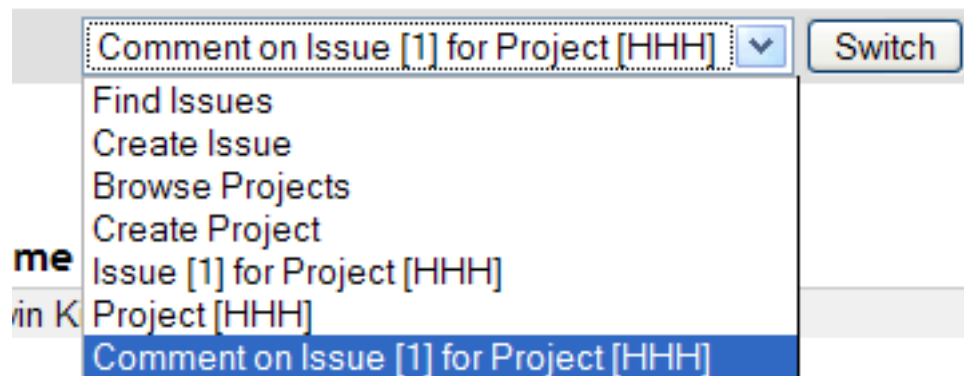
```

<h:selectOneMenu value="#{switcher.conversationIdOrOutcome}">
  <f:selectItem itemLabel="Find Issues" itemValue="findIssue"/>
  <f:selectItem itemLabel="Create Issue" itemValue="editIssue"/>
  <f:selectItems value="#{switcher.selectItems}"/>
</h:selectOneMenu>
<h:commandButton action="#{switcher.select}" value="Switch"/>

```

```
##### ##### 2 #####
```

```
##### (pages.xml ###) #####
```



### 7.10.4. ####

```
#####
```

```
<h:dataTable value="#{conversationList}" var="entry"
```

#7# #####

```

    rendered="{not empty conversationList}">
    <h:column>
      <f:facet name="header"
    >Workspace</f:facet>
      <h:commandLink action="{entry.select}" value="{entry.description}"/>
      <h:outputText value="[current]" rendered="{entry.current}"/>
    </h:column>
    <h:column>
      <f:facet name="header"
    >Activity</f:facet>
      <h:outputText value="{entry.startDatetime}">
        <f:convertDateTime type="time" pattern="hh:mm a"/>
      </h:outputText>
      <h:outputText value=" - "/>
      <h:outputText value="{entry.lastDatetime}">
        <f:convertDateTime type="time" pattern="hh:mm a"/>
      </h:outputText>
    </h:column>
    <h:column>
      <f:facet name="header"
    >Action</f:facet>
      <h:commandButton action="{entry.select}" value="{msg.Switch}"/>
      <h:commandButton action="{entry.destroy}" value="{msg.Destroy}"/>
    </h:column>
  </h:dataTable>
  >

```

#### #####

Workspace	Workspace activity	Action
<a href="#">Comment on Issue [1] for Project [HHH]</a>	01:18 PM - 01:18 PM	Switch Destroy
<a href="#">Issue [1] for Project [HHH]</a>	01:18 PM - 01:18 PM	Switch Destroy
<a href="#">Project [HHH]</a>	01:18 PM - 01:18 PM	Switch Destroy

#####

#####

### 7.10.5. ##### (Breadcrumbs)

#####

```

<ui:repeat value="{conversationStack}" var="entry">

```

```
<h:outputText value=" | "/>
<h:commandLink value="#{entry.description}" action="#{entry.select}"/>
</ui:repeat
```

[Home](#) | [Find Issues](#) | [Create Issue](#) | [Project \[HHH\]](#) | [Issue \[1\] for Project \[HHH\]](#)

Issue Attributes

## 7.11. ##### JSF #####

```
##### JSF ##### (#####
##### JSF
#####) postback #### Seam #####
#####

##### #####
#####
```

```
@Name("grid")
@Scope(ScopeType.EVENT)
public class Grid
{
    private HtmlPanelGrid htmlPanelGrid;

    // getters and setters
    ...
}
```

```
@Name("gridEditor")
@Scope(ScopeType.CONVERSATION)
public class GridEditor
{
    @In(required=false)
    private Grid grid;

    ...
}
```

```
### ##### JSF #####
facesMessages ##### Seam #####
```

## #7# #####

Alternatively, you can access the JSF component tree through the implicit `uiComponent` handle. The following example accesses `getRowIndex()` of the `UIData` component which backs the data table during iteration, it prints the current row number:

```
<h:dataTable id="lineItemTable" var="lineItem" value="#{orderHome.lineItems}">
  <h:column>
    Row: #{uiComponent['lineItemTable'].rowIndex}
  </h:column>
  ...
</h:dataTable
>
```

JSF UI #####

## 7.12. #####

```
Seam ##### #4.1.10. ##### #####
##### (AJAX #####)#
##### Ajax ##### RichFaces
#####
```

```
##### Seam #####
##### ### ##### ###
##### #####
(#####)# ### ##### AJAX
#####
```

```
##### Seam ##### (#####)#
##### ##### AJAX
#####
```

components.xml #####

```
<core:manager concurrent-request-timeout="500" />
```

### #####

```
<page view-id="/book.xhtml"
  conversation-required="true"
  login-required="true"
  concurrent-request-timeout="2000" />
```



```
##### AJAX #####
##### AJAX ##### (1
#####)# ### 1 #####

##### AJAX #####
##### (#####)# #####
##### (#####) #####
```

### 7.12.1. ### AJAX #####

```
### #####

#####
##### (#####)
##### (##### keypress
# onblur ##) #####
#####

### #####

##### @Asynchronous
#####
```

```
int total;

// This method is called when an event occurs on the client
// It takes a really long time to execute
@Asynchronous
public void calculateTotal() {
    total = someReallyComplicatedCalculation();
}

// This method is called as the result of the poll
// It's very quick to execute
public int getTotal() {
    return total;
}
```

### 7.12.2. #####

```
#####
##### concurrent-request-timeout
##### Seam # pages.xml #####
ConcurrentRequestTimeoutException ##### HTTP 503 #####
```

```
<exception class="org.jboss.seam.ConcurrentRequestTimeoutException" log-level="trace">
  <http-error error-code="503" />
</exception>
```



## 503 Service Unavailable (HTTP/1.1 RFC)

```
#####
#####
```

```
#####
```

```
<exception class="org.jboss.seam.ConcurrentRequestTimeoutException" log-level="trace">
  <end-conversation/>
  <redirect view-id="/error.xhtml">
    <message>The server is too busy to process your request, please try again later</message>
  </redirect>
</exception>
```

ICEfaces, RichFaces Ajax and Seam Remoting can all handle HTTP error codes. Seam Remoting will pop up a dialog box showing the HTTP error. ICEfaces will indicate the error in its connection status component. RichFaces provides the most complete support for handling HTTP errors by providing a user definable callback. For example, to show the error message to the user:

```
<script type="text/javascript">
  A4J.AJAX.onError = function(req,status,message) {
    alert("An error occurred");
  };
</script>
```

If instead of an error code, the server reports that the view has expired, perhaps because the session timed out, you use a separate callback function in RichFaces to handle this scenario.

```
<script type="text/javascript">
  A4J.AJAX.onExpired = function(loc,message) {
    alert("View expired");
  };
</script>
```

Alternatively, you can allow RichFaces handle the error, in which case the user will be presented with a prompt that reads "View state couldn't be restored - reload page?" You can customize this message globally by setting the following message key in an application resource bundle.

```
AJAX_VIEW_EXPIRED=View expired. Please reload the page.
```

### 7.12.3. RichFaces (Ajax4jsf)

RichFaces (Ajax4jsf) is the Ajax library most commonly used with Seam, and provides all the controls discussed above:

- `eventsQueue` — provides a queue in which events are placed. All events are queued and requests are sent to the server serially. This is useful if the request to the server can take some time to execute (e.g. heavy computation, retrieving information from a slow source) as the server isn't flooded.
- `ignoreDupResponses` — ignores the response produced by the request if a more recent 'similar' request is already in the queue. `ignoreDupResponses="true"` does *not cancel* the processing of the request on the server side — just prevents unnecessary updates on the client side.

```
##### Seam #####
```

- `requestDelay` — ##### (#####)# #####  
(#####) ## (#####) #####

```
##### Seam #####  
##### (#####) #####
```

- `<a:poll reRender="total" interval="1000" />` — #####



## #####

JBoss jBPM #Java SE # EE ##### jBPM #####  
#####WEB##### jPDL ##### XML  
##### Eclipse ##### jPDL #####WEB  
#####SOA #####

Seam ##### jBPM #2 #####

- ##### jPDL #####  
Seam#####

- ##### ##### ##### jBPM  
#####  
##### #####jBPM  
#####

#####Pageflow, conversation # task #####

Seam#####JPDL#####Seam#####

## 8.1. Seam#####

Seam ##### 2 #####

- JSF###Seam ##### - #####
- jPDL ### - #####

#####  
#####

### 8.1.1. #####

##### (outcome) ## #####  
#####  
#####  
#####

### JSF #####

```
<navigation-rule>  
  <from-view-id  
>/numberGuess.jsp</from-view-id>  
  
  <navigation-case>  
    <from-outcome  
>guess</from-outcome>
```

```
    <to-view-id
>/numberGuess.jsp</to-view-id>
    <redirect/>
</navigation-case>

<navigation-case>
  <from-outcome
>win</from-outcome>
  <to-view-id
>/win.jsp</to-view-id>
  <redirect/>
</navigation-case>

<navigation-case>
  <from-outcome
>lose</from-outcome>
  <to-view-id
>/lose.jsp</to-view-id>
  <redirect/>
</navigation-case>

</navigation-rule
>
```

### Seam #####

```
<page view-id="/numberGuess.jsp">

  <navigation>
    <rule if-outcome="guess">
      <redirect view-id="/numberGuess.jsp"/>
    </rule>
    <rule if-outcome="win">
      <redirect view-id="/win.jsp"/>
    </rule>
    <rule if-outcome="lose">
      <redirect view-id="/lose.jsp"/>
    </rule>
  </navigation>

</page
>
```

##### ID#####

```

public String guess() {
    if (guess==randomNumber) return "/win.jsp";
    if (++guessCount==maxGuesses) return "/lose.jsp";
    return null;
}

```

#####

```

public String search() {
    return "/searchResults.jsp?searchPattern=#{searchAction.searchPattern}";
}

```

```

##### jPDL
#####
#####

```

### jPDL #####

```

<pageflow-definition name="numberGuess">
    <start-page name="displayGuess" view-id="/numberGuess.jsp">
        <redirect/>
        <transition name="guess" to="evaluateGuess">
            <action expression="#{numberGuess.guess}" />
        </transition>
    </start-page>

    <decision name="evaluateGuess" expression="#{numberGuess.correctGuess}">
        <transition name="true" to="win"/>
        <transition name="false" to="evaluateRemainingGuesses"/>
    </decision>

    <decision name="evaluateRemainingGuesses" expression="#{numberGuess.lastGuess}">
        <transition name="true" to="lose"/>
        <transition name="false" to="displayGuess"/>
    </decision>

    <page name="win" view-id="/win.jsp">
        <redirect/>

```

#8# #####

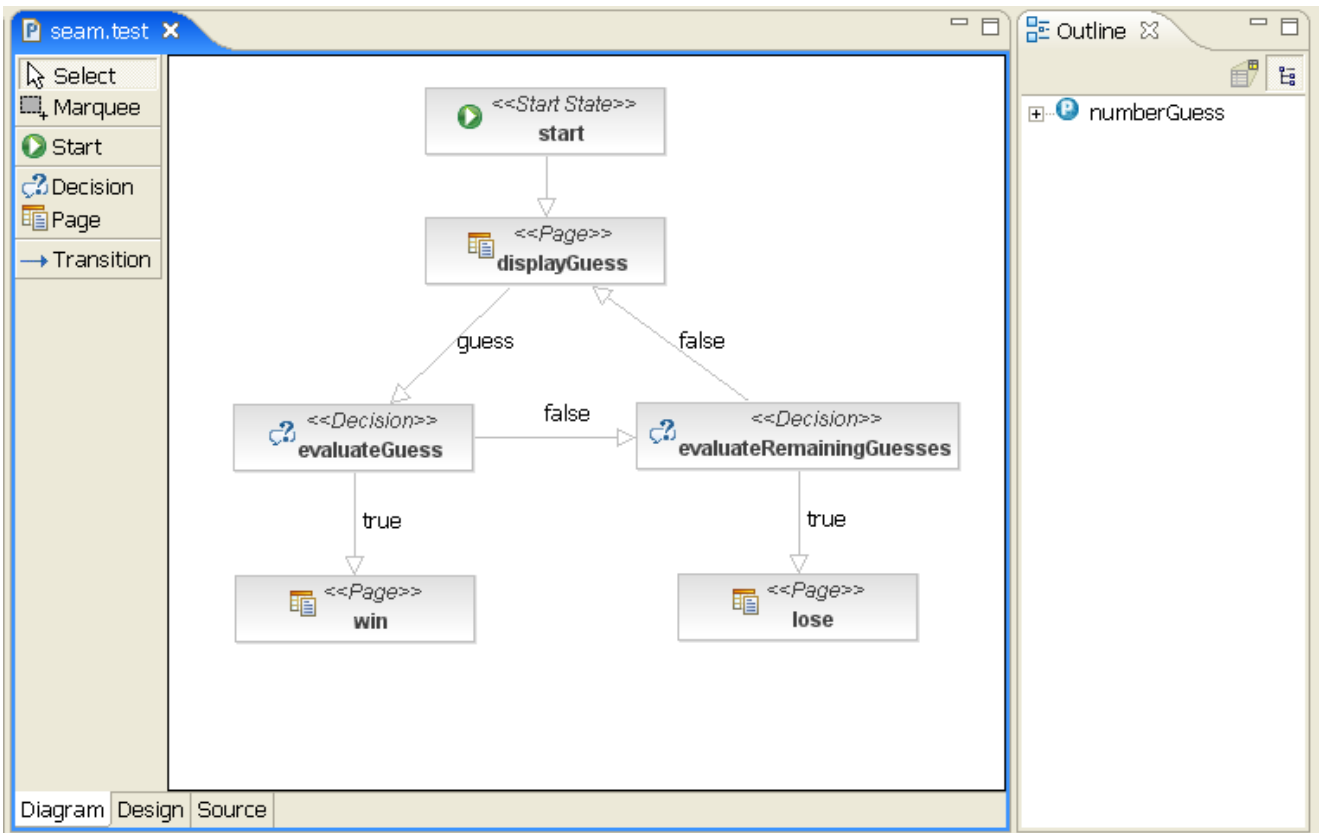
```

<end-conversation />
</page>

<page name="lose" view-id="/lose.jsp">
  <redirect/>
  <end-conversation />
</page>

</pageflow-definition
>

```



#####

- JSF/Seam ##### (##### Java #####)
- jPDL #JSP # Java #####

#####  
#####  
#####

##### / ##### / #####  
##### 1 ##### Seam #####



```
##### Seam #####
#####
#####

#####
```

## 8.1.2. Seam # #####

```
JSF ##### Seam ##### Seam #####
##### Struts # WebWork
##### WEB #####EJB #####Bean
# Spring framework #####
##### Seam ##### Bean
##### no-conversation-
view-id ##### null #####
#####

#####no-conversation-view-id##### pages.xml#####
Seam #####
```

```
<page view-id="/checkout.xhtml"
no-conversation-view-id="/main.xhtml"/>
```

On the other hand, in the stateful model, using the back button is interpreted as an undefined transition back to a previous state. Since the stateful model enforces a defined set of transitions from the current state, the back button is not permitted by default in the stateful model! Seam transparently detects the use of the back button, and blocks any attempt to perform an action from a previous, "stale" page, and simply redirects the user to the "current" page (and displays a faces message). Whether you consider this a feature or a limitation of the stateful model depends upon your point of view: as an application developer, it is a feature; as a user, it might be frustrating! You can enable backbutton navigation from a particular page node by setting `back="enabled"`.

```
<page name="checkout"
view-id="/checkout.xhtml"
back="enabled">
<redirect/>
<transition to="checkout"/>
<transition name="complete" to="complete"/>
</page
>
```

This allows navigation via the back button *from* the `checkout` state to *any previous state!*



##

If a page is set to redirect after a transition, it is not possible to use the back button to return to that page even when back is enabled on a page later in the flow. The reason is because Seam stores information about the pageflow in the page scope and the back button must result in a POST for that information to be restored (i.e., a Faces request). A redirect severs this linkage.

#####  
#####no-conversation-view-id #####:

```
<page name="checkout"
  view-id="/checkout.xhtml"
  back="enabled"
  no-conversation-view-id="/main.xhtml">
  <redirect/>
  <transition to="checkout"/>
  <transition name="complete" to="complete"/>
</page>
>
```

#####

## 8.2. jPDL #####

### 8.2.1. #####

```
Seam # jBPM #####Seam ##### # seam.properties ##### #
##### ( ### jpdl.xml ##### ) ##### ## components.xml # Seam
#####
```

```
<bpm:jbpm />
```

```
Seam # jBPM ##### ## components.xml # Seam
#####
```

```
<bpm:jbpm>
  <bpm:pageflow-definitions>
    <value
>pageflow.jpdl.xml</value>
  </bpm:pageflow-definitions>
```

```
</bpm:jbpm
>
```

## 8.2.2. #####

```
@Begin#@BeginTask ##### @StartTask ##### ##### jPDL
#####:
```

```
@Begin(pageflow="numberguess")
public void begin() { ... }
```

```
#####pages.xml#####
```

```
<page>
  <begin-conversation pageflow="numberguess"/>
</page>
>
```

If we are beginning the pageflow during the `RENDER_RESPONSE` phase — during a `@Factory` or `@Create` method, for example — we consider ourselves to be already at the page being rendered, and use a `<start-page>` node as the first node in the pageflow, as in the example above.

```
##### (outcome)
##### <start-state> #####
(outcome) #####
```

```
<pageflow-definition name="viewEditDocument">

  <start-state name="start">
    <transition name="documentFound" to="displayDocument"/>
    <transition name="documentNotFound" to="notFound"/>
  </start-state>

  <page name="displayDocument" view-id="/document.jsp">
    <transition name="edit" to="editDocument"/>
    <transition name="done" to="main"/>
  </page>

  ...

  <page name="notFound" view-id="/404.jsp">
```

#8# #####

```
</end-conversation/>
</page>

</pageflow-definition
>
```

### 8.2.3. #####

# <page> #####

```
<page name="displayGuess" view-id="/numberGuess.jsp">
  <redirect/>
  <transition name="guess" to="evaluateGuess">
    <action expression="#{numberGuess.guess}" />
  </transition>
</page
>
```

view-id           #JSF####ID###           <redirect/>###JSF#####<redirect/ >#####post-then-redirect#####(Seam#####Ruby on Rails # "flash"#####Seam#####

#####numberGuess.jsp ##### ## ##### JSF ## (outcome) #####

```
<h:commandButton type="submit" value="Guess" action="guess"/>
```

##### numberGuess ##### guess () #####  
jBPM ##### jPDL ##### JSF EL #####  
##### Seam ##### Seam #####  
####JSF ##### jBPM ##### (##### (The One Kind of Stuff principle))

null##outcome   ###   (####action   #####)#   #####Seam  
#####  
#####

```
<h:commandButton type="submit" value="Guess"/>
```

#####

```

<page name="displayGuess" view-id="/numberGuess.jsp">
  <redirect/>
  <transition to="evaluateGuess">
    <action expression="#{numberGuess.guess}" />
  </transition>
</page>
>

```

##### (outcome) #####

```

<h:commandButton type="submit" value="Guess" action="#{numberGuess.guess}"/>

```

```

<page name="displayGuess" view-id="/numberGuess.jsp">
  <transition name="correctGuess" to="win"/>
  <transition name="incorrectGuess" to="evaluateGuess"/>
</page>
>

```

#####  
#####

#### 8.2.4. #####

#####jPDL#####<decision>#####

```

<decision name="evaluateGuess" expression="#{numberGuess.correctGuess}">
  <transition name="true" to="win"/>
  <transition name="false" to="evaluateRemainingGuesses"/>
</decision>
>

```

decision ( ##### ) # Seam ##### JSF EL #####

#### 8.2.5. #####

<end-conversation>#####@End ##### (#####)

```

<page name="win" view-id="/win.jsp">
  <redirect/>

```

## #8# #####

---

```
</end-conversation/>
</page
>
```

```
#####transition ##### Seam
#####
```

```
<page name="win" view-id="/win.jsp">
  <redirect/>
  <end-task transition="success"/>
</page
>
```

### 8.2.6. #####

```
#####<process-state>
#####
```

```
<process-state name="cheat">
  <sub-process name="cheat"/>
  <transition to="displayGuess"/>
</process-state
>
```

```
<start-state> ##### <end-state>
#####<process-state> #####
```

### 8.3. Seam #####

```
#####
Seam # jBPM ##### Seam
#####
```

```
<page> #####<task-node> #####
(##### (The One Kind of Stuff principle)) #####
#####
```

```
<process-definition name="todo">

  <start-state name="start">
    <transition to="todo"/>
```

```

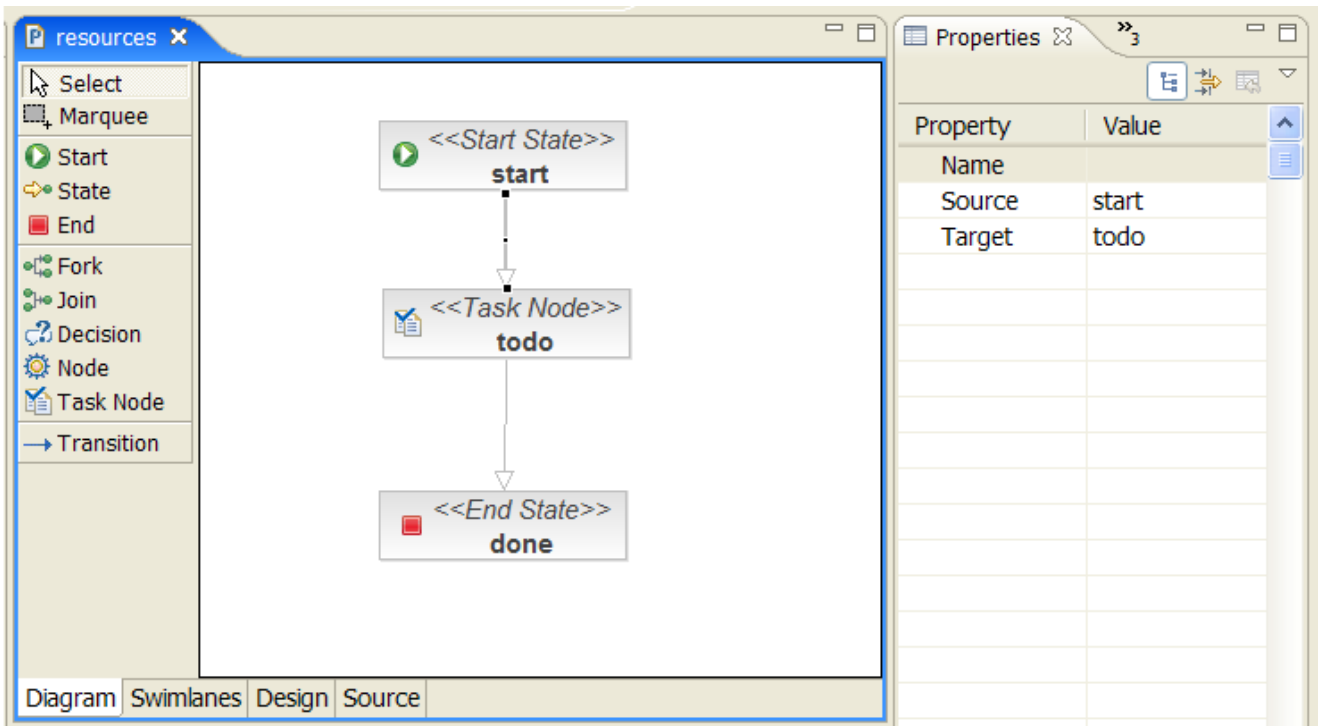
</start-state>

<task-node name="todo">
  <task name="todo" description="#{todoList.description}">
    <assignment actor-id="#{actor.id}"/>
  </task>
  <transition to="done"/>
</task-node>

<end-state name="done"/>

</process-definition
>

```



#####jPDL ##### jPDL #####2 #####  
 <task># ##### <process-definition>#####

## 8.4. jPDL #####

### 8.4.1. #####

jBPM #####jBPM#####

```

<bpm:jbpm>

```

#8# #####

---

```
<bpm:process-definitions>
  <value
>todo.jpdl.xml</value>
  </bpm:process-definitions>
</bpm:jbpm
>
```

```
jbpm ##### Seam
#####Seam#####jbpm#####
#####
```

### 8.4.2. #####ID###

```
##### jbpm #actor id# group actor id##### actor
##### Seam ##### actor id #####
```

```
@In Actor actor;

public String login() {
  ...
  actor.setId( user.getUserName() );
  actor.getGroupActorIds().addAll( user.getGroupNames() );
  ...
}
```

### 8.4.3. #####

```
##### @CreateProcess #####
```

```
@CreateProcess(definition="todo")
public void createTodo() { ... }
```

```
### pages.xml#####:
```

```
<page>
  <create-process definition="todo" />
</page>
>
```



#### 8.4.4. #####

#####ID###

```
<task name="todo" description="#{todoList.description}">
  <assignment actor-id="#{actor.id}"/>
</task>
>
```

#####

```
<task name="todo" description="#{todoList.description}">
  <assignment pooled-actors="employees"/>
</task>
>
```

#### 8.4.5. #####

##### Seam ##### pooledTaskInstanceList #  
#####

```
<h:dataTable value="#{pooledTaskInstanceList}" var="task">
  <h:column>
    <f:facet name="header">
      >Description</f:facet>
    <h:outputText value="#{task.description}"/>
  </h:column>
  <h:column>
    <s:link action="#{pooledTask.assignToCurrentActor}" value="Assign" taskInstance="#{task}"/>
  >
</h:column>
>
</h:dataTable>
>
```

<s:link> ##### JSF <h:commandLink> #####

```
<h:commandLink action="#{pooledTask.assignToCurrentActor}">
  >
  <f:param name="taskId" value="#{task.id}"/>
```

#8# #####

---

```
</h:commandLink
>
```

```
pooledTask #####
```

```
taskInstanceListForType #####
```

```
<h:dataTable value="#{taskInstanceListForType['todo']}" var="task">
  <h:column>
    <f:facet name="header"
>Description</f:facet>
    <h:outputText value="#{task.description}"/>
  </h:column>
  <h:column>
    <s:link action="#{todoList.start}" value="Start Work" taskInstance="#{task}"/>
  </h:column>
>
</h:dataTable
>
```

### 8.4.6. #####

```
##### @StartTask ##### @BeginTask#####
```

```
@StartTask
public String start() { ... }
```

```
### ##### pages.xml #####:
```

```
<page>
  <start-task />
</page
>
```

```
#####
#####
```

```
@EndTask #####Seam #####
```

```
@EndTask(transition="completed")
```

```
public String completed() { ... }
```

```
### pages.xml#####:
```

```
<page>  
  <end-task transition="completed" />  
</page>  
>
```

```
pages.xml###EL#####
```

```
#####jBPM #####  
(#####)
```

```
##### jBPM #####
```



---

## Seam #####

```
Seam # EJB 3.0 ##### Java Persistence API ### Hibernate3
##### Java ##### Seam #####
##### ORM #####
```

### 9.1. ###

Seam grew out of the frustration of the Hibernate team with the statelessness typical of the previous generation of Java application architectures. The state management architecture of Seam was originally designed to solve problems relating to persistence — in particular problems associated with *optimistic transaction processing*. Scalable online applications always use optimistic transactions. An atomic (database/JTA) level transaction should not span a user interaction unless the application is designed to support only a very small number of concurrent clients. But almost all interesting work involves first displaying data to a user, and then, slightly later, updating the same data. So Hibernate was designed to support the idea of a persistence context which spanned an optimistic transaction.

```
##### Seam # EJB 3.0
#####
##### ### #####
## Hibernate ##### LazyInitializationException #####
#####
```

```
EJB 3.0 ##### ##### #####
(##### Bean) ##### (#####) #
#####
```

- ##### Bean #####  
(#####)#
- #####

```
Seam ## ##### Bean ##### 1 #####
(#####) #####
(Seam #####) #####
#####
##### Seam # EJB 3.0
#####
```

### 9.2. Seam #####

```
EJB ##### Bean ##### EJB ##### Bean #####
##### JSF ##### Bean #####
##### 1 #####
```

## #9# Seam #####

---

```
##### Seam  
#####
```

```
#### ##### 1 ##### Seam ##### Bean  
#####
```

- The request might require processing by several loosely-coupled components, each of which is called independently from the web layer. It is common to see several or even many calls per request from the web layer to EJB components in Seam.

- #####

```
1 #####  
#####  
#####
```

```
Hibernate ##### #open session in view# ##### Spring  
#####  
LazyInitializationException ##### Hibernate #####open session in  
view#####
```

This pattern is usually implemented as a single transaction which spans the entire request. There are several problems with this implementation, the most serious being that we can never be sure that a transaction is successful until we commit it — but by the time the "open session in view" transaction is committed, the view is fully rendered, and the rendered response may already have been flushed to the client. How can we notify the user that their transaction was unsuccessful?

```
Seam ##### #open session in view#####  
#####
```

- #####

```
##### 1 #####  
(#####)  
##### 2 #####
```

```
##### Seam  
##### Seam  
##### ## Seam #####  
Seam #####  
#####
```

```
Seam ##### EJB 3.0 ##### Java EE 5 ##### Seam  
##### Seam #####
```

### 9.2.1. Seam #####

```
Seam ##### JSF ##### ## components.xml  
#####
```

```
<core:init transaction-management-enabled="false"/>
```

```
<transaction:no-transaction />
```

## 9.2.2. Seam#####

```
Seam ##### EJB ##### JTA ##### Java EE 5
##### components.xml # EJB #####
```

```
<transaction:ejb-transaction />
```

```
#### EE 5 ##### Seam ##### Seam
#####
```

- JPA RESOURCE\_LOCAL ##### javax.persistence.EntityTransaction
##### EntityTransaction #####
- Hibernate ##### org.hibernate.Transaction #####
HibernateTransaction #####
- Spring ##### org.springframework.transaction.PlatformTransactionManager
##### Spring # PlatformTransactionManagement #####
userConversationContext #####
- Seam #####

```
components.xml ##### JPA RESOURCE_LOCAL ##### #{em} #
persistence:managed-persistence-context ##### ##### entityManager
## entity-manager ##### (Seam ##### ##)
```

```
<transaction:entity-transaction entity-manager="#{em}"/>
```

```
Hibernate ##### ## components.xml ##### #{hibernateSession} #####
persistence:managed-hibernate-session ##### ## Hibernate ##### session ##
session ##### (Seam ##### ##)
```

```
<transaction:hibernate-transaction session="#{hibernateSession}"/>
```

```
Seam ##### components.xml #####
```

## #9# Seam #####

```
<transaction:no-transaction />
```

Spring ##### *Spring # PlatformTransactionManagement #####* #####

### 9.2.3. #####

```
##### beforeCompletion() # afterCompletion()
##### Seam #####
##### Seam
##### Java EE 5 ##### <transaction:ejb-transaction/
> ##### components.xml ##### Seam ##### Seam
#####
```

### 9.3. Seam #####

```
Seam # Java EE 5 #####
EE 5 #####
#####
```

```
##### (JPA #) ### ##### (Hibernate #) #####
Seam ##### Seam ##### EntityManager ### Session
##### @In #####
```

```
Seam ##### EJB 3.0
##### Seam #####
#####
(##### EJB #####)
```

#### 9.3.1. JPA # Seam #####

```
##### components.xml #####
```

```
<persistence:managed-persistence-context name="bookingDatabase"
auto-create="true"
persistence-unit-jndi-name="java:/EntityManagerFactories/bookingData"/>
```

```
##### bookingDatabase ##### Seam ##### JNDI # java:/
EntityManagerFactories/bookingData ##### (EntityManagerFactory #####) #
EntityManager #####
```

```
### EntityManagerFactory # JNDI ##### JBoss ### #####
persistence.xml #####
```

```
<property name="jboss.entity.manager.factory.jndi.name"
```



```
value="java:/EntityManagerFactories/bookingData"/>
```

```
##### EntityManager #####
```

```
@In EntityManager bookingDatabase;
```

```
EJB      3      ##### @TransactionAttribute(REQUIRES_NEW)
##### Seam
##### REQUIRES_NEW #####
##### REQUIRES_NEW ##### @PersistenceContext #####
```

### 9.3.2. Seam ### Hibernate #####

```
Seam ## Hibernate #####components.xml #####
```

```
<persistence:hibernate-session-factory name="hibernateSessionFactory"/>
<persistence:managed-hibernate-session name="bookingDatabase"
    auto-create="true"
    session-factory-jndi-name="java:/bookingSessionFactory"/>
```

```
java:/bookingSessionFactory # hibernate.cfg.xml #####
```

```
<session-factory name="java:/bookingSessionFactory">
  <property name="transaction.flush_before_completion"
>true</property>
  <property name="connection.release_mode"
>after_statement</property>
  <property name="transaction.manager_lookup_class"
>org.hibernate.transaction.JBossTransactionManagerLookup</property>
  <property name="transaction.factory_class"
>org.hibernate.transaction.JTATransactionFactory</property>
  <property name="connection.datasource"
>java:/bookingDatasource</property>
  ...
</session-factory
>
```

```
Seam      ##### hibernate.transaction.flush_before_completion
##### JTA #####
```

## #9# Seam #####

#### ##### JavaBean ##### Hibernate Session #####

```
@In Session bookingDatabase;
```

### 9.3.3. Seam #####

```
merge() ##### LazyInitializationException
# NonUniqueObjectException #####
#####
##### Hibernate # EJB 3.0 ##### @Version
#####
##### (#####)# #####
#####
##### EJB 3.0 ##### JBoss# Sun#
Sybase ##### EJB 3.0
##### Hibernate #####
FlushModeType #####
#####
Seam ##### FlushModeType.MANUAL ##### Hibernate
#####
```

```
@In EntityManager em; //a Seam-managed persistence context
```

```
@Begin(flushMode=MANUAL)
public void beginClaimWizard() {
    claim = em.find(Claim.class, claimId);
}
```

### claim ##### ## claim #####

```
public void addPartyToClaim() {
    Party party = ....;
    claim.addParty(party);
}
```

#### #####

```
@End
```

```
public void commitClaim() {
    em.flush();
}
```

### pages.xml ## flushMode # MANUAL #####

```
<begin-conversation flush-mode="MANUAL" />
```

#### Seam #####

```
<components xmlns="http://jboss.com/products/seam/components"
    xmlns:core="http://jboss.com/products/seam/core">
    <core:manager conversation-timeout="120000" default-flush-mode="manual" />
</components
>
```

## 9.4. JPA #####

EntityManager ##### getDelegate() ##### API #####  
 Hibernate ##### org.hibernate.Session #####  
 ##### ## JPA ##### JPA  
 #####

#### Hibernate ##### Seam  
 #####

```
@In EntityManager entityManager;

@Create
public void init() {
    ((Session) entityManager.getDelegate() ).enableFilter("currentVersions");
}
```

##### Java #####  
 ##### components.xml #####

```
<factory name="session"
    scope="STATELESS"
    auto-create="true"
```

## #9# Seam #####

---

```
value="#{entityManager.delegate}"/>
```

```
#####
```

```
@In Session session;  
  
@Create  
public void init() {  
    session.enableFilter("currentVersions");  
}
```

## 9.5. EJB-QL/HQL # EL #####

```
Seam ##### @PersistenceContext #####  
Seam # EntityManager ### Session ##### EL  
#####
```

```
User user = em.createQuery("from User where username=#{user.username}")  
    .getSingleResult();
```

```
#####
```

```
User user = em.createQuery("from User where username=:username")  
    .setParameter("username", user.getUsername())  
    .getSingleResult();
```

```
### #####
```

```
User user = em.createQuery("from User where username=" + user.getUsername()) //BAD!  
    .getSingleResult();
```

```
(##### SQL #####)
```

## 9.6. Hibernate #####

```
Hibernate #####  
##### Hibernate ##### Seam  
##### Seam Application Framework  
#####
```

Seam ##### EntityManager # Hibernate Session  
##### (### Hibernate #####)

```

<persistence:filter name="regionFilter">
  <persistence:name
>region</persistence:name>
  <persistence:parameters>
    <key
>regionCode</key>
    <value
>#{region.code}</value>
  </persistence:parameters>
</persistence:filter>

<persistence:filter name="currentFilter">
  <persistence:name
>current</persistence:name>
  <persistence:parameters>
    <key
>date</key>
    <value
>#{currentDate}</value>
  </persistence:parameters>
</persistence:filter>

<persistence:managed-persistence-context name="personDatabase"
  persistence-unit-jndi-name="java:/EntityManagerFactories/personDatabase">
  <persistence:filters>
    <value
>#{regionFilter}</value>
    <value
>#{currentFilter}</value>
  </persistence:filters>
</persistence:managed-persistence-context
>

```



---

## Seam ## JSF #####

##### JSF ### #####

```
<h:form>
  <h:messages/>

  <div>
    Country:
    <h:inputText value="#{location.country}" required="true">
      <my:validateCountry/>
    </h:inputText>
  </div>

  <div>
    Zip code:
    <h:inputText value="#{location.zip}" required="true">
      <my:validateZip/>
    </h:inputText>
  </div>

  <h:commandButton/>
</h:form>
>
```

#####  
DRY ##### Seam # Hibernate Validator #####  
Location #####

```
public class Location {
  private String country;
  private String zip;

  @NotNull
  @Length(max=30)
  public String getCountry() { return country; }
  public void setCountry(String c) { country = c; }

  @NotNull
  @Length(max=6)
  @Pattern("^\\d*$")
  public String getZip() { return zip; }
```

## #10# Seam ## JSF #####

---

```
public void setZip(String z) { zip = z; }  
}
```

##### Hibernate Validator #####

```
public class Location {  
    private String country;  
    private String zip;  
  
    @NotNull  
    @Country  
    public String getCountry() { return country; }  
    public void setCountry(String c) { country = c; }  
  
    @NotNull  
    @ZipCode  
    public String getZip() { return zip; }  
    public void setZip(String z) { zip = z; }  
}
```

##### JSF ##### <s:validate>  
#####

```
<h:form>  
    <h:messages/>  
  
    <div>  
        Country:  
        <h:inputText value="#{location.country}" required="true">  
            <s:validate/>  
        </h:inputText>  
    </div>  
  
    <div>  
        Zip code:  
        <h:inputText value="#{location.zip}" required="true">  
            <s:validate/>  
        </h:inputText>  
    </div>  
  
    <h:commandButton/>
```



```
</h:form
>
```

```
##: ##### @NotNull ##### required="true" #####
JSF #####
```

This approach *defines* constraints on the model, and *presents* constraint violations in the view — a significantly better design.

```
#### ##### <s:validateAll> #####
```

```
<h:form>

  <h:messages/>

  <s:validateAll>

    <div>
      Country:
      <h:inputText value="#{location.country}" required="true"/>
    </div>

    <div>
      Zip code:
      <h:inputText value="#{location.zip}" required="true"/>
    </div>

    <h:commandButton/>

  </s:validateAll>

</h:form
>
```

```
##### <s:validate> #####
#####
```

```
#### #####
##### label
#####
```

```
<h:inputText value="#{location.zip}" required="true" label="Zip:">
<s:validate/>
```

#10# Seam ## JSF #####

```
</h:inputText
>
```

```
##### {0} ##### (Hibernate Validator #####
JSF #####)# ##### (Internationalization)
#####
```

```
validator.length={0} ### {min} # {max} #####
```

```
##### (#### JSF ###)# #####
(#####)# ##### (#####) ##### ###
#####
```

```
#####
#####
#### facelets #####
```

```
<ui:composition xmlns="http://www.w3.org/1999/xhtml"
  xmlns:ui="http://java.sun.com/jsf/facelets"
  xmlns:h="http://java.sun.com/jsf/html"
  xmlns:f="http://java.sun.com/jsf/core"
  xmlns:s="http://jboss.com/products/seam/taglib">

  <div>

    <s:label styleClass="#{invalid?'error':''}">
      <ui:insert name="label"/>
      <s:span styleClass="required" rendered="#{required}"
>* </s:span>
    </s:label>

    <span class="#{invalid?'error':''}">
      <h:graphicImage value="/img/error.gif" rendered="#{invalid}"/>
      <s:validateAll>
        <ui:insert/>
      </s:validateAll>
    </span>

    <s:message styleClass="error"/>

  </div>
```

---

```
</ui:composition
>
```

```
<s:decorate> #####
```

```
<h:form>

  <h:messages globalOnly="true"/>

  <s:decorate template="edit.xhtml">
    <ui:define name="label"
  >Country:</ui:define>
    <h:inputText value="#{location.country}" required="true"/>
  </s:decorate>

  <s:decorate template="edit.xhtml">
    <ui:define name="label"
  >Zip code:</ui:define>
    <h:inputText value="#{location.zip}" required="true"/>
  </s:decorate>

  <h:commandButton/>

</h:form
>
```

```
#### ##### RichFaces Ajax #####
```

```
<h:form>

  <h:messages globalOnly="true"/>

  <s:decorate id="countryDecoration" template="edit.xhtml">
    <ui:define name="label"
  >Country:</ui:define>
    <h:inputText value="#{location.country}" required="true">
      <a:support event="onblur" reRender="countryDecoration" bypassUpdates="true"/>
    </h:inputText>
  </s:decorate>

  <s:decorate id="zipDecoration" template="edit.xhtml">
    <ui:define name="label"
```

#10# Seam ## JSF #####

---

```
>Zip code:</ui:define>
  <h:inputText value="#{location.zip}" required="true">
    <a:support event="onblur" reRender="zipDecoration" bypassUpdates="true"/>
  </h:inputText>
</s:decorate>

  <h:commandButton/>

</h:form
>
```

```
##### ID ##### ## UI #####
Selenium ##### ## ID ##### JSF
#####
```

```
<h:form id="form">

  <h:messages globalOnly="true"/>

  <s:decorate id="countryDecoration" template="edit.xhtml">
    <ui:define name="label"
  >Country:</ui:define>
    <h:inputText id="country" value="#{location.country}" required="true">
      <a:support event="onblur" reRender="countryDecoration" bypassUpdates="true"/>
    </h:inputText>
  </s:decorate>

  <s:decorate id="zipDecoration" template="edit.xhtml">
    <ui:define name="label"
  >Zip code:</ui:define>
    <h:inputText id="zip" value="#{location.zip}" required="true">
      <a:support event="onblur" reRender="zipDecoration" bypassUpdates="true"/>
    </h:inputText>
  </s:decorate>

  <h:commandButton/>

</h:form
>
```

```
##### Seam ##### (##### EL
#####) # Hibernate Validator #####
```

---

```
public class Location {  
    private String name;  
    private String zip;  
  
    // Getters and setters for name  
  
    @NotNull  
    @Length(max=6)  
    @ZipCode(message="#{messages['location.zipCode.invalid']}")  
    public String getZip() { return zip; }  
    public void setZip(String z) { zip = z; }  
}
```

```
location.zipCode.invalid = #{location.name} #####
```



---

## Groovy #####

JBoss

Seam#####RAD#####RAD#####

API#####API#####

Java #####Groovy [http://  
groovy.codehaus.org]#####

JBoss Seam #####Java EE #####JBoss Seam

##### Seam

#####Seam

#####API#####

### 11.1. ####

Groovy

##Java#####Python#Ruby#Smalltalk#####Groovy

#####2####

- Java #####Groovy####Java#####

- Groovy #####Java#####Java#####

TODO:Groovy #####

### 11.2. Groovy ### Seam #####

#####Groovy##### # Java #####Seam

#####Groovy#####Groovy#####Java#####

#### 11.2.1. Groovy #####

#####Seam#####Groovy 1.1

#####Seam#####Groovy#####

##### 11.2.1.1. #####

```
@Entity
```

```
  @Name("hotel")
```

```
  class Hotel implements Serializable
```

```
  {
```

```
    @Id @GeneratedValue
```

```
    Long id
```

```
    @Length(max=50) @NotNull
```

```
    String name
```

```
@Length(max=100) @NotNull
String address

@Length(max=40) @NotNull
String city

@Length(min=2, max=10) @NotNull
String state

@Length(min=4, max=6) @NotNull
String zip

@Length(min=2, max=40) @NotNull
String country

@Column(precision=6, scale=2)
BigDecimal price

@Override
String toString()
{
    return "Hotel(${name},${address},${city},${zip})"
}
}
```

Groovy#####(getter/  
setter)#####getter#setter#####hotel####Java##hotel.getCity()#####

### 11.2.1.2. Seam #####

Seam#####Groovy#####Java#####Seam#####

```
@Scope(ScopeType.SESSION)
@Name("bookingList")
class BookingListAction implements Serializable
{
    @In EntityManager em
    @In User user
    @DataModel List<Booking> bookings
    @DataModelSelection Booking booking
    @Logger Log log

    @Factory public void getBookings()
```



```

{
    bookings = em.createQuery("
        select b from Booking b
        where b.user.username = :username
        order by b.checkinDate")
        .setParameter("username", user.username)
        .getResultList()
}

public void cancel()
{
    log.info("Cancel booking: #{bookingList.booking.id} for #{user.username}")
    Booking cancelled = em.find(Booking.class, booking.id)
    if (cancelled != null) em.remove( cancelled )
    getBookings()
    FacesMessages.instance().add("Booking cancelled for confirmation number
    #{bookingList.booking.id}", new Object[0])
}
}

```

## 11.2.2. seam-gen

```

seam-gen #Groovy#####seam-gen
#####Groovy#####Groovy#####.groovy#####src/
main#####.groovy#####src/hot#####

```

## 11.3. ####

```

Groovy#####Java#####3#####
#####JavaBeans#Seam#####JBoss
Seam#####/
#####.groovy#####GroovyBeans#Seam#####

```

### 11.3.1. Groovy #####

```

Groovy#####Java#####Java#####Groovy#####Groovy#####bean#Groovy
Seam#####groovyc
ant#####Groovy#####Java#####Groovy

```

### 11.3.2. #####.groovy #####

```

JBoss
Seam#####.groovy#####

```

## #11# Groovy #####

---

#Seam #####Groovy###(.groovy #####)#WEB-INF/  
dev#####GroovyBean#####  
#####.groovy#####Seam#####

- #####JavaBeans ##### GroovyBeans###EJB3 bean#####
- #####
- ##### WEB-INF/dev #####
- Seam #####


### 11.3.3. seam-gen

Seam-gen  
#Groovy#####.groovy#####src  
hot#WAR, Java, Groovy#####seam-  
gen#####Groovy#####  
examples/groovybooking###Groovy#####

---

## #####Apache Wicket#####

Seam#JSF#####Wicket#####Seam#####wicket#####Wicket#####


 ##  
Wicket#####Seam#####JSF#####Wicket#####

### 12.1. Seam##Wicket#####

Wicket#####

Wicket#####Seam#####

#####this()#super()#####

 ##  
#####

#####

#### 12.1.1. #####

Seam#####Wicket#####Seam#####EVENT#CONVERSATION#SESSION#APPLICATION#BUSINESS

Wicket##Seam#####@In#####

```
@In(create=true)
private HotelBooking hotelBooking;
```

 ####  
Wicket#####Seam#####@Name#####

Wicket#####Seam#####

```
@Out(scope=ScopeType.EVENT, required=false)
private String verify;
```

TODO #####

### 12.1.2. #####

Wicket#####@Restrict#####15#####@Rest  
#####


#:

```
@Restrict
public class Main extends WebPage {

...
}
```

 ####  
Seam#####

Wicket#####@Begin#@End#####Seam#####

 ##  
ifOutcome#####

#:

```
item.add(new Link("viewHotel") {

    @Override
    @Begin
    public void onClick() {
        hotelBooking.selectHotel(hotel);
        setResponsePage(org.jboss.seam.example.wicket.Hotel.class);
    }
});
```

#####@NoConversationPage#####

```
@Restrict
@NoConversationPage(Main.class)
```

```
public class Hotel extends WebPage {
```

```
#####Seam#####Events.instance().raiseEvent("foo")###
(outcome)#####
```

```
Wicket#####@CreateProcess#@ResumeTask#@BeginTask#@EndTask#@StartTask#@Transition#####
```

```
TODO - BPM##### - JBSEAM-3194
```

## 12.2. #####

Seam needs to instrument the bytecode of your Wicket classes to be able to intercept the annotations you use. The first decision to make is: do you want your code instrumented at runtime as your app is running, or at compile time? The former requires no integration with your build environment, but has a performance penalty when loading each instrumented class for the first time. The latter is faster, but requires you to integrate this instrumentation into your build environment.

### 12.2.1. Runtime instrumentation

There are two ways to achieve runtime instrumentation. One relies on placing wicket components to be instrumented in a special folder in your WAR deployment. If this is not acceptable or possible, you can also use an instrumentation "agent," which you specify in the command line for launching your container.

#### 12.2.1.1. Location-specific instrumentation

Any classes placed in the `WEB-INF/wicket` folder within your WAR deployment will be automatically instrumented by the `seam-wicket` runtime. You can arrange to place your wicket pages and components here by specifying a separate output folder for those classes in your IDE, or through the use of ant scripts.

#### 12.2.1.2. Runtime instrumentation agent

The jar file `jboss-seam-wicket.jar` can be used as an instrumentation agent through the Java Instrumentation api. This is accomplished through the following steps:

- Arrange for the `jboss-seam-wicket.jar` file to live in a location for which you have an absolute path, as the Java Instrumentation API does not allow relative paths when specifying the location of an agent lib.
- Add `javaagent:/path/to/jboss-seam-wicket.jar` to the command line options when launching your webapp container:
- In addition, you will need to add an environment variable that specifies packages that the agent should instrument. This is accomplished by a comma separated list of package names:

```
-Dorg.jboss.seam.wicket.instrumented-packages=my.package.one,my.other.package
```

Note that if a package A is specified, classes in subpackages of A are also examined. The classes chosen for instrumentation can be further limited by specifying:

```
-Dorg.jboss.seam.wicket.scanAnnotations=true
```

and then marking instrumentable classes with the `@SeamWicketComponent` annotation, see [#12.2.3. #The @SeamWicketComponent annotation#](#).

## 12.2.2. Compile-time instrumentation

Seam supports instrumentation at compile time through either Apache Ant or Apache Maven.

### 12.2.2.1. Instrumenting with ant

Seam provides an ant task in the `jboss-seam-wicket-ant.jar`. This is used in the following manner:

```
<taskdef name="instrumentWicket"
  classname="org.jboss.seam.wicket.ioc.WicketInstrumentationTask">
  <classpath>
    <pathelement location="lib/jboss-seam-wicket-ant.jar"/>
    <pathelement location="web/WEB-INF/lib/jboss-seam-wicket.jar"/>
    <pathelement location="lib/javassist.jar"/>
    <pathelement location="lib/jboss-seam.jar"/>
  </classpath>
</taskdef>

<instrumentWicket outputDirectory="${build.instrumented}" useAnnotations="true">
  <classpath refid="build.classpath"/>
  <fileset dir="${build.classes}" includes="**/*.class"/>
</instrumentWicket>
```

This results in the instrumented classes being placed in the directory specified by `${build.instrumented}`. You will then need to instruct ant to copy these classes into `WEB-INF/classes`. If you want to hot deploy the Wicket components, you can copy the instrumented classes to `WEB-INF/dev`; if you use hot deploy, make sure that your `WicketApplication` class is also hot-deployed. Upon a reload of hot-deployed classes, the entire `WicketApplication` instance has to be re-initialized, in order to pick up new references to the classes of mounted pages.

The `useAnnotations` attribute is used to make the ant task only include classes that have been marked with the `@SeamWicketComponent` annotation, see [#12.2.3. #The @SeamWicketComponent annotation#](#).

### 12.2.2.2. Instrumenting with maven

The `jboss maven repository repository.jboss.org` provides a plugin named `seam-instrument-wicket` with a `process-classes` mojo. An example configuration in your `pom.xml` might look like:

```
<build>
  <plugins>
    <plugin>
      <groupId>org.jboss.seam</groupId>
      <artifactId>seam-instrument-wicket</artifactId>
      <version>2.2.0</version>
      <configuration>
        <scanAnnotations>true</scanAnnotations>
        <includes>
          <include>your.package.name</include>
        </includes>
      </configuration>
      <executions>
        <execution>
          <id>instrument</id>
          <phase>process-classes</phase>
          <goals>
            <goal>instrument</goal>
          </goals>
        </execution>
      </executions>
    </plugin>
  </plugins>
</build>
```

The above example illustrates that the instrumentation is limited to classes specified by the `includes` element. In this example, the `scanAnnotations` is specified, see [#12.2.3. #The @SeamWicketComponent annotation#](#).

### 12.2.3. The `@SeamWicketComponent` annotation

Classes placed in `WEB-INF/wicket` will unconditionally be instrumented. The other instrumentation mechanisms all allow you to specify that instrumentation should only be applied to classes

## #12# #####Apac...

---

annotated with the `@SeamWicketComponent` annotation. This annotation is inherited, which means all subclasses of an annotated class will also be instrumented. An example usage is:

```
import org.jboss.seam.wicket.ioc.SeamWicketComponent;
@SeamWicketComponent
public class MyPage extends WebPage{
    ...
}
```

### 12.2.4. #####

```
Seam#####Wicket#WebApplication####SeamWebApplication#####Wicket#####
#:
SeamAuthorizationStrategy##Wicket#####@Restrict#####Seam#####SeamWeb
#####getHomePage()#####
```

```
public class WicketBookingApplication extends SeamWebApplication {

    @Override
    public Class getHomePage() {
        return Home.class;
    }

    @Override
    protected Class getLoginPage() {
        return Home.class;
    }

}
```

Seam automatically installs the Wicket filter for you (ensuring that it is inserted in the correct place for you). But you still need to tell Wicket which `WebApplication` class to use.

```
<components xmlns="http://jboss.com/products/seam/components"
    xmlns:wicket="http://jboss.com/products/seam/wicket"
    xsi:schemaLocation=
        "http://jboss.com/products/seam/wicket
        http://jboss.com/products/seam/wicket-2.2.xsd">
```



```
<wicket:web-application
  application-class="org.jboss.seam.example.wicket.WicketBookingApplication" />
</components
```

In addition, if you plan to use JSF-based pages in the same application as wicket pages, you'll need to ensure that the jsf exception filter is only enabled for jsf urls:

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:web="http://jboss.com/products/seam/web"
  xmlns:wicket="http://jboss.com/products/seam/wicket"
  xsi:schemaLocation=
    "http://jboss.com/products/seam/web
    http://jboss.com/products/seam/web-2.2.xsd">

  <!-- Only map the seam jsf exception filter to jsf paths, which we identify with the *.seam path -->
  <web:exception-filter url-pattern="*.seam"/>
</components
```



####

#####Application#####Wicket#####



---

## Seam#####

```
Seam #####                               ###           Java
##### components.xml### (#####)
#####

Seam#####                               JPA           #Hibernae
#####
```

We should emphasize that the framework is extremely simple, just a handful of simple classes that are easy to understand and extend. The "magic" is in Seam itself — the same magic you use when creating any Seam application even without using this framework.

### 13.1. ####

```
Seam #####                               #####          ##
Seam ##### components.xml #####
##### ### components.xml ##### Person ##### CRUD ##### 1
#####
```

```
<framework:entity-home name="personHome"
    entity-class="eg.Person"
    entity-manager="#{personDatabase}">
    <framework:id
>#{param.personId}</framework:id>
</framework:entity-home
>
```

```
#####XML #####
```

```
@Name("personHome")
public class PersonHome extends EntityHome<Person
> {

    @In EntityManager personDatabase;

    public EntityManager getEntityManager() {
        return personDatabase;
    }

}
```

### #13# Seam#####

```
##### (#####) #####  
(#####)
```

```
### ##### EJB ##### Bean #####  
(##EJB#####JavaBean#####) JBoss AS  
#####4.2.2.GA#####
```

```
@Stateful  
@Name("personHome")  
public class PersonHome extends EntityHome<Person  
> implements LocalPersonHome {  
  
}
```

```
##### Bean ##### ##### entityManager  
#####
```

```
@Stateless  
@Name("personHome")  
public class PersonHome extends EntityHome<Person  
> implements LocalPersonHome {  
  
    @In EntityManager entityManager;  
  
    public EntityManager getPersistenceContext() {  
        entityManager;  
    }  
  
}
```

```
#####Seam#####CRUD #####EntityHome  
#HibernateEntityHome###Query###EntityQuery #  
HibernateEntityQuery#4#####  
  
Home#Query#####  
#####  
  
Seam#####Seam#####  
#####entityManager#####
```

## 13.2. Home#####

```
Home#####Person#####
```

```

@Entity
public class Person {
    @Id private Long id;
    private String firstName;
    private String lastName;
    private Country nationality;

    //getters and setters...
}

```

```
#####personHome#####
```

```
<framework:entity-home name="personHome" entity-class="eg.Person" />
```

```
#####
```

```

@Name("personHome")
public class PersonHome extends EntityHome<Person>
{ }

```

```

Home ##### persist()# remove()# update()# getInstance() # #####
remove() ##### update() ##### setId() #####

```

```
Home # JSF #####
```

```

<h1
>Create Person</h1>
<h:form>
  <div
>First name: <h:inputText value="#{personHome.instance.firstName}"/></div>
  <div
>Last name: <h:inputText value="#{personHome.instance.lastName}"/></div>
  <div>
    <h:commandButton value="Create Person" action="#{personHome.persist}"/>
  </div>
</h:form
>

```

```
###Person#person#####components.xml#####
```

### #13# Seam#####

---

```
<factory name="person"
  value="#{personHome.instance}"/>

<framework:entity-home name="personHome"
  entity-class="eg.Person" />
```

```
(#####) PersonHome # @Factory #####
```

```
@Name("personHome")
public class PersonHome extends EntityHome<Person
> {

    @Factory("person")
    public Person initPerson() { return getInstance(); }

}
```

```
(#####) ##### JSF #####
```

```
<h1
>Create Person</h1>
<h:form>
  <div
>First name: <h:inputText value="#{person.firstName}"/></div>
  <div
>Last name: <h:inputText value="#{person.lastName}"/></div>
  <div>
    <h:commandButton value="Create Person" action="#{personHome.persist}"/>
  </div>
</h:form
>
```

```
####Person#####
#####
Person#####PersonHome#####
#####
```

```
<pages>
  <page view-id="/editPerson.jsp">
```

```

    <param name="personId" value="#{personHome.id}"/>
  </page>
</pages
>

```

#####JSF#####

```

<h1>
  <h:outputText rendered="#{!personHome.managed}" value="Create Person"/>
  <h:outputText rendered="#{personHome.managed}" value="Edit Person"/>
</h1>
<h:form>
  <div
>First name: <h:inputText value="#{person.firstName}"/></div>
  <div
>Last name: <h:inputText value="#{person.lastName}"/></div>
  <div>
    <h:commandButton value="Create Person" action="#{personHome.persist}"
rendered="#{!personHome.managed}"/>
    <h:commandButton value="Update Person" action="#{personHome.update}"
rendered="#{personHome.managed}"/>
    <h:commandButton value="Delete Person" action="#{personHome.remove}"
rendered="#{personHome.managed}"/>
  </div>
</h:form
>

```

#####Person#####personId  
#####Person#####

Person ##### nationality #####

```

<factory name="person"
  value="#{personHome.instance}"/>

<framework:entity-home name="personHome"
  entity-class="eg.Person"
  new-instance="#{newPerson}"/>

<component name="newPerson"
  class="eg.Person">
  <property name="nationality"

```

```
>#{country}</property>
</component
>
```

#####

```
@Name("personHome")
public class PersonHome extends EntityHome<Person
> {

    @In Country country;

    @Factory("person")
    public Person initPerson() { return getInstance(); }

    protected Person createInstance() {
        return new Person(country);
    }

}
```

#####Country#####CountryHome##### Home #####

##### ##### PersonHome #####

```
@Name("personHome")
public class PersonHome extends EntityHome<Person
> {

    @In Country country;

    @Factory("person")
    public Person initPerson() { return getInstance(); }

    protected Person createInstance() {
        return new Person(country);
    }

    public void migrate()
    {
        getInstance().setCountry(country);
        update();
    }
}
```



```

}

}

```

The Home object raises an `org.jboss.seam.afterTransactionSuccess` event when a transaction succeeds (a call to `persist()`, `update()` or `remove()` succeeds). By observing this event we can refresh our queries when the underlying entities are changed. If we only want to refresh certain queries when a particular entity is persisted, updated or removed we can observe the `org.jboss.seam.afterTransactionSuccess.<name>` event (where `<name>` is the simple name of the entity, e.g. an entity called "org.foo.myEntity" has "myEntity" as simple name).

Home#####

```

<factory name="person"
  value="#{personHome.instance}"/>

<framework:entity-home name="personHome"
  entity-class="eg.Person"
  new-instance="#{newPerson}">
  <framework:created-message
>New person #{person.firstName} #{person.lastName} created</framework:created-message>
  <framework:deleted-message
>Person #{person.firstName} #{person.lastName} deleted</framework:deleted-message>
  <framework:updated-message
>Person #{person.firstName} #{person.lastName} updated</framework:updated-message>
</framework:entity-home>

<component name="newPerson"
  class="eg.Person">
  <property name="nationality"
>#{country}</property>
</component
>

```

#####

```

@Name("personHome")
public class PersonHome extends EntityHome<Person
> {

  @In Country country;

```

## #13# Seam#####

```
@Factory("person")
public Person initPerson() { return getInstance(); }

protected Person createInstance() {
    return new Person(country);
}

protected String getCreatedMessage() { return createValueExpression("New person
#{person.firstName} #{person.lastName} created"); }
protected String getUpdatedMessage() { return createValueExpression("Person
#{person.firstName} #{person.lastName} updated"); }
protected String getDeletedMessage() { return createValueExpression("Person
#{person.firstName} #{person.lastName} deleted"); }
}
```

##### (##### messages #####) Seam #####

```
Person_created=New person #{person.firstName} #{person.lastName} created
Person_deleted=Person #{person.firstName} #{person.lastName} deleted
Person_updated=Person #{person.firstName} #{person.lastName} updated
```

#####

```
#####<s:validateAll>
#<s:decorate>#####
```

## 13.3. Query#####

#####Person#####Query#####

```
<framework:entity-query name="people"
    ejbql="select p from Person p"/>
```

#####JSF#####

```
<h1
>List of people</h1>
<h:dataTable value="#{people.resultList}" var="person">
    <h:column>
        <s:link view="/editPerson.jsp" value="#{person.firstName} #{person.lastName}">
```

```
</f:param name="personId" value="#{person.id}"/>
</s:link>
</h:column>
</h:dataTable>
>
```

#####

```
<framework:entity-query name="people"
    ejbql="select p from Person p"
    order="lastName"
    max-results="20"/>
```

#####

```
<pages>
  <page view-id="/searchPerson.jsp">
    <param name="firstResult" value="#{people.firstResult}"/>
  </page>
</pages>
>
```

#####JSF#####

```
<h1
>Search for people</h1>
<h:dataTable value="#{people.resultList}" var="person">
  <h:column>
    <s:link view="/editPerson.jsp" value="#{person.firstName} #{person.lastName}">
      <f:param name="personId" value="#{person.id}"/>
    </s:link>
  </h:column>
</h:dataTable>

<s:link view="/search.xhtml" rendered="#{people.previousExists}" value="First Page">
  <f:param name="firstResult" value="0"/>
</s:link>

<s:link view="/search.xhtml" rendered="#{people.previousExists}" value="Previous Page">
  <f:param name="firstResult" value="#{people.previousFirstResult}"/>
```

### #13# Seam#####

---

```
</s:link>

<s:link view="/search.xhtml" rendered="#{people.nextExists}" value="Next Page">
  <f:param name="firstResult" value="#{people.nextFirstResult}"/>
</s:link>

<s:link view="/search.xhtml" rendered="#{people.nextExists}" value="Last Page">
  <f:param name="firstResult" value="#{people.lastFirstResult}"/>
</s:link
>
```

```
#####
#####Query#####
```

```
<component name="examplePerson" class="Person"/>

<framework:entity-query name="people"
  ejbql="select p from Person p"
  order="lastName"
  max-results="20">
  <framework:restrictions>
    <value
>lower(firstName) like lower( concat("#{examplePerson.firstName},%') )</value>
    <value
>lower(lastName) like lower( concat("#{examplePerson.lastName},%') )</value>
  </framework:restrictions>
</framework:entity-query
>
```

```
#####example#####
```

```
<h1
>Search for people</h1>
<h:form>
  <div
>First name: <h:inputText value="#{examplePerson.firstName}"/></div>
  <div
>Last name: <h:inputText value="#{examplePerson.lastName}"/></div>
  <div
><h:commandButton value="Search" action="/search.jsp"/></div>
</h:form>
```

```

<h:dataTable value="#{people.resultList}" var="person">
  <h:column>
    <s:link view="/editPerson.jsp" value="#{person.firstName} #{person.lastName}">
      <f:param name="personId" value="#{person.id}"/>
    </s:link>
  </h:column>
</h:dataTable
>

```

```

##### org.jboss.seam.afterTransactionSuccess
#####

```

```

<event type="org.jboss.seam.afterTransactionSuccess">
  <action execute="#{people.refresh}" />
</event
>

```

```

#### PersonHome # person #####

```

```

<event type="org.jboss.seam.afterTransactionSuccess.Person">
  <action execute="#{people.refresh}" />
</event
>

```

Unfortunately Query objects don't work well with *join fetch* queries - the use of pagination with these queries is not recommended, and you'll have to implement your own method of calculating the total number of results (by overriding `getCountEjbql()`).

```

#####Query#####

```

## 13.4. Controller#####

```

Seam#####Controller##### EntityController#
HibernateEntityController #BusinessProcessController#####
#####Seam#####

```

```

####Seam#Registration###RegisterAction#Seam#####

```

```

@Stateless
@Name("register")
public class RegisterAction extends EntityController implements Register
{

```

```
@In private User user;

public String register()
{
    List existing = createQuery("select u.username from User u where u.username=:username")
        .setParameter("username", user.getUsername())
        .getResultList();

    if ( existing.size()==0 )
    {
        persist(user);
        info("Registered new user #{user.username}");
        return "/registered.jspx";
    }
    else
    {
        addFacesMessage("User #{user.username} already exists");
        return null;
    }
}
}
```

#####

---

## Seam # JBoss Rules

Seam ###Seam ##### jBPM ##### JBoss Rules (Drools) # RuleBase #####

### 14.1. #####

```
#####Seam ##### org.drools.RuleBase ##### Seam
#####
##### components.xml
#####
```

```
<drools:rule-base name="policyPricingRules">
  <drools:rule-files>
    <value
>policyPricingRules.drl</value>
  </drools:rule-files>
</drools:rule-base
>
```

This component compiles rules from a set of DRL (.drl) or decision table (.xls) files and caches an instance of `org.drools.RuleBase` in the Seam `APPLICATION` context. Note that it is quite likely that you will need to install multiple rule bases in a rule-driven application.

Drools DSL##### DSL #####

```
<drools:rule-base name="policyPricingRules" dsl-file="policyPricing.dsl">
  <drools:rule-files>
    <value
>policyPricingRules.drl</value>
  </drools:rule-files>
</drools:rule-base
>
```

Support for Drools RuleFlow is also available and you can simply add a `.rf` or a `.rfm` as part of your rule files as:

```
<drools:rule-base name="policyPricingRules" rule-files="policyPricingRules.drl,
policyPricingRulesFlow.rf"/>
```

## #14# Seam # JBoss Rules

---

Note that when using the Drools 4.x RuleFlow (.x<sub>fm</sub>) format, you need to specify the -Ddrools.ruleflow.port=true system property on server startup. This is however still an experimental feature and we advise to use the Drools5 (.x<sub>f</sub>) format if possible.

If you want to register a custom consequence exception handler through the RuleBaseConfiguration, you need to write the handler, for example:

```
@Scope(ScopeType.APPLICATION)
@Startup
@Name("myConsequenceExceptionHandler")
public class MyConsequenceExceptionHandler implements ConsequenceExceptionHandler,
Externalizable {

    public void readExternal(ObjectInput in) throws IOException, ClassNotFoundException {
    }

    public void writeExternal(ObjectOutput out) throws IOException {
    }

    public void handleException(Activation activation,
        WorkingMemory workingMemory,
        Exception exception) {
        throw new ConsequenceException( exception,
            activation.getRule() );
    }
}
```

and register it:

```
<drools:rule-base name="policyPricingRules" dsl-file="policyPricing.dsl" consequence-
exception-handler="#{myConsequenceExceptionHandler}">
    <drools:rule-files>
        <value>policyPricingRules.drl</value>
    </drools:rule-files>
</drools:rule-base>
```

```
##### RuleBase ####
Drools RuleAgent ##### RuleAgent # Drools ##### (BRMS)
##### RulesAgent ### RuleBase #
components.xml #####
```



```
<drools:rule-agent name="insuranceRules"
    configurationFile="/WEB-INF/deployedrules.properties" />
```

```
##### RulesAgent ##### Drools
#####
```

```
newInstance=true
url=http://localhost:8080/drools-jbrms/org.drools.brms.JBRMS/package/org.acme.insurance/
fmeyer
localCacheDir=/Users/fernandomeyer/projects/jbossrules/drools-examples/drools-examples-
brms/cache
poll=30
name=insuranceconfig
```

```
### #####
```

```
<drools:rule-agent name="insuranceRules"
    url="http://localhost:8080/drools-jbrms/org.drools.brms.JBRMS/package/org.acme.insurance/
fmeyer"
    local-cache-dir="/Users/fernandomeyer/projects/jbossrules/drools-examples/drools-
examples-brms/cache"
    poll="30"
    configuration-name="insuranceconfig" />
```

```
##### org.drools.WorkingMemory ##### (# WorkingMemory
##### fact #####)
```

```
<drools:managed-working-memory name="policyPricingWorkingMemory" auto-create="true"
    rule-base="#{policyPricingRules}"/>
```

```
policyPricingWorkingMemory ## ruleBase ##### RuleBase
#####
```

We can also add means to be notified of rule engine events, including rules firing, objects being asserted, etc. by adding event listeners to WorkingMemory.

```
<drools:managed-working-memory name="policyPricingWorkingMemory" auto-create="true"
    rule-base="#{policyPricingRules}">
    <drools:event-listeners>
```

```
<value>org.drools.event.DebugWorkingMemoryEventListener</value>
<value>org.drools.event.DebugAgendaEventListener</value>
</drools:event-listeners>
</drools:managed-working-memory>
```

## 14.2. Seam #####

WorkingMemory ## ### Seam ##### fact #####

```
@In WorkingMemory policyPricingWorkingMemory;

@In Policy policy;
@In Customer customer;

public void pricePolicy() throws FactException
{
    policyPricingWorkingMemory.insert(policy);
    policyPricingWorkingMemory.insert(customer);
    // if we have a ruleflow, start the process
    policyPricingWorkingMemory.startProcess(startProcessId)
    policyPricingWorkingMemory.fireAllRules();
}
```

## 14.3. jBPM #####

You can even allow a rule base to act as a jBPM action handler, decision handler, or assignment handler — in either a pageflow or business process definition.

```
<decision name="approval">

    <handler class="org.jboss.seam.drools.DroolsDecisionHandler">
        <workingMemoryName>orderApprovalRulesWorkingMemory</workingMemoryName>
        <!-- if a ruleflow was added -->
        <startProcessId>approvalruleflowid</startProcessId>
        <assertObjects>
            <element>#{customer}</element>
            <element>#{order}</element>
            <element>#{order.lineItems}</element>
        </assertObjects>
    </handler>
```

```

<transition name="approved" to="ship">
  <action class="org.jboss.seam.drools.DroolsActionHandler">
    <workingMemoryName>shippingRulesWorkingMemory</workingMemoryName>
    <assertObjects>
      <element>#{customer}</element>
      <element>#{order}</element>
      <element>#{order.lineItems}</element>
    </assertObjects>
  </action>
</transition>

<transition name="rejected" to="cancelled"/>

</decision>

```

```

<assertObjects> ##### WorkingMemory # fact ##### 1 ##### EL
#####

```

The `<retractObjects>` element on the other hand specifies EL expressions that return an object or collection of objects to be retracted from the `WorkingMemory`.

jBPM ##### Drools #####

```

<task-node name="review">
  <task name="review" description="Review Order">
    <assignment handler="org.jboss.seam.drools.DroolsAssignmentHandler">
      <workingMemoryName
>orderApprovalRulesWorkingMemory</workingMemoryName>
      <assertObjects>
        <element
>#{actor}</element>
        <element
>#{customer}</element>
        <element
>#{order}</element>
        <element
>#{order.lineItems}</element>
      </assertObjects>
    </assignment>
  </task>
  <transition name="rejected" to="cancelled"/>
  <transition name="approved" to="approved"/>
</task-node

```

## #14# Seam # JBoss Rules

---

>

```
##### Drools ##### jBPM Assignable # assignable
#### Seam Decision ##### decision ##### decision #####
decision.setOutcome("result") ##### assignment ##### Assignable
#####ID#####
```

```
package org.jboss.seam.examples.shop
```

```
import org.jboss.seam.drools.Decision
```

```
global Decision decision
```

```
rule "Approve Order For Loyal Customer"
```

```
when
```

```
    Customer( loyaltyStatus == "GOLD" )
```

```
    Order( totalAmount <= 10000 )
```

```
then
```

```
    decision.setOutcome("approved");
```

```
end
```

```
package org.jboss.seam.examples.shop
```

```
import org.jbpm.taskmgmt.exe.Assignable
```

```
global Assignable assignable
```

```
rule "Assign Review For Small Order"
```

```
when
```

```
    Order( totalAmount <= 100 )
```

```
then
```

```
    assignable.setPooledActors( new String[] {"reviewers"} );
```

```
end
```



##

Drools ##### <http://www.drools.org> #####



##

Seam ##### Drools ##### Drools  
#####



---

## #####

### 15.1. ##

Seam#####API#Seam#####  
#####

- #####JAAS#####
- ID##Seam#####API#####
- #####
- #####Seam#####
- CAPCHA#####Seam#####
- ##

#####

### 15.2. #####

In some situations it may be necessary to disable Seam Security, for instances during unit tests or because you are using a different approach to security, such as native JAAS. Simply call the static method `Identity.setSecurityEnabled(false)` to disable the security infrastructure. Of course, it's not very convenient to have to call a static method when you want to configure the application, so as an alternative you can control this setting in `components.xml`:


- #####
- Hibernate#####
- Seam#####
- #####
- Servlet API security integration

Assuming you are planning to take advantage of what Seam Security has to offer, the rest of this chapter documents the plethora of options you have for giving your user an identity in the eyes of the security model (authentication) and locking down the application by establishing constraints (authorization). Let's begin with the task of authentication since that's the foundation of any security model.

### 15.3. ##

Seam ##### JAAS (Java Authentication and Authorization Service)  
##### API ##### Seam# # JAAS  
#####

### 15.3.1. #####

 ##

#####Seam#ID#####authenticator#####

#####Seam#####SeamLoginModule#####Seam#####JAAS#####  
 #####Seam#####  
 #####  
 #####components.xml#####identity#####

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:core="http://jboss.com/products/seam/core"
  xmlns:security="http://jboss.com/products/seam/security"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="
    "http://jboss.com/products/seam/components http://jboss.com/products/seam/
components-2.2.xsd
    http://jboss.com/products/seam/security http://jboss.com/products/seam/security-
2.2.xsd">

  <security:identity authenticate-method="{authenticator.authenticate}"/>

</components>
```

EL# #{authenticator.authenticate}  
 #authenticator#####authenticate#####

### 15.3.2. #####

components.xml ##identity#authenticate-  
 method#####SeamLoginModule#####  
 #####boolean#####  
 #####username#password#Credentials.getUsername() #  
 Credentials.getPassword()#####Identity.getInstance().getCredentials()##credentials#####  
 #####Identity.addRole()#####  
 ###POJO#####

```
@Name("authenticator")
public class Authenticator {
  @In EntityManager entityManager;
```



```

@In Credentials credentials;
@In Identity identity;

public boolean authenticate() {
    try {
        User user = (User) entityManager.createQuery(
            "from User where username = :username and password = :password")
            .setParameter("username", credentials.getUsername())
            .setParameter("password", credentials.getPassword())
            .getSingleResult();

        if (user.getRoles() != null) {
            for (UserRole mr : user.getRoles())
                identity.addRole(mr.getName());
        }

        return true;
    }
    catch (NoResultException ex) {
        return false;
    }
}
}

```

```

#####User#UserRole#####Bean#####      #####   roles   #
"admin",                "user"                #####Set#####
#####user#####NoResultException#####false#####

```



####

```

#####
#####API#####
#####
Seam#####

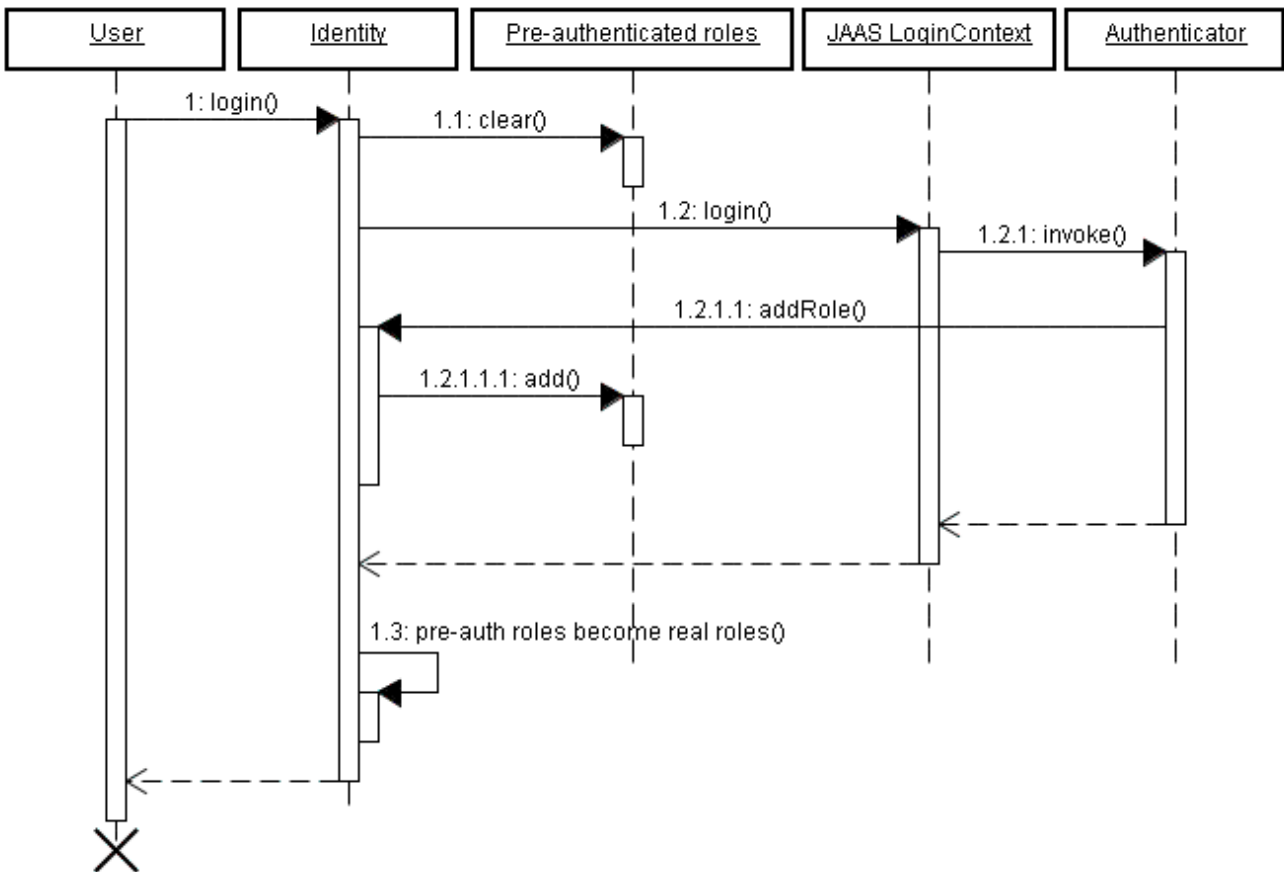
```

### 15.3.2.1. Identity.addRole()

```

Identity.addRole()#####
#####addRole()#####
#####

```



#####Identity.addRole() #####

### 15.3.2.2. #####

#####

####org.jboss.seam.security.loginSuccessful#####

```
@In UserStats userStats;

@Observer("org.jboss.seam.security.loginSuccessful")
public void updateUserStats()
{
    userStats.setLastLoginDate(new Date());
    userStats.incrementLoginCount();
}
```

#####Authenticator#####

#####

### 15.3.3. #####

```

credentials      #####username##password#####
#####username#password#####
#####identity.login()#####username#password#####

```

```

<div>
  <h:outputLabel for="name" value="Username"/>
  <h:inputText id="name" value="#{credentials.username}"/>
</div>

<div>
  <h:outputLabel for="password" value="Password"/>
  <h:inputSecret id="password" value="#{credentials.password}"/>
</div>

<div>
  <h:commandButton value="Login" action="#{identity.login}"/>
</div>
>

```

```

#login######{identity.logout}#####

```

### 15.3.4. #####

```

#####

```

- #####components.xml#####
- #####
- #####

### 15.3.5. Remember Me #####

```

Seam#####WEB#####"Remember
me"(#####
#####username#####password#####
#2#####password#####

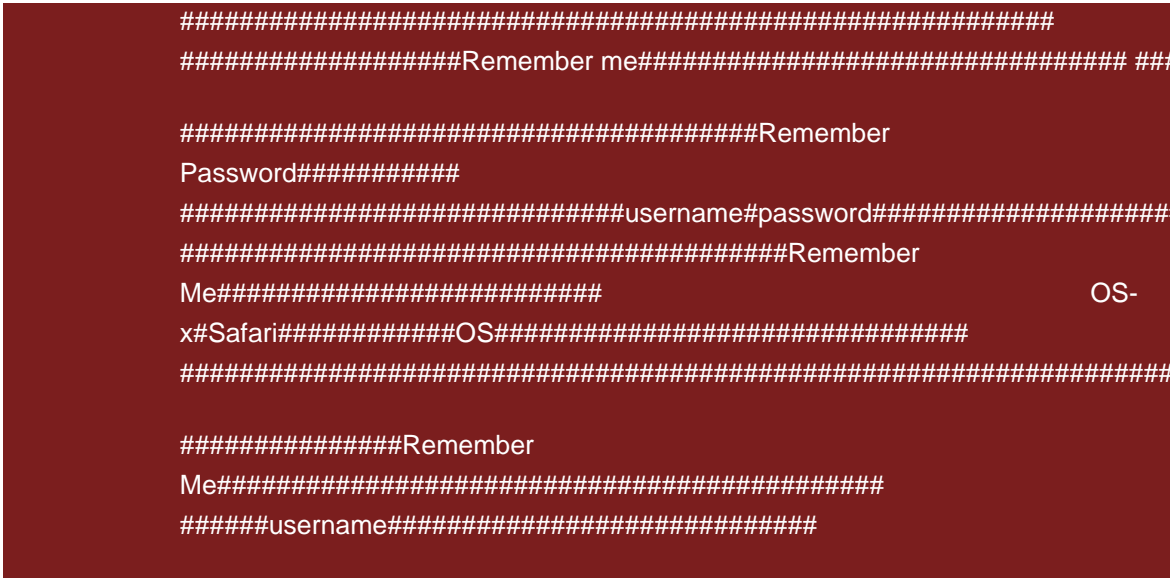
```


##  

```

#####2#####
#####XSS#####

```



```
#####Remember me(username#####
#####remember me#####rememberMe.enabled#####
```

```
<div>
  <h:outputLabel for="name" value="User name"/>
  <h:inputText id="name" value="#{credentials.username}"/>
</div>

<div>
  <h:outputLabel for="password" value="Password"/>
  <h:inputSecret id="password" value="#{credentials.password}" redisplay="true"/>
</div>
>

<div class="loginRow">
  <h:outputLabel for="rememberMe" value="Remember me"/>
  <h:selectBooleanCheckbox id="rememberMe" value="#{rememberMe.enabled}"/>
</div>
>
```

### 15.3.5.1. #####remember me##

```
##### remember me #####
Seam#####
####org.jboss.seam.security.TokenStore #####
#####JpaTokenStore#####

#####
```

```

@Entity
public class AuthenticationToken implements Serializable {
    private Integer tokenId;
    private String username;
    private String value;

    @Id @GeneratedValue
    public Integer getTokenId() {
        return tokenId;
    }

    public void setTokenId(Integer tokenId) {
        this.tokenId = tokenId;
    }

    @TokenUsername
    public String getUsername() {
        return username;
    }

    public void setUsername(String username) {
        this.username = username;
    }

    @TokenValue
    public String getValue() {
        return value;
    }

    public void setValue(String value) {
        this.value = value;
    }
}

```

```

#####username#####@TokenUsername
#@TokenValue#####

#####Bean##### JpaTokenStore##### #### components.xml
#token-class#####

```

```

<security:jpa-token-store
class="org.jboss.seam.example.seamspaces.AuthenticationToken" />

```

token-

## #15# #####

```
#####components.xml #RememberMe#####  
mode#autoLogin#####
```

```
<security:remember-me mode="autoLogin"/>
```

```
####remember me#####
```

```
#####components.xml#####
```

```
<event type="org.jboss.seam.security.notLoggedIn">  
  <action execute="#{redirect.captureCurrentView}"/>  
  <action execute="#{identity.tryLogin()}/>  
</event>  
<event type="org.jboss.seam.security.loginSuccessful">  
  <action execute="#{redirect.returnToCapturedView}"/>  
</event  
>
```

### 15.3.6. #####

```
#####pages.xml#####  
#####API#####
```

- NotLoggedInException - #####

- AuthorizationException -  
#####

```
NotLoggedInException#####  
###AuthorizationException#####  
#####pages.xml#####
```

```
<pages>
```

```
...
```

```
<exception class="org.jboss.seam.security.NotLoggedInException">
```

```

    <redirect view-id="/login.xhtml">
      <message
>You must be logged in to perform this action</message>
    </redirect>
  </exception>

  <exception class="org.jboss.seam.security.AuthorizationException">
    <end-conversation/>
    <redirect view-id="/security_error.xhtml">
      <message
>You do not have the necessary security privileges to perform this action.</message>
    </redirect>
  </exception>

</pages
>

```

#####web#####Seam#####

### 15.3.7. #####

#####Seam#####  
(pages.xml#) #####

```

<pages login-view-id="/login.xhtml">

  <page view-id="/members/*" login-required="true"/>

  ...

</pages
>

```



####

#####

#####components.xml#####

```

<event type="org.jboss.seam.security.notLoggedIn">

```

```
<action execute="#{redirect.captureCurrentView}"/>
</event>

<event type="org.jboss.seam.security.postAuthenticate">
  <action execute="#{redirect.returnToCapturedView}"/>
</event
>
```

```
#####authenticate()#####
```

### 15.3.8. HTTP##

```
#####Seam##RFC2617##HTTPBasic####HTTPDigest#####
#####components.xml# authentication-filter#####
```

```
<web:authentication-filter url-pattern="*.seam" auth-type="basic"/>
```

```
#####auth-type#basic#####digest#####
##### key # realm#####
```

```
<web:authentication-filter url-pattern="*.seam" auth-type="digest" key="AA3JK34aSDIkJ"
realm="My App"/>
```

```
key##### realm#####
```

#### 15.3.8.1. #####

```
#####org.jboss.seam.security.digest.DigestAuthenticator#####validatePass
#####
```

```
public boolean authenticate()
{
  try
  {
    User user = (User) entityManager.createQuery(
      "from User where username = :username")
```



```

        .setParameter("username", identity.getUsername())
        .getSingleResult();

        return validatePassword(user.getPassword());
    }
    catch (NoResultException ex)
    {
        return false;
    }
}

```

### 15.3.9. #####

#####API#####

#### 15.3.9.1. #####JAAS###

```

##Seam#####API#####JAAS#####components.xml#jaas-config-name
#####JAAS#####
#####JBossAS##### other#####JBossAS#####
UsersRolesLoginModule#####components.xml#####

```

```

<security:identity jaas-config-name="other"/>

```

#####Seam#####JAAS#####Seam#####

### 15.4. ID###

```

ID#####ID#####LDAP#####Seam#####API#####
ID##API###identityManager#####
#####identityManager#####IdentityStores#####
#####LDAP#####

```



### 15.4.1. ID#####

```

identityManager
#####ID#####LDAP#####RDB#####

Seam#IdentityStore#####IdentityStore#####
####RDB#####JpaIdentityStore#####ID#####identityManager
#####
#####LdapIdentityStore##LDAP#####

identityManager                #####identityStore                #
roleIdentityStore#####IdentityStore#####Seam#####EL#####
#####
JpaIdentityStore#####identityStore#####roleIdentityStore
#####
####components.xml#LdapIdentityStore#identityManager#####

```

```

<security:identity-manager identity-store="{ldapIdentityStore}"/>

```

```

#####LdapIdentityStore#####JpaIdentityStore#####identityManager
#####

```

```

<security:identity-manager
  identity-store="{ldapIdentityStore}"
  role-identity-store="{jpaIdentityStore}"/>

```

```

#####ID#####

```

### 15.4.2. JpaIdentityStore

```

##ID#####
#####
#####Bean#####

```

#### 15.4.2.1. JpaIdentityStore###

```

JpaIdentityStore      #      user-class      ###role-class#####
#####
#####SeamSpace#components.xml#####

```

```
<security:jpa-identity-store
  user-class="org.jboss.seam.example.seamspaces.MemberAccount"
  role-class="org.jboss.seam.example.seamspaces.MemberRole"/>
```

### 15.4.2.2. #####

```
#####Bean#####
#####
```

### # 15.1. #####

#####	##	##
@UserPrincipal	####	#####username#####
@UserPassword	####	#####password##### password#####hash#####md5, sha # none#####
		<div style="border: 1px solid gray; padding: 5px; margin: 5px 0;">           @UserPassword (hash="md5")  <b>public</b> String getPasswordHash() {              <b>return</b> passwordHash;            }         </div>
		Seam#####PasswordHash#####
@UserFirstName	####	#####
@UserLastName	####	#####
@UserEnabled	####	##### #####boolean##### #####
@UserRoles	####	##### #####

### # 15.2. #####

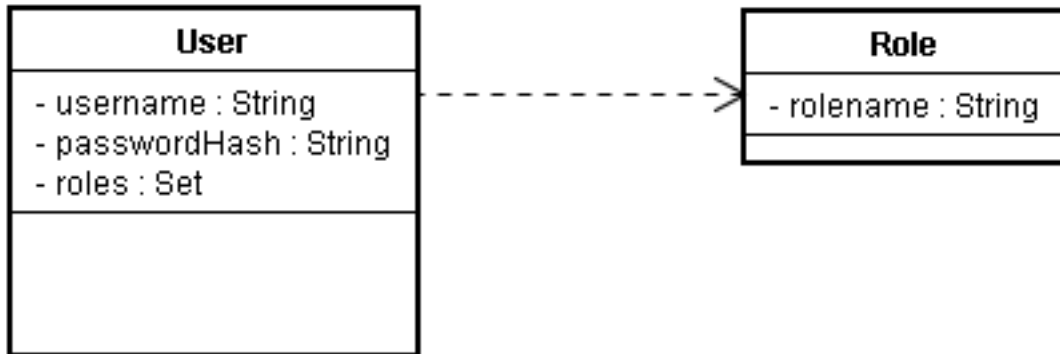
#####	##	##
@RoleName	####	#####
@RoleGroups	####	#####
@RoleConditional	####	#####

### 15.4.2.3. ##### Bean##

#####JpaIdentityStore#####  
#####

#### 15.4.2.3.1. #####

#####UserRoles####many-to-many#####user#role#####



```
@Entity
public class User {
    private Integer userId;
    private String username;
    private String passwordHash;
    private Set<Role
> roles;

    @Id @GeneratedValue
    public Integer getUserId() { return userId; }
    public void setUserId(Integer userId) { this.userId = userId; }

    @UserPrincipal
    public String getUsername() { return username; }
    public void setUsername(String username) { this.username = username; }

    @UserPassword(hash = "md5")
    public String getPasswordHash() { return passwordHash; }
    public void setPasswordHash(String passwordHash) { this.passwordHash = passwordHash; }

    @UserRoles
    @ManyToMany(targetEntity = Role.class)
    @JoinTable(name = "UserRoles",
        joinColumns = @JoinColumn(name = "UserId"),
        inverseJoinColumns = @JoinColumn(name = "RoleId"))
```

```

public Set<Role
> getRoles() { return roles; }
public void setRoles(Set<Role
> roles) { this.roles = roles; }
}

```

```

@Entity
public class Role {
    private Integer roleId;
    private String rolename;

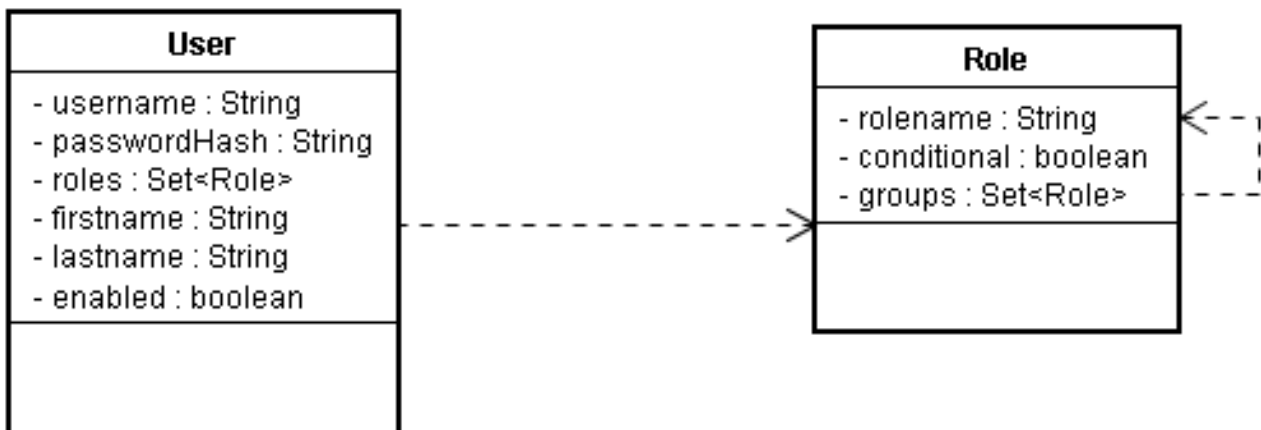
    @Id @Generated
    public Integer getRoleId() { return roleId; }
    public void setRoleId(Integer roleId) { this.roleId = roleId; }

    @RoleName
    public String getRolename() { return rolename; }
    public void setRolename(String rolename) { this.rolename = rolename; }
}

```

#### 15.4.2.3.2. #####

#####



```

@Entity
public class User {
    private Integer userId;
    private String username;
    private String passwordHash;
}

```

```
private Set<Role
> roles;
private String firstname;
private String lastname;
private boolean enabled;

@Id @GeneratedValue
public Integer getUserId() { return userId; }
public void setUserId(Integer userId) { this.userId = userId; }

@UserPrincipal
public String getUsername() { return username; }
public void setUsername(String username) { this.username = username; }

@UserPassword(hash = "md5")
public String getPasswordHash() { return passwordHash; }
public void setPasswordHash(String passwordHash) { this.passwordHash = passwordHash; }

@UserFirstName
public String getFirstname() { return firstname; }
public void setFirstname(String firstname) { this.firstname = firstname; }

@UserLastName
public String getLastname() { return lastname; }
public void setLastname(String lastname) { this.lastname = lastname; }

@UserEnabled
public boolean isEnabled() { return enabled; }
public void setEnabled(boolean enabled) { this.enabled = enabled; }

@UserRoles
@ManyToMany(targetEntity = Role.class)
@JoinTable(name = "UserRoles",
    joinColumns = @JoinColumn(name = "UserId"),
    inverseJoinColumns = @JoinColumn(name = "RoleId"))
public Set<Role
> getRoles() { return roles; }
public void setRoles(Set<Role
> roles) { this.roles = roles; }
}
```

```
@Entity
public class Role {
```

```

private Integer roleId;
private String rolename;
private boolean conditional;

@Id @Generated
public Integer getRoleId() { return roleId; }
public void setRoleId(Integer roleId) { this.roleId = roleId; }

@RoleName
public String getRolename() { return rolename; }
public void setRolename(String rolename) { this.rolename = rolename; }

@RoleConditional
public boolean isConditional() { return conditional; }
public void setConditional(boolean conditional) { this.conditional = conditional; }

@RoleGroups
@ManyToMany(targetEntity = Role.class)
@JoinTable(name = "RoleGroups",
    joinColumns = @JoinColumn(name = "RoleId"),
    inverseJoinColumns = @JoinColumn(name = "GroupId"))
public Set<Role
> getGroups() { return groups; }
public void setGroups(Set<Role
> groups) { this.groups = groups; }

}

```

#### 15.4.2.4. JpaIdentityStore#####

```

IdentityManager#ID#####JpaIdentityStore#####
IdentityManager#####

```

##### 15.4.2.4.1. JpaIdentityStore.EVENT\_PRE\_PERSIST\_USER

```

#####IdentityManager.createUser()#####
#####
#####JpaIdentityStore#### user-class#####

#####createUser()#####

```

##### 15.4.2.4.2. JpaIdentityStore.EVENT\_USER\_CREATED

```

#####IdentityManager.createUser()#####
#####

```

## #15# #####

```
#####EVENT_PRE_PERSIST_USER#####  
#####
```

### 15.4.2.4.3. JpaIdentityStore.EVENT\_USER\_AUTHENTICATED

```
#####IdentityManager.authenticate()#####  
#####
```

## 15.4.3. LdapIdentityStore

```
##ID#####LDAP#####  
#####  
#####ID#####
```

### 15.4.3.1. LdapIdentityStore###

```
#####components.xml #####LdapIdentityStore#####
```

## # 15.3. LdapIdentityStore#####

####	#####	##
server-address	localhost	LDAP#####
server-port	389	LDAP#####
user-context-DN	ou=Person,dc=acme,dc=com	#####DN)
user-DN-prefix	uid=	#####username###
user-DN-suffix	,ou=Person,dc=acme,dc=com	#####username###
role-context-DN	ou=Role,dc=acme,dc=com	#####DN)
role-DN-prefix	cn=	#####
role-DN-suffix	,ou=Roles,dc=acme,dc=com	#####
bind-DN	cn=Manager,dc=acme,dc=com	LDAP#####
bind-credentials	secret	LDAP#####
user-role-attribute	roles	#####
role-attribute-is-DN	true	#####
user-name-attribute	uid	#####username#####
user-password-attribute	userPassword	#####password#####
first-name-attribute	null	#####first name#####



#####	#####	##
last-name-attribute	sn	#####last name#####
full-name-attribute	cn	#####
enabled-attribute	null	#####
role-name-attribute	cn	#####
object-class-attribute	objectClass	#####
role-object-classes	organizationalRole	#####
user-object-classes	person,uidObject	#####
security-authentication-type	simple	The security level to use. Possible values are "none", "simple" and "strong".

### 15.4.3.2. LdapIdentityStore###

```
##### directory.mycompany.com#####LDAP#####LdapIdentityStore
#####
#####ou=Person,dc=mycompany,dc=com#####username#####uid#####
#####ou=Roles,dc=mycompany,dc=com#####roles#####
#####cn#####
#####enabled###false#####
```

```
<security:ldap-identity-store
  server-address="directory.mycompany.com"
  bind-DN="cn=Manager,dc=mycompany,dc=com"
  bind-credentials="secret"
  user-DN-prefix="uid="
  user-DN-suffix=",ou=Person,dc=mycompany,dc=com"
  role-DN-prefix="cn="
  role-DN-suffix=",ou=Roles,dc=mycompany,dc=com"
  user-context-DN="ou=Person,dc=mycompany,dc=com"
  role-context-DN="ou=Roles,dc=mycompany,dc=com"
  user-role-attribute="roles"
  role-name-attribute="cn"
  user-object-classes="person,uidObject"
```

```
enabled-attribute="enabled"
/>
```

### 15.4.4. ###ID#####

```
Seam#####ID#####org.jboss.seam.security.management.Identity
IdentityStore#####JavaDoc#####
```

### 15.4.5. ID#####

If you are using the Identity Management features in your Seam application, then it is not required to provide an authenticator component (see previous Authentication section) to enable authentication. Simply omit the `authenticate-method` from the `identity` configuration in `components.xml`, and the `SeamLoginModule` will by default use `IdentityManager` to authenticate your application's users, without any special configuration required.

### 15.4.6. ID#####

```
IdentityManager#####Seam#####
```

```
@In IdentityManager identityManager;
```

```
#####instance()#####
```

```
IdentityManager identityManager = IdentityManager.instance();
```

```
#####IdentityManager#API#####
```

### # 15.4. ID###API

####	###	##
<code>createUser(String name, String password)</code>	####	#####username#password##### #####true#####false#####
<code>deleteUser(String name)</code>	####	##### #####true#####false#####
<code>createRole(String role)</code>	####	##### #####true#####false#####
<code>deleteRole(String name)</code>	####	##### #####true#####false#####
<code>enableUser(String name)</code>	####	##### #####

####	###	##
disableUser(String name)	####	##### #####true#####false#####
changePassword(String name, String password)	####	#####password##### #####true#####false#####
isUserEnabled(String name)	####	##### true#####false#####
grantRole(String name, String role)	####	##### ##### #####true#####
revokeRole(String name, String role)	####	##### #####
userExists(String name)	####	#####true#####false###
listUsers()	###	ABC#####
listUsers(String filter)	###	#####ABC###
listRoles()	###	#####
getGrantedRoles(String name)	###	#####
getImpliedRoles(String name)	###	##### ##### ###admin###user##### user#####
authenticate(String name, String password)	####	#####ID#####username#password### #####true#####false##### ##### login#####Identity.login()#####
addRoleToGroup(String role, String group)	####	##### #####true#####
removeRoleFromGroup(String role, String group)	####	##### #####true#####
listRoles()	###	#####

ID##API#####

#####IdentityManager#####

**# 15.5. ID# #####**

####	#####	#####
createUser()	seam.user	##
deleteUser()	seam.user	##

#15# #####

####	#####	#####
createRole()	seam.role	##
deleteRole()	seam.role	##
enableUser()	seam.user	##
disableUser()	seam.user	##
changePassword()	seam.user	##
isUserEnabled()	seam.user	####
grantRole()	seam.user	##
revokeRole()	seam.user	##
userExists()	seam.user	####
listUsers()	seam.user	####
listRoles()	seam.role	####
addRoleToGroup()	seam.role	##
removeRoleFromGroup()	seam.role	##

#####admin#####ID#####

```
rule ManageUsers
  no-loop
  activation-group "permissions"
when
  check: PermissionCheck(name == "seam.user", granted == false)
  Role(name == "admin")
then
  check.grant();
end

rule ManageRoles
  no-loop
  activation-group "permissions"
when
  check: PermissionCheck(name == "seam.role", granted == false)
  Role(name == "admin")
then
  check.grant();
end
```

## 15.5. #####

```
#####API#####
#####message.properties#####
#####
```

### # 15.6. #####

#####	##
org.jboss.seam.loginSuccessful	#####API#####
org.jboss.seam.loginFailed	#####
org.jboss.seam.NotLoggedIn	#####
org.jboss.seam.AlreadyLoggedIn	#####

## 15.6. ##

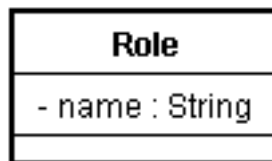
```
Seam#####API#####
#####
#####components.xml#####
```

### 15.6.1. #####

```
Seam#####
Seam#####API#####
```

#### 15.6.1.1. #####

```
#####"admin"# "user"#
"customer"#####
#####
```



#### 15.6.1.2. #####

```
#####1#####
#####
#####"(target)"##(action)" ####(receipt)"#####
#####
#####Bob#####
#####Bob#####
```

Permission
- target : Object
- action : String
- recipient : Principal

#####target:action #####

### 15.6.2. #####

#####@Restrict#####



**@Restrict#####** #####

@Restrict#####EL#####

#### 15.6.2.1. @Restrict#####

```

@Restrict#####Seam#####
#####@Restrict#####
#####Identity.checkRestriction()#####
#####@Restrict#####@Restrict#####

##@Restrict#component:methodName#####

```

```

@Name("account")
public class AccountAction {
    @Restrict public void delete() {
        ...
    }
}

```

```

#####delete()#####account:delete#####
#####@Restrict("#{s:hasPermission('account','delete')}")#####

```

```

@Restrict @Name("account")
public class AccountAction {
    public void insert() {
        ...
    }
}

```

```

@Restrict("#{s:hasRole('admin')}")
public void delete() {
    ...
}
}

```

```
#####@Restrict##### Restrict#####
```

```
##### #{s:hasRole()} ##### s:hasRole # s:hasPermission#EL####
Identity##### API#####EL#####
```

```
EL#####@Restrict#####Seam#####
#####
```

```

@Name("account")
public class AccountAction {
    @In Account selectedAccount;
    @Restrict("#{s:hasPermission(selectedAccount,'modify')}")
    public void modify() {
        selectedAccount.modify();
    }
}

```

```
#####hasPermission()#####selectedAccount#####
```

```
#####Seam#####Identity#hasPermission()#####Account#####
```

### 15.6.2.2. #####

```
#####@Restrict#####Identity.checkRestriction#####
```

```

public void deleteCustomer() {
    Identity.instance().checkRestriction("#{s:hasPermission(selectedCustomer,'delete')}");
}

```

```
####true#####
```

- #####NotLoggedInException#####
- #####AuthorizationException#####

```
#####Java#####hasRole()#hasPermission()#####
```

```
if (!Identity.instance().hasRole("admin"))
```

```
throw new AuthorizationException("Must be admin to perform this action");

if (!Identity.instance().hasPermission("customer", "create"))
    throw new AuthorizationException("You may not create new customers");
```

### 15.6.3. #####

```
#####
Seam#####EL#####1#####
2#####
```

```
#####
#####
identity.isLoggedIn()#####
```

```
<h:form class="loginForm" rendered="#{not identity.loggedIn}"
>
```

```
#####
###manager#####
#####
```

```
<h:outputLink action="#{reports.listManagerReports}" rendered="#{s.hasRole('manager')}">
    Manager Reports
</h:outputLink
>
```

```
#####manager#####outputLink#####rendered#####<s:div>
# <s:span>#####
```

```
##### h:dataTable#####
EL#s:hasPermission#####
#####h:dataTable#####
```

```
<h:dataTable value="#{clients}" var="cl">
    <h:column>
        <f:facet name="header"
>Name</f:facet>
        #{cl.name}
    </h:column>
    <h:column>
```



```

    <f:facet name="header"
>City</f:facet>
    #{cl.city}
</h:column>
<h:column>
    <f:facet name="header"
>Action</f:facet>
    <s:link value="Modify Client" action="{clientAction.modify}"
        rendered="{s:hasPermission(cl,'modify')}" />
    <s:link value="Delete Client" action="{clientAction.delete}"
        rendered="{s:hasPermission(cl,'delete')}" />
</h:column>
</h:dataTable
>

```

#### 15.6.4. #####

```

#####pages.xml#####
page#####<restrict/>#####          #####restrict#####
#####GET#####          /viewId.xhtml:render
#####JSF#####          /viewId.xhtml:restore#####
#####

```

```

<page view-id="/settings.xhtml">
    <restrict/>
</page
>

```

```

#####GET#####/settings.xhtml:render#####/
settings.xhtml:restore#####

```

```

<page view-id="/reports.xhtml">
    <restrict
>#{s:hasRole('admin')}</restrict>
</page
>

```

```

#####faces#####non-faces#####admin#####

```

#### 15.6.5. #####

```

Seam#####read,insert,update###delete#####

```

## #15# #####

#####@Restrict#####

```
@Entity
@Name("customer")
@Restrict
public class Customer {
    ...
}
```

```
###@Restrict#####entity:action#####
#####action # read, insert, update ### delete#####
#####@Restrict #####
```

- @PostLoad - #####read  
#####
  - @PrePersist - ##### (##### insert  
#####
  - @PreUpdate - #####update#####
  - @PreRemove - #####delete#####
- ```
###insert#####
#####
```

```
@PrePersist @Restrict
public void prePersist() {}
```



/META-INF/orm.xml###

/META-INF/orm.xml#####:

```
<?xml version="1.0" encoding="UTF-8"?>
<entity-mappings xmlns="http://java.sun.com/xml/ns/persistence/orm"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://java.sun.com/xml/ns/persistence/orm
    http://java.sun.com/xml/ns/persistence/orm_1_0.xsd"
    version="1.0">
```

```

<entity class="Customer">
  <pre-persist method-name="prePersist" />
</entity>

</entity-mappings
>

```

```
#### #####Customer#prePersist() #####@Restrict#####
```

```
#####MemberBlog#####seamspac#####
#####MemberBlog#####
```

```

rule InsertMemberBlog
  no-loop
  activation-group "permissions"
  when
    principal: Principal()
      memberBlog:      MemberBlog(member      :      member      ->
(member.getUsername().equals(principal.getName())))
    check: PermissionCheck(target == memberBlog, action == "insert", granted == false)
  then
    check.grant();
  end;

```

```
#####Principal#####memberBlog:insert#####
#####      "principal:      Principal()"      #####
#####Principal#####principal#####
#####Principal#####      ####JBoss
Rules #####
```

```
####JPA#####Seam#####
```

### 15.6.5.1. JPA#####

```
EJB3#####Bean#####EntityListener#####META-INF/
orm.xml#####
```

```

<?xml version="1.0" encoding="UTF-8"?>
<entity-mappings xmlns="http://java.sun.com/xml/ns/persistence/orm"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://java.sun.com/xml/ns/persistence/orm http://java.sun.com/
xml/ns/persistence/orm_1_0.xsd"

```

```
        version="1.0">

    <persistence-unit-metadata>
      <persistence-unit-defaults>
        <entity-listeners>
          <entity-listener class="org.jboss.seam.security.EntitySecurityListener"/>
        </entity-listeners>
      </persistence-unit-defaults>
    </persistence-unit-metadata>

  </entity-mappings>
</>
```

### 15.6.5.2. #####Hibernate#####

Seam#####Hibernate#SessionFactory#####orm.xml#####

### 15.6.6. #####

Seam#@Restrict#####@Restrict#####EL#####

Seam#####CRUD#####

###org.jboss.seam.annotations.security#####

- @Insert
- @Read
- @Update
- @Delete

#####  
#####

```
@Insert(Customer.class)
public void createCustomer() {
    ...
}
```

#####Customer#####  
#####Customer.class#java.lang.Class#####inse

#####  
#####

```
public void updateCustomer(@Update Customer customer) {
    ...
}
```

#####@PermissionCheck#####

```
@Target({METHOD, PARAMETER})
@Documented
@Retention(RUNTIME)
@Inherited
@PermissionCheck
public @interface Promote {
    Class value() default void.class;
}
```

#####@PermissionCheck#####

```
@PermissionCheck("upgrade")
```

### 15.6.7. #####

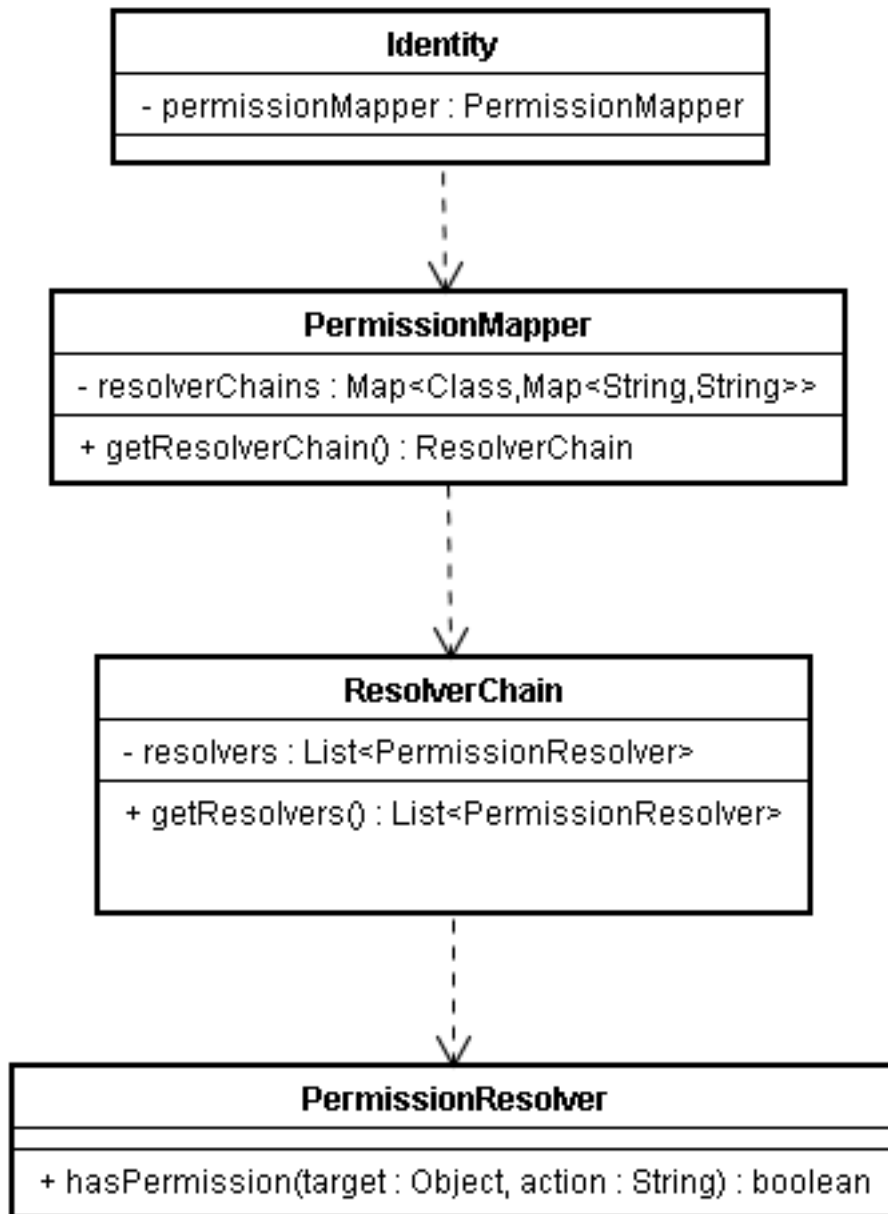
#####Seam#####
Seam#####admin#####org.jboss.s
#####org.jboss.seam.annotations.security.RoleCheck#####

```
@Target({METHOD})
@Documented
@Retention(RUNTIME)
@Inherited
@RoleCheck
public @interface User {
}
```

#####@User#####user#

### 15.6.8. #####

Seam#####
#####Seam#####



#####

### 15.6.8.1. #####

#####

Seam####PermissionResolver#####

- RuleBasedPermissionResolver - #####  
#####Drools#####
- PersistentPermissionResolver - #####


**15.6.8.1.1. #####**

#####PermissionResolver#####

###PermissionResolver###Seam#####ResolverChain

**# 15.7. #####**

####	###	##
####	hasPermission(Object target, String action)	#####Identity.getPrincipal()#####
void	filterSetByAction(Set<Object> targets, String action)	This method should remove any objects from the specified set, that would return true if passed to the hasPermission() method with the same action parameter value.



**##**

As they are cached in the user's session, any custom `PermissionResolver` implementations must adhere to a couple of restrictions. Firstly, they may not contain any state that is finer-grained than session scope (and the scope of the component itself should either be application or session). Secondly, they must not use dependency injection as they may be accessed from multiple threads simultaneously. In fact, for performance reasons it is recommended that they are annotated with `@BypassInterceptors` to bypass Seam's interceptor stack altogether.

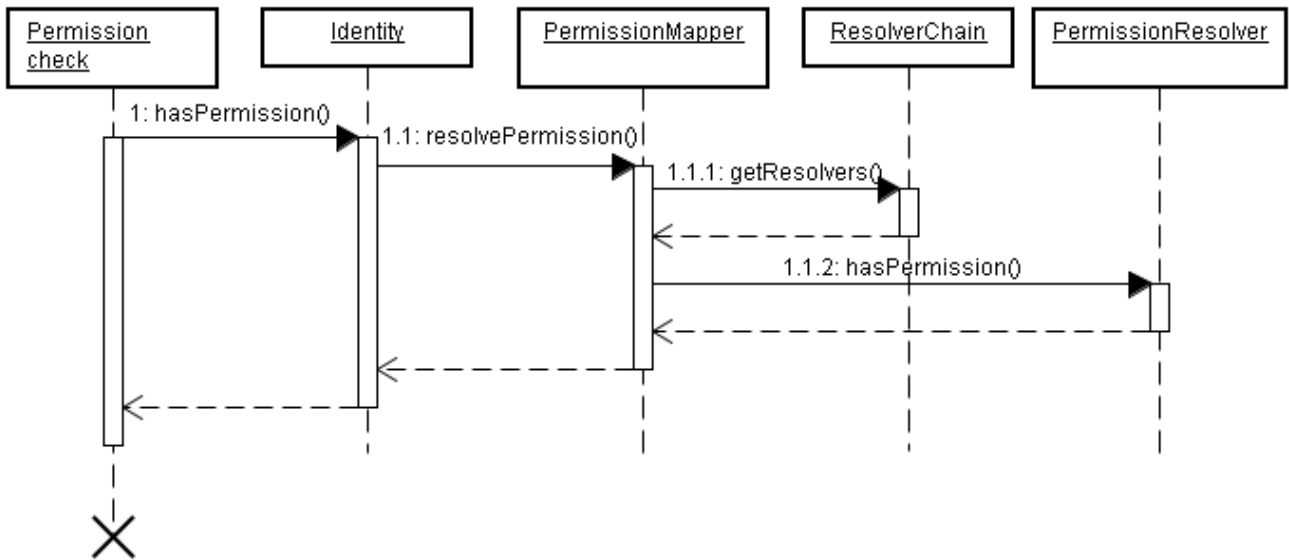
**15.6.8.2. #####**

ResolverChain#PermissionResolvers#####

The default `ResolverChain` consists of all permission resolvers discovered during application deployment. The `org.jboss.seam.security.defaultResolverChainCreated` event is raised (and the `ResolverChain` instance passed as an event parameter) when the default `ResolverChain` is created. This allows additional resolvers that for some reason were not discovered during deployment to be added, or for resolvers that are in the chain to be re-ordered or removed.

#####

#####EL#s:hasPermission#####APIIdentity.checkPermission#####



- 1 #####EL#####Identity.hasPermission()#####
- 1.1. Identity#####PermissionMapper.resolvePermission()#####
- 1.1.1.  
PermissionMapper#####ResolverChain#####Map#####Resolv  
###ResolverChain#####ResolverChain.getResolvers()#####PermissionResolverS#####
- 1.1.2.  
ResolverChain####PermissionResolver####PermissionMapper#####hasPermis  
#####PermissionResolverS  
#true#####PermissionMapper#Identity####true#####  
####PermissionResolverS#true#####

### 15.6.9. #####

```

Seam#####RuleBasedPermissionResolver##Drools(JBoss
Rules)#####
1#####
2#####Drool#####
  
```

#### 15.6.9.1. ####

```

Seam#####Drool#####jar#####
  
```

- drools-api.jar
- drools-compiler.jar



- drools-core.jar
- drools-decisiontables.jar
- drools-templates.jar
- janino.jar
- antlr-runtime.jar
- mvel2.jar

### 15.6.9.2. ##

```
RuleBasedPermissionResolver#####components.xml#Drool#####
#####securityRules#####
```

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:core="http://jboss.com/products/seam/core"
  xmlns:security="http://jboss.com/products/seam/security"
  xmlns:drools="http://jboss.com/products/seam/drools"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation=
    "http://jboss.com/products/seam/core http://jboss.com/products/seam/core-2.2.xsd
      http://jboss.com/products/seam/components http://jboss.com/products/seam/
components-2.2.xsd
      http://jboss.com/products/seam/drools http://jboss.com/products/seam/drools-2.2.xsd
      http://jboss.com/products/seam/security http://jboss.com/products/seam/security-
2.2.xsd">

  <drools:rule-base name="securityRules">
    <drools:rule-files>
      <value>/META-INF/security.drl</value>
    </drools:rule-files>
  </drools:rule-base>

</components>
```

```
#####RuleBasedPermissionResolver#security-rules#####
```

```
<security:rule-based-permission-resolver security-rules="#{prodSecurityRules}"/>
```

```
RuleBase#####
```

### 15.6.9.3. #####

```
#####jar#####/META-INF#####
#####security.drl#####components.xml#####
#####
#####Drools#####
```

```
package MyApplicationPermissions;

import org.jboss.seam.security.permission.PermissionCheck;
import org.jboss.seam.security.Role;

rule CanUserDeleteCustomers
when
  c: PermissionCheck(target == "customer", action == "delete")
  Role(name == "admin")
then
  c.grant();
end
```

```
#####
Drool#####
####PermissionCheck####Role#####
#####
##### (#####)
#####CanUserDeleteCustomers#####
##### (LHS) ##### (RHS)
#####LHS##### (#####)
#####
LHS#when#####RHS#LHS#####
RHS#then#####end#####
#####LHS#####
```

```
c: PermissionCheck(target == "customer", action == "delete")
```

```
#####target#####"customer"####target#####"delete"###PermissionCheck#####
#####
Drool#####
hasPermission()#####PermissionCheck#####(Fact)#####
```

```
##PermissionCheck#####hasPermission("account",
"create")#####target###
"account"#action###"create"###PermissionCheck#####
PermissionCheck#####org.jboss.seam.security.Role#####
##### Role#####
#####Role#####
#####PermissionCheck#
Role#####java.security.Principal#####
#####RuleBasedPermissionResolver.instance().getSecurityContext().insert()###
#####Role#####
#####LHS#c:#####
#####PermissionCheck##
LHS#2#####
```

Role(name == "admin")

```
#####"admin"###name#Role#####
#####admin#####customer:de
##### RHS#####
```

c.grant()

```
RHS#Java#####c##### (#####PermissionCheck#####) #grant()#####
```

### 15.6.9.4. #####

```
#####
#####
#####
#####MemberBlog#####user#####
```

```
rule CanCreateBlogComment
  no-loop
  activation-group "permissions"
when
  blog: MemberBlog()
  check: PermissionCheck(target == blog, action == "create", granted == false)
  Role(name == "user")
then
  check.grant();
```

#15# #####

end

### 15.6.9.5. #####

#####PermissionCheck#acti

```

rule CanDoAnythingToCustomersIfYouAreAnAdmin
when
  c: PermissionCheck(target == "customer")
  Role(name == "admin")
then
  c.grant();
end;

```

#####admin#####customer#####

### 15.6.10. #####

Seam#####PersistentPermissionResolver#####  
#####

#### 15.6.10.1. ##

#####components.xml#####PersistentPermissionResolver#####PermissionStore#####  
#####JpaIdentityStore#####  
#####permission-store#####

```
<security:persistent-permission-resolver permission-store="#{myCustomPermissionStore}"/>
```

#### 15.6.10.2. #####

PersistentPermissionResolver#####  
Seam#####PermissionStore##JpaPermissionStore#####  
#####PermissionStore#####

### # 15.8. #####

####	####	##
List<Permission>	listPermissions(Object target)	#####
List<Permission>	listPermissions(Object target, String action)	#####

####	####	##
List<Permission>	listPermissions(Set<Object> targets, String action)	#####
####	grantPermission(Permission)	#####Permission#####
####	grantPermissions(List<Permission> permissions)	##### List#####Permission#####
####	revokePermission(Permission permission)	#####Permission#####
####	revokePermissions(List<Permission> permissions)	#####Permission##
List<String>	listAvailableActions(Object target)	##### #####

### 15.6.10.3. JpaPermissionStore####

```
#####Seam#####PermissionStore#####
#####
#####
```

```
#####DB#####user-permission-
class#####user-permission-
class#####role-permission-class#####
#####
```

```
<security:jpa-permission-store user-permission-class="com.acme.model.AccountPermission" /
>
```

#####

```
<security:jpa-permission-store user-permission-class="com.acme.model.UserPermission"
role-permission-class="com.acme.model.RolePermission" />
```

#### 15.6.10.3.1. #####

```
#####org.jboss.seam.annotations.security.permission#####
#####
```

### # 15.9. #####

#####	####	##
@PermissionTarget	#####	

#15# #####

#####	#####	##
		##### #####java.lang.String#####
@PermissionAction	#####	##### #####java.lang.String#####
@PermissionUser	#####	##### #####java.lang.String#####username##
@PermissionRole	#####	##### #####java.lang.String#####
@PermissionDiscriminator	#####	##### ##### #####user##### #####userValue#roleValue##### ####user#####u##role#####r#####

@PermissionDiscriminator  
(userValue="u", roleValue="r")

15.6.10.3.2. #####

##### SeamSpace#####

```

@Entity
@Name("message")
@Scope(EVENT)
public class Message implements Serializable
{
    private Long id;
    private String title;
    private String text;
    private boolean read;
    private Date datetime;

    @Id @GeneratedValue
    public Long getId() {
        return id;
    }
    public void setId(Long id) {
        this.id = id;
    }
}

```

```

@NotNull @Length(max=100)
public String getTitle() {
    return title;
}
public void setTitle(String title) {
    this.title = title;
}

@NotNull @Lob
public String getText() {
    return text;
}
public void setText(String text) {
    this.text = text;
}

@NotNull
public boolean isRead() {
    return read;
}
public void setRead(boolean read) {
    this.read = read;
}

@NotNull
@Basic @Temporal(TemporalType.TIMESTAMP)
public Date getDatetime() {
    return datetime;
}
public void setDatetime(Date datetime) {
    this.datetime = datetime;
}
}

```

```
#####getDiscriminator()####
```

```
@PermissionDiscriminator#####JpaPermissio
```

```
####getRecipient()#####@PermissionUser#@PermissionRole#####
```

```
#####
```

```
discriminator#####recipient#####
```

#15# #####

### 15.6.10.3.3. #####

#####  
#####org.jboss.seam.annotation.security.permission#####

### # 15.10. ### #####

#####	#####	##
@Permissions	###	##### #####@Permission#####
@Permission	###	##### action##### ##### mask#####

##### SeamSpace#####

```
@Permissions({
  @Permission(action = "view"),
  @Permission(action = "comment")
})
@Entity
public class MemberImage implements Serializable {
```

#####view#comment#####MemberImage#####

### 15.6.10.3.4. #####

#####action###DB#####  
#####

##### "Bob"#####MemberImage#####Bean#####  
view#comment#####action#####"view, comm  
#####

```
@Permissions({
  @Permission(action = "view", mask = 1),
  @Permission(action = "comment", mask = 2)
})
@Entity
public class MemberImage implements Serializable {
```



```

action#####"3"#bit          1          #          2          #on#####
#####
mask###2#####
  
```

### 15.6.10.3.5. #####

```

JpaPermissionStore#####
#####ID#####identifier          strategy#####
#####ID#####ID#####

IdentifierStrategy#####
  
```

```

public interface IdentifierStrategy {
    boolean canIdentify(Class targetClass);
    String getIdentifer(Object target);
}
  
```

```

#####canIdentify()#####true#####
#2#####getIdentifer()#####

Seam###IdentifierStrategy###ClassIdentifierStrategy#EntityIdentifierStrategy#####

#####ID#####org.jboss.seam.annotations.security.permission.Identifier#
#####name#####
IdentifierStrategy#####
  
```

### 15.6.10.3.6. #####

```

###name#####ID#####SeamID#####Identifier#
#####ID#"customer"#####
  
```

```

@Identifier(name = "customer")
public class Customer {
  
```

```

#####"customerAction"#####:
  
```

```

@Name("customerAction")
public class CustomerAction {
  
```

```

##### "Customer"#####:
  
```

```
public class Customer {
```

### 15.6.10.3.7. #####

```
##ID#####Bean#####ID#####ID#####  
ID#####ClassIdentifierStrategy##### (#####id )  
#  
PersistenceProvider#####  
@Entity#####,#####ID#####
```

```
@Identifier(value = EntityIdentifierStrategy.class)  
public class Customer {
```

```
#####
```

```
@Entity  
public class Customer {  
    private Integer id;  
    private String firstName;  
    private String lastName;  
  
    @Id  
    public Integer getId() { return id; }  
    public void setId(Integer id) { this.id = id; }  
  
    public String getFirstName() { return firstName; }  
    public void setFirstName(String firstName) { this.firstName = firstName; }  
  
    public String getLastName() { return lastName; }  
    public void setLastName(String lastName) { this.lastName = lastName; }  
}
```

```
id#1#Customer#####"Customer:1"#####  
#####
```

```
@Entity  
@Identifier(name = "cust")  
public class Customer {
```

#####id#123#Customer# "cust:123"#####

### 15.7. #####

Seam#####ID##API#####API#  
PermissionManager#####

#### 15.7.1. #####

PermissionManager#####Seam#####  
#####JpaPermissionStore#####  
#####components.xml#permission-store#####

```
<security:permission-manager permission-store="{ldapPermissionStore}"/>
```

#####PermissionManager#####

### # 15.11. #####API####

####	####	##
List<Permission>	listPermissions(Object target, String action)	#####
List<Permission>	listPermissions(Object target)	#####
####	grantPermission(Permission permission)	#####Permis #####true####
####	grantPermissions(List<Permission> permissions)	#####Per #####true####
####	revokePermission(Permission permission)	#####Permi
####	revokePermissions(List<Permission> permissions)	#####P #####true####
List<String>	listAvailableActions(Object target)	##### ##### #####

#### 15.7.2. #####

PermissionManager#####  
#####

# 15.12. #####

####	#####	#####
listPermissions()	###target	seam.read-permissions
grantPermission()	#####Permission#####Permissions	seam.grant-permission
grantPermission()	#####Permission	seam.grant-permission
grantPermissions()	#####Permissions	seam.grant-permission
revokePermission()	#####Permission	seam.revoke-permission
revokePermissions()	#####Permissions	seam.revoke-permission

15.8. SSL#####

Seam#HTTPS#####page#####  
 #####pages.xml#####scheme##### /  
 login.xhtml#HTTPS#####

```
<page view-id="/login.xhtml" scheme="https"/>
```

#####JSF#s:link#s:button##### (view#####)  
 ##### /  
 login.xhtml#HTTPS#####s:link##login.xhtml##HTTPS#####

```
<s:link view="/login.xhtml" value="Login"/>
```

##### (#####) #####  
 schema="https"#####http#####https#####  
 #####scheme#####HTTPS#####  
 #####  
 #####HTTPS#####HTTPS#####HTTPS#####  
 HTTP#####scheme#####pages.xml#####

```
<page view-id="*" scheme="http" />
```

#####HTTPS#####schema#####

#####components.xml#####HTTP#####

```
<web:session invalidate-on-scheme-change="true"/>
```

#####HTTPS#####HTTP#####ID#####

### 15.8.1. #####

#####HTTP#HTTPS#####pages.xml #pages #####http-port ##### https-port#####

```
<pages xmlns="http://jboss.com/products/seam/pages"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://jboss.com/products/seam/pages http://jboss.com/products/seam/pages-2.2.xsd"
  no-conversation-view-id="/home.xhtml"
  login-view-id="/login.xhtml"
  http-port="8080"
  https-port="8443">
```

### 15.9. #####

#####API#####Seam#CAPCHA(Completely Automated Public Turing  
test to tell Computers and Humans  
Apart)#####

#### 15.9.1. #####

#####Seam#####web.xml#####

```
<servlet>
  <servlet-name
>Seam Resource Servlet</servlet-name>
  <servlet-class
>org.jboss.seam.servlet.SeamResourceServlet</servlet-class>
</servlet>

<servlet-mapping>
```

```
<servlet-name
>Seam Resource Servlet</servlet-name>
  <url-pattern
>/seam/resource/*</url-pattern>
</servlet-mapping
>
```

### 15.9.2. #####

#####:

```
<h:graphicImage value="/seam/resource/captcha"/>
<h:inputText id="verifyCaptcha" value="#{captcha.response}" required="true">
  <s:validate />
</h:inputText>
<h:message for="verifyCaptcha"/>
```

```
#####      graphicImage      #####inputText#####
#####
```

### 15.9.3. #####

#####

```
@Name("org.jboss.seam.captcha.captcha")
@Scope(SESSION)
public class HitchhikersCaptcha extends Captcha
{
  @Override @Create
  public void init()
  {
    setChallenge("What is the answer to life, the universe and everything?");
    setCorrectResponse("42");
  }

  @Override
  public BufferedImage renderChallenge()
  {
    BufferedImage img = super.renderChallenge();
    img.getGraphics().drawOval(5, 3, 60, 14); //add an obscuring decoration
    return img;
  }
}
```

```
}

```

## 15.10. ##### ####

```
#####Seam##### # 6. #####
```

### # 15.13. ##### ####

#####	##
org.jboss.seam.security.loginSuccessful	#####
org.jboss.seam.security.loginFailed	#####
org.jboss.seam.security.alreadyLoggedIn	#####
org.jboss.seam.security.notLoggedIn	#####
org.jboss.seam.security.notAuthorized	#####
org.jboss.seam.security.preAuthenticate	#####
org.jboss.seam.security.postAuthenticate	#####
org.jboss.seam.security.loggedOut	#####
org.jboss.seam.security.credentialsUpdated	#####
org.jboss.seam.security.rememberMe	Identity#rememberMe#####

## 15.11. #####

```
#####
Seam#####RunAsOperation#####
Principal#Subject#####

#####RunAsOperation#####addRole()
##### execute() #####
```

```
new RunAsOperation() {
    public void execute() {
        executePrivilegedOperation();
    }
}.addRole("admin")
.run();
```

```
###getPrincipal() # getSubject()#####Principal#####
Subject#####RunAsOperation#####run()#####
```

## 15.12. ID#####Identity component####

#####Identity#####Credent  
#####Identity#####APPLICATION#####Identity###Identity#####

```

@Name("org.jboss.seam.security.identity")
@Scope(SESSION)
@Install(precedence = APPLICATION)
@BypassInterceptors
@Startup
public class CustomIdentity extends Identity
{
    private static final LogProvider log = Logging.getLogProvider(CustomIdentity.class);

    private String companyCode;

    public String getCompanyCode()
    {
        return companyCode;
    }

    public void setCompanyCode(String companyCode)
    {
        this.companyCode = companyCode;
    }

    @Override
    public String login()
    {
        log.info("##### CUSTOM LOGIN CALLED #####");
        return super.login();
    }
}

```



##  
SESSION#####Identity#####@Startup#####  
#####Seam#####



## 15.13. OpenID

OpenID is a community standard for external web-based authentication. The basic idea is that any web application can supplement (or replace) its local handling of authentication by delegating responsibility to an external OpenID server of the user's choosing. This benefits the user, who no longer has to remember a name and password for every web application he uses, and the developer, who is relieved of some of the burden of maintaining a complex authentication system.

When using OpenID, the user selects an OpenID provider, and the provider assigns the user an OpenID. The id will take the form of a URL, for example `http://maximoburrito.myopenid.com` however, it's acceptable to leave off the `http://` part of the identifier when logging into a site. The web application (known as a relying party in OpenID-speak) determines which OpenID server to contact and redirects the user to the remote site for authentication. Upon successful authentication the user is given the (cryptographically secure) token proving his identity and is redirected back to the original web application. The local web application can then be sure the user accessing the application controls the OpenID he presented.

It's important to realize at this point that authentication does not imply authorization. The web application still needs to make a determination of how to use that information. The web application could treat the user as instantly logged in and give full access to the system or it could try and map the presented OpenID to a local user account, prompting the user to register if he hasn't already. The choice of how to handle the OpenID is left as a design decision for the local application.

### 15.13.1. Configuring OpenID

Seam uses the `openid4java` package and requires four additional JARs to make use of the Seam integration. These are: `htmlparser.jar`, `openid4java.jar`, `openxri-client.jar` and `openxri-syntax.jar`.

OpenID processing requires the use of the `OpenIdPhaseListener`, which should be added to your `faces-config.xml` file. The phase listener processes the callback from the OpenID provider, allowing re-entry into the local application.

```
<lifecycle>
  <phase-listener>org.jboss.seam.security.openid.OpenIdPhaseListener</phase-listener>
</lifecycle>
```

With this configuration, OpenID support is available to your application. The OpenID support component, `org.jboss.seam.security.openid.openid`, is installed automatically if the `openid4java` classes are on the classpath.

### 15.13.2. Presenting an OpenIdDLogin form

To initiate an OpenID login, you can present a simple form to the user asking for the user's OpenID. The `#{openid.id}` value accepts the user's OpenID and the `#{openid.login}` action initiates an authentication request.

```
<h:form>
  <h:inputText value="#{openid.id}" />
  <h:commandButton action="#{openid.login}" value="OpenID Login"/>
</h:form>
```

When the user submits the login form, he will be redirected to his OpenID provider. The user will eventually return to your application through the Seam pseudo-view `/openid.xhtml`, which is provided by the `OpenIdPhaseListener`. Your application can handle the OpenID response by means of a `pages.xml` navigation from that view, just as if the user had never left your application.

### 15.13.3. Logging in immediately

The simplest strategy is to simply login the user immediately. The following navigation rule shows how to handle this using the `#{openid.loginImmediately()}` action.

```
<page view-id="/openid.xhtml">
  <navigation evaluate="#{openid.loginImmediately()}">
    <rule if-outcome="true">
      <redirect view-id="/main.xhtml">
        <message>OpenID login successful...</message>
      </redirect>
    </rule>
    <rule if-outcome="false">
      <redirect view-id="/main.xhtml">
        <message>OpenID login rejected...</message>
      </redirect>
    </rule>
  </navigation>
</page>
```

This `loginImmediately()` action checks to see if the OpenID is valid. If it is valid, it adds an `OpenIDPrincipal` to the identity component, marks the user as logged in (i.e. `#{identity.loggedIn}` will be true) and returns true. If the OpenID was not validated, the method returns false, and the user re-enters the application un-authenticated. If the user's OpenID is valid, it will be accessible using the expression `#{openid.validatedId}` and `#{openid.valid}` will be true.

### 15.13.4. Deferring login

You may not want the user to be immediately logged in to your application. In that case, your navigation should check the `#{openid.valid}` property and redirect the user to a local registration or processing page. Actions you might take would be asking for more information and creating a local user account or presenting a captcha to avoid programmatic registrations. When you are done processing, if you want to log the user in, you can call the `loginImmediately` method, either through EL as shown previously or by directly interaction with the `org.jboss.seam.security.openid.OpenId` component. Of course, nothing prevents you from writing custom code to interact with the Seam identity component on your own for even more customized behaviour.

### 15.13.5. Logging out

Logging out (forgetting an OpenID association) is done by calling `#{openid.logout}`. If you are not using Seam security, you can call this method directly. If you are using Seam security, you should continue to use `#{identity.logout}` and install an event handler to capture the logout event, calling the OpenID logout method.

```
<event type="org.jboss.seam.security.loggedOut">
  <action execute="#{openid.logout}" />
</event>
```

It's important that you do not leave this out or the user will not be able to login again in the same session.



## #####

```
Seam #####  
##### Seam #####
```

## 16.1. #####

```
JEE #####  
#####
```



##

Note that all i18n features in Seam work only in JSF context.

```
##### 1  
##### UTF-8  
#####
```

### 16.1.1. #####

```
##### tomcat  
##### Tomcat ### JBoss AS ##### URLEncoder="UTF-8"  
##### JBoss AS 4.2 ## ${JBOSS_HOME}/server/(default)/deploy/jboss-  
web.deployer/server.xml #####
```

```
<Connector port="8080" URLEncoder="UTF-8"/>
```

```
##### JBoss AS #####
```

```
<Connector port="8080" useBodyEncodingForURI="true"/>
```

### 16.1.2. #####

```
##### (## #####)## ##  
##### ASCII ##### ASCII  
#####
```

```
##### ASCII ##### Unicode ##### Unicode #####  
##### JVM ##### ASCII #####  
ASCII ##### \uXXXX ##### Java ##### Unicode  
##### XXXX ##### 16 #####
```

## #16# #####

You can write your translation of labels ([#16.3. #####](#)) to your messages resource bundle in the native encoding and then convert the content of the file into the escaped format through the tool `native2ascii` provided in the JDK. This tool will convert a file written in your native encoding to one that represents non-ASCII characters as Unicode escape sequences.

```
##### Java 5 ##### [http://java.sun.com/j2se/1.5.0/docs/tooldocs/index.html#intl] ###  
Java 6 ##### [http://java.sun.com/javase/6/docs/technotes/tools/#intl] #####  
##### UTF-8 #####
```

```
$ native2ascii -encoding UTF-8 messages_cs.properties >  
messages_cs_escaped.properties
```

### 16.1.3. #####

```
#####  
#####  
##### <f:view locale="cs_CZ" /> #####  
(### JSF #####)# xml ##### xml  
##### ##### xml ### <?xml version="1.0"  
encoding="UTF-8"?> #####  
### JSF # Facelet #####  
##### components.xml #####
```

```
<web:character-encoding-filter encoding="UTF-8"  
override-client="true"  
url-pattern="*.seam" />
```

### 16.2. ####

```
##### java.util.Locale ##### (##### locale  
#####)# ##### Seam #####  
JSF #####
```

- HTTP ##### (#####) #### faces-config.xml  
#####
- ##### faces-config.xml #####
- #####

```
Seam ##### org.jboss.seam.international.localeSelector.language#  
org.jboss.seam.international.localeSelector.country ###
```

```
org.jboss.seam.international.localeSelector.variant ##### ## ####
#####
```

```
##### Seam
#####JSP #####Facelet
#####
```

```
<h:selectOneMenu value="#{localeSelector.language}">
  <f:selectItem itemLabel="English" itemValue="en"/>
  <f:selectItem itemLabel="Deutsch" itemValue="de"/>
  <f:selectItem itemLabel="Francais" itemValue="fr"/>
</h:selectOneMenu>
<h:commandButton action="#{localeSelector.select}"
  value="#{messages['ChangeLanguage']}/>
```

```
#####faces-config.xml #####
```

```
<h:selectOneMenu value="#{localeSelector.localeString}">
  <f:selectItems value="#{localeSelector.supportedLocales}"/>
</h:selectOneMenu>
<h:commandButton action="#{localeSelector.select}"
  value="#{messages['ChangeLanguage']}/>
```

```
##### Seam # JSF
#####
```

```
##### JSF ##### (/META-INF/faces-config.xml)
# <locale-config> ##### Seam #####
Java EE #####
org.jboss.seam.international.localeConfig
##### Seam
##### Seam ##### XML #####
```

```
<international:locale-config default-locale="fr_CA" supported-locales="en fr_CA fr_FR"/>
```

```
#####
```

### 16.3. ###

```
JSF ##### <f:loadBundle /> ##### Seam
##### EL ##### Seam messages
#####
```

#16# #####

### 16.3.1. #####

```
Seam      #      java.util.ResourceBundle      #####      (#####)
org.jboss.seam.core.resourceBundle      #####)
#####
##### Seam #####
messages      #####      messages.properties#      messages_en.properties#
messages_en_AU.properties      #####      #####      WEB-INF/
classes #####

####messages_en.properties ####
```

Hello=Hello

```
####messages_en_AU.properties ####
```

Hello=G'day

```
org.jboss.seam.core.resourceLoader.bundleNames ##### Seam #####
##### (###) #####
```

```
<core:resource-loader>
  <core:bundle-names>
    <value>mycompany_messages</value>
    <value>standard_messages</value>
  </core:bundle-names>
</core:resource-loader>
```

```
##### ##JSF###ID##### ##ID### /
##### ### /welcome/hello.jsp ##### welcome/
hello_en.properties #####

pages.xml #####
```

<page view-id="/welcome/hello.jsp" bundle="HelloMessages"/>

```
### HelloMessages.properties ##### /welcome/hello.jsp #####
```

### 16.3.2. #####

```
###Seam##### <f:loadBundle      ...      />
#####
```



```
<h:outputText value="#{messages['Hello']}/>
```

```
#####
```

```
<h:outputText value="#{messages.Hello}"/>
```

```
##### EL #####
```

```
Hello=Hello, #{user.firstName} #{user.lastName}
```

```
Hello=G'day, #{user.firstName}
```

```
#####
```

```
@In private Map<String, String> messages;
```

```
@In("#{messages['Hello']}") private String helloMessage;
```

### 16.3.3. Faces #####

```
facesMessages ##### faces messages #####
```

```
@Name("hello")
@Stateless
public class HelloBean implements Hello {
    @In FacesMessages facesMessages;

    public String sayIt() {
        facesMessages.addFromResourceBundle("Hello");
    }
}
```

```
#####Hello, Gavin King ##### G'day, Gavin #####
```

## 16.4. #####

```

java.util.Timezone ##### ## org.jboss.seam.international.timezone
##### Seam ##### ## org.jboss.seam.international.timezoneSelector
##### <f:convertDateTime>
##### JSF ##### UTC #####UTC #####
#####

```

```

Seam#####Seam#####
###Seam##Seam##### <s:convertDateTime> #####

```

Seam also provides a default date converter to convert a string value to a date. This saves you from having to specify a converter on input fields that are simply capturing a date. The pattern is selected according to the user's locale and the time zone is selected as described above.

## 16.5. ###

```

Seam##### ##API#####API#####
#####

```

```
#####:
```

```

<theme:theme-selector cookie-enabled="true">
  <theme:available-themes>
    <value>default</value>
    <value>accessible</value>
    <value>printable</value>
  </theme:available-themes>
</theme:theme-selector>

```

```
#####
```

```

##### ## default ## default.properties
##### ##default.properties #####

```

```

css ../screen.css
template /template.xhtml

```

```

### ##### CSS ##### facelet #####
(#####)#

```

```
###JSP#facelet##### ##facelet#####:
```

```
<link href="#{theme.css}" rel="stylesheet" type="text/css" />
```

```
#####
```

```
<link href="#{facesContext.externalContext.requestContextPath}#{theme.css}"
  rel="stylesheet" type="text/css" />
```

```
##### facelet## <ui:composition> #####
```

```
<ui:composition xmlns="http://www.w3.org/1999/xhtml"
  xmlns:ui="http://java.sun.com/jsf/facelets"
  xmlns:h="http://java.sun.com/jsf/html"
  xmlns:f="http://java.sun.com/jsf/core"
  template="#{theme.template}">
```

```
#####
```

```
<h:selectOneMenu value="#{themeSelector.theme}">
  <f:selectItems value="#{themeSelector.themes}" />
</h:selectOneMenu>
<h:commandButton action="#{themeSelector.select}" value="Select Theme" />
```

## 16.6. #####

```
##### ##### ##
components.xml # cookie-enabled #####
```

```
<theme:theme-selector cookie-enabled="true">
  <theme:available-themes>
    <value>default</value>
    <value>accessible</value>
    <value>printable</value>
  </theme:available-themes>
</theme:theme-selector>

<international:locale-selector cookie-enabled="true"/>
```



---

## Seam Text

```
#####  
#####wiki###blog#####  
Seam## Seam Text ##### Web #####  
<s:formattedText/> ##### Seam Text#ANTLR##### Seam  
Text#####ANTLR#####
```

### 17.1. #####

#####:

It's easy to make *emphasis*, |monospace|,  
~deleted text~, super<sup>scripts</sup> or underlines.

```
### <s:formattedText/> ##### ###HTML#####:
```

```
<p>  
It's easy to make <i  
>emphasis</i  
>, <tt  
>monospace</tt>  
<del  
>deleted text</del  
>, super<sup  
>scripts</sup  
> or <u  
>underlines</u  
>.  
</p>  
>
```

```
##### + #####:
```

+This is a big heading  
You /must/ have some text following a heading!

++This is a smaller heading  
This is the first paragraph. We can split it across multiple  
lines, but we must end it with a blank line.

## #17# Seam Text

---

This is the second paragraph.

(#####  
#####) ##### HTML ##:

```
<h1
>This is a big heading</h1>
<p>
You <i
>must</i
> have some text following a heading!
</p>

<h2
>This is a smaller heading</h2>
<p>
This is the first paragraph. We can split it across multiple
lines, but we must end it with a blank line.
</p>

<p>
This is the second paragraph.
</p>
>
```

##### # ##### = #####:

An ordered list:

```
#first item
#second item
#and even the /third/ item
```

An unordered list:

```
=an item
=another item
```

```
<p>
An ordered list:
</p>
```

```
<ol>
>
<li>
>first item</li>
<li>
>second item</li>
<li>
>and even the <i>
>third</i>
> item</li>
</ol>
```

```
<p>
An unordered list:
</p>
```

```
<ul>
<li>
>an item</li>
<li>
>another item</li>
</ul>
>
```

#####:

The other guy said:

"Nyeah nyeah-nee  
/nyeah/ nyeah!"

But what do you think he means by "nyeah-nee"?

```
<p>
The other guy said:
</p>
```

```
<q>
>Nyeah nyeah-nee
<i>
```

```
>nyeah</i>
> nyeah!</q>
```

```
<p>
But what do you think he means by <q
>nyeah-nee</q>
>?
</p>
>
```

## 17.2. #####

\*, |, # #####<, >, & ###HTML##### \ #####:

```
You can write down equations like 2\*3\=6 and HTML tags
like \<body\
> using the escape character: \.
```

```
<p>
You can write down equations like 2*3=6 and HTML tags
like &lt;body&gt; using the escape character: \.
</p>
>
```

### ##### ( ) #####

My code doesn't work:

```
`for (int i=0; i<100; i--)
{
    doSomething();
}
```

Any ideas?

```
<p>
My code doesn't work:
</p>
```



```
<pre>
>for (int i=0; i<100; i--)
{
    doSomething();
}</pre>
```

```
<p>
Any ideas?
</p>
>
```

```
#####
(#####)#
#####
```

This is a |<tag attribute="value"/>| example.

```
### ##### (### ##)#
```

### 17.3. ###

```
#####:
```

Go to the Seam website at [=
>http://jboss.com/products/seam].

```
#####:
```

Go to [the Seam website=
>http://jboss.com/products/seam].

```
#####wiki#####Seam Text#####
```

### 17.4. HTML###

```
#####HTML##### (#####
#####)# #####
```

You might want to link to <a href="http://jboss.com/products/seam"
>something

## #17# Seam Text

---

```
cool</a
>, or even include an image: 
```

```
#####:
```

```
<table>
  <tr
><td
>First name:</td
><td
>Gavin</td
></tr>
  <tr
><td
>Last name:</td
><td
>King</td
></tr>
</table
>
```

```
#####!
```

## 17.5. Using the SeamTextParser

The `<s:formattedText/>` JSF component internally uses the `org.jboss.seam.text.SeamTextParser`. You can use that class directly and implement your own text parsing, rendering, or HTML sanitation procedure. This is especially useful if you have a custom frontend for entering rich text, such as a Javascript-based HTML editor, and you want to validate user input to protect your website against Cross-Site Scripting (XSS) attacks. Another usecase are custom wiki text parsing and rendering engines.

The following example defines a custom text parser that overrides the default HTML sanitizer:

```
public class MyTextParser extends SeamTextParser {

    public MyTextParser(String myText) {
        super(new SeamTextLexer(new StringReader(myText)));

        setSanitizer(
            new DefaultSanitizer() {
                @Override
```

```
    public void validateHtmlElement(Token element) throws SemanticException {
        // TODO: I want to validate HTML elements myself!
    }
}
);
}

// Customizes rendering of Seam text links such as [Some Text=>http://example.com]
@Override
protected String linkTag(String descriptionText, String linkText) {
    return "<a href=\"" + linkText + "\">My Custom Link: " + descriptionText + "</a>";
}

// Renders a <p> or equivalent tag
@Override
protected String paragraphOpenTag() {
    return "<p class=\"myCustomStyle\">";
}

public void parse() throws ANTLRException {
    startRule();
}
}
```

The `linkTag()` and `paragraphOpenTag()` methods are just some of many you can override to customize rendered output. These methods generally return `String`. See the Javadoc for more details.

Also consult the Javadoc of `org.jboss.seam.text.SeamTextParser.DefaultSanitizer` for more information on what HTML elements, attributes, and attribute values or filtered by default.



---

## iText PDF ##

Seam now includes a component set for generating documents using iText. The primary focus of Seam's iText document support is for the generation of PDF documents, but Seam also offers basic support for RTF document generation.

### 18.1. PDF #####

iText support is provided by `jboss-seam-pdf.jar`. This JAR contains the iText JSF controls, which are used to construct views that can render to PDF, and the DocumentStore component, which serves the rendered documents to the user. To include PDF support in your application, put `jboss-seam-pdf.jar` in your `WEB-INF/lib` directory along with the iText JAR file. There is no further configuration needed to use Seam's iText support.

```
Seam iText ##### Facelets ##### JSP
##### seam-ui #####
```

```
examples/itext ##### PDF #####
##### PDF #####
```

#### 18.1.1. #####

<code>&lt;p:document&gt;</code>	<pre>##  ##### http://jboss.com/products/seam/pdf ##### facelet XHTML ##### document ##### document ### Seam ##### DocumentStore ##### HTML #####  ##  • type — ##### PDF# RTF# HTML ##### Seam # PDF ##### PDF #####  • pageSize — ##### LETTER # A4 ##### ##### com.lowagie.text.PageSize ##### pageSize ##### #612 792## LETTER #####  • orientation — ##### portrait # landscape ### landscape #####  • margins — ## ## ## #####  • marginMirroring — #####</pre>
---------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

```
• disposition — ##### PDF #####  
HTTP Content-Disposition #####  
##### inline  
##### attachment #####  
inline ###  
  
• fileName — #####  
  
#####  
  
• title  
  
• subject  
  
• keywords  
  
• author  
  
• creator  
  
###
```

```
<p:document xmlns:p="http://jboss.com/products/seam/pdf"  
>  
  The document goes here.  
</p:document  
>
```

### 18.1.2. #####

Useful documents will need to contain more than just text; however, the standard UI components are geared towards HTML generation and are not useful for generating PDF content. Instead, Seam provides a special UI components for generating suitable PDF content. Tags like `<p:image>` and `<p:paragraph>` are the basic foundations of simple documents. Tags like `<p:font>` provide style information to all the content surrounding them.

```
<p:paragraph> ##  
  
#####  
#####  
  
##  
  
• firstLineIndent
```

- extraParagraphSpace
  - leading
  - multipliedLeading
  - spacingBefore — #####
  - spacingAfter — #####
  - indentationLeft
  - indentationRight
  - keepTogether
- ###

```
<p:paragraph alignment="justify">
  This is a simple document. It isn't very fancy.
</p:paragraph
>
```

<p:text>

```
##
text ##### JSF
##### HTML
##### outputText #####
##
• value — #####
###
```

```
<p:paragraph>
  The item costs <p:text value="#{product.price}">
    <f:convertNumber type="currency" currencySymbol="$"/>
  </p:text>
</p:paragraph
>
```

<p:html>

```
##
html ### HTML ##### PDF #####
```

##

- value — #####

###

```
<p:html value="This is HTML with <b
>some markup</b
>." />
<p:html>
  <h1
>This is more complex HTML</h1>
  <ul>
    <li
>one</li>
    <li
>two</li>
    <li
>three</li>
  </ul>
</p:html>

<p:html>
  <s:formattedText value="*This* is |Seam Text| as HTML. It's
very^cool^." />
</p:html
>
```

<p:font>

##

#####

##

- name — ##### COURIER# HELVETICA# TIMES-ROMAN# SYMBOL# ZAPFDINGBATS #####
- size — #####
- style — ##### NORMAL# BOLD# ITALIC# OBLIQUE# UNDERLINE# LINE-THROUGH



	<ul style="list-style-type: none"> <li>• <code>color</code> — The font color. (see <a href="#">#18.1.7.1. #Color Values#</a> for color values)</li> <li>• <code>encoding</code> — #####</li> </ul> <p>###</p>
<code>&lt;p:textcolumn&gt;</code>	<p>###</p> <p><code>p:textcolumn</code> inserts a text column that can be used to control the flow of text. The most common case is to support right to left direction fonts.</p> <p>###</p> <ul style="list-style-type: none"> <li>• <code>left</code> — The left bounds of the text column</li> <li>• <code>right</code> — The right bounds of the text column</li> <li>• <code>direction</code> — The run direction of the text in the column: RTL, LTR, NO-BIDI, DEFAULT</li> </ul> <p>###</p>
<code>&lt;p:newPage&gt;</code>	<p>###</p> <p><code>p:newPage</code> #####</p> <p>###</p>

```
<p:font name="courier" style="bold" size="24">
  <p:paragraph
>My Title</p:paragraph>
</p:font
>
```

```
<p:textcolumn left="400" right="600" direction="rtl"
>
  <p:font name="/Library/Fonts/Arial Unicode.ttf"
    encoding="Identity-H"
    embedded="true"
>#{phrases.arabic}</p:font
>
</p:textcolumn
>
```

<p:newPage />

<p:image>

##

p:image inserts an image into the document. Images can be loaded from the classpath or from the web application context using the value attribute.

```
##### imageData  
##### java.awt.Image #####
```

##

- value — #####
- rotation — #####
- height — #####
- width — #####
- alignment — ##### ([##### #18.1.7.2. #####](#) ##)
- alt — #####
- indentationLeft
- indentationRight
- spacingBefore — #####
- spacingAfter — #####
- widthPercentage
- initialRotation
- dpi
- scalePercent — ##### (#####)# x # y  
##### 2 #####
- scaleToFit — Specifies the X any Y size to scale the image to. The image will be scale to fit those dimensions as closely as possible while preserving the XY ratio of the image.
- wrap

	<ul style="list-style-type: none"> <li>• underlying</li> </ul> <p>###</p> <p>&lt;p:image value="/jboss.jpg" /&gt;</p> <p>&lt;p:image value="#{images.chart}" /&gt;</p>
<p>&lt;p:anchor&gt;</p>	<p>##</p> <p>p:anchor #####</p> <p>##</p> <ul style="list-style-type: none"> <li>• name — #####</li> <li>• reference — The destination the link refers to. Links to other points in the document should begin with a "#". For example, "#link1" to refer to an anchor position with a name of link1. Links may also be a full URL to point to a resource outside of the document.</li> </ul> <p>###</p> <p>&lt;p:listItem &gt;&lt;p:anchor reference="#reason1" &gt;Reason 1&lt;/p:anchor &gt;&lt;/p:listItem &gt; ... &lt;p:paragraph&gt;   &lt;p:anchor name="reason1" &gt;It's the quickest way to get "rich"&lt;/p:anchor &gt;   ... &lt;/p:paragraph &gt;</p>

### 18.1.3. #####

<p>&lt;p:header&gt;</p>	<p>##</p>
<p>&lt;p:footer&gt;</p>	

```
p:header # p:footer
#####
#####

##

• alignment — ##### (##### #18.1.7.2.
##### ##)#

• backgroundColor — ##### (##### #18.1.7.1.
#Color Values# ##)#

• borderColor — ##### borderColorLeft#
borderColorRight# borderColorTop# borderColorBottom
##### (##### #18.1.7.1. #Color Values# ##)#

• borderWidth — The width of the border. Individual border sides
can be specified using borderWidthLeft, borderWidthRight,
borderWidthTop and borderWidthBottom.

###
```

```
<f:facet name="header">
  <p:font size="12">
    <p:footer borderWidthTop="1" borderColorTop="blue"
      borderWidthBottom="0" alignment="center">
      Why Seam? [<p:pageNumber />]
    </p:footer>
  </p:font>
</f:facet>
>
```

<p:pageNumber>

```
##

##### p:pageNumber #####
##### 1 #####

###
```

```
<p:footer borderWidthTop="1" borderColorTop="blue"
  borderWidthBottom="0" alignment="center">
  Why Seam? [<p:pageNumber />]
</p:footer>
```

## 18.1.4. #####

```
<p:chapter>
##

<p:section> ##### p:chapter # p:section
##### ##### ###
##### ##### PDF
#####
```



##

You cannot include a chapter into another chapter, this can be done only with section(s).

##

- `alignment` — ##### (##### [#18.1.7.2. #####](#) ###)#
- `number` — The chapter/section number. Every chapter/section should be assigned a number.
- `numberDepth` — The depth of numbering for chapter/section. All sections are numbered relative to their surrounding chapter/sections. The fourth section of the first section of chapter three would be section 3.1.4, if displayed at the default number depth of three. To omit the chapter number, a number depth of 2 should be used. In that case, the section number would be displayed as 1.4.



##

Chapter(s) can have a number or without it by setting `numberDepth` to 0.

###

```
<p:document xmlns:p="http://jboss.com/products/seam/pdf"
  title="Hello">

  <p:chapter number="1">
    <p:title
  ><p:paragraph
```

	<pre>&gt;Hello&lt;/p:paragraph &gt;&lt;/p:title&gt;   &lt;p:paragraph &gt;Hello #{user.name}!&lt;/p:paragraph&gt;   &lt;/p:chapter&gt;    &lt;p:chapter number="2"&gt;     &lt;p:title &gt;&lt;p:paragraph &gt;Goodbye&lt;/p:paragraph &gt;&lt;/p:title&gt;   &lt;p:paragraph &gt;Goodbye #{user.name}.&lt;/p:paragraph&gt;   &lt;/p:chapter&gt;  &lt;/p:document &gt;</pre>
<pre>&lt;p:header&gt;</pre>	<pre>##  #####          p:title          #####          #####/ #####          #####          #####          p:paragraph #####</pre>

### 18.1.5. ###

List structures can be displayed using the `p:list` and `p:listItem` tags. Lists may contain arbitrarily-nested sublists. List items may not be used outside of a list. The following document uses the `ui:repeat` tag to to display a list of values retrieved from a Seam component.

<pre>&lt;p:document xmlns:p="http://jboss.com/products/seam/pdf"   xmlns:ui="http://java.sun.com/jsf/facelets"   title="Hello"&gt;   &lt;p:list style="numbered"&gt;     &lt;ui:repeat value="#{documents}" var="doc"&gt;       &lt;p:listItem &gt;#{doc.name}&lt;/p:listItem&gt;     &lt;/ui:repeat&gt;   &lt;/p:list&gt; &lt;/p:document &gt;</pre>	
<pre>&lt;p:list&gt;</pre>	<pre>##</pre>

- style — ##### NUMBERED# LETTERED# GREEK# ROMAN# ZAPFDINGBATS# ZAPFDINGBATS\_NUMBER #####
  - listSymbol — #####
  - indent — #####
  - lowerCase — letters #####
  - charNumber — ZAPFDINGBATS #### #####
  - numberType — ZAPFDINGBATS\_NUMBER ####
- ###

```
<p:list style="numbered">
  <ui:repeat value="#{documents}" var="doc">
    <p:listItem
  >#{doc.name}</p:listItem>
  </ui:repeat>
</p:list
>
```

<p:listItem>

- ##
- p:listItem #####
- ##
- alignment — ##### (#18.1.7.2. #####)##
  - indentationLeft — #####
  - indentationRight — #####
  - listSymbol — #####
- ###

...

### 18.1.6. #

```
##### p:table # p:cell ##### 3  
##### 3 #####
```

<pre>&lt;p:table&gt;</pre>	<pre>##  p:table #####  ##  • columns — ##### (##) #####  • widths — ##### 1 ##### widths="2 1 1" ##### 3 ## 1 ##### 2 ## 3 ##### 2 #####  • headerRows — ##### #####  • footerRows — ##### headerRows ##### 2 ##### 1 ##### headerRows # 3 # footerRows # 1 #####  • widthPercentage — #####  • horizontalAlignment — ##### (#18.1.7.2. #####)##  • skipFirstHeader  • runDirection  • lockedWidth  • splitRows  • spacingBefore — #####  • spacingAfter — #####  • extendLastRow  • headersInEvent  • splitLate  • keepTogether  ###</pre>
----------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



```

<p:table columns="3" headerRows="1">
  <p:cell
>name</p:cell>
  <p:cell
>owner</p:cell>
  <p:cell
>size</p:cell>
  <ui:repeat value="#{documents}" var="doc">
    <p:cell
>#{doc.name}</p:cell>
    <p:cell
>#{doc.user.name}</p:cell>
    <p:cell
>#{doc.size}</p:cell>
  </ui:repeat>
</p:table
>

```

<p:cell>

```

##
p:cell #####
##
• colspan — colspan# 1 #####
#####
• horizontalAlignment — ##### (##### #18.1.7.2. #####
###)#
• verticalAlignment — ##### (##### #18.1.7.2. #####
###)#
• padding — paddingLeft# paddingRight# paddingTop#
paddingBottom #####
• useBorderPadding
• leading
• multipliedLeading
• indent
• verticalAlignment

```

- extraParagraphSpace
  - fixedHeight
  - noWrap
  - minimumHeight
  - followingIndent
  - rightIndent
  - spaceCharRatio
  - runDirection
  - arabicOptions
  - useAscender
  - grayFill
  - rotation
- ###

```
<p:cell  
>...</p:cell  
>
```

### 18.1.7. #####

#####

#### 18.1.7.1. Color Values

Several ways of specifying colors are provided. A limited number of colors are supported by name. They are: white, gray, lightgray, darkgray, black, red, pink, yellow, green, magenta, cyan and blue. Colors can be specified as an integer value, as defined by java.awt.Color. Finally a color value may be specified as rgb(r,g,b) or rgb(r,g,b,a) with the red, green, blue alpha values specified as an integer between 0 and 255 or as a floating point percentages followed by a '%' sign.

#### 18.1.7.2. #####

##### Seam PDF ##### left# right# center# justify# justifyall  
##### ##### top# middle# bottom# baseline ###

## 18.2. ###

Charting support is also provided with `jboss-seam-pdf.jar`. Charts can be used in PDF documents or can be used as images in an HTML page. Charting requires the JFreeChart library (`jfreechart.jar` and `jcommon.jar`) to be added to the `WEB-INF/lib` directory. Four types of charts are currently supported: pie charts, bar charts and line charts. Where greater variety or control is needed, it is possible to construct charts using Java code.

<pre>&lt;p:chart&gt;</pre>	<pre>##  Displays a chart created in Java by a Seam component.  ##  • chart — The chart object to display.  • height — #####  • width — #####  ###</pre> <div data-bbox="491 1081 1390 1227" style="background-color: #f0f0f0; padding: 5px; border: 1px solid #ccc;"> <pre>&lt;p:chart chart="#{mycomponent.chart}" width="500" height="500" /&gt;</pre> </div>
<pre>&lt;p:barchart&gt;</pre>	<pre>##  #####  ##  • chart — The chart object to display, if programmatic chart creation is being used.  • dataset — The dataset to be displayed, if programmatic dataset is being used.  • borderVisible — #####  • borderPaint — #####  • borderBackgroundPaint — #####  • borderStroke —  • domainAxisLabel — #####</pre>

- domainLabelPosition — The angle of the domain axis category labels. Valid values are STANDARD, UP\_45, UP\_90, DOWN\_45 and DOWN\_90. Alternatively, the value can be the positive or negative angle in radians.
- domainAxisPaint — #####
- domainGridlinesVisible — #####
- domainGridlinePaint — #####
- domainGridlineStroke — The stroke style of the domain gridlines, if visible.
- height — #####
- width — #####
- is3D — ##### 2D ##### 3D ##### boolean #####
- legend — ##### boolean #####
- legendItemPaint — #####
- legendItemBackgroundPaint — #####
- legendOutlinePaint — #####
- orientation — ##### vertical (#####) ##### horizontal #####
- plotBackgroundPaint — #####
- plotBackgroundAlpha — ##### (###) ##### 0 (#####) ## 1 (#####) #####
- plotForegroundAlpha — ##### (###) ##### 0 (#####) ## 1 (#####) #####
- plotOutlinePaint — #####
- plotOutlineStroke — The stroke style of the range gridlines, if visible.
- rangeAxisLabel — #####
- rangeAxisPaint — #####
- rangeGridlinesVisible — #####

- rangeGridlinePaint — #####
- rangeGridlineStroke — The stroke style of the range gridlines, if visible.
- title — #####
- titlePaint — #####
- titleBackgroundPaint — #####
- width — #####

###

```
<p:barchart title="Bar Chart" legend="true"
  width="500" height="500">
  <p:series key="Last Year">
    <p:data columnKey="Joe" value="100" />
    <p:data columnKey="Bob" value="120" />
  </p:series>
  >
  <p:series key="This Year">
    <p:data columnKey="Joe" value="125" />
    <p:data columnKey="Bob" value="115" />
  </p:series>
</p:barchart
>
```

&lt;p:linechart&gt;

##

#####

##

- chart — The chart object to display, if programmatic chart creation is being used.
- dataset — The dataset to be displayed, if programmatic dataset is being used.
- borderVisible — #####
- borderPaint — #####
- borderBackgroundPaint — #####
- borderStroke —

- domainAxisLabel — #####
- domainLabelPosition — The angle of the domain axis category labels. Valid values are STANDARD, UP\_45, UP\_90, DOWN\_45 and DOWN\_90. Alternatively, the value can be the positive or negative angle in radians.
- domainAxisPaint — #####
- domainGridlinesVisible — #####
- domainGridlinePaint — #####
- domainGridlineStroke — The stroke style of the domain gridlines, if visible.
- height — #####
- width — #####
- is3D — ##### 2D ##### 3D ##### boolean #####
- legend — ##### boolean #####
- legendItemPaint — The default color of the text labels in the legend.
- legendItemBackgroundPaint — The background color for the legend, if different from the chart background color.
- legendOutlinePaint — The color of the border around the legend.
- orientation — ##### vertical (#####) ##### horizontal #####
- plotBackgroundPaint — The color of the plot background.
- plotBackgroundAlpha — The alpha (transparency) level of the plot background. It should be a number between 0 (completely transparent) and 1 (completely opaque).
- plotForegroundAlpha — The alpha (transparency) level of the plot. It should be a number between 0 (completely transparent) and 1 (completely opaque).
- plotOutlinePaint — The color of the range gridlines, if visible.
- plotOutlineStroke — The stroke style of the range gridlines, if visible.
- rangeAxisLabel — #####

- `rangeAxisPaint` — #####
- `rangeGridlinesVisible` — Controls whether or not gridlines for the range axis are shown on the chart.
- `rangeGridlinePaint` — The color of the range gridlines, if visible.
- `rangeGridlineStroke` — The stroke style of the range gridlines, if visible.
- `title` — #####
- `titlePaint` — The color of the chart title text.
- `titleBackgroundPaint` — The background color around the chart title.
- `width` — #####

###

```
<p:linechart title="Line Chart"
  width="500" height="500">
  <p:series key="Prices">
    <p:data columnKey="2003" value="7.36" />
    <p:data columnKey="2004" value="11.50" />
    <p:data columnKey="2005" value="34.625" />
    <p:data columnKey="2006" value="76.30" />
    <p:data columnKey="2007" value="85.05" />
  </p:series>
</p:linechart
>
```

&lt;p:piechart&gt;

##

#####

##

- `title` — #####
- `chart` — The chart object to display, if programmatic chart creation is being used.
- `dataset` — The dataset to be displayed, if programmatic dataset is being used.

- `label` — The default label text for pie sections.
- `legend` — A boolean value indicating whether or not the chart should include a legend. Default value is `true`
- `is3D` — A boolean value indicating that the chart should be rendered in 3D instead of 2D.
- `labelLinkMargin` — The link margin for labels.
- `labelLinkPaint` — The paint used for the label linking lines.
- `labelLinkStroke` — The stroke used for the label linking lines.
- `labelLinksVisible` — A flag that controls whether or not the label links are drawn.
- `labelOutlinePaint` — The paint used to draw the outline of the section labels.
- `labelOutlineStroke` — The stroke used to draw the outline of the section labels.
- `labelShadowPaint` — The paint used to draw the shadow for the section labels.
- `labelPaint` — The color used to draw the section labels
- `labelGap` — The gap between the labels and the plot as a percentage of the plot width.
- `labelBackgroundPaint` — The color used to draw the background of the section labels. If this is null, the background is not filled.
- `startAngle` — The starting angle of the first section.
- `circular` — A boolean value indicating that the chart should be drawn as a circle. If false, the chart is drawn as an ellipse. The default is `true`.
- `direction` — The direction the pie section are drawn. One of: `clockwise` or `anticlockwise`. The default is `clockwise`.
- `sectionOutlinePaint` — The outline paint for all sections.
- `sectionOutlineStroke` — The outline stroke for all sections
- `sectionOutlinesVisible` — Indicates whether an outline is drawn for each section in the plot.



- `baseSectionOutlinePaint` — The base section outline paint.
- `baseSectionPaint` — The base section paint.
- `baseSectionOutlineStroke` — The base section outline stroke.

###

```

<p:piechart title="Pie Chart" circular="false" direction="anticlockwise"
  startAngle="30" labelGap="0.1" labelLinkPaint="red"
>
  <p:series key="Prices"
>
  <p:data key="2003" columnKey="2003" value="7.36" />
  <p:data key="2004" columnKey="2004" value="11.50" />
  <p:data key="2005" columnKey="2005" value="34.625" />
  <p:data key="2006" columnKey="2006" value="76.30" />
  <p:data key="2007" columnKey="2007" value="85.05" />
  </p:series
>
</p:piechart
>

```

&lt;p:series&gt;

##

#####

#####

##

- `key` — #####
- `seriesPaint` — #####
- `seriesOutlinePaint` — #####
- `seriesOutlineStroke` — #####
- `seriesVisible` — ##### boolean ###
- `seriesVisibleInLegend` — A boolean indicating if the series should be listed in the legend.

###

	<pre>&lt;p:series key="data1"&gt;   &lt;ui:repeat value="{data.pieData1}" var="item"&gt;     &lt;p:data columnKey="{item.name}" value="{item.value}" /&gt;   &lt;/ui:repeat&gt; &lt;/p:series&gt; &gt;</pre>
<p>&lt;p:data&gt;</p>	<pre>## #####  ##  • key — #####  • series — &lt;p:series&gt; #####  • value — #####  • explodedPercent — ##### explodedPercent #####  • sectionOutlinePaint — #####  • sectionOutlineStroke — #####  • sectionPaint — #####  ###</pre> <pre>&lt;p:data key="foo" value="20" sectionPaint="#111111"   explodedPercent=".2" /&gt; &lt;p:data key="bar" value="30" sectionPaint="#333333" /&gt; &lt;p:data key="baz" value="40" sectionPaint="#555555"   sectionOutlineStroke="my-dot-style" /&gt;</pre>
<p>&lt;p:color&gt;</p>	<pre>## #####  ##  • color — ##### #18.1.7.1. #Color Values#</pre>

	<ul style="list-style-type: none"> <li>• color2 — #####</li> <li>• point — #####</li> <li>• point2 — #####</li> </ul> <p>###</p> <pre data-bbox="491 504 1391 689">&lt;p:color id="foo" color="#0ff00f"/&gt; &lt;p:color id="bar" color="#ff00ff" color2="#00ff00"     point="50 50" point2="300 300"/&gt;</pre>
<pre data-bbox="223 721 507 761">&lt;p:stroke&gt;</pre>	<p>##</p> <p>#####</p> <p>##</p> <ul style="list-style-type: none"> <li>• width — #####</li> <li>• cap — ##### butt# round# square ###</li> <li>• join — ##### miter# round# bevel ###</li> <li>• miterLimit — #####</li> <li>• dash — #####</li> <li>• dashPhase — The dash phase indicates the offset into the dash pattern that the line should be drawn with.</li> </ul> <p>###</p> <pre data-bbox="491 1505 1391 1612">&lt;p:stroke id="dot2" width="2" cap="round" join="bevel" dash="2 3" /&gt;</pre>

### 18.3. #####

Seam # iText ##### PDF  
##### Web ##### HTML #####  
#####

<pre data-bbox="223 1897 507 1937">&lt;p:barCode&gt;</pre>	<p>##</p> <p>#####</p>
------------------------------------------------------------	------------------------

```
##  
  
• type — iText ##### EAN13# EAN8# UPCA#  
UPCE# SUPP2# SUPP5# POSTNET# PLANET# CODE128# CODE128_UCC#  
CODE128_RAW# CODABAR #####  
  
• code — The value to be encoded by the barcode.  
  
• xpos — For PDFs, the absolute x position of the barcode on the page.  
  
• ypos — For PDFs, the absolute y position of the barcode on the page.  
  
• rotDegrees — PDF #####  
  
• barHeight — barCode #####  
  
• minBarWidth — #####  
  
• barMultiplier — ##### ### POSTNET # PLANET  
#####  
  
• barColor — #####  
  
• textColor — #####  
  
• textSize — #####  
  
• altText — HTML ##### alt #####  
  
###
```

```
<p:barCode type="code128"  
  barHeight="80"  
  textSize="20"  
  code="(10)45566(17)040301"  
  codeType="code128_ucc"  
  altText="My BarCode" />
```

### 18.4. #####

If you have a complex, pre-generated PDF with named fields, you can easily fill in the values from your application and present it to the user.

<pre>&lt;p:form&gt;</pre>	<pre>##  #####</pre>
---------------------------	------------------------------

	<pre>##  • URL — ##### PDF ##### URL ### ##### (:/) #####  • filename — ##### PDF #####  • exportKey — ##### DocumentData ##### PDF #####</pre>
--	-------------------------------------------------------------------------------------------------------------------------------------------------

<p:field>	<pre>##  #####  ##  • name — #####  • value — #####  • readOnly — ##### true ##</pre>
-----------	---------------------------------------------------------------------------------------

```
<p:form
  xmlns:p="http://jboss.com/products/seam/pdf"
  URL="http://localhost/Concept/form.pdf">
  <p:field name="person.name" value="Me, myself and I"/>
</p:form>
```

## 18.5. Swing/AWT #####

Seam now provides experimental support for rendering Swing components into a PDF image. Some Swing look and feels supports, notably ones that use native widgets, will not render correctly.

<p:swing>	<pre>##  Swing ##### PDF #####  ##  • width — #####</pre>
-----------	-----------------------------------------------------------

- height — The height of the component to be rendered.
- component — Swing ### AWT #####

###

<p:swing width="310" height="120" component="{aButton}" />

## 18.6. iText #####

```
#####
#####
```

```
##### URL /seam-doc.seam ## PDF ##### /myDocument.pdf
##### PDF ##### URL #####
PDF ##### *.pdf ##### DocumentStoreServlet #####
```

```
<servlet>
  <servlet-name
>Document Store Servlet</servlet-name>
  <servlet-class
>org.jboss.seam.document.DocumentStoreServlet</servlet-class>
</servlet>

<servlet-mapping>
  <servlet-name
>Document Store Servlet</servlet-name>
  <url-pattern
>*.pdf</url-pattern>
</servlet-mapping
>
```

```
##### use-extensions
##### URL #####
```

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:document="http://jboss.com/products/seam/document"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="
  http://jboss.com/products/seam/document http://jboss.com/products/seam/document-2.2.xsd
  http://jboss.com/products/seam/components http://jboss.com/products/seam/components-
  2.2.xsd">
```

```
<document:document-store use-extensions="true"/>
</components>
```

```
#####
documentStore # error-page
#####
```

```
<document:document-store use-extensions="true" error-page="/documentMissing.seam" />
```

## 18.7. #####

iText #####

- [iText #####](http://www.lowagie.com/iText/) [http://www.lowagie.com/iText/]
- [iText in Action \(#####\)](http://www.manning.com/lowagie/) [http://www.manning.com/lowagie/]





---

## Microsoft® Excel® #####

Seam#####JExcelAPI [http://jexcelapi.sourceforge.net/]#####Microsoft® Excel®

#####the Microsoft® Excel® spreadsheet application#95#97#

### 19.1. Microsoft® Excel® #####

The Microsoft® Excel® spreadsheet application `jboss-seam-excel.jar`. This JAR contains the the Microsoft® Excel® spreadsheet application JSF controls, which are used to construct views that can render the document, and the DocumentStore component, which serves the rendered document to the user. To include the Microsoft® Excel® spreadsheet application support in your application, include `jboss-seam-excel.jar` in your `WEB-INF/lib` directory along with the `jxl.jar` JAR file. Furthermore, you need to configure the DocumentStore servlet in your `web.xml`

Microsoft® Excel® #####Seam##### Facelets  
##### seam-ui #####

examples/excel #####Microsoft® Excel® #####  
#####

Microsoft® Excel®  
#####API#####ExcelWorkbook#####

```
<excel:excelFactory>
  <property name="implementations">
    <key
>myExcelExporter</key>
    <value
>my.excel.exporter.ExcelExport</value>
  </property>
</excel:excelFactory
>
```

####excel####components#####

```
xmlns:excel="http://jboss.com/products/seam/excel"
```

####myExcelExporter#####UIWorkbook#####"jxl"####"csv"#####

#####.xls#####18.6. #iText #####

####IE####https#####http://  
[www.nwnetworks.com/iezones.htm](http://www.nwnetworks.com/iezones.htm)#####web.xml#####

## 19.2. #####

#####<h:dataTable>#####List#Set#Map#Array#DataModel#####

```
<e:workbook xmlns:e="http://jboss.com/products/seam/excel">
  <e:worksheet>
    <e:cell column="0" row="0" value="Hello world!"/>
  </e:worksheet>
</e:workbook>
```

#####

```
<e:workbook xmlns:e="http://jboss.com/products/seam/excel">
  <e:worksheet value="#{data}" var="item">
    <e:column>
      <e:cell value="#{item.value}"/>
    </e:column>
  </e:worksheet>
</e:workbook>
```

#####workbook#####worksheet#####worksheet#####

#####

## 19.3. workbook##

workbook#####worksheet#####link#####

<code>&lt;e:workbook&gt;</code>	<p><b>##</b></p> <ul style="list-style-type: none"> <li>• <code>type</code> — Defines which export module to be used. The value is a string and can be either "jxl" or "csv". The default is "jxl".</li> <li>• <code>templateURI</code> — A template that should be used as a basis for the workbook. The value is a string (URI).</li> </ul>
---------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

- `arrayGrowSize` — The amount of memory by which to increase the amount of memory allocated to storing the workbook data. For processes reading many small workbooks inside a WAS it might be necessary to reduce the default size. Default value is 1 megabyte. The value is a number (bytes).
- `autoFilterDisabled` — Should autofiltering be disabled?. The value is a boolean.
- `cellValidationDisabled` — Should cell validation be ignored? The value is a boolean.
- `characterSet` — The character set. This is only used when the spreadsheet is read, and has no effect when the spreadsheet is written. The value is a string (character set encoding).
- `drawingsDisabled` — Should drawings be disabled? The value is a boolean.
- `excelDisplayLanguage` — The language in which the generated file will display. The value is a string (two character ISO 3166 country code).
- `excelRegionalSettings` — The regional settings for the generated excel file. The value is a string (two character ISO 3166 country code).
- `formulaAdjust` — Should formulas be adjusted? The value is a boolean.
- `gcDisabled` — Should garbage collection be disabled? The value is a boolean.
- `ignoreBlanks` — Should blanks be ignored? The value is a boolean.
- `initialFileSize` — The initial amount of memory allocated to store the workbook data when reading a worksheet. For processes reading many small workbooks inside a WAS it might be necessary to reduce the default size. Default value is 5 megabytes. The value is a number (bytes).
- `locale` — The locale used by JExcelApi to generate the spreadsheet. Setting this value has no effect on the language or region of the generated excel file. The value is a string.
- `mergedCellCheckingDisabled` — Should merged cell checking be disabled? The value is a boolean.

- `namesDisabled` — Should handling of names be disabled? The value is a boolean.
- `propertySets` — Should any property sets be enabled (such as macros) to be copied along with the workbook? Leaving this feature enabled will result in the JXL process using more memory. The value is a boolean.
- `rationalization` — Should the cell formats be rationalized before writing out the sheet? The value is a boolean. Default is true.
- `suppressWarnings` — Should warnings be suppressed?. Due to the change in logging in version 2.4, this will now set the warning behaviour across the JVM (depending on the type of logger used). The value is a boolean.
- `temporaryFileDuringWriteDirectory` — Used in conjunction with the `useTemporaryFileDuringWrite` setting to set the target directory for the temporary files. This value can be NULL, in which case the normal system default temporary directory is used instead. The value is a string (the directory to which temporary files should be written).
- `useTemporaryFileDuringWrite` — Should a temporary file is used during the generation of the workbook. If not set, the workbook will take place entirely in memory. Setting this flag involves an assessment of the trade-offs between memory usage and performance. The value is a boolean.
- `workbookProtected` — Should the workbook be protected? The value is a boolean.
- `filename` — The filename to use for the download. The value is a string. Please note that if you map the `DocumentServlet` to some pattern, this file extension must also match.
- `exportKey` — A key under which to store the resulting data in a `DocumentData` object under the event scope. If used, there is no redirection.

###

- `<e:link/>` — Zero or more stylesheet links (see [#19.14.1.#####](#)).
- `<e:worksheet/>` — Zero or more worksheets (see [#19.4.#worksheet###](#)).

#####

- ##

```
<e:workbook>
  <e:worksheet>
    <e:cell value="Hello World" row="0" column="0"/>
  </e:worksheet>
</e:workbook>
```

#####A1#####

## 19.4. worksheet##

Worksheets are the children of workbooks and the parent of columns and worksheet commands. They can also contain explicitly placed cells, formulas, images and hyperlinks. They are the pages that make up the workbook.

&lt;e:worksheet&gt;

- `value` — An EL-expression to the backing data. The value is a string. The target of this expression is examined for an Iterable. Note that if the target is a Map, the iteration is done over the Map.Entry entrySet(), so you should use a `.key` or `.value` to target in your references.
- `var` — The current row iterator variable name that can later be referenced in cell value attributes. The value is a string.
- `name` — The name of the worksheet. The value is a string. Defaults to `Sheet#` where `#` is the worksheet index. If the given worksheet name exists, that sheet is selected. This can be used for merging several data sets into a single worksheet, just define the same name for them (using `startRow` and `startCol` to make sure that they don't occupy the same space).
- `startRow` — Defines the starting row for the data. The value is a number. Used for placing the data in other places than the upper-left corner (especially useful if having multiple data sets for a single worksheet). The defaults is 0.
- `startColumn` — Defines the starting column for the data. The value is a number. Used for placing the data in other places than the upper-

left corner (especially useful if having multiple data sets for a single worksheet). The default is 0.

- `automaticFormulaCalculation` — Should formulas be automatically calculated? The value is a boolean.
- `bottomMargin` — The bottom margin. The value is a number (inches).
- `copies` — The number of copies. The value is a number.
- `defaultColumnWidth` — The default column width. The value is a number (characters \* 256).
- `defaultRowHeight` — The default row height. The value is a number (1/20ths of a point).
- `displayZeroValues` — Should zero-values be displayed? The value is a boolean.
- `fitHeight` — The number of pages vertically that this sheet will be printed into. The value is a number.
- `fitToPages` — Should printing be fit to pages? The value is a boolean.
- `fitWidth` — The number of pages widthwise which this sheet should be printed into. The value is a number.
- `footerMargin` — The margin for any page footer. The value is a number (inches).
- `headerMargin` — The margin for any page headers. The value is a number (inches).
- `hidden` — Should the worksheet be hidden? The value is a boolean.
- `horizontalCentre` — Should the worksheet be centered horizontally? The value is a boolean.
- `horizontalFreeze` — The row at which the pane is frozen vertically. The value is a number.
- `horizontalPrintResolution` — The horizontal print resolution. The value is a number.
- `leftMargin` — The left margin. The value is a number (inches).
- `normalMagnification` — The normal magnification factor (not zoom or scale factor). The value is a number (percentage).

- `orientation` — The paper orientation for printing this sheet. The value is a string that can be either "landscape" or "portrait".
- `pageBreakPreviewMagnification` — The page break preview magnification factor (not zoom or scale factors). The value is a number (percentage).
- `pageBreakPreviewMode` — Show page in preview mode? The value is a boolean.
- `pageStart` — The page number at which to commence printing. The value is a number.
- `paperSize` — The paper size to be used when printing this sheet. The value is a string that can be one of "a4", "a3", "letter", "legal" etc (see [jxl.format.PaperSize](http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/PaperSize.html) [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/PaperSize.html] ).
- `password` — The password for this sheet. The value is a string.
- `passwordHash` — The password hash - used only when copying sheets. The value is a string.
- `printGridLines` — Should grid lines be printed? The value is a boolean.
- `printHeaders` — Should headers be printed? The value is a boolean.
- `sheetProtected` — Should the sheet be protected (read-only)? The value is a boolean.
- `recalculateFormulasBeforeSave` — Should the formulas be recalculated when the sheet is saved? The value is a boolean. Default value is false.
- `rightMargin` — The right margin. The value is a number (inches).
- `scaleFactor` — The scale factor for this sheet to be used when printing. The value is a number (percent).
- `selected` — Should the sheet be selected when the workbook opens? The value is a boolean.
- `showGridLines` — Should gridlines be shown? The value is a boolean.
- `topMargin` — The top margin. The value is a number (inches).
- `verticalCentre` — Center verically? The value is a boolean.

- `verticalFreeze` — The row at which the pane is frozen vertically. The value is a number.
- `verticalPrintResolution` — The vertical print resolution. The value is a number.
- `zoomFactor` — The zoom factor. Do not confuse zoom factor (which relates to the on screen view) with scale factor (which refers to the scale factor when printing). The value is a number (percentage).

###

- `<e:printArea/>` — Zero or more print area definitions (see [#19.11. #printArea###printTitle###](#)).
- `<e:printTitle/>` — Zero or more print title definitions (see [#19.11. #printArea###printTitle###](#)).
- `<e:headerFooter/>` — Zero or more header/footer definitions (see [#19.10. #header###footer###](#)).
- `0#####` [#19.12. #####](#)

#####

- `header`— Contents that will be placed at the top of the data block, above the column headers (if any).
- `footer`— Contents that will be placed at the bottom of the data block, below the column footers (if any).

```
<e:workbook>
  <e:worksheet name="foo" startColumn="1" startRow="1">
    <e:column value="#{personList}" var="person">
      <f:facet name="header">
        <e:cell value="Last name"/>
      </f:facet>
      <e:cell value="#{person.lastName}"/>
    </e:column>
  </e:worksheet>
</e:workbook>
```



```
###B2#####"foo"#####
```

## 19.5. column##

```
column####worksheet#####cell###image###formula###hyperlink#####  
#####
```

<code>&lt;e:column&gt;</code>	<p><b>##</b></p> <ul style="list-style-type: none"> <li>• ##</li> </ul> <p><b>###</b></p> <ul style="list-style-type: none"> <li>• <code>&lt;e:cell/&gt;</code> — Zero or more cells (see <a href="#">#19.6. #cell###</a>).</li> <li>• <code>&lt;e:formula/&gt;</code> — Zero or more formulas (see <a href="#">#19.7. #formula###</a>).</li> <li>• <code>&lt;e:image/&gt;</code> — Zero or more images (see <a href="#">#19.8. #image###</a>).</li> <li>• <code>&lt;e:hyperLink/&gt;</code> — Zero or more hyperlinks (see <a href="#">#19.9. #hyperlink###</a>).</li> </ul> <p><b>#####</b></p> <ul style="list-style-type: none"> <li>• <code>header</code> — This facet can/will contain one <code>&lt;e:cell&gt;</code>, <code>&lt;e:formula&gt;</code>, <code>&lt;e:image&gt;</code> or <code>&lt;e:hyperLink&gt;</code> that will be used as header for the column.</li> <li>• <code>footer</code> — This facet can/will contain one <code>&lt;e:cell&gt;</code>, <code>&lt;e:formula&gt;</code>, <code>&lt;e:image&gt;</code> or <code>&lt;e:hyperLink&gt;</code> that will be used as footer for the column.</li> </ul>
-------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

```
<e:workbook>  
  <e:worksheet value="#{personList}" var="person">  
    <e:column>  
      <f:facet name="header">  
        <e:cell value="Last name"/>  
      </f:facet>  
      <e:cell value="#{person.lastName}"/>  
    </e:column>  
  </e:worksheet>  
</e:workbook>
```

#####

## 19.6. cell##

Cells are nested within columns (for iteration) or inside worksheets (for direct placement using the `column` and `row` attributes) and are responsible for outputting the value (usually through an EL-expression involving the `var`-attribute of the datatable. See ???

<code>&lt;e:cell&gt;</code>	<p><b>##</b></p> <ul style="list-style-type: none"> <li><code>column</code> — The column where to place the cell. The default is the internal counter. The value is a number. Note that the value is 0-based.</li> <li><code>row</code> — The row where to place the cell. The default is the internal counter. The value is number. Note that the value is 0-based.</li> <li><code>value</code> — The value to display. Usually an EL-expression referencing the <code>var</code>-attribute of the containing datatable. The value is a string.</li> <li><code>comment</code> — A comment to add to the cell. The value is a string.</li> <li><code>commentHeight</code> — The height of the comment. The value is a number (in pixels).</li> <li><code>commentWidth</code> — A width of the comment. The value is a number (in pixels).</li> </ul> <p><b>###</b></p> <ul style="list-style-type: none"> <li>0#####<a href="#">#19.6.1. #validation###</a>#####</li> </ul> <p><b>####</b></p> <ul style="list-style-type: none"> <li><b>##</b></li> </ul>
-----------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

```

<e:workbook>
  <e:worksheet
>
  <e:column value="#{personList}" var="person">
    <f:facet name="header">
      <e:cell value="Last name"/>

```

```

    </f:facet>
    <e:cell value="#{person.lastName}"/>
  </e:column>
</e:worksheet>
</e:workbook
>

```

```
#####
```

### 19.6.1. validation##

Validations are nested inside cells or formulas. They add constrains for the cell data.

```
<e:numericValidation##
```

- value — The limit (or lower limit where applicable) of the validation. The value is a number.
  - value2 — The upper limit (where applicable) of the validation. The value is a number.
  - condition — The validation condition. The value is a string.
    - "equal" - #####value#####
    - "greater\_equal" - #####value#####
    - "less\_equal" - #####value#####
    - "less\_than" - #####value#####
    - "not\_equal" - #####value#####
    - "between" - #####value#####value2#####
    - "not\_between" - #####value#####value2#####
- ```
###
```
- ##
- ```
#####
```

	<ul style="list-style-type: none"><li>• ##</li></ul>
--	------------------------------------------------------

```
<e:workbook>
  <e:worksheet>
    <e:column value="{personList}" var="person"
>
    <e:cell value="{person.age}">
      <e:numericValidation condition="between" value="4"
        value2="18"/>
    </e:cell>
  </e:column>
</e:worksheet>
</e:workbook
>
```

#####4#18#####

<code>&lt;e:rangeValidation&gt;</code>	<b>##</b> <ul style="list-style-type: none"><li>• <code>startColumn</code> — The starting column of the range of values to validate against. The value is a number.</li><li>• <code>startRow</code> — The starting row of the range of values to validate against. The value is a number.</li><li>• <code>endColumn</code> — The ending column of the range of values to validate against. The value is a number.</li><li>• <code>endRow</code> — The ending row of the range of values to validate against. The value is a number.</li></ul> <b>###</b> <ul style="list-style-type: none"><li>• ##</li></ul> <b>#####</b> <ul style="list-style-type: none"><li>• ##</li></ul>
----------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

```

<e:workbook>
  <e:worksheet>
    <e:column value="{personList}" var="person"
  >
    <e:cell value="{person.position}">
    <e:rangeValidation startColumn="0" startRow="0"
      endColumn="0" endRow="10"/>
    </e:cell>
  </e:column>
</e:worksheet>
</e:workbook>
  >

```

#####A1:A10#####

<e:listValidation>	##
	• ##
	###
	• 0###listValidationItem##
	#####
	• ##

e:listValidation#####e:listValidationItem#####

<e:listValidationItem>	##
	• value — A values to validate against.
	###
	• ##
	#####
	• ##

```

<e:workbook>
  <e:worksheet>
    <e:column value="{personList}" var="person"
  >
    <e:cell value="{person.position}">
      <e:listValidation>
        <e:listValidationItem value="manager"/>
        <e:listValidationItem value="employee"/>
      </e:listValidation>
    </e:cell>
  </e:column>
</e:worksheet>
</e:workbook
>

```

#####"manager"#####"employee"#####

### 19.6.2. #####

Format masks are defined in the mask attribute in cells or formulas. There are two types of format masks, one for numbers and one for dates

#### 19.6.2.1. #####

#####"format1"#"accounting\_float"#####  
[jxl.write.NumberFormats](http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/write/NumberFormats.html) [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/write/NumberFormats.html]#####

##### [java.text.DecimalFormat](http://java.sun.com/javase/6/docs/api/java/text/DecimalFormat.html) [http://java.sun.com/javase/6/docs/api/java/text/DecimalFormat.html]#####"0.00"#####

#### 19.6.2.2. #####

When encountering a format mask, first it is checked if it is in internal form, e.g "format1", "format2" and so on (see [jxl.write.DateFormats](http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/write/DateFormats.html) [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/write/DateFormats.html] ).

##### [java.text.DateFormat](http://java.sun.com/javase/6/docs/api/java/text/DateFormat.html) [http://java.sun.com/javase/6/docs/api/java/text/DateFormat.html]#####"dd.MM.yyyy"#####

## 19.7. formula##

formula####column#####worksheet#####column###row#####  
#cell########formula#####

The formula of the cell is placed in the `value`-attribute as a normal the Microsoft® Excel® spreadsheet application notation. Note that when doing cross-sheet formulas, the worksheets must exist before referencing a formula against them. The value is a string.

```
<e:workbook>
  <e:worksheet name="fooSheet">
    <e:cell column="0" row="0" value="1"/>
  </e:worksheet>
  <e:worksheet name="barSheet">
    <e:cell column="0" row="0" value="2"/>
    <e:formula column="0" row="1"
      value="fooSheet!A1+barSheet1!A1">
      <e:font fontSize="12"/>
    </e:formula>
  </e:worksheet>
</e:workbook>
```

####BarSheet#B1####FooSheet#BarSheet#A1#####

## 19.8. image##

image####column#####worksheet#####startColumn/startRow###rowSpan/  
columnSpan#####span#####

<e:image>

##

- `startColumn` — The starting column of the image. The default is the internal counter. The value is a number. Note that the value is 0-based.
- `startRow` — The starting row of the image. The default is the internal counter. The value is a number. Note that the value is 0-based.
- `columnSpan` — The column span of the image. The default is one resulting in the default width of the image. The value is a float.

- `rowSpan` — The row span of the image. The default is the one resulting in the default height of the image. The value is a float.
- `URI` — The URI to the image. The value is a string.

###

- ##

#####

- ##

```
<e:workbook>
  <e:worksheet>
    <e:image startRow="0" startColumn="0" rowSpan="4"
      columnSpan="4" URI="http://foo.org/logo.jpg"/>
  </e:worksheet>
</e:workbook
```

>

#####URI####A1:E5#####

## 19.9. hyperlink##

hyperlink####column#####worksheet#####startColumn/  
startRow###endColumn/endRow#####URI#####

<e:hyperlink>

##

- `startColumn` — The starting column of the hyperlink. The default is the internal counter. The value is a number. Note that the value is 0-based.
- `startRow` — The starting row of the hyperlink. The default is the internal counter. The value is a number. Note that the value is 0-based.
- `endColumn` — The ending column of the hyperlink. The default is the internal counter. The value is a number. Note that the value is 0-based.



- `endRow` — The ending row of the hyperlink. The default is the internal counter. The value is a number. Note that the value is 0-based.
- `URL` — The URL to link. The value is a string.
- `description` — The description of the link. The value is a string.

###

- ##

#####

- ##

```

<e:workbook>
  <e:worksheet>
    <e:hyperLink startRow="0" startColumn="0" endRow="4"
      endColumn="4" URL="http://seamframework.org"
      description="The Seam Framework"/>
  </e:worksheet>
</e:workbook
>

```

#####seamframework.org#####A1:E5#####

## 19.10. header###footer##

header###footer###worksheet#####facet#####facet#####

&lt;e:header&gt;

##

- ##

###

- ##

#####

	<ul style="list-style-type: none"> <li>• left — The contents of the left header/footer part.</li> <li>• center — The contents of the center header/footer part.</li> <li>• right — The contents of the right header/footer part.</li> </ul>
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<e:footer>	<p>##</p> <ul style="list-style-type: none"> <li>• ##</li> </ul> <p>###</p> <ul style="list-style-type: none"> <li>• ##</li> </ul> <p>####</p> <ul style="list-style-type: none"> <li>• left — The contents of the left header/footer part.</li> <li>• center — The contents of the center header/footer part.</li> <li>• right — The contents of the right header/footer part.</li> </ul>
------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

facet#####

#date#	#####
#page_number#	#####
#time#	#####
#total_pages#	#####
#worksheet_name#	#####
#workbook_name#	#####
#bold#	#####bold#####
#italics#	#####italic#####
#underline#	#####underline#####
#double_underline#	#####double_underline#####
#outline#	#####outline#####
#shadow#	#####shadow#####
#strikethrough#	#####strikethrough#####
#subscript#	#####subscript#####
#superscript#	#####superscript#####
#superscript#	#####font_name=Verdana#####

#font\_size#

#####font\_size=12#####

```

<e:workbook>
  <e:worksheet
>
  <e:header>
    <f:facet name="left">
      This document was made on #date# and has #total_pages# pages
    </f:facet>
    <f:facet name="right">
      #time#
    </f:facet>
  </e:header>
</e:worksheet>
</e:workbook>

```

## 19.11. printArea###printTitle##

printArea###printTitle#####

&lt;e:printArea&gt;

##

- `firstColumn` — The column of the top-left corner of the area. The parameter is a number. Note that the value is 0-based.
- `firstRow` — The row of the top-left corner of the area. The parameter is a number. Note that the value is 0-based.
- `lastColumn` — The column of the bottom-right corner of the area. The parameter is a number. Note that the value is 0-based.
- `lastRow` — The row of the bottom-right corner of the area. The parameter is a number. Note that the value is 0-based.

###

- ##

#####

- ##

```
<e:workbook>
  <e:worksheet
>
  <e:printTitles firstRow="0" firstColumn="0"
    lastRow="0" lastColumn="9"/>
  <e:printArea firstRow="1" firstColumn="0"
    lastRow="9" lastColumn="9"/>
  </e:worksheet>
</e:workbook>
```

####A1:A10#####B2:J10#####

## 19.12. #####

#####workbook#####

### 19.12.1. #####

#####

<code>&lt;e:groupRows&gt;</code>	<p><b>##</b></p> <ul style="list-style-type: none"><li>• <code>startRow</code> — The row to start the grouping at. The value is a number. Note that the value is 0-based.</li><li>• <code>endRow</code> — The row to end the grouping at. The value is a number. Note that the value is 0-based.</li><li>• <code>collapse</code> — Should the grouping be collapsed initially? The value is a boolean.</li></ul> <p><b>###</b></p> <ul style="list-style-type: none"><li>• <code>##</code></li></ul> <p><b>#####</b></p> <ul style="list-style-type: none"><li>• <code>##</code></li></ul>
----------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<code>&lt;e:groupColumns&gt;</code>	<b>##</b>
-------------------------------------	-----------

- `startColumn` — The column to start the grouping at. The value is a number. Note that the value is 0-based.
- `endColumn` — The column to end the grouping at. The value is a number. Note that the value is 0-based.
- `collapse` — Should the grouping be collapsed initially? The value is a boolean.

###

- ##

#####

- ##

```

<e:workbook>
  <e:worksheet
>
    <e:groupRows startRow="4" endRow="9" collapse="true"/>
    <e:groupColumns startColumn="0" endColumn="9" collapse="false"/>
  </e:worksheet>
</e:workbook>

```

groups rows 5 through 10 and columns 5 through 10 so that the rows are initially collapsed (but not the columns).

## 19.12.2. #####

#####

&lt;e:rowPageBreak&gt;

##

- `row` — The row to break at. The value is a number. Note that the value is 0-based.

###

- ##

	#####  • ##
--	-------------------

```
<e:workbook>  
  <e:worksheet  
>  
    <e:rowPageBreak row="4"/>  
  </e:worksheet>  
</e:workbook  
>
```

#####5#####

### 19.12.3. #####

#####

<e:mergeCells>	##  • startRow — The row to start the merging from. The value is a number. Note that the value is 0-based.  • startColumn — The column to start the merging from. The value is a number. Note that the value is 0-based.  • endRow — The row to end the merging at. The value is a number. Note that the value is 0-based.  • endColumn — The column to end the merging at. The value is a number. Note that the value is 0-based.  ###  • ##  #####  • ##
----------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

```

<e:workbook>
  <e:worksheet>
    <e:mergeCells startRow="0" startColumn="0" endRow="9" endColumn="9"/>
  </e:worksheet>
</e:workbook
>

```

####A1:J10#####

### 19.13. #####

#####XHTML#####JSF#####org.jboss.seam.excel.excelExporter.export##

```

<h:form id="theForm">
  <h:dataTable id="theDataTable" value="#{personList.personList}"
    var="person">
    ...
  </h:dataTable>
</h:form>

```

###Microsoft® Excel®#####

```

<h:commandLink
  value="Export"
  action="#{excelExporter.export('theForm:theDataTable')}"
/>

```

#####s:link#####

#####19.14. #####

## 19.14. #####

CSS#####font#border#background####CSS#####

The CSS attributes cascade down from parent to children and within one tag cascades over the CSS classes referenced in the `styleClass` attributes and finally over the CSS attributes defined in the `style` attribute. You can place them pretty much anywhere but e.g. placing a column width setting in a cell nested within that column makes little sense.

If you have format masks or fonts that use special characters, such as spaces and semicolons, you can escape the css string with " characters like `xls-format-mask:'$;'`

### 19.14.1. #####

#####e:link#####e:link####workbook#####

<code>&lt;e:link&gt;</code>	##
	<ul style="list-style-type: none"> <li>• URL — The URL to the stylesheet</li> </ul>
	###
	<ul style="list-style-type: none"> <li>• ##</li> </ul>
	#####
	<ul style="list-style-type: none"> <li>• ##</li> </ul>

```

<e:workbook>
  <e:link URL="/css/excel.css"/>
</e:workbook
>

```

#####"/css/excel.css"#####

### 19.14.2. ####

###XLS-CSS#####

<code>xls-font-family</code>	#####OS#####
<code>xls-font-size</code>	#####



xls-font-color	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Colour.html">jxl.format.Colour</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Colour.html]#####
xls-font-bold	#####"true"#####"false"#####
xls-font-italic	#####"true"#####"false"#####
xls-font-script-style	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/ScriptStyle.html">jxl.format.ScriptStyle</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/ScriptStyle.html]#####
xls-font-underline-style	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/UnderlineStyle.html">jxl.format.UnderlineStyle</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/UnderlineStyle.html]#####
xls-font-struck-out	#####"true"#####"false"#####
xls-font	#####'Times New Roman'#####'italic'#"bold"#"struckout"##### Example style="xls-font: red bold italic 22 Verdana"

### 19.14.3. ####

This group of XLS-CSS attributes defines the borders of the cell

xls-border-left-color	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Colour.html">jxl.format.Colour</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Colour.html]#####
xls-border-left-line-style	The border line style of the left edge of the cell (see <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/BorderLineStyle.html">jxl.format.BorderLineStyle</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/BorderLineStyle.html] ).
xls-border-left	#####style="xls-border-left: thick red"#####
xls-border-top-color	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Colour.html">jxl.format.Colour</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Colour.html]#####
xls-border-top-line-style	The border line style of the top edge of the cell (see <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/BorderLineStyle.html">jxl.format.BorderLineStyle</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/BorderLineStyle.html] ).
xls-border-top	A shorthand for setting line style and color of the top edge of the cell, e.g style="xls-border-top: red thick"
xls-border-right-color	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Colour.html">jxl.format.Colour</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Colour.html]#####
xls-border-right-line-style	The border line style of the right edge of the cell (see <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/BorderLineStyle.html">jxl.format.BorderLineStyle</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/BorderLineStyle.html] ).
xls-border-right	#####style="xls-border-right: thick red"#####

xls-border-bottom-color	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Colour.html">jxl.format.Colour</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Colour.html]#####
xls-border-bottom-line-style	The border line style of the bottom edge of the cell (see <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/BorderLineStyle.html">jxl.format.BorderLineStyle</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/BorderLineStyle.html] ).
xls-border-bottom	#####style="xls-border-bottom: thick red"#####
xls-border	#####style="xls-border: thick red"#####

#### 19.14.4. ##

This group of XLS-CSS attributes defines the background of the cell

xls-background-color	The color of the background (see <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/BorderLineStyle.html">jxl.format.BorderLineStyle</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/BorderLineStyle.html] ).
xls-background-pattern	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Pattern.html">jxl.format.Pattern</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Pattern.html]#####
xls-background	#####

#### 19.14.5. ####

This group of XLS-CSS attributes defines the column widths etc.

xls-column-width	#####5000#####XHTML#####e:column#####
xls-column-widths	#####5000##### Example style="xls-column-widths: 5000, 5000, *, 10000"
xls-column-autosize	#####"true"#####"false"#####
xls-column-hidden	#####"true"#####"false"#####
xls-column-export	Should the column be shown in export? Valid values are "true" and "false". Default is "true".

#### 19.14.6. ####

This group of XLS-CSS attributes defines the cell properties

xls-alignment	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Alignment.html">jxl.format.Alignment</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Alignment.html]#####
xls-force-type	#####"general"#"number"#"text"#"date"#"formula"#"bool"#####
xls-format-mask	#####19.6.2. ##### 19.6.2. #####

xls-indentation	#####
xls-locked	#####"true"#####"false"#####
xls-orientation	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Orientation.html">jxl.format.Orientation</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/Orientation.html]#####
xls-vertical-alignment	##### <a href="http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/VerticalAlignment.html">jxl.format.VerticalAlignment</a> [http://jexcelapi.sourceforge.net/resources/javadocs/current/docs/jxl/format/VerticalAlignment.html]#####
xls-shrink-to-fit	#####"true"#####"false"#####
xls-wrap	#####"true"#####"false"#####

### 19.14.7. #####

#####XHTML#####XLS-CSS#####xls-column-widths#####UIColumn#style#styleClass#####

### 19.14.8. #####

TODO

### 19.14.9. ##

#####CSS#####

- When using .xhtml documents, stylesheets must be referenced through the `<e:link>` tag
- #####CSS#XLS-CSS#####

## 19.15. Internationalization

There are only two resources bundle keys used, both for invalid data format and both take a parameter (the invalid value)

- `org.jboss.seam.excel.not_a_number` — When a value thought to be a number could not be treated as such
- `org.jboss.seam.excel.not_a_date` — When a value thought to be a date could not be treated as such

### 19.16. #####

The core of the the Microsoft® Excel® spreadsheet application functionality is based on the excellent JExcelAPI library which can be found on <http://jexcelapi.sourceforge.net/> [http://jexcelapi.sourceforge.net] and most features and possible limitations are inherited from here.

#####Seam#####JBoss  
Seam JIRA#"excel"#####

---

## RSS####

YARFRAW

[<http://yarfraw.sourceforge.net/>]

```
]#####Seam#RSS#####RSS#####"#####  
#####"
```

### 20.1. #####

```
RSS#####WEB-INF/lib#####jboss-seam-
```

```
rss.jar#####RSS#####RSS#####
```

```
#Seam RSS #####
```

```
Seam RSS##### #Facelets#####
```

### 20.2. #####

```
examples/rss
```

```
#####
```

```
RSS
```

```
#####RSS#####
```

```
#####xhtml#####
```

```
<r:feed  
  xmlns="http://www.w3.org/1999/xhtml"  
  xmlns:ui="http://java.sun.com/jsf/facelets"  
  xmlns:r="http://jboss.com/products/seam/rss"  
  title="#{rss.feed.title}"  
  uid="#{rss.feed.uid}"  
  subtitle="#{rss.feed.subtitle}"  
  updated="#{rss.feed.updated}"  
  link="#{rss.feed.link}">  
  <ui:repeat value="#{rss.feed.entries}" var="entry">  
    <r:entry  
      uid="#{entry.uid}"  
      title="#{entry.title}"  
      link="#{entry.link}"  
      author="#{entry.author}"  
      summary="#{entry.summary}"  
      published="#{entry.published}"  
      updated="#{entry.updated}"  
    />  
  </ui:repeat>  
</r:feed>
```

## 20.3. ####

#####0#####

<code>&lt;r:feed&gt;</code>	<p><b>##</b></p> <ul style="list-style-type: none"><li>• <code>uid</code> — An optional unique feed id. The value is a string.</li><li>• <code>title</code> — The title of the feed. The value is a string.</li><li>• <code>subtitle</code> — The subtitle of the feed. The value is a string.</li><li>• <code>updated</code> — When was the feed updated? The value is a date.</li><li>• <code>link</code> — The link to the source of the information. The value is a string.</li><li>• <code>feedFormat</code> — The feed format. The value is a string and defaults to ATOM1. Valid values are RSS10, RSS20, ATOM03 and ATOM10.</li></ul> <p><b>###</b></p> <ul style="list-style-type: none"><li>• 0#####</li></ul> <p><b>#####</b></p> <ul style="list-style-type: none"><li>• ##</li></ul>
-----------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## 20.4. ####

#####"headlines"#####

<code>&lt;r:feed&gt;</code>	<p><b>##</b></p> <ul style="list-style-type: none"><li>• <code>uid</code> — An optional unique entry id. The value is a string.</li><li>• <code>title</code> — The title of the entry. The value is a string.</li><li>• <code>link</code> — A link to the item. The value is a string.</li><li>• <code>author</code> — The author of the story. The value is a string.</li><li>• <code>summary</code> — The body of the story. The value is a string.</li><li>• <code>textFormat</code> — The format of the body and title of the story. The value is a string and valid values are "text" and "html". Defaults to "html".</li></ul>
-----------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

```
• published — When was the story first published? The value is a date.  
• updated — When was the story updated? The value is a date.  
###  
• ##  
#####  
• ##
```

**20.5. #####**

The core of the RSs functionality is based on the YARFRAW library which can be found on <http://yarfraw.sourceforge.net/> and most features and possible limitations are inherited from here.

ATOM 1.0#####[ATOM1.0##](http://atompub.org/2005/07/11/draft-ietf-atompub-format-10.html) [http://atompub.org/2005/07/11/draft-ietf-atompub-format-10.html]#####

RSS 2.0#####[RSS 2.0##](http://cyber.law.harvard.edu/rss/rss.html) [http://cyber.law.harvard.edu/rss/rss.html]#####





---

## #####

Seam ## #####

##### jboss-seam-mail.jar ##### ## JAR ##### JSF #####  
mailSession #####

examples/mail #####  
#####

Seam##### #37.3.4. #Seam#####

## 21.1. #####

Seam#####Facelets#####

```
<m:message xmlns="http://www.w3.org/1999/xhtml"
  xmlns:m="http://jboss.com/products/seam/mail"
  xmlns:h="http://java.sun.com/jsf/html">

  <m:from name="Peter" address="peter@example.com" />
  <m:to name="#{person.firstname} #{person.lastname}"
>#{person.address}</m:to>
  <m:subject
>Try out Seam!</m:subject>

  <m:body>
  <p
><h:outputText value="Dear #{person.firstname}" /></p>
  <p
>You can try out Seam by visiting
  <a href="http://labs.jboss.com/jbossseam"
>http://labs.jboss.com/jbossseam</a
>.</p>
  <p
>Regards,</p>
  <p
>Pete</p>
  </m:body>

</m:message
>
```

## #21# #####

---

```
<m:message> ##### Seam # email ##### <m:message> #####  
##### <m:from> ### ##### <m:to> ## (###Facelets ##### EL  
#####)# ## <m:subject> #####
```

```
<m:body> # email ##### HTML ##### JSF #####
```

```
##### m:message ##### mailSession # email  
##### Seam #####
```

```
@In(create=true)  
private Renderer renderer;  
  
public void send() {  
    try {  
        renderer.render("/simple.xhtml");  
        facesMessages.add("Email sent successfully");  
    }  
    catch (Exception e) {  
        facesMessages.add("Email sending failed: " + e.getMessage());  
    }  
}
```

```
#####
```

### 21.1.1. #####

```
Seam ##### java #####
```

```
jboss-seam-mail.jar #####
```

```
<m:attachment value="/WEB-INF/lib/jboss-seam-mail.jar"/>
```

```
Seam ##### jboss-seam-mail.jar  
##### fileName #####
```

```
<m:attachment value="/WEB-INF/lib/jboss-seam-mail.jar" fileName="this-is-so-cool.jar"/>
```

```
java.io.File, java.net.URL #####
```

```
<m:attachment value="#{numbers}"/>
```

#### byte[] #### java.io.InputStream

```
<m:attachment value="#{person.photo}" contentType="image/png"/>
```

#####byte[]#java.io.InputStream#####MIME#####

##### <m:attachment> ##### Seam ## PDF ### JSF ###  
#####

```
<m:attachment fileName="tiny.pdf">
  <p:document
  >
    A very tiny PDF
  </p:document>
</m:attachment
>
```

##### (## #####)# <ui:repeat> #####

```
<ui:repeat value="#{people}" var="person">
  <m:attachment value="#{person.photo}" contentType="image/jpeg"
  fileName="#{person.firstname}_#{person.lastname}.jpg"/>
</ui:repeat
>
```

#####

```
<m:attachment
  value="#{person.photo}"
  contentType="image/jpeg"
  fileName="#{person.firstname}_#{person.lastname}.jpg"
  status="personPhoto"
  disposition="inline" />

```

cid:#{...}#####IETF#####  
ID#####

"status"#####

### 21.1.2. HTML/Text ####

#####HTML#####

```
<m:body>
  <f:facet name="alternative"
>Sorry, your email reader can't show our fancy email,
please go to http://labs.jboss.com/jbossseam to explore Seam.</f:facet>
</m:body
>
```

### 21.1.3. #####

#####<ui:repeat>#####

```
<ui:repeat value="#{allUsers}" var="user">
  <m:to name="#{user.firstname} #{user.lastname}" address="#{user.emailAddress}" />
</ui:repeat
>
```

### 21.1.4. #####

#### (#####)# #####  
<ui:repeat> #####

```
<ui:repeat value="#{people}" var="p">
  <m:message>
    <m:from name="#{person.firstname} #{person.lastname}"
>#{person.address}</m:from>
    <m:to name="#{p.firstname}"
>#{p.address}</m:to>
    ...
  </m:message>
</ui:repeat
>
```

### 21.1.5. #####

The mail templating example shows that facelets templating just works with the Seam mail tags.

jboss.org # template.xhtml #####

```

<m:message>
  <m:from name="Seam" address="do-not-reply@jboss.com" />
  <m:to name="{person.firstname} {person.lastname}"
>#{person.address}</m:to>
  <m:subject
>#{subject}</m:subject>
  <m:body>
    <html>
      <body>
        <ui:insert name="body"
>This is the default body, specified by the template.</ui:insert>
      </body>
    </html>
  </m:body>
</m:message>
>

```

jboss.org # templating.xhtml #####

```

<ui:param name="subject" value="Templating with Seam Mail"/>
<ui:define name="body">
  <p
>This example demonstrates that you can easily use <i
>facelets templating</i
> in email!</p>
</ui:define
>

```

WEB-INF/lib#jar#####Facelets#####

Seam#####web.xml##.taglib.xml#####Seam####JSF#####

web.xml#####

#####Facelets#JSF#####

### 21.1.6. ###

Seam ##### JSF #####  
#####

```

<m:message charset="UTF-8">
  ...
</m:message>

```

#21# #####

>

#####  
#####Facelets#####

<?xml version="1.0" encoding="UTF-8"?>

### 21.1.7. #####

#####Seam#####[#21.5.](#) #####  
#####

```
<m:message xmlns:m="http://jboss.com/products/seam/mail"
  importance="low"
  requestReadReceipt="true"/>
```

Otherwise you can add any header to the message using the `<m:header>` tag:

```
<m:header name="X-Sent-From" value="JBoss Seam"/>
```

### 21.2. #####

If you are using EJB then you can use a MDB (Message Driven Bean) to receive email. JBoss provides a JCA adaptor — `mail-ra.rar` — but the version distributed with JBoss AS 4.x has a number of limitations (and isn't bundled in some versions) therefore we recommend using the `mail-ra.rar` distributed with Seam (it's in the `extras/` directory in the Seam bundle). `mail-ra.rar` should be placed in `$JBOSS_HOME/server/default/deploy`; if the version of JBoss AS you use already has this file, replace it.



##

JBoss AS 5.x and newer has `mail-ra.rar` applied the patches, so there is no need to copy the `mail-ra.rar` from Seam distribution.

#####

```
@MessageDriven(activationConfig={
  @ActivationConfigProperty(propertyName="mailServer", propertyValue="localhost"),
```

```

    @ActivationConfigProperty(propertyName="mailFolder", propertyValue="INBOX"),
    @ActivationConfigProperty(propertyName="storeProtocol", propertyValue="pop3"),
    @ActivationConfigProperty(propertyName="userName", propertyValue="seam"),
    @ActivationConfigProperty(propertyName="password", propertyValue="seam")
}
@ResourceAdapter("mail-ra.rar")
@Name("mailListener")
public class MailListenerMDB implements MailListener {

    @In(create=true)
    private OrderProcessor orderProcessor;

    public void onMessage(Message message) {
        // Process the message
        orderProcessor.process(message.getSubject());
    }
}

```

```

#####onMessage(Message message)#####
MDB#####Seam#####MDB###persistence context#####

```

You can find more information on `mail-ra.rar` at <http://www.jboss.org/community/wiki/InboundJavaMail>.

```

JBoss AS#####mail-
ra.rar#####

```

## 21.3. ##

```

Seam#####jboss-seam-mail.jar#WEB-INF/lib##### JBoss
AS#####Seam##### JBoss
AS#####JavaMailAPI#####JBoss AS#####API#Impl#lib/
mail.jar###Seam#####Java Activation Framework#####lib/
activation.jar###Seam#####

```



##

The Seam Mail module requires the use of Facelets as the view technology. Future versions of the library may also support the use of JSP. Additionally, it requires the use of the seam-ui package.

```

mailSession#####SMTP#####JavaMail#####

```

### 21.3.1. mailSession

JEE ##### ## Seam ###Session##### JNDI  
#####javaMail#Session#####

mailSession#####[#32.9. #####](#)

#### 21.3.1.1. JBoss AS # JNDI #####

The JBossAS `deploy/mail-service.xml` configures a JavaMail session binding into JNDI. The default service configuration will need altering for your network. <http://www.jboss.org/community/wiki/JavaMail> describes the service in more detail.

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:core="http://jboss.com/products/seam/core"
  xmlns:mail="http://jboss.com/products/seam/mail">

  <mail:mail-session session-jndi-name="java:/Mail"/>

</components
>
```

### Seam # JNDI ## java:/Mail #####mailSession#####

#### 21.3.1.2. Seam ###Session

mailSession#components.xml#####  
#####smtp.example.com###Seam#smtp#####

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:core="http://jboss.com/products/seam/core"
  xmlns:mail="http://jboss.com/products/seam/mail">

  <mail:mail-session host="smtp.example.com"/>

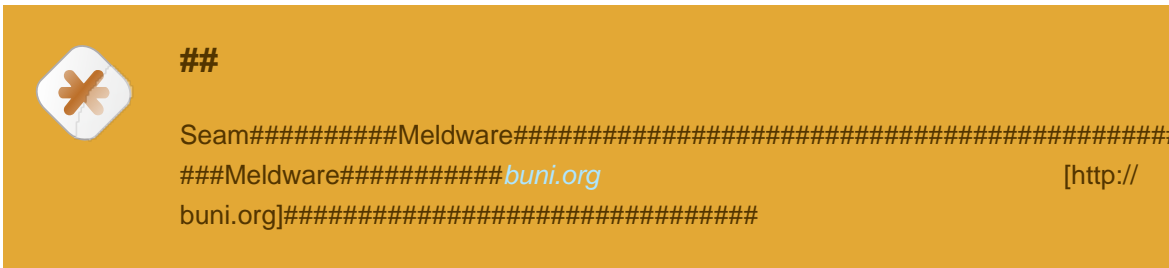
</components
>
```

## 21.4. Meldware

Meldware#####Seam#####[buni.org](http://buni.org) [http://buni.org]##### Meldware#SMTP,  
POP3,



IMAP#webmail#####JEE#####Seam#####JBoss  
AS#####



## 21.5. ##

##### http://jboss.com/products/seam/mail #####  
##### message ##### Seam #####

Facelets#####

#####JSF#####Javascript#####urlBase#####

<m:message>

#####

- importance —#####(low,normal,high)#####normal##
- precedence —#####
- requestReadReceipt —#####false##### true#####From:  
#####
- urlBase — #####urlBase#requestContextPath#####  
<h:graphicImage>#####
- messageId — #####ID#####

<m:from>

#####From:#####

- name —#####
- address — #####

<m:replyTo>

#####(Reply-to:#####

- address — #####

<m:to>

##### <m:to> ##### <ui:repeat>.  
#####

## #21# #####

---

- name — #####
- address — #####

### <m:cc>

email # CC ##### CC ##### <m:cc> ##### <ui:repeat>  
#####

- name — #####
- address — #####

### <m:bcc>

email # BCC ##### BCC ##### <m:bcc> ##### <ui:repeat>  
#####

- name — #####
- address — #####

### <m:header>

#####X-Sent-From: JBoss Seam)

- name — ##### (e.g. X-Sent-From).
- value — #####JBoss Seam#

### <m:attachment>

#####

- value — #####:
  - String —String#####
  - java.io.File —EL##File #####
  - java.net.URL — EL##URL#####
  - java.io.InputStream — EL##InputStream#####fileName#contentType#####
  - byte[] — EL##byte[]#####fileName#contentType#####

#####

- If this tag contains a <p:document> tag, the document described will be generated and attached to the email. A `fileName` should be specified.
- If this tag contains other JSF tags a HTML document will be generated from them and attached to the email. A `fileName` should be specified.

- fileName — #####
- contentType —#####MIME#####

<m:subject>

#####

<m:body>

#####

alternative#####HTML#####html#####

- type — plain#####HTML#####



---

## #####

Seam makes it very easy to perform work asynchronously from a web request. When most people think of asynchronicity in Java EE, they think of using JMS. This is certainly one way to approach the problem in Seam, and is the right way when you have strict and well-defined quality of service requirements. Seam makes it easy to send and receive JMS messages using Seam components.

But for cases when you are simply want to use a worker thread, JMS is overkill. Seam layers a simple asynchronous method and event facility over your choice of *dispatchers*:

- `java.util.concurrent.ScheduledThreadPoolExecutor` (#####)
- EJB ##### (EJB 3.0 #####)
- Quartz

This chapter first covers how to leverage Seam to simplify JMS and then explains how to use the simpler asynchronous method and event facility.

## 22.1. Seam #####

Seam makes it easy to send and receive JMS messages to and from Seam components. Both the message publisher and the message receiver can be Seam components.

You'll first learn to setup a queue and topic message publisher and then look at an example that illustrates how to perform the message exchange.

### 22.1.1. ##

```
JMS ##### Seam ##### Seam #
#####
TopicConnectionFactory #####

Seam #####JBossMQ ##### UIL2ConnectionFactory #####
##### JMS ##### seam.properties#web.xml #####components.xml
## queueConnection.queueConnectionFactoryJndiName#
topicConnection.topicConnectionFactoryJndiName #####

Seam ### TopicPublisher #### QueueSender ##### components.xml ## topic ###
queue #####
```

```
<jms:managed-topic-publisher name="stockTickerPublisher"
    auto-create="true"
    topic-jndi-name="topic/stockTickerTopic"/>

<jms:managed-queue-sender name="paymentQueueSender"
```

```
auto-create="true"  
queue-jndi-name="queue/paymentQueue"/>
```

### 22.1.2. #####

Now, you can inject a JMS `TopicPublisher` and `TopicSession` into any Seam component to publish an object to a topic:

```
@Name("stockPriceChangeNotifier")  
public class StockPriceChangeNotifier  
{  
    @In private TopicPublisher stockTickerPublisher;  
  
    @In private TopicSession topicSession;  
  
    public void publish(StockPrice price)  
    {  
        try  
        {  
            stockTickerPublisher.publish(topicSession.createObjectMessage(price));  
        }  
        catch (Exception ex)  
        {  
            throw new RuntimeException(ex);  
        }  
    }  
}
```

or to a queue:

```
@Name("paymentDispatcher")  
public class PaymentDispatcher  
{  
    @In private QueueSender paymentQueueSender;  
  
    @In private QueueSession queueSession;  
  
    public void publish(Payment payment)  
    {  
        try  
        {  
            paymentQueueSender.send(queueSession.createObjectMessage(payment));  
        }  
    }  
}
```

```

    }
    catch (Exception ex)
    {
        throw new RuntimeException(ex);
    }
}
}
}

```

### 22.1.3. ##### Bean #####

You can process messages using any EJB 3 message-driven bean. The MDB can even be a Seam component, in which case it's possible to inject other event- and application- scoped Seam components. Here's an example of the payment receiver, which delegates to a payment processor.



##

You'll likely need to set the `create` attribute on the `@In` annotation to `true` (i.e. `create = true`) to have Seam create an instance of the component being injected. This isn't necessary if the component supports auto-creation (e.g., it's annotated with `@Autocreate`).

First, create an MDB to receive the message.

```

@MessageDriven(activationConfig = {
    @ActivationConfigProperty(
        propertyName = "destinationType",
        propertyValue = "javax.jms.Queue"
    ),
    @ActivationConfigProperty(
        propertyName = "destination",
        propertyValue = "queue/paymentQueue"
    )
})
@Name("paymentReceiver")
public class PaymentReceiver implements MessageListener
{
    @Logger private Log log;

    @In(create = true) private PaymentProcessor paymentProcessor;

    @Override

```

```
public void onMessage(Message message)
{
    try
    {
        paymentProcessor.processPayment((Payment) ((ObjectMessage) message).getObject());
    }
    catch (JMSEException ex)
    {
        log.error("Message payload did not contain a Payment object", ex);
    }
}
}
```

Then, implement the Seam component to which the receiver delegates processing of the payment.

```
@Name("paymentProcessor")
public class PaymentProcessor
{
    @In private EntityManager entityManager;

    public void processPayment(Payment payment)
    {
        // perhaps do something more fancy
        entityManager.persist(payment);
    }
}
```

If you are going to be performing transaction operations in your MDB, you should ensure that you are working with an XA datasource. Otherwise, it won't be possible to rollback database changes if the database transaction commits and a subsequent operation being performed by the message fails.

#### 22.1.4. #####

Seam Remoting ##### JavaScript ## JMS ##### ##### # 25.  
#####

#### 22.2. ####

```
#####
ScheduledThreadPoolExecutor #####
##### EJB 3.0 #####
components.xml #####
```



```
<async:timer-service-dispatcher/>
```

```
##### EJB #####
##### Seam
##### EJB 3.0
#####

##### Quartz ##### EAR # Quartz #####
JAR (lib #####) ##### application.xml # Java #####
Quartz ##### Quartz ##### seam.quartz.properties
##### components.xml ##### Quartz #####
```

```
<async:quartz-dispatcher/>
```

```
##### ScheduledThreadPoolExecutor # Seam API# EJB3 Timer# Quartz Scheduler
##### components.xml # 1 #####
```

### 22.2.1. #####

```
##### (#####) #####
#####
#####AJAX#####
EJB#####
```

```
@Local
public interface PaymentHandler
{
    @Asynchronous
    public void processPayment(Payment payment);
}
```

```
(JavaBean #####)
```

```
#####bean#####
```

```
@Stateless
@Name("paymentHandler")
public class PaymentHandlerBean implements PaymentHandler
{
    public void processPayment(Payment payment)
```

```
{
    //do some work!
}
```

#####

```
@Stateful
@Name("paymentAction")
public class CreatePaymentAction
{
    @In(create=true) PaymentHandler paymentHandler;
    @In Bill bill;

    public String pay()
    {
        paymentHandler.processPayment( new Payment(bill) );
        return "success";
    }
}
```

#####

#####@Duration#@Expiration# @IntervalDuration#####

```
@Local
public interface PaymentHandler
{
    @Asynchronous
    public void processScheduledPayment(Payment payment, @Expiration Date date);

    @Asynchronous
    public void processRecurringPayment(Payment payment,
        @Expiration Date date,
        @IntervalDuration Long interval)
}
```

```
@Stateful
@Name("paymentAction")
```

```

public class CreatePaymentAction
{
    @In(create=true) PaymentHandler paymentHandler;
    @In Bill bill;

    public String schedulePayment()
    {
        paymentHandler.processScheduledPayment( new Payment(bill), bill.getDueDate() );
        return "success";
    }

    public String scheduleRecurringPayment()
    {
        paymentHandler.processRecurringPayment( new Payment(bill), bill.getDueDate(),
  ONE_MONTH );
        return "success";
    }
}

```

```

##### ##### Timer ##### Timer #####
EJB3 ##### EJB 3 ##### ScheduledThreadPoolExecutor ####
##### JDK ### Future ##### Quartz ##### QuartzTriggerHandle #####
#####

```

```

@Local
public interface PaymentHandler
{
    @Asynchronous
    public Timer processScheduledPayment(Payment payment, @Expiration Date date);
}

```

```

@Stateless
@Name("paymentHandler")
public class PaymentHandlerBean implements PaymentHandler
{
    @In Timer timer;

    public Timer processScheduledPayment(Payment payment, @Expiration Date date)
    {
        //do some work!
    }
}

```

```
    return timer; //note that return value is completely ignored
}

}
```

```
@Stateful
@Name("paymentAction")
public class CreatePaymentAction
{
    @In(create=true) PaymentHandler paymentHandler;
    @In Bill bill;

    public String schedulePayment()
    {
        Timer timer = paymentHandler.processScheduledPayment( new Payment(bill),
  bill.getDueDate() );

        return "success";
    }
}
```

#####

### 22.2.2. Quartz #####

Quartz ##### (#####) ##### @Asynchronous# @Duration#  
@Expiration# @IntervalDuration ##### #### ##### Quartz  
##### 3 #####

@FinalExpiration ##### QuartzTriggerHandle  
#####

```
    @In QuartzTriggerHandle timer;

    // Defines the method in the "processor" component
    @Asynchronous
    public QuartzTriggerHandle schedulePayment(@Expiration Date when,
  @IntervalDuration Long interval,
  @FinalExpiration Date endDate,
  Payment payment)
    {
        // do the repeating or long running task until endDate
    }
}
```

```

}

... ..

// Schedule the task in the business logic processing code
// Starts now, repeats every hour, and ends on May 10th, 2010
Calendar cal = Calendar.getInstance ();
cal.set (2010, Calendar.MAY, 10);
processor.schedulePayment(new Date(), 60*60*1000, cal.getTime(), payment);

```

```

##### QuartzTriggerHandle ##### #####
##### QuartzTriggerHandle #####
#####

```

```

QuartzTriggerHandle handle =
    processor.schedulePayment(payment.getPaymentDate(),
        payment.getPaymentCron(),
        payment);
payment.setQuartzTriggerHandle( handle );
// Save payment to DB

// later ...

// Retrieve payment from DB
// Cancel the remaining scheduled tasks
payment.getQuartzTriggerHandle().cancel();

```

```

@IntervalCron ##### Unix cron ##### ##### 3
##### 2:10pm # 2:44pm #####

```

```

// Define the method
@Asynchronous
public QuartzTriggerHandle schedulePayment(@Expiration Date when,
    @IntervalCron String cron,
    Payment payment)
{
    // do the repeating or long running task
}

... ..

```

```
// Schedule the task in the business logic processing code
QuartzTriggerHandle handle =
processor.schedulePayment(new Date(), "0 10,44 14 ? 3 WED", payment);
```

```
@IntervalBusinessDay          #####X#####          #####
#####2##### 14:00 #####          ##### 2010 #####
```

```
// Define the method
@Asynchronous
public QuartzTriggerHandle schedulePayment(@Expiration Date when,
   @IntervalBusinessDay NthBusinessDay nth,
   Payment payment)
{
    // do the repeating or long running task
}
```

... ..

```
// Schedule the task in the business logic processing code
QuartzTriggerHandle handle =
processor.schedulePayment(new Date(),
    new NthBusinessDay(2, "14:00", WEEKLY), payment);
```

```
NthBusinessDay          #####          additionalHolidays
##### (## ##### #####)
```

```
public class NthBusinessDay implements Serializable
{
    int n;
    String fireAtTime;
    List <Date
> additionalHolidays;
    BusinessDayIntervalType interval;
    boolean excludeWeekends;
    boolean excludeUsFederalHolidays;

    public enum BusinessDayIntervalType { WEEKLY, MONTHLY, YEARLY }

    public NthBusinessDay ()
    {
```

```

n = 1;
fireAtTime = "12:00";
additionalHolidays = new ArrayList <Date
> ();
interval = BusinessDayIntervalType.WEEKLY;
excludeWeekends = true;
excludeUsFederalHolidays = true;
}
... ..
}

```

```

@IntervalDuration# @IntervalCron# @IntervalNthBusinessDay #####
##### RuntimeException #####

```

### 22.2.3. #####

```

##### ##### Events #
raiseAsynchronousEvent() ##### #####
raiseTimedEvent() ##### schedule #####
(##### TimerSchedule #####)#
#####
#####

```

### 22.2.4. #####

```

##### ##### java.util.concurrent
##### EJB3 #####
##### Seam #####

##### #####
org.jboss.seam.async.asynchronousExceptionHandler
#####

```

```

@Scope(ScopeType.STATELESS)
@Name("org.jboss.seam.async.asynchronousExceptionHandler")
public class MyAsynchronousExceptionHandler extends AsynchronousExceptionHandler {

    @Logger Log log;

    @In Future timer;

    @Override
    public void handleException(Exception exception) {
        log.debug(exception);
    }
}

```

```
timer.cancel(false);  
}  
  
}
```

Here, for example, using `java.util.concurrent dispatcher`, we inject its control object and cancel all future invocations when an exception is encountered

```
### ##### public void handleAsynchronousException(Exception exception);  
#####
```

```
public void handleAsynchronousException(Exception exception) {  
    log.fatal(exception);  
}
```



---

## #####

In almost all enterprise applications, the database is the primary bottleneck, and the least scalable tier of the runtime environment. People from a PHP/Ruby environment will try to tell you that so-called "shared nothing" architectures scale well. While that may be literally true, I don't know of many interesting multi-user applications which can be implemented with no sharing of resources between different nodes of the cluster. What these silly people are really thinking of is a "share nothing except for the database" architecture. Of course, sharing the database is the primary problem with scaling a multi-user application — so the claim that this architecture is highly scalable is absurd, and tells you a lot about the kind of applications that these folks spend most of their time working on.

#####

#####1#####

Seam#####

- #####

- ORM#####Hibernate#####JPA#####2#####

#####

#####

#####

#####2#####

##Seam#####

- Seam#####

#####

- ###Seam#####Bean#####EJB#####

- #####Seam#####

#####

- #####JBossCache#JBoss

POJO

Cache#EHCache#####Seam#cacheProvider#####

#####

- #####JSF#####

ORM#####2#####

#####

2#####ORM#####cacheProvider#####<s:cache>

## 23.1. Seam#####

#####cacheProvider#####

#23# #####

---

JBoss Cache 1.x (suitable for use in JBoss 4.2.x or later and other containers)

org.jboss.cache.TreeCache

JBoss Cache 2.x #JBoss 5.x#####

org.jboss.cache.Cache

JBoss POJO Cache 1.x (suitable for use in JBoss 4.2.x or later and other containers)

org.jboss.cache.aop.PojoCache

EHCache #####

net.sf.ehcache.CacheManager

###Java#####

cacheProvider#####jar#####

JBoss Cache 1.x

- jboss-cache.jar - JBoss Cache 1.4.1
- jgroups.jar - JGroups 2.4.1

JBoss Cache 2.x

- jboss-cache.jar - JBoss Cache 2.2.0
- jgroups.jar - JGroups 2.6.2

JBoss POJO Cache 1.x

- jboss-cache.jar - JBoss Cache 1.4.1
- jgroups.jar - JGroups 2.4.1
- jboss-aop.jar - JBoss AOP 1.5.0

EHCache

- ehcache.jar - EHCache 1.2.3



####  
JBoss#####JBossCache#####JBossCache  
[http://wiki.jboss.org/wiki/JBossCache]#####

wiki

Seam#EAR#####jar#####EAR#####

JBossCache#####treecache.xml#####EJB

JAR#####WEB-INF/

classes####JBossCache#####JBossCache#####

treecache.xml#####examples/blog/resources/treecache.xml#####

EHCACHE#####

#####components.xml#####

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:cache="http://jboss.com/products/seam/cache">
  <cache:jboss-cache-provider configuration="META-INF/cache/treecache.xml" />
</components
>
```

Seam#####

```
@Name("chatroomUsers")
@Scope(ScopeType.STATELESS)
public class ChatroomUsers
{
  @In CacheProvider cacheProvider;

  @Unwrap
  public Set<String> getUsers() throws CacheException {
    Set<String> userList = (Set<String>) cacheProvider.get("chatroom", "userList");
    if (userList==null) {
      userList = new HashSet<String>();
      cacheProvider.put("chatroom", "userList", userList);
    }
    return userList;
  }
}
```

#####components.xml#####

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:cache="http://jboss.com/products/seam/cache">
  <cache:jboss-cache-provider name="myCache" configuration="myown/cache.xml"/>
  <cache:jboss-cache-provider name="myOtherCache" configuration="myother/cache.xml"/>
</components
>
```

## 23.2. #####

Seam#####JSF#####&lt;s:cache&gt;#####&lt;s:cache&gt;#####pojoCache#####

## #23# #####

---

```
<s:cache>#####  
#####blog#####blog#####
```

```
<s:cache key="recentEntries-#{blog.id}" region="welcomePageFragments">  
  <h:dataTable value="#{blog.recentEntries}" var="blogEntry">  
    <h:column>  
      <h3  
>#{blogEntry.title}</h3>  
      <div>  
        <s:formattedText value="#{blogEntry.body}"/>  
      </div>  
    </h:column>  
  </h:dataTable>  
</s:cache  
>
```

```
key#####blog#####region#####
```

```
##### <s:cache> ##### (##### blog #####) #####  
#####
```

```
public void post() {  
  ...  
  entityManager.persist(blogEntry);  
  cacheProvider.remove("welcomePageFragments", "recentEntries-" + blog.getId() );  
}
```

```
#####JBossCache#####
```

---

## Web####

Seam#JBossWS#####JEE

#Web#####Web#####Seam#####Seam###Web#####

### 24.1. #####

Web#####Seam#####Seam#####SOAP#####

#####standard-jaxws-endpoint-config.xml##Web#####jar#####META-INF#####SOAP#####

```
<jaxws-config xmlns="urn:jboss:jaxws-config:2.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:javaee="http://java.sun.com/xml/ns/javaee"
  xsi:schemaLocation="urn:jboss:jaxws-config:2.0 jaxws-config_2_0.xsd">
  <endpoint-config>
    <config-name>
>Seam WebService Endpoint</config-name>
    <pre-handler-chains>
      <javaee:handler-chain>
        <javaee:protocol-bindings>
>##SOAP11_HTTP</javaee:protocol-bindings>
          <javaee:handler>
            <javaee:handler-name>
>SOAP Request Handler</javaee:handler-name>
              <javaee:handler-class>
>org.jboss.seam.webservice.SOAPRequestHandler</javaee:handler-class>
            </javaee:handler>
          </javaee:handler-chain>
        </pre-handler-chains>
      </endpoint-config>
</jaxws-config>
</pre>
```

### 24.2. ###Web####

###Web#####

Seam###SOAP#####SOAP#####conversation

ID#####conversation ID###Web#####

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
```

```
xmlns:seam="http://seambay.example.seam.jboss.org/">
<soapenv:Header>
  <seam:conversationId xmlns:seam='http://www.jboss.org/seam/webservice'
>2</seam:conversationId>
</soapenv:Header>
<soapenv:Body>
  <seam:confirmAuction/>
</soapenv:Body>
</soapenv:Envelope
>
```

```
###SOAP#####SOAP#####conversation
ID#####2###conversationId#####Web#####
ID#####Web#####

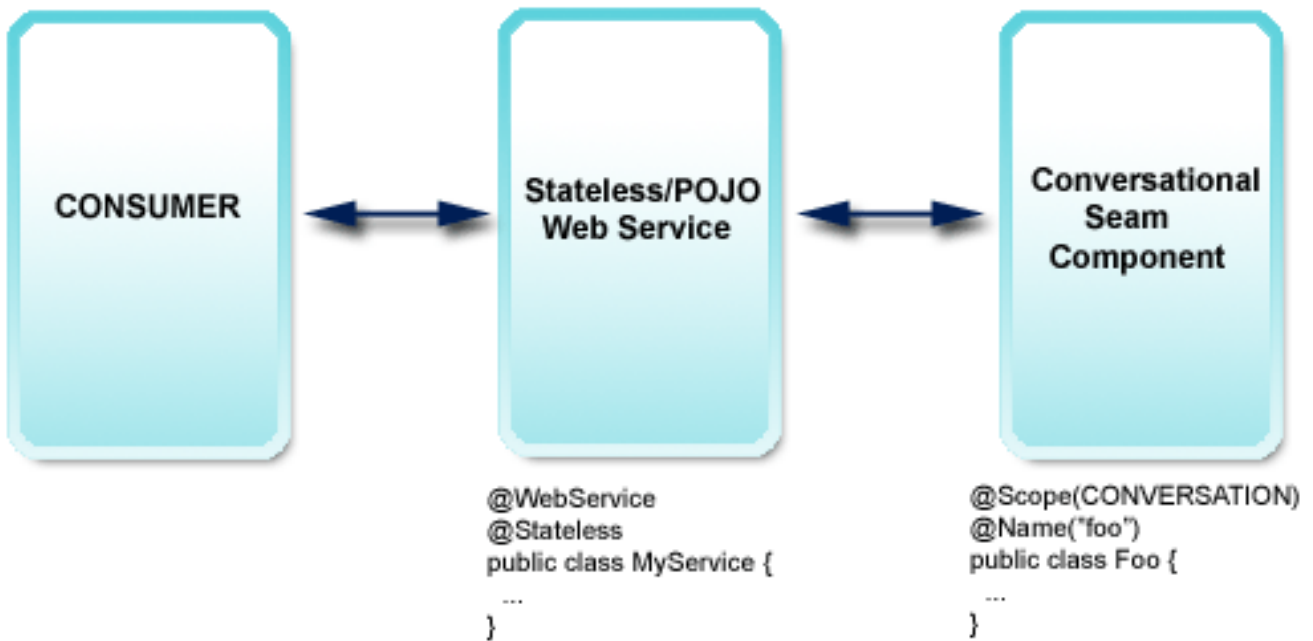
##### conversationId#####http://www.jboss.org/seam/
webservice#####Seam#####conversation
ID#####
```

```
<env:Envelope xmlns:env='http://schemas.xmlsoap.org/soap/envelope/'>
  <env:Header>
    <seam:conversationId xmlns:seam='http://www.jboss.org/seam/webservice'
>2</seam:conversationId>
  </env:Header>
  <env:Body>
    <confirmAuctionResponse xmlns="http://seambay.example.seam.jboss.org/">
  </env:Body>
</env:Envelope
>
```

```
#####conversationId#####
```

### 24.2.1. #####

```
Web#####Bean###POJO#####Web#####Seam#####
```



#####Bean#####Web#####@Name#####Seam#####Seam#####

### 24.3. Web#####

Web#####Seam# /

examples#####seamBay#####Web#####

```

@Stateless
@WebService(name = "AuctionService", serviceName = "AuctionService")
public class AuctionService implements AuctionServiceRemote
{
    @WebMethod
    public boolean login(String username, String password)
    {
        Identity.instance().setUsername(username);
        Identity.instance().setPassword(password);
        Identity.instance().login();
        return Identity.instance().isLoggedIn();
    }

    // snip
}

```

####Web#####Bean##JSR-

181#####javax.jws#####JWS#####@WebService#####Web#####  
login()#####@WebMethod#####Web#####@WebService#####name#serviceName##

## #24# Web###

---

```
#####Web#####Web#####Web#####
#####AuctionServiceRemote#####@WebMethod#####login()#####
#####Web#####login()#####Seam#####Identity#####
#####Web#####AuctionAction.createAuction()#####
```

```
@WebMethod
public void createAuction(String title, String description, int categoryId)
{
    AuctionAction action = (AuctionAction) Component.getInstance(AuctionAction.class, true);
    action.createAuction();
    action.setDetails(title, description, categoryId);
}
```

```
####AuctionAction#####
```

```
@Begin
public void createAuction()
{
    auction = new Auction();
    auction.setAccount(authenticatedAccount);
    auction.setStatus(Auction.STATUS_UNLISTED);
    durationDays = DEFAULT_AUCTION_DURATION;
}
```

```
#####Web#####Seam#####
```

## 24.4. RESTEasy ###RESTful HTTP Web###

```
Seam#JAX-RS #####(JSR
311)###RESTEasy#####Seam#####"##"#####
```

- RESTEasy #####
- SeamResourceServlet ###HTTP/REST #####web.xml #####
- Seam #####Seam#####

### 24.4.1. RESTEasy #####

First, get the RESTEasy libraries and the `jaxrs-api.jar`, deploy them with the other libraries of your application. Also deploy the integration library, `jboss-seam-resteasy.jar`.



In seam-gen based projects, this can be done by appending `jaxrs-api.jar`, `resteasy-jaxrs.jar` and `jboss-seam-resteasy.jar` to the `deployed-jars.list` (war deployment) or `deployed-jars-ear.list` (ear deployment) file. For a JBoss Tools based project, copy the libraries mentioned above to the `EarContent/lib` (ear deployment) or `WebContent/WEB-INF/lib` (war deployment) folder and reload the project in the IDE.

#####@javax.ws.rs.Path#####HTTP#####Seam#####SeamResourceServ

- The URI starts with the host and context path of your application, e.g. `http://your.hostname/myapp`.
- Then the pattern mapped in `web.xml` for the `SeamResourceServlet`, e.g. `/seam/resource` if you follow the common examples, is appended. Change this setting to expose your RESTful resources under a different base. Note that this is a global change and other Seam resources (e.g. `s:graphicImage`) are then also served under that base path.
- The RESTEasy integration for Seam then appends a configurable string to the base path, by default this is `/rest`. Hence, the full base path of your resources would e.g. be `/myapp/seam/resource/rest`. We recommend that you change this string in your application, you could for example add a version number to prepare for a future REST API upgrade of your services (old clients would keep the old URI base): `/myapp/seam/resource/restv1`.
- Finally, the actual resource is available under the defined `@Path`, e.g. a resource mapped with `@Path("/customer")` would be available under `/myapp/seam/resource/rest/customer`.

As an example, the following resource definition would return a plaintext representation for any GET requests using the URI `http://your.hostname/myapp/seam/resource/rest/customer/123`:

```
@Path("/customer")
public class MyCustomerResource {

    @GET
    @Path("/{customerId}")
    @Produces("text/plain")
    public String getCustomer(@PathParam("customerId") int id) {
        return ...;
    }
}
```

#####web.xml#####Seam#####RESTE

<components

```
xmlns="http://jboss.com/products/seam/components"
xmlns:resteasy="http://jboss.com/products/seam/resteasy"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation=
  http://jboss.com/products/seam/resteasy
  http://jboss.com/products/seam/resteasy-2.2.xsd
  http://jboss.com/products/seam/components
  http://jboss.com/products/seam/components-2.2.xsd">
```

```
#####/rest#####
```

```
<resteasy:application resource-path-prefix="/restv1"/>
```

The full base path to your resources is now `/myapp/seam/resource/restv1/{resource}` - note that your `@Path` definitions and mappings do NOT change. This is an application-wide switch usually used for versioning of the HTTP interface.

```
#####@javax.ws.rs.Path#####@javax.ws.rs.ext.Provider#####Seam#####
```

```
<resteasy:application
  scan-providers="false"
  scan-resources="false"
  use-builtin-providers="true">

  <resteasy:resource-class-names>
    <value>org.foo.MyCustomerResource</value>
    <value>org.foo.MyOrderResource</value>
    <value>org.foo.MyStatelessEJBImplementation</value>
  </resteasy:resource-class-names>

  <resteasy:provider-class-names>
    <value>org.foo.MyFancyProvider</value>
  </resteasy:provider-class-names>

</resteasy:application>
```

```
use-built-in-providers##RETEasy#####
#####JSON#JAXB#####
```

RETEasy supports plain EJBs (EJBs that are not Seam components) as resources. Instead of configuring the JNDI names in a non-portable fashion in `web.xml` (see RETEasy documentation), you can simply list the EJB implementation classes, not the business interfaces,

in `components.xml` as shown above. Note that you have to annotate the `@Local` interface of the EJB with `@Path`, `@GET`, and so on - not the bean implementation class. This allows you to keep your application deployment-portable with the global Seam `jndi-pattern` switch on `<core:init/>`. Note that plain (non-Seam component) EJB resources will not be found even if scanning of resources is enabled, you always have to list them manually. Again, this whole paragraph is only relevant for EJB resources that are not also Seam components and that do not have an `@Name` annotation.

```
#####URI#####
```

```
<resteasy:application>

  <resteasy:media-type-mappings>
    <key>txt</key><value>text/plain</value>
  </resteasy:media-type-mappings>

  <resteasy:language-mappings>
    <key>deutsch</key><value>de-DE</value>
  </resteasy:language-mappings>

</resteasy:application>
```

```
#####.txt.deutsch###URI#####Accept###Accept-Language#####text/
plain#de-DE#####
```

## 24.4.2. Resources as Seam components

```
#####RESTEasy#####RESTEasy#####
RS#####
```

You can write resources as Seam components and benefit from the richer lifecycle management of Seam, and interception for bijection, security, and so on. Simply make your resource class a Seam component:

```
@Name("customerResource")
@Path("/customer")
public class MyCustomerResource {

  @In
  CustomerDAO customerDAO;

  @GET
  @Path("/{customerId}")
  @Produces("text/plain")
```

```
public String getCustomer(@PathParam("customerid") int id) {  
    return customerDAO.find(id).getName();  
}  
  
}
```

An instance of `customerResource` is now handled by Seam when a request hits the server. This is a Seam JavaBean component that is `EVENT`-scoped, hence no different than the default JAX-RS lifecycle. You get full Seam injection and interception support, and all other Seam components and contexts are available to you. Currently also supported are `APPLICATION` and `STATELESS` resource Seam components. These three scopes allow you to create an effectively stateless Seam middle-tier HTTP request-processing application.

You can annotate an interface and keep the implementation free from JAX-RS annotations:

```
@Path("/customer")  
public interface MyCustomerResource {  
  
    @GET  
    @Path("/{customerid}")  
    @Produces("text/plain")  
    public String getCustomer(@PathParam("customerid") int id);  
  
}
```

```
@Name("customerResource")  
@Scope(ScopeType.STATELESS)  
public class MyCustomerResourceBean implements MyCustomerResource {  
  
    @In  
    CustomerDAO customerDAO;  
  
    public String getCustomer(int id) {  
        return customerDAO.find(id).getName();  
    }  
  
}
```

You can use `SESSION`-scoped Seam components. By default, the session will however be shortened to a single request. In other words, when an HTTP request is being processed by the RESTEasy integration code, an HTTP session will be created so that Seam components can

utilize that context. When the request has been processed, Seam will look at the session and decide if the session was created only to serve that single request (no session identifier has been provided with the request, or no session existed for the request). If the session has been created only to serve this request, the session will be destroyed after the request!

Assuming that your Seam application only uses event, application, or stateless components, this procedure prevents exhaustion of available HTTP sessions on the server. The RESTEasy integration with Seam assumes by default that sessions are not used, hence anemic sessions would add up as every REST request would start a session that will only be removed when timed out.

If your RESTful Seam application has to preserve session state across REST HTTP requests, disable this behavior in your configuration file:

```
<resteasy:application destroy-session-after-request="false"/>
```

Every REST HTTP request will now create a new session that will only be removed by timeout or explicit invalidation in your code through `Session.instance().invalidate()`. It is your responsibility to pass a valid session identifier along with your HTTP requests, if you want to utilize the session context across requests.

CONVERSATION-scoped resource components and mapping of conversations to temporary HTTP resources and paths is planned but currently not supported.

EJB Seam components are supported as REST resources. Always annotate the local business interface, not the EJB implementation class, with JAX-RS annotations. The EJB has to be `STATELESS`.

Sub-resources as defined in the JAX RS specification, section 3.4.1, can also be Seam component instances:

```
@Path("/garage")
@Name("garage")
public class GarageService
{
    ...

    @Path("/vehicles")
    public VehicleService getVehicles() {
        return (VehicleService) Component.getInstance(VehicleService.class);
    }
}
```



##

RESTEasy components do not support hot redeployment. As a result, the components should never be placed in the `src/hot` folder. The `src/main` folder should be used instead.



##

Provider classes can currently not be Seam components. Although you can configure an `@Provider` annotated class as a Seam component, it will at runtime be managed by RESTEasy as a singleton with no Seam interception, bijection, etc. The instance will not be a Seam component instance. We plan to support Seam component lifecycle for JAX-RS providers in the future.

### 24.4.3. Securing resources

You can enable the Seam authentication filter for HTTP Basic and Digest authentication in `components.xml`:

```
<web:authentication-filter url-pattern="/seam/resource/rest/*" auth-type="basic"/>
```

See the Seam security chapter on how to write an authentication routine.

After successful authentication, authorization rules with the common `@Restrict` and `@PermissionCheck` annotations are in effect. You can also access the client `Identity`, work with permission mapping, and so on. All regular Seam security features for authorization are available.

### 24.4.4. Mapping exceptions to HTTP responses

Section 3.3.4 of the JAX-RS specification defines how checked or unchecked exceptions are handled by the JAX RS implementation. In addition to using an exception mapping provider as defined by JAX-RS, the integration of RESTEasy with Seam allows you to map exceptions to HTTP response codes within Seam's `pages.xml` facility. If you are already using `pages.xml` declarations, this is easier to maintain than potentially many JAX RS exception mapper classes.

Exception handling within Seam requires that the Seam filter is executed for your HTTP request. Ensure that you do filter *all* requests in your `web.xml`, not - as some Seam examples might show - a request URI pattern that doesn't cover your REST request paths. The following example intercepts *all* HTTP requests and enables Seam exception handling:

```
<filter>  
  <filter-name>Seam Filter</filter-name>
```

```

    <filter-class>org.jboss.seam.servlet.SeamFilter</filter-class>
  </filter>

  <filter-mapping>
    <filter-name>Seam Filter</filter-name>
    <url-pattern>/*</url-pattern>
  </filter-mapping>

```

To convert the unchecked `UnsupportedOperationException` thrown by your resource methods to a 501 Not Implemented HTTP status response, add the following to your `pages.xml` descriptor:

```

<exception class="java.lang.UnsupportedOperationException">
  <http-error error-code="501">
    <message>The requested operation is not supported</message>
  </http-error>
</exception>

```

Custom or checked exceptions are handled the same:

```

<exception class="my.CustomException" log="false">
  <http-error error-code="503">
    <message>Service not available: #{org.jboss.seam.handledException.message}</message>
  </http-error>
</exception>

```

You do not have to send an HTTP error to the client if an exception occurs. Seam allows you to map the exception as a redirect to a view of your Seam application. As this feature is typically used for human clients (web browsers) and not for REST API remote clients, you should pay extra attention to conflicting exception mappings in `pages.xml`.

Note that the HTTP response still passes through the servlet container, so an additional mapping might apply if you have `<error-page>` mappings in your `web.xml` configuration. The HTTP status code would then be mapped to a rendered HTML error page with status 200 OK!

### 24.4.5. Exposing entities via RESTful API

Seam makes it really easy to use a RESTful approach for accessing application data. One of the improvements that Seam introduces is the ability to expose parts of your SQL database for remote access via plain HTTP calls. For this purpose, the Seam/RESTEasy integration module provides two components: `ResourceHome` and `ResourceQuery`, which benefit from the API provided by the Seam Application Framework ([# 13. Seam#####](#)). These components allow you to bind domain model entity classes to an HTTP API.

### 24.4.5.1. ResourceQuery

ResourceQuery exposes entity querying capabilities as a RESTful web service. By default, a simple underlying Query component, which returns a list of instances of a given entity class, is created automatically. Alternatively, the ResourceQuery component can be attached to an existing Query component in more sophisticated cases. The following example demonstrates how easily ResourceQuery can be configured:

```
<resteasy:resource-query
  path="/user"
  name="userResourceQuery"
  entity-class="com.example.User"/>
```

With this single XML element, a ResourceQuery component is set up. The configuration is straightforward:

- The component will return a list of `com.example.User` instances.
- The component will handle HTTP requests on the URI path `/user`.
- The component will by default transform the data into XML or JSON (based on client's preference). The set of supported mime types can be altered by using the `media-types` attribute, for example:

```
<resteasy:resource-query
  path="/user"
  name="userResourceQuery"
  entity-class="com.example.User"
  media-types="application/fastinfoset"/>
```

Alternatively, if you do not like configuring components using XML, you can set up the component by extension:

```
@Name("userResourceQuery")
@Path("/user")
public class UserResourceQuery extends ResourceQuery<User>
{
}
```

Queries are read-only operations, the resource only responds to GET requests. Furthermore, ResourceQuery allows clients of a web service to manipulate the resultset of a query using the following path parameters:



Parameter name	Example	Description
start	/user?start=20	Returns a subset of a database query result starting with the 20th entry.
show	/user?show=10	Returns a subset of the database query result limited to 10 entries.

For example, you can send an HTTP GET request to `/user?start=30&show=10` to get a list of entries representing 10 rows starting with row 30.



##

RESTEasy uses JAXB to marshal entities. Thus, in order to be able to transfer them over the wire, you need to annotate entity classes with `@XMLRootElement`. Consult the JAXB and RESTEasy documentation for more information.

### 24.4.5.2. ResourceHome

Just as ResourceQuery makes Query's API available for remote access, so does ResourceHome for the Home component. The following table describes how the two APIs (HTTP and Home) are bound together.

#### # 24.1.

HTTP method	Path	Function	ResourceHome method
GET	{path}/{id}	Read	getResource()
POST	{path}	Create	postResource()
PUT	{path}/{id}	Update	putResource()
DELETE	{path}/{id}	Delete	deleteResource()

- You can GET, PUT, and DELETE a particular user instance by sending HTTP requests to `/user/{userId}`
- Sending a POST request to `/user` creates a new user entity instance and persists it. Usually, you leave it up to the persistence layer to provide the entity instance with an identifier value and thus an URI. Therefore, the URI is sent back to the client in the `Location` header of the HTTP response.

The configuration of ResourceHome is very similar to ResourceQuery except that you need to explicitly specify the underlying Home component and the Java type of the entity identifier property.

```
<resteasy:resource-home
  path="/user"
  name="userResourceHome"
  entity-home="#{userHome}"
  entity-id-class="java.lang.Integer"/>
```

Again, you can write a subclass of ResourceHome instead of XML:

```
@Name("userResourceHome")
@Path("/user")
public class UserResourceHome extends ResourceHome<User, Integer>
{

    @In
    private EntityHome<User
> userHome;

    @Override
    public Home<?, User
> getEntityHome()
    {
        return userHome;
    }
}
```

For more examples of ResourceHome and ResourceQuery components, take a look at the *Seam Tasks* example application, which demonstrates how Seam/RESTEasy integration can be used together with a jQuery web client. In addition, you can find more code example in the *Restbay* example, which is used mainly for testing purposes.

### 24.4.6. Testing resources and providers

Seam includes a unit testing utility class that helps you create unit tests for a RESTful architecture. Extend the `SeamTest` class as usual and use the `ResourceRequestEnvironment.ResourceRequest` to emulate HTTP requests/response cycles:

```
import org.jboss.seam.mock.ResourceRequestEnvironment;
import org.jboss.seam.mock.EnhancedMockHttpServletRequest;
import org.jboss.seam.mock.EnhancedMockHttpServletResponse;
import static org.jboss.seam.mock.ResourceRequestEnvironment.ResourceRequest;
import static org.jboss.seam.mock.ResourceRequestEnvironment.Method;
```

```
public class MyTest extends SeamTest {

    ResourceRequestEnvironment sharedEnvironment;

    @BeforeClass
    public void prepareSharedEnvironment() throws Exception {
        sharedEnvironment = new ResourceRequestEnvironment(this) {
            @Override
            public Map<String, Object> getDefaultHeaders() {
                return new HashMap<String, Object>() {{
                    put("Accept", "text/plain");
                }};
            }
        };
    }

    @Test
    public void test() throws Exception
    {
        //Not shared: new ResourceRequest(new ResourceRequestEnvironment(this), Method.GET,
        "/my/relative/uri)

        new ResourceRequest(sharedEnvironment, Method.GET, "/my/relative/uri)
        {
            @Override
            protected void prepareRequest(EnhancedMockHttpServletRequest request)
            {
                request.addQueryParameter("foo", "123");
                request.addHeader("Accept-Language", "en_US, de");
            }

            @Override
            protected void onResponse(EnhancedMockHttpServletResponse response)
            {
                assert response.getStatus() == 200;
                assert response.getContentAsString().equals("foobar");
            }
        }

        }.run();
    }
}
```

This test only executes local calls, it does not communicate with the `SeamResourceServlet` through TCP. The mock request is passed through the Seam servlet and filters and the response is then available for test assertions. Overriding the `getDefaultHeaders()` method in a shared instance of `ResourceRequestEnvironment` allows you to set request headers for every test method in the test class.

Note that a `ResourceRequest` has to be executed in a `@Test` method or in a `@BeforeMethod` callback. You can not execute it in any other callback, such as `@BeforeClass`.

---

## #####

Seam ## Web ##### AJAX (Asynchronous Javascript and XML)  
##### Seam ### #####  
- ##### AJAX ##### AJAX ### Web  
##### Seam Remoting #####

## 25.1. ##

#####web.xml#####Seam Resource#####

```
<servlet>
  <servlet-name
>Seam Resource Servlet</servlet-name>
  <servlet-class
>org.jboss.seam.servlet.SeamResourceServlet</servlet-class>
</servlet>

<servlet-mapping>
  <servlet-name
>Seam Resource Servlet</servlet-name>
  <url-pattern
>/seam/resource/*</url-pattern>
</servlet-mapping
>
```

#####Web#####JavaScript#####

```
<script type="text/javascript" src="seam/resource/remoting/resource/remote.js"
></script
>
```

```
#####
#####
#####
##### @Name("customerAction")
##### Bean #####
```

```
<script type="text/javascript"
  src="seam/resource/remoting/interface.js?customerAction"
></script
```

## #25# #####

>

#####

```
<script type="text/javascript"
  src="seam/resource/remoting/interface.js?customerAction&accountAction"
></script
>
```

```
#####      ###      Javascript      #####      s:remote      #####
#####
```

```
<s:remote include="customerAction,accountAction"/>
```

## 25.2. "Seam"#####

```
##### Seam Javascript ##### remote.js
##### Seam.Component ##### Seam.Remoting ### #####
#####
```

### 25.2.1. Hello World ####

```
Seam ##### helloAction
##### Seam #####
```

```
@Stateless
@Name("helloAction")
public class HelloAction implements HelloLocal {
  public String sayHello(String name) {
    return "Hello, " + name;
  }
}
```

```
##### @WebRemote #####
#####
```

```
@Local
public interface HelloLocal {
    @WebRemote
    public String sayHello(String name);
}
```

That's all the server-side code we need to write.



##

If you are performing a persistence operation in the method marked `@WebRemote` you will also need to add a `@Transactional` annotation to the method. Otherwise, your method would execute outside of a transaction without this extra hint. That's because unlike a JSF request, Seam does not wrap the remoting request in a transaction automatically.

Now for our web page - create a new page and import the `helloAction` component:

```
<s:remote include="helloAction"/>
```

```
#####
```

```
<button onclick="javascript:sayHello()"
>Say Hello</button
>
```

```
#####
```

```
<script type="text/javascript">
  <![CDATA[

  function sayHello() {
    var name = prompt("What is your name?");
    Seam.Component.getInstance("helloAction").sayHello(name, sayHelloCallback);
  }

  function sayHelloCallback(result) {
    alert(result);
  }
  ]>
```

## #25# #####

```
// ]]>
</script
>
```

```
#####! #####
##### hello ##### Seam # /examples/
remoting/helloworld ##### Hello World #####
```

```
##### Javascript
#####
```

```
Seam.Component.getInstance("helloAction").sayHello(name, sayHelloCallback);
```

```
##### Seam.Component.getInstance("helloAction") ## helloAction
#####"###"##### #####
sayHello(name, sayHelloCallback); #####
```

```
#####sayHello##### name#####
#####sayHelloCallback## ##### sayHello##### Seam
Remoting ##### sayHelloCallback Javascript #####
##### void #####
```

```
sayHelloCallback#####
```

### 25.2.2. Seam.Component

```
Seam.Component Javascript ##### Seam #####
#####newInstance()# getInstance()## #####
#####newInstance()
#####getInstance()#####
```

#### 25.2.2.1. Seam.Component.newInstance()

```
#####JavaBean #####
##### getter/setter #####
##### Seam #####
```

```
@Name("customer")
@Entity
public class Customer implements Serializable
{
    private Integer customerId;
```



```
private String firstName;
private String lastName;

@Column public Integer getCustomerId() {
    return customerId;
}

public void setCustomerId(Integer customerId) {
    this.customerId = customerId;
}

@Column public String getFirstName() {
    return firstName;
}

public void setFirstName(String firstName) {
    this.firstName = firstName;
}

@Column public String getLastName() {
    return lastName;
}

public void setLastName(String lastName) {
    this.lastName = lastName;
}
}
```

```
##### Customer #####
```

```
var customer = Seam.Component.newInstance("customer");
```

```
##### customer #####
```

```
customer.setFirstName("John");
// Or you can set the fields directly
customer.lastName = "Smith";
```

### 25.2.2.2. Seam.Component.getInstance()

```

getInstance()##### Seam ##### Bean #####
#####
#####

#####
###customer#####customerAction#####saveCustomer()#####

```

```
Seam.Component.getInstance("customerAction").saveCustomer(customer);
```

### 25.2.2.3. Seam.Component.getComponentName()

```
##### null #####
```

```

if (Seam.Component.getComponentName(instance) == "customer")
    alert("Customer");
else if (Seam.Component.getComponentName(instance) == "staff")
    alert("Staff member");

```

### 25.2.3. Seam.Remoting

```

Seam Remoting #####Seam.Remoting#####
#####

```

#### 25.2.3.1. Seam.Remoting.createType()

```

##### Seam ##### JavaBean #####
#####
createType() ##### Java #####

```

```
var widget = Seam.Remoting.createType("com.acme.widgets.MyWidget");
```

#### 25.2.3.2. Seam.Remoting.getTypeName()

```

##### Seam.Component.getComponentName() #####
##### null ##### Java
#####

```

## 25.3. #####

```
##### seam/resource/remoting/interface.js
##### s:remote #####
```

```
<script type="text/javascript"
  src="seam/resource/remoting/interface.js?customerAction"
></script
>
```

```
<s:remote include="customerAction"/>
```

```
#####
```

```
#####
```

```
##### ##### Bean
##### #####
#####
```

```
##### Seam ##### Bean #####
##### ##### JavaBean #####
##### JavaBean (##### Bean # ##### Bean #####) #####
@WebRemote ##### ##### Bean
##### EJB ### JavaBean #####
```

## 25.4. #####

```
Seam ##### / ##### ID
#####
```

### 25.4.1. ## ID #####

```
##### Seam Remoting#####ID
##### ID
#####Seam.Remoting.getContext().getConversationId()#####ID
#####Seam.Remoting.getContext().setConversationId()#####
```

```
##ID ##### Seam.Remoting.getContext().setConversationId()#####
#####ID #####ID
#####ID#####ID#####
#####
```

## 25.4.2. #####

```
##### ID
##### JavaScript ##### ID ##### ID
#####
```

```
Seam.Remoting.getContext().setConversationId( #{conversation.id} );
```

## 25.5. #####

```
Seam #####
#####

Seam.Remoting.startBatch()#### ## #####
#####

#####Seam.Remoting.executeBatch()#####
#####
##### (#####) #####

startBatch()#####
Seam.Remoting.cancelBatch()#####

#####/examples/remoting/chatroom#####
```

## 25.6. #####

### 25.6.1. ##### / #####

```
#####
#####
```

#### 25.6.1.1. String #

```
String ##### Javascript String #####
```

#### 25.6.1.2. Number #

```
Java ##### String #####
##### Byte# Double# Float#
Integer# Long# Short #####
```

#### 25.6.1.3. Boolean #

```
Boolean ##### Javascript# Boolean ##### Java boolean #####
```

## 25.6.2. JavaBeans

```
##### JavaBeans # Seam ##### JavaBean ##### ### non-
component ##### (Seam #####
Seam.Component.newInstance()# ##### Seam.Remoting.createType()#
```

```
#####
#####
#####
```

```
@Name("myAction")
public class MyAction implements MyActionLocal {
    public void doSomethingWithObject(Object obj) {
        // code
    }
}
```

```
##### myWidget ##### myAction
##### myWidget ##### MyWidget
#####
```

```
<s:remote include="myAction,myWidget"/>
```

```
##### myWidget ##### Seam.Component.newInstance("myWidget") #####
myAction.doSomethingWithObject() #####
```

## 25.6.3. #####

```
##### ##### String ##### ##### Javascript Date
##### ##### java.util.Date ##### (### java.sql.Date #
java.sql.Timestamp #####)#
```

## 25.6.4. Enum

```
##### Enum # String ##### Enum ##### enum # String #####
#####
```

```
@Name("paintAction")
public class paintAction implements paintLocal {
    public enum Color {red, green, blue, yellow, orange, purple};

    public void paint(Color color) {
        // code
    }
}
```

## #25# #####

---

```
}  
}
```

```
paint() ##### red ##### String #####
```

```
Seam.Component.getInstance("paintAction").paint("red");
```

```
##### enum ##### (##### enum  
#####)# ##### String #####
```

### 25.6.5. ##

#### 25.6.5.1. Bag

```
Bag #### ##### (### Map #### #####)#  
Javascript #####  
##### Javascript ##### Javascript  
##### bag #####
```

#### 25.6.5.2. Map

```
Javascript ### Map ##### Map ### Seam Remoting  
##### Map ##### Seam.Remoting.Map  
#####
```

```
var map = new Seam.Remoting.Map();
```

```
## Javascript ##### Map ##### size()# isEmpty()# keySet()# values()#  
get(key)# put(key, value)# remove(key)# contains(key) ##### Java  
##### keySet() ### values() ##### Javascript  
Array #####
```

### 25.7. #####

```
#####  
#####  
##### Javascript ## setDebug() #####
```

```
Seam.Remoting.setDebug(true);
```

```
components.xml #####
```

```
<remoting:remoting debug="true"/>
```

```
#####      setDebug(false)      #####      #####
Seam.Remoting.log(message) #####
```

## 25.8. Handling Exceptions

When invoking a remote component method, it is possible to specify an exception handler which will process the response in the event of an exception during component invocation. To specify an exception handler function, include a reference to it after the callback parameter in your JavaScript:

```
var callback = function(result) { alert(result); };
var exceptionHandler = function(ex) { alert("An exception occurred: " + ex.getMessage()); };
Seam.Component.getInstance("helloAction").sayHello(name, callback, exceptionHandler);
```

If you do not have a callback handler defined, you must specify `null` in its place:

```
var exceptionHandler = function(ex) { alert("An exception occurred: " + ex.getMessage()); };
Seam.Component.getInstance("helloAction").sayHello(name, null, exceptionHandler);
```

The exception object that is passed to the exception handler exposes one method, `getMessage()` that returns the exception message which is produced by the exception thrown by the `@WebRemote` method.

## 25.9. #####

```
#####
```

### 25.9.1. #####

```
##### "Please Wait..." ##### Seam.Remoting.loadingMessage
#####
```

```
Seam.Remoting.loadingMessage = "Loading...";
```

### 25.9.2. #####

```
##### displayLoadingMessage() ### hideLoadingMessage()
#####
```

## #25# #####

```
// don't display the loading indicator
Seam.Remoting.displayLoadingMessage = function() {};
Seam.Remoting.hideLoadingMessage = function() {};
```

### 25.9.3. #####

```
##### displayLoadingMessage() #
hideLoadingMessage() #####
```

```
Seam.Remoting.displayLoadingMessage = function() {
    // Write code here to display the indicator
};

Seam.Remoting.hideLoadingMessage = function() {
    // Write code here to hide the indicator
};
```

### 25.10. #####

```
##### XML #####
Javascript ##### (Javabeans ##)#
#####
#####
#####
#####
#####)# #####

Seam Remoting ## ##### @WebRemote ##### exclude
##### (#.#)
##### String #####
#####

##### Widget #####
```

```
@Name("widget")
public class Widget
{
    private String value;
    private String secret;
    private Widget child;
    private Map<String,Widget> widgetMap;
    private List<Widget> widgetList;
```



```
// getters and setters for all fields
}
```

### 25.10.1. #####

```
##### widget ##### secret #####
```

```
@WebRemote(exclude = {"secret"})
public Widget getWidget();
```

```
#secret#####          secret          #####          ####
#####
##### widget ### child #####
### widget #####      ### child # secret #####
#####
```

```
@WebRemote(exclude = {"child.secret"})
public Widget getWidget();
```

### 25.10.2. Map #####

```
##### Map# ##### (List# Set# Array ##)#
##### widget # widgetList ##### widget #####
##### widget # secret #####
```

```
@WebRemote(exclude = {"widgetList.secret"})
public Widget getWidget();
```

```
Map ##### Map ##### [key] ##### Map
##### [value] ##### widgetMap ##### secret
#####
```

```
@WebRemote(exclude = {"widgetMap[value].secret"})
public Widget getWidget();
```

### 25.10.3. #####

```
#####
##### (##### Seam #####) ##### (##### Seam
#####) #####
```

## #25# #####

---

```
@WebRemote(exclude = {"[widget].secret"})
public Widget getWidget();
```

### 25.10.4. #####

#####

```
@WebRemote(exclude = {"widgetList.secret", "widgetMap[value].secret"})
public Widget getWidget();
```

## 25.11. Transactional Requests

By default there is no active transaction during a remoting request, so if you wish to perform database updates during a remoting request, you need to annotate the `@WebRemote` method with `@Transactional`, like so:

```
@WebRemote @Transactional(TransactionPropagationType.REQUIRED)
public void updateOrder(Order order) {
    entityManager.merge(order);
}
```

## 25.12. JMS #####

Seam Remoting # JMS ##### JMS  
#####

### 25.12.1. ##

```
JMS ##### ## Seam Remoting #####
seam.properties# web.xml ### components.xml #
org.jboss.seam.remoting.messaging.subscriptionRegistry.allowedTopics
#####
```

```
<remoting:remoting poll-timeout="5" poll-interval="1"/>
```

### 25.12.2. JMS Topic #####

##### JMS Topic #####

```
function subscriptionCallback(message)
{
  if (message instanceof Seam.Remoting.TextMessage)
    alert("Received message: " + message.getText());
}

Seam.Remoting.subscribe("topicName", subscriptionCallback);
```

```
Seam.Remoting.subscribe() ##### JMS Topic #####
#####
#####                               #####
#####                               instanceof          #####
Seam.Remoting.TextMessage ### Seam.Remoting.ObjectMessage #####
TextMessage ### text ##### (##### getText() #####) # ObjectMessage ###
value ##### (##### getValue() #####) #
```

### 25.12.3. #####

```
##### Seam.Remoting.unsubscribe() #####
```

```
Seam.Remoting.unsubscribe("topicName");
```

### 25.12.4. #####

```
##### Seam.Remoting.pollInterval ##
##### 10 #####

##### Seam.Remoting.pollTimeout ## #####
##### 0###
#####

pollTimeout #####
#####

##### components.xml ##### Javascript #####
#####
#####
```

components.xml:

```
<remoting:remoting poll-timeout="5" poll-interval="1"/>
```

JavaScript:

```
// Only wait 1 second between receiving a poll response and sending the next poll request.  
Seam.Remoting.pollInterval = 1;  
  
// Wait up to 5 seconds on the server for new messages  
Seam.Remoting.pollTimeout = 5;
```

---

## Seam#Google Web Toolkit

```
#####Ajax#####Google                               Web                               Toolkit
(GWT)#####Seam#GWT#####Seam#####
GWT#####GWT  tools##### http://code.google.com/
webtoolkit/#####GWT#####
```

### 26.1. ##

```
Seam#####GWT#####Seam#####GWT#####
Seam ##### Seam #####
```

### 26.2. #####

```
GWT#####Seam#####G
```

```
public interface MyService extends RemoteService {
    public String askIt(String question);
}
```

```
#####AsyncCallback #####
```

```
public interface MyServiceAsync extends RemoteService {
    public void askIt(String question, AsyncCallback callback);
}
```

```
##MyServiceAsync#####GWT#####
```

```
#####Seam#####
```

```
@Name("org.jboss.seam.example.remoting.gwt.client.MyService")
public class ServiceImpl implements MyService {

    @WebRemote
    public String askIt(String question) {

        if (!validate(question)) {
            throw new IllegalStateException("Hey, this shouldn't happen, I checked on the client, " +
                "but its always good to double check.");
        }
        return "42. Its the real question that you seek now.";
    }
}
```

```
}  
  
public boolean validate(String q) {  
    ValidationUtility util = new ValidationUtility();  
    return util.isValid(q);  
}  
}
```

The name of the seam component *must* match the fully qualified name of the GWT client interface (as shown), or the seam resource servlet will not be able to find it when a client makes a GWT call. The methods that are to be made accessible via GWT also need to be annotated with the `@WebRemote` annotation.

### 26.3. GWT##### Seam #####

#####

```
private MyServiceAsync getService() {  
    String endpointURL = GWT.getModuleBaseURL() + "seam/resource/gwt";  
  
    MyServiceAsync svc = (MyServiceAsync) GWT.create(MyService.class);  
    ((ServiceDefTarget) svc).setServiceEntryPoint(endpointURL);  
    return svc;  
}
```

#####

```
public class AskQuestionWidget extends Composite {  
    private AbsolutePanel panel = new AbsolutePanel();  
  
    public AskQuestionWidget() {  
        Label lbl = new Label("OK, what do you want to know?");  
        panel.add(lbl);  
        final TextBox box = new TextBox();  
        box.setText("What is the meaning of life?");  
        panel.add(box);  
        Button ok = new Button("Ask");  
        ok.addClickListener(new ClickListener() {  
            public void onClick(Widget w) {  
                ValidationUtility valid = new ValidationUtility();  
                if (!valid.isValid(box.getText())) {
```

```

        Window.alert("A question has to end with a '?'");
    } else {
        askServer(box.getText());
    }
}
});
panel.add(ok);

initWidget(panel);
}

private void askServer(String text) {
    getService().askIt(text, new AsyncCallback() {
        public void onFailure(Throwable t) {
            Window.alert(t.getMessage());
        }

        public void onSuccess(Object data) {
            Window.alert((String) data);
        }
    });
}
}

...

```

```

#####askServer()#####askServer()#
(#####)#####

```

## HelloWorld

This is an example of a host page for the HelloWorld application. You can attach a Web Toolkit module to any HTML page you like, making it easy to add bits of AJAX functionality to existing pages without starting from scratch.

OK, what do you want to know?

What is the meaning of li

```

#####Seam##### examples/remoting/gwt#####

```

## 26.4. GWT#Ant#####

GWT#####-

```

Javascript####(#####ant#####GWT###GUI#####
task#jar#####GWT(#####

```

```

#####ant#####

```

```
<taskdef uri="antlib:de.samaflost.gwttasks"
  resource="de/samaflost/gwttasks/antlib.xml"
  classpath=".lib/gwttasks.jar"/>

<property file="build.properties"/>
```

```
#####build.properties#####
```

```
gwt.home=/gwt_home_dir
```

```
#####GWT#####
```

```
<!-- GWT#zg#)j#####gY.
GWT##F4#oS6gYLGWT##%k#####Y##LB#~Y -->
<target name="gwt-compile">
  <!-- Sn4## GWT#### "re homing" WfD~Yng
GWT####`Q#cfD~Y - URL#####kY#_#kLjcfD~Y -->
  <delete>
    <fileset dir="view"/>
  </delete>
  <gwt:compile outDir="build/gwt"
    gwtHome="${gwt.home}"
    classBase="${gwt.module.name}"
    sourceclasspath="src"/>
  <copy todir="view">
    <fileset dir="build/gwt/${gwt.module.name}"/>
  </copy>
</target
>
```

```
#####GWT#####war#webapp###.
```

```
GWT#HTML#Javascript#####gwt-compile
```

```
#####GWT#####
```

```
GWT#####GWT#####
```



---

## Spring Framework ##

The Spring integration (part of the Seam IoC module) allows easy migration of Spring-based projects to Seam and allows Spring applications to take advantage of key Seam features like conversations and Seam's more sophisticated persistence context management.

```
##! Spring ##### jboss-seam-ioc ##### seam-spring
#####
```

```
Spring # Seam #####
```

- Seam ##### Spring Bean #####
- Spring Bean # Seam #####
- Spring Bean # Seam #####
- Spring Bean # Seam #####
- Seam ##### # Spring Web #####
- Spring PlatformTransactionManagement #####
- Spring # OpenEntityManagerInViewFilter ### OpenSessionInViewFilter ##### Seam #####
- @Asynchronous ##### Spring TaskExecutors #####

### 27.1. Seam ##### Spring Bean #####

```
Seam ##### Spring Bean ##### <seam:instance/> #####
Seam ##### Seam ##### Spring Bean #####
```

```
<beans xmlns="http://www.springframework.org/schema/beans"
  xmlns:seam="http://jboss.com/products/seam/spring-seam"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.springframework.org/schema/beans
    http://www.springframework.org/schema/beans/spring-beans-2.0.xsd
    http://jboss.com/products/seam/spring-seam
    http://jboss.com/products/seam/spring-seam-2.2.xsd">
```

```
#### Seam ##### Spring Bean #####
```

```
<bean id="someSpringBean" class="SomeSpringBeanClass" scope="prototype">
```

## #27# Spring Framework ##

---

```
<property name="someProperty">
  <seam:instance name="someComponent"/>
</property>
</bean
>
```

##### EL #####

```
<bean id="someSpringBean" class="SomeSpringBeanClass" scope="prototype">
  <property name="someProperty">
    <seam:instance name="{someExpression}"/>
  </property>
</bean
>
```

Seam ##### Spring Bean id # Spring Bean #####

```
<seam:instance name="someComponent" id="someSeamComponentInstance"/>

<bean id="someSpringBean" class="SomeSpringBeanClass" scope="prototype">
  <property name="someProperty" ref="someSeamComponentInstance">
</bean>
```

##!

Seam##### Spring ##### Seam  
##### Spring ##### Spring Bean  
##### ##### Bean #####  
Bean##### Bean ##### Seam ## #####  
### ## Spring Bean ##### Spring Bean  
##### (scope impedance) #####  
##### Seam ##### Spring ## Seam  
#####

<seam:instance/> ##### Seam #####

```
<seam:instance id="seamManagedEM" name="someManagedEMComponent" proxy="true"/>

<bean id="someSpringBean" class="SomeSpringBeanClass">
  <property name="entityManager" ref="seamManagedEM">
</bean
```

&gt;

```
##### Spring Bean ## Seam ##### (Spring
OpenEntityManagerInView ##### Seam ##### Spring #
Seam #####)
```

## 27.2. Spring Bean # Seam #####

```
Spring Bean # Seam ##### ## ##### 2 #####
```

- EL ##### Spring Bean #####
- Spring Bean # Seam #####

```
##### 2 ##### EL ##### Spring Bean #####
```

```
Spring # DelegatingVariableResolver # Spring # JSF ##### Spring
##### ## VariableResolver ## Bean ID ##### EL ##### Spring Bean
##### DelegatingVariableResolver # faces-config.xml #####
```

```
<application>
  <variable-resolver>
    org.springframework.web.jsf.DelegatingVariableResolver
  </variable-resolver>
</application>
>
```

```
##### @In ##### Spring Bean #####
```

```
@In("#{bookingService}")
private BookingService bookingService;
```

```
EL ##### Spring Bean ##### Seam # EL #####
Spring Bean #####
```

## 27.3. Spring Bean # Seam #####

```
<seam:component /> ##### Spring Bean ## Seam ##### Seam
##### Bean ##### <seam:component /> #####
```

```
<bean id="someSpringBean" class="SomeSpringBeanClass" scope="prototype">
  <seam:component/>
</bean>
```

>

```
##### <seam:component/># Bean ##### STATELESS#####
#####FactoryBean ##### Spring Bean #### # Bean
##### class #####
Seam #####

Spring Bean #### Seam ##### <seam:component/> # scope #####
Seam ##### STATELESS ##### Spring Bean # prototype ##### Spring
Bean #####
```

## 27.4. Seam ##### Spring Bean

```
Seam ##### Seam ##### Spring 2.0 #####
##### Seam ##### Spring Bean #####
Spring #####
##### Spring Bean ##### Bean ##### Bean
#####
```

```
Spring Bean factory ###<seam:configure-scopes/> ##### Seam
##### Spring Bean ##### Spring Bean #### Seam ##### Bean
### scope ### Seam #####
```

<!-- Only needs to be specified once per bean factory-->

<seam:configure-scopes/>

...

```
<bean id="someSpringBean" class="SomeSpringBeanClass"
scope="seam.CONVERSATION"/>
```

```
configure-scopes ##### prefix #####
(##### seam. ###)
```

```
##### Spring ##### @In #####
##### @In(create=true) ##### Bean #####
configure-scopes # default-auto-create ##### Seam ##### Spring Bean
#####
```

```
##### Seam ##### Spring Bean ## <seam:instance/> ##### Spring Bean
##### ##### Spring ##### Bean
##### <aop:scoped-proxy/> ##### Seam ##### Spring Bean # <aop:scoped-
proxy/> ##### Bean # Seam #### Spring Bean#####
<seam:instance/>#####
```

```

<bean          id="someSpringBean"          class="SomeSpringBeanClass"
  scope="seam.CONVERSATION"/>

...

<bean id="someSingleton">
  <property name="someSeamScopedSpringBean">
    <seam:instance name="someSpringBean" proxy="true"/>
  </property>
</bean
>

```

## 27.5. Spring # PlatformTransactionManagement #####

Spring ##### API (JPA# Hibernate# JDO# JTA ##)  
 ##### ## Spring # Websphere # Weblogic ##### TransactionManagers  
 ##### Spring #####  
 REQUIRES\_NEW # NOT\_SUPPORTED ##### Java EE #####  
 ##### Spring ##### ## [http://static.springframework.org/spring/docs/2.0.x/reference/  
 transaction.html] #####

Seam # Spring ##### SpringTransaction #####

```

<spring:spring-transaction platform-transaction-manager="{transactionManager}"/>

```

spring:spring-transaction ##### Spring #####

## 27.6. Spring # Seam #####

Seam ##### EntityManager #####  
 ##### ## LazyInitializationException  
 ##### Spring # Web #####  
 (OpenEntityManagerInViewFilter)# ##### Spring # JPA #####  
 Seam ##### Spring #####  
 (PersistenceAnnotationBeanPostProcessor# JpaTemplate ##)#

Seam ##### JPA ##### Spring # Seam ##### Spring  
 #####

#####

- Spring ##### Seam #####
- Web ##### Seam ##### (#### quartz #####)

## #27# Spring Framework ##

---

- Seam ##### Spring ##### (#####)

Spring ##### EntityManagerFactory ##### EntityManager ##### Seam  
### EntityManagerFactory # Seam #####

```
<bean                                id="seamEntityManagerFactory"
  class="org.jboss.seam.ioc.spring.SeamManagedEntityManagerFactoryBean">
  <property name="persistenceContextName" value="entityManager"/>
</bean>
>
```

#persistenceContextName## Seam #####  
EntityManagerFactory ## Seam ##### unitName #### #####entityManager#####  
## unitName ##### persistenceUnitName #####

```
<bean                                id="seamEntityManagerFactory"
  class="org.jboss.seam.ioc.spring.SeamManagedEntityManagerFactoryBean">
  <property name="persistenceContextName" value="entityManager"/>
  <property name="persistenceUnitName" value="bookingDatabase:extended"/>
</bean>
>
```

##### EntityManagerFactory ##### Spring ##### ##### Spring #  
PersistenceAnnotationBeanPostProcessor #####

```
<bean
  class="org.springframework.orm.jpa.support.PersistenceAnnotationBeanPostProcessor"/>
```

Spring ##### EntityManagerFactory ##### Seam #####  
defaultPersistenceUnitName ##### persistenctUnitName #  
PersistenceAnnotationBeanPostProcessor #####  
applicationContext.xml #####

```
<bean                                id="entityManagerFactory"
  class="org.springframework.orm.jpa.LocalEntityManagerFactoryBean">
  <property name="persistenceUnitName" value="bookingDatabase"/>
</bean>
<bean                                id="seamEntityManagerFactory"
  class="org.jboss.seam.ioc.spring.SeamManagedEntityManagerFactoryBean">
  <property name="persistenceContextName" value="entityManager"/>
```

```

    <property name="persistenceUnitName" value="bookingDatabase:extended"/>
</bean>
<bean
  class="org.springframework.orm.jpa.support.PersistenceAnnotationBeanPostProcessor">
  <property name="defaultPersistenceUnitName" value="bookingDatabase:extended"/>
</bean>
>

```

component.xml #####

```

<persistence:managed-persistence-context name="entityManager"
  auto-create="true" entity-manager-factory="#{entityManagerFactory}/>

```

```

JpaTemplate    ###    JpaDaoSupport    #    Seam    #####    Seam
#####

```

```

<bean id="bookingService" class="org.jboss.seam.example.spring.BookingService">
  <property name="entityManagerFactory" ref="seamEntityManagerFactory"/>
</bean>
>

```

## 27.7. Spring # Seam ### Hibernate #####

```

Seam Spring ##### Spring ##### Seam ## Hibernate #####
##### JPA ## #####

```

```

Spring # JPA ##### Spring #####EntityManagerFactory ##### EntityManager
## Spring ##### Seam Session ### proxy sessionFactory # Seam
### Hibernate #####

```

```

<bean                                     id="seamSessionFactory"
  class="org.jboss.seam.ioc.spring.SeamManagedSessionFactoryBean">
  <property name="sessionName" value="hibernateSession"/>
</bean>
>

```

```

#sessionName## persistence:managed-hibernate-session #####
SessionFactory ##### Spring #####
SeamManagedSessionFactory # getCurrentInstance() #####
SessionFactory.getCurrentInstance() #####

```

## 27.8. Seam ##### Spring Application Context

##### Spring # ApplicationContext ##### Spring # ContextLoaderListener  
#####

- Spring ApplicationContext ## SeamListener#####
- Seam ##### Spring ApplicationContext #####

```
### 2 ##### Spring ##### Spring ApplicationContext ##### Seam #####
## Seam ##### <spring:context-loader/> ##### components.xml
##### config-locations ##### Spring #####
##### <spring:config-locations/> ##### components.xml
#####
```

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:spring="http://jboss.com/products/seam/spring"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://jboss.com/products/seam/components
    http://jboss.com/products/seam/components-2.2.xsd
    http://jboss.com/products/seam/spring
    http://jboss.com/products/seam/spring-2.2.xsd">

  <spring:context-loader config-locations="/WEB-INF/applicationContext.xml"/>

</components>
```

## 27.9. @Asynchronous # Spring # TaskExecutor #####

```
Spring ##### TaskExecutor ##### Spring Seam #####
@Asynchronous ##### Spring # TaskExecutor #####
SpringTaskExecutorDispatcher ##### Spring Bean ### taskExecutor #####
```

```
<spring:task-executor-dispatcher task-executor="{springThreadPoolTaskExecutor}"/>
```

```
Spring # TaskExecutor ##### Seam Dispatcher
#####
```

```
<!-- Install a ThreadPoolDispatcher to handle scheduled asynchronous event -->
<core:thread-pool-dispatcher name="threadPoolDispatcher"/>
```



```
<!-- Install the SpringDispatcher as default -->
```

```
<spring:task-executor-dispatcher          task-executor="#{springThreadPoolTaskExecutor}"  
    schedule-dispatcher="#{threadPoolDispatcher}"/>
```

---

---

## Guice integration

Google Guice is a library that provides lightweight dependency injection through type-safe resolution. The Guice integration (part of the Seam IoC module) allows use of Guice injection for all Seam components annotated with the `@Guice` annotation. In addition to the regular bijection that Seam performs (which becomes optional), Seam also delegates to known Guice injectors to satisfy the dependencies of the component. Guice may be useful to tie non-Seam parts of large or legacy applications together with Seam.



##

The Guice integration is bundled in the `jboss-seam-ioc` library. This dependency is required for all integration techniques covered in this chapter. You will also need the Guice JAR file on the classpath.

### 28.1. Creating a hybrid Seam-Guice component

The goal is to create a hybrid Seam-Guice component. The rule for how to do this is very simple. If you want to use Guice injection in your Seam component, annotate it with the `@Guice` annotation (after importing the type `org.jboss.seam.ioc.guice.Guice`).

```
@Name("myGuicyComponent")
@Guice public class MyGuicyComponent
{
    @Inject MyObject myObject;
    @Inject @Special MyObject mySpecialObject;
    ...
}
```

This Guice injection will happen on every method call, just like with bijection. Guice injects based on type and binding. To satisfy the dependencies in the previous example, you might have bound the following implementations in a Guice module, where `@Special` is an annotation you define in your application.

```
public class MyGuicyModule implements Module
{
    public void configure(Binder binder)
    {
        binder.bind(MyObject.class)
            .toInstance(new MyObject("regular"));

        binder.bind(MyObject.class).annotatedWith(Special.class)
```

```
.toInstance(new MyObject("special"));  
}  
}
```

Great, but which Guice injector will be used to inject the dependencies? Well, you need to perform some setup first.

## 28.2. Configuring an injector

You tell Seam which Guice injector to use by hooking it into the injection property of the Guice initialization component in the Seam component descriptor (components.xml):

```
<components xmlns="http://jboss.com/products/seam/components"  
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
  xmlns:guice="http://jboss.com/products/seam/guice"  
  xsi:schemaLocation="  
    http://jboss.com/products/seam/guice  
    http://jboss.com/products/seam/guice-2.2.xsd  
    http://jboss.com/products/seam/components  
    http://jboss.com/products/seam/components-2.2.xsd">  
  
  <guice:init injector="#{myGuiceInjector}"/>  
  
</components>
```

`myGuiceInjector` must resolve to a Seam component that implements the `Guice Injector` interface.

Having to create an injector is boiler-plate code, though. What you really want to be able to do is simply hook up Seam to your Guice modules. Fortunately, there is a built-in Seam component that implements the `Injector` interface to do exactly that. You can configure it in the Seam component descriptor with this additional stanza.

```
<guice:injector name="myGuiceInjector">  
  <guice:modules>  
    <value>com.example.guice.GuiceModule1</value>  
    <value>com.example.guice.GuiceModule2</value>  
  </guice:modules>  
</guice:injector>
```

Of course you can also use an injector that is already used in other, possibly non-Seam part of your application. That's one of the main motivations for creating this integration. Since the injector

is defined with EL expression, you can obtain it in whatever way you like. For instance, you may use the Seam factory component pattern to provide injector.

```
@Name("myGuiceInjectorFactory")
public InjectorFactory
{
    @Factory(name = "myGuiceInjector", scope = APPLICATION, create = true)
    public Injector getInjector()
    {
        // Your code that returns injector
    }
}
```

### 28.3. Using multiple injectors

By default, an injector configured in the Seam component descriptor is used. If you really need to use multiple injectors (AFAIK, you should use multiple modules instead), you can specify different injector for every Seam component in the `@Guice` annotation.

```
@Name("myGuicyComponent")
@Guice("myGuiceInjector")
public class MyGuicyComponent
{
    @Inject MyObject myObject;
    ...
}
```

That's all there is to it! Check out the guice example in the Seam distribution to see the Seam Guice integration in action!



---

# Hibernate Search

## 29.1. #####

Apache Lucene™ ##### Apache  
Lucene ##### Hibernate  
Search#####

Hibernate Search has been designed to integrate nicely and as naturally as possible with JPA and Hibernate. As a natural extension, JBoss Seam provides an Hibernate Search integration.

Please refer to the [Hibernate Search documentation](#) [] for information specific to the Hibernate Search project.

## 29.2. ##

Hibernate Search ##META-INF/persistence.xml ### hibernate.cfg.xml  
#####

Hibernate Search  
#####

```
<persistence-unit name="sample">
  <jta-data-source>java:/DefaultDS</jta-data-source>
  <properties>
    [...]
    <!-- use a file system based index -->
    <property name="hibernate.search.default.directory_provider"
      value="org.hibernate.search.store.FSDirectoryProvider"/>
    <!-- directory where the indexes will be stored -->
    <property name="hibernate.search.default.indexBase"
      value="/Users/prod/apps/dvdstore/dvdindexes"/>
  </properties>
</persistence-unit>
```

If you plan to target Hibernate Annotations or EntityManager 3.2.x (embedded into JBoss AS 4.2.x and later), you also need to configure the appropriate event listeners.

```
<persistence-unit name="sample">
  <jta-data-source>java:/DefaultDS</jta-data-source>
  <properties>
    [...]
```

```
<!-- use a file system based index -->
<property name="hibernate.search.default.directory_provider"
  value="org.hibernate.search.store.FSDirectoryProvider"/>
<!-- directory where the indexes will be stored -->
<property name="hibernate.search.default.indexBase"
  value="/Users/prod/apps/dvdstore/dvdindexes"/>

<property name="hibernate.ejb.event.post-insert"
  value="org.hibernate.search.event.FullTextIndexEventListener"/>
<property name="hibernate.ejb.event.post-update"
  value="org.hibernate.search.event.FullTextIndexEventListener"/>
<property name="hibernate.ejb.event.post-delete"
  value="org.hibernate.search.event.FullTextIndexEventListener"/>

</properties>
</persistence-unit>
```



##

It is not longer necessary the register the event listeners if Hibernate Annotations or EntityManager 3.3.x are used. When using Hibernate Search 3.1.x more eventlisteners are needed, but these are registered automatically by Hibernate Annotations; refer to the [Hibernate Search reference](#) for configuring it without EntityManager and Annotations.

##### jar #####:

- hibernate-search.jar
- hibernate-commons-annotations.jar
- lucene-core.jar

hibernate-commons-annotations.jar is not needed in JBossAS6. Some Hibernate Search extensions require additional dependencies, a commonly used is hibernate-search-analyzers.jar. For details, see the [Hibernate Search documentation](http://www.hibernate.org/subprojects/search/docs) [http://www.hibernate.org/subprojects/search/docs] for details.



##

#### EAR #####application.xml #####



## 29.3. ###

Hibernate Search uses annotations to map entities to a Lucene index, check the [reference documentation](http://www.hibernate.org/subprojects/search/docs) [http://www.hibernate.org/subprojects/search/docs] for more informations.

```

Hibernate Search ##API # JPA/Hibernate #####HQL
#####
##FullTextSession API ###(Hibernate # Session #####)#

```

```

Hibernate Search #####JBoss Seam # FullTextSession #####

```

```

@Stateful
@Name("search")
public class FullTextSearchAction implements FullTextSearch, Serializable {

    @In FullTextSession session;

    public void search(String searchString) {
        org.apache.lucene.search.Query luceneQuery = getLuceneQuery();
        org.hibernate.Query query session.createFullTextQuery(luceneQuery, Product.class);
        searchResults = query
            .setMaxResults(pageSize + 1)
            .setFirstResult(pageSize * currentPage)
            .list();
    }
    [...]
}

```



##

```

FullTextSession # org.hibernate.Session ##### Hibernate Session
#####

```

```

Java Persistence API #####

```

```

@Stateful
@Name("search")
public class FullTextSearchAction implements FullTextSearch, Serializable {

    @In FullTextEntityManager em;

    public void search(String searchString) {

```

## #29# Hibernate Search

```
org.apache.lucene.search.Query luceneQuery = getLuceneQuery();
javax.persistence.Query query = em.createFullTextQuery(luceneQuery, Product.class);
searchResults = query
    .setMaxResults(pageSize + 1)
    .setFirstResult(pageSize * currentPage)
    .getResultList();
}
[...]
```

```
Hibernate Search #####JBoss Seam # FullTextEntityManager
#####FullTextEntityManager ##### EntityManager
#####FullTextSession # Session #####

EJB 3.0 Session #####Bean(Message Driven Bean)
#####(#####@PersistenceContext #####)##### EntityManager #####
FullTextEntityManager #####
FullTextEntityManager #####
```

```
@Stateful
@Name("search")
public class FullTextSearchAction implements FullTextSearch, Serializable {

    @PersistenceContext EntityManager em;

    public void search(String searchString) {
        org.apache.lucene.search.Query luceneQuery = getLuceneQuery();
        FullTextEntityManager ftEm = (FullTextEntityManager) em;
        javax.persistence.Query query = ftEm.createFullTextQuery(luceneQuery, Product.class);
        searchResults = query
            .setMaxResults(pageSize + 1)
            .setFirstResult(pageSize * currentPage)
            .getResultList();
    }
    [...]
}
```



##

For people accustomed to Hibernate Search out of Seam, note that using `Search.getFullTextSession` is not necessary.

DVDStore # JBoss Seam ##### blog #####Hibernate Search #####



---

## Seam ##### Seam #####

Configuration is a very boring topic and an extremely tedious pastime. Unfortunately, several lines of XML are required to integrate Seam into your JSF implementation and servlet container. There's no need to be too put off by the following sections; you'll never need to type any of this stuff yourself, since you can just use seam-gen to start your application or you can copy and paste from the example applications!

### 30.1. Seam #####

```
### JSF # Seam #####
```

#### 30.1.1. Seam # JSF# #####

```
## faces #####
```

```
<servlet>
  <servlet-name
>Faces Servlet</servlet-name>
  <servlet-class
>javax.faces.webapp.FacesServlet</servlet-class>
  <load-on-startup
>1</load-on-startup>
</servlet>

<servlet-mapping>
  <servlet-name
>Faces Servlet</servlet-name>
  <url-pattern
>*.seam</url-pattern>
</servlet-mapping>
>
```

```
(## URL #####)
```

```
### Seam ## web.xml#####
```

```
<listener>
  <listener-class
>org.jboss.seam.servlet.SeamListener</listener-class>
</listener>
>
```

## #30# Seam #### Seam #####...

```
##### Seam #####
```

```
JSF          #####          Seam          #####  
##### web.xml #####
```

```
<context-param>  
  <param-name>  
>javax.faces.STATE_SAVING_METHOD</param-name>  
  <param-value>  
>client</param-value>  
</context-param>  
>
```

```
##### JSF ##### Seam # JSF #####  
PAGE ##### JSF-RI ##### PAGE  
#### Bean #####  
##### PAGE #####  
##### ( ##### [https://javaserverfaces-  
spec-public.dev.java.net/issues/show_bug.cgi?id=295] ###)# #####  
JSF#####
```

```
<context-param>  
  <param-name>com.sun.faces.serializeServerState</param-name>  
  <param-value>>true</param-value>  
</context-param>
```

### 30.1.2. Using Facelets

If you want follow our advice and use Facelets instead of JSP, add the following lines to `faces-config.xml`:

```
<application>  
  <view-handler>  
>com.sun.facelets.FaceletViewHandler</view-handler>  
</application>  
>
```

```
#### web.xml#####
```

```
<context-param>
```

```

    <param-name
>javax.faces.DEFAULT_SUFFIX</param-name>
    <param-value
>.xhtml</param-value>
</context-param
>

```

If you are using facelets in JBoss AS, you'll find that Facelets logging is broken (the log messages don't make it to the server log). Seam provides a bridge to fix this, to use it copy `lib/interop/jboss-seam-jul.jar` to `$JBOSS_HOME/server/default/deploy/jboss-web.deployer/jsf-lib/` and include the `jboss-seam-ui.jar` in the `WEB-INF/lib` of your application. The Facelets logging categories are itemized in the [Facelets Developer Documentation](https://facelets.dev.java.net/nonav/docs/dev/docbook.html#config-logging) [https://facelets.dev.java.net/nonav/docs/dev/docbook.html#config-logging].

### 30.1.3. Seam #####

```

Seam ##### Seam Remoting ##### (#####) # JSF # UI
##### Seam ##### web.xml #####

```

```

<servlet>
  <servlet-name
>Seam Resource Servlet</servlet-name>
  <servlet-class
>org.jboss.seam.servlet.SeamResourceServlet</servlet-class>
</servlet>

<servlet-mapping>
  <servlet-name
>Seam Resource Servlet</servlet-name>
  <url-pattern
>/seam/resource/*</url-pattern>
</servlet-mapping
>

```

### 30.1.4. Seam#####

```

Seam ##### Seam
##### Seam #####
##### web.xml #####

```

```

<filter>
  <filter-name

```

```

>Seam Filter</filter-name>
  <filter-class
>org.jboss.seam.servlet.SeamFilter</filter-class>
</filter>

<filter-mapping>
  <filter-name
>Seam Filter</filter-name>
  <url-pattern
>/*</url-pattern>
</filter-mapping
>

```

```

Seam ##### web.xml #####
#####

```

```

Seam ##### components.xml #####

```

- url-pattern — ##### url-pattern  
##### Tomcat #####
- regex-url-pattern — ##### regex-url-pattern  
#####
- disabled — #####

```

##### URI ##### (HttpServletRequest.getURIPath() ###)#
#####

```

```

#####

```

### 30.1.4.1. ####

```

##### pages.xml ##### (#####)# ###
##### (Java EE ##### Web
##### ###
Tomcat #####)

```

```

##### components.xml#<web:exception-
filter>#####

```

```

<components xmlns="http://jboss.com/products/seam/components"
  xmlns:web="http://jboss.com/products/seam/web">

```



```
<web:exception-filter url-pattern="*.seam"/>

</components
>
```

### 30.1.4.2. #####

```
#####Seam##### Seam ###
ID #####

##### components.xml#####
```

```
<web:redirect-filter url-pattern="*.seam"/>
```

### 30.1.4.3. URL #####

```
##### Seam # pages.xml ##### URL #####
##### components.xml #####
```

```
<web:rewrite-filter view-mapping="*.seam"/>
```

```
view-mapping ##### web.xml ##### Faces #####
##### *.seam #####
```

### 30.1.4.4. #####

```
##### Seam ##### JSF #####
RFC-2388 (multipart/form-data ##) #####
components.xml#####
```

```
<web:multipart-filter create-temp-files="true"
    max-request-size="1000000"
    url-pattern="*.seam"/>
```

- create-temp-files — true  
#####  
##### false ###
- max-request-size — ##### (#### Content-Length  
#####) ##### 0 ## (#####)#

### 30.1.4.5. #####

#####

#####components.xml #####

```
<web:character-encoding-filter encoding="UTF-16"
    override-client="true"
    url-pattern="*.seam"/>
```

- encoding — #####
- override-client — true #####
  - encoding ##### false
  - ##### false ###

### 30.1.4.6. RichFaces

RichFaces ##### Seam # RichFaces Ajax  
##### web.xml ##### RichFaces  
Ajax #####

RichFaces Ajax ##### RichFaces jar #####

##### components.xml ##### RichFaces Developer Guide  
#####

```
<web:ajax4jsf-filter force-parser="true"
    enable-cache="true"
    log4j-init-file="custom-log4j.xml"
    url-pattern="*.seam"/>
```

- force-parser — JSF ##### Richfaces # XML ##### false ##  
AJAX ##### XML ##### force-parser # false #####  
AJAX #####
- enable-cache — ##### (javascript# CSS# #####)# #####  
javascript # CSS ##### true #####
- log4j-init-file — ##### log4j.xml  
#####

### 30.1.4.7. #####

```
##### log4j ##### %X{username}
#####

##### <web:logging-filter> #####
components.xml #####
```

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:web="http://jboss.com/products/seam/web">
  <web:logging-filter url-pattern="*.seam"/>
</components
>
```

### 30.1.4.8. #####

```
JSF #####JSF##### Seam#
Seam#####

##### Seam#####
#####Seam##### JSF# FacesServlet
##### Seam #JSF##### phase listener#####

#####components.xml #####
```

```
<web:context-filter url-pattern="/media/*"/>
```

```
#####conversationId##### ID #####
ID#####

##### ID##### Seam##### conversation#####
ID#####
```

### 30.1.4.9. Enabling HTTP cache-control headers

Seam does *not* automatically add `cache-control` HTTP headers to any resources served by the Seam resource servlet, or directly from your view directory by the servlet container. This means that your images, Javascript and CSS files, and resource representations from Seam resource servlet such as Seam Remoting Javascript interfaces are usually not cached by the browser. This is convenient in development but should be changed in production when optimizing the application.

You can configure a Seam filter to enable automatic addition of `cache-control` headers depending on the requested URI in `components.xml`:

```

<web:cache-control-filter name="commonTypesCacheControlFilter"
    regex-url-pattern=".*(\.gif|\.png|\.jpg|\.jpeg|\.css|\.js)"
    value="max-age=86400"/> <!-- 1 day -->

<web:cache-control-filter name="anotherCacheControlFilter"
    url-pattern="/my/cachable/resources/*"
    value="max-age=432000"/> <!-- 5 days -->

```

You do not have to name the filters unless you have more than one filter enabled.

### 30.1.4.10. #####

```

Seam #####
web.xml #####)# @Filter ##### Seam #####
(javax.servlet.Filter #####) #####

```

```

@Startup
@Scope(APPLICATION)
@Name("org.jboss.seam.web.multipartFilter")
@BypassInterceptors
@Filter(within="org.jboss.seam.web.ajax4jsfFilter")
public class MultipartFilter extends AbstractFilter {

```

```

@Startup ##### Seam #####
(@BypassInterceptors)# ##### RichFaces #####
(@Filter(within="org.jboss.seam.web.ajax4jsfFilter"))#

```

### 30.1.5. EJB #### Seam ###

In a Seam application, EJB components have a certain duality, as they are managed by both the EJB container and Seam. Actually, it's more that Seam resolves EJB component references, manages the lifetime of stateful session bean components, and also participates in each method call via interceptors. Let's start with the configuration of the Seam interceptor chain.

We need to apply the `SeamInterceptor` to our Seam EJB components. This interceptor delegates to a set of built-in server-side interceptors that handle such concerns as bijection, conversation demarcation, and business process signals. The simplest way to do this across an entire application is to add the following interceptor configuration in `ejb-jar.xml`:

```

<interceptors>
  <interceptor>
    <interceptor-class

```

```

>org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
  </interceptor>
</interceptors>

<assembly-descriptor>
  <interceptor-binding>
    <ejb-name
>*</ejb-name>
    <interceptor-class
>org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
    </interceptor-binding>
  </assembly-descriptor>

```

Seam needs to know where to go to find session beans in JNDI. One way to do this is specify the `@JndiName` annotation on every session bean Seam component. However, this is quite tedious. A better approach is to specify a pattern that Seam can use to calculate the JNDI name from the EJB name. Unfortunately, there is no standard mapping to global JNDI defined in the EJB3 specification, so this mapping is vendor-specific (and may depend on your own naming conventions as well). We usually specify this option in `components.xml`.

JBoss#####

```
<core:init jndi-name="earName/#{ejbName}/local" />
```

In this case, `earName` is the name of the EAR in which the bean is deployed, Seam replaces `#{ejbName}` with the name of the EJB, and the final segment represents the type of interface (local or remote).

Outside the context of an EAR (when using the JBoss Embeddable EJB3 container), the first segment is dropped since there is no EAR, leaving us with the following pattern:

```
<core:init jndi-name="#{ejbName}/local" />
```

How these JNDI names are resolved and somehow locate an EJB component might appear a bit like black magic at this point, so let's dig into the details. First, let's talk about how the EJB components get into JNDI.

The folks at JBoss don't care much for XML, if you can't tell. So when they designed JBoss AS, they decided that EJB components would get assigned a global JNDI name automatically, using the pattern just described (i.e., EAR name/EJB name/interface type). The EJB name is the first non-empty value from the following list:

- The value of the `<ejb-name>` element in `ejb-jar.xml`

- The value of the `name` attribute in the `@Stateless` or `@Stateful` annotation
- The simple name of the bean class

Let's look at an example. Assume that you have the following EJB bean and interface defined.

```
package com.example.myapp;

import javax.ejb.Local;

@Local
public interface Authenticator
{
    boolean authenticate();
}

package com.example.myapp;

import javax.ejb.Stateless;

@Stateless
@Name("authenticator")
public class AuthenticatorBean implements Authenticator
{
    public boolean authenticate() { ... }
}
```

Assuming your EJB bean class is deployed in an EAR named `myapp`, the global JNDI name `myapp/AuthenticatorBean/local` will be assigned to it on JBoss AS. As you learned, you can reference this EJB component as a Seam component with the name `authenticator` and Seam will take care of finding it in JNDI according to the JNDI pattern (or `@JndiName` annotation).

So what about the rest of the application servers? Well, according to the Java EE spec, which most vendors try to adhere to religiously, you have to declare an EJB reference for your EJB in order for it to be assigned a JNDI name. That requires some XML. It also means that it is up to you to establish a JNDI naming convention so that you can leverage the Seam JNDI pattern. You might find the JBoss convention a good one to follow.

There are two places you have to define the EJB reference when using Seam on non-JBoss application servers. If you are going to be looking up the Seam EJB component through JSF (in a JSF view or as a JSF action listener) or a Seam JavaBean component, then you must declare the EJB reference in `web.xml`. Here is the EJB reference for the example component just shown:

```
<ejb-local-ref>
```

```

<ejb-ref-name>myapp/AuthenticatorBean/local</ejb-ref-name>
<ejb-ref-type>Session</ejb-ref-type>
<local>org.example.vehicles.action.Authenticator</local>
</ejb-local-ref>

```

This reference will cover most uses of the component in a Seam application. However, if you want to be able to inject a Seam EJB component into another Seam EJB component using `@In`, you need to define this EJB reference in another location. This time, it must be defined in `ejb-jar.xml`, and it's a bit trickier.

Within the context of an EJB method call, you have to deal with a somewhat sheltered JNDI context. When Seam attempts to find another Seam EJB component to satisfy an injection point defined using `@In`, whether or not it finds it depends on whether an EJB reference exists in JNDI. Strictly speaking, you cannot simply resolve JNDI names as you please. You have to define the references explicitly. Fortunately, JBoss recognized how aggravating this would be for the developer and all versions of JBoss automatically register EJBs so they are always available in JNDI, both to the web container and the EJB container. So if you are using JBoss, you can skip the next few paragraphs. However, if you are deploying to GlassFish, pay close attention.

For application servers that stubbornly adhere to the EJB specification, EJB references must always be defined explicitly. But unlike with the web context, where a single resource reference covers all uses of the EJB from the web environment, you cannot declare EJB references globally in the EJB container. Instead, you have to specify the JNDI resources for a given EJB component one-by-one.

Let's assume that we have an EJB named `RegisterAction` (the name is resolved using the three steps mentioned previously). That EJB has the following Seam injection:

```

@In(create = true)
Authenticator authenticator;

```

In order for this injection to work, the link must be established in the `ejb-jar.xml` file as follows:

```

<ejb-jar>
  <enterprise-beans>
    <session>
      <ejb-name>RegisterAction</ejb-name>
      <ejb-local-ref>
        <ejb-ref-name>myapp/AuthenticatorAction/local</ejb-ref-name>
        <ejb-ref-type>Session</ejb-ref-type>
        <local>com.example.myapp.Authenticator</local>
      </ejb-local-ref>
    </session>
  </enterprise-beans>
</ejb-jar>

```

```
</enterprise-beans>
```

```
...
```

```
</ejb-jar>
```

Notice that the contents of the `<ejb-local-ref>` are identical to what we defined in `web.xml`. What we are doing is bringing the reference into the EJB context where it can be used by the `RegisterAction` bean. You will need to add one of these references for any injection of a Seam EJB component into another Seam EJB component using `@In`. (You can see an example of this setup in the `jee5/booking` example).

But what about `@EJB`? It's true that you can inject one EJB into another using `@EJB`. However, by doing so, you are injecting the actual EJB reference rather than the Seam EJB component instance. In this case, some Seam features will work, while others won't. That's because Seam's interceptor is invoked on any method call to an EJB component. But that only invokes Seam's server-side interceptor chain. What you lose is Seam's state management and Seam's client-side interceptor chain. Client-side interceptors handle concerns such as security and concurrency. Also, when injecting a SFSB, there is no guarantee that you will get the SFSB bound to the active session or conversation, whatever the case may be. Thus, you definitely want to inject the Seam EJB component using `@In`.

That covers how JNDI names are defined and used. The lesson is that with some application servers, such as GlassFish, you are going to have to specify JNDI names for all EJB components explicitly, and sometimes twice! And even if you are following the same naming convention as JBoss AS, the JNDI pattern in Seam may need to be altered. For instance, the global JNDI names are automatically prefixed with `java:comp/env` on GlassFish, so you need to define the JNDI pattern as follows:

```
<core:init jndi-name="java:comp/env/earName/#{ejbName}/local" />
```

Finally, let's talk about transactions. In an EJB3 environment, we recommend the use of a special built-in component for transaction management, that is fully aware of container transactions, and can correctly process transaction success events registered with the `Events` component. If you don't add this line to your `components.xml` file, Seam won't know when container-managed transactions end:

```
<transaction:ejb-transaction/>
```



### 30.1.6. #####

```
##### Seam##### seam.properties#META-
INF/seam.properties      #####      META-INF/components.xml#####
(#####)#                      Seam#####
Seam#####seam.properties#####

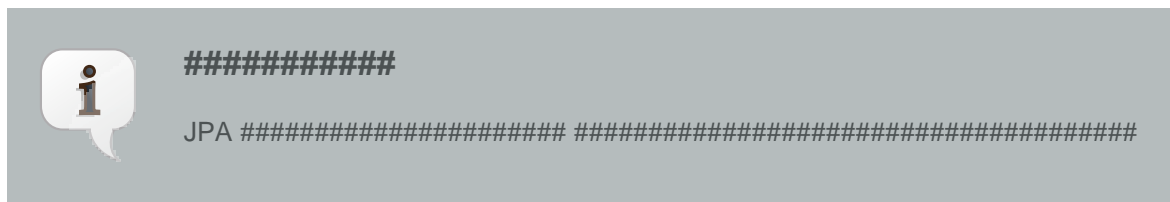
Seam#####web#####      (WAR)      #WEB-INF/classes#####
seam.properties#####

####      Seam      #####      seam.properties      #####
#####
```

You might think this is silly and what kind of idiot framework designers would make an empty file affect the behavior of their software?? Well, this is a workaround for a limitation of the JVM — if we didn't use this mechanism, our next best option would be to force you to list every component explicitly in `components.xml`, just like some other competing frameworks do! I think you'll like our way better.

### 30.2. ### JPA #####

```
Seam ##### JPA ##### Hibernate ##### ## JPA
##### seam #####
```



```
Seam #### JPA ##### 2 #####
```

```
##### components.xml ##### ##### PersistenceProvider # hibernate
#####
```

```
<component name="org.jboss.seam.persistence.persistenceProvider"
  class="org.jboss.seam.persistence.PersistenceProvider"
  scope="stateless">
</component
>
```

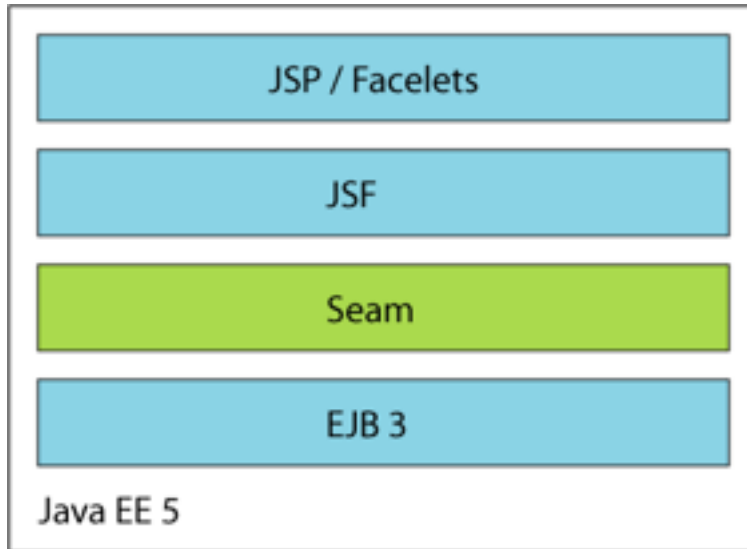
```
JPA ##### PersistenceProvider #####
HibernatePersistenceProvider ##### (#####)# #####
seam #####
```

```
<component name="org.jboss.seam.persistence.persistenceProvider"
```

```
class="org.your.package.YourPersistenceProvider">  
</component  
>
```

##### persistence.xml ##### jar  
#####

### 30.3. Java EE 5 # Seam ###



Java EE 5 ##### Seam #####

#### 30.3.1. #####

EAR #####

```
my-application.ear/  
  jboss-seam.jar  
  lib/  
    jboss-el.jar  
  META-INF/  
    MANIFEST.MF  
    application.xml  
my-application.war/  
  META-INF/  
    MANIFEST.MF  
  WEB-INF/  
    web.xml  
    components.xml  
    faces-config.xml  
  lib/
```

```

jsf-facelets.jar
jboss-seam-ui.jar
login.jsp
register.jsp
...
my-application.jar/
META-INF/
  MANIFEST.MF
  persistence.xml
seam.properties
org/
  jboss/
    myapplication/
      User.class
      Login.class
      LoginBean.class
      Register.class
      RegisterBean.class
    ...

```

```

jboss-seam.jar # ejb ##### META-INF/application.xml ##### jboss-el.jar
# EAR # lib ##### (EAR #####)#

```

```

jBPM ### Drools ##### EAR # lib ##### jar #####

```

```

facelets ##### (##) # WAR#WEB-INF/lib##### jsf-facelets.jar#####

```

```

Seam ##### (##### Seam #####)# WAR ##### WEB-INF/lib
##### jboss-seam-ui.jar ##### PDF# email ##### WEB-INF/lib
# jboss-seam-pdf.jar ### jboss-seam-mail.jar #####

```

```

Seam ##### (facelets #####) #### WAR# WEB-INF/lib#####jboss-
seam-debug.jar#####

```

```

##### EJB 3.0##### Java EE##### Seam #####

```

```

#####          ###3          #####
#####

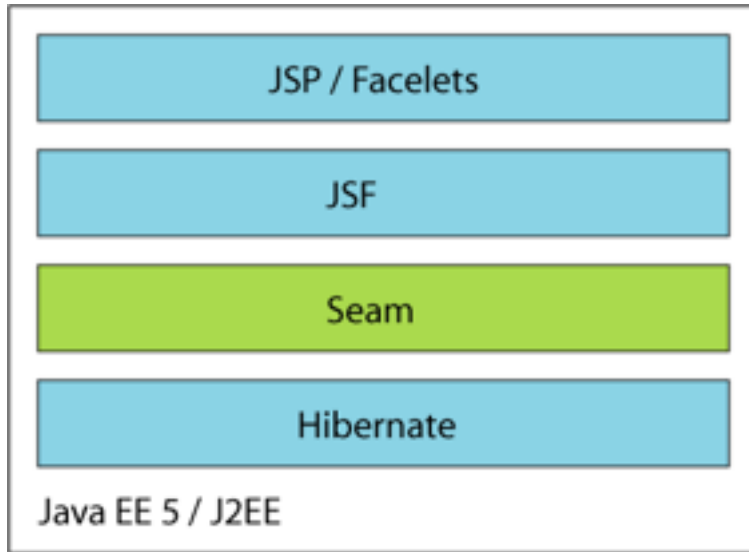
```

## 30.4. J2EE## Seam ###

```

Seam # EJB 3.0 ##### EJB 3.0 ##### Hibernate3
# JPA ##### Bean ##### JavaBean ##### Bean
##### EJB 3.0 ##### Seam
#####

```



```
Seam JavaBean ##### Bean ##### JTA
UserTransaction ##### Seam # @Transactional #####
JavaBean # Hibernate ##### Seam #####
```

```
Seam #####EJB3 ##### Hibernate # JavaBean #####
#####J2EE#####
```

### 30.4.1. Seam ## Hibernate#####

```
Seam ##### hibernate.cfg.xml ##### Hibernate #
SessionFactory #####
```

```
<persistence:hibernate-session-factory name="hibernateSessionFactory"/>
```

```
#####Seam##### Hibernate#Session##### managed
session#####
```

```
<persistence:managed-hibernate-session name="hibernateSession"
session-factory="#{hibernateSessionFactory}"/>
```

### 30.4.2. Seam ## JPA#####

```
Seam #####persistence.xml ##EntityManagerFactory
JPA#####
```

```
<persistence:entity-manager-factory name="entityManagerFactory"/>
```

##### Seam ###JPA EntityManager #####

```
<persistence:managed-persistence-context name="entityManager"
    entity-manager-factory="#{entityManagerFactory}"/>
```

### 30.4.3. #####

##### WAR#####

```
my-application.war/
  META-INF/
    MANIFEST.MF
  WEB-INF/
    web.xml
    components.xml
    faces-config.xml
    lib/
      jboss-seam.jar
      jboss-seam-ui.jar
      jboss-el.jar
      jsf-facelets.jar
      hibernate3.jar
      hibernate-annotations.jar
      hibernate-validator.jar
      ...
    my-application.jar/
      META-INF/
        MANIFEST.MF
      seam.properties
      hibernate.cfg.xml
      org/
        jboss/
          myapplication/
            User.class
            Login.class
            Register.class
            ...
    login.jsp
    register.jsp
    ...
```

Hibernate # Tomcat # TestNG #### EE #####

### 30.5. JBoss Embedded #### Java SE # Seam #####

Seam #### EE #####  
##### JPA ##### Seam # JPA #####  
EntityTransaction #####

```
<transaction:entity-transaction entity-manager="{entityManager}"/>
```

Hibernate ##### Seam ##### Hibernate ##### API #####

```
<transaction:hibernate-transaction session="{session}"/>
```

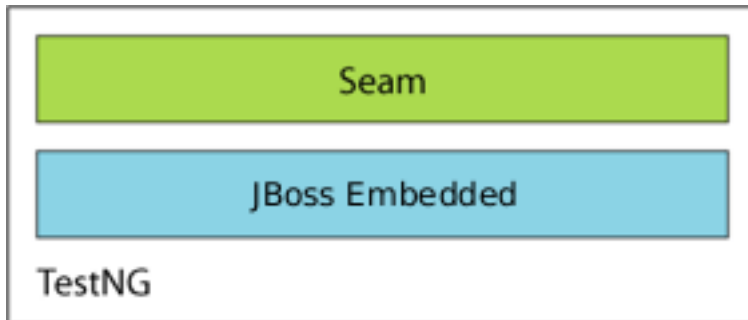
### #####

##### JBoss Embedded ##### EE # API #####

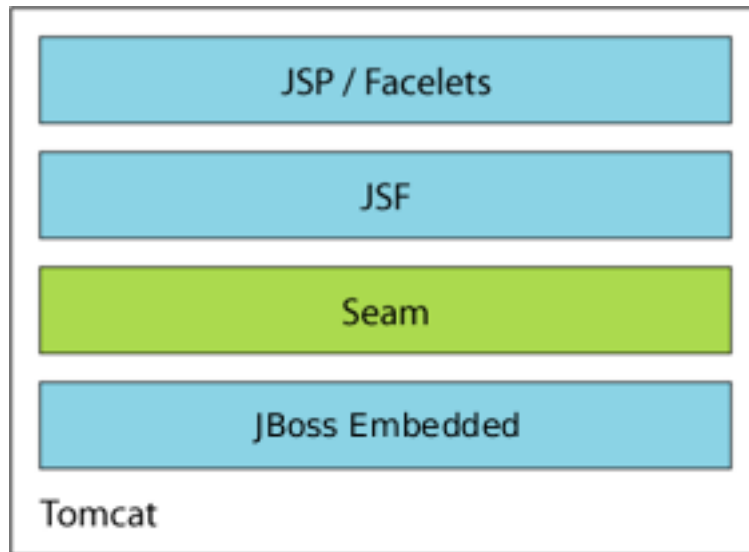
### 30.6. JBoss Embedded #### Java SE # Seam #####

JBoss Embedded ### Java EE 5 ##### EJB 3  
#####

Seam ##### TestNG ##### SeamTest #### JBoss Embedded #####



##### Tomcat #####



### 30.6.1. Embedded JBoss #####

Embedded JBoss must be installed into Tomcat for Seam applications to run correctly on it. Embedded JBoss runs with JDK 5 or JDK 6 ( see #42.1. #JDK ##### for details on using JDK 6). Embedded JBoss can be downloaded [here](http://sourceforge.net/projects/jboss/files/Embedded%20JBoss/Embedded%20JBoss%20Beta%203/) [http://sourceforge.net/projects/jboss/files/Embedded%20JBoss/Embedded%20JBoss%20Beta%203/]. The process for installing Embedded JBoss into Tomcat 6 is quite simple. First, you should copy the Embedded JBoss JARs and configuration files into Tomcat.

- `jndi.properties ##### Embedded JBoss # bootstrap ##### lib ##### Tomcat # lib #####`
- `Tomcat # lib ##### annotations-api.jar #####`
- `### Embedded JBoss ##### 2 #####`
- `Embedded JBoss #### EmbeddedJBossBootstrapListener # conf/server.xml #####`

```
<Server port="8005" shutdown="SHUTDOWN">

  <!-- Comment these entries out to disable JMX MBeans support used for the
       administration web application -->
  <Listener className="org.apache.catalina.core.AprLifecycleListener" />
  <Listener className="org.apache.catalina.mbeans.ServerLifecycleListener" />
  <Listener className="org.apache.catalina.mbeans.GlobalResourcesLifecycleListener" />
  <Listener className="org.apache.catalina.storeconfig.StoreConfigLifecycleListener" />
```

### #30# Seam #### Seam #####...

---

```
<!-- Add this listener -->
<Listener className="org.jboss.embedded.tomcat.EmbeddedJBossBootstrapListener" />
```

- WAR ##### WebinfScanner ##### conf/context.xml #####

```
<Context>
  <!-- Default set of monitored resources -->
  <WatchedResource>WEB-INF/web.xml</WatchedResource>

  <!-- Uncomment this to disable session persistence across Tomcat restarts -->
  <!--
  <Manager pathname="" />
  -->
```

```
<!-- Add this listener -->
<Listener className="org.jboss.embedded.tomcat.WebinfScanner" />
```

```
</Context
>
```

- If you are using Sun JDK 6, you need to set the Java option `sun.lang.ClassLoader.allowArraySyntax` to `true` in the `JAVA_OPTS` environment variable used by the Catalina startup script (`catalina.bat` on Windows or `catalina.sh` on Unix).

Open the script appropriate for your operating system in a text editor. Add a new line immediately below the comments at the top of the file where you will define the `JAVA_OPTS` environment variable. On Windows, use the following syntax:

```
set JAVA_OPTS=%JAVA_OPTS% -Dsun.lang.ClassLoader.allowArraySyntax=true
```

On Unix, use this syntax instead:

```
JAVA_OPTS="$JAVA_OPTS -Dsun.lang.ClassLoader.allowArraySyntax=true"
```

##### Embedded JBoss Tomcat ## [wiki](http://wiki.jboss.org/wiki/Wiki.jsp?page=EmbeddedAndTomcat) ##### [http://wiki.jboss.org/wiki/Wiki.jsp?page=EmbeddedAndTomcat] #####



## 30.6.2. #####

Tomcat ##### WAR #####

```

my-application.war/
  META-INF/
    MANIFEST.MF
  WEB-INF/
    web.xml
    components.xml
    faces-config.xml
  lib/
    jboss-seam.jar
    jboss-seam-ui.jar
    jboss-el.jar
    jsf-facelets.jar
    jsf-api.jar
    jsf-impl.jar
    ...
  my-application.jar/
    META-INF/
      MANIFEST.MF
      persistence.xml
    seam.properties
    org/
      jboss/
        myapplication/
          User.class
          Login.class
          LoginBean.class
          Register.class
          RegisterBean.class
        ...
    login.jsp
    register.jsp
    ...

```

##### Seam ##### ant deploy.tomcat ##### Tomcat #####

## 30.7. Seam##jBPM##

```

Seam # jBPM ##### jBPM
##### ## components.xml #####

```

```
<bpm:jbpm>
  <bpm:pageflow-definitions>
    <value
>createDocument.jpdl.xml</value>
    <value
>editDocument.jpdl.xml</value>
    <value
>approveDocument.jpdl.xml</value>
    </bpm:pageflow-definitions>
    <bpm:process-definitions>
    <value
>documentLifecycle.jpdl.xml</value>
    </bpm:process-definitions>
</bpm:jbpm
>
```

```
##### jBPM ##### jBPM ##
Hibernate #####Seam DVD Store demo# Seam #####
jbpm.cfg.xml#hibernate.cfg.xml#### #####
```

```
<jbpm-configuration>

  <jbpm-context>
    <service name="persistence">
      <factory>
        <bean class="org.jbpm.persistence.db.DbPersistenceServiceFactory">
          <field name="isTransactionEnabled"
><false/></field>
        </bean>
      </factory>
    </service>
    <service name="tx" factory="org.jbpm.tx.TxServiceFactory" />
    <service name="message" factory="org.jbpm.msg.db.DbMessageServiceFactory" />
    <service name="scheduler" factory="org.jbpm.scheduler.db.DbSchedulerServiceFactory" />
    <service name="logging" factory="org.jbpm.logging.db.DbLoggingServiceFactory" />
    <service name="authentication"
      factory="org.jbpm.security.authentication.DefaultAuthenticationServiceFactory" />
  </jbpm-context>

</jbpm-configuration
>
```

#####jBPM#####  
 Seam#####EJB3#JTA#####

### 30.7.1. #####

jBPM ##### Seam  
 ##### EAR #####  
 ##### EAR #####

```

my-application.ear/
  jboss-seam.jar
  lib/
    jboss-el.jar
    jbpm-3.1.jar
  META-INF/
    MANIFEST.MF
    application.xml
my-application.war/
  META-INF/
    MANIFEST.MF
  WEB-INF/
    web.xml
    components.xml
    faces-config.xml
  lib/
    jsf-facelets.jar
    jboss-seam-ui.jar
  login.jsp
  register.jsp
  ...
my-application.jar/
  META-INF/
    MANIFEST.MF
    persistence.xml
  seam.properties
  org/
    jboss/
      myapplication/
        User.class
        Login.class
        LoginBean.class
        Register.class
        RegisterBean.class
    ...

```

```
jbpm.cfg.xml
hibernate.cfg.xml
createDocument.jpdl.xml
editDocument.jpdl.xml
approveDocument.jpdl.xml
documentLifecycle.jpdl.xml
```

## 30.8. JBoss AS## SFSB#####

```
##### Bean ##### HTTP #####
SFSB ##### HTTP ##### JBoss Application Server
##### Bean ##### 30 ##### server/default/conf/standardjboss.xml (default
#####)
```

```
##### SFSB ##### LRUStatefulContextCachePolicy ##### max-bean-life
#####
```

```
<container-cache-conf>
  <cache-policy
>org.jboss.ejb.plugins.LRUStatefulContextCachePolicy</cache-policy>
  <cache-policy-conf>
    <min-capacity
>50</min-capacity>
    <max-capacity
>1000000</max-capacity>
    <remover-period
>1800</remover-period>

    <!-- SFSB timeout in seconds; 1800 seconds == 30 minutes -->
    <max-bean-life
>1800</max-bean-life
  >

    <overager-period
>300</overager-period>
    <max-bean-age
>600</max-bean-age>
    <resizer-period
>400</resizer-period>
    <max-cache-miss-period
>60</max-cache-miss-period>
    <min-cache-miss-period
>1</min-cache-miss-period>
```

```

    <cache-load-factor
>0.75</cache-load-factor>
    </cache-policy-conf>
</container-cache-conf
>

```

The default HTTP session timeout can be modified in `server/default/deploy/jbossweb-tomcat55.sar/conf/web.xml` for JBoss 4.0.x, or in `server/default/deploy/jboss-web.deployer/conf/web.xml` for JBoss 4.2.x or later. The following entry in this file controls the default session timeout for all web applications:

```

<session-config>
  <!-- HTTP Session timeout, in minutes -->
  <session-timeout
>30</session-timeout>
</session-config
>

```

```
##### web.xml #####
```

## 30.9. Portlet # Seam #####

```

Seam ##### porlet ##### Seam ### RichFaces ##### portlet ## JSF
##### JSR-301 ### JBoss Portlet Bridge ##### ### http://labs.jboss.com/portletbridge
#####

```

## 30.10. #####

```

Seam ##### /seam.properties# /META-INF/components.xml# ### /META-INF/
seam.properties ##### jar ##### @Name ##### Seam
##### Seam #####

```

```

### Seam ##### Seam
##### ## Seam # /META-INF/seam-deployment.properties
#####

```

```

# A colon-separated list of annotation types to handle
org.jboss.seam.deployment.annotationTypes=com.acme.Foo:com.acme.Bar

```

```
##### @Foo #####
```

```
@Name("fooStartup")
@Scope(APPLICATION)
@Startup
public class FooStartup {

    @In("#{deploymentStrategy.annotatedClasses['com.acme.Foo']}")
    private Set<Class<Object>> fooClasses;

    @In("#{hotDeploymentStrategy.annotatedClasses['com.acme.Foo']}")
    private Set<Class<Object>> hotFooClasses;

    @Create
    public void create() {
        for (Class clazz: fooClasses) {
            handleClass(clazz);
        }
        for (Class clazz: hotFooClasses) {
            handleClass(clazz);
        }
    }

    public void handleClass(Class clazz) {
        // ...
    }
}
```

```
###      ####      #####
#####      .foo.xml      #####
#####
```

```
public class FooDeploymentHandler implements DeploymentHandler {
    private static DeploymentMetadata FOO_METADATA = new DeploymentMetadata()
    {

        public String getFileNameSuffix() {
            return ".foo.xml";
        }
    };

    public String getName() {
        return "fooDeploymentHandler";
    }
}
```

```

public DeploymentMetadata getMetadata() {
    return FOO_METADATA;
}
}

```

```
##### .foo.xml #####
```

Then, we need to register the deployment handler with Seam in `/META-INF/seam-deployment.properties`. You can register multiple deployment handler using a comma separated list.

```

# For standard deployment
org.jboss.seam.deployment.deploymentHandlers=com.acme.FooDeploymentHandler
# For hot deployment
org.jboss.seam.deployment.hotDeploymentHandlers=com.acme.FooDeploymentHandler

```

Seam uses deployment handlers internally to install components and namespaces. You can easily access the deployment handler during an `APPLICATION` scoped component's startup:

```

@Name("fooStartup")
@Scope(APPLICATION)
@Startup
public class FooStartup {

    @In("#{deploymentStrategy.deploymentHandlers['fooDeploymentHandler']}")
    private FooDeploymentHandler myDeploymentHandler;

    @In("#{hotDeploymentStrategy.deploymentHandlers['fooDeploymentHandler']}")
    private FooDeploymentHandler myHotDeploymentHandler;

    @Create
    public void create() {
        for (FileDescriptor fd: myDeploymentHandler.getResources()) {
            handleFooXml(fd);
        }

        for (FileDescriptor f: myHotDeploymentHandler.getResources()) {
            handleFooXml(f);
        }
    }
}

```

```
public void handleFooXml(FileDescriptor fd) {  
    // ...  
}  
}
```



---

## Seam #####

```
Seam ##### Seam
##### EJB 3.0
##### Hibernate Validator ##### Seam # Seam
#####
```

```
##### org.jboss.seam.annotations #####
```

### 31.1. #####

```
##### Seam #####
```

@Name

```
@Name("componentName")
```

```
##### Seam ##### # Seam #####
```

@Scope

```
@Scope(ScopeType.CONVERSATION)
```

```
##### ##### ScopeType ##### EVENT, PAGE,
CONVERSATION, SESSION, BUSINESS_PROCESS, APPLICATION, STATELESS #####
```

```
##### ##### ##### Bean ####
##### STATELESS ##### ##### bean ##### Bean ### ##### CONVERSATION
#### JavaBeans ##### EVENT #####
```

@Role

```
@Role(name="roleName", scope=ScopeType.SESSION)
```

```
Seam ##### @Name/@Scope
##### # @Role #####
```

- name — #####

- scope — #####

### #31# Seam #####

---

@Roles

```
@Roles({
    @Role(name="user", scope=ScopeType.CONVERSATION),
    @Role(name="currentUser", scope=ScopeType.SESSION)
})
```

#####

@BypassInterceptors

```
@BypassInterceptors
```

#####

@JndiName

```
@JndiName("my/jndi/name")
```

Seam # EJB ##### JNDI ##### JNDI ##### Seam #  
org.jboss.seam.core.init.jndiPattern ##### JNDI #####

@Conversational

```
@Conversational
```

#####

@PerNestedConversation

```
@PerNestedConversation
```

#####

#####

@Startup

```
@Scope(APPLICATION) @Startup(depends="org.jboss.seam.bpm.jbpm")
```

#####  
#####  
#####

@Scope(SESSION) @Startup

#####

- depends — #####

@Install

@Install(false)

##### @Install  
#####

@Install(dependencies="org.jboss.seam.bpm.jbpm")

#####

@Install(genericDependencies=ManagedQueueSender.class)

#####  
#####

@Install(classDependencies="org.hibernate.Session")

#####

@Install(precedence=BUILT\_IN)

#####  
##### (##) :

- BUILT\_IN — #####Seam#####
- FRAMEWORK — Seam#####
- APPLICATION — Precedence of application components (the default precedence)

## #31# Seam #####

---

- DEPLOYMENT — #####
- MOCK — #####

@Synchronized

```
@Synchronized(timeout=1000)
```

```
##### Seam #####  
#####
```

@ReadOnly

```
@ReadOnly
```

```
JavaBean #####
```

@AutoCreate

```
@AutoCreate
```

```
##### create=true #####
```

## 31.2. #####

```
#####
```

@In

```
@In
```

```
##### null ####  
#####
```

```
@In(required=false)
```

```
##### null  
#####
```

```
@In(create=true)
```

```
##### null
##### Seam #####
```

```
@In(value="contextVariableName")
```

```
#####
```

```
@In(value="#{customer.addresses[shipping]}")
```

```
##### JSF EL #####
```

- value — ##### #{...} ##### JSF EL #####
- create — ##### (null) ##### Seam ##### false ###
- required — ##### Seam #####

@Out

```
@Out
```

```
Seam ##### null
#####
```

```
@Out(required=false)
```

```
Seam ##### null
#####
```

```
@Out(scope=ScopeType.SESSION)
```

```
Seam #####
##### @Out #####
(##### EVENT) #
```

## #31# Seam #####

---

```
@Out(value="contextVariableName")
```

```
#####
```

- value — #####
- required — ##### null ##### Seam #####

```
##### #:
```

```
@In(create=true) @Out private User currentUser;
```

The next annotation supports the *manager component* pattern; a Seam component manages the lifecycle of an instance of some other class that is to be injected. It appears on a component getter method.

@Unwrap

```
@Unwrap
```

```
##### getter #####
```

The next annotation supports the *factory component* pattern; a Seam component is responsible for initializing the value of a context variable. This is especially useful for initializing any state needed for rendering the response to a non-faces request. It appears on a component method.

@Factory

```
@Factory("processInstance") public void createProcessInstance() { ... }
```

```
#####  
void #####
```

```
@Factory("processInstance", scope=CONVERSATION) public ProcessInstance  
createProcessInstance() { ... }
```

```
##### Seam #####  
##### @Factory
```

#####

##### (#####)  
#####EVENT #####) #

- value — ##### getter ##### JavaBeans  
#####
- scope — Seam#####
- autoCreate — #####@In # create=true  
#####

Log #####:

@Logger

```
@Logger("categoryName")
```

##### org.jboss.seam.log.Log ##### Bean ####  
##### static #####

- value — #####

#####:

@RequestParam

```
@RequestParam("parameterName")
```

#####

- value — #####

### 31.3. #####

#####  
#####

@Create

```
@Create
```

## #31# Seam #####

---

```
##### Seam ##### create #####  
JavaBeans ##### Bean #####
```

@Destroy

```
@Destroy
```

```
##### destroy ##### JavaBeans  
##### Bean #####
```

```
Destroy ##### Seam # destroy  
#####
```

@Observer

```
@Observer("somethingChanged")
```

```
#####
```

```
@Observer(value="somethingChanged",create=false)
```

```
#####  
create # false #####create ##### true ###
```

## 31.4. #####

```
##### Seam #####
```

```
##### Web #####  
#####@Begin ##### (long-running conversation)  
#####
```

@Begin

```
@Begin
```

```
##### null ##### (outcome) #####
```

```
@Begin(join=true)
```



#####

```
@Begin(nested=true)
```

##### @End  
#####

```
@Begin(pageflow="process definition name")
```

##### jBPM #####

```
@Begin(flushMode=FlushModeType.MANUAL)
```

Seam ##### flushMode=FlushModeType.MANUAL # #####  
(atomic conversation) ##### flush () (### #####)  
#####

• join — #####true ##### false  
##### false ###nested=true #####

• nested — #####

• flushMode — ##### Seam ### Hibernate ##### JPA  
#####

• pageflow — org.jboss.seam.bpm.jbpm.pageflowDefinitions ##### jBPM  
#####

@End

```
@End
```

##### null ##### (outcome) #####

• beforeRedirect —  
#####beforeRedirect=true  
#####

• root — #####root=true  
#####  
#####

## #31# Seam #####

@StartTask

@StartTask

```
jBPM ##### null ##### (outcome) #####  
##### jBPM #####  
#####
```

- The `jBPM TaskInstance` will be available in a request context variable named `taskInstance`. The `jBPM ProcessInstance` will be available in a request context variable named `processInstance`. (Of course, these objects are available for injection via `@In`.)
- `taskIdParameter` — `##### "taskId" ##### Seam taskList JSF #####`
- `flushMode` — `##### Seam ### Hibernate ##### JPA #####`

@BeginTask

@BeginTask

```
##### jBPM ##### null ##### (outcome) #####  
##### jBPM #####  
#####
```

- The `jBPM org.jbpm.taskmgmt.exe.TaskInstance` will be available in a request context variable named `taskInstance`. The `jBPM org.jbpm.graph.exe.ProcessInstance` will be available in a request context variable named `processInstance`.
- `taskIdParameter` — `##### "taskId" ##### Seam taskList JSF #####`
- `flushMode` — `##### Seam ### Hibernate ##### JPA #####`

@EndTask

@EndTask

```
jBPM ##### null ##### (outcome) #####  
##### jBPM ##### transition #####  
Transition.setName ( ) #####
```

```
@EndTask(transition="transitionName")
```

##### jBPM #####

- transition — ##### jBPM #####
- beforeRedirect —  
#####beforeRedirect=true  
#####

@CreateProcess

```
@CreateProcess(definition="process definition name")
```

##### null ##### (outcome) ##### ### jBPM #####  
ProcessInstance ##### processInstance #####

- definition — org.jboss.seam.bpm.jbpm.processDefinitions ##### jBPM  
#####

@ResumeProcess

```
@ResumeProcess(processIdParameter="processId")
```

##### null ##### (outcome) ##### ### jBPM #####  
ProcessInstance ##### processInstance #####

- processIdParameter — ##### ID ##### "processId" ###

@Transition

```
@Transition("cancel")
```

##### null ##### jBPM #####

## 31.5. J2EE ### Seam JavaBean

#####

Seam ##### (outcome) ##### JTA #####

## #31# Seam #####

@Transactional

@Transactional

JavaBean ##### Bean #####  
#### #####  
#####

EJB 3.0 #####@TransactionAttribute #####

@ApplicationException

@ApplicationException

javax.ejb.ApplicationException #####Java EE 5  
#####(#####)#####

EJB 3.0 #####@javax.ejb.ApplicationException  
#####

- rollback — ##### false ###true ##### rollback only #####
- end — ##### false ###true #####

@Interceptors

@Interceptors({DVDInterceptor, CDIInterceptor})

javax.interceptors.Interceptors #####Java EE 5  
#####

EJB 3.0 #####@javax.interceptor.Interceptors  
#####

##### JavaBean Seam #####EJB 3.0 ##### Java EE5  
#####

## 31.6. #####

##### Seam #####

`@Redirect``@Redirect(viewId="error.jsp")``##### ID #####`

- `viewId` — `##### JSF ### ID ##### EL #####`
- `message` — `#####`
- `end` — `##### false ###`

`@HttpError``@HttpError(errorCode=404)``##### HTTP #####`

- `errorCode` — `HTTP ##### 500 ###`
- `message` — `HTTP #####`
- `end` — `##### false ###`

## 31.7. Seam Remoting#####

`Seam Remoting##### Bean #####``@WebRemote``@WebRemote(exclude="path.to.exclude")`

Indicates that the annotated method may be called from client-side JavaScript. The `exclude` property is optional and allows objects to be excluded from the result's object graph (see the [# 25. #####](#) chapter for more details).

## 31.8. Seam #####

`#####Seam #####``EJB ##### EJB 3.0 #####`

## #31# Seam #####

---

@Interceptor

```
@Interceptor(stateless=true)
```

```
##### Seam #####
```

```
@Interceptor(type=CLIENT)
```

```
##### EJB #####
```

```
@Interceptor(around={SomeInterceptor.class, OtherInterceptor.class})
```

```
#####
```

```
@Interceptor(within={SomeInterceptor.class, OtherInterceptor.class})
```

```
#####
```

## 31.9. #####

```
##### #:
```

```
@Asynchronous public void scheduleAlert(Alert alert, @Expiration Date date) { ... }
```

```
@Asynchronous public Timer scheduleAlerts(Alert alert,  
@Expiration Date date,  
@IntervalDuration long interval) { ... }
```

@Asynchronous

```
@Asynchronous
```

```
#####
```

@Duration

```
@Duration
```

##### (#####) #

@Expiration

```
@Expiration
```

##### (#####) #####

@IntervalDuration

```
@IntervalDuration
```

#####

### 31.10. JSF #####

##### JSF #####

@Converter

Seam ##### JSF ##### Seam  
##### javax.faces.convert.Converter #####

- id — JSF #####ID#####
- forClass — #####

@Validator

Seam ##### JSF ##### Seam  
##### javax.faces.validator.Validator #####

- id — JSF #####ID#####

#### 31.10.1. dataTable #####

##### Bean #####

@DataModel

```
@DataModel("variableName")
```

## #31# Seam #####

```
List, Map, Set ### Object[] ##### JSF DataModel
#####(##### STATELESS #### EVENT
####)#Map ####DataModel #### Map.Entry ###
```

- value — #####
- scope — scope=ScopeType.PAGE #####DataModel # PAGE #####

@DataModelSelection

@DataModelSelection

```
JSF DataModel #####(### DataModel # Collection #####
Map ####)##### @DataModel ##### DataModel
##### @DataModel ##### @DataModelSelection #
value #####
```

```
##### @DataModel # PAGE ##### DataModel Selection
##### DataModel #####@DataModel
##### getter ##### setter #### Seam #
#####API#####
```

- value — ##### @DataModel #####

@DataModelSelectionIndex

@DataModelSelectionIndex

```
JSF DataModel #####(### DataModel # Collection
##### Map ####)##### @DataModel #####
DataModel ##### @DataModel #####
@DataModelSelectionIndex # value #####
```

- value — ##### @DataModel #####

## 31.11. #####

```
##### @DataModel # @DataModelSelection
#####
```

@DataBinderClass

@DataBinderClass(DataModelBinder.class)



#####  
@DataSelectorClass

```
@DataSelectorClass(DataModelSelector.class)
```

#####

### 31.12. #####

##### ##### ## Java  
#####

@Namespace

```
@Namespace(value="http://jboss.com/products/seam/example/seampay")
```

##### ##### components.xml  
##### XML #####

```
@Namespace(value="http://jboss.com/products/seam/core", prefix="org.jboss.seam.core")
```

##### ## XML  
##### ##### init ## XML  
##### org.jboss.seam.core.init #####

### 31.13. #####

##### Seam #####

@Filter

@Filter ##### Seam ##### (javax.servlet.Filter #####)  
#####Seam #####

```
@Filter(around={"seamComponent", "otherSeamComponent"})
```

#####

```
@Filter(within={"seamComponent", "otherSeamComponent"})
```

#####

---

## #### Seam #####

```
#### Seam ##### components.xml
##### 1 #####
components.xml #####
```

```
@Name #####
```

### 32.1. #####

```
#####
##### Seam #####
```

```
@In private Context sessionContext;
```

```
org.jboss.seam.core.contexts
    Seam #####
    org.jboss.seam.core.contexts.sessionContext['user'] ###
```

```
org.jboss.seam.faces.facesContext
    FacesContext ##### (### Seam #####) #####
```

```
#####
```

### 32.2. JSF-related components

The following set of components are provided to supplement JSF.

```
org.jboss.seam.faces.dateConverter
```

Provides a default JSF converter for properties of type `java.util.Date`.

This converter is automatically registered with JSF. It is provided to save a developer from having to specify a `DateTimeConverter` on an input field or page parameter. By default, it assumes the type to be a date (as opposed to a time or date plus time) and uses the short input style adjusted to the Locale of the user. For `Locale.US`, the input pattern is `mm/DD/yy`. However, to comply with Y2K, the year is changed from two digits to four (e.g., `mm/DD/yyyy`).

It's possible to override the input pattern globally using component configuration. Consult the JavaDoc for this class to see examples.

```
org.jboss.seam.faces.facesMessages
```

```
##### faces #####
```

```
• add(FacesMessage facesMessage) — faces #####
#####
```

## #32# ### Seam #####

---

- `add(String messageTemplate)` — `faces` ##### EL  
#####
- `add(Severity severity, String messageTemplate)` — `faces` ##### EL  
#####
- `addFromResourceBundle(String key)` — `faces` ##### EL ##### Seam  
#####
- `addFromResourceBundle(Severity severity, String key)` — `faces` ##### EL  
##### Seam #####
- `clear()` — #####

`org.jboss.seam.faces.redirect`

##### API ## (#####)#

- `redirect.viewId` — ##### JSF ### ID ###
- `redirect.conversationPropagationEnabled` — #####
- `redirect.parameters` — #####
- `execute()` — #####
- `captureCurrentRequest()` — ### GET ## (#####) ##### ID #####  
`execute()` #####

`org.jboss.seam.faces.httpError`

HTTP ##### API ###

`org.jboss.seam.ui.renderStampStore`

A component (session-scoped by default) responsible for maintaining a collection of render stamps. A render stamp is an indicator as to whether a form which was rendered has been submitted. This store is useful when the client-side state saving method of JSF is being used because it puts the determination of whether a form has been posted in the control of the server rather than in the component tree which is maintained on the client.

To unbind this check from the session (which is one of the main design goals of client-side state saving) an implementation must be provided that stores the render stamps in the application (valid as long as the application is running) or the database (valid across server restarts).

- `maxSize` — The maximum number of stamps to be kept in the store. Default: 100

These components are installed when the class `javax.faces.context.FacesContext` is available on the classpath.

## 32.3. #####

#####

---

org.jboss.seam.core.events

@Observer ##### components.xml ##### API ###

- raiseEvent(String type) — #####
- raiseAsynchronousEvent(String type) — EJB3 #####
- raiseTimedEvent(String type, ...) — EJB3  
#####
- addListener(String type, String methodBinding) — #####

org.jboss.seam.core.interpolator

Strings # JFS EL ##### API ###

- interpolate(String template) — #{...} ### JSF EL  
#####

org.jboss.seam.core.expressions

##### API ###

- createValueBinding(String expression) — #####
- createMethodBinding(String expression) — #####

org.jboss.seam.core.pojoCache

JBoss Cache PojoCache #####

- .pojoCache.cfgResourceName — ##### treecache.xml #####

#####

## 32.4. #####

##### Seam #####

org.jboss.seam.core.locale

Seam #####

org.jboss.seam.international.timezone

Seam #####

org.jboss.seam.core.resourceBundle

Seam ##### Seam ##### Java  
#####

org.jboss.seam.core.resourceLoader

#####

- resourceLoader.bundleNames — Seam ##### Java #####  
##### messages #####

## #32# ### Seam #####

---

org.jboss.seam.international.localeSelector

#####

- select() — #####
- localeSelector.locale — ### java.util.Locale ###
- localeSelector.localeString — #####
- localeSelector.language — #####
- localeSelector.country — #####
- localeSelector.variant — #####
- localeSelector.supportedLocales — jsf-config.xml #####  
SelectItem #####
- localeSelector.cookieEnabled — #####

org.jboss.seam.international.timezoneSelector

#####

- select() — #####
- timezoneSelector.timezone — ### java.util.TimeZone ###
- timezoneSelector.timeZoneId — #####
- timezoneSelector.cookieEnabled — #####

org.jboss.seam.international.messages

Seam #####

org.jboss.seam.theme.themeSelector

#####

- select() — #####
- theme.availableThemes — #####
- themeSelector.theme — #####
- themeSelector.themes — ##### SelectItem #####
- themeSelector.cookieEnabled — #####

org.jboss.seam.theme.theme

#####

#####

## 32.5. #####

#####

org.jboss.seam.core.conversation

### Seam ##### API ###

- getId() — ##### ID #####
- isNested() — #####?
- isLongRunning() — #####?
- getId() — ##### ID #####
- getParentId() — ##### ID #####
- getRootId() — ##### ID #####
- setTimeout(int timeout) — #####
- setViewId(String outcome) — #####  
##### ID #####
- setDescription(String description) — #####  
#####
- redirect() — ##### ID ##### (#####)#
- leave() — #####
- begin() — ##### (@Begin ###)#
- beginPageflow(String pageflowName) — #####  
(@Begin(pageflow="...") ###)#
- end() — ##### (@End ###)#
- pop() — #####
- root() — #####
- changeFlushMode(FlushModeType flushMode) — #####

org.jboss.seam.core.conversationList

#####

org.jboss.seam.core.conversationStack

##### (breadcrumbs)#

org.jboss.seam.faces.switcher

conversation switcher ###

#####

## 32.6. jBPM #####

jBPM #####

org.jboss.seam.pageflow.pageflow

Seam ##### API #####

- isInProcess() — ##### true #####
- getProcessInstance() — ##### jBPM ProcessInstance #####
- begin(String pageflowName) — #####
- reposition(String nodeName) — #####

org.jboss.seam.bpm.actor

##### jBPM actor ##### API ###

- setId(String actorId) — ##### jBPM ### ID #####
- getGroupActorIds() — ##### jBPM ### ID ##### Set #####

org.jboss.seam.bpm.transition

##### jBPM ##### API ###

- setName(String transitionName) — ##### @EndTask ##### jBPM #####

org.jboss.seam.bpm.businessProcess

##### API ###

- businessProcess.taskId — ##### ID ###
- businessProcess.processId — ##### ID ###
- businessProcess.hasCurrentTask() — #####?
- businessProcess.hasCurrentProcess() — #####
- createProcess(String name) — #####
- startTask() — #####
- endTask(String transitionName) — #####
- resumeTask(Long id) — ### ID #####
- resumeProcess(Long id) — ### ID #####



---

- `transition(String transitionName)` — #####

```

org.jboss.seam.bpm.taskInstance
  jBPM TaskInstance #####

org.jboss.seam.bpm.processInstance
  jBPM ProcessInstance #####

org.jboss.seam.bpm.jbpmContext
  ##### JbpmContext #####

org.jboss.seam.bpm.taskInstanceList
  jBPM task list #####

org.jboss.seam.bpm.pooledTaskInstanceList
  jBPM pooled task list #####

org.jboss.seam.bpm.taskInstanceListForType
  jBPM #####

org.jboss.seam.bpm.pooledTask
  pooled task #####

org.jboss.seam.bpm.processInstanceFinder
  #####

org.jboss.seam.bpm.processInstanceList
  #####

org.jboss.seam.bpm.jbpm #####

```

## 32.7. #####

#####

```

org.jboss.seam.web.userPrincipal
  ##### Principal #####

org.jboss.seam.web.isUserInRole
  ##### JSF ##### <h:commandButton
value="edit" rendered="{isUserInRole['admin']}" />

```

## 32.8. JMS #####

##### TopicPublisher ### QueueSender ##### (###)#

```

org.jboss.seam.jms.queueSession
  JMS QueueSession #####

```

## #32# ### Seam #####

---

org.jboss.seam.jms.topicSession  
JMS TopicSession #####

### 32.9. #####

Seam Email #####

org.jboss.seam.mail.mailSession  
JavaMail Session ##### JNDI ##### (sessionJndiName  
#####)##### host #####

- org.jboss.seam.mail.mailSession.host — ### SMTP #####
- org.jboss.seam.mail.mailSession.port — ### SMTP #####
- org.jboss.seam.mail.mailSession.username — SMTP #####
- org.jboss.seam.mail.mailSession.password — SMTP #####
- org.jboss.seam.mail.mailSession.debug — JavaMail ##### (#####)#
- org.jboss.seam.mail.mailSession.ssl — SMTP ## SSL ##### (#####465)#  
org.jboss.seam.mail.mailSession.tls — ##### true ## ##### TLS  
#####
- org.jboss.seam.mail.mailSession.sessionJndiName — JNDI #####  
javax.mail.Session #####

### 32.10. #####

##### components.xml  
##### install="true" #####

org.jboss.seam.core.init  
Seam #####

- org.jboss.seam.core.init.jndiPattern — ##### Bean ##### JNDI  
#####
- org.jboss.seam.core.init.debug — Seam ##### false  
#####
- org.jboss.seam.core.init.clientSideConversations — true ##### Seam  
##### HttpSession #####

org.jboss.seam.core.manager  
Seam #####

---

- org.jboss.seam.core.manager.conversationTimeout —  
#####
- org.jboss.seam.core.manager.concurrentRequestTimeout —  
#####
- org.jboss.seam.core.manager.conversationIdParameter — ## ID  
##### conversationId ###
- org.jboss.seam.core.manager.conversationIsLongRunningParameter —  
##### conversationIsLongRunning  
###
- org.jboss.seam.core.manager.defaultFlushMode — #### Seam  
##### AUTO ###

org.jboss.seam.navigation.pages  
Seam #####

- org.jboss.seam.navigation.pages.noConversationViewId —  
##### ID #####
- org.jboss.seam.navigation.pages.loginViewId —  
##### ID #####
- org.jboss.seam.navigation.pages.httpPort — http  
#####
- org.jboss.seam.navigation.pages.httpsPort — https  
#####
- org.jboss.seam.navigation.pages.resources — pages.xml  
##### WEB-INF/pages.xml ###

org.jboss.seam.bpm.jbpm  
JbpmConfiguration ##### org.jboss.seam.bpm.Jbpm #####

- org.jboss.seam.bpm.jbpm.processDefinitions — ##### jPDL  
#####
- org.jboss.seam.bpm.jbpm.pageflowDefinitions — ##### jPDL  
#####

org.jboss.seam.core.conversationEntries  
#####

org.jboss.seam.faces.facesPage  
#####

org.jboss.seam.persistence.persistenceContexts  
#####

## #32# #### Seam #####

---

org.jboss.seam.jms.queueConnection

Manages a JMS QueueConnection. Installed whenever managed QueueSender is installed.

- org.jboss.seam.jms.queueConnection.queueConnectionFactoryJndiName — JMS  
QueueConnectionFactory # JNDI #### ##### UIL2ConnectionFactory ###

org.jboss.seam.jms.topicConnection

Manages a JMS TopicConnection. Installed whenever managed TopicPublisher is installed.

- org.jboss.seam.jms.topicConnection.topicConnectionFactoryJndiName — JMS  
TopicConnectionFactory # JNDI #### ##### UIL2ConnectionFactory ###

org.jboss.seam.persistence.persistenceProvider

JPA #####

org.jboss.seam.core.validators

Hibernate Validator ClassValidator #####

org.jboss.seam.faces.validation

#####

org.jboss.seam.debug.introspector

Seam Debug Page #####

org.jboss.seam.debug.contexts

Seam Debug Page #####

org.jboss.seam.exception.exceptions

#####

org.jboss.seam.transaction.transaction

##### JTA ##### API ###

org.jboss.seam.faces.safeActions

## URL #####

## 32.11. #####

org.jboss.seam.async.dispatcher

##### Bean

org.jboss.seam.core.image

#####

org.jboss.seam.core.pojoCache

PojoCache #####

```
org.jboss.seam.core.uiComponent
##### ID ##### UIComponents #####
```

## 32.12. #####

```
##### Seam ##### Seam ##### name ##### #####
components.xml ##### Seam ##### 2 #####
```

```
<component name="bookingDatabase"
  class="org.jboss.seam.persistence.ManagedPersistenceContext">
  <property name="persistenceUnitJndiName"
>java:/comp/emf/bookingPersistence</property>
</component>

<component name="userDatabase"
  class="org.jboss.seam.persistence.ManagedPersistenceContext">
  <property name="persistenceUnitJndiName"
>java:/comp/emf/userPersistence</property>
</component
>
```

```
Seam ##### bookingDatabase # userDatabase ###
```

```
<entityManager>, org.jboss.seam.persistence.ManagedPersistenceContext
##### EntityManager #####
```

- <entityManager>.entityManagerFactory — EntityManagerFactory  
#####
- <entityManager>.persistenceUnitJndiName — ##### JNDI #####  
java:/<managedPersistenceContext> ###

```
<entityManagerFactory>, org.jboss.seam.persistence.EntityManagerFactory
JPA EntityManagerFactory ##### EJB 3.0 ##### JPA #####
```

- entityManagerFactory.persistenceUnitName — #####
- ##### API JavaDoc #####

```
<session>, org.jboss.seam.persistence.ManagedSession
##### Hibernate Session #####
```

- <session>.sessionFactory — SessionFactory #####
- <session>.sessionFactoryJndiName — ##### JNDI ##### java:/  
<managedSession> ###

## #32# #### Seam #####

---

<sessionFactory>, org.jboss.seam.persistence.HibernateSessionFactory  
HibernateSessionFactory #####

- <sessionFactory>.cfgResourceName — ##### hibernate.cfg.xml  
###

##### API JavaDoc #####

<managedQueueSender>, org.jboss.seam.jms.ManagedQueueSender  
##### JMS QueueSender #####

- <managedQueueSender>.queueJndiName — JMS #### JNDI ####

<managedTopicPublisher>, org.jboss.seam.jms.ManagedTopicPublisher  
##### JMS TopicPublisher #####

- <managedTopicPublisher>.topicJndiName — JMS ##### JMDI ####

<managedWorkingMemory>, org.jboss.seam.drools.ManagedWorkingMemory  
##### Drools WorkingMemory #####

- <managedWorkingMemory>.ruleBase — RuleBase #####

<ruleBase>, org.jboss.seam.drools.RuleBase  
##### Drools RuleBase #####  
#####

- <ruleBase>.ruleFiles — Drools #####

<ruleBase>.dslFile — Drools DSL #####

<entityHome>, org.jboss.seam.framework.EntityHome

<hibernateEntityHome>, org.jboss.seam.framework.HibernateEntityHome

<entityQuery>, org.jboss.seam.framework.EntityQuery

<hibernateEntityQuery>, org.jboss.seam.framework.HibernateEntityQuery

---

## Seam JSF #####

Seam ## Seam ##### JSF #####  
JSF ##### Seam #####JBoss  
RichFaces#Apache MyFaces Trinidad ##### Tomahawk  
#####

### 33.1. ##

##### "s" ##### (facelets ##)#

```
<html xmlns="http://www.w3.org/1999/xhtml"
  xmlns:s="http://jboss.com/products/seam/taglib"
  >
```

UI####(examples/ui)#####

#### 33.1.1. #####

##### 33.1.1.1. <s:button>

##

#####

##

- value — ####
- action — #####
- view — ##### JSF view id #
- fragment — ##### ID #
- disabled — #####
- propagation — determines the conversation propagation style: begin, join, nested, none, end or endRoot.
- pageflow — ##### (propagation="begin" ### propagation="join" #####)#
- includePageParams — when set to false, page parameters defined in pages.xml will be excluded from rendering.

###

```
<s:button id="cancel"
  value="Cancel"
  action="#{hotelBooking.cancel}"/>
```

```
<s:link />      ###      view      #      action      #####
#####
```

```
<s:button />#####(#####JSF#####)#####
```

### 33.1.1.2. <s:conversationId>

##

```
JSF ##### ID ##### ( # <h:commandLink />#<s:button />)#
```

##

##

### 33.1.1.3. <s:taskId>

##

```
#####{task}#####(#####JSF#####)#####ID#####
```

##

##

### 33.1.1.4. <s:link>

##

```
#####
```

```
<s:link />#####(#####JSF#####)#####
```

##

- value — #####
- action — #####
- view — ##### JSF view id #



- fragment — ##### ID #
- disabled — #####
- propagation — determines the conversation propagation style: begin, join, nested, none, end or endRoot.
- pageflow — ##### (propagation="begin" ### propagation="join" #####)
- includePageParams — when set to false, page parameters defined in pages.xml will be excluded from rendering.

###

```
<s:link id="register" view="/register.xhtml"
value="Register New User"/>
```

```
<s:link /> ### view # action #####
#####
```

### 33.1.1.5. <s:conversationPropagation>

##

##### (##### JSF #####) ##### Facelets #####

##

- type — determines the conversation propagation style: begin, join, nested, none, end or endRoot.
- pageflow — ##### (propagation="begin" ### propagation="join" #####)

###

```
<h:commandButton value="Apply" action="#{personHome.update}">
  <s:conversationPropagation type="join" />
</h:commandButton
>
```

### 33.1.1.6. <s:defaultAction>

##

enter#####

## #33# Seam JSF #####

---

```
##### (###<h:commandButton />#<a:commandButton /> ### <tr:commandButton />#####)
```

```
#####ID#####
```

```
##
```

```
##
```

```
###
```

```
<h:commandButton id="foo" value="Foo" action="#{manager.foo}">
  <s:defaultAction />
</h:commandButton
>
```

### 33.1.2. #####

#### 33.1.2.1. <s:convertDateTime>

```
##
```

```
Seam #####
```

```
##
```

```
##
```

```
###
```

```
<h:outputText value="#{item.orderDate}">
  <s:convertDateTime type="both" dateStyle="full"/>
</h:outputText
>
```

#### 33.1.2.2. <s:convertEntity>

```
##
```

```
#####
```

```
#####JSF#####
```

```
##
```

##

##

```
<s:convertEntity /> # Seam##### (Seam managed transaction) ( #9.2. #Seam
##### ##) #####
```

```
##### (Managed Persistence Context) # entityManager #####
components.xml#####:
```

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:ui="http://jboss.com/products/seam/ui">

  <ui:jpa-entity-loader entity-manager="#{em}" />
```

```
##### Hibernate ##### #####components.xml#####:
```

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:ui="http://jboss.com/products/seam/ui">

  <ui:hibernate-entity-loader />
```

```
##### Hibernate ##### (Managed Hibernate Session) # session
#####components.xml#####:
```

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:ui="http://jboss.com/products/seam/ui">

  <ui:hibernate-entity-loader session="#{hibernateSession}" />
```

```
#####components.xml
```

```
#####
```

```
<components xmlns="http://jboss.com/products/seam/components"
  xmlns:ui="http://jboss.com/products/seam/ui">

  <ui:entity-converter name="standardEntityConverter" entity-loader="#{standardEntityLoader}"
  />

  <ui:jpa-entity-loader name="standardEntityLoader" entity-
manager="#{standardEntityManager}" />
```

```
<ui:entity-converter name="restrictedEntityConverter" entity-loader="#{restrictedEntityLoader}"
/>

<ui:jpa-entity-loader name="restrictedEntityLoader" entity-
manager="#{restrictedEntityManager}" />
```

```
<h:selectOneMenu value="#{person.continent}">
  <s:selectItems value="#{continents.resultList}" var="continent"
    label="#{continent.name}" />
  <f:converter converterId="standardEntityConverter" />
</h:selectOneMenu
>
```

###

```
<h:selectOneMenu value="#{person.continent}" required="true">
  <s:selectItems value="#{continents.resultList}" var="continent"
    label="#{continent.name}"
    noSelectionLabel="Please Select..." />
  <s:convertEntity />
</h:selectOneMenu
>
```

### 33.1.2.3. <s:convertEnum>

##

```
enum #####
```

##

##

###

```
<h:selectOneMenu value="#{person.honorific}">
  <s:selectItems value="#{honorifics}" var="honorific"
    label="#{honorific.label}"
    noSelectionLabel="Please select" />
  <s:convertEnum />
</h:selectOneMenu
```

&gt;

#### 33.1.2.4. <s:convertAtomicBoolean>

##

java.util.concurrent.atomic.AtomicBoolean ##### javax.faces.convert.Converter ###

##

##

###

```
<h:outputText value="{item.valid}">
  <s:convertAtomicBoolean />
</h:outputText
>
```

#### 33.1.2.5. <s:convertAtomicInteger>

##

java.util.concurrent.atomic.AtomicInteger ##### javax.faces.convert.Converter ###

##

##

###

```
<h:outputText value="{item.id}">
  <s:convertAtomicInteger />
</h:outputText
>
```

#### 33.1.2.6. <s:convertAtomicLong>

##

java.util.concurrent.atomic.AtomicLong ##### javax.faces.convert.Converter ###

##

##

###

```
<h:outputText value="#{item.id}">
  <s:convertAtomicLong />
</h:outputText
>
```

### 33.1.2.7. <s:validateEquality>

##

Tag to nest inside an input control to validate that its parent's value is equal (or not equal!) to the referenced control's value.

##

- `for` — #####ID
- `message` — #####
- `required` — False will disable a check that a value at all is inputted in fields.
- `messageId` — #####ID
- `operator` — What operator to use when comparing the values Valid operators are:
  - `equal` — Validates that `value.equals(forValue)`
  - `not_equal` — Validates that `!value.equals(forValue)`
  - `greater` — Validates that `((Comparable)value).compareTo(forValue) > 0`
  - `greater_or_equal` — Validates that `((Comparable)value).compareTo(forValue) >= 0`
  - `less` — Validates that `((Comparable)value).compareTo(forValue) < 0`
  - `less_or_equal` — Validates that `((Comparable)value).compareTo(forValue) <= 0`

###

```
<h:inputText id="name" value="#{bean.name}"/>
<h:inputText id="nameVerification" >
  <s:validateEquality for="name" />
</h:inputText
>
```

**33.1.2.8. <s:validate>**

##

##### Hibernate Validator ##### JSF #####

##

##

###

```

<h:inputText id="userName" required="true"
    value="#{customer.userName}">
  <s:validate />
</h:inputText>
<h:message for="userName" styleClass="error" />

```

**33.1.2.9. <s:validateAll>**

##

##### Hibernate Validator ##### JSF #####

##

##

###

```

<s:validateAll>
  <div class="entry">
    <h:outputLabel for="username"
  >Username:</h:outputLabel>
    <h:inputText id="username" value="#{user.username}"
      required="true"/>
    <h:message for="username" styleClass="error" />
  </div>
  <div class="entry">
    <h:outputLabel for="password"
  >Password:</h:outputLabel>
    <h:inputSecret id="password" value="#{user.password}"
      required="true"/>
    <h:message for="password" styleClass="error" />
  </div>
</div class="entry">

```

```
<h:outputLabel for="verify"
>Verify Password:</h:outputLabel>
  <h:inputSecret id="verify" value="#{register.verify}"
    required="true"/>
  <h:message for="verify" styleClass="error" />
</div>
</s:validateAll
>
```

### 33.1.3. #####

#### 33.1.3.1. <s:decorate>

##

```
##### required="true" ##### JSF ##### "##" #####
```

##

- `template` — #####facelet#####
- `enclose` — if true, the template used to decorate the input field is enclosed by the element specified with the "element" attribute. By default this is a div element.
- `element` — the element to enclose the template used to decorate the input field. By default, the template is enclosed with a div element.

```
{invalid} # {required} # s:decorate #####;
######{required} # true ######{invalid} #
true #####
```

###

```
<s:decorate template="edit.xhtml">
  <ui:define name="label"
>Country:</ui:define>
  <h:inputText value="#{location.country}" required="true"/>
</s:decorate
>
```

```
<ui:composition xmlns="http://www.w3.org/1999/xhtml"
  xmlns:ui="http://java.sun.com/jsf/facelets"
  xmlns:h="http://java.sun.com/jsf/html"
  xmlns:f="http://java.sun.com/jsf/core"
  xmlns:s="http://jboss.com/products/seam/taglib">
```



```
<div
>

  <s:label styleClass="{invalid?'error:'}">
    <ui:insert name="label"/>
    <s:span styleClass="required" rendered="{required}"
>*</s:span>
  </s:label>

  <span class="{invalid?'error:'}">
    <s:validateAll>
      <ui:insert/>
    </s:validateAll>
  </span>

  <s:message styleClass="error"/>

</div
>

</ui:composition
>
```

### 33.1.3.2. <s:div>

##

HTML <div> #####

##

##

###

```
<s:div rendered="{selectedMember == null}">
  Sorry, but this member does not exist.
</s:div
>
```

### 33.1.3.3. <s:span>

##

## #33# Seam JSF #####

---

HTML <span> #####

##

- title — span #####

###

```
<s:span styleClass="required" rendered="#{required}" title="Small tooltip"
>*</s:span
>
```

### 33.1.3.4. <s:fragment>

##

#####/#####

##

##

###

```
<s:fragment rendered="#{auction.highBidder ne null}">
  Current bid:
</s:fragment
>
```

### 33.1.3.5. <s:label>

##

```
JSF##### "##" #####HTML## <label> #####JSF#####
## <s:decorate> #####
```

##

- style — #####
- styleClass — #####

###

```

<s:label styleClass="label">
  Country:
</s:label>
<h:inputText value="#{location.country}" required="true"/>

```

### 33.1.3.6. <s:message>

```

##

##### JSF ##### "##" ####

##

##

###

```

```

<f:facet name="afterInvalidField">
  <s:span>
    &#160;Error:&#160;
    <s:message/>
  </s:span>
</f:facet
>

```

## 33.1.4. Seam Text

### 33.1.4.1. <s:validateFormattedText>

```

##

#####Seam Text#####

##

##

```

### 33.1.4.2. <s:formattedText>

```

##

Seam          Text          #####Seam          Text          #####wiki
#####
#####

```

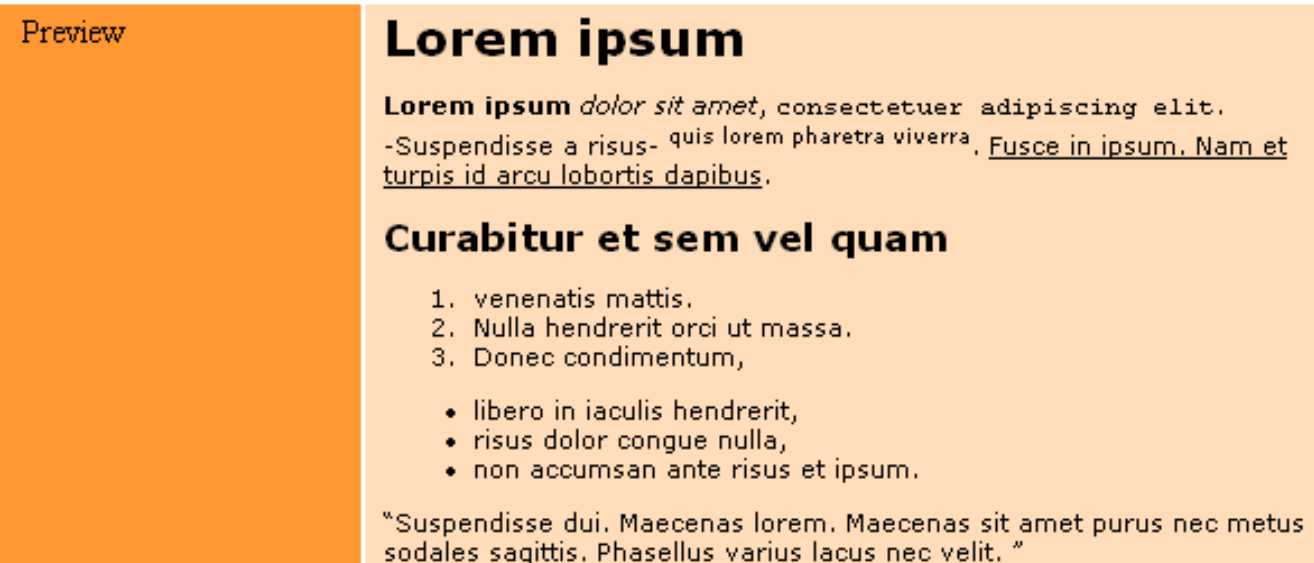
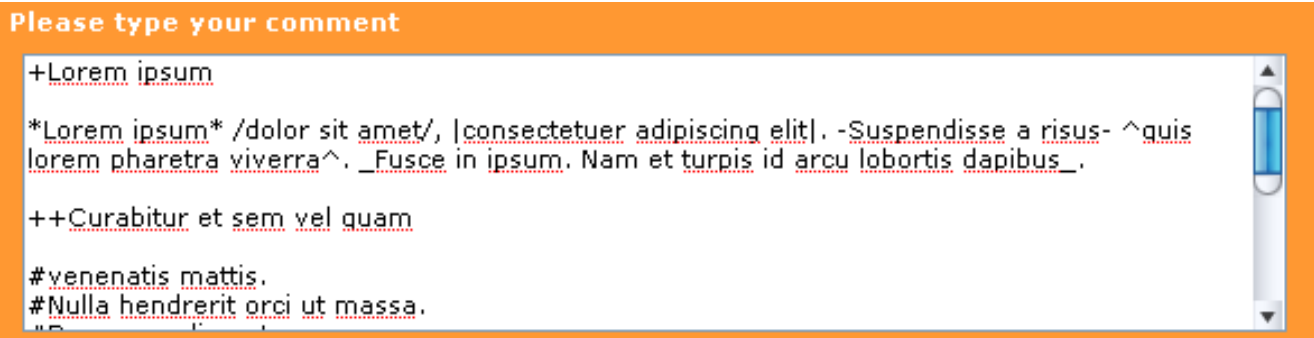
##

- value — #####EL#

###

```
<s:formattedText value="#{blog.text}"/>
```

#



### 33.1.5. Form support

#### 33.1.5.1. <s:token>

##

Produces a random token that is inserted into a hidden form field to help to secure JSF form posts against cross-site request forgery (XSRF) attacks. Note that the browser must have cookies enabled to submit forms that include this component.

##

- `requireSession` — indicates whether the session id should be included in the form signature, hence binding the token to the session. This value can be set to false if the "build before restore" mode of Facelets is activated (the default in JSF 2.0). (default: false)
- `enableCookieNotice` — indicates that a JavaScript check should be inserted into the page to verify that cookies are enabled in the browser. If cookies are not enabled, present a notice to the user that form posts will not work. (default: false)
- `allowMultiplePosts` — indicates whether to allow the same form to be submitted multiple times with the same signature (as long as the view does not change). This is a common need if the form is perform Ajax calls but not rerendering itself or, at the very least, the `UIToken` component. The preferred approach is to have the `UIToken` component rerendered on any Ajax call where the `UIToken` component would be processed. (default: false)

###

```
<h:form>
  <s:token enableCookieNotice="true" requireSession="false"/>
  ...
</h:form>
```

### 33.1.5.2. `<s:enumItem>`

##

enum ##### SelectItem #####

##

- `enumValue` — #####
- `label` — SelectItem #####

###

```
<h:selectOneRadio id="radioList"
  layout="lineDirection"
  value="#{newPayment.paymentFrequency}">
  <s:convertEnum />
  <s:enumItem enumValue="ONCE"    label="Only Once" />
  <s:enumItem enumValue="EVERY_MINUTE" label="Every Minute" />
  <s:enumItem enumValue="HOURLY"    label="Every Hour" />
  <s:enumItem enumValue="DAILY"    label="Every Day" />
  <s:enumItem enumValue="WEEKLY"    label="Every Week" />
</h:selectOneRadio>
```

>

### 33.1.5.3. <s:selectItems>

##

List# Set# DataModel ### Array ## List<SelectItem> #####

##

- value — List<SelectItem> #####EL##
- var — #####
- label — SelectItem ##### var #####
- itemValue — ##### var #####
- disabled — true #### SelectItem #####var #####
- noSelectionLabel — ##### (#####) ##### ( required="true" #####) #
- hideNoSelectionLabel — true ##### noSelectionLabel #####

###

```

<h:selectOneMenu value="#{person.age}"
    converter="ageConverter">
  <s:selectItems value="#{ages}" var="age" label="#{age}" />
</h:selectOneMenu
>

```

### 33.1.5.4. <s:fileUpload>

##

```
##### multipart/form-data
#####
```

```

<h:form enctype="multipart/form-data"
>

```

##### Seam Multipart ##### web.xml #####

```

<filter>
  <filter-name>
>Seam Filter</filter-name>
  <filter-class>
>org.jboss.seam.servlet.SeamFilter</filter-class>
</filter>

<filter-mapping>
  <filter-name>
>Seam Filter</filter-name>
  <url-pattern>
>/*</url-pattern>
</filter-mapping>
>

```

##

components.xml ### #####

- createTempFiles — true #####
- maxRequestSize — #####

#:.

```

<component class="org.jboss.seam.web.MultipartFilter">
  <property name="createTempFiles"
>true</property>
  <property name="maxRequestSize"
>1000000</property>
</component>
>

```

##

- data — ##### byte[] ### InputStream  
#####(##)#
- contentType — ##### (#####)#
- fileName — ##### (#####)#
- fileSize — ##### (#####)#

## #33# Seam JSF #####

---

- accept — ##### ## "images/  
png,images/jpg"# "images/\*"#
- style — #####
- styleClass — #####

###

```
<s:fileUpload id="picture" data="{register.picture}"
  accept="image/png"
  contentType="{register.pictureContentType}" />
```

### 33.1.6. ###

#### 33.1.6.1. <s:cache>

##

JBoss Cache ##### Cache ## <s:cache> ##### pojoCache  
##### JBoss Cache #####

##

- key —  
#####  
key="Document-#{document.id}" #####
- enabled — #####
- region — ##### JBoss Cache #####(#####)#

###

```
<s:cache key="entry-#{blogEntry.id}" region="pageFragments">
  <div class="blogEntry">
    <h3
  >#{blogEntry.title}</h3>
    <div>
      <s:formattedText value="{blogEntry.body}"/>
    </div>
    <p>
      [Posted on&#160;
    <h:outputText value="{blogEntry.date}">
      <f:convertDateTime timezone="{blog.timeZone}" locale="{blog.locale}"
        type="both"/>
    </p>
  </div>
</s:cache>
```



```

    </h:outputText
  >]
  </p>
</div>
</s:cache
>

```

### 33.1.6.2. `<s:resource>`

##

A tag that acts a file download provider. It must be alone in the JSF page. To be able to use this control, web.xml must be set up as follows.

##

```

<servlet>
  <servlet-name>Document Store Servlet</servlet-name>
  <servlet-class>org.jboss.seam.document.DocumentStoreServlet</servlet-class>
</servlet>
<servlet-mapping>
  <servlet-name>Document Store Servlet</servlet-name>
  <url-pattern>/seam/docstore/*</url-pattern>
</servlet-mapping>

```

##

- `data` — Data that should be downloaded. May be a `java.util.File`, an `InputStream` or a byte array.
- `fileName` — Filename of the file to be served
- `contentType` — content type of the file to be downloaded
- `disposition` — disposition to use. Default is inline

###

Here is an example on how to use the tag:

```

<s:resource xmlns="http://www.w3.org/1999/xhtml"
  xmlns:s="http://jboss.com/products/seam/taglib"
  data="#{resources.data}"
  contentType="#{resources.contentType}"
  fileName="#{resources.fileName}" />

```

## #33# Seam JSF #####

---

The bean named `resources` is some backing bean that given some request parameters servers a specific file, see `s:download`.

### 33.1.6.3. `<s:download>`

##

Builds a RESTful link to a `<s:resource>`. Nested `f:param` build up the url.

- `src` — Resource file serving files.

##

```
<s:download src="/resources.xhtml">
  <f:param name="fileId" value="{someBean.downloadableFileId}"/>
</s:download>
```

Will produce something like: `http://localhost/resources.seam?fileId=1`

### 33.1.6.4. `<s:graphicImage>`

##

```
##### <h:graphicImage> ##Seam#####
```

```
<h:graphicImage> #####
```

##

- `value` — image to display. Can be a path `String` (loaded from the classpath), a `byte[]`, a `java.io.File`, a `java.io.InputStream` or a `java.net.URL`. Currently supported image formats are `image/png`, `image/jpeg`, `image/gif` and `image/bmp`.

- `fileName` —  
#####

##

```
##### Seam ####
```

```
<s:transformImageSize>
```

- `width` — #####
- `height` — #####
- `maintainRatio` — `true` ##### `width` # `height` # ##  
#####

```

    • factor — #####

<s:transformImageBlur>

    • radius — #####

<s:transformImageType>

    • contentType — ##### image/jpeg ### image/png #####

##### - org.jboss.seam.ui.graphicImage.ImageTransform #####
UIComponent ##### applyTransform()##### image.getBufferedImage()
#####image.setBufferedImage() #####
###

```

```

<s:graphicImage rendered="{auction.image ne null}"
    value="{auction.image.data}">
  <s:transformImageSize width="200" maintainRatio="true"/>
</s:graphicImage
>

```

### 33.1.6.5. <s:remote>

```

##

Seam Remoting ##### Javascript #####

##

• include — ##### (#####)##### Seam Remoting # Javascript
##### # 25. ##### #####

###

```

```

<s:remote include="customerAction,accountAction,com.acme.MyBean"/>

```

## 33.2. #####

```

Seam#####Seam#####JSF#####:

```

```

@Converter

```

```

@Name("itemConverter")

```

```
@BypassInterceptors
@Converter
public class ItemConverter implements Converter {

    @Transactional
    public Object getAsObject(FacesContext context, UIComponent cmp, String value) {
        EntityManager entityManager = (EntityManager)
Component.getInstance("entityManager");
        entityManager.joinTransaction();
        // Do the conversion
    }

    public String getAsString(FacesContext context, UIComponent cmp, Object value) {
        // Do the conversion
    }

}
```

```
<h:inputText value="#{shop.item}" converter="itemConverter" />
```

Seam#####JSF#####JTA#####JPA#####

@Validator

```
@Name("itemValidator")
@BypassInterceptors
@org.jboss.seam.annotations.faces.Validator
public class ItemValidator implements javax.faces.validator.Validator {

    public void validate(FacesContext context, UIComponent cmp, Object value)
        throws ValidatorException {
        ItemController itemController = (ItemController) Component.getInstance("itemController");
        boolean valid = itemController.validate(value);
        if (!valid) {
            throw ValidatorException("Invalid value " + value);
        }
    }
}
```

```
<h:inputText value="#{shop.item}" validator="itemValidator" />
```

Seam#####JSF#####Seam#####



---

## JBoss EL

Seam # ### Unified Expression Language (EL) ##### JBoss EL ##### JBoss EL # EL  
#####

### 34.1. #####

## EL ##### ## JSF ##### (valueChangeListener) #  
JSF #####

JBoss EL #####

```
<h:commandButton action="#{hotelBooking.bookHotel(hotel)}" value="Book Hotel"/>
```

```
@Name("hotelBooking")
public class HotelBooking {

    public String bookHotel(Hotel hotel) {
        // Book the hotel
    }
}
```

#### 34.1.1. ###

#### Java ## #####

```
<h:commandButton action="#{hotelBooking.bookHotel(hotel, user)}" value="Book Hotel"/>
```

##### hotel # user ##### bookHotel() #####

#####

```
<h:commandButton
    action="#{hotelBooking.bookHotel(hotel.id, user.username)}"
    value="Book Hotel"/>
```

#### EL ##### ## ##### (##  
hotel.id # user.username)# #####

## #34# JBoss EL

```
#####  
##### null #####  
#####
```

```
<h:commandLink action="#{printer.println('Hello world!')}}" value="Hello"/>
```

```
Unified      EL      #####      #####      Bean      #####  
###      JavaBean      #####      getter      #      setter      #####      JSF  
#####      (get)      #####      (rendered      ##)##      #####  
#####  
JBoss EL #####
```

```
<h:outputText value="#{person.name}" rendered="#{person.name.length()  
> 5}" />
```

```
##### 1 #####
```

```
{searchResults.size()}
```

```
##### #{obj.property} ##### #{obj.getProperty()} #####
```

```
##### ##### productsByColorMethod #####
```

```
{controller.productsByColor('blue')}
```

### 34.1.2. #####

```
JBoss EL #####
```

- JSP 2.1 ##### — JBoss EL ### JSP 2.1 ##### JSF 1.2 ##### Facelets ##### JSP 2.0 #####
- ##### — <c:forEach /> # <ui:repeat /> ##### List ##### <h:commandButton /> # <h:commandLink /> #####

```
@Factory("items")  
public List<Item
```



```
> getItems() {
    return entityManager.createQuery("select ...").getResultList();
}
```

```
<h:dataTable value="#{items}" var="item">
  <h:column>
    <h:commandLink value="Select #{item.name}" action="#{itemSelector.select(item)}" />
  </h:column>
</h:dataTable>
>
```

```
##### <s:link /> # <s:button /> #####
DataModel ##### <dataTable /> (### <rich:dataTable /
> #####) ### ##### <s:link /> ###
<s:button /> ##### (#####)
##### DataModel
#####
```

- **Java ##### MethodExpression #####** — **### MethodExpression #####**  
**JSF #####** **##### JSF #####** **#####**  
**##### 2 #####**

- **Java#### MethodExpression #####** **#####**

- **### methodExpression.getMethodInfo().getParamTypes() #####**  
**##### ## MethodExpression ##### getParamTypes() #####**

**##### Java #### MethodExpression #####**

## 34.2. #####

**JBoss EL ##### (### #####) #####**  
**#####**

```
#{company.departments}
```

```
##### JBoss EL
#####
```

```
#{company.departments.{d|d.name}}
```

## #34# JBoss EL

---

##### d.name ##### d #####  
#####

##### (###)  
#####

```
# {company.departments.{d|d.size()}}
```

#####

```
# {company.departments.{d|d.employees.{emp|emp.lastName}}}
```

#####

```
# {company.departments.{d|d.employees}}
```

#####

```
# {company.departments.{d|d.employees.{e|e}}}
```

##### Facelets # JSP ##### xhtml ### JSP #####  
JBoss EL #####

---

## Clustering and EJB Passivation

*Please note that this chapter is still being reviewed. Tread carefully.*

This chapter covers two distinct topics that happen share a common solution in Seam, (web) clustering and EJB passivation. Therefore, they are addressed together in this reference manual. Although performance tends to be grouped in this category as well, it's kept separate because the focus of this chapter is on the programming model and how it's affected by the use of the aforementioned features.

In this chapter you will learn how Seam manages the passivation of Seam components and entity instances, how to activate this feature, and how this feature is related to clustering. You will also learn how to deploy a Seam application into a cluster and verify that HTTP session replication is working properly. Let's start with a little background on clustering and see an example of how you deploy a Seam application to a JBoss AS cluster.

### 35.1. Clustering

Clustering (more formally web clustering) allows an application to run on two or more parallel servers (i.e., nodes) while providing a uniform view of the application to clients. Load is distributed across the servers in such a way that if one or more of the servers fails, the application is still accessible via any of the surviving nodes. This topology is crucial for building scalable enterprise applications as performance and availability can be improved simply by adding nodes. But it brings up an important question. *What happens to the state that was on the server that failed?*

Since day one, Seam has always provided support for stateful applications running in a cluster. Up to this point, you have learned that Seam provides state management in the form of additional scopes and by governing the life cycle of stateful (scoped) components. But state management in Seam goes beyond creating, storing and destroying instances. Seam tracks changes to JavaBean components and stores the changes at strategic points during the request so that the changes can be restored when the request shifts to a secondary node in the cluster. Fortunately, monitoring and replication of stateful EJB components is already handled by the EJB server, so this feature of Seam is intended to put stateful JavaBeans on par with their EJB cohorts.

But wait, there's more! Seam also offers an incredibly unique feature for clustered applications. In addition to monitoring JavaBean components, Seam ensures that managed entity instances (i.e. JPA and Hibernate entities) don't become detached during replication. Seam keeps a record of the entities that are loaded and automatically loads them on the secondary node. You must, however, be using a Seam-managed persistence context to get this feature. More in depth information about this feature is provided in the second half of this chapter.

Now that you understand what features Seam offers to support a clustered environment, let's look at how you program for clustering.

### 35.1.1. Programming for clustering

Any session- or conversation-scoped mutable JavaBean component that will be used in a clustered environment must implement the `org.jboss.seam.core.Mutable` interface from the Seam API. As part of the contract, the component must maintain a dirty flag that is reported and reset by the `clearDirty()` method. Seam calls this method to determine if it is necessary to replicate the component. This avoids having to use the more cumbersome Servlet API to add and remove the session attribute on every change of the object.

You also must ensure that all session- and conversation-scoped JavaBean components are `Serializable`. Additionally, all fields of a stateful component (EJB or JavaBean) must be `Serializable` unless the field is marked `transient` or set to null in a `@PrePassivate` method. You can restore the value of a transient or nullified field in a `@PostActivate` method.

One area where people often get bitten is by using `List.subList` to create a list. The resulting list is not `Serializable`. So watch out for situations like that. If you hit a `java.io.NotSerializableException` and cannot locate the culprit at first glance, you can put a breakpoint on this exception, run the application server in debug mode and attach a debugger (such as Eclipse) to see what deserialization is choking on.



##

Please note that clustering does not work with hot deployable components. But then again, you shouldn't be using hot deployable components in a non-development environment anyway.

### 35.1.2. Deploying a Seam application to a JBoss AS cluster with session replication

The procedure outlined in this tutorial has been validated with an `seam-gen` application and the Seam booking example.

In the tutorial, I assume that the IP addresses of the master and slave servers are 192.168.1.2 and 192.168.1.3, respectively. I am intentionally not using the `mod_jk` load balancer so that it's easier to validate that both nodes are responding to requests and can share sessions.

I'm using the farm deployment method in these instructions, though you could also deploy the application normally and allow the two servers to negotiate a master/slave relationship based on startup order.



##

JBoss AS clustering relies on UDP multicasting provided by `jGroups`. The SELinux configuration that ships with RHEL/Fedora blocks these packets by default. You

## Deploying a Seam application to a JBoss AS cluster with session replication

can allow them to pass by modifying the iptables rules (as root). The following commands apply to an IP address that matches 192.168.1.x.

```
/sbin/iptables -I RH-Firewall-1-INPUT 5 -p udp -d 224.0.0.0/4 -j ACCEPT
/sbin/iptables -I RH-Firewall-1-INPUT 9 -p udp -s 192.168.1.0/24 -j ACCEPT
/sbin/iptables -I RH-Firewall-1-INPUT 10 -p tcp -s 192.168.1.0/24 -j ACCEPT
/etc/init.d/iptables save
```

Detailed information can be found on [this page](http://www.jboss.org/community/docs/DOC-11935) [http://www.jboss.org/community/docs/DOC-11935] on the JBoss Wiki.

- Create two instances of JBoss AS (just extract the zip twice)
- Deploy the JDBC driver to `server/all/lib/` on both instances if not using HSQLDB
- Add `<distributable/>` as the first child element in `WEB-INF/web.xml`
- Set the `distributable` property on `org.jboss.seam.core.init` to `true` to enable the `ManagedEntityInterceptor` (i.e., `<core:init distributable="true"/>`)
- Ensure you have two IP addresses available (two computers, two network cards, or two IP addresses bound to the same interface). I'll assume the two IP address are 192.168.1.2 and 192.168.1.3
- Start the master JBoss AS instance on the first IP

```
./bin/run.sh -c all -b 192.168.1.2
```

The log should report that there are 1 cluster members and 0 other members.

- Verify that the `server/all/farm` directory is empty in the slave JBoss AS instance
- Start the slave JBoss AS instance on the second IP

```
./bin/run.sh -c all -b 192.168.1.3
```

The log should report that there are 2 cluster members and 1 other members. It should also show the state being retrieved from the master.

- Deploy the `-ds.xml` to `server/all/farm` of the master instance

In the log of the master you should see acknowledgement of the deployment. In the log of the slave you should see a corresponding message acknowledging the deployment to the slave.

- Deploy the application to the server/all/farm directory

In the log of the master you should see acknowledgement of the deployment. In the log of the slave you should see a corresponding message acknowledging the deployment to the slave. Note that you may have to wait up to 3 minutes for the deployed archive to be transferred.

Your application is now running in a cluster with HTTP session replication! But, of course, you are going to want to validate that the clustering actually works.

### 35.1.3. Validating the distributable services of an application running in a JBoss AS cluster

It's all well and fine to see the application start successfully on two different JBoss AS servers, but seeing is believing. You likely want to validate that the two instances are exchanging HTTP sessions to allow the slave to take over when the master instance is stopped.

Start off by visiting the application running on the master instance in your browser. That will produce the first HTTP session. Now, open up the JBoss AS JMX console on that instance and navigate to the following MBean:

- *Category:* jboss.cache
- *Entry:* service=TomcatClusteringCache
- *Method:* printDetails()

Invoke the printDetails() method. You will see a tree of active HTTP sessions. Verify that the session your browser is using corresponds to one of the sessions in this tree.

Now switch over to the slave instance and invoke the same method in the JMX console. You should see an identical list (at least underneath this application's context path).

So you can see that at least both servers claim to have identical sessions. Now, time to test that the data is serializing and unserializing properly.

Sign in using the URL of the master instance. Then, construct a URL for the second instance by putting the ;jsessionid=XXXX immediately after the servlet path and changing the IP address. You should see that the session has carried over to the other instance. Now kill the master instance and see that you can continue to use the application from the slave instance. Remove the deployments from the server/all/farm directory and start the instance again. Switch the IP in the URL back to that of the master instance and visit the URL. You'll see that the original session is still being used.

One way to watch objects passivate and activate is to create a session- or conversation-scoped Seam component and implement the appropriate life-cycle methods. You can either use methods from the HttpSessionActivationListener interface (Seam automatically registers this interface on all non-EJB components):

```
public void sessionWillPassivate(HttpSessionEvent e);  
public void sessionDidActivate(HttpSessionEvent e);
```

Or you can simply mark two no-argument public void methods with `@PrePassivate` and `@PostActivate`, respectively. Note that the passivation step occurs at the end of every request, while the activation step occurs when a node is called upon.

Now that you understand the big picture of running Seam in a cluster, it's time to address Seam's most mysterious, yet remarkable agent, the `ManagedEntityInterceptor`.

## 35.2. EJB Passivation and the ManagedEntityInterceptor

The `ManagedEntityInterceptor` (MEI) is an optional interceptor in Seam that gets applied to conversation-scoped components when enabled. Enabling it is simple. You just set the `distributable` property on the `org.jboss.seam.init.core` component to `true`. More simply put, you add (or update) the following component declaration in the component descriptor (i.e., `components.xml`).

```
<core:init distributable="true"/>
```

Note that this doesn't enable replication of HTTP sessions, but it does prepare Seam to be able to deal with passivation of either EJB components or components in the HTTP session.

The MEI serves two distinct scenarios (EJB passivation and HTTP session passivation), although to accomplish the same overall goal. It ensures that throughout the life of a conversation using at least one extended persistence context, the entity instances loaded by the persistence context(s) remain managed (they do not become detached prematurely by a passivation event). In short, it ensures the integrity of the extended persistence context (and therefore its guarantees).

The previous statement implies that there is a challenge that threatens this contract. In fact, there are two. One case is when a stateful session bean (SFSB) that hosts an extended persistence context is passivated (to save memory or to migrate it to another node in the cluster) and the second is when the HTTP session is passivated (to prepare it to be migrated to another node in the cluster).

I first want to discuss the general problem of passivation and then look at the two challenges cited individually.

### 35.2.1. The friction between passivation and persistence

The persistence context is where the persistence manager (i.e., JPA `EntityManager` or Hibernate `Session`) stores entity instances (i.e., objects) it has loaded from the database (via the object-

relational mappings). Within a persistence context, there is no more than one object per unique database record. The persistence context is often referred to as the first-level cache because if the application asks for a record by its unique identifier that has already been loaded into the persistence context, a call to the database is avoided. But it's about more than just caching.

Objects held in the persistence context can be modified, which the persistence manager tracks. When an object is modified, it's considered "dirty". The persistence manager will migrate these changes to the database using a technique known as write-behind (which basically means only when necessary). Thus, the persistence context maintains a set of pending changes to the database.

Database-oriented applications do much more than just read from and write to the database. They capture transactional bits of information that need to be transferred into the database atomically (at once). It's not always possible to capture this information all on one screen. Additionally, the user might need to make a judgement call about whether to approve or reject the pending changes.

What we are getting at here is that the idea of a transaction from the user's perspective needs to be extended. And that is why the extended persistence context fits so perfectly with this requirement. It can hold such changes for as long as the application can keep it open and then use the built-in capabilities of the persistence manager to push these pending changes to the database without requiring the application developer to worry about the low-level details (a simple call to `EntityManager#flush()` does the trick).

The link between the persistence manager and the entity instances is maintained using object references. The entity instances are serializable, but the persistence manager (and in turn its persistence context) is not. Therefore, the process of serialization works against this design. Serialization can occur either when a SFSB or the HTTP session is passivated. In order to sustain the activity in the application, the persistence manager and the entity instances it manages must weather serialization without losing their relationship. That's the aid that the MEI provides.

### 35.2.2. Case #1: Surviving EJB passivation

Conversations were initially designed with stateful session beans (SFSBs) in mind, primarily because the EJB 3 specification designates SFSBs as hosts of the extended persistence context. Seam introduces a complement to the extended persistence context, known as a Seam-managed persistence context, which works around a number of limitations in the specification (complex propagation rules and lack of manual flushing). Both can be used with a SFSB.

A SFSB relies on a client to hold a reference to it in order to keep it active. Seam has provided an ideal place for this reference in the conversation context. Thus, for as long as the conversation context is active, the SFSB is active. If an `EntityManager` is injected into that SFSB using the annotation `@PersistenceContext(EXTENDED)`, then that `EntityManager` will be bound to the SFSB and remain open throughout its lifetime, the lifetime of the conversation. If an `EntityManager` is injected using `@In`, then that `EntityManager` is maintained by Seam and stored directly in the conversation context, thus living for the lifetime of the conversation independent of the lifetime of the SFSB.



With all of that said, the Java EE container can passivate a SFSB, which means it will serialize the object to an area of storage external to the JVM. When this happens depends on the settings of the individual SFSB. This process can even be disabled. However, the persistence context is not serialized (is this only true of SMPC?). In fact, what happens depends highly on the Java EE container. The spec is not very clear about this situation. Many vendors just tell you not to let it happen if you need the guarantees of the extended persistence context. Seam's approach is more conservative. Seam basically doesn't trust the SFSB with the persistence context or the entity instances. After each invocation of the SFSB, Seam moves the reference to entity instance held by the SFSB into the current conversation (and therefore into the HTTP session), nullifying those fields on the SFSB. It then restores this references at the beginning of the next invocation. Of course, Seam is already storing the persistence manager in the conversation. Thus, when the SFSB passivates and later activates, it has absolutely no adverse affect on the application.

**##**

If you are using SFSBs in your application that hold references to extended persistence contexts, and those SFSBs can passivate, then you must use the MEI. This requirement holds even if you are using a single instance (not a cluster). However, if you are using clustered SFSB, then this requirement also applies.

It is possible to disable passivation on a SFSB. See the [Ejb3DisableSfsbPassivation](http://www.jboss.org/community/docs/DOC-9656) [http://www.jboss.org/community/docs/DOC-9656] page on the JBoss Wiki for details.

### 35.2.3. Case #2: Surviving HTTP session replication

Dealing with passivation of a SFSB works by leveraging the HTTP session. But what happens when the HTTP session passivates? This happens in a clustered environment with session replication enabled. This case is much trickier to deal with and is where a bulk of the MEI infrastructure comes into play. In this case, the persistence manager is going to be destroyed because it cannot be serialized. Seam handles this deconstruction (hence ensuring that the HTTP session serializes properly). But what happens on the other end. Well, when the MEI sticks an entity instance into the conversation, it embeds the instance in a wrapper that provides information on how to reassociate the instance with a persistence manager post-serialization. So when the application jumps to another node in the cluster (presumably because the target node went down) the MEI infrastructure essentially reconstructs the persistence context. The huge drawback here is that since the persistence context is being reconstructed (from the database), pending changes are dropped. However, what Seam does do is ensure that if the entity instance is versioned, that the guarantees of optimistic locking are upheld. (why isn't the dirty state transferred?)

**##**

If you are deploying your application in a cluster and using HTTP session replication, you must use the MEI.

### 35.2.4. ManagedEntityInterceptor wrap-up

The important point of this section is that the MEI is there for a reason. It's there to ensure that the extended persistence context can retain intact in the face of passivation (of either a SFSB or the HTTP session). This matters because the natural design of Seam applications (and conversational state in general) revolve around the state of this resource.

---

## Performance Tuning

This chapter is an attempt to document in one place all the tips for getting the best performance from your Seam application.

### 36.1. Bypassing Interceptors

For repetitive value bindings such as those found in a JSF dataTable or other iterative control (like `ui:repeat`), the full interceptor stack will be invoked for every invocation of the referenced Seam component. The effect of this can result in a substantial performance hit, especially if the component is accessed many times. A significant performance gain can be achieved by disabling the interceptor stack for the Seam component being invoked. To disable interceptors for the component, add the `@BypassInterceptors` annotation to the component class.



##

It is very important to be aware of the implications of disabling interceptors for a Seam component. Features such as bijection, annotated security restrictions, synchronization and others are unavailable for a component marked with `@BypassInterceptors`. While in most cases it is possible to compensate for the loss of these features (e.g. instead of injecting a component using `@In`, you can use `Component.getInstance()` instead) it is important to be aware of the consequences.

The following code listing demonstrates a Seam component with its interceptors disabled:

```
@Name("foo")
@Scope(EVENT)
@BypassInterceptors
public class Foo
{
    public String getRowActions()
    {
        // Role-based security check performed inline instead of using @Restrict or other security
        // annotation
        Identity.getInstance().checkRole("user");

        // Inline code to lookup component instead of using @In
        Bar bar = (Bar) Component.getInstance("bar");

        String actions;
        // some code here that does something
        return actions;
    }
}
```

```
}  
}
```

---

## Seam#####

Seam#####2##### Seam#####  
#####Java# (#####) #####

#####

### 37.1. Seam#####

####Seam#####POJO#####Seam#####

#####Seam#####

```
@Stateless
@Scope(EVENT)
@Name("statementOfAccount")
public class StatementOfAccount {

    @In(create=true) EntityManager entityManager

    private double statementTotal;

    @In
    private Customer customer;

    @Create
    public void create() {
        List<Invoice
> invoices = entityManager
        .createQuery("select invoice from Invoice invoice where invoice.customer = :customer")
        .setParameter("customer", customer)
        .getResultList();
        statementTotal = calculateTotal(invoices);
    }

    public double calculateTotal(List<Invoice
> invoices) {
        double total = 0.0;
        for (Invoice invoice: invoices)
        {
            double += invoice.getTotal();
        }
        return total;
    }
}
```

## #37# Seam#####

---

```
// getter and setter for statementTotal  
  
}
```

calculateTotal#####

```
public class StatementOfAccountTest {  
  
    @Test  
    public testCalculateTotal {  
        List<Invoice  
> invoices = generateTestInvoices(); // A test data generator  
        double statementTotal = new StatementOfAccount().calculateTotal(invoices);  
        assert statementTotal = 123.45;  
    }  
}
```

You'll notice we aren't testing retrieving data from or persisting data to the database; nor are we testing any functionality provided by Seam. We are just testing the logic of our POJOs. Seam components don't usually depend directly upon container infrastructure, so most unit testing are as easy as that!

#####

## 37.2. Seam#####

#####

Seam#####Seam#JBoss#####[#30.6.1.](#)  
[#Embedded JBoss #####](#)

```
public class RegisterTest extends SeamTest  
{  
  
    @Test  
    public void testRegisterComponent() throws Exception  
    {  
  
        new ComponentTest() {  
  
            protected void testComponents() throws Exception  
            {
```

```

    setValue("#{user.username}", "1ovthafew");
    setValue("#{user.name}", "Gavin King");
    setValue("#{user.password}", "secret");
    assert invokeMethod("#{register.register}").equals("success");
    assert getValue("#{user.username}").equals("1ovthafew");
    assert getValue("#{user.name}").equals("Gavin King");
    assert getValue("#{user.password}").equals("secret");
  }

  }.run();

}

...

}

```

### 37.2.1. #####

```

#####Seam#####
#####Seam#####

```

```

@Name("paymentProcessor")
public class PaymentProcessor {
    public boolean processPayment(Payment payment) { ... }
}

```

```

#####

```

```

@Name("paymentProcessor")
@Install(precedence=MOCK)
public class MockPaymentProcessor extends PaymentProcessor {
    public boolean processPayment(Payment payment) {
        return true;
    }
}

```

```

MOCK#####Seam# #####
#####

```

### 37.3. #####

#####W

SeamTest#####JSF#####Seam#####JS

#####

#####JSF#####

```
<html>
<head>
<title>
>Register New User</title>
</head>
<body>
<f:view>
<h:form>
<table border="0">
<tr>
<td>
>Username</td>
<td>
><h:inputText value="#{user.username}"/></td>
</tr>
<tr>
<td>
>Real Name</td>
<td>
><h:inputText value="#{user.name}"/></td>
</tr>
<tr>
<td>
>Password</td>
<td>
><h:inputSecret value="#{user.password}"/></td>
</tr>
</table>
<h:messages/>
<h:commandButton type="submit" value="Register" action="#{register.register}"/>
</h:form>
</f:view>
</body>
</html>
```



&gt;

#####Register#####TestNG#####JSF#####

```
public class RegisterTest extends SeamTest
{
    @Test
    public void testRegister() throws Exception
    {
        new FacesRequest() {

            @Override
            protected void processValidations() throws Exception
            {
                validateValue("#{user.username}", "1ovthafew");
                validateValue("#{user.name}", "Gavin King");
                validateValue("#{user.password}", "secret");
                assert !isValidationFailure();
            }

            @Override
            protected void updateModelValues() throws Exception
            {
                setValue("#{user.username}", "1ovthafew");
                setValue("#{user.name}", "Gavin King");
                setValue("#{user.password}", "secret");
            }

            @Override
            protected void invokeApplication()
            {
                assert invokeMethod("#{register.register}").equals("success");
            }

            @Override
            protected void renderResponse()
            {
                assert getValue("#{user.username}").equals("1ovthafew");
                assert getValue("#{user.name}").equals("Gavin King");
                assert getValue("#{user.password}").equals("secret");
            }
        }
    }
}
```

```
    }.run();  
  
    }  
  
    ...  
  
    }
```

#####Seam#####SeamTest#####JSF#####SeamTest.FacesRequest#####

Seam#####Ant#####Eclipse#TestNG#####

The screenshot shows the TestNG results window in an IDE. At the top, the window title is 'TestNG'. Below the title bar, the text 'Results of running suite' is displayed. Three summary boxes show: 'Suites: 1/1', 'Tests: 1/1', and 'Methods: 2/2'. Below these, the status is 'Passed: 2', 'Failed: 0', and 'Skipped: 0'. A green progress bar is visible. The test tree shows a 'Registration' suite (2/0/0/0) containing a 'Register' test (2/0/0/0), which in turn contains two successful test methods from the class 'org.jboss.seam.example.numberguess.test.NumberGues'. At the bottom, a 'Failure Exception' pane is visible but empty.

Outline JUnit TestNG

Results of running suite

**Suites:** 1/1      **Tests:** 1/1      **Methods:** 2/2

✓ **Passed:** 2      ✗ **Failed:** 0      ✗ **Skipped:** 0

All Tests    Failed Tests

- Registration ( 2/0/0/0 )
  - Register ( 2/0/0/0 )
    - org.jboss.seam.example.numberguess.test.NumberGues
    - org.jboss.seam.example.numberguess.test.NumberGues

Failure Exception

### 37.3.1. ##

seam-gen#####ant, maven,  
Eclipse#####

#####

#### # 37.1.

####ID	#####ID	Seam ###
org.jboss.seam.embedded	hibernate-all	lib/test/hibernate-all.jar
org.jboss.seam.embedded	jboss-embedded-all	lib/test/jboss-embedded-all.jar
org.jboss.seam.embedded	thirdparty-all	lib/test/thirdparty-all.jar
org.jboss.seam.embedded	jboss-embedded-api	lib/jboss-embedded-api.jar
org.jboss.seam	jboss-seam	lib/jboss-seam.jar
org.jboss.el	jboss-el	lib/jboss-el.jar
javax.faces	jsf-api	lib/jsf-api.jar
javax.el	el-api	lib/el-api.jar
javax.activation	javax.activation	lib/activation.jar

#####JBoss#####JBoss AS#####jboss-system.jar##lib/  
#####Drools#jBPM#####

#####JBoss#####bootstrap/#####

#####jar#####JPA#Seam#####

#####java:/

DefaultDS#####JBoss#####HSQL#####foo-  
ds.xml#bootstrap/deploy#####

### 37.3.2. #####SeamTest###

Seam##TestNG#####JUnit#####

#####AbstractSeamTest#####

- #####super.begin()###
- #####super.end()###

- #####super.setupClass()#####
- #####super.cleanupClass()####
- #####super.startSeam()####Seam#####
- #####super.stopSeam()####Seam#####

### 37.3.3. #####

If you want to insert or clean data in your database before each test you can use Seam's integration with DBUnit. To do this, extend `DBUnitSeamTest` rather than `SeamTest`.

You have to provide a dataset for DBUnit.



#### ##

DBUnit supports two formats for dataset files, flat and XML. Seam's `DBUnitSeamTest` assumes the flat format is used, so make sure that your dataset is in this format.

```
<dataset>

<ARTIST
  id="1"
  dtype="Band"
  name="Pink Floyd" />

<DISC
  id="1"
  name="Dark Side of the Moon"
  artist_id="1" />

</dataset
>
```

In your test class, configure your dataset with overriding `prepareDBUnitOperations()`:

```
protected void prepareDBUnitOperations() {
  beforeTestOperations.add(
    new DataSetOperation("my/datasets/BaseData.xml")
  );
}
```

### #37# Seam#####

DataSetOperation#####DatabaseOperation.CLEAN\_INSERT#####  
#####afterTestOperations#####

You need to tell DBUnit which datasource you are using. This is accomplished by defining a *test parameter* [http://testng.org/doc/documentation-main.html#parameters-testng-xml] named `datasourceJndiName` in `testng.xml` as follows:

```
<parameter name="datasourceJndiName" value="java:/seamdiscsDatasource"/>
```

DBUnitSeamTest has support for MySQL and HSQL - you need to tell it which database is being used, otherwise it defaults to HSQL:

```
<parameter name="database" value="MYSQL" />
```

It also allows you to insert binary data into the test data set (n.b. this is untested on Windows). You need to tell it where to locate these resources on your classpath:

```
<parameter name="binaryDir" value="images/" />
```

You do not have to configure any of these parameters if you use HSQL and have no binary imports. However, unless you specify `datasourceJndiName` in your test configuration, you will have to call `setDatabaseJndiName()` before your test runs. If you are not using HSQL or MySQL, you need to override some methods. See the Javadoc of `DBUnitSeamTest` for more details.

### 37.3.4. Seam#####



Seam#####

```
public class MailTest extends SeamTest {

    @Test
    public void testSimpleMessage() throws Exception {

        new FacesRequest() {
```

```
@Override
protected void updateModelValues() throws Exception {
    setValue("#{person.firstname}", "Pete");
    setValue("#{person.lastname}", "Muir");
    setValue("#{person.address}", "test@example.com");
}

@Override
protected void invokeApplication() throws Exception {
    MimeMessage renderedMessage = getRenderedMailMessage("/simple.xhtml");
    assert renderedMessage.getAllRecipients().length == 1;
    InetAddress to = (InetAddress) renderedMessage.getAllRecipients()[0];
    assert to.getAddress().equals("test@example.com");
}

}.run();
}
}
```

#####FacesRequest#####invokeApplication#####viewId#####getRenderedMailMessage(vie

##JSF#####





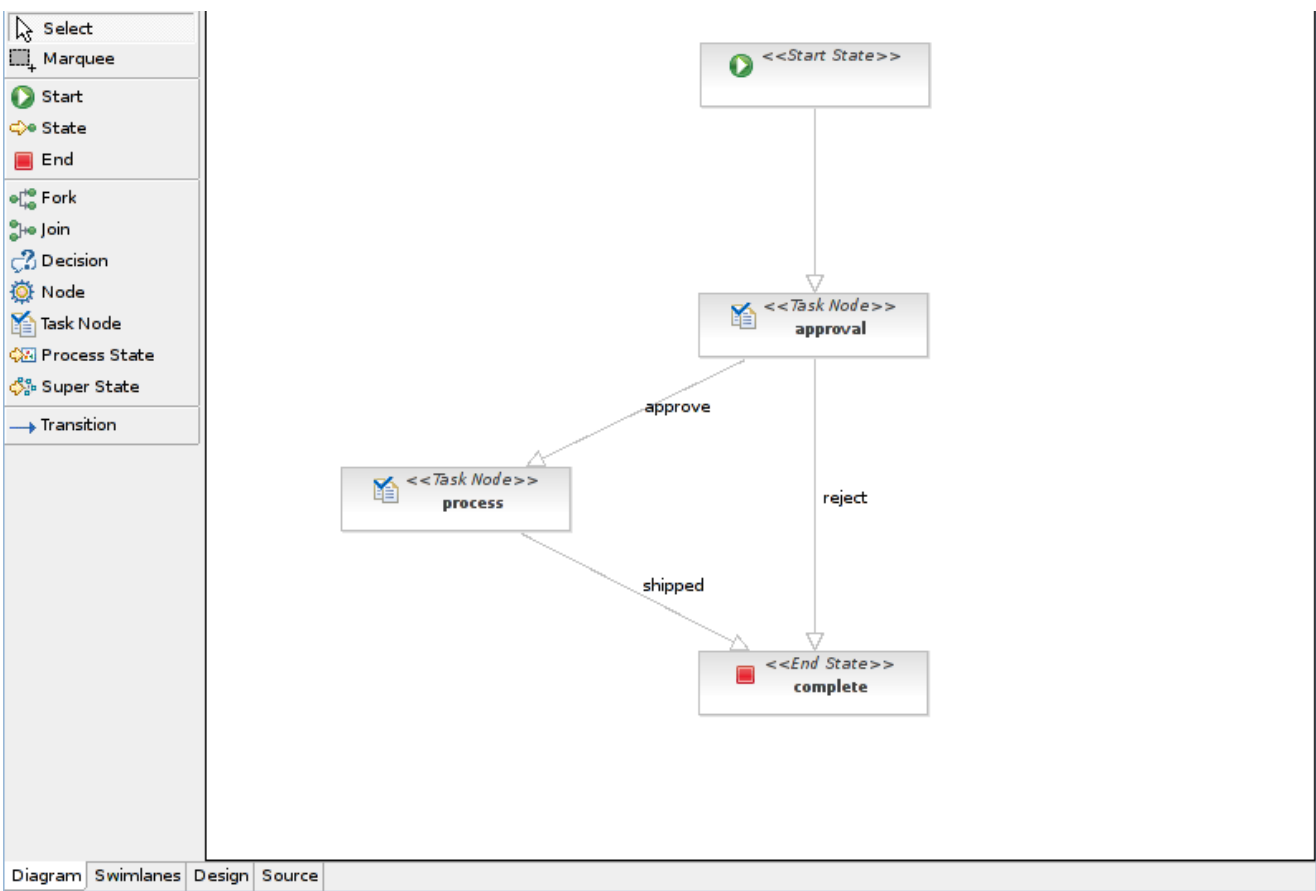
## Seam ###

### 38.1. jBPM #####

The jBPM designer and viewer will let you design and view in a nice way your business processes and your pageflows. This convenient tool is part of JBoss Eclipse IDE and more details can be found in the jBPM's [documentation](http://docs.jboss.com/jbpm/v3/gpd/) [http://docs.jboss.com/jbpm/v3/gpd/]

#### 38.1.1. #####

#####

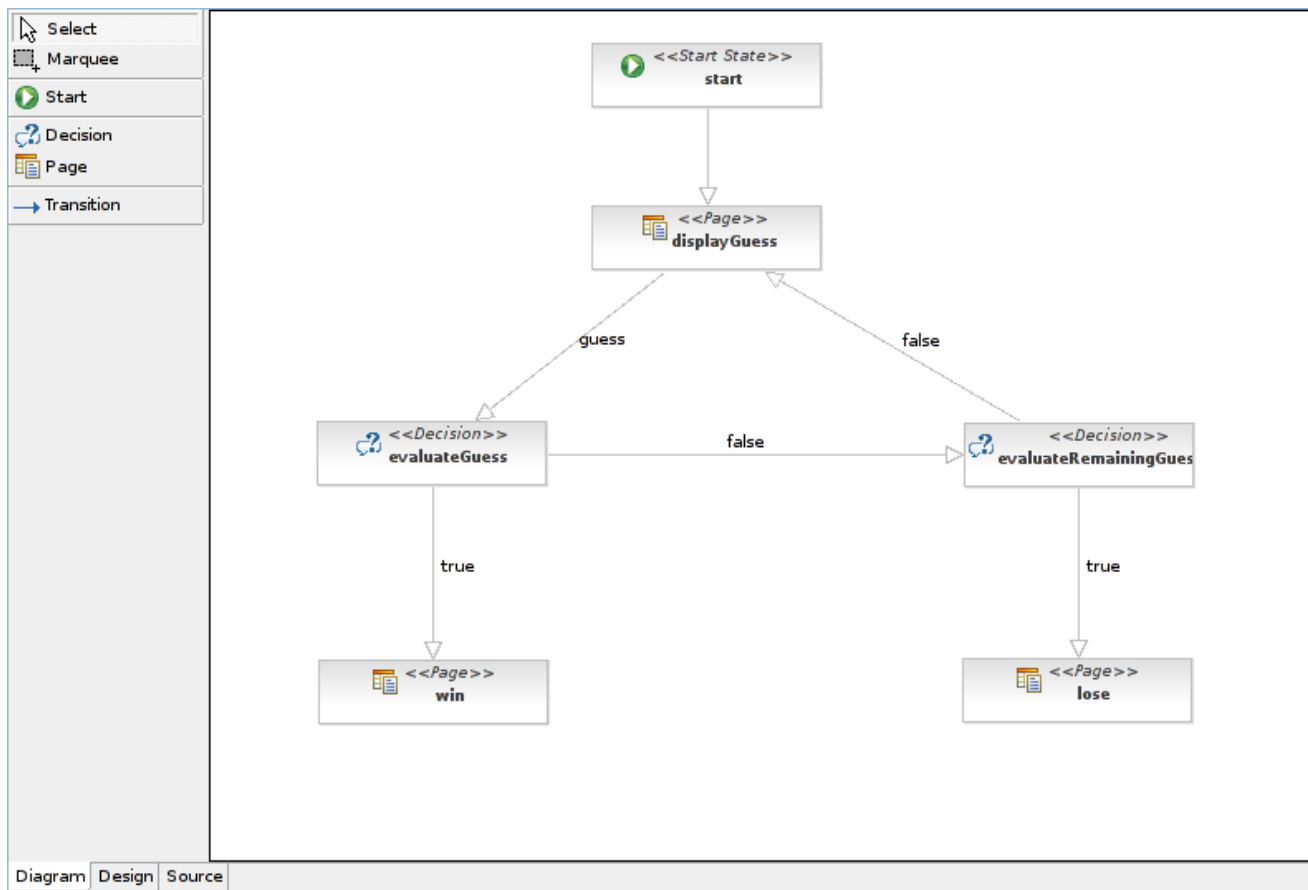


#### 38.1.2. #####

#####

#####

#####



---

## BEA Weblogic ##### Seam

WebLogic 10.3

#BEA#####J2EE#####Seam#####WebLogic#####WebLog

###WebLogic#####Seam#JEE5#####JPA#####

seam-gen #####

### 39.1. WebLogic#####


#####10.3#####BEA#####

- Weblogic 10.0.MP1 — ##### [http://www.oracle.com/technology/software/products/ias/htdocs/wls\_main.html]

10.0.MP1##EJB#####varargs#####transi  
#Weblogic##EJB3####

- Weblogic 10.3 — ##### [http://www.oracle.com/technology/software/products/ias/htdocs/wls\_main.html]

###WebLogic#####10.0.MP1#####EJB#####  
#####39.2.1. #Weblogic##EJB3####  
#####WebLogic##jar#####



**Weblogic EJB ##### jboss-seam.jar**

Seam 2.0.2.CR2

#####WebLogic###jar#####TimerServiceDispatcher

#####EJB#####EJB##2#####BEA#####jee5/  
booking #####jar#####

#### 39.1.1. 10.3#####

###Weblogic

10.3#####BEA##### Weblogic  
10.3 ##### [http://edocs.bea.com/wls/docs103/] . ##### RHEL #####5  
#####

1. 10.3

#####

2. #####server103\_XX.bin #####

## #39# BEA Weblogic #### Seam

---

```
chmod a+x server103_XX.bin#####
```

3. #####

```
./server103_XX.bin
```

4. #####BEA#####BEA#####  
\$BEA\_HOME #####

```
/jboss/apps/bea
```

5. #####Complete#####struts#beehive#####

6. #####

### 39.1.2. Weblogic#####

WebLogic#####JBoss#####

1. Weblogic#####

```
$BEA_HOME/wlserver_10.3/common/bin/config.sh
```

2. #####Weblogic  
Server#####

3. #####

4. #####Development Mode#####JDK#####

5. ##### No#####

6. #####seam\_examples #####

### 39.1.3. ##### ##/##/#### ##

#####

- #####


```
##### $BEA_HOME/user_projects/domains/seam_examples/bin ##### ./  
startWeblogic.sh#####
```

- #####  
#####http://127.0.0.1:7001/  
console#####

- #####  
####2#3#####

- #####  
1. #####seam\_examples#####  
2. #####seam\_examples#####  
3. #####AdminServer#####  
4. ##### Shutdown##### When work completes #Force shutdown  
now#####

- #####Ctrl-C####  
#####

-  **Weblogic#####**  
#####/autodeploy  
#####NoClassDefFound#####Weblogic#####  
deployed EAR/WAR  
files#####

### 39.1.4. Weblogic#JSF#####

#####Weblogic#JSF  
1.2#####Weblogic#####JSF#####  
[Weblogic 10.3 Configuring JSF and JSTL Libraries](http://edocs.bea.com/wls/docs103/webapp/configurejsfandjtsl.html) [http://edocs.bea.com/wls/docs103/webapp/configurejsfandjtsl.html]#####

1. #####Deployments #####
2. #####Install#####
3. #####\$BEA\_HOME/wlserver\_10.3/common/deployable-libraries  
##### jsf-1.2.war#####Next #####
4. Install this deployment as a library #####Install Application  
Assistant ##### Next #####

## #39# BEA Weblogic #### Seam

---

```
5. Optional Settings#####Next#####

6. Yes, take me to the deployment's configuration screen.#####
   Review your choices and click Finish##### Finish#####

7. #####Settings for jsf(1.2,1.2.3.1)####
   Deployment Order# 99##### Save #####

JSF##### jsf-api.jar
#####jsf-
1.2.war## javax.jsf_1.2.0.0.jar (jsf-api.jar)#####
```

### 39.2. jee5/booking####

```
Weblogic#EJB####Seam#####BEA#####
booking#####
```

#### 39.2.1. Weblogic##EJB3###

```
Weblogic#####Weblogic#####EJB#####W
9.X#10.0.MP1#####10.3#####
```

##### 39.2.1.1. varargs###

```
#####Weblogic#EJB#####transient#####varargs#####BEA#####
TimerServiceDispatcher)#####10.0.MP1#####
```

```
java.io.IOException: Compiler failed executable.exec:
/jboss/apps/bean/wlserver_10.0/user_projects/domains/seam_examples/servers/AdminServer
/cache/EJBCompilerCache/5yo5dk9ti3yo/org/jboss/seam/async/
TimerServiceDispatcher_qzt5w2_LocalTimerServiceDispatcherImpl.java:194: modifier transient
not allowed here
    public transient javax.ejb.Timer scheduleAsynchronousEvent(java.lang.String arg0,
        java.lang.Object[] arg1)
           ^
/jboss/apps/bean/wlserver_10.0/user_projects/domains/seam_examples/servers/AdminServer
/cache/EJBCompilerCache/5yo5dk9ti3yo/org/jboss/seam/async/
TimerServiceDispatcher_qzt5w2_LocalTimerServiceDispatcherImpl.java:275: modifier transient
not allowed here
    public transient javax.ejb.Timer scheduleTimedEvent(java.lang.String arg0,
        org.jboss.seam.async.TimerSchedule arg1, java.lang.Object[] arg2)
```

```
#####Weblogic 10.3#####BEA#####Weblogic 10.0.MP1#####(
CR327275 )#####BEA#####
```

#####BEA#####

**39.2.1.2. #####EJB#####**

#####10.0.MP1#####CR327275#####BEA#####BEA#10.0.MP1#####

#####Weblogic#####EJB#####

```

<<Error
> <EJB
> <BEA-012036
> <Compiling generated EJB classes produced the following Java compiler error message:
<Compilation Error
> TimerServiceDispatcher_qzt5w2_Impl.java: The type TimerServiceDispatcher_qzt5w2_Impl
      must      implement      the      inherited      abstract      method
TimerServiceDispatcher_qzt5w2_Intf.scheduleTimedEvent(String, Schedule, Object[])
<Compilation Error
> TimerServiceDispatcher_qzt5w2_LocalTimerServiceDispatcherImpl.java: Type mismatch:
cannot convert from Object to Timer
<Compilation Error
> TimerServiceDispatcher_qzt5w2_LocalTimerServiceDispatcherImpl.java: Type mismatch:
cannot convert from Object to Timer
>
<Error
> <Deployer
> <BEA-149265
> <Failure occurred in the execution of deployment request with ID '1223409267344' for task '0'.
Error is: 'weblogic.application.ModuleException: Exception preparing module: EJModule(jboss-
seam.jar)

```

#####Weblogic 10.3#####Weblogic

10.0.MP1#####10.3#####Seam#jar#####

BEA#####JBoss#####

Seam

2.0.2.CR2#####Seam#####EJB#####Weblogic#####Weblogic#jar#####jar#####

lib/interop#####jar#####jboss-seam-wls-

compatible.jar#####jar#####jboss-seam.jar#####TimerServiceDispatcher

EJB#####jar#####jboss-seam-wls-compatible.jar# jboss-

seam.jar#####jee5/

booking#####jar#####TimerServiceDispatcher#####

**39.2.2. jee5/booking ###**

##### jee5/booking#####

### 39.2.2.1. hsql#####

#####

1. Weblogic#####hsqldb.jar##### cp \$SEAM\_HOME/lib/hsqldb.jar  
\$BEA\_HOME/user\_projects/domains/seam\_examples/lib

2. ##### #39.1.3. ##### #/#/#### ##

3. #####seam\_examples - Services- JDBC - Data Sources#####

4. #####New#####

5. #####

- a. Name: seam-jee5-ds
- b. JNDI Name: seam-jee5-ds
- c. Database Type and Driver: other
- d. Next #####

6. Transaction Options #####Next#####

7. Connection Properties #####

- a. Database Name: hsqldb
- b. Host Name: 127.0.0.1
- c. Port: 9001
- d. Username:sa #####
- e. Password: ###
- f. Next #####

8. Connection Properties #####

- a. Driver Class Name: org.hsqldb.jdbcDriver
- b. URL: jdbc:hsqldb:.
- c. Username: sa
- d. Password: ###
- e. #####
- f. Next #####

9. #####AdminServer#####



**39.2.2.2. #####**

###Weblogic#####Seam#####

resources/META-INF/persistence.xml

- jta-data-source#####

```
<jta-data-source
>seam-jee5-ds</jta-data-source
>
```

- #####glassfish#####
- weblogic#####

```
<property name="hibernate.dialect"
value="org.hibernate.dialect.HSQLDialect"/>
<property name="hibernate.transaction.manager_lookup_class"
value="org.hibernate.transaction.WeblogicTransactionManagerLookup"/>
```

resources/META-INF/weblogic-application.xml

- #####

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<weblogic-application>
  <library-ref>
    <library-name
>jsf</library-name>
    <specification-version
>1.2</specification-version>
    <implementation-version
>1.2</implementation-version>
    <exact-match
>false</exact-match>
  </library-ref>
  <prefer-application-packages>
    <package-name
>antlr.*</package-name>
```

```
</prefer-application-packages>
</weblogic-application>
```

- ##### library-  
ref#weblogic#####JSF#####  
prefer-application-packages  
weblogic#antlr#jar#####hibernate#####

resources/META-INF/ejb-jar.xml

- #####Weblogic#####sessionBeanInterceptor#####Bean#####  
assembly-descriptor #####

```
<assembly-descriptor>
  <interceptor-binding
  >
    <ejb-name
  >AuthenticatorAction</ejb-name>
    <interceptor-class
  >org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
    </interceptor-binding>
    <interceptor-binding
  >
    <ejb-name
  >BookingListAction</ejb-name>
    <interceptor-class
  >org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
    </interceptor-binding>
    <interceptor-binding
  >
    <ejb-name
  >RegisterAction</ejb-name>
    <interceptor-class
  >org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
    </interceptor-binding>
    <interceptor-binding
  >
    <ejb-name
  >ChangePasswordAction</ejb-name>
    <interceptor-class
  >org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
    </interceptor-binding>
    <interceptor-binding
```

```

>
  <ejb-name
>HotelBookingAction</ejb-name>
  <interceptor-class
>org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
  </interceptor-binding>
  <interceptor-binding
>
  <ejb-name
>HotelSearchingAction</ejb-name>
  <interceptor-class
>org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
  </interceptor-binding>
  <interceptor-binding
>
  <ejb-name
>EjbSynchronizations</ejb-name>
  <interceptor-class
>org.jboss.seam.ejb.SeamInterceptor</interceptor-class>
  </interceptor-binding>
</assembly-descriptor
>

```

resources/WEB-INF/weblogic.xml

- #####

```

<?xml version="1.0" encoding="UTF-8"?>

<weblogic-web-app
>
<library-ref>
  <library-name
>jsf</library-name>
  <specification-version
>1.2</specification-version>
  <implementation-version
>1.2</implementation-version>
  <exact-match
>false</exact-match>
  </library-ref>
</weblogic-web-app>

```

## #39# BEA Weblogic #### Seam

- #####library-ref  
#####Weblogic#####JSF#####  
weblogic-application.xml  
#####

### 39.2.2.3. #####

#####jboss-seam.jar#####

build.xml

- ##### weblogic-application.xml #####

```
<!-- Resources to go in the ear -->
<fileset id="ear.resources" dir="{resources.dir}">
  <include name="META-INF/application.xml" />
  <include name="META-INF/weblogic-application.xml" />
  <include name="META-INF/*-service.xml" />
  <include name="META-INF/*-xmbean.xml" />
  <include name="treecache.xml" />
  <include name="*.jpd.xml" />
  <exclude name=".gpd.*" />
  <include name="*.cfg.xml" />
  <include name="*.xsd" />
</fileset
>
```

\$SEAM/lib/interop/jboss-seam-wls-compatible.jar

- #39.2.1. #Weblogic##EJB3####

##jar##### \$SEAM/lib/jboss-seam.jar  
#####EAR#####jboss-  
seam.jar#####

#####EAR##### jboss-  
seam.jar#####jar#####

jboss-seam-wls-compatible.jar##### jee5/  
booking#####ant archive#####

#####Weblogic#####EAR#####

```
cp ./dist/jboss-seam-jee5.ear
   $BEA_HOME/user_projects/domains/seam_examples/autodeploy
```

http://localhost:7001/seam-jee5/#####

### 39.3. jpa #####

####Seam POJO#Hibernate  
JPA#####EJB3#####Weblogic  
10.X#####

#####Weblogic  
10.x#####Weblogic#####JBoss  
AS#####

#####Weblogic#JSF#####[#39.1.4.](#) #  
[Weblogic#JSF#####](#)

### 39.3.1. jpa #####

#####

#### 39.3.1.1. #####

#####Weblogic 10.X  
#####PointBase#####hsq#####PointBase#####PointBase#####  
#hibernate#### PointBase#####jpa/  
weblogic92#####PointBase#####

#####jee5 [#39.2.2.1.](#)  
[#hsq#####](#)

- DataSource Name: seam-jpa-ds
- JNDI Name: seam-jpa-ds

#### 39.3.1.2. #####

Building it only requires running the correct ant command:

```
ant weblogic10
```

This will create a container specific distribution and exploded archive directories.

#### 39.3.1.3. #####

[#39.1.2.](#)  
[#Weblogic#####](#)#####Weblogic#####

```
cp ./dist-weblogic10/jboss-seam-jpa.war
$BEA_HOME/user_projects/domains/seam_examples/autodeploy
```

http://localhost:7001/jboss-seam-jpa/#####

### 39.3.2. Weblogic 10.x####

- Weblogic#10.x#9.2#####

- META-INF/persistence.xml — 9.2#####PointBase#####10.x#####hsq1#####
- WEB-INF/weblogic.xml — #####Weblogic 10.x#####ANTLR#####OC4J #####

```
<?xml version="1.0" encoding="UTF-8"?>
<weblogic-web-app
xmlns="http://www.bea.com/ns/weblogic/90"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.bea.com/ns/weblogic/90
http://www.bea.com/ns/weblogic/90/weblogic-web-app.xsd">
  <library-ref>
    <library-name
>jsf</library-name>
    <specification-version
>1.2</specification-version>
    <implementation-version
>1.2</implementation-version>
    <exact-match
>false</exact-match>
  </library-ref>
  <container-descriptor>
    <prefer-web-inf-classes
>true</prefer-web-inf-classes>
  </container-descriptor>
</weblogic-web-app
>
```

####Weblogic#####Web#####hibernate##  
 INF/persistence.xml#####

```
<property name="hibernate.query.factory_class"
  value="org.hibernate.hql.classic.ClassicQueryTranslatorFactory"/>
```

- WEB-INF/components.xml — Weblogic  
10.x#####JPA#####

```
<transaction:entity-transaction entity-manager="#{em}"/>
```

- WEB-INF/web.xml — jsf-impl.jar# WAR#####

```
<listener>
  <listener-class>
>com.sun.faces.config.ConfigureListener</listener-class>
</listener>
>
```

- Weblogic#10.x#####JBoss#####
- META-INF/persistence.xml — #####Weblogic#####

```
<property name="hibernate.transaction.manager_lookup_class"
  value="org.hibernate.transaction.WeblogicTransactionManagerLookup"/>
```

- WEB-INF/lib — Weblogic#####JBoss  
AS#####hibernate#####
- JPA#####Hibernate#####jar#####
  - hibernate.jar
  - hibernate-annotations.jar
  - hibernate-entitymanager.jar
  - hibernate-validator.jar

- jboss-common-core.jar
- commons-logging.jar
- commons-collections.jar
- jboss-common-core.jar
- #####jar#####Weblogic#####
- antlr.jar
- cglib.jar
- asm.jar
- dom4j.jar
- el-ri.jar
- javassist.jar
- concurrent.jar

### 39.4. Weblogic 10.x #seam-gen#####

```
seam-gen
#####seam-
gen#####JBoss AS#####

seam-gen#####seam-gen#####           Weblogic
10.x#####Weblogic                       10.x
#####jar#####

#####seam-gen  WAR#####Seam POJO#####Hibernate JPA,
Facelets, Drools security, RichFaces, #####
```

#### 39.4.1. seam-gen#p#####

```
#####seam-
gen#####Seam#####./seam
setup#####
```

```
./seam setup
Buildfile: build.xml

init:
```



setup:

[echo] Welcome to seam-gen :-)

[input] Enter your Java project workspace (the directory that contains your Seam projects) [C:/Projects] [C:/Projects]  
/home/jbalunas/workspace

[input] Enter your JBoss home directory [C:/Program Files/jboss-4.2.3.GA]  
[C:/Program Files/jboss-4.2.3.GA]  
/jboss/apps/jboss-4.2.3.GA

[input] Enter the project name [myproject] [myproject]  
weblogic-example

[echo] Accepted project name as: weblogic\_example

[input] Select a RichFaces skin (not applicable if using ICEFaces) [blueSky]  
([blueSky], classic, ruby, wine, deepMarine, emeraldTown, sakura, DEFAULT)

[input] Is this project deployed as an EAR (with EJB components) or a WAR  
(with no EJB support) [ear] ([ear], war, )

war

[input] Enter the Java package name for your session beans [org.jboss.seam.  
tutorial.weblogic.action] [org.jboss.seam.tutorial.weblogic.action]  
org.jboss.seam.tutorial.weblogic.action

[input] Enter the Java package name for your entity beans [org.jboss.seam.  
tutorial.weblogic.model] [org.jboss.seam.tutorial.weblogic.model]  
org.jboss.seam.tutorial.weblogic.model

[input] Enter the Java package name for your test cases [org.jboss.seam.  
tutorial.weblogic.action.test] [org.jboss.seam.tutorial.weblogic.action.test]  
org.jboss.seam.tutorial.weblogic.test

[input] What kind of database are you using? [hsq] ([hsq], mysql, oracle,  
postgres, mssql, db2, sybase, enterprisedb, h2)

[input] Enter the Hibernate dialect for your database [org.hibernate.  
dialect.HSQLDialect] [org.hibernate.dialect.HSQLDialect]

[input] Enter the filesystem path to the JDBC driver jar [/tmp/seamlib/hsqldb.jar]  
[/tmp/seam/lib/hsqldb.jar]

[input] Enter JDBC driver class for your database [org.hsqldb.jdbcDriver]  
[org.hsqldb.jdbcDriver]

[input] Enter the JDBC URL for your database [jdbc:hsqldb:] [jdbc:hsqldb:]

[input] Enter database username [sa] [sa]

[input] Enter database password [] []

```
[input] Enter the database schema name (it is OK to leave this blank) [] []

[input] Enter the database catalog name (it is OK to leave this blank) [] []

[input] Are you working with tables that already exist in the database? [n]
(y, [n], )

[input] Do you want to drop and recreate the database tables and data in
import.sql each time you deploy? [n] (y, [n], )

[input] Enter your ICEfaces home directory (leave blank to omit ICEfaces) [] []

[propertyfile] Creating new property file:
/rhdev/projects/jboss-seam/cvs-head/jboss-seam/seam-gen/build.properties
[echo] Installing JDBC driver jar to JBoss server
[copy] Copying 1 file to /jboss/apps/jboss-4.2.3.GA/server/default/lib
[echo] Type 'seam create-project' to create the new project

BUILD SUCCESSFUL
```

```
./seam new-project##### cd /home/jbalunas/workspace/
weblogic_example#####
```

### 39.4.2. Weblogic 10.X#####

#####

#### 39.4.2.1. #####

build.xml

- #####archive#####

```
<project name="weblogic_example" default="archive" basedir="."
>
```

resources/META-INF/persistence-dev.xml

- jta-data-source#seam-gen-  
ds#####Weblogic#####jndi-name#####
- JPA#####RESOURCE\_LOCAL#####

```
<persistence-unit name="weblogic_example" transaction-type="RESOURCE_LOCAL"
>
```

- Weblogic#####

```
<property name="hibernate.cache.provider_class"
value="org.hibernate.cache.HashtableCacheProvider"/>
<property name="hibernate.transaction.manager_lookup_class"
value="org.hibernate.transaction.WeblogicTransactionManagerLookup"/>
```

- #####Weblogic#####persistence-prod.xml #####

resource/WEB-INF/weblogic.xml

##### [description of WEB-INF/weblogic.xml \[578\]](#)#####

resource/WEB-INF/components.xml

JPA#####Seam#####

```
<transaction:entity-transaction entity-manager="{entityManager}"/>
```

#####

```
xmlns:transaction="http://jboss.com/products/seam/transaction"
```

```
http://jboss.com/products/seam/transaction http://jboss.com/products/seam/transaction-2.2.xsd
```

resource/WEB-INF/web.xml

WEB-INF/web.xml — jsf-impl.jar# WAR#####

```
<listener>
<listener-class
>com.sun.faces.config.ConfigureListener</listener-class>
</listener
```

## #39# BEA Weblogic #### Seam

---

```
>
```

```
resources/WEB-INF/jboss-web.xml
JBoss          AS#####jboss-app.xml#JBoss
AS#####
```

```
resources/*-ds.xml
JBoss          AS#####JBoss
AS#####Weblogic#####
```

### 39.4.2.2. #####

```
seam-gen#####jpa######39.3.2.      #Weblogic
10.x#####
```

- build.xml — #####build.xml#####war#####

```
<copy todir="${war.dir}/WEB-INF/lib">
  <fileset dir="${lib.dir}">
    <!-- Misc 3rd party -->
    <include name="commons-logging.jar" />
    <include name="dom4j.jar" />
    <include name="javassist.jar" />
    <include name="cglib.jar" />
    <include name="antlr.jar" />

    <!-- Hibernate -->
    <include name="hibernate.jar" />
    <include name="hibernate-commons-annotations.jar" />
    <include name="hibernate-annotations.jar" />
    <include name="hibernate-entitymanager.jar" />
    <include name="hibernate-validator.jar" />
    <include name="jboss-common-core.jar" />
    <include name="concurrent.jar" />
  </fileset>
</copy>
>
```

### 39.4.3. #####

```
#####
```

### 39.4.3.1. #####

#####jee5 #39.2.2.1. #hsq#####

- DataSource Name: seam-gen-ds
- JNDI Name: seam-gen-ds

### 39.4.3.2. #####

#####ant#####

### 39.4.3.3. #####

#39.1.2.

#Weblogic#####Weblogic#####

```
cp ./dist/weblogic_example.war /jboss/apps/bean/user_projects/domains/seam_examples/
autodeploy
```

http://localhost:7001/weblogic\_example/#####



---

## Seam on IBM's WebSphere AS v7

### 40.1. WebSphere AS environment and version recommendation

WebSphere Application Server v7 is IBM's application server offering. This release is fully Java EE 5 certified.

WebSphere AS being a commercial product, we will not discuss the details of its installation. At best, we will instruct you to follow the directions provided by your particular installation type and license.

First, we will go over some basic considerations on how to run Seam applications under WebSphere AS v7. We will go over the details of these steps using the JEE5 booking example. We will also deploy the JPA (non-EJB3) example application.

All of the examples and information in this chapter are based on WebSphere AS v7. A trial version can be downloaded here : [WebSphere Application Server V7](http://www.ibm.com/developerworks/downloads/ws/was) [http://www.ibm.com/developerworks/downloads/ws/was]

WebSphere v7.0.0.5 is the minimal version of WebSphere v7 to use with Seam. WAS v7.0.0.9 is highly recommended. Earlier versions of WebSphere have bugs in the EJB container that will cause various exceptions to occur at runtime.



##

You may encounter two exceptions with Seam on WebSphere v7.0.0.5 :

`EJBContext` may only be looked up by or injected into an EJB

This is a bug in WebSphere v7.0.0.5. WebSphere does not conform to the EJB 3.0 specs as it does not allow to perform a lookup on "java:comp/EJBContext" in callback methods.

This problem is associated with APAR PK98746 at IBM and is corrected in v7.0.0.9.

```
NameNotFoundException: Name "comp/UserTransaction" not found in context "java:"
```

Another bug in WebSphere v7.0.0.5. This occurs when an HTTP session expires. Seam correctly catches the exception when necessary and performs the correct actions in these cases. The problem is that even if the exception is handled by Seam, WebSphere prints the traceback of the exception in SystemOut. Those messages are harmless and can safely be ignored.

This problem is associated with APAR PK97995 at IBM and is corrected in v7.0.0.9.

The following sections in this chapter assume that WebSphere is correctly installed and is functional, and a WebSphere "profile" has been successfully created.

This chapter explains how to compile, deploy and run some sample applications in WebSphere. These sample applications require a database. WebSphere comes by default with a set of sample applications called "Default Application". This set of sample applications use a Derby database running on the Derby instance installed within WebSphere. In order to keep this simple we'll use this Derby database created for the "Default Applications". However, to run the sample application with the Derby database "as-is", a patched Hibernate dialect must be used (The patch changes the default "auto" key generation strategy) as explained in [# 41. GlassFish ##### Seam](#). If you want to use another database, it's just a matter of creating a connection pool in WebSphere pointing to this database, declare the correct Hibernate dialect and set the correct JNDI name in `persistence.xml`.

## 40.2. Configuring the WebSphere Web Container

This step is mandatory in order to have Seam applications run with WebSphere v7. Two extra properties must be added to the Web Container. Please refer to the IBM WebSphere Information Center for further explanations on those properties.

To add the extra properties:

- Open the WebSphere administration console
- Select the `Servers/Server Types/WebSphere Application Servers` in the left navigation menu
- Click on the server name (`server1`)
- On the right navigation menu, select `Web Container Settings/Web container`
- On the right navigation menu, select `custom properties` and add the following properties:
  - `prependSlashToResource = true`
  - `com.ibm.ws.webcontainer.invokefilterscompatibility = true`
- Save the configuration and restart the server

## 40.3. Seam and the WebSphere JNDI name space

In order to use component injection, Seam needs to know how to lookup for session beans bound to the JNDI name space. Seam provides two mechanisms to configure the way it will search for such resources:



Strategy 1: Specify which JNDI name Seam must use for each Session Bean

- The global `jndi-pattern` switch on the `<core:init>` tag in `components.xml`. The switch can use a special placeholder `"#{ejbName}"` that resolves to the unqualified name of the EJB
- The `@JndiName` annotation

[#30.1.5. #EJB ##### Seam #####](#) gives detailed explanations on how those mechanisms work.

By default, WebSphere will bind session beans in its local JNDI name space under a "short" binding name that adheres to the following pattern `ejblocal:<package.qualified.local.interface.name>`.

For a detailed description on how WebSphere v7 organizes and binds EJBs in its JNDI name spaces, please refer to the WebSphere Information Center.

As explained before, Seam needs to lookup for session bean as they appear in JNDI. Basically, there are three strategies, in order of complexity:

- Specify which JNDI name Seam must use for each session bean using the `@JndiName` annotation in the java source file,
- Override the default session bean names generated by WebSphere to conform to the `jndi-pattern` attribute,
- Use EJB references.

### 40.3.1. Strategy 1: Specify which JNDI name Seam must use for each Session Bean

This strategy is the simplest and fastest one regarding development. It uses the WebSphere v7 default binding mechanism. To use this strategy:

- Add a `@JndiName("ejblocal:<package.qualified.local.interface.name>)` annotation to each session bean that is a Seam component.
- In `components.xml`, add the following line:

```
<core:init jndi-name="java:comp/env/#{ejbName}" />
```

- Add a file named `WEB-INF/classes/seam-jndi.properties` in the web module with the following content:

```
com.ibm.websphere.naming.hostname.normalizer=com.ibm.ws.naming.util.DefaultHostnameNormalizer
java.naming.factory.initial=com.ibm.websphere.naming.WsnInitialContextFactory
com.ibm.websphere.naming.name.syntax=jndi
com.ibm.websphere.naming.namespace.connection=lazy
com.ibm.ws.naming.ldap.LdapInitialContextFactory=com.sun.jndi.ldap.LdapCtxFactory
```

```
com.ibm.websphere.naming.jndicache.cacheobject=populated
com.ibm.websphere.naming.namespaceroot=defaultroot
com.ibm.ws.naming.wsn.factory.initial=com.ibm.ws.naming.util.WsnInitCtxFactory
com.ibm.websphere.naming.jndicache.maxcachelife=0
com.ibm.websphere.naming.jndicache.maxentrylife=0
com.ibm.websphere.naming.jndicache.cachename=providerURL
java.naming.provider.url=corbaloc:rir:/NameServiceServerRoot
java.naming.factory.url.pkgs=com.ibm.ws.runtime:com.ibm.ws.naming
```

- At the end of `web.xml`, add the following lines:

```
<ejb-local-ref>
  <ejb-ref-name>EjbSynchronizations</ejb-ref-name>
  <ejb-ref-type>Session</ejb-ref-type>
  <local-home></local-home>
  <local>org.jboss.seam.transaction.LocalEjbSynchronizations</local>
</ejb-local-ref>
```

That's all folks! No need to update any file during the development, nor to define any EJB to EJB or web to EJB reference!

Compared to the other strategies, this strategy has the advantage to not have to manage any EJBs reference and also to not have to maintain extra files. The only drawback is one extra line in the java source code with the `@JndiName` annotation

### 40.3.2. Strategy 2: Override the default names generated by WebSphere

There is no simple way to globally override the default naming strategy for session beans in WebSphere. However, WebSphere provides a way to override the name of each bean.

To use this strategy:

- Add a file named `META-INF/ibm-ejb-jar-bnd.xml` in the EJB module and add an entry for each session bean like this:

```
<?xml version="1.0" encoding="UTF-8"?>
<ejb-jar-bnd
  xmlns="http://websphere.ibm.com/xml/ns/javaee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://websphere.ibm.com/xml/ns/javaee
    http://websphere.ibm.com/xml/ns/javaee/ibm-ejb-jar-bnd_1_0.xsd"
  version="1.0">
```

```

<session name="AuthenticatorAction" simple-binding-name="AuthenticatorAction" />
<session name="BookingListAction" simple-binding-name="BookingListAction" />

</ejb-jar-bnd
>

```

WebSphere will then bind the `AuthenticatorAction` EJB to the `ejblocal:AuthenticatorAction` JNDI name

- In `components.xml`, add the following line:

```

<core:init jndi-name="ejblocal:#{ejbName}" />

```

- Add a file named `WEB-INF/classes/seam-jndi.properties` as described in strategy 1
- In `web.xml`, add the following lines (Note the different `ejb-ref-name` value):

```

<ejb-local-ref>
  <ejb-ref-name>ejblocal:EjbSynchronizations</ejb-ref-name>
  <ejb-ref-type>Session</ejb-ref-type>
  <local-home></local-home>
  <local>org.jboss.seam.transaction.LocalEjbSynchronizations</local>
</ejb-local-ref>

```

Compared to the first strategy, this strategy requires to maintain an extra file (`META-INF/ibm-ejb-jar-ext.xml`), where a line must be added each time a new session bean is added to the application), but still does not require to maintain EJB reference between beans.

### 40.3.3. Strategy 3: Use EJB references

This strategy is based on the usage of EJB references, from EJB to EJB and from the web module to EJB. To use it:

- In `components.xml`, add the following line:

```

<core:init jndi-name="java:comp/env/#{ejbName}" />

```

- Follow the instructions in [#30.1.5. #EJB ##### Seam #####](#) to declare the references from web to EJB and from EJB to EJB

This is the most tedious strategy as each session bean referenced by another session bean (i.e. "injected") as to be declared in `ejb-jar.xml` file. Also, each new session bean has to be added to the list of referenced bean in `web.xml`

## 40.4. Configuring timeouts for Stateful Session Beans

A timeout value has to be set for each stateful session bean used in the application because stateful bean must not expire in WebSphere while Seam might still need them. At the time of writing this document, WebSphere does not provide a way to configure a global timeout at neither the cluster, server, application nor ejb-jar level. It has to be done for each stateful bean individually. By default, the default timeout is 10 minutes. This is done by adding a file named `META-INF/ibm-ejb-jar-ext.xml` in the EJB module, and declare the timeout value for each bean:

```
<?xml version="1.0" encoding="UTF-8"?>
<ejb-jar-ext
  xmlns="http://websphere.ibm.com/xml/ns/javaee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://websphere.ibm.com/xml/ns/javaee
    http://websphere.ibm.com/xml/ns/javaee/ibm-ejb-jar-ext_1_0.xsd"
  version="1.0">

  <session name="BookingListAction"><time-out value="605"/></session>
  <session name="ChangePasswordAction"><time-out value="605"/></session>

</ejb-jar-ext>
```

The `time-out` is expressed in seconds and must be higher than the Seam conversation expiration timeout and a few minutes higher than the user's HTTP session timeout (The session expiration timeout can trigger a few minutes after the number of minutes declared to expire the HTTP session).

## 40.5. `jee5/booking` ####

The `jee5/booking` example is based on the Hotel Booking example (which runs on JBoss AS). Out of the box, it is designed to run on Glassfish, but with the following steps, it can be deployed on WebSphere. It is located in the `$SEAM_DIST/examples/jee5/booking` directory.

The example already has a breakout of configurations and build scripts for WebSphere. First thing, we are going to do is build and deploy this example. Then we'll go over some key changes that we needed.

The tailored configuration files for WebSphere use the second JNDI mapping strategy ("Override the default names generated by WebSphere") as the goal was to not change any java code to add the `@JndiName` annotation as in the first strategy.

### 40.5.1. `jee5/booking` #####

Building it only requires running the correct ant command:

```
ant -f build-websphere7.xml
```

This will create container specific distribution and exploded archive directories with the `websphere7` label.

### 40.5.2. Deploying the `jee5/booking` example

The steps below are for the WAS version stated above. The ports are the default values, if you changed them, you must substitute the values.

1. Log in to the administration console

```
http://localhost:9060/admin
```

Enter your userid and/or your password if security is enabled for the console.

2. Go to the WebSphere enterprise applications menu option under the Applications --> Application Type left side menu.
3. At the top of the Enterprise Applications table select Install. Below are installation wizard pages and what needs to be done on each:

- #####
- Browse to the `examples/jee5/booking/dist-websphere7/jboss-seam-jee5.ear` file using the file upload widget.
- Next #####
- Select the Fast Path button.
- Next #####
- #####
- Select the "Allow EJB reference targets to resolve automatically" check boxes at the bottom of the page. This will let WebSphere use its simplified JNDI reference mapping.
- Next #####
- #####
- No changes needed here as we only have one server. Select the Next button.
- Map virtual hosts for Web modules
- No changes needed here as we only have one virtual host. Select the Next button.

- Summary (##)
  - #####Finish #####
- Installation (#####)
  - Now you will see WebSphere installing and deploying your application.
  - When done, select the `Save` link and you will be returned to the `Enterprise Applications` table.
  - To start the application, select the application in the list, then click on the `Start` button at the top of the table.

4. You can now access the application at `http://localhost:9080/seam-jee5-booking`

### 40.5.3. Deviation from the original base files

Below are the differences between the base configuration files and the WebSphere specific files held in the `resources-websphere7` directory.

- `META-INF/ejb-jar.xml` — Removed all the EJB references
- `META-INF/ibm-ejb-jar-bnd.xml` — This WebSphere specific file has been added as we use the second JNDI mapping strategy. It defines, for each session bean, the name WebSphere will use to bind it in its JNDI name space
- `META-INF/ibm-ejb-jar-ext.xml` — This WebSphere specific file defines the timeout value for each stateful bean
- `META-INF/persistence.xml` — The main changes here are for the datasource JNDI path, switching to the WebSphere transaction manager lookup class, turning off the `hibernate.transaction.flush_before_completion` toggle, and forcing the Hibernate dialect to be `GlassfishDerbyDialect` as we are using the integrated Derby database
- `WEB-INF/components.xml` — the change here is `jndi-pattern` to use `ejblocal:#{ejbname}` as using the second JNDI matching strategy
- `WEB-INF/web.xml` — Remove all the `ejb-local` ref except the one for `EjbSynchronizations` bean. Changed the ref fo this bean to `ejblocal:EjbSynchronizations`
- `import.sql` — due to the cutomized hibernate Derby dialect, the `ID` column can not be populated by this file and was removed.

Also the build procedure has been changed to include the `log4j.jar` file and exclude the `concurrent.jar` and `jboss-common-core.jar` files.

### 40.6. `jpa` booking ####

This is the Hotel Booking example implemented in Seam POJOs and using Hibernate JPA with JPA transactions. It does not use EJB3.

The example already has a breakout of configurations and build scripts for many of the common containers including WebSphere.

First thing, we are going to do is build and deploy that example. Then we'll go over some key changes that we needed.

### 40.6.1. jpa #####

Building it only requires running the correct ant command:

```
ant websphere7
```

This will create container specific distribution and exploded archive directories with the `websphere7` label.

### 40.6.2. jpa #####

Deploying jpa application is very similar to the `jee5/booking` example at [#40.5.2. #Deploying the jee5/booking example#](#). The main difference is, that this time, we will deploy a war file instead of an ear file, and we'll have to manually specify the context root of the application.

Follow the same instructions as for the `jee5/booking` sample. Select the `examples/jpa/dist-websphere7/jboss-seam-jpa.war` file on the first page and on the `Map` context roots for Web modules page (after the `Map` virtual host for Web module), enter the context root you want to use for your application in the `Context Root` input field.

When started, you can now access the application at the `http://localhost:9080/<context root>`.

### 40.6.3. Deviation from the generic base files

Below are the configuration file differences between the base configuration files and the files customized for WebSphere held in the `resources-websphere7` directory.

- `META-INF/persistence.xml` — The main changes here are for the `datasource` JNDI path, switching to the WebSphere transaction manager look up class, turning off the `hibernate.transaction.flush_before_completion` toggle, and forcing the Hibernate dialect to be `GlassfishDerbyDialect` how as using the integrated Derby database
- `import.sql` — due to the customized hibernate Derby dialect, the `ID` column can not be populated by this file and was removed.

Also the build procedure have been changed to include the `log4j.jar` file and exclude the `concurrent.jar` and `jboss-common-core.jar` files.





---

## GlassFish ##### Seam

GlassFish ##Java EE 5 ##### v2 UR2 ##

```
##### GlassFish ##### jee5 #####jpa
#####seam-gen ##### GlassFish
#####
```

### 41.1. GlassFish #####

#### 41.1.1. #####

##### GlassFish #####

- [GlassFish v2 UR2 - #####](https://glassfish.dev.java.net/downloads/v2ur2-b04.html) [https://glassfish.dev.java.net/downloads/v2ur2-b04.html]

GlassFish #####

```
$ java -Xmx256m -jar glassfish-installer-v2ur2-b04-linux.jar
```

```
#####GlassFish #####
```

```
$ cd glassfish; ant -f setup.xml
```

```
#####domain1 ###
```

```
##### JavaDB #####
```

```
$ bin/asadmin start-database
```



##

JavaDB ##HSQLDB # JBoss AS #####GlassFish #####

```
#####GlassFish #####
```

```
$ bin/asadmin start-domain domain1
```

## #41# GlassFish #####...

---

The web administration console is available at `http://localhost:4848/`. You can access the web admin console with the default username (`admin`) and password (`adminadmin`). We will be using the the admin console to deploy our examples. You can also copy EAR/WAR files to the `glassfish/domains/domain1/autodeploy` directory to deploy them, although we are not going to cover that.

#####

```
$ bin/asadmin stop-domain domain1; bin/asadmin stop-database
```

### 41.2. `jee5/booking` ####

```
jee5/booking #####(JBoss AS #####) ##### GlassFish
##### $SEAM_DIST/examples/jee5/booking #####
```

#### 41.2.1. Building the `jee5/booking` example

To build the example, simply execute the default `ant` target:

```
$ ant
```

in the `examples/jee5/booking` directory. This will create the `dist` and `exploded-archives` directories.

#### 41.2.2. GlassFish #####

```
GlassFish ##### GlassFish #####
```

1. `http://localhost:4848` #####
2. ##### Applications (#####) ##### Enterprise Applications (#####) #####
3. Enterprise Application (#####) ##### Deploy (##) #####
  - #####
  - ##### `examples/jee5/booking/dist/jboss-seam-jee5.ear` #####
  - OK #####
4. `http://localhost:8081/seam-jee5/` #####

## 41.3. `jpa` booking ####

```
####Hibernate      JPA      #      JPA      #####
#####EJB3 #####

#####GlassFish #####
```

### 41.3.1. `jpa` #####

```
#####glassfish #####
```

```
$ ant glassfish
```

```
##### dist-glassfish ##### exploded-archives-glassfish #####
```

### 41.3.2. `jpa` #####

This is very similar to the `jee5` example at [#41.2.2. #GlassFish #####](#) except that this is a `war` and not an `ear`.

- #####

```
http://localhost:4848
```

- ##### Applications (#####) ##### Web Applications (Web #####) #####
- #####
  - ##### examples/jpa/dist-glassfish/jboss-seam-jpa.war #####
  - OK #####
- http://localhost:8081/jboss-seam-jpa/ #####



#### Hypersonic SQL DB ##### Derby ###

In order for the app to work out of the box with GlassFish, we have used the Derby (aka JavaDB) database in GlassFish. However, we strongly recommend that you use another database (e.g. HSQL). `examples/jpa/resources-glassfish/WEB-INF/classes/GlassfishDerbyDialect.class` is a hack to get around a Derby bug in GlassFish server. You must use it as your Hibernate dialect if you use Derby with GlassFish.

### 41.3.3. GlassFish v2 UR2 #####

- #####
- META-INF/persistence.xml — the main changes needed are the datasource JNDI, switching to the GlassFish transaction manager lookup class, and changing the hibernate dialect to be GlassfishDerbyDialect.
- WEB-INF/classes/GlassfishDerbyDialect.class — this class is needed for the Hibernate dialect change to GlassfishDerbyDialect
- import.sql — ##### Derby DB ##### ID #####

## 41.4. seam-gen ##### GlassFish v2 UR2 #####

seam-gen is a very useful tool for developers to quickly get an application up and running, and provides a foundation to add your own functionality. Out of box seam-gen will produce applications configured to run on JBoss AS. These instructions will show the steps needed to get it to run on GlassFish.

### 41.4.1. seam-gen #####

```
##### seam-gen
##### Hibernate
#####
```

```
$. /seam setup
Buildfile: build.xml

init:

setup:
[echo] Welcome to seam-gen :-)
[input] Enter your Java project workspace (the directory that contains your
Seam projects) [C:/Projects] [C:/Projects]
/projects
[input] Enter your JBoss home directory [C:/Program Files/jboss-4.2.3.GA]
[C:/Program Files/jboss-4.2.3.GA]

[input] Enter the project name [myproject] [myproject]
seamgen_example
[echo] Accepted project name as: seamgen_example
[input] Do you want to use ICEfaces instead of RichFaces [n] (y, [n])
```

[input] skipping input as property icefaces.home.new has already been set.

[input] Select a RichFaces skin [blueSky] ([blueSky], classic, ruby, wine, deepMarine, emeraldTown, japanCherry, DEFAULT)

[input] Is this project deployed as an EAR (with EJB components) or a WAR (with no EJB support) [ear] ([ear], war)

[input] Enter the Java package name for your session beans  
[com.mydomain.seamgen\_example] [com.mydomain.seamgen\_example]  
org.jboss.seam.tutorial.glassfish.action

[input] Enter the Java package name for your entity beans  
[org.jboss.seam.tutorial.glassfish.action]  
[org.jboss.seam.tutorial.glassfish.action]  
org.jboss.seam.tutorial.glassfish.model

[input] Enter the Java package name for your test cases  
[org.jboss.seam.tutorial.glassfish.action.test]  
[org.jboss.seam.tutorial.glassfish.action.test]  
org.jboss.seam.tutorial.glassfish.test  
[input] What kind of database are you using? [hsqldb] ([hsqldb], mysql, oracle, postgres, mssql, db2, sybase, enterprisedb, h2)

[input] Enter the Hibernate dialect for your database  
[org.hibernate.dialect.HSQLDialect]  
[org.hibernate.dialect.HSQLDialect]

[input] Enter the filesystem path to the JDBC driver jar  
[/tmp/seam/lib/hsqldb.jar] [/tmp/seam/lib/hsqldb.jar]

[input] Enter JDBC driver class for your database [org.hsqldb.jdbcDriver]  
[org.hsqldb.jdbcDriver]

[input] Enter the JDBC URL for your database [jdbc:hsqldb:~]  
[jdbc:hsqldb:~]

[input] Enter database username [sa] [sa]

[input] Enter database password [] []

[input] Enter the database schema name (it is OK to leave this blank) [] []

[input] Enter the database catalog name (it is OK to leave this blank) [] []

## #41# GlassFish #####...

---

```
[input] Are you working with tables that already exist in the database? [n]
(y, [n])
```

```
[input] Do you want to drop and recreate the database tables and data in
import.sql each time you deploy? [n] (y, [n])
```

```
[propertyfile] Creating new property file:
/home/mnovotny/workspaces/jboss/jboss-seam/seam-gen/build.properties
[echo] Installing JDBC driver jar to JBoss server
[copy] Copying 1 file to
/home/mnovotny/workspaces/jboss/jboss-seam/seam-gen/C:/Program
Files/jboss-4.2.3.GA/server/default/lib
[echo] Type 'seam create-project' to create the new project
```

```
BUILD SUCCESSFUL
Total time: 4 minutes 5 seconds
```

```
#####$ ./seam new-project ##### cd /projects/seamgen_example
#####
```

### 41.4.2. GlassFish #####

```
#####
```

#### 41.4.2.1. #####

```
resources/META-INF/persistence-dev.xml
```

- jta-data-source # jdbc/\_\_default ##### GlassFish Derby DB #####
- Replace all of the properties with the following. The key differences are briefly described in [#41.3.3. #GlassFish v2 UR2 #####](#):

```
<property name="hibernate.dialect" value="GlassfishDerbyDialect"/>
<property name="hibernate.hbm2ddl.auto" value="update"/>
<property name="hibernate.show_sql" value="true"/>
<property name="hibernate.format_sql" value="true"/>
<property name="hibernate.cache.provider_class"
value="org.hibernate.cache.HashtableCacheProvider"/>
<property name="hibernate.transaction.manager_lookup_class"
value="org.hibernate.transaction.SunONETransactionManagerLookup"/>
```

- prod ##### GlassFish ##### persistence-prod.xml #####

```
resources/GlassfishDerbyDialect.class
#####jpa ##### seamgen_example/
resources #####
```

```
$ cp \
$SEAM_DIST/examples/jpa/resources-glassfish/WEB-INF/classes/
GlassfishDerbyDialect.class \
./resources
```

```
resources/META-INF/jboss-app.xml
JBoss AS ##### (JBoss AS ## jboss-app.xml
#####)
```

```
resources/*-ds.xml
JBoss AS ##### (#####JBoss AS
#####GlassFish #####)
```

```
resources/WEB-INF/components.xml
```

- ##### - <transaction:ejb-transaction/> #####  
xmlns:transaction="http://jboss.com/products/seam/transaction" #####
- Alter the `jndi-pattern` to `java:comp/env/seamgen_example/#{ejbName}`

```
resources/WEB-INF/web.xml
```

As with the `jee5/booking` example, we need to add EJB references to `web.xml`. Technically, the reference type is not required, but we add it here for good measure. Note that these references require the presence of an empty `local-home` element to retain compatibility with a JBoss AS 4.x deployment.

```
<ejb-local-ref>
  <ejb-ref-name>seamgen_example/AuthenticatorAction</ejb-ref-name>
  <ejb-ref-type>Session</ejb-ref-type>
  <local-home/>
  <local>org.jboss.seam.tutorial.glassfish.action.Authenticator</local>
</ejb-local-ref>

<ejb-local-ref>
  <ejb-ref-name>seamgen_example/EjbSynchronizations</ejb-ref-name>
  <ejb-ref-type>Session</ejb-ref-type>
  <local-home/>
  <local>org.jboss.seam.transaction.LocalEjbSynchronizations</local>
</ejb-local-ref>
```

Keep in mind that if you are deploying to JBoss AS 4.x, and have defined the EJB references shown above in your web.xml, you will need to also define local JNDI names for each of them in jboss-web.xml, as shown below. This step is not required when deploying to GlassFish, but it's mentioned here in case you are also deploying the application to JBoss AS 4.x (not required for JBoss AS 5).

```
<ejb-local-ref>
  <ejb-ref-name>seamgen_example/AuthenticatorAction</ejb-ref-name>
  <local-jndi-name>AuthenticatorAction</local-jndi-name>
</ejb-local-ref>

<ejb-local-ref>
  <ejb-ref-name>seamgen_example/EjbSynchronizations</ejb-ref-name>
  <local-jndi-name>EjbSynchronizations</local-jndi-name>
</ejb-local-ref>
```

#### 41.4.2.2. AuthenticatorAction EJB ###

### Authenticator Seam POJO #####EJB3 #####

- ##### AuthenticatorAction #####
  - @Stateless ##### AuthenticatorAction #####
  - AuthenticatorAction ##### Authenticator ##### (EJB3 ##### Bean #####)##### @Local #####AuthenticatorAction # authenticate #####

```
@Name("authenticator")
@Stateless
public class AuthenticatorAction implements Authenticator {
```

```
@Local
public interface Authenticator {

    public boolean authenticate();
}
```

2. ### web.xml ##### EJB #####



**41.4.2.3. build.xml ## jar #####**

#####jee5/booking #####

- ##### archive ##### (GlassFish #####)#

```
<project name="seamgen_example" default="archive" basedir=".">
```

- We need to get the `GlassfishDerbyDialect.class` into our application jar. To do that find the jar task and add the `GlassfishDerbyDialect.class` line as shown below:

```
<target name="jar" depends="compile,copyclasses" description="Build the distribution .jar file">
  <copy todir="${jar.dir}">
    <fileset dir="${basedir}/resources">
      <include name="seam.properties" />
      <include name="*.drl" />
      <include name="GlassfishDerbyDialect.class" />
    </fileset>
  </copy>
  ...
```

- Now we need to get extra jars into the ear file. Look for the `<copy todir="${ear.dir}/lib" >` section of the ear target. Add the following to the child `<fileset dir="${lib.dir}" >` element.
- Hibernate #####

```
<!-- Hibernate and deps -->
<include name="hibernate.jar"/>
<include name="hibernate-commons-annotations.jar"/>
<include name="hibernate-annotations.jar"/>
<include name="hibernate-entitymanager.jar"/>
<include name="hibernate-validator.jar"/>
<include name="jboss-common-core.jar"/>
```

- #####

```
<!-- 3rd party and supporting jars -->
<include name="javassist.jar"/>
<include name="dom4j.jar"/>
<include name="concurrent.jar" />
```

## #41# GlassFish #####...

```
<include name="cglib.jar"/>
<include name="asm.jar"/>
<include name="antlr.jar" />
<include name="commons-logging.jar" />
<include name="commons-collections.jar" />
```

#####

```
<fileset dir="{lib.dir}">
  <includesfile name="deployed-jars-ear.list" />

  <!-- Hibernate and deps -->
  <include name="hibernate.jar"/>
  <include name="hibernate-commons-annotations.jar"/>
  <include name="hibernate-annotations.jar"/>
  <include name="hibernate-entitymanager.jar"/>
  <include name="hibernate-validator.jar"/>
  <include name="jboss-common-core.jar" />

  <!-- 3rd party and supporting jars -->
  <include name="javassist.jar" />
  <include name="dom4j.jar" />
  <include name="concurrent.jar" />
  <include name="cglib.jar" />
  <include name="asm.jar" />
  <include name="antlr.jar" />
  <include name="commons-logging.jar" />
  <include name="commons-collections.jar" />
</fileset>
```

### 41.4.2.4. seam-gen ##### GlassFish #####

- #####(### /projects/seamgen-example)# ant  
##### dist/seamgen-example.ear ###
- ##### #41.2.2. #GlassFish ##### ##### jboss-  
seam-jee5 ##### seamgen-example #####
- http://localhost:8081/seamgen\_example/ #####

###

## 42.1. JDK ####

Seam does not work with JDK 1.4 and requires JDK 5 or above as it uses annotations and other JDK 5.0 features. Seam has been thoroughly tested using Sun's JDKs. However there are no known issues specific to Seam with other JDKs.

### 42.1.1. Sun # JDK 6 #####

```
Sun # JDK 6 ##### JAXB ##### "endorsed" #####
Sun # JDK 6 Update 4 ##### JAXB 2.1 #####
#####
```

```
Seam ##### JBoss Embedded ##### JDK 6
##### JBoss Embedded # JDK 6 ##### ## JVM
#####
```

```
-Dsun.lang.ClassLoader.allowArraySyntax=true
```

```
Seam ##### Seam ##### ## ## JBoss
Embedded #####
```

## 42.2. #####

This section both lists the compile-time and runtime dependencies for Seam. Where the type is listed as `ear`, the library should be included in the `/lib` directory of your application's ear file. Where the type is listed as `war`, the library should be placed in the `/WEB-INF/lib` directory of your application's war file. The scope of the dependency is either `all`, `runtime` or `provided` (by JBoss AS 4.2 or 5.0).

```
##### /dependency-report.txt ##### ##
/build ##### Maven POM ##### ant dependencyReport #####
```

### 42.2.1. Core

#### # 42.1.

##	##	###	##
jboss-seam.jar	all	ear	### Seam #####
jboss-seam-debug.jar	runtime	war	Seam #####
jboss-seam-ioc.jar	runtime	war	Spring # Seam #####

#42# ###

##	##	###	##
jboss-seam-pdf.jar	runtime	war	Seam # PDF #####
jboss-seam-excel.jar	runtime	war	Seam # Microsoft® Excel® #####
jboss-seam-rss.jar	runtime	war	Seam # RSS #####
jboss-seam-remoting.jar	runtime	war	Seam Remoting #####
jboss-seam-ui.jar	runtime	war	Seam JSF #####
jsf-api.jar	provided		JSF API
jsf-impl.jar	provided		JSF #####
jsf-facelets.jar	runtime	war	Facelets ###
urlrewrite.jar	runtime	war	URL Rewrite #####
quartz.jar	runtime	ear	Seam ##### Quartz #####

### 42.2.2. RichFaces

#### # 42.2. RichFaces #####

##	##	###	##
richfaces-api.jar	all	ear	<del>RichFaces</del> API #####
richfaces-impl.jar	runtime	war	RichFaces #####
richfaces-ui.jar	runtime	war	RichFaces ##### all # UI #####

### 42.2.3. Seam Mail

#### # 42.3. Seam Mail #####

##	##	###	##
activation.jar	runtime	ear	#####
mail.jar	runtime	ear	#####
mail-ra.jar	compile		#####  mail-ra.rar #####

##	##	###	##
jboss-seam-mail.jar	runtime	war	Seam Mail #####

## 42.2.4. Seam PDF

### # 42.4. Seam PDF ####

##	###	##	##
itext.jar	runtime	war	PDF #####
jfreechart.jar	runtime	war	#####
jcommon.jar	runtime	war	JFreeChart #####
jboss-seam-pdf.jar	runtime	war	Seam PDF #####

## 42.2.5. Seam Microsoft® Excel®

### # 42.5. Seam Microsoft® Excel® ####

##	###	##	##
jxl.jar	runtime	war	JExcelAPI #####
jboss-seam-excel.jar	runtime	war	Seam Microsoft® Excel® #####

## 42.2.6. Seam RSS ####

### # 42.6. Seam RSS ####

##	###	##	##
yarfraw.jar	runtime	war	YARFRAW RSS #####
JAXB	runtime	war	JAXB XML #####
http-client.jar	runtime	war	Apache HTTP Client #####
commons-io	runtime	war	Apache commons IO #####
commons-lang	runtime	war	Apache commons #####
commons-codec	runtime	war	Apache commons codec #####
commons-collections	runtime	war	Apache commons collections #####
jboss-seam-rss.jar	runtime	war	Seam RSS #####

## 42.2.7. JBoss Rules

JBoss Rules ##### Seam # drools/lib #####

### # 42.7. JBoss Rules #####

##	##	###	##
antlr-runtime.jar	runtime	ear	ANTLR #####
core.jar	runtime	ear	Eclipse JDT #####
drools-api.jar	runtime	ear	
drools-compiler.jar	runtime	ear	
drools-core.jar	runtime	ear	
drools-decisiontables.jar	runtime	ear	
drools-templates.jar	runtime	ear	
janino.jar	runtime	ear	
mvel2.jar	runtime	ear	

### 42.2.8. JBPM

#### # 42.8. JBPM #####

##	##	###	##
jbpm-jpdl.jar	runtime	ear	

### 42.2.9. GWT

##### Seam ##### Google Web Toolkit (GWT) #####

#### # 42.9. GWT #####

##	##	###	##
gwt-servlet.jar	runtime	war	GWT Servlet #####

### 42.2.10. Spring

##### Seam ##### Spring Framework #####

#### # 42.10. Spring Framework #####

##	##	###	##
spring.jar	runtime	ear	Spring Framework #####

### 42.2.11. Groovy

##### Seam ##### Groovy #####

**# 42.11. Groovy ####**

##	##	###	##
groovy-all.jar	runtime	ear	Groovy #####

**42.3. Maven #####**

Maven ##### Seam ##### Maven Ant Tasks  
#### Maven # Ant ##### Maven #####

#### Maven ##### POM #####

Released versions of Seam are available in <http://repository.jboss.org/maven2> [http://repository.jboss.org/maven2] and nightly snapshots are available in <http://snapshots.jboss.org/maven2> [http://snapshots.jboss.org/maven2].

Seam ##### Maven #####

```
<dependency>
  <groupId>
>org.jboss.seam</groupId>
  <artifactId>
>jboss-seam</artifactId>
</dependency>
>
```

```
<dependency>
  <groupId>
>org.jboss.seam</groupId>
  <artifactId>
>jboss-seam-ui</artifactId>
</dependency>
>
```

```
<dependency>
  <groupId>
>org.jboss.seam</groupId>
  <artifactId>
>jboss-seam-pdf</artifactId>
</dependency>
>
```

```
<dependency>
  <groupId>
>org.jboss.seam</groupId>
  <artifactId>
>jboss-seam-remoting</artifactId>
</dependency>
>
```

```
<dependency>
  <groupId>
>org.jboss.seam</groupId>
  <artifactId>
>jboss-seam-ioc</artifactId>
</dependency>
>
```

```
<dependency>
  <groupId>
>org.jboss.seam</groupId>
  <artifactId>
>jboss-seam-ioc</artifactId>
</dependency>
>
```

This sample POM will give you Seam, JPA (provided by Hibernate), Hibernate Validator and Hibernate Search:

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/maven-
v4_0_0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>org.jboss.seam.example</groupId>
  <artifactId>my-project</artifactId>
  <version>1.0</version>
  <name>My Seam Project</name>
  <packaging>jar</packaging>
  <repositories>
```



```
<repository>
  <id>repository.jboss.org</id>
  <name>JBoss Repository</name>
  <url>http://repository.jboss.org/maven2</url>
</repository>
</repositories>

<dependencies>

  <dependency>
    <groupId>org.hibernate</groupId>
    <artifactId>hibernate-validator</artifactId>
    <version>3.1.0.GA</version>
  </dependency>

  <dependency>
    <groupId>org.hibernate</groupId>
    <artifactId>hibernate-annotations</artifactId>
    <version>3.4.0.GA</version>
  </dependency>

  <dependency>
    <groupId>org.hibernate</groupId>
    <artifactId>hibernate-entitymanager</artifactId>
    <version>3.4.0.GA</version>
  </dependency>

  <dependency>
    <groupId>org.hibernate</groupId>
    <artifactId>hibernate-search</artifactId>
    <version>3.1.1.GA</version>
  </dependency>

  <dependency>
    <groupId>org.jboss.seam</groupId>
    <artifactId>jboss-seam</artifactId>
    <version>2.2.0.GA</version>
  </dependency>

</dependencies>

</project>
```

