

**Web Beans: Java Contexts
and Dependency Injection**

**The new standard
for dependency
injection and contextual
state management**

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Note

JSR-299 has recently changed its name from "Web Beans" to "Java Contexts and Dependency Injection". The reference guide still refers to JSR-299 as "Web Beans" and the JSR-299 Reference Implementation as the "Web Beans RI". Other documentation, blogs, forum posts etc. may use the new nomenclature, including the new name for the JSR-299 Reference Implementation - "Web Beans".

I. ì»`í##ì#αί#, ê°#ì²' ì#¬ì#©

Web Beans (JSR-299) #### ##### ## ## ##### ## Java EE #### ## #### #####. Web Beans#
JavaBeans # Enterprise Java Bean# ##### Java ## ## #### ## ## # ## ## #####.
Java EE ##### ## ## ####, Web Beans# #### ## #####:

- ##### ## ##### ## ## ## ## ## ##
- #### ## (dependency injection)#### ## #### (typesafe) ##
- #### ## #### ## #####
- ##### (decorator) ## #### #### ##### ## ##### ##### ## #### #####, ##### ## #### ##
##

API #####:

- #### #### ## #### #####?
- #### ## ##### ## #### ## # #####?
- ## #####?
- #### ## # #####?
- ## ##### ##### ##?
- ## ##### ## ## ## #### ##### ##?
- #### ## ## #### #####, #### #### ## #### ## # # #####?
- #### ## ## ## ##### ##### ##### # #####?

Web Bean# ##### ## Web Beans# ## # #### ## #####. ## ##### ## Web Bean ##### ## ####
##, ##### ## ##, #### ## #### #####. # #### ##### Web Bean# #### ##, ## ##, #### ## ####
#####.

####, ##### # ##### #### #### ##### ##### (loose-coupling) ####:

- #### #### ##### #### #####
- ##### ##### ##### #### #####
- ##### ##### #### #####.

Web Beans# #### ## #### ## #### (typesafe) #####. Web Beans# #### ##### ##
#####. XML# ##### ##### ## #####. ## Web Beans#

(binding annotations)### ### ## Java ## ##### ## ## ## ## ## ## ## ## Web Beans
Web Beans# ###, ####, ##### # ### ##### ## #####.

Web Beans ##### Java EE ### ## ## ## ## ## ## ## ## ##:

- ## JavaBeans
- ## EJB
- ## Servlets

Web Beans# ## ### ##### ## Java EE ##### ## ### ##### ## ### ## ## ## ## ## Web Beans#
Web Beans ##### ### ## ## ## Web Bean# ## #####.

Web Beans# Seam, Guice, Spring# ##### ## ## Java ##### ## ### ##### Web Beans# #####
#####: Seam ## # ## ##, ## # ## ##, Spring ## # XML-##, Guice ## #
#####-##### ##

Web Beans# Java EE # ## ## EJB Lite# #### # ## Java SE ### ## JCP #####.

Web Beans#

```
# ## Web Bean ### ## #####? ## ## ## Web Beans ### ## ##### # ## ## ## ##### ## # #
#####! # ## ## ## ##### ## ##### ## ##### Web Beans# ## ## # ##### ##### #####. ## ##### #####
##### Web Beans# ##### ## ## # # #####.
```

1.1. # ## Web Bean

```
### ## ##### ## #### ## ## ##### ##### ##### ## Java ##### Web Bean## #### ## JavaBean# #####.
## #### ## EJB 3-### ## ## Web Bean####. ## ## ##### JavaBeans # EJB# Web Beans #### ##
#### ## ##### ##### ## # ####, Web Beans#### ## #### ##### ## # ## ## ##### # ##### # ## ## Web
Beans## ##, Web Beans XML ## #### ## ##, ##### # ##### ## ##
```

```
#### ##### ##### # # ## Java ##### ## ### #####. # ## ##### ##### ## ##### ## #####:
```

```
public class SentenceParser {
    public List<String>
    > parse(String text) { ... }
}
```

```
# ## ##### #### ##### ## #### ##### # ## ## ##### ## #### ## # #####:
```

```
@Stateless
public class SentenceTranslator implements Translator {
    public String translate(String sentence) { ... }
}
```

```
### Translator# ## #####:
```

```
@Local
public interface Translator {
    public String translate(String sentence);
}
```

```
##### ## ### #### ##### ## ##### #####, ### ### ##### Web Bean# #####:
```

```
public class TextTranslator {  
  
    private SentenceParser sentenceParser;
```


1.2. Web Bean# #####?

Web Bean# #####?

Web Bean# ##### ## ## ##### #####. Web Bean# Java ##### ## ##### ## Unified EL#
#####. Web Bean# ##### ##### ## # #####. Web Beans ##### ##### Web Bean #####
#####. ##### Web Beans# ## ## (stateful) # ##### #####. Web Bean ## ## ## Web
Bean ##### ## #####.

##. "#####"#### ## ## #####? Web Beans# ## ## ## ##, ##### ## #
#####. ## ## ## ## ## (#: ## ## #) ## singleton ##### ## (#: ervlets ## singleton #)##
Web Bean# ## ##### ## ## ## Web Bean# ## ##. #####-#### ## ##### ##### ## Web
Bean# ##### ##### #####.

####, ## ## ## ## ## ## ## ## ## ## ## ##, ##### ##### ## ## ##### ## ## ## ## ## ## ##.
##, Web Bean# ## ## ## ## #####:

- #### Web Bean ##### ## ##
- ## ##### ## Web Bean ##### ## ## ##

Web Beans ##### ## ## ## ## ##, Web Bean ## ## ## ## ## ## ## ## ##. ## ##### #####
(#: ## ## ##) ## ## ## ## ## ## ## ## (#: Web Bean# ## ## ##) ## ## ## ## ## ##
(Web Bean# ##### ## ##).

(#: ## ## Web Bean)# #### Web Bean# ##### ## ##. ## ## #####
##.

Web Beans# ##### ##### ## #####! ##### ##### Web Bean# ## ##
##. Web Beans# ##### ##### ##### Web Bean ## ## ##
##. Web Beans# ## ## ## ## ## ## ## ## ##:

- # ## ## API# ## ## #####
- ## ## ## ## ## ## ##

Web Bean# ## API# ##### ## Web Bean ## ## ## ## ## ## ## ## ## (# ##)## ## ## Web
Bean## ## # #####. ##, 4.2#. "## ## "## ##### # ## Web Beans# ## Web Bean ## ## #####
##.

Web Bean ##### Web Beans# # # ## #####. Servlets ## Message-Driven Beans# ## # ##
Web Beans# ## ## ## ## ##.

spec# ##:

Web Bean# ## ## ## ## ## ##:

1#. Web Beans#

- (## ## ##) API ## ##
- (## ## ##) #### ##### ## ##
- ##
- ## ##
- Web Bean ## (## ##)
- ##### ## ## ##
- Web Bean ##

Web Bean ##### ## ## ##.

1.2.1. API ##, #### ## # ####

Web Beans# #### ## ## Web Beans# #### #####. #### ## ## Web Bean# ##### "##"##
#####. ##### ## ## ##.

- API ##
- #### ## ##

API# #### ## #### ## #####. (Web Bean# EJB ## ## ##, API #### @Local ##### ## bean-
class ## #####.) #### #####-#### ##### #### API# ## #### ## #####.

@BindingType## ##### ## ## ##### ## #####. ## ##, #### ## ## ##
PaymentProcessor API ## # @CreditCard #### ## ##:

```
@CreditCard PaymentProcessor paymentProcessor
```

##, #### ## ##@Current# #####.

##, Web Bean ##### ## ## ## (API# ##### ## ## ## ##) Web Bean# ##### ## #####.

Web Bean# @CreditCard #### ## ## PaymentProcessor API #### #####. #### ## ## ##
##:

```
@CreditCard  
public class CreditCardPaymentProcessor  
    implements PaymentProcessor { ... }
```

Web Bean# #### ## ## ## ##### ## ##, ## ## ## ## ## @Current## #### ## ## ##.

Web Beans# ##### #### # ## ##### ##### ## ## # ## ##### ## ## Web Bean# ## ## ##### ##
#####. ## ## ## 4#. ### ## ## #####.

1.2.2. ##

```
## ### ## ##### ## Web Beans# ##### ##. ## ### ## ## ##### ##### ## ## @Mock,
@Staging,@AustralianTaxLaw# #####. ##### # Web Beans# ##### #####. ## ### ##
##### ##### ## Web Beans ### ## ## ## ##.
```

```
### Web Beans# ##### ## ## @Production# #####, ### ## ## ### ##### ## ## ##. ### ##
Web Bean ### @Production ## ### #####.
```

```
### ####, SentenceTranslator Web Bean# "## ##"### ####:

```

```
@Mock
public class MockSentenceTranslator implements Translator {
    public String translate(String sentence) {
        return "Lorem ipsum dolor sit amet";
    }
}
```

```
MockSentenceTranslator # ## ## Web Bean ##### @Mock# ##### ## ##### ## ##### @Mock
## ## ## ## # #####.
```

4.2#. “## ##”## #### ##### ### #### ## #### ## #####.

1.2.3.

Web Bean# ## ### #####. Web Beans ##### ## ####, ### #####. ###, ## ## ### ##### ##, Web Bean #####. ### ##### ## ## #####.

```
## ##, # ##### ## ## Web Beans# ## # #####:
```

```
@SessionScoped
public class ShoppingCart { ... }
```

```
## ## Web Bean# ##### ## ##### ## ##### ## ##### ## ##### ## #####.
```

```
#####, Web Beans# dependent pseudo-scope## ## ### #####. ### ### ## Web Beans# #####
### ### ### ##### ##### ### ##### #####.
```

5#. ## # ##### ## ### ## ## ##### #####.

1.2.4. Web Bean ## # Unified EL

Web Bean# ### # # ###, Unified EL ##### # # ###. Web Bean# ### ##### # # #####:

1#. Web Beans#

```
@SessionScoped @Named("cart")
public class ShoppingCart { ... }
```

JSF ## JSP ##### ## Web Bean# ### # #####:

```
<h:dataTable value="#{cart.lineItems}" var="item">
    ....
</h:dataTable
>
```

Web Bean ##### ## ##### ## ## ## ## #####:

```
@SessionScoped @Named
public class ShoppingCart { ... }
```

##, ## ##### shoppingCart# ### # ### ## ##### # ##### ##### ## ##.

1.2.5. ##### ##

Web Beans# EJB beans # # ### ## Java ##### ## EJB 3# ## ## ## ##### ## #####. ## ##, Web Beans# ## ## ##, EJB beans # ## ## Web Beans# ## ## ## ## #####.

@Interceptors ##### ## ## ## ## ## ## ## ## ## ##:

```
@SessionScoped
@Interceptors(TransactionInterceptor.class)
public class ShoppingCart { ... }
```

###, ##### ## ## ## ## ## ## ## ## ## ## ## ## ## ## ##:

```
@SessionScoped @Transactional
public class ShoppingCart { ... }
```

7#. ##### # 8#. ##### ## Web Beans ##### # ##### ## #####.

1.3. ## ## ## Web Beans# # # #####?

JavaBeans, EJB # ## ## Java ##### Web Beans# # # ## #####. ##, ## ## ## ## Web Beans###?

1.3.1. ## Web Beans

Web Beans ### ## ## ## ## Java ##### ## Web Bean### #####:

- EJB, Servlet ## JPA ##### ## EE ##### ## ## ##### ## ##,
- #-### ## ##### ## ##,
- ## ##### ## ## ##,
- ## ## ## ##### ## @Initializer ##### ##### ## ##,

###, ## ## JavaBean# ## Web Bean# ###.

Web Bean# ## ## ## ##### ## ## ##### API ## ## Web Bean###. ## # ##### API
##.

1.3.2. ##### Web Beans

EJB 3 ## ## # singleton beans# EJB 3 ##### Web Beans## #####. Message driven
beans# Web Beans# ##### # ## ## ##### ## ## # ## ## ## ## # ##### ## ## ## Web
Beans ### ## ## # #####.

Web Bean# ## ## ##### # ## ##### ## ## ## Web
Bean# API #####. EJB bean# bean ##### ## ## ## ## bean ##### # ## ## ## ## API #####.

@Destructor# ##### ## ## ## ## ##. Web Bean ##### ## ## ##
##. ## ## ## ## ## Web Bean# ## ## ## ##.

```
@Stateful @SessionScoped
public class ShoppingCart {

    ...

    @Remove
    public void destroy() {}

}
```

Web Bean ## ##### Web Bean# ##### ##? ## ## EJB# ## ##### ## ##### ## ##
##.

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

- ##### Web Bean# ##### ###. ### ## ## ##### ## ##, ## Web Bean# # ### #####.

```
Web Beans# ### ##### ### ##### ### EJB @Stateless/@Stateful/@Singleton ### ## ### ##
##### ## ##### ### #### ## #### #### # ##### ## ### ## ##### ### ##.
```

```
## Web Bean## ####, @Stateless, @Stateful, @Singleton ##### #### EJB# #####.
```

```
#### ## # ##### ##### ## # Web Bean# ##### ##### ## Web Bean ##### ## ##### #####.
#### ## ##### Web Bean ##### ##### ## ## ##### ##### ##### ## ## ##### ##. #:
```

```
#### ## #### ## ## Web Bean# ## #####.
```

```
### ## # ##### ##### ##/##### ## ##### API ### ## ## ##. ## ## ## ## ## ##### API
### ##.
```

```
@Produces @RequestScoped Connection connect(User user) {
```

```
return createConnection( user.getId(), user.getPassword() );
}
```

####:

```
void close(@Disposes Connection connection) {
    connection.close();
}
```

```
### ## ### ## ##### Web Bean ##### ## ##### #####.
```

6#. ### ## ### ### ## ## #####.

1.3.4. JMS

JMS # ## ### Web Bean# # # #####. Web Beans# # # ### ##### ## ### ## ### JMS
#####. 13.4#. "JMS ##### "## JMS ##### ### ##.

JSF # #####

#####. JSF# ##### ##### #####. ##, ##### ### ##
Web Bean# #####:

```
@Named @RequestScoped
public class Credentials {

    private String username;
    private String password;

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

    public String getPassword() { return password; }
    public void setPassword(String password) { this.password = password; }

}
```

Web Bean# #### ## JSF ##### #####:

```
<h:form>
  <h:panelGrid columns="2" rendered="#{!login.loggedIn}">
    <h:outputLabel for="username"
  >Username:</h:outputLabel>
    <h:inputText id="username" value="#{credentials.username}"/>
    <h:outputLabel for="password"
  >Password:</h:outputLabel>
    <h:inputText id="password" value="#{credentials.password}"/>
  </h:panelGrid>
  <h:commandButton value="Login" action="#{login.login}" rendered="#{!login.loggedIn}"/>
  <h:commandButton value="Logout" action="#{login.logout}" rendered="#{login.loggedIn}"/>
</h:form>
>
```

Web Bean ## #### ## #### ##### ## Web Beans# User #####:

```
@SessionScoped @Named
public class Login {
```

```
@Current Credentials credentials;
@PersistenceContext EntityManager userDatabase;

private User user;

public void login() {

    List<User
> results = userDatabase.createQuery(
    "select u from User u where u.username=:username and u.password=:password")
    .setParameter("username", credentials.getUsername())
    .setParameter("password", credentials.getPassword())
    .getResultList();

    if ( !results.isEmpty() ) {
        user = results.get(0);
    }

}

public void logout() {
    user = null;
}

public boolean isLoggedIn() {
    return user!=null;
}

@Produces @LoggedIn User getCurrentUser() {
    return user;
}

}
```

@LoggedIn# ### #####:

```
@Retention(RUNTIME)
@Target({TYPE, METHOD, FIELD})
@BindingType
public @interface LoggedIn {}
```

Web Bean# ## ##### ## ### # #####:

```
public class DocumentEditor {

    @Current Document document;
    @LoggedIn User currentUser;
    @PersistenceContext EntityManager docDatabase;

    public void save() {
        document.setCreatedBy(currentUser);
        docDatabase.persist(document);
    }

}
```

```
### ## Web Bean ##### ### ## ## ### ##### ###. ## ##### Web Beans ### ### ## ### #####.
```

3#. Web Beans ##

##, Ant 1.7.0# ##### ANT_HOME ## ## ## ##. #:

```
$ unzip apache-ant-1.7.0.zip
$ export ANT_HOME=~/.apache-ant-1.7.0
```

##. ##### ##### Maven# ##### Web Beans # EJB3# ##### #####.

```
$ cd webbeans-$VERSION/jboss-as
$ ant update
```

##, ### ## ## ## #####!



##

#####. ### ## ## ## ##:

- ant restart - exploded ##### ## #####
- ant explode - ## ## ## ## exploded ## #####
- ant deploy - ### jar ##### ## #####
- ant undeploy - ##### ## #####
- ant clean - ## ##

numberguess ### #####:

```
$ cd examples/numberguess
ant deploy
```

Start JBoss AS:

```
$ /Application/jboss-5.0.0.GA/bin/run.sh
```



##

If you use Windows, use the run.bat script.

<http://localhost:8080/webbeans-numberguess>#####

Web Beans RI#####. numberguess war beans#####;
ear ##### beans# EJB #####. ## ##:

```
$ cd examples/translator
ant deploy
```

<http://localhost:8080/webbeans-translator>#####

3.1. numberguess

numberguess ##### 1## 100### ## ## 10 ## ##. ## # ## ## ##
##.

numberguess ## Web Beans, ##, Facelet JSF #####, war# ##### ## ##
#####.

WEB-INF/# ##, ## ## WebContent# #####. ##, faces-
config.xml# #####, Facelets# JSF# ##:

```
<?xml version='1.0' encoding='UTF-8'?>
<faces-config version="1.2"
  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">

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

</faces-config
>
```

web-beans.xml ##, ## Web Beans #####.

#####, web.xml ##:

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

<web-app version="2.5"
```

```
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">

<display-name
>Web Beans Numbergues example</display-name>

<!-- JSF -->

<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
>*.jsf</url-pattern>
</servlet-mapping>

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

  <param-value
>.xhtml</param-value>
</context-param>

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

</web-app
>
```

- ① Enable and load the JSF servlet
- ② Configure requests to .jsf pages to be handled by JSF
- ③ Tell JSF that we will be giving our source files (facelets) an extension of .jsf
- ④ Configure a session timeout of 10 minutes



##

Whilst this demo is a JSF demo, you can use the Web Beans RI with any Servlet based web framework.

Let's take a look at the Facelet view:

```
<!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: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">

  <ui:composition template="template.xhtml">                                ①
    <ui:define name="content">
      <h1
>Guess a number...</h1>

      <h:form id="NumberGuessMain">                                     ②
        <div style="color: red">
          <h:messages id="messages" globalOnly="false"/>
          <h:outputText id="Higher" value="Higher!" rendered="#{game.number gt game.guess
and game.guess ne 0}"/>
          <h:outputText id="Lower" value="Lower!" rendered="#{game.number lt game.guess and
game.guess ne 0}"/>
        </div>

        <div>                                                            ③
          I'm thinking of a number between #{game.smallest} and #{game.biggest}.
          You have #{game.remainingGuesses} guesses.
        </div>

        <div>                                                            ④
          Your guess:
```

```
<h:inputText id="inputGuess"
    value="#{game.guess}"
    required="true"
    size="3"

    disabled="#{game.number eq game.guess}"
    <f:validateLongRange maximum="#{game.biggest}"
        minimum="#{game.smallest}"/>

</h:inputText>
<h:commandButton id="GuessButton"
    value="Guess"
    action="#{game.check}"
    disabled="#{game.number eq game.guess}"/>
</div>
<div>
    <h:commandButton id="RestartButton" value="Reset" action="#{game.reset}"
immediate="true" />
</div>
</h:form>
</ui:define>
</ui:composition>
</html>
>
```

- ① Facelets is a templating language for JSF, here we are wrapping our page in a template which defines the header.
- ② There are a number of messages which can be sent to the user, "Higher!", "Lower!" and "Correct!"
- ③ As the user guesses, the range of numbers they can guess gets smaller - this sentence changes to make sure they know what range to guess in.
- ④ This input field is bound to a Web Bean, using the value expression.
- ⑤ A range validator is used to make sure the user doesn't accidentally input a number outside of the range in which they can guess - if the validator wasn't here, the user might use up a guess on an out of range number.
- ⑥ And, of course, there must be a way for the user to send their guess to the server. Here we bind to an action method on the Web Bean.

4 ## ##### #####, # ## # ## #### #####. ##, ### #### ##### ## ##### @Random #### #### #####:

```
@Target( { TYPE, METHOD, PARAMETER, FIELD })
@Retention(RUNTIME)
@Documented
@BindingType
```

```
public @interface Random {}
```

```
### # ## ## ## ##### ## ##### @MaxNumber ### ### #####:
```

```
@Target( { TYPE, METHOD, PARAMETER, FIELD })
```

```
@Retention(RUNTIME)
```

@Documented

```
@BindingType
```

```
public @interface MaxNumber {}
```

Generator ##### ### ## ### ## ### ## # ### #####. ## ## ### ### ### ## ## ## ## ## ##:

@ApplicationScoped

```
public class Generator {
```

```
private java.util.Random random = new java.util.Random( System.currentTimeMillis() );
```

```
private int maxNumber = 100;
```

```
java.util.Random getRandom()
```

```
{
    return random;
}
```

```
@Produces @Random int next() {  
    return getRandom().nextInt(maxNumber);  
}
```

```
@Produces @MaxNumber int getMaxNumber()
{
    return maxNumber;
}
```

```
Generator# ##### ## ## #### #; ### ## ## ## ## ## ##.
```

```
##### ## ### Web Bean# Game ## #####.
```

```
@Named ##### JSF ##### EL# ## bean# ### # ### #####. ##### ## ## ## ##
#####. ##, ## ##### ## ##### ##### ##### ##, FacesMessage# #####.
```

```
package org.jboss.webbeans.examples.numberguess;
```

```
import javax.annotation.PostConstruct;  
import javax.faces.application.FacesMessage;  
import javax.faces.context.FacesContext;  
import javax.webbeans.AnnotationLiteral;  
import javax.webbeans.Current;  
import javax.webbeans.Initializer;  
import javax.webbeans.Named;  
import javax.webbeans.SessionScoped;  
import javax.webbeans.manager.Manager;
```

```
@Named
```

```
@SessionScoped
```

```
public class Game
```

```
{
```

```
    private int number;
```

```
    private int guess;
```

```
    private int smallest;
```

```
    private int biggest;
```

```
    private int remainingGuesses;
```

```
    @Current Manager manager;
```

```
    public Game()
```

```
    {
```

```
    }
```

```
    @Initializer
```

```
    Game(@MaxNumber int maxNumber)
```

```
    {
```

```
        this.biggest = maxNumber;
```

```
    }
```

```
    public int getNumber()
```

```
    {
```

```
        return number;
```

```
    }
```

```
    public int getGuess()
```

```
    {
```



```
    return guess;
}

public void setGuess(int guess)
{
    this.guess = guess;
}

public int getSmallest()
{
    return smallest;
}

public int getBiggest()
{
    return biggest;
}

public int getRemainingGuesses()
{
    return remainingGuesses;
}

public String check()
{
    if (guess
>number)
    {
        biggest = guess - 1;
    }
    if (guess<number)
    {
        smallest = guess + 1;
    }
    if (guess == number)
    {
        FacesContext.getCurrentInstance().addMessage(null, new FacesMessage("Correct!"));
    }
    remainingGuesses--;
    return null;
}

@PostConstruct
public void reset()
```


>

url (<http://localhost:8080/webbeans-translator>)# ##### ## ## ## ##.



##

Maven# ##### ## ## ## ##, META-INF/application.xml# #####:

```
<?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>
>webbeans-translator-ear</display-name>
    <description>
>Ear Example for the reference implementation of JSR 299: Web Beans</
description>

    <module>
        <web>
            <web-uri>
>webbeans-translator.war</web-uri>
            <context-root>
>/webbeans-translator</context-root>
        </web>
    </module>
    <module>
        <ejb>
>webbeans-translator.jar</ejb>
        </module>
    </application>
>
```

####, war# #####. numberguess ### ##, WebContent/WEB-INF# ## faces-config.xml
(Facelets# ####) # web.xml (JSF# ####)# #####.

facet# #####. numberguess ##### ## ##### ##### (##### ## ## ##### ##):

```
<h:form id="NumberGuessMain">
```

```
<table>
  <tr align="center" style="font-weight: bold" >
    <td>
      Your text
    </td>
    <td>
      Translation
    </td>
  </tr>
  <tr>
    <td>
      <h:inputTextarea id="text" value="#{translator.text}" required="true" rows="5" cols="80" />
    </td>
    <td>
      <h:outputText value="#{translator.translatedText}" />
    </td>
  </tr>
</table>
<div>
  <h:commandButton id="button" value="Translate" action="#{translator.translate}" />
</div>

</h:form
>
```

###, ##### ### #### ##### ## ### ##### ##.

#####, ejb ### webbeans-translator-ejb# #####. src/main/resources/META-INF## Web Beans# ## ## ### ##### ##### ## ##### # web-beans.xml# #####.

#####! ##### # ## ## beans# SentenceParser # TextTranslator#
beans# TranslatorControllerBean # SentenceTranslator# #####. ## Web Bean#
##, ## ### ### #####.

SentenceParser # TextTranslator# beans# #####, TextTranslator# ### ##### #####:

```
public class TextTranslator {
  private SentenceParser sentenceParser;
  private Translator sentenceTranslator;

  @Initializer
  TextTranslator(SentenceParser sentenceParser, Translator sentenceTranslator)
  {
```

```

this.sentenceParser = sentenceParser;
this.sentenceTranslator = sentenceTranslator;

```

```

TextTranslator# #### ##### (## ##### ##### ##), #### ##### ## ##, # ##### #####!

#####, UI ## ##### ##, ## ##### ## ##### ##### ## #####. ## ## ##, ##, ## ## ##### #####
##### #####.

```

```

@Stateful
@RequestScoped
@Named("translator")
public class TranslatorControllerBean implements TranslatorController
{

    @Current TextTranslator translator;

```

```

bean# ##### ## ## ## ## getter # setter# #####.

## ## ## ## #####, ## ## ## ## ##:

```

```

@Remove
public void remove()
{

}

```

```

Web Beans ##### bean# #### # ## ## ##### ##; #### ## ## ##### ##### ##.

## Web Beans RI #### ## #####. RI# ## ## ## ## http://www.seamframework.org/
WebBeans/Development## ##### #####.

## ##, #### ## ##, ## ##, ## ##### ## ## ##### ## #####.

```

##

Web Beans# #### ## # ## ## ##### #####:

##:

```
public class Checkout {  
  
    private final ShoppingCart cart;  
  
    @Initializer  
    public Checkout(ShoppingCart cart) {  
        this.cart = cart;  
    }  
  
}
```

##:

```
public class Checkout {  
  
    private ShoppingCart cart;  
  
    @Initializer  
    void setShoppingCart(ShoppingCart cart) {  
        this.cart = cart;  
    }  
  
}
```

##:

```
public class Checkout {  
  
    private @Current ShoppingCart cart;  
  
}
```

Web Bean ##### ## ##### ## #### #####.

4#. ###

- ##, Web Bean ##### Web Bean ##### Web Bean ##### #####.
- #####, Web Bean ##### Web Bean# ### ## ### ## #####.
- # #, Web Bean ##### Web Bean# ## ### ### #####.
- ##### Web Bean# @PostConstruct ### #####.

EJB# Web Bean ##### ## EJB ##### ## ##### ## ### ##### ## EJB beans# ##### #####.

@Current# ##### ## ##### ## ## # ### ##### ##### ##### ## #####. ### ##
##, ## ### ## ## ## ## ## ##### ##. ### ## ## ## ## ## ##, ##
##.

#####:

```
@Produces Checkout createCheckout(ShoppingCart cart) {  
    return new Checkout(cart);  
}
```

(9#. ### ## #####), ## ## # ### ## ## ## ## ## #####.

Web Beans ### ## ## ## ##### ## ## ##, Web Bean ##### ## ## ## ## Web
Bean# ### # ## ## ##. ### ##### ## ## ## ##, ## ## ##, ## ## #####. ##
##, ##### ## ## ## ##### Web Bean# ##### ## ##,
UnsatisfiedDependencyException ## AmbiguousDependencyException ## ##.

Web Beans# ##### ## API ### ##### ## #####:

- ## ##### ## ##### ## ## ## ## ## ##,
- ##### ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ##.
- ### API ### ##### ## ## ## ## ## ## ## ## ## API ### ##### ##.

Web Beans ##### ## Web Bean# ## ## ## ## ##.

4.1. ###

API ### ##### ## ## Web Bean# ## ##, ## ## ## ##### ## ## Web Bean# ##### # ##
#####. ## ##, PaymentProcessor# # ## ## ## # #####:

```
@PayByCheque  
public class ChequePaymentProcessor implements PaymentProcessor {  
    public void process(Payment payment) { ... }  
}
```



```
@PayByCreditCard
public class CreditCardPaymentProcessor implements PaymentProcessor {
    public void process(Payment payment) { ... }
}
```

```
### @PayByCheque # @PayByCreditCard# ### #####:
```

```
@Retention(RUNTIME)
@Target({TYPE, METHOD, FIELD, PARAMETER})
@BindingType
public @interface PayByCheque {}
```

```
@Retention(RUNTIME)
@Target({TYPE, METHOD, FIELD, PARAMETER})
@BindingType
public @interface PayByCreditCard {}
```

```
##### Web Bean ##### ### ##### ##### ### Web Bean# ##### ## ## #####.
```

```
## ## ##:
```

```
@PayByCheque PaymentProcessor chequePaymentProcessor;
@PayByCreditCard PaymentProcessor creditCardPaymentProcessor;
```

```
### ## ## ##:
```

```
@Initializer
public void setPaymentProcessors(@PayByCheque PaymentProcessor
    chequePaymentProcessor,
    @PayByCreditCard PaymentProcessor creditCardPaymentProcessor) {
    this.chequePaymentProcessor = chequePaymentProcessor;
    this.creditCardPaymentProcessor = creditCardPaymentProcessor;
}
```

```
### ## ##:
```

```
@Initializer
```

```
public Checkout(@PayByCheque PaymentProcessor chequePaymentProcessor,
    @PayByCreditCard PaymentProcessor creditCardPaymentProcessor) {
    this.chequePaymentProcessor = chequePaymentProcessor;
    this.creditCardPaymentProcessor = creditCardPaymentProcessor;
}
```

4.1.1. ### ####

##:

```
@Retention(RUNTIME)
@Target({TYPE, METHOD, FIELD, PARAMETER})
@BindingType
public @interface PayBy {
    PaymentType value();
}
```

##, ## ## #####:

```
@PayBy(CHEQUE) PaymentProcessor chequePaymentProcessor;
@PayBy(CREDIT_CARD) PaymentProcessor creditCardPaymentProcessor;
```

Web Bean ##### @NonBinding #### ##### ## ## ## ## ## ## ## ##.

4.1.2. ### #####

##:

```
@Asynchronous @PayByCheque PaymentProcessor paymentProcessor
```

##, ## #### ##### ## Web Bean# #### # ##.

4.1.3. ### ##### # ###

##:

```
@Produces
@Asynchronous @PayByCheque
PaymentProcessor createAsyncPaymentProcessor(@PayByCheque PaymentProcessor
processor) {
```

- ### ### ### ## ## ##### ## ##### ## #####
- ### ### ### ### ## ### ### ## Web Bean##

```
## Web Beans# ## ### #####. ### ## ### ##### ## ### ##### ##### ## Web Beans ### #####.

## ##, @Mock## ## ### ## # ##, ## ##### ##### ##### ## ### ## # ##### ## Web Beans# #####:
```

```
@Retention(RUNTIME)
@Target({TYPE, METHOD})
@DeploymentType
public @interface Mock {}
```

```
## ### ##### ## ### ##### ## ##### ## Web Bean# ### #####:
```

```
public class ExternalPaymentProcessor {  
  
    public void process(Payment p) {  
        ...  
    }  
}
```

```
### Web Bean# ## ### ##### #### # ## ##, ## ### ## ## @Production# ## ##.
```

```
## ## ## ##### ## #### ##### ## ## ##### ## ## #####. ### ## ### ## # #####:
```

```
@Mock
public class MockPaymentProcessor implements PaymentProcessor {
```

```
@Override
public void process(Payment p) {
    p.setSuccessful(true);
}
}
```

Web Bean ##### ## #### ## #### #### ## #### #####?

4.2.1. ## ##

```
Web Beans# # ## ### ## ### #####: @Production # @Standard. ##### ##### ##### ### ## ###
## Web Beans ## #####. web-beans.xml## ### ##### ## ##### ##### ## ## ### ### # #####.
```

```
### ## #####, ### ##### ### #, ## @Mock ### ##### ##:
```

```
<WebBeans>
  <Deploy>
    <Standard/>
    <Production/>
    <test:Mock/>
  </Deploy>
</WebBeans>
>
```

```
## Web Bean ##### @Production, @Standard, @Mock ##### ## Web Beans# ## # ##### ##.
```

```
@Standard ## ### Web Beans ### ## ### ## Web Beans#### #####. ### Web Beans## ## ###
# ### ## ##### # #####.
```

```
@Production ## ### ## ### ##### ## Web Beans# ## ### ## ##### ##### # #####.
```

4.2.2. ## ## ##

```
### #####, Web Bean #### ## ## ExternalPaymentProcessor ## MockPaymentProcessor
# # ### ## ##### ## ### ## ##. ##### ## ## ## ## # ## ## ## ## ##;
```

@Current PaymentProcessor paymentProcessor

```
PaymentProcessor ### ##### # ## Web Beans# #####. ## ##### ### ##### ### ##-##### ####,
##### ## ## ### ##### ### # ###. ##### ### ## ## ### #####!
```

```
### ### #### ## # ## # ## #####.# ## ## ## web-beans.xml# #### ##  
#####.## @Mock@Production## ## ##### ## ## ## ##
```


4#. ###

Web Bean### ## ## ## ## Web Bean# ## ##. ## ##
##. ##, ##### ## Web Bean ##### ## ##
Web Bean# ## ##### ###!

###, Web Bean# ## ## @Dependent# ## ## #, Web Bean ##### ## ## ## ## Web
Bean## ## ## ##. ## ##### ## ## ## Web Bean ##### ## ##### ## ##
##. ## ##### Web Beans# ## ## Web Beans# ##### ## ## ## ## ##
##.

Java ### ## ##, ## Java ### Web Bean ##### ## ## ## ##. ##, ## ## ## ## # ## ##
Web Bean ##### UnproxyableDependencyException# ## ##.

Java ### Web Bean ##### ## ## ## # ##:

- final### ##### ## final ### ## ##,
- ## ## ## ## ## ## ##,
- ## # ## ##

UnproxyableDependencyException# ##### ##. ##### ## ## ## ## ##, #####
#####, ## Web Bean# ## @Dependent# #####.

4.5. ##### lookup# ## Web Bean

Manager ##### ## ## # ##:

```
@Current Manager manager;
```

Manager ### ##### Web Bean ##### ## ## ## ##.

```
PaymentProcessor p = manager.getInstanceByType(PaymentProcessor.class);
```

AnnotationLiteral ### ##### ## # ##, ## ## Java## ##### ##
##.

```
PaymentProcessor p = manager.getInstanceByType(PaymentProcessor.class,  
new AnnotationLiteral<CreditCard  
>());
```

##, AnnotationLiteral# ## ##### ## # ## ## named ## ##
##:

```
abstract class CreditCardBinding
  extends AnnotationLiteral<CreditCard>
  >
  implements CreditCard {}
```

```
@Produces Logger createLogger(InjectionPoint injectionPoint) {
    return Logger.getLogger(injectionPoint.getMember().getDeclaringClass().getName());
}

}
```

##:

```
@Current Logger log;
```

? ##### ## # ## ## ##. HTTP ## ## ##, ## ## ## ##:

```
@BindingType
@Retention(RUNTIME)
@Target({TYPE, METHOD, FIELD, PARAMETER})
public @interface HttpParam {
    @NonBinding public String value();
}
```

##:

```
@HttpParam("username") String username;
@HttpParam("password") String password;
```

##:

```
class HttpParams
```

```
@Produces @HttpParam("")
String getParamValue(ServletRequest request, InjectionPoint ip) {
    return request.getParameter(ip.getAnnotation(HttpParam.class).value());
}

}
```

HttpParam ##### value() #####@NonBinding.# ##### Web Bean ##### ## ## ## ##.

Web Bean ##### InjectionPoint ##### ## ## Web Bean# #####:


```
public interface InjectionPoint {  
    public Object getInstance();  
    public Bean<?> getBean();  
    public Member getMember():  
    public <T extends Annotation  
> T getAnnotation(Class<T  
> annotation);  
    public Set<T extends Annotation  
> getAnnotations();  
}
```

#####

#####. Web Bean# ### Web Bean #####. ## ##
Web Bean ##### ## # ##. Web Beans ### ## ## ## ##:

- ### ## Web Bean# ### ##### ## ##
- ### ## Web Bean# ## ##### ## ##
- ### ## ## ## ## Web Bean ##### ## ##

##, Web Bean ## ## ## ##, currentUser, ### HttpSession ##### ## Web Beans#
currentUser #####. ### ##### currentUser# ##### ## # ##### ## ##
#####.

5.1. ##

Web Beans# *extensible context model*#####. ### ## ## ##### ## ## ## ## # ##:

```
@Retention(RUNTIME)
@Target({TYPE, METHOD})
@ScopeType
public @interface ClusterScoped {}
```

##. ### ## ## ## ##, ### ##### Context ### ##### ##! Context ###
##.

Web Bean ### ##### ## Web Bean ## ##### ## ## ##### ## # ##:

```
@ClusterScoped
public class SecondLevelCache { ... }
```

##, Web Beans# ### ## # ## ## ##.

5.2. ###

Web Beans# # ## ## ##:

- @RequestScoped
- @SessionScoped
- @ApplicationScoped

5#. ## #

- @ConversationScoped

Web Beans# ##### # ##### ##:

- servlet #### ## ##, ## # ##### ## #####

- JSF #### ## ##### ## #####.

##:

- EJB ## ## ##

- EJB ## ##

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

- # ## ##

Web Bean# ##### ##, ##### ContextNotActiveException# Web Bean ##### ## ## ##.

Java EE ##### ##, ## ## ##. ## # # ## ## ## ##.

5.3. #####

Web Beans ##### ## ## ## ## ## ## ## ## ## ##, ## ## ## ## ##. ##, ## ## ## ## ## ## ## ##:

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

- JSF ##### ## ## # ## ## ## ## ##.

##, ## ## ##. ##### ##### ## ## ## ## ## ##. ##### ## ## ## ## ## ## ##, ## ## ## ## ##.

JSF ## # ##### ##. ## ## ## ## ## ## ##. ##### ## ## ## ## ## ## ## # ##, ## ## ## ## ## ##.

5.3.1. ##### ##

Web Beans# JSF ##### ## ##### ## ## ## ## ## Web Bean# #####. ## Web Bean# ## ## ## # ##:

```
@Current Conversation conversation;
```

```
## ## ##### ## ## ## ##### ##, ##### ## begin() ## ##. ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## end()# ##.
```

###, ##### ## Web Bean# ## # ##### #####:

```
@ConversationScoped @Stateful
public class OrderBuilder {

    private Order order;
    private @Current Conversation conversation;
    private @PersistenceContext(type=EXTENDED) EntityManager em;

    @Produces public Order getOrder() {
        return order;
    }

    public Order createOrder() {
        order = new Order();
        conversation.begin();
        return order;
    }

    public void addLineItem(Product product, int quantity) {
        order.add( new LineItem(product, quantity) );
    }

    public void saveOrder(Order order) {
        em.persist(order);
        conversation.end();
    }

    @Remove
    public void destroy() {}

}
```

Web Bean# Conversation API# ##### ## ### ### # #####. ### ## ## Web Beans# ## ### ###
#####.

5.3.2. #####

JSF faces ## (JSF ## ##)# ## #####. ## ##, ### ## ##### ## ## non-faces
#####.

non-faces ### ## ##### ## # #####. Web Beans
cid ## ## ## #####. ##### ## ##### Conversation ##### ## # ##,
conversation### Web Beans ### #####.

5#. ## #

###, ### ## #### ##### ##

```
<a href="/addProduct.jsp?cid=#{conversation.id}"
>Add Product</a
>
```

Web Bean ##### ## ##### ## ##, ##### ## ##### ## ##. ## "####" ## ##
POST-then-redirect ## ## ##### ##. ## ## Web Bean ##### ##
URL# ## ## ## ## ##.

5.3.3. ##### ##

Web Bean ##### ## ## ## ## ## ## ## ## ## ## ## ## ##. Web Bean ##
Web Beans ## ## ## ## ##. ## ## ## ## ## ##
##.

Conversation ## ## ## ## ## ## ##. ## Web Bean ##### ## ##, ## ## ## ## ##
##.

```
conversation.setTimeout(timeoutInMillis);
```

5.4. dependent pseudo-scope

##, Web Beans# *dependent pseudo-scope*## ## ## ##. ## ## ## ## ##
Web Bean# ## ## ##.

##, Web Bean## @Dependent ## ## ##:

```
public class Calculator { ... }
```

Web Bean# ## ## ## Web Bean# ## #, ## Web Bean# ## ##### ## Web Bean# ##
##. ## Web Beans# ##### ## Web Bean ##### ## ## ## ## ## ##. ## ##
Web Bean ##### ## ## ##.

Web Bean ##### ##.

EJB bean# ## ## ## ## Web Bean## ##### ##, Web Beans# Java ### ## EJB bean#
##.

5.4.1. @New

@New ### ##### ## ## ## Web Bean# ## ## ##. ### ## ## ## ## ##:

```
@New Calculator calculator;
```

```
@Dependent ##, @New ### ##, Calculator API ##, Calculator ## ###, @Standard ## ## ##  
Web Bean# ##### #####.
```

```
Calculator# ## ## ### ## ## ##### ## ## #####, #:
```

```
@ConversationScoped  
public class Calculator { ... }
```

```
### ## ### ## Calculator ##### #####:
```

```
public class PaymentCalc {  
  
    @Current Calculator calculator;  
    @New Calculator newCalculator;  
  
}
```

```
calculator ##### Calculator# ##### ## ##### #####. newCalculator ##### PaymentCalc  
##### ## ### ## Calculator# ### ##### ##### #####.
```

```
## ### ### ## ### ### # ### ##### #####.
```

##

Web Bean ##### ## ##### ## ## # ## # ## ## ## ## # ## ##. Web Beans#
Web Beans ##### ## ## ## ## ##. (12#. XML# #### Web Beans ## ## ## ##
#####.)

spec# ##:

Web Beans ### ## ## ## ## ##, ##

- ### ## Web Beans# ##### # ## ##,
- ##### # ## ## ## ## ## # ## # ##
- ### ## ##### ## ## Web Bean ##### ## #####

##, ## ## ## ##:

- Web Bean#### JPA ## ##,
- Web Bean#### JDK ## ##,
- ### ## ##### ## ## ## ## ## ## ## Web Beans# ##,
- ### # ## API ## ##.

##, ## ## Web Beans# ##### ## ##### ## ##. ## ## ##, ## ## ## ## ## ## ## ## ## ##.
Web Bean ### #####. #### ## ## ## ##:

```
@SessionScoped
public class Preferences {

    private PaymentStrategyType paymentStrategy;

    ...

    @Produces @Preferred
    public PaymentStrategy getPaymentStrategy() {
        switch (paymentStrategy) {
            case CREDIT_CARD: return new CreditCardPaymentStrategy();
            case CHEQUE: return new ChequePaymentStrategy();
            case PAYPAL: return new PayPalPaymentStrategy();
            default: return null;
        }
    }
}
```

```
}
```

```
## ## ##:
```

```
@Preferred PaymentStrategy paymentStrat;
```

```
#### ## #### #### #### #### #### #### ####, #### Web Beans ## #### #### #### ####.  
#### #### Web Bean #### ## #### #### ## #### #### ## #### ####.
```

6.1. ### ###

```
#### #### #### @Dependent# ## ####, # # Web Bean #### #### ## ## #### #### #### ##  
#### #### # ## ####, ####, #### #### ## PaymentStrategy #### #### ## # ##.
```

```
#### #### ####, @SessionScoped #### ## ## # ##.
```

```
@Produces @Preferred @SessionScoped  
public PaymentStrategy getPaymentStrategy() {  
    ...  
}
```

```
## #### ####, #### PaymentStrategy# ## #### ####, #### #### ## ## ## ##.
```

6.2. ### ####

```
## #### # ## ## ## # ####. CreditCardPaymentStrategy #### Java new #### #### ####.  
##### ## ## ##### ## ## ## ## ## # ## ##### ## ##.
```

```
#### #### ## ##, #### #### #### #### Web Bean #### ## ##:
```

```
@Produces @Preferred @SessionScoped  
public PaymentStrategy getPaymentStrategy(CreditCardPaymentStrategy ccps,  
    ChequePaymentStrategy cps,  
    PayPalPaymentStrategy ppps) {  
    switch (paymentStrategy) {  
        case CREDIT_CARD: return ccps;  
        case CHEQUE: return cps;  
        case PAYPAL: return ppps;  
        default: return null;  
    }  
}
```

CreditCardPaymentStrategy# ## ## Web Bean## ### ##? ## ## ### ## ## ## ##
 ## ## "#####" ###. ## #####! ## ## ### ## ## ## # Web Bean ##### ## #####, ## ## ##
 ## ## "## ##" ###. ### ## Web Bean ##### ## ##### ## ## ## Web Bean ##### ## ##
 ### ##### ###!

##. CreditCardPaymentStrategy ## ## ## # ##, Web Bean#
 ##### ## ## # #####. ## ## ##### ## ## ## @Dependent ## @RequestScoped# ##### ##.

@New ### ##### ## ## ##.

6.3. ### ### ## @New

#####:

```
@Produces @Preferred @SessionScoped
public PaymentStrategy getPaymentStrategy(@New CreditCardPaymentStrategy ccps,
                                           @New ChequePaymentStrategy cps,
                                           @New PayPalPaymentStrategy ppps) {
    switch (paymentStrategy) {
        case CREDIT_CARD: return ccps;
        case CHEQUE: return cps;
        case PAYPAL: return ppps;
        default: return null;
    }
}
```

CreditCardPaymentStrategy# ### ### ##### ##, ## ## ## ##, ## ## ## ## #, #####
 ## ##### #####. ### ## ## ## ## Preferences ### ## # ## ## ## ##.

II. ë###ì#`í###ê²# ì#°ê²°ë## (loosely-coupled) ë°©ì###ì## ì½#ë## ê°#ë°#

Web Beans# ### ## ### ## (loose coupling)###. ### ### ## ### ##### ## ### ### ## ### ###:

- ## ### ## ## #####
- ### ### ### #####
- ##### ##### ## Web Bean ## ### ## #####.

#####. ##### ### API ##### # ###, ## ### ##### ### # #####. ### ##### ## ## ### ##### # ## ## ##### ##.

#####. ##### # ### ##### ## ### ### # #####. ## ### ### ##### ### ## ### ##### ## ##### ##### ## #####. Web Beans# ## ### ##### ## ### ##### ## ### #####.

Web Beans# ### ## ### ##### ## # ## ### ### ### #####:

- ##### ##### ##### ## ## ## ## #####
- ##### ## ##### ## ## ##### ## ## # #####.
- ### ### ### ##### ## ### ##### ## #####.

#####.

####

Web Beans# EJB 3.0# ## ##### ## #####, # ## ##### ## #####:

- Web Bean## ## beans ## ## ##### ## # #####.
- Web Beans# Web Beans# ##### ##### ## ## ## ##### ## ## ##### ##.

EJB ### # ### ##### ## #####:

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

Web Bean ##### ## Web Bean ## ## #####:

```
public class TransactionInterceptor {  
    @AroundInvoke public Object manageTransaction(InvocationContext ctx) { ... }  
}
```

#####:

```
public class DependencyInjectionInterceptor {  
    @PostConstruct public void injectDependencies(InvocationContext ctx) { ... }  
}
```

#####.

7.1. ####

Web Beans# ### ##### # ### ##### ## #####. ##### ## ## ## Web Beans# ### ## ## #####
##:

```
@InterceptorBindingType  
@Target({METHOD, TYPE})  
@Retention(RUNTIME)  
public @interface Transactional {}
```

ShoppingCart# ##### ##### ## ## # #####:

```
@Transactional
public class ShoppingCart { ... }
```

```
### ##, ### ## ## ##### ##### ## # #####:
```

```
public class ShoppingCart {
    @Transactional public void checkout() { ... }
}
```

7.2. ####

```
## ## ##### ## ##### ## ## ##### ## ##### ##### ##. ## # ## ## EJB ##### ## ##
@Interceptor # @Transactional# ##### ##.
```

```
@Transactional @Interceptor
public class TransactionInterceptor {
    @AroundInvoke public Object manageTransaction(InvocationContext ctx) { ... }
}
```

```
## Web Beans ##### ## Web Beans##, ### ## ##### ## ## ## ## ## # #####.
```

```
@ApplicationScoped @Transactional @Interceptor
public class TransactionInterceptor {

    @Resource Transaction transaction;

    @AroundInvoke public Object manageTransaction(InvocationContext ctx) { ... }

}
```

```
## ##### ## ##### ## ## ## ## # #####.
```

7.3. ####

```
##### web-beans.xml## ##### ##### ##.
```

```
<Interceptors>
  <tx:TransactionInterceptor/>
```



```
<Interceptors>
  <sx:SecurityInterceptor/>
  <tx:TransactionInterceptor/>
</Interceptors>
>
```

```
@InterceptorBindingType
@Target({METHOD, TYPE})
@Retention(RUNTIME)
public @interface Transactional {
    boolean requiresNew() default false;
}
```

```
@Transactional(requiresNew=true) @Interceptor
public class RequiresNewTransactionInterceptor {
    @AroundInvoke public Object manageTransaction(InvocationContext ctx) { ... }
}
```

57

```
@Transactional(requiresNew=true)
public class ShoppingCart { ... }
```

```
# ## ##### ## ##### ##### # requiresNew ## ##### ## ##### ## ##### @NonBinding #####
### # #####:
```

```
@InterceptorBindingType
@Target({METHOD, TYPE})
@Retention(RUNTIME)
public @interface Secure {
    @NonBinding String[] rolesAllowed() default {};
}
```

7.5.

```
##### ##### ##### Web Bean# ##### ## ##### ## ##### ## #####. ## ##, ### ## ## ## ##### ##
Web Bean# TransactionInterceptor # SecurityInterceptor# ##### # #####:
```

```
@Secure(rolesAllowed="admin") @Transactional
public class ShoppingCart { ... }
```

```
### ## ## ## ##### ## ##### ## ## ## ## ## ## ## ## ## ##:
```

```
@Transactional @Secure @Interceptor
public class TransactionalSecureInterceptor { ... }
```

```
# # ## ##### ## ## ## # ## ## ## checkout() ## ## ## ## ##:
```

```
public class ShoppingCart {
    @Transactional @Secure public void checkout() { ... }
}
```

```
@Secure
public class ShoppingCart {
    @Transactional public void checkout() { ... }
}
```


7#.

- ##### ### ##### ##### #####
- ##### ### ## ##### # #####,
- ##### ### ##### # ## ### ### ### ##### ## #####.

Web Beans ## ##### ### ## #####.

```
##### ## ##### ## ## ## ### ##### ##### ##### #####. ##### ## Java ## ### ### # #####. ## #####
## # ### ## ### ### ##### #####. ###, ## ##### ### ##### ### ##### #####. ###, #####
##### ## ### ##### ## ##### ##### #####.
```

```
### #### ## #####. ##### ## Java ##### #### ## ####, ##### ## ## #### #####.
## ## #### ## ##### ## ##### #### ## ####. ## ##### ##### ## ## ##. #####
## #### ## ##### ## ## ## # #####.
```

```
public interface Account {  
    public BigDecimal getBalance();  
    public User getOwner();  
    public void withdraw(BigDecimal amount);  
    public void deposit(BigDecimal amount);  
}
```

```
##### ## ## Web Beans# Account #####. ###, #### ## ##### ##, ## ## ##### ##,
##### ## ##### ## ##### ##. ## ##### ## ## #####.
```

```
@Decorator
public abstract class LargeTransactionDecorator
    implements Account {

    @Decorates Account account;

    @PersistenceContext EntityManager em;

    public void withdraw(BigDecimal amount) {
        account.withdraw(amount);
        if ( amount.compareTo(LARGE_AMOUNT)
>0 ) {
            em.persist( new LoggedWithdrawal( amount ) );
        }
    }

    public void deposit(BigDecimal amount);
    account.deposit(amount);
    if ( amount.compareTo(LARGE_AMOUNT)
```

```
>0){
    em.persist( new LoggedDeposit(amount) );
}
}
```

Web Beans# ##, ##### ## ## ##. ##### ## ## ## ## ## ## ## ## ## ##, # ## ## ## ## ##.

8.1. ##

##. ## ## ## # ## ## ## Web Beans# ##### ## ## ##. ## ## ## ## ## ## ## ## ## ## ## ## ## ##.

Account# ##### ## Web Beans# ##### ## ##.

```
@Decorates Account account;
```

##. # # ## ## ## ## ## Web Beans# ##### ##.

```
@Decorates @Foreign Account account;
```

Web Bean## #####:

- API ## ## ## ## ##
- ## ## ## ## ## ## ##

##, ##### InvocationContext.proceed()# ##### ## ## ## ##.

8.2. #####

web-beans.xml## ##### ## ##.

```
<Decorators>
  <myapp:LargeTransactionDecorator/>
</Decorators>
>
```

<Interceptors> ## ## ## ## ## ## ## ## ## ##.

- ## ##### ## ##### ## ##### ## ## # ## #####, ##### ## #####
- ### ##### ##### ## ## ##### ##.

#####.

###

Web Beans ### ## ### Web Beans# ## ## ## ##### ## ##### ###. ### ##### ##### ## # Web Bean ##### ## ### ##### #####. ### ##### ##### #####/#### ## ##### #####, # ## ## ## #####:

- ### ##### ##### ## ##### ## ###; ##### ##### ##### ## #####.
- ##### "####" ### ##### ## ## ## ## #####.
- ##### ## ##### ## ## ##### ## ## ## ## ##### ## # #####.

9.1. ###

@Observes# ##### Web Bean #####.

```
public void onAnyDocumentEvent(@Observes Document document) { ... }
```

#####. ### ## ## ## ##### ##### #####. ### ## Web Beans ###
"####" # ## ##. ### ## ## ##### ## ##, ## ## ## ##### #####.

```
@BindingType  
@Target({PARAMETER, FIELD})  
@Retention(RUNTIME)  
public @interface Updated { ... }
```

#####:

```
public void afterDocumentUpdate(@Observes @Updated Document document) { ... }
```

##. ### ##### ##### ##
##, ### ## ## ## ##### ## ## ##.

##, ## ##### Web Beans ## ## ## ## ##### ## #####:

```
public void afterDocumentUpdate(@Observes @Updated Document document, User user) { ... }
```

9.2. ###

#####:

```
@Observable Event<Document>  
> documentEvent
```

```
@observable ##### @Dependent ## # @Standard ## ##, Web Bean ##### ## ##### ##### Web  
Bean# #####.
```

```
##### Event ##### fire() ### ##### ##### ##, ### ## #####:
```

```
documentEvent.fire(document);
```

```
### ## ##### ## ##### ## ## ## ## Java ##### ##### # # # #####. ##### ## ## ## ## ##  
### ## #####:
```

- ### ## ## ## # ## ## ## ## ## ##,
- ### ## ## ## #####.

```
Web Bean ##### ## ## ## ## ##, ### ## ## ## ## ## ## ##. ### ## ## ## ## ## # ##, Web  
Bean ##### ## ## ## ## ## ## ## fire() ### ## ## ## ## ##.
```

```
"###" # #####, ### ##### ## ## ## ## fire() ### ##### ##:
```

```
documentEvent.fire( document, new AnnotationLiteral<Updated  
>{} );
```

```
Java## ##### ##### ## ## AnnotationLiteral# ### ## ##### ##### # ## ##.
```

```
##### ## ## ## ##### #####:
```

- ### ## ## ## # ## ## ## ## ## ##,
- ## fire()# ### ## ## ## ## ## ## ## ## ## ## ## ## ## ## ##.

```
## ##### ## ## ## ## ## ## ## ## ## ## ## ## ## ## ##:
```

```
@Observable @Updated Event<Document>  
> documentUpdatedEvent
```

```
### Event ##### ## ## ## ## ## ## ## ## ## ## ## ## ## ## ##:
```

- #### ## ## # ## ## ## ## ##,
- ## ## ## ## ## ## ## ## fire()# ## ## ## ## ## ## ## ## ## ## ##.

9.3. ####

##. ##### Observer ##### ## observe() ## ## ## ## ## ## ## ## # ##.

```
documentEvent.observe( new Observer<Document
>() { public void notify(Document doc) { ... } });
```

observe() ## ## ## ## ## ## ## ## # ##:

```
documentEvent.observe( new Observer<Document
>() { public void notify(Document doc) { ... } },
                        new AnnotationLiteral<Updated
>{} );
```

9.4. ### ###

##:

```
@BindingType
@Target({PARAMETER, FIELD})
@Retention(RUNTIME)
public @interface Role {
    RoleType value();
}
```

##:

```
public void adminLoggedIn(@Observes @Role(ADMIN) LoggedIn event) { ... }
```

##:

```
@Observable @Role(ADMIN) Event<LoggedIn
```

```
> LoggedInEvent;}}
```

```
## #####, ### ### ## ## ## ## ## ## ## ## ## ##. AnnotationLiteral# ### #####  
##### ## ## ##:
```

```
abstract class RoleBinding  
  extends AnnotationLiteral<Role  
>  
  implements Role {}
```

```
### ##### ## ## ## ## ## ## ## ## ## fire()# #####:
```

```
documentEvent.fire( document, new RoleBinding() { public void value() { return user.getRole();  
} });
```

9.5. ## ###

```
### ### ### ### # #####, #:
```

```
@Observable @Blog Event<Document  
> blogEvent;  
...  
if (document.isBlog()) blogEvent.fire(document, new AnnotationLiteral<Updated  
>({});
```

```
### ##### ## ## ## ## ## ## ## ## ##, ### ## ## ## ## ## ## ## ##:
```

```
public void afterBlogUpdate(@Observes @Updated @Blog Document document) { ... }
```

```
public void afterDocumentUpdate(@Observes @Updated Document document) { ... }
```

```
public void onAnyBlogEvent(@Observes @Blog Document document) { ... }
```

```
public void onAnyDocumentEvent(@Observes Document document) { ... }}
```


Product# ## # ##### Web Bean# ##### ### # #####, #:

```
@Stateless
public class ProductManager {

    @PersistenceContext EntityManager em;
    @Observable Event<Product
> productEvent;

    public void delete(Product product) {
        em.delete(product);
        productEvent.fire(product, new AnnotationLiteral<Deleted
>());
    }

    public void persist(Product product) {
        em.persist(product);
        productEvent.fire(product, new AnnotationLiteral<Created
>());
    }

    ...

}
```

Catalog# ##### ##### ### ## ##### ##### # #####:

```
@ApplicationScoped @Singleton
public class Catalog {

    ...

    void addProduct(@AfterTransactionSuccess @Observes @Created Product product) {
        products.add(product);
    }

    void addProduct(@AfterTransactionSuccess @Observes @Deleted Product product) {
        products.remove(product);
    }

}
```

III. ê°#ì#¥ ê°#í## í##ì#´í## (strong typing) ì#¬ì#©

Web Beans# #### ## #### ## #### (strong typing)####. Web Bean# ####, ####, ####### ## ## # ####
Java ## #### ## ####.

Web Beans ##### ## ## #### ## # ####. # #### ##### # "### ## ##"#### ## # #### ## ####
#####!

IDE# ## ## ## ## ##, ##, ##### ## # ####. ### ## #### ## ####. ## ##
##, ###, ##### ##### # ## #### ## #### ## #### ## # ####.

Web Beans# #### ## ## ##### ##### ##. #:

- @Asynchronous,
- @Mock,
- @Secure ##
- @Updated,

##

- asyncPaymentProcessor,
- mockPaymentProcessor,
- SecurityInterceptor ##
- DocumentUpdatedEvent.

####. ## ##### ## ## ## #### ## #### ##### ##, ### ##### ##### ## # ####.
##, ### ## # ##### ## # # ## ##.

Web Beans# ##### ## ## #### ## # ## # #####. ##### ## ##### ##### ##### ## ## #### ##. ##
##, ##### ##, ## ## ## ## #### ## #### ## ## ## ## #### #####.

Web Beans XML ##### ## #####! XML # ##### ##### Web Beans# XML ##### ## ##
XML# ##### Java ## # #### ##### ##. ##### Java #### ## # # ## ## # ## #### ## XML# ## #
##.

Web Beans# ## ## #### ## #### ## #####. #### ## ## ## ## ##### ## ##### ## ## ##### ##
#####. #### ## ## ## ## #### ## ## ##### ## ##, ### ## ## ## # #####.

(Stereotypes)

Web Beans ### ##:

#####, ##### ### ##### Web Bean ### ##### ### #####. ##### #####
Web Beans# ##### ##### ##### ##.

#####:

- ### ## ##
- ### ## ##
- Web Bean ##### ##,
- ## ### Web Bean# ##### ##### ## ## ##
- ##### ##### ##### ##

Web Beans# Web Bean ### ##### ##### ## # # #####.

Web Bean# 0 ## ## ### ##### ##### ##.

Java ##### #####. ### ##### ## MVC ##### ## ##### #####:

```
@Retention(RUNTIME)
@Target(TYPE)
@Stereotype
public @interface Action {}
```

Web Bean# ##### ##### ##### #####.

```
@Action
public class LoginAction { ... }
```

10.1. ##### ## ### ## # ##

Web Beans# ### ## ## ## ## ## ## ##. ## ##, @WebTier ## ###
Web Beans# ##### ##### ##, ### ## ##### ## ## ## ## ## ## ##:

```
@Retention(RUNTIME)
```

10#. ##### (Stereotypes)

```
@Target(TYPE)
@RequestScoped
@WebTier
@Stereotype
public @interface Action {}
```

##.

```
@Dependent @Mock @Action
public class MockLoginAction { ... }
```

##.

10.2. ##### ## # ##

##. Web Beans# ## ## ## ## ## Web Beans# ## ## ## ## ## ## ## ## ## ##. #:

```
@Retention(RUNTIME)
@Target(TYPE)
@RequestScoped
@WebTier
@Stereotype(supportedScopes=RequestScoped.class)
public @interface Action {}
```

Web Beans ## ## ## ## ## ## ## ## ## ## ## ##. ## ## ## ## Web Bean ## ## ## ## ##.

Web Bean# ## ## ## ## ## ## ## ## ## ## ##.

```
@Retention(RUNTIME)
@Target(TYPE)
@RequestScoped
@WebTier
@Stereotype(requiredTypes=AbstractAction.class)
public @interface Action {}
```

AbstractAction ## ## ## ## ## ## ## ## ## ## ## ##. ## ## ## ## Web Bean ## ## ## ## ##.

10.3. ##### # #####

Web Beans# ## ## ## ## ## ## ## ## ## ## ##.

```

@Retention(RUNTIME)
@Target(TYPE)
@RequestScoped
@Transactional(requiresNew=true)
@Secure
@WebTier
@Stereotype
public @interface Action {}

```

```
## ##### ##### ### # ## ### ### ##### ## ###!
```

10.4. ##### ## ### #####

```
##### ## ##### ## ## Web Beans# Web Bean ##### ## ##### Web Bean ### ## ## # #####.
### JSP ##### ## # ##, ### ### ##### ## # ## ## # # #####. ### ## # @Named ##### #####
####:
```

```

@Retention(RUNTIME)
@Target(TYPE)
@RequestScoped
@Transactional(requiresNew=true)
@Secure
@Named
@WebTier
@Stereotype
public @interface Action {}

```

```
## LoginAction# loginAction### ## ## ##.
```

10.5. ##

```
Web Beans ### ## ### ## ## ##### @Interceptor # @Decorator# #####.
```

```
Web Beans# ## ## ## ##### ##:
```

```

@Named
@RequestScoped
@Stereotype
@Target({TYPE, METHOD})
@Retention(RUNTIME)
public @interface Model {}

```

10#. ##### (Stereotypes)

JSF# ## ##### ## #####. JSF ## beans# ##### ## Web Bean @Model# ##### ##
JSF ##### #####.

###

Web Beans ### ## ### API ### ##### ## ##. ## ##, ### ## ##### Web Bean# #####
API PaymentProcessor ### #####:

```
@CreditCard @Stateless
public class CreditCardPaymentProcessor
    implements PaymentProcessor {
    ...
}
```

staging #####, ## Web Bean# ##### PaymentProcessor ### ##### ##:

```
@CreditCard @Stateless @Staging
public class StagingCreditCardPaymentProcessor
    implements PaymentProcessor {
    ...
}
```

StagingCreditCardPaymentProcessor# ##### ##### ## ## ## ##
AsyncPaymentProcessor# ## #####. ### ## ## @Staging# ### ## ## @Production ## ##
##:

```
@CreditCard PaymentProcessor ccpp
```

StagingCreditCardPaymentProcessor ##### ## ##.

##:

- ## ## ## Web Bean# ##### Web Bean# ## API ### ## # ##.
- ## ## ## Web Bean# ##### Web Bean# ## ## ## ## # ##.
- ## ## ## Web Bean# ## ##### Web Bean# ### ## ## # ##.
- ##### Web Bean# ### ##, ## ## ## ## ## ## # ##.

##, ## ##### Web Bean# ##### ## ##### ## ##, ##### ## ## ## ## ## ##.

Web Beans# ##### ## ## ##, ##### ## ## ## ## ##. ### ## ## ## ## ## ##, ## ## ## ## ## ## ## ## ##.

11.1. ### ##

Web Beans # ##### Web Beans## ## #####. ### ### ##### ## ## ## Web Bean#
##:

- ##### Web Bean# ##### ## ##### ## ##.
- ##### Web Bean# ## Web Bean# ## ## Web Bean# #### ## ## ##### # Web Bean# #####
Web Bean# ## ##### Web Bean# #### ##
- @Specializes# ##### ##.

```
@Stateless @Staging @Specializes
public class StagingCreditCardPaymentProcessor
    extends CreditCardPaymentProcessor {
    ...
}
```

Web Bean# ## ##### ##### ##.

11.2. ### ###

##:

- ##### ## ## @Specializes# ##### Web Bean# ## #####
- ##### Web Bean ### @Specializes# ##### Web Bean# ## #####
- ##### ## ## ## ##, ## ## # ## ## @Specializes# ##### Web Bean #####.

CreditCardPaymentProcessor# @CreditCard ### ##
StagingCreditCardPaymentProcessor# ## #####.

Web Bean ##### ## ## #####:

- ##### ## API ### @Specializes# ##### Web Bean# API ##### (##### ## ## ##
##)
- @Specializes# ##### Web Bean# ## ## ##### ## ##### ## ## ##
- ##### ##### Web Bean# #####.

##, Web Bean ##### ## ## ## ##.

###, @Specializes## ##### Web Bean# ##### ##### ## ##### ##### ## ## ##
#####.

XML# ##### Web Beans

Web Beans# ## #####. ## Web Bean# ##### ## ##### ##
#####:

- ## ##### ## ## ##### ##### ##,
- ### ## ##### ## ## Web Beans# ## ##

##, Web Beans# # ## ## #####:

- ### ## ## ##
- XML# ##### Web Bean ##

XML# ##### Java ### ## ##### #####. ##, Web Beans# ### ## ## ## Java
##, ##, ### ##### ## ##### #####. XML ## # ### ## ## ## # ## ## ## ## ##, Web
Beans# XML ## ##### ## ## ## ## ## ##.

XML ##### ## ## ## ## ## XML ##### ## # ## ##. ##### Java ##### XML
##. ## ## ## ## ## ## ## ## ## ## ## ## ## ## ##.

12.1. Web Bean ###

Java ##### ##, Web Beans# ## XML namespace# #####. namespace# Java
urn:java:# ##### #####. com.mydomain.myapp ##### ##, XML namespace#
urn:java:com.mydomain.myapp###.

Java ### ##### namespace# ## XML ### #####. ## ## Java ### ## ##.
namespace# ## ## ## ## #####. ## ##### ## ##, ## ## ## ## ##.

##, ## XML ### ## <util:Date/> ## java.util.Date ##### #####:

```
<WebBeans xmlns="urn:java:javax.webbeans"
  xmlns:util="urn:java:java.util">

  <util:Date/>

</WebBeans
>
```

Date# ## Web Bean## ##### # ## #####! Date# ##### ## ## Web Bean# ## ## # #####:

@Current Date date

12.2. Web Bean #####

Web Bean ### ##### ## #### ##### ##, ## ##, ##### ### #### # #####:

```
<myapp:ShoppingCart>
  <SessionScoped/>
  <myfwk:Transactional requiresNew="true"/>
  <myfwk:Secure/>
</myapp:ShoppingCart>
>
```

#####:

```
<util:Date>
  <Named
>currentTime</Named>
</util:Date>

<util:Date>
  <SessionScoped/>
  <myapp:Login/>
  <Named
>loginTime</Named>
</util:Date>

<util:Date>
  <ApplicationScoped/>
  <myapp:SystemStart/>
  <Named
>systemStartTime</Named>
</util:Date>
>
```

@Login # @SystemStart# ### ##### #####.

```
@Current Date currentTime;
@Login Date loginTime;
@SystemStart Date systemStartTime;
```

Web Bean# ## #### ##### # #####:


```
<myapp:AsynchronousChequePaymentProcessor>
  <myapp:PayByCheque/>
  <myapp:Asynchronous/>
</myapp:AsynchronousChequePaymentProcessor>
>
```

Web Beans####, ## ## ## Web Bean## #### # #####:

```
<myfwk:TransactionInterceptor>
  <Interceptor/>
  <myfwk:Transactional/>
</myfwk:TransactionInterceptor>
>
```

12.3. Web Bean ##

##!

12.4. ### Web Beans

Web Beans# ## ##### Web Bean# #### # ## #### . #:

```
<myapp:System>
  <ApplicationScoped/>
  <myapp:admin>
    <myapp:Name>
      <myapp:firstname>
>Gavin</myapp:firstname>
      <myapp:lastname>
>King</myapp:lastname>
      <myapp:email>
>gavin@hibernate.org</myapp:email>
    </myapp:Name>
  </myapp:admin>
</myapp:System>
>
```

<Name> ### ## ## ## ## @Dependent ### ## Web Bean # Name ##### #####. Web Bean# ###
#####.

Web Beans XML ### Java ### ## ##### ##### ##### ###. ## ### #####
##, ### #####!

12.5. ###

Java ### ### ## ### ##### # ## ##### ## ### XML ## ##### ##, ##### ##### ###. ##### ## ##
Web Beans# ### #####.

```
<WebBeans xmlns="urn:java:javax.webbeans"
  xmlns:myapp="urn:java:com.mydomain.myapp"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:java:javax.webbeans http://java.sun.com/jee/web-beans-1.0.xsd
    urn:java:com.mydomain.myapp http://mydomain.com/xsd/myapp-1.2.xsd">

  <myapp:System>
    ...
  </myapp:System>

</WebBeans>
>
```

XML ### ### ## #####. ### Web Beans RI ##### ## ##### XML ##### ##### ##### ##
###.

Java EE ì###ì½#ì###ì#ᄁí##

```
Web Beans# ##### Java EE ##### ## #####. ## Web Beans#
### ## ##### SPI ### #####. ### SPI ## ## ## ## # # ##, ## ##
## ## ## ## ## #####. ## ## ## ## ## ## # ## ## ## ## ## ##.
```

Java EE

Web Beans# Java EE #####. Web Beans# Java EE ### # JPA ### #####. ## JSF # JSP ##### Unified EL ##### ### # #####. ## Web Beans# ## Servlets # Message-Driven Beans# ## ## ## ## ## # # #####.

13.1. Java EE ##### Web Bean##

Web Beans# @Resource, @EJB, @PersistenceContext# ##### Java EE ### ## ## ## # #####. ## ## ## ## ## #####:

```
@Transactional @Interceptor
public class TransactionInterceptor {

    @Resource Transaction transaction;

    @AroundInvoke public Object manageTransaction(InvocationContext ctx) { ... }

}
```

```
@SessionScoped
public class Login {

    @Current Credentials credentials;
    @PersistenceContext EntityManager userDatabase;

    ...

}
```

Java EE @PostConstruct # @PreDestroy ### ## ##### Web Beans# ## #####. ## ## ## ## # @PostConstruct ### #####.

#####: @PersistenceContext(type=EXTENDED)# #### Web Beans# ## ##### #####.

13.2. Servlet## Web Bean

Java EE 6# ## Servlet## Web Bean# ##### #####. Web Beans ## ## ## ## ## ## ## ## Web Bean# #####.

```
public class Login extends HttpServlet {

    @Current Credentials credentials;

    @Current Login login;

    @Override
    public void service(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        credentials.setUsername( request.getAttribute("username") );
        credentials.setPassword( request.getAttribute("password") );
        login.login();
        if ( login.isLoggedIn() ) {
            response.sendRedirect("/home.jsp");
        }
        else {
            response.sendRedirect("/loginError.jsp");
        }
    }

}
```

```
Web Beans ##### Servlet## ## ## # ### HTTP ### ### Credentials # Login ##### ##  
##### ##.
```

13.3. Message-Driven Bean## Web Bean

```
Web Beans ### ## EJB# ####, Web Bean ### ## ## ## ## ##### (## ##, JNDI lookup# ## #####  
@EJB# ##### ##### ##) #####. ##, Message-Driven Beans## Web Beans ### ## # ###, ## ###  
# ## ### ## Web Beans# ##### #####.
```

Message-Driven Beans# ## Web Beans ##### ##### ### # #####.

```
@Transactional @MessageDriven
public class ProcessOrder implements MessageListener {

    @Current Inventory inventory;
    @PersistenceContext EntityManager em;

    public void onMessage(Message message) {
        ...
    }
}
```

```
}
```

```
###, Web Beans ##### ## ## #####. ### ##### Message-Driven Bean## ### # ### # ##
## ## ## ##### ## ##### #####. @RequestScoped # @ApplicationScoped Web Beans ## ###
# #####.
```

```
## Web Beans# ##### ##### ##### #####.
```

13.4. JMS

```
JMS# ##### ##### ##### ## ## ## # #####. ## ## ## ## ##### ## #####. ## ## Queue,
QueueConnectionFactory, QueueConnection, QueueSession QueueSender# #####. ### ##
Topic, TopicConnectionFactory, TopicConnection, TopicSession, TopicPublisher# #####.
### ## ## ##### ## ## # ## ## ## ## #####.
```

```
Web Beans# ### ## ## #####. ### ##### # ### web-beans.xml# ## # ## ## ##### ## ## ##
# ## ##### ##### #####.
```

```
<Queue>
  <destination
>java:comp/env/jms/OrderQueue</destination>
  <connectionFactory
>java:comp/env/jms/QueueConnectionFactory</connectionFactory>
  <myapp:OrderProcessor/>
</Queue
>
```

```
<Topic>
  <destination
>java:comp/env/jms/StockPrices</destination>
  <connectionFactory
>java:comp/env/jms/TopicConnectionFactory</connectionFactory>
  <myapp:StockPrices/>
</Topic
>
```

```
## ## ## Queue, QueueConnection, QueueSession, QueueSender# ##### # ##, ### ## Topic,
TopicConnection, TopicSession TopicPublisher# ##### # #####.
```

```
@OrderProcessor QueueSender orderSender;
@OrderProcessor QueueSession orderSession;
```

```
public void sendMessage() {  
    MapMessage msg = orderSession.createMapMessage();  
    ...  
    orderSender.send(msg);  
}
```

```
@StockPrices TopicPublisher pricePublisher;  
@StockPrices TopicSession priceSession;  
  
public void sendMessage(String price) {  
    pricePublisher.send( priceSession.createTextMessage(price) );  
}
```

JMS ### ##### Web Bean ##### ## ##### #####.

13.5. ### #

Web Beans# ## ## ##### #####. JAR, EJB-JAR ## WAR# ## Web Beans # #####
classpath# ## ## ## ##### # #####. ### Web Beans# ## ## ##### META-INF ## WEB-INF
web-beans.xml## ## ## ##. ### ## ## # # #####. web-beans.xml ### ## #####
Web Beans# ##### ## # #####.

Java SE ### ##, ### ## EJB Lite ##### ## ## EJB# ### # ## ## Web Beans# ### # #####.
web-beans.xml ### ## ## ##.

Web Beans

Web Beans# ## ##### ##, ##, ##### ## ##### ## ## #####. ####, Web Beans# Web Beans## ####
SPI #### #####. ## ##, #### ## ##### Web Beans ##### ## #####.

- ##### ##### ## ##### ##
- Spring, Seam, GWT, Wicket# ## #### ##### ##
- Web Beans ##### #### ##### ## #### ##

Web Beans #### #### Manager #####.

14.1. Manager

Manager ##### Web Beans, ####, #####, #### # ##### ##### ##### #### # ## ##.

```
public interface Manager
{

    public <T>
    > Set<Bean<T>
    >
    > resolveByType(Class<T>
    > type, Annotation... bindings);

    public <T>
    > Set<Bean<T>
    >
    > resolveByType(TypeLiteral<T>
    > apiType,
        Annotation... bindings);

    public <T>
    > T getInstanceByType(Class<T>
    > type, Annotation... bindings);

    public <T>
    > T getInstanceByType(TypeLiteral<T>
    > type,
        Annotation... bindings);

    public Set<Bean<?>
    > resolveByName(String name);
```

```
public Object getInstanceByName(String name);

public <T
> T getInstance(Bean<T
> bean);

public void fireEvent(Object event, Annotation... bindings);

public Context getContext(Class<? extends Annotation
> scopeType);

public Manager addContext(Context context);

public Manager addBean(Bean<?> bean);

public Manager addInterceptor(Interceptor interceptor);

public Manager addDecorator(Decorator decorator);

public <T
> Manager addObserver(Observer<T
> observer, Class<T
> eventType,
    Annotation... bindings);

public <T
> Manager addObserver(Observer<T
> observer, TypeLiteral<T
> eventType,
    Annotation... bindings);

public <T
> Manager removeObserver(Observer<T
> observer, Class<T
> eventType,
    Annotation... bindings);

public <T
> Manager removeObserver(Observer<T
> observer,
    TypeLiteral<T
> eventType, Annotation... bindings);

public <T
```

```

> Set<Observer<T
>
> resolveObservers(T event, Annotation... bindings);

    public List<Interceptor
> resolveInterceptors(InterceptionType type,
    Annotation... interceptorBindings);

    public List<Decorator
> resolveDecorators(Set<Class<?>
> types,
    Annotation... bindings);

}

```

```

### ## Manager ##### ## # ####:

```

```

@Current Manager manager

```

14.2. Bean

```

Bean ## ##### ##### Web Beans# #####. ##### ## ## Web Bean# ##### Manager ### ###
Bean ##### #####.

```

```

public abstract class Bean<T> {

    private final Manager manager;

    protected Bean(Manager manager) {
        this.manager=manager;
    }

    protected Manager getManager() {
        return manager;
    }

    public abstract Set<Class> getTypes();
    public abstract Set<Annotation> getBindingTypes();
    public abstract Class<? extends Annotation> getScopeType();
    public abstract Class<? extends Annotation> getDeploymentType();
    public abstract String getName();
}

```

14#. Web Beans

```
public abstract boolean isSerializable();  
public abstract boolean isNullable();  
  
public abstract T create();  
public abstract void destroy(T instance);  
  
}
```

```
Web Beans ## (## Web Beans # ##### Web Beans, ### ## # JMS #####) # ## ## # #### ##
#### Web Beans# ##### ## Bean ##### ##### Manager .addBean ( ) # ##### ##### ## # #####. ## ##,
Bean ##### ##### Web Beans# ### ## ##### ## ##### ## ##### # # #####.
```

```
Web Beans #### ## ##### # ## Bean ## ##### #####: Interceptor # Decorator.
```

14.3. Context

Context ##### Web Beans# #### #### ##### #### #### #### #### ## #####.

```
public interface Context {  
  
    public Class<? extends Annotation> getScopeType();  
  
    public <T> T get(Bean<T> bean, boolean create);  
  
    boolean isActive();  
  
}
```

```
## ##, Web Beans# ##### ## Wicket# ##### ##### ## ## ## ##
## Context# ## # #####.
```

##

Web Beans# ### ##### ## ##### ## ### ## ## ##.

Web Beans ### ## Web Beans ### ## #####. ## # 100 ##### # # ### # # ### ## # #
#####. ## ### ##### ##### ##, <http://jcp.org/en/jsr/detail?id=299>## ## # #####.

Web Beans Reference ### <http://seamframework.org/WebBeans>## #####. RI ### # Web
Beans ### <http://in.relation.to>## #####. ### ### ##### ##### ## ## ##### ## ##
###.

A. Web Beans RI# ## #####

Web Beans RI# JBoss AS 5#### #####; RI# ## ## EE ## (## ## Glassfish# ## ## #####
##)## ##, ## servlet ##### ## (#: Tomcat), ## ## EJB3.1 #### ##### ## #####. Appendix## ##
#####.



##

SE ##### Web Beans# #### # #### ##, #### ##### # ## ## ## ## # ## ## ## ## ##.
Web Beans RI# ## ## ## ## ## ## ##, Web Beans RI ##### ## ## ## ## ## ##.

A.1. Web Beans RI SPI

Web Beans SPI# webbeans-ri-spi #### ##### webbeans-ri-spi.jar# ##### #####. ## SPI#
#####, ## ## ##### ##, ## ## ## ##.

SPI #### ##### ## ## ## META-INF/web-beans-ri.properties# #### # #####. ## ## ## ##
#####; ## ## ## ## ## ## ## ## ## ##.

SPI# ## ## ##### ##### ## ## ## Forwarding ##### #####.

A.1.1. Web Bean

```
public interface WebBeanDiscovery {  
    /**  
     * Gets list of all classes in classpath archives with web-beans.xml files  
     *  
     * @return An iterable over the classes  
     */  
    public Iterable<Class<?>  
> discoverWebBeanClasses();  
  
    /**  
     * Gets a list of all web-beans.xml files in the app classpath  
     *  
     * @return An iterable over the web-beans.xml files  
     */  
    public Iterable<URL  
> discoverWebBeansXml();  
  
}
```

A. Web Beans RI# ## #####

Web Bean #### # web-bean.xml ## #### # # ##### (##### JSR-299 ## 11.1## ##### ##### ##
#####).

Web Beans RI# ## ##### #### ## ## ##
org.jboss.webbeans.bootstrap.spi.WebBeanDiscovery #### ##### WebBeanDiscovery ####
#####. #:

```
org.jboss.webbeans.bootstrap.spi.WebBeanDiscovery=org.jboss.webbeans.integration.jbossas.WebBeanDiscovery
```

Web Beans RI# servlet ##### ## #, ## #### ##### ##:

```
public WebBeanDiscoveryImpl(ServletContext servletContext) {}
```

servlet ##### WebBeanDiscovery #### ##### ## ##### ##### # #####.

A.1.2. EJB

Web Beans RI# ##### EJB3 bean #### ##### EJB3 ##### ##### ejb-jar.xml# #### #####.
EJB# ## EJBDescriptor# ##### ##:

```
public interface EjbDiscovery
{
    public static final String PROPERTY_NAME = EjbDiscovery.class.getName();

    /**
     * Gets a descriptor for each EJB in the application
     *
     * @return The bean class to descriptor map
     */
    public Iterable<EjbDescriptor<?>>
    > discoverEjbs();
}
```

```
public interface EjbDescriptor<T>
{
    /**
     * Gets the EJB type
     *
     */
}
```



```
* @return The EJB Bean class
*/
public Class<T>
> getType();

/**
 * Gets the local business interfaces of the EJB
 *
 * @return An iterator over the local business interfaces
 */
public Iterable<BusinessInterfaceDescriptor<?>
> getLocalBusinessInterfaces();

/**
 * Gets the remote business interfaces of the EJB
 *
 * @return An iterator over the remote business interfaces
 */
public Iterable<BusinessInterfaceDescriptor<?>
> getRemoteBusinessInterfaces();

/**
 * Get the remove methods of the EJB
 *
 * @return An iterator over the remove methods
 */
public Iterable<Method>
> getRemoveMethods();

/**
 * Indicates if the bean is stateless
 *
 * @return True if stateless, false otherwise
 */
public boolean isStateless();

/**
 * Indicates if the bean is a EJB 3.1 Singleton
 *
 * @return True if the bean is a singleton, false otherwise
 */
public boolean isSingleton();

/**
```

```
* Indicates if the EJB is stateful
*
* @return True if the bean is stateful, false otherwise
*/
public boolean isStateful();

/**
* Indicates if the EJB is and MDB
*
* @return True if the bean is an MDB, false otherwise
*/
public boolean isMessageDriven();

/**
* Gets the EJB name
*
* @return The name
*/
public String getEjbName();

}
```

EjbDescriptor# ## # # #### ## EJB #### ##### ##### ##### #####. #### # ## ##### ##,
BusinessInterfaceDescriptor# #####. (EJB ##### ##### #####
jndi #### ##)

Web Beans RI# ## ##### ## # # # # # org.jboss.webbeans.bootstrap.spi.EjbDiscovery
EjbDiscovery #### ##### # # #####. #:

```
org.jboss.webbeans.bootstrap.spi.EjbDiscovery=org.jboss.webbeans.integration.jbossas.EjbDiscoveryImpl
```

Web Beans RI# servlet ##### ## #, ## #### ## ##### ##:

```
public EjbDiscoveryImpl(ServletContext servletContext) {}
```

servlet ##### EjbDiscovery #### ##### ## ##### ##### ##### # #####.

A.1.3. JNDI

Web Beans RI# #### ## JNDI #### # lookup# #####, #### # lookup# ##### ## # ##### (## ## JNDI#
#####). ## ## org.jboss.webbeans.spi.resources.NamingContext#####:

```
public interface NamingContext extends Serializable {
```

```
    /**
     * Typed JNDI lookup
     *
     * @param <T>
     * > The type
     * @param name The JNDI name
     * @param expectedType The expected type
     * @return The object
     */
    public <T>
    > T lookup(String name, Class<? extends T>
    > expectedType);

    /**
     * Binds an item to JNDI
     *
     * @param name The key to bind under
     * @param value The item to bind
     */
    public void bind(String name, Object value);

}
```

RI## ### ## #####:

```
org.jboss.webbeans.resources.spi.NamingContext=com.acme.MyNamingContext
```

Web Beans RI# servlet ##### ## ## ## ## ## ## ##:

```
public MyNamingContext(ServletContext servletContext) {}
```

servlet ##### NamingContext ### ##### ## ##### ## ## # #####.

A.1.4. ###

Web Beans RI# ### classpath## ### # ##### ##### ##. ##### RI# #####
classloader## #####, ## ##### ##### ## # # #####. ### ##,
org.jboss.webbeans.spi.ResourceLoader# ### # #####:

```
public interface ResourceLoader {

    /**
     * Creates a class from a given FQCN
     *
     * @param name The name of the clas
     * @return The class
     */
    public Class<?> classForName(String name);

    /**
     * Gets a resource as a URL by name
     *
     * @param name The name of the resource
     * @return An URL to the resource
     */
    public URL getResource(String name);

    /**
     * Gets resources as URLs by name
     *
     * @param name The name of the resource
     * @return An iterable reference to the URLs
     */
    public Iterable<URL
> getResources(String name);

}
```

RI## ### ## #####:

```
org.jboss.webbeans.resources.spi.ResourceLoader=com.acme.ResourceLoader
```

Web Beans RI# servlet ##### ## ##, ## ### ## ##### ##:

```
public MyResourceLoader(ServletContext servletContext) {}
```

servlet ##### ResourceLoader ### ##### ## ##### ##### # #####.

A.2. #####

API# ## ##### ## ## ##### ## ## Web Beans RI# ##### ##### ## # ## ## ## ##

ClassLoader ##

Web Beans RI# ### ##### ## ## ## ## ## ##, ### Web Beans ##### ## #####
##.

Servlet ###

Web Beans# Servlet ##### ## ##, Servlet# ##### ## Web Beans ##### ## ##### ## ##
org.jboss.webbeans.servlet.WebBeansListener# Servlet ##### ##### ##.

Session Bean #####

Web Beans# EJB ##### # ## ##### beans# ##### ## Web Beans ##### ## ##
EJB ##### ## EJB ##### org.jboss.webbeans.ejb.SessionBeanInterceptor# #####
##.

webbeans-ri.jar

Web Beans# ##### ## ## ## ## ## ## ##, webbeans-ri.jar# ##### ## classloader#
##. ## ## classloader## ## ## ##.
