JUnit EJB Testing

This tutorial will demonstrate how to use JUnitEE to unit test an Enterprise JavaBeans.

General

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http://www.laliluna.de/tutorials.html – Tutorials for Struts, EJB, xdoclet and eclipse.

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Software:
Eclipse 3.x
MyEclipse 3.8.x
JUnitEE 1.x (http://www.junitee.org)
PDF

http://www.laliluna.de/download/junit-testing-ejb-en.pdf

Sources

http://www.laliluna.de/download/junit-testing-ejb-source.zip

What is JUnitEE ?

JUnitEE makes the JUnit framework available for J2EE applications without writing your tests as external clients to your application server. It runs directly in the application server environment as a J2EE project and provides a couple of servlets which call the normal JUnit test cases. It is not necessary to set up all the client JNDI properties, like you do if you use a external client and it comes with nice report displaying the results of running tests.

Configure the J2EE project

First you have to download the binary archive of *JUnitEE*.

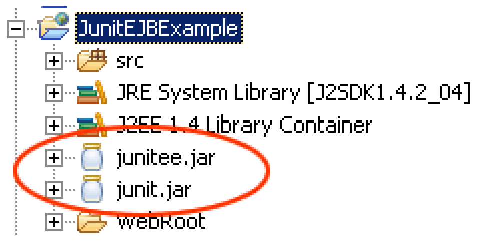
http://sourceforge.net/project/showfiles.php?group_id=31476

Next, create a new *J2EE* web project *JunitEJBExample* (*in MyEclipse choose New > Project > J2EE > Web Project*).

Copy the *junitee.jar*, you will find the the *lib* directory of archive, to the */WebRoot/WEB-INF/lib* folder of your *J2EE* project.

Copy the *junit.jar* in the */WebRoot/WEB-INF/lib* folder.

You project tree will looks like the follows:


JunitEJBExample
src
JRE System Library [J2SDK1.4.2_04]
J2EE 1.4 Library Container
junitee.jar
junit.jar
WebRoot

JUnitEE provides three servlets which differ in the format of the test report they generate by default and the thread mode they use. You have to set the servlet and the servlet mapping in the *web.xml* of your *J2EE* project.

Now open your *web.xml* and add the following:

Using JunitEEServlet

The *JunitEEServlet* is the standard you will normally use. It generates html output by default and does not fork a new thread for test execution.

```
<?xml version="1.0"?>
<!DOCTYPE web-app
    PUBLIC "-//Sun Microsystems, Inc.//DTD Web Application 2.2//EN"
    "http://java.sun.com/j2ee/dtds/web-app_2_2.dtd">

<web-app>
  <display-name>Unit Tester Web Application</display-name>

  <servlet>
    <servlet-name>JUnitEETestServlet</servlet-name>
    <description>JUnitEE test runner</description>
    <servlet-class>org.junitee.servlet.JUnitEEServlet</servlet-class>
  </servlet>

  <servlet-mapping>
    <servlet-name>JUnitEETestServlet</servlet-name>
    <url-pattern>/TestServlet/*</url-pattern>
  </servlet-mapping>
</web-app>
```

Using JunitEEThreadServlet

The second servlet is the *JunitEEThreadedServlet* which by default forks a new thread for each test execution. For the other servlets you can get the the same behavior by using the *thread* parameter in the reuquest.

```
<?xml version="1.0"?>
<!DOCTYPE web-app
    PUBLIC "-//Sun Microsystems, Inc.//DTD Web Application 2.2//EN"
    "http://java.sun.com/j2ee/dtds/web-app_2_2.dtd">

<web-app>
  <display-name>Unit Tester Web Application</display-name>

  <servlet>
    <servlet-name>JUnitEETestServlet</servlet-name>
    <description>JUnitEE test runner</description>
    <servlet-class>org.junitee.servlet.JUnitEEThreadedServlet</servlet-class>
  </servlet>

  <servlet-mapping>
    <servlet-name>JUnitEETestServlet</servlet-name>
    <url-pattern>/TestServlet/*</url-pattern>
  </servlet-mapping>
</web-app>
```

JunitEEXMLServlet

The *JunitEEXMLServlet* display the test reports in the xml format. All three servlets support the output request parameter to override the default output. You can also use the *JunitEEServlet* servlet to display the output in xml format.

```
<?xml version="1.0"?>
<!DOCTYPE web-app
    PUBLIC "-//Sun Microsystems, Inc.//DTD Web Application 2.2//EN"
    "http://java.sun.com/j2ee/dtds/web-app_2_2.dtd">
```

```
<web-app>
  <display-name>Unit Tester Web Application </display-name>

  <servlet>
    <servlet-name>JUnitEETestServlet</servlet-name>
    <description>JUnitEE test runner</description>
    <servlet-class>org.junitee.servlet.JUnitEEXMLServlet</servlet-class>
  </servlet>

  <servlet-mapping>
    <servlet-name>JUnitEETestServlet</servlet-name>
    <url-pattern>/TestServlet/*</url-pattern>
  </servlet-mapping>
</web-app>
```

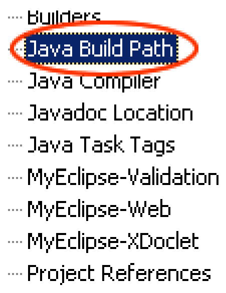
On this point your J2EE web project is ready to use JunitEE for testing.

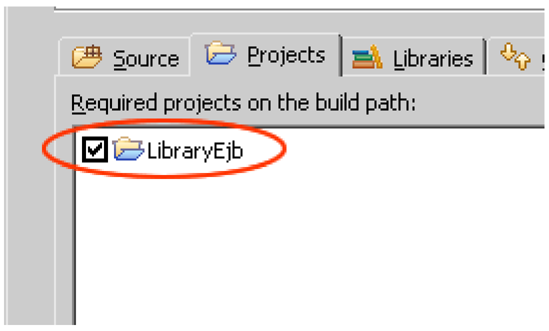
Create the test cases

We want to test some session bean methods of an existing EJB project. You can download the source of the LibraryEJB project at http://www.laliluna.de/...

Import the LibraryEJB project into your Eclipse workspace.

Add the EJB project to the *Java-Build-Path* of your J2EE test project.
(Open the project properties and choose *Java-Build-Path* and the *Project* tab. Select the *LibraryEJB* project.)





Now we have access to the classes of the *LibraryEJB* project within the J2EE test project.

For the next step create a new package *test.laliluna.tutorial.junitejb* and a new class *BookSessionTest* which extends from the super class *TestCase* of the JUnit framework.

```
public class BookSessionTest extends TestCase {
      ....
}
```

Provide some protected and private variables:

```
public class BookSessionTest extends TestCase {

    protected BookSessionHome bookSessionHome;
    protected BookSession bookSession;
    private BookValue bookValue;
}
```

Override the *setUp* method of the *TestCase* class and use the default JNDI *InitialContext* to get a reference to the EJB. Initialize a new *BookValue* which we use to test if we can add a book.

```
public void setUp() throws Exception {
        super.setUp();

        Context context = new InitialContext();
        Object finderRef = context.lookup(BookSessionHome.JNDI_NAME);
        bookSessionHome = (BookSessionHome) PortableRemoteObject
                .narrow(finderRef, BookSessionHome.class);
        bookSession = bookSessionHome.create();


        // set a example book to add
        bookValue = new BookValue();
        bookValue.setAuthor("laliluna");
        bookValue.setTitle("JunitEE EJB Example");
        bookValue.setAvailable(new Boolean(true));
}
```

Override the *tearDown* method to reset the properties.

```
public void tearDown() throws Exception {
        super.tearDown();
        bookSession = null;
        bookSessionHome = null;
        bookValue = null;
}
```

testSaveBook

The first test scenario tests if there are problems while adding a new book with the EJB session method saveBook. First have a look to the session method to know whats going on there.

Create a new method *testSaveBook*. Within the method you call the method *saveBook* of the session bean BookSession with the additional parameter *bookValue*, which represent a new book.

Catch all exception thrown by the method *saveBook* and use the fail method to output the exception message. If something goes wrong, for example the table where the book will be added is not there, you will see it later in the test report.

```
public void testSaveBook() {
      try{
          bookSession.saveBook(this.bookValue);
      } catch(Exception e){
          fail("Received Exception: "
               + e.getClass()
                 + " : " + e.getMessage());
      }
}
```

testGetAllBooks

In the next scenario we want to test if we can get all books from the session bean. So first have a look to the method *getAllBooks* of the session bean *BookSession* in the EJB project to know what happens there.

Create a new method *testGetAllBooks*. Do the same as before, catch all exceptions thrown by the method and output the error message with the fail method. Furthermore use the method *assertNotNull* to test if the collection returned by the method *getAllBooks* is not null.

```
public void testGetAllBooks() {
        try {
            assertNotNull(bookSession.getAllBooks());
        } catch (Exception e) {
            fail("Received Exception: "
                 + e.getClass()
                 + " : " + e.getMessage());
        }
}
```

Run the tests

Now we want to run the tests in the *JUnitEE* servlet container. There are two modes possible the Basic Test Mode and the Smart Mode. In the basic test mode you have to create a web application to choose your test. In the smart mode you can specify jar files which will be searched for tests or you can add a text file containing the tests.

If you have a jar file which contains the test classes you have to initialize a parameter *searchResources* within the *servlet* element of the application configuration file *web.xml*.

You may also tell JUnitEE to search more than one jar file for your tests. In this case the parameter value is a comma-separated list.

```
<servlet>
    <servlet-name>JUnitEETestServlet</servlet-name>
    <description>JUnitEE test runner</description>
    <servlet-class>org.junitee.servlet.JUnitEEServlet</servlet-class>
    <init-param>
      <param-name>searchResources</param-name>
      <param-value>test.jar, test2.jar</param-value>
    </init-param>
</servlet>
```

In our example we use no jar package, so you have to create a file which holds a list of test classes. Create a new file *testCase.txt* in the directory */WebRoot/WEB-INF* and add the following lines:

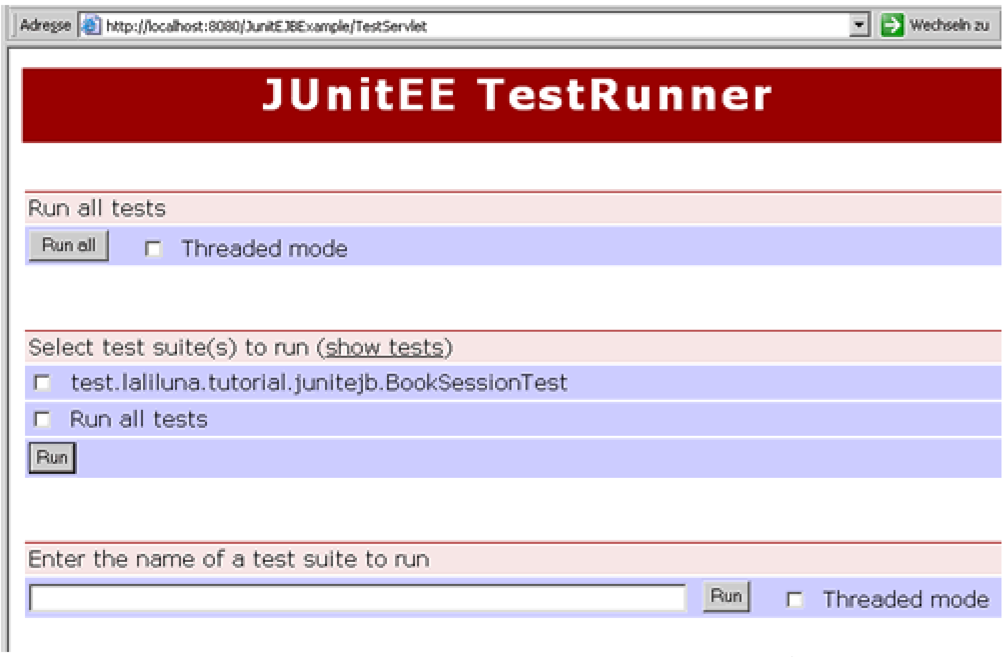
```
# Test cases which can be run
test.laliluna.tutorial.junitejb.BookSessionTest
```

Now you can deploy the JUnitEE project, but make sure you have deployed the EJB project before. After deploying the JUnitEE project you can call it in your favorite browser.

For our example use the following link:

http://localhost:8080/JunitEJBExample/TestServlet

You will find a dialog where you can choose which test classes you want to execute.



JUnitEE TestRunner

Run all tests

Run all ☐ Threaded mode

Select test suite(s) to run (show tests)

☐ test.laliluna.tutorial.junitejb.BookSessionTest

☐ Run all tests

Run

Enter the name of a test suite to run

Run ☐ Threaded mode

That's all, we hope we could make you understand creating test cases for your EJB project.