Struts 2 + Hibernate integration with "Full Hibernate Plugin"

Written on July 20, 2010 at 4:53 pm by mkyong | Under Struts2 category

Download it – Struts2-Hibernate-FullHibernatePluginExample.zip

In last Struts 2 + Hibernate integration example, it use the servlet context listener to play around with the Hibernate session, and it did very well to integrate the Struts 2 and Hibernate together.

But, there are always something to improve 🙂 In this tutorial, it show a complete example to integrate the Struts 2 and Hibernate by using a Struts2's plugin named "Full Hibernate Plugin", version 2.2GA, created by jyoshiriro.

See the summary of integration steps :

1. Put the "**Full Hibernate Plugin**" jar in the project class path.
2. Use annotations "**@SessionTarget**" to inject the Hibernate session; While "**@TransactionTarget**" to inject the Hibernate transaction.
3. In **struts.xml**, make the package extends "**hibernate-default**", instead of the default stack.

See the relationship :

```
Struts 2 <-- (Full Hibernate Plugin) ---> Hibernate <-----> Database
```

This tutorial is an update version from the previous Struts 2 + Hibernate integration example (servlet context listerner), So the JSP and Hibernate configuration are almost same, just the integration part is a bit different, try to compare both to spot the different.

1. Project structure

See this full project folder structure.

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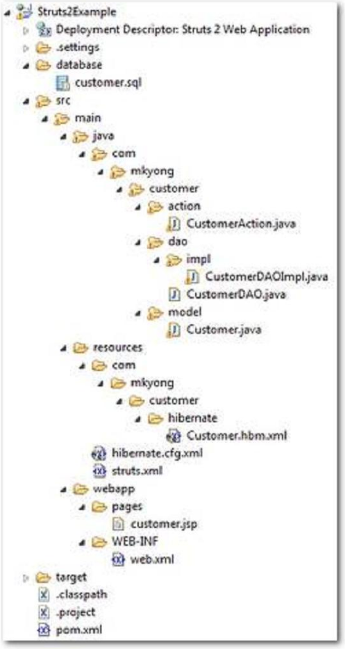

```
Struts2Example
  Deployment Descriptor: Struts 2 Web Application
  .settings
  database
    customer.sql
  src
    main
      java
        com
          mkyong
            customer
              action
                CustomerAction.java
              dao
                impl
                  CustomerDAOImpl.java
                CustomerDAO.java
              model
                Customer.java
      resources
        com
          mkyong
            customer
              hibernate
                Customer.hbm.xml
        hibernate.cfg.xml
        struts.xml
      webapp
        pages
          customer.jsp
        WEB-INF
          web.xml
  target
  .classpath
  .project
  pom.xml
```

2. MySQL table script

Customer's table script.

```
DROP TABLE IF EXISTS `mkyong`.`customer`;
CREATE TABLE  `mkyong`.`customer` (
  `CUSTOMER_ID` bigint(20) UNSIGNED NOT NULL AUTO_INCREMENT,
  `NAME` varchar(45) NOT NULL,
  `ADDRESS` varchar(255) NOT NULL,
  `CREATED_DATE` datetime NOT NULL,
  PRIMARY KEY (`CUSTOMER_ID`)
) ENGINE=InnoDB AUTO_INCREMENT=17 DEFAULT CHARSET=utf8;
```

3. Get "Full Hibernate Plugin" and Dependencies

Get all the Struts2, Hibernate, "**Full Hibernate Plugin**" and MySQL dependency libraries. Since the "**Full Hibernate Plugin**" is not support Maven, you need to download it from the official website and include into your Maven local repository manually.

1. Download "Full Hibernate Plugin".
2. Put the downloaded jar into c: drive and use following Maven's command to include it into Maven local repository.

```
mvn install:install-file -Dfile=c:\struts2-fullhibernatecore-plugin-2.2-GA.jar
-DgroupId=com.google.code -DartifactId=struts2-fullhibernatecore-plugin
-Dversion=2.2 -Dpackaging=jar
```

3. Link it with the follow Maven coordinate.

```
        <dependency>
                <groupId>com.google.code</groupId>
                <artifactId>struts2-fullhibernatecore-plugin</artifactId>
                <version>2.2</version>
        </dependency>
```

Here's all the dependency libraries in this tutorial :

pom.xml

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saleem : Sorry for late reply I don't know where and what are the jar file to be added to this project...

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Van Long Nguyen : Thanks you very much. My problem solved!...

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sapardi : Your error problem is same with me. In my way, i replace application server from tomcat to be glassf...

```
//...
        <!-- Struts 2 -->
        <dependency>
                <groupId>org.apache.struts</groupId>
                <artifactId>struts2-core</artifactId>
                <version>2.1.8</version>
        </dependency>

        <!-- MySQL database driver -->
        <dependency>
                <groupId>mysql</groupId>
                <artifactId>mysql-connector-java</artifactId>
                <version>5.1.9</version>
        </dependency>

        <!-- Struts 2 Hibernate Plugins -->
        <dependency>
                <groupId>com.google.code</groupId>
                <artifactId>struts2-fullhibernatecore-plugin</artifactId>
                <version>2.2</version>
        </dependency>

        <!-- Log4j logging (Struts 2 Hibernate Plugins dependency) -->
        <dependency>
                <groupId>log4j</groupId>
                <artifactId>log4j</artifactId>
                <version>1.2.9</version>
        </dependency>

        <!-- Hibernate validator (Struts 2 Hibernate Plugins dependency) -->
        <dependency>
               <groupId>org.hibernate</groupId>
               <artifactId>hibernate-validator</artifactId>
               <version>3.1.0.GA</version>
        </dependency>

        <!-- slf4j logging (Struts 2 Hibernate Plugins dependency) -->
        <dependency>
               <groupId>org.slf4j</groupId>
               <artifactId>slf4j-api</artifactId>
               <version>1.6.1</version>
        </dependency>

        <!-- Hibernate core -->
        <dependency>
                <groupId>org.hibernate</groupId>
                <artifactId>hibernate</artifactId>
                <version>3.2.7.ga</version>
        </dependency>

        <!-- Hibernate core library dependency start -->
        <dependency>
                <groupId>dom4j</groupId>
                <artifactId>dom4j</artifactId>
                <version>1.6.1</version>
        </dependency>

        <dependency>
                <groupId>commons-logging</groupId>
                <artifactId>commons-logging</artifactId>
                <version>1.1.1</version>
        </dependency>

        <dependency>
                <groupId>commons-collections</groupId>
                <artifactId>commons-collections</artifactId>
                <version>3.2.1</version>
        </dependency>

        <dependency>
                <groupId>cglib</groupId>
                <artifactId>cglib</artifactId>
                <version>2.2</version>
        </dependency>
        <!-- Hibernate core library dependency end -->

        <!-- Hibernate query library dependency start -->
        <dependency>
                <groupId>antlr</groupId>
                <artifactId>antlr</artifactId>
                <version>2.7.7</version>
        </dependency>
        <!-- Hibernate query library dependency end -->
//...
```

The "**Full Hibernate Plugin**" is required the **Hibernate validator** and **SLF4j** dependency, which is not really make sense, as most of the Java developers still do not use it.

4. Hibernate Stuff

All the Hibernate models and configuration stuff.

Customer.java – Create a class for customer table.

```
package com.mkyong.customer.model;

import java.util.Date;

public class Customer implements java.io.Serializable {

        private Long customerId;
        private String name;
        private String address;
        private Date createdDate;

        //getter and setter methods
}
```

Customer.hbm.xml – Hibernate mapping file for customer.

```
<?xml version="1.0"?>
<!DOCTYPE hibernate-mapping PUBLIC "-//Hibernate/Hibernate Mapping DTD 3.0//EN"
"http://hibernate.sourceforge.net/hibernate-mapping-3.0.dtd">
<!-- Generated 20 Julai 2010 11:40:18 AM by Hibernate Tools 3.2.5.Beta -->
<hibernate-mapping>
    <class name="com.mkyong.customer.model.Customer"
                table="customer" catalog="mkyong">
        <id name="customerId" type="java.lang.Long">
            <column name="CUSTOMER_ID" />
            <generator class="identity" />
        </id>
        <property name="name" type="string">
            <column name="NAME" length="45" not-null="true" />
        </property>
        <property name="address" type="string">
            <column name="ADDRESS" not-null="true" />
        </property>
        <property name="createdDate" type="timestamp">
            <column name="CREATED_DATE" length="19" not-null="true" />
        </property>
    </class>
</hibernate-mapping>
```

hibernate.cfg.xml – Hibernate database configuration file.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE hibernate-configuration PUBLIC
"-//Hibernate/Hibernate Configuration DTD 3.0//EN"
"http://hibernate.sourceforge.net/hibernate-configuration-3.0.dtd">
<hibernate-configuration>
  <session-factory>
    <property name="hibernate.bytecode.use_reflection_optimizer">false</property>
    <property name="hibernate.connection.password">password</property>
    <property name="hibernate.connection.url">jdbc:mysql://localhost:3306/mkyong</property>
    <property name="hibernate.connection.username">root</property>
    <property name="hibernate.dialect">org.hibernate.dialect.MySQLDialect</property>
    <property name="show_sql">true</property>
    <property name="format_sql">true</property>
    <property name="use_sql_comments">false</property>
    <mapping resource="com/mkyong/customer/hibernate/Customer.hbm.xml" />
  </session-factory>
</hibernate-configuration>
```

5. DAO

Implements DAO design pattern to perform the database operation. In the **CustomerDAOImpl** class, declared both Hibernate session and transaction as class members. During the Struts 2 project initialization, "**Full Hibernate Plugin**" will injects the corresponding Hibernate session and transaction into the class members using **@SessionTarget** and **@TransactionTarget** annotation respectively.

CustomerDAO.java

```
package com.mkyong.customer.dao;

import java.util.List;

import com.mkyong.customer.model.Customer;

public interface CustomerDAO{

        void addCustomer(Customer customer);

        List<Customer> listCustomer();

}
```

CustomerDAOImpl.java

```
package com.mkyong.customer.dao.impl;

import java.util.List;

import org.hibernate.Session;
import org.hibernate.Transaction;

import com.googlecode.s2hibernate.struts2.plugin.annotations.SessionTarget;
import com.googlecode.s2hibernate.struts2.plugin.annotations.TransactionTarget;
import com.mkyong.customer.dao.CustomerDAO;
import com.mkyong.customer.model.Customer;

public class CustomerDAOImpl implements CustomerDAO{

        @SessionTarget
        Session session;

        @TransactionTarget
        Transaction transaction;

        //add the customer
        public void addCustomer(Customer customer){

                session.save(customer);

        }

        //return all the customers in list
        public List<Customer> listCustomer(){

                return session.createQuery("from Customer").list();

        }

}
```

6. Action

In Action class, call the DAO class to perform the database operation.

CustomerAction.java

```
package com.mkyong.customer.action;

import java.util.ArrayList;
import java.util.Date;
import java.util.List;

import com.mkyong.customer.dao.CustomerDAO;
import com.mkyong.customer.dao.impl.CustomerDAOImpl;
import com.mkyong.customer.model.Customer;
import com.opensymphony.xwork2.ActionSupport;
import com.opensymphony.xwork2.ModelDriven;

public class CustomerAction extends ActionSupport
        implements ModelDriven{

        Customer customer = new Customer();
        List<Customer> customerList = new ArrayList<Customer>();
        CustomerDAO customerDAO = new CustomerDAOImpl();

        public String execute() throws Exception {
                return SUCCESS;
        }

        public Object getModel() {
                return customer;
        }

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

        public void setCustomerList(List<Customer> customerList) {
                this.customerList = customerList;
        }

        //save customer
        public String addCustomer() throws Exception{

                //save it
                customer.setCreatedDate(new Date());
                customerDAO.addCustomer(customer);

                //reload the customer list
                customerList = null;
                customerList = customerDAO.listCustomer();

                return SUCCESS;

        }

        //list all customers
        public String listCustomer() throws Exception{

                customerList = customerDAO.listCustomer();

                return SUCCESS;

        }

}
```

7. JSP page

JSP pages to add and list the customer.

customer.jsp

```
<%@ taglib prefix="s" uri="/struts-tags" %>
<%@ taglib prefix="s" uri="/struts-tags" %>
<html>
<head>
</head>

<body>
<h1>Struts 2 Full Hibernate Plugin example</h1>

<h2>Add Customer</h2>
<s:form action="addCustomerAction" >
  <s:textfield name="name" label="Name" value="" />
  <s:textarea name="address" label="Address" value="" cols="50" rows="5" />
  <s:submit />
</s:form>

<h2>All Customers</h2>

<s:if test="customerList.size() > 0">
<table border="1px" cellpadding="8px">
        <tr>
                <th>Customer Id</th>
                <th>Name</th>
                <th>Address</th>
                <th>Created Date</th>
        </tr>
        <s:iterator value="customerList" status="userStatus">
                <tr>
                        <td><s:property value="customerId" /></td>
                        <td><s:property value="name" /></td>
                        <td><s:property value="address" /></td>
                        <td><s:date name="createdDate" format="dd/MM/yyyy" /></td>
                </tr>
        </s:iterator>
</table>
</s:if>
<br/>
<br/>

</body>
</html>
```

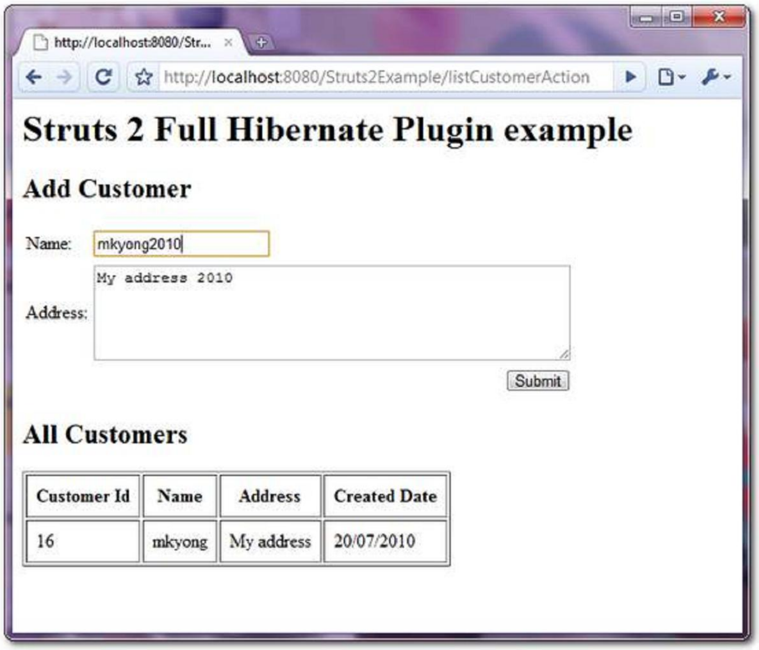
8. struts.xml

Link it all ~ make package extends the "**hibernate-default**" instead of the "**struts-default**".

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE struts PUBLIC
"-//Apache Software Foundation//DTD Struts Configuration 2.0//EN"
"http://struts.apache.org/dtds/struts-2.0.dtd">

<struts>
  <constant name="struts.devMode" value="true" />

  <package name="default" namespace="/" extends="hibernate-default">

    <action name="addCustomerAction"
        class="com.mkyong.customer.action.CustomerAction" method="addCustomer" >
       <result name="success">pages/customer.jsp</result>
    </action>

    <action name="listCustomerAction"
        class="com.mkyong.customer.action.CustomerAction" method="listCustomer" >
        <result name="success">pages/customer.jsp</result>
    </action>

</package>
</struts>
```

9. Demo

Access it : http://localhost:8080/Struts2Example/listCustomerAction.action


http://localhost:8080/Str...
http://localhost:8080/Struts2Example/listCustomerAction

Struts 2 Full Hibernate Plugin example

Add Customer

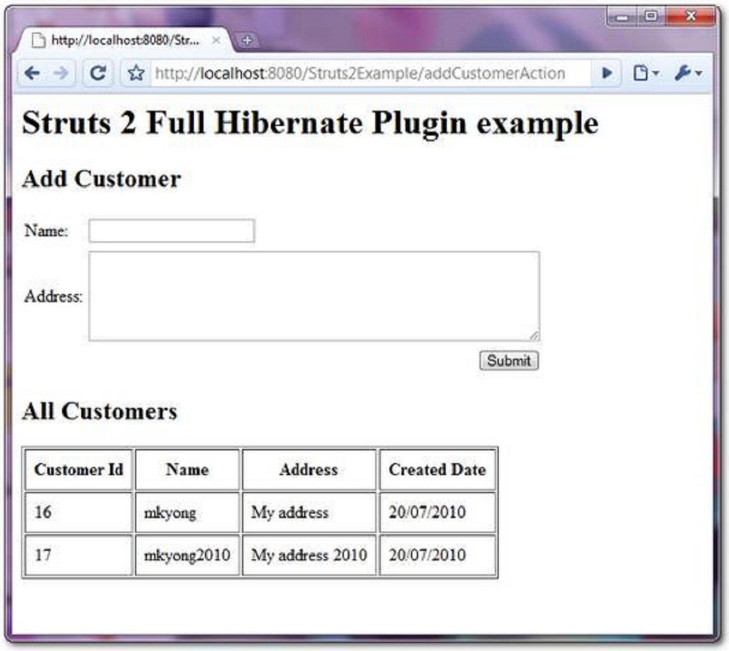
Name: mkyong2010

Address: My address 2010

Submit

All Customers

Customer Id	Name	Address	Created Date
16	mkyong	My address	20/07/2010


http://localhost:8080/Str...
http://localhost:8080/Struts2Example/addCustomerAction

Struts 2 Full Hibernate Plugin example

Add Customer

Name:

Address:

Submit

All Customers

Customer Id	Name	Address	Created Date
16	mkyong	My address	20/07/2010
17	mkyong2010	My address 2010	20/07/2010

Reference

1. Struts 2 Full Hibernate Plugin documentation
2. Struts 2 + Hibernate integration example (servlet context listener)
3. Install library into Maven local repository

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4 Comments

padmanabha says:
March 22, 2011 at 3:43 pm

Hi …

I get following error when i deploy the application

com.googlecode.s2hibernate.lang.SessionInjectionException: Error! Please, check your JDBC/JDNI Configurations and Database Server avaliability. at /addCustomerAction – Method: com.mkyong.customer.action.CustomerAction.addCustomer() Could not open or inject a Hibernate Session in ValueStack: org.hibernate.HibernateException: Unable to instantiate default tuplizer [org.hibernate.tuple.entity.PojoEntityTuplizer]

```
com.googlecode.s2hibernate.struts2.plugin.interceptors.SessionTransactionInjectorInterceptor.intercept(SessionTransactionInjectorInterceptor.java:177)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.googlecode.s2hibernate.struts2.plugin.s2hibernatevalidator.interceptor.HibernateValidatorInterceptor.intercept(HibernateValidatorInterceptor.java:118)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.DefaultWorkflowInterceptor.doIntercept(DefaultWorkflowInterceptor.java:165)
com.opensymphony.xwork2.interceptor.MethodFilterInterceptor.intercept(MethodFilterInterceptor.java:87)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.ConversionErrorInterceptor.intercept(ConversionErrorInterceptor.java:122)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.ParametersInterceptor.doIntercept(ParametersInterceptor.java:195)
com.opensymphony.xwork2.interceptor.MethodFilterInterceptor.intercept(MethodFilterInterceptor.java:87)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.StaticParametersInterceptor.intercept(StaticParametersInterceptor.java:179)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
org.apache.struts2.interceptor.CheckboxInterceptor.intercept(CheckboxInterceptor.java:94)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
org.apache.struts2.interceptor.FileUploadInterceptor.intercept(FileUploadInterceptor.java:235)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.ModelDrivenInterceptor.intercept(ModelDrivenInterceptor.java:89)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.ScopedModelDrivenInterceptor.intercept(ScopedModelDrivenInterceptor.java:130)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
org.apache.struts2.interceptor.ProfilingActivationInterceptor.intercept(ProfilingActivationInterceptor.java:104)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
org.apache.struts2.interceptor.debugging.DebuggingInterceptor.intercept(DebuggingInterceptor.java:267)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.ChainingInterceptor.intercept(ChainingInterceptor.java:126)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.I18nInterceptor.intercept(I18nInterceptor.java:165)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.PrepareInterceptor.doIntercept(PrepareInterceptor.java:138)
com.opensymphony.xwork2.interceptor.MethodFilterInterceptor.intercept(MethodFilterInterceptor.java:87)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
org.apache.struts2.interceptor.ServletConfigInterceptor.intercept(ServletConfigInterceptor.java:164)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.AliasInterceptor.intercept(AliasInterceptor.java:179)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
com.opensymphony.xwork2.interceptor.ExceptionMappingInterceptor.intercept(ExceptionMappingInterceptor.java:176)
com.opensymphony.xwork2.DefaultActionInvocation.invoke(DefaultActionInvocation.java:237)
org.apache.struts2.impl.StrutsActionProxy.execute(StrutsActionProxy.java:52)
org.apache.struts2.dispatcher.Dispatcher.serviceAction(Dispatcher.java:488)
org.apache.struts2.dispatcher.ng.ExecuteOperations.executeAction(ExecuteOperations.java:77)
org.apache.struts2.dispatcher.ng.filter.StrutsPrepareAndExecuteFilter.doFilter(StrutsPrepareAndExecuteFilter.java:91)
org.apache.catalina.core.ApplicationFilterChain.internalDoFilter(ApplicationFilterChain.java:215)
org.apache.catalina.core.ApplicationFilterChain.doFilter(ApplicationFilterChain.java:188)
org.apache.catalina.core.StandardWrapperValve.invoke(StandardWrapperValve.java:213)
org.apache.catalina.core.StandardContextValve.invoke(StandardContextValve.java:172)
org.apache.catalina.core.StandardHostValve.invoke(StandardHostValve.java:127)
org.apache.catalina.valves.ErrorReportValve.invoke(ErrorReportValve.java:117)
org.apache.catalina.core.StandardEngineValve.invoke(StandardEngineValve.java:108)
org.apache.catalina.connector.CoyoteAdapter.service(CoyoteAdapter.java:174)
org.apache.coyote.http11.Http11AprProcessor.process(Http11AprProcessor.java:843)
org.apache.coyote.http11.Http11AprProtocol$Http11ConnectionHandler.process(Http11AprProtocol.java:679)
org.apache.tomcat.util.net.AprEndpoint$Worker.run(AprEndpoint.java:1293)
java.lang.Thread.run(Thread.java:662)
```

Reply

padmanabha says:
March 22, 2011 at 6:08 pm

It got solved…. I added dependency asm to pom.xml.. Thanks for the good example

Reply

ron says:
September 8, 2010 at 9:29 pm

How would you write a JUnit test for the DAO class. I was trying to finf a way to do it but all i can find is JUnit with Spring. I have implemented this hibernate plug-in in my mproject and need to write the Unit test for the DAO classes. thanks in advance.

ron

Reply

Struts 2 + Hibernate integration example says:
July 20, 2010 at 4:54 pm

[...] Struts 2 + Hibernate integration with "Full Hibernate Plugin" [...]

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