The Java Standard Tag Library

Kevin Jones
@kevinrjones

Objectives

- **Understand why there is a Java Standard Tag Library**

- **Understand the basic concepts behind the JSTL**

- **Understand how the core tags work**

Why Tags?

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- **Provide encapsulation of (UI) logic**

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Why Tags?

- **Provide encapsulation of (UI) logic**

- **Replace script on a page**

- **Better for page designers than having to write Java code**

What is a 'TagLibrary'?

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What is a 'TagLibrary'?

- **Tag libraries are collections of tags**

- **The Java Standard Tag Library (JSTL) is a set of standard tags used in JavaServer Pages**

Using Tags

- **Tags are managed as libraries**
  - Individual tags are Java classes
  - Tag metadata held in Tag Library Descriptor file
  - Collected together in a JAR file

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```
<taglib>
  <tlib-version>1.0</tlib-version>
  <jsp-version>3.0</jsp-version>
  <short-name>u</short-name>
  <uri>http://kevinj.mantiso.com/tags</uri>

  <tag>
    <name>user</name>
    <tag-class>ejsp.User</tag-class>
</tag>
</taglib>
```

Using Tags

- **Tag libraries are introduce with a directive**
    - Prefix is used on the page as a shorthand name
    - URI identifies the tag library

- **Container has to associate URI with tag library**

```
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c" %>

<c:out value="${param['name']}" />
```

'c' is the standard
prefix for the core
library

http://java.sun.com/jstl/core
is the JSTL core URIs

The different libraries

- **Core ('c')**
  - □ Setting and displaying data
  - □ Flow control
  - □ Text/URL management

- **I18N ('fmt')**
  - □ Locale and resource management

- **XML**
  - □ Basic XML
  - □ Flow control
  - □ Transforms

- **SQL**
  - □ Database management

- **Core covered here, others are covered in the appropriate chapter**

General

- **Many tag attribute accept expressions**

- **Many tags can process their bodies**
  - typically body replaces a tag attribute

- **Many tags can save result into a variable**

- **Can configure JSTL tags**
  - Global configuration
  - use **`<context-param>`**
  - Access and set through static methods of **`Context`** class

```
<context-param>
  <param-name>javax.servlet.jsp.jstl.fmt.locale<param-name>
  <param-value>en_GB</param-value>
</context-param>
```

Core Tags - Conditional

- **Conditional**
    - ◻ **if**

```
<c:if test="${param['name'] == 'fred'}">
    <b>Hi <c:out value="${param['name']}" /></b>
</c:if>

<%-- var and scope are optional --%>
<c:if test="${param['name'] == 'fred'}" var="isFred" scope='request'>
    <b>Hi <c:out value="${param['name']}" /></b>
</c:if>
<br/>

<c:if test="${isFred}">
    Hello Again
</c:if>
```

Core Tags - Conditional

- **Conditional**
    - **choose/when/otherwise**

```
<c:choose>
    <c:when test="${param.name == 'fred'}" >Hello Fred</c:when>
    <c:when test="${param.name == 'alice'}" >Hello Alice</c:when>
    <c:otherwise>You're not Alice or Fred</c:otherwise>
</c:choose>
```

Core Tags - Iteration

- **Two tags, for-each and for-tokens that support**
    - exporting an object that holds the current value
    - ranges to iterator
    - exposure of a status variable

Core Tags - Iteration

- **`forEach`**
  - Iterate over a collection
    - java.util.Collection
    - java.util.Map
    - array
    - java.util.Iterator
    - java.util.Enumeration
  - comma separated **`java.lang.String`**

**Use Iterator and
Enumeration with care
Not resettable.
Must only be used
by one tag at a time**

```
<c:forEach[var="varName"] items="collection"
[varStatus="varStatusName"]
[begin="begin"] [end="end"] [step="step"]>

body content

</c:forEach>
```

Core Tags - Iteration examples

```
<c:forEach items="${list}" begin="1" end="10" step="2"
           var="dte" varStatus="status">
  <c:if test="${status.first}" >
    Begin: ${status.begin}<br/>
    End: ${status.end}<br/>
    Step: ${status.step}<br/>
    <hr/>
  </c:if>
    Date: ${dte}<br/>
    Current: ${status.current}<br/>
    Last: ${status.last}<br/>
    First: ${status.first}<br/>
    Count: ${status.count}<br/>
    Index: ${status.index}<br/>
  <hr/>
</c:forEach>
```

status variable holds information about the iteration

```
Begin: 1
End: 10
Step: 2

Date: Thu Jan 01 06:33:20 GMT 1970
Current: Thu Jan 01 06:33:20 GMT 1970
Last: false
First: true
Count: 1
Index: 1

Date: Thu Jan 01 12:06:40 GMT 1970
Current: Thu Jan 01 12:06:40 GMT 1970
Last: false
First: false
Count: 2
Index: 3
```

Core Tags - Iteration

- **`forTokens`**

  - Iterate over a token 'delimited' list

```
<c:forTokens items="stringOfTokens" delims="delimiters"
[var="varName"]
[varStatus="varStatusName"]
[begin="begin"] [end="end"] [step="step"]>

body content

</c:forEach>
```

Core Tags - Iteration examples

```
<c:forTokens items="This;is;a;test"
             delims=";"
             var="item">
    ${item}<br/>
</c:forTokens>
```

```
This
is
a
test
```

Core Tags - Import

- **Managing text is an important part of JSP**
    - \<c:import\> == \<jsp:include\>++

- **Can import from**
    - This context
    - Another context on this server
    - Another server

- **Imported data can be**
    - written to page
    - stored in a string
    - 'stored' in a Reader

```
<c:import url="url" [context="context"]
    [var="varName"] [scope="{page|request|session|application}"]
    [charEncoding="charEncoding"]>
optional body content for <c:param> subtags
</c:import>
```

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```

Core Tags - Import

- **Examples**

```
<c:import url="/header.jsp"/>

<c:import url="footer.jsp" var='footer'/>

${footer}

<c:import context="/tomcat-docs"
          url="/servletapi/help-doc.html" />



<c:import url="http://kevinj.mantiso.com/index.jsp"/>
```

This context

To a variable

**Cross context
This must be
allowed by the
container**

Another server

Core Tags - URL

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- **Using '/[url]' give server relative urls**
    - /somepage.jsp
    - http://myserver.com/sompage.jsp

Core Tags - URL

- **There are issues with relative URLs in a web application**

- **No concept of a 'web application'**

- **Using '/[url]' give server relative urls**
  - /somepage.jsp
  - http://myserver.com/sompage.jsp

- **Using '[url]' somepage.jsp**
  - is relative to the page
  - From foo/index.jsp would give
  - http://myserver.com/myapp/foo/sompage.jsp

Core Tags - URL

- **<c:url ... />**
  - Allows the creation of application relative URLs
  - Also adds session encoding where necessary

Core Tags - URL

- **Can specify**
  - 'value' of URL
  - 'params' to be added
  - Can create **application** relative urls
  - application relative URLs start with a '/'

- **Set 'context' param if importing from a foreign context**

```
<c:url value="value" [context="context"]
[var="varName"] [scope="{page|request|session|application}"]/>


<c:url value="value" [context="context"]
[var="varName"] [scope="{page|request|session|application}"]>
<c:param> subtags
</c:url>
```

URL - examples

```
<a href='/ForEach.jsp'>ForEach</a><br/>
<!-- output as -->
<a href='/ForEach.jsp'>ForEach</a><br/>
```

```
<a href='<c:url value="/ForEach.jsp"/>'>ForEach</a>
<!-- output as -->
<a href='/TestJSTL/ForEach.jsp'>ForEach</a>



<a href='
  <c:url value="/RemoteImport.jsp">
    <c:param name="url" >http://localhost:8080/index.jsp</c:param>
  </c:url>
'>Remote Import</a>
<!-- output as -->
<a href='
  /TestJSTL/RemoteImport.jsp?url=http%3A%2F%2Flocalhost%3A8080%2Findex.jsp
'>Remote Import</a>
```

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- **Other functionality also provided**
  - SQL
  - XML