

JavaServer Faces (Intro)

MSIS 531 – Spring 2006

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Learning Goals

- Old school: JavaServer Pages (JSP)
- Introducing JavaServer Faces (JSF)
- JSF application overview and structure
- JavaBeans and their role in JSF applications
 - JavaBean structure
 - Managed beans
- JSF Navigation
 - Recall HTTP is stateless; “what to do next” must be stated completely and robustly
- Standard JSF tags
 - Core JSF, HTML support

JavaServer Pages (JSP)

- Old-school J2EE view components
 - Combination of Java code and HTML
 - Clear competitor for ASP pages
 - Not sure who came first
 - Tags are very similar
- Implementation issues:
 - Easy for developers to combine presentation, business logic in JSP pages
 - Lacks “separation of concerns”
 - Mixed HTML, Java makes code cleanliness, maintenance an issue
 - Simple examples illustrate this

Examples: `echo.jsp`, `echo2.jsp`

Why JSF?

- Goal: rapid UI development for server-side Java applications
 - Target market: web projects with/without J2EE
 - J2EE infrastructure is available if needed
 - Competition: ASP.NET
- Key components:
 - Prefabricated UI components
 - Event-driven programming model
 - Easily extended component model, allowing developers to implement new components
 - Significant if JSF use is to expand

JSF and NetBeans

- With NetBeans 5.0, JSF support can be included in any project
- Embedded Tomcat allows easy developer deployment, testing of JSF applications
 - Huge benefit over other Java IDEs, which currently require additional setup
- Some need to follow the “NetBeans rules” on JSFs for now; we’ll break them pretty quickly
 - NB naming standards are different from Core JSF book
- Bottom line: strong result from the NetBeans team
 - And NB6 is in the works

Getting Started with JSF

- Sample app from CJSF Ch. 1: login screen and navigation to “hello” screen
- Key components:
 - JSP page with JSF tags included
 - JavaBean storing, accessing properties (username, password) needed for the application
 - Imagine this being stored externally (e.g. in a database)
 - Navigation configuration (where to go next)
- These components implement the Model/View/Controller (MVC) pattern
 - JavaBean -> Model; JSF -> View; Config file -> Controller

Example: JSF Login

JavaBeans: Introduction

- JavaBeans are just Java classes that expose properties, events
- Specific format to store, retrieve properties
 - Java does the “translation”, e.g. from variable “name” to getName() and setName()

```
public class UserBean {
    private String name;
    private String password;

    public String getName() { return name; }
    public void setName(String newValue) { name = newValue; }

    public String getPassword() { return password; }
    public void setPassword(String newValue) { password = newValue; }
}
```



JSF Pages

- One JSF page per browser screen
- Externally, we'll use “.jhtml” for our extension (not .faces)
- Internally, these will map to .jsp
- Within the JSF, the two tag libraries map HTML-like tags to Java code
 - More on this in later chapters
- Input values bound to “user” JavaBean
 - “Value-binding expression”
- Command button invokes action “login”

```
<html>
<@< taglib uri="http://java.sun.com/jsf/core" prefix="f" %>
<@< taglib uri="http://java.sun.com/jsf/html" prefix="h" %>
</html>
<f:view>
<head>
<title>A Simple JavaServer Faces Application</title>
</head>
<body>
<h:form>
<h3>Please enter your name and password.</h3>
<table>
<tr>
<td>Name:</td>
<td>
<h:inputText value="#{user.name}"/>
</td>
</tr>
<tr>
<td>Password:</td>
<td>
<h:inputSecret value="#{user.password}"/>
</td>
</tr>
</table>
<p>
<h:commandButton value="Login" action="login"/>
...

```



The Controller – faces-config.xml

- Two key components to note in this important file:
 - Navigation rules
 - Bean definitions
- For our example, an outcome of “login” on login.jsp sends the user to welcome.jsp`
- The bean definition maps the “user” bean to the class shown
 - This separates the “view” reference from the “model” implementation
- We also give the class a scope (request), which we’ll discuss in the next chapter

```
<faces-config>
  <navigation-rule>
    <from-view-id>/login.jsp</from-view-id>
    <navigation-case>
      <from-outcome>login</from-outcome>
      <to-view-id>/welcome.jsp</to-view-id>
    </navigation-case>
  </navigation-rule>
  <managed-bean>
    <managed-bean-name>user</managed-bean-name>
    <managed-bean-class>edu.washington.ms531.jsf_samples.UserBean</managed-bean-class>
    <managed-bean-scope>session</managed-bean-scope>
  </managed-bean>
</faces-config>
```

Message Bundles

- Localization (internationalization) is well supported in JSF
- Messages (groups of string localized for a particular language) are loaded using `<f:loadBundle>`
- Then specify locale using either
 - `<f:view locale="en">` in JSF page
 - `<supported-locale>` tag in faces-config.xml
- We won’t spend much time on message bundles, but we’ll install and use them if they’re made available in the text (e.g. the one in this chapter)

Example: Number Quiz

- Slightly more complicated example, esp. in terms of the model
 - Beans contain more complex “business logic”, not just getters/setters
 - Allows model changes without changes to view
 - Note only QuizBean is exposed in faces-config.xml
- Message bundles are easy to switch out: change the loadBundle line in the JSP page
 - English->German is a view change without affecting model
- Navigation is a little too simple: no way to “end the game” (solution in Ch. 3 example)

Example: Number Quiz

JSF Application Navigation

- Since HTTP is stateless, all navigation must be managed by the developer
 - Must always have reasonable “what to do next” steps
- Static navigation: responses specified in config file
- Dynamic navigation: next navigation step determined programmatically
 - Example in book (p. 69): user validation determines action
- String values are used for result codes
 - Return null to force same page to redisplay

Example: Java Quiz

- Another quiz, this time with more complex navigation
 - See transition diagram on p. 75; key design artifact
 - Allows model changes without changes to view
- Some changes from structure in book
 - Name overlap w/previous chapter
 - Solved with renames, subdirectories, separate packages
- Navigation is still a little cheesy, but it gives you a sense of what's possible

Example: Java Quiz

Standard JSF Tags

- Those two tag libraries do a lot...
 - Core tags manage components, support HTML
 - HTML tags add input, output, command, selection, layout, data, other components
- We'll treat Ch. 4 as a reference, looking at all the samples projects given
 - Easy way to grasp component use is through examples
- We'll leave data tables (Ch. 5) for our database discussion next week

Examples: Several from Ch. 4