Introducing JavaServer Faces
Building Standards Based Web Applications

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Agenda

- JSF Overview
- Patterns & Architecture of JSF
- JSF Request/Response Lifecycle
- Components
- Validation & Conversion
- Events & Listeners
- Renderers
- Example
JSF Overview

- What Is JSF?
- Goals of JSF
What Is JSF?

- Standard Web Application Framework
  - Defines the Programming Model
  - Reusable Components
  - Builds HTML from Components
  - Validation & Conversion
  - Component Tree
Goals of JSF

- Ease/Simplify Development
- Support from/by tools
- Events easily tied to server side code
- Ease of extension
- Manage UI state
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Patterns & Architecture of JSF

- Model-View-Controller
- Factory Based
- Composite Component Tree
- Server Side Events
Classic MVC

- Login
  - Panel
  - Action
  - DAO
Classic MVC

- View, Model & Controller Loosely coupled
- View responds by invoking Controller
- Controller responds by updating Model
- Model responds by posting events
- Other Controllers & View Observe events
No Dice on the Web

- Browsers don’t listen to server events
- What objects would observe models?
- So what to do to get the benefits?
Enter JSF Web MVC
JSF Provides Web MVC

- Controller
  - FacesServlet
  - LifeCycle
  - Application
  - NavaigationHandler
  - ActionListener
  - Conversion and Validation
JSF Provides Web MVC

- **View**
  - RenderKit
  - Renderers

- **Model**
  - JavaBeans
  - EJB’s

- **Extension Points**
  - View & Controller are extensible
JSF & J2EE Patterns
Factory Based

- FactoryFinder
  - A factory for factories
  - Deploy time configurable

- Factories
  - Application
  - FacesContext
  - Lifecycle
  - RenderKit
Factory Configuration

- Implementation Provided Defaults
- Easily Overridden
  - Configuration files
  - Full implementation
  - Extend & Delegate
Composite Component Tree

- Client view is simple
  - Whole tree looks like one
- Implementation
  - Simplified
Server Side Events

- Events are cued & consumed server side
  - Typically from user actions (button clicks *etc.*)
  - Possible to add programatically

- Observer Pattern
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JSF Request/Response Lifecycle

- Restore View
- Apply Request Values
- Process Validations
- Update Model Values
- Invoke Application
- Render Response
Restore View

1. Request /faces/index.jsp
2. Check if index.jsp exists?
   - Yes: Deserialize
   - No: Create
     - Set root
3. Check if view found?
   - Yes: Apply Request Values
   - No: Render View
Apply Request Values
Process Validations

Apply Request Values

validate()

index.jsp

errors?

yes

Render

no

Update Model
Update Model Values

Process Validations

index.jsp

#{index.a}
#{index.b}
#{index.c}

Index

a: String
b: String
c: String

Invoke Application

errors?

yes

no

Render
Invoke Application
Render Response
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UIComponent

- Hub of the framework
- Typically Delegate
  - Rendering
  - Validating
  - Converting
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Conversion

- Process Strings to Objects and back
  - Process Validations
  - Apply Request Values
- Request
  - Convert String to Object
- Response
  - Convert Object to String
Conversion - Request
Conversion - Response
Validation

- Semantic Validation
  - Is the value in the right range?
  - Is the value the proper length?
  - Are required values set?

- Extensible
  - Method binding
  - Implement an interface
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Events & Listeners

- **Server Side**
  - Posted by decoding of UICommands
  - Other processing
- **Listened to by your classes**
- **Augmented by** `actionListener` method bindings
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Renders

- Builds the output for the client
  - Easy to replace with your own implementation
  - Customizable
  - Overridable
Rendering

- Creates client side view of component tree
- Managed by the component
  - Most cases delegated to renderers
- Responsible for decoding client response
  - Take request parameters and put them into the correct component
Rendering
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