Ajax in Java Applications v5.0

Course Summary

Description

This course guides Java developers through the sometimes-bewildering array of approaches to adding Ajax functionality into their web applications. We analyze the challenges of supporting Ajax from the server side, going beyond simple Ajax request-handling strategies to consider goals such as:

- Adhering to the model/view/controller pattern
- Minimizing duplication of business and presentation logic
- Providing Ajax code transparent access to the application's domain model
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Reuse mechanisms such as JSP tag files and JSF facelets are also considered.

We then look at two of the dominant forms of Ajax framework: the RMI approach, and JSF component libraries. For each class of tool we investigate two popular options -- DWR and jabsorb; RichFaces and Trinidad -- and use that comparison to discover the broader architectural patterns of that approach.

Students will complete the course ready to make intelligent choices of Ajax tooling for their applications, and to start working with their chosen framework.

Objectives

At the end of this course, students will be able to:

- Identify architectural and design challenges inherent in the use of Ajax for Java applications.
- Define a request-handling path that best addresses the needs of a given Java web application.
- Manage script content and bind scripts to graphical widgets using JSP.
- Use JSP tag files to consolidate presentation chunks such that they can be shared between pages and Ajax responses.
- Process and generate various Ajax wire formats, including text, HTML fragments, XML, and JSON, both client-side and server-side.
- Understand the impact of Ajax processing on session management and security.
- Use RMI frameworks including DWR and jabsorb to provide direct connectivity to Java domain and/or service classes.
- Use JSF component libraries including RichFaces and Trinidad to model Ajax functionality as part of the usual JSF UI model and processing lifecycle.

Topics

- Ajax Strategies
- Ajax Custom Tags
- Handling Requests
- RMI Frameworks
- Introduction to JavaServer Faces
- Facelets
- JSF Component Libraries
- The State of the Art
- Appendix A. Learning Resources

Prerequisites

An understanding of the Ajax programming model is required. Students should also have significant Java programming experience and basic servlets and JSP programming experience. JSF experience will be helpful for the final unit, but is not required.

Duration

Two days

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Course Outline

I. Ajax Strategies
- A. The Simplest Solution
- B. Issues with Ajax Processing
- C. Model/View/Controller for Ajax
- D. Rendering Ajax Responses
- E. RMI Frameworks
- F. Ajax/JSF Frameworks

II. Ajax Custom Tags
- A. JSP Custom Tags
- B. Tag Files
- C. Encapsulating UI Fragments
- D. Encapsulating Scripts
- E. Delivering Scripts Once
- F. Generating Unique Scripts
- G. Binding Scripts to Widgets
- H. Rendering Ajax Responses with JSP

III. Handling Requests
- A. Ajax-Only Servlets
- B. Multi-Purpose Servlets
- C. Front Controllers
- D. Parsing Ajax Wire Formats
- E. Producing Ajax Wire Formats
- F. Session Management and Security
- G. Finding Domain Objects
- H. Impacts of Ajax on Page Processing

IV. RMI Frameworks
- A. Java Objects in JavaScript
- B. RMI for Ajax
- C. Direct Web Remoting
- D. jabsorb
- E. Serialization Issues
- F. Serialization vs. Remote Invocation
- G. Creating Objects on the Client Side
- H. Ajax RMI vs. Web Services
- I. Security Issues

V. Introduction to JavaServer Faces
- A. MVC and Ajax
- B. JavaServer Faces
- C. UI Components
- D. The JSF Lifecycle
- E. What JSF Does for Ajax

VI. Facelets
- A. Issues with JSP and JSF
- B. JSP Custom Tags and JSF
- C. Facelets

VII. JSF Component Libraries
- A. Ajax Component Libraries
- B. RichFaces
- C. The Ajax4jsf Model
- D. Trinidad
- E. Partial Page Rendering
- F. Customizing Client-Side Logic
- G. Ajax-Aware Widgets
- H. Polling and Pushing
- I. JSF and User Events

VIII. The State of the Art
- A. Comparison of Ajax Strategies
- B. Metrics: Code Efficiency
- C. Metrics: Runtime Efficiency
- D. Intangibles: Completeness and Correctness
- E. Intangibles: Ease of Development
- F. Whither Hence?

IX. Appendix A. Learning Resources

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