

This intensive, hands-on, four-day course emphasizes becoming productive quickly as a Java™ AJAX developer. It starts with an introduction to using JavaScript™ and XMLHttpRequest. It includes in-depth coverage of programming with AJAX to send and retrieve data to and from a server, updating a Web page with JavaScript, and using CSS to modify the look of a Web page. The course also includes detailed coverage of how to handle AJAX requests using Servlets/JSP and Java Web applications. Generation of HTML, XML and JSON from Java, as well as the use of various other server-side AJAX techniques are covered. In addition, the course provides extensive coverage on using frameworks - both client side JavaScript and server side Java - to support the complex programming that AJAX requires.

Course Objectives:

- Understand the principles of interactive Web applications and how AJAX is used to create them.
- Understand how XMLHttpRequest works, and use it with JavaScript to update a Web page.
- Use Servlets/JSP to handle AJAX requests.
- Be familiar with AJAX technologies and frameworks such as Prototype, script.aculo.us, Dojo, JSON libraries, SWF (Direct Web Remoting), and GWT (Google Web Toolkit).
- Understand the basics of CSS and use it with AJAX to dynamically change the Web page look.
- Understand and use JSON (JavaScript Object Notation).
- Use JavaScript with DOM and AJAX to manipulate the structure of a Web page.
- Use AJAX with HTML, JSON, or XML on both the client-side and the server-side (Java).
- Use DWR (Direct Web Remoting) to invoke server-side Java from the browser.
- Use AJAX with JSF.
- Understand issues with using AJAX technology.

Audience: Web developers using AJAX and Java developers who need to work with AJAX-based Web applications.

Prerequisites: Basic knowledge of HTML and JavaScript as well as practical Java and Servlet/JSP programming skills for the Java material.

Number of Days: 4 days

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| <p>1. Ajax Overview
 Rich Internet Applications
 What are Rich Internet Applications?
 RIA Technologies
 Ajax Introduction
 What is Ajax?
 The Ajax Difference
 Ajax, JavaScript, DHTML, and More
 XMLHttpRequest
 How Ajax Works
 Overview of Ajax Technologies</p> | <p>Java Script Introduction
 What is JavaScript
 Exploring JavaScript
 JavaScript Variables
 JavaScript – Writing to the Web Page
 JavaScript PopUp Boxes
 JavaScript Functions
 External JavaScript Files
 Functions as Data
 Standard JavaScript Functions
 Accessing and Modifying HTML
 Elements</p> |
| <p>2. JavaScript Basics</p> | |

- A More Complex HTML Page
- Accessing Elements via the document Object
- The innerHTML Property
- 3. XMLHttpRequest**
- XMLHttpRequest Basics
- More about XMLHttpRequest
- Creating an XMLHttpRequest Object
- Submitting a Request
- XMLHttpRequest Properties
- Asynchronous Request
- Handling an Asynchronous Response
- Submitting a Request
- XMLHttpRequest Properties
- Asynchronous Request
- Handling an Asynchronous Response
- The readyState Property
- onreadystatechange Event Handler
- XMLHttpRequest Methods
- 4. Servlets and JSP with Ajax**
- Overview of Servlets
- Java EE and Web Applications
- Simple Web-centric Architecture
- Java EE Web Applications
- Web Application Structure
- Using Servlets
- A Simple HTTP Servlet
- How a Servlet Works
- The Web Archive (war) File
- Deploying Web Applications
- Servlets and Ajax
- Accessing the Servlet Using Ajax
- A Servlet Handling a Post Request
- Overview of JavaServer Pages (JSP)
- What is a JSP?
- A Very Simple JSP – simple.jsp
- JSPs Look Like HTML
- JSP Expressions
- JSPs are Really Servlets
- Lifecycle of a JSP
- Object Buckets or Scopes
- Predefined JSP Variables – Implicit Objects
- Working with <jsp:useBean>
- More <jsp:useBean>
- How a Servlet Works With a JSP
- Issues with JSP
- Custom Tags
- Custom Tags and Tag Libraries
- The JSTL
- taglib Directive in JSP
- A Servlet and JSP Cooperating
- 5. More JavaScript and Ajax**
- Browser Events
- Event Based programming
- Event Handlers
- Defined Browser Events
- Defined Events
- Form Validation
- onload and onunload Events
- Using Ajax and Events
- JavaScript Objects and Arrays
- JavaScript Objects
- Creating JavaScript Objects
- Working with Objects and Functions
- Working with Object Properties
- Arrays in JavaScript
- Working with Arrays
- Array methods
- Objects as Arrays
- Classes in JavaScript
- JavaScript Constructors
- The new Operator
- More on Constructors
- The Object Class
- The prototype Property
- Properties of the Prototype
- A More Complete Class
- Modules and Namespaces
- Utility Modules
- 6. Client Side Frameworks**
- Framework Overview
- No Need to Reinvent the Wheel
- Capabilities of Client Side JavaScript Libraries
- General Library Capabilities
- Some Client Side JavaScript Libraries
- Prototype Overview
- About Prototype
- Utility methods and DOM Extensions
- Utility methods of Element Class
- The \$() Utility Function

- Using \$ and the DOM Extensions
- Prototype Ajax Support
- Ajax.Request
- Ajax.Request – Additional Options
- Ajax.Updater
- Other Prototype Capabilities
- Much More Capability
- script.aculo.us Overview
- Using script.aculo.us
- The Scriptaculous Autocompleter
- Other Frameworks and Libraries
- Some Well Known Frameworks
- Dojo Functionality
- dojo.xhr Functions
- Using dojo.xhrGet()
- Dojo.xhrGet Error Handling
- Some Issues with Dojo
- Yahoo User Interface Toolkit (YUI)
- The YUI Dom Class
- YUI and Ajax
- TabView and TreeView
- Rich Text Editor and Calendar Control
- Other YUI Capabilities
- The Google Ajax Search API
- Google Search API Code
- Google Search Page Display
- Much More Capability
- Google Maps API
- Maps API Display
- Additional Google Maps API Capability

7. Cascading Style Sheets

- Issues with Formatting in HTML
- Cascading Style Sheets (CSS)
- Declaring Style Information
- Style Sheets
- Using Style Sheets
- Resulting Display
- The class Selector
- Descendant Selectors
- ID Selectors
- Display and Visibility Style Properties
- Other Style Properties
- Scripting Styles
- Scripting Classes
- The ‘Cascading’ in CSS

8. JSON (JavaScript Object Notation)

- What is JSON
- Review of JavaScript Literals
- Arrays and More Complex Objects
- JSON Details
- Creating JSON Strings in JavaScript
- Parsing JSON Strings in JavaScript
- Parsing Strings with JSON.parse()
- JSON on the Server
- Creating JSON Text on the Server
- JSONObject and JSON
- JSONArray
- Creating JSON Text from POJOs
- Creating JSON Text from Collections
- Dealing with Dates
- Custom Date Serialization
- JSONSerializer
- JSONStringer
- Other json-lib Capabilities
- Autocomplete Example Using JSON
- An Input Field Generating Ajax Request
- Producing JSON in a Servlet
- JavaScript Code Constructing Suggestions
- Accessing the JSON Data We Want
- JavaScript Code Constructing the Suggestions
- Autocomplete at Work
- Other JSON Tools
- The JSON Universe

9. XML and Ajax

- XML Overview
- What is XML?
- The Underlying Theme of XML
- JavaTunes Purchase order Document – Body
- The Document Body and Elements
- Attributes
- Working with XML
- Working with XML and Ajax
- Accessing XML with Ajax
- Working with XML Documents
- JavaTunes Purchase Order Document
- JavaTunes Order as a Dom Tree
- More About the W3C DOM
- Traversing a Document with JavaScript
- Getting Node Information
- Finding Nodes in a Document

White Space Handling and Other Issues
 Creating XML Documents on the Server
 Producing XML with a Servlet and JSP
 The JSP Generating the XML
 Autocomplete Example Using XML
 An Input Field Generating Ajax Request
 XML Document from Servlet/JSP
 JavaScript Code Constructing the
 Suggestions

Accessing the XML Nodes We Want
 Using the Suggestions
 Autocomplete at Work
 XML Versus JSON
 XML and JSON for Data Interchange

10. DWR (Direct Web Remoting) and Other Technologies

DWR Overview
 What is DWR?
 How DWR Works
 Getting Started with DWR
 web.xml Configuration for SWR
 dwr.xml Configuration File

Running the Test Page - <webapp>/dwr
 Working with DWR
 Including the DWR JavaScript Code
 Using the SWR Proxies
 Functions with Java Object Arguments
 DWR Options
 Reverse Ajax
 Other Technologies

JSON-RPC
 Using JSON-RPC-Java
 Google Web Toolkit (GWT)
 GWT Architecture
 Hello World with GWT
 The Generated Application
 More About GWT
 Pros/Cons of GWT

11. Ajax and JSF

JSF Overview
 JSF Purpose and Goals
 JSF API
 Using JSF
 JSF as MVC
 JSF Views

Managed Beans as JSF Model
 Managed Beans as JSF Controller
 JSF Controller Components
 Architecture Overview
 faces-config.xml Details
 Your First JSF Application
 Configuring FacesServlet in web.xml
 JSF Controller

Writing a Managed Bean
 A Simple Managed Bean
 faces-config.xml <managed-bean>
 Examining the Logon Form
 Linking Input Fields to Bean Properties
 Submitting the Form

Method Binding Expressions
 Dynamic Navigation Rule
 Creating / Deploying a JSF Application
 Ajax4jsf

Using Ajax with JSF
 Ajax4jsf
 Ajax4jsf Component Structure
 How the Ajax Filter Works
 Ajax4jsf Request Processing Flow
 Ajax4jsf Action Components
 Ajax4jsf Container Components

RichFaces
 RichFaces Overview
 RichFaces Suggestionbox Component
 The SearchBean Managed Bean
 RichFaces Suggestionbox Display

12. Design and Best Practices

JavaScript Best Practices
 JavaScript is a Key Ajax Technology
 Object-Oriented Modular JavaScript
 Dealing with Browsers
 Separate Content, Behavior, &
 Presentation
 JavaScript Tips and Techniques
 Don't Reinvent the Wheel
 Ajax Design
 Ajax is Still Evolving and Maturing
 Basic Ajax Design Principles and Patterns
 Basic Ajax Design Patterns
 Use Ajax Where Appropriate
 Network Usage Considerations

Ajax and the Back Button – The Problem

Ajax and the Back Button – Solutions

User Interface Design Considerations

Other Ajax Design Considerations

Ajax Security Ideas

General Security Issues for Ajax

Basic Security Guidelines

Scripting Vulnerabilities – Malicious Code

The Dangers of Code Injection

XSS – Same Origin Policy

Same Origin Policy – The Good and the Bad

Preventing Malicious Content

JSON Issues