

Ajax (Asynchronous JavaScript™ and XML) is a browser-based technology for creating highly interactive Web applications by updating parts of a Web page with new data without reloading the whole page. There is no formal definition of Ajax, but using XMLHttpRequest/JavaScript has become the dominant Ajax technology. The course starts with an introduction to using XMLHttpRequest and a brief introduction to JavaScript fundamentals. It includes in-depth coverage of programming with Ajax to send/retrieve data to/from a server, updating a Web page with JavaScript, and using CSS to modify the look of a Web page. There is also detailed coverage of how to handle Ajax requests using Servlets/JSP and Java Web applications and how to use frameworks, both client side JavaScript and server side Java. This course is hands on with labs to reinforce all the important concepts. It will enable you to build working Ajax applications, and give you an understanding of the important concepts and technology in a very short time.

Audience: Web developers using Ajax (about 2/3 of the course does not require Java knowledge) and Java developers who need to work with Ajax-based Web applications.

Prerequisites: Basic knowledge of HTML and JavaScript and practical Java and Servlet/JSP programming experience.

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>2. JavaScript Basics
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>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</p> <p>4. Servlets and JSP with Ajax
Overview of Servlets
Java EE and Web Applications
Simple Web-centric Architecture
Java EE Web Applications</p> | <p>A More Complex HTML Page
Accessing Elements via the document
Object
The innerHTML Property</p> |
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- 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

12.

Ajax4jsf Action Components
Ajax4jsf Container Components
RichFaces
RichFaces Overview
RichFaces Suggestionbox Component
The SearchBean Managed Bean
RichFaces Suggestionbox Display
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