

442: XML and Web Services (5 days)

Course Description...

Web Services represent a groundbreaking evolution in distributed computing. The concepts are not altogether new, but the application of them, and the unanimous acceptance of core standards like HTTP, XML, SOAP, WSDL, and UDDI, has paved the way for XML Web Services and service-oriented architecture.

This five day course first introduces Java developers to XML and then to Web Services. Developers are introduced to the basics of XML and then to the JAXP APIs for working with XML. Student are then introduced to the core standards that enable Web Services, and provides them hands-on experience with implementations of the Java XML and Web Service APIs including JAXP, JAXB, SAAJ, JAX-WS/RPC, WSEE, and XWSS.

We will look at the current state of the art of Web services, what works and what doesn't work, and also at newer standards, and how they fit into the Web services picture. Web services are still evolving rapidly, and this course will give you a thorough understanding of the current Web services architecture, and the technologies that support Web services including:

- **SOAP/SAAJ** – Simple Object Access Protocol - A remote invocation (RPC) and messaging mechanism.
- **WSDL** – Web services Description Language – An XML language that describes the interface and semantics of a Web service.
- **UDDI** – Universal Description, Discovery, and Integration – A standard for describing, publishing and finding Web services.
- **JAX-WS/RPC** – Accessing Web services using Java
- **REST**- Representational State Transfer - A style of implementing web services that is gaining increasing acceptance and use
- **WS-I** –Web Services Interoperability
- **WS Security/XWSS** – Web Services Security

Who Should Attend...

Java developers and architects.

Prerequisites...

Students should have 1-2 years experience with J2EE.

Learning Objectives...

- Understand and work with XML applications and components.
- Understand and intelligently discuss Web Services and the core technologies involved
- Develop and deploy real-world J2EE Web Services
- Expose existing Java components as Web Services
- Write Java components that access remote Web Services hosted by a third party
- Read and understand a WSDL document
- Parse, process, and respond to a SOAP message
- Understand what REST is and how it fits in the web services world



- Effectively use the tools and APIs provided by the JWS DP
- Understand and work with the standards and technologies encompassed by WS-Security

Hands-on Approach:

This course is hands on, and students will actually build and deploy a Web service during the course. This course consists of

- Over 10 individual exercises, all tied together
- Instructor demonstrations
- Class discussion
- Daily reviews

Materials

Student Materials include a Student Guide complete with a detailed written lab books, as well as our workshop-specific Student Developer Resource CD, complete with workshop labs and solutions; workshop software, pertinent javadocs, technical education papers, specifications and freeware.

Course Outline...

Session: XML Overview

- XML Mechanics
- [Lab - Working with XML](#)

Session: JAXP and SAX Parsing

- JAXP and SAX (Part 1)
- [Lab - SAX Parsing Using JAXP](#)
- JAXP and SAX (Part 2)
- [Lab - SAX Content Handling](#)

Session: JAXP and DOM Parsing

- JAXP and DOM (Part 1)
- [Lab - DOM Parsing Using JAXP](#)
- JAXP and DOM (Part 2)
- [Lab - DOM Processing](#)

Session: Rendering - JAXP and Transformations

- XSLT Transformations in Java
- [Lab - Working With XSLT Processors](#)

Session: Path to Useful Web Services

- Services via the Web
- Web Services Overview
- [Exercise: Web Services in Action](#)
- Web Services, Java, and J2EE
- Web Services Quickstart
- [Exercise: Implementing a Web Service](#)
- [Exercise: Debugging Web Services](#)

Session: Foundation for Web Services

- XML: Basics, Namespaces and Schemas
- [Exercise: Namespaces and Schemas](#)
- XML in Java: JAXP and JAXB



- [Exercise: Using JAXB](#)

Session: Binding: SOAP

- SOAP Overview
- [Exercise: SOAP in Action](#)
- SOAP in Detail
- [Exercise: Creating a SOAP Message](#)
- [Exercise: Accessing a Service with a Servlet](#)

Session: Description: WSDL

- WSDL Overview
- [Exercise: WSDL in Action](#)

Session: Web Services in Java: JAX-WS/RPC

- JAX-WS/RPC Overview
- Working with JAX-WS/RPC
- [Exercise: WSDL-generated service](#)
- [Exercise: WSDL-generated client](#)

Session: REST in Java

- REST Overview
- Principles and Best Practices with REST Web Services
- [Exercise: Publishing and Consuming REST Web Services in Java](#)

Session: Web Services in J2EE - WSEE

- Implementing Enterprise Web Services

Session: Finding Web Services

- UDDI
- [Exercise: Discovery in Action](#)

Session: Security - WS-Security and Defenses

- Securing Untrusted Input
- [Exercise: Insecure Web Services](#)
- XML Signature and Encryption
- Securing Web Services: WS-Security