

TT7340: Mastering J2EE, SOA and Web Services (5 days)

This five day course first introduces Java developers to J2EE and then to Service-Oriented Architectures (SOA) and Web Services. SOA and 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.

Developers are introduced to the J2EE framework, its components (servlets, JSPs, and EJBs), packaging, and deployment. 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.

What You'll Learn

Today's development environments are increasingly dominated by sophisticated tooling that makes the initial development of web services less arduous. The production-level implementation, deployment, and maintenance of web services are far more complex and demanding. This course is focused on providing an understanding of the fundamental technologies used in web services. This understanding is critical to being able to diagnose, troubleshoot, tune, and perform other lifecycle activities.

After successfully completing this course, students will be able to:

- Understand and work with J2EE applications and components.
- Understand and apply the basic concepts of SOA to the identification and design of web services
- 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 the concepts behind REST and implement a REST-based web service
- Understand and work with the standards and technologies encompassed by WS-Security

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

Course Overview: Hands-On Work

Throughout the course, students will be led through a series of progressively advanced topics, where each topic consists of lecture, group discussion, comprehensive hands-on lab exercises, and lab review.

This workshop is about 50% hands-on lab and 50% lecture. Multiple detailed lab exercises are laced throughout the course, designed to reinforce fundamental skills and concepts learned in the lessons. Because these lessons, labs and projects are presented in a building block fashion, students will gain a solid understanding of not only the core concepts, but also how all the pieces fit together in a complete application. At the end of each lesson, developers will be tested with a set of review

questions to ensure that he/she has fully understands that topic.

Audience & Pre-requisites: Who Should Attend

This is an **intermediate** level J2EE and web services training course, designed for Java developers and architects who need to identify, design, and implement web services within J2EE. We will explore and apply the terminology, the specification, the processes and technologies specific to both J2EE and web services.

Students should have 1-2 years of working knowledge with Java and should already be familiar with XML.

Related Courses – Suggested Options

Take Before: Students should have basic understanding and working knowledge in the following topics, or attend these courses as a pre-requisite:

- **TT2101 Core Java Programming**
- **TT4300 Core XML (XML, Schema, XPath, and XSLT)**

Take Instead: We offer other courses that provide different levels of knowledge or that blend web services development with other pertinent topics:

- If your team needs high level web services training, the **TT7005 Understanding SOA and Web Services** course may be more appropriate.
- For those members of your team that are focusing on using SOA and Web Services, please consider **TT7150 Mastering Service-Oriented Architecture (SOA) and Web Services**.
- If you need in-depth web services training but have minimal working knowledge with XML, consider: **TT7360 Mastering XML, SOA, and Web Services**.
- If you need in-depth web services training and already have working knowledge with J2EE and XML, consider: **TT7300 Core SOA and Web Services for J2EE Developers**.

Take After:

- If you need in-depth training in web services security, consider: **TT7800 Securing Web Services in J2EE**.

Trivera Technologies offers a variety of advanced Java and J2EE courses for those members of your team that will be working with technologies such as Spring, Hibernate, JSF, SOA, EJB 3.0, and security. They may want consider taking one or more of these courses as a follow-on to this course:

- Service-Oriented Analysis and Design
- Securing J2EE Web Applications
- Mastering JSF
- Transitioning to EJB 3.0
- Mastering the Spring Framework
- Applying Hibernate to Persistence in Java
- Integrating Hibernate and Spring
- Advanced J2EE Design Patterns
- Integrating J2EE and AJAX
- Advanced J2EE Topics

Delivery Environment

This course can be delivered using Eclipse and the Web Tools Project, MyEclipse, or RAD.

Student Materials and Setup Support

Student Materials include a comprehensive Student Guide complete with detailed course notes, diagrams and a copy of the presentation. Step-by-step lab instructions are clearly illustrated for maximum learning. Trivera Technologies' students also receive a copy of workshop labs and solutions; non-restricted workshop software, pertinent JavaDocs, technical education papers, specifications and freeware at the conclusion of the course.

We're pleased to provide a detailed set up guide for all private or on-site courses, and as much assistance as you require to prepare your students or classroom for the course. Our support personnel and instructors can be contacted for any advice you may require to prepare your classroom and/or students for attendance.

Optional Pre-Testing & Assessment

We work with you to ensure that your resources are well spent. Through our basic pre-testing, we ensure your team is up to the challenges that this course offers. We will work with you to come up with the best solution to ensure your needs are met, whether we customize the material, or devise a different educational path to prepare for this course.

Course Details

Need more details? Please note that a more detailed course outline, including list of lab exercises, is available. This course may also be easily tailored to best suit your needs. Please contact us at Training@triveratech.com for info.

Need courseware? This course is *wholly-owned* by our firm, fully customizable, and also available for license with complete support.

J2EE Application Architecture

- Technical Overview of J2EE
- J2EE Application Architectures (Web based)
- IDE Introduction

Web Applications

- Understanding Web Applications
- Configuring Web Applications
- Exploring Web Applications

Writing HTTP Servlets

- Introduction to Servlets
- Hello World Servlet
- Processing Input Data
- Form Processing
- Maintaining Client State - Sessions
- Creating a Hit Counter

Writing JSP Pages

- Introduction to JSP: Life-Cycle, basic JSP syntax, implicit objects
- User Registration Form, Part 1

Database Integration: JDBC and J2EE

- JDBC and Position in J2EE
- Java JDBC Data Access API
- The DAO Pattern
- Setting Up a Datasource in the App Server
- Using the Database from the Web App

Path to Useful Web Services

- SOA via the Web
- Web Services Overview
- Web Services in Action
- Web Services, Java, and J2EE
- Web Services Quickstart
- Implementing a Web Service
- Debugging Web Services

Foundation for Web Services

- XML: Basics, Namespaces and Schemas
- Namespaces and Schemas

- XML in Java: JAXP and JAXB
- Using JAXB

Binding: SOAP

- SOAP Overview
- SOAP in Action
- SOAP in Detail
- SAAJ
- Creating a SOAP Message
- Accessing a Service with a Servlet

Description: WSDL

- WSDL Overview
- WSDL in Action

Web Services in Java: JAX-WS/RPC

- JAX-WS/RPC Overview
- Working with JAX-WS/RPC
- WSDL-generated service
- WSDL-generated client

Web Services in J2EE - WSEE

- Implementing Enterprise Web Services

REST in Java

- REST Overview
- Principles and Best Practices with REST Web Services
- Publishing and Consuming REST Web Services in Java

Finding Web Services

- UDDI
- Discovery in Action

Security - WS-Security and Defenses

- Securing Untrusted Input
- Insecure Web Services
- XML Signature and Encryption
- Securing Web Services: WS-Security

Appendices:

Introduction to SOA

- SOA Overview
- Thinking Services
- Enabling Infrastructure

Working with SOA

- Layering of Services
- Legacy Functions and Resources
- Defining and Creating New Services
- Implementing SOA

Please note that a more detailed course outline, including exercises, is available.

Why Choose This Course?

- Each lesson has performance driven objectives that ensure students will learn technologies and hands-on skills core to essential web services development – nothing more, nothing less. Progressive labs are designed in such a way that students get a firm grasp on fundamental skills while they work toward building a complete web services application. All lessons have clear objectives, are fundamental to learning core programming practices, and are reinforced by hands-on code labs and solid practical examples.
- A detailed Work Book accompanies this course to guide students through hands-on exercises and projects. Formal written exercises, tutorials and code solutions ensure hands-on work is clear, concise and useful, both during class and afterwards. Solution code is presented in an easy to use self-study format for future use and review.
- Trivera's instructors and course authors are also skilled mentors, J2EE & web services developers and architects. We believe that learning, using and maintaining solid software execution and delivery methods are as important as gaining sharp coding skills. Best Practices for software development and execution, beyond technical coding skills, are enforced throughout all of our courses.
- Our team was selected to write the online **Web Services Tutorial Series for IBM developerWorks®** (www.ibm.com). These are the same instructors who train our classes and author the courseware. Most of our trainers/consultants have also authored additional articles on web services, J2EE and advanced Java topics, and are recognized speakers and presenters on the industry technical seminar circuit.

For Additional Information

All courses can be brought onsite for a private presentation, customized to suit your unique requirements or goals. Our team of development experts, architects and mentors are also available to help your team design and deliver your critical development project, while transferring critical skills to your team through our unique **Collaborative Mentoring Programs** and educational services. Work with our experts to set your project off on the right path with our **Project JumpStart Programs**, or have our expert architectural team assess your designs, troubleshoot your work, or make suggestions for time and cost-savings improvements with our **Project Assessment and/or Project Rescue Programs**.

Buy these books! Let us take the risk out of your classroom delivery! All materials are also available for corporate license with complete instructor support and free corporate branding. We guarantee our pricing and service. Samples of our course materials, as well as live client references for all of our services are available upon request.

For more information about our services, or to receive a free needs analysis or education roadmap, please contact us at Training@triveratech.com or call 609-953-1515.