

## TT6242: Mastering Struts 2.0 Developer's Workshop (5 days)

**Duration:** 5 days

**Skill Level:** Intermediate to Advanced

**Focus:** Struts 2.0 application development

**Audience:** Experienced J2EE developers

**Format:** Extensive hands-on programming labs, expert lecture combined with open discussions and high-level demonstrations and dynamic group exercises.

**Language / Tools:** J2EE with Struts 2 delivered with compliant IDEs: IBM Rational Application Developer (RAD); Oracle JDeveloper, Eclipse / Ganymede, Eclipse WTP, MyEclipse and more. Application server options include: IBM WebSphere, JBoss, Apache TomCat and others. This course is also offered for Struts 1.x (TT6240).

**Delivery Format:** Available for onsite private classroom presentation, or live online / virtual presentation

**Customizable:** Yes



Created in collaboration with several leading J2EE and Struts authors and industry experts, Trivera Technologies **Mastering Struts 2.0 Developer's Workshop** is a lab-intensive, hands-on programming course that will provide students with the skills required to design and build scalable, secure, maintainable web applications - leveraging our team's extensive experience in the delivery of scalable enterprise applications with complex web interfaces based on J2EE technologies. This course not only provides essential Struts 2.0 knowledge that can be used as the foundation for developing production-quality web applications. It covers an entire spectrum of advanced topics including zero configuration, testing, using Tiles to enhance the view, and design practices.

### ► Course Overview

**Struts 2.0** is the second generation of the open source, Model-View-Controller (MVC) framework developed by The Apache Software Foundation as part of its Jakarta project. Struts 2.0 is built on top of a variety of components and technologies to provide tremendous flexibility and address many lifecycle issues. After reading the first J2EE Blueprints from Sun with their explanation of MVC and how to accomplish it with custom tags, Servlets, and JSP, one can clearly see that Struts 2.0 is a manifestation of Sun's J2EE MVC vision that uses many of the more recent innovations in both Java and J2EE.

Struts 2.0 addresses many major issues by using vanilla POJOs, filters, and other components to build web systems. It solves the problem of controller complexity by removing the workflow logic from the code, and directing workflow in an XML configuration file. Struts 2.0 improves on the limited form support in JSP (and first generation the Struts 1.x framework) by adding numerous capabilities to form processing including easy validation, easy error display, and the refilling of form input on retries from a user's previous entries. It minimizes the complexity of JSP pages by supplying a very extensive and flexible set of custom tag libraries for many of the standard operations needed in JSP pages.

This course will get you up to speed with Struts 2.0 in a very short time. It includes all the important concepts, and hands on labs that will have you building working Struts 2.0 applications in no time flat.

Struts 2.0 is powerful, very flexible, and easily extended. For example, there are modules on working with Struts 2.0 using minimal configuration; on various options for extending Struts 2, including with Tiles; on how to use JUnit for testing Struts 2.0

components; and on various advanced topics such as best practices and performance.

### ► Course Objectives: What You'll Learn

Students who attend the **Mastering Struts 2.0 Developers Workshop** will leave the course armed with a full set of skills to design, implement, deploy, and troubleshoot Struts 2.0 web applications. This course provides coverage of all the standard components, filters, renderers, converters, and validators, along with advice on how to use them to create solid applications. Working in a hands-on environment students will explore and use complex user interface layouts, prototyping, and integrating templates with back-end model objects.

Working in a dynamic, interactive discussion and hands-on programming environment, developers will:

- Understand the problems with vanilla servlets/JSP, and the motivation for the general Struts framework
- Understand MVC and the Struts architecture
- Understand the lessons learned from Struts 1.x and how they influenced Struts 2.0
- Understand the Struts FilterDispatcher, actions, and results
- Create & configure applications using Struts 2.0 and either XML configuration files or annotations
- Define, implement, and test ActionSupport and Action classes
- Use Struts for form processing
- Handle errors and debug Struts applications
- Utilize the Struts 2.0 validation framework
- Understand and work with the value stack to bind objects to views and request processing
- Customize data type conversions and validation
- Extend Struts with commonly available or custom plug-ins

- Use Struts using annotations and smart defaults to achieve minimal or zero configuration
- Understand how Struts 2.0 lends itself very nicely to JUnit testing
- Work extensively with OGNL and the value stack
- Further enhance the view portion of Struts using Tiles and the Tiles plugin
- Examine the bigger picture of using Struts 2 constructs within various business patterns and in conjunction with J2EE development practices
- Understand how maximize the leverage of the Struts 2.0 architecture

The course provides a solid foundation in basic terminology and concepts, extended and built upon throughout the engagement. The course then builds on this solid foundation to provide a complete picture of effective Struts 2.0 application development. Processes and best practices are discussed and illustrated through both discussions and group activities.

Attending students will be led through a series of advanced topics comprised of integrated lectures, extensive hands-on lab exercises, group discussions and comprehensive demonstrations. Please see below for additional information about the hands-on lab work.

► **Audience & Pre-requisites: Who Should Attend**

This is an **intermediate to advanced level** Struts training course, designed for experienced J2EE developers that need to further extend their skills in web development and Struts.

Attendees should have an extensive working knowledge in developing J2EE applications.

► **Related Courses – Suggested Learning Path**

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

- **TT2100 Core Java Programming Fundamentals**
- **TT5100 Mastering J2EE Web Applications (Servlets, JSPs, JDBC, Security, etc.)**

**Take Instead:** We offer other courses that provide different levels of knowledge or focus:

- For teams with existing Struts 1.x development experience, please consider **TT6210 Transitioning to Struts 2.0**
- If you need quick into to basic Struts 2.0 coverage please consider our three day subset course: **TT6202 Core Struts 2.0**
- If you already have Struts 2.0 experience, consider: **TT6252 Advanced Struts 2.0 Development**
- If you need both basic J2EE and Struts training, consider: **TT6262 Developing J2EE Web Applications using Servlets/JSPs, Tags, and Struts 2**

**Take After:** We offer a variety of introductory through advanced security, development, project management, engineering,

architecture and design courses. Students may want to consider the following topics as a follow-on to this course.

- Additional advanced J2EE, JEE / Java EE topics
- Java or J2EE Security topics
- Service-Oriented Analysis and Design
- Web Services – Intro through Advanced
- AJAX, XML or other Web Development topics
- Java EE topics: EJB3.0; Spring; Hibernate; Design Patterns & more.
- Architecture & Analysis courses

Please note all development courses may also be offered in other programming languages or tailored to suit your unique requirements. Please contact us for recommended next steps tailored to your longer term education, project or development objectives.

► **Experiential Learning: Hands-On Labs**

This class is “technology-centric”, designed to train attendees in essential Struts 2.0 development skills, coupling the most current, effective techniques with the soundest industry practices.

This workshop is about **50% dynamic lab exercises** and **50% lecture**. 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. Multiple detailed lab exercises are laced throughout the course, designed to reinforce fundamental skills and concepts learned in the lessons. 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.

► **Delivery Environment: Tools to Use**

Although this training is skills-centric, this course can be delivered using a variety of software combinations, including but not limited to: Eclipse / Ganymede, MyEclipse, IBM® WebSphere Rational Application Developer (RAD), Oracle JDeveloper or other IDEs. Application server options include IBM WebSphere, Apache TomCat, JBoss and others. Please inquire for details and options.

Our detailed lab workbooks are complete with software-specific instructions, screen shots and step-by-step tutorials for using the software you select. In most cases, we can easily port our classes to run in the environment of your choosing.

► **Easy & Secure Set Up! LoadNGo™ Instant Classroom Kit**

For course deliveries or virtual presentation using open-source tools, we’ll provide our unique **LoadNGo Instant Classroom Kit**, which enables students to run the entire course off of a DVD that hosts the entire course set up software, labs, and other pertinent useful educational resources, whitepapers and more. You only need to provide the hardware and appropriate O/S, and we’ll do the rest. No installation needed. **Great for secure environments.** Minimum set up burden for your team or firm, with maximum

results for your students.

No matter which set up option or software your firm requires, 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.

► **Student Materials: What You'll Receive**

Our robust course materials include much more than a simple slideshow presentation handout. Student materials include a comprehensive hard-copy course manual, complete with detailed course notes, code samples, diagrams and current reference materials, all directly related to the course at hand, indexed for ease of use. Step-by-step lab instructions and project descriptions are clearly illustrated and commented for maximum learning.

In addition to everything students need for the course, the **LoadNGo Instant Classroom Kit** described above also includes of workshop labs and solutions; non-restricted workshop software, APIs, documentation, technical education papers, and specifications and tutorials pertinent to the training course. Our course kits are designed to serve as an excellent and useful reference set, long after we leave your classroom.

► **Optional Pre / Post-Testing & Skills Assessment**

We work with you to ensure that your resources are well spent. Through our basic course pre-testing and/or post-course assessments, we ensure your team is up to the challenges that this course offers. Our goal is to structure 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.

Please contact us for details about our online pre and post test assessment services, custom managed training plans for one student or your entire organization, or our custom online training program management system for monitoring the courses or progress while skilling your students of all experience levels.

► **Bridging the Gap: Collaborative Mentoring Services**

Our team of technical experts is also available for various project assistance services to help your team apply their newly-learned classroom skills to their real-world project in a meaningful, practical way, right after the training ends.

Our custom **collaborative mentoring programs** integrate with or extend your team's classroom training experience, to help bring these skills into existing (or inherited) legacy projects, into new projects, or to simply keep your students sharp them in between projects. Our programs can be highly involved and closely integrated with your project timelines or group development efforts, or can be less involved, serving simply as an overarching educational framework or 'spot check' to keep your group skills moving forward in between projects or waiting for projects to begin. Please contact us for details about this exciting custom service.

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**Workshop Topics Covered**

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**Need more info?** Please note that a more detailed outline of the course table of contents, lists of lab exercises and project descriptions is available. Please contact us at [Training@triveratech.com](mailto:Training@triveratech.com) for info.

**Need courseware?** This course is fully customizable, and also available for license with complete support for qualified organizations. Please contact [Courseware@triveratech.com](mailto:Courseware@triveratech.com) for details

**Session: Getting Started with Struts 2.0**

- Jakarta Struts Project
- MVC and Struts
- Review Filters, Servlets, JSP and Web Applications
- Struts Architecture
- Struts Components: FilterDispatcher, Interceptors, Actions, and Results

**Session: Your First Struts Application**

- Struts 2.0 components
- Configuring web.xml
- Configuring struts.xml: package, results, exceptions, and actions
- Action implementation
- Adding basic view components
- Review using Custom Tags
- Introducing Struts Tags
- Themes and Templates
- Velocity and Freemarker

**Session: Validation and Interceptors**

- XWork validation framework
- Implementing validation
- Type conversion
- Interceptor role
- Using interceptors

**Session: Localization and I18n**

- Locales
- Formatting Messages
- Resource Bundles
- Internationalization
- Tags
- I18n Interceptor

**Session: Putting It All Together**

- Understanding the Design
- Implementing the Design
- Actions
- Searching
- Prepopulating Forms
- Validating forms
- Showing and Editing Error Messages
- Handling Exceptions
- Add/Edit/Delete Listing

**Session: Advanced Topics**

- Zero Configuration
  - Annotations

- Intelligent Defaults
- Testing in Struts 2.0
- Advanced OGNL
- Working with the Value Stack

- Defining templates
- Using put and insert
- Defining Tile Layouts
- Advanced Tiles
- XML Layout Definitions

**Session: Best Practices**

- Business Patterns Within Struts 2.0
- J2EE Best Practices Within Struts 2.0
- Best Practices for Leveraging the Struts 2.0 Architecture

**Session: Enhancing the View****► Why Work With Trivera Technologies?**

- **We provide a solid J2EE / JEE and struts development foundation.** Students will learn how to develop (and reuse!) essential design skills and concepts properly, using best design practices, grounding them for advanced curriculum. Students will be prepared for designing and implementing real solutions, right after the class ends. Students will learn the importance of developing well-designed enterprise Java applications.
- **Our courses are focused - no "fluff" included.** We offer more than a “laundry list” approach to teaching. All lessons have clear objectives, are fundamental to core Java, JEE or J2EE development and design practices, and are reinforced by hands-on labs and solid practical examples. Each lesson has performance driven objectives that ensure students will learn technologies and skills core to fundamental server-side application design – nothing more, nothing less.
- **Our materials are comprehensive, and current.** Our comprehensive manuals include not only a hard copy of the course presentation, but also detailed reference notes, pertinent diagrams and charts, current lists of suggested online resources and articles, and often technical tutorials or white papers geared to the topics at hand. Our dedicated course development team keeps everything as current as possible with both industry trends and software editions to ensure your team is getting the most current information available.
- **We set you up!** Hands-on courses also include our unique materials for each student, complete with our **LoadNGo Instant Classroom** course set up DVD, software, and a multitude of learning resources that complement the course. Run the course right off the DVD – minimal set up for your company – maximum results for your students.
- **We foster "Learning by Doing".** Progressive labs are designed in such a way that students get a firm grasp on fundamental skills while they work toward designing a complete application. All labs are take-home, and all solution code is presented in an easy to use self-study format for future use and review.
- **True content ownership gives us flexibility & quality above the rest.** These course materials are wholly-owned by our company and fully customizable - at little or no cost- to help you best meet your learning objectives. We have many dedicated experts available worldwide to instruct your team, and can provide services around the globe, either locally or virtually. We work closely with you to produce the most effective events and materials for your team, within your desired timeframe and budget.
- **We have to adhere to higher standards.** As a courseware provider, our content and hands-on lab materials are licensed internationally by dozens of firms, and are therefore subject to very stringent quality requirements. Not only will your organization benefit from our own technical team’s technical expertise, but also the feedback of hundreds of students and trainers using these materials, worldwide, on a regular basis. This unique fact guarantees that our materials are not only robust and interesting, but also technically correct, current and of the highest quality and usability.
- **We bring years of practical, current experience into the classroom and content.** Our instructors and course authors are also skilled mentors, Java, JEE/ JavaEE, J2EE, .Net, Agile, SOA, and web services developers, architects and security-oriented professionals. 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 and discussions. Our team brings this extensive experience into every classroom and engagement.
- **We're skills-centric.** Although our team has extensive experience using a variety of tools and solutions, our core content is “technology-centric”. Our aim is to teach you the best skills and solutions out there – not to sell you software from any particular vendor.
- **We're Java & JEE / J2EE authors and industry speakers.** Our team was selected to write the online *J2EE, EJB, EJB CMP-CMR and Web Services Tutorial Series for IBM developerWorks®* ([www.ibm.com](http://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, EJB< Struts, J2EE and advanced Java topics, and are recognized speakers and presenters on the industry technical seminar circuit. Our team is comprised on several successful published authors. Members of our team have written or contributed to: *Eclipse Kick Start, Mastering Eclipse; Professional Jakarta Struts; Using Java Tools for Extreme Programming; Mastering Resin; Mastering TomCat and others.*
- **Our services are guaranteed.** Whether you’re a stakeholder organizing your firm’s educational services, a student in our live or virtual classroom or a trainer using our materials to educate your own client or team – **Our core mission is to make YOU a success in the classroom.**

► **For Additional Information**

**Need dedicated training?** All courses can be brought onsite for a **private presentation**, customized to suit your unique requirements or goals. Please contact [Training@triveratech.com](mailto:Training@triveratech.com) for course details, Public Schedule dates and locations, and Special Discount Offers.

**Need courseware?** 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. Please contact [Courseware@triveratech.com](mailto:Courseware@triveratech.com) for details.

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