Professional Jakarta Struts
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About the Authors

James Goodwill

James Goodwill is the co-founder and chief technology officer at Virtuas Solutions, LLC, located in Denver, Colorado. With over 10 years of experience, James leads Virtuas’ Senior Internet Architects in the development of cutting-edge tools designed for J2EE e-business acceleration.

In addition to his professional experience, James is a member of the JSP 2.0 Expert Group (JSR-152.) He is the author of the best-selling Java titles Developing Java Servlets, Pure JavaServer Pages, Apache Jakarta Tomcat, and Mastering JSP Custom Tags and Tag Libraries. James is also a regular columnist on the Java community Web site, OnJava.com.

More information about James, his work, and his previous publications can be found at his company’s web site, www.virtuas.com.

Rick Hightower

Rick Hightower (www.rickhightower.com) is a developer who enjoys working with Java, J2EE, Ant, Struts, Web Services and XDoclet. Rick is also the CTO of Trivera Technologies (www.triveratch.com), a global training, mentoring, and consulting company focusing on enterprise development. Rick is a regular contributor to IBM developerWorks and has written more than 10 IBM developerWorks tutorials on subjects ranging from EJB to Web Services to XDoclet to Struts to Custom Tags.

While working at eBlox, Rick and the eBlox team used Struts and J2EE to build two frameworks and an ASP (application service provider) for online ecommerce stores. They started using Struts long before the 1.0 release.

Rick recently helped put together a well-received course for Trivera on Struts that runs on Tomcat 4.x, Resin EE 2.x, IBM WebSphere 5.0 (WSAD), JBoss 3.x, and WebLogic 8.1. When not traveling around the country teaching the Trivera Struts course (our bestseller), speaking at conferences about Struts, or doing Struts consulting and mentoring, Rick enjoys drinking coffee at an all night coffee shop and writing code, writing about Struts and other Java, J2EE and XP topics, and writing about himself in the third person.
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Dedication

To my girls, Christy, Abby, and Emma
—James Goodwill

To my sons, Dante, Ryan, and Richard Jr., and my lovely first-born Whitney Marie.
And, to the memory of Dave Richardson and Lou Souza; mentors and friends
—Rick Hightower
Acknowledgments

I would like to begin this text by thanking the people who made this book what it is today. They are the people who took my words and shaped them into something that I hope will help you use and develop Jakarta Struts applications. Of these people, I would like to especially thank Tim Ryan, and Liz Welch. They both contributed considerably to what I hope is a successful book. I would also like to thank Rick Hightower for his incredible contributions of Chapters 5, 12, 13, and 21. He work is an invaluable addition to this text.

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—James Goodwill

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Thanks to my wife Kiley and kids for sacrificing time with me so I could work on this book. Last but not least, I’d like to thank the Trivera Technologies Team and Kimberly Morello who gave me some schedule flexibility so I could work on this book. Thanks to our clients, where I learned a lot of new Struts tricks while training Struts, and mentoring and consulting on Struts projects. Okay one more: Thanks to the Struts contributors who provided a great framework to build J2EE web applications.

—Rick Hightower
Throughout my experiences in server-side development, I have assembled many applications using many different technology combinations. Of all of these, I am most impressed with the Java server-side technologies, including servlets, EJBs, JSPs, and JSP custom tags.

This text focuses on a particular server-side Java framework, known as the Jakarta Struts project, or simply enough Struts. Struts combines two of the most popular server-side Java technologies—JSPs and servlets—into a server-side implementation of the Model-View-Controller design pattern. It was conceived by Craig McClanahan in May of 2000, and has been under the watchful eye of the Apache Jakarta open source community since that time.

The remarkable thing about the Struts project is its early adoption, which is obviously a testament to both its quality and utility. The Java community, both commercial and private, has really gotten behind Struts. It is currently supported by all of the major application servers including BEA, Sun, Caucho, and of course Apache’s Jakarta-Tomcat. The Tomcat group has even gone so far as to use a Struts application in its most recent 4.0.4 release for managing Web applications hosted by the container.

This book covers everything you need to know about the Struts 1.1 project and its supporting technologies, including JSPs, servlet, Web applications, the Validator framework, the Tiles framework, and the Jakarta-Tomcat JSP/servlet container. We also cover best practices, discuss design issues, and warn of potential roadblocks with each technology. The goal of this text is to provide you with the foundation you need to design, build, and deploy Jakarta Struts applications with all of the Struts 1.1 features and techniques.

As I have stated with most of my book projects, there will be topics that I have not discussed but that are of interest to individual readers. If you run across such an issue or just have a question, please feel free to contact me at books@virtuas.com or Rick Hightower at rick_m_hightower@hotmail.com. In these e-mails, please be sure to place the text "Jakarta-Struts" in the subject line.

Thanks and good luck,

James Goodwill III

The Organization of the Book

The book you are about to begin is formatted as a tutorial describing the Jakarta Struts project. It is divided into 16 distinct chapters, beginning with an introduction of Struts and continuing with discussions about each of the major Struts components:

Chapter 1: Introducing the Jakarta Struts Project and Its Supporting Components lays the groundwork for the complete text. We introduce the Jakarta Struts project and discuss the Model-
Introduction

View-Controller (MVC) design pattern that it's based on. We also define Java Web applications and explain how to construct and use them. In addition, we examine the Jakarta-Tomcat Web application container, the container used for all our examples.

Chapter 2: An Overview of the Java Servlet and JavaServer Pages Architectures contains a JSP and servlet primer. It is aimed at the Java developer who is not yet familiar with these two technologies. These topics are the foundation of Jakarta Struts projects, and you must understand them before continuing with the text.

Chapter 3: Getting Started with Struts is where we first encounter actual Struts code. This chapter covers the step-by-step process of building a Struts application by taking you through the development of a simple Struts application.

Chapter 4: Actions and the ActionServlet begins our first detailed discussions of an individual group of Struts components. In this chapter, we look at four distinct Struts Controller components: the ActionServlet class, the Action class, Plugins, and the RequestProcessor.

Chapter 5: Advanced Action Classes continues our Controller discussions with a look at some prepackaged Struts Action classes including the DispatchAction, ForwardAction, IncludeAction, LookupDispatchAction, and SwitchAction.

Chapter 6: Building the Presentation Layer discusses the Struts implementation of the View component of the MVC design pattern. This chapter covers everything you need to know when connecting JSPs to a Struts Controller. We also briefly discuss some of the tag libraries provided by the Struts framework.

Chapter 7: Debugging Struts Applications takes you through the process of configuring the Eclipse and IntelliJ IDEs for debugging Struts application. This chapter discusses both debugging your applications and stepping through the actual Struts framework.

Chapter 8: Working with Custom ActionMappings discusses the org.apache.struts.action.ActionMapping class, which provides the information that the ActionServlet needs knows about the mapping of a request to a particular instance of an action class. After describing the default ActionMapping, we go on to explain how you can extend the ActionMapping class to provide specialized mapping information to the ActionServlet.

Chapter 9: Internationalizing Your Struts Applications describes the Struts mechanisms for internationalized application development. Here, we examine each of the components used and provide an example of internationalizing a Struts application.

Chapter 10: Managing Errors looks at some of the methods available to you when you're managing errors in a Struts application. We begin by looking at the different error classes provided by the Struts framework, and we show how errors can be managed in both the Controller and Views of a Struts application by adding error handling to a sample application.

Chapter 11: Integrating the Jakarta Commons Database Connection Pool (DBCP) discusses how you can leverage the Commons Database Connection Pool’s functionality to manage a DataSource connected to a sample database.
Introduction

Chapter 12: Working with the Validator In this chapter, you will learn how to use Struts to validate form fields. We go a step further and cover best practices regarding validation, and then have you develop your own validator components.

Chapter 13: Using Tiles will describe the newly contributed Tiles templating mechanism and provide several examples of how Tiles can be used to give your application a common look and feel, while also saving you a tremendous amount of time on the presentation layer. We take the Tiles coverage further and show you how to create tile based visual components, managed tile scope and write tile controllers.

Chapter 14: Developing a Compete Struts Application takes you through the development of an entire Struts application. The purpose of this chapter is to tie all of the previous discussions together by creating a practical Struts application.

Chapter 15: The struts-config.xml File describes the struts-config.xml file, the Struts deployment descriptor. We tell you how you can add and configure each major Struts component in this file.

Chapters 16-20: The Struts Custom Tag Libraries describe the Struts framework's tag libraries. In these chapters, we examine each of the Struts tag libraries, including the Tiles, Bean, HTML, Logic, and Template tag libraries. We describe the custom tags in the library, look at their attributes, and provide examples of how they can be used.

Chapter 21: Struts Cookbook contains a wealth of advanced material that will enable you to get the most out of Struts and this book. Think of it as a cookbook for recipes that will help you solve common problems in your Web application development with Struts. We cover transaction tokens, dynamically changing locale, i18n enabled messaging, allow user to cancel an operation, Best Practices and much more. You may want to read the Best Practices section before you start your first Struts application. Then, for good measure, we throw in a list of related tools you should consider using when developing Struts applications namely JSTL (tags and API), Cactus, StrutsTestCase, and XDoclet.
# Contents

| Acknowledgments                                | ix |
| Introduction                                  | x |
| **Chapter 1: Introducing the Jakarta Struts Project and Its Supporting Components** | 1 |
| The Jakarta Struts Project                    | 1 |
| Understanding the MVC Design Pattern          | 2 |
| The Struts Implementation of the MVC          | 3 |
| Web Applications                              | 5 |
| The Directory Structure                       | 6 |
| The Web Application Deployment Descriptor     | 7 |
| Packaging a Web Application                   | 8 |
| The Tomcat JSP/Servlet Container              | 8 |
| Installing and Configuring Tomcat             | 8 |
| Testing Your Tomcat Installation              | 9 |
| What’s Next?                                  | 11 |
| **Chapter 2: An Overview of the Java Servlet and JavaServer Pages Architectures** | 13 |
| The Java Servlet Architecture                 | 13 |
| The GenericServlet and HttpServlet Classes   | 15 |
| The Lifecycle of a Servlet                   | 15 |
| Building a Servlet                            | 16 |
| The ServletContext                            | 20 |
| Using Servlets to Retrieve HTTP Data          | 25 |
| What Are JavaServer Pages?                   | 30 |
| The Components of a JavaServer Page           | 31 |
| What’s Next                                   | 53 |
| **Chapter 3: Getting Started with Struts**    | 55 |
| Obtaining and Installing the Jakarta Struts Archive | 55 |
| Creating Your First Struts Application        | 56 |
| Creating the Views                            | 57 |
| Creating the Controller Components            | 62 |
| Deploying Your Struts Application             | 66 |
| Walking through the ch03app Web Application   | 68 |
| What’s Next                                   | 71 |