

# Practical WebObjects

CHARLES HILL AND SACHA MALLAIS

Apress®

**Practical WebObjects**  
**Copyright © 2004 by Charles Hill and Sacha Mallais**

All rights reserved. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage or retrieval system, without the prior written permission of the copyright owner and the publisher.

ISBN (pbk): 1-59059-296-4

Printed and bound in the United States of America 9 8 7 6 5 4 3 2 1

Trademarked names may appear in this book. Rather than use a trademark symbol with every occurrence of a trademarked name, we use the names only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark.

Lead Editor: Steve Anglin

Technical Reviewers: Shehryar Khan and Gary Teter

Editorial Board: Steve Anglin, Dan Appleman, Ewan Buckingham, Gary Cornell, Tony Davis, John Franklin, Jason Gilmore, Chris Mills, Steve Rycroft, Dominic Shakeshaft, Jim Sumser, Karen Watterson, Gavin Wray, John Zukowski

Project Manager: Tracy Brown Collins

Copy Edit Manager: Nicole LeClerc

Copy Editor: Suzanne Goraj

Production Manager: Kari Brooks

Production Editor: Ellie Fountain

Interior Book Designer: Diana Van Winkle, Van Winkle Design Group

Compositor: Diana Van Winkle, Van Winkle Design Group

Proofreader: Gregory Teague

Indexer: Michael Brinkman

Artist: Diana Van Winkle, Van Winkle Design Group

Cover Designer: Kurt Krames

Manufacturing Manager: Tom Debolski

Distributed to the book trade in the United States by Springer-Verlag New York, Inc., 175 Fifth Avenue, New York, NY 10010 and outside the United States by Springer-Verlag GmbH & Co. KG, Tiergartenstr. 17, 69112 Heidelberg, Germany.

In the United States: phone 1-800-SPRINGER, e-mail [orders@springer-ny.com](mailto:orders@springer-ny.com), or visit <http://www.springer-ny.com>. Outside the United States: fax +49 6221 345229, e-mail [orders@springer.de](mailto:orders@springer.de), or visit <http://www.springer.de>.

For information on translations, please contact Apress directly at 2560 Ninth Street, Suite 219, Berkeley, CA 94710. Phone 510-549-5930, fax 510-549-5939, e-mail [info@apress.com](mailto:info@apress.com), or visit <http://www.apress.com>.

The information in this book is distributed on an “as is” basis, without warranty. Although every precaution has been taken in the preparation of this work, neither the author(s) nor Apress shall have any liability to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the information contained in this work.

The source code for this book is available to readers at <http://www.apress.com> in the Downloads section.

# Contents

About the Authors .....	xv
About the Technical Reviewers .....	xvii
Acknowledgments .....	xix
<b>CHAPTER 1 Making Your Code Better .....</b>	<b>1</b>
Eclipse and WOLips/WOProject .....	1
What Is Eclipse? .....	1
What Is WOLips/WOProject? .....	3
Why Use Eclipse and WOLips/WOProject? .....	3
Issues with Eclipse .....	4
Pros and Cons .....	4
Automated Unit Testing .....	5
The Case for Automated Unit Testing .....	5
JUnit: Java Unit Testing .....	6
JUnit and EOF: DbUnit .....	9
Design by Contract .....	11
What Are Contracts? .....	12
DBC and Unit Testing .....	14
What Design by Contract Is Not .....	14
More on Design by Contract .....	15
Why Contract Your Code? .....	15
Java and DBC .....	17
Debugging Techniques: Logging in WebObjects .....	17
Using Subclasses .....	17
Delegates .....	19
Using Notifications .....	19
NSLog and Other Logging Tools .....	21
Snooping on EOF .....	24
Digging Deeper: Seeing the Fetched Data .....	25
The Last Log Entry .....	27
Creating Java Classes from EOModels .....	27
The Generation Gap Pattern .....	27
The Trusty EOGenerator .....	27
Alternatives to EOGenerator .....	29
Summary .....	30

<b>CHAPTER 2</b>	<b>EO Modeling Techniques</b>	31
	Inheritance	31
	Inheritance Implementation Details	31
	Inheritance and Primary Keys	32
	Inheritance and the Overly Required Attribute	33
	Inheritance and the Impossible Constraint	33
	Inheritance and Multiple Models	34
	Inheritance, Multiple Models, and SQL Generation	34
	Relationships	35
	Optimizing Relationships with Batch Faulting	35
	One-Sided Relationships	36
	AddObjectsToBothSidesOfRelationshipWithKey()	37
	Attribute Value Types	38
	Noninteger Numbers	38
	Custom Types	41
	Handling LOB Data Efficiently	44
	Prototypes	45
	JDBC Prototypes (Old vs. New Prototypes)	46
	Strategies for Managing Prototypes	47
	One Last Consideration: The Connection Dictionary	53
	Debugging JDBC Connection Problems	55
	Understanding the Source of the Problem	55
	Finding and Fixing the Problem	57
	EO Modeling with Eclipse	60
	Summary	60
<b>CHAPTER 3</b>	<b>Managing the Object Graph</b>	61
	Understanding the Object Graph	61
	Viewing the Object Graph in Context	62
	Understanding the Varieties of Editing Contexts	64
	Rules of Engagement	65
	Seeing State Changes in the Object Graph	67
	Introducing the EOStateTransition Interface	69
	The CooperatingEditingContext	70
	Debugging Object Graph Problems	78
	Finding and Preventing Cross-Editing Context Relationships	78
	Defeating Referential Integrity Problems	80
	Locking, Concurrency, and EOF	83
	What Needs to Be Locked?	84

How to Lock Correctly . . . . .	84
Debugging Locking Problems . . . . .	91
Managing Object Freshness . . . . .	94
Fetching Fresh Objects . . . . .	94
Using Snapshot Timestamps to Ensure Fresh Data . . . . .	95
Refreshing and Relationships . . . . .	96
Freshening Data Through Distributed Change Notifications . . . . .	97
Summary . . . . .	97
<b>CHAPTER 4 Authentication and Security . . . . .</b>	<b>99</b>
Beginning with the Basics . . . . .	99
The Technical Details of Secure HTTP . . . . .	99
Practical Use of HTTPS . . . . .	100
Using HTTPS with WOHyperlink . . . . .	100
Using HTTPS with WOForm . . . . .	102
Authenticating Users . . . . .	105
Introducing the AbstractUser . . . . .	105
Introducing the SimpleUser . . . . .	108
Tracking the User After Authentication . . . . .	108
Producing a Login Form . . . . .	110
Handling Logout . . . . .	111
Advanced Authentication Methods . . . . .	112
Obscuring the Password . . . . .	113
Encrypting the Password . . . . .	115
Using LDAP for Authentication . . . . .	119
Using Kerberos for Authentication . . . . .	122
Advanced Login Topics . . . . .	126
Just in Time Login . . . . .	126
Automating User Login . . . . .	131
Advanced Security Topics . . . . .	135
Preventing Session Hijacking . . . . .	135
Preventing Direct Component Access . . . . .	137
Summary . . . . .	138
<b>CHAPTER 5 Input and State Validation of Enterprise Objects . . . . .</b>	<b>139</b>
Validation Basics . . . . .	139
NSValidation . . . . .	139
EOValidation . . . . .	141

Getting into the Details . . . . .	141
Validation During Take Values . . . . .	142
Validation on saveChanges . . . . .	144
Formatters . . . . .	145
Limitations of WebObjects Validation . . . . .	145
Values Are Not Assigned If Not Valid . . . . .	145
Only One Validation Error per Attribute . . . . .	148
No Immediate Validation . . . . .	148
Making Changes While Validating an EO . . . . .	149
Lack of Customization of Validation Messages . . . . .	150
Lack of Localization of Validation Messages . . . . .	150
Missing Database Validations . . . . .	151
The Practical Solution . . . . .	152
The Classes . . . . .	152
Getting Started . . . . .	153
Using Message Key Paths . . . . .	153
Message Key Path Search Order . . . . .	155
Messages and Variable Substitution . . . . .	155
Validation Methods . . . . .	156
Summary . . . . .	157
<b>CHAPTER 6 The Secret Life of Components . . . . .</b>	<b>159</b>
The Hypertext Transfer Protocol . . . . .	159
Spying on HTTP . . . . .	161
The Request—Response Loop, Briefly . . . . .	164
The Role of the WebObjects Frameworks . . . . .	164
The Big Picture . . . . .	165
The Request—Response Loop, Deeply . . . . .	166
The Beginning: The Request Is Made . . . . .	167
The Web Server Receives the Request . . . . .	168
The woadaptor and wotaskd Forward the Request . . . . .	168
The Application Receives the Request . . . . .	169
The Application Forwards the Request to the Request Handler . . . . .	169
The Request Handler Forwards the Request to the Component . . . . .	170
The Main Event . . . . .	171
Detour: Component Templates . . . . .	173
The Take Values Phase . . . . .	173
Performing the Requested Action . . . . .	179
Generating the Response . . . . .	181
The End of the World As WO Knows It . . . . .	183

...And Beyond .....	183
Complications .....	184
Summary .....	185
<b>CHAPTER 7 Components and Elements .....</b>	<b>187</b>
The Case of the Missing Element .....	187
Request—Response and Component Debugging .....	188
The Golden Rule .....	190
The Mystery of the Missing Submit .....	191
Dynamic Elements .....	193
Dynamic Elements, Components, and Associations .....	193
How Dynamic Elements Work .....	194
An Example Dynamic Element .....	195
Replacing the WebObjects Dynamic Elements .....	199
Mysteries of Binding Synchronization .....	201
Timing .....	201
A Binding Synchronization Example .....	201
Binding Instance Variables and Methods .....	205
Debugging Binding Synchronization .....	205
Manual Synchronization .....	206
The Carat Notation .....	207
Stateless Components .....	207
The Mapped List Popup Stateless Component .....	209
Debugging and Optimization with WOEvent .....	212
Preparing for WOEvent Logging .....	213
Displaying the Logged Events .....	214
Some Practice Reading the Event Log .....	214
Creating Custom Events .....	215
Summary .....	219
<b>CHAPTER 8 Localization .....</b>	<b>221</b>
Parlez-vous Anglais? .....	221
Text Encoding .....	222
Localize Early .....	223
Detecting User Language Preferences .....	223
Encoding in Responses .....	226
Encoding in Requests .....	228
Database Localization Issues .....	229
Sorting It All Out .....	230

	The Biggest Problem of Our Time (Zone) . . . . .	230
	Standard WebObjects Localization . . . . .	231
	An Alternate Localization Strategy . . . . .	232
	Strings, All Shapes and Sizes . . . . .	235
	Debugging Issues . . . . .	236
	Summary . . . . .	236
<b>CHAPTER 9</b>	<b>Copying Enterprise Objects . . . . .</b>	<b>237</b>
	Understanding the Problem . . . . .	237
	Types of Copies . . . . .	238
	Naive Copy . . . . .	239
	EOEnterpriseObject Metadata . . . . .	240
	EOAttribute . . . . .	240
	EORelationship . . . . .	240
	EOEntity . . . . .	240
	EOModel . . . . .	241
	EOModelGroup . . . . .	241
	EOClassDescription . . . . .	241
	EOModel-Based Copy . . . . .	241
	The EOCopyable Default Implementation . . . . .	248
	Making Use of the Default Implementation . . . . .	250
	The EOCopyable Utility Methods . . . . .	250
	Tweaking the Copy Process . . . . .	264
	Object Migration . . . . .	266
	Using javaeoutil . . . . .	266
	Using BulkMover . . . . .	269
	Using Dedicated Migration Tool . . . . .	269
	Summary . . . . .	270
<b>CHAPTER 10</b>	<b>WebObjects in a J2EE World . . . . .</b>	<b>271</b>
	What Is J2EE and Why Is It Important? . . . . .	271
	Servlets . . . . .	272
	JavaServer Pages . . . . .	273
	JSP Tag Libraries . . . . .	274
	Enterprise JavaBeans . . . . .	274
	Understanding WebObjects Servlet Deployment . . . . .	275
	Single Servlet Deployment vs. Standard Deployment . . . . .	276
	Class Loading . . . . .	276
	Resource Location . . . . .	277

Differences Between WebObjects Applications and WebObjects Servlets . . . . .	278
Multithreaded Servlet Containers . . . . .	279
EAR, WAR, WOA . . . . .	280
Tips and Tricks . . . . .	283
Using WebObjects with JavaServer Pages . . . . .	284
WComponent Integration with JSP Example . . . . .	284
Deploying the Sample Application . . . . .	291
JSP/WO Best Practices . . . . .	297
Summary . . . . .	300
<b>CHAPTER 11 XML and WebObjects . . . . .</b>	<b>301</b>
What About XML? . . . . .	301
Document Type Definitions. . . . .	303
XML Schema . . . . .	304
XSL and Related Technologies. . . . .	304
XML Parsers . . . . .	305
DOM Parsers . . . . .	305
SAX Parsers . . . . .	306
Other Parsers . . . . .	306
XML and Object Serialization. . . . .	307
WebObjects Application Support . . . . .	307
Sample Application . . . . .	308
Serializing EO Data into XML . . . . .	308
Step 2: Serializing the Cart. . . . .	311
Step 3: XML Transformation. . . . .	314
Step 4: HTML Transformation . . . . .	321
Step 5: PDF Generation. . . . .	324
Step 6: Deserialization of XML Back to EO . . . . .	329
Summary . . . . .	330
<b>APPENDIX Setting Up the Code . . . . .</b>	<b>331</b>
Installing FrontBase. . . . .	331
Installing Eclipse . . . . .	331
A Word on Eclipse Directories . . . . .	332
Patching Ant. . . . .	332
Installing WOLips. . . . .	333
Installing EOGenerator . . . . .	333

Getting Ready to Install the Code .....	334
Get the Practical WebObjects File .....	334
Install the Jass4Eclipse Plug-in. ....	334
Configuring Eclipse .....	335
Installing the Practical WebObjects Frameworks .....	335
Importing the Projects .....	335
Setting up the Database .....	336
Run Unit Tests to Verify Installation .....	337
Setup for Each Chapter .....	339
Chapter 1 .....	339
Chapter 2 .....	339
Chapter 3 .....	340
Chapter 4 .....	340
Chapter 5 .....	349
Chapter 6 .....	349
Chapter 7 .....	350
Chapter 8 .....	350
Chapter 9 .....	350
Chapter 10 .....	350
Chapter 11 .....	351

■ INDEX .....	353
---------------	-----