

Grails IN ACTION

Glen Smith
Peter Ledbrook

FOREWORD BY Dierk König



contents

foreword xvii
preface xix
acknowledgments xxi
about this book xxiv
about the title xxviii
about the cover illustration xxix

PART 1 INTRODUCING GRAILS..... 1

1 *Grails in a hurry...* 3

1.1 Why Grails? 4

First there was Rails... 4 ■ *Why Grails changed the game* 5
Big idea #1: Convention over Configuration 6 ■ *Big idea #2: agile philosophy* 6 ■ *Big idea #3: rock-solid foundations* 7 ■ *Big idea #4: scaffolding and templating* 7 ■ *Big idea #5: Java integration* 8 ■ *Big idea #6: incredible wetware* 8 ■ *Big idea #7: productivity ethos* 9

1.2 Getting set up 9

1.3 Our sample program: a Web 2.0 QOTD 10

Writing your first controller 11 ■ *Writing stuff out: the view* 13
Adding some style with Grails layouts 15

- 1.4 Creating the domain model 17
 - Configuring the data source* 18
 - *Exploring database operations* 19
- 1.5 Adding UI actions 20
 - Scaffolding: just add rocket fuel* 22
 - *Surviving the worst case scenario* 23
- 1.6 Improving the architecture 24
 - Your first Grails test case* 26
 - *Going Web 2.0: Ajax-ing the view* 27
 - *Bundling the final product: creating a WAR file* 29
 - *And 55 lines of code later* 29
- 1.7 Summary and best practices 30

2 *The Groovy essentials* 31

- 2.1 An introduction 32
 - Let's play with Groovy!* 32
 - *Some basic differences from Java* 34
 - *Some new operators* 36
- 2.2 Exploring types 38
 - Looking at basic types* 39
 - *Syntax sugar for lists, maps, and ranges* 42
- 2.3 Time-saving features 44
 - Who needs semicolons?* 44
 - *Native regular expressions* 46
 - *Property notation* 48
 - *Anything in Java that's not in Groovy?* 49
- 2.4 Expert Groovy 50
 - Discovering closures* 50
 - *Programming dynamically* 53
 - The Groovy JDK* 55
 - *Creating and parsing XML the easy way* 58
- 2.5 Summary and best practices 60

PART 2 CORE GRAILS 63

3 *Modeling the domain* 65

- 3.1 Hubbub: starting our example application 66
 - Domain-driven design* 67
 - *Hubbub kick-start: from 0 to first hit* 68
 - *Introducing GORM (Grails object relational mapping)* 69
- 3.2 Your first domain class object 69
 - Saving and retrieving users via tests* 70
 - *Updating user properties* 72
 - *Deleting users* 73

- 3.3 Validation: stopping garbage in and out 74
 - Standard validators* 76
 - *Custom validation with regular expressions* 78
 - *Cross-field validation tricks* 78
- 3.4 Defining the data model—1:1, 1:m, m:n 79
 - One-to-one relationships* 79
 - *One-to-many relationships* 82
 - Many-to-many relationships* 86
 - *Self-referencing relationships* 89
- 3.5 Summary and best practices 90

4 *Putting the model to work* 92

- 4.1 Creating instant UIs with scaffolding 93
 - Scaffolding Hubbub's domain classes* 93
 - *Scaffolding and validation* 95
 - *Customizing error messages* 96
 - Managing relationships via scaffolds* 98
 - *Tweaking scaffold layouts with CSS* 100
 - *What can't you do with dynamic scaffolds?* 102
 - *Static scaffolding: generating and customizing scaffold code* 102
 - *Customizing scaffolding templates: building your own UI generator* 104
- 4.2 Groovy querying with dynamic finders and Query by Example 104
 - Implementing a basic search form* 105
 - *The many faces of dynamic finders* 107
 - *Tuning dynamic finders with eager and lazy fetching* 109
 - *When dynamic finders don't deliver* 110
 - Introducing Query by Example (QBE)* 110
 - *Getting dynamic with list(), listOrderBy(), and countBy()* 111
- 4.3 More sophisticated query options 112
 - With great power: criteria querying* 112
 - *Dynamic queries with criteria* 114
 - *Creating a tag cloud using report-style query projections* 116
 - *Using HQL directly* 117
- 4.4 Bootstrapping reference data 118
- 4.5 Summary and best practices 119

5 *Controlling application flow* 121

- 5.1 Controller essentials 122
 - Implementing a timeline for Hubbub* 123
 - *Adding new posts* 125
 - *Exploring scopes* 128
 - *Handling default actions* 131
 - *Working with redirects* 132
- 5.2 Services: making things robust and maintainable 133
 - Implementing a PostService* 133
 - *Wiring our PostService to our PostController* 134

- 5.3 Data binding 136
 - Binding to an existing object* 136
 - *Whitelist and blacklist bind params* 137
 - *Complex forms: binding multiple objects* 137
 - *Error handling* 140
 - 5.4 Command objects 141
 - Handling custom user registration forms* 141
 - *Participating in injection* 144
 - 5.5 Working with images 144
 - Handling file uploads* 144
 - *Uploading to the filesystem* 146
 - *Rendering photos from the database* 146
 - 5.6 Intercepting requests with filters 148
 - Writing your first filter* 148
 - *Filter URL options* 150
 - 5.7 Creating custom URL mappings 151
 - myHubbub: rolling your own permalinks* 152
 - *Optional variables and constraints* 152
 - *Handling response codes* 153
 - *Mapping directly to the view* 153
 - *Wildcard support* 153
 - 5.8 Summary and best practices 154
- 6** *Developing tasty views, forms, and layouts* 155
- 6.1 Understanding the core form tags 156
 - A handful of essential tags* 156
 - *A pocketful of link tags* 157
 - *A tour of the form tags* 158
 - *Adding pagination to the timeline* 164
 - 6.2 Extending views with your own tags 165
 - Simple tags* 165
 - *Logical tags* 167
 - *Iteration tags* 168
 - Calling one tag from another* 169
 - 6.3 Adding delicious layouts 170
 - Introducing SiteMesh* 170
 - *Standardizing page layouts* 173
 - Fragment layouts with templates* 175
 - *Adding skinning* 176
 - Implementing navigation tabs* 177
 - 6.4 Applying Ajax tags 179
 - Choosing a JavaScript library* 179
 - *Essential Ajax form remoting* 180
 - *Sizzle++: going further with animation and effects* 182
 - 6.5 Summary and best practices 186

7 *Building reliable applications* 188

- 7.1 Why should we test software? 188
- 7.2 Unit testing 190
 - Testing domain classes* 191 ▪ *Testing services* 195 ▪ *General mocking in Grails* 198 ▪ *Testing controllers* 201 ▪ *Testing tag libraries* 204
- 7.3 Integration testing 206
 - Filling the gaps* 207 ▪ *When only an integration test will do* 210
- 7.4 Functional testing 211
 - Introducing the Functional Test plugin* 212 ▪ *Other testing tools* 215
- 7.5 Summary and best practices 216

PART 3 EVERYDAY GRAILS 219

8 *Using plugins: adding Web 2.0 in 60 minutes* 221

- 8.1 Taking advantage of others' hard work 222
 - Finding plugins* 223 ▪ *Installing plugins* 225
- 8.2 Adding charts and graphs 228
 - Installing the Google Chart plugin* 228 ▪ *Creating your first chart* 229 ▪ *What's the story with dataType?* 230 ▪ *Bar charts: setting custom colors and gridlines* 231 ▪ *Line charts: handling multiple datasets and line styles* 232 ▪ *Intranet charts: Google Chart without Google* 233
- 8.3 Adding mail support 233
 - Sending mail inline* 235 ▪ *Using a view as your mail body* 236
- 8.4 Full-text search: rolling your own search 237
 - Making objects searchable* 238 ▪ *Highlighting hit terms* 241
 - Implementing pagination* 243 ▪ *Customizing what gets indexed* 244 ▪ *Query suggestions: did you mean "Grails"?* 245
 - Searching across relationships* 246
- 8.5 GrailsUI makeover 248
 - Adding tooltips* 249 ▪ *Implementing rich-text editing* 249
 - Implementing calendar-style dates* 251 ▪ *Introducing autocomplete* 252
- 8.6 Summary and best practices 253

9 *Wizards and workflow with webflows* 255

- 9.1 What is a webflow? 256
 - Writing your first flow: a checkout wizard* 257
 - Anatomy of a flow state* 259
- 9.2 Working with webflows 261
 - Flow scope: better than Flash scope, cheaper than session scope* 261
 - Strategies for binding and validation* 262
 - Making decisions programmatically with action states* 265
- 9.3 Advanced webflows 266
 - Flow-scoped services* 266
 - Subflows and conversations* 269
- 9.4 Testing webflows 273
 - Handling input parameters* 275
 - Testing subflow transitions* 276
 - Testing flow termination* 277
- 9.5 Summary and best practices 278

10 *Don't let strangers in—security* 280

- 10.1 Why security matters 280
- 10.2 Protecting against malicious intent 281
 - Validate all your inputs* 282
 - Escape all your outputs* 284
 - SSL, encryption, and message digests* 287
 - Don't give away information* 289
- 10.3 Access control 291
 - Getting started with Spring Security* 293
 - Protecting URLs* 295
 - Getting hold of the current user* 298
 - Using a custom login page* 300
 - Testing access control* 301
- 10.4 Further exploration of Spring Security 302
 - Adding user registration* 303
 - Tightening restrictions on access* 304
 - Other authentication options* 306
- 10.5 Summary and best practices 308

11 *Remote access* 310

- 11.1 Using a RESTful solution 311
 - Your first steps in REST* 311
 - Serializing and deserializing domain instances* 315
 - Testing the API* 318
- 11.2 Negotiating the representation 320
 - REST and the `params` property* 321
 - Handling multiple response formats* 323
 - How the response format is decided* 325
- 11.3 REST in practice 327
 - Keeping the API stable* 327
 - Applying the theory* 329

- 11.4 Operation-oriented remoting 333
 - The Remoting plugin* 333
 - *Comparing the remoting protocols* 335
 - *Web Services via SOAP* 336
- 11.5 Summary and best practices 338

12 *Understanding messaging and scheduling* 340

- 12.1 A hitchhiker's guide to messaging 341
 - Learning to think in async: what are good messaging candidates?* 342
 - *Messaging terminology: of producers, consumers, topics, and queues* 342
 - *Installing and configuring the JMS plugin* 344
- 12.2 Using the Grails JMS plugin 346
 - Our killer Hubbub feature: IM integration with Jabber* 346
 - Sending JMS messages* 347
 - *Reading the queue* 349
- 12.3 Grails scheduling 352
 - Writing a daily digest job* 352
 - *Fine-grained scheduling with cron* 354
- 12.4 Advanced scheduling 355
 - Dealing with re-entrance and stateful jobs* 356
 - *Pausing and resuming stateful jobs programmatically* 357
 - *Persistence and clustering* 360
- 12.5 Summary and best practices 361

PART 4 *ADVANCED GRAILS*..... 363

13 *Advanced GORM kung fu* 365

- 13.1 Domain model kung fu 366
 - Exploring inheritance options* 366
 - *Embedding domain classes* 368
 - *Using maps for quick and dirty (or cheap and cheerful) tables* 368
 - *Exploring domain model events* 369
- 13.2 Caching kung fu: moving from 2 users to 2¹⁰ 370
 - Hibernate settings: should you use the second-level cache?* 370
 - Cache configuration* 371
 - *Caching individual domain classes* 372
 - *Enough talk, let's profile* 374
 - *Improving performance with indexed fields* 376
 - *What about query caching?* 377
 - *JNDI? That's so old school...* 378
- 13.3 Legacy integration kung fu: dealing with multiple data sources 379

- 13.4 Dealing with difficult legacy databases 380
 - Recycling Hibernate mappings* 381
 - *Using GORM DSL to access existing database table structures* 388
- 13.5 Summary and best practices 393

14 *Spring and transactions* 395

- 14.1 Spring and Grails 396
 - A conventional approach* 397
 - *Creating and defining your own beans* 401
- 14.2 Using transactions with GORM 406
 - Easy transactions with services* 406
 - *Transactions, the session, and me* 410
 - *Fine-grained transactions* 412
- 14.3 Summary and best practices 413

15 *Beyond compile, test, and run* 415

- 15.1 The Grails build system 417
 - Packaging an application* 417
 - *Going it alone: how to create a dist command* 420
 - *Deployment* 426
- 15.2 Build integration—not for the hobbyist 430
 - Ant* 430
 - *Maven* 434
- 15.3 Coping with a changing data model 436
 - Schema migration with Hibernate* 437
 - *Intelligent migration with Autbase* 438
- 15.4 Summary and best practices 440

16 *Plugin development* 442

- 16.1 Creating your first plugin 443
 - Are you sure it's not an application?* 443
 - *Controllers, views, and other artifacts* 446
- 16.2 Publishing your plugin 450
 - Testing plugins* 451
 - *Releasing the plugin into the wild* 452
- 16.3 Integrating with Grails 454
 - Enhancing artifacts with dynamic methods* 455
 - *Dealing with class reloading* 460
 - *Leveraging Spring* 463
 - *Playing with servlets and filters* 465
 - *Augmenting the available Grails commands* 467
- 16.4 Summary and best practices 468
 - index* 471