contents

foreword xvii

foreword to the first edition xix

preface xxi

preface to the first edition xxii

acknowledgments xxiv

about this book xxvi

about the source code xxix

about the authors xxxiv

about the cover illustration xxxv

1 Introducing SQL Server 2005 Reporting Services 1

- 1.1 What is Reporting Services? 2
 Solving reporting problems with Reporting Services 3
 Choosing a Reporting Services edition 4
 Reporting Services and the Microsoft SQL Server platform 6
- 1.2 Reporting Services at a glance 7
 Authoring features 8 ★ Management features 10
 Delivery features 11 ★ Extensibility features 11
 Scalability features 12 ★ Security features 12
 Deployment features 12
- 1.3 RS architecture 13

 The Report Server engine 15 ◆ The Report Server database 16 ◆ The Report Manager 17
- 1.4 Understanding report processing 19
 Execution stage 20 ★ Rendering stage 20
- 1.5 Delivering reports 22On-demand delivery 22 ◆ Subscribed delivery 23
- 1.6 What is the report lifecycle? 24

- 1.7 RS in action 25About the Adventure Works Reporter 26Your first report 26
- 1.8 Evaluating RS 36
- 1.9 Summary 37

Part 1 Authoring reports 39

2 Report authoring basics 41

- 2.1 The report-authoring process: step by step 42
 Analysis 43 ★ Construction 43 ★ Testing 44
 Deployment 44
- 2.2 Authoring reports in VS .NET 44
 Authoring reports with the Report Wizard 45
 Authoring reports with the Report Designer 46
 Importing reports from Microsoft Access 55
- 2.3 Creating reports programmatically 57
 Generating RDL: The AW Ad Hoc Reporter 59
 Implementation details 60
- 2.4 Summary 62

3 Working with data 64

- 3.1 Working with data sources 64
 Connecting to the database 65 ◆ Choosing an authentication mechanism 70 ◆ Deploying data sources 78
- 3.2 Working with report datasets 78

 Understanding the dataset definition 79 ◆ Creating a report dataset 80 ◆ Using multiple datasets 84
- 3.3 Authoring dataset queries 85
 Using the Graphical Query Designer 85 ◆ Using the Generic Query Designer 87
- 3.4 Parameter-driven reports 90

 The role of parameters 90 ◆ Building parameter-driven queries 91 ◆ Setting up the report-level parameters 93
- 3.5 Working with stored procedures 98
 Using a stored procedure as a dataset query 98
 Defining query-based lookup parameter values 100
 Creating cascading parameters 101 → Working with multivalued parameters 102
- 3.6 Summary 102

x CONTENTS

4 Designing reports 104

- 4.1 Anatomy of a report 105
 Getting started with a new report 106 ◆ Understanding report sections 106 ◆ Understanding report items 107
 Understanding data regions 110
- 4.2 Designing tabular reports 112
 Tabular reports with groups 113 → Parameterized tabular reports 116 → Tabular reports with interactive features 121
 Table region limitations 123
- 4.3 Designing freeform reports 123
 Freeform reports with nested regions 123
 Grouping freeform data 125
 Freeform reports with side-by-side data regions 127
- 4.4 Designing chart reports 128
 The chart data region 129 ◆ Working with charts 129
 Nesting chart regions 132
- 4.5 Designing crosstab (matrix) reports 133
 Matrix region advantages 133 ◆ Working with the matrix region 134 ◆ Adjusting the report layout 138
- 4.6 Using other design features in your reports 140

 Setting up multiple columns 140 ★ Adding interactive sort 142 ★ Passing multivalued parameters into a stored procedure 144 ★ Designing subreports 145
- 4.7 Summary 148

5 Using expressions and functions 150

- Understanding expressions 151
 Using the Expression Editor 152 ◆ Expression syntax 153
 Determining expression execution order 154 ◆ Understanding expression scope 154 ◆ Dealing with expression errors 156
- 5.2 Exploring the Report Object Model 157
 Using the ReportItems collection 159 → Using the Fields collection 163 → Using the Parameters collection 166
 Using the Globals collection 166 → Using the User collection 167
- 5.3 Working with functions 167
 Referencing external functions 168 ◆ Using aggregate functions 168 ◆ Using other internal functions 173
- Designing reports with navigational features 175
 Reports with hyperlinks 176 → Reports with document maps 178

CONTENTS xi

- 5.5 Report rendering considerations 181
 Exporting reports to HTML 181 ★ Exporting reports to
 MHTML 182 ★ Exporting reports to other formats 182
- 5.6 Summary 183

6 Using custom code 185

- 6.1 Understanding custom code 186

 Using embedded code 186 ◆ Using external assemblies 189
- 6.2 Custom code in action: implementing report forecasting 193
 Forecasting with OpenForecast 194 ◆ Implementing report
 forecasting features 194
- 6.3 Using XML-based reports 207
 Understanding XML exporting 208 ★ Exposing the report content as an RSS feed 209
- 6.4 Summary 213

7 Ad hoc reporting with the Report Builder application 215

- 7.1 About the Report Builder application 216
 A quick tour of the Report Builder 217 ★ Setting up for ad hoc reporting 218 ★ The Developer toolset for ad hoc reporting 220
- 7.2 Building the Report Model using BIDS 221
 Building a report model project 222 ★ Setting up the data source 223 ★ Creating a data source view 227
 Building the report model 233 ★ Deploying report models 241
- 7.3 Ad hoc reporting in action 242

 Launching the Report Builder 242 ★ Creating the Product Profit Margin report 244 ★ Getting more with infinite drill-through reporting 247 ★ Advanced filtering with the Report Builder 249
- 7.4 Implementing Report Builder security 252
 Securing the Report Builder with roles 252 ★ Securing report model items 253
- 7.5 Summary 255

xii CONTENTS

Part 2 Managing reports 257

8 Managing the Reporting Services environment 259

- 8.1 Managing RS with the Report Manager 260 How the Report Manager works 260 ★ Managing Report Server settings 263 ★ Managing content 268 ★ Managing report execution 275 ★ Managing linked reports 286
- 8.2 Managing RS with the Web service 288

 Using the Web service management API 288 ◆ Tracing calls to the SOAP API 289 ◆ Deploying reports programmatically 292 ◆ Batching methods together 295
- 8.3 Managing RS with the WMI provider 296
 Understanding the WMI provider 296 ★ Implementing an RS management console 297
- 8.4 Other ways to manage Reporting Services 299

 Managing RS with SQL Management Studio 299 ★ Managing RS with the script host 300 ★ Using the Reporting Services configuration tool 302
- 8.5 Analyzing report execution 305

 Analyzing the Report Server execution log 305 ◆ Analyzing trace log files 307
- 8.6 Summary 309

9 Securing Reporting Services 311

- 9.1 Role-based security basics 312

 The purpose of role-based security 312 ★ Authentication models: using Windows or creating your own 312
- 9.2 Windows authentication: a closer look 313
 Exploring the Client-to-Report Server model 314 ◆ Exploring the Client-to-Façade-to-Report Server model 316
- 9.3 Using role-based authorization 318
 Understanding tasks 319 ◆ Defining roles 320
 Understanding securable items 321 ◆ Defining policies 322
- 9.4 Managing role-based security with the Report Manager 324
 Creating Windows user accounts and groups 325 ◆ Creating
 custom roles 326 ◆ Defining security policies 327
- 9.5 Managing role-based security with the Web service 329

 Determining role-based security policies 329 ★ Calling securityrelated Web service methods 330 ★ Implementing "pseudo"
 report events 332

CONTENTS xiii

- 9.6 Techniques for advanced security issues 333
 Filtering data 334 → Using dynamic dataset queries 335
 Hiding data 337 → Implementing custom security models 337 → Enforcing a secured connection to the Report Server 337
- Part 3 Delivering reports 339

9.7

10 On-demand report delivery 341

Summary 338

- 10.1 How RS provides on-demand report delivery 342
- 10.2 URL-based report access 343
 Understanding URL syntax 344 ★ Requesting resources
 by URL 345 ★ Requesting reports by URL 347
 Working with report commands 348 ★ Working with the
 HTML Viewer 351
- 10.3 URL access in action 354
 URL Access with WinForms: AccessOptions 355 ◆ URL Access with WebForms: AWReporterWeb 358
- 10.4 Web service-based report access 366
 Requesting reports with SOAP 368 ◆ Rendering images 370
 Handling report sessions 373
- 10.5 Web service access (SOAP) in action 376
 Generating report requests with SOAP on the client side 376
 An automation solution: AW Campaigner 379
- 10.6 Evaluating URL and Web service access options 383
 Evaluating URL access 384 ★ Evaluating Web service
 access 385 ★ Choosing an integration approach 386
- 10.7 Summary 387

11 Mastering the ReportViewer controls 389

- 11.1 How the .NET ReportViewer controls work 390
 Controls for web and Windows applications 390 ★ Choosing remote or local mode 391 ★ Managing properties of the ReportViewer controls 392
- 11.2 Using ReportViewer in remote mode 394
 Creating, configuring, and running the control 394
 Additional customizations for the ReportViewer control 397

xiv CONTENTS

- 11.3 Using ReportViewer in local mode 397
 Creating a local report with a database as the data source 398
 Creating a local report with an object as the data source 401
- 11.4 Custom validation with the ReportViewer control 406
 Creating a parameters section 407 ★ Creating event methods 407 ★ Write validation code 410
- 11.5 Converting report files 411
 Converting RDL files into RDLC files 412
 Converting RDLC files into RDL files 415
- 11.6 Deploying applications that use ReportViewer controls 416 Redistributing the ReportViewer controls 416 ★ ReportViewer deployment for Windows applications 417 ★ ReportViewer deployment for web applications 418 ★ Using the ReportViewer web server control in a web farm 418
- 11.7 Summary 418

12 Subscribed report delivery 420

- 12.1 Understanding subscribed report delivery 421
 Subscription-based reporting scenarios 421 ★ The subscriberpublisher design pattern 422 ★ How the RS subscription-based model works 422
- 12.2 Configuring subscribed report delivery 425
 Creating a new subscription 426 ★ Choosing the subscription type 427 ★ Configuring delivery extensions 430
 Managing subscriptions 432
- 12.3 Subscribed report delivery in action 434

 "Pushing" reports via standard e-mail subscriptions 434

 Archiving reports to a file share 437 ★ Sending reports to a datadriven list of recipients 440 ★ Triggering subscriptions programmatically 446
- 12.4 Summary 450

Part 4 Advanced reporting 451

13 Extending Reporting Services 453

13.1 Understanding Reporting Services extensibility 454
Interface-based programming 454 ★ Working with interface inheritance 456 ★ Extending RS with interface inheritance 459

CONTENTS xv

13.2 Reporting with a custom dataset data extension 460 Identifying design goals and trade-offs 461 ★ Authoring dataset-bound reports 462 ★ Implementing the custom dataset extension 469 ★ Debugging dataset extensions 473
13.3 Distributing reports to Web services using custom delivery extensions 473 Design goals and trade-offs 474 ★ Using the custom delivery extension 475 ★ Implementing the custom delivery extension 476 ★ Debugging custom delivery extensions 480
13.4 Implementing custom security 482 Design goals and trade-offs 485 ★ Intranet reporting with custom security 486 ★ Implementing the custom security extension 488 ★ Debugging the custom security extension 495
13.5 Summary 496
Performance and scalability 497
14.1 Understanding capacity planning 498 Capacity-planning fundamentals 498 ◆ The capacity-planning process 503
14.2 Capacity planning for Reporting Services in action 508 Determining requirements 508 ★ Setting up the testing environment 511 ★ Performance testing 515 ★ Analyzing performance results 516 ★ Identifying resource constraints 519 ★ Eliminating resource constraints 520
14.3 Summary 523
Installing SQL Server Reporting Services 524
A.1 Software requirements 524
A.2 Installing SQL Server Reporting Services 525
Understanding .NET code access security 531
B.1 Code access security basics 532
B.2 Understanding code access terminology 532
B.3 Exploring the RS default security policy 536
B.4 Managing RS code access security 538
resources 542
index 5/10

14

appendix A

appendix B

xvi CONTENTS