

CRYSTAL REPORTS®

2008

OFFICIAL GUIDE



NEIL FITZGERALD, BOB COATES,
RYAN GOODMAN, MICHAEL VOLOSHKO


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2008

OFFICIAL GUIDE

“In this guide, you’ll find everything from the basics to get you started on your first report, to using even the most advanced features. Listen to these experts – they will show you how to create any type of report you may need.”

—James Thomas, Vice President, Product Management,
Volume Products, Business Objects,
an SAP company

NEIL FITZGERALD
BOB COATES
RYAN GOODMAN
MICHAEL VOLOSHKO

PREVIOUS CONTRIBUTORS:
KELLY BYRNE
JAMES EDKINS
ANNETTE JONKER
RYAN MARPLES

SAMS

Sams Publishing
800 East 96th Street
Indianapolis, IN 46240 USA



CONTENTS AT A GLANCE

- Introduction 1
- I Crystal Reports Design**
 - 1 Creating and Designing Basic Reports 15
 - 2 Selecting and Grouping Data 51
 - 3 Filtering, Sorting, and Summarizing Data .. 77
 - 4 Understanding and Implementing Formulas 95
 - 5 Implementing Parameters for Dynamic Reporting 131
- II Formatting Crystal Reports**
 - 6 Fundamentals of Report Formatting 155
 - 7 Working with Report Sections 179
 - 8 Visualizing Your Data with Charts and Maps 203
 - 9 Custom Formatting Techniques 233
- III Advanced Crystal Reports Design**
 - 10 Using Cross-Tabs for Summarized Reporting 253
 - 11 Using Record Selections, Sort Controls, and Alerts for Interactive Reporting 275
 - 12 Using Subreports for Advanced Reports 299
 - 13 Using Formulas and Custom Functions 317
 - 14 Designing Effective Report Templates 331
 - 15 Additional Data Sources in Crystal Reports 351
 - 16 Formatting Multidimensional Reporting Against OLAP Data 369
- IV Report Distribution and Advanced Report Design with Crystal Xcelsius**
 - 17 Introduction to Crystal Reports Server, crystalreports.com, and the Crystal Report Viewer 395
 - 18 Crystal Reports Java Components 411
 - 19 Crystal Reports Microsoft .NET Components 433
 - 20 Basic Xcelsius Development 457
 - 21 Advanced Xcelsius Visualization and Connectivity 487
- Index 523

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CONTENTS

Introduction	1
Introduction to Information Delivery	2
Spectrum of Business Objects Product Usage	3
Custom Information Delivery Applications	3
Enterprise BI Initiatives	4
Spectrum of BI Tool Users	5
Content Creators (Information Designers)	7
Information Analysts	7
Information Consumers	7
The Product Family from Business Objects	8
What Is in This Book	8
Part I: Crystal Reports Design	9
Part II: Formatting Crystal Reports	9
Part III: Advanced Crystal Reports Design	10
Part IV: Report Distribution and Advanced Report Design with Crystal Xcelsius	10
Equipment Used for This Book	10
Web Resources	10
Intended Audience	10
Requirements for This Book	11
Conventions Used in This Book	11

I Crystal Report Design

1 Creating and Designing Basic Reports	15
Introducing the Crystal Reports Designer	16
Crystal Report Sections	16
Using Toolbars and Menus	18
Report Design Explorers	21
Locating and Using the Report Design Explorers	22
The Workbench and Dependency Checker	23
Understanding Data and Data Sources	23
Understanding Direct Access Drivers	23
Understanding Indirect Access Drivers	24
Introducing the Database Expert	25
Creating a New Connection	26
Using My Connections	27
Adding Database Objects to Your Report	27
Reporting on Tables	28
Reporting on Views	29

Reporting on Stored Procedures	29
Reporting on SQL Commands	29
Joining Database Objects	31
Understanding the Different Join Types	32
Using the Report Creation Wizards	33
Getting Started with the Report Wizards	34
Using the Standard Report Creation Wizard	35
Creating a Report Without Wizards	44
Troubleshooting	48
Crystal Reports in the Real World—HTML Preview	49
Crystal Reports in the Real World—SQL Commands	49
2 Selecting and Grouping Data	51
Introduction	52
Understanding Field Objects	52
Accessing Database Fields	53
Accessing Formula Fields	54
Accessing SQL Expression Fields	56
Accessing Parameter Fields	56
Implementing Running Total Fields	58
Using Group Name Fields	61
Special Fields	61
Working with Groups	63
Inserting Groups	64
Reordering Groups	66
Using the Group Expert	68
Grouping on Date/Time Fields	68
Hierarchical Grouping	69
Understanding Drill-Down Reports	71
Creating a Drill-Down Report	71
Hiding Details on a Drill-Down Report	72
Troubleshooting	74
Crystal Reports in the Real World—Group on a Formula	74
3 Filtering, Sorting, and Summarizing Data	77
Introduction	78
Filtering the Data in Your Report	78
Working with the Select Expert	78
The Record Selection Formula	82
Working with the Formula Editor	83

Learning to Sort Records	84
Working with the Sort Expert	84
Creating Effective Summaries	86
Creating Grand Totals	86
Creating Group Summaries	87
Using Group Selection and Sorting	88
Creating Running Totals	90
Troubleshooting	92
Crystal Reports in the Real World—Nesting Formulas	92
4 Understanding and Implementing Formulas	95
Introduction	96
Using the Formula Workshop	96
Navigating the Formula Workshop with the Workshop Tree	98
Using the Workshop Formula Editor	101
Arithmetic Formulas	103
Date and Time Formulas	108
String Formulas	111
Using Type Conversion in Formulas	114
Control Structures—Conditional and Looping Structures	116
Variables	120
Creating Formulas with the Formula Expert	120
Using the Formula Extractor to Create Custom Functions	121
The Multipass Reporting Process of the Crystal Reports Engine	124
Crystal Reports Processing Engine—Pre-Pass #1	124
Crystal Reports Processing Engine—Pass #1	124
Crystal Reports Processing Engine—Pre-Pass #2	125
Crystal Reports Processing Engine—Pass #2	125
Crystal Reports Processing Engine—Pass #3	126
Troubleshooting	126
Crystal Reports in the Real World—Custom Functions	126
5 Implementing Parameters for Dynamic Reporting	131
Introduction	132
Understanding the Value of Parameters	132
Creating and Implementing Parameters Fields	134
Reviewing Parameter Field Properties	134
Creating Parameter Fields	138
Setting Default Values for Parameter Fields	140
Implementing Parameter Fields	142

Using Parameters with Record Selections	143
Using Parameters with Top/Bottom N Group Selections	146
Creating and Implementing Dynamic and Cascading Parameters	147
Using the Parameter Panel in the Preview Tab	150
Troubleshooting	150
Crystal Reports in the Real World—Custom Filtering	151

II Formatting Crystal Reports

6 Fundamentals of Report Formatting	155
Introduction	156
Positioning and Sizing Report Objects	156
Modifying Object Properties for Formatting Purposes	162
Exploring the Format Editor Dialog Common Options	166
The Common Tab of the Format Editor	167
The Border Tab of the Format Editor	168
The Font Tab of the Format Editor	168
The Hyperlink Tab of the Format Editor	169
Other Format Editor Tabs	170
Combining and Layering Report Objects	170
Configuring Report Page and Margin Properties	174
Troubleshooting	176
Crystal Reports in the Real World—Exporting Options	176
Crystal Reports in the Real World—Referencing External Resources	176
7 Working with Report Sections	179
Introduction	180
Formatting Report Sections	180
Modifying Report Section Properties	184
The Section Expert Settings and Functionality	188
Using Multiple Report Sections	193
Resizing Report Sections	194
Inserting New Report Sections	194
Deleting Report Sections	197
Merging Report Sections	198
Troubleshooting	199
Crystal Reports in the Real World—Advanced Formatting	199
Crystal Reports in the Real World—Advanced Formatting on Drill-Down Reports	201

8 Visualizing Your Data with Charts and Maps	203
Introduction	204
Using the Chart Expert	204
Using the Chart Expert Type Tab	205
Using the Chart Expert Data Tab	207
Using the Chart Expert Axes Tab	211
Using the Chart Expert Options Tab	211
Using the Chart Expert Color Highlight Tab	212
Using the Chart Expert Text Tab	212
Using the Map Expert	214
Using the Map Expert Data Tab	215
Using the Map Expert Type Tab	218
Using the Map Expert Text Tab	220
Modifying Chart and Map Properties	220
Modifying Chart Properties	221
Format Chart Options	221
Using and Creating Chart Templates	221
Specifying Chart Size and Position	221
Modifying Chart Options	221
Specifying Series Options	223
Specifying X-Axis and Y-Axis Options	224
Specifying Selected Item Formatting Options	225
Specifying 3D Viewing Angle Options	225
Modifying Map Properties	227
Troubleshooting	228
Crystal Reports in the Real World—Complex Charts	228
9 Custom Formatting Techniques	233
Introduction	234
Making Presentation-Quality Reports	234
Common Formatting Features	234
Working with ToolTips	235
Lines and Boxes	236
Creating a Vertical Text Watermark	238
Conditional Formatting—Using Data to Drive the Look of a Report	240
Applying Formatting from Another Field	241
Report-to-Report Linking and the Hyperlink Wizard	242
Report-to-Report Linking	242
Hyperlink Wizard	243
Find in Field Explorer	244

Barcode Support	245
Convert to Barcode	245
Convert from Barcode	246
Crystal Reports in the Real World—Advanced Charting	247

III Advanced Crystal Report Design

10 Using Cross-Tabs for Summarized Reporting 253

Introduction to Cross-Tabs	254
Benefits of Cross-Tabs	254
Leveraging Experience with the Spreadsheet Format	255
Horizontal Expansion	256
Custom Formatting	256
Using the Cross-Tab Wizard	256
Using Top N with Cross-Tabs Reports	258
Using Advanced Cross-Tab Features	260
Setting Relative Position	260
Inserting a “Percentage of” Summary	261
Horizontal and Vertical Placement	263
Inserting Summary Labels	263
Adding a Display String	264
What’s New in Cross-Tabs	267
New Cross-Tab Functions Defined	267
Crystal Reports in the Real World—Advanced Cross-Tabs	271

11 Using Record Selections, Sort Controls, and Alerts for Interactive Reporting 275

Introduction	276
Creating Advanced Record Selection Formulas	276
Record Selection Review	276
Displaying Record Selections	276
Dealing with Dates	277
Working with Strings	278
Pushing Record Selections to the Database	279
An Introduction to SQL Expressions	281
Adding Alerting to Your Reports	283
Creating, Editing, and Using Alerts	284
Using Alerts in BusinessObjects Enterprise	285
Performance Monitoring and Tuning	286
Group By On Server	286
SQL Expressions in Record Selections	286

Use Indexes on Server for Speed	287
On-Demand or Reduced Number of Subreports	287
Performance Monitor	287
Dynamic Cascading Prompts	289
Sort Controls	292
Crystal Reports in the Real World—Web Report Alert Viewing	294
Troubleshooting	298
12 Using Subreports for Advanced Reports	299
Introduction to Subreports	300
Common Subreport Usage	300
Adding Subreports to Your Reports	301
Understanding Linked Versus Unlinked Subreports	304
Considering Subreport Execution Time and Performance	307
Using Variables to Pass Data Between Reports	309
Emulating Nested Subreports	312
Troubleshooting	312
Crystal Reports in the Real World—Multiple Subreports	313
13 Using Formulas and Custom Functions	317
Introduction	318
Choosing a Formula Language: Crystal Versus Basic Syntax	318
Understanding Syntax Differences	318
Why Basic Syntax Was Added	319
Selecting the Best Syntax for You	319
Using Brackets in Formulas	319
Using Characters in Formulas	320
Recent Improvements to Formulas	320
Manipulating Memo Fields in Formulas	320
Working with the Additional Financial Functions	323
Creating Custom Functions in Your Reports	323
Sharing Custom Functions with Others	324
Understanding Runtime Errors	324
Crystal Reports in the Real World—Custom Functions	327
14 Designing Effective Report Templates	331
Understanding the Importance of Reuse in Reporting	332
Understanding Report Templates	332
Using Report Templates	332

Using Existing Crystal Reports as Templates	333
Understanding How Templates Work	335
Creating Useful Report Templates	336
Using Custom Functions as Replacements for Data-Dependent Business Logic	337
Using the CurrentFieldValue Function	338
Using Template Field Objects	338
Using Report Templates to Reduce Report Creation Effort	344
Applying Multiple Templates	345
Exporting Capabilities in Crystal Reports	345
Crystal Reports in the Real World—Standardized Templates	347
Troubleshooting	349
15 Additional Data Sources in Crystal Reports	351
Understanding the Additional Crystal Reports Data Sources	352
Connecting to COM or .NET Data Sources	352
Leveraging Legacy Mainframe Data	353
Handling Complex Queries	353
Runtime Manipulation of Data	353
Review an .ADO.NET Data Provider	354
Connecting to an ADO.NET XML Recordset	356
Connecting to Java-Based Data Sources	356
JavaDir	357
JavaBeansClassPath	357
Connecting to XML Data Sources	358
Connect to a Local XML Data Source	358
Connect to an HTTP(S) Data Source	359
Connect to a Web Service Data Source	359
Introduction to the Integration Kits	359
Honor the Security	360
Access to All the Data	360
Sample Reports	360
Leverage the Metadata of the ERP Application	360
Provide Real-Time Access to Data	361
SAP Integration Kit	361
Reporting Off R3 Data	361
Reporting Off BW Data	362
Viewing the Reports	365
PeopleSoft Integration Kit	365
Reporting Off PeopleSoft Data	366
Viewing the Reports	366

Siebel Integration Kit	366
Troubleshooting	366
Crystal Reports in the Real World—Leveraging XML as a Data Source	367
16 Formatting Multidimensional Reporting Against OLAP Data	369
Introduction to OLAP	370
OLAP Concepts and OLAP Reporting	370
Recently Added or Changed OLAP Features in Crystal Reports	371
Using the OLAP Report Creation Wizard and OLAP Expert	372
Specifying an OLAP Data Source	373
Specifying OLAP Rows and Columns	375
Specifying OLAP Dimension Slices (Filters) and Pages	377
Adding Report Styles in the OLAP Report Creation Wizard	380
Adding Charts via the OLAP Report Creation Wizard	381
Customizing Styles in the OLAP Expert	383
Customizing Labels in the OLAP Expert	384
Advanced OLAP Reporting	385
Interacting with the OLAP Grid	385
Pivoting the OLAP Grid	386
Using the Cube View Functionality	387
Using Charts and Maps Based on OLAP Grids	388
Troubleshooting	389
Crystal Reports in the Real World—OLAP Summary Report with Drill-Down	389
 IV Report Distribution and Advanced Report Design with Crystal Xcelcius	
17 Introduction to Crystal Reports Server, Crystalreports.com, and the Crystal Reports Viewer	395
What Is Crystal Reports Server?	396
Crystal Reports Server Architecture	397
Client Tier	397
Application Tier	398
Intelligence Tier	399
Processing Tier	400
Data Tier	401
Crystal Reports Server Applications	401
Central Configuration Manager	401
Use the Central Management Console (CMC)	402
Launch InfoView	405

What Is Crystalreports.com?	406
Getting Started with Crystalreports.com	406
Adding Reports to Crystalreports.com	407
Sharing Reports on Crystalreports.com	408
Offline Viewing with the Crystal Reports Viewer	409
Troubleshooting	410
18 Crystal Reports Java Components	411
Overview of the Crystal Reports Java Reporting Component	412
Components Run on the Web Application Server	412
Components Are Generally Less Scalable	413
Components Are 100% Pure Java	413
Understanding the Java Reporting Components Architecture	413
Differences with the Java Reporting Engine	415
Supported File Formats	415
Support for User Function Libraries in Version XI of the Java Reporting Components	415
The Java Reporting Engine Uses JDBC	416
Configuring the Application Server	418
Delivering Reports in Web Applications	419
The setReportSource Method	419
The processHttpRequest Method	420
Customizing the Toolbar	422
Customizing the Group Tree	422
Using the Crystal Tag Libraries	422
Exporting Reports to Other File Formats	423
Exporting via the Toolbar Button	424
Exporting via Code	425
Printing Reports from the Browser	427
Common Programming Tasks	428
Passing Parameters	428
Setting Data Source Information	430
Developing with a Visual Development Environment	430
19 Crystal Reports Microsoft .NET Components	433
Understanding Microsoft's .NET Platform	434
Understanding the Different Crystal .NET Components	435
An Overview of the Crystal Reports 2008 .NET Components	436
The Report Designer	436
Understanding the Report Designer's User Interface Conventions	438
The Property Browser	438

The Report Engine Object Model	439
Opening Reports	440
Exporting Reports	440
Printing Reports	443
Delivering Reports with the Windows Forms Viewer	444
The ReportSource Property	445
Customizing the Windows Forms Viewer	446
Delivering Reports with the Web Forms Viewer	447
Customizing the Web Forms Viewer	448
Database Credentials	449
Setting Parameters	451
Understanding the Report Application Server Bridge	453
Creating a Crystal Reports Web Service	453
Troubleshooting	455
20 Basic Xcelsius Development	457
Introduction to Dashboards with Xcelsius	458
Xcelsius Development Paradigm	458
Xcelsius Integrated Development Environment	460
Components	460
Properties	461
Object Browser	462
Data Manager	463
Basic Component Categories	465
Single Value Components	465
Charts	468
Selectors	471
Containers	474
Alerts	476
Dashboard Design Enhancements	479
Color Schemes	479
Themes	481
Backgrounds	481
Label Text	482
Image Component	483
Publishing and Deployment	483
Adobe SWF	484
Adobe PDF Document	484
Microsoft PowerPoint	484
Microsoft Word	484
Business Objects Enterprise	484

HTML	485
Crystal Reports	485
Troubleshooting	486
21 Advanced Xcelsius Visualization and Connectivity	487
Advanced Global Features and Techniques	488
Dynamic Visibility	488
Chart Drill Down	490
Insert Filtered Rows	492
Map Components	494
Multilayer Dashboards	496
Advanced Functionality with Excel Logic	498
Conditional Formulas	500
Lookup Functions	502
Concatenating Values	503
Working with Dates	505
Advanced Connectivity and Integration	505
Data Manager Usage Tab	506
BusinessObjects Enterprise Integration	508
Live Office Connectivity	509
Universe Query with Query as a Web Service	514
Web Service Connection	515
Excel XML Maps	515
Using Flash Variables	519
Index	523

ABOUT THE LEAD AUTHOR

Neil FitzGerald is an entrepreneur who has successfully started or contributed to multiple consulting companies in the IT consulting domain. Neil combined his bachelor's degree in computer science from Queen's University in Kingston, Canada and his MBA from the Ivey School of Business at the University of Western Ontario with his more than 8 years of experience at Business Objects in a variety of senior roles to help provide information solutions to Fortune 500 companies across North America. He has spent more than 13 years in the information delivery domain and is available for onsite or remote consulting to companies large and small. Neil can be contacted at neil_fitzgerald@hotmail.com.

ABOUT THE CONTRIBUTING AUTHORS

Bob Coates has worked for Business Objects, an SAP company (through the Crystal Decisions and Business Objects acquisitions), for more than 11 years. While there he worked in technical support, global services, and sales consulting. Presently Bob is a principal sales consultant working on the SAP Synergy Team—a branch of the Strategic Technology Group focused on the top 100 SAP customers. Bob would like to thank his wife Amanda for her infinite patience and support.

Ryan Goodman is the founder of Centigon Solutions Inc. As a previous technical evangelist and sales consultant at Infommersion and then Business Objects, Ryan has implemented hundreds of Xcelsius projects spanning more than 4 years. His interactive data visualization and design background coupled with his business insight and technical aptitude have made him one of the top Xcelsius experts in the world. Ryan continues to push the envelope and evangelize Xcelsius on his blog: www.ryangoodman.net/blog.

Michael Voloshko is a principal solutions architect for the financial services vertical at Business Objects, an SAP company.

DEDICATION

To my growing family, including my daughter Maya and her expecting mom, Arlene.

—Neil FitzGerald

Dedicated to my wife Amanda for all of her love and support.

—Bob Coates

To my mentors and counterparts who have contributed to my growth, both as a professional and as a person.

—Ryan Goodman

To all the people throughout the years who have inspired me to continue achieving and advancing in life.

—Michael Voloshko

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INTRODUCTION



In this chapter

- Introduction to Information Delivery 2
- Spectrum of Business Objects Product Usage 3
- Spectrum of BI Tool Users 5
- The Product Family from Business Objects 8
- What Is in This Book 8
- Equipment Used for This Book 10

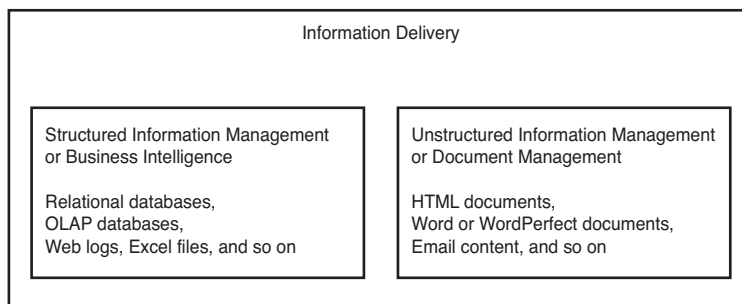
INTRODUCTION TO INFORMATION DELIVERY

Organizations of all sizes today find themselves increasingly awash in data, yet hungering for information to help them meet their business objectives. These corporations, from Main Street and Wall Street alike, have spent large amounts of time and money over the past 10 or so years implementing systems to help collect data on and streamline their operations. From monolithic Enterprise Resource Planning (ERP) systems (SAP, PeopleSoft, Oracle Financials, and so on) through Customer Relationship Management (CRM) systems (Siebel, Rightnow.com, Salesforce.com, and so on) to Custom Data Warehousing projects, these firms are now looking for ways to extract value from the collective body of data to help them run their businesses more productively and competitively. These firms are looking for a strategic information delivery or business intelligence solution to help them become more productive and ultimately compete more effectively. The products covered in this book are geared toward meeting that challenge.

The information delivery products and solutions presented in this book are often categorized under the *Business Intelligence (BI)* banner. BI is the industry of value-added information delivery based on structured data sources—essentially providing meaningful, business-driven value and information to business end users by connecting them to data with appropriate tools and products. Figure I.1 highlights the conceptual divide of information delivery solutions into the structured and unstructured world. Although evidence suggests an eventual blurring of the boundaries between these discrete industries over time, the Business Objects products covered in this book most aptly fit under the BI banner.

Figure I.1

The information delivery industry divides broadly into structured and unstructured information management.



Industry analysts in the information delivery area regularly highlight the impressive adoption rates of BI products in the past few years as testimony to their value. The dynamic double-digit percentage growth rates for industry leaders such as Business Objects are especially impressive when the difficult macroeconomic operating environment of recent years is taken into account. Ironically, many suggest, this same poor economic environment has largely driven the increased worldwide demand for BI functionality as firms work to increase their productivity and competitiveness by leveraging existing investments—and doing more with less. The next section covers the BI industry driver along with a few others.

SPECTRUM OF BUSINESS OBJECTS PRODUCT USAGE

BI products such as those distributed by Business Objects (Crystal Reports, Crystal Reports Server, BusinessObjects Enterprise, Crystal Xcelsius, and Web Intelligence) are deployed and used in about as many different ways as there are product implementations—and there are millions. However, as you examine a broad swath of BI clients and their implementations, you can find definite themes to their deployments. Taking a step back, distinctive drivers to worldwide BI product adoption become evident. The following sections discuss a few of the most common.

CUSTOM INFORMATION DELIVERY APPLICATIONS

Despite the increasing functionality of turnkey software and web applications available today, corporations of all sizes still regularly look to custom-developed applications to provide them with unique competitive advantage and to meet their proprietary business requirements. These applications run the gamut in size from small business applications through large departmental applications to enterprise intranet and extranet applications. The key component of these custom projects is the integration of BI functionality, such as formatted reporting, ad hoc query, dashboarding, self-service web reporting, and/or analytic capabilities, within an internally developed application. Table I.1 highlights some typical examples of custom applications using the Business Objects suite of products to help deliver custom applications.

TABLE I.1 SAMPLE CUSTOM INFORMATION DELIVERY APPLICATIONS

Application	Application Audience	Product Usage
Small retail chain's internal Java-based sales metrics application	Approximately 20 sales employees and managers	Using Crystal Reports Java Engine, the developer provides the sales team with Web access to on-demand metrics reports built into the intranet application.
Large portfolio	10,000+ high value customers of firm	Using Crystal Xcelsius and Crystal Reports Server, the management firm's developer provides access to the scalable client extranet application reporting infrastructure and facilitates those customers getting online web access to their portfolio reports.
Asset management firm's report batch of institution scheduling application	50,000+ clients	Using the Business Objects reporting server and scheduling engine, the developer's application dynamically creates tens of thousands of customized reports daily and automatically emails them to the appropriate clients in PDF and XLS formats.

A key strength of the Business Objects suite of products is that it lends itself readily to integration into custom applications. From the inclusion of basic formatted reports within Java/J2EE or .NET applications through the inclusion of rich ad hoc query and self-service reporting functionality in proprietary information product applications to provision of large-scale enterprise BI analytics, scheduling, and security functionality in a globally deployed application, the Business Objects suite of products can meet your requirements. Table I.2 provides a jump-point for those looking for each type of application integration covered in this book.

TABLE I.2 CUSTOM APPLICATION CHAPTERS OVERVIEW

Development Environment	Required Functionality	Part or Chapters
Java/J2EE	Prebuilt reports included in custom Java application	Part IV, Chapter 18
.NET	Prebuilt reports included in custom .NET application	Part IV, Chapter 19

ENTERPRISE BI INITIATIVES

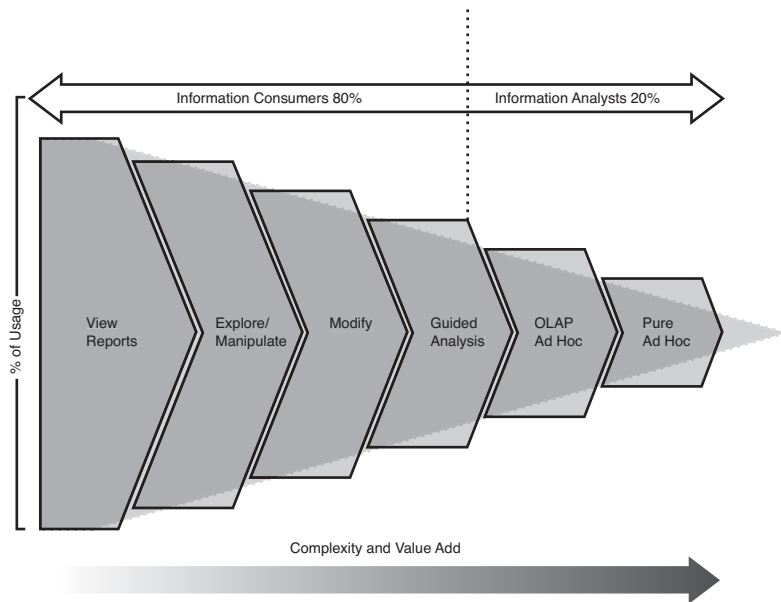
With the proliferation of BI tools and the acceleration of product adoption around the globe, there has been concurrent pressure for the involved companies to standardize on a single set of products and tools—effectively a BI infrastructure or platform. The main arguments for such standardization include the following:

- Reduced total cost of product ownership
- Creation of enterprise centers of excellence
- Reduced vendor relationships
- Movement toward a BI infrastructure/platform

As BI products have matured from different areas of historical strength and their marketplace acceptance has grown, end user organizations have found themselves with disparate and incompatible BI tools and products across or even within the same departments in their organization. To eliminate the costliness of managing such a broad set of tools, many firms are now moving to adopt a single BI platform such as BusinessObjects Enterprise (or Crystal Reports Server for smaller businesses).

The infrastructure of BusinessObjects Enterprise provides a single architecture to manage all the content and tools required to serve an organization's structured information delivery requirements. Figure I.2 shows an end user map of a typical organization. To be productive, each type of end user in a company requires different types of tools. There are clear organizational benefits to a common infrastructure or centrally managed center of excellence, such as BusinessObjects Enterprise, which can meet the various end user and IT requirements.

Figure I.2
Organizational end
user requirements
map from Business
Objects.



Details of the breakdown of this book are included later in this Introduction, but to jump-start your learning on this type of BI application, Table I.3 can point you to the sections and chapters of particular relevance.

TABLE I.3 ENTERPRISE BUSINESS INTELLIGENCE CHAPTER OVERVIEW

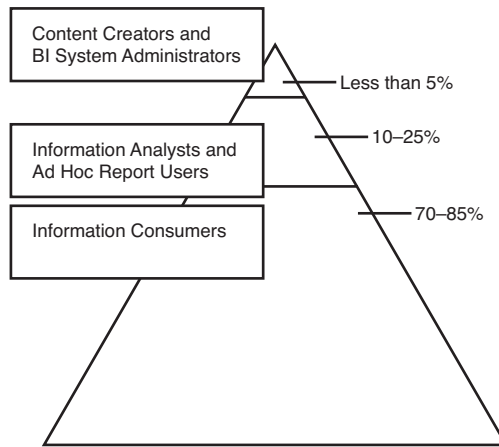
Enterprise Business Intelligence Focus	Chapter
Out-of-the-box product using Crystal Reports Server for small- and medium-sized businesses	Part IV, Chapter 17
Using crystalreports.com to distribute reporting content	Part IV, Chapter 17

SPECTRUM OF BI TOOL USERS

Across the usage profiles of the thousands of BI scenarios/implementations, there generally exists a consistency in the types of people who become involved. Figure I.3 provides a relatively high level yet accurate graphic that shows a typical distribution of the people involved in BI implementations.

Figure I.3

Average BI implementation user distribution.

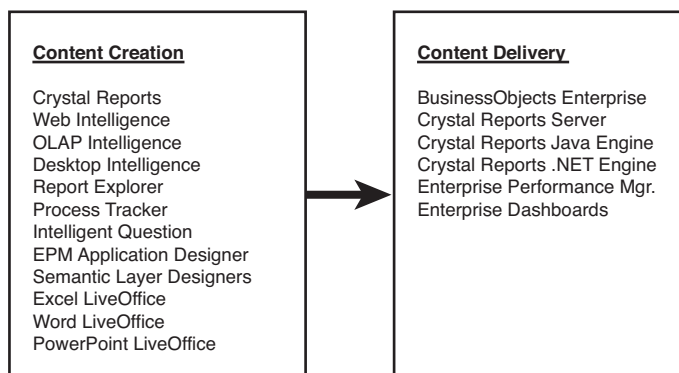


Each of the three communities outlined in the pyramid plays a key role in the ongoing success and operation of any BI implementation. The content creators and system administrators play perhaps the most important role in ensuring the short- and long-term success of any deployment because their work sets up the system content and tools from which the other users derive benefit. The information analysts generally come from across an organization's typical functions and are highly demanding users who require rich and highly functional interactive tools to facilitate their jobs as analysts. The last group is by far the largest group and includes employees, partners, customers, and suppliers who rely on the BI implementation to provide timely, secure, and reliable information or corporate truths. This group tends to span the entire corporate ladder from foot soldiers right up to the executive suite—all of whom have the same requirement of simple information provision to enable them to complete their regular day-to-day assignments successfully.

Figure I.4 provides a schematic highlighting the distinction between the different content creation tools and the content delivery tools—BusinessObjects Enterprise, Crystal Reports Server, or Java/.NET reporting engines. This book breaks down into two sections covering these two themes: content creation (Chapters 1–16) and content delivery in all of its possible forms (Chapters 17–21) using some of the Business Objects suite of products.

Figure I.4

Content creation and content delivery schematic.



CONTENT CREATORS (INFORMATION DESIGNERS)

Content creators provide the foundation to any BI implementation. This group uses content creation tools such as Crystal Reports, Crystal Xcelsius, Web Intelligence, Desktop Intelligence (formerly BusinessObjects), Excel, and so on. These users—primarily composed of IT folks but sometimes complemented with technically savvy business users—create the report content, dashboards, OLAP cubes, and reporting metadata that facilitates system usage and benefits derived from the other system users. Because these tasks are of paramount importance in an enterprise suite deployment, the entire first half of the book is dedicated to providing these folks with a comprehensive tutorial and reference on content creation using Crystal Reports and Crystal Xcelsius.

After content exists, it is ready for distribution through an infrastructure such as BusinessObjects Enterprise, the new Crystal Reports Server product, or a custom application. Finally, the content requires management. Another small but critical group of BI system users—the BI administrators—need to ensure that the system is deployed and tuned correctly to ensure optimal performance for the business end users.

INFORMATION ANALYSTS

Although not the primary group in number, the information analysts in a BI deployment are those who are primarily responsible for the extraction of new business insights and actionable recommendations derived from the BI implementation. Using such analytic tools as Web Intelligence, Crystal Xcelsius, and Excel, these users spend their time interrogating, massaging, and slicing and dicing the data provided in the various back-end systems until they glean nuggets of business relevance. These users tend to come from a wide variety of functional areas in a company, including operations, finance, sales, HR, and marketing and all work with the provided BI tools to extract new information out of the existing corporate data set. Chapters 20 and 21 provide detailed information on using Crystal Xcelsius, and www.usingcrystal.com provides information on Web Intelligence and Microsoft Live Office plug-ins.

INFORMATION CONSUMERS

This group of users composes the clear majority of those involved with a BI implementation. They are also the most diverse group and come from every rung on the corporate ladder. Executives who view corporate performance dashboards fit into this category, as would truck drivers who receive their daily mileage and shipping reports online through a wireless device. The common characteristic of members of this group is that their interactions with the BI system are not indicative of their primary jobs. Unlike the content creators and information analysts, information consumers have jobs outside of the BI implementation, and the key measure of success for them is that the BI system helps facilitate their variety of assignments. Chapter 17 provides an introduction to the out-of-the-box Crystal Reports Server interfaces.

THE PRODUCT FAMILY FROM BUSINESS OBJECTS

As Figure I.4 showed, the product family distributed by Business Objects is broken into two major segments: content creation and content delivery. This book is roughly split in two, with each section covering one of the topics in great detail. The primary products in the family covered in these sections are Crystal Reports (first section) and Crystal Reports Server, the Crystal Reports SDKs, and Crystal Xcelsius (second section). The content creation section of the book introduces Crystal Reports version 2008—the world standard for professional formatted reporting across the largest spectrum of data sources. The Crystal Reports Application Designer benefits from more than 15 years of development and provides an unparalleled combination of powerful functionality and report-design flexibility.

The content delivery half of the book covers the following Crystal Products and SDKs:

- **Crystal Reports Server**—New since version XI, Crystal Reports Server provides all the functionality of BusinessObjects Enterprise but is limited to a single multi-CPU server and is aggressively priced for small- and medium-sized businesses. This solution is a very attractive option for deploying BI and reporting solutions.
- **Crystal Xcelsius**—Xcelsius 2008 is a dynamic and customizable data visualization tool that enables users of different skill levels to create insightful and engaging dashboards from any data source with point-and-click ease. Xcelsius 2008 offers a comprehensive set of new features and integrations with Crystal Reports 2008, making it easy to put the power of dashboards into the hands of business users.
- **Crystal Vision**—New to version XI release 2, Crystal Vision provides a combination of the functionality of Crystal Reports Server with the newly acquired Crystal Xcelsius dashboarding functionality.
- **Crystal Reports Engine for .NET Applications**—The only third-party tool distributed with Visual Studio .NET, this reporting component enables .NET developers to quickly embed limited but powerful reporting functionality into their .NET applications.
- **Crystal Reports Engine for Java Applications**—Embedded in Borland's JBuilder and other Java IDEs, this reporting component enables Java developers to quickly embed limited but powerful reporting functionality into their Java applications.

WHAT IS IN THIS BOOK

This book is broken down into several sections to address the varied and evolving requirements of the different users in a BI deployment.

The entire first half of the book (Parts I through III) focuses exclusively on content creation with Crystal Reports. Through hands-on step-by-step examples and detailed descriptions of

key product functionality, you learn to leverage the powerful report creation capabilities of Crystal Reports v2008. Some profiles of people who find these sections of particular relevance:

- New and mature Crystal Reports designers
- Professional Crystal Reports designers upgrading to 2008
- Existing and new OLAP Intelligence, Web Intelligence, and Desktop Intelligence (formerly Business Objects) designers and analysts
- Existing and new BusinessObjects Enterprise (formerly Crystal Enterprise) administrators
- New Crystal Reports Server administrators

The second section of the book (Part IV) focuses on the distribution or delivery of the valuable content created in the first half and additional insights into advanced content creation with Crystal Xcelsius. An introduction to Crystal Reports Server, crystalreports.com, and the offline Crystal Reports Viewer complements a comprehensive introduction to Crystal Xcelsius. This extends with an introduction to the .NET and Java SDKs around Crystal Reports. Some profiles of people who find these sections of high value:

- New Crystal Reports Server administrators
- New or existing Crystal Reports Server users
- .NET-based application developers
- Java/J2EE-based application developers
- Application developers looking to integrate report design or modification into their applications

PART I: CRYSTAL REPORTS DESIGN

Part I should familiarize you with the foundations of Crystal Reports and get you up and running as quickly as possible. It is critical for someone who is new to Crystal Reports and includes the fundamental report design concepts that even experienced users can use for the rest of their Crystal Reports–writing career. This section also provides powerful exercises and real-world usage tips and tricks with which even seasoned reporting experts can become more productive.

PART II: FORMATTING CRYSTAL REPORTS

Part II focuses on some of the more subtle nuances of Crystal Report design: effective report formatting and data visualization through charting and mapping. Improper formatting and incorrect use of visualization techniques can make reports confusing and not user friendly. This section also provides powerful exercises and real-world usage tips and tricks, enabling mature reporting experts to become more productive.

PART III: ADVANCED CRYSTAL REPORTS DESIGN

Part III presents a host of advanced Crystal Reports design concepts that involve features such as subreports, cross-tabs, report templates, and alerts. This part also touches on advanced data access methods such as JavaBeans, XML objects, SAP, and PeopleSoft systems. The section also provides powerful exercises and real-world usage tips and tricks, enabling mature reporting experts to become more effective in their report design work.

PART IV: REPORT DISTRIBUTION AND ADVANCED REPORT DESIGN WITH CRYSTAL XCELSIUS

Part IV focuses on the different methods of distribution of the Crystal Reports content created in the first three sections. These methods include Crystal Reports Server, crystalreports.com, the .NET and Java SDKs, and the offline Crystal Reports Viewer. This section provides a comprehensive introduction to advanced visualizations and dashboard creation with Crystal Xcelsius.

EQUIPMENT USED FOR THIS BOOK

You can find various supporting material that will assist you in the completion of the exercises in this book, as well as supplemental documentation on related topics. You should have access to a computer that has at least a 450MHz Pentium II or equivalent processor, 128MB of RAM, and Windows 2000, Windows 2003, or Windows XP Professional.

WEB RESOURCES

You can find all the source code and report samples for the examples in the book, as well as links to great external content, at www.usingcrystal.com. You'll find report samples to download and code for you to leverage in your report design and sharing efforts. Also, a great deal of additional product-related information on the Business Objects suite of products including Crystal Reports, Web Intelligence, OLAP Intelligence, Desktop Intelligence, Crystal Reports Server, and BusinessObjects Enterprise can be found at www.businessobjects.com.

INTENDED AUDIENCE

This book was written to appeal to the full range of Crystal Reports, Crystal Reports Server, and Crystal Xcelsius users. You'll find this book useful if you've never used the Business Objects suite of products before, if you are a mature Crystal Reports user looking for some new productivity tips, or if you want to explore some of the new features found in version 2008 and their related SDKs.

You don't have to be an expert, but you should have a basic understanding of the following concepts:

- Database systems such as Microsoft SQL Server, Oracle, Sybase, and Informix
- Operating system functions in Windows 2003/XP/Vista
- General Internet/intranet-based concepts such as HTML, DHTML, ActiveX, and Java

Parts I through III build on each other, so skipping around those parts isn't the best approach unless you have some familiarity with Crystal Reports 2008. Even if you are familiar with Crystal Reports, many new features have been introduced in recent versions, so you are encouraged to read the entire first three sections of the book so that you don't miss anything. Part IV focuses on the different methods of content delivery, so you can approach each part independently without loss of context.

REQUIREMENTS FOR THIS BOOK

All reports are based on sample data available from the businessobjects.com website, so you have access to the same data used in this book. You'll need to install Crystal Reports to get the most out of the examples included in each chapter in the first half of the book.

CONVENTIONS USED IN THIS BOOK

Several conventions are used within this book to help you get more out of the text. Look for special fonts or text styles and icons that emphasize special information.

- Objects such as fields or formulas normally appear on separate lines from the rest of the text. However, there are special situations in which some formulas or fields appear directly in the paragraph for explanation purposes. These types of objects appear in a special font like this: `Some Special Code`. Formula examples appear on the Sams Publishing website as well.
- In some cases, I might refer to your computer as a *machine* or *server*. This is always in reference to the physical computer on which you have installed Crystal Reports.
- You'll always be able to recognize menu selections and command sequences because they're implemented like this:
Use the File, Open command.
- New terms appear in *italic* when they are defined.
- Text that you are asked to type appears in **boldface**.
- URLs for websites are presented like this: <http://www.businessobjects.com>.

NOTE

Notes help you understand principles or provide amplifying information. In many cases, a Note emphasizes some piece of critical information that you need. All of us like to know special bits of information that make our job easier, more fun, or faster to perform.

TIP

Tips help you get the job done faster and more safely. In many cases, the information found in a Tip comes from experience rather than through experimentation or documentation.

Sidebar

Sidebar spend more time on a particular subject that could be considered a tangent but will help you be a better Business Objects product user as a result.

Real World sections provide some practical and productivity-enhancing usage insights derived from the author's real-world experience designing and deploying hundreds of Crystal Reports.

Troubleshooting sections provide some quick chapter summary notes and examples that are useful reminders on the product operations.

CHAPTER 16

FORMATTING MULTIDIMENSIONAL REPORTING AGAINST OLAP DATA

In this chapter

Introduction to OLAP 370

OLAP Concepts and OLAP Reporting 370

Recently Added or Changed OLAP Features in Crystal Reports 371

Using the OLAP Report Creation Wizard and OLAP Expert 372

Advanced OLAP Reporting 385

Troubleshooting 389

Crystal Reports in the Real World—OLAP Summary Report with Drill-Down 389

INTRODUCTION TO OLAP

The first 15 chapters exposed you to a wide variety of the reporting capabilities found in Crystal Reports. Up to this point, however, all the reports you created were based on relational data sources, often known as *Online Transactional Processing (OLTP)* databases, where most organizations generally keep their operational data.

In many organizations and for many people today, data reporting ends with Crystal Reports pointing at existing relational data sources such as Microsoft SQL Server, Oracle, DB2, Sybase, or even Microsoft Access. All those relational databases are designed for the efficient storage of information. These databases are not designed optimally, however, for the efficient extraction of data for aggregated analysis across multiple dimensions—that is where OLAP databases excel.

OLAP stands for *Online Analytical Processing*, which enables business users to quickly identify patterns and trends in their data while reporting against multiple dimensions at once. Examples of dimensions for analysis include time, geographic region, product line, financial measure, customer, supplier, salesperson, and so on. Crystal Reports provides powerful OLAP-based formatted reporting capabilities, and this chapter introduces them.

This chapter covers the following topics:

- Introduction to OLAP concepts and OLAP reporting
- Recently added OLAP features in Crystal Reports
- Creation of OLAP-based Crystal Reports

OLAP CONCEPTS AND OLAP REPORTING

OLAP is an analysis-oriented technology that enables rapid analysis of large sets of aggregated data. Instead of representing information in the common two-dimensional row and column format of traditional relational databases, OLAP databases store their aggregated data in logical structures called *cubes*. Designers create OLAP cubes around specific business areas or problems. Cubes contain an appropriate number of dimensions to satisfy analysis in that particular area of interest or for a specific business issue. OLAP is a technology that facilitates data viewing, analysis, and navigation. More than a particular storage technology, OLAP is a conceptual model for viewing and analyzing data. Table 16.1 highlights some common business areas and typical sets of related dimensions.

TABLE 16.1 BUSINESS AREAS AND COMMONLY ASSOCIATED OLAP DIMENSIONS	
Business Area	Associated Business and Common OLAP Dimensions
Sales	Sales Employees, Products, Regions, Sales Channels, Time, Customers, Measures
Finance	Company Divisions, Regions, Products, Time, Measures
Manufacturing	Suppliers, Product Parts, Plants, Products, Time, Measures

OLAP cubes pre-aggregate data at the intersection points of their associated dimension's members. A *member* is a valid field value for a dimension. For example, members of a time dimension could be 2006, 2007, Q1, or Q2; members of a product dimension could be Gadget1, Gizmo2, DooDah1, and so on. This pre-aggregation facilitates the speed-of-thought analysis associated with OLAP.

Precalculating the numbers at the intersection points of an OLAP cube's associated dimension members enables rapid high-level analysis of large volumes of underlying data that would not be practical with traditional relational databases. Consider the example of analysis on several years of sales data by year, quarter, and month and by region, sales manager, and product. The pre-aggregated nature of OLAP facilitates speed-of-thought analysis that otherwise would not be practical when working with the phenomenal amount of data and involved calculations required to provide answers on a traditional relational (OLTP) database system—it would simply take too long.

When a Crystal Report uses an OLAP cube as a data source, it presents the multidimensional data in a two-dimensional OLAP grid that resembles a spreadsheet or cross-tab. The focus of Crystal Reports when reporting against OLAP cubes is to present professionally formatted two-dimensional (or flat) views of the multidimensional data of particular business use for report-consuming end users and not necessarily analysts requiring interactivity—the more traditional OLAP end users.

The concepts of OLAP usually become more understandable after you explore them. To that end, later sections in this chapter step you through a Crystal Reports report creation example against an OLAP cube.

RECENTLY ADDED OR CHANGED OLAP FEATURES IN CRYSTAL REPORTS

This section is specifically targeted for users of older versions of Crystal Reports. Table 16.2 lists the newly added OLAP-oriented features of recent versions and their practical use or benefit. If you are a new user to Crystal Reports or you have not previously used the OLAP reporting features in the product, you might want to skip directly to the next section.

TABLE 16.2 LATEST OLAP FEATURES IN CRYSTAL REPORTS

OLAP Feature	Feature Benefit and Value
Row/Column Dimension Parameter links	Enables the direct linking of report parameters to member selection and filtering in the column and row dimensions of the selected cube. You access this feature through either the OLAP Report Creation Wizard or the OLAP Report Settings option under the Report menu.

continues

TABLE 16.2 CONTINUED

OLAP Feature	Feature Benefit and Value
Slice/Page Dimension Parameter links	This productivity feature enables the direct linking of report parameters to pages and slices in the OLAP grid. This enables the end user to dynamically specify the values of slices and pages in the OLAP grid. You access this feature in either the OLAP Report Creation Wizard or the OLAP Report Settings option under the Report menu.
Interactive OLAP Worksheet (Analyzer) in new Cube tab	The New OLAP Analyzer feature (a Cube tab in Crystal Reports Designer) is accessed by right-clicking on an existing OLAP grid object and selecting the Launch Analyzer option. The Cube tab provides a fully functioning drag-and-drop OLAP worksheet that enables rapid selection of the most appropriate OLAP viewpoint for the Crystal Report. The associated Crystal Reports OLAP grid, where you can apply advanced formatting, reflects all changes made in the Analyzer worksheet.
Interactive drill-down of OLAP grids in Preview tab	The OLAP grid presented in the Crystal Reports Preview tab is more fully functional. In addition to having access to advanced OLAP grid functionality including calculations, exception highlighting, sorting, filtering, and member reordering from the right-click button, the OLAP grid now enables the report designer to expand (drill-down) and contract members directly from within the Preview tab.
New and improved data sources	At the time of writing, Crystal Reports 2008 provides OLAP access to multiple versions of Hyperion Essbase, DB2 OLAP, SQL Server Analysis Services, and SAP BW.

The following sections explore the creation of an OLAP report through the OLAP Report Creation Wizard, the added value of the OLAP Expert, and the advanced interactivity features of Crystal Reports.

USING THE OLAP REPORT CREATION WIZARD AND OLAP EXPERT

Crystal Reports provides two easy ways to create reports against OLAP data sources. As introduced in Chapter 1, “Creating and Designing Basic Reports,” Crystal provides several report wizards to step you through the creation of some popular types of reports—one of those is OLAP. The OLAP Report Creation Wizard involves five steps and walks you through the process of creating an OLAP grid and an optional supporting graphic based on an existing data source. You can access the OLAP Report Creation Wizard when you are creating a new report.

The second method of creating an OLAP-based report is through the OLAP Expert that you access from the Insert OLAP Grid on the Insert menu. This expert provides six tabs that step through the creation of an OLAP grid to be placed anywhere on a report.

The two methods of creation offer very similar degrees of functionality, and their respective dialog screens and tabs are almost identical. The OLAP Report Creation Wizard provides a built-in Charting screen not found in the OLAP Expert, whereas the OLAP Expert provides Style Customization and Label tabs not found in the OLAP Report Creation Wizard.

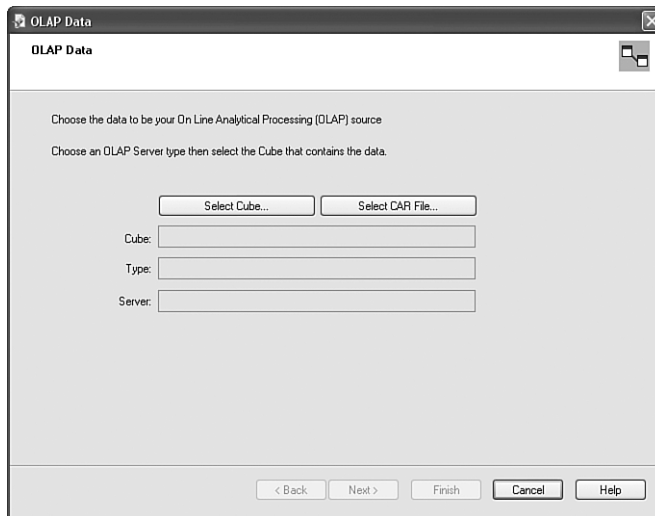
NOTE

Although Crystal Reports has been designed to report off of numerous multidimensional/OLAP databases including Hyperion Essbase, Microsoft SQL Server Analysis Services, and SAP BW, for the purposes of demonstration in this chapter, examples will be based on the SQL Server 2005 sample Sales and Employee cube—FoodMart. If a different OLAP database is available, the general principles should be followed against that native OLAP cube.

SPECIFYING AN OLAP DATA SOURCE

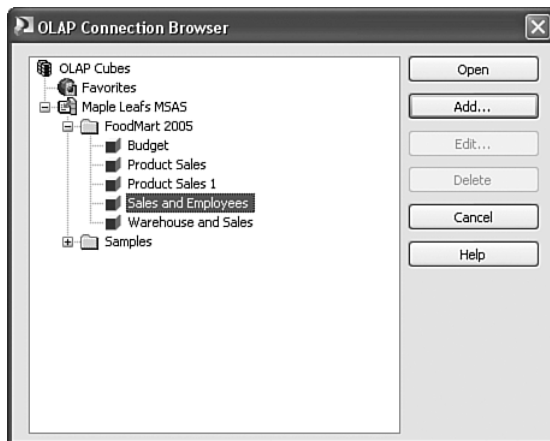
The OLAP Data tab (or screen in the OLAP Report Creation Wizard) requests the OLAP data source on which the report is to be based. This wizard and its associated dialog screens are to multidimensional data sources what the data explorer, introduced in Chapter 1, is to relational data. Figure 16.1 shows the OLAP Data screen from the OLAP Report Creation Wizard.

Figure 16.1
The OLAP Data dialog from the OLAP Report Creation Wizard.



When this screen first displays, you must use the Select Cube button to select a cube. Clicking on this button opens the OLAP Connection Browser, displayed in Figure 16.2. From the tree control presented in this dialog, select the desired cube.

Figure 16.2
The OLAP Connection Browser enables the specification of an OLAP data source for the involved Crystal Report.

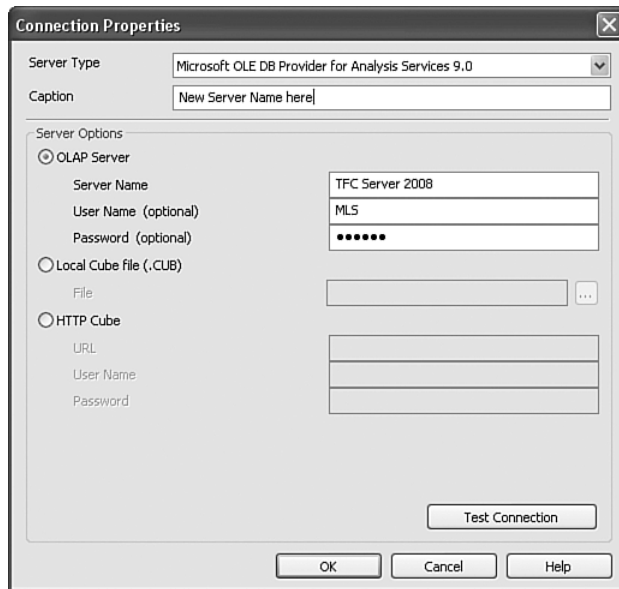


To help you learn about the creation of an OLAP-based Crystal Report, here are the introductory steps to doing exactly that against SQL Server 2005's sample FoodMart Sales and Employee cube (provided at usingcrystal.com). Other exercise steps will appear throughout the chapter after the presentation of related text and figures. For now, start the OLAP Report Creation process with the following steps:

1. Create a New Crystal Report by selecting the OLAP Cube Report Wizard from the Crystal Reports Start Page.
2. Click the Select Cube button from the OLAP Data dialog.
3. Assuming that the location of the OLAP Server has not already been identified to the OLAP Connection Browser, click the Add Server button and identify the location of your SQL Server Analysis Server and the sample Sales and Employees cube. Figure 16.3 shows the New Server dialog.
4. Enter a caption for the OLAP server you are adding. This caption appears in the OLAP Connection Browser. Enter the name of the SQL Server Analysis Server for the server name and click on OK.
5. Back in the OLAP Connection Browser, navigate into the presented list of servers (there will likely be only the server you just added) and double-click on the sample Sales and Employees cube.
6. Before clicking on the Next button to proceed, you see the Page Dimension Selector dialog. New to version 2008, from here you can select the specific dimensions from the cube that you would like to report on. For this exercise, select the highest level dimension from each group and click on OK to move forward. In the future you can use this functionality to restrict retrieved data/dimensions from larger cubes.

Figure 16.3

The Connection Properties dialog for a new OLAP server creates new connections to OLAP data sources.

**NOTE**

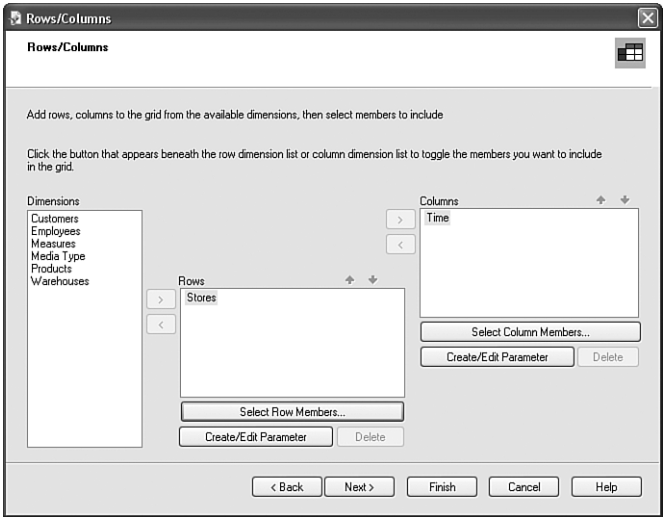
A Select CAR File button exists on the Data screen of the OLAP Report Creation Wizard, in addition to the Select Cube button. The name CAR comes from the legacy name Crystal Analysis Reports (CAR). CAR files are created with the sister online OLAP product to Crystal Reports used within BusinessObjects Enterprise. (This tool was formerly called Crystal Analysis.) CAR files can be treated as multidimensional data sources because they contain connectivity information to an underlying OLAP data source.

SPECIFYING OLAP ROWS AND COLUMNS

The Rows/Columns dialog screen enables you to select both the dimensions and fields to be presented along the columns and rows of the OLAP grid. The Dimensions list box depicted in Figure 16.4 lists all the available dimensions in the selected cube/data source.

To select a dimension for placement in the rows section or the columns section of the OLAP grid, highlight the desired dimension and click either the column or row arrow (>) button. It is possible to select multiple dimensions for display and to have them nested in the OLAP grid by successively selecting multiple dimensions for either the rows or the columns section. It is also possible to remove dimensions from the existing row or column list boxes; however, you cannot leave the column and row dimension list boxes empty.

Figure 16.4
The Rows/Columns dialog of the OLAP Report Creation Wizard.



After selecting the desired dimensions, you can select a subset of the fields (also known as *members*) for those dimensions by using the Select Row Members or Select Column Members button. Examples of this include selecting only a certain subset of provinces or states in a region dimension or, alternatively, selecting only a certain year's worth of data in a time dimension. By highlighting a dimension in either the Rows or the Columns list box and then selecting the appropriate selection button, you can use the Member Selector dialog to select a subset of the members for the involved dimension, as shown in Figure 16.5.

Figure 16.5
Use the Member Selector dialog to select default column and row dimension members.



The last and newest feature of the Rows/Column screen is the Create/Edit Parameter functionality provided for each of the row and column dimensions. This capability provides the business user or report consumer with the capability to interact with the report and control its content by entering parameters that directly affect the dimension members displayed in the OLAP grid(s) on the report.

Because Chapter 5, “Implementing Parameters for Dynamic Reporting,” covered parameters in detail, you are familiar with this topic. Of significance for this wizard screen is that the parameter creation process is directly accessible here, and this facilitates the rapid development of formatted and interactive OLAP reports. If necessary, review Chapter 5 for a refresher on creating and editing parameters.

TIP

The Member Selector dialog provides some powerful shortcuts for the selection of certain logical groups of members. These selection shortcuts are accessible through either the Select drop-down box or by right-clicking on any part of the Member Selection list box. Sample selection shortcuts include the ability to select all base level members or all members at a highlighted level.

Continuing with the creation of the sample report started in the last section, the following steps walk through the Rows/Columns screen part of this report creation example and allow for the refinement of the data to be viewed in the OLAP grid. Follow these steps to add rows and columns to your OLAP-based report:

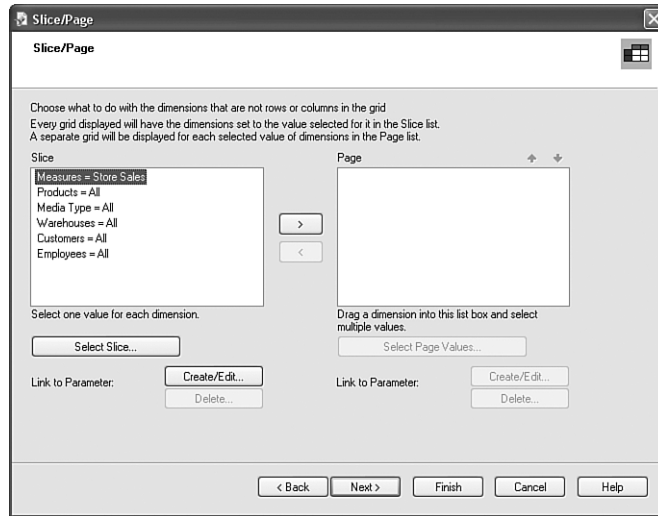
1. Select the Stores dimension from the available dimensions list as the Row dimension using the row dimension arrow button. (Note: It will likely be necessary to remove a default dimension to ensure that this is the only dimension in the row dimensions list view.)
2. Using the Select Row Members button, select all the store country locations (for example, Canada, USA, and Mexico) from the Member Selector dialog, but deselect the aggregated top-level All field. This enables the OLAP grid to present all the different store types down the side of the grid as rows.
3. Select the Time dimension from the available dimensions list as the Column dimension using the column dimension arrow (>) button. (Note: It will likely be necessary to remove a default dimension to ensure that this is the only dimension in the column dimensions list view.)
4. Using the Select Column Members button, select the quarters Q1, Q2, Q3, and Q4 from the year 1998 from the Member Selector dialog, but be sure not to select any children members. This enables the OLAP grid to present a comparison of the four quarters of data in four side-by-side columns.
5. Click the Next button to proceed.

At this point, you will review the concept of OLAP dimension filters and pages in your OLAP report.

SPECIFYING OLAP DIMENSION SLICES (FILTERS) AND PAGES

The Slice/Page dialog of the OLAP Report Creation Wizard, shown in Figure 16.6, enables you to select values or members for the dimensions not selected to be row or column dimensions. In the OLAP world, these dimensions are *paged* or *sliced dimensions*.

Figure 16.6
The Slice/Page screen of the OLAP Report Creation Wizard allows manipulation of the dimensions not selected for use on either the rows or columns.



The Slice list box lists all the paged dimensions and their current member settings. The default setting is usually all members for any given dimension. An example is that for the Media Type Dimension, the default slice setting is All. To change the member selection (slice) for a particular dimension, that dimension must be selected in the Slice list box, and the Select Slice button must be used to open the familiar Member Selection dialog (refer to Figure 16.5). This dialog is identical to the Member Selector dialog used previously except that you can choose only one member from the selected dimension. If multiple members from a slice dimension are required in a report, use the Page list box and create separate pages/grids for each selected value.

The Page list box is initially empty but can contain any dimensions outside the row and column dimensions that require multiple member selection. An example could involve selecting the three countries of North America as store regions. The selection of multiple values for a paged dimension creates completely separate grids (based on the same preselected rows and columns) for each selected member value. To select multiple members for a dimension, select the involved dimension in the Slice list box and move it to the Page list box using the transfer arrow buttons between the list boxes. After you move the dimension to the Page list box, the Select Page Values button enables multiple member selection through the Member Selector dialog.

The last, but perhaps most powerful, feature of the Slice/Page screen is the Link to Parameter functionality provided for each of the filtered and paged dimensions. This capability provides the business user or report consumer with the capability to interact with the report and control its content by entering parameters that directly affect the information displayed in the OLAP grid(s) on the report.

Of significance for this wizard screen is that the parameter creation process is directly accessible here, which facilitates the rapid development of formatted and interactive OLAP reports.

→ For more information on creating and editing parameters, see “Creating and Implementing Parameters Fields,” p. 134

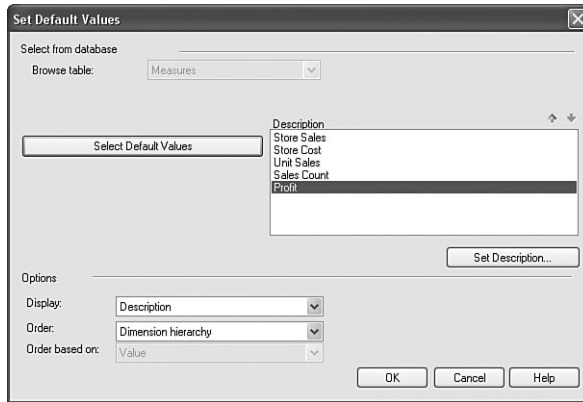
Continuing with the creation of the sample report, the following steps walk through the Slice/Page dialog part of this report creation example and enable you to select the measure to display in the OLAP grid. Follow these steps to select measures on the page/slice dimensions:

1. Select the Measures dimension from the Slice list box.
2. Instead of selecting a specific filter using the Select Slice button, click the Link to Parameter Create/Edit button to enable the business user to dynamically select this slice every time the report runs. The Create Parameter Field dialog appears, as shown in Figure 16.7.

Figure 16.7
The Create Parameter Field dialog called from the Slice/Page screen.

3. In the Prompting Text text box, enter the text that you want your user to be prompted with when this report runs. In this case, it could be something similar to **Please select the measure to be used in your report**. Also, ensure that the Discrete Value(s) radio button is active because a range of entries is not required or allowed here.
4. To avoid requiring users to type in any text, defaults can be set so that selection from a drop-down box is possible. To do this, click the Default Values button. The dialog in Figure 16.8 appears.
5. The Measures table is preselected because the report respects the association with the previously highlighted dimension. Move all the available member values for the Measures dimension to the Description list box by clicking on the Select Default Values button and selecting all the members through the familiar Member Selector dialog.

Figure 16.8
The Set Default Values
dialog for the OLAP
slice parameter.



6. Ensure that the Display drop-down box has Description selected and that the Order drop-down box has no sort selected. Click on OK twice to get back to the Slice/Page dialog of the OLAP Report Creation Wizard.
7. When you return to the Slice/Page dialog, highlight the Products dimension in the Slice list box, and click on the arrow transfer/select button to move it to the Page list box. The Member Selection dialog immediately appears with the Products Dimension Hierarchy presented.
8. Select the Food and Drink Product types (two of the children of All Products), and deselect the All Products field. Individual OLAP grids are created for each of the drink products and the food products. If this isn't clear now, it should make more sense when you visualize the report.
9. Click on OK and then Next to proceed.

CAUTION

After parameters or multivalue paged dimensions have been set in the OLAP Report Creation Wizard, you can access them for editing only through the OLAP Design Wizard under the main Report menu. These settings are not configurable in the OLAP Expert.

ADDING REPORT STYLES IN THE OLAP REPORT CREATION WIZARD

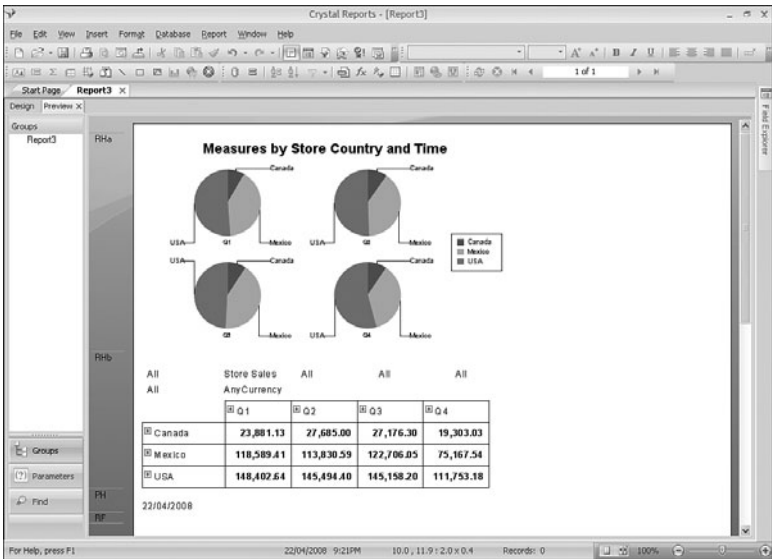
The Style dialog in the OLAP Report Creation Wizard enables you to select any one of a predetermined number of styles for OLAP grids available in Crystal Reports. Figure 16.9 displays the Style dialog. The styles are a good starting point for formatting the OLAP grids on your reports. You can enhance them through the Customize Style tab of the OLAP Expert (described later in the chapter) and by using many of the advanced formatting features you have already learned about.

Aside from selecting the type of chart (bar, line, or pie) and specifying a title on this screen, you must specify an On Change Of field with an optional Subdivided By field before this screen is complete. As Chapter 8 discussed, On Change Of is the data source field that provides the breaking point for the involved graphic. Examples could include country, region, year, store, product, and so on. The Subdivided By field can provide a second variable to base your charts on. An example of a two-variable OLAP chart using the FoodMart sample cube is a chart showing salary information by year and then subdivided by store type.

To complete the OLAP report creation process, the following steps take you through the addition of a style, a chart, and the creation of the finished report:

1. On the Style dialog, select any style that suits your preference, and click on the Next button.
2. On the Chart dialog, select Pie Chart as the chart type by selecting the associated radio button. This provides a nice way of visualizing comparables across different store types.
3. Give your chart a title similar to **Measures by Store Country and Time** by entering it in the Chart Title text box.
4. Select all grid column fields as the On Change Of field. This facilitates the comparison of the three store locales. Select all the grid row fields as the Subdivided By drop-down selection.
5. Click on the Finish button on the OLAP Report Creation Wizard. The wizard prompts you to select a parameter for the Measure dimension. After you select Store Sales (or another field if you prefer), the wizard generates a report that looks similar to Figure 16.11.

Figure 16.11
The sample OLAP report created using the OLAP Report Creation Wizard.

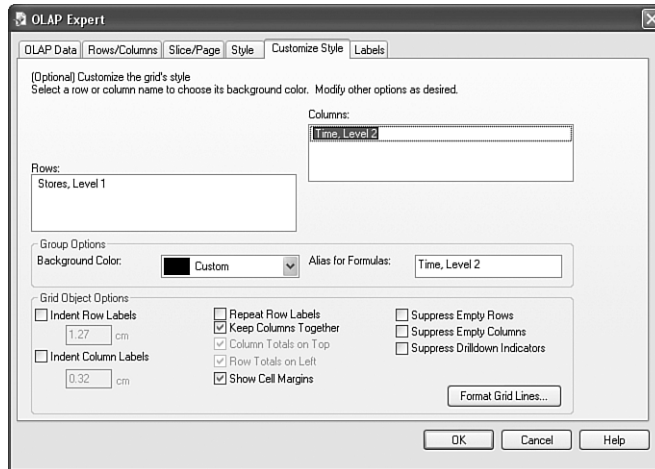


The OLAP Report Creation Wizard provides an efficient and effective method to getting value out of OLAP data in a short time. After placing an OLAP grid or OLAP chart on your report through the wizard, you can perform further formatting and analysis through a variety of built-in Crystal Reports formatting tools. The next two sections explore further customization options, and the three subsequent sections discuss the powerful interactivity available in Crystal Reports OLAP objects.

CUSTOMIZING STYLES IN THE OLAP EXPERT

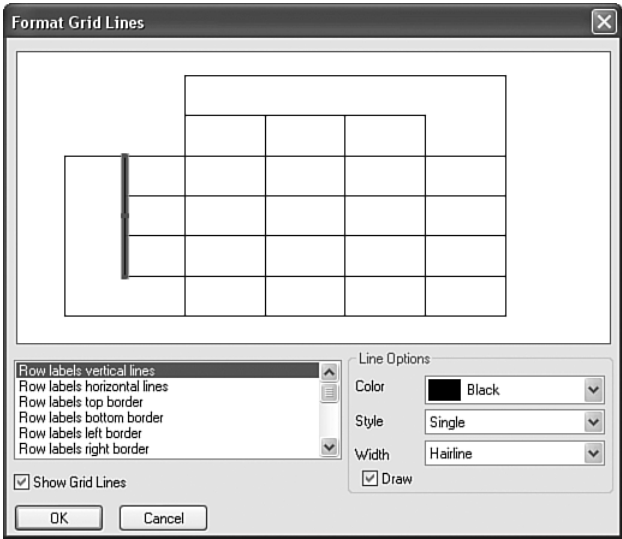
After an OLAP grid has been added to a report, with or without a selected style, Crystal Reports provides the capability to enhance and customize the formatting of that grid through the Customize Style tab of the OLAP Expert. Figure 16.12 shows the OLAP Expert dialog, which you access by right-clicking on an existing OLAP grid object and selecting OLAP Grid Expert or by selecting the Insert OLAP Grid option from the Insert menu.

Figure 16.12
The OLAP Expert dialog provides the capability to edit many OLAP grid display properties including the customization of styles.



Four of the tabs in the OLAP Expert have identical functionality to that presented in the previous OLAP Report Creation Wizard sections. The Customize Style tab shown in Figure 16.12 is unique to the OLAP Expert and provides the capability to fine-tune the formatting of the row and column dimensions selected for the involved OLAP grid. By selecting any of the column or row dimensions from the presented list boxes, you can select custom colors for the backgrounds of the OLAP grid row and column headings. The Customize Style tab offers a number of formatting options for the presentation of the grid, including indentation, blank column/row suppression, margins, and labels. Also provided is an option to format grid lines, as shown in Figure 16.13. This dialog enables granular level formatting and selection of grid lines for display on the OLAP grid's layout.

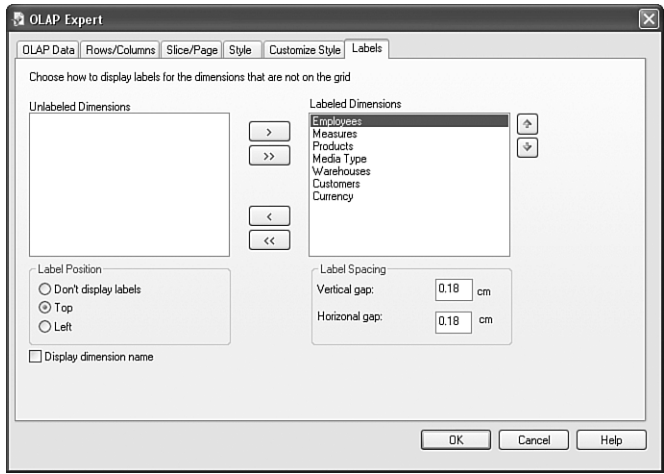
Figure 16.13
The Format Grid Lines dialog is accessed from the Customize Style tab of the OLAP Expert dialog and enables granular-level control of the grid lines in the OLAP grid.



CUSTOMIZING LABELS IN THE OLAP EXPERT

The Labels tab of the OLAP Expert, shown in Figure 16.14, provides the capability to customize the display of the paged dimension (non-row/column dimensions) labels on the OLAP grid.

Figure 16.14
The Labels tab of the OLAP Expert enables you to specify display properties around the OLAP grid's dimensions.



Paged/sliced dimension member values for the display grid can be displayed or hidden by simply moving the selected dimension between the unlabeled dimension and labeled dimension list boxes using the transfer arrow (>, >>, <, <<) buttons. You can select additional labeling options such as label location, label spacing, and dimension names in this tab.

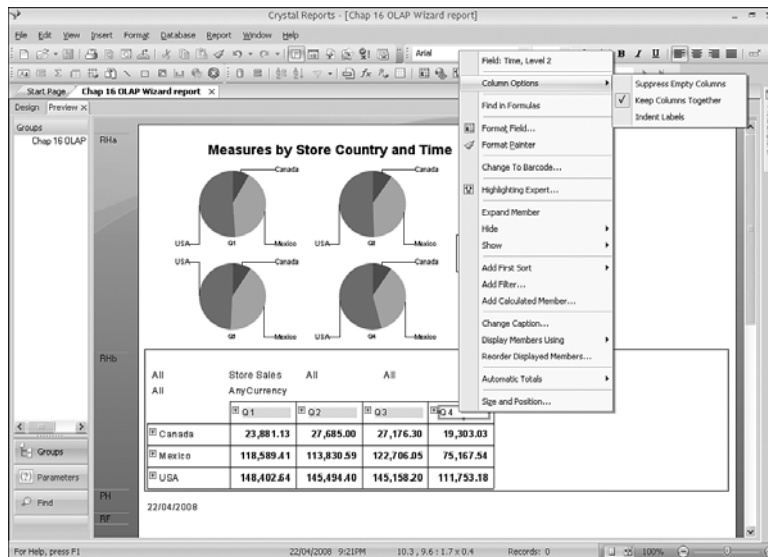
ADVANCED OLAP REPORTING

Up to this point, the OLAP Expert and OLAP Report Creation Wizard have demonstrated the capability of Crystal Reports to rapidly create OLAP-based reports. In addition to those capabilities, Business Objects provides advanced analytic capabilities against OLAP data sources through some advanced OLAP-oriented features in Crystal Reports and through a set of online OLAP functionality via BusinessObjects Enterprise's Voyager functionality (formerly called OLAP Intelligence and before that Crystal Analysis). The last four sections of this chapter introduce some of these advanced features for Crystal Reports.

INTERACTING WITH THE OLAP GRID

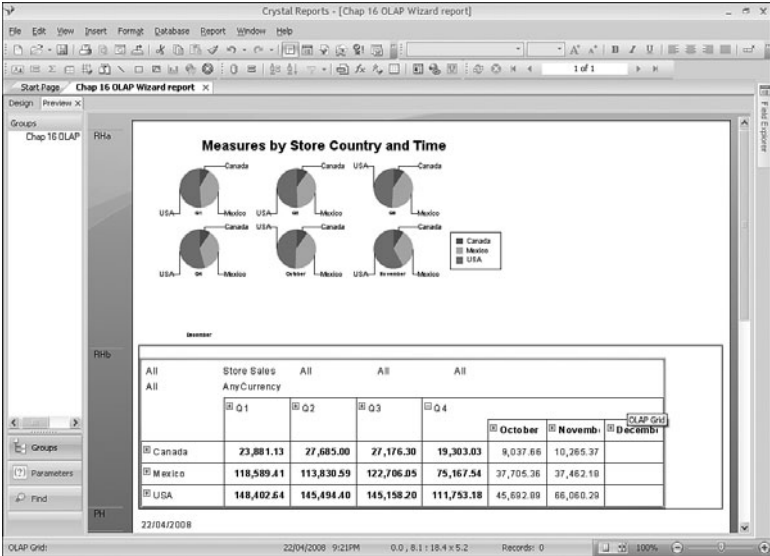
Crystal Reports provides some powerful interactive OLAP features from within the Crystal Reports Preview and Design tabs. Figure 16.15 displays the right-click menu that appears when you right-click on the year Q4 member in this chapter's sample report.

Figure 16.15
The right-click menu provides access to advanced OLAP features.



Advanced features made available here include conditional member highlighting, setting column display options, hiding and showing members for asymmetrical reporting, adding calculations, adding filters, reordering members, changing the member caption, expanding members (that is, drilling into the children members), adding sorts, and adding automatic totals to the OLAP grid. Although exploring these features in detail is beyond the scope of this chapter, it is important to note their availability for enhancing your OLAP grid presentations and reports. For detailed information on all these functions, you can review a legacy chapter on OLAP Intelligence that is available at www.usingcrystal.com.

Figure 16.16
Sample OLAP-based
report with Q4 mem-
ber's children
expanded.



A dimension member can subsequently have its children contracted by double-clicking on the parent member or clicking on the – icon beside the involved parent member. This feature enables you to interactively determine the best static viewpoint to provide to the business user audience for the report.

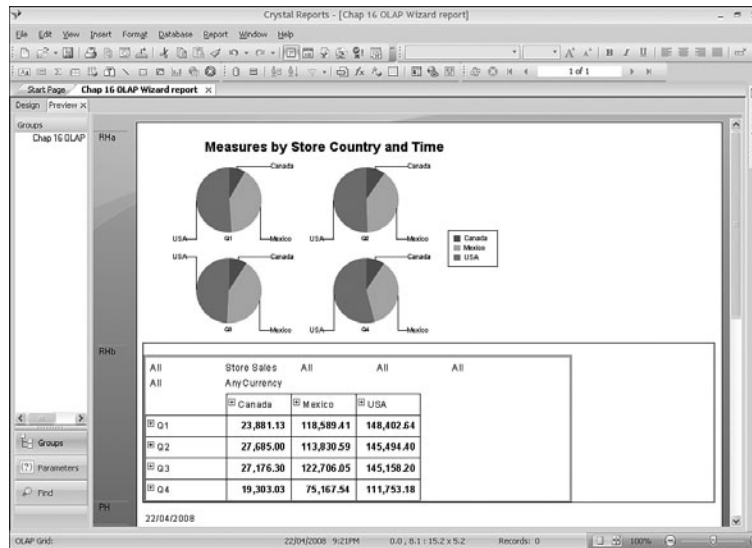
PIVOTING THE OLAP GRID

After an OLAP grid has been added to a report, as in this chapter’s sample, Crystal Reports provides the capability to easily swap the grid’s columns and rows. OLAP parlance calls this *pivoting* the OLAP grid. Figure 16.17 highlights this chapter’s sample report after pivoting with this function. To access this function, right-click on the OLAP grid and select the Pivot OLAP Grid option. Pivoting the OLAP grid does not affect any OLAP charts or maps already on the report.

This function is particularly useful when attempting to decide which viewpoint of the involved OLAP grid is most helpful to the business users of the report.

Figure 16.17

A preview of the sample report after pivoting the OLAP grid. Notice how the chart and the grid have changed.

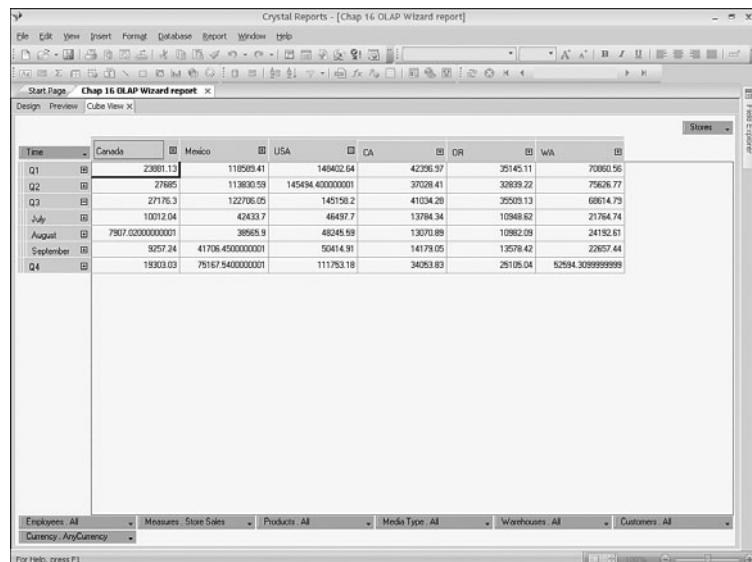


USING THE CUBE VIEW FUNCTIONALITY

The Cube View (previously called the OLAP Analyzer) is a powerful worksheet analysis tool introduced in version 9 of Crystal Reports. The Cube View is initiated through the View Cube option on the right-click menu of the OLAP grid (make sure that you don't have any specific grid objects selected) and is accessed through the Cube View tab in the Crystal Reports Designer (see Figure 16.18). Report designers and analysts familiar with other OLAP interface tools are instantly comfortable with the Analyzer because it provides access to the OLAP cube through a traditional OLAP worksheet.

Figure 16.18

The Cube View tab launched by the OLAP Analyzer provides a powerful analytic tool for report designers and power users.



The Cube View tab's worksheet is designed for rapid analysis of the underlying OLAP data through a rich and interactive interface not available in the OLAP grid presented in the Crystal Reports Preview tab. Dimensions can be rapidly shifted, swapped, and nested by double-clicking on them and dragging them into any row, column, or paged dimension area. A dimension member can be quickly expanded and contracted by clicking on its associated + or – icon. A right-click menu in the OLAP Analyzer view of the cube offers access to additional calculations, sorts, filters, automatic totaling, exception highlighting, data analysis, and custom captions.

The Cube View is a powerful report design tool because it lets Crystal Reports developers create impressive flat views of the underlying multidimensional/OLAP data in a short time-frame and subsequently format the created OLAP grid in the Preview tab.

CAUTION

Although both the Cube View tab and the in-place OLAP grids within the Crystal Reports Designer offer much of the same functionality, not all the work handled in the Cube View necessarily translates back to the related OLAP grid on Crystal Reports. Exception Highlighting and Field Formatting are two examples of functionality that does not cross over. It is generally recommended that the majority of formatting work be done in-place within the Crystal Report's Design or Preview tabs and that cube and dimension orientation be the primary focus of the Cube View tab.

USING CHARTS AND MAPS BASED ON OLAP GRIDS

As described in Chapter 8 and discussed briefly in the “Adding Charts via the OLAP Report Creation Wizard” section earlier in this chapter, OLAP grid data can be presented through visually appealing charts and maps. To create a chart or a map based on OLAP data, an OLAP grid must pre-exist on your report as a data source to form the basis of the chart or map. Selecting the Insert Chart or Map command from the Insert menu (or the respective icons on the Insert toolbar) enables the creation of an OLAP-based visualization.

The creation process for both charts and maps requires the specification of an On Change Of field. This is the field that the chart or map breaks its summaries on (for example, country, state, product, sales rep, and so on). You can specify an optional Subdivided On field as well. The results of specifying an extra variable to divide the data on has different results for various chart types. Explore various charts to find those most suitable for your business problem. Using the Subdivided On field with a map adds a bar or pie chart to every main region on the selected map. An example of this might be a pie chart depicting the breakdown of sales for each country.

CAUTION

It is imperative that the On Change Of field be a geographic-based field when creating a map. Otherwise, the mapping component returns an empty map.



TROUBLESHOOTING

ADDING AN OLAP GRID TO AN EXISTING REPORT

I want to add an aggregated OLAP grid view to an existing drill-down report.

You can quickly accomplish this by accessing the Insert OLAP Grid functionality from the main Insert menu. An alternative approach that might make sense in certain situations is to insert a subreport that points to the involved OLAP data source. Using a subreport to host the OLAP grid enables you to dynamically pass in parameters from the main report to the subreport and its associated OLAP grid. These parameters can dynamically filter the columns, rows, and slices of the involved OLAP grid(s).

CRYSTAL REPORTS IN THE REAL WORLD—OLAP SUMMARY REPORT WITH DRILL-DOWN

The scenario discussed here describes the flexibility behind accessing multidimensional and relational data sources in one report. The benefit of this type of functionality is to enable the user to see aggregated information coming from a cube while allowing drill-down on the relational data to provide greater detail. By using parameters in this report, you let the user decide which information elements to display.

1. Start by creating a simple sales report against the sample Xtreme data source. For the data, select the First Name, Last Name, and Last Year's Sales fields from the Customer table. Group the report by region, city, and then customer. Hide the Details section and the City and Customer groups and enable drill-down on these sections. The report at design time should look like Figure 16.19. Before moving on, add Summary fields for Last Year's Sales into each of the Group Header fields (Country, Region, and City). You can quickly accomplish this by using the new (in version 2008) Add to All Group Levels check box in the Insert Summary dialog.
2. Now add to this report an OLAP grid against the sample cube used earlier in this chapter—Sales and Employees from Foodmart. Using the steps described earlier in this chapter, point the grid at the sample Sales and Employee OLAP cube selecting only the Measures, Time, and Stores dimensions. Select the Stores dimension for the rows and the Time dimension for the columns. Change the Stores rows to include only USA, Canada, and Mexico to limit the number of rows displaying in the report. Also change the Time dimension members selected to Q1, Q2, Q3, and Q4 of 1998.
3. Drop the OLAP grid in the Report Header area. Now insert a bar chart based on the relational source that displays Last Year's Sales on change of values in the City field and place the chart in the Group Header for Country to enable the user to visually understand the contribution of sales from each of the selected cities. In design view, the report should look similar to Figure 16.20. Perform the same filtering task in the report Select Expert so that the relational data source is limited to the same three countries (USA, Canada, and Mexico).

Figure 16.19
Framework for drill-down integrating both relational and OLAP data.

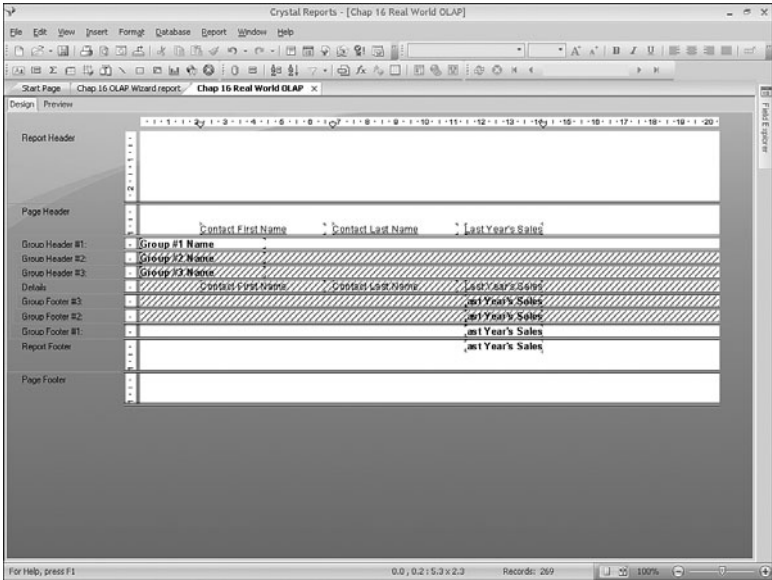
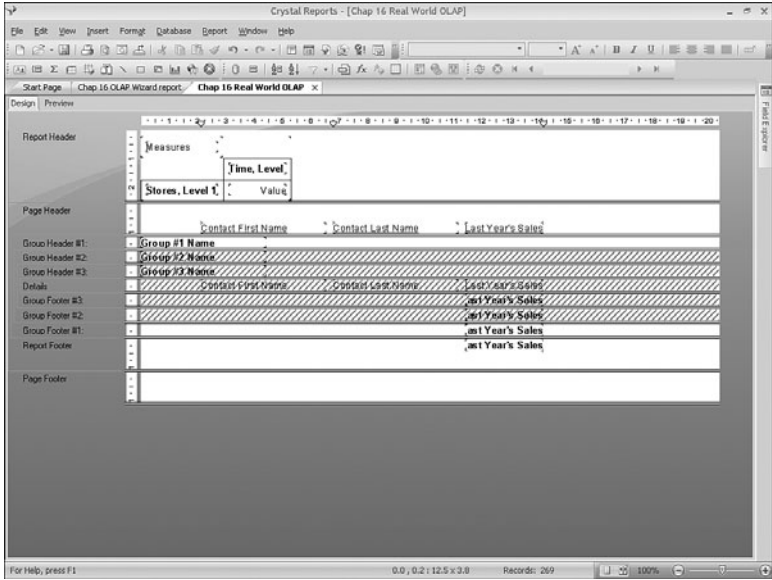


Figure 16.20
A report using both OLAP and relational data sources. The pie chart based on the relational data enables drill-down into the relational data details.



4. If the user viewed this report, he would currently see both the chart and the OLAP grid at the top of the report summarizing the same information but sourced from two different data sources: a pre-aggregated SQL Server data cube and a relational database. (This example assumes that similar data is the basis for both data sources.) To enable end users to turn off the grid display, create a parameter field that specifies whether to

display the grid. This enables users to decide whether they want to look at the summary information in both a grid and chart format or only in a chart.

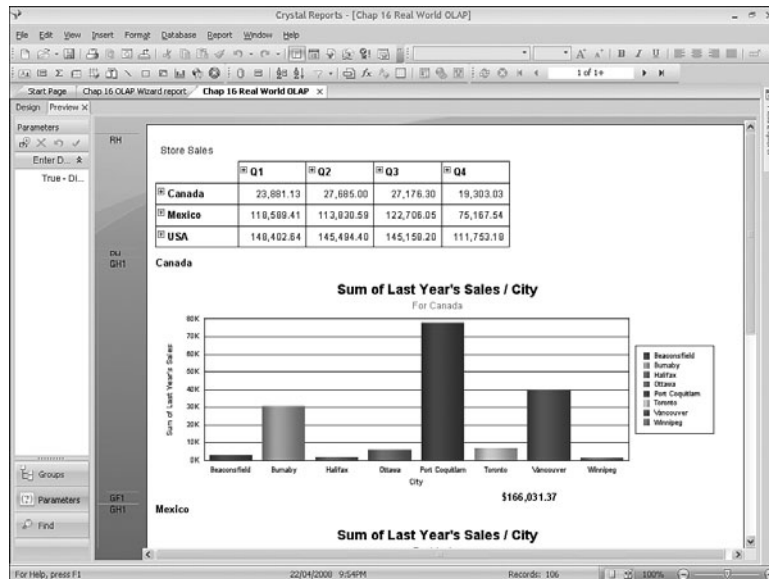
5. Create a parameter of Boolean type called Display Grid.
6. Conditionally suppress the Report Header section containing the grid based on the values supplied to the parameters by right-clicking on the Report Header and selecting Section Expert from the Report Explorer. Click on the X+2 formula button next to the suppress option. Inside the formula editor, type

{?Display Grid}=false

and close the editor. Now when a user runs the report, he is prompted to select whether he wants to see the summary OLAP grid. Save the report. On display, it should look similar to Figure 16.21.

Figure 16.21

Report showing both the OLAP grid and charts and enabling drill-down from the high-level summary information displayed from the OLAP grid into the relational details.



This example illustrates how to combine relational and multidimensional data in one report to allow for different views based on the same underlying data. This allows drill-down on relational elements and provides aggregate header information for views on summary OLAP data.

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INDEX

SYMBOLS

- & (ampersand), concatenating**
 - string formulas, 112-113
 - Xcelsius values, 504
- * (asterisks)**
 - parameter fields with, 151
 - wildcards, 81
- @ (at symbol) in formulas, 320**
- = (equals to) operators, parameter fields, 152**
- { } (French brackets) in, 319-320**
- () (parentheses) in formulas, 320**
- % (percent symbol) in formulas, 320**
- + (plus sign), concatenating string formulas, 112-113**
- # (pound symbol) in formulas, 320**
- ? (question marks)**
 - formulas, 320
 - wildcards, 81
- // (slashes) in comments, 114**
- [] (square brackets) in formulas, 319**
- _ (underscore) as continued line character, 117**

NUMBERS

- 3D charts, angle options, 225-226**
- 100,000 loop limit, 119**

A

- ABAP data dictionary, SAP integration kit connections, 361**
- Action drop-down box (Static List of Values) property (parameter fields), 134**
- Actual versus Target reports, chart types, 207**
- ADO.NET data providers, 352, 434**
 - complex query management, 353
 - creating, 354-355
 - legacy applications, 353
 - runtime data manipulation, 353
 - XML recordset connections, 356
- Advanced layout button**
 - Chart Expert, Data tab, 208-209
 - Map Expert, Data tab, 216
- Alert iView (SAP integration kits), 365**
- alerts**
 - advantages of, 283
 - BusinessObjects Enterprise with, 285

- components of, 283
- creating, 284-285
- detail sections triggering, highlighting, 295
- editing, 284-285
- example of, 294-296
- functions for, 286
- IsAlertTriggered function, 295
- message creation, 285
- naming, 284
- prompting for trigger condition, 285
- ToolTips with, 296
- trigger condition specification, 285
- triggering, 284
- Web delivery of, 285
- Xcelsius dashboards, 476-479

aliasing tables, 29

aligning

- horizontal alignment, 162, 167
- text, report sections, 183

All Values parameters (parameter fields), 151

Allow Custom Values property (parameter fields), 136

Allow Discrete Values property (parameter fields), 136

Allow Multiple Values property (parameter fields), 136, 148

Allow Range Values property (parameter fields), 136

ampersand (&), concatenating

- string formulas, 112-113
- Xcelsius values, 504

Another Report Object option (Format Editor, Hyperlink tab), 170

Appearance tab (Chart Expert), 222-223

application servers, Java, 414, 418

application tier (Crystal Reports Server), 398-399

arguments, naming, 122

arithmetic formulas

- error checking, 106
- formatting results of, 107
- Formula Editor, creating in, 103-105
- functions available for, 103
- help files for, 103
- naming, 106
- operators, accessing, 106

arrays (string), 279

ASP.NET

- defined, 434
- printing issues, troubleshooting, 455
- Web Forms Viewer, 447-449

asterisks (*)

- parameter fields with, 151
- wildcards, 81

at symbol (@) in formulas, 320

Auto Alerts icon, Xcelsius dashboards, 478

Auto-Complete feature (Formula Editor), 105

autosave feature, 48

averages (moving), displaying in charts, 230

axes

- cross-tabs, 254
- dual axes, creating, 249

Axes tab (Chart Expert), 211, 223

Axis Options dialog (Chart Expert), 224-225

B

Background Color box (Section Expert), 181, 200

Background Color option (Format Editor, Border tab), 168

Background tab (Format Editor), 168

backgrounds

- report sections, color selection in, 181-183
- Xcelsius dashboards, 481-482

Bar Chart maps, 219

bar charts, creating, 247-250

barcodes

- conversion formulas, 116
- converting fields to, 245-246
- converting to fields, 246

Basic syntax, 318-319

BeforeReadingRecords process (multipass reporting process), 124

Behavior tab (Xcelsius), 470

blank reports, creating, 16, 44

blank spaces, removing from report sections, 199

Boolean tab (Format Editor), 170

Border tab (Format Editor), 163, 168

borders, formatting, 163

Bottom N group selections using parameter fields, 146-147

Box tab (Format Editor), 170

boxes, creating, 237

brackets in formulas

- French brackets ({}), 319-320
- square brackets ([]), 319

Browse Data option (Formula Workshop), 196

BusinessObjects Enterprise

- alerts with, 285
- Crystal Reports Server, compared, 397

Xcelsius
dashboards, 484
integration, 508

BW data
OLAP Intelligence, reporting off via, 365
SAP integration kits, 362-363
Voyager Intelligence, reporting off via, 363-365
Web Intelligence, reporting off via, 363-365

BW Query drivers, SAP integration kits, 362

By Series radio button (Xcelsius, General tab), 470

C

Cache Servers, Crystal Reports Server, 399-400

Can Grow option (Format Editor, Common tab), 167

CAR File button (OLAP Report Creation Wizard), 375

cascading
parameters, 147-149
prompts, 289-292

categorizing
custom functions, 123
database objects via Database Expert, 28

CCM (Central Configuration Manager), 401-402

CDate() function, 115

CDateTime() function, 115

CDBl() function, 115

cells (cross-tabs)
defined, 254
summaries for, 257

Central Repositories
custom functions, adding to, 126-128
troubleshooting, 126

Change Group Options dialog, 65

Character Spacing Exactly option (Format Editor, Font tab), 169

Chart Analyzer tab (Chart Expert), 221

Chart dialog
OLAP Report Creation Wizard, 381-382
Standard Report Creation Wizard, 35, 42

Chart Drill Down feature (Xcelsius), 490-491

Chart Excel tab (Xcelsius), 468, 473

Chart Expert
accessing, 205
Axes tab, 211
axes, dual, 249
Axis Options dialog, 224-225
Chart Analyzer tab, 221
Chart Options menu, 221-223
Color Highlight tab, 212
Data tab, 207
Chart Layout section, 208-209
On Change Of field, 209, 228-229
Show field, 209
editing charts, 221
formatting options, 221
Load Template option, 221
On Change Of fields, 248
Options tab, 211
Save Template option, 221
Series Option dialog, 223-224
Text tab, 212
trend lines, 249
type selection, 247
Type tab, 205-206

Chart Layout section (Chart Expert, Data tab), 208-209

Chart menu (Designer), 20-21

Chart Options menu (Chart Expert), 221

Appearance tab, 222
Axes tab, 223
Choose a Viewing Angle dialog, 226
Data Labels tab, 223
Gridlines tab, 223
Legend tab, 223
Multi-Axes tab, 223
Titles tab, 222

charts

3D viewing angle options, 225-226
Actual versus Target reports, 207
axes, dual, 249
axis options, 223
Chart dialog (OLAP Report Creation Wizard), 381-382
Chart Expert
accessing, 205
Axes tab, 211
Axis Options dialog, 224-225
Chart Analyzer tab, 221
Chart Options menu, 221-223, 226
Choose a Viewing Angle dialog (Chart Options menu), 226
Color Highlight tab, 212
Data tab, 207-209
Options tab, 211
Series Option dialog, 223
Text tab, 212
Type tab, 205-206
Chart Options menu, 221-223, 226
color selection, 223
Company Sales reports, 207
data
complementary data in a single chart, 228-230

- customizing value divisions, 211
- customizing value ranges, 211
- customizing value scales, 211
- label options, 223
- specifying, 209
- Depth option, 222
- dual axis setup, 230
- editing, 221
- Explode Pie option, 222
- formatting options, 221, 225
- Funnel charts, 206
- Gantt charts, 206
- Gap Width slider, 222
- Gauge charts, 205
- grid options, 225
- gridlines
 - customizing, 211
 - options, 223
- grids (OLAP), 388
- help instructions, 226
- Histogram charts, 206
- inserting, 205-206
- layouts
 - options, 224
 - specifying, 208-209
- legend options, 223
- line chart setup, 230
- moving averages, displaying, 230
- new types of, 204-206
- number options, 225
- numeric axis charts, 205
- On Change Of fields, 248
- Overlap slider, 222
- Pie Rotation slider, 222
- Pie Tilt slider, 222
- position of, specifying, 221
- Product Profitability reports, 207
- recurrences of, in relation to
 - location in report, 206
- Riser Shape option, 222
- scale options, 225
- sizing, 221
- summaries, 210

- templates for, 221, 349
- title options, 222
- trend lines, 249
- trendline options, 224
- troubleshooting, 228-229
- type selection, 247
- Use Depth option, 222
- Xcelsius dashboards, 468-470

Choose a Data Source (Dynamic List of Values) property (parameter fields), 135

Clamp Page Footer option (Section Expert, Common tab), 189

client tier (Crystal Reports Server), 397

Close Border on Page Break option (Format Editor, Common tab), 168

CMC (Central Management Console), 402-405

CMS (Central Management Server), 399

color

- Background Color option (Format Editor, Border tab), 168
- Border Color option (Format Editor, Border tab), 168
- branding considerations, 238
- charts, selecting for, 223
- conditional formatting formulas for, 241-242
- Font, Style, Size, and Color option (Format Editor, Font tab), 169
- fonts, 164
- report sections
 - backgrounds, 181-183
 - fonts, 183
- selecting, 163
- Xcelsius dashboard schemes, 479-480

Color Highlight tab (Chart Expert), 212

Color Scheme drop-down (Xcelsius, Format toolbar), 479

Color tab (Section Expert), 191, 200

columns

- cross-tab columns, 254
- cursor focus, 165
- Format Groups with
 - Multiple Column option (Section Expert, Layout tab), 191
- multiple columns, formatting, 192
- titles, editing, 163-164

.COM data providers

- complex query management, 353
- creating, 354-355
- legacy applications, 353
- runtime data manipulation, 353
- troubleshooting, 366-367
- XML data, reading, 367-368

.COM data sources, 352

combining objects, 170-174

comments, adding to formulas, 114

Common tab

- Format Editor
 - Can Grow option, 167
 - Close Border on Page Break option, 168
 - CSS Class Name option, 168
 - Display String option, 167
 - Horizontal Alignment option, 167
 - Keep Object Together option, 168
 - Lock Position and Size option, 167
 - Object Name option, 167
 - Read Only option, 167

- Repeat on Horizontal Pages option, 168
- Suppress If Duplicated option, 167
- Suppress option, 167
- Text Rotation option, 167
- ToolTip Text option, 167
- Section Expert
 - Clamp Page Footer option, 189
 - Format with Multiple Columns option, 189
 - Hide (Drill-Down OK) option, 189
 - Keep Together option, 189
 - Print at Bottom of Page option, 189
 - Read-Only option, 190
 - Relative Positions option, 190
 - Reserve Minimum Page Footer option, 189
 - Suppress (No Drill-Down) option, 189, 197
 - Suppress Blank Section option, 189
 - Underlay Following Sections option, 189
- Company Sales reports, chart types, 207**
- complex queries, managing, 353**
- Components window (Xcelsius), 460-461**
- concatenating**
 - string formulas, 111-112
 - strings, 55-56
 - Xcelsius values, 503-504
- conditional formatting**
 - CurrentFieldValue function, 338
 - formulas for, entering, 241-242
 - Highlighting Expert for, 240
 - viewing, 241
- conditional formulas (Excel), Xcelsius, 500-501**
- Connection Browser (OLAP), 374**
- Connection Refresh button (Xcelsius), 507**
- containers, Xcelsius dashboards, 474-475**
- Content Locale fields, 61**
- continued line character (), 117**
- control structures**
 - Do/While structures, 119
 - For/Step/Do structures, 119
 - formatting of, 117
 - Formula Editor for, 116
 - If/Then/Else, 116-118
 - Select Case, 116, 118
 - Switch structures, 119
 - While/Do structures, 119
- converting**
 - barcodes to fields, 246
 - fields to barcodes, 245-246
 - type conversion, 114-116, 126
- copying formatting, 161**
- Count summary, 87**
- Create Parameter Field dialog**
 - Field Explorer, 138-140
 - OLAP Report Creation Wizard, Slice/Page dialog, 379
- Create Running Total Field dialog, 59**
- Create/Edit Parameter functionality (Rows/columns dialog), 376**
- cross-domain policies, 508**
- Cross-Tab layout button**
 - Chart Expert, Data tab, 208
 - Map Expert, Data tab, 216
- cross-tabs**
 - advantages of, 254
 - axes of, 254
- cells**
 - defined, 254
 - summaries for, 257
 - columns, defined, 254
 - creating, 257, 268
 - Cross-Tab Expert, 257, 270
 - CurrentColumnIndex function, 268
 - CurrentRowIndex function, 268
 - CurrentSummaryIndex function, 268
 - display strings, 264-266
 - formatting features, 256
 - GridRowPathIndexOf function, 268
 - GridValueAt function, 267
 - group headers, placing in, 271-272
 - horizontal expansion feature, 256
 - horizontal/vertical summary placement, 263
 - percentage-of summaries, 261-262
 - previewing changes to, 257
 - quarterly sales by customer example, 254-255
 - relative position, setting, 260
 - reports, inserting in, 257
 - rows, defined, 254
 - spreadsheets, similarity to, 255
 - summaries
 - editing, 270
 - labels, 263
 - Top N groups in, 258-259
- Crystal Reports**
 - offline viewer, 409
 - Xcelsius dashboards, 485
- Crystal Reports Designer, group organization, 66-67**
- Crystal Reports Servers**
 - applications
 - CCM, 401-402
 - CMC, 402-405
 - InfoView, 405

- architecture, 397
 - BusinessObjects Enterprise
 - comparisons to, 397
 - Cache Server, 399
 - Cache Servers, 400
 - CMS, 399
 - components of, 396
 - concurrent users, 397
 - Event Server, 400
 - Input/Output File
 - Repository Servers, 399
 - instances, 400
 - Job Servers, 400
 - limitations of, 397
 - on-demand reports, viewing, 404
 - Page Servers, 400
 - platforms supported, 397
 - publishing reports, 403
 - RAS, 400
 - scalability, 397
 - tiers
 - application tier, 398-399
 - client tier, 397
 - data tier, 401
 - intelligence tier, 399-400
 - processing tier, 400
 - Web-based viewing, 405
 - Web Intelligence, 397
- Crystal Repository, custom functions in, 324**
- Crystal syntax, 318**
- crystalreports.com report-sharing service website**
- adding reports to, 407
 - home page, 406
 - offline viewer, 409
 - sharing reports via, 408
- CrystalReportViewer class**
- instantiating, 419
 - processHttpRequest method, 420
 - setReportSource method, 419
- CSS Class Name option (Format Editor, Common tab), 168**
- CStr() function, 115, 126**
- CTime() function, 115**
- Cube tab (OLAP), Interactive OLAP Worksheet (Analyzer), 372**
- Cube View (OLAP), 387-388**
- cubes (OLAP), 370**
- aggregation in, 371
 - grid presentations, 371
 - members defined, 371
 - Select Cube button, 374
- Current CE User ID fields, 61**
- Current CE User Name fields, 61**
- Current CE User Time Zone fields, 61**
- Current Date function, Date and Time formulas, 109**
- Current Website or Email Field Value option (Format Editor, Hyperlink tab), 169**
- CurrentColumnIndex function (cross-tabs), 268**
- CurrentFieldValue function, 338**
- CurrentRowIndex function (cross-tabs), 268**
- CurrentSummaryIndex function (cross-tabs), 268**
- cursor focus, deleting, 165**
- Custom Color Scheme window (Xcelsius), 479**
- Custom Function Extractor, 127**
- custom functions**
- argument names, 122
 - author information, 123
 - calling, 324
 - categorizing, 123
 - Central Repositories, adding to, 126-128
 - converting formulas to, 327
 - creating, 121-123, 127-129, 323-324
 - Crystal Repository with, 324
 - CurrentFieldValue function
 - in, 338
 - database field access in, 324
 - default values, 123
 - descriptions for, 324
 - divide-by-zero errors, 126-129
 - division example, 127-128
 - End Function statements, 324
 - Extractor for, 127
 - field header example, 128-129
 - Formula Expert, creating formulas with, 121
 - Formula Extractor, creating formulas with, 337
 - Formula Workshop, creating in, 98
 - Help text for, 123
 - name formula example, 327, 330
 - optional parameters, 324
 - Repository
 - adding to, 99
 - Formula Workshop, 98
 - sharing, methods for, 324
 - statelessness, 337
 - summary descriptions, 122
 - syntax options, 324
 - templates, creating for, 337-338
- Customer Contact Listing reports, creating, 158-161**
- Customize Style tab (OLAP Expert), 383**
- customizing**
- color schemes, Xcelsius
 - dashboards, 480
 - Java Report Component viewer
 - group trees, 422
 - toolbars, 422
 - labels in OLAP Expert, 384
 - status bars, Windows Forms, 446
 - styles in OLAP Expert, 383

- toolbars
 - Java Reporting
 - Component viewer, 422
 - Windows Forms, 446
- viewers
 - Web Forms Viewer, 448-449
 - Windows Forms viewers, 446-447
- Web Forms Viewer, 449
- Windows Forms
 - status bars, 446
 - toolbars, 446
 - viewers, 446-447

D

dashboards

- Excel, developing in, 466
- multilayer dashboards, 496-498
- Xcelsius
 - alerts, 476-479
 - backgrounds, 481-482
 - BusinessObjects
 - Enterprise, 484, 508
 - Chart Drill Down feature, 490-491
 - charts in, 468-470
 - color schemes, 479-480
 - connectivity guidelines, 505
 - containers in, 474-475
 - cross-domain policies, 508
 - Crystal Reports, 485
 - Data Manager Usage tab, 506-507
 - deploying, 484-485
 - design rules, 458
 - development paradigm, 458-460
 - Dynamic Visibility, 488-498
 - Excel logic in, 498-505
 - Flash variables in, 519-520
 - gauges in, 468
 - HTML in, 485, 519-520

- Image component, 483
- Insert Filtered Rows feature, 492-493
- Label component, 482
- life cycle management, 508
- Live Office connectivity, 509-513
- Map Components feature, 494-496
- multilayer dashboards, 496-498
- parameterized reports, 513-514, 518-519
- PDF documents, 484
- portal integration, 521
- PowerPoint, 484
- previewing, 467
- publishing, 484-485
- Query as a Web Service, 514
- refreshing Live Office connections, 513
- scheduling Live Office instances, 513
- selectors in, 471-473
- sliders, 467
- SWF files, 484
- themes, 481
- troubleshooting, 486
- Web Service connections, 515
- Word, 484
- XML Maps, 515-518

Data (Y) Axis Settings dialog (Chart Expert, Axis Options dialog), 224

Data Date fields, 61

Data Labels tab (Chart Expert), 223

Data Manager window (Xcelsius)

- Definition tab, 463
- Usage tab, 464, 506-507
- Web service connection methods in, 463-464

data sources

- ADO.NET data providers
 - complex query management, 353
 - creating, 354-355
 - legacy applications, 353
 - runtime data manipulation, 353
 - XML recordset connections, 356
- .COM data providers
 - complex query management, 353
 - creating, 354-355
 - legacy applications, 353
 - reading XML data, 367-368
 - runtime data manipulation, 353
 - troubleshooting, 366-367
- connections, creating via Database Expert, 26
- Java data providers
 - creating, 356-357
 - JavaBeansClassPath property, 357
 - JavaDir property, 357
 - troubleshooting, 366-367
- .NET data providers
 - complex query management, 353
 - creating, 354-355
 - legacy applications, 353
 - runtime data manipulation, 353
- XML data providers
 - HTTP data source connections, 358-359
 - local data source connections, 358
 - Web service data source connections, 358-359

Data tab

- Chart Expert, 207
- Chart Layout section, 208-209
- On Change Of field, 209, 228-229
- Show field, 209
- Map Expert, 215
- Layout section, 215-216
- Map Placement section, 215

OLAP
 CAR File button, 375
 Chart dialog, 381-382
 data sources, specifying, 373-374
 dimension slices (filters)/pages, specifying, 377-380
 dimensions, specifying, 377
 Member Selector dialog, 377
 Rows/Columns dialog, 375-377
 rows/columns, specifying, 375-377
 Select Cube button, 374
 Slice/Page dialog, 377-380
 Style dialog, 380

data tier (Crystal Reports Server), 401

Data Time fields, 61

Data Time Zone fields, 62

database connectivity
 Java Reporting Component requirements, 416-418
 open connections, listing via My Connection node (Database Expert), 27

database credentials, .NET viewers with, 449-451

database drivers
 direct access, overview, 23
 indirect access, overview, 24
 ODBC, 24
 OLE DB, 24

Database Expert
 data source connections, creating, 26
 database objects, categorizing, 28
 More Data Sources node, 26
 My Connection node, 27
 open database connections, listing, 27
 opening, 25
 troubleshooting, 48

Database Explorer dialog, 158

database fields, 336
 Field Explorer view of, 53
 multiple fields, selecting, 54
 reports, adding to, 53
 sample data, browsing, 54

Database menu, 20, 280

database objects
 adding to reports, 27
 categorizing via Database Expert, 28
 joins, 31
 Full Outer, 33
 Inner, 32
 Left Outer, 32
 Not Equal, 33
 SQL commands
 adding to reports, 29-31
 parameters of, 30
 stored procedures, 29
 tables, adding to reports, 28
 viewing, 28
 views, adding to reports, 29

Date and Time formulas
 conversion functions, 109
 Current Date function, 109
 Formula Editor, creating via, 108-110
 operators for, 108
 range functions, 109

Date and Time tab (Format Editor), 170

date functions (Excel), Xcelsius, 505

dates
 comparators, 277-278
 Date function, 277
 DateTime function, 277
 DTSToDate function, 278
 formats for specifying, 278
 grouping on, 68-69
 strings, converting from, 277-278
 templates field objects for formatting, 340

Default Value property (parameter fields), 135

Definition tab (Xcelsius, Data Manager window), 463

Delete button (Section Expert, Sections area), 188

deleting
 cursor focus, 165
 report sections, 197

Dependency Checker, 23

Depth option for charts, 222

Description Field (Static List of Values) property (parameter fields), 134

Description Table field, 135

design consistency. *See* templates

design explorers
 docking, 22
 Field Explorer, 21
 hiding, 22
 Report Explorer, 21
 Repository Explorer, 21
 tabs view, 22
 viewing, 22

Designer
 Blank Report link, 16
 Chart menu, 20-21
 Database menu, 20
 Dependency Checker, 23
 design explorers, 21-22
 Edit menu, 19
 Expert Tools toolbar, 18
 External Commands toolbar, 19
 File menu, 19
 Format menu, 20
 Formatting toolbar, 18
 Getting Started page, 16
 Help menu, 21
 Insert menu, 20
 Insert Tools toolbar, 18
 Navigation Tools toolbar, 19
 Report menu, 20
 report sections, 16
 design guidelines, 18
 Details, 17
 objects, 17

- Page Header, 17
- Report Header, 17
- Section Expert, 18
- Standard toolbar, 18
- ToolTips, 19
- View menu, 20
- Window menu, 21
- Workbench, 23
- destination cells in selectors, 473**
- Destination property field (Xcelsius), 472**
- Detail Size option (Section Expert, Layout tab), 191**
- Details section, 17, 186**
 - lines, adding between, 236
 - template, created by, 336
- direct access drivers, 23**
- Disable Mouse Input on Load property (Xcelsius, Data Manager Usage tab), 507**
- Display String option (Format Editor, Common tab), 167**
- display strings, cross-tabs with, 264-266**
- distinct records option, 306**
- divide-by-zero errors, custom functions, 126-129**
- Do/While structures, 119**
- docking design explorers, 22**
- Dot Density maps, 219**
- dragging/dropping objects, 171**
- Drill Down feature (Xcelsius), 490-491**
- drill-down functionality**
 - commands for, 386, 389-391
 - OLAP, 372, 386, 389-391
 - report sections, 186-187, 201-202
- drill-down reports**
 - group paths for, 71
 - hiding details, 72-73
 - icon for, 71

- navigating for, 72
 - purpose of, 71
 - Suppress (No Drill-Down) option, 73
- drivers**
 - direct access database, 23
 - indirect access database, 24
- Drop Shadow option (Format Editor, Border tab), 168**
- DSNs (Data Source Names), 24**
- DTSToDate function, 278**
- dynamic cascading prompts, 289-292**
- Dynamic List of Values properties, 135, 147**
- dynamic parameters, 147-149**
- Dynamic Visibility (Xcelsius), 488-498**

E

- email addresses**
 - columns, 165-166
 - Email address option (Format Editor, Hyperlink tab), 169
- Edit Mask property (parameter fields), 136-137**
- Edit menu (Designer), 19**
- editing**
 - alerts, 284-285
 - charts, 221
 - column titles, 163-164
 - cross-tab summaries, 270
- Editing area (Formula Editor), 101**
- Enable Load Cursor property (Xcelsius, Data Manager Usage tab), 507**
- Enter Values dialog, 29**
- equals to (=) operators, parameter fields, 152**
- ERP (Enterprise Resource Planning) integration kits**
 - application support, 359-360
 - full data access, 360
 - metadata in, 360
 - real-time data access, 361
 - sample reports, 360
 - security, 360
- errors**
 - looping errors, 119
 - runtime, variable data, 324-326
- ETL (Extract Transform & Load) products, XML format as, 347**
- EvaluateAfter() function, 120, 126**
- Event Server, Crystal Reports Server, 400**
- Excel (MS)**
 - dashboard development, 460, 466
 - reports, exporting to, 346
 - Xcelsius
 - Chart Drill Down feature, 490-491
 - concatenating values, 503-504
 - conditional formulas, 500-501
 - dashboard development, 460
 - date functions, 505
 - Excel Sheet tab, 468
 - Excel tabs, 466
 - IF() statements, 500-502
 - INDEX function, 502-503
 - Insert Filtered Rows feature, 492-493
 - lookup functions, 502-503
 - Map Components feature, 494-496
 - multilayer dashboards, 496-498

supported Excel functions in, 498-500

XML Maps, 515-518

ExcelRecord format, exporting to, 441

Expert Tools toolbar, 18, 181

exporting reports

batched .NET code example, 442-443

Excel format, 346

ExcelRecord format, 441

formats, .NET, 441

HTML format, 441

Java Reporting Component, 424-427

.NET methods for, 440-443

option presets, 176

output formats, 345-346

PDF format, 346

plain text format, 441

Report Definition format, 347

RPT format, 441

RTF Export format, 176

RTF format, 441

XML format, 347

External Commands toolbar (Designer), 19

external resources, referencing, 176-177

F

Field Explorer, 21, 158

active field indicators, 53

arithmetic formulas, creating in, 105

Create Parameter Field dialog, 138-140

database fields, 53

formula creation, 92

formula fields, 54-55

group name fields, 61

opening, 52

parameter fields, 56-57, 138-140

parameter options, setting, 138

Parameter Order dialog, 138

purpose of, 52

running totals, 58-61, 91

special fields, 61-63

SQL Expression fields, 56

Fields area (Formula Editor), 101

Fields frame (Formula Editor), 106

File Author fields, 62

File Creation Date fields, 62

File menu, 19

Page Setup command, 174

Save command, 48

File option (Format Editor, Hyperlink tab), 169

File Path and Name fields, 62

filtering, 35. *See also* sorting

custom filtering via parameter fields, 151

field selection, 79

Formula Editor, 83-84

formulas from Select

Expert, 82

multiple filter application, 81-82

new filters, adding, 81

overview, 78

ranges for, setting, 80

record selection formulas, 82-84

refreshing data options, 80

Select Expert, 78-81

subreports with linked data, 305

values for, setting, 80

financial functions, 323

Find in Field Explorer, 244-245

Fit Section command, 183, 199

Flash variables, Xcelsius dashboards, 519-520

FlashVars tab, SWF files, 520

Folder iView (SAP integration kits), 365

Font tab (Format Editor), 169

Font, Style, Size, and Color option (Format Editor, Font tab), 169

fonts (text)

color selection, 164, 183, 234

face selection, 234

formatting, 162-164

rotating, 238-239

footers

creating, 46

cross-tab placement in, 271-272

Group Footers, 180

templates for formatting, 347-348

For/Step/Do structures, 119

Format Chart Frame dialog (Chart Expert, Chart Options menu), 225

Format Editor, 100, 162

Boolean tab, 170

Border tab, 163, 168

Box tab, 170

colors, 163

column titles, 163

Common tab

Can Grow option, 167

Close Border on Page

Break option, 168

CSS Class Name option, 168

Display String option, 167

Horizontal Alignment option, 167

Keep Object Together option, 168

Lock Position and Size option, 167

Object Name option, 167

Read Only option, 167

- Repeat on Horizontal Pages option, 168
- Suppress If Duplicated option, 167
- Suppress option, 167
- Text Rotation option, 167
- ToolTip Text option, 167
- Date and Time tab, 170
- Font tab, 162, 169
- horizontal alignment, 162
- Hyperlink tab, 165-166
 - Another Report Object option, 170
 - Current Website or Email Field Value option, 169
 - Email address option, 169
 - File option, 169
 - Report Part Drilldown option, 169
 - Website on the Internet option, 169
- Line tab, 170
- Numbers tab, 170
- opening, 162
- Paragraph tab, 170
- Picture tab, 170
- Rounding tab, 170
- Subreport tab, 170
- Format Grid Lines dialog (OLAP Expert, Customize Style tab), 383**
- Format Groups with Multiple Column option (Section Expert, Layout tab), 191**
- Format Map dialog (Map Expert), 227**
- Format menu, 20, 181**
- Format Painter, 161**
- Format toolbar (Xcelsius), Color Scheme drop-down, 479**
- Format with Multiple Columns option (Section Expert, Common tab), 189**

formatting

- barcodes
 - converting fields to, 245-246
 - converting to fields, 246
- borders, 163
- box creation, 237
- charts, 221, 225
- conditional formatting
 - CurrentFieldValue function, 338
 - entering formulas for, 241-242
 - Highlighting Expert for, 240
 - viewing, 241
- copying, 161
- cross-tabs, 256
- email addresses, 165-166
- field objects, 159-160
- fonts, 162-164
- Format Editor
 - Border tab, 168
 - borders, 163
 - colors, 163
 - column titles, 163
 - Common tab, 167-168
 - Font tab, 169
 - fonts, 162
 - horizontal alignment, 162
 - hyperlinks, 165-166
 - opening, 162
- Formula Workshop, 100
- hyperlinks, 165-166
- importance of, 234
- line creation, 236
- margins, 174
- numbers to display strings, 264-266
- object names, 167
- OLAP, 383
- phone numbers, 176
- report sections
 - background color, 181-183
 - font color, 183
 - summary counts, 182
 - text alignment, 183

- reports, 156, 192
- rotating text, 238-239
- template field objects for, 338-339, 343-344
- templates for. *See* templates
- text
 - Boolean tab (Format Editor), 170
 - Box tab (Format Editor), 170
 - Date and Time tab (Format Editor), 170
 - Font tab (Format Editor), 169
 - Hyperlink tab (Format Editor), 169-170
 - Line tab (Format Editor), 170
 - Numbers tab (Format Editor), 170
 - objects, 159
 - Paragraph tab (Format Editor), 170
 - Picture tab (Format Editor), 170
 - Rounding tab (Format Editor), 170
 - Subreport tab (Format Editor), 170
- toolbars for, 163, 234
- ToolTips, 167, 235-236
- troubleshooting, 176

Formatting toolbar (Designer), 18

Formula Editor, 83-84, 96

- arithmetic formulas, 103-108
- Auto-Complete feature, 105
- available elements, dependencies of, 102
- comments, 114
- continued line characters, 117
- control structures, 116-119
- Custom Function creation, 98
- Date and Time formulas, 108-110

- Editing area, 101
 - error-checking while
 - designing, 106
 - features list, 97
 - Fields area, 101
 - Fields frame, 106
 - formatting control structures, 117
 - formatting results, 107
 - formula creation example, 102-103
 - Functions area, 101
 - naming formulas, 106
 - Operators area, 101
 - Operators frame, 106, 120
 - operators, accessing, 106
 - order of operations, 110
 - string formulas, 111-113
 - toolbar area, 101
 - type conversion, 114-116
 - Use Expert button, accessing through, 106
 - variables, 120
- Formula Expert**
- accessing, 120
 - creating formulas with, 121
- Formula Extractor**
- argument names, 122
 - creating functions from formulas, 121-123
 - templates, advantages with, 337
- Formula Workshop**
- advantages of, 337
 - Browse Data option, 196
 - components of, 97
 - Format Editor, 100
 - formatting formulas with, 100
 - Formula Editor, 96
 - accessing operators, 106
 - arithmetic formulas, 103-108
 - Auto-Complete feature, 105
 - available element dependencies, 102
 - comments, 114
 - continued line characters, 117
 - control structures, 116-119
 - Custom Function creation, 98
 - Date and Time formulas, 108-110
 - Editing area, 101
 - features list, 97
 - Fields area, 101
 - Fields frame, 106
 - formatting results, 107
 - formula creation example, 102-103
 - Functions area, 101
 - naming formulas, 106
 - Operators area, 101
 - Operators frame, 106, 120
 - order of operations, 110
 - string formulas, 111-113
 - toolbar area, 101
 - type conversion, 114
 - variables, 120
 - Formula Editor, type conversion, 116
 - Formula Extractor, creating functions from formulas, 121-123
 - formula fields with, 99
 - navigating, 98
 - Report Section Expert with, 100
 - Repository Custom Functions, 98
 - selection formulas, 100
 - SQL Expression fields, 99
 - Workshop Tree, navigating, 98
- formulas**
- arithmetic formulas, 103-108
 - at symbol (@), 320
 - barcode conversion formulas, 116
 - Basic syntax, 318-319
 - brackets in
 - French brackets ({}), 319-320
 - square brackets ([]), 319
 - commenting in/out, 114, 338
 - complex filters, 92-94
 - control structures, 116-119
 - creating functions from, 121-123
 - Crystal syntax, 318
 - custom functions, creating, 127-129
 - Date and Time formulas
 - conversion functions, 109
 - creating via Formula Editor, 108-110
 - Current Date function, 109
 - operators for, 108
 - range functions, 109
 - date comparators, 277-278
 - fields
 - @ (at symbol), 320
 - adding to reports, 54
 - concatenating strings, 55
 - Field Explorer view of, 54
 - Formula Workshop with, 99
 - new formula creation, 55
 - objects, 338-339, 343-344
 - Formula Expert, creating via, 121
 - Formula Workshop, 100
 - groups
 - creating for, 74-76
 - selecting, 89, 92
 - memo field operations, 320-322
 - multipass reporting process
 - Pass #1 phase, 124
 - Pass #2 phase, 125
 - Pass #3 phase, 126
 - Pre-Pass #2 phase, 125
 - Pre-Pass phase, 124
 - name custom function example, 327, 330
 - nesting, 92-94
 - order of precedence, 320
 - parameter fields in, 142
 - parentheses () in, 320

percent symbol (%), 320
 pound symbol (#), 320
 question marks (?), 320
 record selection, 82-84
 report sections, adding
 pages to, 185
 runtime errors, 324-326
 S (sigma) symbol, 320
 selection formulas (Formula Workshop), 100
 slashes (/), comments, 114
 string comparisons, 278-279
 string field searches within, 320-322
 string formulas
 concatenation, 111-112
 creating via Formula Editor, 111-113
 Left function, 112
 subreports with linked data, 305
 symbols in, 320
 syntax
 availability of, 101
 options of, 318
 selecting, 319
 templates, issues with, 337
 ToolTips
 adding to results, 113
 creating via, 235
 type conversion, 114-116

French brackets ({ }) in formulas, 319

Full Outer joins, 33

functions
 arguments, naming, 122
 concatenating, string formulas, 111-112
 custom functions
 argument names, 122
 author information, 123
 calling other custom functions, 324
 categorizing, 123
 Central Repositories, 126-128
 converting formulas to, 327

creating, 121-123,
 127-129, 323-324
 Crystal Repository with, 324
 CurrentFieldValue function in, 338
 database field access in, 324
 default values, 123
 descriptions for, 324
 divide-by-zero errors, 126-129
 division example, 127-128
 End Function statements, 324
 Extractor for, 127
 field header example, 128-129
 Formula Expert, 121
 Formula Extractor, 337
 Formula Workshop, 98
 Help text for, 123
 name formula example, 327, 330
 optional parameters, 324
 Repository, 98-99
 sharing, 324
 statelessness, 337
 summary descriptions, 122
 syntax options, 324
 templates, 337-338
 formulas, creating via, 123
 financial, 323
 help files for, 103
 string, 111
 type conversion, 114-116

Functions area (Formula Editor), 101

Funnel charts, 206

G

Gantt charts, 206

Gap Between Details option (Section Expert, Layout tab), 191

Gap Width slider for charts, 222

Gauge Behavior tab (Xcelsius, Gauge Properties window), 467

Gauge charts, 205

Gauge Properties window (Xcelsius), 466-467

gauges, Xcelsius dashboards, 468

General tab (Xcelsius), 470

Geographic field (Map Expert, Data tab), 217-218

geographic prompts, cascading, 289-292

geographical mapping, 204

Bar Chart maps, 219
 blank result maps, 216
 Dot Density maps, 219
 formatting options, 227
 Graduated maps, 219
 layer control, 227
 layout of, specifying, 215-216
 Map Expert, 214
 Data tab, 215-216
 Text tab, 220
 Type tab, 218-220
 mismatches, resolving, 227
 Pie Chart maps, 219
 placement of, specifying, 215
 positioning, 227
 Ranged maps, 219
 thumbnail images, 228
 Web resources, 214
 zooming in/out of, 228

Getting Started page, 16

global variables, 120

Graduated maps, 219

grand totals

alternative summaries, 87
 creating, 86-87

graphics, adding to reports, 173

Grid tab (Chart Expert, Axis Options dialog), 225

Gridlines tab (Chart Expert, Chart Options menu), 223

GridRowPathIndexOf function (cross-tabs), 268

grids (OLAP)

charts/maps based on, 388

interactivity in, 385-386

pivoting, 386

subreports, 389

GridValueAt function (cross-tabs), 267

Group By On Server option, 286-288

Group command (Insert menu), 171

Group Headers/Footers, 180

group name fields, 61

Group number fields, 62

Group Selection Formula fields, 62

Group Sort Expert, Top/Bottom N parameters, 146

Group Sorting dialog (Standard Report Creation Wizard), 41

group trees

Java Reporting Component viewer, customizing in, 422

Web Forms Viewer property for, 448

Windows Forms, 446

grouping data, report creation, 46

Grouping dialog (Standard Report Creation Wizard), 39

Grouping layout button (Chart Expert, Data tab), 208

groups

boxes, creating around, 237
complex filter formulas, 92-94

cross-tab placement in headers, 271-272

date/time related, 68-69

Design window for organizing, 66-67

details, hiding, 88

drill-down paths, 71. *See also* drill-down reports

field selection for, 64

formula creation for, 74-76

formula ranges, 74

Group Expert, 68, 75

Group Indent fields, 70

Group Sort Expert, 88-89

group trees, 67

hierarchical, 69-70

inserting, 64-66

multiple fields, sorting on, 66-68

naming, 65

option settings, 65

parameter field selections from, 146-147

purpose of, 63

reordering, 66-68

selection formulas, 89, 92

selections, 88-89

sort order selection for, 65

sorting, 66-68, 88-89

summaries for, 87-88

top 10 sort option, 206

troubleshooting

complex filter formulas, 92

formula ranges, 74

selection formulas, 92

headers

cross-tab placement in, 271-272

Group Headers, 180

reports, creating, 46

templates for formatting, 347-348

help

chart creation, 226

custom functions, 123

Help menu (Designer), 21

Hide (Drill-Down OK)

option (Section Expert, Common tab), 189

hiding

design explorers, 22

details of drill-down reports, 72-73

hierarchical grouping, 69-70

highlighting, conditional formatting for, 241-242

Highlighting Expert, 240

Histogram charts, 206

horizontal alignment, 162, 167

Horizontal Page Number fields, 62

horizontal/vertical summary placement in cross-tabs, 263

HTML (Hypertext Markup Language)

.NET Components, exporting to/from, 441

report example, 49

Xcelsius dashboards, 485, 519-520

HTML report viewer, Java, 419-421

HTTP (Hypertext Transfer Protocol), data source connections, 358-359

Hyperlink tab (Format Editor), 165-166

Another Report Object option, 170

H

handles (objects), viewing, 159

HasValue() function, parameter fields, 137

Current Website or Email
Field Value option, 169
Email address option, 169
File option, 169
Report Part Drilldown
option, 169
Website on the Internet
option, 169

**Hyperlink Wizard, report-
to-report linking, 243-244**

hyperlinks
formatting, 165-166
QueryStrings, 176-177
reports opening with,
242-244

I

**IF() statements, Xcelsius,
500-502**

**If/Then/Else structures,
116-118**

**Ignore Blank Cell check box
(Xcelsius, Behavior tab),
470**

**Image component (Xcelsius
dashboards), 483**

**images, adding to reports,
173**

In operator, 279

**In-Place Subreports,
307-308**

**INDEX function (Excel),
Xcelsius, 502-503**

indexed databases, 287

indirect access drivers, 24

**InfoSet drivers, SAP integra-
tion kits, 361**

InfoView
Crystal Reports Server com-
bination, 405
Xcelsius models, publishing
to, 410

Inner joins, 32

**Input File Repository
Servers, Crystal Reports
Server, 399**

**Insert button (Section
Expert, Sections area), 188**

**Insert Filtered Rows feature
(Xcelsius), 492-493**

**Insert Group dialog, 46, 64,
171**

Insert menu, 20
Cross-Tab command, 257
Group command, 64, 171
Insert Chart command, 205
Insert OLAP Grid com-
mand, 373, 383
Insert Subreport command,
301-302, 314
Text Object command, 159

**Insert Summary dialog, 46,
182**

**Insert Tools toolbar
(Designer), 18**

**Insert Type property field
(Xcelsius), 472**

**Insertion Type combo box
(Xcelsius, Properties win-
dow), 472**

installing on-demand, 26

integration kits
ERP
applications support,
359-360
full data access, 360
metadata in, 360
real-time data access, 361
sample reports, 360
security, 360
PeopleSoft, 365
reporting off data, 366
troubleshooting, 367
viewing reports, 366

SAP
ABAP data dictionary
connections, 361
Alert iView, 365
BW Query drivers, 362
Folder iView, 365
InfoSet drivers, 361

MDX query drivers, 363
ODS drivers, 363
Open SQL drivers, 361,
367
reporting off BW data,
362-363
reporting off R3 data,
361
Thumbnail iView, 365
troubleshooting, 367
viewing reports, 365

Siebel, 366

**intelligence tier (Crystal
Reports Server), 399-400**

**Interactive OLAP Worksheet
(Analyzer), 372**

Is date operators, 277

**Is Equal To option (Select
Expert), 81**

**Is Less Than option (Select
Expert), 81**

**is like operators, parameter
fields, 152**

**Is Like option (Select
Expert), 81**

**Is One Of option (Select
Expert), 81**

**IsAlertTriggered function,
295**

J

**Java Crystal Enterprise SDK,
412**

Java data providers
creating, 356-357
JavaBeansClassPath prop-
erty, 357
JavaDir property, 357
troubleshooting, 366-367

**Java Report Application
Server SDK, 412**

Java Reporting Component
API of, 414
application server
configuring, 418
support for, 414

architecture of, 412-414
 COM libraries with, 415
 configuring, 417
 connection URLs, 416
 CrystalReportViewer class, 419
 data source coding methods, 430
 databases
 classnames, 416
 connectivity, 416-418
 desktop viewer controls for, 414
 exporting reports
 code for, 425-427
 format limitations, 426
 page number specifications for, 427
 PDF files, 424, 426-427
 RTF files, 424
 group trees, customizing, 422
 HTML report viewer, 419-421
 HTML sample code, viewing in, 420-421
 IDEs for, 430-431
 JDBC connections, 416-418
 JNDI references, 417
 native Java code makeup of, 413
 parameter passing, 428-429
 printing reports, 427
 processHttpRequest method, 420
 report engine, 414
 report source types, 423
 report tags, 423
 ReportExportControl, 425-427
 scalability of, 413
 setReportSource method, 419
 supported file formats, 415
 tag libraries, 418, 422-423
 toolbars
 customizing, 422
 toolbars for viewers, 421

user function libraries, 415-416
 Web application configuration, 418
JavaBeansClassPath property, 357
JavaDir property, 357
JDBC (Java Data Base Connectivity), 416-418
JNDI (Java Naming and Directory Interface), 417
Job Servers, Crystal Reports Server, 400
joins, 31
 Full Outer, 33
 Inner, 32
 Left Outer, 32
 Not Equal, 33
 tables, linking manually, 45
JRE (Java Runtime Environment), 357
JSP pages, tag libraries for, 422-423
justification, rotated text, 240

K - L

Keep Object Together option (Format Editor, Common tab), 168
Keep Together option (Section Expert, Common tab), 189
Key fields (Dynamic Visibility), 488, 490
Label component (Xcelsius dashboards), 482
labels (summary) in cross-tabs, 263
Labels property field (Xcelsius), 472

Labels tab (OLAP Expert), 384
Layer Control dialog (Map Expert), 227
layering objects, 170-174
Layout section (Map Expert, Data tab), 215-216
Layout tab
 Chart Expert, Axis Options dialog, 224
 Section Expert, 191
Left function, string formulas, 112
Left Outer joins, 32
Legend tab (Chart Expert, Chart Options menu), 223
Length Limit property (parameter fields), 136
like operators, parameter fields, 152
Line Style drop-down boxes option (Format Editor, Border tab), 168
Line tab (Format Editor), 170
lines, creating, 236
Link dialog (Standard Report Creation Wizard), 38
Link tab (Report Wizard), 32
linked subreports, 305-306, 314
linking
 database objects. *See* joins
 reports to reports, 242-244
 subreports on derived fields, 300
List of Values Type property (parameter fields), 134
Live Office
 On Demand option, 513
 Refresh option, 513
 Web Intelligence connectivity
 parameterized reports, 513-514

scheduled instances versus refreshing, 513
 Xcelsius connectivity, 509-512
 parameterized reports, 513-514
 scheduled instances versus refreshing, 513

Load Template option (Chart Expert), 221

local variables, 120

Lock Position and Size option (Format Editor, Common tab), 167

logos, placement of, 347-348

look and feel, consistency in.
See templates

lookup functions (Excel), Xcelsius, 502-503

looping, 119

LowerCase() function, 321-322

M

manual design process

data sources, 44
 fields, adding, 45
 grouping data, 46
 headers/footers, 46
 saving reports, 48
 summaries, 46
 tables, 45
 viewing reports, 47

Map Components feature (Xcelsius), 494-496

Map Expert

accessing, 214
 blank result maps, 216
 Data tab
 Layout section, 215-216
 Map Placement section, 215
 Rapid Map Creation function, 217
 Text tab, 220
 Type tab, 218-220

Map Navigator, thumbnail map images, 228

Map Placement section (Map Expert, Data tab), 215

MapInfo website, 214

maps

Bar Chart maps, 219
 blank result maps, 216
 Dot Density maps, 219
 formatting options, 227
 geographic mapping, 204
 Graduated maps, 219
 layer control, 227
 layout of, specifying, 215-216
 Map Expert
 accessing, 214
 Data tab, 215-216
 Text tab, 220
 Type tab, 218-220
 mismatches, resolving, 227
 Pie Chart maps, 219
 placement of, specifying, 215
 positioning, 227
 Ranged maps, 219
 sizing, 227
 thumbnail images, 228
 Web resources, 214
 zooming in/out of, 228

margins

defaults, 175
 formatting, 174

MDX query drivers, SAP integration kits, 363

Measures table (Set Default Values dialog), 379

Member Selector dialog (OLAP Report Creation Wizard), 377

members (OLAP)

defined, 371
 drill-down functionality, 386
 fields same as, 376
 specifying, 376

memo fields, keyword searches of, 320-322

Merge button (Section Expert, Sections area), 188

Merge Section Below command, 198-199

merging report sections, 198

metadata, ERP integration kits, 360

Min/Max Data Ranges option (Chart Expert, Axes tab), 211

Modification Date fields, 62

Modification Time fields, 62

Modify Command dialog box, 30

More Data Sources node (Database Expert), 26

Move tab (Choose a Viewing Angle dialog), 226

moving averages, displaying in charts, 230

Multi-Axes tab (Chart Expert, Chart Options menu), 223

multicolumn reports, formatting, 192

multilayer dashboards, 496-498

multipass reporting process

Pass #1 phase,
 WhileReadingRecords process, 124
 Pass #2 phase,
 WhilePrintingRecords process, 125
 Pass #3 phase, 126
 Pre-Pass #2 phase, 125
 Pre-Pass phase,
 BeforeReadingRecords process, 124

multipass system, SQL Expressions, 283

My Connection node (Database Expert), 27

N

name builder custom function, 327, 330

Name property (parameter fields), 134

names

- alerts, 284
- Object Name option (Format Editor, Common tab), 167
- tables, 29

native drivers. *See* direct access drivers

Navigation Tools toolbar (Designer), 19

nesting formulas, 92-94

nesting subreports, 312

.NET

- ADO.NET, 434
- ASP.NET, 434
- data providers
 - complex query management, 353
 - creating, 354-355
 - legacy applications, 353
 - runtime data manipulation, 353
- data sources, 352
- SOAP, 434
- Visual Studio, 435
- XML Web services, 434, 453-454

.NET Components

- batched exports, 442-443
- database credentials, 449-451
- Excel format, exporting to, 441
- ExcelRecord format, exporting to, 441
- exporting reports, 440-443
- Field Explorer, 438
- formats for exporting reports, 441
- HTML format, exporting to, 441

- new reports, adding, 436
- opening reports, 440
- overview of, 436
- parameter fields with viewers, 451-452
- plain text format, exporting to, 441
- print methods, 443-444
- printing reports, 455
- Property Browser, 438-439
- Report Application Server, 453
- report designer, 436-439
- Report Engine Object Model, 439
- Report Wizard, 437
- repository with, 438
- RPT format, exporting to, 441
- RTF format, exporting to, 441
- SetDatabaseLogon method, 450-451
- strongly typed reports, 440
- threads with, 442-443
- user interface conventions, 438
- versions of, 435
- Viewer, Windows Forms, 444
- Web Forms Viewer, 447-449
- Web services with, 453-454
- Windows Forms, 444-447
- xcopy, troubleshooting deployments, 455

New Page After option (Section Expert, Paging tab), 191, 194

New Page Before option (Section Expert, Paging tab), 190

Not Equal joins, 33

NOW() function, Xcelsius, 505

Number of Divisions option (Chart Expert, Axes tab), 211

numbers

- display strings for, 264, 266
- phone numbers, formatting, 176
- templates field objects for formatting, 340

Numbers tab

- Chart Expert, Axis Options dialog, 225
- Format Editor, 170

numeric axis charts, 205

O

Object Browser (Xcelsius), 462

Object Name option (Format Editor, Common tab), 167

objects

- combining, 170, 172-174
- dragging/dropping, 171
- fields, formatting, 159-160
- handles, viewing, 159
- layering, 170-174
- reports, 17
- text, formatting, 159

ODBC (Open Database Connectivity), 24, 158

ODS (Operational Data Store) drivers, SAP integration kits, 363

offline viewer (Crystal Reports), 409

OLAP (Online Analytical Processing)

- advantages of, 371
- Connection Browser, 374
- Cube tab, Interactive OLAP Worksheet (Analyzer), 372
- Cube View, 387-388
- cubes, 370
 - aggregation within, 371
 - Select Cube button (OLAP Report Creation Wizard), 374
- data source accessibility, 372

- Data tab
 - CAR File button, 375
 - Chart dialog, 381-382
 - Member Selector dialog, 377
 - Rows/Columns dialog, 375-377
 - Select Cube button, 374
 - Slice/Page dialog, 377-380
 - specifying data sources, 373-374
 - specifying dimension slices (filters)/pages, 377-380
 - specifying dimensions, 377
 - specifying rows/columns, 375-377
 - Style dialog, 380
- defined, 370
- drill-down functionality, 372, 386, 389-391
- formatting options, 383
- grids
 - charts/maps based on, 388
 - interactivity in, 385-386
 - pivoting, 386
 - presentations, 371
 - subreports, 389
- members
 - defined, 371
 - fields same as, 376
 - specifying, 376
- new features, 371-372
- OLAP Analyzer. *See* Cube View
- OLAP Expert
 - accessing, 373
 - Customize Style tab, 383
 - Labels tab, 384
- OLAP Intelligence, reporting BW data off, 365
- OLAP Report Creation Wizard, 372
 - CAR File button, 375
 - Chart dialog, 381-382
 - Member Selector dialog, 377
 - Rows/Columns dialog, 375-377
 - Select Cube button, 374
 - Slice/Page dialog, 377-380
 - specifying data sources, 373-374
 - specifying dimension slices (filters)/pages, 377-380
 - specifying dimensions, 377
 - specifying rows/columns, 375-377
 - Style dialog, 380
- Preview tab, 372
- Row/Column Dimension
 - Parameter links, 371
- Slice/Page Dimension
 - Parameter links, 372
- summary report example, 389, 391
- troubleshooting, 389
- OLAP layout button**
 - Chart Expert, Data tab, 208
 - Map Expert, Data tab, 216
- OLAP Report Creation Wizard, nesting dimensions, 375**
- OLE (Object Linking and Embedding), 20**
- OLE DB database drivers, 24**
- OLTP (Online Transactional Processing) databases, 370**
- On Change Of field (Chart Expert, Data tab), 209, 228-229**
- On Demand option (Live Office), 513**
- on-demand installations, 26**
- on-demand reports, viewing in Crystal Reports Server, 404**
- On-Demand Subreports, 307-310**
- Open Database Connectivity. *See* ODBC**
- Open SQL drivers**
 - SAP integration kits, 361, 367
 - troubleshooting, 367
- operators**
 - arithmetic, 106
 - Date and Time formula, 108
 - date comparators, 277-278
 - help files for, 103
- Operators area (Formula Editor), 101**
- Operators frame (Formula Editor), 106, 120**
- Optional Prompt property (parameter fields), 135**
- Options tab (Chart Expert), 211**
- Orientation option (Section Expert, Paging tab), 191**
- Output File Repository Servers, Crystal Reports Server, 399**
- Overlap slider for charts, 222**

P

- Page Header section, 17**
- Page N of M fields, 62**
- Page Number fields, 62**
- Page Servers, Crystal Reports Server, 400**
- Page Setup command (File menu), 174**
- Page Setup dialog, 174**
- page sizes, selecting, 175**
- Paging tab (Section Expert)**
 - New Page After option, 191, 194
 - New Page Before option, 190
 - Orientation option, 191
 - Reset Page Number After option, 190
- Pan tab (Choose a Viewing Angle dialog), 226**

Paragraph tab (Format Editor), 162, 170**parameter fields**

- adding to reports, 57
- advantages of, 132-133
- All Values parameters, 151
- Allow Custom Values property, 136
- Allow Discrete Values property, 136
- Allow Multiple Values property, 136, 148
- Allow Range Values property, 136
- Append All Database Values action, 141
- asterisk (*) with, 151
- Bottom N group selections, 146-147
- cascading parameters, 147-149
- Create Parameter Field dialog, 138-140
- creating, 57, 138-140
- database derived values, 147-149
- Default Value property, 135
- default values for, setting, 140-142
- defined, 56
- denotation of, 144
- Dynamic List of Values properties, 135, 147
- dynamic parameters, 147-149
- Edit Mask property, 136-137
- equals to operators, 152
- filtering via, 151
- formulas, using in, 142
- group selections with, 146-147
- HasValue() function, 137
- input properties of, 134-136
- is like operators, 152
- Length Limit property, 136
- like operators, 152
- List of Values Type, 134
- multiple values, displaying, 145

- Name property, 134
- .NET viewers with, 451-452
- Optional Prompt property, 135
- options, setting, 138
- Parameter Order dialog, 138
- Parameters panel (Preview tab), 150
- Prompt Text property, 135
- Prompt with Description Only property, 135
- prompts, 133
- refreshing, 142
- reports
 - adding to, 142
 - previewing in, 142
- reusing, 150
- selecting records via, 143-145
- Show on (Viewer) Panel property, 135, 150
- Sort Order property, 135
- Static List of Values properties, 134-135
- static parameters, 140-142
- storing values for, 150
- text-entry field creation, 138
- Top N Value fields, 140, 146-147
- Top/Bottom N groupings, 133
- troubleshooting, 150
- Value Type property, 134
- values, entering, 142

Parameter Order dialog (Field Explorer), 138**Parameter Table field (Dynamic List of Values) property (parameter fields), 135****parameterized reports, 513-514, 518-519****parameters**

- fields, creating, 321
- Java Reporting Component, passing in, 428-429
- optional, 324
- question marks (?), 320

Parameters panel (Preview tab), 150**parentheses (()) in formulas, 320****Pass #1 phase (multipass reporting process), 124****Pass #2 phase (multipass reporting process), 125****Pass #3 phase (multipass reporting process), 126****PDF files**

- exporting
 - from Java Reporting Component, 424-427
 - reports to, 346
- Xcelsius dashboards, 484

PeopleSoft integration kits, 365

- reporting off data, 366
- reports, viewing, 366
- troubleshooting, 367

percent calculations, divide-by-zero errors, 126**percent symbol (%) in formulas, 320****percentage of summaries in cross-tabs, 261-262****performance**

- database level, grouping at, 286
- Group By On Server data, 288
- indexed databases, 287
- Latest Report Changes data, 288
- monitoring, 286
- Page N of M Used option, 288
- Performance Information tool, 287-289
- processing metrics, 288
- record selection, 279-281
- report contents information, 288
- saved data information, 288
- SQL Expressions, 283, 286-287
- SQL statements, 280-281

- string searches in databases, 322
- subreports, 287, 307-308
- timing metrics, 288
- Performance Information tool, 287-289**
- phone numbers, formatting, 176**
- Picture tab (Format Editor), 170**
- pictures, adding, 173**
- Pie Charts**
 - exploding, 222
 - maps, 219
 - Rotation slider, 222
 - Tilt slider, 222
- pivoting grids (OLAP), 386**
- plain text format, .NET exports to, 441**
- plus sign (+), concatenating string formulas, 112-113**
- portal integration, Xcelsius dashboards, 521**
- pound symbol (#) in formulas, 320**
- PowerPoint (MS), Xcelsius dashboards, 484**
- Pre-Pass #2 phase (multipass reporting process), 125**
- Pre-Pass phase (multipass reporting process), 124**
- Preview mode (Xcelsius), 467**
- Preview tab**
 - OLAP, 372
 - Parameters panel, 150
 - Section Expert, 182
 - Suppress option (Format Editor, Common tab), 167
 - view, 160-161
- previewing**
 - cross-tab changes, 257
 - dashboards in Xcelsius, 467
 - parameter fields in reports, 142
 - reports, 43, 161, 164, 182

- Print at Bottom of Page option (Section Expert, Common tab), 189**
- Print Date fields, 62**
- Print Time fields, 62**
- Print Time Zone fields, 62**
- printing**
 - ASP.NET issues, troubleshooting, 455
 - Java Reporting Component reports, 427
 - .NET methods for, 443-444
 - printers, selecting, 175
- Printing Direction option (Section Expert, Layout tab), 191**
- processHttpRequest method, 420**
- processing tier (Crystal Reports Server), 400**
- Product Profitability reports, chart types, 207**
- programming formulas. *See* control structures**
- Prompt Group Text (Dynamic List of Values) property (parameter fields), 135**
- Prompt Text property (parameter fields), 135**
- Prompt with Description Only property (parameter fields), 135**
- Prompting Text box (Create Parameter Field dialog), 379**
- prompts**
 - dynamic cascading, 289-292
 - multiple values, allowing, 279
- Proper Name formula, 327**
- Properties window (Xcelsius), 461, 472**
- Property Browser, Visual Studio .NET, 438-439**

- publishing Xcelsius dashboards, 484-485**

Q - R

- queries**
 - complex queries, managing, 353
 - views, adding to reports, 29
- Query as a Web Service, Xcelsius dashboards, 514**
- QueryStrings, 176-177**
- question marks (?)**
 - formulas, 320
 - wildcards, 81
- R3 data, SAP integration kits, 361**
- Ranged maps, 219**
- Rapid Map Creation function (Map Expert), 217**
- RAS (Report Application Server), Crystal Reports Server, 400**
- Read Only option**
 - Format Editor, Common tab, 167
 - Section Expert, Common tab, 190
- readability, improving in report sections, 200**
- Record Number fields, 63**
- Record Selection Formula fields, 63**
- record selection**
 - formulas, 82-84
 - complex example, 297
 - date comparators, 277-278
 - displaying, 276
 - performance, 279-281
 - string comparisons, 278-279
 - tools for, 276
 - troubleshooting, 298
 - parameter fields, 143-144

Record Sort Expert, 84-86

Refresh option (Live Office), 513

Refresh Report Data command, Report menu, 47

refreshing

Live Office/Xcelsius connections, 513

parameter fields, 142

Web Intelligence reports, 513

Relative Positions option (Section Expert, Common tab), 190

Rem comments, adding to formulas, 114

reordering groups, 66-68

Repeat on Horizontal Pages option (Format Editor, Common tab), 168

Report Application Server
Java edition of, 412
.NET, bridge for, 453

Report Comments fields, 63

Report Custom Functions.
See custom functions

Report Definition format, exporting reports to, 347

Report Description fields, templates for, 349

report design explorers. *See design explorers*

Report Engine Object Model, .NET, 439

Export method, 441

exporting reports, 440-443

ExportToDisk method, 440

ExportToHttpResponse method, 441

ExportToStream method, 441

formats for exporting reports, 441

print methods, 443-444

ReportDocument objects, 440

strongly typed reports, 440

report experts. *See report wizards*

Report Explorer, 21

Report Header section, 17

Report menu, 20

Refresh Report Data, 47

Select Expert command, 79

Report Part Drilldown option (Format Editor, Hyperlink tab), 169

report sections, 16, 180. *See also reports*

blank space removal, 183, 199

deleting, 197

design guidelines, 18

Details section, 17

drill-down functionality in, 186-187, 201-202

formatting

background color, 181-183

font color, 183

general properties of, 184

merging, 198-199

minimal configuration of, 198

moving fields between, 184

multiple sections, 193

inserting into reports, 194-197

resizing, 194

names of, 181

navigating between, 181

objects, 17

Page Header section, 17

pages, adding

by formula, 185

unique pages, 184-185

previewing reports, 182

Report Header section, 17

Section Expert, 18

Color tab, 191, 200

Common tab, 189-190

Layout tab, 191

Paging tab, 190

Sections area, 188

selecting all objects in, 183

summary counts, inserting, 182

text

aligning, 183

improving readability, 200

troubleshooting, 199

Report Selection Formula field, 83

report tags, Java Reporting Component, 423

Report Title fields, 63

report wizards, 33

accessing, 34

Database Expert

categorizing database objects, 28

creating data source connections, 26

listing open database connections, 27

More Data Sources node, 26

My Connection node, 27

opening, 25

troubleshooting, 48

Link tab, 32

Standard Report Creation Wizard

Chart dialog, 35, 42

creating sales reports, 35-42

Group Sorting dialog, 41

Grouping dialog, 39

Link dialog, 38

ODBC Data Source

Selection dialog, 36

previewing reports, 43

Summaries dialog, 40-41

Template dialog, 42

subreport creation, 303

report-to-report linking, 242-244

ReportDocument objects, .NET, 440

ReportExportControl (Java), 425-427

reports. *See also* subreports

Actual versus Target reports,
chart types, 207

blank reports
creating, 16, 44
templates, 16

charts, specifying position
of, 221

Company Sales reports,
chart types, 207

components of, 180. *See also*
report sections

crystalreports.com report-
sharing service website,
407-408

Customer Contact Listings,
creating, 158-161

database fields, adding to,
53

database objects, adding to,
27

drill-down reports

group paths for, 71
hiding details, 72-73
icon for, 71
navigating for, 72
purpose of, 71
Suppress (No Drill-
Down) option, 73

exporting

Excel format, 346
option presets, 176
output formats, 345-346
PDF format, 346
Report Definition format
format, 347
RTF Export format, 176
XML format, 347

fields

converting barcodes to,
246
converting to barcodes,
245-246

filtering data in, 78

formatting, 156, 192

formula fields, adding to, 54

Group Headers/Footers,
180

HTML example, 49

manual creation

data sources, 44
fields, adding, 45
grouping data, 46
headers/footers, 46
saving, 48
summaries, 46
tables, 45
viewing reports, 47

maps

specifying layout of,
215-216
specifying placement of,
215

multipass reporting process

Pass #1 phase, 124
Pass #2 phase, 125
Pass #3 phase, 126
Pre-Pass #2 phase, 125
Pre-Pass phase, 124

multiple report sections,
inserting, 194-197

parameter fields

adding to, 57, 142
previewing, 142

perfect reports as basis for
templates, 336

previewing, 43, 161, 164,
182

Product Profitability

reports, chart types, 207
running total fields, adding
to, 58

sales reports, creating, 35-42

saving, 48

SQL commands

adding to, 29-31
example of, 49-50

SQL Expression fields,
adding to, 56

stored procedures, adding
to, 29

tables, adding to, 28, 38

templates

applying, 333-335, 345
functionality of, 335-336
guidelines for, 336
perfect reports as basis
for, 336

viewing via

PeopleSoft integration
kit, 366

SAP integration kits, 365

views, adding to, 29

ReportSource property

Web Forms Viewer, 448

Windows Forms, 445

repository, .NET

Components with, 438

Repository Custom

Functions, Formula

Workshop access to, 98

Repository Explorer, 21**Reserve Minimum Page**

Footer option (Section
Expert, Common tab), 189

Reset Page Number After

option (Section Expert,
Paging tab), 190

resizing

charts, 221

maps, 227

multiple report sections, 194

Resolve Mismatch dialog

(Map Expert), 227

reusing reports. *See* tem-
plates

Riser Shape option for

charts, 222

Roman() function, 115

Rotate tab (Choose a
Viewing Angle dialog), 226

rotating text, 167, 238-239

Rounding tab (Format
Editor), 170

Row/Column Dimension
Parameter links (OLAP),
371

rows

cross-tabs, 254

Insert Filtered Rows feature
(Xcelsius), 492-493

Rows/Columns dialog
(OLAP Report Creation
Wizard), 375-377

RPT files, .NET exports to, 441

RTF Export format, 176

RTF files

Java Reporting Component,
exporting from, 424
.NET exports to, 441

running total fields

creating, 58
example of, 58-59
financial statements with, 60
formula option, 60
large order sums, 60
placement guideline, 60
reports, adding to, 58

running totals

creating, 90-92
pound symbol (#), 320

runtime errors

stack, 325
variable data, 324-326

S

S (sigma) symbol in formulas, 320

sales reports, creating, 35-42

SAP integration kits

ABAP data dictionary connections, 361
Alert iView, 365
BW Query drivers, 362
Folder iView, 365
InfoSet drivers, 361
MDX query drivers, 363
ODS drivers, 363
Open SQL drivers, 361, 367
reporting off
 BW data, 362-363
 R3 data, 361
reports, viewing, 365
Thumbnail iView, 365
troubleshooting, 367

Save menu commands, 48

Save Template option (Chart Expert), 221

saving

autosave feature, 48
reports, 48

scalability

component limitations, 413
Crystal Reports Server, 397

Scales tab (Chart Expert, Axis Options dialog), 225

scheduling Live

Office/Xcelsius instances, 513

searches

Find in Field Explorer,
244-245
keywords in fields, 320-322

Section Expert

accessing, 18, 181
Background Color check box, 181
Color tab, 191, 200
command access, 185
Common tab
 Clamp Page Footer option, 189
 Format with Multiple Columns option, 189
 Hide (Drill-Down OK) option, 189
 Keep Together option, 189
 Print at Bottom of Page option, 189
 Read-Only option, 190
 Relative Positions option, 190
 Reserve Minimum Page Footer option, 189
 Suppress (No Drill-Down) option, 189, 197
 Suppress Blank Section option, 189
 Underlay Following Sections option, 189
Details section, 186
fields, moving, 184
Fit Section command, 183, 199

general properties of sections, 184

Layout tab, 191

navigating between sections,
navigating between, 181

objects, selecting in, 183

pages, adding

 by formula, 185

 unique pages, 184-185

Paging tab, 190

 New Page After option,
 191, 194

 New Page Before option,
 190

 Orientation option, 191

 Reset Page Number
 After option, 190

Preview tab, 182

Sections area, 188

sections, navigating
 between, 181

summary counts, inserting,
182

text, aligning, 183

X+2 button, 190, 196

sections (report). See report sections

Sections area (Section Expert), 188

Sections box (Section Expert, Sections area), 188

security, ERP integration kits, 360

Select Case structures, 116-118

Select Column Members button (OLAP Report Creation Wizard), 376-377

Select Expert

date comparators, 277-278

field selection, 79

filters, adding, 81

formulas generated, showing, 82

Is Equal To option, 81

Is Less Than option, 81

Is Like option, 81

Is One Of option, 81

- multiple filter application, 81-82
- opening, 79
- purpose of, 78
- ranges, setting, 80
- record selection
 - formulas, 82-83
 - parameter fields, 144
- refreshing data options, 80
- tabs, 79
- values for filters, 80
- Select Row Members button (OLAP Report Creation Wizard), 377**
- selection formulas, 89, 92**
 - Formula Workshop with, 100
 - string field searches, 321
 - Windows Forms, 447
- Selection Locale fields, 63**
- selectors**
 - destination cells, 473
 - Xcelsius dashboards, 471-473
- Series Option dialog (Chart Expert)**
 - Appearance tab, 223
 - Data Labels tab, 223
 - Trendline tab, 224
- servers (Crystal Reports)**
 - applications
 - CCM, 401-402
 - CMC, 402-405
 - InfoView, 405
 - architecture, 397
 - BusinessObjects Enterprise, compared, 397
 - Cache Server, 399
 - Cache Servers, 400
 - CMS, 399
 - components, 396
 - concurrent users, 397
 - defined, 396
 - Event Server, 400
 - Input/Output File
 - Repository Servers, 399
 - instances, 400
 - Job Servers, 400
 - limitations, 397
 - Page Servers, 400
 - platforms supported, 397
 - publishing reports, 403
 - RAS, 400
 - scalability, 397
 - tiers
 - application, 398-399
 - client, 397
 - data, 401
 - intelligence, 399-400
 - processing, 400
 - viewing on-demand reports, 404
 - Web Intelligence, 397
 - Web-based viewing, 405
- Set Default Values dialog (OLAP Report Creation Wizard, Slice/Page dialog), 379**
- SetDatabaseLogon method, 450-451**
- setReportSource method, 419**
- shared variables, 120, 309-312**
- SharePoint Services, Xcelsius dashboard portal integration, 521**
- Show field**
 - Chart Expert, Data tab, 209
 - Map Expert, Data tab, 218
- Show on (Viewer) Panel property (parameter fields), 135, 150**
- Show SQL Query command, 280**
- Siebel integration kits, 366**
- sigma (S) symbol in formulas, 320**
- single value components (Xcelsius), 465-467**
- sizing**
 - charts, 221
 - field objects, 159-160
 - maps, 227
 - multiple report sections, 194
 - text objects, 159
- slashes (/) in comments, 114**
- Slice/Page dialog (OLAP Report Creation Wizard), 377-380**
 - Create Parameter Field dialog, 379
 - Link to Parameter functionality, 378
 - Set Default Values dialog, 379
- Slice/Page Dimension Parameter links (OLAP), 372**
- sliders, Xcelsius dashboards, 467**
- slideshows, multilayer dashboards, 497**
- SOAP (Simple Object Access Protocol)**
 - defined, 434
 - Xcelsius Web Service connections, 515
- Sort control, 292-294**
- Sort Expert. *See* Record Sort Expert**
- Sort Order property (parameter fields), 135**
- sorting. *See also* filtering**
 - Group Sort Expert, 88-89
 - groups, 66-68
 - Record Sort Expert, 84-86
 - top 10 sort option, 206
- Source Data property field (Xcelsius), 472**
- spacing (text), Character Spacing Exactly option (Format Editor, Font tab), 169**
- special fields**
 - Report Selection Formula field, 83
 - table of, 61-63

Specified Order tab, 65**SQL (Structured Query Language)****commands**

- adding to reports, 29-31
- advantages, 50
- creating, 50
- parameters of, 30
- report example, 49-50

statements

- performance, 280-281
- viewing, 280

storing, 31**SQL Expressions, 281**

- database fields, limitation to, 282

Editor, launching, 282**fields**

- adding to reports, 56
- Field Explorer for, 282
- Formula Workshop with, 99
- vendor dependencies of, 56

- generation of SQL queries from, 282

multipass issues, 283**percent symbol (%), 320****performance, 283, 286-287****syntax for fields, 282**

- WHERE statement generation, 283

SQL Servers, JDBC driver for, 416**square brackets ([]) in formulas, 319****Standard Report Creation Wizard**

- Chart dialog, 35, 42
- Group Sorting dialog, 41
- Grouping dialog, 39
- Link dialog, 38
- ODBC Data Source Selection dialog, 36
- previewing reports, 43
- sales reports, creating, 35-42
- Summaries dialog, 40-41
- Template dialog, 42

Standard toolbar (Designer), 18**Static List of Values properties, 134-135****status bars, customizing Windows Forms, 446****Status fields (Dynamic Visibility), 488, 490****storing**

- parameter field values, 150
- procedures, 29
- SQL Commands, 31

Strikeout and Underline option (Format Editor, Font tab), 169**strings**

- arrays, 279
- comparisons, 278-279
- concatenating, 55-56
- Display String option (Format Editor, Common tab), 167

formulas

- concatenation, 111-112
- creating via Formula Editor, 111-113
- functions for, 111
- Left function, 112
- keyword searches of, 320-322
- numbers, converting from, 126

strongly typed reports, 440**Style dialog (OLAP Report Creation Wizard), 380****styles versus templates, 333****Subreport tab (Format Editor), 170****subreports. *See also* report sections; reports**

- advantages of, 300-301
- Available Fields for links, 304
- Change Subreport Links option, 314
- creating, 303, 314

defined, 300**Design tabs for, 303****distinct records option, 306****editing, 303, 312****filters for linked data, 305****formatting details of, 312****formulas for linking data, 305****hiding sections of, 303****In-Place, 307-308****inserting, 301-302, 314****link creation, 306****linked versus unlinked, 304-306****linking on derived fields, 300****main reports based on multiple subreports, 313-316****multiple views of data, enabling, 300-304****nesting, 312****OLAP grids in, 389****On-Demand, 307-310****On-Demand Subreport****check box, 303****performance, 287, 307-308****reports, adding to, 301-302, 314****reusability of components feature, 301****summary field flexibility with, 301****troubleshooting, 312****unlinked, 304****unrelated data sources with, 300****variables, passing data with, 309-312****writing to databases from, 313****summaries****charts, 210****Count, 87****cross-tabs****editing in, 270****horizontal/vertical placement in, 263****labels in, 263**

- percentage of summaries in, 261-262
- details, hiding, 88
- grand total creation, 86-87
- groups, by, 87-88
- reports, creating, 46
- S (sigma) symbol, 320
- subreports for flexibility with, 301

Summaries dialog (Standard Report Creation Wizard), 40-41

Summary command, 182

summary counts, inserting in report sections, 182

Suppress (No Drill-Down) option, 73, 189, 197

Suppress Blank Section option (Section Expert, Common tab), 189

Suppress If Duplicated option (Format Editor, Common tab), 167

Suppress option (Format Editor, Common tab), 167

SWF files

- cross-domain policies, 508
- FlashVars tab, 520
- multilayer dashboards, 496-498
- provider/consumer connections, 521
- Xcelsius, 460
- Xcelsius dashboards, 484

Switch structures, 119

T

Tab Set component (Xcelsius), 474-475

tables

- adding to reports, 28, 38
- aliasing, 29
- linking, 45
- selecting, 45

tag libraries, Java Reporting Component, 418, 422-423

telephone numbers, formatting, 176

Template dialog (Standard Report Creation Wizard), 42

templates

- advantages of, 344-345
- blank reports, 16
- capabilities of, 332-333
- charts with, 221, 349
- CurrentFieldValue function, 338
- custom functions in, 337-338
- database field issues, 336
- field mismatches with, 336
- field objects, 338-339, 343-344
- folder for, 342
- Formula Extractor advantages, 337
- formulas in, problems with, 337
- functionality of, 335-336
- guidelines for, 336
- headers and footers with, 347-348
- importance of, 332
- logos with, 347-348
- multiple templates, applying, 345
- perfected reports as basis for, 336
- preview pictures of, 344
- reapplying, 345
- Report Description fields, 349
- reports, applying to, 333-335
- selecting to apply, 343
- statelessness, 337
- styles versus, 333
- Template Expert, 334-335
- thumbnails, 344
- Title fields, 349

- Title property for, 341
- undoing, 335, 344

text

- colors, 164
- fonts
 - color selection in report sections, 183
 - formatting, 162, 169
- horizontal alignment, 162
- hyperlinks, 165-166
- objects, formatting, 159
- report sections
 - aligning in, 183
 - improving readability in, 200
- rotating, 167, 238-239
- spacing, 169
- striking out, 169
- underlining, 169

Text Object command, 159

Text Rotation option (Format Editor, Common tab), 167

Text tab

- Chart Expert, 212
- Map Expert, 220

themes, Xcelsius dashboards, 481

Thumbnail iView (SAP integration kits), 365

Tight Horizontal option (Format Editor, Border tab), 168

time, grouping on, 68-69

time formulas. *See* Date and Time formulas

Title fields, templates for, 349

titles (columns), editing, 163-164

Titles tab (Chart Expert, Chart Options menu), 222

ToNumber() function, 115

toolbar area (Formula Editor), 101

Toolbar dialog, 164**toolbars**

- Formatting toolbar, 234
- formatting with, 163
- Java Reporting Component viewer, customizing in, 422
- Web Forms Viewer properties, 448
- Windows Forms, customizing, 446

Toolbars command (View menu), 164**ToolTip Text option (Format Editor, Common tab), 167****ToolTips**

- adding to formulas, 113
- alerts with, 296
- creating, 235-236
- enabling/disabling, 19
- formulas for creating, 235
- ToolTip Text option (Format Editor, Common tab), 167

top 10 sort option, 206**Top N groups**

- cross-tabs with, 258
- formulas for N, 258-259

Top N Value parameter fields, 140, 146-147**Total Page Count fields, 63****ToText() function, 115****ToWords() function, 115****trend lines, creating, 249****Trendline tab (Chart Expert, Series Option dialog), 224****Trigger Cell events, Xcelsius, 506****troubleshooting**

- ASP.NET, printing reports, 455
- Central Repositories, 126
- charts, 228-229, 349
- .COM data providers, 366-367

Database Expert, 48**formatting, 176****groups**

- complex filter formulas, 92
- formula ranges, 74
- selection formulas, 92

Java data providers, 366-367**looping errors, 119****.NET Components, 455****OLAP, 389****Open SQL drivers, 367****parameter fields, 150****PeopleSoft integration kits, 367****record selection formulas, 298****report sections, 199****SAP integration kits, 367****subreports, 312****templates, 349****type conversion, 126****updates, 48****Web Services Wizard, 410****Xcelsius****dashboards, 486****models published to InfoView, 410****xcopy deployments, 455****type conversion, 114-116, 126****Type tab****Chart Expert, 205-206****Map Expert, 218-220****U - V****Underlay Following Sections option (Section Expert), 189, 228****Underlay Section property, 238-239****underlining text, Strikeout and Underline option (Format Editor, Font tab), 169****underscore (_) as continued line character, 117****Up/Down Arrow buttons (Section Expert, Sections area), 188****updates, troubleshooting, 48****Usage tab (Xcelsius, Data Manager window), 464****Use Depth option for charts, 222****user function libraries, 278, 415-416****Value Field (Static List of Values) property (parameter fields), 134****Value Table field (Dynamic List of Values) property (parameter fields), 135****Value Table Field (Static List of Values) property (parameter fields), 134****Value Type property (parameter fields), 134****variables****Formula Editor, using in, 120****runtime errors data, 324-326****scope of, 120****shared, 309-312****subreports, passing data with, 309-312****types of, 120****vertical/horizontal summary placement in cross-tabs, 263****View menu (Designer), 20, 164****viewer tags, Java Reporting Component, 423****viewers****Web Forms Viewer, 447****creating, 447****customizing, 448-449****database credentials with, 449-451****group trees, 448**

- parameter fields with, 451-452
- ReportSource property, 448
- toolbars, 448
- Windows Forms Viewer, 444-445
 - customizing, 446-447
 - database credentials with, 449-452

viewing

- database objects, 28
- design explorers, 22
- handles, 159
- on-demand reports in Crystal Reports Server, 404
- reports, 47

views

- Preview tab, 160-161
- reports, adding to, 29

Visual Studio .NET

- Crystal Reports with, 435
- Field Explorer, 438
- new reports, adding, 436
- Property Browser, 438-439
- report designer, 436-439
- Report Wizard, 437
- repository with, 438
- user interface conventions, 438
- Web Forms Viewer, 447
- Web services for reports, 453
- Windows Forms Viewer, 444

Voyager Intelligence, reporting off BW data, 363-365

W

Walls tab (Choose a Viewing Angle dialog), 226

watermarks, 189, 238-239

Web applications, configuring Java Reporting Component for, 418

Web Forms Viewer

- creating, 447
- customizing, 448-449
- database credentials with, 449-451
- group trees, 448
- parameter fields with, 451-452
- ReportSource property, 448
- toolbars, 448

Web Intelligence reports

- BW data, 363-365
- parameterized reports, 513-514, 518-519
- refreshing, 513

Web services

- data source connections, XML data providers, 358-359
- defined, 434
- reports using, 453-454
- Xcelsius connections, 463-464, 515

Web Services Wizard, troubleshooting, 410

Website on the Internet option (Format Editor, Hyperlink tab), 169

WebSphere, Xcelsius dashboard portal integration, 521

WHERE statements

- forcing generation from formulas, 281
- SQL Expressions for generating, 283

While/Do structures, 119

WhilePrintingRecords process (multipass reporting process), 125

WhileReadingRecords process (multipass reporting process), 124

wildcards, 81

Window menu (Designer), 21

Windows Forms

- customizing
 - status bar, 446
 - toolbar, 446
 - viewers, 446-447
- database credentials with, 449, 451
- drilldown options, 447
- group trees, 446
- invoking viewers, 446
- parameter fields with, 451-452
- ReportSource property, 445-446
- selection formulas, 447
- status bar, customizing, 446
- toolbar, customizing, 446
- viewers, 444
 - customizing, 446
 - invoking, 446

wizards

- Cross-Tab Expert, 257, 270
- Hyperlink Wizard, report-to-report linking, 243-244
- OLAP Report Creation Wizard, 372
 - CAR File button, 375
 - Chart dialog, 381-382
 - Member Selector dialog, 377
 - Rows/Columns dialog, 375-377
 - Select Cube button, 374
 - Slice/Page dialog, 377-380
 - specifying data sources, 373-374
 - specifying dimension slices (filters)/pages, 377-380
 - specifying dimensions, 377
 - specifying rows/columns, 375-377
 - Style dialog, 380
- Report Wizard, 33
 - accessing, 34
 - Database Expert. *See* Database Expert

- Link tab, 32
- .NET Components, 437
- Standard Report
 - Creation, 35-43
- Web Services Wizard, troubleshooting, 410
- Word (MS), Xcelsius dashboards, 484**
- Workbench, 23**
- Workshop Tree (Formula Workshop), navigating, 98**
- WSDL (Web Service Definition Language), Xcelsius Web Service connections, 515**

X

- X+2 button (Section Expert), 190, 196**

Xcelsius

- Behavior tab, 470
- BusinessObjects Enterprise integration, 508
- Chart Drill Down feature, 490-491
- Chart Excel tab, 468, 473
- Components window, 460-461
- Custom Color Scheme window, 479
- dashboards
 - alerts, 476-479
 - backgrounds, 481-482
 - BusinessObjects Enterprise, 484
 - charts in, 468-470
 - color schemes, 479-480
 - connectivity guidelines, 505
 - containers in, 474-475
 - cross-domain policies, 508
 - Crystal Reports, 485
 - deploying, 484-485
 - design rules, 458
 - development paradigm, 458-460

- Flash variables in, 519-520
- gauges in, 468
- HTML in, 485, 519-520
- Image component, 483
- Label component, 482
- life cycle management, 508
- Live Office connectivity, 509-513
- multilayer dashboards, 496-498
- parameterized reports, 513-514, 518-519
- PDF documents, 484
- portal integration, 521
- PowerPoint, 484
- previewing, 467
- publishing, 484-485
- Query as a Web Service, 514
- refreshing Live Office connections, 513
- scheduling Live Office instances, 513
- selectors in, 471-473
- sliders, 467
- SWF files, 484
- themes, 481
- troubleshooting, 486
- Web Service connections, 515
- Word, 484
- XML Maps, 515-518
- Data Manager window
 - Definition tab, 463
 - Usage tab, 464, 506-507
 - Web service connection methods in, 463-464
- Destination property field, 472
- Dynamic Visibility, 488-498
- Excel logic in
 - concatenating values, 503-504
 - conditional formulas, 500-501
 - date functions, 505
 - IF() statements, 500-502

- INDEX function, 502-503
- lookup functions, 502-503
- supported Excel functions, 498-500
- Excel Sheet tab, 468
- Excel tabs, 466
- Format toolbar, Color Scheme drop-down, 479
- Gauge Properties window, 466-467
- General tab, 470
- InfoView, publishing to, 410
- Insert Filtered Rows feature, 492-493
- Insert Type property field, 472
- Labels property field, 472
- Map Components feature, 494-496
- Object Browser, 462
- Preview mode, 467
- project management, 466
- Properties window, 461, 472
- single value components, 465-467
- Source Data property field, 472
- SWF files, 460
- Tab Set component, 474-475
- Trigger Cell events, 506
- xcopy, troubleshooting deployments, 455**
- XML (Extensible Markup Language)**
 - ADO.NET recordset connections, 356
 - COM data providers, reading data via, 367-368
 - data providers
 - HTML data source connections, 358-359
 - local data source connections, 358
 - Web service data source connections, 358-359

ETL products, 347

reports

exporting to, 347

Web services, 434, 453-454

XML Maps (Excel), Xcelsius, 515-516, 518

Y - Z

zero, dividing by (custom functions), 126-129

Zoom In/Out options (Map Expert), 228