

Microsoft

2005  
EDITION



MICROSOFT™

# SQL SERVER™ 2005 REPORTING SERVICES

*Step by Step*

*Stacia Misner  
Hitachi Consulting*

PUBLISHED BY  
Microsoft Press  
A Division of Microsoft Corporation  
One Microsoft Way  
Redmond, Washington 98052-6399

Copyright © 2006 by Hitachi Consulting

All rights reserved. No part of the contents of this book may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Library of Congress Control Number 2006921725

Printed and bound in the United States of America.

1 2 3 4 5 6 7 8 9 QWE 1 0 9 8 7 6

Distributed in Canada by H.B. Fenn and Company Ltd.

A CIP catalogue record for this book is available from the British Library.

Microsoft Press books are available through booksellers and distributors worldwide. For further information about international editions, contact your local Microsoft Corporation office or contact Microsoft Press International directly at fax (425) 936-7329. Visit our Web site at [www.microsoft.com/mspress](http://www.microsoft.com/mspress). Send comments to [mspinput@microsoft.com](mailto:mspinput@microsoft.com).

Microsoft, Microsoft Press, ActiveX, Excel, Internet Explorer, MapPoint, MSDN, PivotTable, SharePoint, Visual Basic, Visual C#, Visual Studio, Windows, Windows NT, and Windows Server are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Other product and company names mentioned herein may be the trademarks of their respective owners.

The example companies, organizations, products, domain names, e-mail addresses, logos, people, places, and events depicted herein are fictitious. No association with any real company, organization, product, domain name, e-mail address, logo, person, place, or event is intended or should be inferred.

This book expresses the author's views and opinions. The information contained in this book is provided without any express, statutory, or implied warranties. Neither the authors, Microsoft Corporation, nor its resellers, or distributors will be held liable for any damages caused or alleged to be caused either directly or indirectly by this book.

**Acquisitions Editor:** Ben Ryan

**Project Editor:** Denise Bankaitis

**Technical Editor:** Robert Hogan

**Copy Editor:** William Evan Gelder

**Indexer:** John Lewis

# Table of Contents

<b>Introduction</b> . . . . .	<b>xiii</b>
Finding Your Best Starting Point . . . . .	xiii
About the Companion CD-ROM . . . . .	xiv
System Requirements . . . . .	xiv
Installing and Using the Sample Files . . . . .	xv
Conventions and Features in This Book . . . . .	xvii

## **Part I Getting Started with Reporting Services**

<b>1 Understanding Reporting</b> . . . . .	<b>3</b>
Reporting Scenarios . . . . .	3
Reporting User Communities . . . . .	5
The Enterprise Reporting Life Cycle . . . . .	6
Authoring . . . . .	7
Management . . . . .	7
Access and Delivery . . . . .	8
Reporting Services Components . . . . .	8
Authoring Components . . . . .	9
Management Components . . . . .	11
Access and Delivery Components . . . . .	13
Chapter 1 Quick Reference . . . . .	16
<b>2 Installing Reporting Services</b> . . . . .	<b>17</b>
Considering Deployment Options . . . . .	17
Choosing a Reporting Services Edition . . . . .	17
Planning a Site Configuration . . . . .	18
Deciding Naming Conventions . . . . .	19
Preparing for Installation . . . . .	19
Reviewing Operating System Requirements . . . . .	19
Reviewing Software Requirements . . . . .	20

**What do you think of this book?**  
We want to hear from you!

Microsoft is interested in hearing your feedback about this publication so we can continually improve our books and learning resources for you. To participate in a brief online survey, please visit: [www.microsoft.com/learning/booksurvey/](http://www.microsoft.com/learning/booksurvey/)

	Reviewing Configuration Prerequisites .....	20
	Creating Reporting Services Credentials .....	21
	Installing Reporting Services .....	23
	Launching Setup .....	23
	Choosing the Components .....	24
	Selecting the Service Account .....	27
	Using the Reporting Services Configuration Manager .....	28
	Configuring Virtual Directories .....	29
	Specifying the Report Server Database .....	31
	Specifying Report Delivery Options .....	32
	Verifying the Installation .....	34
	Chapter 2 Quick Reference .....	36
<b>3</b>	<b>Building Your First Report .....</b>	<b>37</b>
	Authoring a Report .....	37
	Starting a New Report .....	38
	Connecting to a Data Source .....	40
	Getting Data for the Report .....	43
	Structuring Data in the Report .....	45
	Placing Data in the Report Structure .....	46
	Applying a Style Template .....	48
	Finishing the Report Wizard .....	49
	Checking the Report Layout .....	51
	Correcting Report Layout Issues .....	55
	Publishing a Report .....	57
	Managing a Report .....	59
	Reviewing Report Properties .....	59
	Changing Report Properties .....	62
	Reviewing Execution Properties .....	63
	Changing Data Sources Properties .....	65
	Changing Execution Properties .....	66
	Accessing a Report .....	67
	Displaying a Report .....	67
	Searching a Report .....	68
	Exporting a Report .....	69
	Chapter 3 Quick Reference .....	71

## Part II Authoring Reports

<b>4</b>	<b>Developing Basic Reports . . . . .</b>	<b>75</b>
	Understanding a Report Definition File . . . . .	75
	Preparing a Report Using Report Designer . . . . .	76
	Creating a New Report Project . . . . .	76
	Creating a New Report . . . . .	77
	Connecting to a Data Source . . . . .	78
	Working with Datasets . . . . .	79
	Structuring a Report Using Report Designer . . . . .	82
	Adding Items from the Toolbox . . . . .	82
	Working with Table Rows . . . . .	83
	Sorting Table Rows . . . . .	86
	Grouping Data in a Table . . . . .	88
	Adding Group Headers . . . . .	91
	Computing Group Subtotals . . . . .	92
	Formatting a Report Using Report Designer . . . . .	93
	Setting the <i>Format</i> Property . . . . .	93
	Applying Styles . . . . .	94
	Editing Properties . . . . .	96
	Adding Floating Headers . . . . .	98
	Triggering Page Breaks . . . . .	100
	Adding a Textbox . . . . .	100
	Setting Table Properties . . . . .	103
	Working with Page Headers . . . . .	104
	Working with Page Footers . . . . .	105
	Adding Graphical Elements . . . . .	106
	Adding Images . . . . .	108
	Chapter 4 Quick Reference . . . . .	111
<b>5</b>	<b>Working with Expressions . . . . .</b>	<b>113</b>
	Using Expressions to Calculate Values . . . . .	113
	Creating Calculated Fields . . . . .	114
	Using Global Variables . . . . .	119
	Using the <i>ReportItems</i> Collection . . . . .	122

- Using Aggregate Functions . . . . . 125
  - Using Aggregate Functions in a Table . . . . . 127
  - Using Aggregate Functions in a Textbox . . . . . 129
- Using Expressions to Change an Object's Behavior . . . . . 132
  - Using Conditional Formatting . . . . . 132
  - Sorting . . . . . 133
- Chapter 5 Quick Reference . . . . . 135
- 6 Organizing Data in Reports . . . . . 137**
  - Understanding Data Regions . . . . . 137
    - Comparing Types of Data Regions . . . . . 137
    - Using Data Regions . . . . . 138
  - Using a Matrix . . . . . 138
    - Adding a Matrix Data Region . . . . . 139
    - Grouping Rows . . . . . 140
    - Sorting Rows . . . . . 141
    - Grouping Columns . . . . . 142
    - Using Subtotals in a Matrix . . . . . 144
    - Using Static Rows and Columns in a Matrix . . . . . 146
  - Using a Chart . . . . . 148
    - Adding a Chart . . . . . 148
    - Adding Values and Column Groups to a Chart . . . . . 149
    - Grouping Data by Series . . . . . 150
    - Adding a Chart Legend . . . . . 152
    - Setting Chart Properties . . . . . 154
  - Using a List . . . . . 155
    - Adding a List . . . . . 156
    - Grouping and Sorting a List . . . . . 157
    - Using Fields in a List . . . . . 157
    - Nesting Data Regions . . . . . 158
  - Chapter 6 Quick Reference . . . . . 160
- 7 Building Advanced Reports . . . . . 161**
  - Using Parameters to Change Report Data . . . . . 161
    - Adding a Report Parameter . . . . . 162

Using the <i>Parameters</i> Collection . . . . .	164
Adding a Query Parameter . . . . .	167
Supplying Values for a Query Parameter . . . . .	169
Creating a Report Parameter for a Filter . . . . .	172
Adding a Filter . . . . .	175
Adding a Parameter Value to a Report . . . . .	177
Linking Information with Interactive Features . . . . .	177
Adding Actions . . . . .	179
Using the <i>Hidden</i> Property . . . . .	182
Using the <i>ToggleItem</i> Property . . . . .	183
Adding a Subreport . . . . .	186
Working with Hierarchical Data . . . . .	188
Displaying a Recursive Hierarchy in a Data Region . . . . .	189
Using the <i>Level</i> Function . . . . .	191
Using the <i>Recursive</i> Keyword . . . . .	192
Creating an Analysis Services Data Source and Dataset . . . . .	194
Using an Analysis Services Dataset . . . . .	196
Chapter 7 Quick Reference . . . . .	197
<b>8 Building Report Models . . . . .</b>	<b>199</b>
Understanding Report Models . . . . .	199
Creating a Report Model . . . . .	200
Adding a Report Model Data Source . . . . .	200
Adding a Data Source View . . . . .	201
Adding a Report Model . . . . .	204
Reviewing a Report Model . . . . .	207
Modifying a Report Model . . . . .	211
Changing Model Objects . . . . .	212
Organizing Model Objects . . . . .	215
Adding Source Fields . . . . .	220
Adding Expressions . . . . .	222
Managing a Report Model . . . . .	223
Publishing a Report Model . . . . .	224
Securing a Report Model . . . . .	226
Chapter 8 Quick Reference . . . . .	229

**Part III Managing the Report Server**

<b>9</b>	<b>Managing Content. . . . .</b>	<b>233</b>
	Publishing Reports. . . . .	233
	Defining Deployment Properties by Project . . . . .	234
	Deploying Reports. . . . .	236
	Uploading Reports. . . . .	239
	Creating a Script File . . . . .	240
	Using the rs Utility. . . . .	241
	Organizing Content. . . . .	242
	Working with Folders . . . . .	242
	Moving Content. . . . .	244
	Linking Reports . . . . .	246
	Working with General Properties . . . . .	248
	Using Properties to Manage Report Content . . . . .	250
	Working with Data Sources . . . . .	250
	Specifying a Default Value . . . . .	253
	Disabling a Parameter Prompt . . . . .	255
	Managing Report Execution. . . . .	256
	Executing Reports with Current Data . . . . .	257
	Implementing Cached Instances. . . . .	259
	Working with Shared Schedules . . . . .	261
	Managing Snapshots. . . . .	263
	Using Report History. . . . .	266
	Chapter 9 Quick Reference. . . . .	268
<b>10</b>	<b>Managing Security. . . . .</b>	<b>271</b>
	Using Report Server Security . . . . .	271
	Adding Role Assignments . . . . .	272
	Applying Item Security . . . . .	277
	Applying System Security. . . . .	280
	Applying Data Security . . . . .	285
	Using Roles and Parameters to Restrict Data . . . . .	285
	Restricting the Source Query by User. . . . .	288
	Filtering the Report Data by User . . . . .	293
	Chapter 10 Quick Reference . . . . .	296

<b>11</b>	<b>Managing Server Components</b> .....	<b>299</b>
	Configuring Reporting Services .....	299
	Editing the rsreportserver.config File .....	300
	Changing Encrypted Configuration Information	
	Using the <i>rsconfig</i> Utility .....	302
	Configuring Tracing on the Report Server .....	305
	Managing the Report Server .....	307
	How to Monitor Performance .....	308
	Managing Execution Logging .....	308
	Initializing an Execution Log Database .....	309
	Using an Execution Log Report .....	312
	Adding Current Data to the Execution Log .....	315
	Applying Time-outs to Source Queries .....	317
	Applying Time-outs to Report Execution .....	318
	Canceling Jobs .....	320
	Disabling a Shared Data Source .....	321
	Administering Reporting Services Databases .....	324
	Monitoring Database Storage Consumption .....	324
	Implementing a Backup and Restore Strategy .....	326
	Chapter 11 Quick Reference .....	328

## Part IV Delivering Reports

<b>12</b>	<b>Accessing Reports</b> .....	<b>333</b>
	Finding and Viewing Reports .....	333
	Navigating the Folder Hierarchy .....	334
	Refreshing Reports .....	336
	Searching for Reports .....	337
	Using the HTML Viewer .....	339
	Using My Reports .....	342
	Saving Reports for Future Reference .....	346
	Creating a Report History Snapshot .....	347
	Saving Reports to Local Files .....	349
	Printing Reports .....	351
	Chapter 12 Quick Reference .....	353

<b>13</b>	<b>Rendering Reports . . . . .</b>	<b>355</b>
	Comparing Rendering Formats . . . . .	355
	Rendering for Online Viewing . . . . .	356
	Rendering as MHTML . . . . .	356
	Rendering for Document Management . . . . .	358
	Rendering as a TIFF File . . . . .	358
	Rendering as a PDF File . . . . .	362
	Rendering for Data Exchange . . . . .	367
	Rendering as an Excel File . . . . .	367
	Rendering a Report as a CSV File . . . . .	371
	Rendering a Report as an XML File . . . . .	373
	Chapter 13 Quick Reference . . . . .	374
<b>14</b>	<b>Managing Subscriptions . . . . .</b>	<b>375</b>
	Creating a Standard Subscription . . . . .	375
	Delivering a Report by E-Mail . . . . .	376
	Delivering a Report to a File Share . . . . .	383
	Creating a Data-Driven Subscription . . . . .	389
	Creating a Subscription Delivery Table . . . . .	389
	Creating a Data-Driven Subscription . . . . .	390
	Managing Subscriptions . . . . .	398
	Using the My Subscriptions Page . . . . .	399
	Deleting Subscriptions . . . . .	403
	Chapter 14 Quick Reference . . . . .	404
<b>15</b>	<b>Creating Reports with Report Builder . . . . .</b>	<b>405</b>
	Building Basic Reports . . . . .	405
	Getting Started with Report Builder . . . . .	405
	Building a Report . . . . .	408
	Building a Matrix Report . . . . .	412
	Using Clickthrough . . . . .	415
	Building a Chart Report . . . . .	417
	Enhancing Reports . . . . .	420
	Formatting a Report . . . . .	421

Filtering a Report . . . . .	423
Adding Expressions . . . . .	426
Chapter 15 Quick Reference . . . . .	428

## Part V Programming Reporting Services

<b>16</b>	<b>Report Authoring with Custom Development . . . . .</b>	<b>433</b>
	Using Custom Code . . . . .	433
	Adding Custom Code to a Report . . . . .	434
	Accessing Functions Using the <i>Code</i> Global Member . . . . .	436
	Creating a Custom Class Library . . . . .	438
	Using Functions from a Custom Assembly . . . . .	441
	Creating Custom Data Processing Extensions . . . . .	446
	Assigning a Namespace . . . . .	447
	Creating a Connection Object . . . . .	448
	Creating a Command Object . . . . .	450
	Creating a Data Reader Object . . . . .	451
	Deploying a Custom Data Processing Extension . . . . .	454
	Generating Report Definition Language . . . . .	462
	Creating a Console Application . . . . .	462
	Adding a Data Source Connection . . . . .	464
	Generating a Fields List . . . . .	465
	Generating the RDL . . . . .	466
	Chapter 16 Quick Reference . . . . .	469
<b>17</b>	<b>Programming Report Server Management . . . . .</b>	<b>471</b>
	Understanding Web Services . . . . .	471
	Using the <i>rs</i> Utility . . . . .	472
	Querying Report Server . . . . .	474
	Using a Custom Application to Manage Reporting Services . . . . .	477
	Querying Report Server . . . . .	478
	Managing Reports . . . . .	485
	Using the Reporting Services WMI Provider . . . . .	493
	Querying a Report Server . . . . .	493
	Chapter 17 Quick Reference . . . . .	497

<b>18</b>	<b>Building Custom Reporting Tools</b> .....	<b>499</b>
	Using URLs .....	499
	How to Use URLs to Access Reports .....	500
	Viewing Reports .....	500
	Working with Report Parameters .....	503
	Using URL Access Parameters .....	505
	Using the Web Service .....	510
	Rendering a Report .....	511
	Authenticating Users .....	515
	Using Report Parameters in a Control .....	517
	Enabling Multiselect for Parameters .....	524
	Chapter 18 Quick Reference .....	527
	<b>Glossary</b> .....	<b>529</b>
	<b>Index</b> .....	<b>531</b>

**What do you think of this book?**  
We want to hear from you!

Microsoft is interested in hearing your feedback about this publication so we can continually improve our books and learning resources for you. To participate in a brief online survey, please visit: [www.microsoft.com/learning/booksurvey/](http://www.microsoft.com/learning/booksurvey/)

## Chapter 3

# Building Your First Report

After completing this chapter, you will be able to:

- Use the Report Designer wizards to create a simple tabular report.
- Publish a report solution.
- Use Report Manager to manage report properties.
- Use the HTML Viewer to access and export a report.

In Chapter 1, “Understanding Reporting,” you learned about the three stages of the reporting life cycle: authoring, managing, and accessing reports. In Chapter 2, “Installing Reporting Services,” you learned how to install and configure Reporting Services, so you should be ready to go exploring now. In this chapter, rather than review each component of Reporting Services in detail, you take a tour of it. You visit each stage of the reporting cycle as you build, manage, and review your first report, and you also learn about the key components of Reporting Services.

You start your tour by authoring a simple report using wizards in the Report Designer, which will enable you to set up and design the report. You also use the Report Designer to polish and publish your report. Then, you move on to the management stage and use Report Manager to update the report’s description and execution properties. Finally, you wrap up your tour in the access stage by using Report Manager to explore the report online and to export it as a Microsoft Excel file. When finished, you wind up with a high-level understanding of the various components of Reporting Services and the way they work together to create a powerful reporting platform.

## Authoring a Report

The process of authoring, or building, a report consists of several steps. The first step is to define a Reporting Services *data source*, which packages information about where the data to be used in your report is stored. To create a data source, you need to know which server hosts the data and which database or file stores the data, as well as have the credentials with permission to retrieve that data. Each report that you author must have at least one data source defined. Data sources are covered in more detail in Chapter 4, “Developing Basic Reports.”

The second step in building a report is to create a *dataset* for the report. An important component of the dataset is a query, which requires that you know the language and syntax used to retrieve data. For example, if your report will use data from a Microsoft SQL Server database, you’ll need to be able to create a Transact-SQL query (or know someone who can write it for you!). A dataset also includes a pointer to the data source and other information that’s used

when the query executes. When you use the Report Server Project Wizard, as you will in this chapter, you can define only one dataset, but you'll learn how to work with multiple datasets in a single report in Chapter 7, "Building Advanced Reports."

The third and final step in the construction of your report is the creation of a *report layout*, which is the design template used by Reporting Services to arrange and format the data. The report layout includes the structure, or *data region*, into which data is placed when the report is processed, such as a table or matrix. You can set properties for each section of a data region to define style properties, such as font, color, and format. Additionally, you can set these properties for report items, such as the report title in a textbox or the report background, which gives you enormous flexibility to control the look and feel of your report.

In this chapter, you use the Report Server Project Wizard and the Report Wizard to help you start and build a new report. You'll learn another way to begin a report in Chapter 4. These wizards, which are provided within the Report Designer, are handy tools that walk you through the three main steps of authoring a report.

## Starting a New Report

When you start a new report using the Report Server Project Wizard, you are creating Microsoft Visual Studio containers to hold your report, a project, and a solution. You must name these containers and provide a storage location for them on your computer's hard drive or on a network file share.

In this procedure, you'll create a new report project called Adventure Works and specify a storage location for the project.

### Start the Report Server Project Wizard

1. Start SQL Server Business Intelligence Development Studio.

Notice the title of the application is Microsoft Visual Studio. SQL Server Business Intelligence Development Studio is Visual Studio. You are simply using a shortcut from the Microsoft SQL Server 2005 program group to access Visual Studio.

2. On the File menu, point to New, and then click Project.

The New Project dialog box appears. Templates are organized by Project Type, represented as folders in this dialog box.



**Note** If this is your first time working with Visual Studio, you might not be familiar with the way that items are organized in this environment. A report is placed inside of a project, which you can think of as a folder that organizes many reports into a collection. Because you're using the Report Server Project Wizard, you can work with only one project right now. However, you'll be adding reports to this project as you progress through this book. When you publish all reports in a project, they are automatically organized into the same folder on the Report Server.

3. Click Report Server Project Wizard.
4. Type a name for the project: **Adventure Works**.

Notice that as you type, the text in the Solution Name box of the New Project dialog box changes to match the project name. You have the option of changing the solution name later if you change your mind.



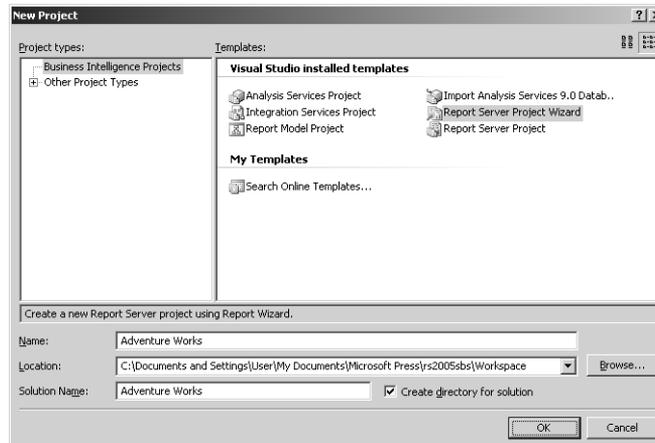
**Note** In the same way that a project is a container for a report, a solution is a container for one or more projects. Visual Studio lets you work with only one solution at a time, but you can access any project within the open solution.

5. Type a location for the project: **C:\Documents and Settings\\My Documents\Microsoft Press\rs2005sbs\Workspace**.



**Important** Be sure to replace the placeholder <username> with the name you use to log into your computer.

The New Project dialog box looks like this:



6. Click OK to continue.

The Welcome page of the Report Wizard is displayed. Note that this wizard is different from the Report Server Project Wizard. The Report Server Project Wizard lets you create a solution, a project, and a report in one step, and then launches the Report Wizard. You can use the Report Wizard any time you want to add a report to an existing project using a wizard interface. (This is explained in more detail in Chapter 4.)

If you want to bypass this page of the Report Wizard in the future, you can select the check box here to disable the Welcome Page.

7. Click Next.

## Connecting to a Data Source

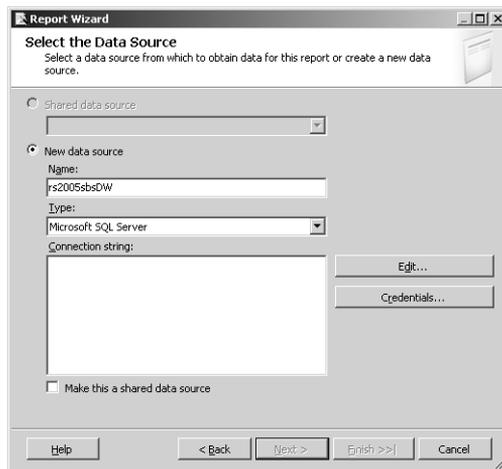
The next step of the Report Wizard allows you to specify connection information. Here you identify the server and database hosting the data. If necessary, you can also supply credentials information to be used by Reporting Services for authentication when querying the database.

In this procedure, you'll create a data source that defines a connection to the rs2005sbsDW database in your SQL Server using Microsoft Windows authentication.

### Select a data source

1. Type a name for the data source: **rs2005sbsDW**.
2. Select Microsoft SQL Server in the Type drop-down list, if necessary.

The Select The Data Source page of the Report Wizard now looks like this:



You can choose from seven connection types: Microsoft SQL Server, OLE DB, Microsoft SQL Server Analysis Services, Oracle, Open Database Connectivity (ODBC), XML, or Report Server Model. Once you select a connection type, you can type a connection string manually, or you can click Edit to use the Connection Properties dialog box to generate the connection string automatically. By default, the data source you create here will be available only to the current report, which allows you to manage its usage separately from other reports. You can select the Make This A Shared Data Source check box at the bottom of the dialog box to allow this data source to be shared with other reports, which simplifies the management of data sources in general.

3. Click Edit.

The Connection Properties dialog box is displayed. Because you selected Microsoft SQL Server as the connection type on the Select The Data Source page of the Report Wizard, the data source defaults to Microsoft SQL Server (SqlClient).

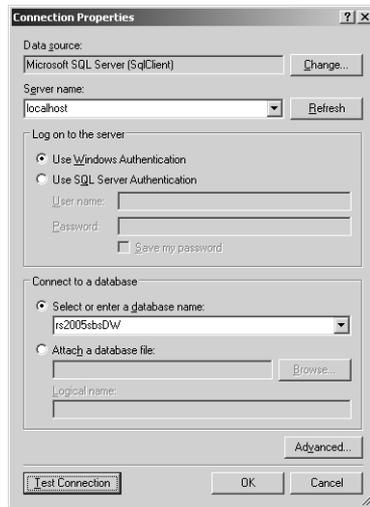
4. Type **localhost** or the name of the SQL Server instance that you are using in the Server Name box.



**Note** This book assumes that you have all Reporting Services components and SQL Server installed on one computer. In a real-world environment, there are advantages to using localhost instead of a SQL Server instance since you can easily reuse the data source when moving from development to production if everything is similarly contained in a single machine. However, if you maintain separate instances of SQL Server, this strategy will not be useful.

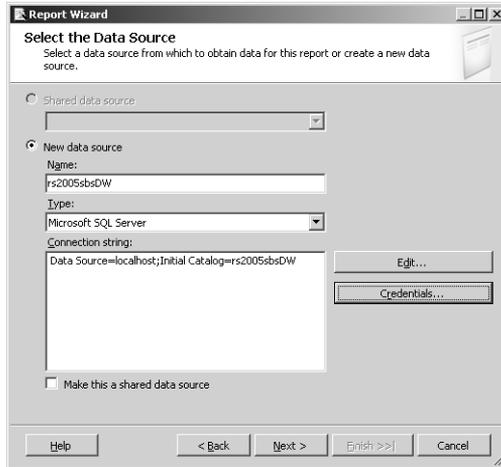
5. Click Use Windows Authentication.
6. Select or enter rs2005sbsDW in the Select Or Enter A Database Name drop-down list.

The Connection Properties dialog box looks like this:



7. Click Test Connection to make sure you can connect to the rs2005sbsDW database, and then click OK to close the confirmation dialog box.
8. Click OK to close the Connection Properties dialog box.

The current page of the Report Wizard looks like this:

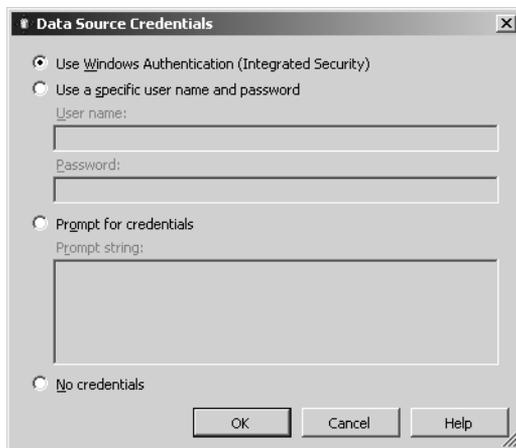


Notice the connection string generated for your SQL Server data source: `Data Source=localhost;Initial Catalog=rs2005sbsDW`. Remember that you can also type in a connection string for a data source, but it must use the syntax of the database to which Reporting Services will connect.

Now you have defined a data source that contains the information that Reporting Services needs to connect to the database it will use to retrieve data for your report. The data source includes a connection type, a connection string, and the credentials that will be used when the database is queried.

9. Click Credentials.

The Data Source Credentials dialog box is displayed:



You can click the applicable option to override the authentication method you specified in the Connection Properties dialog box. Authentication methods include Windows Authentication, a single user's credentials, a prompt at run time for the user's credentials, or no credentials at all. (You'll learn more about credential management in Chapter 9, "Managing Content.")

10. Click Cancel.
11. Click Next.

## Getting Data for the Report

In this next step of the Report Wizard, you design the query that will be displayed in the report. The query must conform to the relational database syntax you defined in the data source. You must get this query correct, or you won't be able to continue with this wizard.

In this procedure, you'll paste in a query that summarizes the Adventure Works sales for each employee by year, sales territory group, and sales territory country.

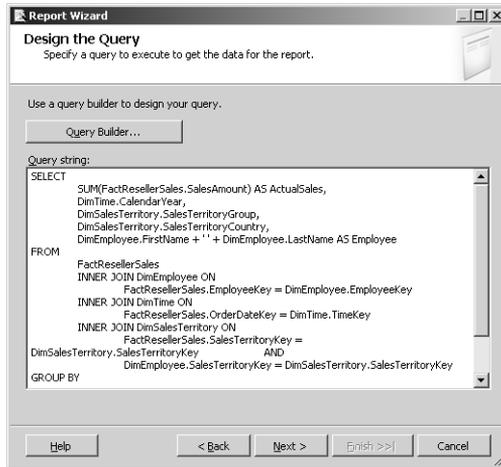
### Design a query

1. Start Microsoft Notepad.
2. On the File menu, click Open.
3. Open the Sales Summary.txt file in the C:\Documents and Settings\\My Documents\Microsoft Press\rs2005sbs\chap03 folder.
4. Copy the following query entirely:

```
SELECT
    SUM(FactResellerSales.SalesAmount) AS ActualSales,
    DimTime.CalendarYear,
    DimSalesTerritory.SalesTerritoryGroup,
    DimSalesTerritory.SalesTerritoryCountry,
    DimEmployee.FirstName + ' ' + DimEmployee.LastName AS Employee
FROM
    FactResellerSales
    INNER JOIN DimEmployee ON
        FactResellerSales.EmployeeKey = DimEmployee.EmployeeKey
    INNER JOIN DimTime ON
        FactResellerSales.OrderDateKey = DimTime.TimeKey
    INNER JOIN DimSalesTerritory ON
        FactResellerSales.SalesTerritoryKey = DimSalesTerritory.SalesTerritoryKey
AND
    DimEmployee.SalesTerritoryKey = DimSalesTerritory.SalesTerritoryKey
GROUP BY
    DimTime.CalendarYear,
    DimSalesTerritory.SalesTerritoryGroup,
    DimSalesTerritory.SalesTerritoryCountry,
    DimEmployee.FirstName + ' ' + DimEmployee.LastName
```

- Paste the copied query into the Query String box on the Design The Query page of the Report Wizard.

Now the current page of the Report Wizard looks like this:



**Note** Instead of typing or pasting in a query string, you can also click Query Builder to open the Query Builder to create a SELECT statement using a graphical interface. If you've used the Query Builder in SQL Server 2000 Enterprise Manager or the Query Designer in Microsoft SQL Server Management Studio for SQL Server 2005, you'll be in familiar territory. If you haven't used either of these applications, you can learn more about the Query Builder in Chapter 7.

This query will be used to retrieve data from the defined data source for use in your report. The format of the query depends on the data source you selected. For this procedure, because you selected a Microsoft SQL Server data source, you use Transact-SQL to build your query.

The query that you create is just one of several items stored in a dataset. As you learned earlier in this chapter, a dataset is a container for a pointer to the data source and the query you design. (You'll learn more about designing queries to create a dataset in Chapter 4.) In general, you can type a query directly into the Query String box, use the Query Builder button to open the Query Builder, or paste in a query that has been tested first in Query Analyzer or saved in a file.

- Click Next.

When you click Next, the query is validated against the data source. If there is any problem, such as an invalid column name, an error message will be displayed in the bottom section of the Design the Query page. You will not be able to continue past this page of the wizard until you correct the error.

## Structuring Data in the Report

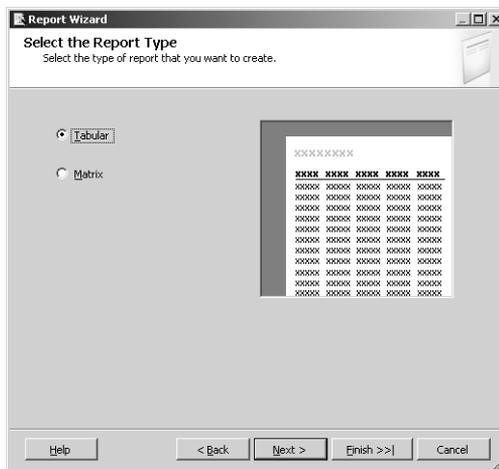
After defining the data source and the dataset, you're ready to move on to design considerations. Now you select a report type that defines how the data is structured in the report. In the wizard, you can choose between a tabular or a matrix report type only. You also arrange the data within the selected structure and finish the design by applying a style template. These steps make it easy to create a nice-looking report without a lot of effort, but you'll still have an opportunity to make adjustments to the layout and style before you publish the report.

In this procedure, you'll select the tabular report type for your report.

### Choose a report type

Click Tabular.

1. The Report Wizard page looks like this:



Notice that the Finish button is now enabled. You have, at this point, created a basic report that is ready for publishing. Now you can decide how you want to proceed. You could click Finish and make any desired modifications using the Report Designer. However, to find out everything you can do with this tool, you'll continue designing your report with the wizard.

The *report type* defines the structure, or data region, of the data that is returned by the query you design. The Report Wizard allows you to present this information as either a table or a matrix. (You do have more options, but the Report Wizard limits you to these two data regions, referred to as report types in the wizard.) The main difference between these two types of data regions is the number of columns. A table has a fixed number of columns, whereas a matrix has a variable number of columns that is determined by the query results. You'll find more information about these and other data regions in Chapter 6, "Organizing Data in Reports."

2. Click Next.

## Placing Data in the Report Structure

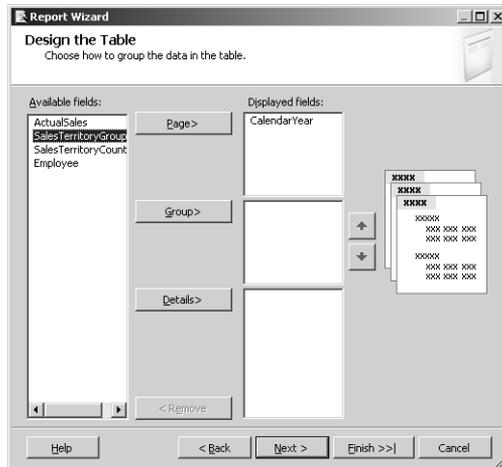
In this step of the Report Wizard, you arrange the data within the report type that you selected. This process determines how data is grouped and the order in which it is displayed. You can think of grouped data as the vertical sections of a report (although groups can be displayed next to each other), and the data order as the sequence in which the data is presented in the same row—vertically for groups and horizontally for columns.

In this procedure, you'll arrange the five fields produced by the query to build a report that displays the ActualSales amount for each Employee as detail rows, in groups by SalesTerritoryGroup and SalesTerritoryCountry, with a page break for each CalendarYear.

### Arrange data on the report

1. Click CalendarYear, and then click Page to place the *CalendarYear* field in the Page section of the Displayed Fields list.

The Report Wizard looks like this:



When you place a field in a display section, the corresponding section in the sample table is highlighted to show you where the field will appear in your report. Each column of data returned by the query is linked, or mapped, to a report field that is displayed in the Available Fields list until assigned to a section of the data region. When assigned to a data region's section, the report fields appear in the Displayed Fields list. The section to which you assign the field determines whether you see detail rows, aggregated rows, or both types of rows in the report. Assignment of fields to data regions and the use of aggregations are discussed more thoroughly in Chapter 4 and Chapter 5, “Working with Expressions.”

Because you are using a tabular report type, you can assign fields to the page, group, or details section of the report. For example, a field assigned to the page section will not be included in the table in the report, but will instead be placed in a textbox positioned at

the top-left corner of the report. Each distinct value for a page field creates a page break in the report. Fields added to the group section of the report are used to break the table into separate sections, which can include subtotals by section.

The table rows are built from the values for the fields assigned to the details section of the report. There is one table row for each row returned by the defined query. A numeric field in the details section is summed up into the subtotals if you select the option to include subtotals. You can decide later whether you want to hide the details in the report if you prefer to display just summary information.



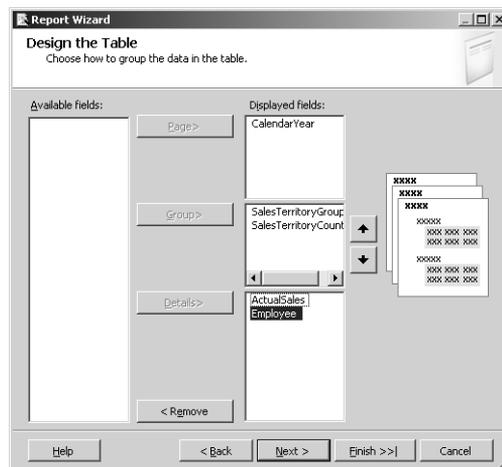
**Note** If you choose a matrix report type, the field assignment is slightly different. The wizard still includes the page and details sections, but the group section is replaced by sections for columns and rows. You'll need to assign at least one field to each of these sections to build a matrix, which is also known as a crosstab. Matrix reports are covered in Chapter 6.

2. Click SalesTerritoryGroup, and then click Group to place the field in the Group section. Repeat for SalesTerritoryCountry. Alternatively, you can use the drag-and-drop feature to move a field from the list of available fields to the appropriate section.

The order in which you add fields to each section determines the sequence in which the data is displayed in the report. The fields in the Group section will be displayed in order from top to bottom or from left to right, depending on the style template that you select in a later step in the wizard. Fields in the Details section will be displayed in columns in order from left to right.

3. Drag ActualSales to the Details section, which is the bottom section of the Displayed Fields list, and then drag Employee to the same section.

The Design The Table page of the Report Wizard looks like this:



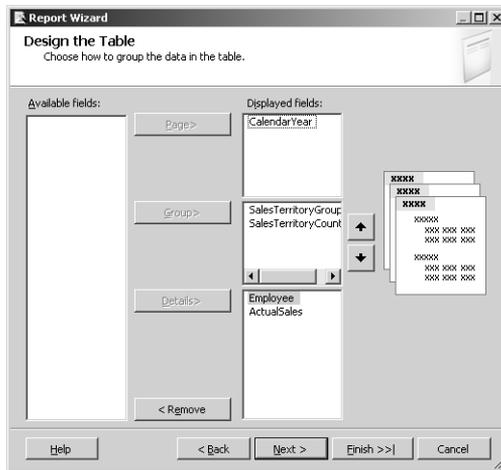


**Tip** Even after the fields are placed into the Displayed Fields list, you can still rearrange them to affect their order in the respective sections.

If you had selected the Matrix option on the previous page, Select the Report Type, you would see the Design the Matrix page here instead of the Design The Table page.

4. Click Employee, and then click the Up button to move Employee above ActualSales. You can also drag and drop to rearrange fields within a data region.

Now the page looks like this:



5. Click Next.

## Applying a Style Template

In this step of the Report Wizard, you make your last design decision for your report. When you apply a style template, you define the look and feel of the report.

In this procedure, you'll define a block layout for the table, which includes group subtotals, and select the Bold style template.

### Select a report style

1. Select Block.



**Note** This page of the wizard will not be displayed if you selected a matrix report type.

Notice that the sample layout changes to give you a preview of the block layout. Here, you are choosing a layout style for the tabular report that controls the placement of detail rows relative to aggregated rows on the report. You can also choose to include subtotals or enable drilldown. The difference between the layout options will become clearer when you can actually view your report. At that time, you'll see examples of the other layout styles for comparison.

On this page of the Report Wizard, you must select either a stepped or block report layout style. In a stepped layout, each distinct group value is arranged on its own row and in its own column. The drilldown option (which displays hidden detail data) is available only for stepped layout. By contrast, the block layout is more compact—you place data in each column and start a new row only for additional detail rows within the same group or for a new group value.

2. Select the Include Subtotals check box to include subtotals in your report.
3. Click Next.
4. Click each table style to preview the style in the Choose The Table Style page.

The assignment of a style template to a tabular or matrix report sets the overall color theme and font usage for the report.

5. Click Bold to set the style for your report.
6. Click Next.

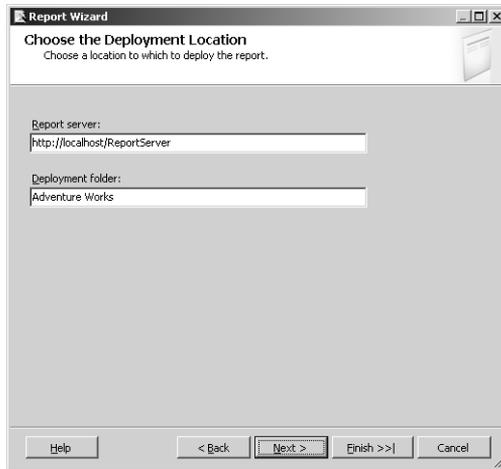
## Finishing the Report Wizard

You're almost finished building your report by using the wizard. You've defined where to find the data, what data to include in the report, and how the data will look in the report. All that remains is to specify a location on the Report Server that will be the ultimate destination of your report when it is published and to give your report a name. You also have an opportunity to review a summary of the selections that you made throughout the wizard and to proceed to a preview of your report.

In this procedure, you'll provide the URL for your local Report Server, specify the Adventure Works folder for deployment, and name your report. When you're finished with the wizard, you will be able to preview the report.

## Set report and project properties

1. Confirm that the current page of the Report Wizard looks like this:



The deployment location is a URL for the Report Server that will host the report as well as the folder into which the report will be placed on the server. This step of the Report Wizard simply sets the project properties and does not actually *deploy*, or publish, the report to the Report Server. Notice that the default folder has the same name as your project. If this folder does not already exist, the folder will be created when you deploy the report. Otherwise, the report will be deployed to the existing folder.



**Important** The server name will not be validated in this step. If you enter an incorrect server name, deployment fails. You can update the project properties in the Solution Explorer if this occurs. You'll learn how to do this in Chapter 9.

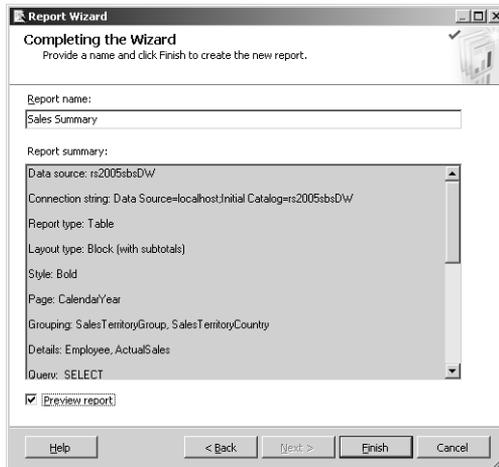
2. Click Next.
3. Type **Sales Summary** in the Report Name box.



**Important** If you use the name of a report that has already been deployed to the Report Server, you will overwrite the published report during deployment of the report in Visual Studio—but only if you deploy the report to the same folder as the existing folder. There will be no warning message during deployment that you are about to overwrite an existing report, so be careful when assigning names and folder locations to reports.

4. Scroll through the information in the Report Summary box to review your selections.
5. Select the Preview Report check box to preview your report.

The final page of the Report Wizard now looks like this:



At the completion of the Report Wizard, you can immediately preview the report. Sometimes you might prefer to make some additional changes to the report before you display the preview. If you do not select the Preview Report check box, the Report Designer displays your report in layout mode. If the report is in layout mode, you can easily switch to preview mode by clicking the Preview tab in the Report Designer.



**Tip** An important reason to preview the report is to check the size of the columns. The columns will all default to the same size and will probably not be wide enough for data. Also, you might need to adjust formatting for numeric values. You can fix these problems using the layout mode, and then review the fixes using the preview mode.

6. Click Finish.

## Checking the Report Layout

When you finish designing your report, you need to preview it to check the layout and make some corrections to improve its appearance. You also need to make sure you get the data you expected and that the data is formatted correctly. When you finish making any necessary corrections, you wrap up this authoring stage of the reporting life cycle by publishing the report to the Report Server, where it can be accessed by the users.

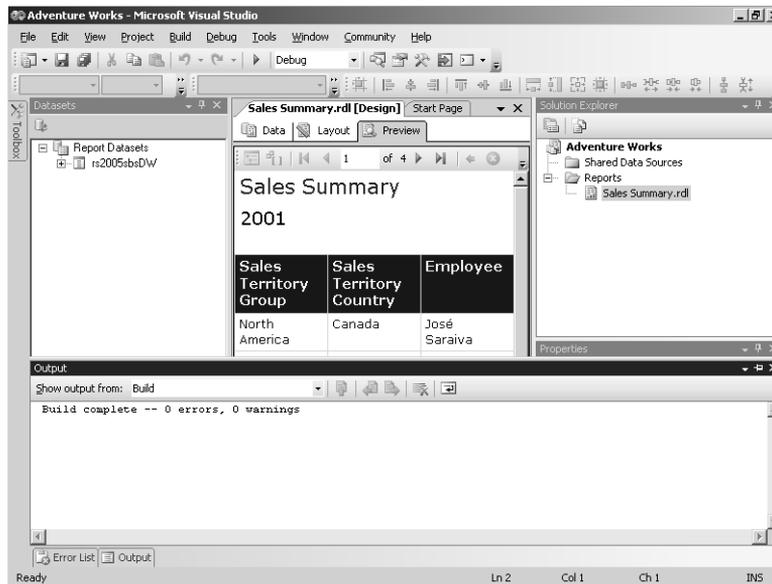
In this procedure, you'll explore your report in preview mode so you can see the results of the selections you made in the Report Wizard.

## Preview a report

1. If you selected the check box to preview the report on the last page of the Report Wizard, you will see your report in preview mode. If not, just click the Preview tab in the Report Designer.

When you display a report in preview mode, the query is executed and the query results are stored in a dataset and assigned to fields. The report is then rendered according to the assignment of the fields to data regions that you specified as well as the layout and style that you selected. At this point, the report format and the report data are merged to produce the preview that you can see in the Report Designer. In preview mode, you can interact with the report just as if it were published to the server so you can test the results before making it available on the Report Server.

Your screen now looks like this:



Take a moment to review the layout of the data in the report. The *CalendarYear* field is displayed in the top-left corner. Just below the *CalendarYear*, you can see the column names in the table header with the details displayed in rows by groups. The first group is *SalesTerritoryGroup*, and the second group is *SalesTerritoryCountry*. Because these fields are defined as groups, their values are displayed only in the first row of details within that group. In the example, you can see actual sales amounts for employees in Canada which is grouped in North America. The row beneath these details is the group subtotal for Canada.

Once you've closed the wizard, you can't return to it to make layout changes. Instead, you must create a new report, which you may find easier to do than making changes to the layout directly in the Report Designer. If you were to use the wizard to create a

stepped report with subtotals (on the Choose The Table Layout page) using the same query, then the report would look like this:

Sales Summary (Stepped)			
2001			
Sales Territory Group	Sales Territory Country	Employee	Actual Sales
North America			9665054.3 4490999
	Canada		1817823.6 86814
		José Saraiva	1248852.64 571
		Garrett Vargas	568971.041 104
	United States		7847230.6 5809599
		Shu Ito	1068441.30 7732

Notice that North America is now in its own row, and its subtotal is included on the same row. Then Canada appears by itself on the next row, followed by the detail rows. This report style is longer than the block layout.

If you had instead used the wizard to create a report with a stepped layout with drill-down selected, the report—with North America and Canada expanded to show the detail rows—would look like this:

Sales Summary (Stepped - Drilldown)			
2001			
Sales Territory Group	Sales Territory Country	Employee	Actual Sales
▣ North America			9665054.3 4490999
	▣ Canada		1817823.6 86814
		José Saraiva	1248852.64 571
		Garrett Vargas	568971.041 104
	▣ United States		7847230.6 5809599

With drilldown, the user can click the plus sign to expand the report and click the minus sign to collapse the report at will. By default, the report is completely collapsed when it is opened.

2. Scroll down to the bottom of the first page. Notice the group subtotal for United States. Beneath this group subtotal, you can see the group subtotal for SalesTerritoryGroup, which is the subtotal for Canada and the United States.
3. Click the Next Page button on the Preview toolbar to view the page for 2002.

Since you assigned CalendarYear to the Page data region of the report, each page contains data for a separate year. You can use the page buttons on the Preview toolbar to navigate between pages, or you can type in the page number that you want to view as shown here:



4. Scroll to the bottom of the second page to see the layout when there are multiple values for SalesTerritoryGroup, then scroll back to the top of the page.
5. If you can't see the full width of the report, scroll horizontally to see the Actual Sales column.

The top of your report looks like this:

2002

Sales Territory Group	Sales Territory Country	Employee	Actual Sales
Europe	France	Ranjit Varkey Chudukatil	1028496.74 5306
	<b>Total</b>		<b>1028496.7 45306</b>
	United Kingdom	José Saraiva	925011.839 071001
	<b>Total</b>		<b>925011.83 9071001</b>
<b>Total</b>			<b>1953508.5 84377</b>
North America	Canada	Jae Pak	3046514.64 750499
		José	1283648.26

Notice that the text is wrapping in several columns: SalesTerritoryCountry, Employee, and ActualSales. If you are trying to fit many columns onto a printed page, you may need to use text wrapping to fit a table within the available horizontal space. However, for online viewing, you generally have more room available and you can minimize vertical scrolling for the user if you widen each column to accommodate the maximum expected string length. In addition, the format of the ActualSales values can be improved.

## Correcting Report Layout Issues

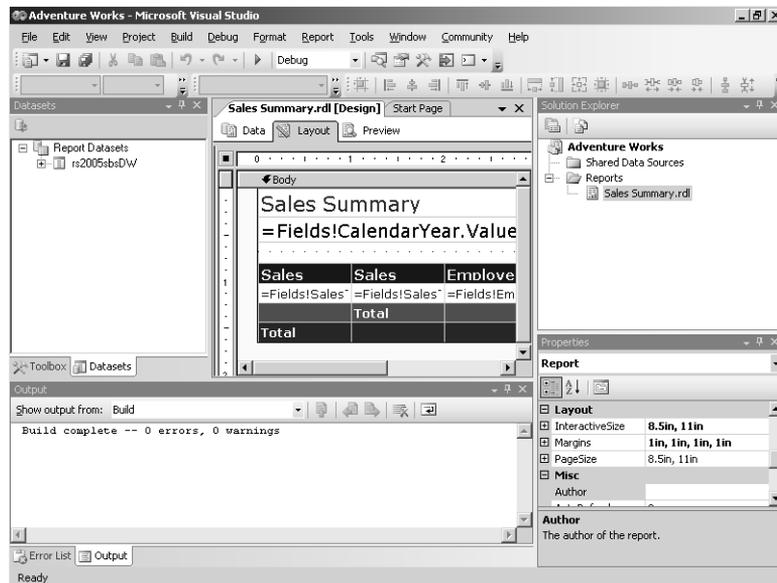
Preview mode in Report Designer allows you to see where you need to clean up your report, but you need to switch to layout mode in order to fix the problems. In layout mode, you can adjust every property of every element in the report, giving you complete control over everything that you can see. You can easily switch back and forth to test the results of your changes to the report in layout mode.

In this procedure, you'll use layout mode to improve the appearance of the report and check the results by again previewing the report.

### Fix column sizes and data formatting in the report layout

1. Click the Layout tab.

The report is displayed in layout mode:



Notice the rulers that appear both above and to the left of the report layout. You can use these rulers as a visual guide when making changes to the report, such as when resizing report items or positioning new report items.

2. Click any cell in the table to display the column and row handles.

The table now looks like this:

	Sales	Sales	Employee	Actual
	=Fields!Sales	=Fields!Sales	=Fields!Emplo	=Fields!Actua
		Total		=Sum(Fields
	Total			=Sum(Fields

The column handles are the shaded cells that appear above the table, and the row handles are the shaded cells with icons that are shown to the left of the table. You use these handles to modify the table properties.

3. Position your cursor between the second and third column handles, and then click and drag to widen the second column, Sales Territory Country, to approximately 1.5 inches.

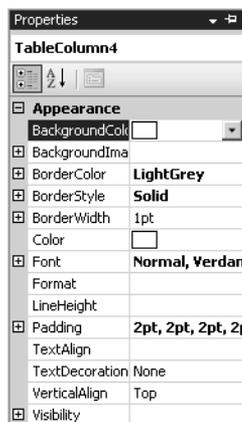
Now the table looks like this:

Sales	Sales Territory	Employee	Actual
=Fields!Sales	=Fields!SalesTerritory	=Fields!Emplo	=Fields!Actua
Total			=Sum(Fields
Total			=Sum(Field

You can drag the column only when the cursor is properly positioned and the cursor changes to a double-headed arrow. Making the column bigger eliminates the text wrapping problem, but it also requires you to have some idea of the maximum length of the data that could appear in that column.

4. Position the cursor between the third and fourth column handles, and then click and drag to widen the Employee column to approximately 1.75 inches.
5. Right-click the fourth column handle, above Actual Sales, to select the entire column, and then click Properties.

The Properties window for the selected column, named TableColumn4, is displayed in Visual Studio:



6. Scroll through the Properties window, if necessary, to find the *Format* property, and then type **C0** in the *Format* property field to format the field as currency with no decimal places.



**Note** Use .NET formatting strings to control the data display. You can find more information about formatting numeric strings online at <http://msdn.microsoft.com/library/default.asp?url=/library/en-us/cpguide/html/cpconstandardnumericformatstrings.asp>. Information about formatting date strings is located at <http://msdn.microsoft.com/library/default.asp?url=/library/en-us/cpguide/html/cpconDateTimeFormatStrings.asp>.

Scroll to the bottom of the Properties window to find the *Width* property, and then type **1.25in** to resize this column.

You can provide a specific measurement for the *Width* property when you require more granular control over the size of a column.

Click the Preview tab to preview the modified report.

The newly formatted report is displayed:

## Sales Summary

2001

Sales Territory Group	Sales Territory Country	Employee	Actual Sales
North America	Canada	José Saraiva	\$1,248,853
		Garrett Vargas	\$568,971
	<b>Total</b>		<b>\$1,817,824</b>
	United States	Shu Ito	\$1,068,441
		Linda Mitchell	\$1,374,860
		Michael Blythe	\$903,230

The text wrapping problem is solved, and the format of the Actual Sales column is improved. Your first report is ready for publishing!

## Publishing a Report

Now you'll wrap up the authoring stage of the reporting life cycle by publishing the report to the Report Server, where it can be accessed by the user community.

In this procedure, you'll deploy a report solution that enables you to publish your report to your local Report Server.

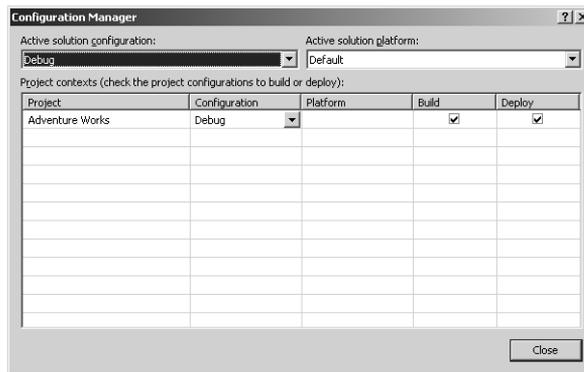
## Deploy a report solution

1. On the File menu, click Save All.
2. In the Solution Explorer window, right-click the Adventure Works project at the top of the tree, and then click Properties.

The Adventure Works Property Pages dialog box is displayed. You can see the Target ReportFolder and TargetServerURL properties for which values were provided on the Choose The Deployment Location page of the Report Wizard.

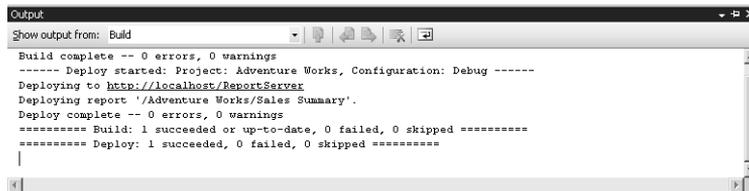
3. Click Configuration Manager.
4. Verify that the Deploy check box is selected.

The Configuration Manager dialog box looks like this:



5. Click Close, and then click OK.
6. On the Build menu, click Deploy Adventure Works.

The Output window displays the progress of deployment. Deployment of the solution is complete when you see messages in the Output window announcing that the build and deploy operations succeeded:



Instead of deploying an entire solution, you also have the option to deploy a single report or multiple reports within a project or solution. A report is published by using one of these deployment options to transfer it from Visual Studio to the Report Server. You can alternatively publish a report programmatically using a script or manually using the Web application called Report Manager, which you'll learn about in Chapter 9.

## Managing a Report

You can manage published reports by using Report Manager, which is supplied by Reporting Services. Management of reports includes such activities as setting report properties and execution properties, managing content in folders, and applying security on the Report Server to control how users access and interact with reports. You perform only a few management tasks in this chapter. (You'll learn about all the management tasks in Part III, "Managing the Report Server.")

## Reviewing Report Properties

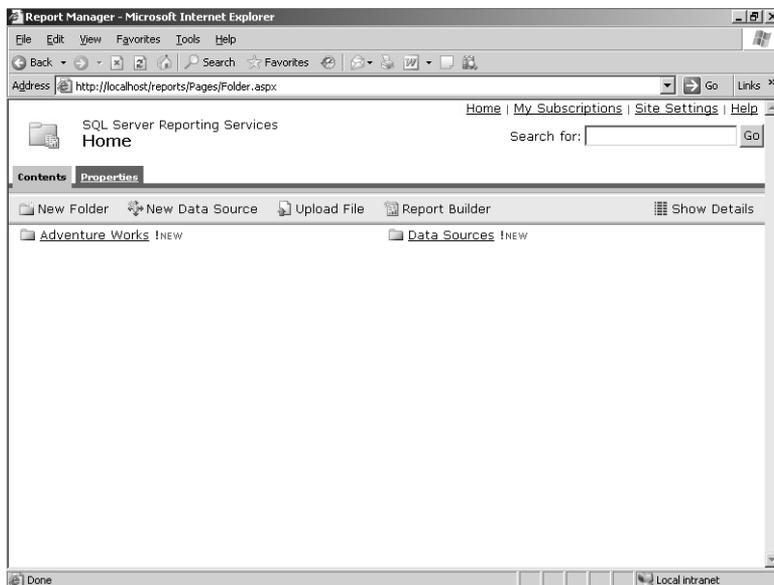
Each report has a set of properties pages that you must manage. You need to know how to use the Report Manager to find these properties and to review the types of properties you can manage.

In this procedure, you'll navigate from the Home page of Report Manager to the Properties page of your report.

### Open the report's Properties page

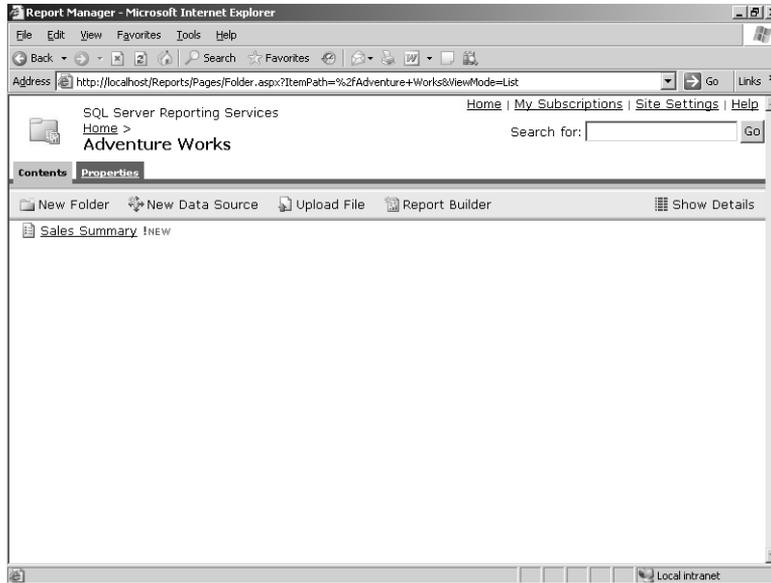
1. Open Internet Explorer.
2. Type the URL *http://localhost/Reports* to open the Report Manager.

The Home page of Report Manager is displayed:



3. Click the Adventure Works folder link.

The folder contents are displayed:



Notice that this page has a Properties tab in addition to the Contents tab. (You'll learn more about managing folder properties in Chapter 9.) Currently, the Adventure Works folder contains only one report, the Sales Summary report that you just published.

4. Click the Sales Summary link.

Reporting Services generates and displays the Sales Summary report:

Sales Territory Group	Sales Territory Country	Employee	Actual Sales
North America	Canada	José Saraiva	\$1,248,853
		Garrett Vargas	\$568,971
	<b>Total</b>		<b>\$1,817,824</b>
	United States	Shu Ito	\$1,068,441
		Linda Mitchell	\$1,374,860
		Michael Blythe	\$903,230
		Fernando Caro	\$1,499,400

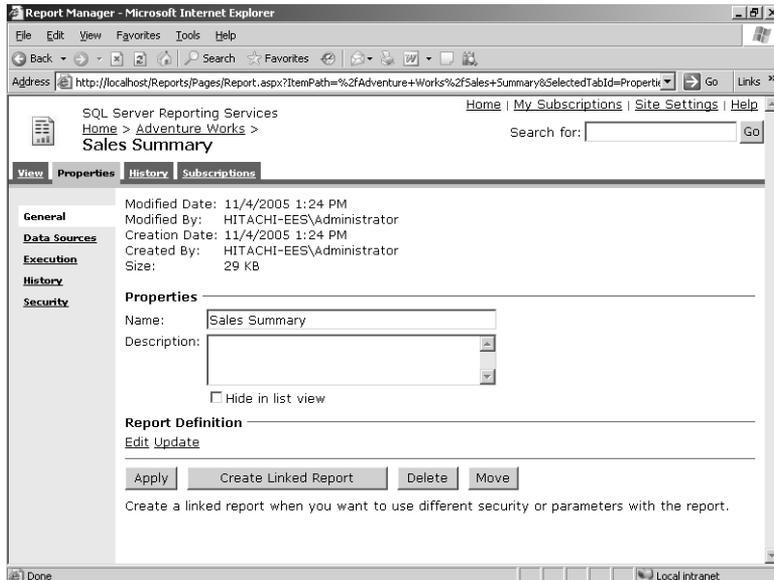
The View tab is displayed by default when you open a report. Three other tabs are available for this report: Properties, History, and Subscriptions. In this section, you review the Properties page. Later, in Chapter 7, you'll learn more about the other tabs.



**Tip** You don't have to wait for the report to be displayed before clicking another tab.

5. Click the Properties tab.

The Properties page for the Sales Summary report is displayed:



On this page, you can see the author and also the date the report was created. The modification author and date of modification match creation information until the report is subsequently modified. Notice that you can change the name of the report on this page and add a description. The other tasks that you can perform on this page are covered later in Chapter 9.

Notice the links in the left frame of the browser window. The many types of report properties are logically organized into separate pages, where you can apply changes to current settings. Properties determine, for example, how the report appears in Report Manager, how users can interact with the report, and how the Report Server connects to the data sources. You'll review report properties in greater detail in Chapter 9.

## Changing Report Properties

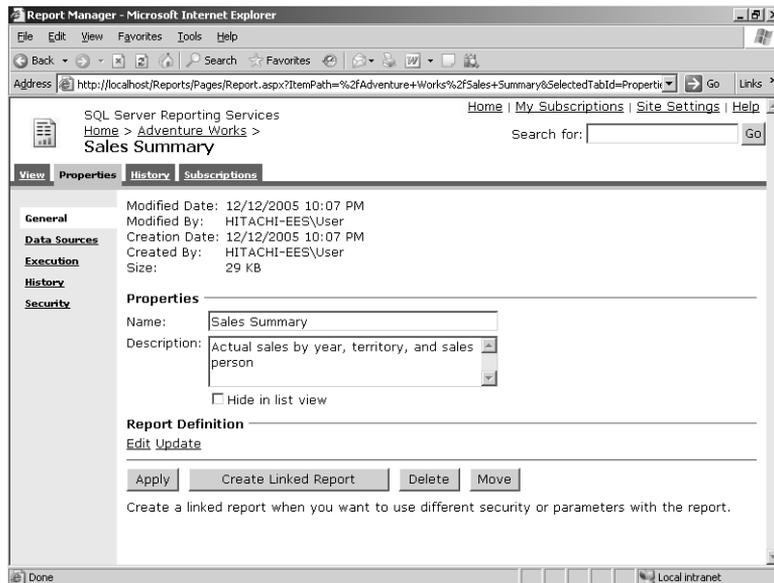
Often, you will want to add a description so a user knows what your report contains before opening it. This property is accessible on the main properties page of the report.

In this procedure, you'll add a description and observe how a description is displayed on the Contents page of a folder.

### Add a description

1. In the Description box, type **Actual sales by year, territory, and salesperson.**

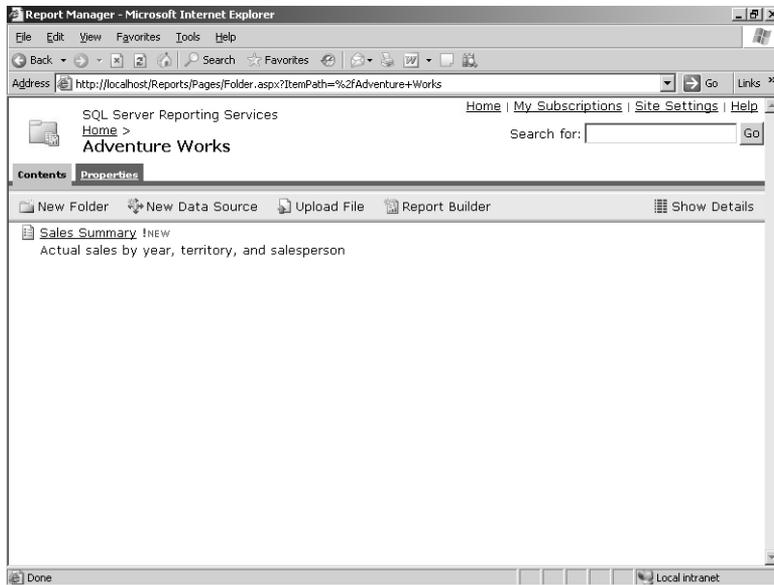
Your screen looks like this:



This report description is displayed on the Contents page and, importantly, is visible only to users who have been granted permission to view the report.

2. Click Apply.  
Clicking Apply doesn't appear to change anything. However, the report description is now visible on the Contents page of the Adventure Works folder.
3. Click the Adventure Works folder link at the top-left corner of the browser window.

Your screen looks like this:



Notice how the report description is displayed below the report name.

## Reviewing Execution Properties

Execution properties are a subset of the report properties maintained for each report. When you understand the implications of the execution property settings, you can choose the most appropriate property setting for your reporting environment. Execution properties allow you to manage reports by balancing system resources and performance with the users' information requirements. For example, you set up caching to achieve a reasonable balance when data used in the report is not changing rapidly at the source. To use caching, you first need to change the data sources properties so you can assign logon credentials that will be used to execute the report for the cache. Separate logon credentials are required by Reporting Services to implement report caching in order to make a single report available to many users.

In this procedure, you'll open the Execution Properties page for your report to review the available options.

### Open the report's Execution Properties page

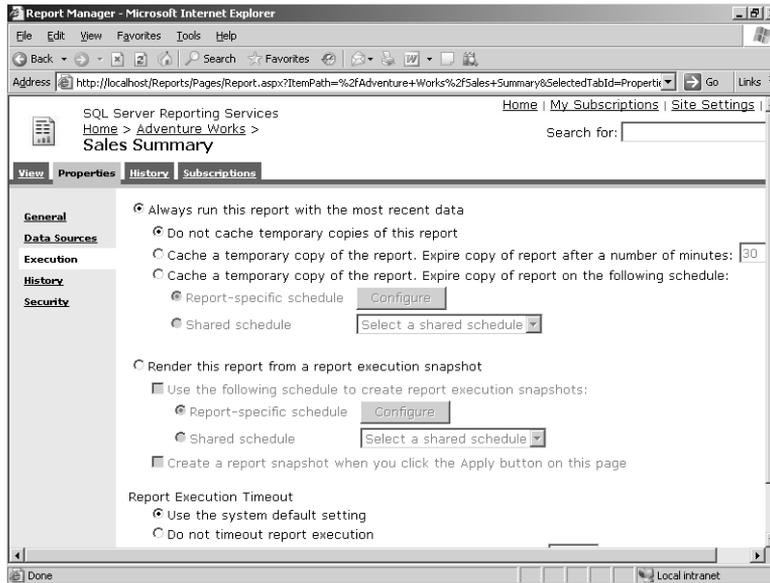
1. Click the Sales Summary link.

Assume for a moment that you've just started a new browser session. Just like the previous time you opened this report, a message is displayed to let you know that several activities are occurring: "Report is being generated". Each time a report executes on demand, as you initiated in this step, a query is executed to retrieve data from the

rs2005sbsDW database. The data is processed with the report, which is then rendered into the HTML display in your browser window.

2. Click the Properties tab.
3. Click the Execution link in the left frame of the page.

The Execution Properties page is displayed:



Notice that you can render the report either on demand or on a scheduled basis. When rendered on demand, the report typically displays the most recent data and may or may not use caching. By default, a report renders on demand without caching. When rendered on a scheduled basis, the report is stored as an execution snapshot, which captures data for the report at a point in time.

Execution properties control when report processing occurs. When a report executes on demand, which occurs every time another user opens the report, the defined query runs and the query results are merged with the report definition to produce the HTML output format. You can alternatively set the execution properties to process the report at a scheduled time so the report is ready when accessed. However, if you choose to do this, let users know that the data in the report is not current. Another option is to cache a report temporarily to make the same output available to several users for the duration of a specified timeframe. The key difference between a snapshot and a cached report is that the snapshot is stored permanently until physically deleted, while the cache is stored temporarily with a predetermined expiration. The options for specifying execution properties are covered in Chapter 9.

## Changing Data Sources Properties

Data sources properties define the connection to be used for query execution. You can change these properties to override the credentials used for authentication when the report executes. Queries that run unattended, such as when a report is cached or scheduled for execution, require stored credentials. These credentials are encrypted when stored in the ReportServer database. (You'll learn more about using secured credentials in Chapter 9.) To set up a cache for your report, you need to change the credentials information in the data sources properties.

### Use secured credentials

1. Click the Data Sources link in the left frame of the page.
2. Click the Credentials Stored Securely In The Report Server option.
3. Type **ReportExecution** as the user name.

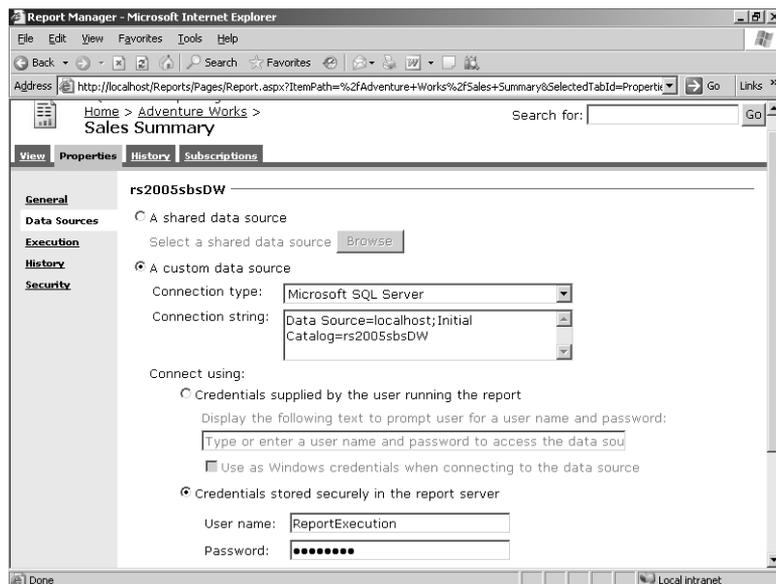
This SQL Server login was added when you installed the sample databases.

4. Type **ReportExecution** as the password.



**Important** In a production environment in which you are using stored credentials, it's important to test the report by viewing it to ensure that you have entered the user name and password correctly. The credentials will not be validated until the report executes.

Your screen now looks like this:



5. Click Apply.

## Changing Execution Properties

You might want to temporarily cache a report to improve performance. When a user first opens the report, a copy of the report is placed in temporary storage and made available to other users who open the same report. You can also assign a time limit for the cache so that the report can be periodically refreshed with more current data.



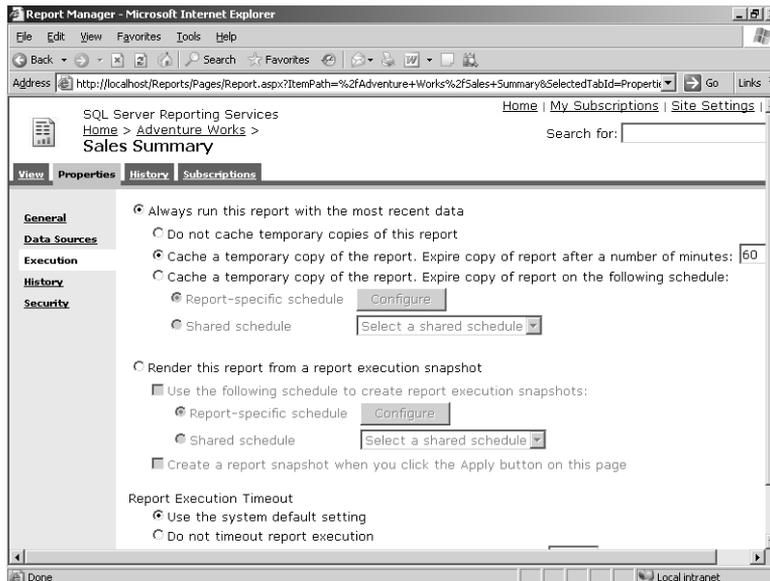
**Note** The type of caching discussed in this chapter refers to the access of a single report by multiple users. When you open a report, the report is automatically cached for you as part of your browser session. You can then return to this report repeatedly during the same session without having to wait for the query to execute again, regardless of the current setting of the report's execution properties. When you close the browser window, the report is removed from this cache. You'll learn more about session caching in Chapter 9.

In this procedure, you'll change the report execution properties to cache your report, and set the cache to expire after 60 minutes.

### Define a report cache

1. Click the Execution link.
2. Click the Cache A Temporary Copy Of The Report. Expire Copy Of Report After A Number Of Minutes option to cache the report and expire after a specified number of minutes. Change the number of minutes to **60**.

Your screen looks like this:



3. Click Apply at the bottom of the page.

The next time this report is opened, a temporary copy of it will be placed in the cache to speed up its display for any later requests by other users within the same hour. At the end of 60 minutes, the temporary copy is removed from the cache. A new copy is only placed in the cache when a user requests the report again.

As mentioned earlier, by using the caching option, you can improve performance for the next user who opens the same report. Any subsequent request for a report results in the display of the cached copy of the report rather than in the execution of the query and processing of the report. That is, any subsequent request displays the cached report until the cache expires. The purpose of expiring the cache on a periodic basis is to force the report to be refreshed with the most current data when the next user accesses the report. The result is a new cached instance of the report until the next scheduled expiration.



**Tip** The caching feature is useful when you have a query that takes a few minutes or more to execute and many people want to see the same report. It minimizes the demand for resources on the database server, reduces the level of network traffic associated with transporting the data from the database server to the Report Server, and speeds up the display of reports when requested. For more details about report caching, refer to Chapter 9.

## Accessing a Report

Each published report has its own URL on the Report Server. Instead of using the Report Manager to navigate through folders to find a report, you can enter the report's URL address into your browser. You can also use this URL in a hyperlink that you add to a custom HTML page. (In fact, you could even include additional characters in the URL to control the behavior of the report, such as formatting the report with a different rendering extension, but you'll learn how to do that in Chapter 18, "Building Custom Reporting Tools.") For now, it's easiest to use the Report Manager to find and view a report online and to export the report to another format.

## Displaying a Report

Now that you successfully authored and managed your report, you are ready for the access stage of the reporting life cycle. When you access a report online, you can use a toolbar in the viewer to help you explore your report. After opening the report, you can navigate through its pages or search for specific text so you can jump forward in it.

In this procedure, you'll explore each page of your report.

## View report pages

1. Click the View tab.

The first page of the report, for calendar year 2001, is displayed. This presentation of the report is nearly identical to the version you saw in the Report Designer. You now have the HTML viewer that includes a report toolbar to help you explore and interact with the report. For example, you can use controls in the toolbar to page through the report, to search for a string in the report, or to export the report to another format. The HTML Viewer is covered in more detail in Chapter 12, “Accessing Reports.”

2. Click the Next Page button on the View toolbar to view the sales data for each year.

## Searching a Report

Sometimes the information you’re looking for can be difficult to find in a lengthy or multipage report. The HTML Viewer provides a feature to help you find a text string anywhere in the report, from your current position to the end of the report.

In this procedure, you’ll use the search feature to locate specific text in the report.

### Find text in a report

1. In the Find text box, located in the center of the View toolbar, type **Linda**. Click the Find link.

Your screen looks like this:

The screenshot shows the Report Manager interface in Microsoft Internet Explorer. The browser window title is "Report Manager - Microsoft Internet Explorer". The address bar shows the URL: "http://localhost/Reports/Pages/Report.aspx?ItemPath=%2FAdventure+Works%2FSales+Summary&SelectedSubTabId=Exec". The page content includes a search bar with "Linda" entered and a "Find" button. Below the search bar is a table with columns for region, name, and sales amount. The table is filtered to show only entries containing "Linda".

Region	Name	Sales Amount
America	José Saraiva	\$1,283,648
	Garrett Vargas	\$1,452,267
	<b>Total</b>	<b>\$5,782,429</b>
United States	Tsvi Reiter	\$3,045,079
	Pamela Ansman-Wolfe	\$1,109,717
	<b>Linda</b> Mitchell	\$3,983,247
	David Campbell	\$1,750,383
	Michael Blythe	\$3,744,103
	Tete Mensa-Annan	\$307,548
	Shu Ito	\$2,691,267
	Fernando Caro	\$4,605,108
	<b>Total</b>	<b>\$21,236,453</b>
<b>Total</b>		<b>\$27,018,882</b>

The Find link is not enabled until you type a string into the associated search box. When you click this link, the report scrolls to the first occurrence of this string in the report.

- Use the Next link to find the next occurrence of the string.

The search operation begins in the currently selected page or section and continues across each page of the report until the end of the report is reached.



**Tip** You don't need to worry about using the correct case, because the search operation is not case-sensitive. However, you are limited to a string length of 256 characters.

## Exporting a Report

The HTML format is not the only format you can use to view your report. You can also export the report to another format that allows you to create a file that you can open immediately or save to your computer. The View toolbar includes a drop-down list from which you can choose an export format. (Reporting Services includes several export formats, also referred to as rendering formats, which you'll review more closely in Chapter 13, "Rendering Reports.") This feature gives you the flexibility to produce several versions of your report from a single platform.

In this procedure, you'll complete your tour of Reporting Services by exporting your report to an Excel format, opening the generated Excel workbook, and examining each sheet in the workbook, comparing them with the rendering of your report as HTML.

### Export to Excel

- Click Excel in the drop-down list at the far right of the View toolbar.

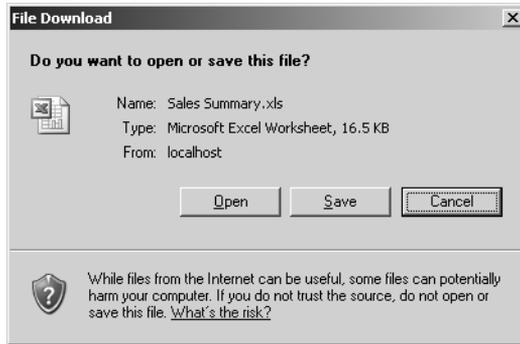
Your screen now looks like this:

SQL Server Reporting Services			
Home > Adventure Works >		Home   My Subscriptions   Site Settings   Help	
<b>Sales Summary</b>			
Search for: <input type="text"/> Go			
View Properties History Subscriptions			
New Subscription			
3 of 4		100% Linda Find   Next [Excel] Export	
		Garrett Vargas	\$1,675,682
	<b>Total</b>		<b>\$6,749,183</b>
	United States	Michael Blythe	\$4,746,079
		Fernando Caro	\$4,402,105
		Tete Mensa-Annan	\$1,499,014
		Shu Ito	\$2,875,924
		Linda Mitchell	\$4,995,826
		Tsvi Reiter	\$2,697,740
		David Campbell	\$2,779,322
	<b>Total</b>		<b>\$23,996,010</b>
<b>Total</b>			<b>\$30,745,193</b>
Pacific	Australia	Lynn Tsoflias	\$893,851
	<b>Total</b>		<b>\$893,851</b>
<b>Total</b>			<b>\$893,851</b>

As mentioned earlier, the Export feature of the HTML view gives you the ability to view the report in a different format. When you export the report, if a viewer is available for the selected format, a new browser window opens. For example, to export to the Excel format, you must have Microsoft Excel installed on your computer.

2. Click the Export link.

A new browser window opens and the File Download dialog box is displayed:



You can open the file to view it now, or you can save the file to view it later.

3. Click Open.

The Report Server renders the report as an Excel file that downloads to your computer. Microsoft Excel opens, and the report is displayed:

Sales Territory Group	Sales Territory Country	Employee	Actual Sales
North America	Canada	José Saraiva	\$1,248,853
		Garrett Vargas	\$568,971
	<b>Total</b>		<b>\$1,817,824</b>
	United States	Shu Ito	\$1,068,441
		Linda Mitchell	\$1,374,860
		Michael Blythe	\$903,230
		Fernando Caro	\$1,499,400
		Tsvi Reiter	\$1,663,099
		Pamela Ansman-Wolfe	\$729,654
		David Campbell	\$608,546
	<b>Total</b>		<b>\$7,847,231</b>
<b>Total</b>			<b>\$9,665,054</b>

Notice that the report style in Reporting Services is closely reproduced in the Excel version of the report. Much of the color style, font style, and layout that you see in the HTML version of the report also appears in the Excel version. Each page has been placed on a separate worksheet in the Excel workbook.

4. Click each worksheet tab to review the sales data for each year.

With the report in this format, you can take advantage of all of Excel's features to interact with the report data and perform additional analysis that was not possible using the static report in the browser.

## Chapter 3 Quick Reference

To	Do this
Start the Report Server Project Wizard	Start a new project in Visual Studio (SQL Server Business Intelligence Development Studio) and select Report Server Project Wizard from the Business Intelligence Projects folder. You must provide a name for the project and solution and designate a folder location for the solution.
Add a data source using the Report Wizard	On the Select The Data Source page, enter a name for the data source; select a connection type; and enter a connection string, or use the Edit button to access the Connection Properties dialog box to generate the connection string automatically. For example:  <code>Data Source=localhost;Initial Catalog=rs2005sbsDW</code>
Add a query string using the Report Wizard	On the Design The Query page, enter or paste in a query string, or click the Query Builder button to open the Query Builder.
Select a report type using the Report Wizard	On the Select The Report Type page, click either the Tabular or Matrix option.
Arrange the data using the Report Wizard	On the Design The Table page, assign fields to the Page, Group, and Details sections.  In the Design The Matrix page, assign fields to the Page, Columns, Rows, and Details sections.
Select a table layout using the Report Wizard	On the Choose The Table Layout page, select Block or Stepped, or optionally include subtotals. If you choose the stepped layout, you can enable drilldown.
Apply a style template using the Report Wizard	On the Choose The Table Style page or the Choose The Matrix Style page, click a style name.
Assign a deployment location and a report name using the Report Wizard	On the Choose The Deployment Location page, enter the URL for the Report Server to host the report. For example: <i>http://localhost/ReportServer</i>  Optionally, enter a folder name. The folder will be created on deployment if it does not already exist.  The final page of the Report Wizard requires a report name.
Preview a report	In Visual Studio, click the Preview tab.

To	Do this
Adjust the size of a column in a table	In Visual Studio, click the table to display the column and row handles, and then drag the column handle to the left to make the column smaller or to the right to make it larger. Alternatively, set the <i>Width</i> property for the selected column.
Publish a report solution	On the Build menu of Visual Studio, click <i>Deploy projectname</i> .
Open Report Manager	Enter the URL in your browser. For example: <i>http://localhost/Reports</i> .
View a report	In Report Manager, navigate the folder hierarchy to the report, and then click the report link.
Manage report properties	With the report open in Report Manager, click the Properties tab. Use the applicable link in the left frame to access the set of properties to be managed. Set a property by clicking an option or selecting a check box, and then clicking the Apply button.
Export a report	With the report open in Report Manager, select the export format from the list box and click the Export link.