Aras Innovator 2023 Release

Microsoft Reporting Services Guide

For use with Microsoft SQL Server 2012

Document #: *D-008115*

Last Modified: *12/8/2022*

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Document Conventions

The following table highlights the document conventions used in the document:

Convention	Description
Bold	This shows the names of menu items, dialog boxes, dialog box elements, and commands. Example: Click **OK**.
`Code`	Code examples appear in `courier` text. It may represent text you type or data you read.
`Yellow highlight`	Code with yellow highlight is used to draw attention to the code that is being indicated in the content.
`Yellow highlight with red text`	Red color text with yellow highlight is used to indicate the code parameter that needs to be changed or replaced.
Italics	Reference to other documents.
Note:	Notes contain additional useful information.
Warning	Warning contains important information. Pay special attention to information highlighted this way.
Successive menu choices	Successive menu choices may appear with a greater than sign (-->) between the items that you will select consecutively. Example: Navigate to **File** --> **Save** --> **OK**.

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1 Introduction

Aras Innovator's Report ItemType includes support for Microsoft's 'Reporting Services' in addition to supporting the existing XSLT based reports.

Reporting Services is an integral component of SQL Server 2012, and any customer with a SQL Server 2012 license can install Reporting Services. (See installation instructions below).

Usage of this release is recommended only for those with advanced Aras Innovator and SQL training.

Primary benefits to switching from stylesheet driven reports to Report Server:

- Query building is in SQL and is graphical (same as in Enterprise Manager).
- Report definitions are transportable, you can develop on your laptop, and then deploy to a production server.
- Report layout is more drag-n-drop and has more powerful formatting tools.
- The resulting reports are paginated.
- The end-user can easily print, PDF, or export to Excel the report output.
- Excel like Charts and graphs can be produced

To learn more about Microsoft Reporting Services visit: Microsoft SQL Server: Reporting.

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2 Installing Reporting Services

Reporting Services is a component of Microsoft SQL server 2012 and can be installed by selecting the **Reporting Services** option during the SQL server installation.

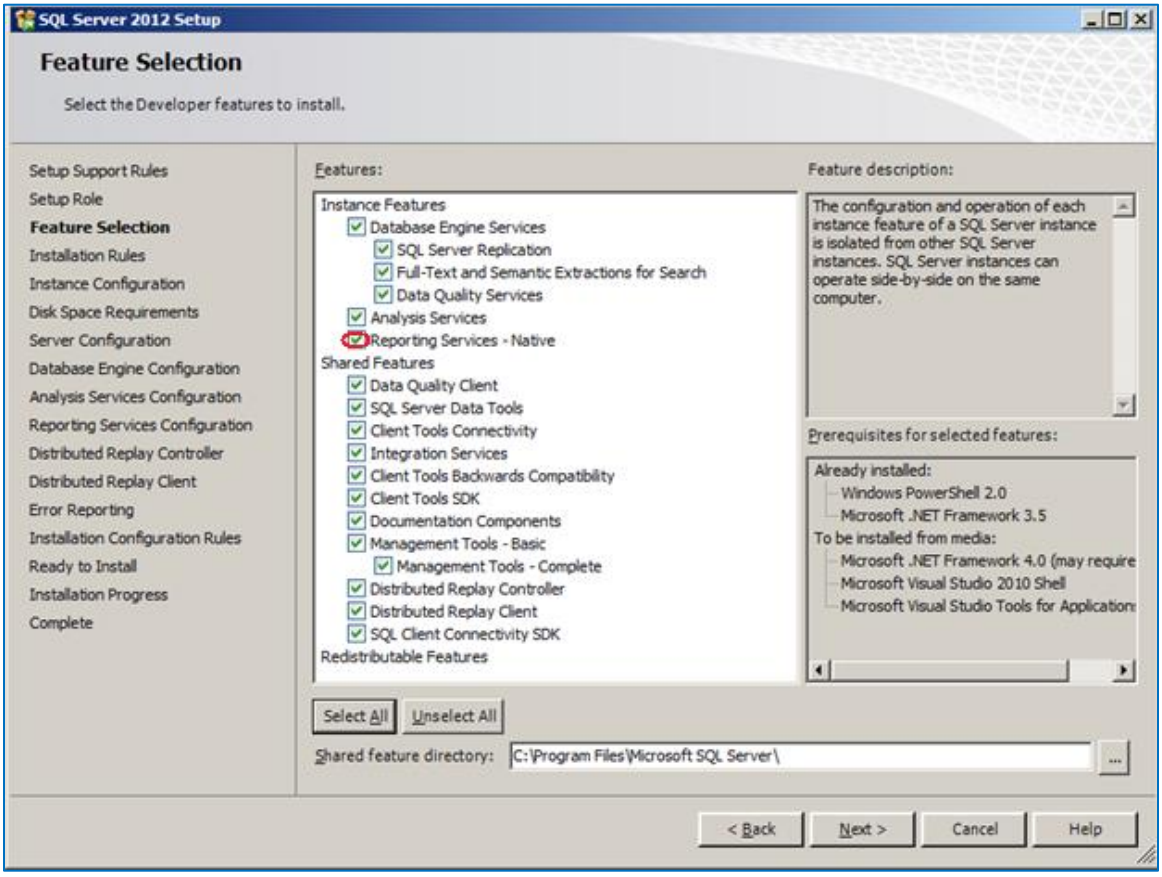

Figure 1.

In addition to selecting the **Reporting Services** option, you can select **Analysis Services** that provides graphing and charting functionality.

Selecting the **Reporting Services** option also installs components of Visual Studio 2012 for report design and deployment

2.1 Installation is a component of SQL Server 2012

This section is a summary of dialogs for installing SQL server 2012.

Note: If you view dialog boxes not listed here, use the default selections.

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2.1.1 Default Instance

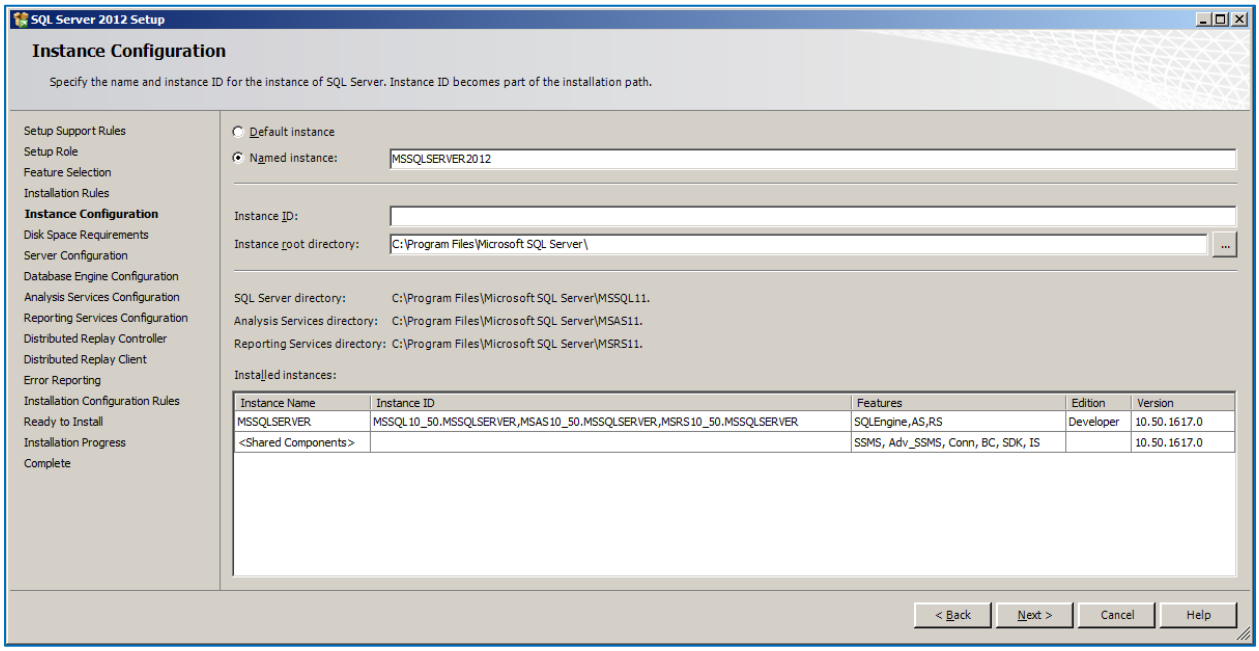

Figure 2.

2.1.2 Service account Setup

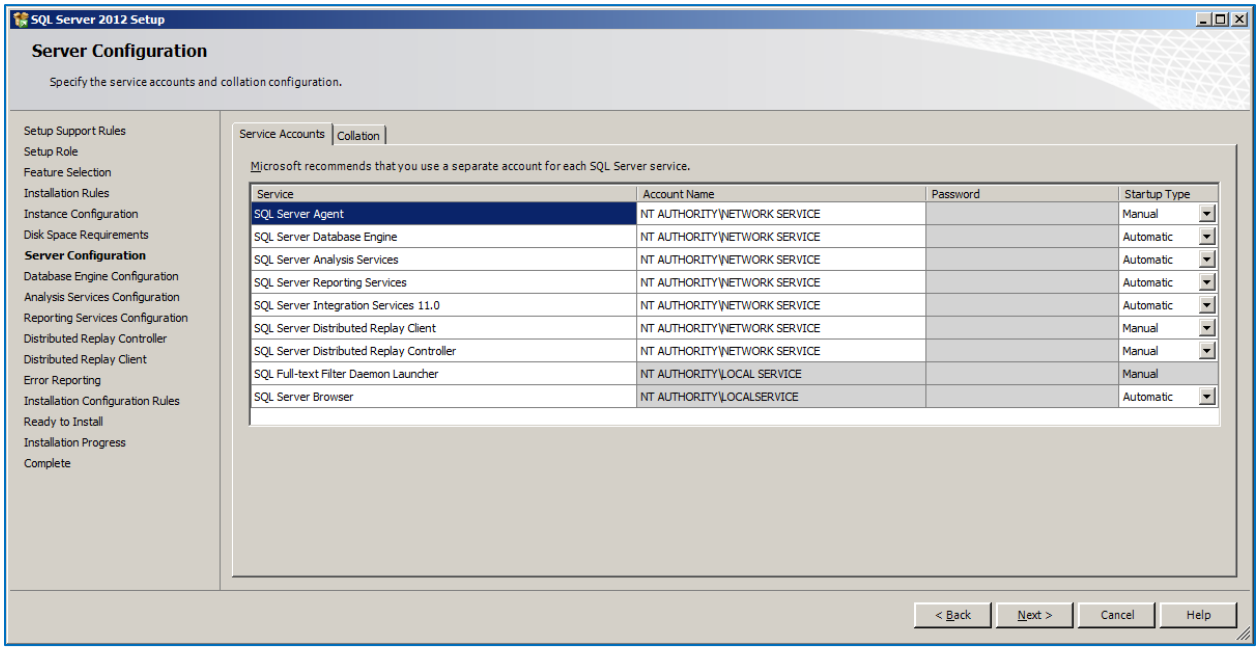

Figure 3.

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2.1.3 Database Engine Configuration and Authentication Mode

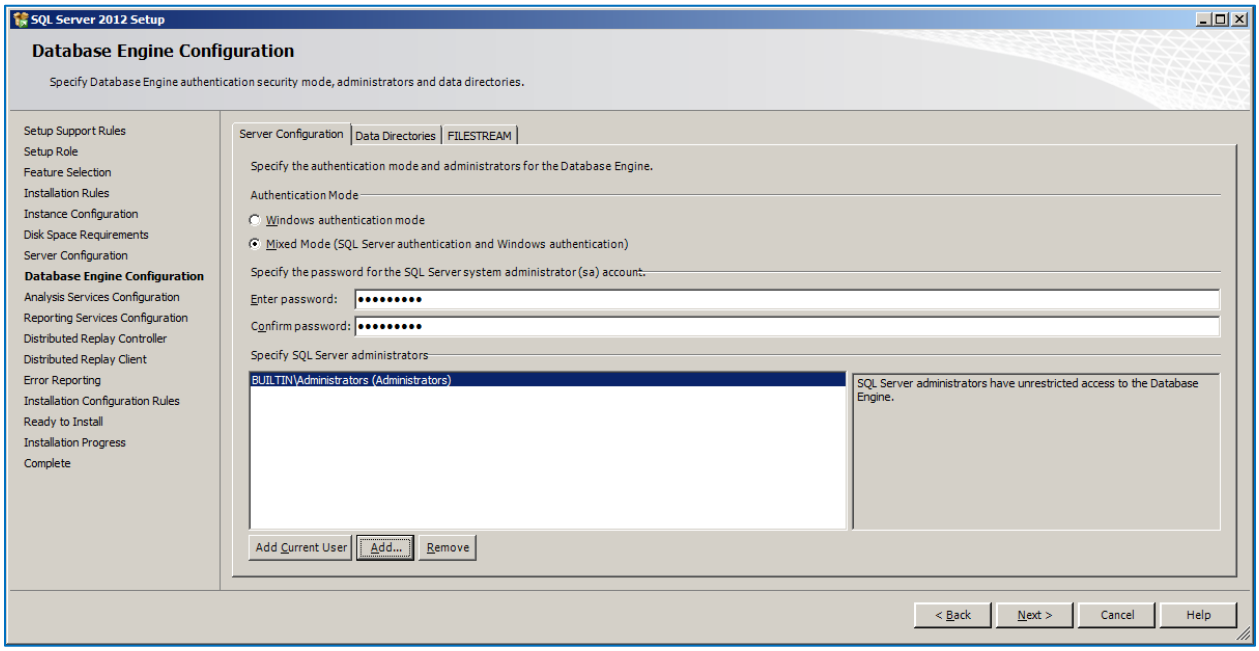

Figure 4.

2.1.4 Analysis Services Configuration

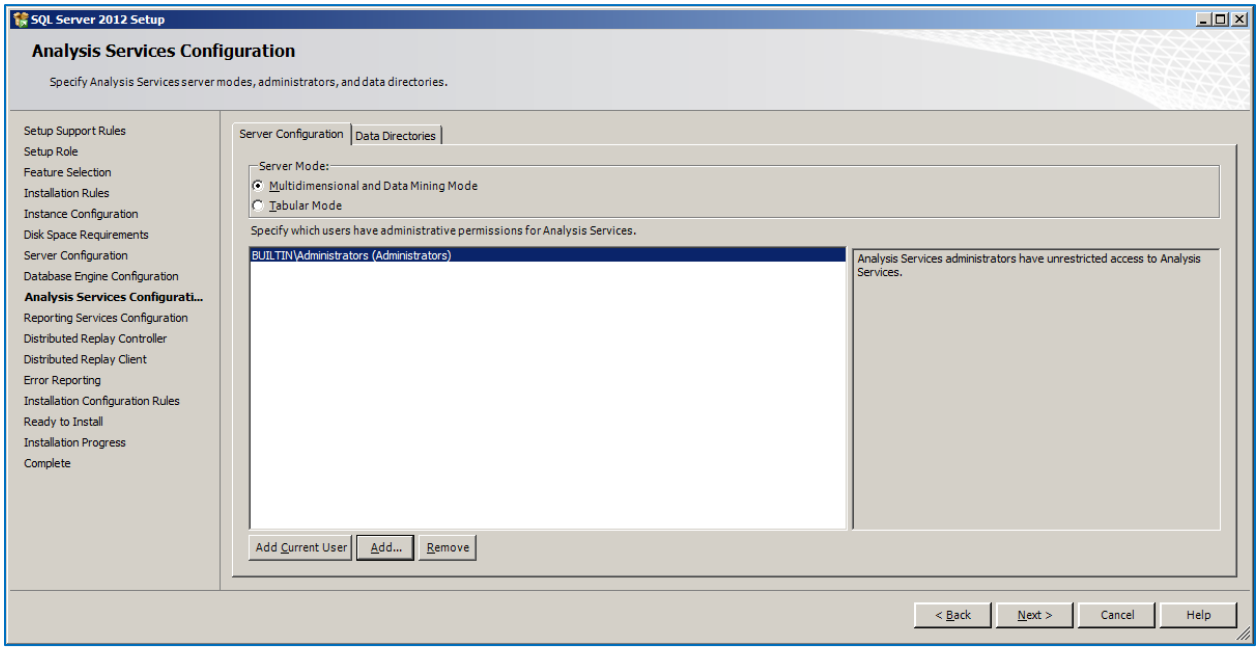

Figure 5.

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2.1.5 Reporting Services Options

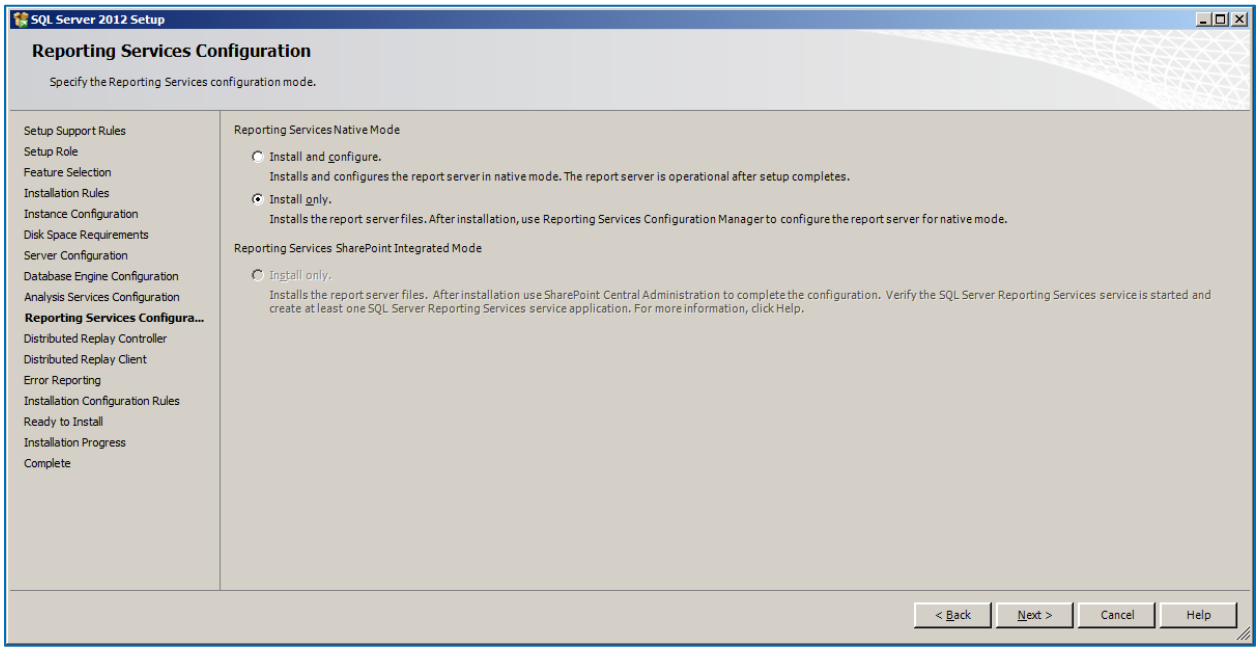

Figure 6.

2.1.6 Remaining Selections

The default selections can be used from this point forward.

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3 Configuring Reporting Services

The Reporting Services use Folders to organize Reports. The Aras Innovator integration with Reporting Services use as the default **Innovator Reports** Folder.

In this section, we configure the Reporting Services using the Report Manager by adding the **Innovator Reports** Folder and a Shared Data Source, which the Reports use to connect to the database.

3.1 Add Reports Folder

The **ReportServer** Reporting Services comes with the **Report Manager** page used to configure the Reports, Folders, Data Sources, and so on. This page has been integrated into Innovator client via an Innovator Report that opens the **Report Manager** page.

1. Open your browser with http://localhost:8080/Reports on the default installation.

Note: If your installation is not default, open the Reporting Services Configuration Manger to verify the URL.

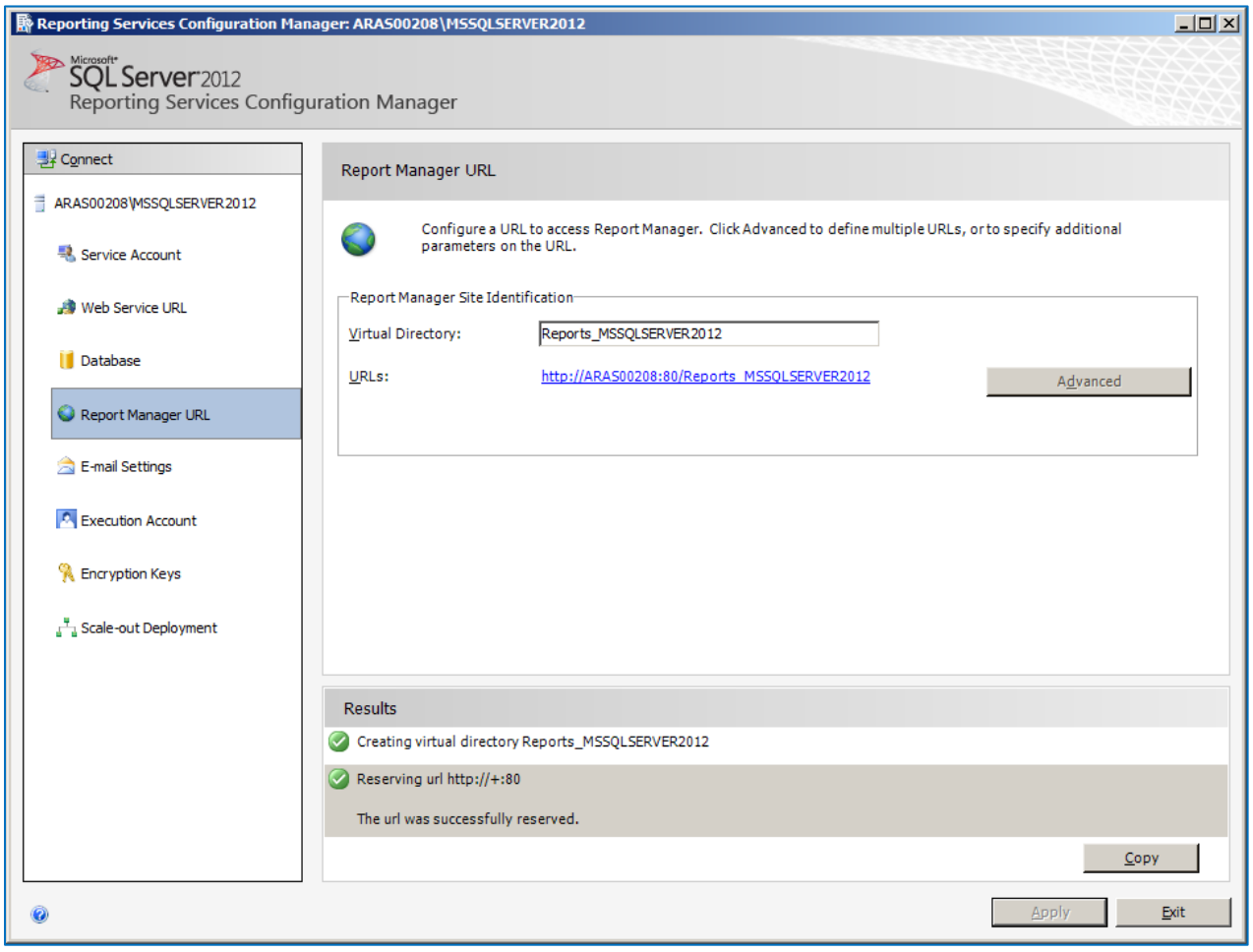

Figure 7.

The **Report Manager** page opens in a new dialog as shown in Figure 8.

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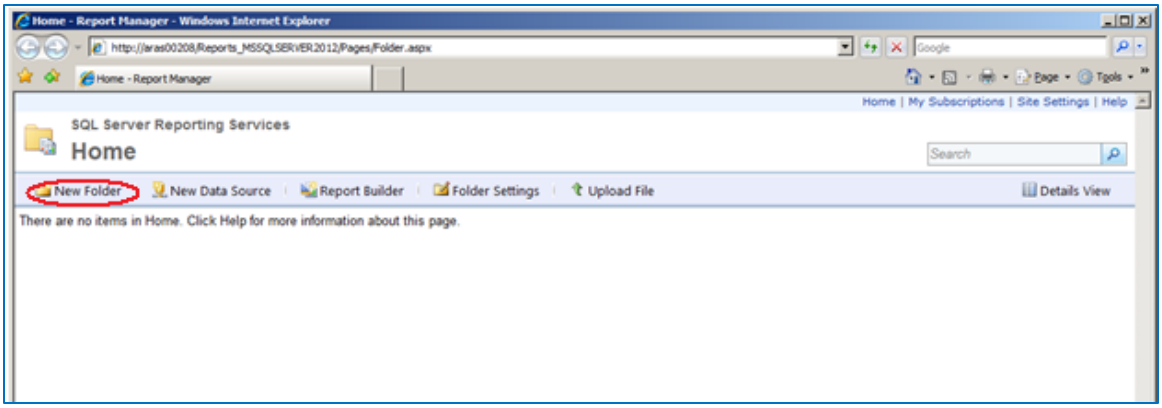

Figure 8.

2. Click **New Folder**.
3. Enter **Innovator Reports** for the name and click **OK**.

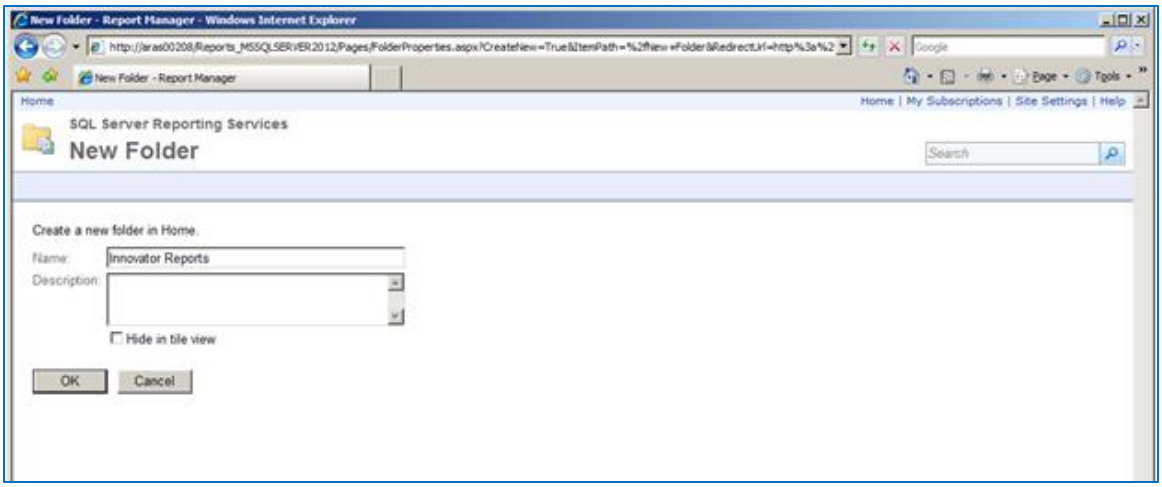

Figure 9.

4. If you use a folder named something other than **Innovator Reports**, you need to change the **Report Server Folder** variable in the database as well in TOC --> **Administration** --> **Variables**. The default value for this is **Innovator Reports**, but it can be customized for each database. For the purposes of these instructions, we assume the default value is used.

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3.2 Add Shared Data Source

Once you add the **Innovator Report** folder, navigate into it by clicking on the link. Now, you add a Shared Data Source for the Reports to use to connect to the database.

1. Click **+** and then **Data Source** inside the Innovator Reports folder.

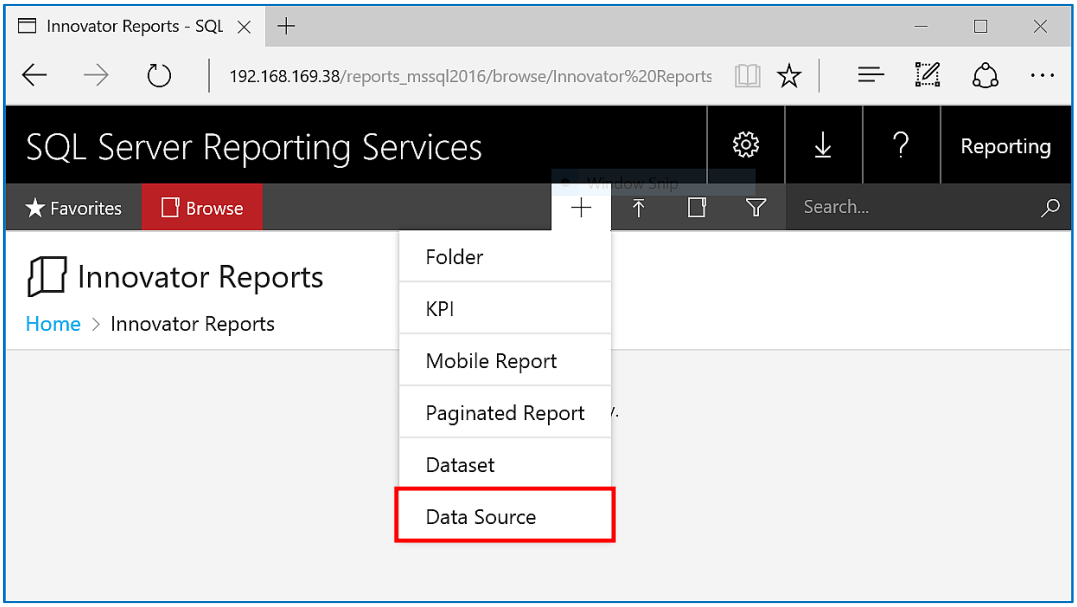

Figure 10.

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The **New data source** dialog appears.

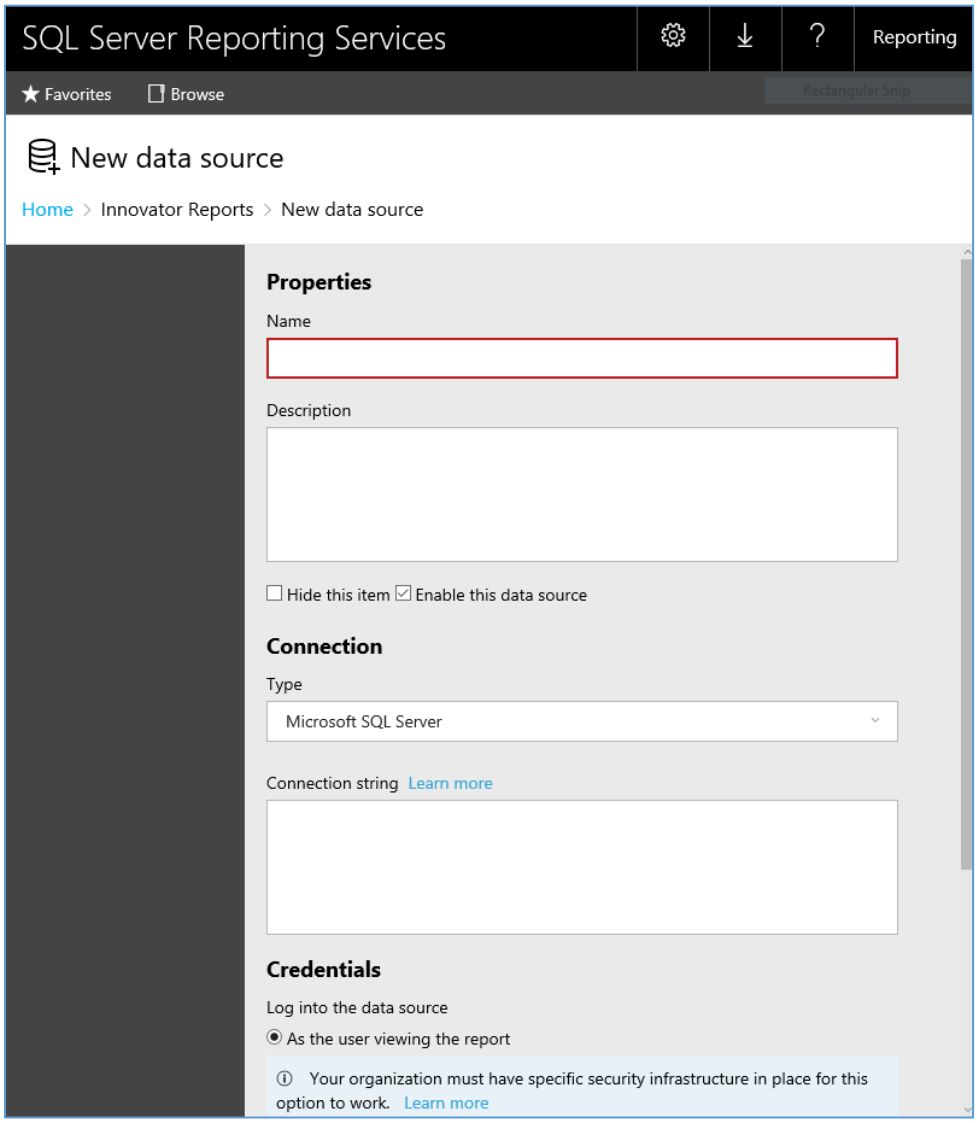

Figure 11.

2. Enter **innovator_regular** for the Data Source Name.

Note:	By using this same name for both the development and production servers, exporting/importing Reports becomes simpler because there is no need to reassign the Data Source for the Reports you import.

3. Enter the following for the 'Connection String' replacing the values for the two parameters with the actual server name where SQL Server is installed as well as the actual database name.

```
data source=<SQLServerName>;initial catalog=<InnovatorDatabase>
e.g.
data source=MyServer\MSSQLSERVER2016;initial catalog=InnovatorSolutions
```

4. Select the **Using the following credential** choice for the **Connect Using** field and enter the **DB Client Login** credentials for your database.
5. Click **Create** to deploy the shared Data Source.

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3.3 Add Reporting User and Role

The ReportServer.asmx Web Service is the Report Server entry point for the Microsoft Reporting Services. The same Web Service is used to request Reports and administer the Report Server. The Web Service is by default configured to use Windows Authentication. You can't simply open the security for anonymous Web users because that would open the Report Manager as well.

This security model requires the User be authenticated when they request Reports. A dialog opens requesting the user's login credentials the first time they request a Report each time the browser is opened again. When requesting the Report from within Aras Innovator this would not be desirable. This also means the user must have a domain or local User Account on the server and that becomes an issue for not 100% Microsoft shops with Intranet only Aras Innovator.

The initial release of the Aras Innovator Reporting Services uses one shared User Account for all Report requests. The Aras Innovator Client calls the Aras Innovator Reporting Services Gateway to request Reports. The Gateway submits the actual Report request using this shared User Account and propagates the results back to the client. The Report renders without the authentication dialog appearing.

If the user attempts to view the Report directly outside Aras Innovator they view the authentication dialog as normal and unless the IT department shares the credentials, the users can only view the Reports through Aras Innovator.

The local User Account on the server by default is named ‘Reporting’ with a default password is ‘reporting’ and must be mapped as a Role in the Report Server.

3.3.1 Add User Account for Reporting

The administrator for the server where Microsoft Reporting Services is installed must add a new Windows User Account named ‘Reporting’. Once the User Account is created Aras Innovator needs to be configured to use account credentials.

3.3.1.1 Configure User Account for On-Premises Innovator instance

Reporting Service configuration is stored in InnovatorServerConfig.xml configuration file. <ReportingServices> section needs to be updated with the username and password:

```
<ReportingServices>
  <ReportServer>http://localhost/ReportServer/</ReportServer>
  <User>Reporting</User>
  <Password>reporting</Password>
  <Domain>Domain for the above User</Domain>
</ReportingServices>
```

Optional node, <Domain>, should contain the domain name you want to use to connect to Reporting services.

3.3.2 Add the Reporting Role

The **Reporting** User Account must next be mapped as a Role in the Reporting Services enabling this account Browser privileges:

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1. Click the **Site Settings** link in the upper right-hand corner of the **Report Manager** page.

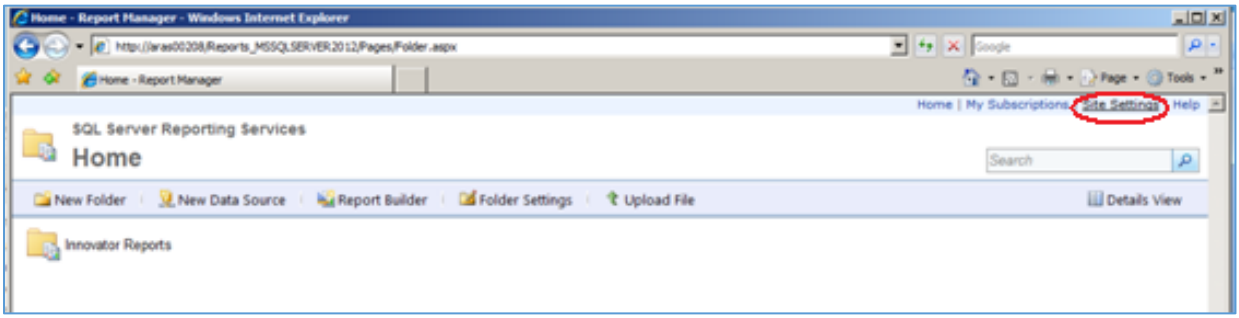

Figure 12.

2. Click the **Security** tab.

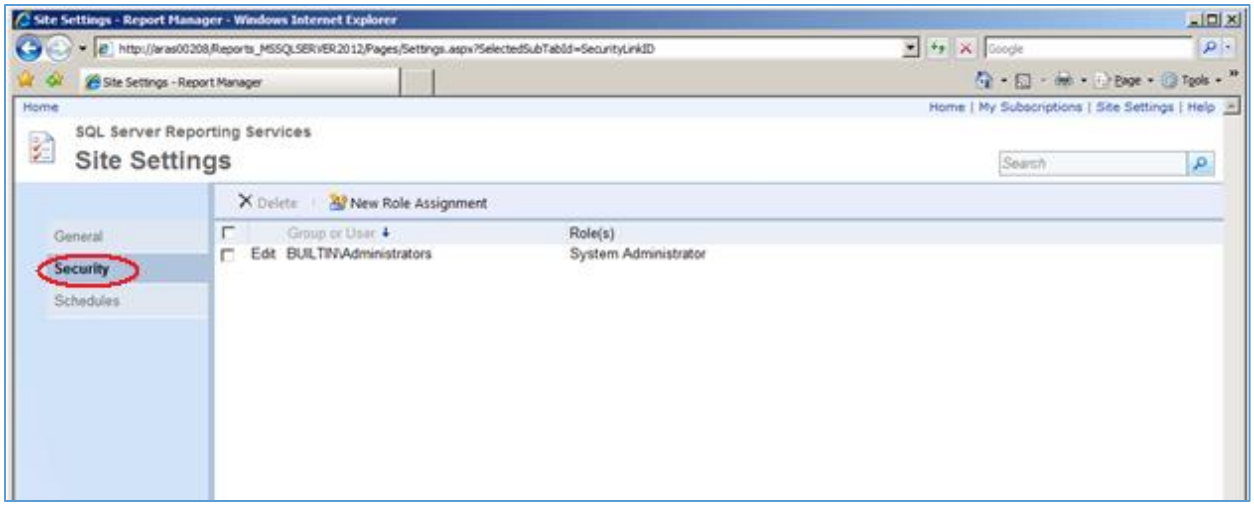

Figure 13.

3. Click **New Role Assignments** to map the **Reporting** User Account as a Reporting Services Role.

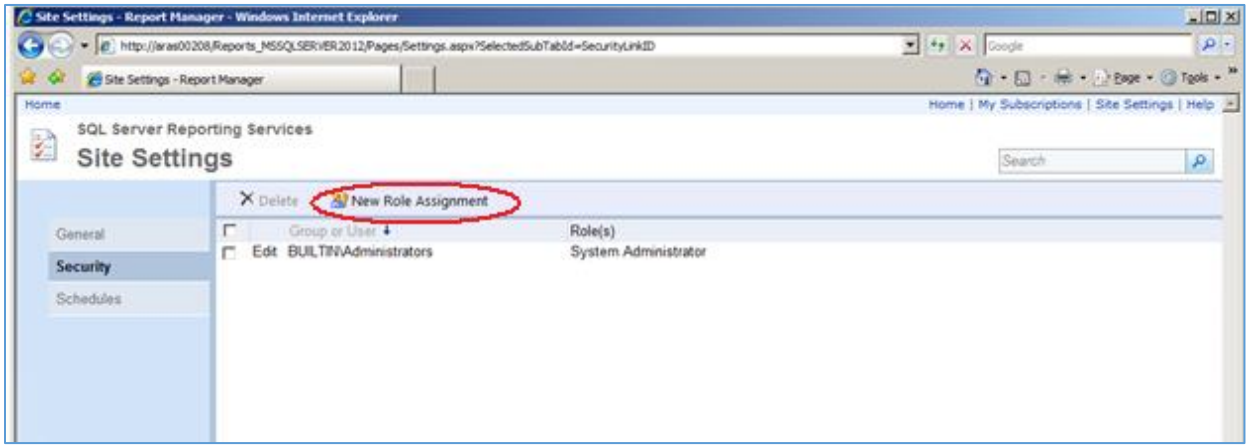

Figure 14.

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4. Enter the **Reporting** User Account name, select the **System User** checkbox, and click **OK** to create the new Role.

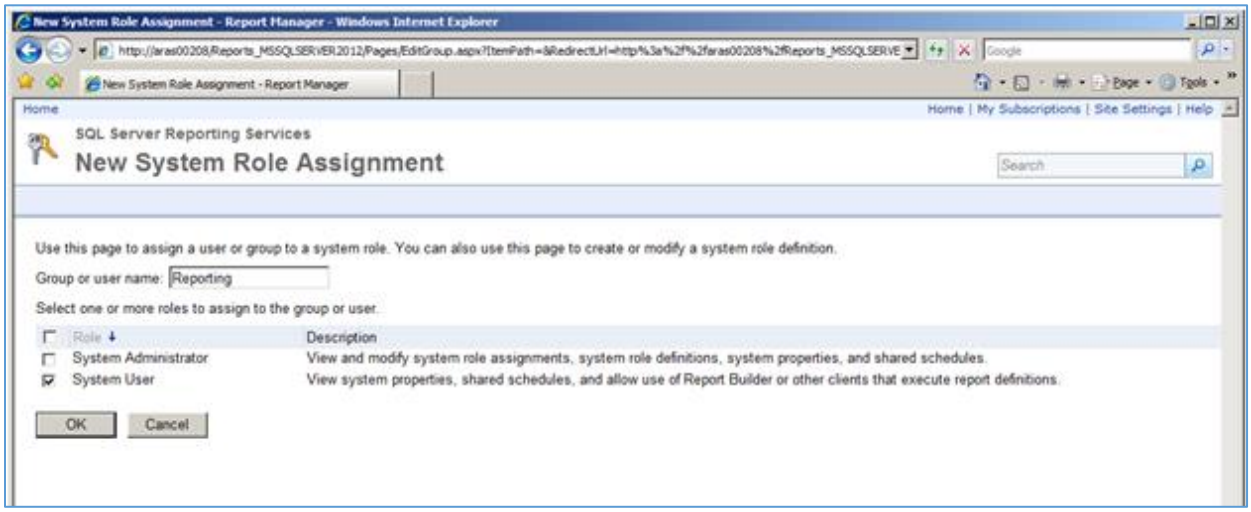

Figure 15.

5. Next we need to add the new Reporting Role to the **Innovator Reports** folder's security. Click the **Home** link in the upper right-hand corner on the page, then **Details View**, and select the **Edit** icon for the Innovator folder.

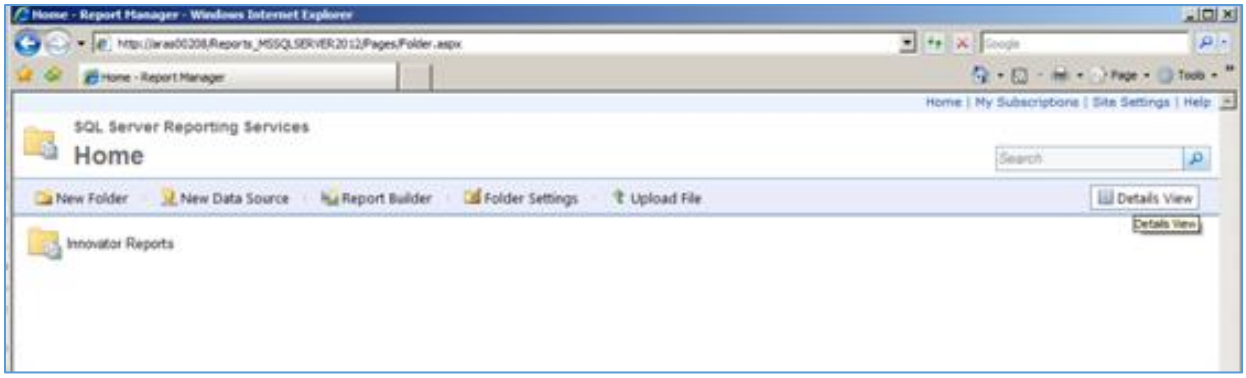

Figure 16.

6. Click the **Folder Settings** link on the left-hand side of the page to open the **Security** page for the **Innovator Reports** folder.

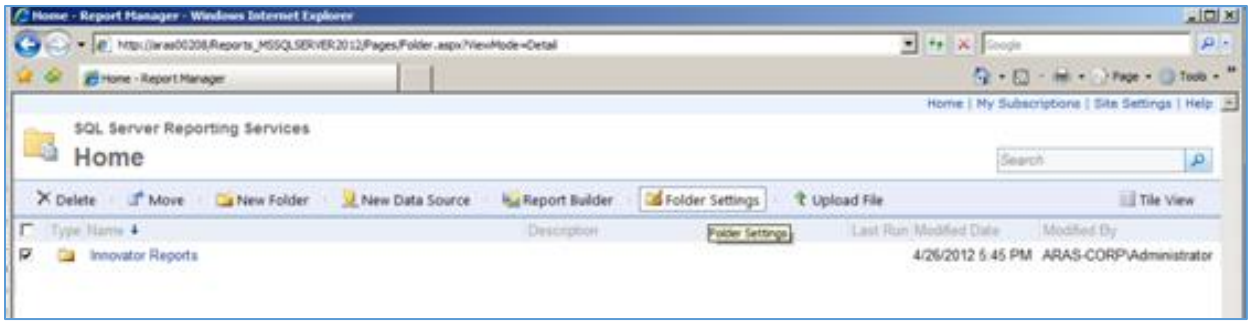

Figure 17.

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7. Click **New Role Assignment**.

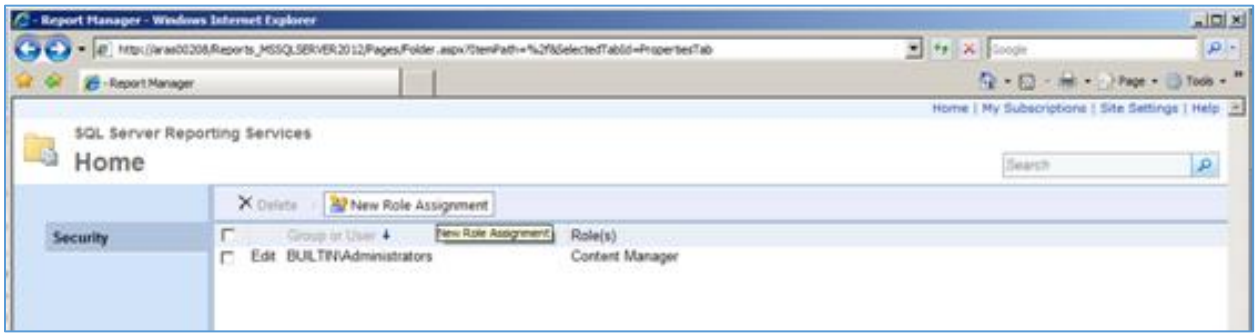

Figure 18.

8. Enter the **Reporting** Role, select the **Browser** checkbox, and click **OK** to create a new Role Assignment for the **Innovator Reports** folder.

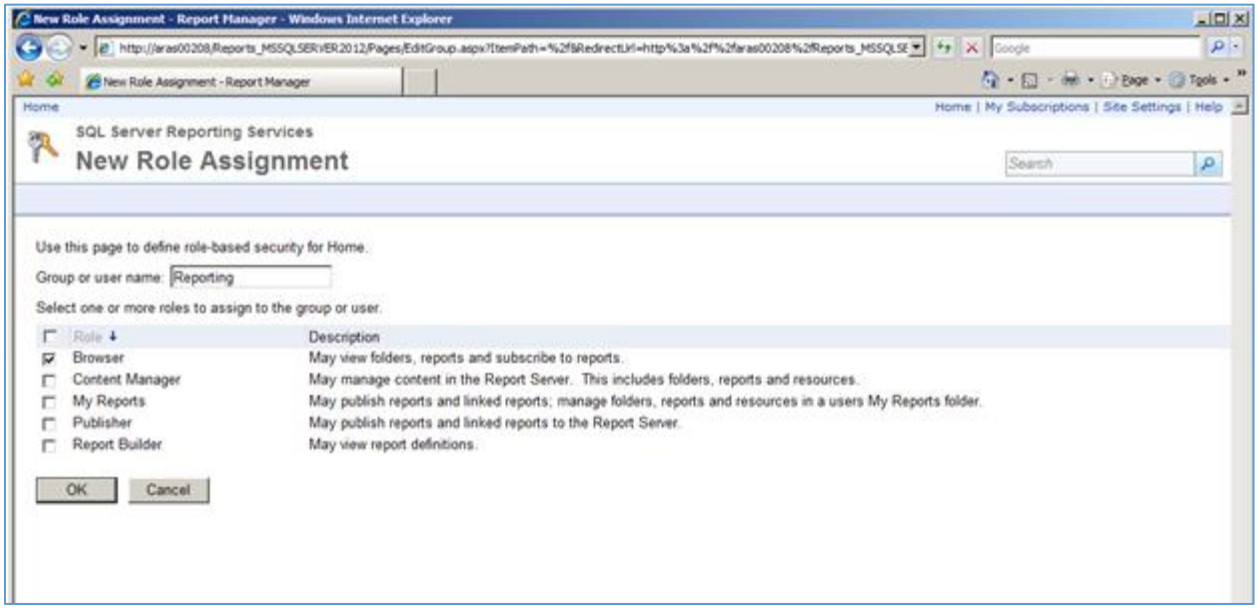

Figure 19.

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4 Using Visual Studio for Report Design

Once the Reporting Services is installed, you need to configure Visual Studio to create a Project to hold the Reports. You also need to configure a Shared Data Source, which is the database connection information for the Reports.

Note: It is required that you follow the exact naming conventions as shown here to ensure that the Aras Innovator integration with the Reporting Services works correctly.

4.1 Create a New Report Project

Start **SQL Server Data Tools** and create a new **Innovator Reports** project.

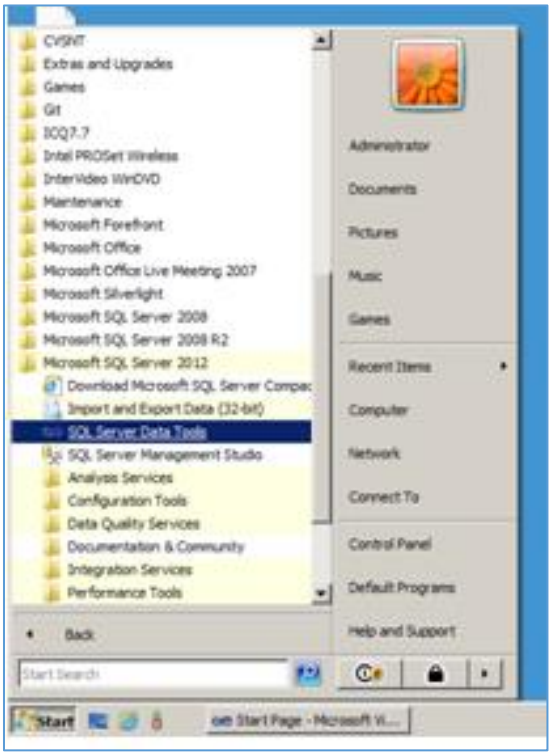

Figure 20.

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This becomes the **Reporting Services** folder to hold the Reports for Aras Innovator.

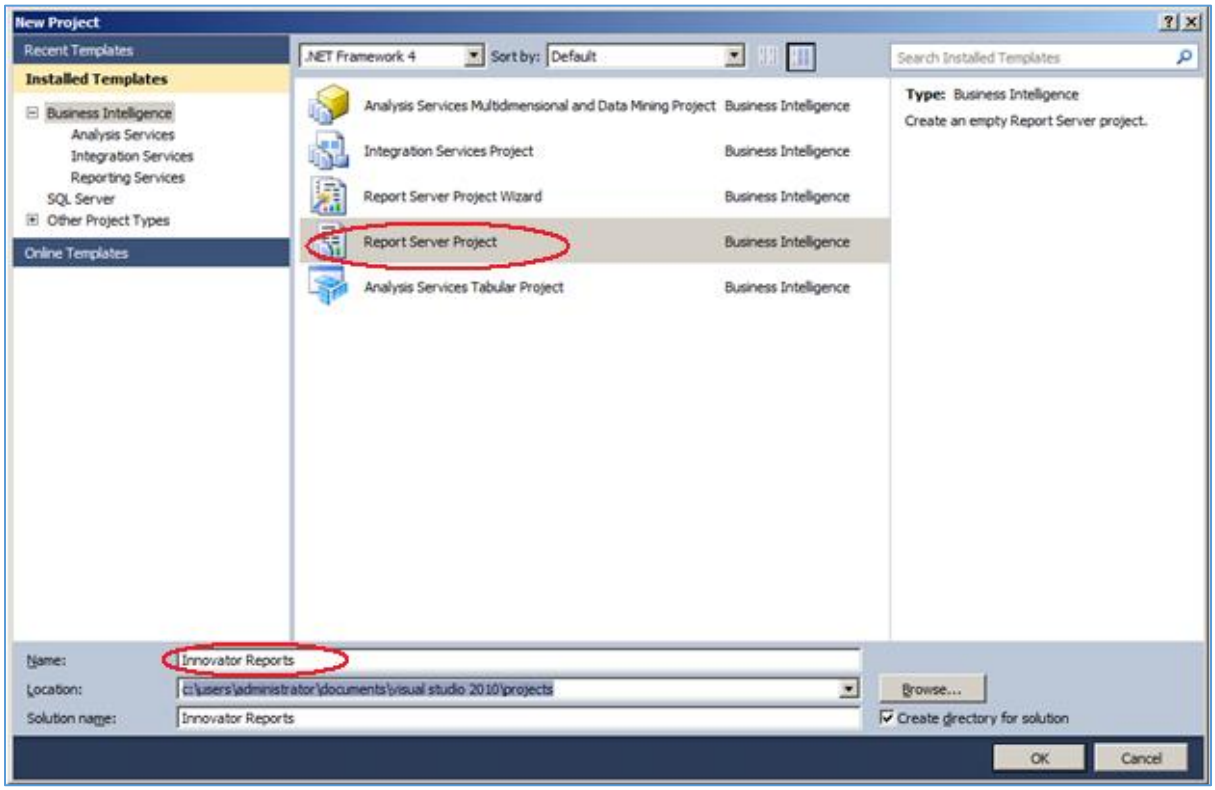

Figure 21.

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4.2 Configure Project Properties

1. Open the **Solutions Explorer** panel from the **View** --> **Solutions Explorer** menu if it is not already opened.
2. Right-click the **Innovator Reports** folder and select the **Properties** context menu choice.
3. In the **Properties** dialog, set the **TargetServerURI** field to the URL of the Report Server. For example, **http://localhost:8080/ReportServer**, where the actual server hostname is entered in place of localhost.
4. Set the **OverwriteDateSources** flag to **True**.

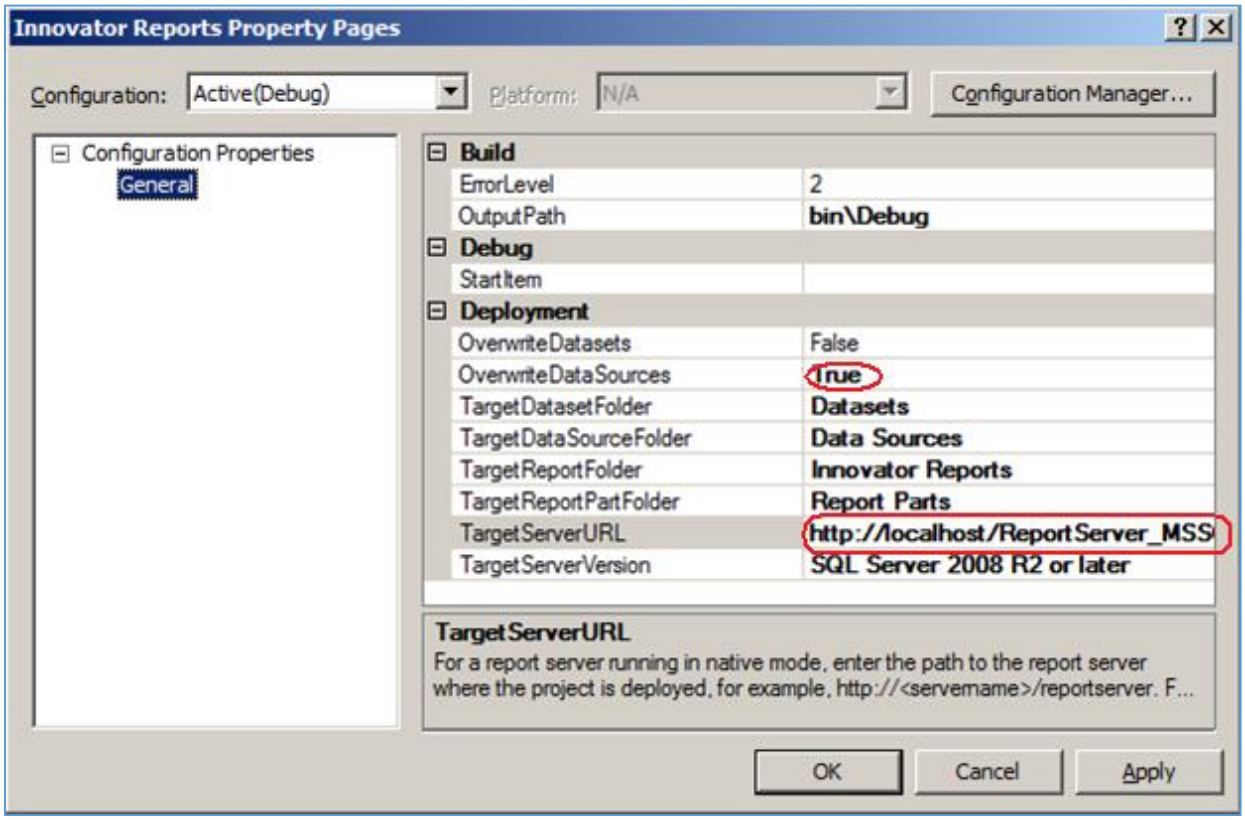

Figure 22.

4.3 Add New Shared Data Source

In the same **Solutions Explorer** panel, right-click the **Shared Data Sources** folder, select **Add New Data Source** context menu choice, and click **Edit** to configure the new data source.

4.3.1 Connection Properties

1. Select or enter a server name for the machine with the installed SQL Server
2. Select the **Use a specific user name and password** option, enter login credentials for the database, and select the **Save My password** option.

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3. Select or enter a database name.

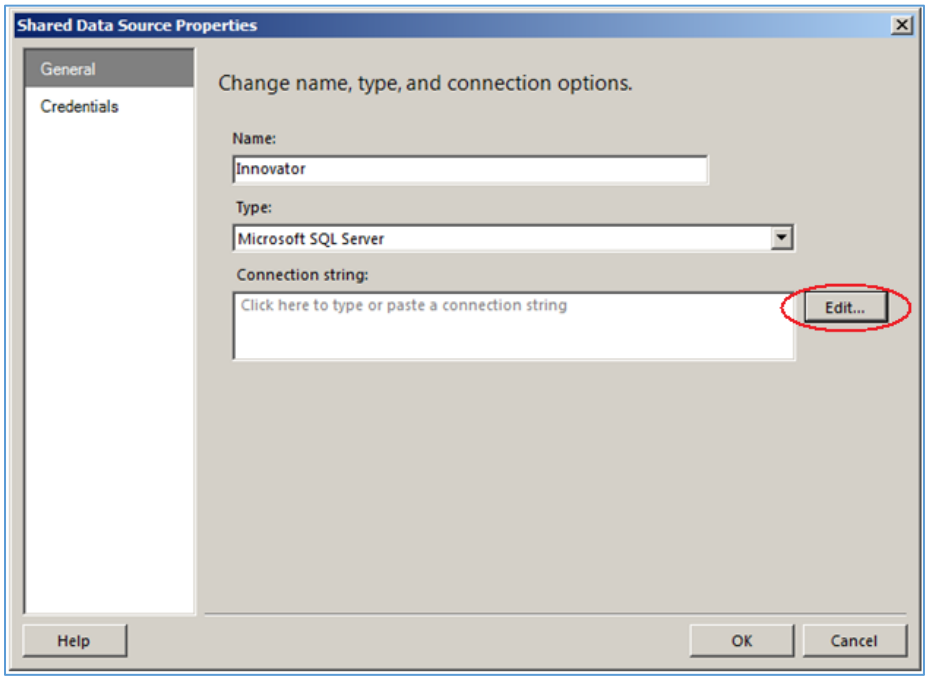

Figure 23.

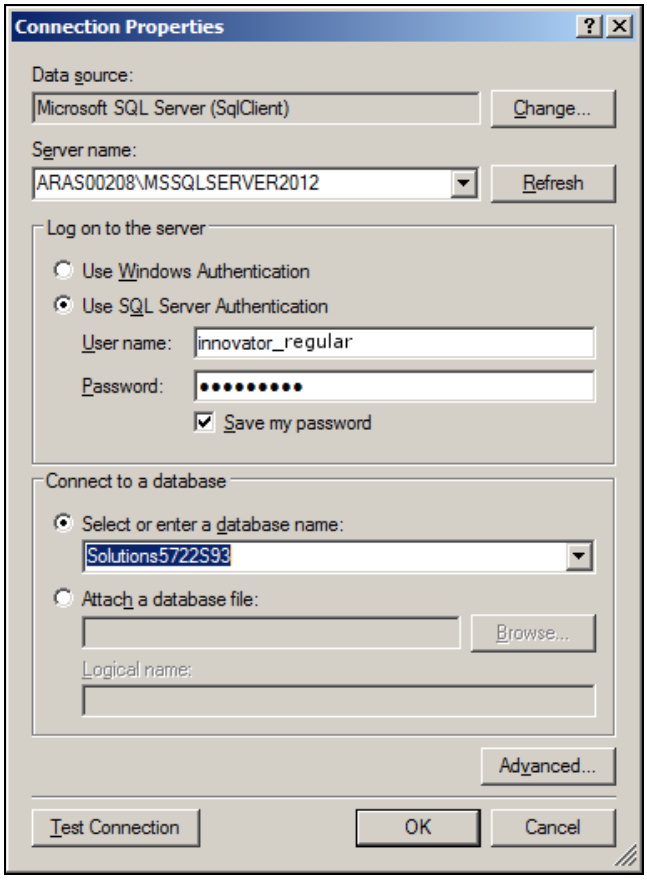

Figure 24.

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4.3.2 Deploy the Shared Data Source

By default, the Shared Data Source name is the name of the database you selected above. You can rename this if you want. Finally, you need to deploy this new Shared Data Source.

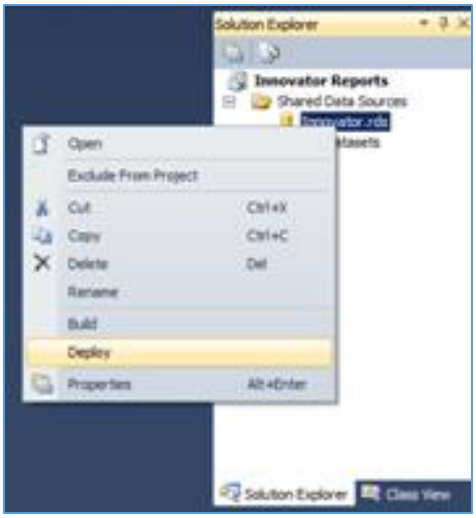

Figure 25.

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5 Creating your First Report

This section describes how to create a new Report using the Report Wizard. We will create a simple User Directory Report showing the User's First Name, Last Name, Email, Phone Number, and Company Name.

5.1 Start a New Report using the Wizard

In the **Solution Explorer** panel, right-click the **Reports** folder, and select the **Add New Report** context menu choice.

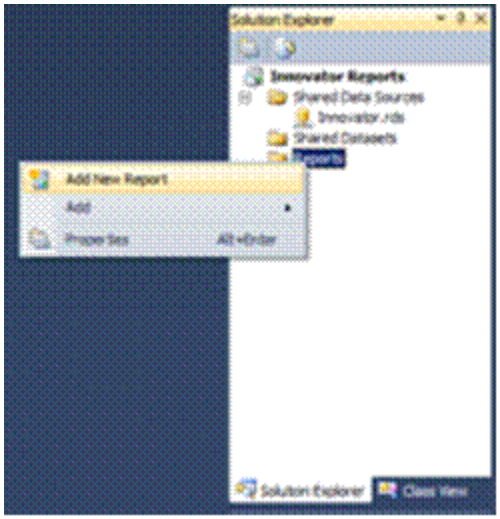

Figure 26.

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5.2 Select the Data Source

You can create a unique Data Source for this Report, but you would typically use the default Shared Data Source that you created.

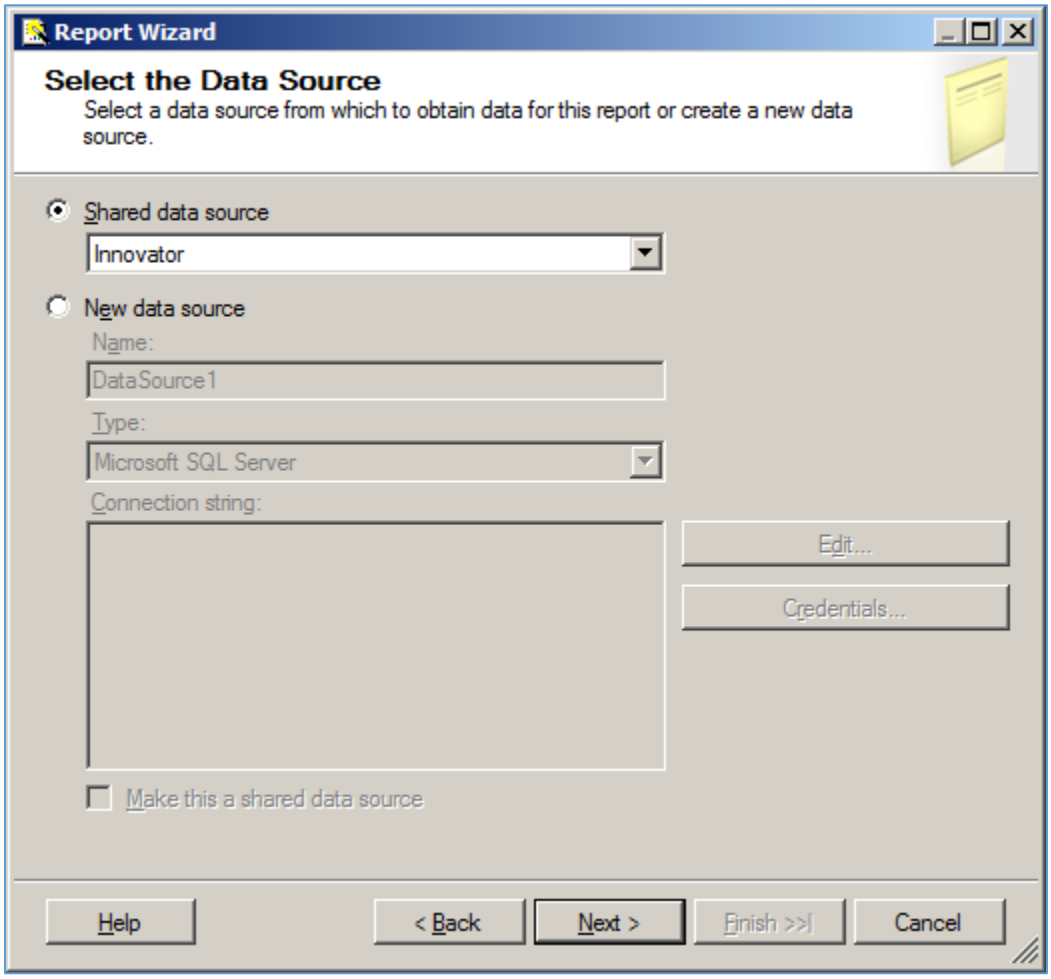

Figure 27.

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5.3 Design the Query

You need to provide the `SELECT` SQL query that fetches data for the Report. In many cases, you can enter a simple `SELECT` clause directly in the dialog box.

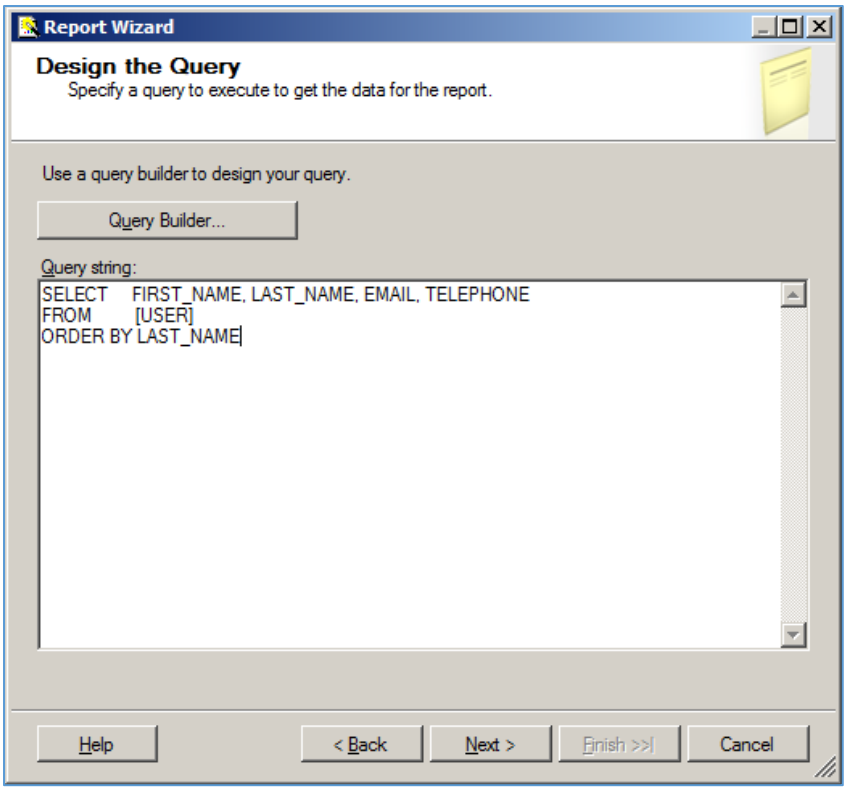

Figure 28.

Note: It is possible to pass Named Parameters into the query such as:
`SELECT * FROM [PROJECT] WHERE id=@ID`
The **Edit…** button opens a Query Builder interface, which is covered later in more detail.

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5.4 Select the Report Type

There are two choices for the Report Type:

- **Tabular**: column layout.
- **Matrix**: rows and columns layout.

Select the **Tabular** type.

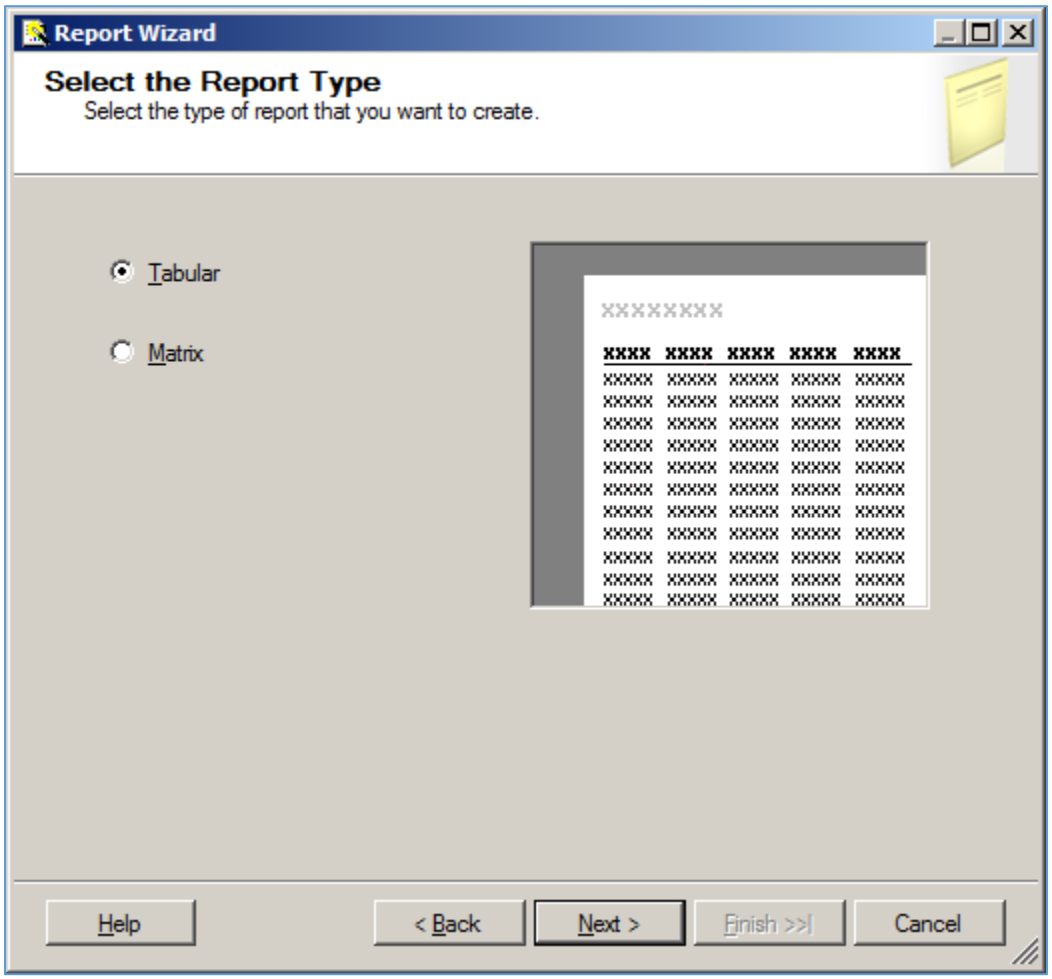

Figure 29.

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5.5 Design the Table

Select the fields that you want to show on the Report. In this case, we were selective about which fields to return from the query select clause, so we want all the fields.

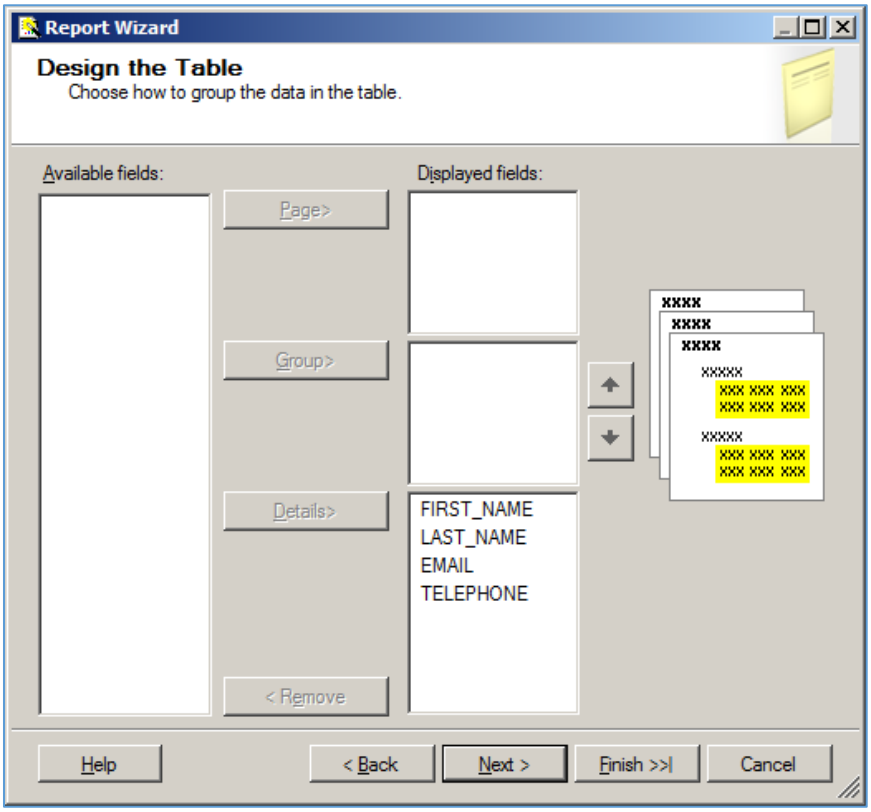

Figure 30.

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5.6 Choose the Table Style

Select the style for the table for the Report. This example simply uses the default **Slate** style.

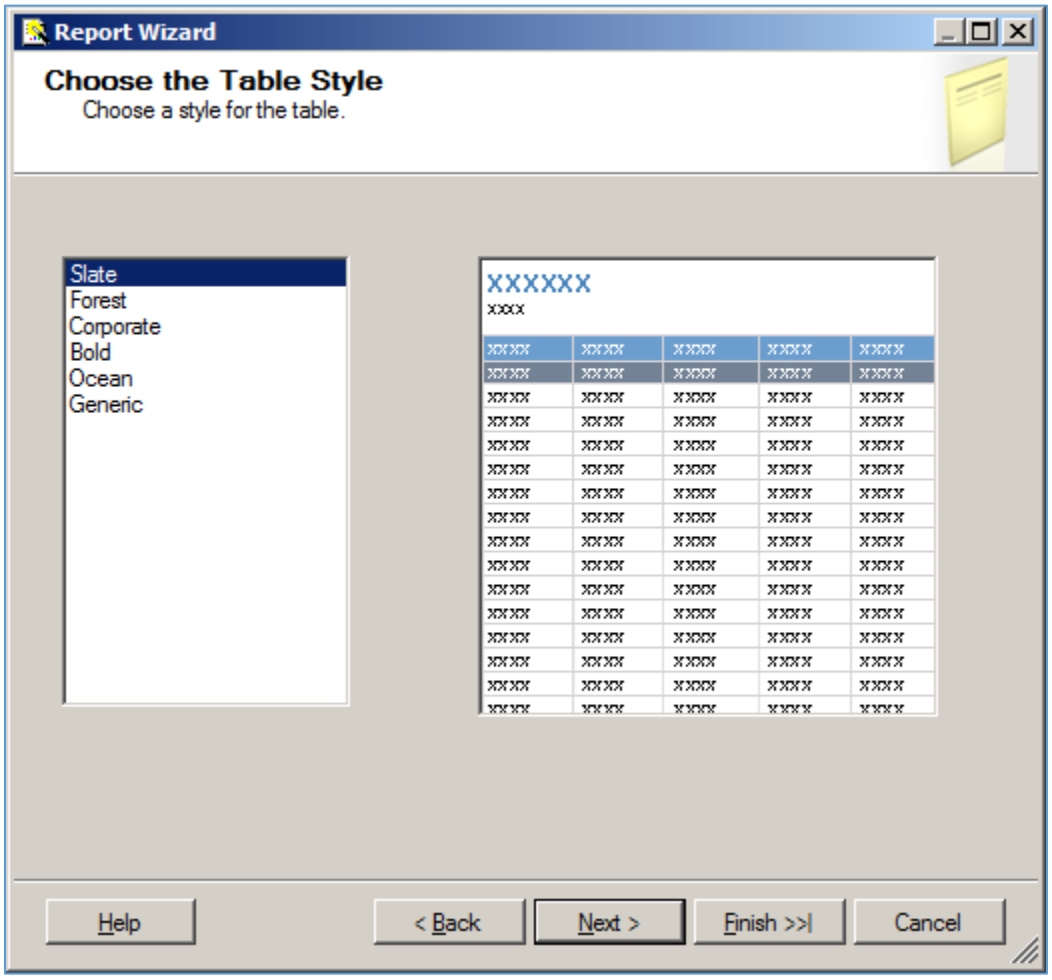

Figure 31.

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5.7 Name the Report

The final step in the Report wizard is to name the Report.

Note: The chosen **Report Name** must be meaningful and should be the same name you set as the name of the **Report** Item in Aras Innovator.

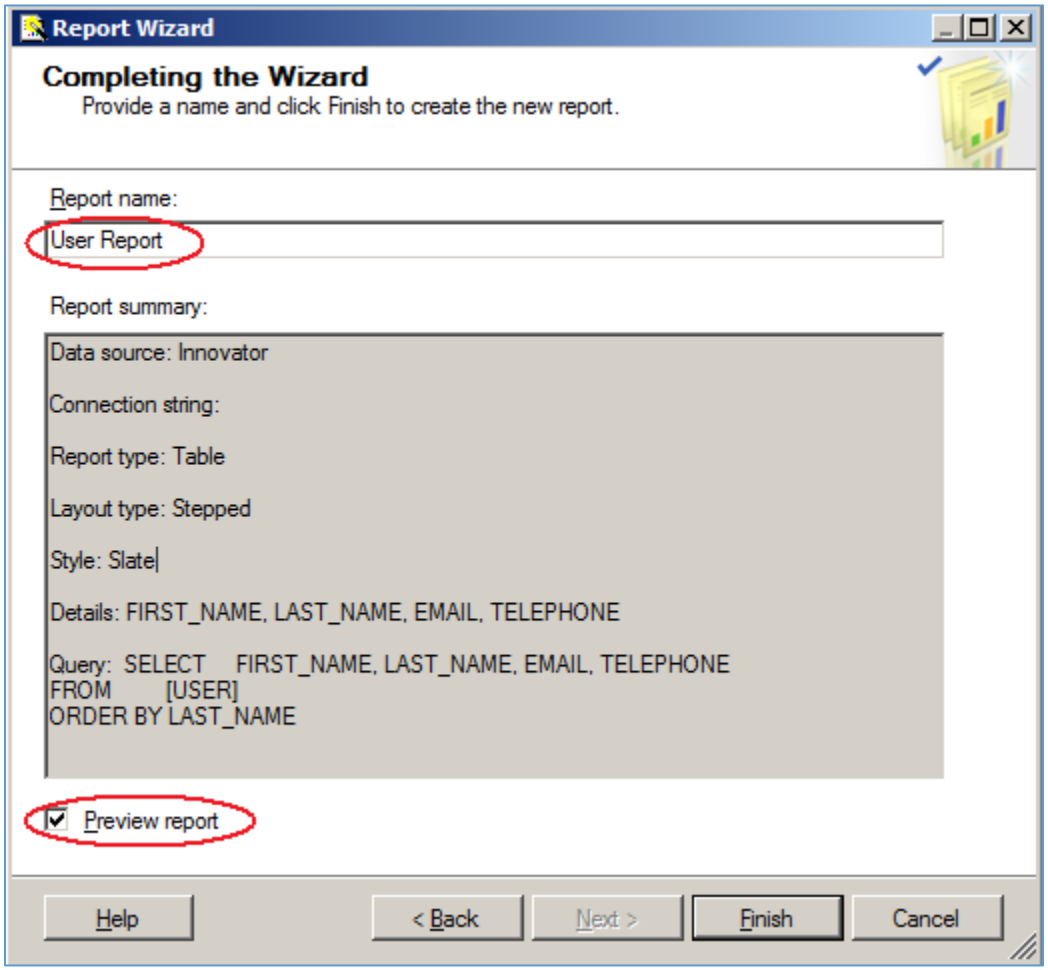

Figure 32.

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5.8 Wizard Report Results

The Report wizard builds the Report, which looks like Figure 33.

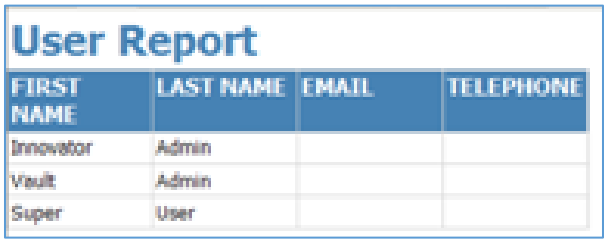

Figure 33.

Once the Report is opened in the **Layout** Tab, you can make further changes as required. In this example, we use camel case for the column headers. For example, the first name becomes **First Name**, and we resize the width of the table and the columns to take up 6.5 inches horizontally.

5.9 Visual Studio Layout

The Report pane has three Tabs:

- **Data**: for editing the query for the Report. Look at the appendix in this document to see a more complex Report query example, using the graphical query builder instead of the wizard.
- **Layout**: for visually designing the Report with drag and drop functionality.
- **Preview**: for viewing the finished report with real data.

The **Properties** panel on the right is used for setting fonts, color, and other visual properties.

The **Fields** panel on the left is used to drag database fields onto the report.

The **Toolbox** panel also on the left is for dragging Report controls onto the Report layout. This is how you can add tables, labels, images, and charts to the Report layout.

Note: Use **View** --> **Fields** to open the **Fields** panel when in the **Layout** mode.
Use **View** --> **Toolbox** to open the **Toolbox** panel.
To open the Header and Footer, right-click to open the context menu in the pink field in the **Report** layout.

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5.10 Deploying the Report

Once you are satisfied with the Report query and layout as viewed from the **Preview** Tab, you need to deploy the Report to the Reporting Service:

- In the **Solution Explorer** panel, right-click the User Directory Report item and select the **Deploy** context menu choice.

Watch for error messages in the output window at the bottom of the frame.

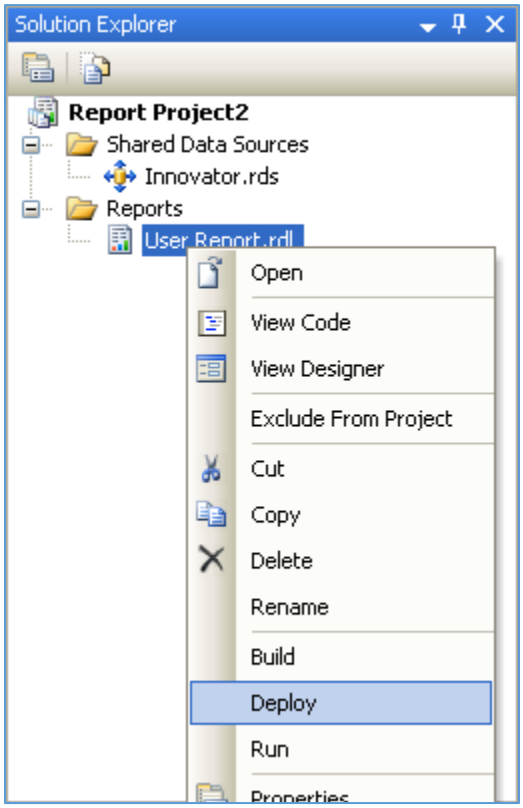

Figure 34.

5.11 Confirm Deployment

To confirm the new Report has been deployed:

1. Open a browser and go to http://localhost:8080/Reports.

   You should see the **Innovator Reports** folder.
2. Click that link.

   You should see the report you created.
3. Select the hyperlink for the new Report.
4. Run the Report.

Note: The URL for directly testing this report outside of Aras Innovator would look like this: http://localhost:8080/ReportServer?/Innovator Reports/User Directory.

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5.12 Running the Report from within Aras Innovator

For users to run the new Reporting Services Report from within Aras Innovator, you need to create an **Innovator Report** Item. The important settings to enable the Innovator Reporting Services interface are:

- The **Innovator Report** Item name must be the same as the Reporting Services Report name.
- The **Location** Field choice must be set to the new **Service** option.
- The **Report Query** field specifies the parameters that are passed to the Report Server.

5.12.1 Adding Aras Innovator Report Item

1. Log into Aras Innovator as admin.
2. In the TOC, go to **Administration** --> **Reports**.
3. Click **New** in the main toolbar.
4. When the new Report Form opens, enter a name of the Report.

Note: Again, this is the name you specified when you created the Report in Visual Studio.

5. Select the Report Type, which in this case is **Generic**, meaning this Report is always available.
6. Select the Report Location, which in this case is **Service**.
7. Select the Report Target, which in this case is **Window**.

   Because this sample Report is of type ItemType, there is no Report query Value.

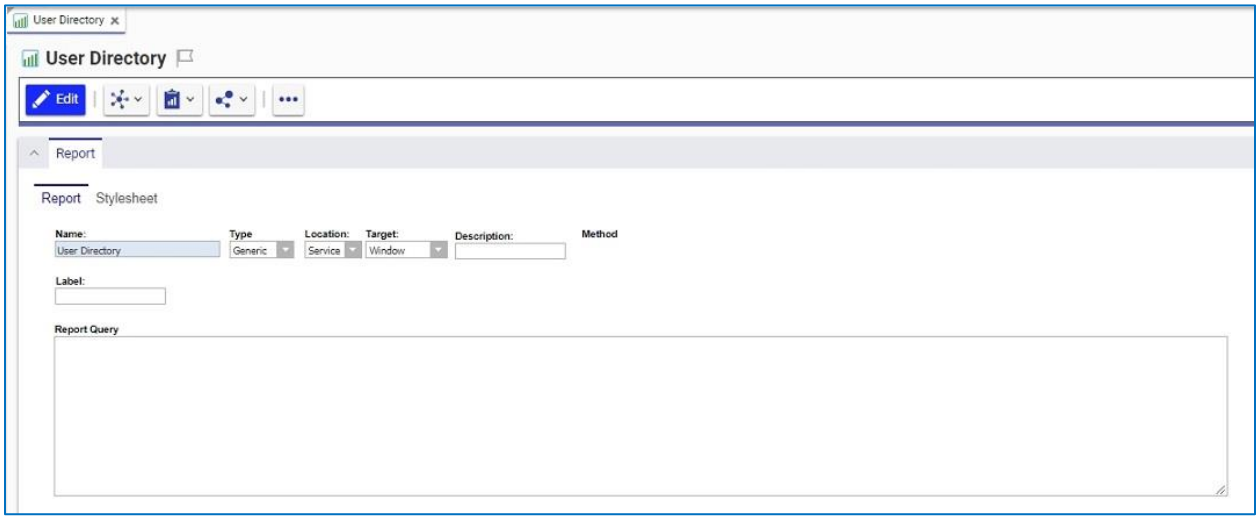

Figure 35.

Note: If you use Firefox, you have to manually enter a stylesheet under the **Stylesheet** tab.

8. Test the Report by clicking the **Reports** main menu bar choice.

   You should see the new **User Report** choice.
9. Click the **menu** choice.

   You should see a new dialog opened with the **User Directory** Report.

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5.12.2 Passing Named Parameters to the ReportServer

As step 4 describes in section 0, the value of the **report_query** Innovator Report Item Property is appended to the ReportServer URL, providing additional parameters to control the ReportServer.

For example, the ID of the Item can be passed as the Named Parameter @ID for the SQL Select for the Reporting Services Report as in this example:

- `SELECT * FROM [PROJECT] WHERE id=@ID`

To pass the ID for the context Item (the selected Item) on the URL to the ReportServer, the Innovator Report Item report_query Property would look like this:

- `np:id=<xsl:value-of select="@id"/>`

This is actually an XSLT stylesheet fragment and the directive for Aras Innovator to add the &id=ACBDEF0123456789ACBDEF0123456789 string to the end of the ReportServer URL, but the actual ID value is used.

In this case, the Innovator Report is of the `Generic` type, so no ID is required, but perhaps we want the Reporting Services Report to be returned in the PDF or Excel format. We can control the ReportServer by adding the following parameter as the **report_query** value for the **User Directory** Report:

- `rs:Format=PDF`

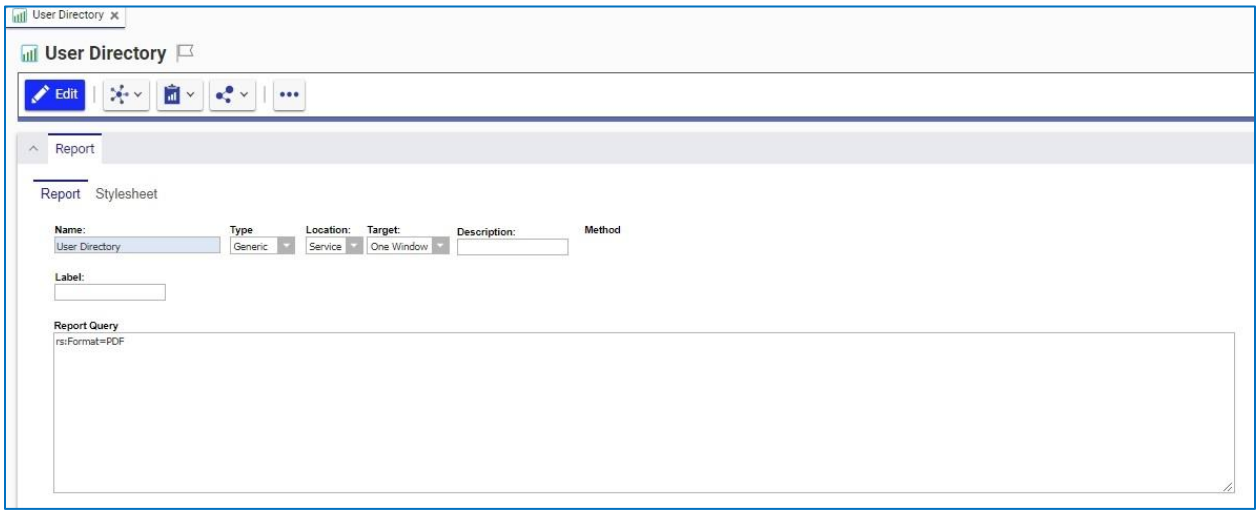

Figure 36.

Note: If you need to include more than one parameter for the **report_query** value, you need to use the **&** Entity rather than the actual **&** symbol to delimit the parameters. Recall that the **report_query** value is eventually part of the **query_string** for the URL to the ReportServer but is actually an XSLT stylesheet fragment and so the special symbols like **<**, **>**, and **&** need to be protected in XML need to be entered as Entities **< &gt**; and **&** respectively.

For example, to pass the Named Parameter ID and Format PDF in the same **report_query**, the value would look like this:

- `np:id=<xsl:value-of select="@id"/>&rs:Format=PDF`

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6 Report Server query_string Parameters

There are several parameters that you can use to control how the Reporting Services run your Report requests. You include these in the **report_query** Innovator Report Item property, which the client then uses to form **query_string** for the **ReportServer** request.

6.1 Named Parameters

Named Parameters passed onto the SQL Select query. For example:

- `np:last_name=Kohl`

Would map the **Kohl** value to the **@last_name** Named Parameter in the SQL Select:

- `SELECT * FROM [USER] WHERE last_name=@last_name`

6.2 Format Parameter

Use the `Format` parameter to control the format the Report is rendered:

- `rs:Format=XML`
- `rs:Format=PDF`
- `rs:Format=HTML4.0`
- `rs:Format=MHTML`
- `rs:Format=EXCEL`
- `rs:Format=Word`

6.3 Zoom

Use the `Zoom` parameter to control the zoom:

- `rc:Zoom=100`
- `rc:Zoom=% zoom as integer`
- `rc:Zoom=Page Width`
- `rc:Zoom=Whole Page`

6.4 Reports Folder

The default Folder where Reporting Services Reports are deployed is in **Innovator Reports**; however, you may deploy the Reports in other Folders, and you specify this using this Parameter:

- `irs:Folder=Your Folder Name`

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6.5 Report Name

The Aras Innovator client automatically appends the Parameter to specify the Report to run on **query_string**, which is the name of the **Innovator Report** Item. However, if you run reports programmatically, you may need to set this directly yourself:

- `irs:Report=Your Report Name`

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7 Report Manager

The **ReportServer** Reporting Services comes with the **Report Manager** page to administer the Reports, Folders, Data Sources, and so on. This page has been integrated into the Aras Innovator client via an Innovator Report that opens the **Report Manager** page; see section 2 for more information about this **Report** Item.

Reports that are created and tested on the development machine can be moved to a production **ReportServer** by exporting an RDL file for a Report from your local development machine and then importing it into the production machine.

The process of exporting a Report, importing it into another **ReportServer**, and enabling the Report in Aras Innovator has four steps:

1. Export an RDL file via the **Report Manager** page.
2. Import the RDL file via the **Report Manager** page.
3. Reassign the Data Source to the imported Report.
4. Add an **Innovator Report** Item to call the **Reporting Services** Report.

7.1 Opening the Report Manager page

1. In the TOC, go to **Administration** --> **Reports**.
2. In the main menu, click **Reports** and the **Report Manager** choice.

   The **Report Manager** page opens in a new dialog shown in Figure 37.

Note: You may need to click **Show Details**.

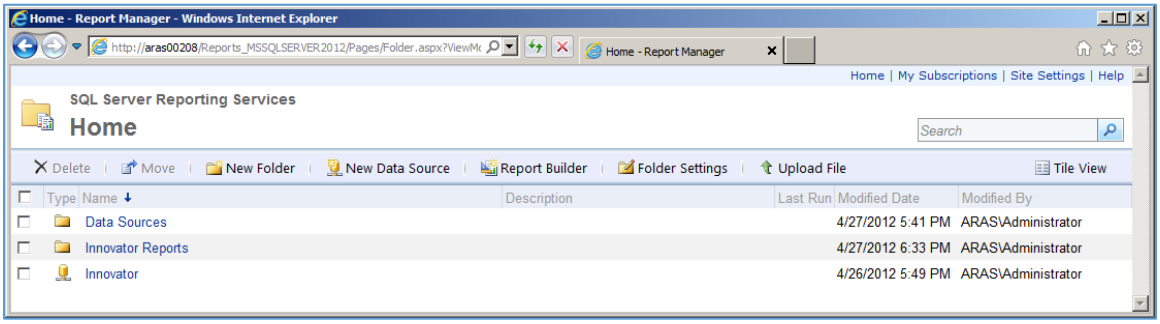

Figure 37.

Note: This page can be opened from your browser with http://localhost:8080/Reports.

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7.2 Export the RDL

To export an RDL file for a Report:

1. Click the **Innovator Reports** folder.

   You see a list of Reports and Shared Data Sources.

2. In the **Report** context menu, click **Download**.

   This opens a dialog asking for a confirmation that you want to save the RDL file.

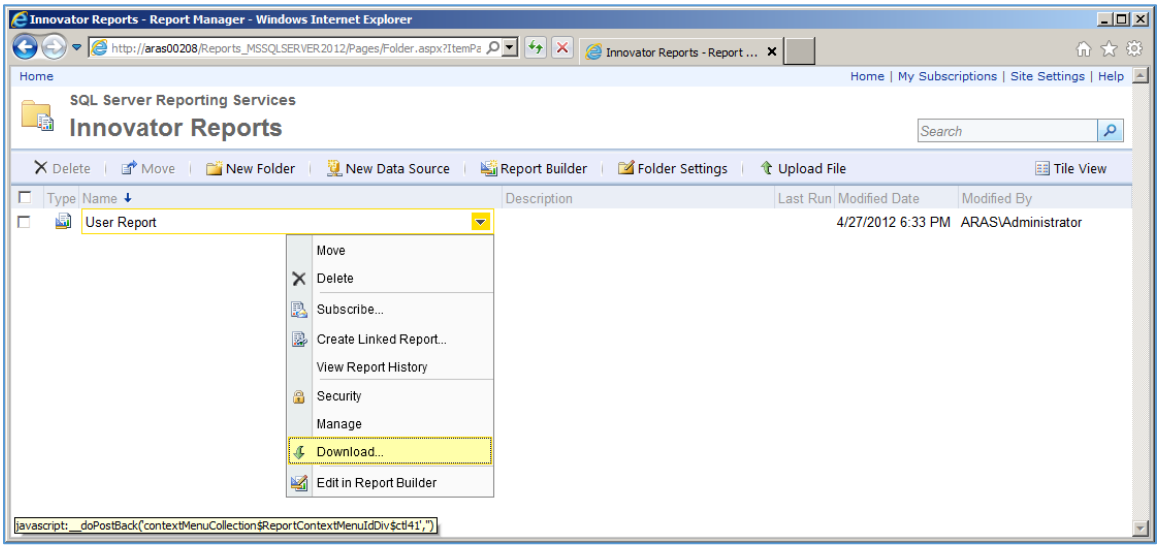

Figure 38.

7.3 Import the RDL

1. Log into the target Aras Innovator Server.
2. In the TOC, go to **Administration** --> **Reports**.
3. In the main menu, click **Reports** and then **Report Manager**.

   The Report Manager page opens in a new dialog as shown in Figure 39.

> **Note:** This page can be opened from your browser with http://localhost:8080/Reports.

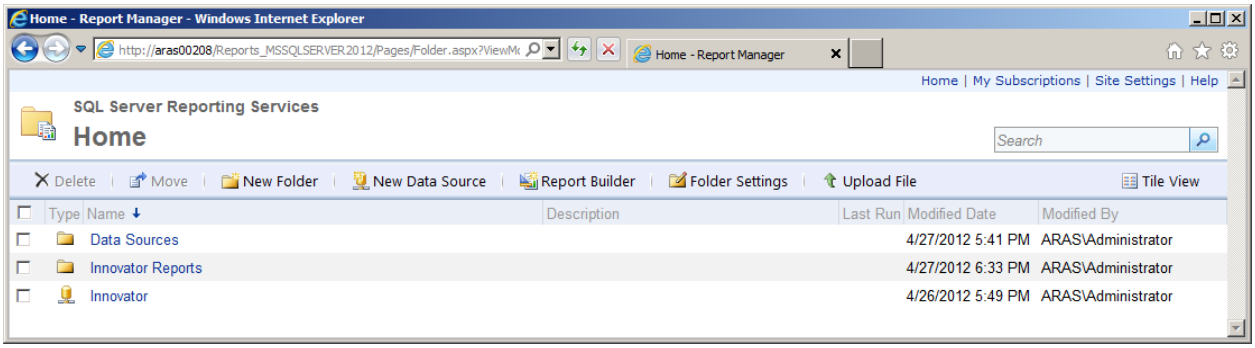

Figure 39.

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4. Click the **Innovator Reports** folder.

   You see a list of Reports and Shared Data Sources.

5. Click **Upload File** in the dialog middle.

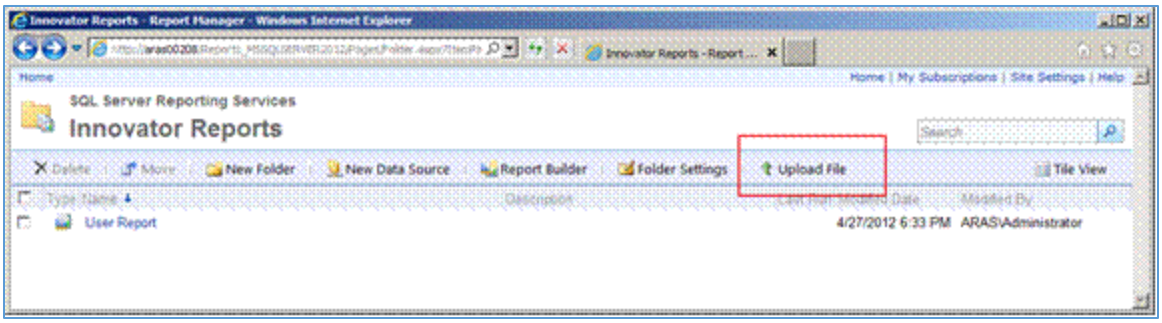

Figure 40.

This opens the **Upload File** page.

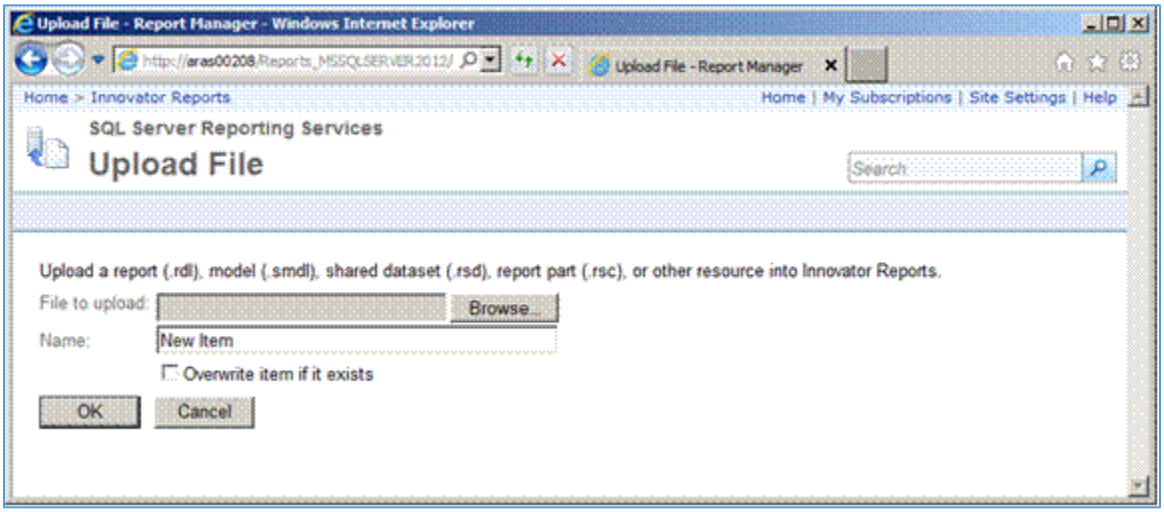

Figure 41.

6. Click **Browse...**, which opens the **File Selection** dialog for you to select an RDL file to upload.
7. Select the RDL file and click **Open**.

   This inserts the file name in the **File to upload** field and also set the **Name** field to the name of the selected RDL file.

8. If this is a new version of an existing Report, select the **Overwrite** checkbox.
9. Click **OK** to complete the upload.

   The RDL file is uploaded to the **ReportServer** target and deployed. You should see the new Report in the folder now.

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7.4 Select the Shared Data Source

The Data Source for the Report may need to be changed if the name of the Shared Data Source is different on the **ReportServer** target.

1. Click the **Properties** button in the **Edit** column for the new Report that was uploaded.

   This opens the **Properties** page for the Report where you can select its Shared Data Source.

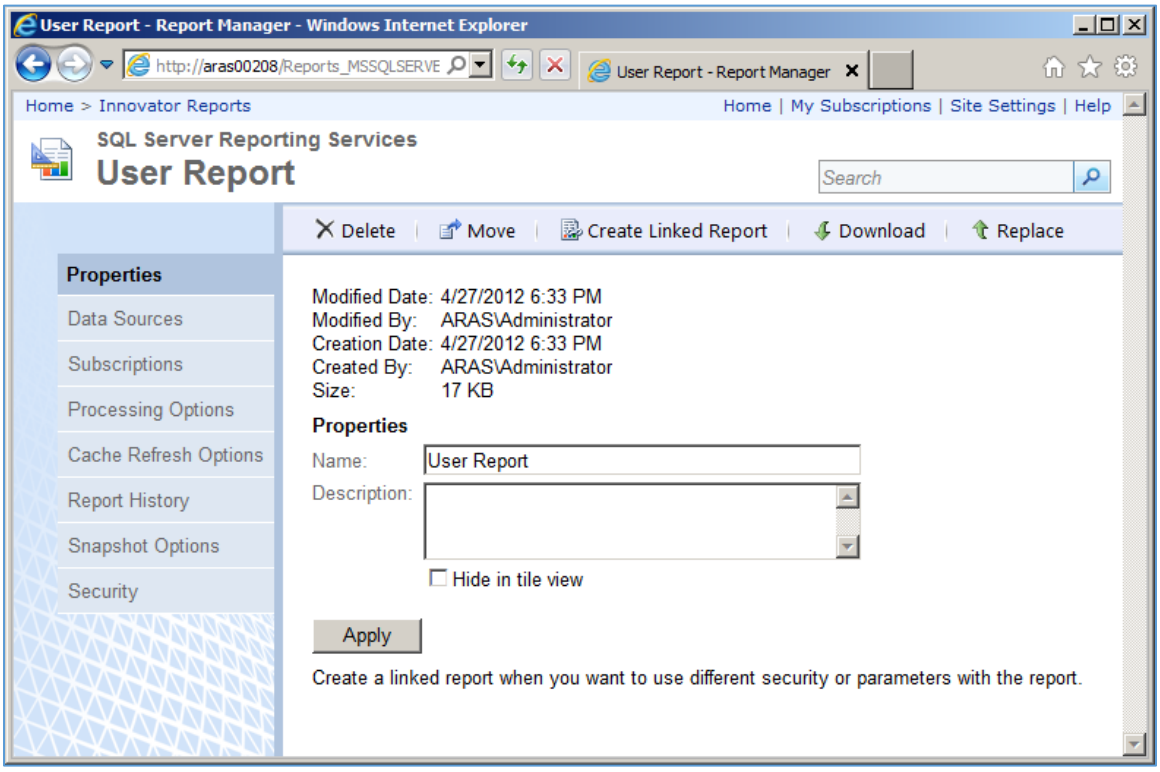

Figure 42.

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2. Select the **Data Sources** navigation link.
3. Select the first **A shared data source** choice.

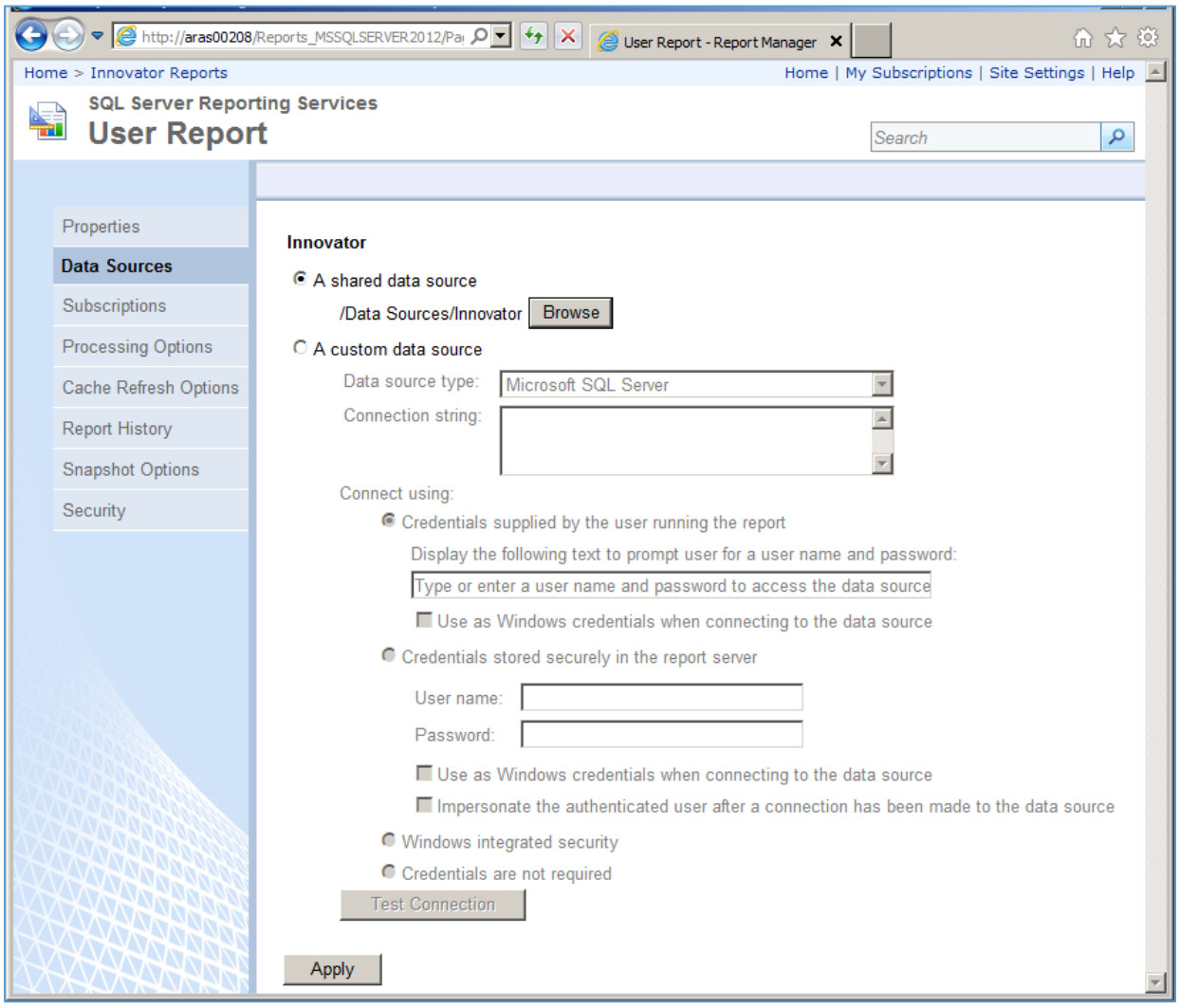

Figure 43.

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4. If the named Shared Data Source is incorrect for this ReportServer, click **Browse** to open the Shared Data Source page, navigate the folders to locate the desired Shared Data Source, select it, and click **OK**.

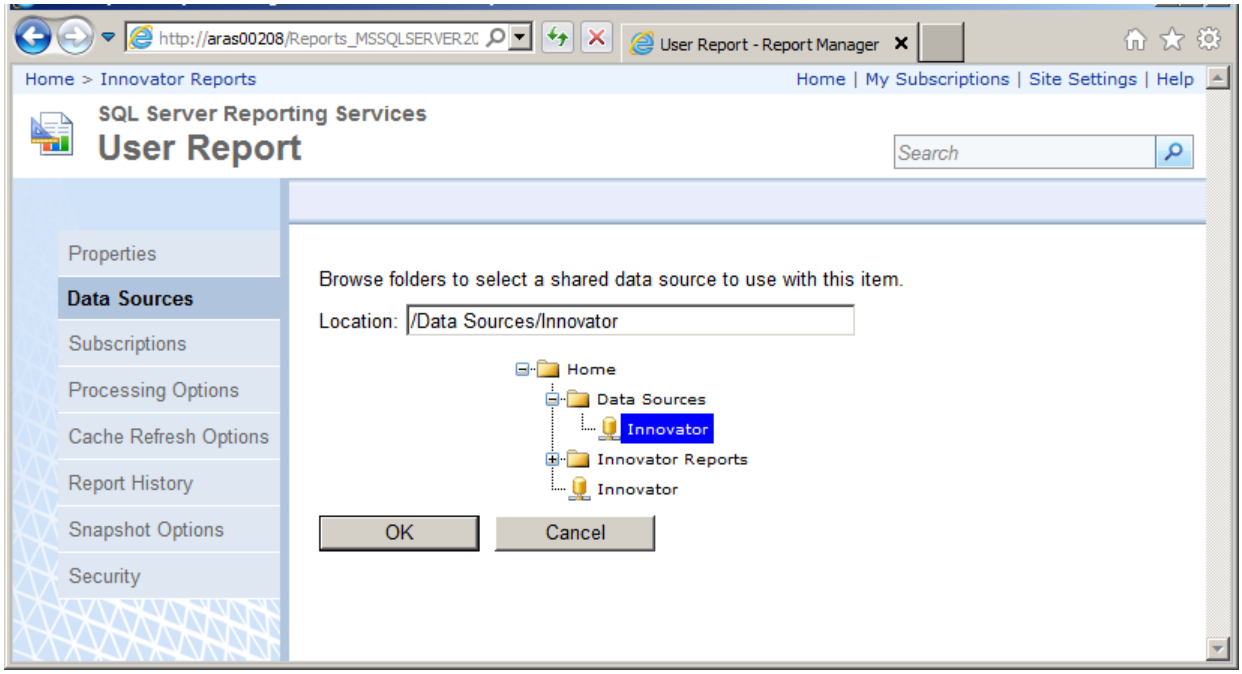

Figure 44.

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8 Date Related SQL Queries

AML is the language of Aras Innovator, but some external add-ons do connect to Aras Innovator on a direct SQL level. Because Aras Innovator stores DateTimes in SQL Server as UTC, we have provided an add-on function for Microsoft SQL Server that allows the easy conversion of DateTime to and from UTC.

To convert DateTime values from UTC to a specific time zone, use the `ConvertToLocal ({value},{Time Zone})` function. The time zone should be specified according to the registry key name of the time zone desired; refer to *Aras Innovator 2023 Release- Configuring Internationalization*. To use the `DEFAULT` parameter for the `{Time Zone}`, it is required that a value be set for `CorporateTimeZone`.

Example:

```
select item_number, created_on

from innovator.Document
```

Would be written as:

```
select item_number, innovator.ConvertToLocal(created_on,DEFAULT) as
CreadtedOn

from innovator.Document
```

Or:

```
select item_number, innovator.ConvertToLocal(created_on,'Eastern Standard
Time') as CreadtedOn

from innovator.Document
```

To convert `DateTime` values from a specific time zone to UTC, use the `ConvertFromLocal({value},{Time Zone})` function. The time zone should be specified according to the registry key name of the time zone desired; refer to *Aras Innovator 2023 Release- Configuring Internationalization*. To use the `DEFAULT` parameter for `{Time Zone}`, it is required that a value be set for `CorporateTimeZone`.

Example:

```
update innovator.Document

set effective_date = '1/1/2007 00:00:00.00'
```

Would be written as:

```
update innovator.Document

set effective_date = innovator.ConvertFromLocal('1/1/2007
00:00:00.00',DEFAULT)
```

Or:

```
update innovator.Document

set effective_date = innovator.ConvertFromLocal('1/1/2007
00:00:00.00','Eastern Standard Time')
```

This allows users to write queries in a familiar time zone context.

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```
select item_number, innovator.ConvertToLocal(release_date,DEFAULT) as
ReleaseDate

from innovator.Document

where created_on >= innovator.ConvertFromLocal('1/1/2007
00:00:00.00',DEFAULT)
```

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