



Aras Innovator 12

Microsoft Reporting Services Guide

For use with Microsoft SQL Server 2012

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Document Conventions

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

Table 1: Document Conventions

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 <code>courier</code> text. It may represent text you type or data you read.
<code>Yellow highlight</code>	Code with yellow highlight is used to draw attention to the code that is being indicated in the content.
<code>Yellow highlight with red text</code>	Red color text with yellow highlight is used to indicate the code parameter that needs to be changed or replaced.
<i>Italics</i>	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 .

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

Planned enhancements are a tighter integration of the authentication / permissions model, and finding an alternative to Visual Studio for end-use report layout.

To learn more about Microsoft Reporting Services visit: [Microsoft SQL Server: Reporting](#)

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.

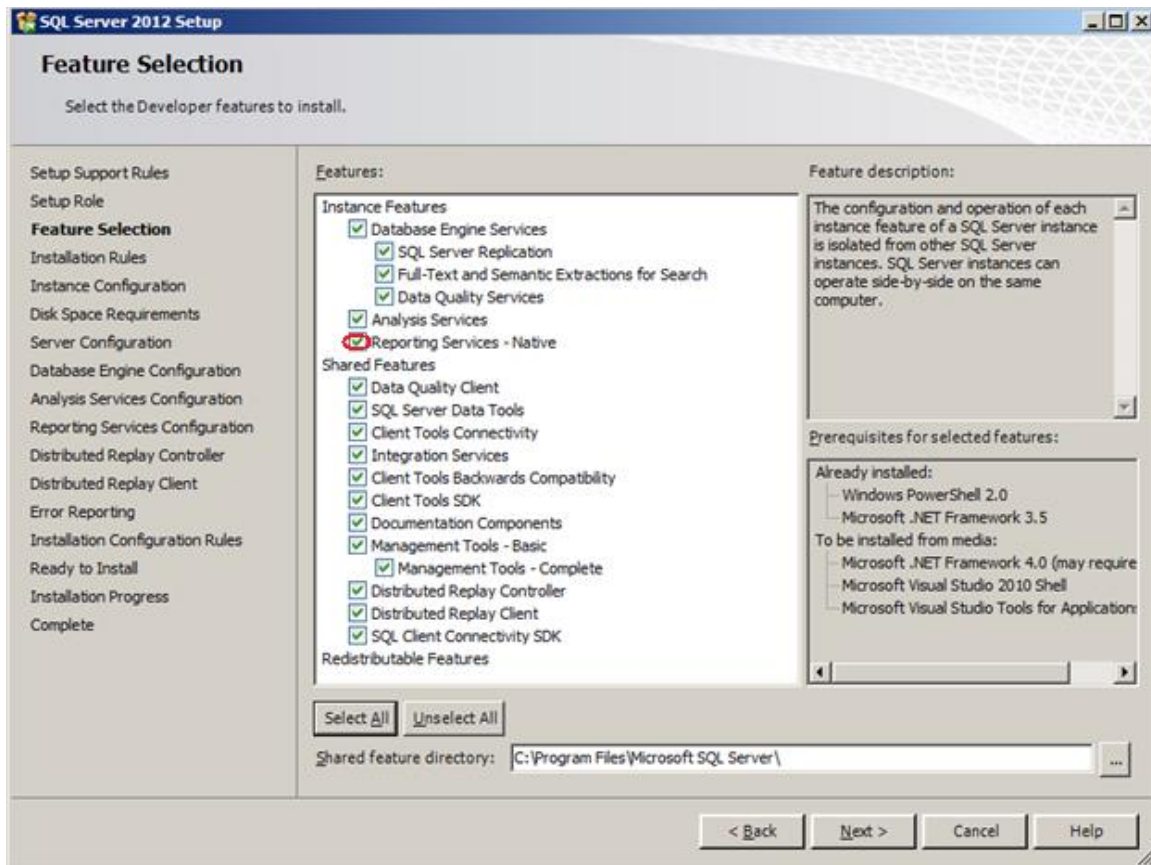


Figure 1.

In addition to selecting the Reporting Services option, you can select 'Analysis Services' which 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

The following is a summary of dialogs to be used when installing SQL server 2012.

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

2.1.1 Default Instance

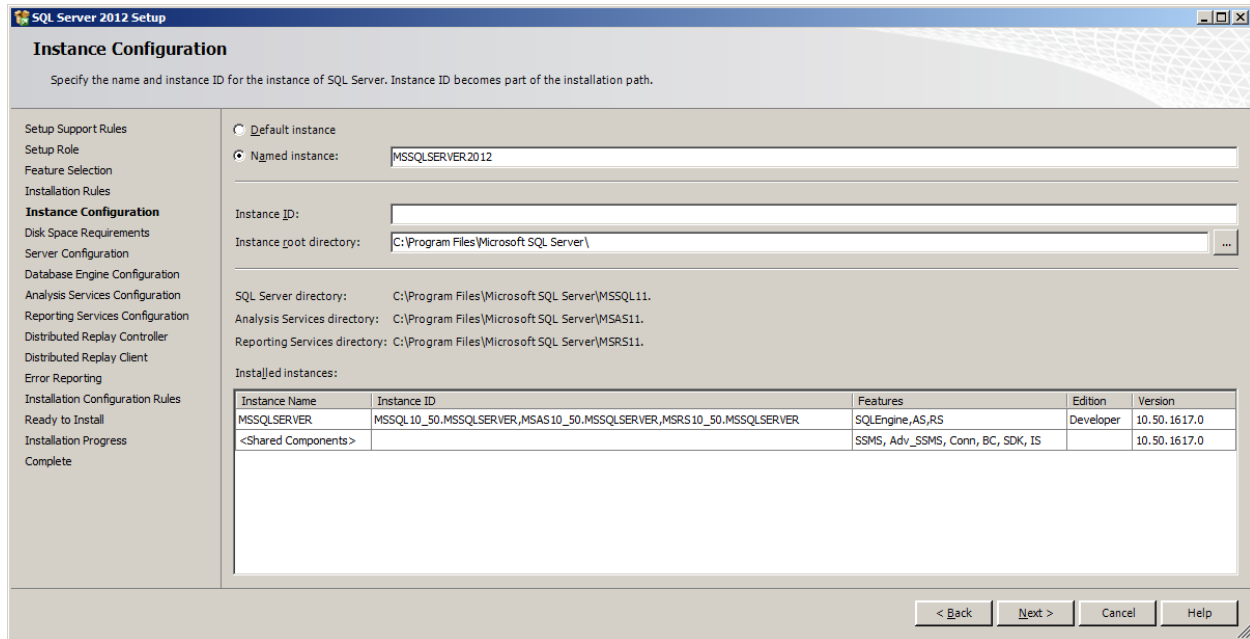


Figure 2.

2.1.2 Service account Setup

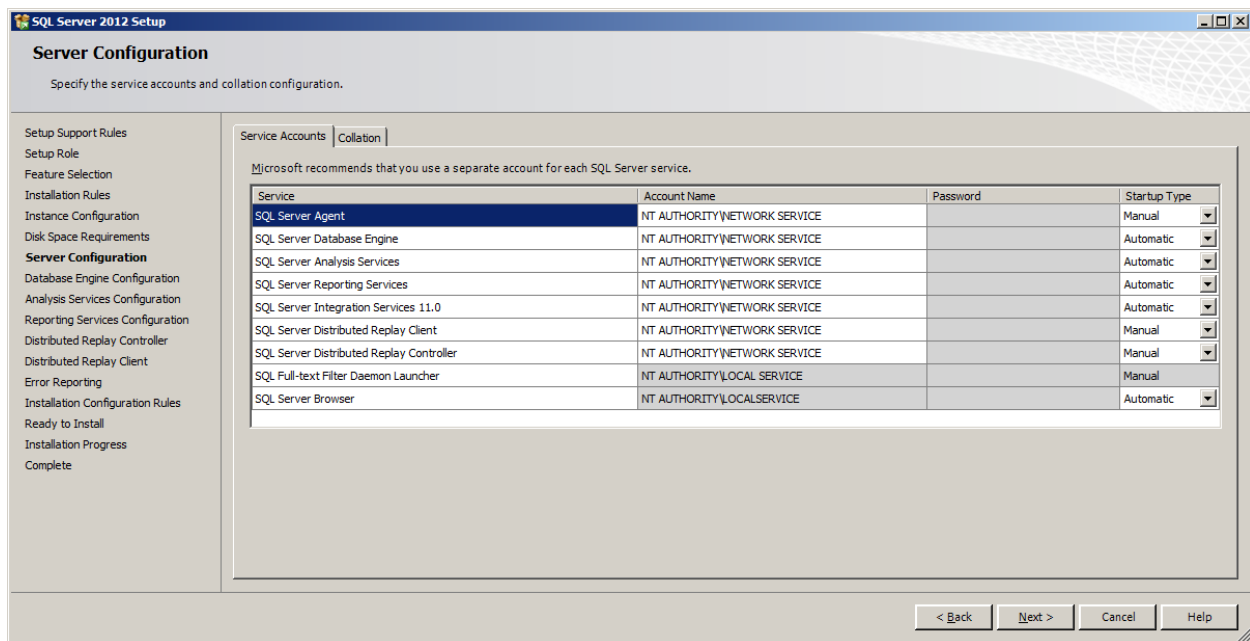


Figure 3.

2.1.3 Database Engine Configuration and Authentication Mode

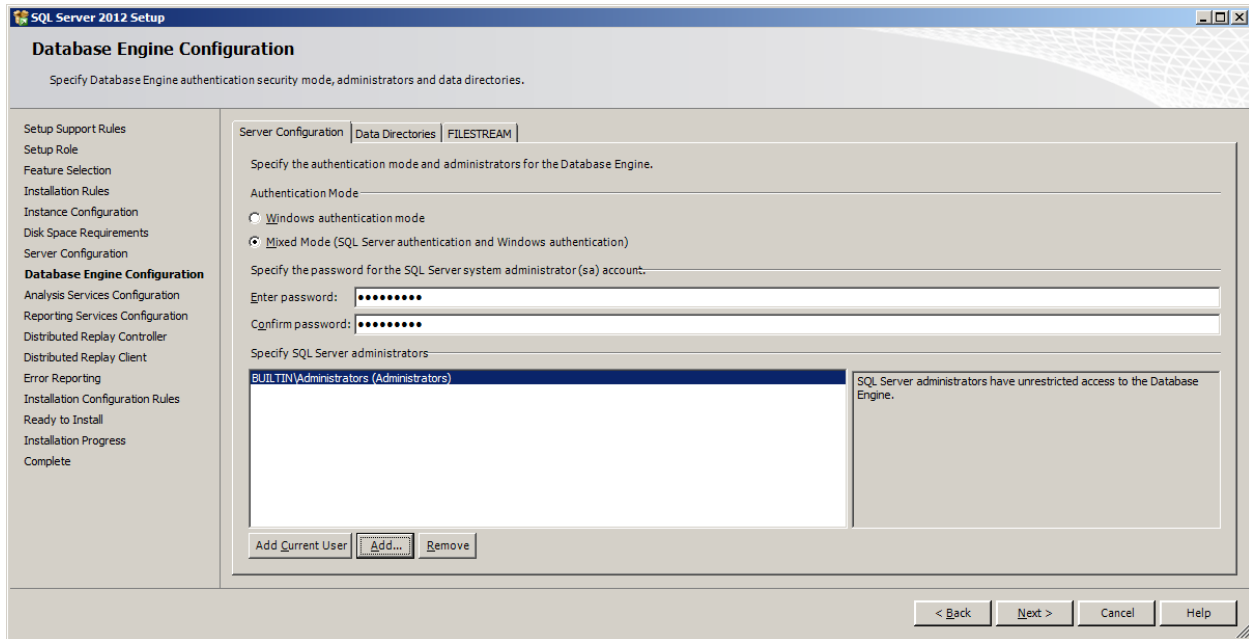


Figure 4.

2.1.4 Analysis Services Configuration

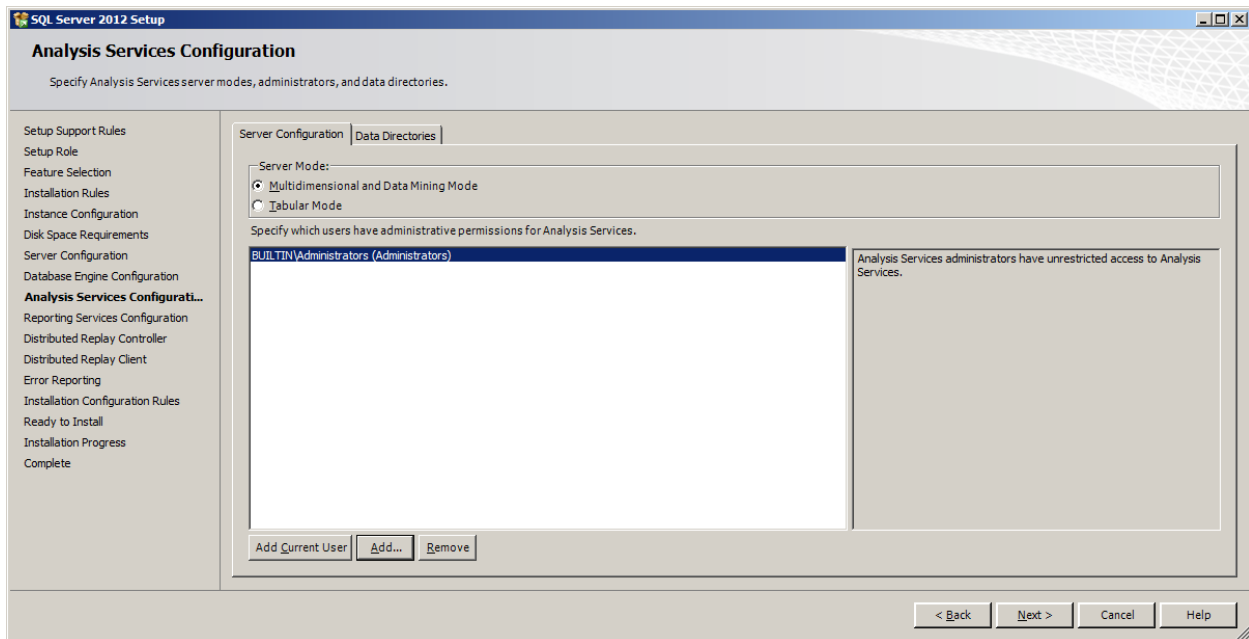


Figure 5.

2.1.5 Reporting Services Options

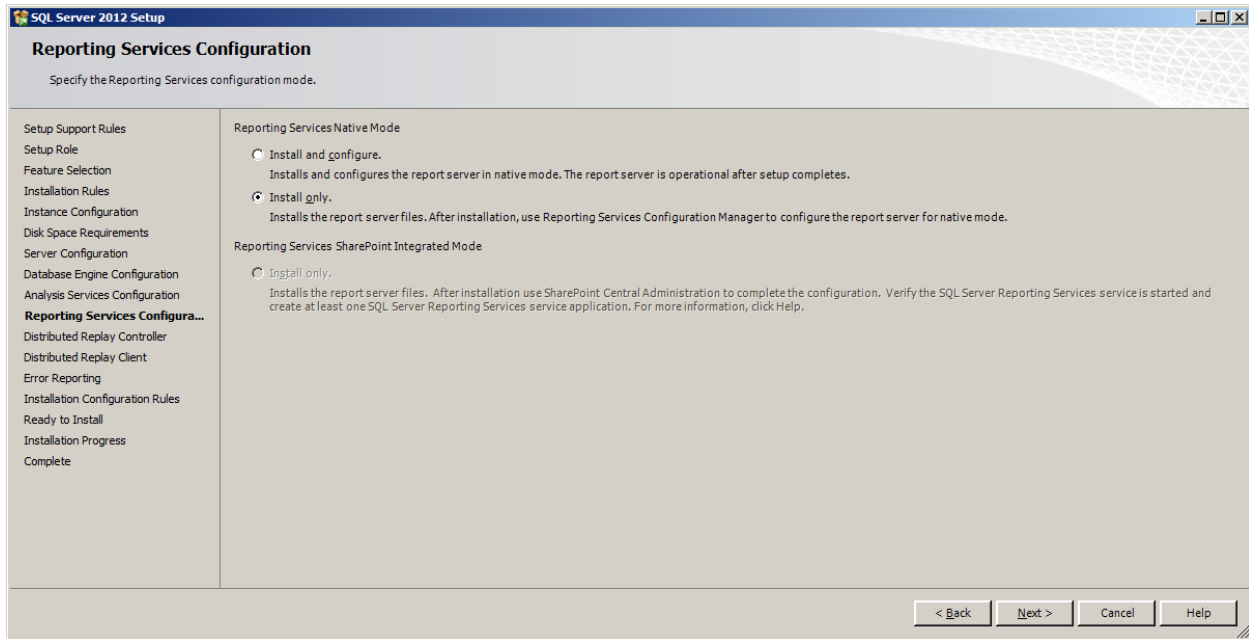


Figure 6.

2.1.6 Remaining Selections

The default selections can be used from this point forward.

3 Configuring Reporting Services

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

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 Reporting Services ReportServer comes with a 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.

Open your browser with the URL <http://localhost:8080/Reports> (on a default install).

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

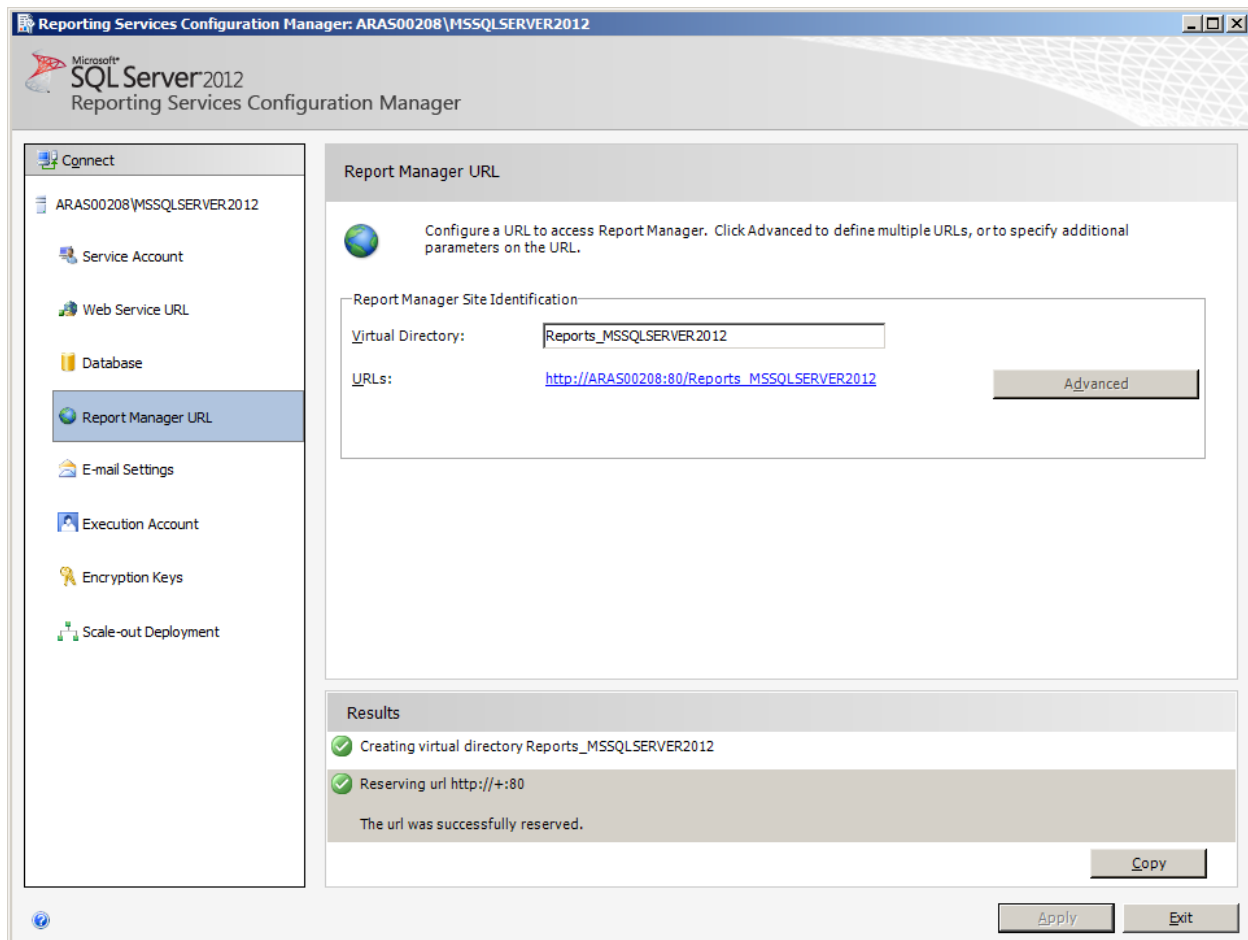


Figure 7.

1. The **Report Manager** page opens in a new window as shown below:

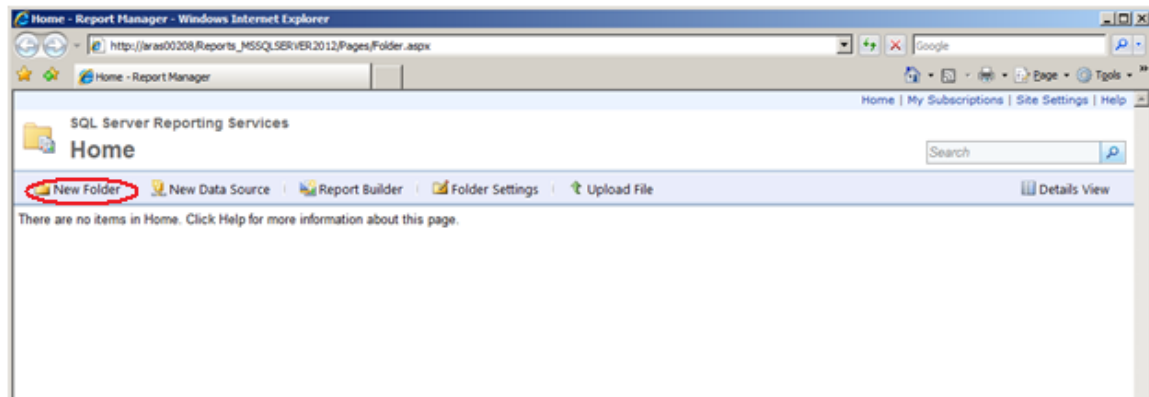


Figure 8.

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

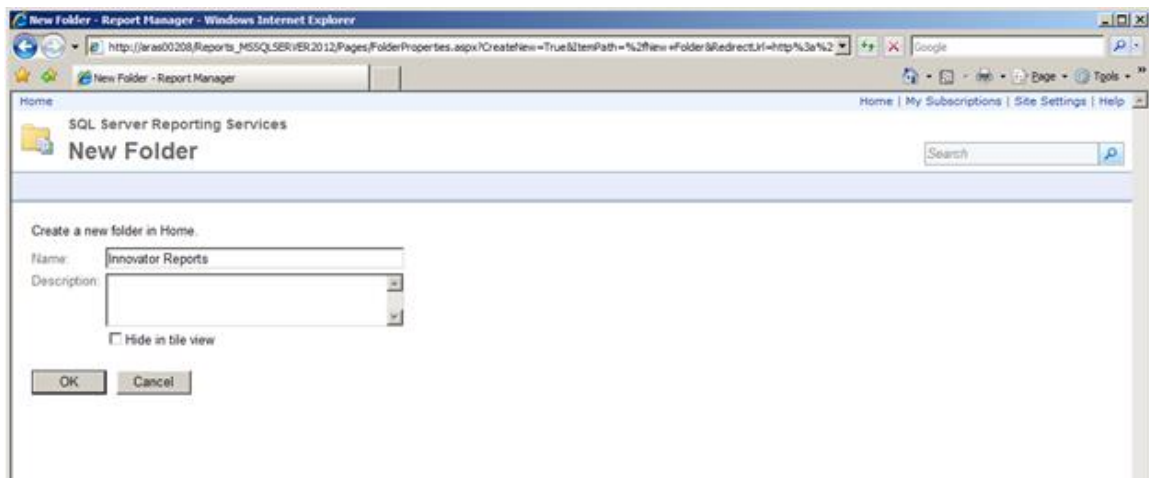


Figure 9.

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 Administration\Variables in the TOC. The default value for this is 'Innovator Reports' but can be customized for each database. For the purposes of these instructions, we assume the default value is used.

3.2 Add Shared Data Source

Once you add the 'Innovator Reports' 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 **+** then **Data Source** inside the Innovator Reports folder.

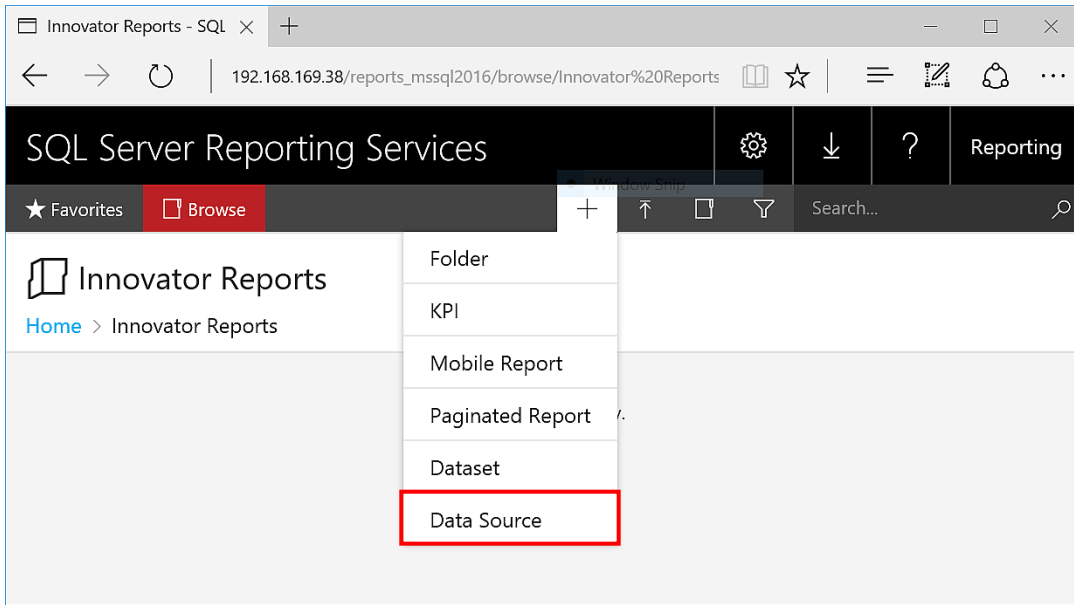


Figure 10.

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.

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 local 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 you can configure Aras Innovator by setting the user name and password in the InnovatorServerConfig.xml configuration file:

```
<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.

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

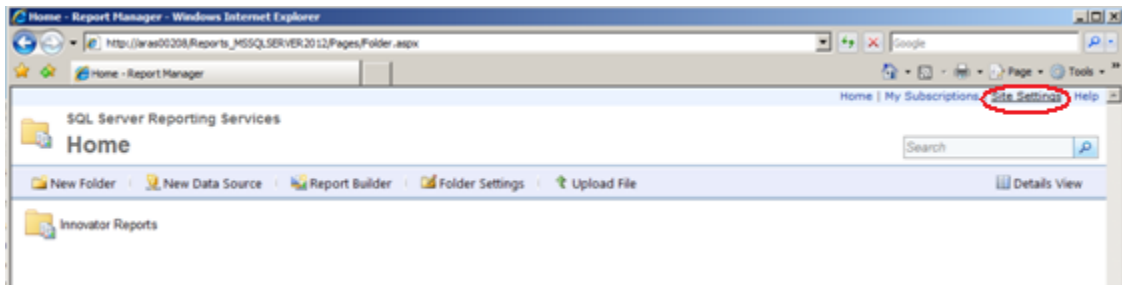


Figure 12.

2. Click on the **'Security'** tab.

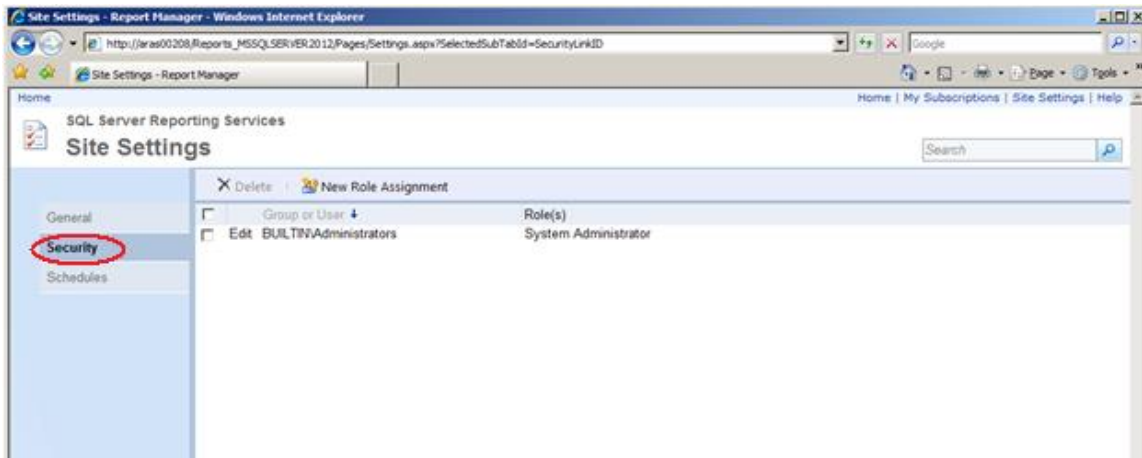


Figure 13.

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

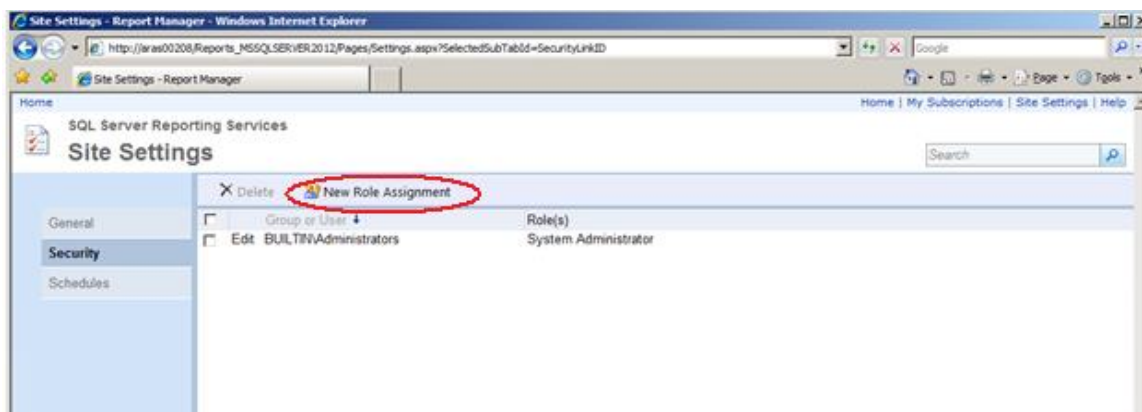


Figure 14.

- Enter the User Account name Reporting and check the **'System User'** checkbox and click **'OK'** to create the new Role.

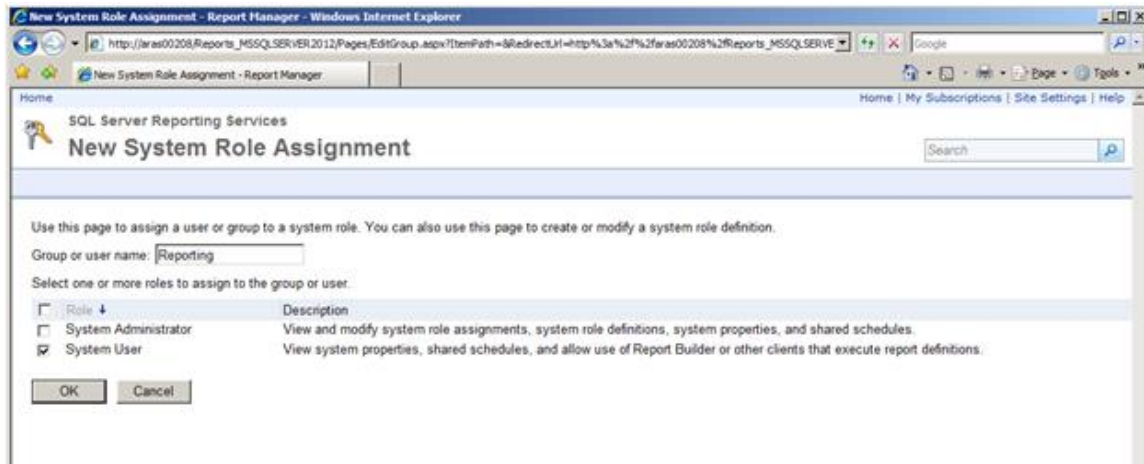


Figure 15.

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

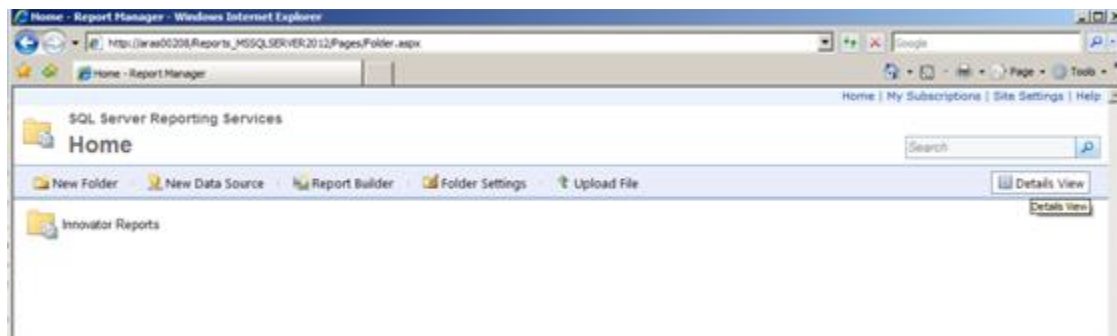


Figure 16.

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

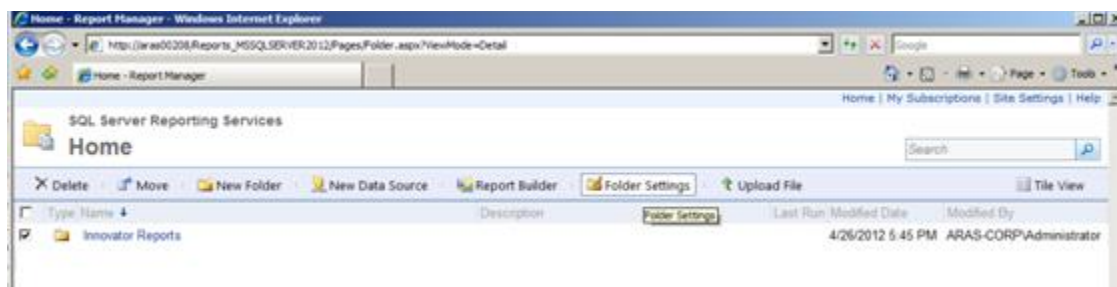


Figure 17.

7. Click 'New Role Assignment'.



Figure 18.

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

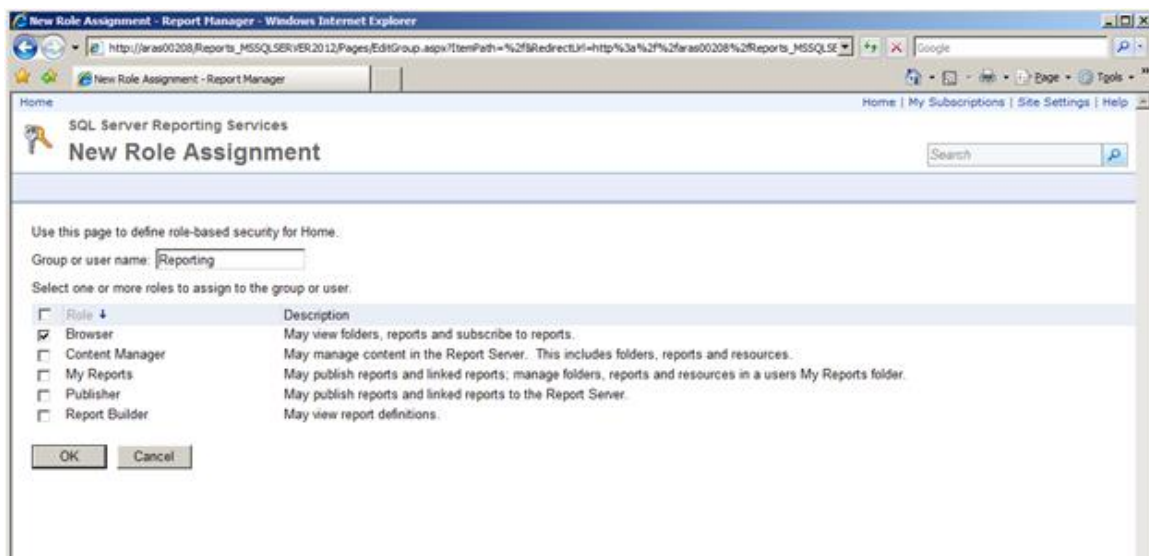


Figure 19.

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. Plus 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 project named 'Innovator Reports'. This becomes the Reporting Services Folder to hold the Reports for Aras Innovator.

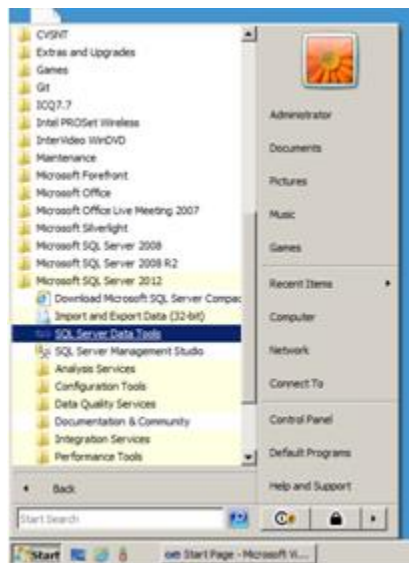


Figure 20.

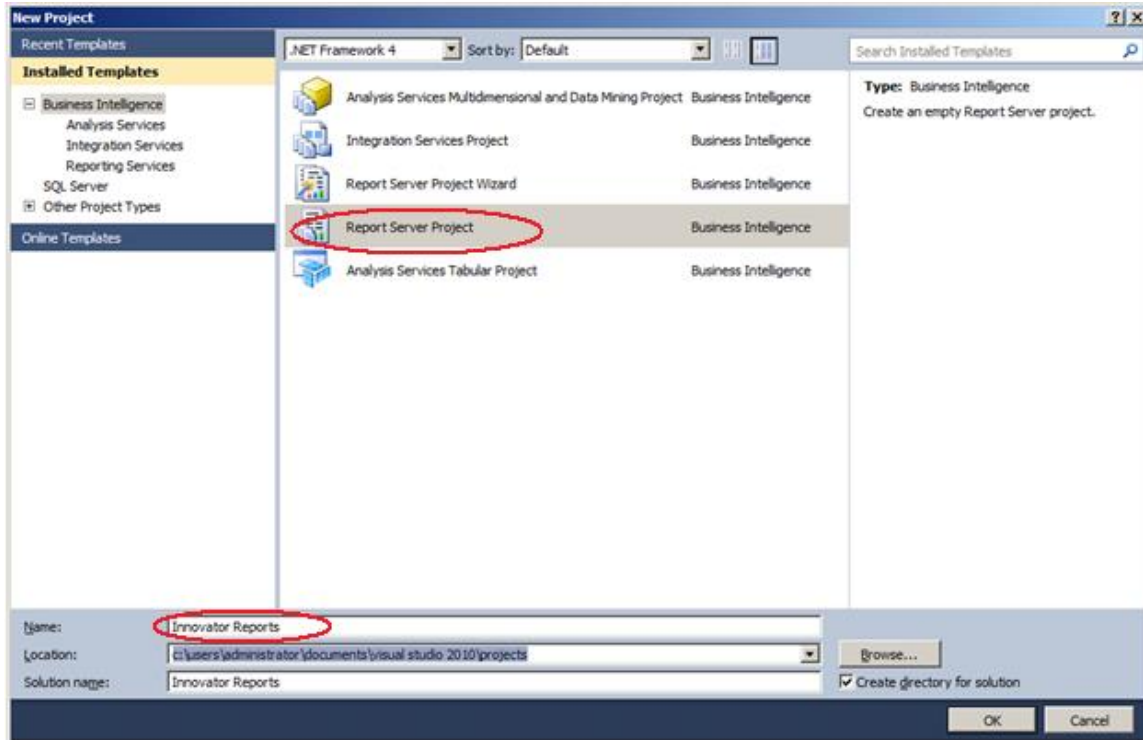


Figure 21.

4.2 Configure Project Properties

Open the 'Solutions Explorer' panel from the menu **View --> Solutions Explorer** if it is not already opened.

Right-click the 'Innovator Reports' folder and select the Properties context menu choice.

On the Properties dialog set the TargetServerURI field to the URL of the Report Server. For example, <http://localhost:8080/ReportServer> where the actual name of the server host name is entered in place of localhost.

Also set the **OverwriteDateSources** flag to True.

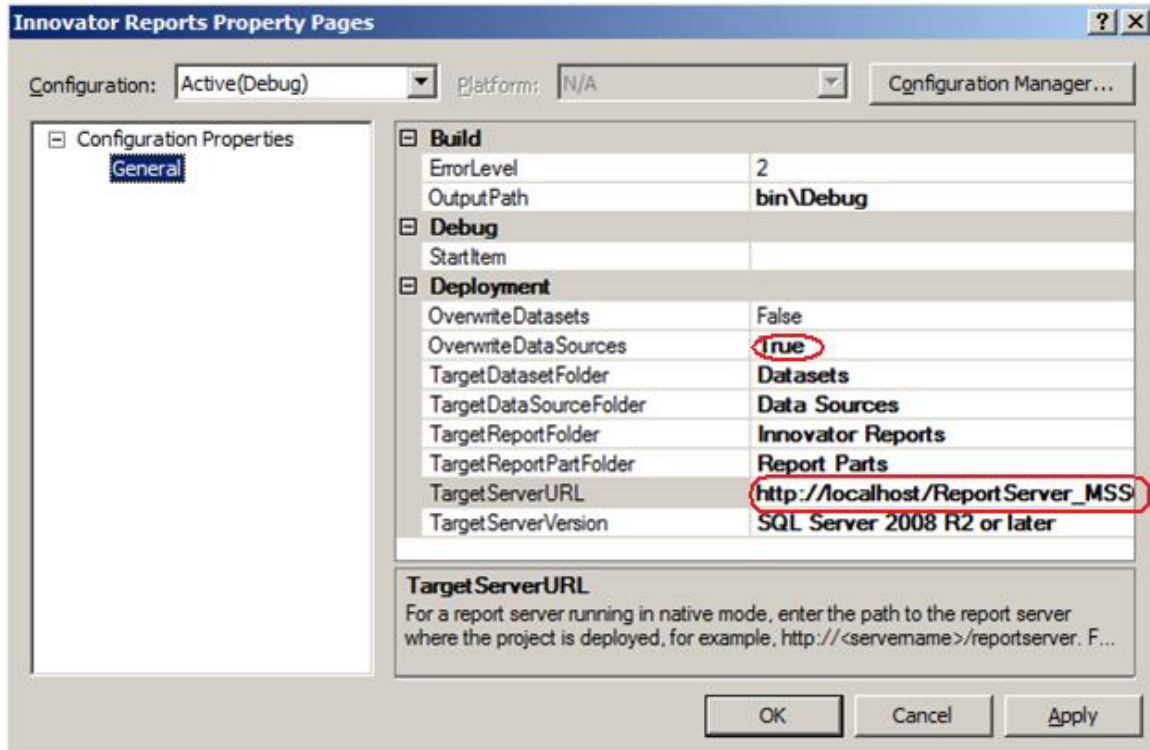


Figure 22.

4.3 Add New Shared Data Source

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

4.3.1 Connection Properties

1. Select or enter the '**Server name**' for the machine SQL Server is installed.
2. Select the '**Use a specific user name and password**' option and enter the login credentials for the database and check the **Save My password** option.
3. Select or enter the '**Database name**'.

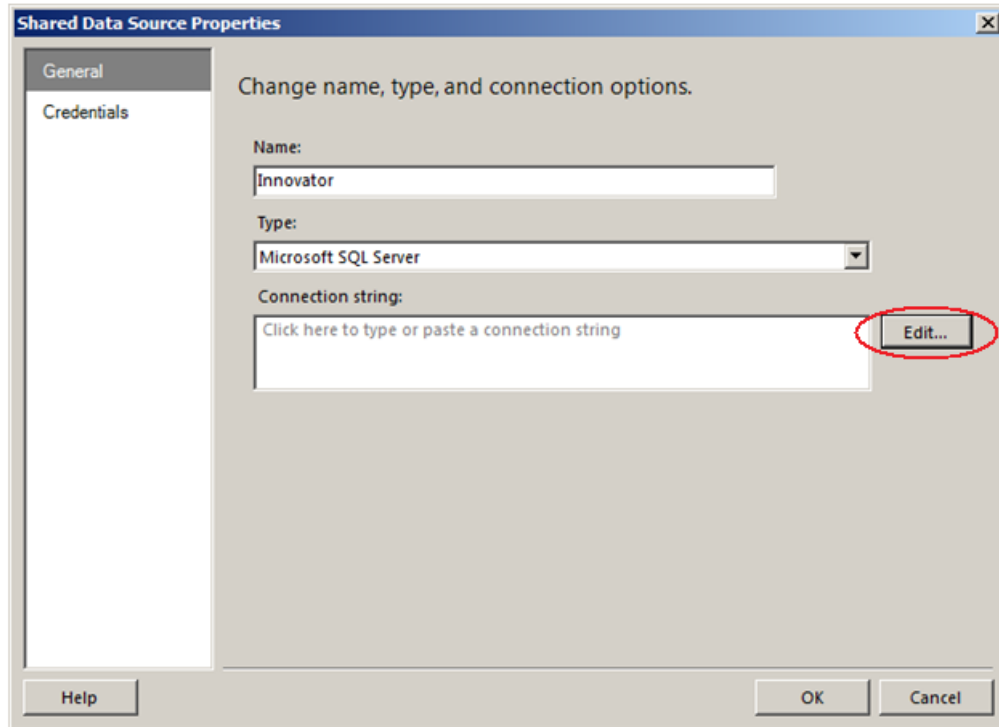


Figure 23.

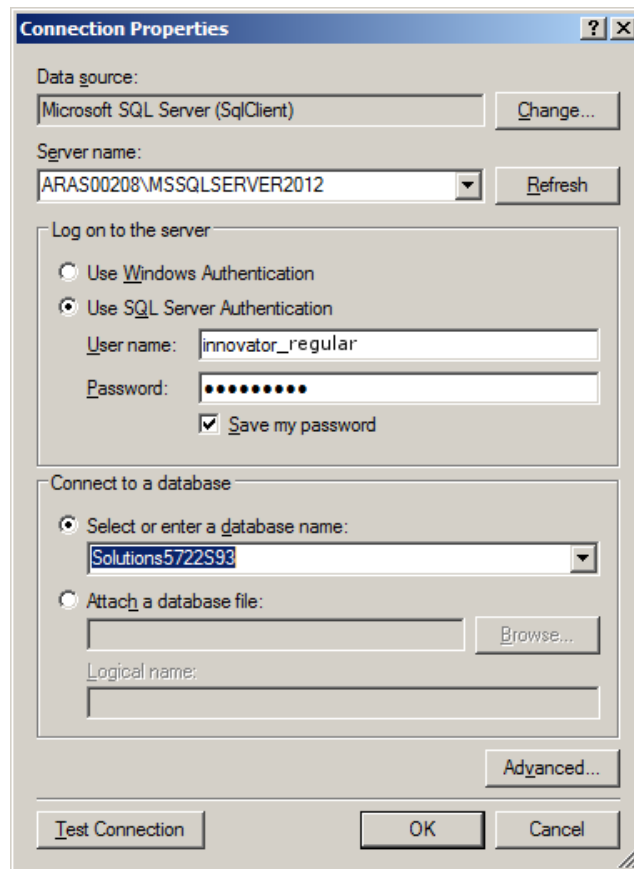


Figure 24.

4.3.2 Deploy the Shared Data Source

By default, the name of the Shared Data Source 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.

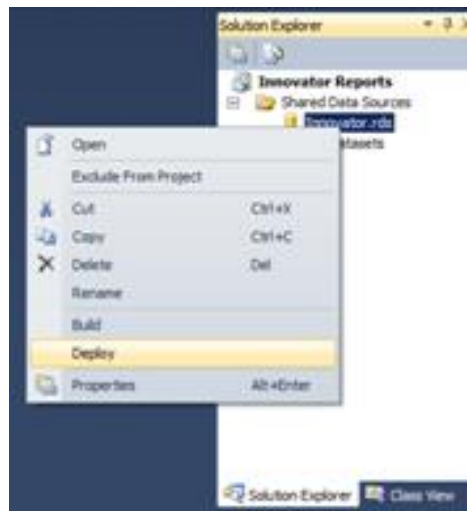


Figure 25.

5 Creating your First Report

The following illustrates using the Report Wizard to create a new Report. For this Report we create a simple User Directory Report showing the Users First Name, Last Name, Email, Phone Number, and Company Name. The following is a screen shot of the Report that we will be creating:

5.1 Start a New Report using the Wizard

From the '**Solution Explorer**' panel right mouse click on the '**Reports**' folder and select the context menu choice '**Add New Report**'.

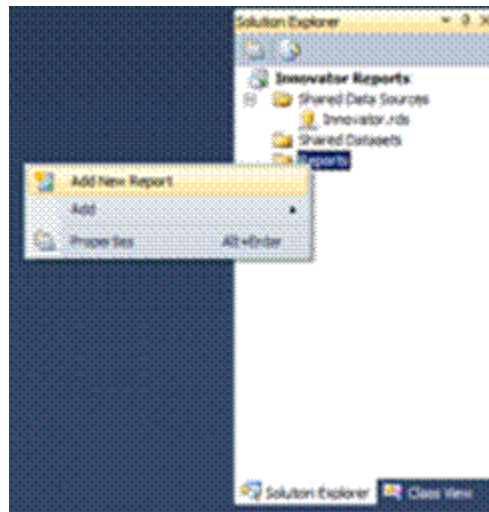


Figure 26.

5.2 Select the Data Source

You can create a unique Data Source for this Report but it typical that you use the default Shared Data Source that you created.

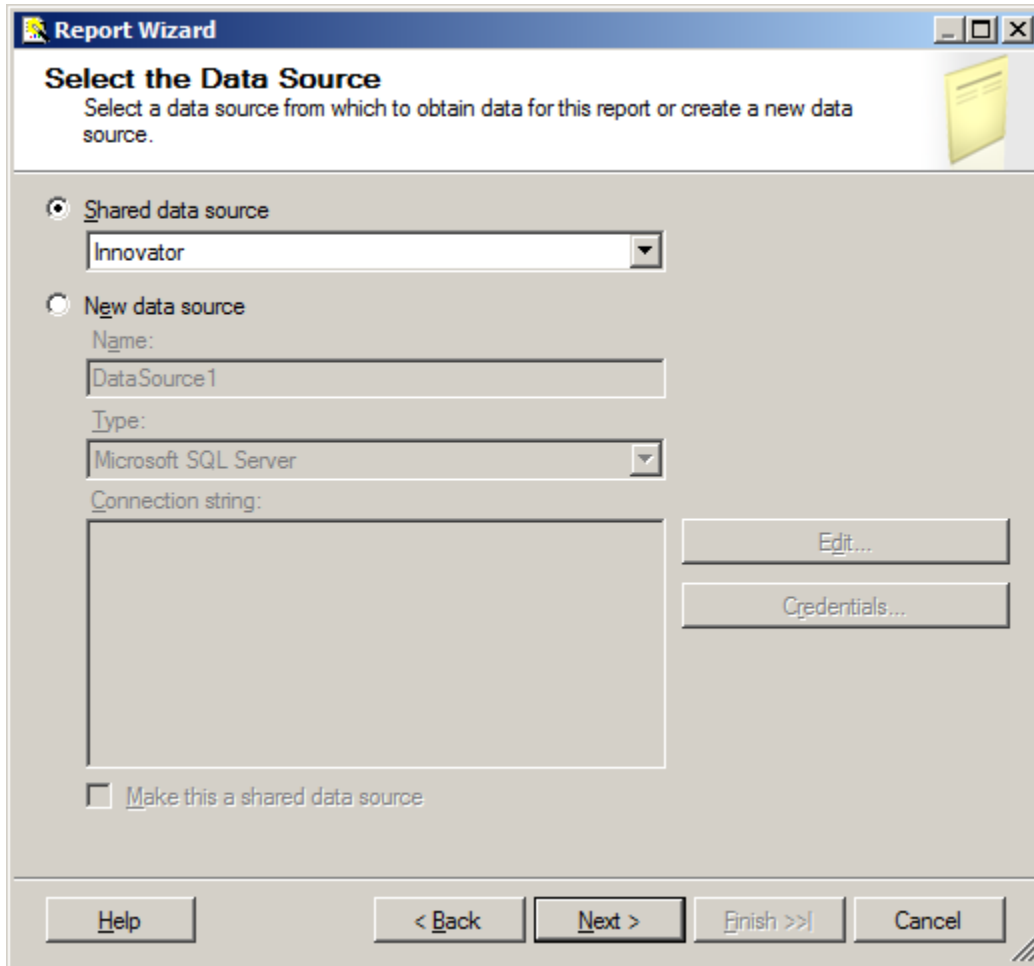


Figure 27.

5.3 Design the Query

You need to provide the SQL Select query that fetches the data for the Report. In many cases you can enter the simple select clause in the dialog directly.

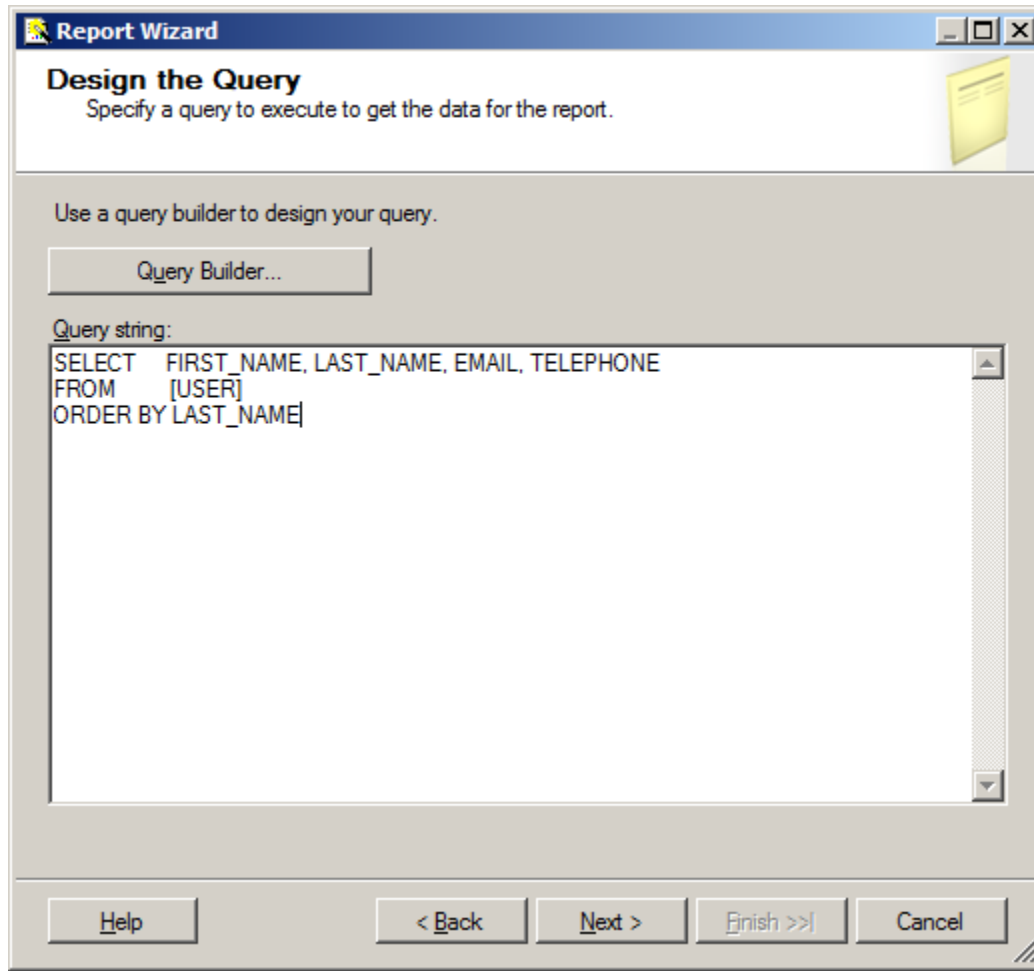


Figure 28.

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.

5.4 Select the Report Type

There are two choices for the Report Type: **Tabular** (column layout) and **Matrix** (rows and columns layout). Select the **Tabular** type:

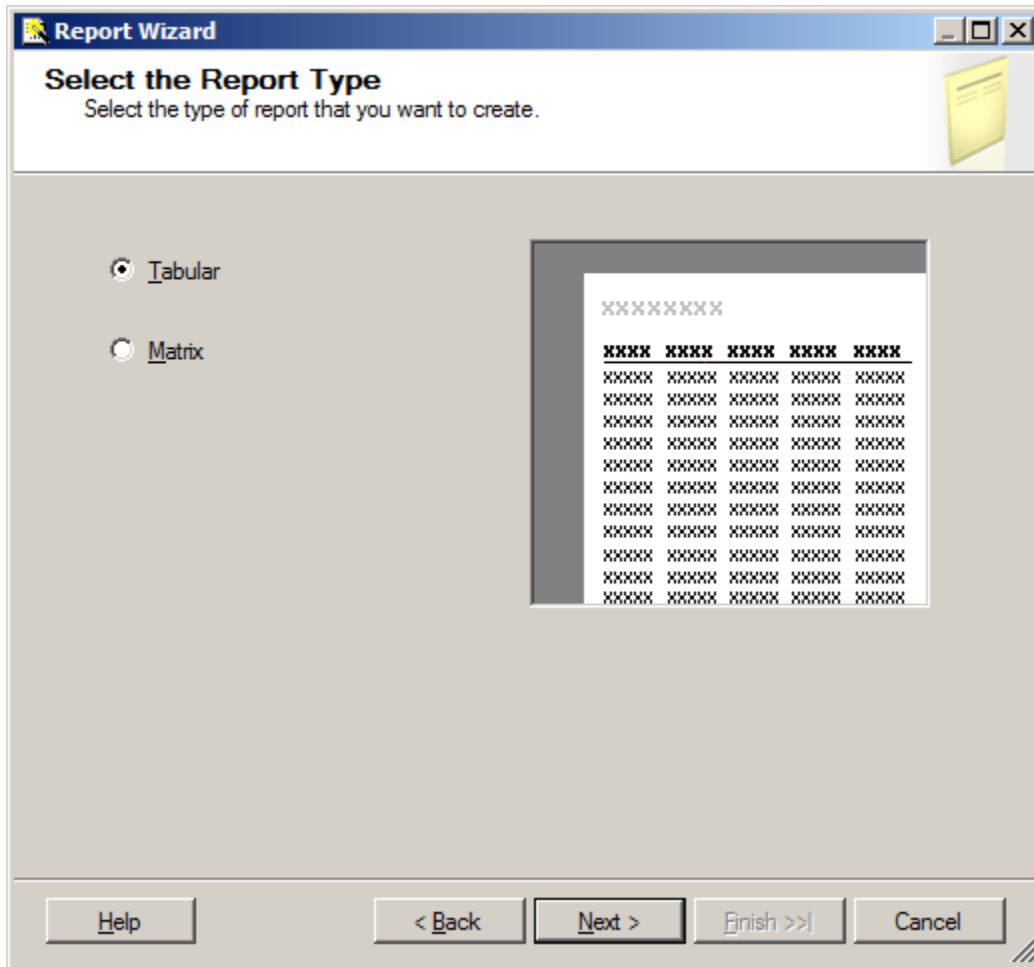


Figure 29.

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.

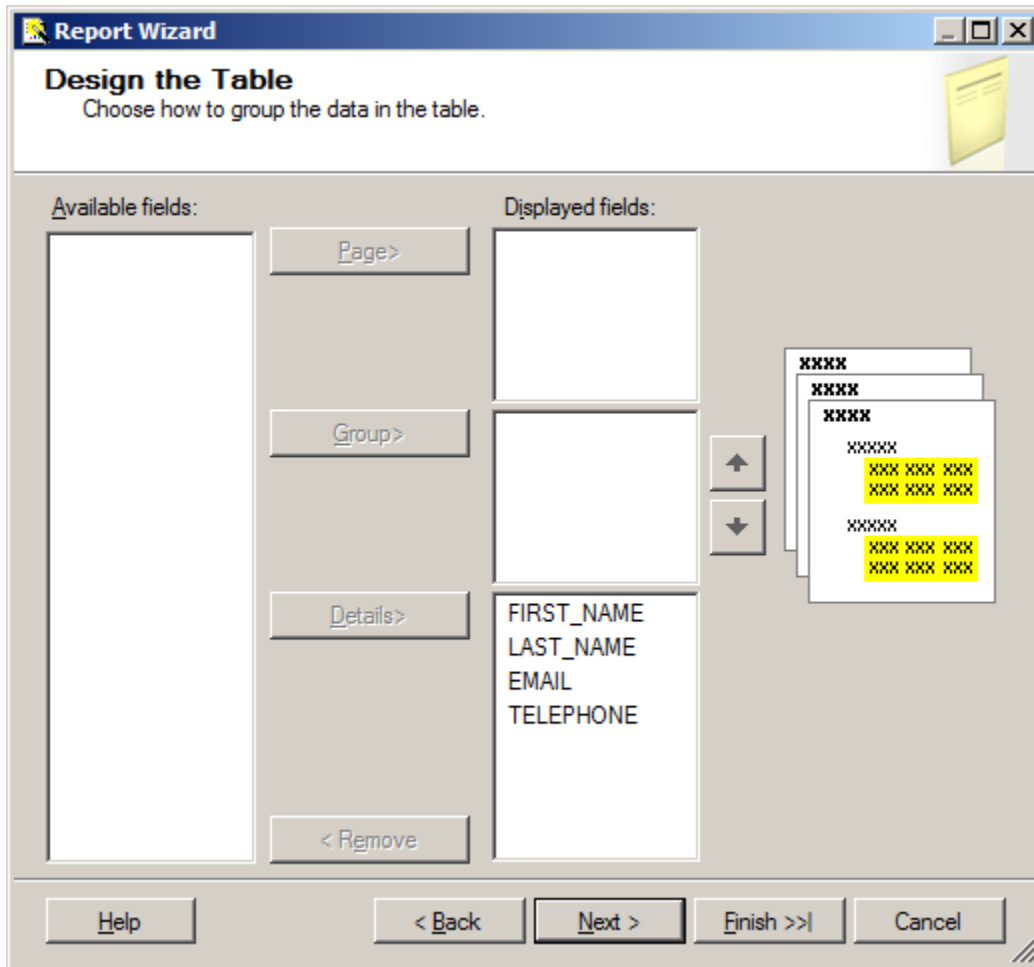


Figure 30.

5.6 Choose the Table Style

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

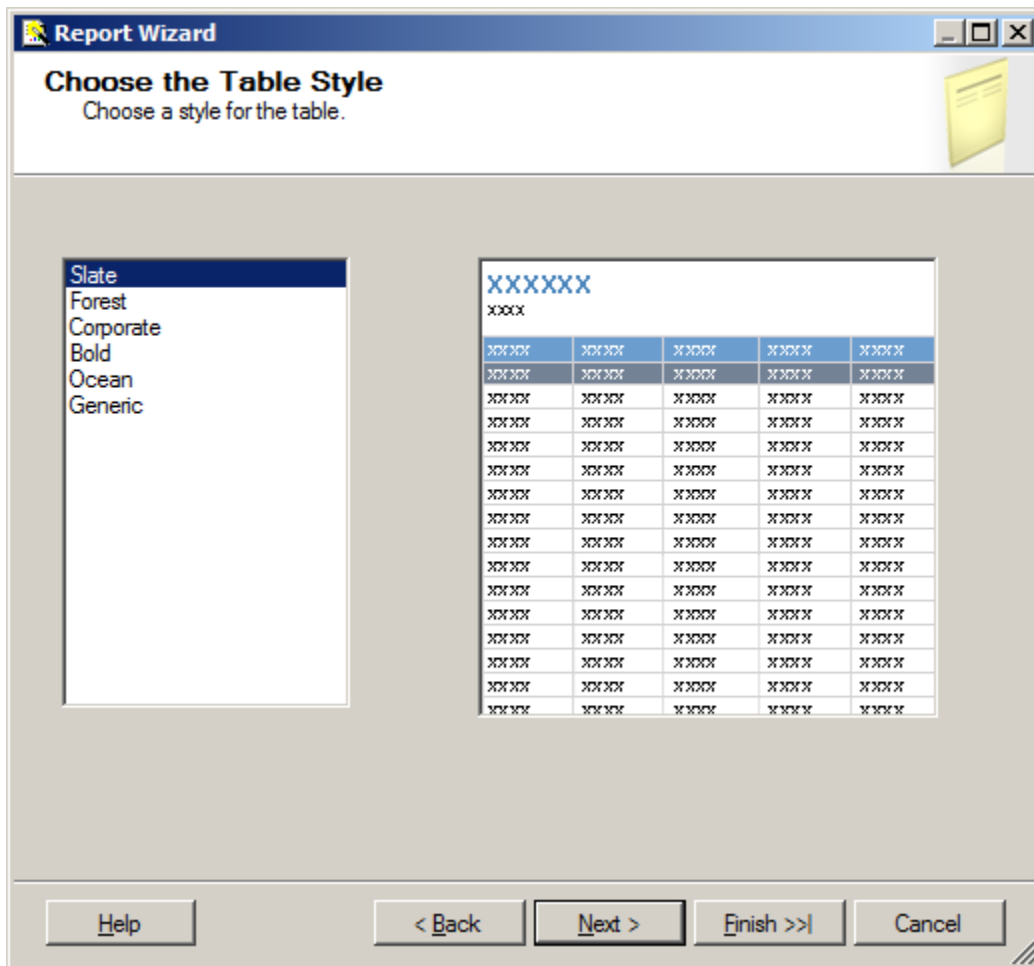


Figure 31.

5.7 Name the Report

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

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

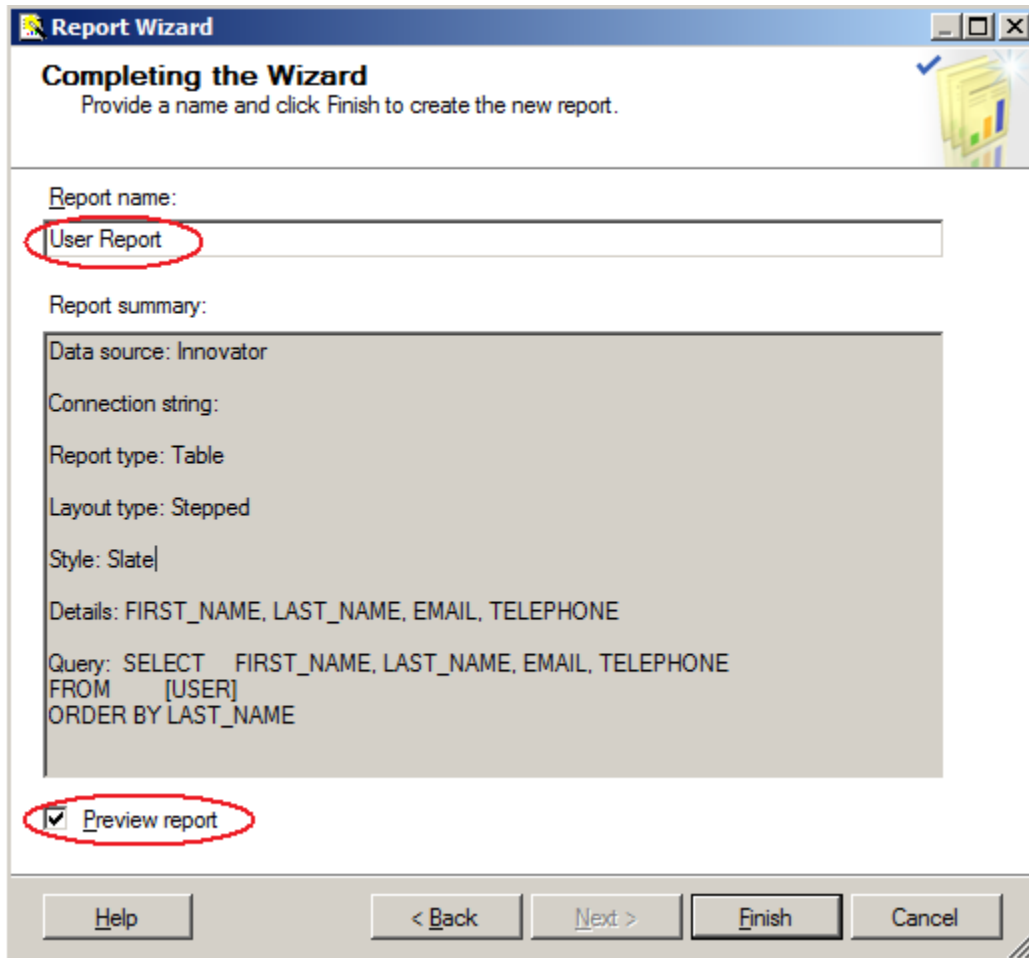
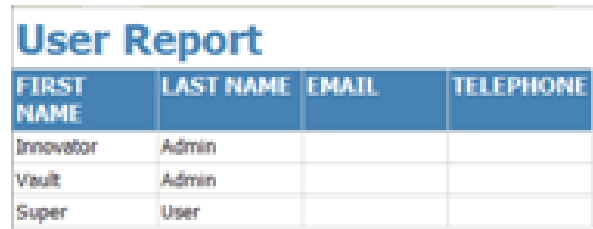


Figure 32.

5.8 Wizard Report Results

The Report wizard builds the report, which looks similar to following screen shot:



FIRST NAME	LAST NAME	EMAIL	TELEPHONE
Innovator	Admin		
Vault	Admin		
Super	User		

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, 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 the **View --> Fields** menu, pick to open the Fields panel when in Layout mode.
 Use the **View --> Toolbox** menu, pick 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.

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. From the 'Solution Explorer' panel right mouse click on the 'User Directory' Report item and select the context menu choice Deploy. Watch for error messages in the output window at the bottom of the frame.

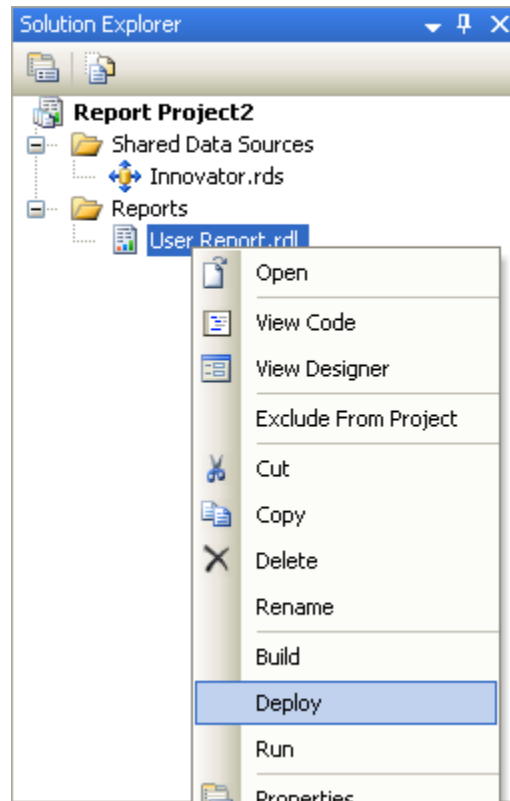


Figure 34.

5.11 Confirm Deployment

To confirm the new report has been deployed, open IE Browser and navigate to <http://localhost:8080/Reports>. You should see the 'Innovator Reports' folder. Click on that link and you should see the report you created.

Select the hyperlink for the new Report and after it opens, 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](http://localhost:8080/ReportServer/?/Innovator%20Reports/User%20Directory).

5.12 Running the Report from within Aras Innovator

In order 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 exactly 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, navigate to **Administration --> Reports**.
3. Click **New** on the main Toolbar.
4. When the new Report Form opens enter the name of the Report (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 available always.
6. Select the Report Location, which in this case is **'Service'**.
7. Select the Report Target, which in the case we want **'Window'**.
8. Because this sample Report is of type ItemType there is no Report query Value.

The screenshot shows the 'User Directory' report configuration form in Aras Innovator. The form is titled 'Report' and has two tabs: 'Report' and 'Stylesheet'. The 'Report' tab is active, showing the following fields:

- Name:** User Directory
- Type:** Generic
- Location:** Service
- Target:** Window
- Description:** (empty text box)
- Method:** (empty text box)
- Label:** (empty text box)
- Report Query:** (empty text area)

Figure 35.

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

9. Test the Report by clicking on the Reports main menu bar choice and you should see the new **'User Report'** choice. Click on the menu choice and you should see a new window open with the **'User Directory'** Report.

5.12.2 Passing Named Parameters to the ReportServer

As step 4 describes in the section 3.1, Report Server Variable, the value of the Innovator Report Item Property `report_query` 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 is the directive for Innovator to add the string `&id=ACBDEF0123456789ACBDEF0123456789` to the end of the ReportServer URL (but the actual ID value is used).

In this case the Innovator Report is of type `Generic` so no ID is required but perhaps we want the Reporting Services Report to be returned in 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
```

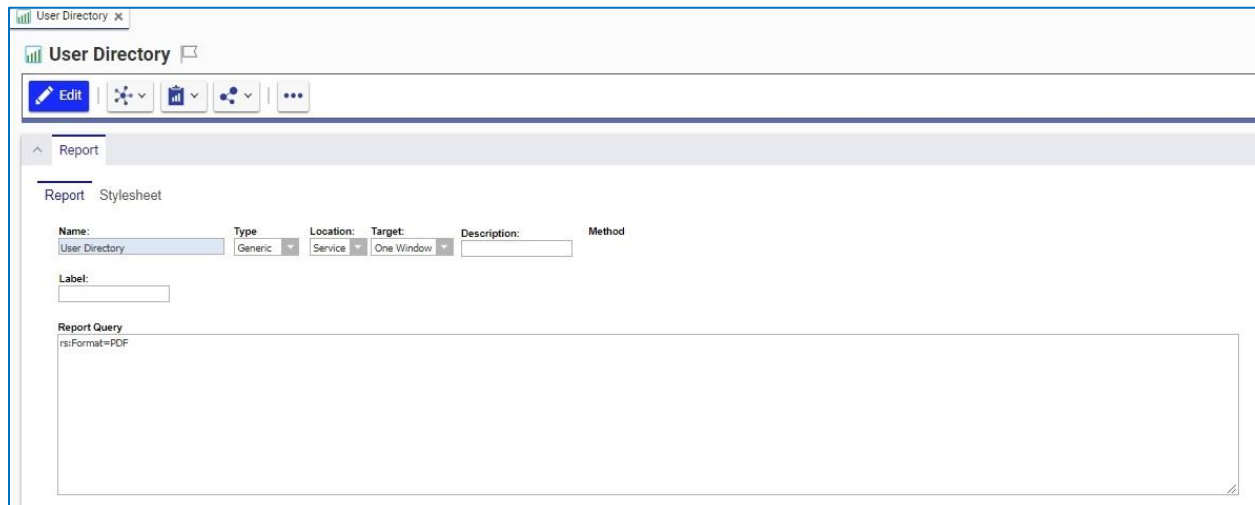


Figure 36.

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 `<`, `>`, and `&`, respectively.

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

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

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 Innovator Report Item's report_query property, which the client then uses to form the 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 value Kohl to the Named Parameter @last_name in the SQL Select:

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

6.2 Format Parameter

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

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
```

6.5 Report Name

The Aras Innovator client automatically appends the Parameter to specify the Report to run on the 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
```

7 Report Manager

The Reporting Services ReportServer comes with a Report Manager page to administer the Reports, Folders, Data Sources, and so on. This page has been integrated into Aras Innovator client via an Innovator Report that opens the Report Manager page (see section 2 Configuring Aras Innovator 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 the RDL file for the Report from your local development machine and then importing it into the production machine.

The process of exporting a Report and importing it into another ReportServer and enabling the Report in Aras Innovator is a four step process:

1. Export the 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, navigate to **Administration --> Reports**.
2. Click **Reports** on the main menu and the **'Report Manager'** choice.
3. The **Report Manager** page opens in a new window as shown below:

You may need to click **'Show Details'**.

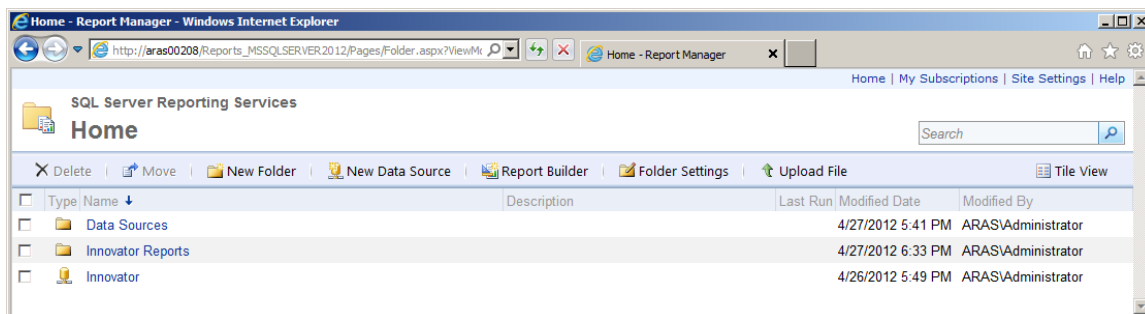


Figure 37.

Note: This same page can be opened from your browser with the URL <http://localhost:8080/Reports>

7.2 Export the RDL

To export a RDL file for a Report, click on the **'Innovator Reports'** Folder. You see a list of Reports and Shared Data Sources.

Select **'Download'** from the Report Context menu. This opens a dialog asking for confirmation that you want to save the RDL file.

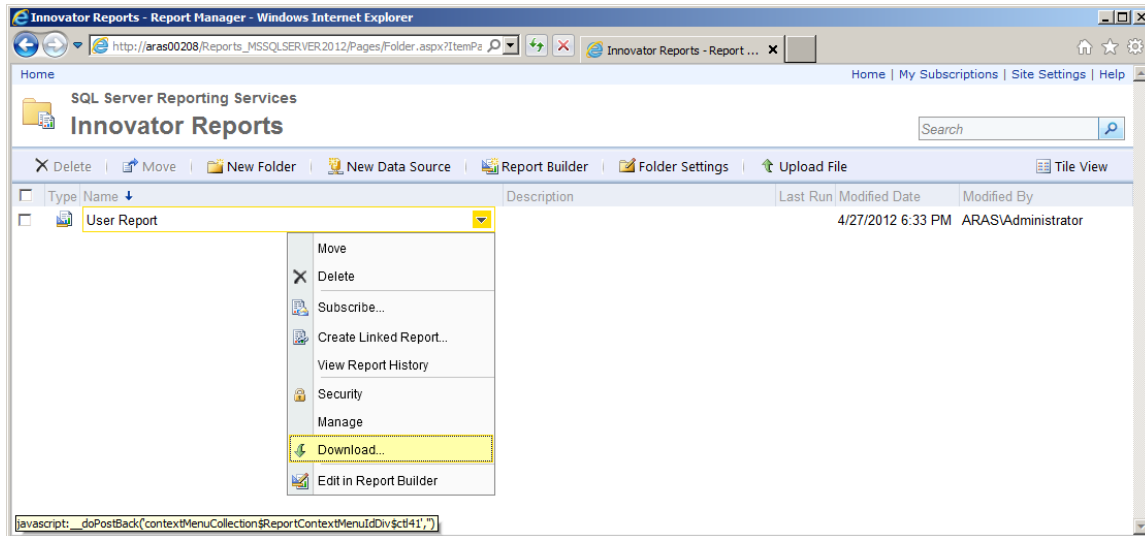


Figure 38.

7.3 Import the RDL

Log into the target Aras Innovator Server:

1. In the TOC, navigate to **Administration --> Reports**.
2. Click **Reports** on the main menu and the **'Report Manager'** choice.
3. The Report Manager page opens in a new window as shown below:

Note: This same page can be opened from your browser with the URL <http://localhost:8080/Reports>

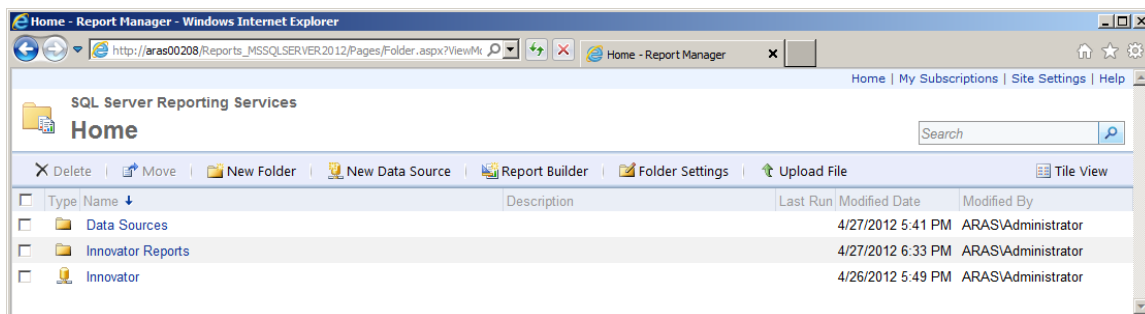
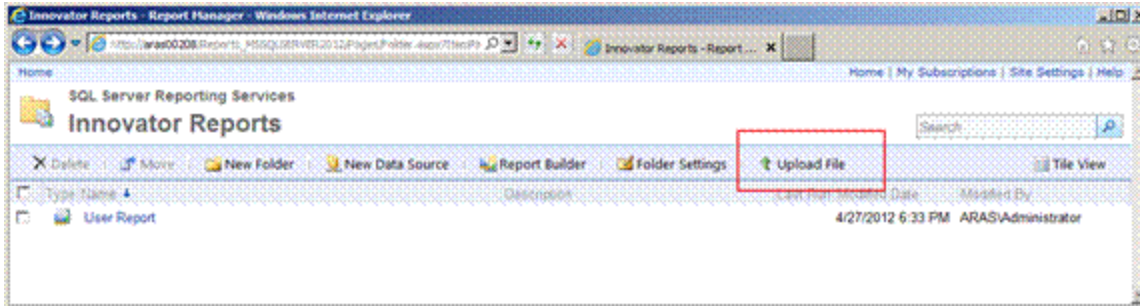
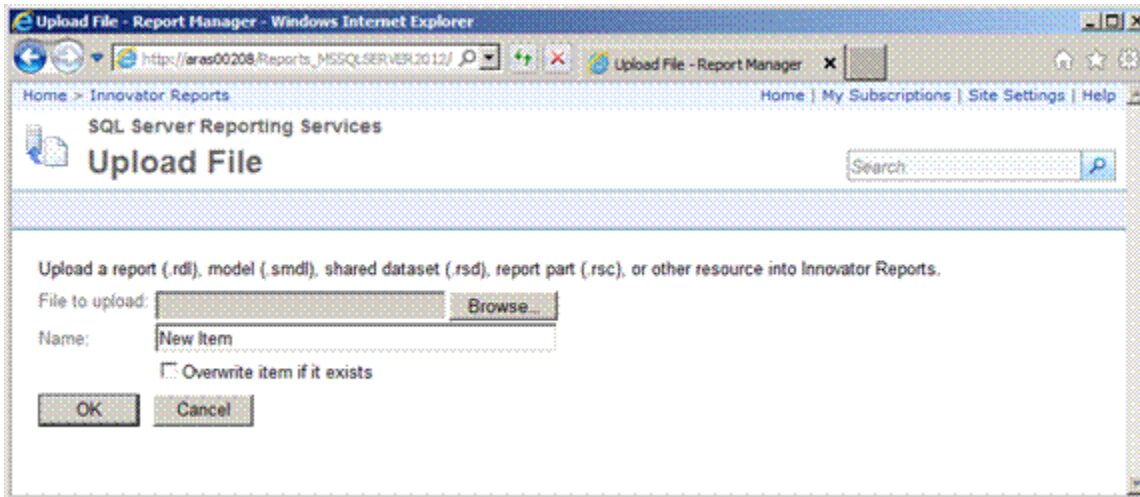


Figure 39.

Click on the **'Innovator Reports'** Folder and you see a list of Reports and Shared Data Sources. Click **'Upload File'** in the middle of the screen.



This opens the Upload File page.



Click '**Browse...**', which opens a File Selection dialog for you to select the RDL file to upload.

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 RDL file selected.

If this is a new version of an existing Report select the Overwrite checkbox. Click '**OK**' to complete the upload. The RDL file is uploaded to the target ReportServer and deployed. You should see the new Report in the Folder now.

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 target ReportServer. Click on the properties icon 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.

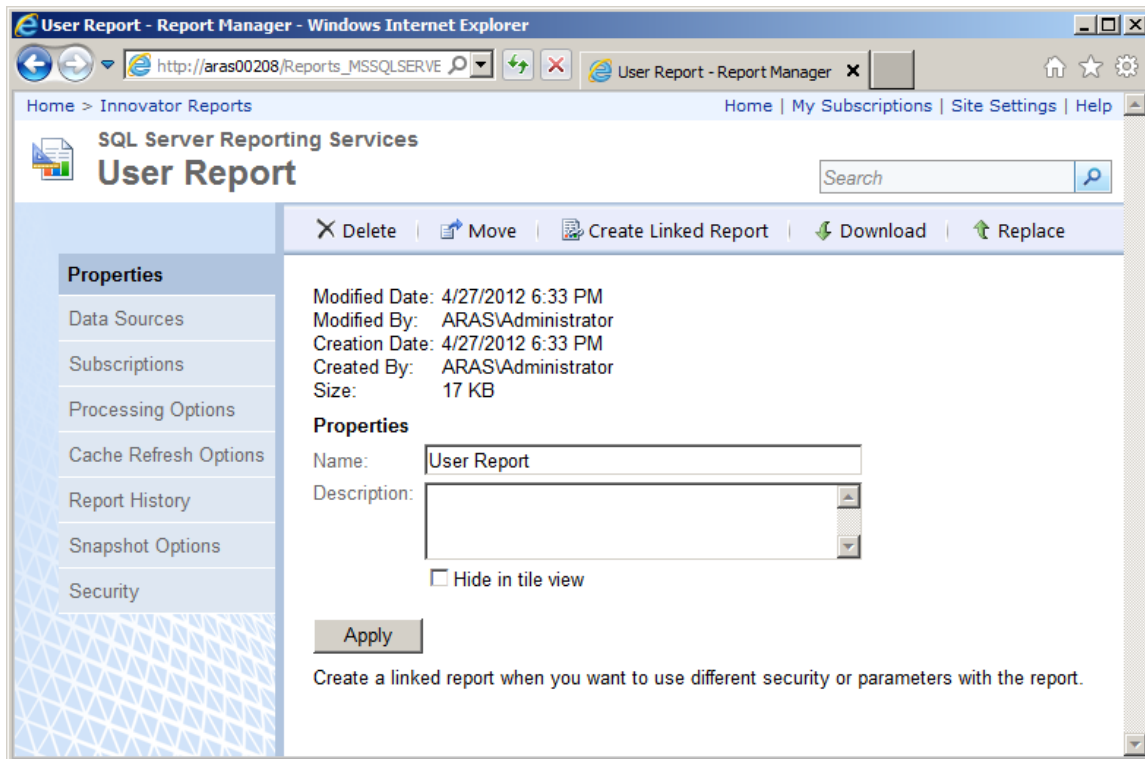


Figure 40.

Select the **'Data Sources'** navigation link. The first choice **'A shared data source'** should be selected.

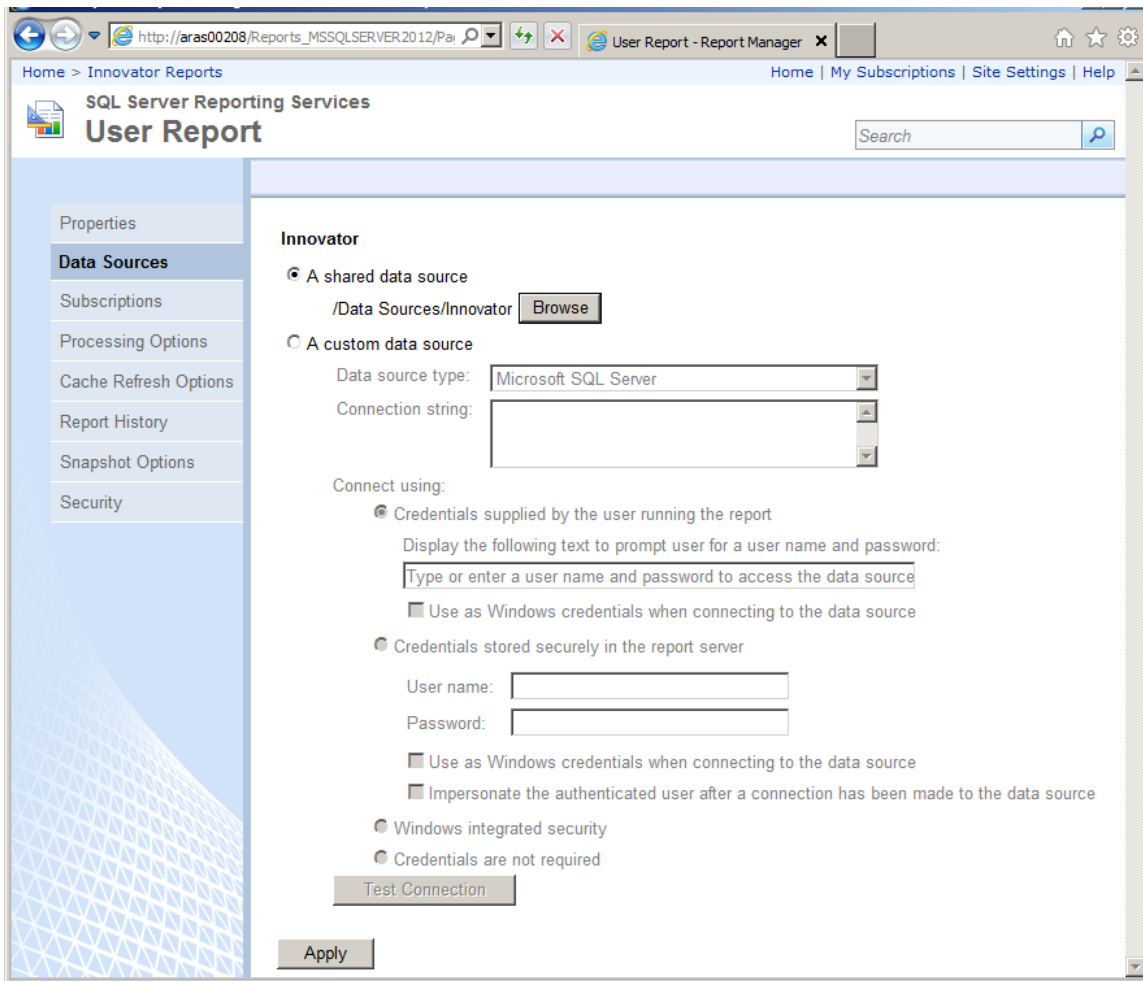


Figure 41.

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**'.

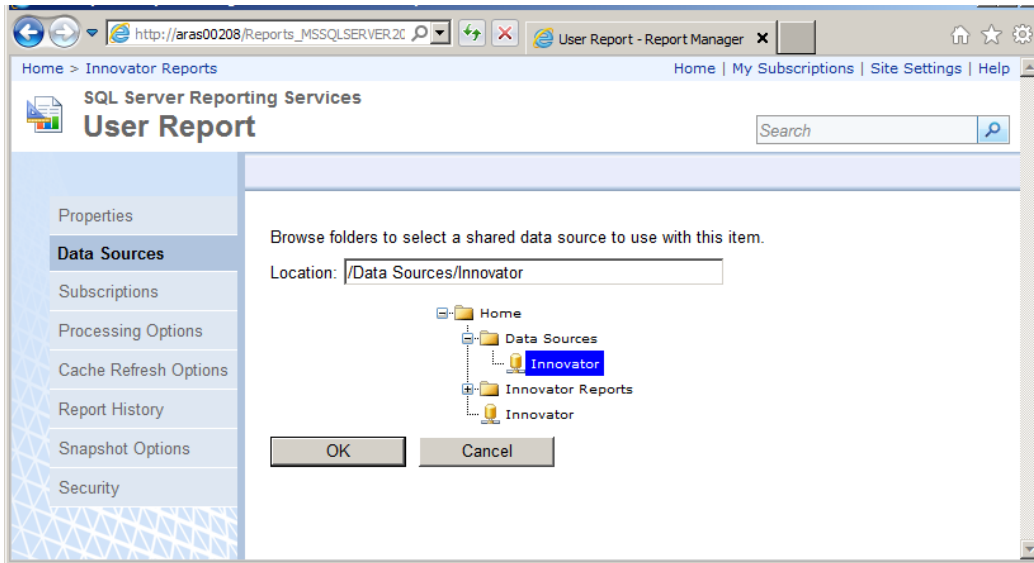


Figure 42.

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 function ConvertToLocal({value},{Time Zone}). The time zone should be specified according to the registry key name of the time zone desired. (Refer to *Aras Innovator - 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 function ConvertFromLocal({value},{Time Zone}). The time zone should be specified according to the registry key name of the time zone desired. (Refer to *Aras Innovator - 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.

```
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)
```