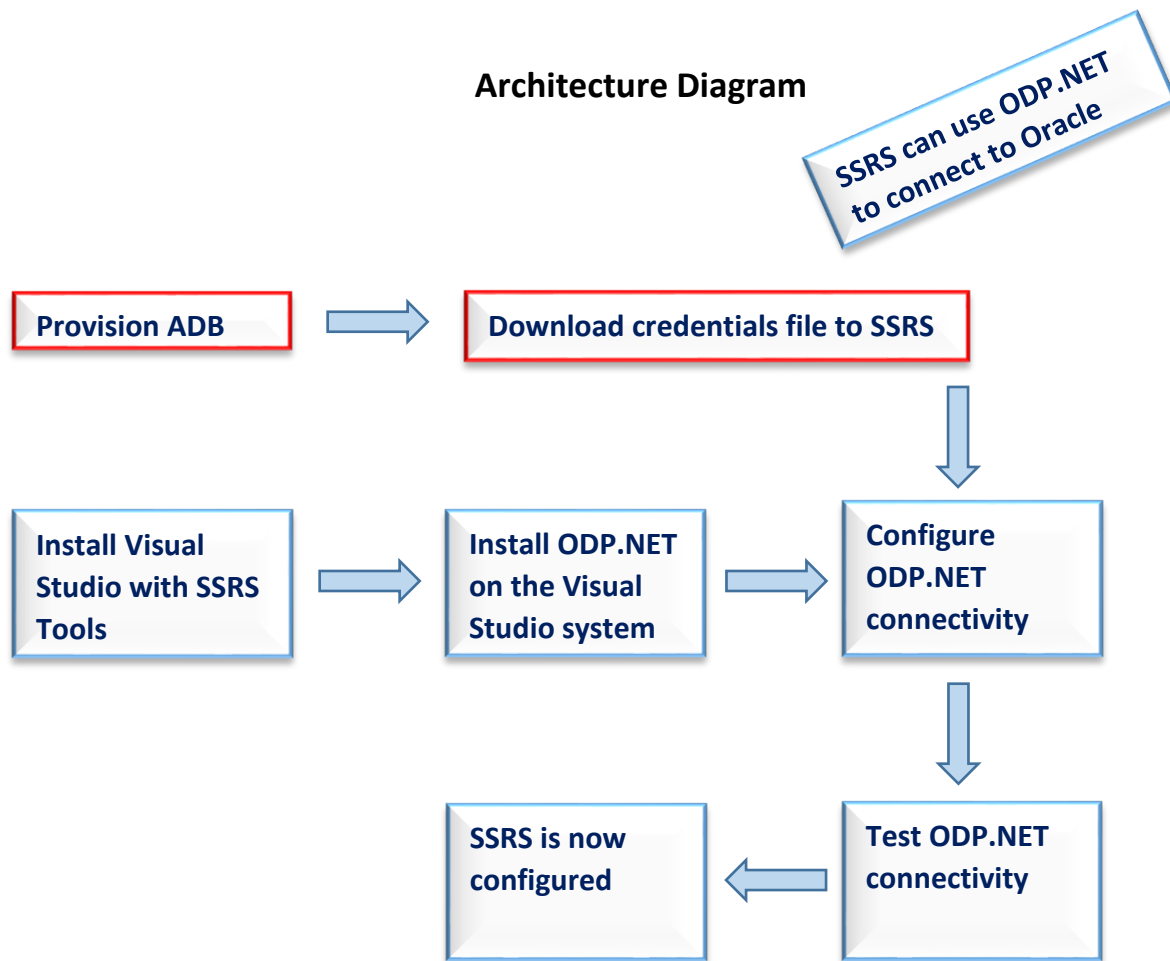


Connecting Microsoft SQL Server Reporting Services to Oracle Autonomous Database

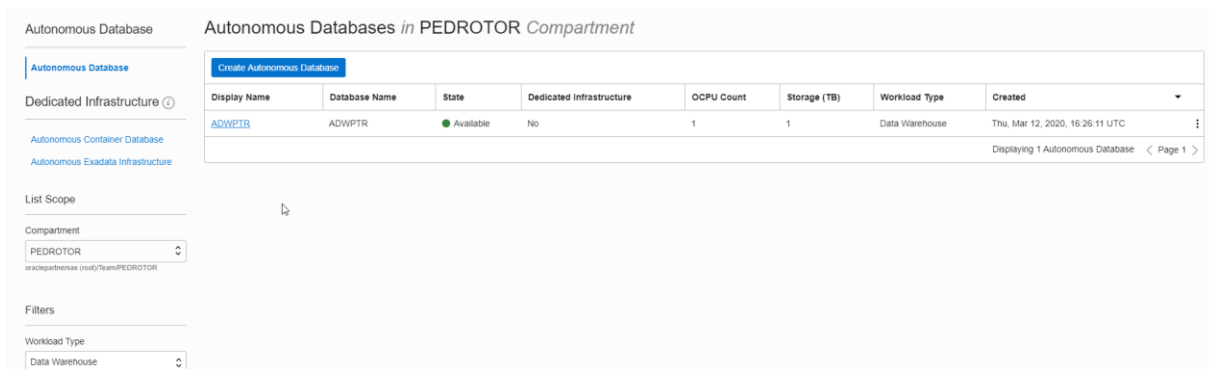
Pedro Torres, Alex Keh

This step by step tutorial guides how to configure Microsoft SQL Server Reporting Services (SSRS) connectivity to Oracle Autonomous Database (ADB).

These instructions use managed Oracle Data Provider for .NET (ODP.NET) for data access and work for both dedicated and shared infrastructure ADB.

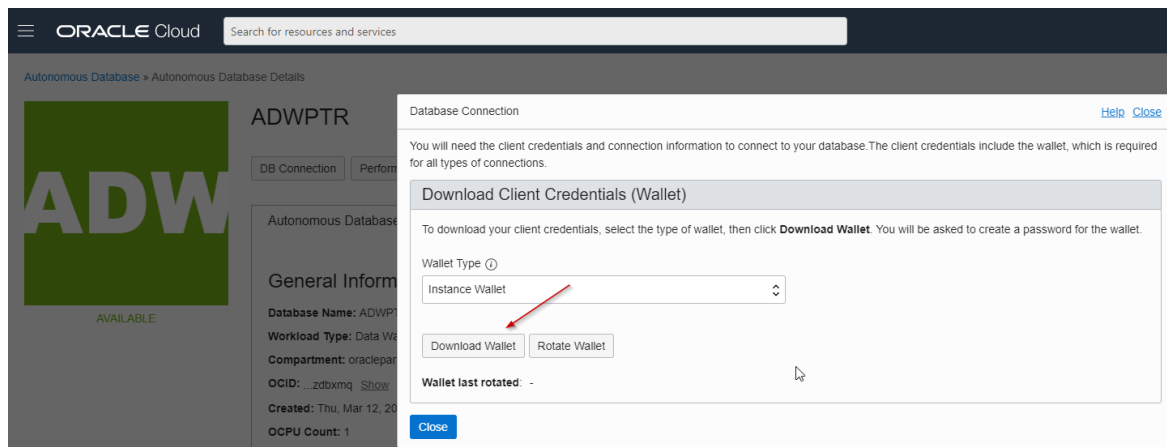


This document assumes that the Autonomous Data Warehouse (ADW) or Autonomous Transaction Processing (ATP) was provisioned.



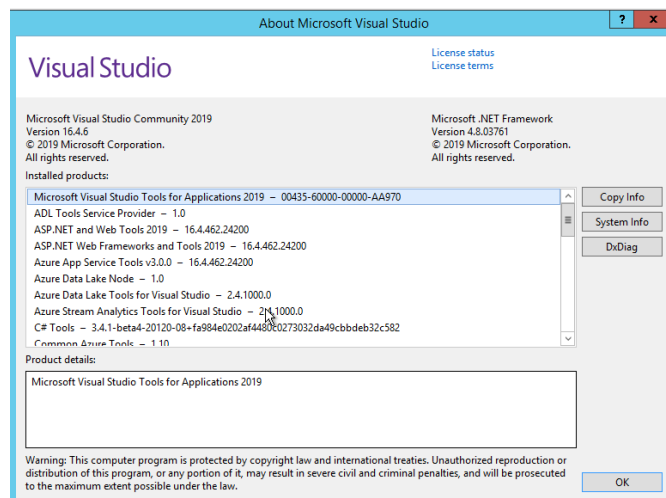
*Note: Please check here for the Oracle documentation to [provision ADW](#).

1. Download the corresponding credentials.zip file to the system that has SSRS installed. These credential files will be used to connect SSRS to ADB.



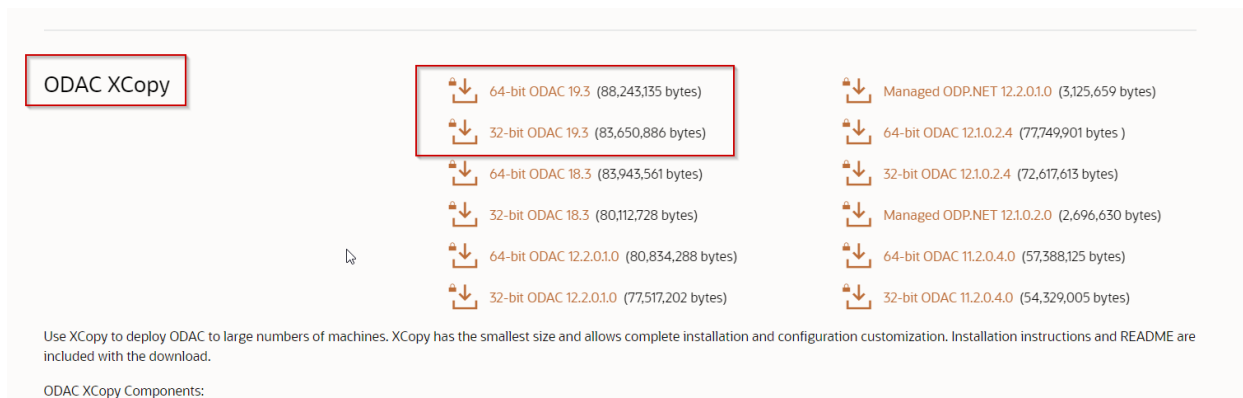
*Note: Also check Downloading Client Credentials (Wallets).

2. Check that SQL Server Data Tools and SQL Server Reporting Services are installed on Visual Studio 2017 or Visual Studio 2019 in the Installed Products window of the About Microsoft Visual Studio dialog.



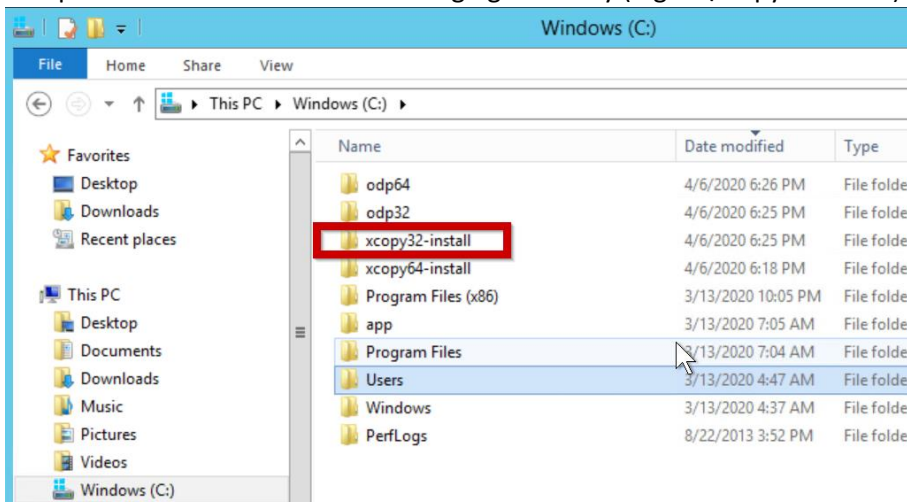
3. Download 32-bit ODAC 19.3 from the ODAC Xcopy section in the middle of this Oracle.com web page:

<https://www.oracle.com/database/technologies/dotnet-odacdeploy-downloads.html>



This procedure guides how to connect Visual Studio SSRS tools to ADB to retrieve data. You will download and enable managed ODP.NET for data access.

4. Unzip the download contents to a staging directory (e.g. c:\xcopy32-install).

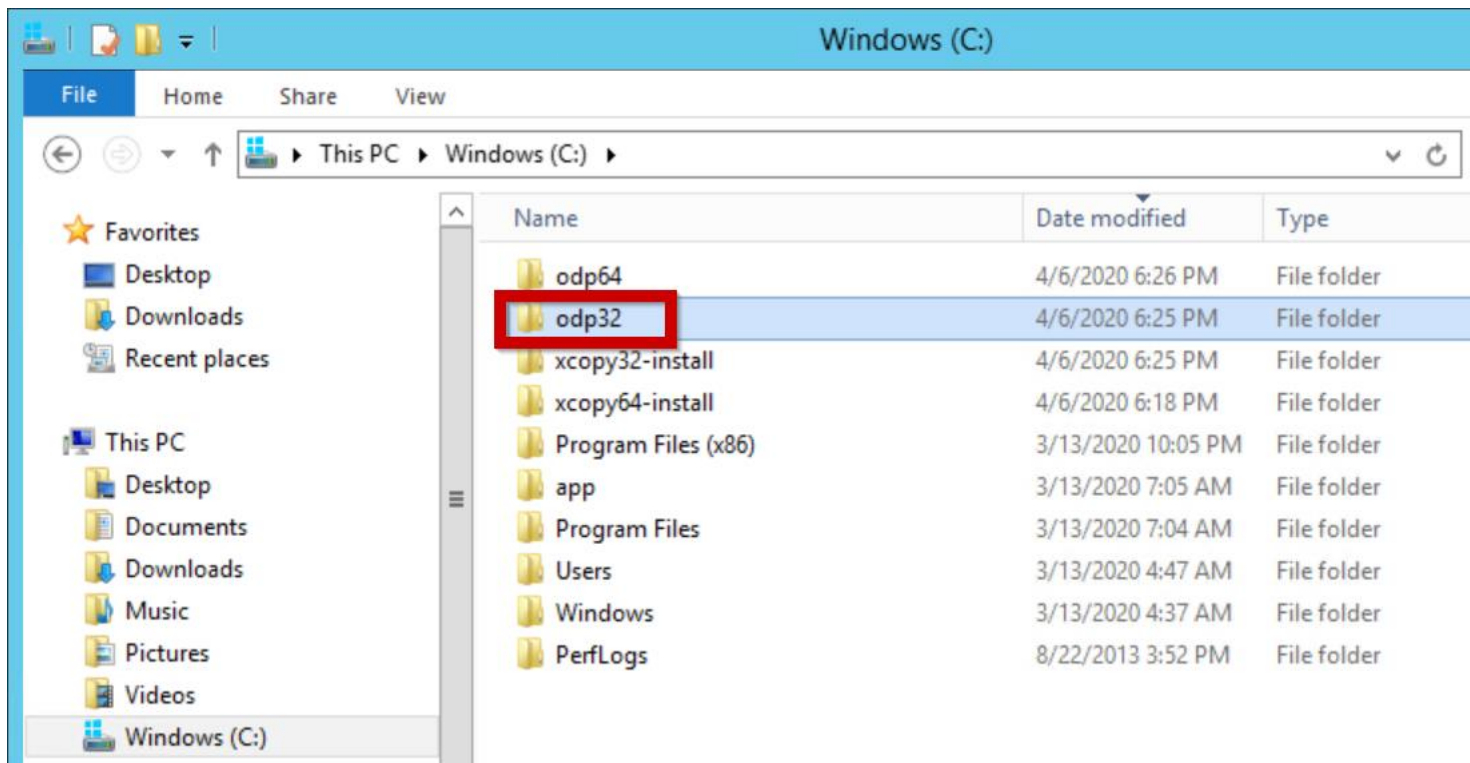


5. Open a Windows command prompt ***in administrator mode***. Navigate to the staging directory, then execute the next command to install managed ODP.NET:

```
install.bat odp.net4 <installation directory> odp32
```

```
C:\xcopy32-install\ODAC193Xcopy_32bit>install.bat odp.net4 c:\odp32 odp32
```

*Note: Enter the installation location (e.g. c:\odp32) for the directory parameter.

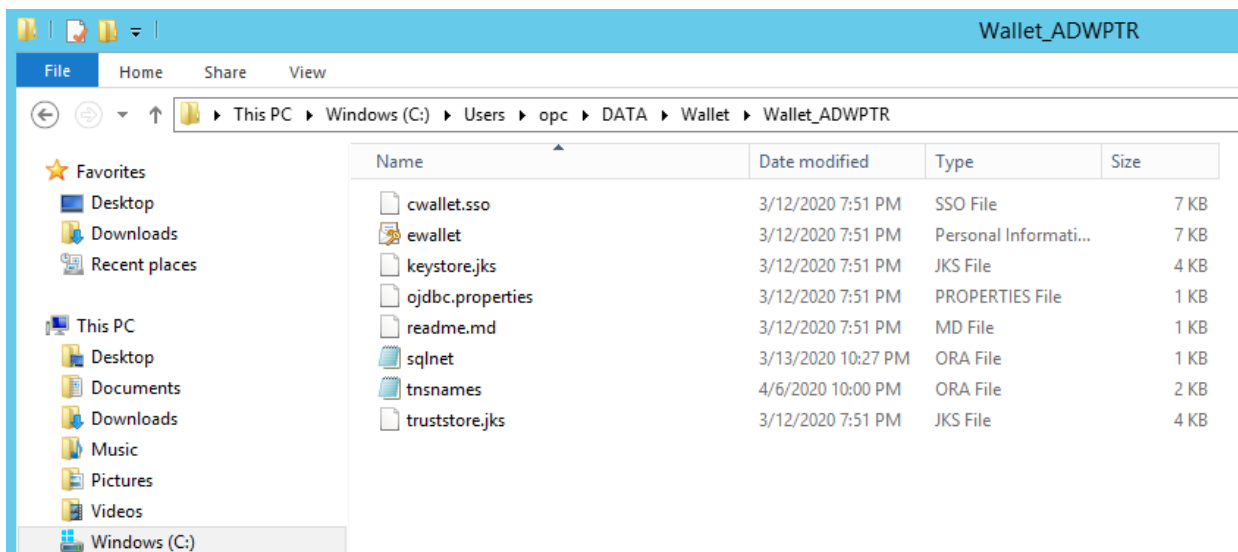


6. In the same command prompt **with administrator privileges**, navigate to the installation subdirectory, <installation directory>\odp.net\bin\4. Then, execute the following command to configure managed ODP.NET on the machine:

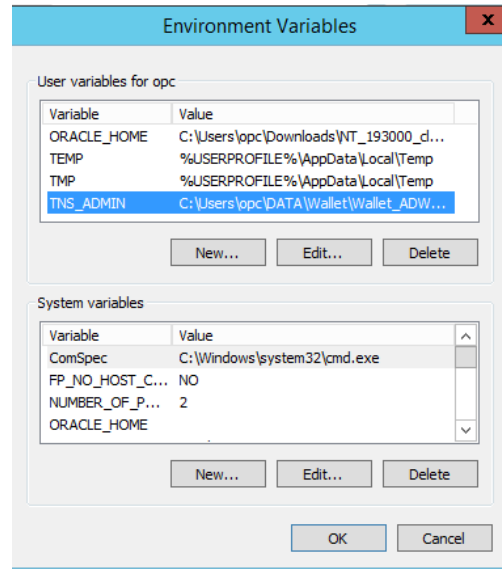
```
OraProvCfg /action:config /product:odpm /frameworkversion:v4.0.30319
/providerpath:".././managed/common/Oracle.ManagedDataAccess.dll"
```

```
C:\odp64\odp.net\bin\4>OraProvCfg /action:config /product:odpm /frameworkversion:v4.0.30319 /providerpath:".././managed/common/Oracle.ManagedDataAccess.dll"
INFO: Configuration Section oracle.manageddataaccess.client removed!
INFO: Oracle.ManagedDataAccess.Dll Provider Factory entry removed!
INFO: The following section has been added.
<section name="oracle.manageddataaccess.client" type="OracleInternal.Common.ODPMSectionHandler, Oracle.ManagedDataAccess, Version=4.122.19.1, Culture=neutral, PublicKeyToken=89b483f429c47342" />
INFO: The following element added under DbProviderFactories.
<add name="ODP.NET, Managed Driver" invariant="Oracle.ManagedDataAccess.Client" description="Oracle Data Provider for .NET, Managed Driver" type="Oracle.ManagedDataAccess.Client.OracleClientFactory, Oracle.ManagedDataAccess, Version=4.122.19.1, Culture=neutral, PublicKeyToken=89b483f429c47342" />
```

7. Navigate to where you downloaded the Oracle ADB credentials. Unzip the contents to a directory.

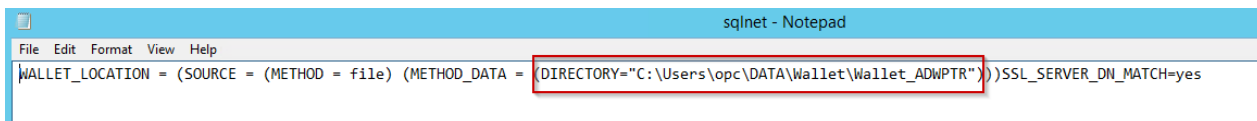


8. In the Windows environment variables dialog, create the TNS_ADMIN variable and set it to the directory location where you unzipped the ADB credentials.

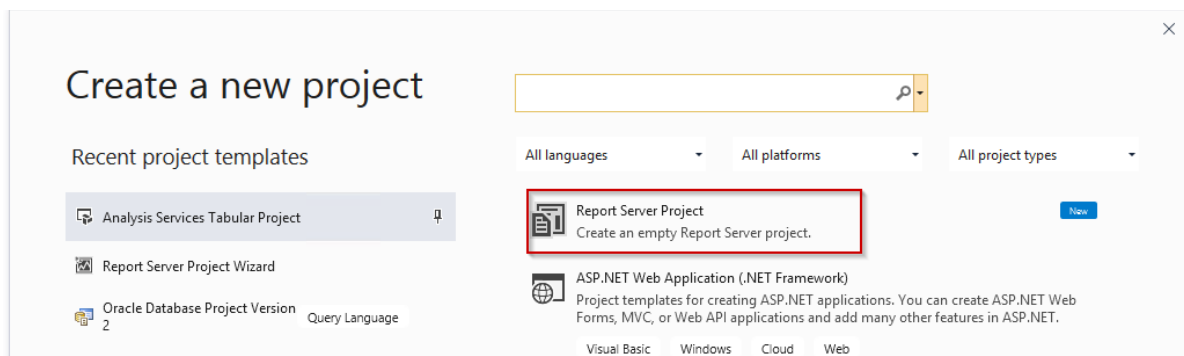


*Note: The tnsnames.ora net service names will be used to connect to ADB.

9. Modify the sqlnet.ora file. Change the directory location where the wallet (cwallet.sso) has been unzipped. It is recommended you remove the quotes around the directory location as well.



10. Open Visual Studio and create a SSRS project.



11. Configure the new project for SSRS and click the Create button.

Configure your new project

Report Server Project

Project name

Report Project SSRS

Location

C:\Users\opc\source\repos

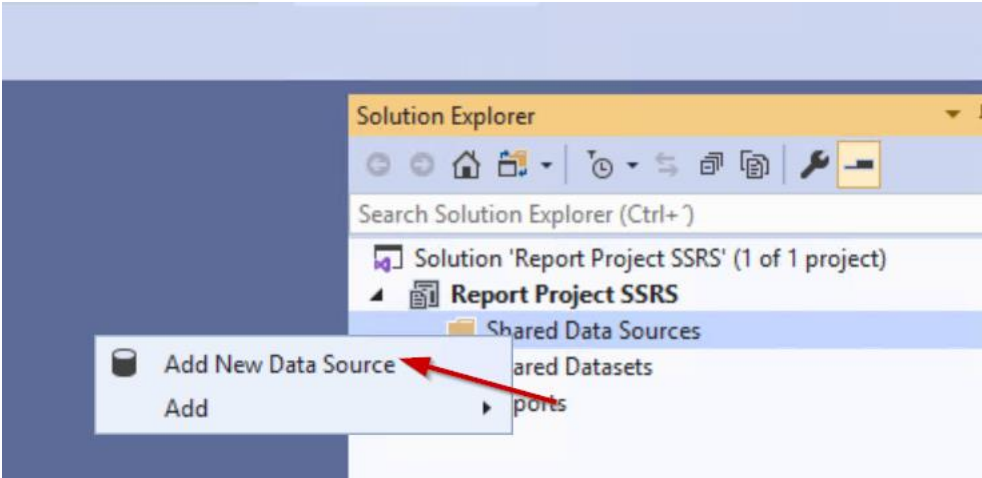
Solution name

Report Project SSRS

☐ Place solution and project in the same directory

BackCreate

12. In Solution Explorer, right-click on Shared Data Sources. Select Add New Data Source.



13. Provide a Name and choose Oracle Database as the connection type.

Shared Data Source Properties

General
Credentials

Change name, type, and connection options.

Name:
SSRSADW

Type:
Microsoft SQL Server Analysis Services
Azure Analysis Services
Azure SQL Data Warehouse
Enter Data
Microsoft Analytics Platform System
Microsoft Azure SQL Database
Microsoft SQL Server
Microsoft SQL Server Analysis Services
Microsoft SharePoint List
ODBC
OLE DB
Oracle Database
Oracle Essbase
Report Server Model
SAP BW
TERADATA
XML

Build...

Help OK Cancel

14. Click on Build...

Shared Data Source Properties

General
Credentials

Change name, type, and connection options.

Name:
SSRSADW

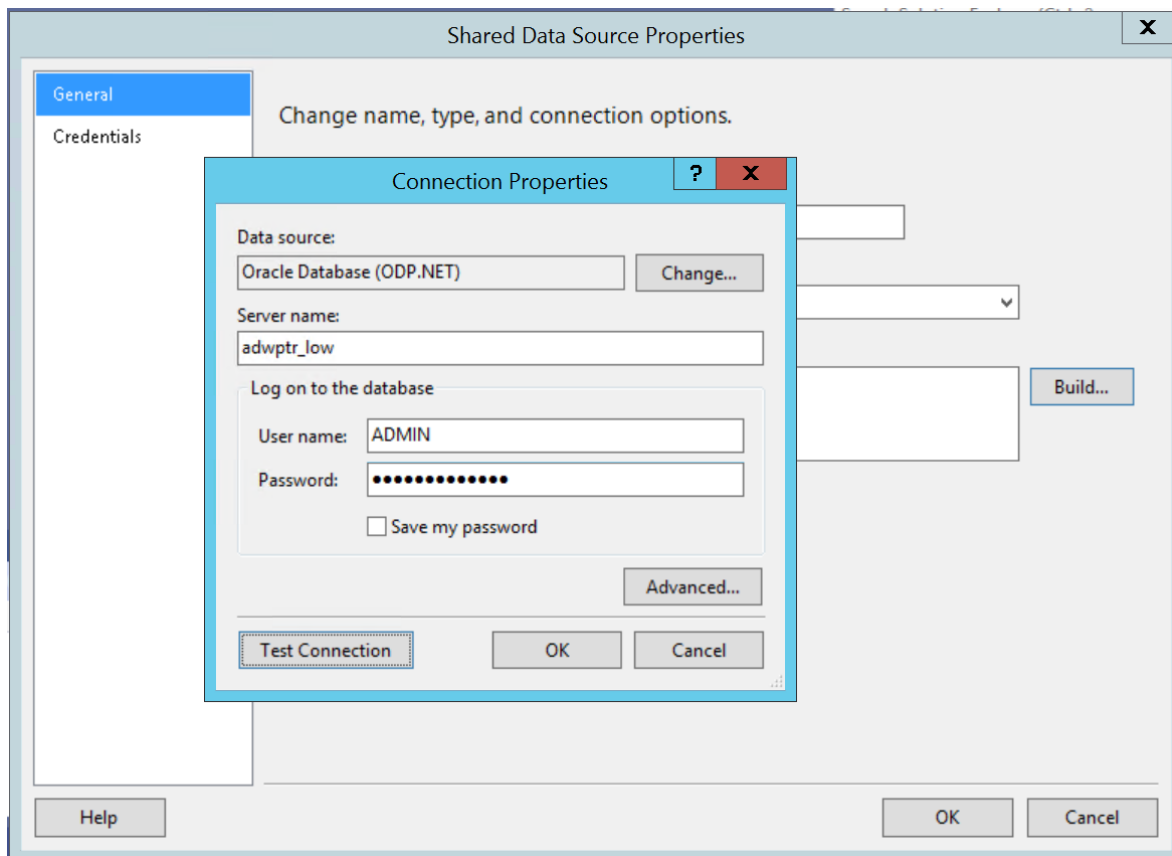
Type:
Oracle Database

Connection string:
Click here to type or paste a connection string

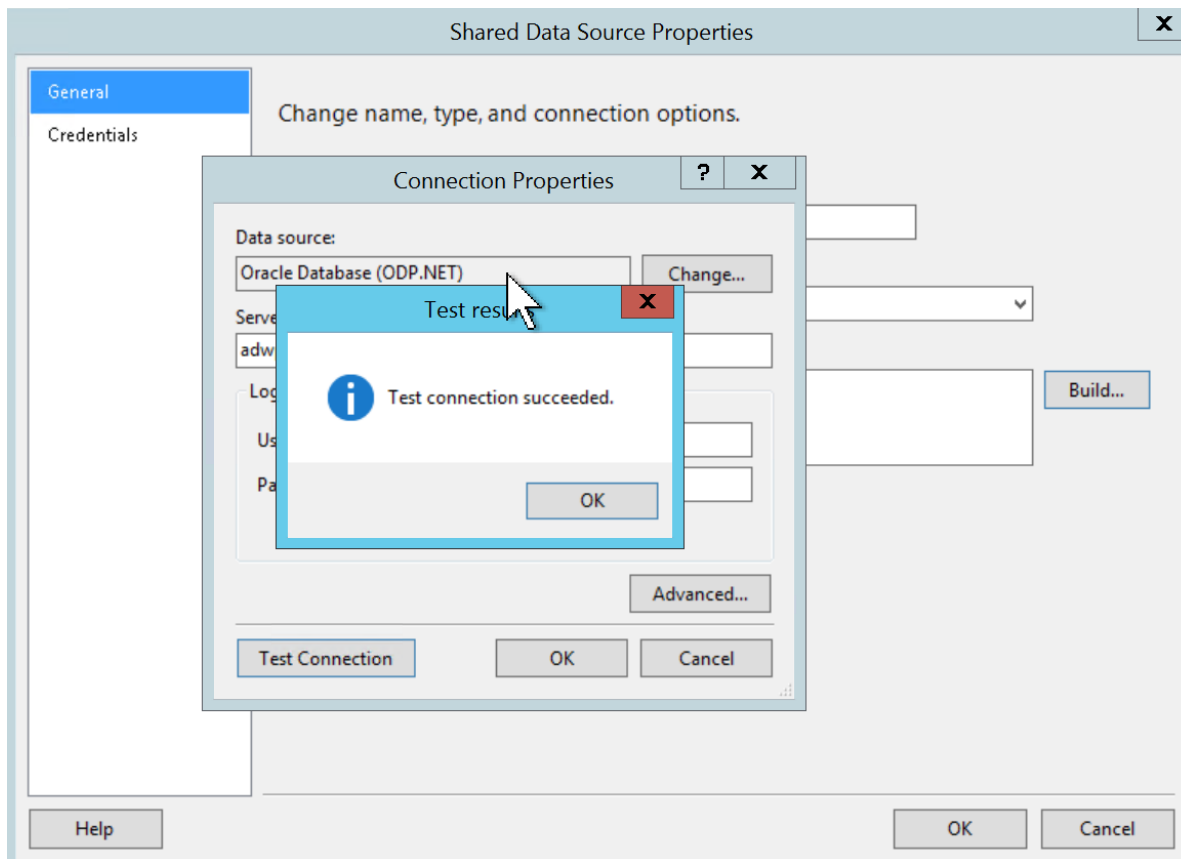
Build...

Help OK Cancel

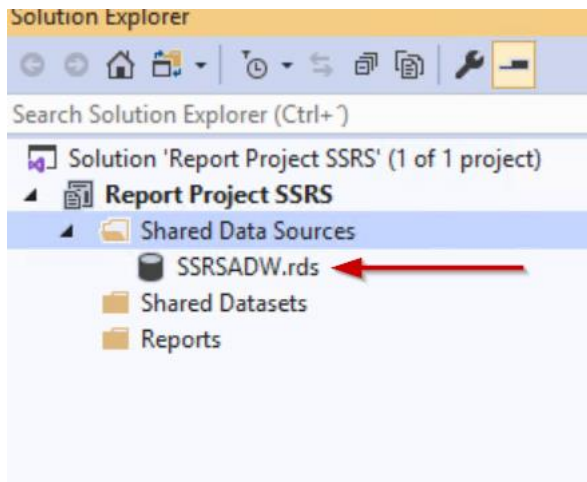
15. Enter in one of the ADB net service names from the tnsnames.ora files. Enter in the user name (e.g. ADMIN) and password. Click on Test Connection to verify connectivity.



16. The test will succeed if connectivity has been properly set up.

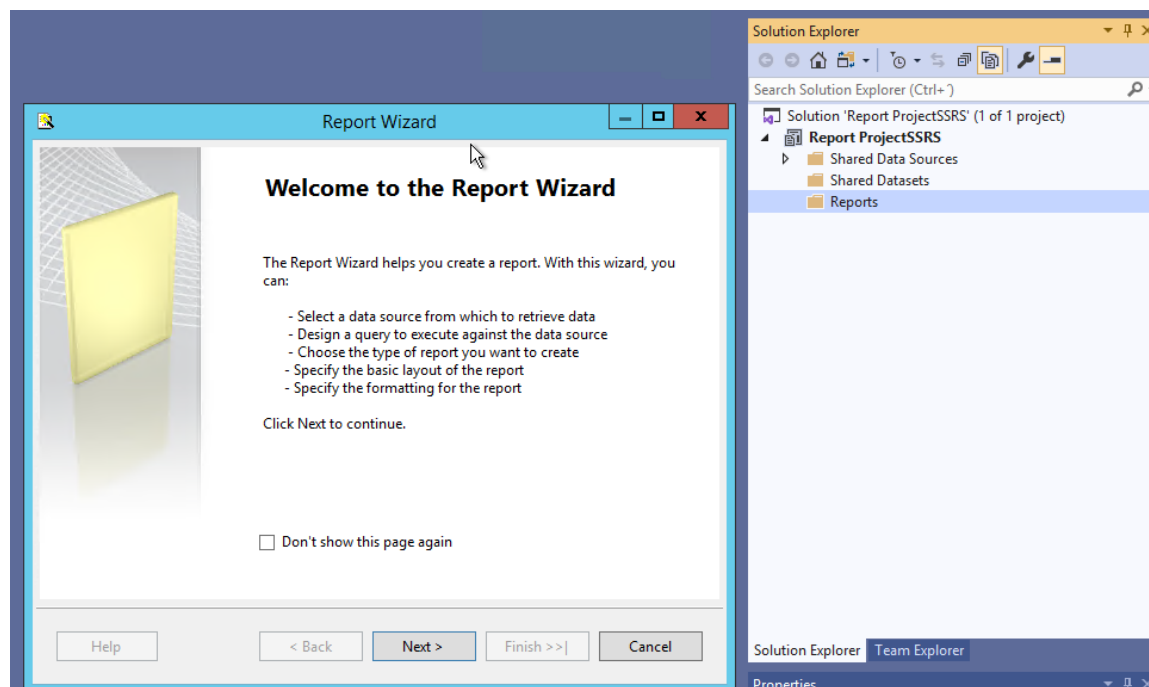


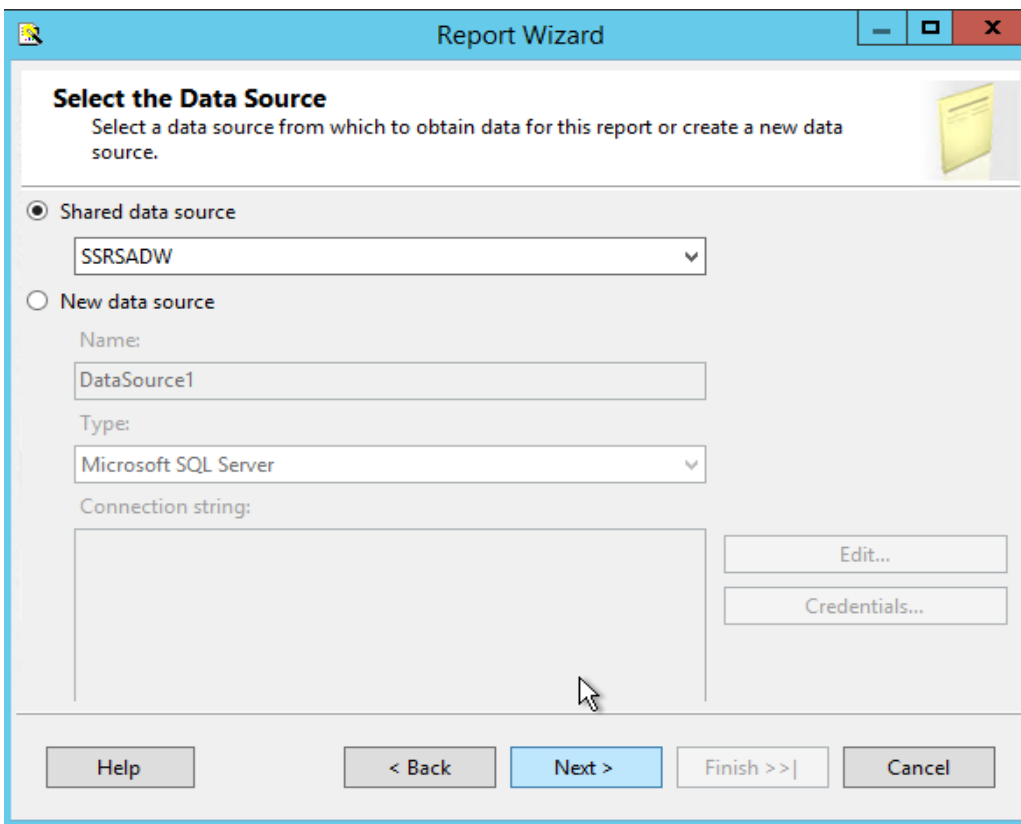
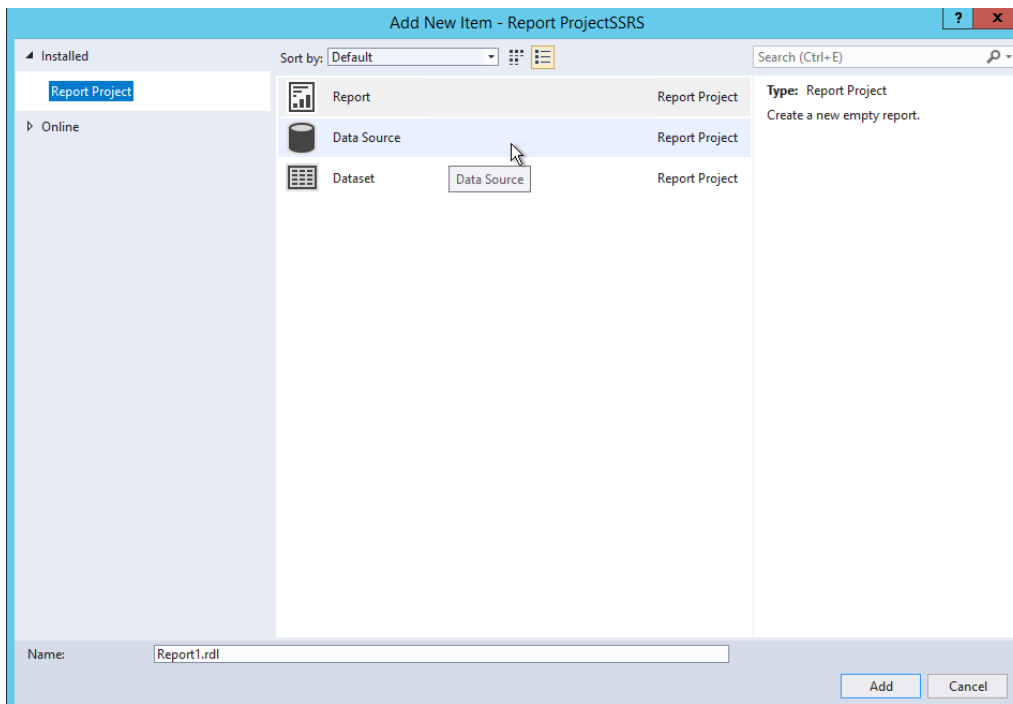
17. Click Ok three times. You will see that your Oracle data source has been created for SSRS to use. You can now proceed building a report with ADB.



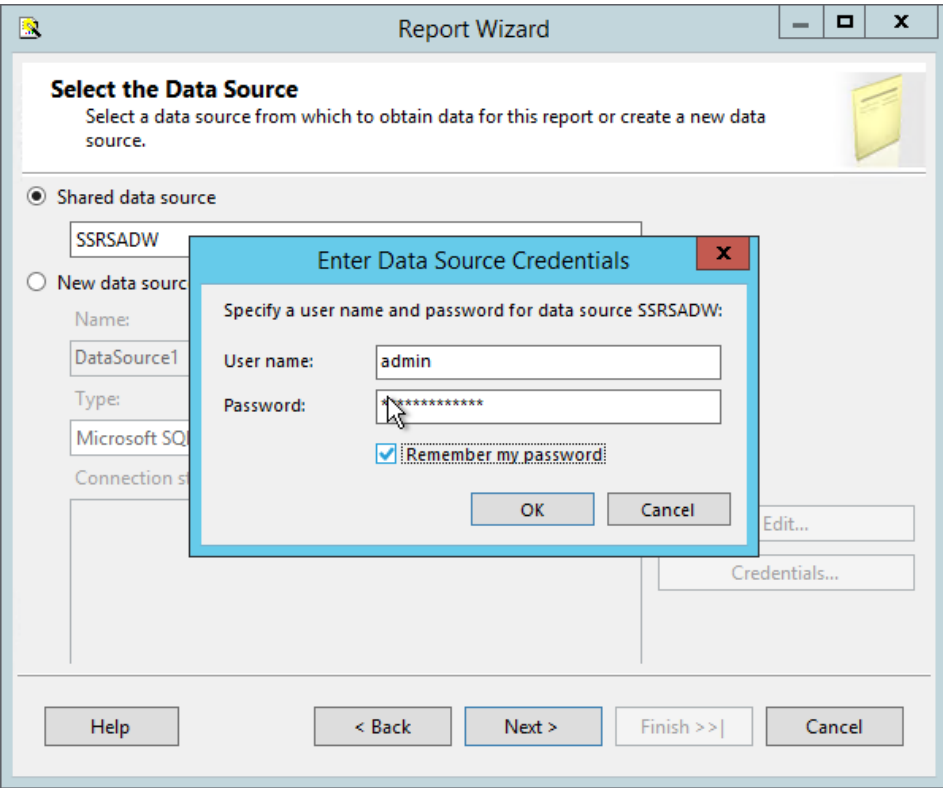
Using SSRS Tools with ADB

18. To create a report, right-click Reports, select Add New Data Source Item, then select the Data Source that was just created, (e.g. SSRSADW).

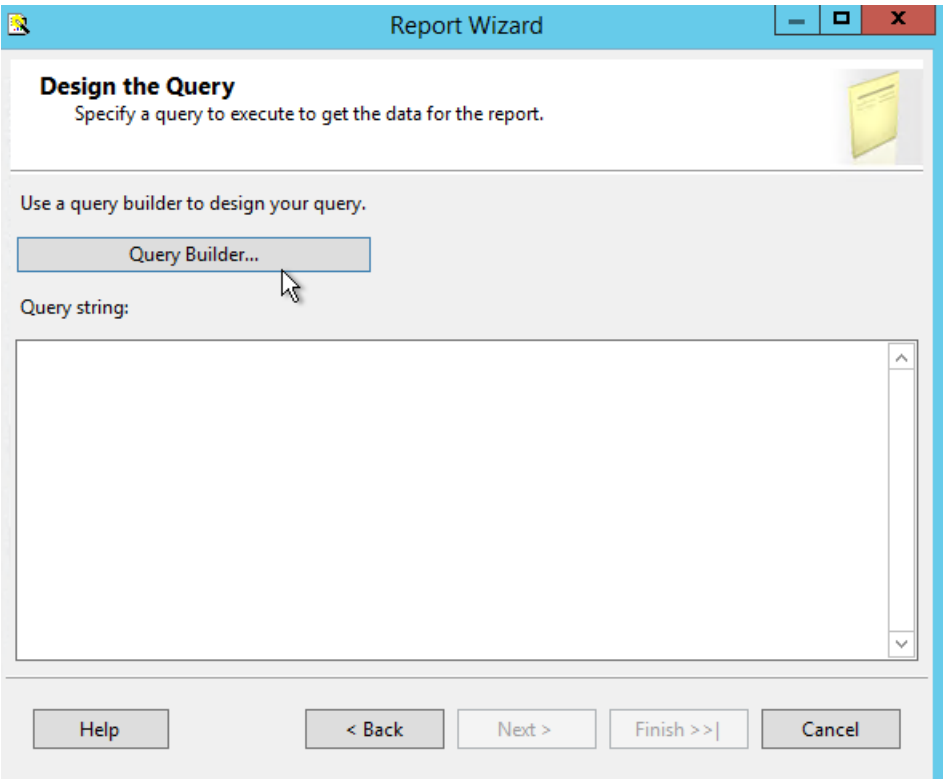


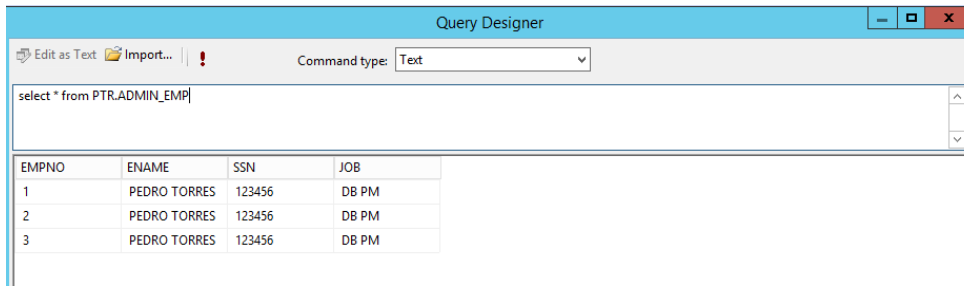


19. Enter Data Source Credentials

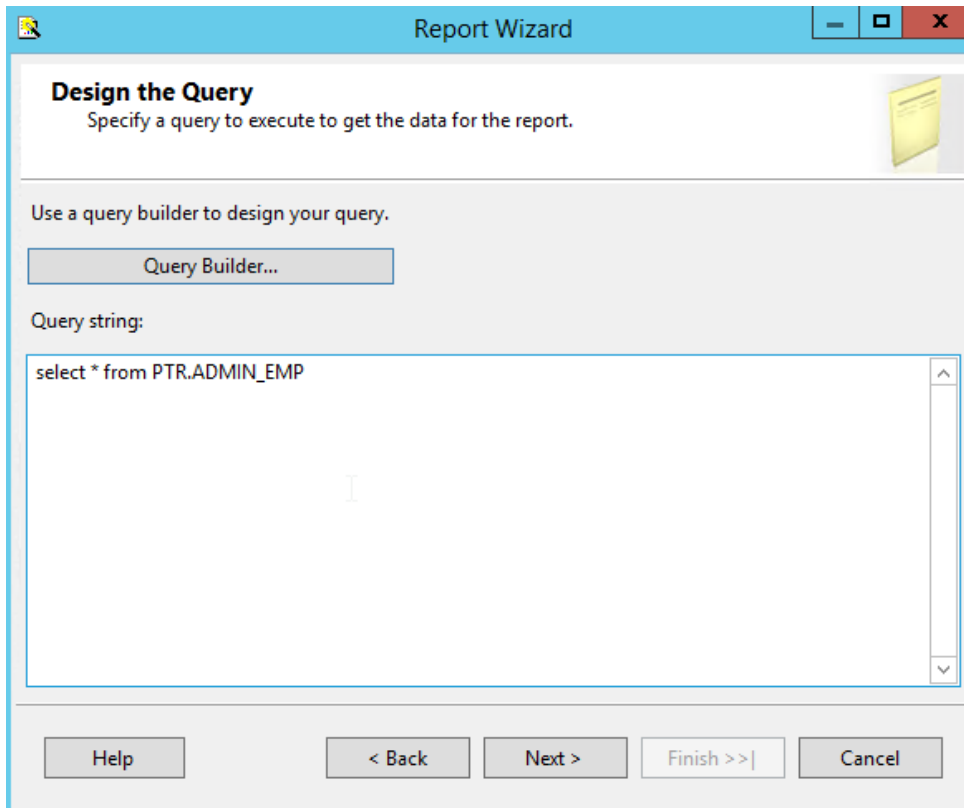


20. You can use Query Builder to design the query. It can retrieve data and validate the Oracle SQL's validity.





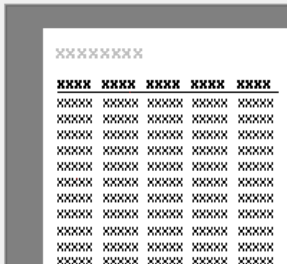
21. Once the query design is complete, click Next to design the report to your preferences.



Report Wizard

Select the Report Type
Select the type of report that you want to create.

☒ Tabular
☐ Matrix



Help < Back **Next >** Finish >>| Cancel

22. Choose how to group the data in the report.

Report Wizard


Design the Table
Choose how to group the data in the table.

Available fields:

- EMPNO
- ENAME
- SSN
- JOB

Displayed fields:

Page>
 Group>
 Details>
 < Remove



Help < Back **Next >** Finish >>| Cancel

24. Provide a report name and click Finish.

Report Wizard

Completing the Wizard

Provide a name and click Finish to create the new report.

Report name:

SSRS-ADW-PTR

Report summary:

Data source: SSRSADW

Connection string:

Report type: Table

Layout type: Block

Style: Modern

Page: EMPNO, ENAME

☐ Preview report

Help

< Back

Next >

Finish

Cancel

Report Wizard

Completing the Wizard

Provide a name and click Finish to create the new report.

Report name:

SSRS-ADW-PTR

Report summary:

Microsoft Visual Studio

Opening the file...

Layout

Style

Page

Grouping: SSN

Details: JOB

Query: select * from PTR.ADMIN_EMP

☒ Preview report

Help

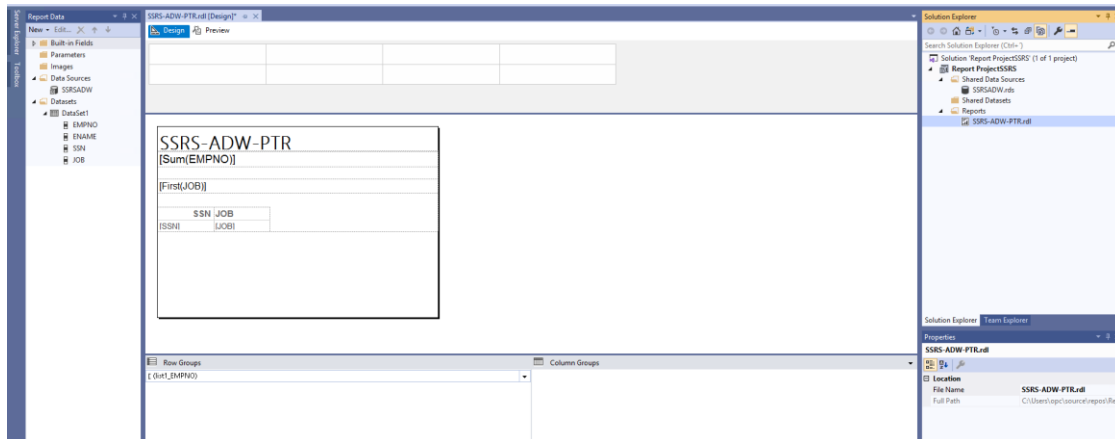
< Back

Next >

Finish

Cancel

25. Finally, you see the report according to your defined design.



ODP.NET Performance Tuning for Large Data Retrievals

Typically, BI and ETL applications retrieve large data amounts from a source database for further processing. To speed up Oracle data retrieval via SSIS or SSRS, the ODP.NET FetchSize can be increased from its default 128K value (131,072 bytes) to as large as `int.MaxValue`. The FetchSize determines the amount of data ODP.NET fetches into its internal cache upon each database round trip. It's possible to improve performance by an order of magnitude by significantly increasing FetchSize when retrieving large result sets.

To increase the FetchSize, modify the .NET machine.config file. Modifying the machine.config requires Windows Administrator privileges. This file is generally located in the following directory:
C:\WINDOWS\Microsoft.NET\Framework\v4.0.30319\Config.

Add an `<oracle.manageddataaccess.client>` section in the machine.config file for managed ODP.NET. This section should be placed within the `<configuration>` section and after the `<configSections>` `</configSections>`. Here's an example setting the FetchSize to 4 MB:

```
<configuration>
  <configSections>
    ...
  </configSections>

  <oracle.manageddataaccess.client>
    <version number="*">
      <settings>
        <setting name="FetchSize" value="4194304" />
      </settings>
    </version>
  </oracle.manageddataaccess.client>
</configuration>
```


</oracle.manageddataaccess.client>

</configuration>

Once done, restart SSRS so that ODP.NET will use the new setting.