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USING ANALYSIS SERVICES FOR TABULAR MODE

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Using Analysis Services for Tabular Mode



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About SQL Server Analysis Services

Analysis Services is an analytical data engine used in decision support and business analytics. It provides enterprise-grade semantic data models for business reports and client applications such as Power BI, Excel, Reporting Services reports, and other data visualization tools.

A typical workflow includes creating a tabular or multidimensional data model project in Visual Studio, deploying the model as a database to a server instance, setting up recurring data processing, and assigning permissions to allow data access by end-users. When it's ready to go, your semantic data model can be accessed by client applications supporting Analysis Services as a data source.

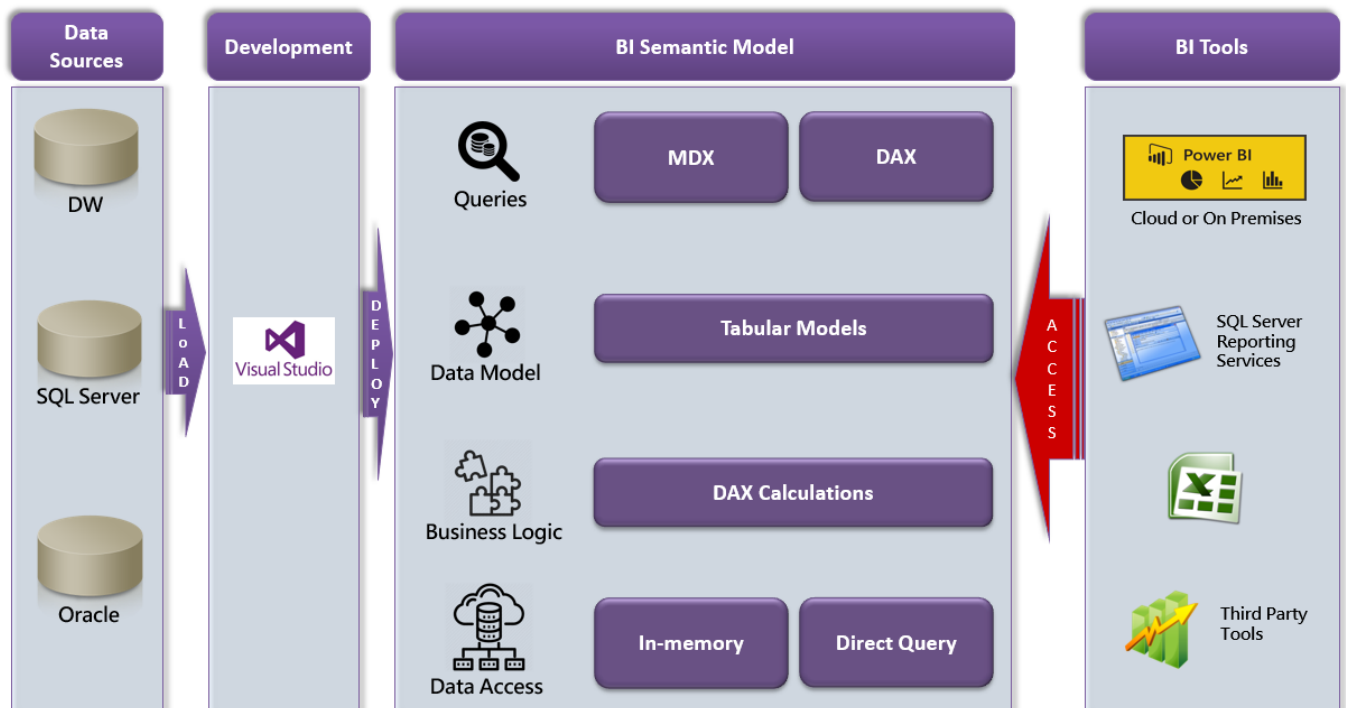
Analysis Services is available in two different platforms:

Azure Analysis Services - Supports tabular models at the 1200 and higher compatibility levels. DirectQuery, partitions, row-level security, bi-directional relationships, and translations are all supported. To learn more, see Azure Analysis Services.

SQL Server Analysis Services - Supports tabular models at all compatibility levels, multidimensional models, data mining, and Power Pivot for SharePoint.

<https://docs.microsoft.com/en-gb/sql/analysis-services/analysis-services?view=sql-server-2017>

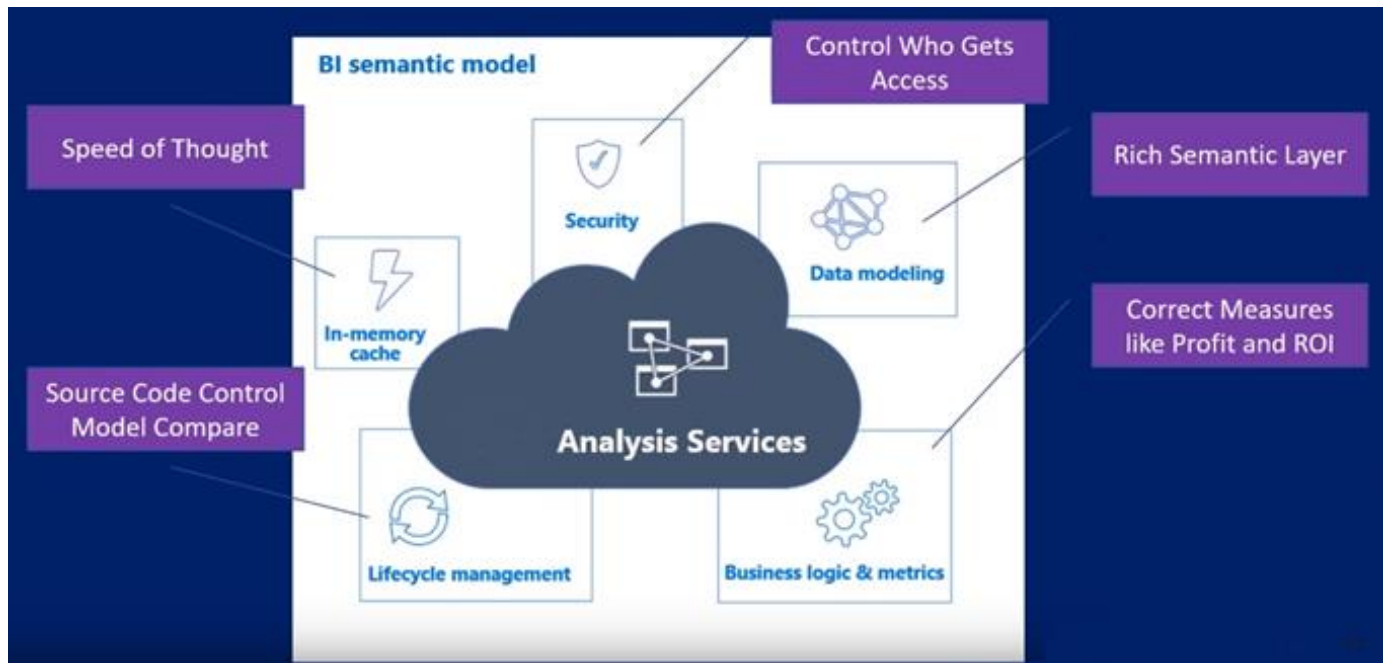
Architecture



Development: Brsasql0247\corupa - 4 CPUs + 16GB RAM

Production: Brsasql0248\urubici – 8 CPUs + 16GB RAM

Analysis Services Value Add

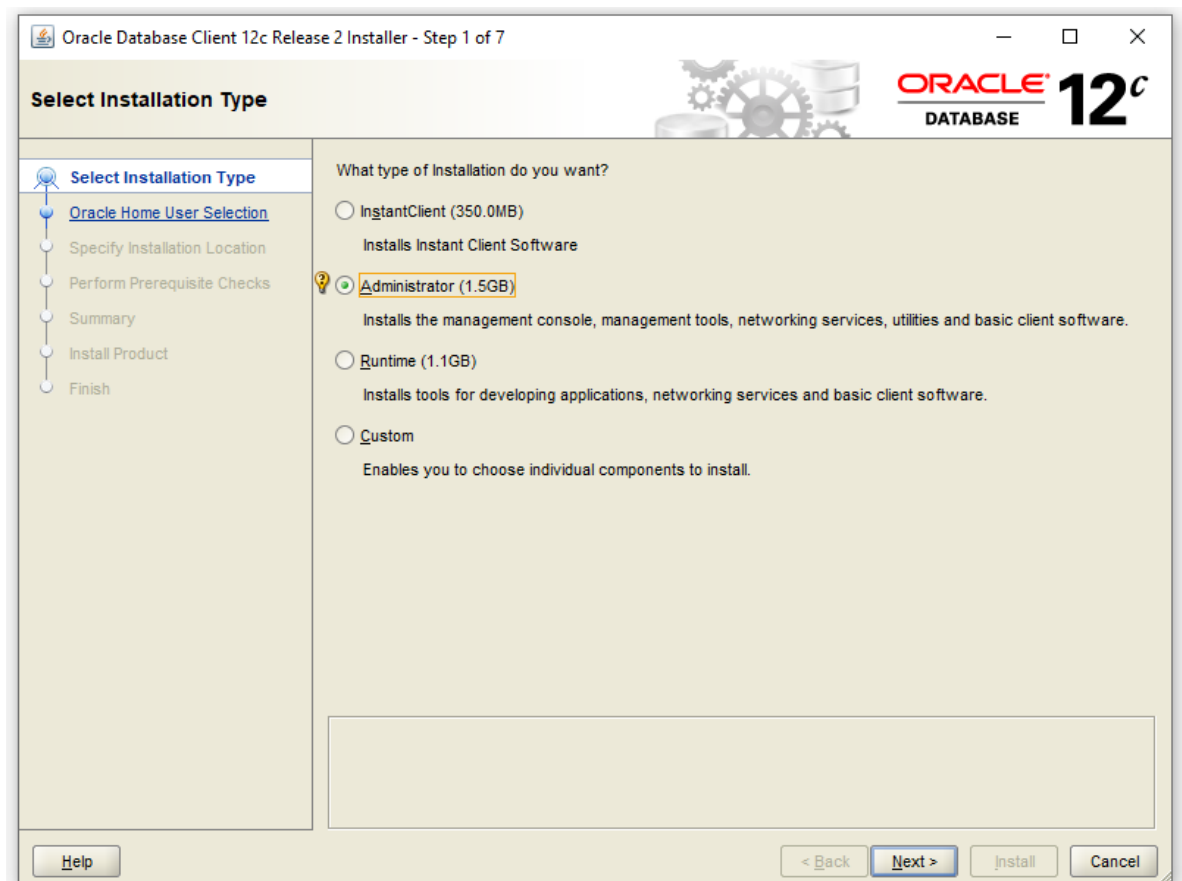


Advantages to use Analysis Services:

- Lightning Response;
- Larger Models;
- Reusability;
- Data Governance;
- Single Source of Truth;
- Documented;
- Direct Query Mode;
- In-Memory;
- Access by AD group;
- Solution code saves on Tfs or Git repositories;
- Refresh routine can be scheduled.

Pre-Requirements for the Development

- Visual Studio 2017 Professional or Enterprise. Call to 9500(customer support)
- Microsoft SQL-Server Data Tools. Available on [\\brsanas01\public\\$\SSAS\SSDT-Setup-ENU.exe](\\brsanas01\public$\SSAS\SSDT-Setup-ENU.exe)
- Microsoft SQL-Server Management Studio. Available on [\\brsanas01\public\\$\SSAS\SSMS-Setup-ENU.exe](\\brsanas01\public$\SSAS\SSMS-Setup-ENU.exe)
- Oracle Client 32 bits for Visual Studio and install using the Administrator type. Available on [\\brsanas01\public\\$\SSAS\Oracle12c_Client_for_Windows_32bits\win32_12201_client\client32\setup.exe](\\brsanas01\public$\SSAS\Oracle12c_Client_for_Windows_32bits\win32_12201_client\client32\setup.exe)



- ODAC12102432bit and it is available on [\\brsanas01\public\\$\SSAS\ODAC122010Xcopy_32bit](\\brsanas01\public$\SSAS\ODAC122010Xcopy_32bit), unzip on the folder and install using the command below:



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install.bat oledb C:\app\client\product\12.2.0\client_1 oracle_home true

Edit your environment variable on:

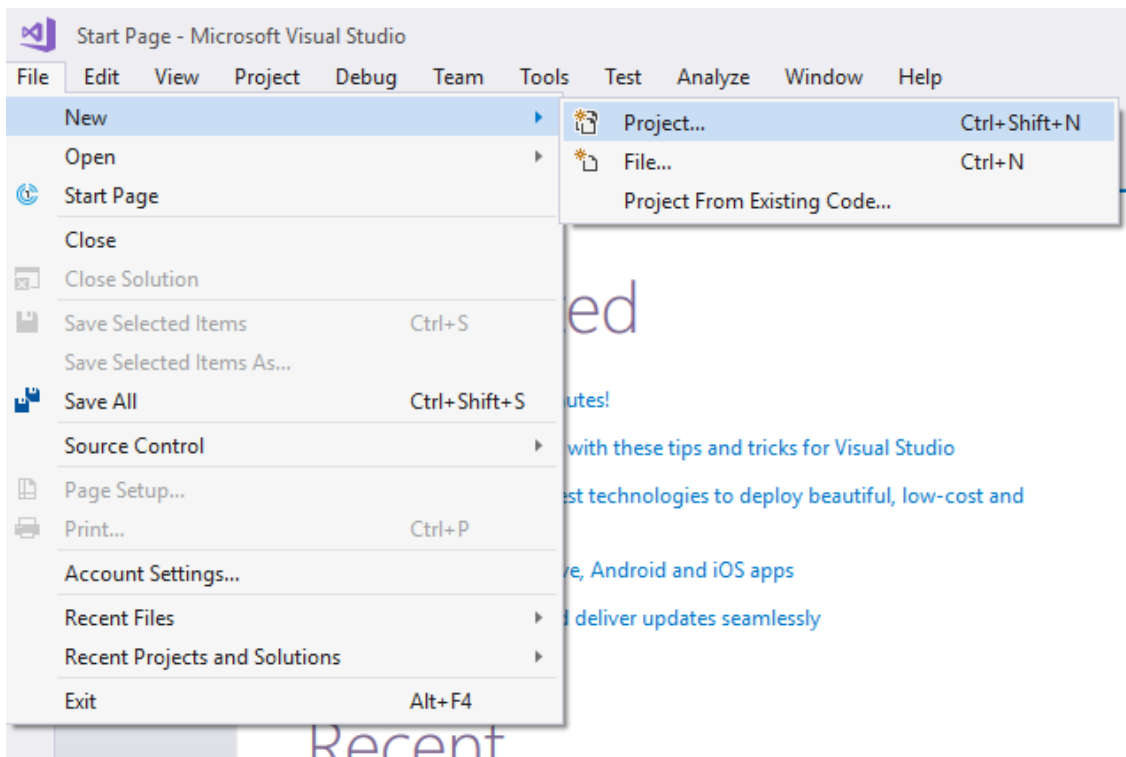
Path -> C:\app =

client\product\12.2.0\client_1;C:\app\client\product\12.2.0\client_1\bin

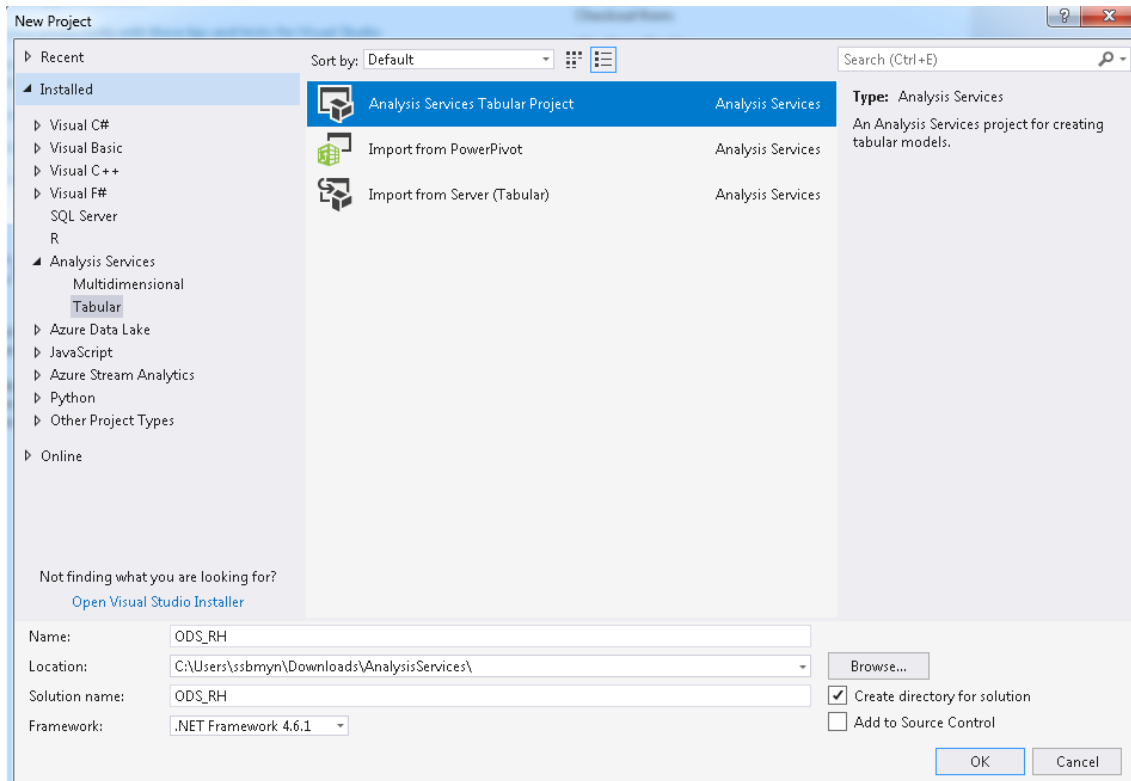
TNS_Admin = C:\app\client\product\12.2.0\client_1\network\admin

Creating a new SSAS project by Visual Studio

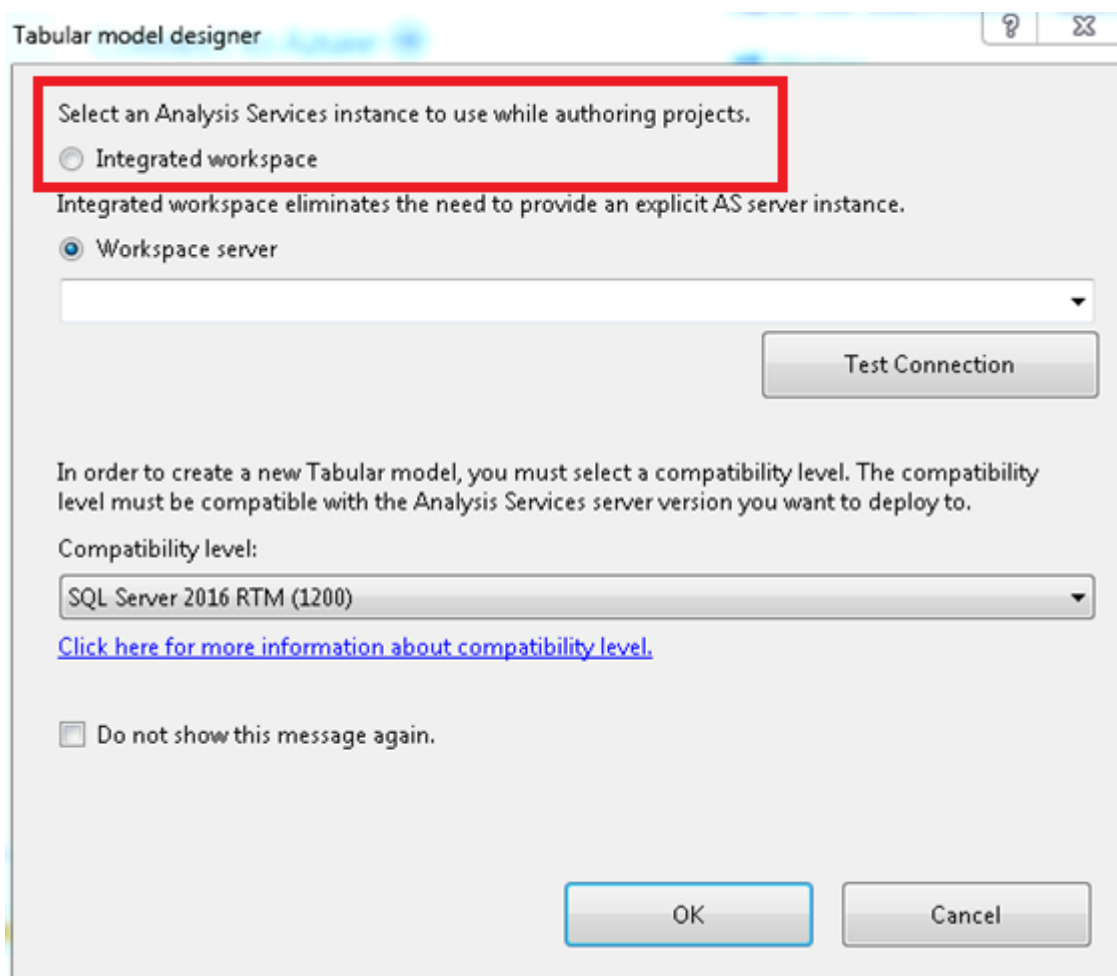
Open the Visual Studio and click on menu File\New\Project.



Choose the Analysis Services Tabular Project and fill the fields Name, Location, Solution Name and press OK button.



On Tabular Model Designer screen choose the option “Integrated Workspace” and press OK button.



Tabular model designer

Select an Analysis Services instance to use while authoring projects.

☐ Integrated workspace

Integrated workspace eliminates the need to provide an explicit AS server instance.

☒ Workspace server

Test Connection

In order to create a new Tabular model, you must select a compatibility level. The compatibility level must be compatible with the Analysis Services server version you want to deploy to.

Compatibility level:

SQL Server 2016 RTM (1200)

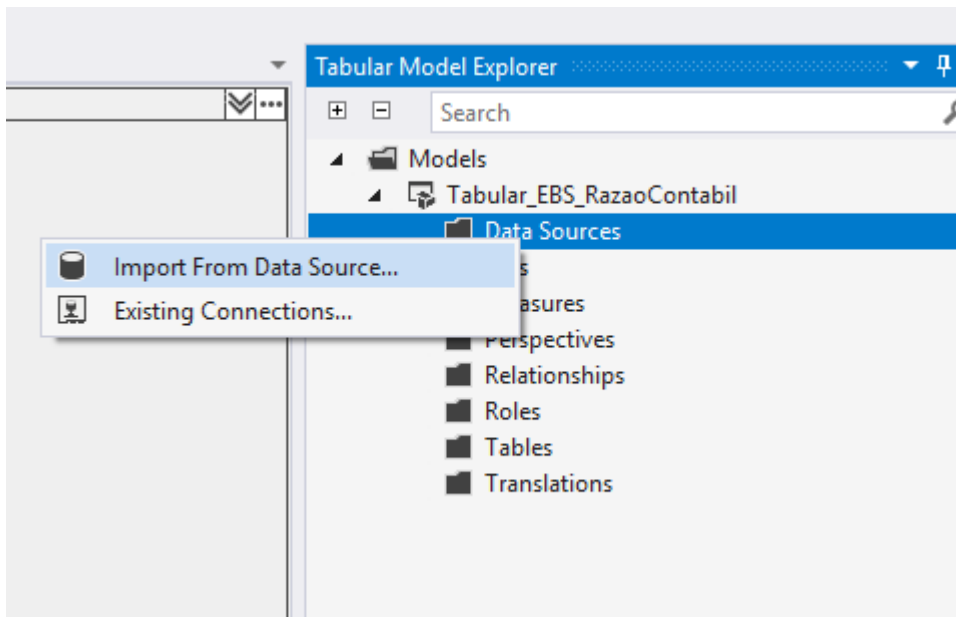
[Click here for more information about compatibility level.](#)

☐ Do not show this message again.

OK Cancel

Importing tables from Oracle Database

In Tabular Model Explorer click on Data Sources with right button and choose “Import From Data Source”



Choose Oracle:



Fill the connection name, server name, username and password and test it:

Table Import Wizard ? X

Connect to an Oracle Database
Enter the information required to connect to the Oracle database.

Friendly connection name:

Server name:

Log on to the database


User name:

Password:

☒ Save my password

Advanced... Test Connection

Tabular Model Designer X

 Test connection succeeded.

OK

< Back Next > Finish Cancel

Choose the Oracle Provider for OLE DB as Providers:

Advanced

?

×

Set Advanced Properties

Select a provider, and set the connection string properties.

Providers: Oracle Provider for OLE DB

Extended Properties

Locale Identifier1046

Named ConnectionString

File Name

Pooling

OLE DB ServicesDefault

Security

Password••••••

Persist Security InfoTrue

User IDdwla_ods

Source

Data Sourcedelta.br.scania.com

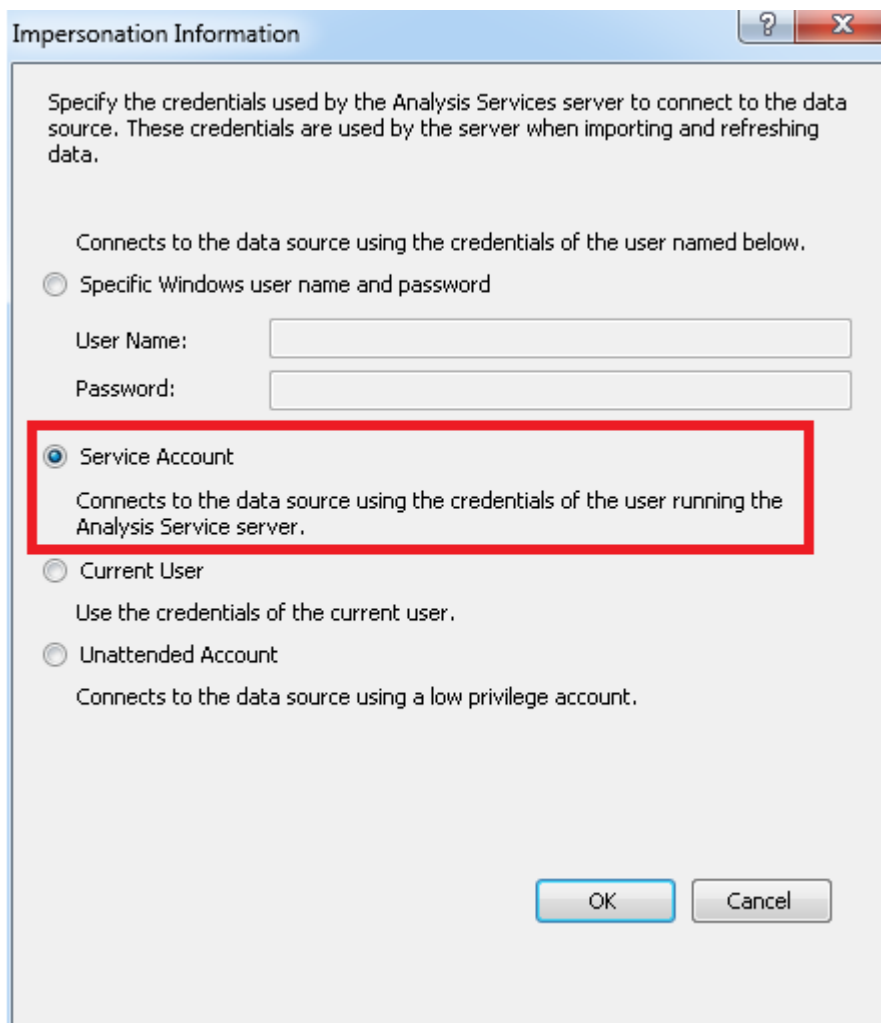
ProviderOraOLEDB.Oracle

Provider
The name of the OLE DB Provider to use when connecting to the Data Source.

Connection String:
Provider=OraOLEDB.Oracle;Data Source=delta.br.scania.com;Persist Security Info=True;Password=*****;User ID=dwla_ods

Test Connection
OK
Cancel

In Impersonation Information choose the Service Account:



Impersonation Information

Specify the credentials used by the Analysis Services server to connect to the data source. These credentials are used by the server when importing and refreshing data.

Connects to the data source using the credentials of the user named below.

☐ Specific Windows user name and password

User Name:

Password:

☒ **Service Account**

Connects to the data source using the credentials of the user running the Analysis Service server.

☐ Current User

Use the credentials of the current user.

☐ Unattended Account

Connects to the data source using a low privilege account.

OK Cancel

Choose how to import the Data according to username filled before where you can select the tables or write a query that will specify the data:

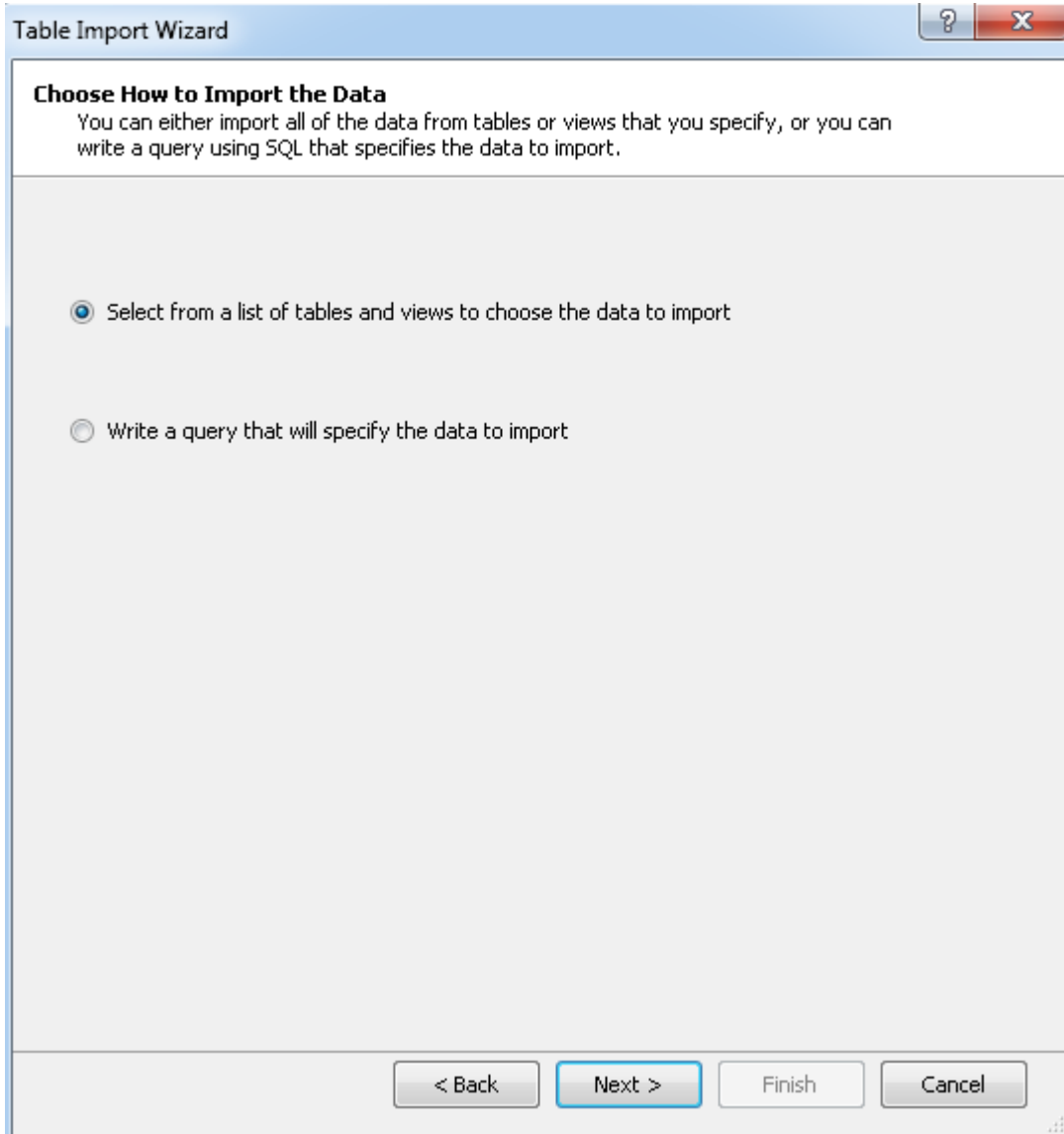


Table Import Wizard

Choose How to Import the Data
You can either import all of the data from tables or views that you specify, or you can write a query using SQL that specifies the data to import.

☒ Select from a list of tables and views to choose the data to import

☐ Write a query that will specify the data to import

< Back Next > Finish Cancel

Select the tables to be imported and press the Finish button:

Existing Connections

? X

Select Tables and Views

Select the tables and views that you want to import data from.

Data Source: delta.br.scania.com


Tables and Views:

<input type="checkbox"/>	Source Table	Schema	Friendly Name	Filter Details
<input checked="" type="checkbox"/>	AUD\$UNIFIED	AUDSYS		
<input type="checkbox"/>	EXEMPLO_TREINAME...	DWLA_ODS		
<input type="checkbox"/>	MV_ACCOUNT	DWLA_ODS		
<input type="checkbox"/>	MV_BALANCE2	DWLA_ODS		
<input type="checkbox"/>	MV_BALANCE3	DWLA_ODS		
<input type="checkbox"/>	MV_LEDGER2	DWLA_ODS		
<input type="checkbox"/>	MV_PERIOD_EBS	DWLA_ODS		
<input type="checkbox"/>	MV_PROFILE2	DWLA_ODS		
<input type="checkbox"/>	VHR_COLABORADOR...	DWLA_ODS		
<input type="checkbox"/>	XDB\$ACL	XDB		
<input type="checkbox"/>	XDB\$ALL_MODEL	XDB		
<input type="checkbox"/>	XDB\$ANY	XDB		
<input type="checkbox"/>	XDB\$ANYATTR	XDB		
<input type="checkbox"/>	XDB\$ATTRGROUP_DEF	XDB		

The data will be imported showing the message Success.


Existing Connections
?
X

Importing
The import operation might take several minutes to complete. To stop the import operation, click the Stop Import button.


Success

Total: 1 Cancelled: 0
Success: 1 Error: 0

Details:

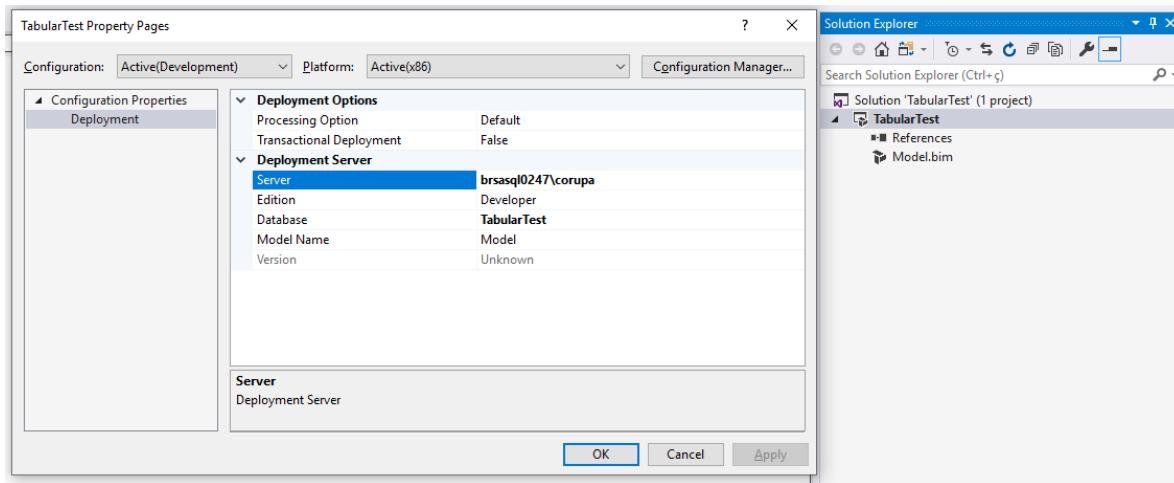
	Work Item	Status	Message
	Ledger	Success. 48 rows transferred.	

Stop Import

Close

Configuring the deployment server

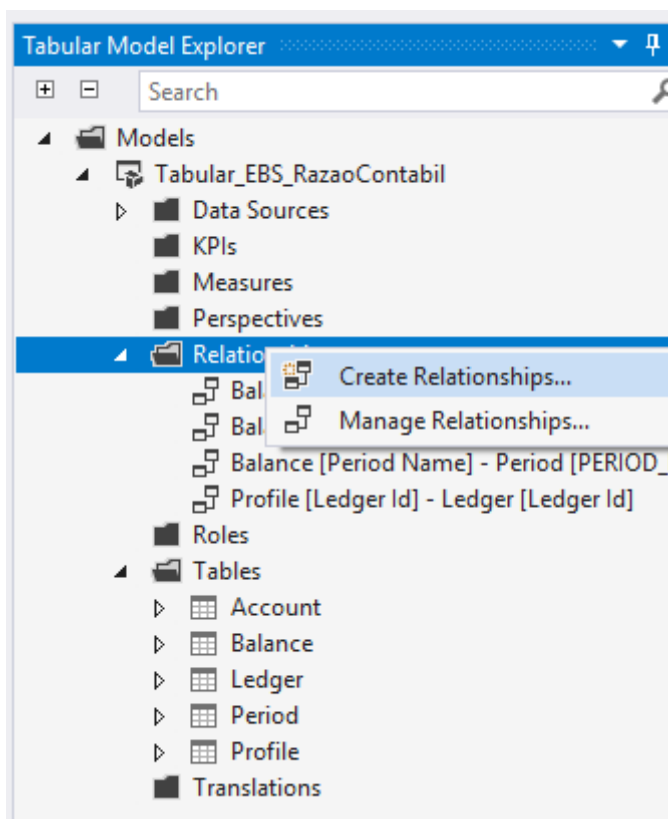
In Solution Explorer go to properties and fill the server name, the **brsasql0247\corupa** is development environment and the **brsasql0248\urubici** is production environment.



Creating relationships

In Tabular Model Explorer go to Relationships and click with right button.

You can also create KPIs, Measures and Perspectives.





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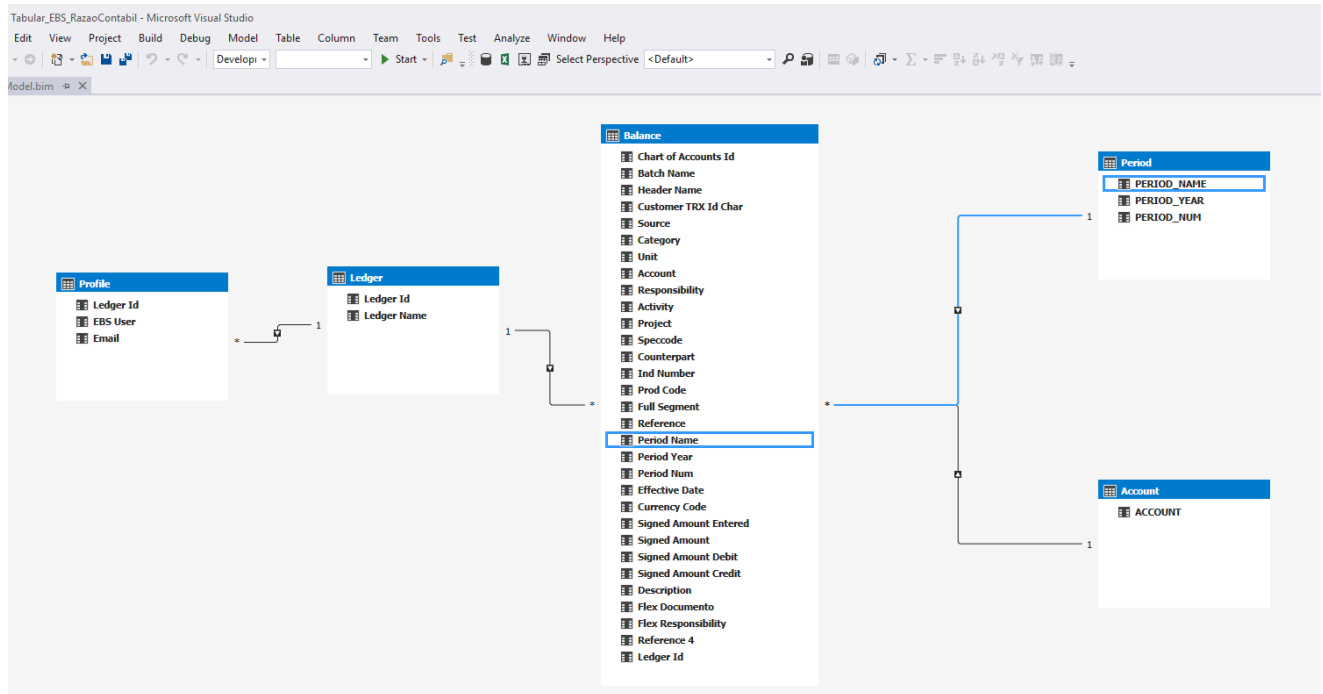
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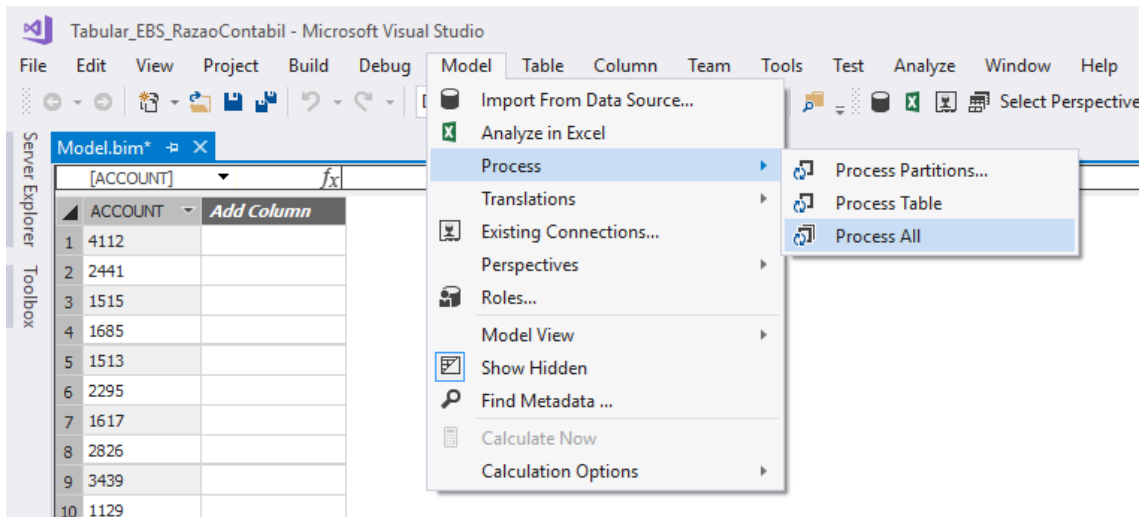
For information (department acronym name)

Create the relationships between the tables.



Process the Model


Process the model go to menu Model\Process and choose the option that you want it.



If the structure and the data are OK then the processing will be finished OK.






Data Processing
?
X

Processing Progress
Processing gets updated data from the original data sources.


Success

5 Total 0 Cancelled
5 Success 0 Error

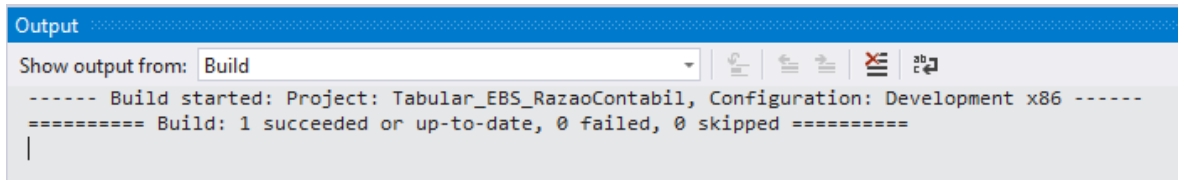
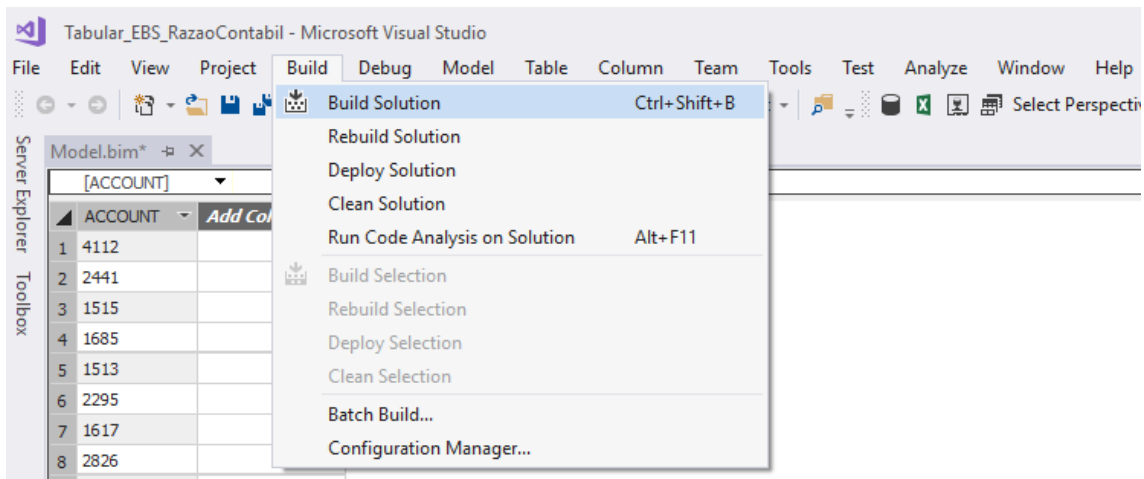
Details:

	Work Item	Status	Message
	Profile	Success. 1.993 rows transferred.	
	Ledger	Success. 48 rows transferred.	
	Balance	Success. 27.880.648 rows transferred.	
	Period	Success. 39 rows transferred.	
	Account	Success. 1.049 rows transferred.	

Stop Processing
Close

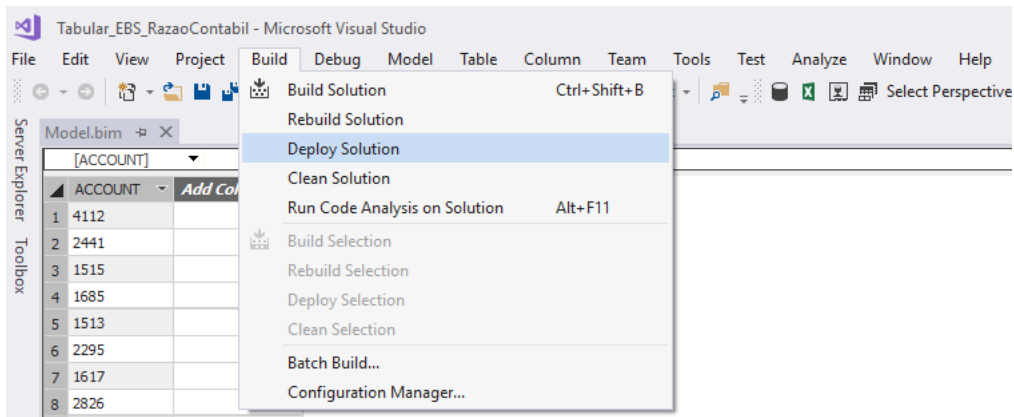
Build Solution

Build Solution go to menu Build\Build Solution and if the solution will be OK then a message with Succeeded will be showed.

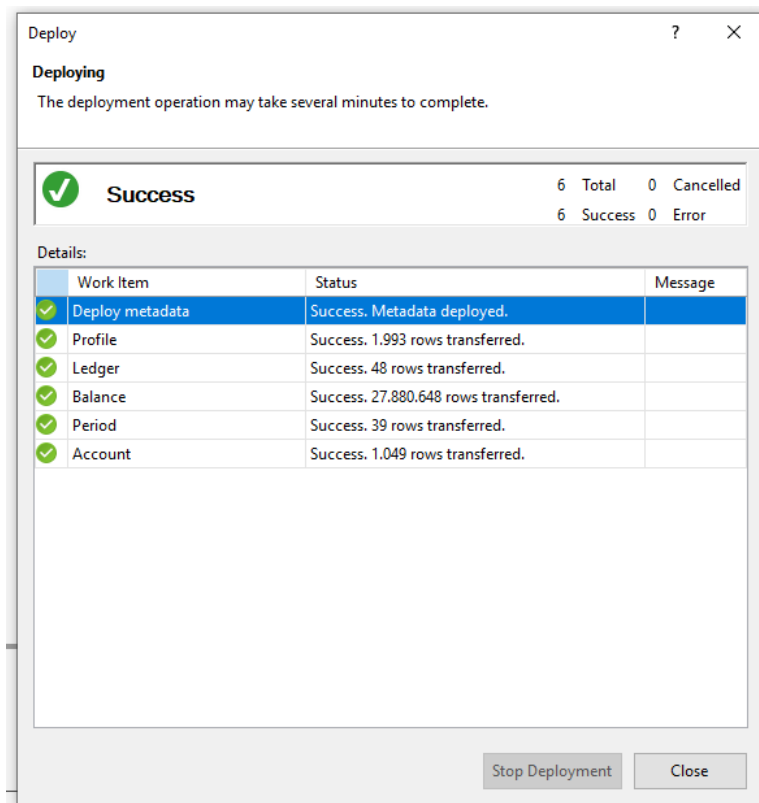


Deploy Solution

Deploy Solution go to menu Build\Deploy Solution.

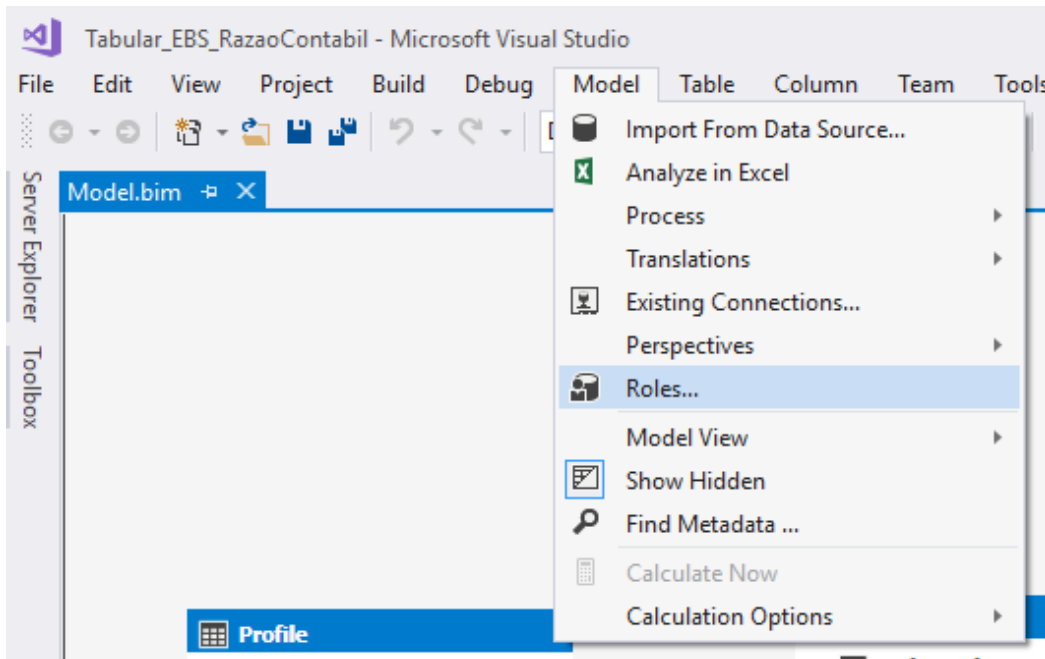


If it is OK then the solution will be deployed in SSAS.



Roles

Define roles go to menu Model\Roles.



Fill the role name, permissions, row filters and the members.

Role Manager

?

×

Specify the roles for the tabular project. Roles define a group of users with a set of permissions on the Analysis Services database.

Name	Permissions	Description
Read_Only	None	

New

Copy

Delete

Details - Read_Only

Row Filters

Members

Specify DAX expressions that return Boolean values. Only rows that match the specified filters are visible to users in this role.

Table	DAX Filter
Profile	
Ledger	
Balance	
Period	
Account	

OK

Cancel

Fill the username or AD group.

Role Manager ? X

Specify the roles for the tabular project. Roles define a group of users with a set of permissions on the Analysis Services database.

Name	Permissions	Description
Read_Only	None	

New

Details

Row Filters

Specify the

Add... Add External... Find Users... Remove

OK Cancel

Select Users or Groups X

Select this object type:

Users or Built-in security principals Object Types...

From this location:

M11977 Locations...

Enter the object names to select (examples):

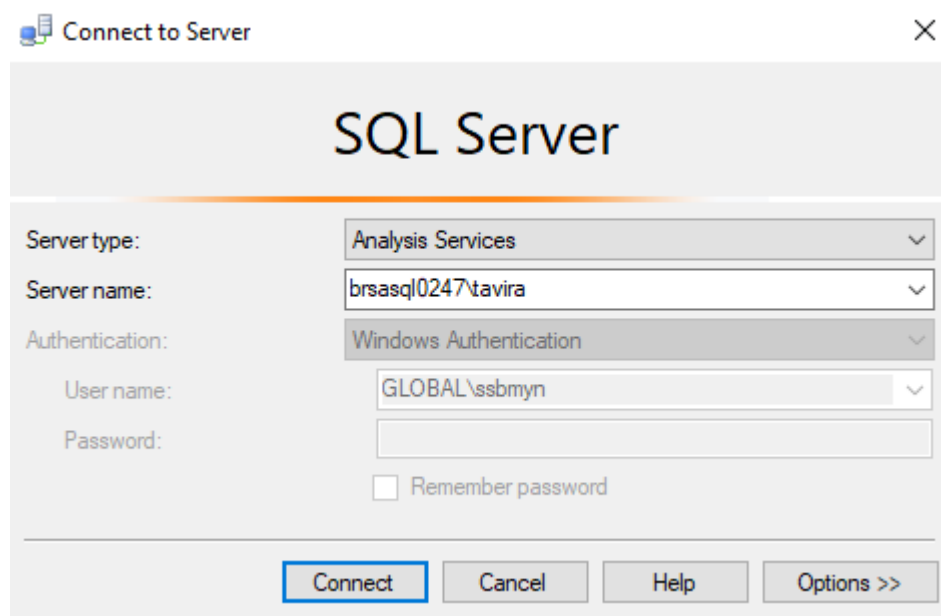
SSBMYN (marcius.nishida@scania.com);

Check Names

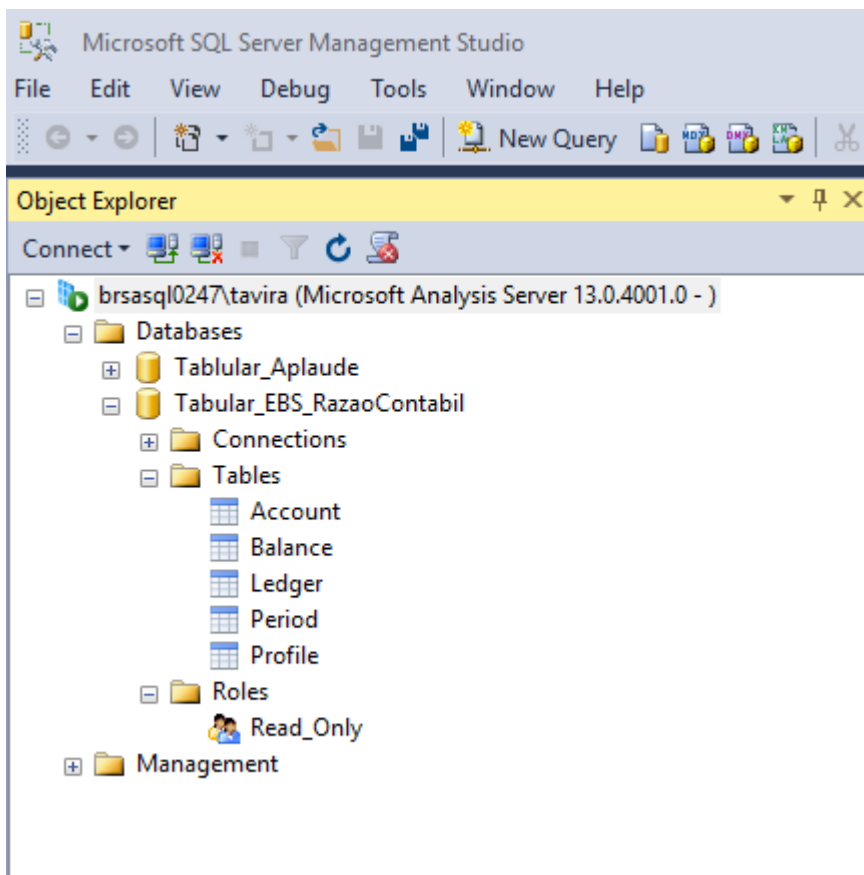
Advanced... OK Cancel

Opening the Analysis Services

If you have permission so open the SQL-Server Management Studio and select the Analysis Services as Server Type and the server name is brsasql0247\tavira(development) or brsasql0248\tavira(production).

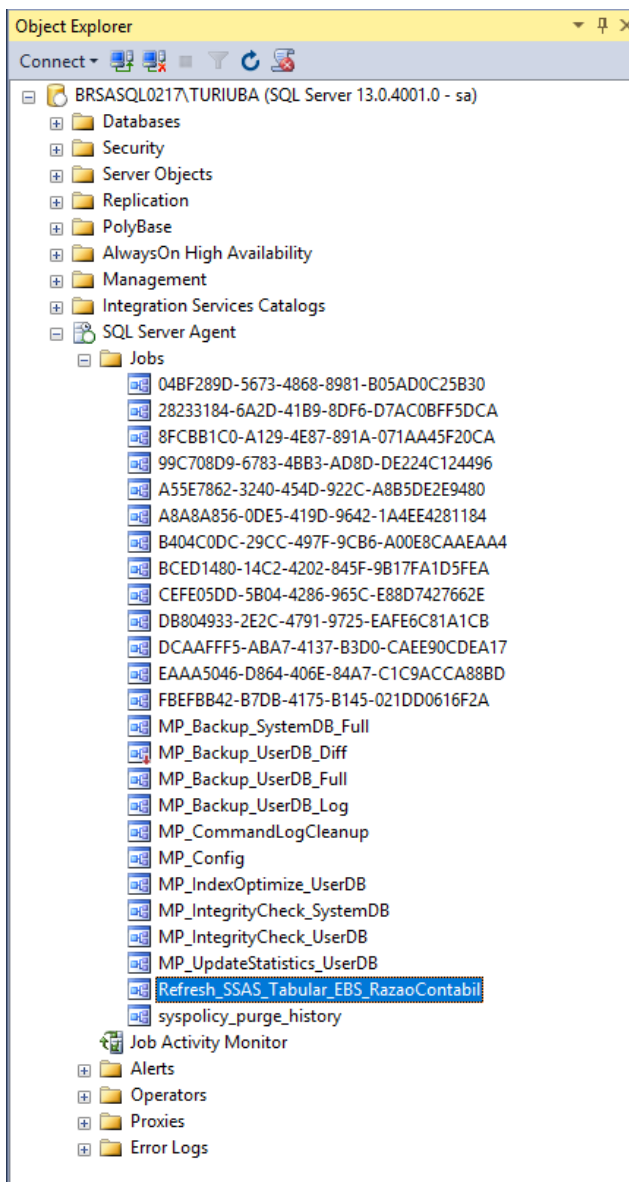


You can see the database on Analysis Services, connections, tables and roles as deployed by Visual Studio.

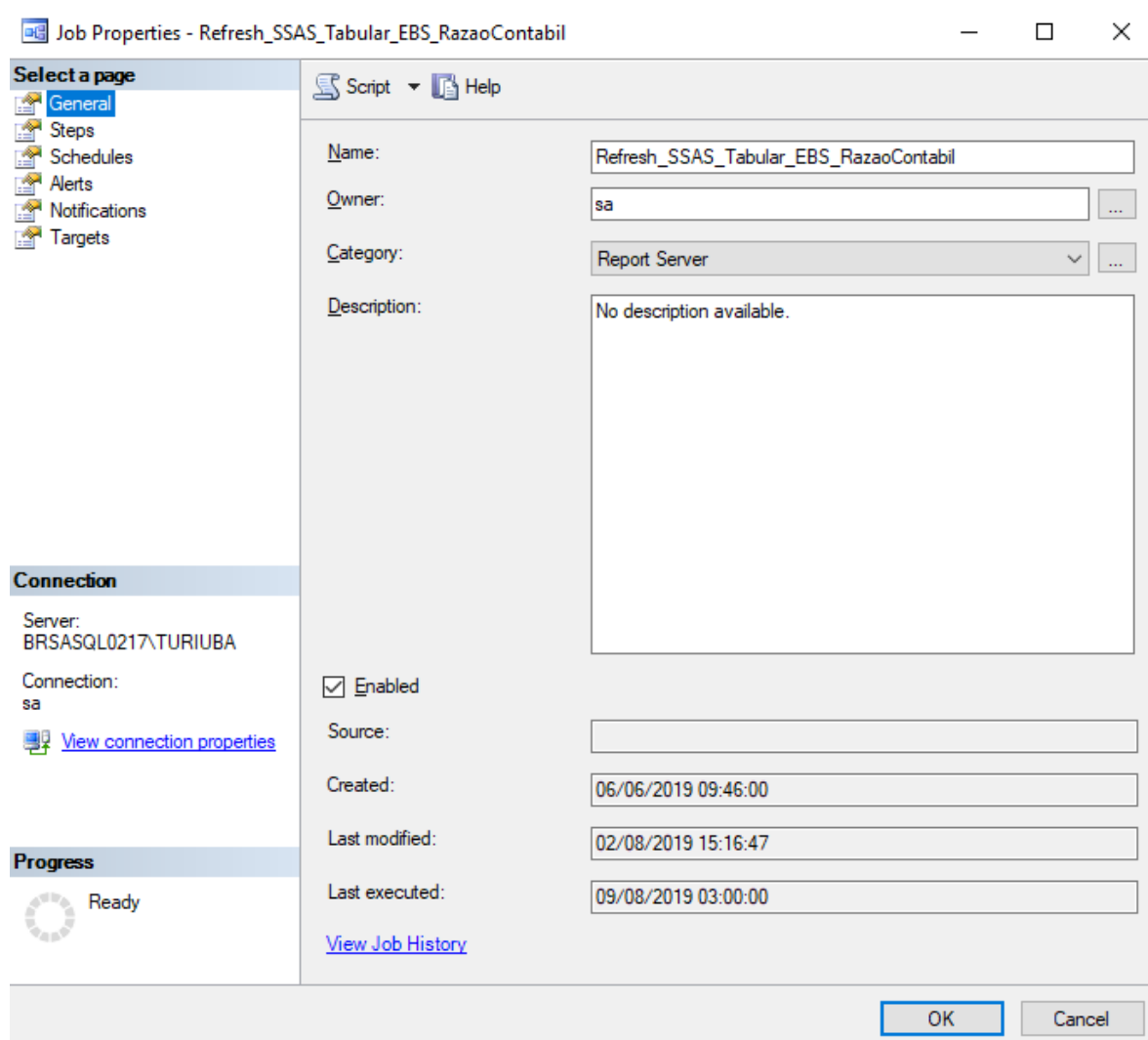


Creating the refresh job for Analysis Services

Create a new job on SQL-Server to refresh the data on Analysis Services, the data is in memory so you can schedule the refresh data loading from data sources.



Create a new job fill the Name on the page General.



Job Properties - Refresh_SSAS_Tabular_EBS_RazaoContabil

Select a page

- General**
- Steps
- Schedules
- Alerts
- Notifications
- Targets

Script **Help**

Name: Refresh_SSAS_Tabular_EBS_RazaoContabil

Owner: sa

Category: Report Server

Description: No description available.

Connection

Server: BRSQL0217\TURIUBA

Connection: sa

[View connection properties](#)

Progress

Ready

☒ Enabled

Source:

Created: 06/06/2019 09:46:00

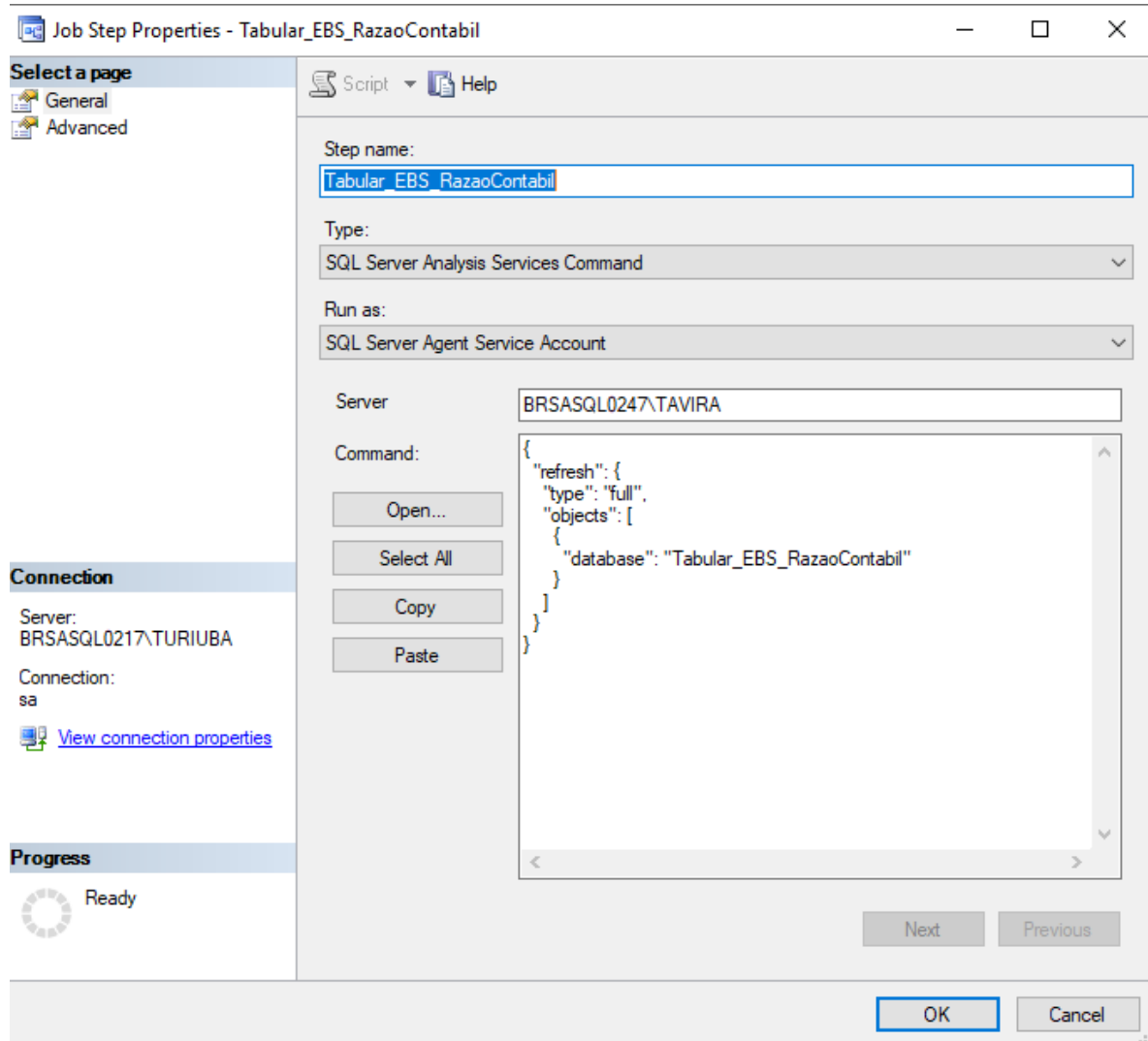
Last modified: 02/08/2019 15:16:47

Last executed: 09/08/2019 03:00:00

[View Job History](#)

OK **Cancel**

Fill the Step name, Server and the Command on the page Steps.



Job Step Properties - Tabular_EBS_RazaoContabil

Select a page
 General
 Advanced

Script Help

Step name:
 Tabular_EBS_RazaoContabil

Type:
 SQL Server Analysis Services Command

Run as:
 SQL Server Agent Service Account

Server
 BRSASQL0247\TAVIRA

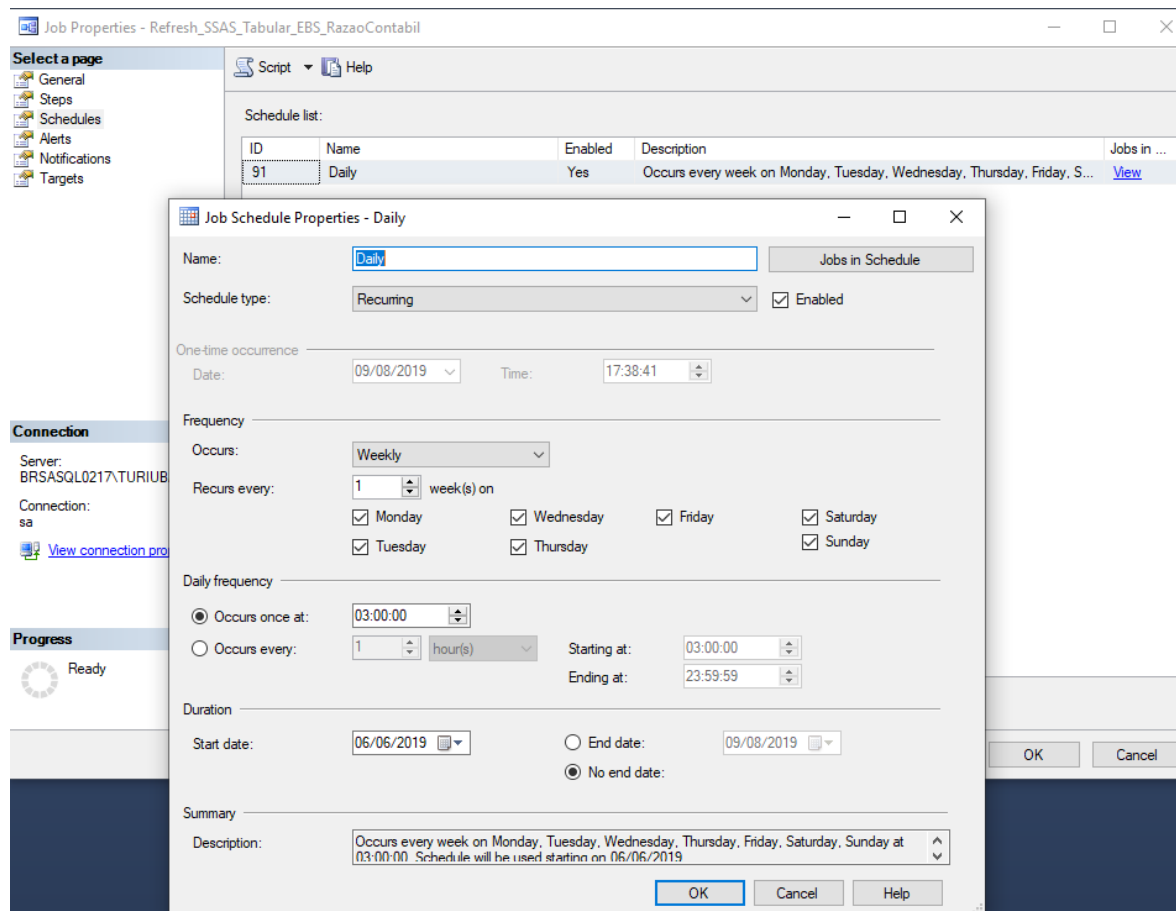
Command:
 {
 "refresh": {
 "type": "full",
 "objects": [
 {
 "database": "Tabular_EBS_RazaoContabil"
 }
]
 }
 }
 Open...
 Select All
 Copy
 Paste

Connection
 Server:
 BRSASQL0217\TURIUBA
 Connection:
 sa
[View connection properties](#)

Progress
 Ready

Next Previous OK Cancel

Fill the Name and the frequency on the page Schedules.



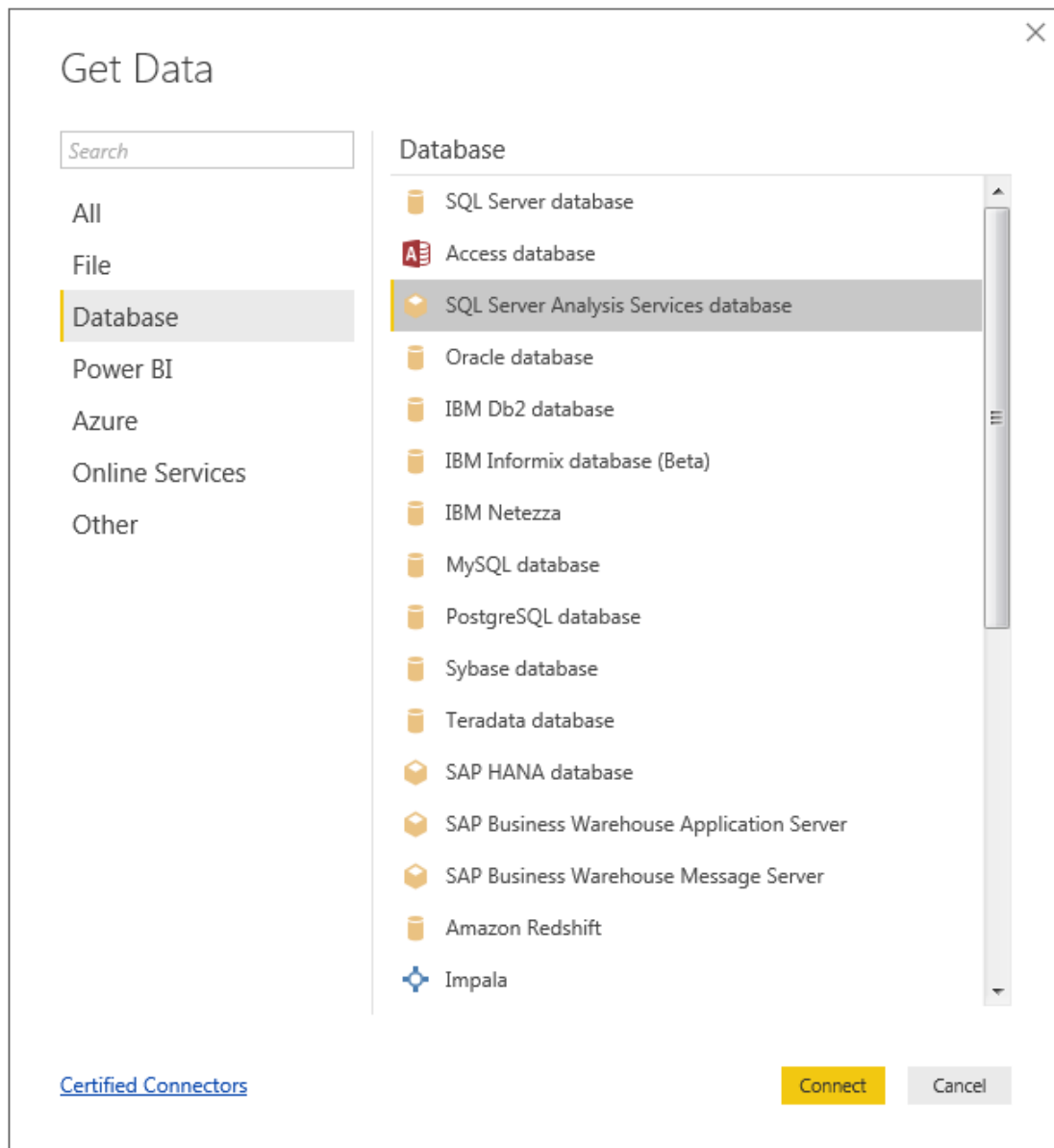
The screenshot shows the 'Job Properties - Refresh_SSAS_Tabular_EBS_RazaoContabil' application. The 'Schedules' tab is selected in the left sidebar. The 'Job Schedule Properties - Daily' dialog box is open, showing the following configuration:

- Name:** Daily
- Schedule type:** Recurring
- Enabled:** ☒
- One-time occurrence:** Date: 09/08/2019, Time: 17:38:41
- Frequency:** Occurs: Weekly, Recurs every: 1 week(s) on
 - ☒ Monday, ☒ Tuesday, ☒ Wednesday, ☒ Thursday, ☒ Friday, ☒ Saturday, ☒ Sunday
- Daily frequency:** ☒ Occurs once at: 03:00:00
- Duration:** Start date: 06/06/2019, End date: 09/08/2019, No end date: ☒
- Summary:** Description: Occurs every week on Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday at 03:00:00. Schedule will be used starting on 06/06/2019

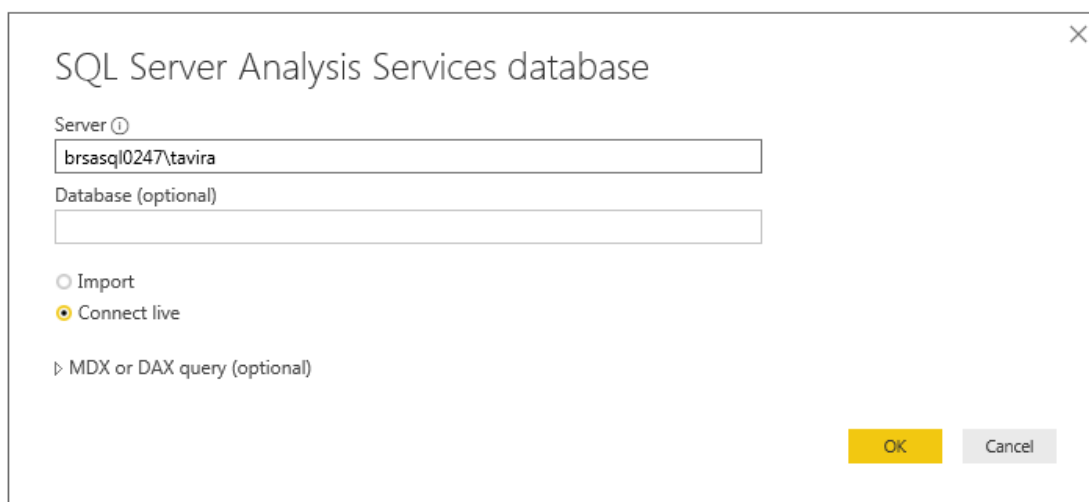
The dialog box has 'OK', 'Cancel', and 'Help' buttons at the bottom.

Using Analysis Services by PowerBI

Open the PowerBI on Get Data and choose Database – SQL Server Analysis Services database.



Fill the server name.



SQL Server Analysis Services database

Server ⓘ
 brsasql0247\tavira

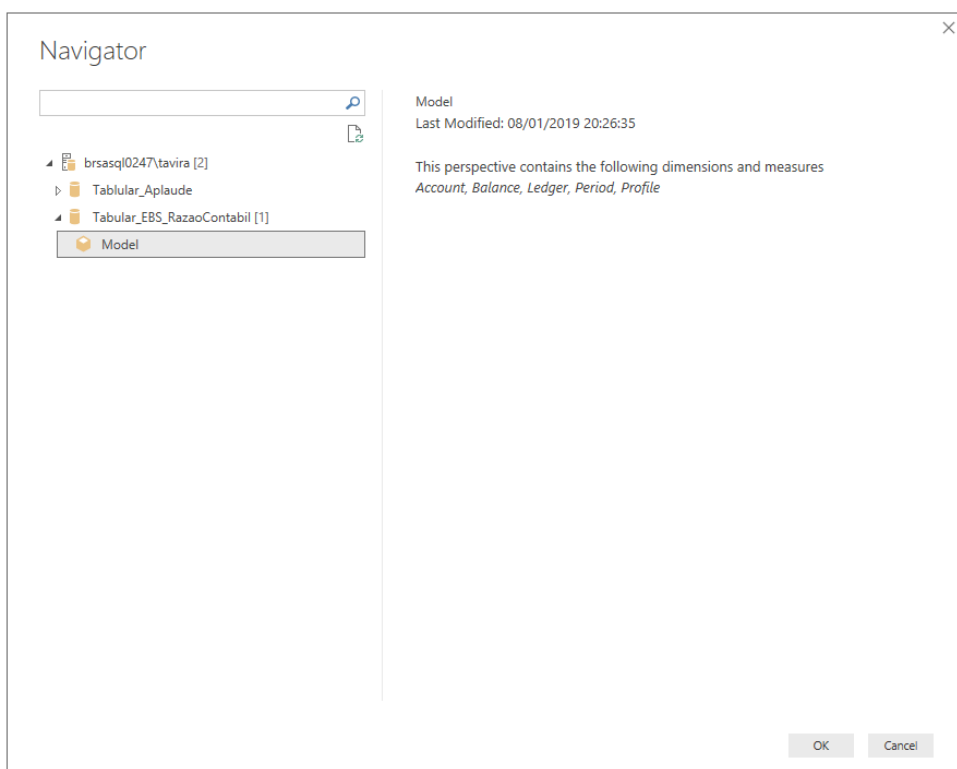
Database (optional)

☐ Import
☒ Connect live

▶ MDX or DAX query (optional)

OK Cancel

It will show the databases that you have permission.



Navigator

Model
 Last Modified: 08/01/2019 20:26:35

This perspective contains the following dimensions and measures
 Account, Balance, Ledger, Period, Profile

OK Cancel



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The tables from Analysis Services will be loaded on right side and you can create your report.

The screenshot displays the Microsoft Power BI Desktop interface. The main area shows a data table with the following columns: Reference, Project, Effective Date, Batch Name, Header Name, Description, Signed Amount, and Ledger Id. The table contains 30 rows of data, including a 'Total' row at the bottom. The right-hand pane shows the 'Visualizations' and 'Fields' sections. The 'Visualizations' section is currently empty, and the 'Fields' section lists various data fields that can be added to a visualization.

Reference	Project	Effective Date	Batch Name	Header Name	Description	Signed Amount	Ledger Id
B	000000	01/01/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	69.263.417,56	4.275,00
B	000000	01/02/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	65.475.223,44	3.420,00
B	000000	01/03/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	113.281.451,70	3.135,00
B	000000	01/04/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	139.557.272,21	3.705,00
B	000000	01/05/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	135.954.656,29	3.420,00
B	000000	01/06/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	149.518.932,75	3.990,00
B	000000	01/07/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	157.761.210,87	4.275,00
B	000000	01/08/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	85.929.767,09	3.420,00
B	000000	01/09/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	150.389.596,93	3.990,00
B	000000	01/10/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	118.180.547,89	3.420,00
B	000000	01/11/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	88.065.151,73	3.705,00
B	000000	01/12/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	117.072.507,99	3.705,00
B	000000	31/12/2016 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	90.490.654,09	4.560,00
B	000000	01/01/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	90.490.654,09	4.560,00
B	000000	01/02/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	67.582.298,08	3.705,00
B	000000	01/03/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	95.377.024,14	3.990,00
B	000000	01/04/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	145.652.399,59	4.275,00
B	000000	01/05/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	135.706.326,26	3.420,00
B	000000	01/06/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	171.216.558,68	3.420,00
B	000000	01/07/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	179.521.421,65	3.705,00
B	000000	01/08/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	135.027.455,17	2.850,00
B	000000	01/09/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	151.948.522,91	3.420,00
B	000000	01/10/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	185.546.287,99	3.705,00
B	000000	01/11/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	186.296.076,14	3.705,00
B	000000	01/12/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	251.745.255,92	3.420,00
B	000000	31/12/2017 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	175.055.912,14	3.705,00
B	000000	01/01/2018 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	175.055.912,14	3.705,00
B	000000	01/02/2018 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	173.579.824,25	4.560,00
B	000000	01/03/2018 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	210.318.316,64	4.275,00
B	000000	01/04/2018 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	261.799.737,05	3.705,00
B	000000	01/05/2018 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	218.983.233,03	3.420,00
B	000000	01/06/2018 00:00:00	BATCH NAME - OPEN BALANCE	HEADER NAME - OPEN BALANCE	SALDO INICIAL DO PERÍODO	260.610.070,59	3.135,00
Total						2.148.330.339,74	458.850,00