TARGIT®

Data Service

- User Guide

Contents

About

TARGIT Data Service enables an end-user to consume data from a wide variety of data sources and combine them with other data without knowing about data types and complicated query languages, we call these combinations for cubes.

Users of TARGIT Data Service will notice that there is very little effort needed when it comes to keeping the data in the cubes up-to-date since one of the key points of the design is to make solution that feels alive to the users accessing the cubes.

TARGIT Data Service is not meant to be a replacement for a traditional BI solution, but rather be the add-on that gives business analysts and other user types with basic understanding of data structures a tool to instantly deploy company-wide solutions in a collaborative spirit.

Terminology

- Data Sources - A data source is the building stone of a cube. TARGIT supports a wide range of data.
- Format - A format is a way of presenting the data from a data source in a different perspective, this includes unpivoting data, adding calculations, stripping out spaces and more than a hundred other functions. The syntax for the formulas are similar in nature and functionality to Excel®.
- Cubes - A cube is where data is joined with other data sources making it possible to compare different datasets in a dimensional model.
- Fact table - A fact table is a dataset in which you find measures. If a table isn't marked as a fact table data can be lost during joining several tables. Fact tables are treated differently by the TARGIT Data Discovery tool and ensures the integrity of the data

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Getting Started

An easy way to get started is to find two relevant Excel sheets e.g. a files with sales and a file with budget, lets assume that each sheet has a column with a date, customer number and sales amount or budget amount depending on the file.

- Go to Data Sources and add each Excel sheet as a new data source, label each file with the appropriate name: sales or budget
- Go to cubes and add a new cube
- Drag the two tables to the working area
- Drag from the arrow to the dot from the sales table to the budget table for the two tables

- In the upper right corner of the tables shown in the cube designer you will find a little sum-symbol. Click this icon to make both tables fact tables.
- Close the designer and try building your first analysis based on the new cube

HINT: You can do the operation below directly in the cube designer, however going to Data Sources teaches you to explore a part of the application that gives you even greater control over the data sources.

The cubes tab

The cubes tab shows all cubes available to the user. On the left side is a selector that can limit the cubes shown to a particular user, the latter is very useful for Data Discovery Administrators with access to all cubes created in the entire system.
Each cube listed in the right pane can be expanded and the data of the data sources can be seen. In addition to this right-clicking an existing cube shows the menu with:

- Edit - Opens the cube in the cube designer
- Reload - Reloads the cube with the data currently in memory
- Permissions - Change permissions for the cube
- Share - Share the cube with other users.
- Delete -
- Removes the cube - The cube icon indicated different statuses, below is a description of these:
- Available - The cube is updated and all data sources are updated
- Broken - A data source is damaged or removed causing the cube to be offline.
- Pending restore - The cube has not yet been made online after a restart of the service.

The Data Source Tab

The data sources tab shows an overview of all data source available to the logged in user. Formats for a data source will appear indented below the original data source.
When hovering the status shown to the right of the data source name diagnostics information will be shown regarding number of rows and the time it took to gather the data. If an error occurs the last exception will be shown in here as well.

Statuses

A data source can have the following statuses:

- Available - The data source was refreshed according to the specified schedule and is working.
- Broken - The data source did not get create correctly or the input data from the plugin has changed from its original form thereby breaking the data source and the related cubes.
- Updating - Data is currently being retrieved and processed.
- Disabled - A user has disabled the data source from being updated and available.
- Creating - This is the initial process where the data is retrieved for the first time and data types are auto-detected.
- For admins - For users with Data Discovery Administrator permissions a settings icon will appear in the upper right corner.

Options

Right-clicking an existing data source brings up the popup menu with the following items:

- Preview - Shows a preview of the first 100 rows in the data source. In this preview data types can quickly be adjusted from e.g. where a customer number is detected as numeric but should be a string.

- Create format - Allows the user to create a format that can radically change the contents of the data source, e.g. concatenate strings, perform calculations on columns or unpivot columns. See separate topic for detailed information on this subject.
- Column types - Here specific data types and other settings related to data types can be adjusted. For example the date pattern that is auto-detected can be overridden.
- Edit properties -Change properties for the data source, e.g. URL or user name and password. Please note that you typically can’t change the structure of the data source. If structural changes are needed the data source must be recreated due to dependencies in cubes or formats.
- Reload - Reloads the data from the data source immediately and updates the associated cubes
- Permissions - Used to share and set ownership and permissions for the data source
- Share - Share
  The owner can share the data source with other users. The IT department could e.g. share a SQL data source that would extract the last years sales information which a user then could combine with their own Excel sheet
- Disable - Disables the data source and cubes associated with it
  Delete Removes the data source from the system. This will break all cubes that makes use of the data source

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Settings

The settings dialog allows for adjusting systemwide settings for TARGIT Data Service. The settings are split onto several tabs:

Main

- Enable telemetry - This enables automatic error reporting to TARGIT. We do not collect any data from any data source. The information that is collected is stacktraces of exceptions and similar diagnostics information. This is actively used in improving the product. This does not affect performance of TARGIT Data Service.
- Query Statistics - Shows the statistics for queries served based on type: Succeeded, Failed, Current, Cached, Average time (ms)
- Visualize errors - Indicates whether an error bar should be shown in the UI when errors occur either in the UI or in the Engine

Plugin Management

On this tab each plugin type can be enabled or disabled. Please note that certain plugins are reused and will therefore result in other plugins being disabled (e.g. the CSV plugin)

- Plugins -Here relevant plugins need to have their OAuth information and similar required connection information entered. OAuth information is tokens that allow Data Service to connect to the service and obtaining these tokens are unique to each data source provider, for example does the Google Analytics plugin require you to create a Google Developer account and set up the correct permissions.
- How to obtain tokens are described below - Facebook
  (coming soon)
  eBay (coming soon)
  SalesForce (coming soon)
  Twitter (coming soon)
  Cache

Cache

To improve query performance the Data Discovery server has built in proactive caching.

- Enable query cache - Toggles the cache on or off
- Max query cache size (Mb) - Specifies the maximum memory that can be allocated for the query cache in Mb

Lifetime of Dynamic Cubes (Seconds)   Specifies how long a query from e.g. the SQL Server stored procedure should be held in memory before a new query should be executed.

Proxy

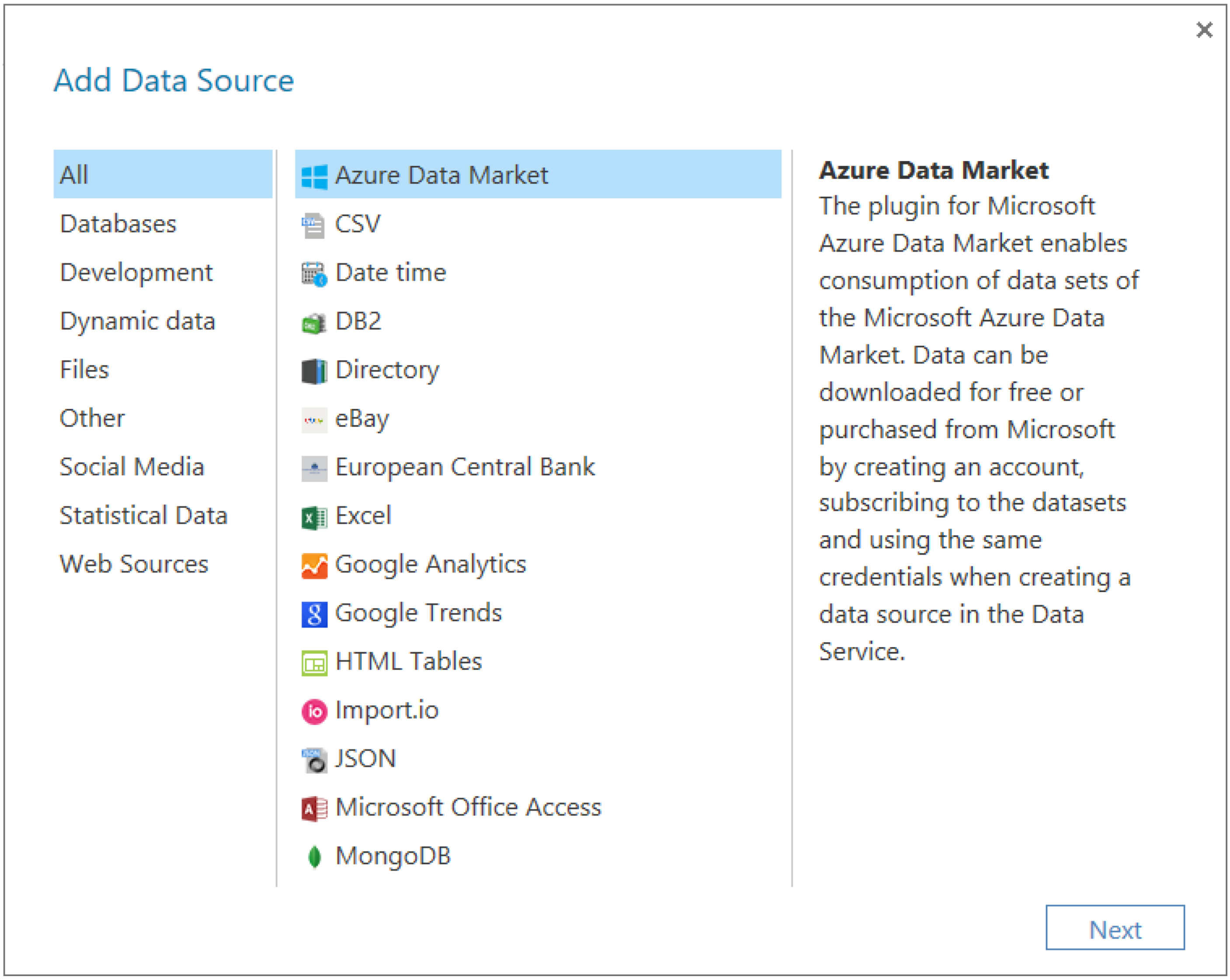
In organizations where an internet proxy server is installed this option must be configured. By default it is detected by the installer, however it can also be adjusted in the settings.

- Proxy Enabled - Turns the proxy support on or off
- Proxy address - Enter the address of the proxy server
- Proxy user - Enter the username that has access to the proxy
- Proxy password - Enter the password for the user account entered above

Data Sources

TARGIT Data Service puts complex data exploration into the hands of everyday business users with simple drag-and-drop technology. Combine data from the data warehouse with Excel spreadsheets or connect to external data sources for access to millions of data sets to integrate with company data. With TARGIT Data Service, the data discovery possibilities are endless.

Here, we'll show you how to connect those data sources.



Add Data Source

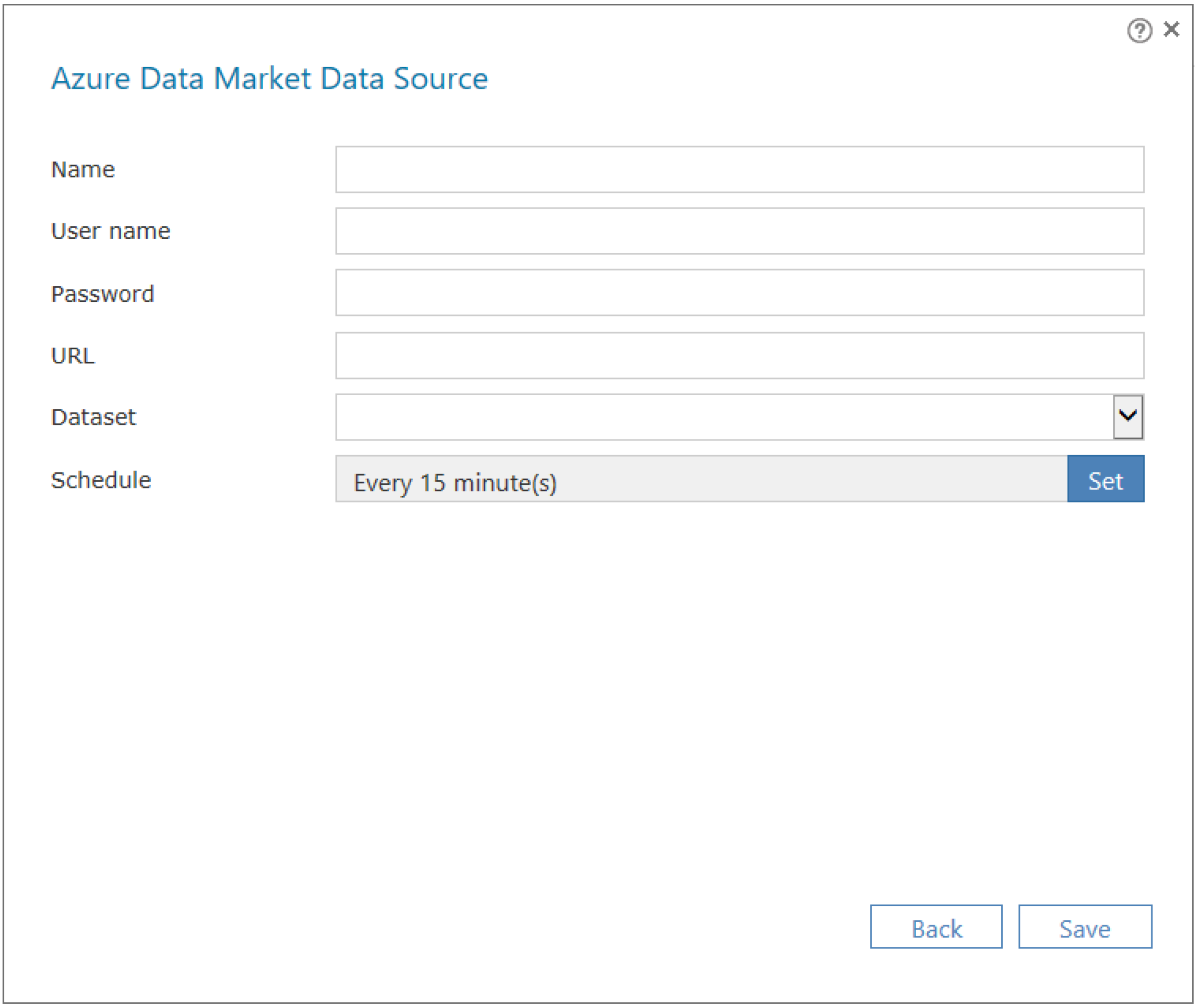
All
Databases
Development
Dynamic data
Files
Other
Social Media
Statistical Data
Web Sources

Azure Data Market
CSV
Date time
DB2
Directory
eBay
European Central Bank
Excel
Google Analytics
Google Trends
HTML Tables
Import.io
JSON
Microsoft Office Access
MongoDB

Azure Data Market
The plugin for Microsoft Azure Data Market enables consumption of data sets of the Microsoft Azure Data Market. Data can be downloaded for free or purchased from Microsoft by creating an account, subscribing to the datasets and using the same credentials when creating a data source in the Data Service.

Azure Data Market

The plugin for Microsoft Azure Data Market enables consumption of data sets of the Microsoft Azure Data Market. Data can be downloaded for free or purchased from Microsoft by creating an account, subscribing to the datasets and using the same credentials when creating a data source in the Data Service.



Azure Data Market Data Source

Name

User name

Password

URL

Dataset

Schedule: Every 15 minute(s)

Name

Enter the name of the data source

User Name

Specify the username created on the Microsoft Azure Data Market

Password

Specify the password to access your Microsoft Azure Data Market account

Url

Specify the url from which to retrieve data from Azure Data Market.
Use the URL from the Microsoft Data Market Connection and remove the part after the version (highlighted in italics below)

https://datamarket.azure.com/Provide/DataSourceName/v1/*DataSource*

Dataset

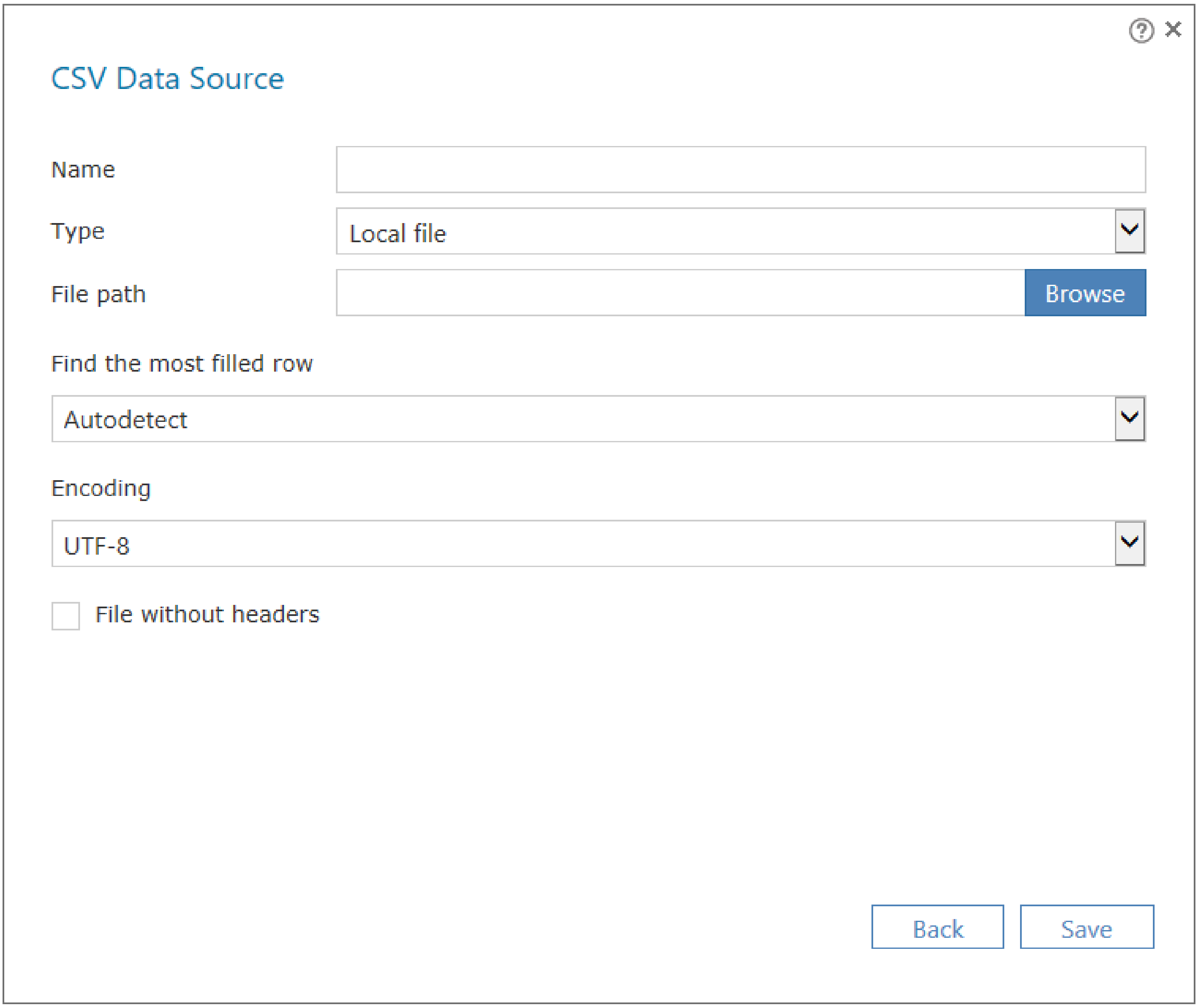
A list of all available datasets in the account will be listed here.

Schedule

Decide how often you would like to schedule the data to refresh.

CSV

The plugin can consume data from correctly formatted CSV files. The files can reside either on the file system available to the service account utilizing the TARGIT Data Service or be downloaded from a URL.



CSV Data Source

Name

Type: Local file

File path

Find the most filled row: Autodetect

Encoding: UTF-8

□ File without headers

Name

Enter the name of the data source

Type

- Local file - Point to the local file on the file system. (Updates will happen automatically based on changes to the file, thuerefore the schedule option is not available.
- URL - Retrieve the CSV file from an unprotected internet source.
    - **Server** - Enter the URL to access the CSV file

- **If *Use Credentials* is checked** - Enter username and password to access the CSV file
- **Schedule** - Decide how often you would like to schedule the data to refresh

Find the most filled row

- Autodetect - Determines the way the file is loaded. Autodetect will automatically start looking for the most complete row and expect that row to be the header with data below.
- Skip X Lines - Enables the option to specify that it should skip the first X lines of the file and start loading data from that point and on.
- Skip Lines - Enter the number of lines that you wish to skip from the file. This option is available if "Skip X Lines" are chosen in the previous option.
- Do nothing - Will expect the data to start in the first line in the sheet.

Encoding

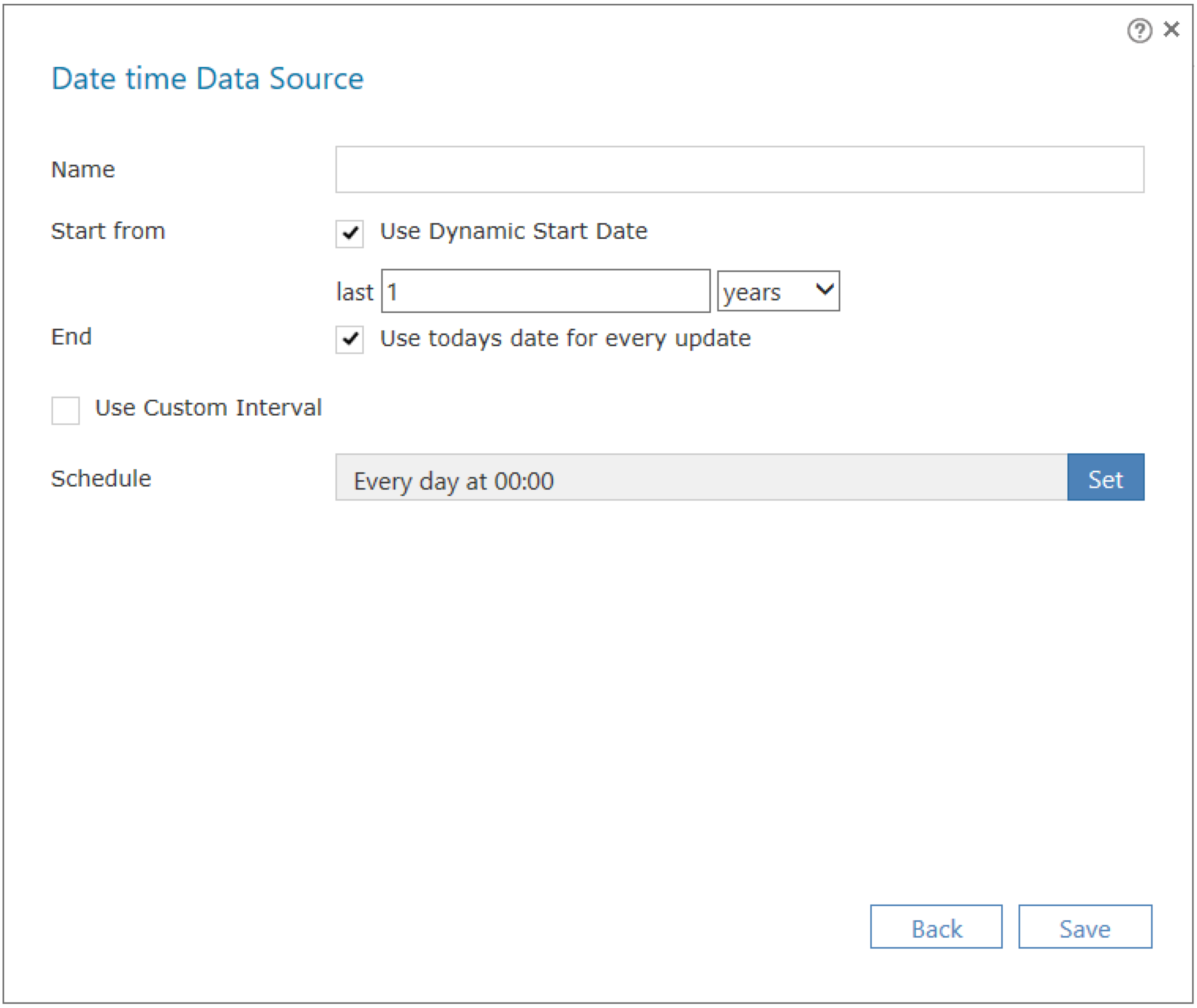
Default code page: UTF-8.
Note: you can always change the code page: <Right click> the source - select <edit properties>

File without headers

If this option is checked the file including the first line will be loaded and instead of utilizing the first row as column headers all columns will be named like "Column1, Column2 etc." and at the same time load the first line of data as "data".

Date Time

Date Time plugin. Used in Cubes to make it possible to use ‘Dynamic period’ as a criteria.



Date time Data Source

Name

Start from ☑ Use Dynamic Start Date

last 1 years

End ☑ Use todays date for every update

□ Use Custom Interval

Schedule Every day at 00:00

Name

Give the Data Source a name

Start From

If you uncheck “Use Dynamic Start Date” and uncheck “Use todays date for every update”, then you will have the option for selecting the exact date that your Date Table will begin or end and it will never change.

If you check the box for “Use Dynamic Start Date” then the next option will be to decide how far back from Today, you want to start your Date Table.

End

If you check the box for “Use todays date for every update”, then your Date Table will always update until today. You can decide that Today’s date is always used for the update of the Date Table.

Use Custom Interval

This option is for adding entries to your time table with a custom time interval.

- Interval - Insert an Integer value.
- Interval type - Choose from Hours, Minutes or Seconds.
- Example - If you set **Interval** to '5' and **Interval type** to 'Hours', you will get time table entries something like this: 12/31/2014 00:00:00; 12/31/2014 05:00:00; 12/31/2014 10:00:00; 12/31/2014 15:00:00 etc.

Use Accurate Time

This option is for setting a custom daily timestamp if it should be different than 00:00:00.

Eg. setting an accurate time stamp to 18:00:00 will produce time table entries something like this:

12/29/2014 18:00:00

12/30/2014 18:00:00

12/31/2014 18:00:00

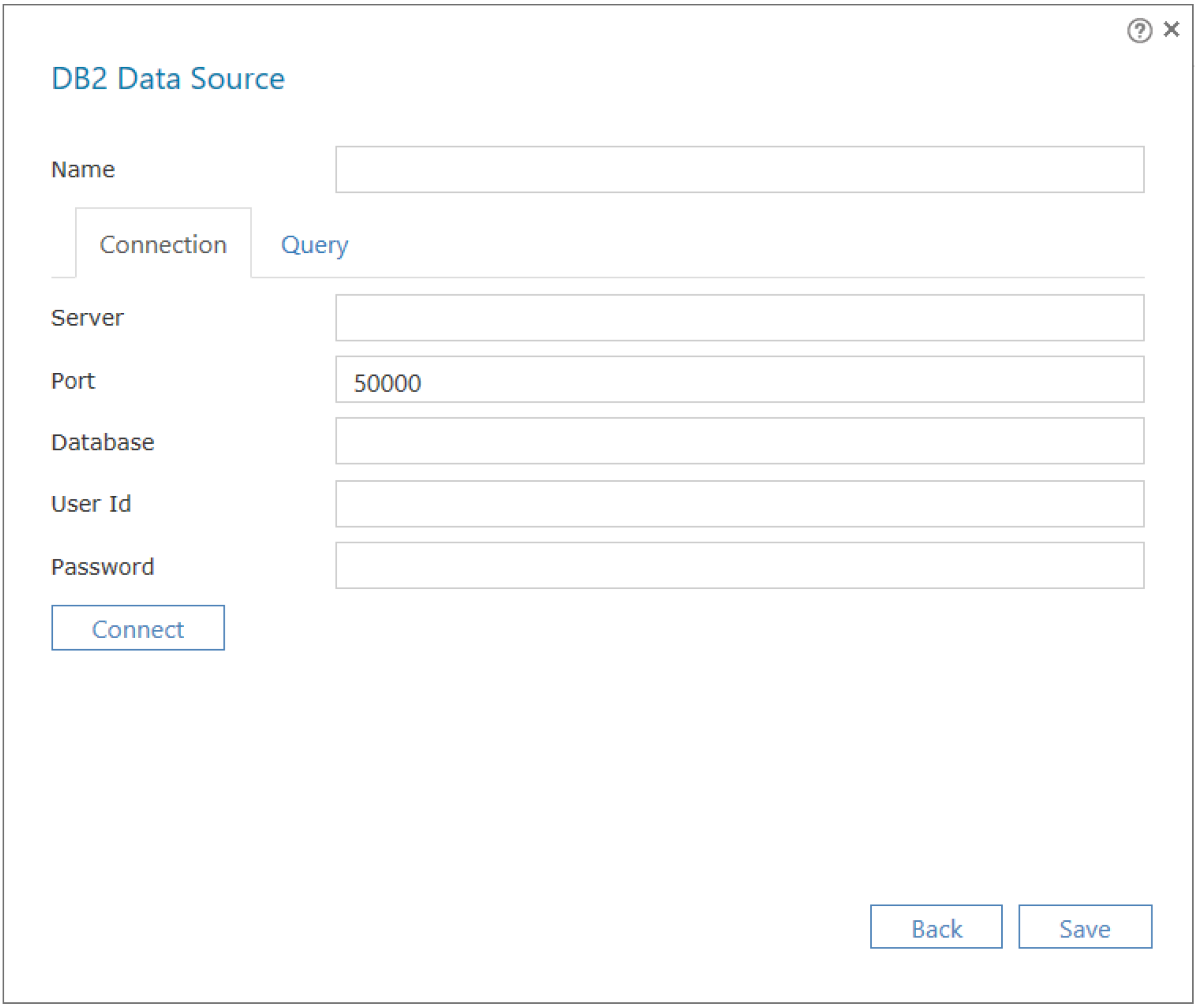
etc.

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

DB2

Allows connecting to DB2 database. Requires IBM Data Server client



Port: 50000

Name

Give your connection a name.

Connection Tab

- Server - Enter Server Name

- Port - Enter Port Name
- Database - Enter Database Name
- User Id - Enter User Id
- Password - Enter Password
- Connect - Press the Connect button to Connect to the Database

Query Tab

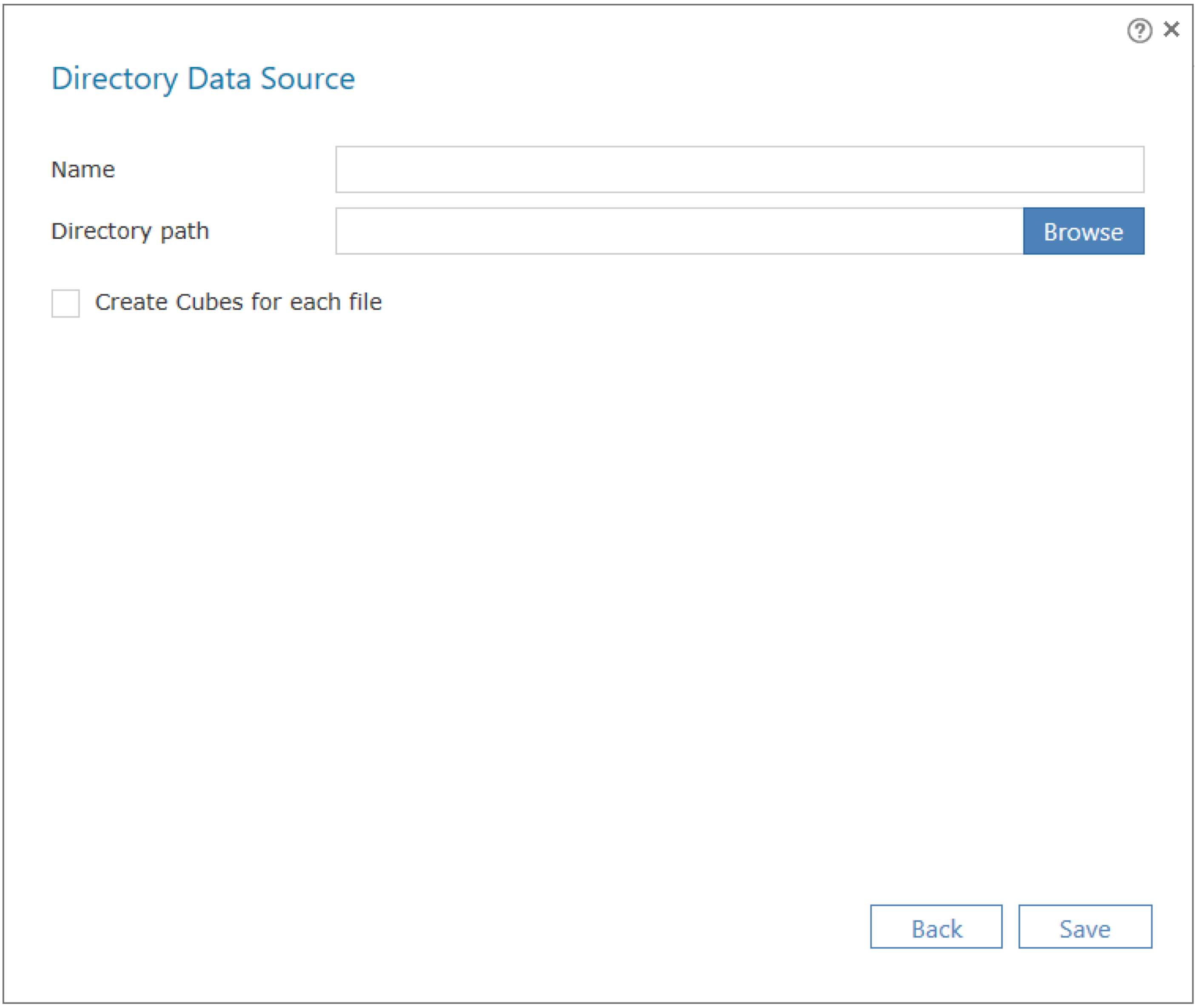
- Schema - Select the Schema
- Table - Select the Table
- SQL Command - Enter the SQL Command in the box
- Schedule - Decide how often you would like to schedule the data to refresh.

Directory

The directory plugin can be pointed to a folder where CSV, Excel and JSON files automatically will be loaded. The settings for the file types cannot be controlled and the TARGIT Data Service will apply the defaults for each file type. When changes are made to any files in the directory specified the TARGIT Data Service will automatically reload the data.

The directory plugin automatically looks for new or changed files and loads them automatically.

File types supported: Excel, CSV, JSON.



Directory Data Source

Name

Directory path

□ Create Cubes for each file

Name

Enter the name of the data source

Directory path

Either browse or enter a UNC network path to monitor for files

Create cubes for each file

Automatically generates a cube for each file in the directory

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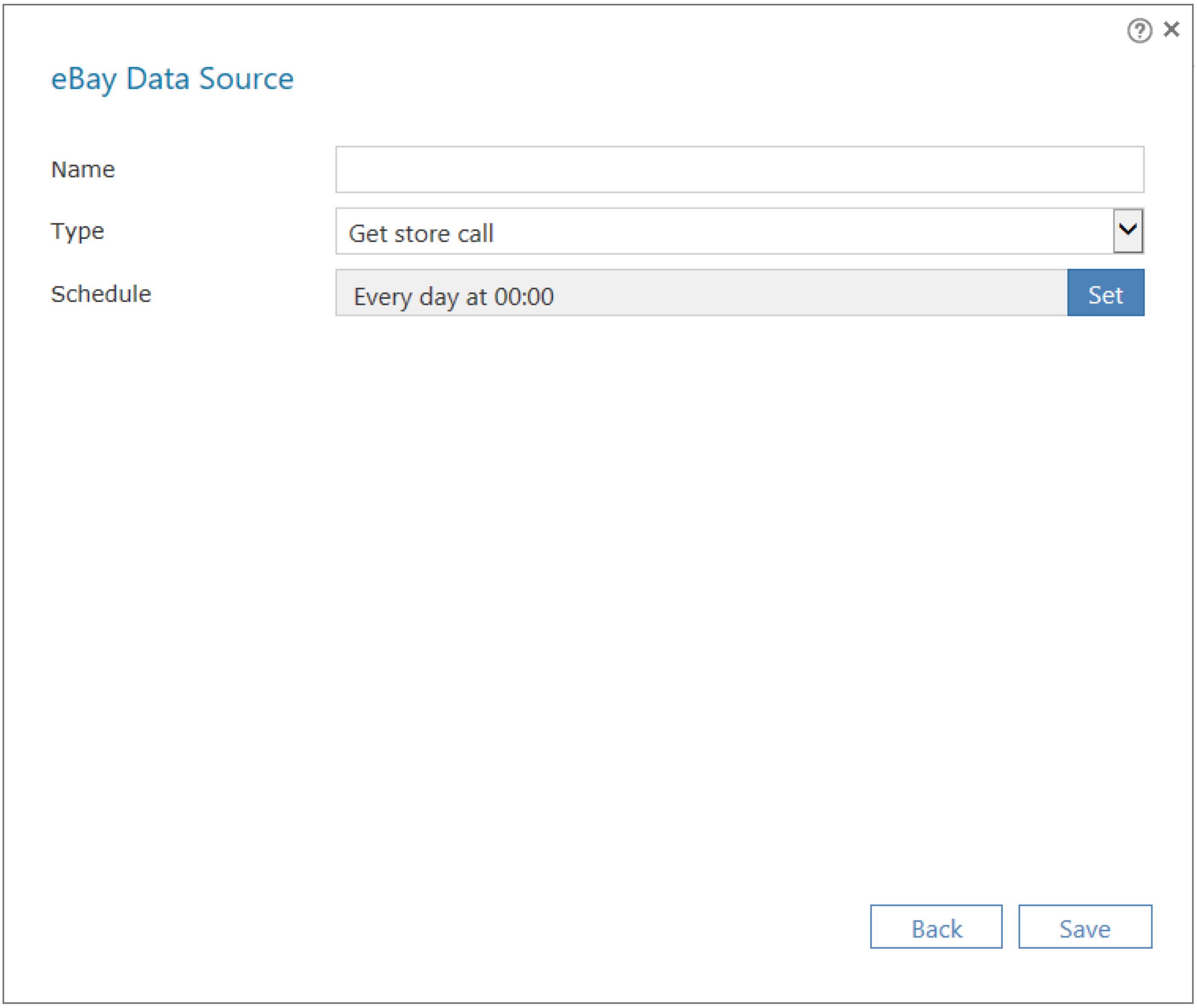
eBay

The eBay data source enables you to get data from your eBay activities.

Note: It is a requirement that you sign up for the eBay API and configure your own API keys in “Data Sources|Settings (the gear icon)|Plugins” and change the properties to eBay for the relevant information.



eBay Data Source

Name	
Type	Get store call
Schedule	Every day at 00:00

Name

Enter the name of the data source

Type: Get store call

Information about your store

Type: Get feedback call

Retrieves feedback to you as authorized user or for the username that you specify

Type: Get orders call

Retrieves information about orders available for you

- Order Type - Return information about orders where you're either the Buyer or Seller
- Order Status - Choose the type of order status you want to return
- Order Status Active - Orders that are active
- Order Status Inactive - Orders that are inactive and shouldn't be processed
- Order Status Completed - Orders that are completed

Start from

Specifies the starting date

End

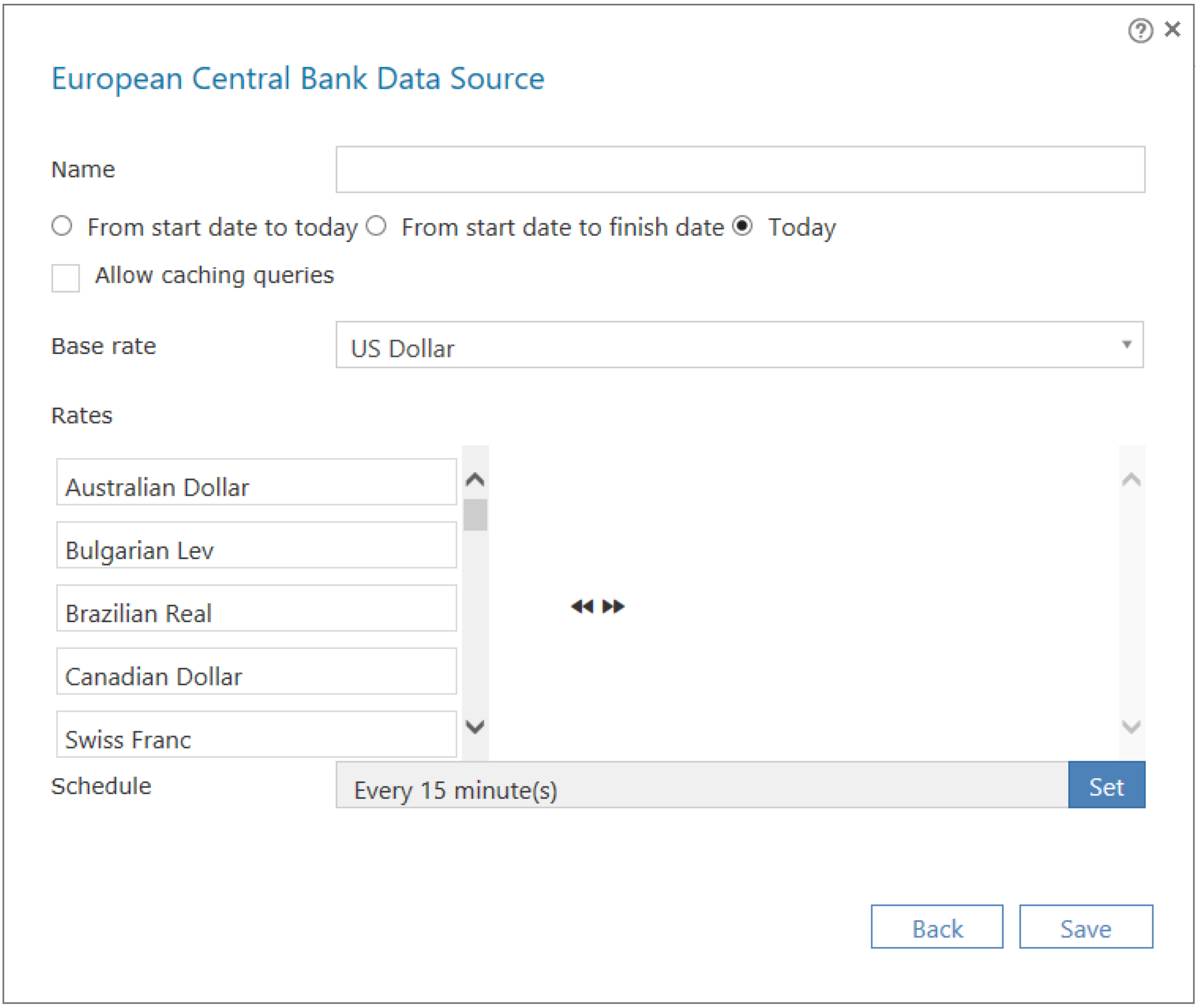
Specifies the ending date

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

European Central Bank

This plugin allows communication to European Central Bank to get information about currency rates



European Central Bank Data Source

Name

○ From start date to today ○ From start date to finish date ● Today

□ Allow caching queries

Base rate: US Dollar

Rates

- Australian Dollar
- Bulgarian Lev
- Brazilian Real
- Canadian Dollar
- Swiss Franc

Schedule: Every 15 minute(s)

Name

Enter the name of the data source

From start date to today

Retrieves data from the specified date until todays date

From start date to finish date

Retrieves data for a specified period

Today

Retrieves data for the current day

Allow caching queries

Caches data for every day. Can only be used in combination with the "Today" option. It will incrementally build a currency table.

Base rate

Select the base currency for your conversion.

- Eg. select US Dollar as your base rate and Danish Krone as your rates.

- The resulting table will show two fields, 'Value' and 'ReferenceRate'.
- The 'Value' field is the USD to DKK conversion, eg. 1 USD = 7.035 DKK.
- The 'ReferenceRate' field is the DKK to USD conversion, eg. 1 DKK = 0.1421146410803127 USD.

Rates

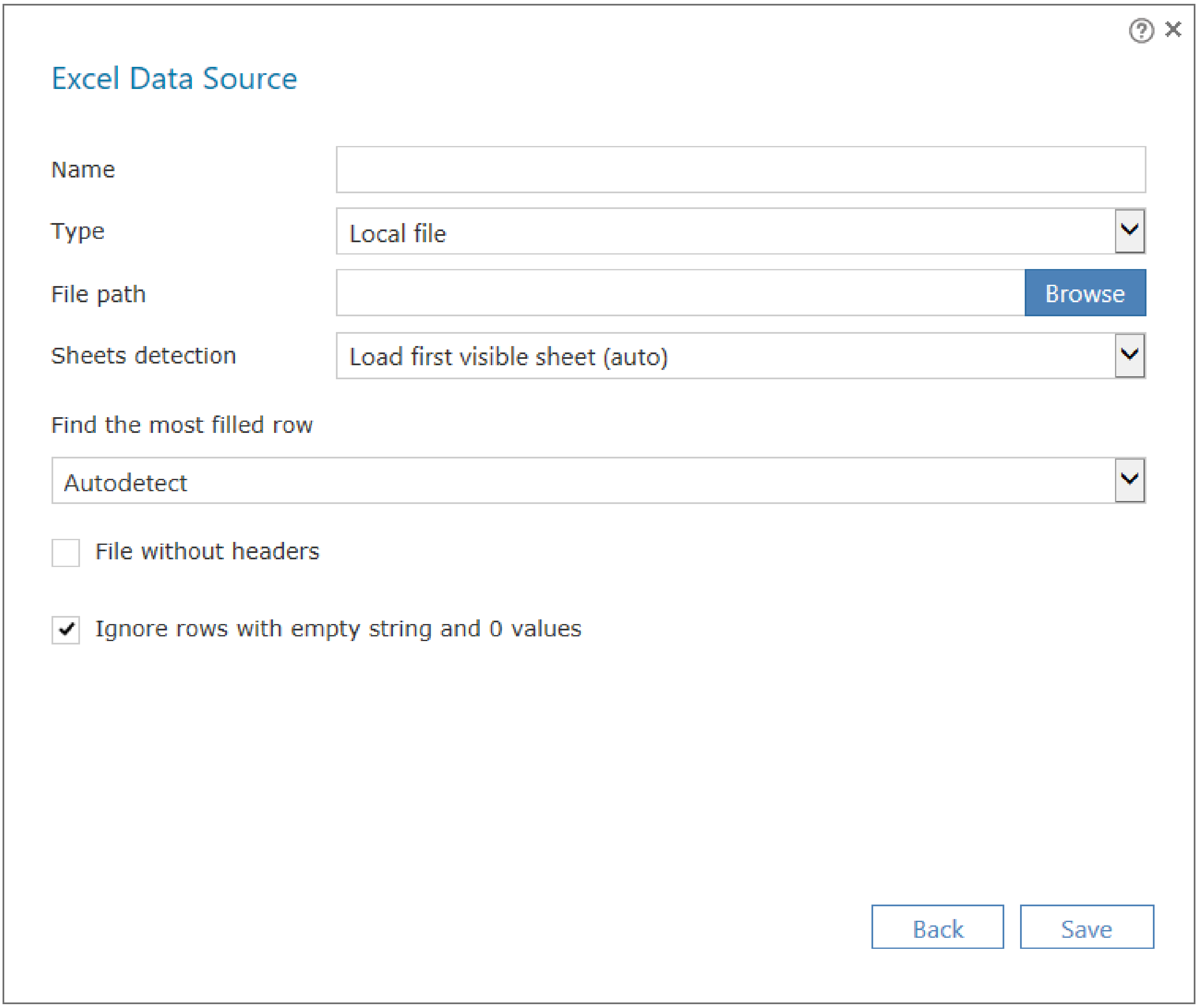
Lists all available currencies. Choose the currencies you need and add them to the included list on the right by clicking the arrows.

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

Excel

The plugin can consume data from correctly formatted Excel files. The files can reside either on the file system available to the service account utilizing the TARGIT Data Service or be downloaded from a URL, comes from Google Drive or Microsoft OneDrive Excel.



Excel Data Source

Name

Type: Local file

File path

Sheets detection: Load first visible sheet (auto)

Find the most filled row

Autodetect

□ File without headers

☑ Ignore rows with empty string and 0 values

Name

Enter the name of the data source

Type

Select one of the following types:

- Local file - Load data from a local Excel file
- URL - Specify URL to an Excel file. With or without credentials.
- OneDrive - Allows connecting directly to OneDrive and retrieving data from an Excel sheet
- GoogleDocs - Allows connecting directly to Google Docs and retrieving data from a sheet
- Email - Will be shown when relevant for Google Drive etc.
- Password - Enter the password that works with the email account above.
- Server - Enter the URL for the file

Sheets detection

- Load first visible sheet (auto) - Will load the first sheet visible in the Excel file
- Select sheet from list - Will show all sheets in the file and allow you to pick the sheet you want to import

Find the most filled row

- Autodetect - Will automatically look for the first row where there are many columns filled out, thereby bypassing e.g. headers.
- Skip X Lines - Skips the number of lines entered from the file and starts loading data from the line below
- Do nothing - Assumes data is available in the first row

File Without Headers

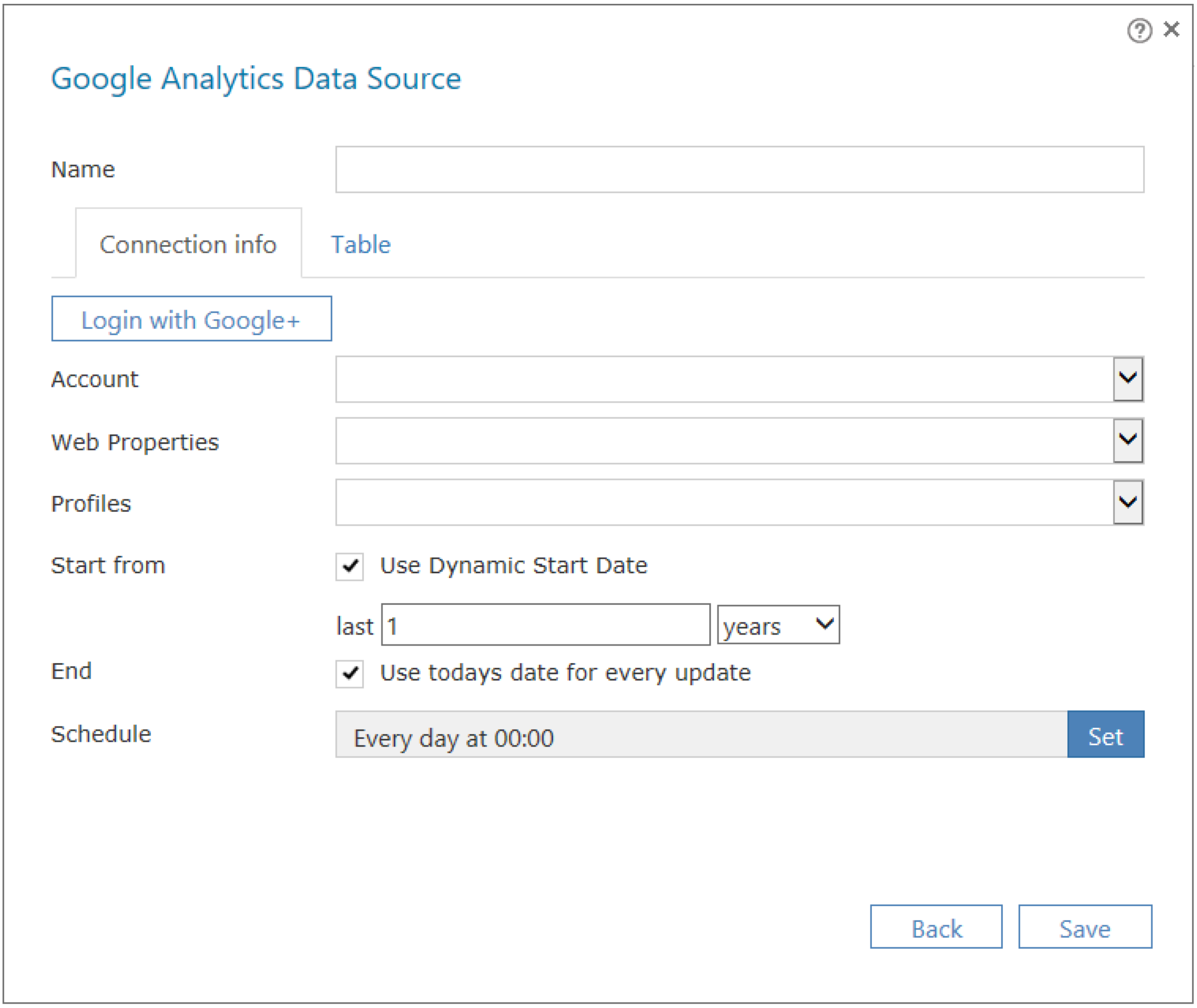
If this option is checked, the file including the first line will be loaded and instead of utilizing the first row as column headers all columns will be named like "Column1, Column2 etc." and at the same time load the first line of data as "data".

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

Google Analytics

If you have websites taking advantage of Google Analytics you can analyze your data directly in TARGIT. It is required that you have a valid Google Account to connect as well as configure your server to be able to access Google Analytics by providing the correct server information.
Please note that selections you make regarding tables and data is final since the data structure is saved in a fixed format – so spend a little more time on ensuring you’ve made the best selections for you.



Google Analytics Data Source

Name

Account

Web Properties

Profiles

Start from ☑ Use Dynamic Start Date

last 1 years

End ☑ Use todays date for every update

Schedule Every day at 00:00

Name

Enter the name of the data source

Login with Google+

Before doing anything it is a requirement that you sign in to Google+.
When you have signed in you will be able to select the properties below as well as make selections on the table tab
Note: If Data Service isn't running on your local machine you will have to sign up for a Google Developer account and have your Data Discovery Administrator set up the application keys in the "Data Sources|Settings (Gear Icon)|Plugin Management"-form for Google to allow the server to send requests on the behalf of you.

Account

Choose the account you want to analyze

Web Properties

Choose the available web properties

Profiles

Select the profiles you want to extract data from

StartFrom

Select the starting date for the Google Analytics data

End

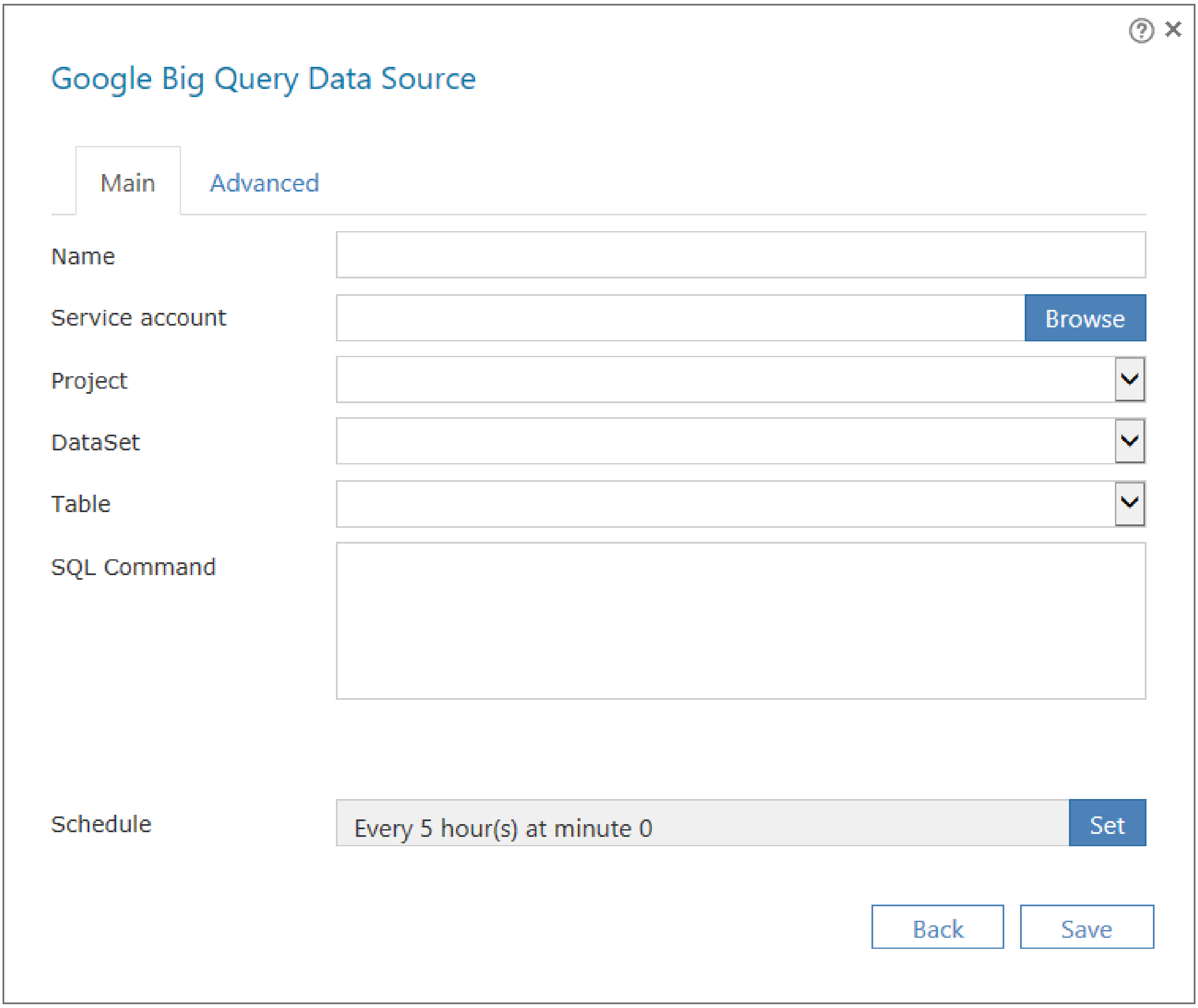
Select the ending date

Schedule

Decide how often you would like to schedule the data to refresh.

Google Big Query

Allows connecting to Google Big Query database. Create a service account in Google Cloud platform in the IAM & ADMIN consol.



Schedule: Every 5 hour(s) at minute 0

Name

Enter the name of the data source.

Service account

Browse to the JSON Service account file created in the IAM & ADMIN console in Google Cloud Platform.

Project

The Project ID that owns the service account. Added from the Service account file.

Dataset

Choose the Dataset you want to retrieve Tables from.

Table

Choose the table/view from the dataset that you want to use in a cube.

SQL command

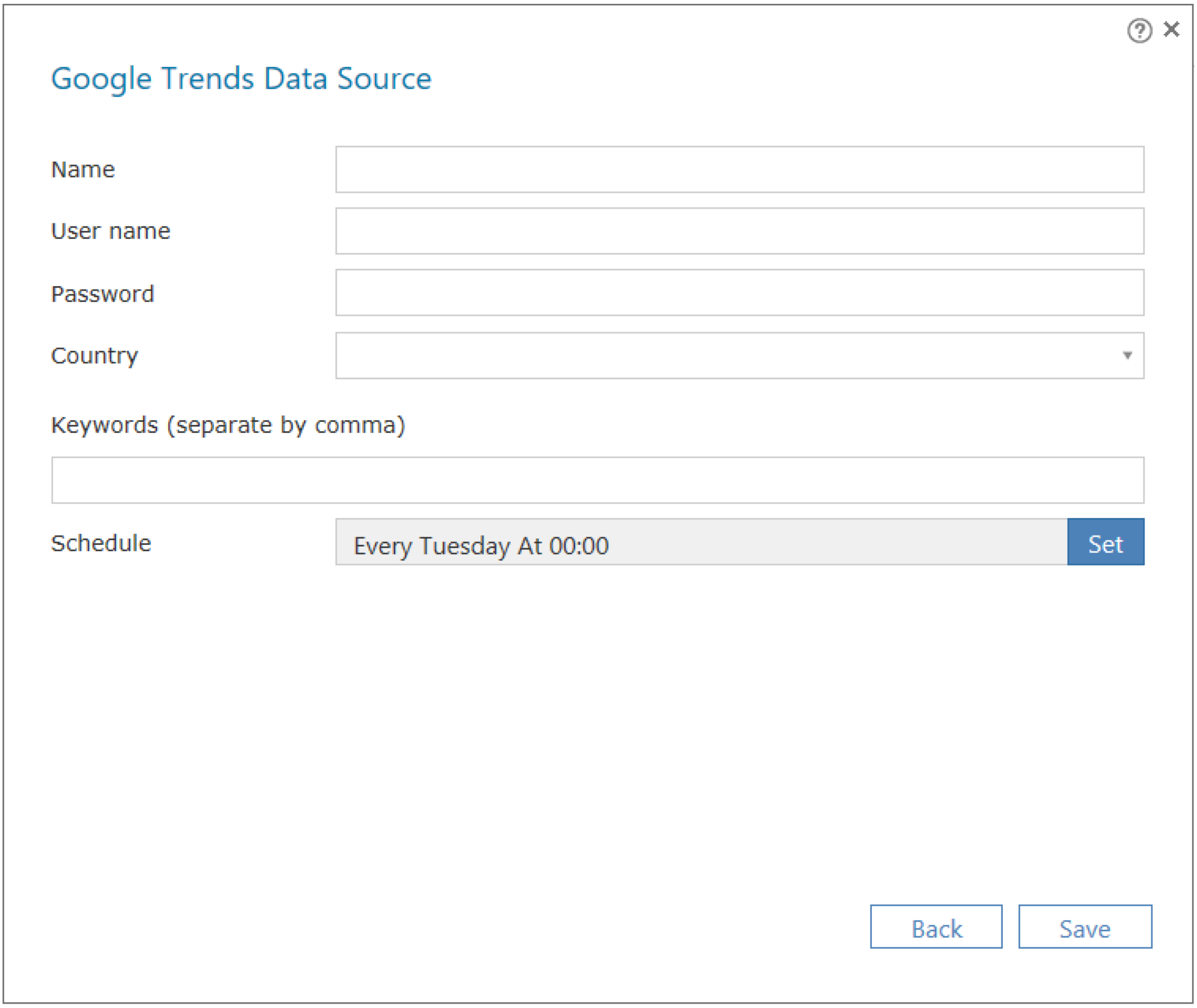
Type a valid SQL command to retrieve data from the Table. When making choices in Dataset and Table this field will be modified according to selections.

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

Google trends

Google Trends access the information made available by Google. To utilize this valid credentials for a Google Account must be entered in the plugin.



Google Trends Data Source

Name	
User name	
Password	
Country	

Keywords (separate by comma)

Schedule: Every Tuesday At 00:00

Name

Enter the name of the data source

User name

Specify the user name for you Google Account

Password

Specify password for the Google Account

Country

Choose what country to retrieve trends based on keyword for

Keywords

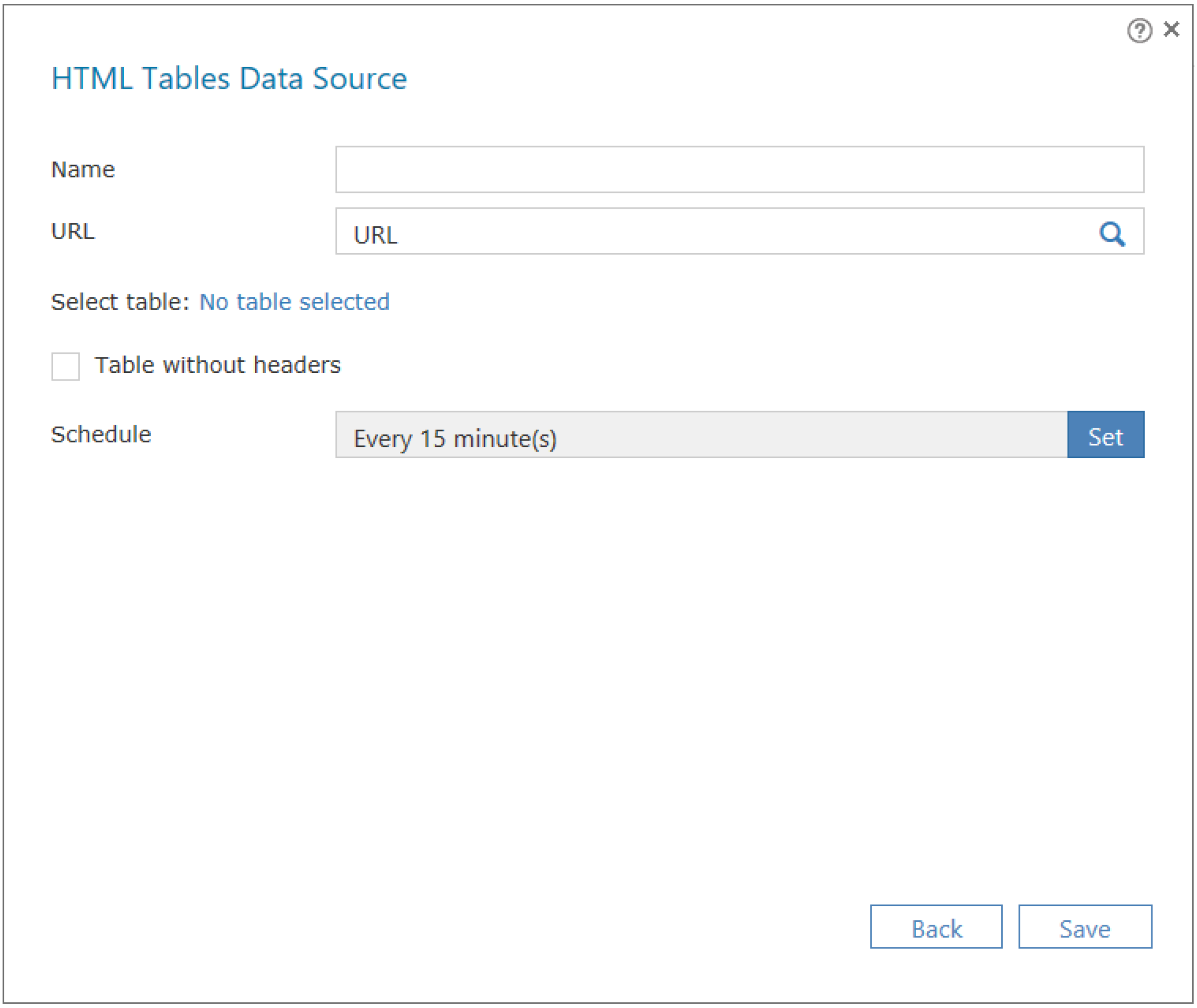
Enter keywords, seperate these with a comma (,)

Schedule

Decide how often you would like to schedule the data to refresh.

HTML Tables

This plugin allows consumption of a HTML table on a website. The table must be available at request time and not be a result of JavaScript being executed on the page. The table you want to import is visually picked in the plugin.



HTML Tables Data Source

Name

URL: URL

Select table: No table selected

□ Table without headers

Schedule: Every 15 minute(s)

Name

Enter the name of the data source

Url

Specify the URL to the page having an HTML table.

Please note that the HTML table must be available when loading the page and not as a result of JavaScripts running on the page after it loads.

Hit ENTER or click the search button when the URL has been typed in to select a table from the page.

Table without headers

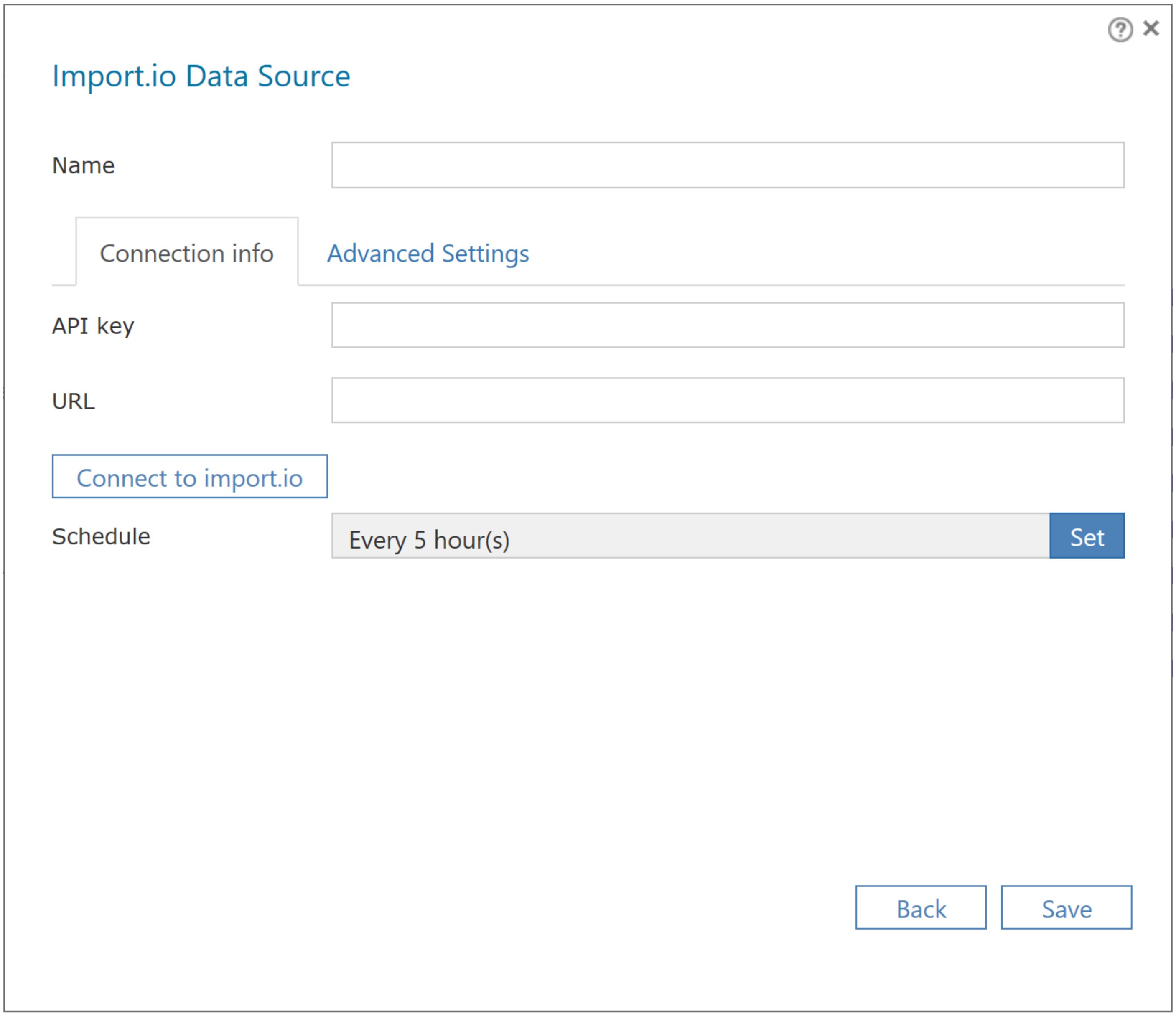
If this option is checked the file including the first line will be loaded and instead of utilizing the first row as column headers all columns will be named like "Column1, Column2 etc." and at the same time load the first line of data as "data".

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

Import.io

Allows connection and consumption of data from Import.io
Import.io extracts list data from a web page using just a URL. You will need to set up an account for Import.io



Import.io Data Source

Schedule: Every 5 hour(s)

Name

Give your Data Source a Name

API Key

You will find your API Key under “My Account” at http://import.io

URL

Enter the Url that you want to extract data from. Note: Not all web pages are designed to extract data from. Here is an example: http://growthhackers.com/

Connect to import.io

Click on 'Connect to import.io' when you have entered your API Key and URL.

Advanced Settings

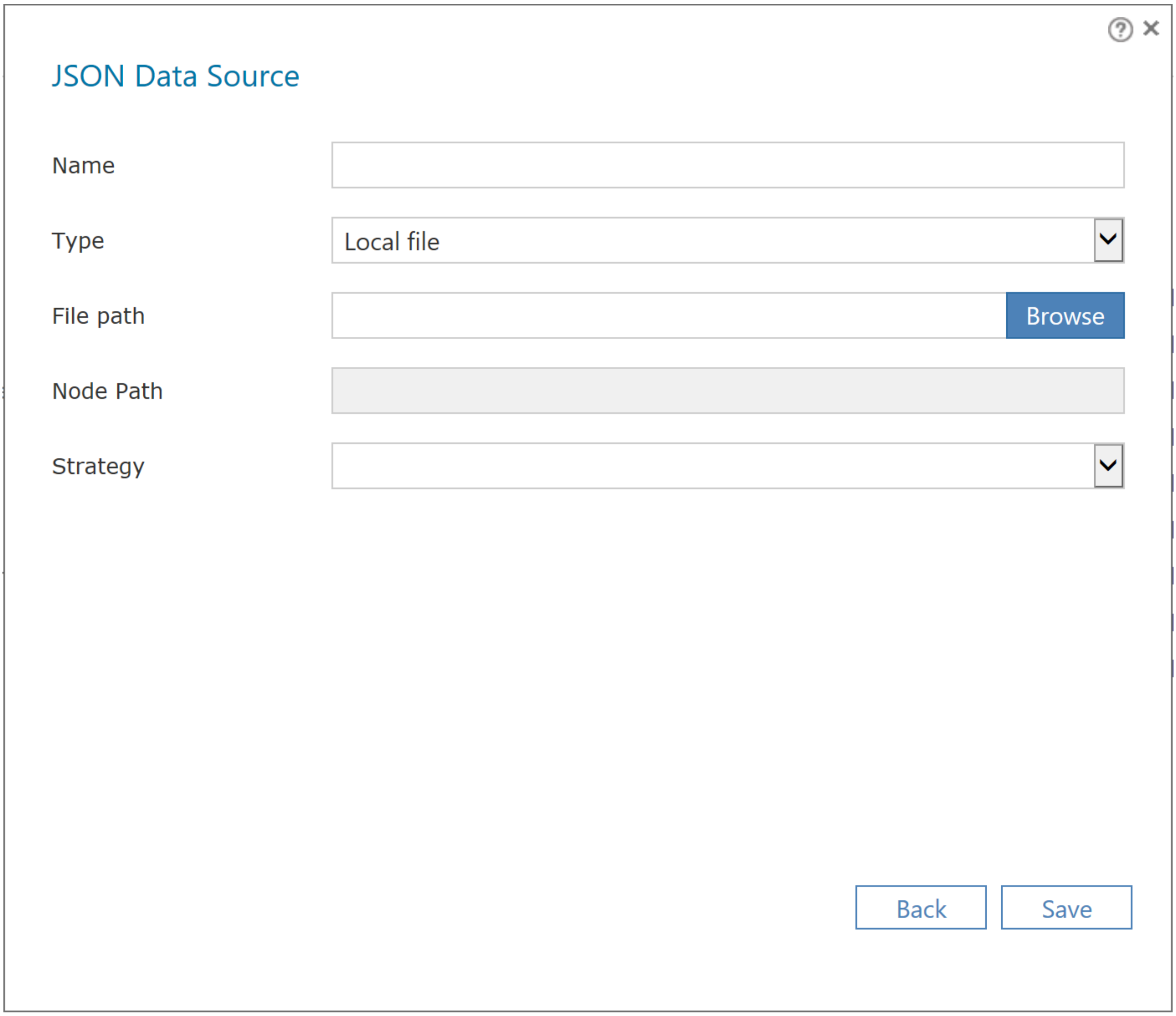
- Process the area that contains this phrase - Enter your phrase
- Process JavaScript - Option to Process JavaScript
- Pagination type - You have a choice between Pages or Infinite scroll
- Start Page - The page you would like to start on.
- Process all - Option to process everything

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

JSON

Allows connecting to data sources with JSON data.



JSON Data Source

Name

Type: Local file

File path

Node Path

Strategy

Name

Enter the name of the data source

Type: Local file

Browse a local file as specified in the file path.

Type: URL

Browse a JSON file as specified in the Server URL.

With credentials, if necessary.

Strategy

- Empty - All the Node path in the JSON file will be used.
- Automatic - The Node Path will be found automatically in the JSON file
- Advanced - The Node Path must be typed in manually in the 'Node Path' field.

Node Path

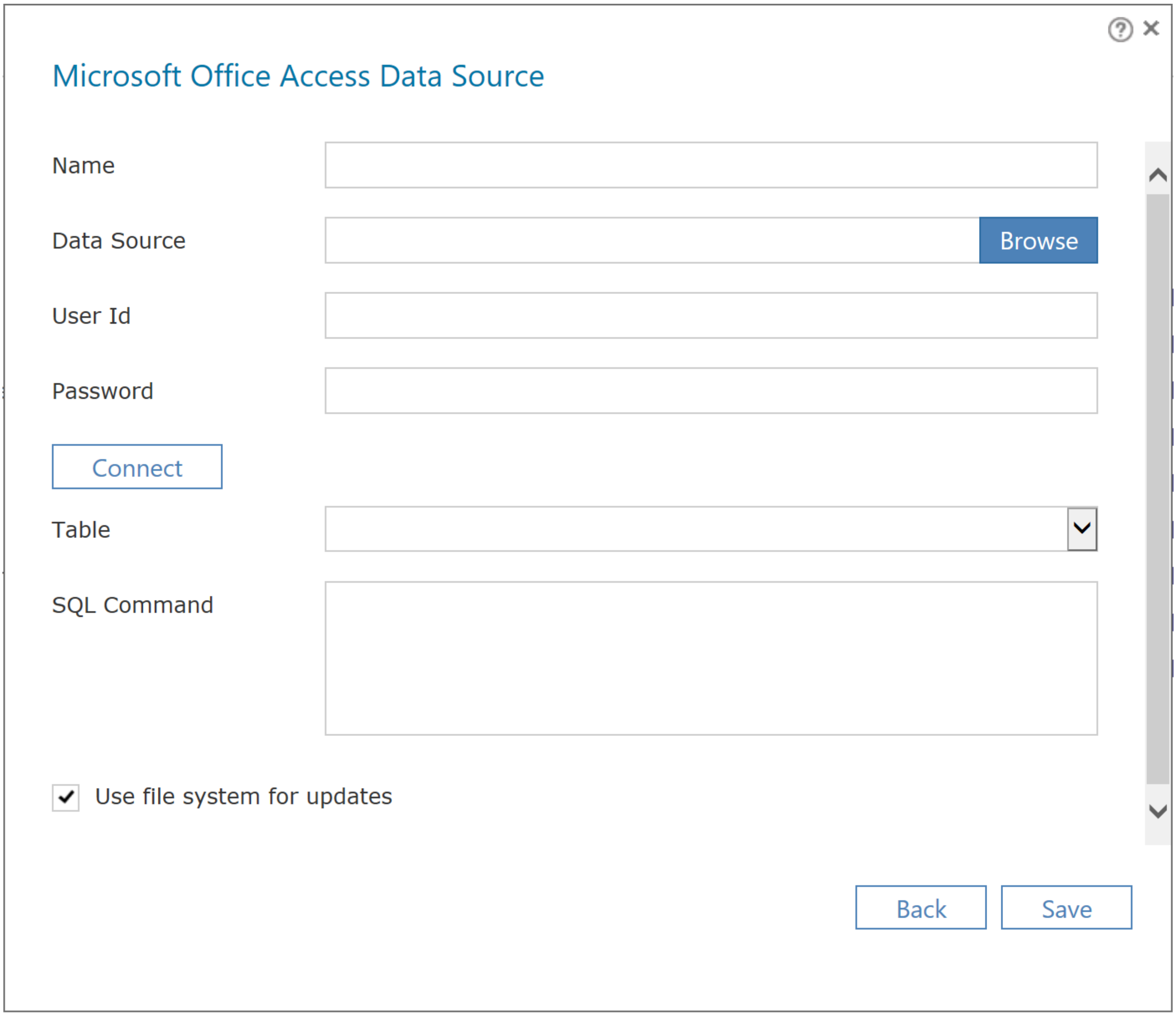
Manually type in the Node Path for the JSON file. Only available if 'Advanced' strategy has been selected.

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

Microsoft Office Access

Allows connecting to Microsoft Office Access database. Requires Microsoft Access Database Engine 2010 Redistributable x64



Microsoft Office Access Data Source

☑ Use file system for updates

Name

Give your Data Source a name

Data Source

Browse for the MS Office Access Database

User Id

If your Database is protected you will need a user name and password

Password

If your Database is protected you will need a user name and password

Connect

Click on the Connect Button

Table

Select the table you want to use for your data source

SQL Command

You can write your own query here.

Use file system for updates

If checked, the data source will be updated when any changes are made to the Microsoft Access DB file.

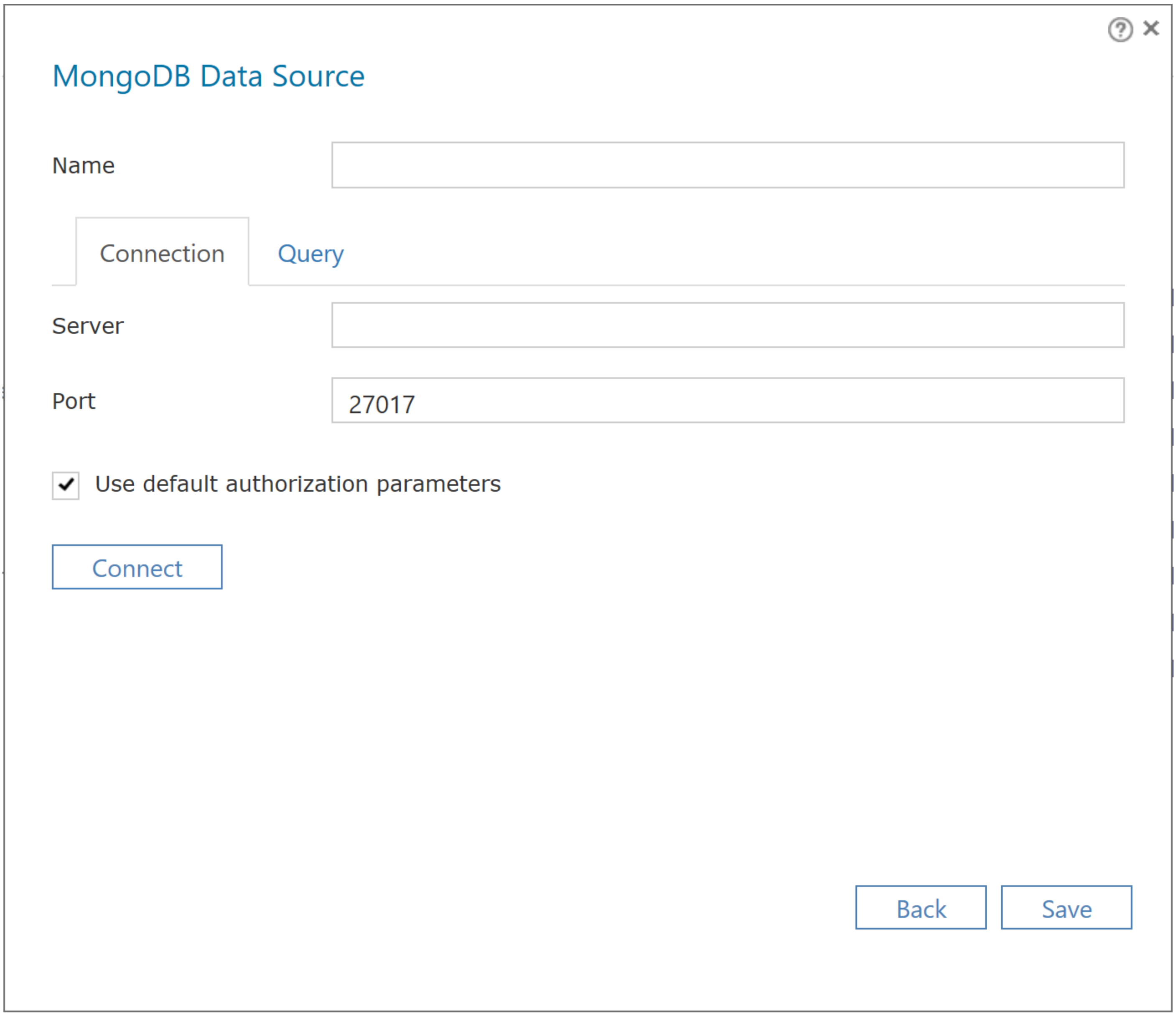
If unchecked, updates are handled by a schedule.

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

MongoDB

Allows connecting to MongoDB database.



Name

Server

Port 27017

☑ Use default authorization parameters

Name

Give your data source a name

Connection

- Server - Enter Server Name
- Port - The port is defaulted to 27017
- Authorization Parameters - You can use the default authorization parameters or you can enter your credentials.

- Connect -Click 'Connect' when the above settings are complete.

Query

- Database - Select the database
- Collection - Select the collection
- JSON Filter - If you have a JSON filter, enter it here. You can check your filter with the 'Check Filter' button.

Node Nested depth

Select either:

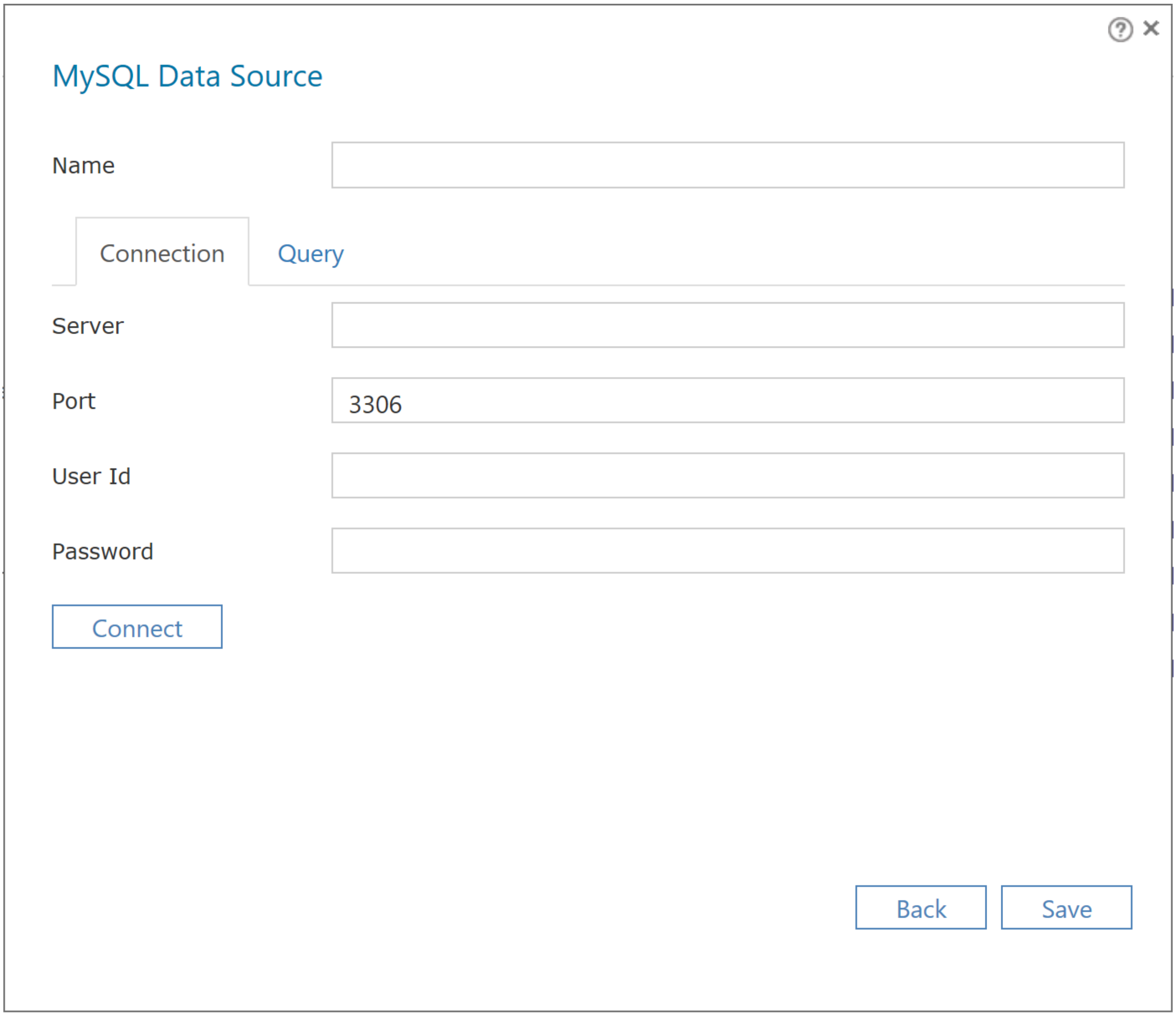
- None
- 1st level
- 2nd level
- Custom level

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

MySQL

Allows connecting to MySQL database.



Port 3306

Name

Give your data source a name

Connection

- Server - Enter Server name
- Port - Enter Port. Default is 3306
- User Id - Enter User Id
- Password - Enter your password

- Connect - Click on Connect

Query

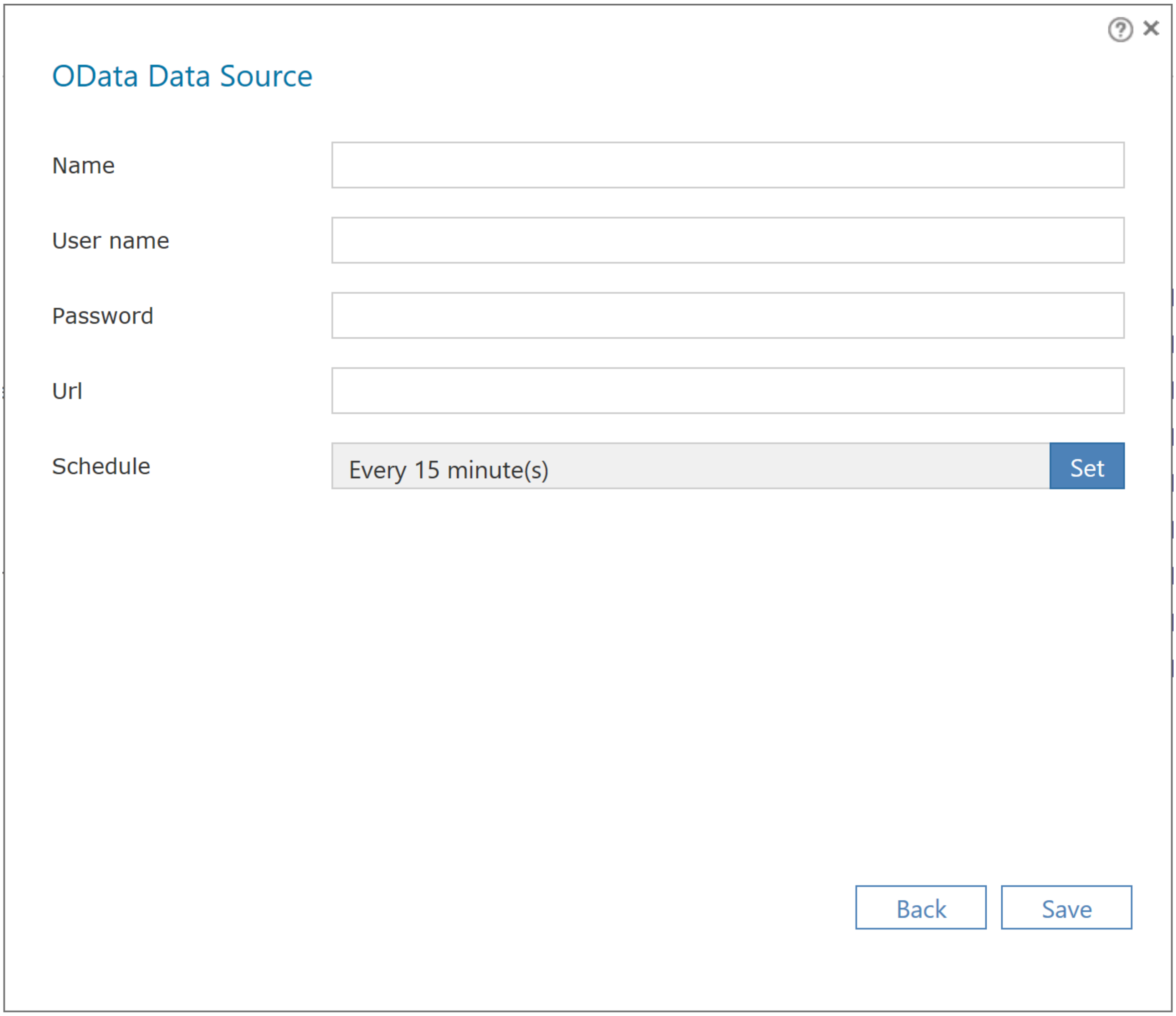
- Database - Choose the database you want to retrieve data from.
- Table - Choose the table/view from the database that you want to use in a cube.
- SQL Command - Type a valid SQL command to retrieve data from the database. When making choices in Database and Table this field will be modified according to selections.

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

Odata

Allows connecting to data sources with OData, examples are Dynamics NAV, Dynamics AX, SharePoint lists etc.



OData Data Source

Name

User name

Password

Url

Schedule

Every 15 minute(s)

Name

Enter the name of the data source

User name

Enter the user name to access the data source

Password

Enter the password for the user account that is used to access the OData source

URL

Specify the URL for the OData source

Schedule

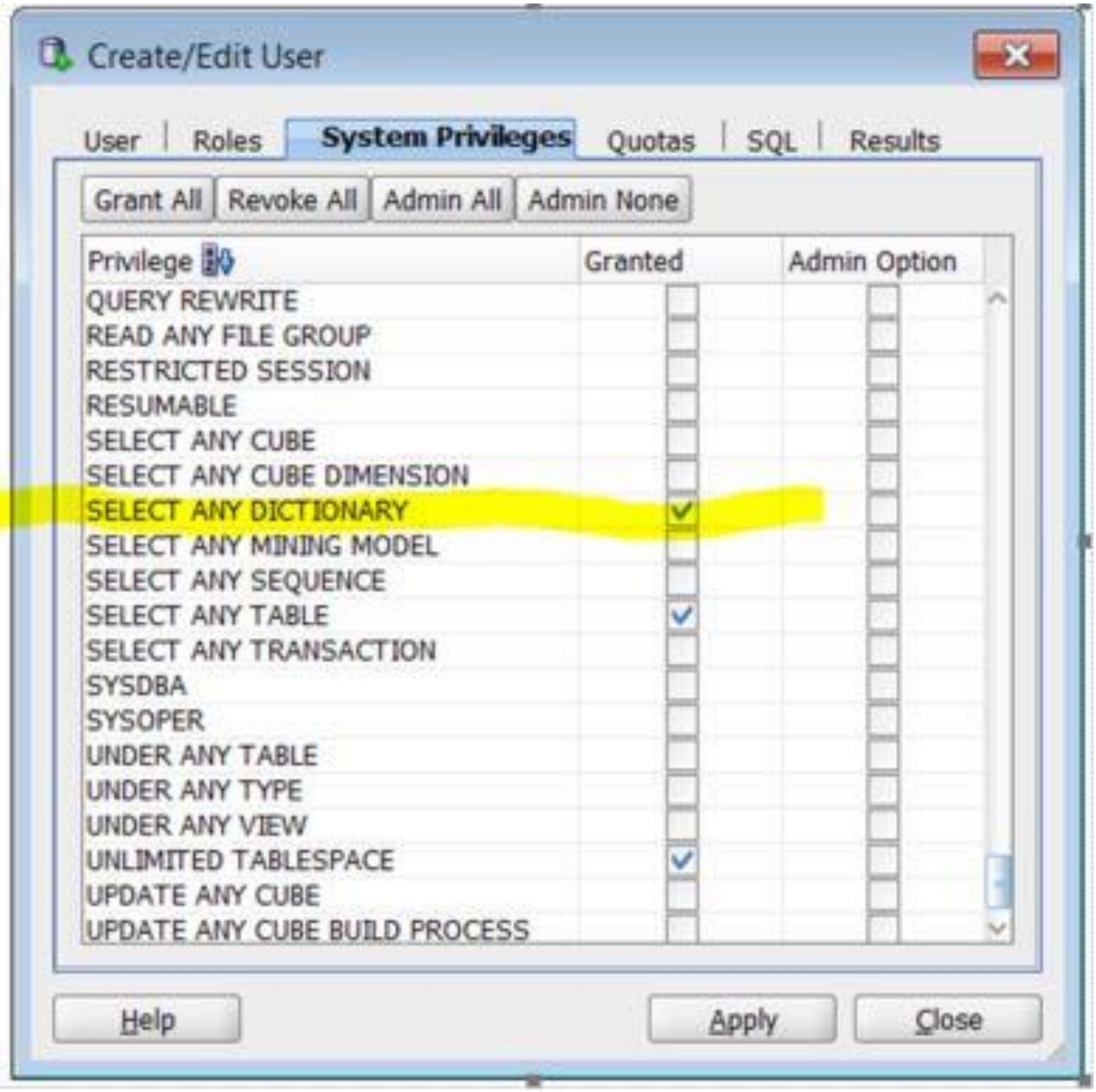
Decide how often you would like to schedule the data to refresh.

Oracle

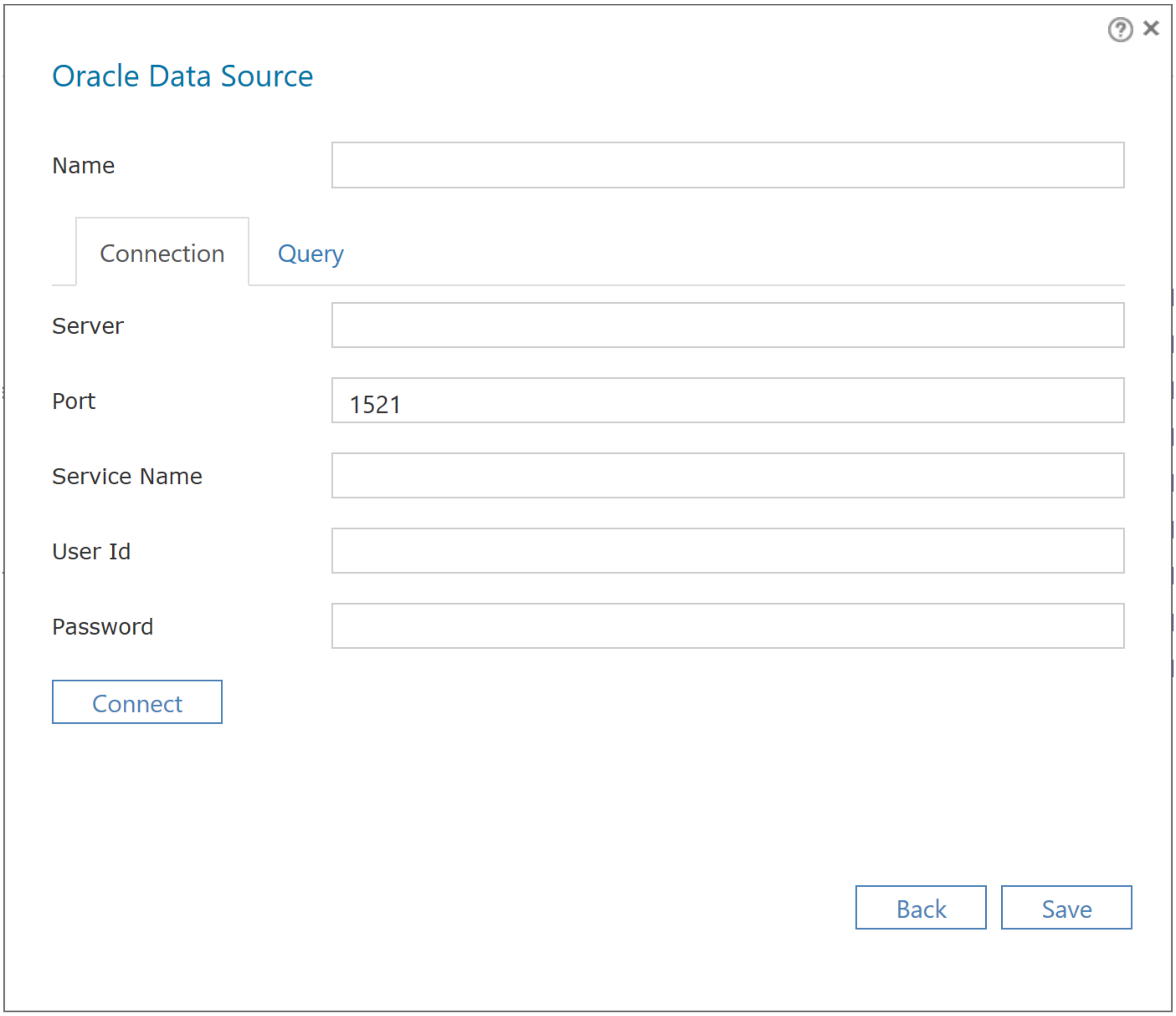
Allows connecting to Oracle database.

For the Oracle connection to work it is a requirement that the latest Oracle ODAC is installed on the machine.

Ensure the Oracle User Account has the Select Any Dictionary rights grated as shown below.



Privilege	Granted	Admin Option
QUERY REWRITE	□	□
READ ANY FILE GROUP	□	□
RESTRICTED SESSION	□	□
RESUMABLE	□	□
SELECT ANY CUBE	□	□
SELECT ANY CUBE DIMENSION	□	□
SELECT ANY DICTIONARY	☑	□
SELECT ANY MINING MODEL	□	□
SELECT ANY SEQUENCE	□	□
SELECT ANY TABLE	☑	□
SELECT ANY TRANSACTION	□	□
SYSDBA	□	□
SYSOPER	□	□
UNDER ANY TABLE	□	□
UNDER ANY TYPE	□	□
UNDER ANY VIEW	□	□
UNLIMITED TABLESPACE	☑	□
UPDATE ANY CUBE	□	□
UPDATE ANY CUBE BUILD PROCESS	□	□



Oracle Data Source

Name

Connection

Query

Server

Port

1521

Service Name

User Id

Password

Name

Enter the name of the data source

Server

Name of the server hosting the Oracle database

Port

Specify the port where Oracle is listening for connections. Default port is 1521.

Service Name

Enter the Service Name for your Oracle connection.

User Id

Enter the User Id to logon to Oracle DBMS

Password

Enter the password to logon to the Oracle DBMS

Connect

Click connect to establish the connection to Oracle

Database

Choose the schema/database from which you want to retrieve the data

Table

Choose the table to import data from

SQL Command

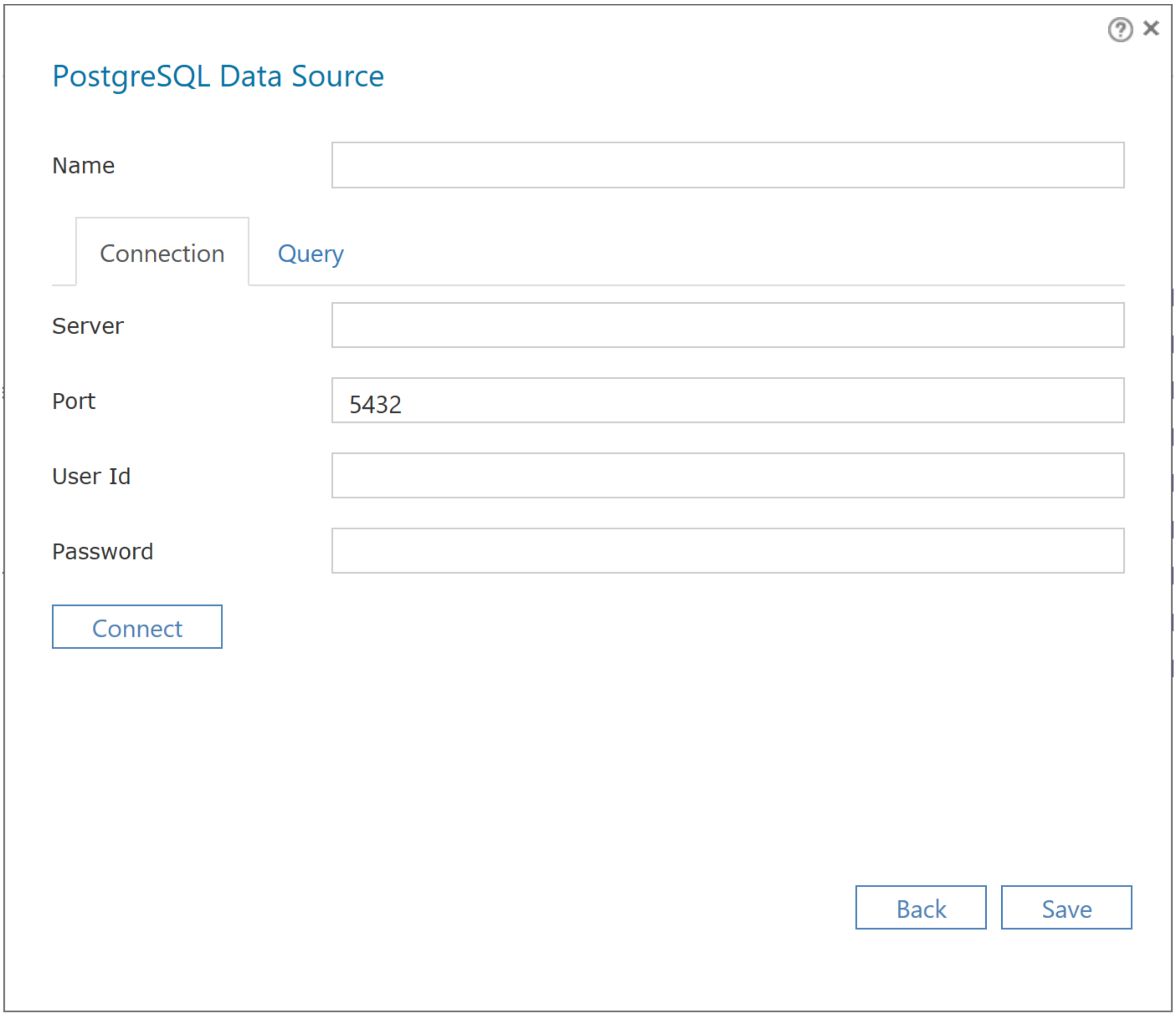
Enter a custom and valid SQL command that will select data from your Oracle database

Schedule

Decide how often you would like to schedule the data to refresh.

PostgreSQL

Allows connecting to PostgreSQL database.



PostgreSQL Data Source

Port 5432

Name

Give your data source a name

Connection

- Server - Enter Server name
- Port - Enter Port. Default is 5432
- User Id - Enter User Id

- Password - Enter your password
- Connect - Click on Connect

Query

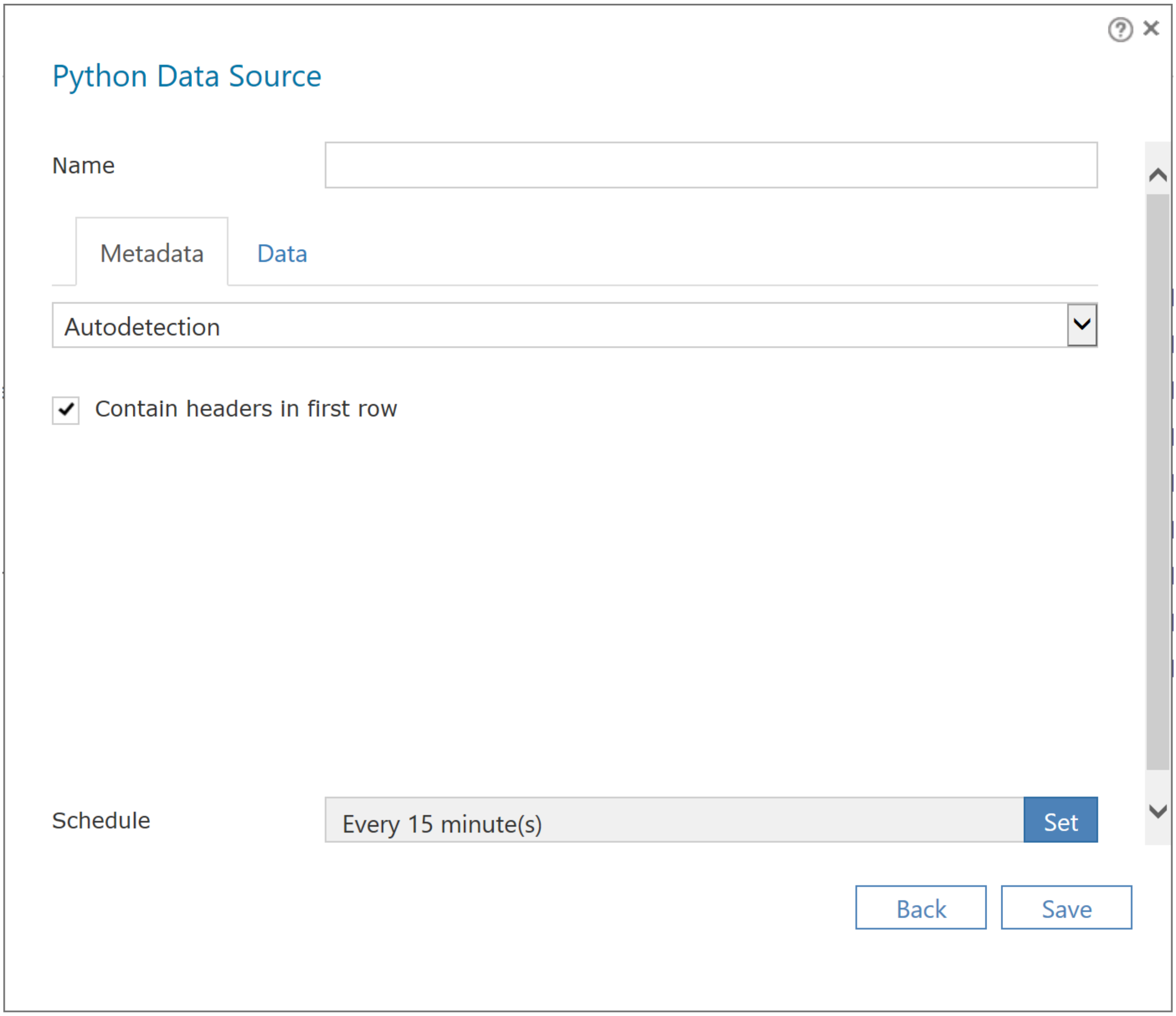
- Database -Choose the database you want to retrieve data from.
- Table - Choose the table/view from the database that you want to use in a cube.
- SQL Command - Type a valid SQL command to retrieve data from the database. When making choices in Database and Table this field will be modified according to selections.

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

Python

The Python plugin enables running Python scripts compatible with the IronPython implementation.



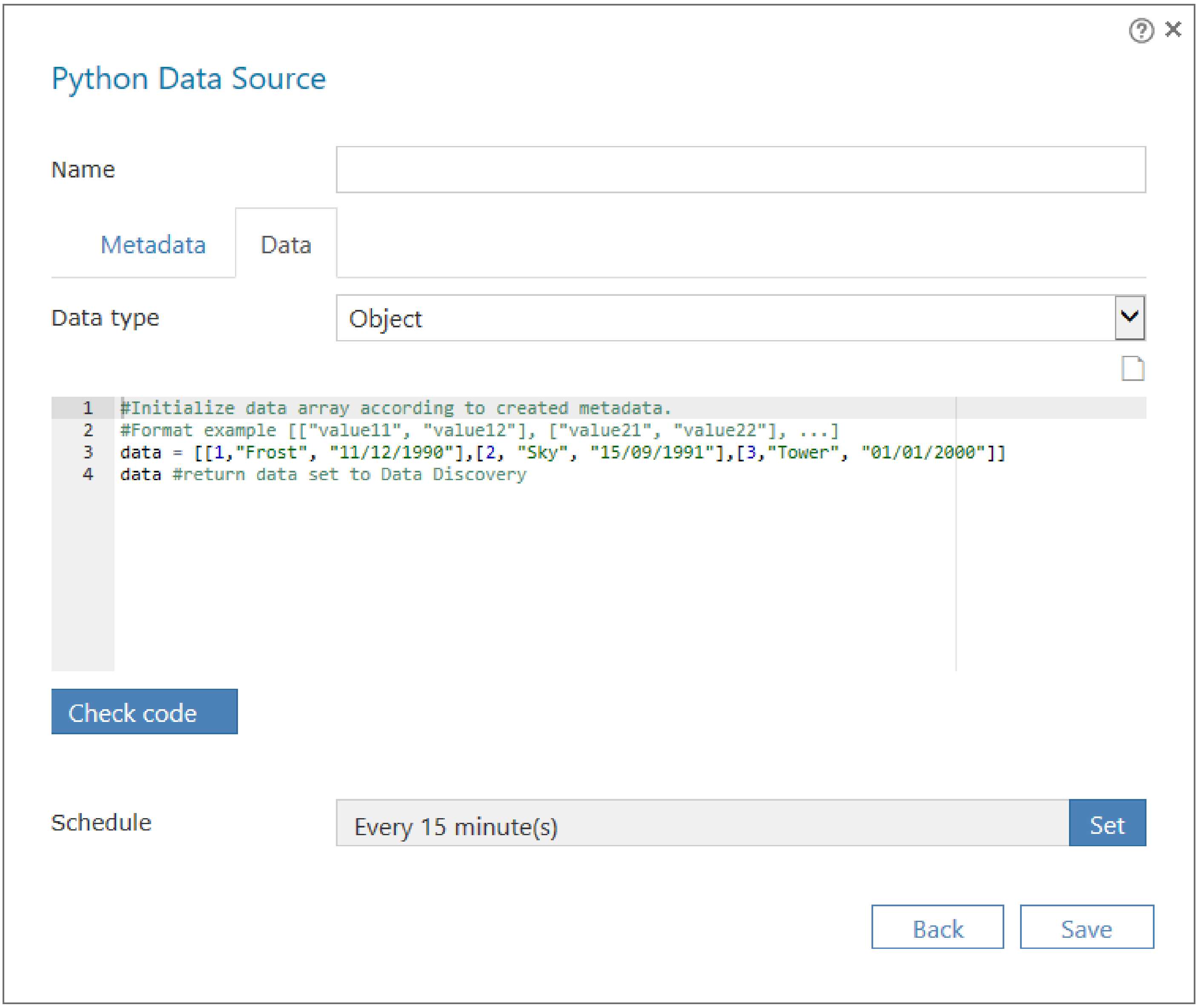
Python Data Source

Name

Autodetection

☑ Contain headers in first row

Schedule: Every 15 minute(s)



Python Data Source

Name

Data type: Object

```
#Initialize data array according to created metadata.
#Format example [["value11", "value12"], ["value21", "value22"], ...]
data = [[1,"Frost", "11/12/1990"],[2, "Sky", "15/09/1991"],[3,"Tower", "01/01/2000"]]
data #return data set to Data Discovery
```

Schedule: Every 15 minute(s)

Name

Give your data source a name

Metadata

On the meta data tab the expected results of the executing script must be configured.
By default the setting is to do auto-detection. This means that columns in the return data set will be automatically read the first time. However in some cases it is necessary to specify these manually.

- Auto-detection - Return data types are automatically parsed and recognized when the data source is saved and thereby created.

- Manual - Here the fields expected must be manually added with name and type.

- Script - In scripting mode the destination variables are created as a scripting structure. An example already shows how an Id, a company name and a created date can be added.

Data

The data tab is where you can insert a Python script.

The last value of the script is what will be returned to TARGIT Data Service, for example will c(1,2,3,4,5) return a dataset with no data but the columns 1,2,3,4 and 5.

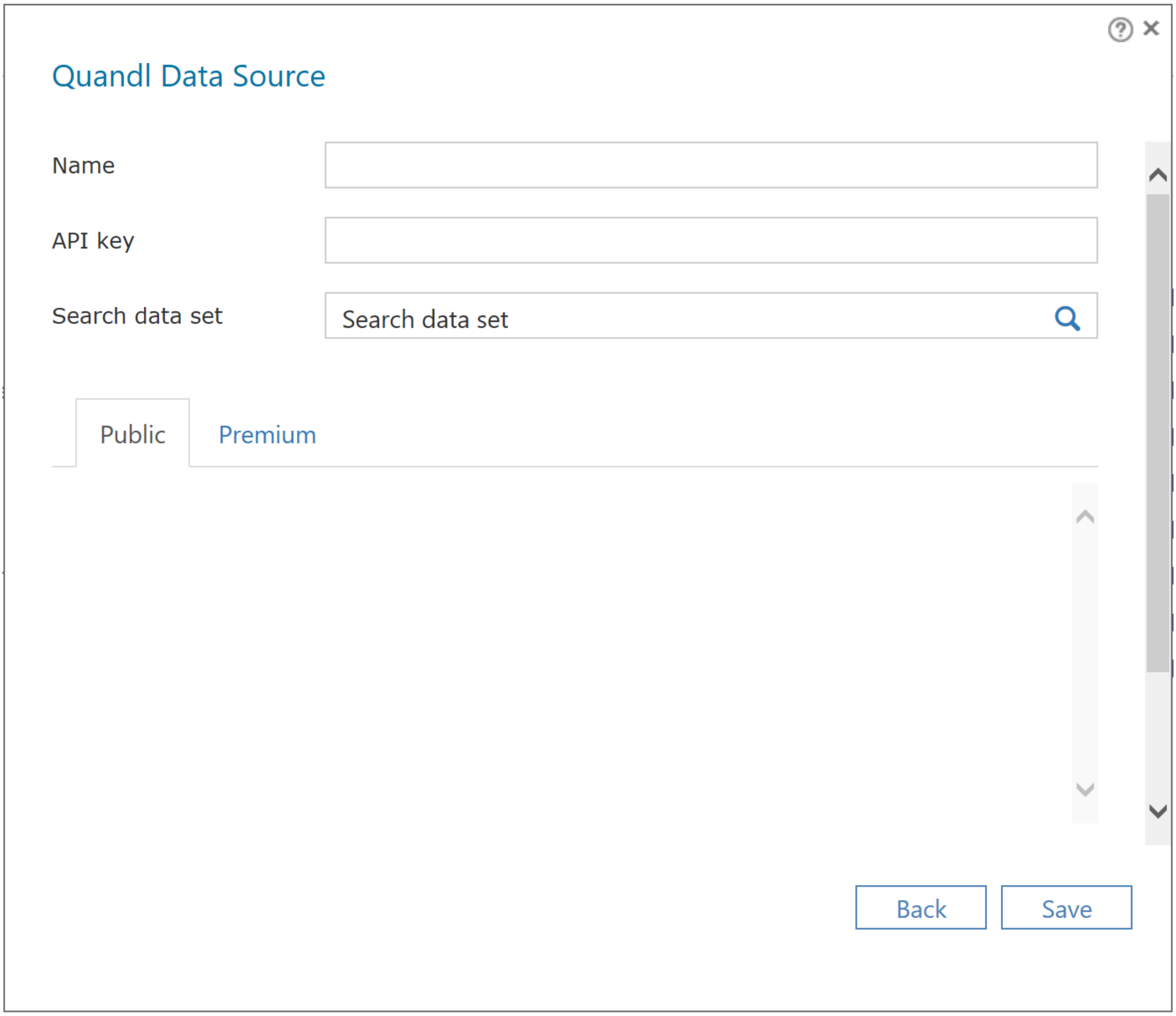
Note: When clicking check syntax the script is executed and not just parsed.

Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

Quandl

Quandl has one mission: help users find the data they need, in the format they want. Fast. You can search for almost any keywords and immediately consume the data with the TARGIT Data Service. This connection is delivered as a built-in plugin, so all you need is the API key that can be found in the account page when you're signed in in Quandl.



Quandl Data Source

Name

API key

Search data set

Name

Enter the name of the data source

API Key

The API key can be found on the account page when you have created an Account at Quandl.com

Search data set

Enter the data set to search for. Hit ENTER or the Search button.

Public

List of freely available data sets that you can extract information from.

Premium

Data sources that can be used either as a trial or by paying a subscription to Quandl.

Data set code

The 'Data set code' is generated when you select one of the datasets in either 'Public' or 'Premium'.

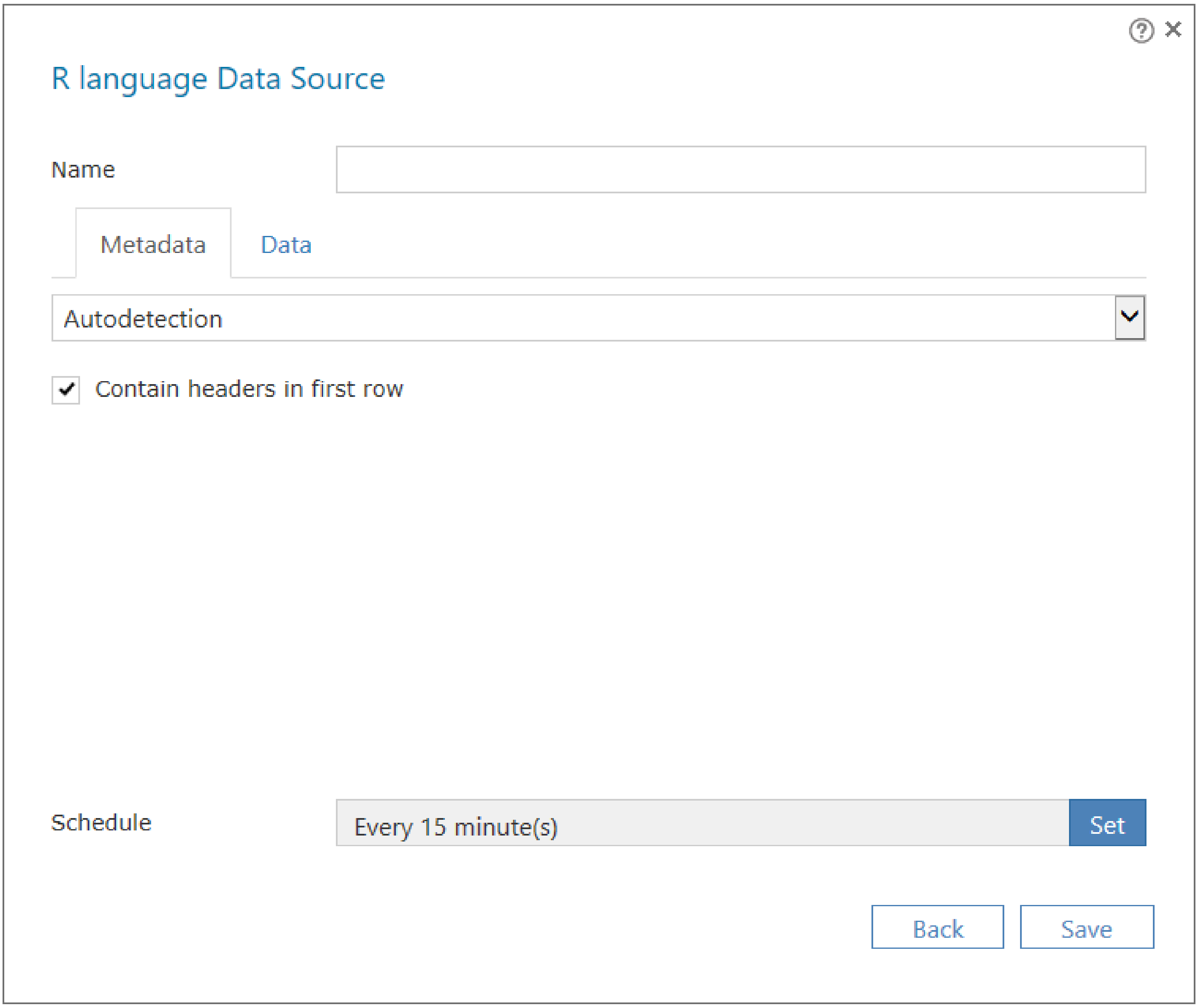
Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

R Language

The R plugin enables running R scripts compatible with the R implementation. To run R scripts the full R-engine version 3.5 and higher must be installed on the server.

The installer for R can be obtained from one of the mirrors specified at https://www.r-project.org/



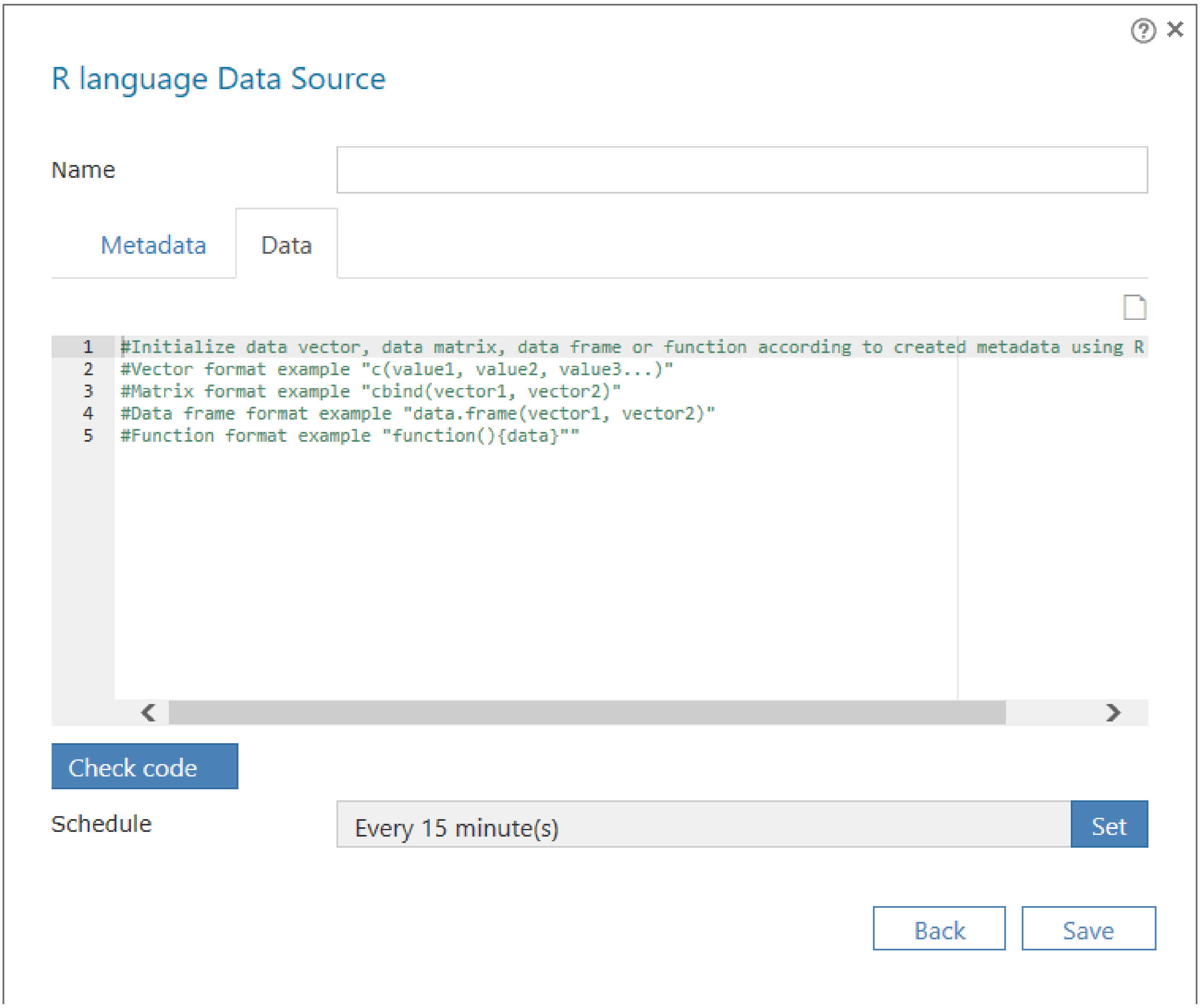
R language Data Source

Name

Autodetection

☑ Contain headers in first row

Schedule: Every 15 minute(s)



```
#Initialize data vector, data matrix, data frame or function according to created metadata using R
#Vector format example "c(value1, value2, value3...)"
#Matrix format example "cbind(vector1, vector2)"
#Data frame format example "data.frame(vector1, vector2)"
#Function format example "function(){data}""
```

Schedule: Every 15 minute(s)

Name

Give your data source a name

Metadata

On the meta data tab the expected results of the executing script must be configured.
By default the setting is to do auto-detection. This means that columns in the return data set will be automatically read the first time. However in some cases it is necessary to specify these manually.

- Auto-detection - Return data types are automatically parsed and recognized when the data source is saved and thereby created.

- Manual - Here the fields expected must be manually added with name and type.

Data

The data tab is where you can insert an R script.

The last value of the script is what will be returned to TARGIT Data Service, for example will c(1,2,3,4,5) return a dataset with no data but the columns 1,2,3,4 and 5.

Note: When clicking check syntax the script is executed and not just parsed.

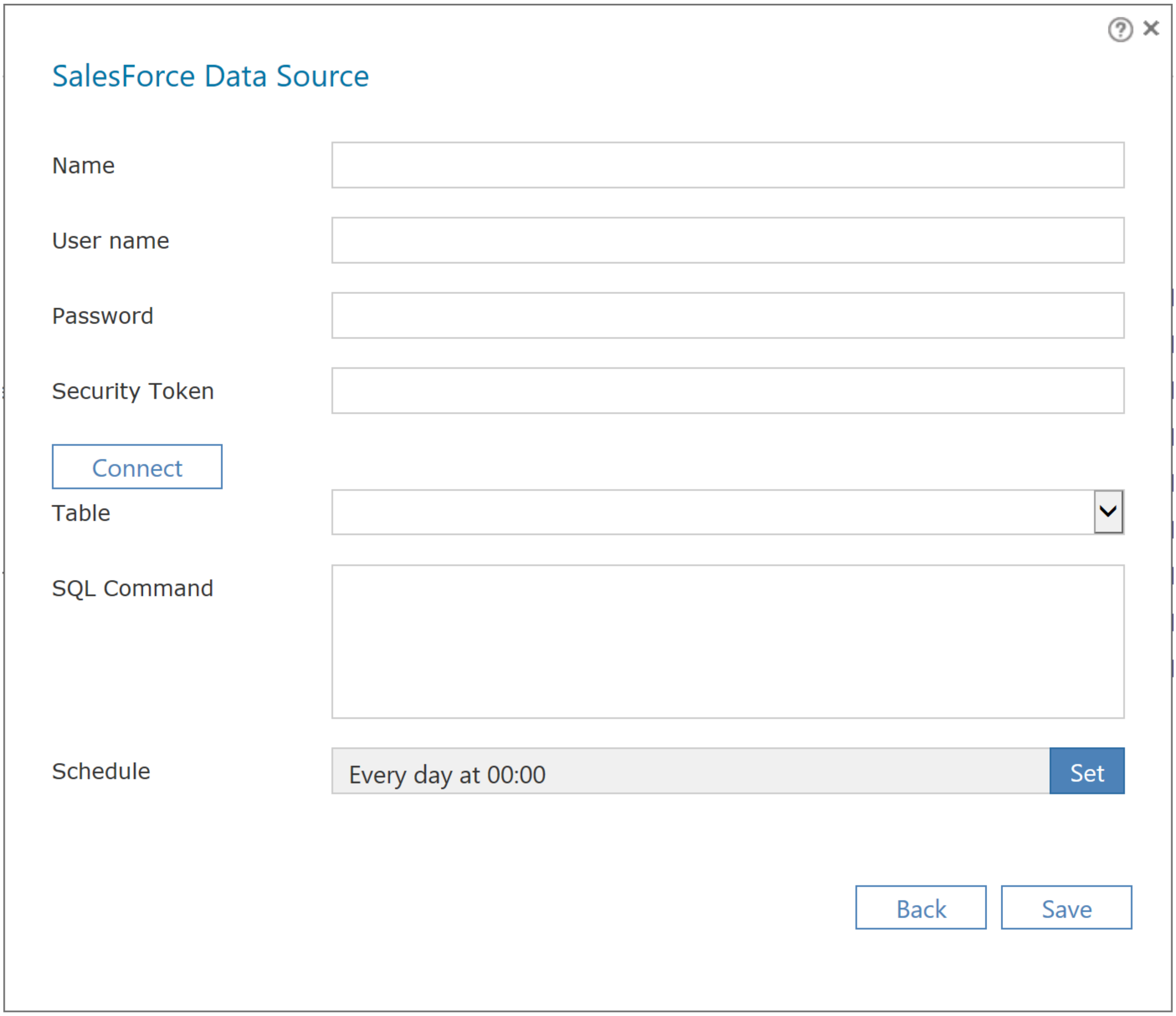
Schedule

Use this setting to determine how often you would like to refresh your data from this data source.

Examples

SalesForce.com

Allows connection and consumption of data from SalesForce.com



Schedule: Every day at 00:00

Name

Give your data source a name

User name

Enter your user name

Password

Enter your password

Connect

Click on Connect

Table

Select the table you want to use for your data source

SQL Command

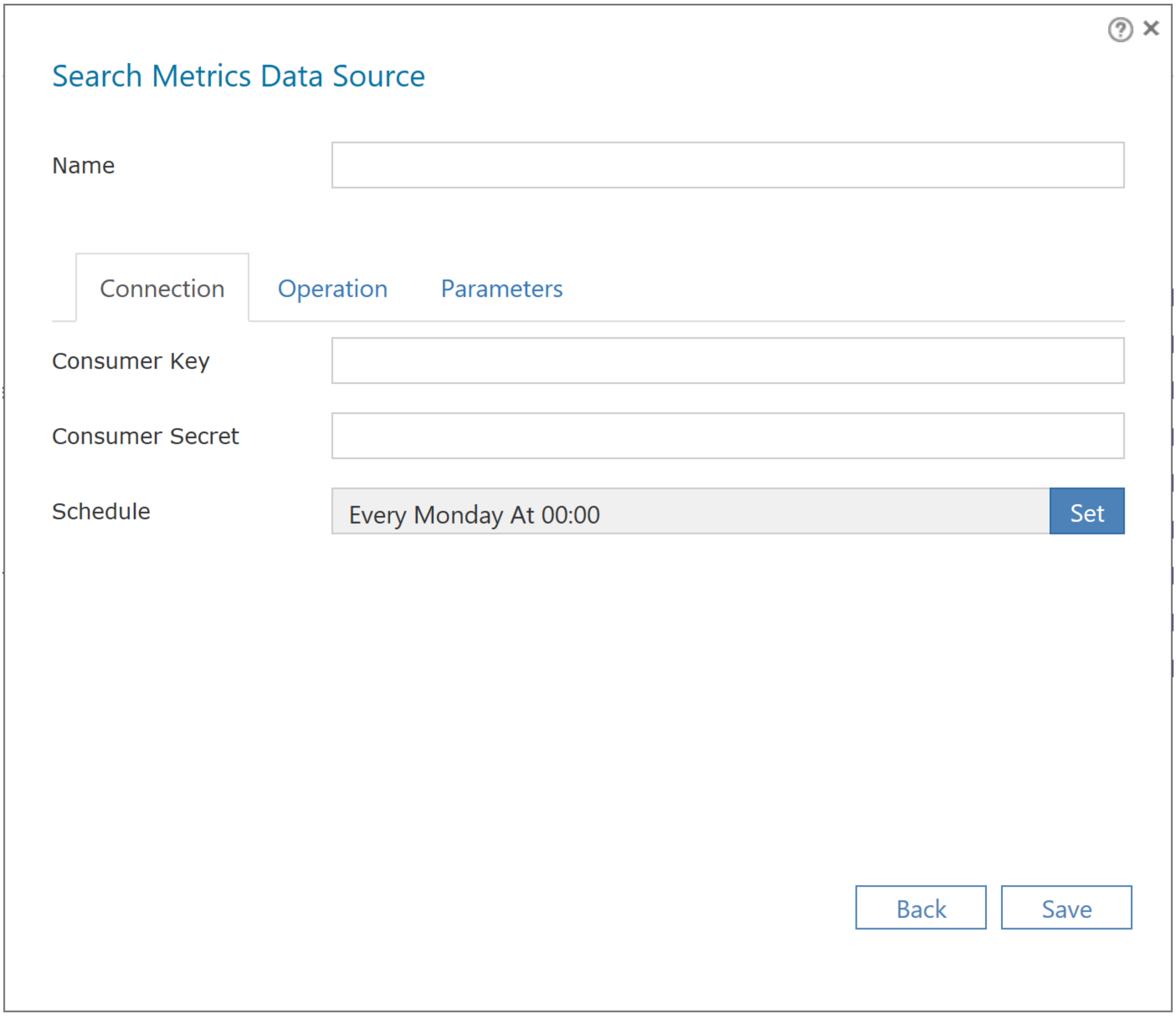
You can use a custom SQL Command here

Schedule

Decide how often you would like to schedule the data to refresh.

Search Metrics

Provides access to SearchMetrics.com data sets. To make use of the SearchMetrics data it is required that you're a SearchMetrics customer and have purchased API access.



Search Metrics Data Source

Name

Consumer Key

Consumer Secret

Schedule: Every Monday At 00:00

Name

Give your data source a name

Connection

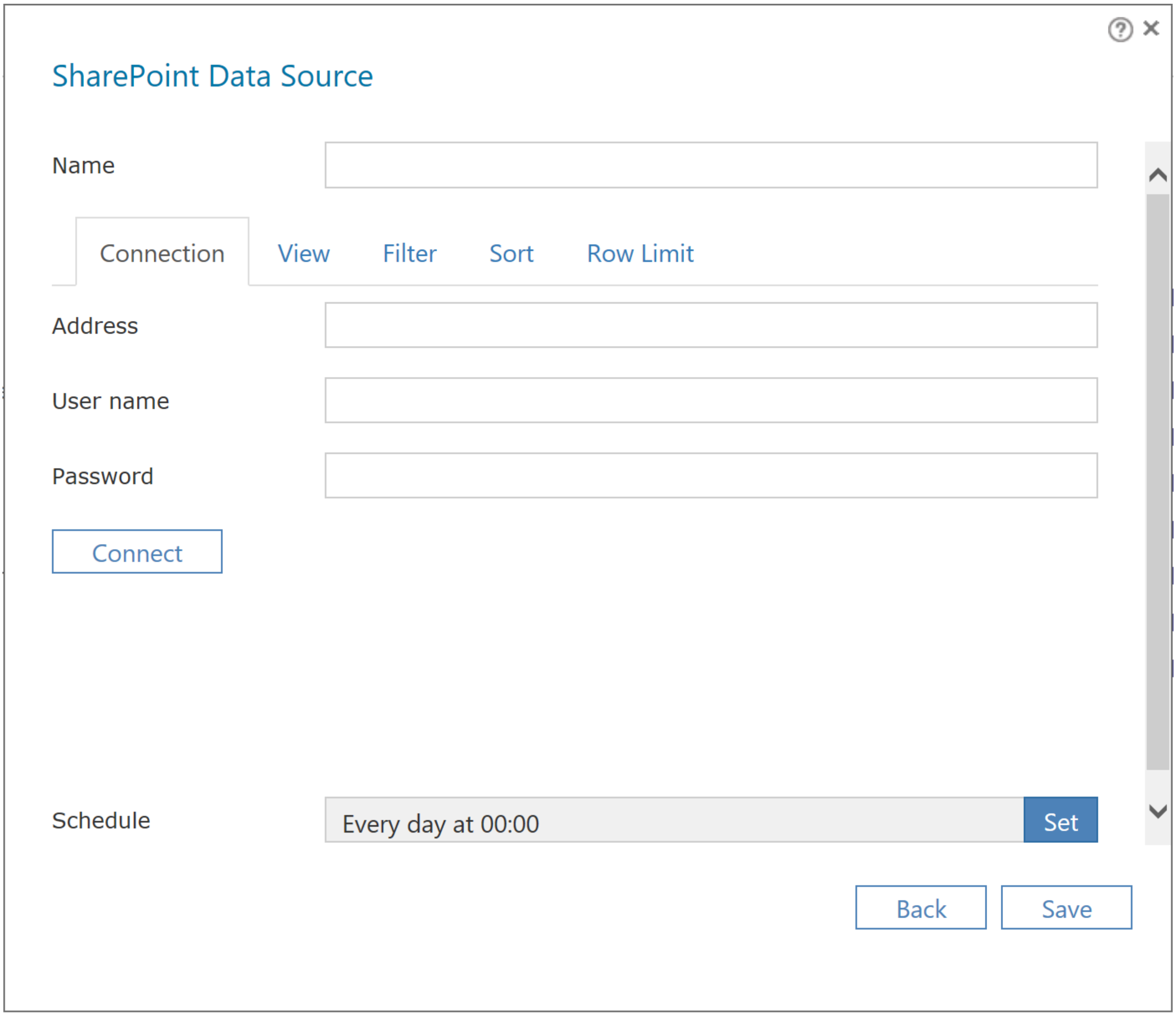
- Consumer Key - Consumer Key is found on the account page within your SearchMetrics account page
- Consumer Secret - Consumer Secret is found on the account page within your SearchMetrics account page.

Schedule

Decide how often you would like to schedule the data to refresh.

SharePoint

Allows connecting to SharePoint data sources.



SharePoint Data Source

Every day at 00:00

Name

Enter the name of the Data Source

Connection

- Address - Enter the URL of the SharePoint server
- Username - Enter the username
- Password - Enter the password of the user
- Connect - When the information is entered press the “Connect” button to retrieve all SharePoint lists.

View

In the dropdown select the list available and choose the relevant fields in the checkboxes below.
Note: When you have saved the SharePoint data source it is not possible to change the List. If you wish to use another list you have to add a new SharePoint data source.

Filter

Choose the fields and add the operator in the dropdown as well as the parameter name and click the add filter button.

Sort

Choose the sort order for the data.

Descending sets the sort order to sort the selected field in descending order.

Row Limit

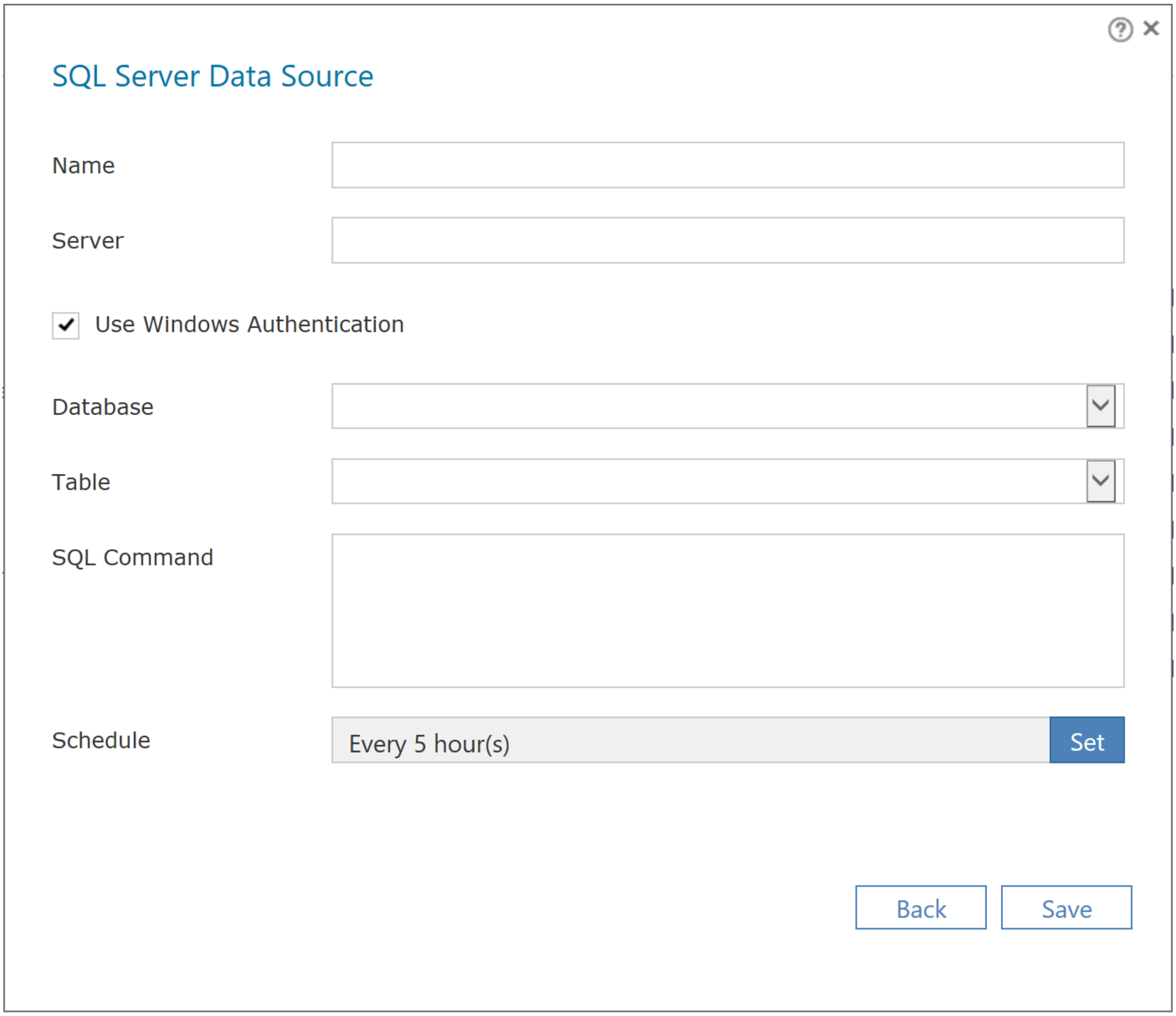
Enter the max number of rows to request from the SharePoint list.

Schedule

Schedule how often you would like to refresh your data from this data source.

SQL Server

Allows connecting to Microsoft SQL Server data sources. If utilizing Windows Security on SQL Server the service account for the TARGIT Data Service must be changed to a user having access to the SQL Server tables.



SQL Server Data Source

Name

Server

☑ Use Windows Authentication

Database

Table

SQL Command

Schedule: Every 5 hour(s)

Name

Enter the name of the data source

Server

Enter the name of the SQL Server you want to connect to.
Note: When using Windows Security the TARGIT Data Service account will be used for authentication.

Windows Authentication

By default, the connection is made using SQL Server authentication.

Uncheck the Box to use SQL Server authentication. Enter 'Username' and 'Password'.

Database

Choose the database you want to retrieve data from

Table

Choose the table/view from the database that you want to use in a cube

SQL Command

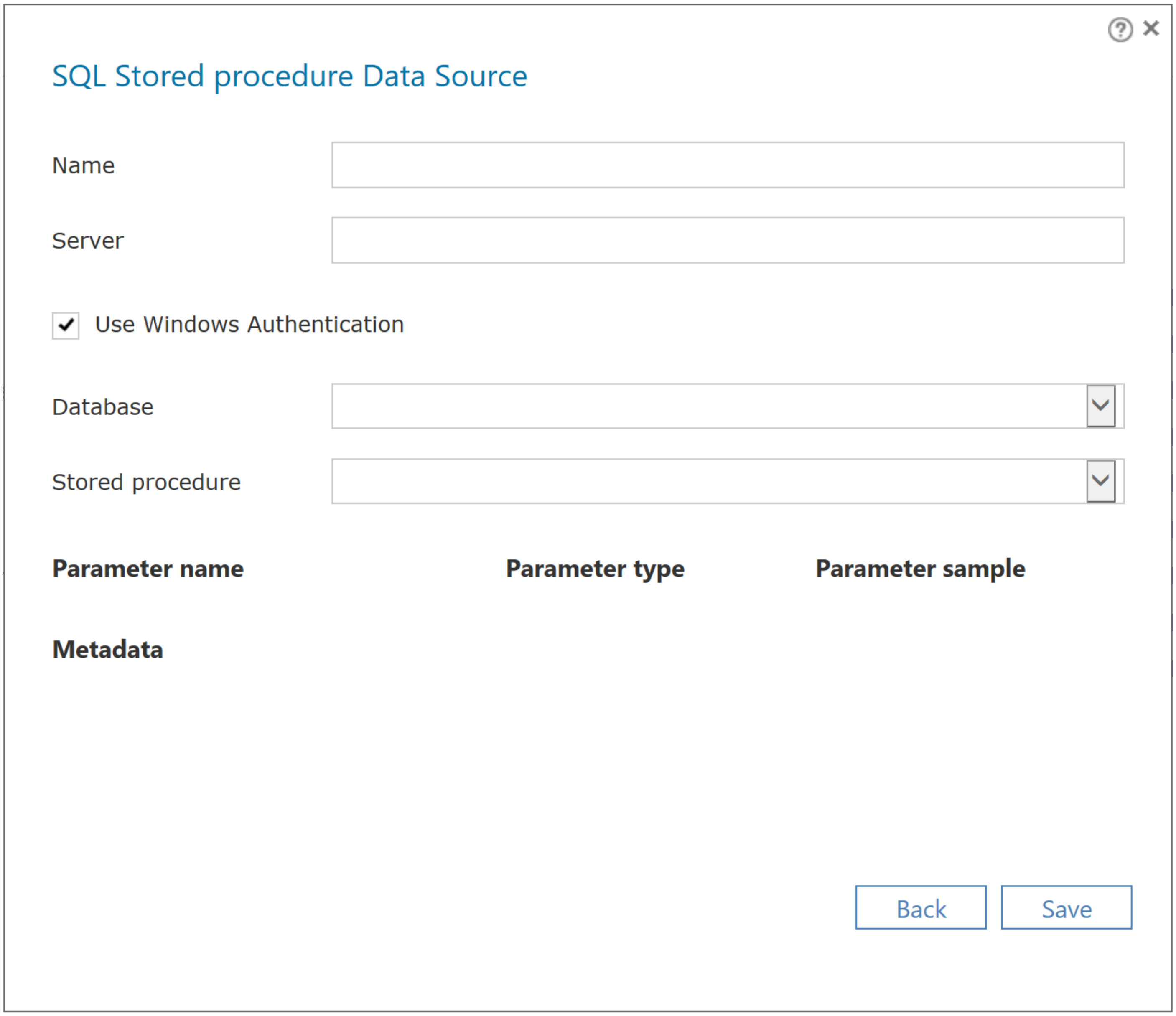
Type a valid SQL command to retrieve data from the database. When making choices in Database and Table this field will be modified according to selections.

Schedule

Schedule how often you would like to refresh your data from this data source.

SQL Server Stored Procedure

This data source is unique in behavior as it is a dynamic data source which will be repopulated every time a selection is made within the TARGIT application.



SQL Stored procedure Data Source

Name

Server

☑ Use Windows Authentication

Database

Stored procedure

Parameter name **Parameter type** **Parameter sample**

Metadata

Name

Specify the name for the data source

Server

Enter the hostname of the SQL Server

Use Windows Authentication

Specifies that TARGIT Data Service will connect with the service credentials. If this box is unchecked you will be asked to enter credentials for SQL Server Standard Edition.

- User name - Enter the username when using SQL Server standard authentication.
- Password - Enter the username when using SQL Server standard authentication.

Database

Select the database where the stored procedure exists

Stored Procedure

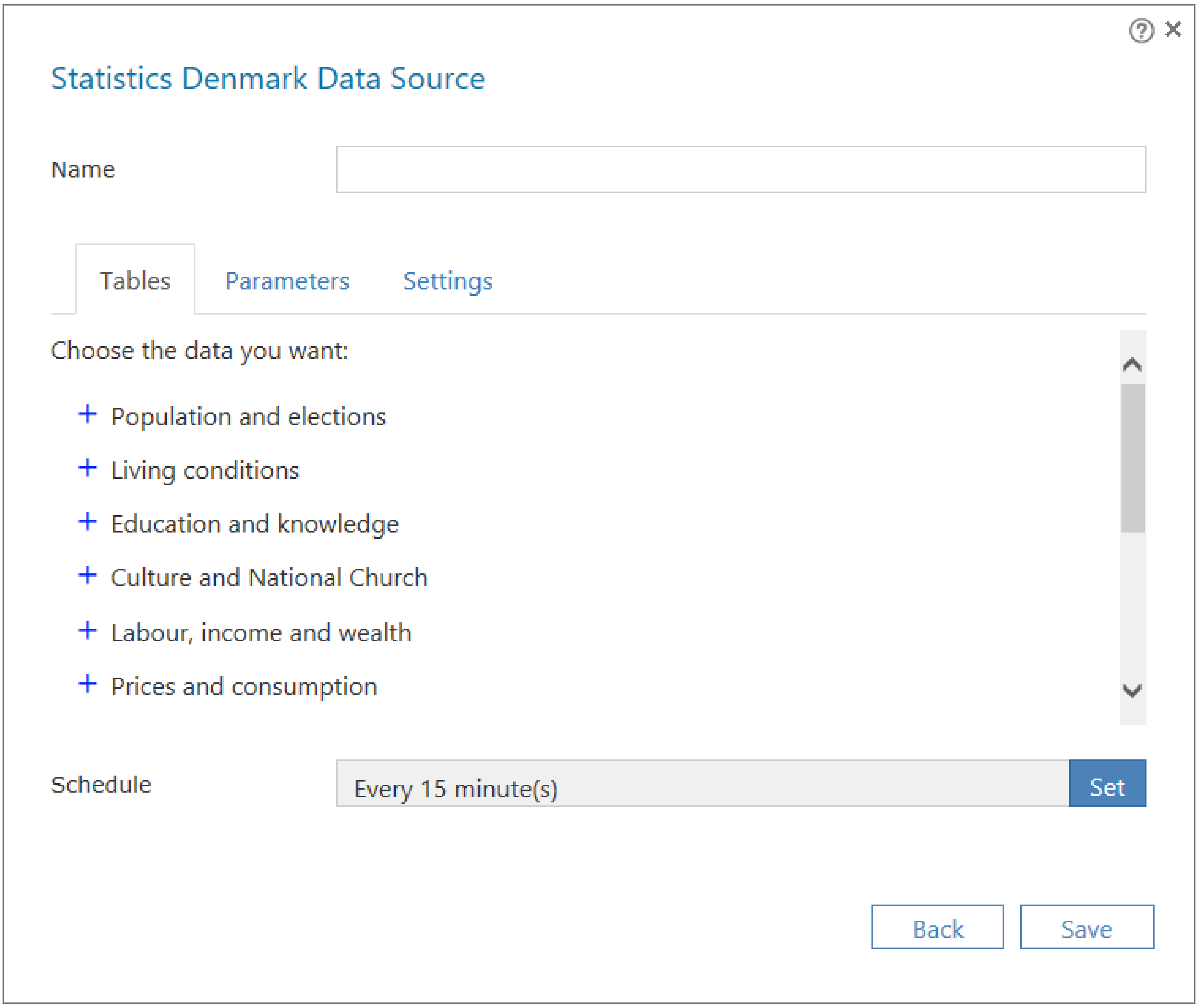
Choose the stored procedure on the server
After choosing the stored procedure a list of parameter names will be shown. To configure this you will have to enter the correct parameters for the Stored procedure to run and return a data set for detection the return results.

Metadata

The metadata can be toggled from automatic to manual.
When manual is chosen you will have to add the returned columns by name and specifying the datatype.

Statistics Denmark

This data source allows you to retrieve information from the Danish Governments Office of Statistics.



Statistics Denmark Data Source

Name

Tables | Parameters | Settings

Choose the data you want:

- + Population and elections
- + Living conditions
- + Education and knowledge
- + Culture and National Church
- + Labour, income and wealth
- + Prices and consumption

Schedule: Every 15 minute(s)

Name

Enter the name of the data source

Tables

On the tables tab you find the categories that are made available by statistics Denmark. Choose a table from the list and configure parameters and settings to tweak the data.

Parameters

For each table a set of parameters can be configured. These will filter the data set as the records sets in themselves can contain millions of records.

Settings

On the settings tab the format of the returned data can be configured. By default the value is returned.

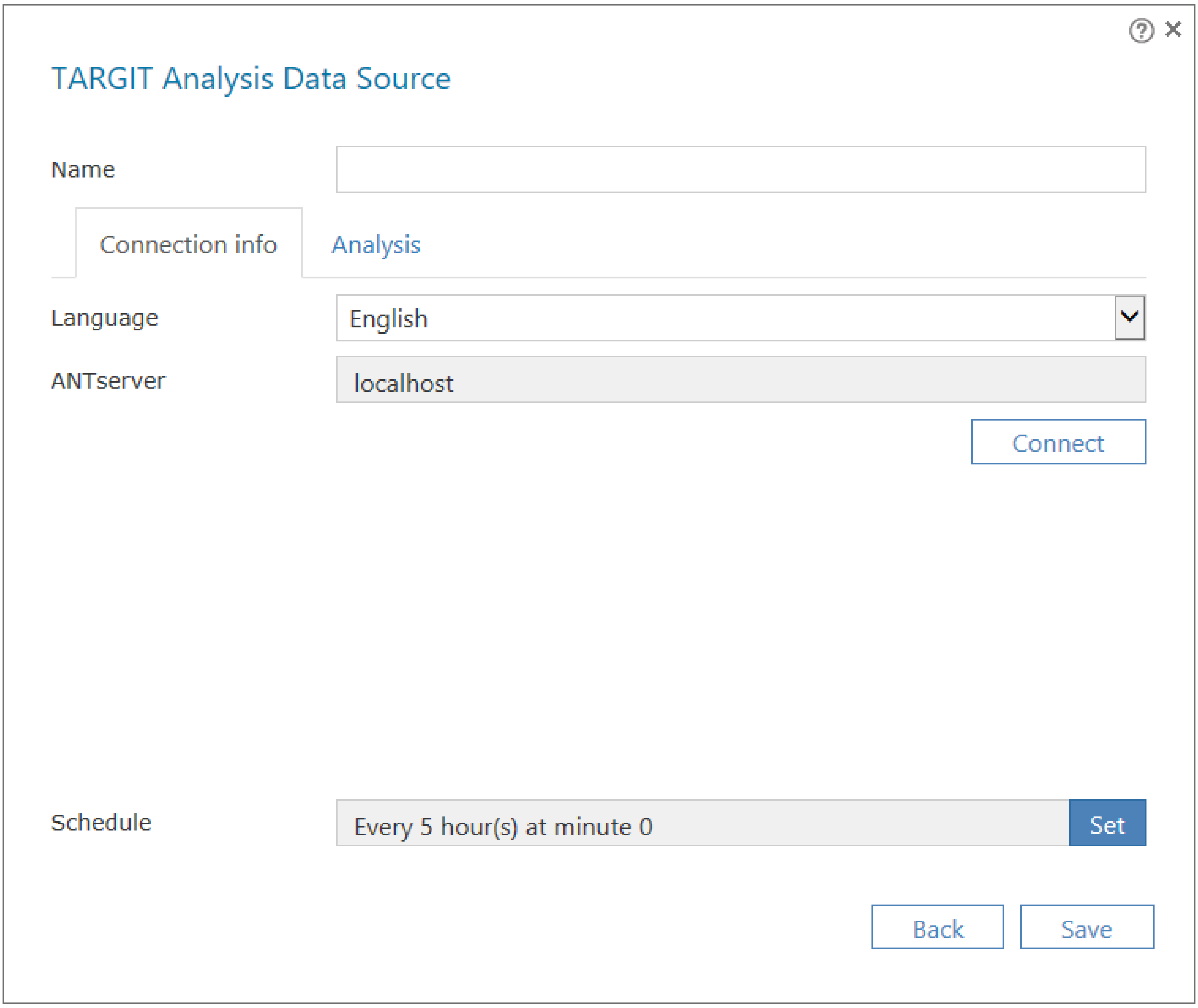
- Value - Will return eg. 'Copenhagen'
- Code - Will return '10'
- Code and Value - Will return '10 Copenhagen'

Schedule

Schedule how often you would like to refresh your data from this data source.

TARGIT Analysis

This data source allows you to consume data from your TARGIT solution by extracting data from a crosstable.



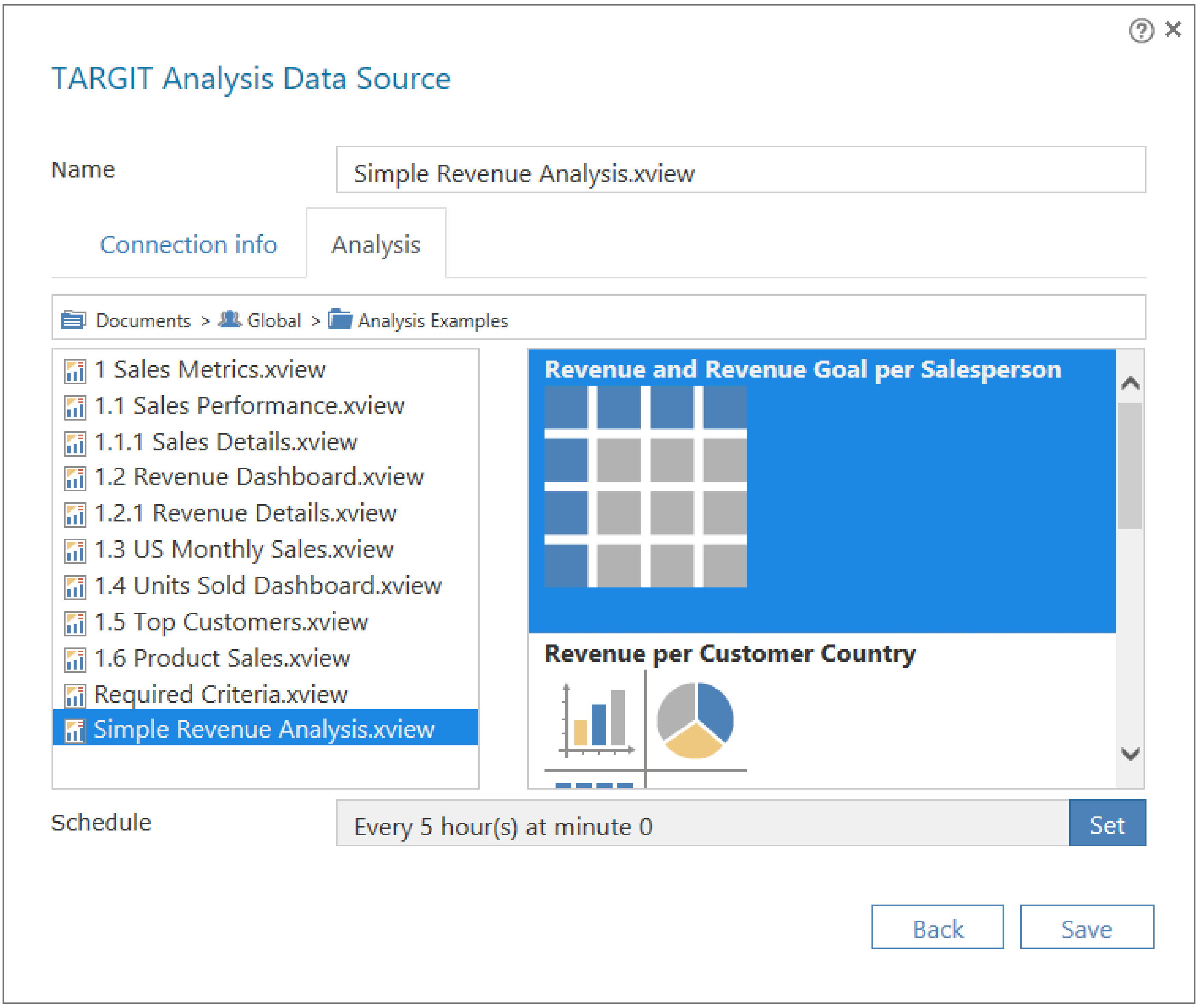
TARGIT Analysis Data Source

Name

Language: English

ANTserver: localhost

Schedule: Every 5 hour(s) at minute 0



TARGIT Analysis Data Source

Name: Simple Revenue Analysis.xview

Connection info
Analysis
Documents > Global > Analysis Examples

- 1 Sales Metrics.xview
- 1.1 Sales Performance.xview
- 1.1.1 Sales Details.xview
- 1.2 Revenue Dashboard.xview
- 1.2.1 Revenue Details.xview
- 1.3 US Monthly Sales.xview
- 1.4 Units Sold Dashboard.xview
- 1.5 Top Customers.xview
- 1.6 Product Sales.xview
- Required Criteria.xview
- Simple Revenue Analysis.xview

Revenue and Revenue Goal per Salesperson
Revenue per Customer Country

Schedule: Every 5 hour(s) at minute 0

Name

Give your data source a name

Connection Info

- Language - Default is 'English'. Specify another language, if necessary.
- ANTserver -The TARGIT Server is always the local server 'Localhost'.

- Connect -
  When you click 'Connect' you will be taken to the 'Analysis' tab from where you can browse and select from the available analyses.

Analysis

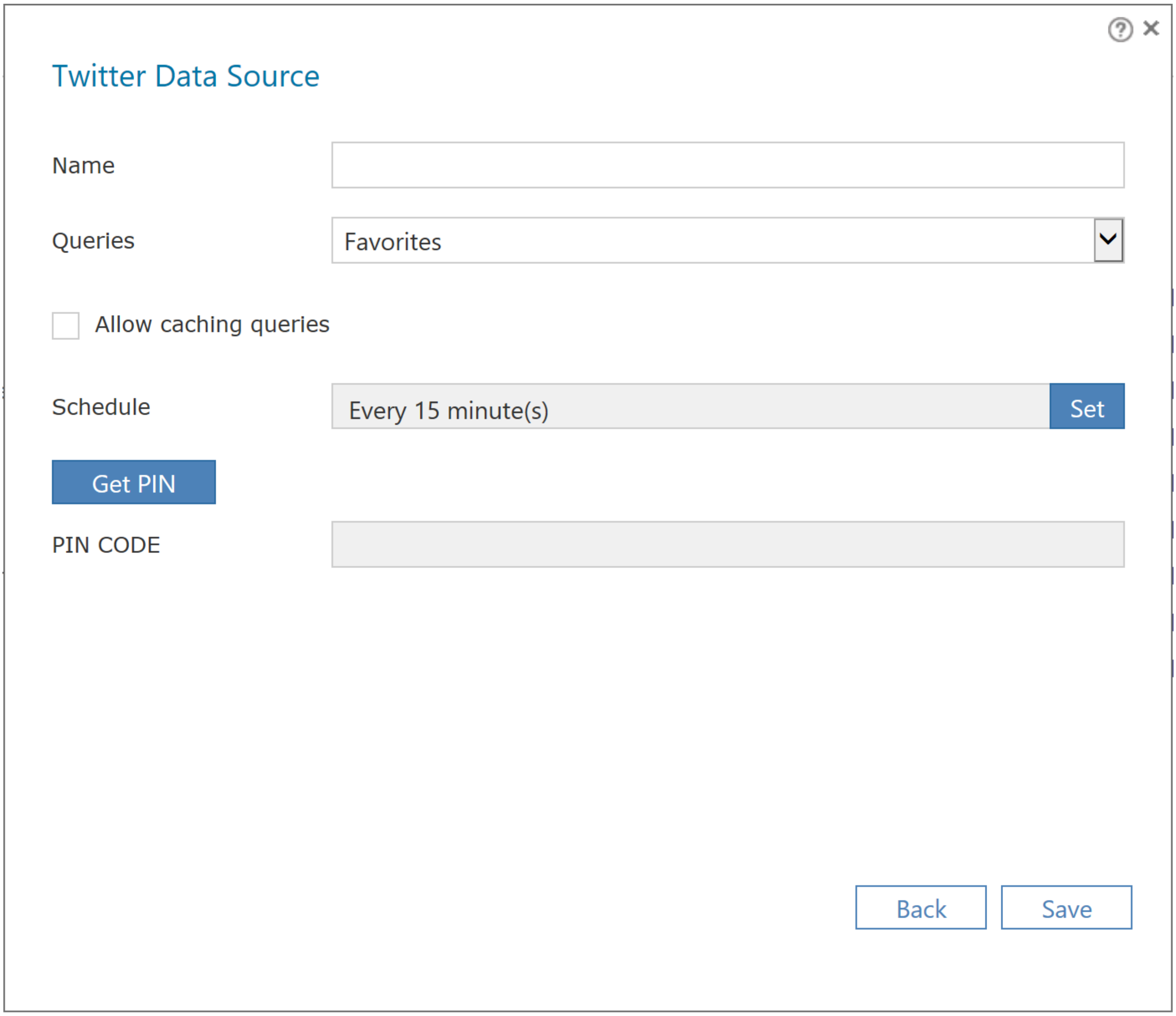
On the analysis tab all analyses stored on the TARGIT server will be available. Choose the analysis and the object you wish to import into TARGIT Data Service.

Schedule

Schedule how often you would like to refresh your data from this data source.

Twitter

With the Twitter plugin data can be retrieved from Twitters API and analyzed in TARGIT



Twitter Data Source

Name	
Queries	Favorites
□ Allow caching queries	
Schedule	Every 15 minute(s)
PIN CODE	

Name

Enter the name of the data source

Queries

Select the query you want to run against Twitter.

Favorites

Users marked as favorites

Following

Users that you are following

Tweets

Tweets posted

Followers

People following you

Users

User information incl. number of followers etc.

Trends

Retweets

Mentions

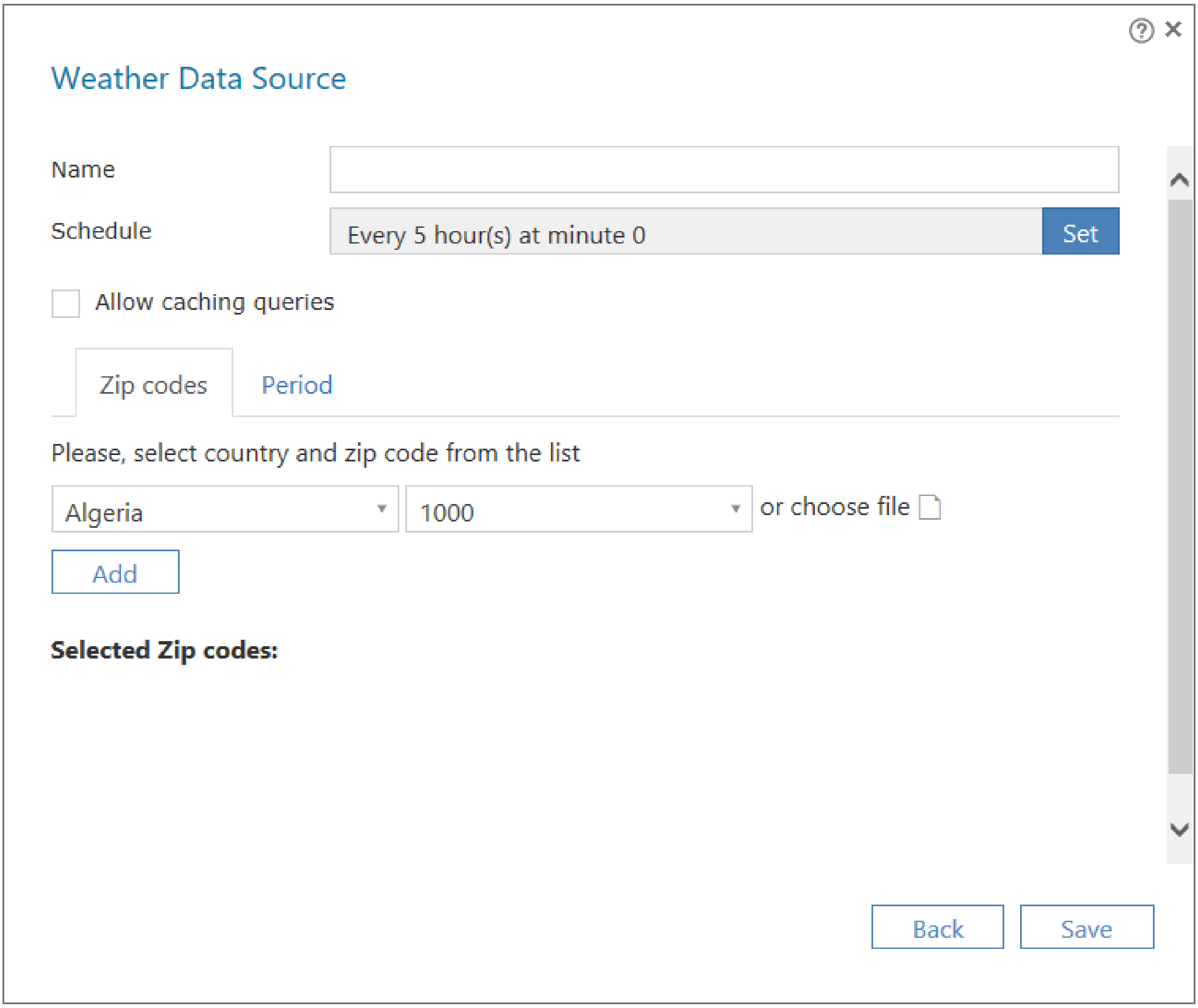
Lists

Schedule

Decide how often you would like to schedule the data to refresh.

Weather

Weather plugin allows retrieval of historical weather information based on zip codes.



Weather Data Source

Name

Schedule: Every 5 hour(s) at minute 0

□ Allow caching queries

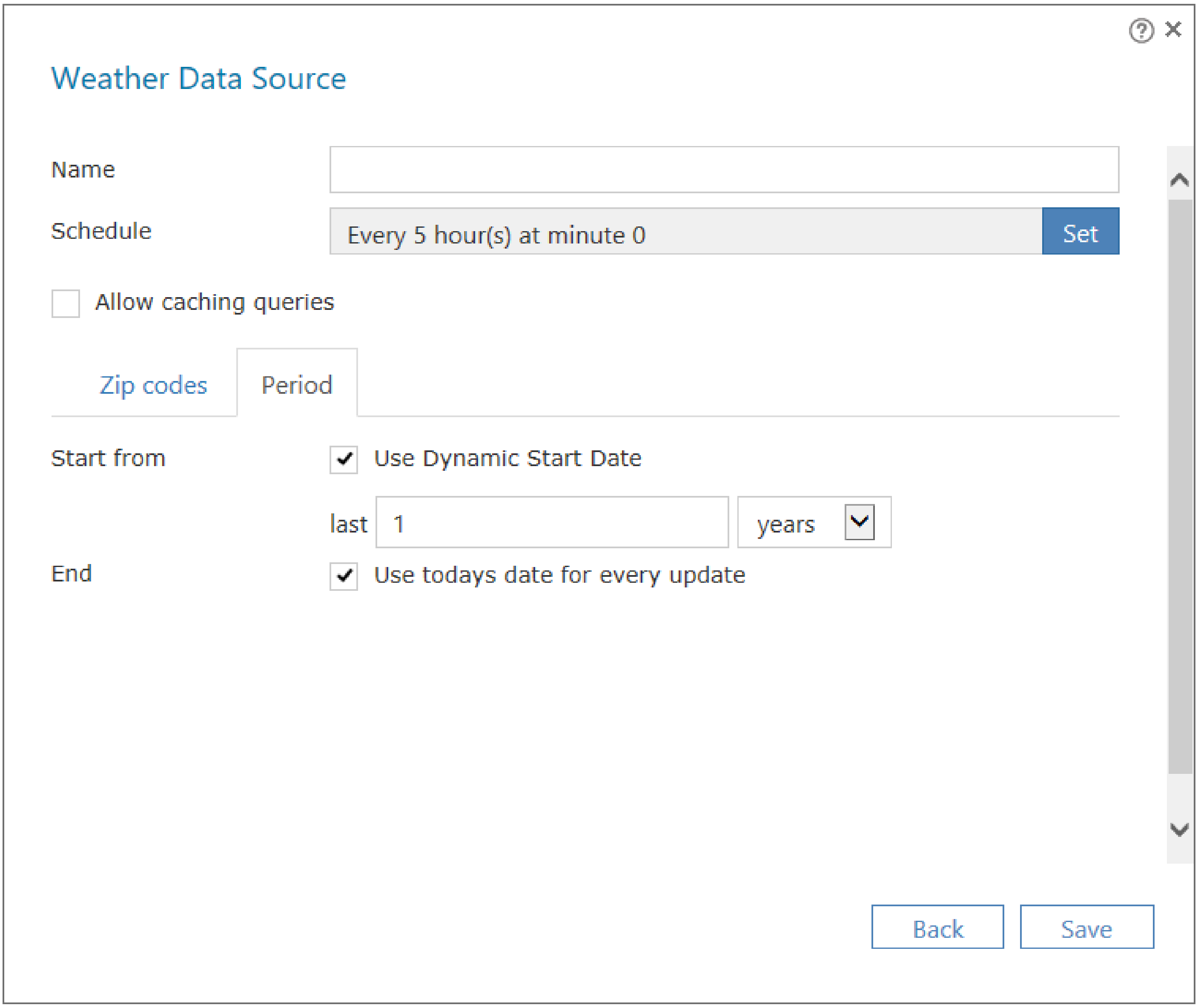
Please, select country and zip code from the list

Algeria

1000

or choose file

Selected Zip codes:



Weather Data Source

Name

Schedule: Every 5 hour(s) at minute 0

□ Allow caching queries

Start from: ☑ Use Dynamic Start Date

last 1 years

End: ☑ Use todays date for every update

Name

Enter the name of the data source

Schedule

Schedule how often you would like to refresh your data from this data source.

Zipcodes

Choose the country and Zipcodes from the dropdown list and click the add button. Please note that you can search in the dropdowns.

In case you have a large list of zipcodes you can create a file containing zipcodes in this format: CountryCode-ZipCode. A real life example is US-33618 selecting the country United States and the zipcode 33618 which is Tampa. Save the file and click "Choose file" in the dialog to upload the list.

Periods

You can choose to retrieve weather data for either a dynamic period or a fixed period. Simply select the option you want and choose the date range.

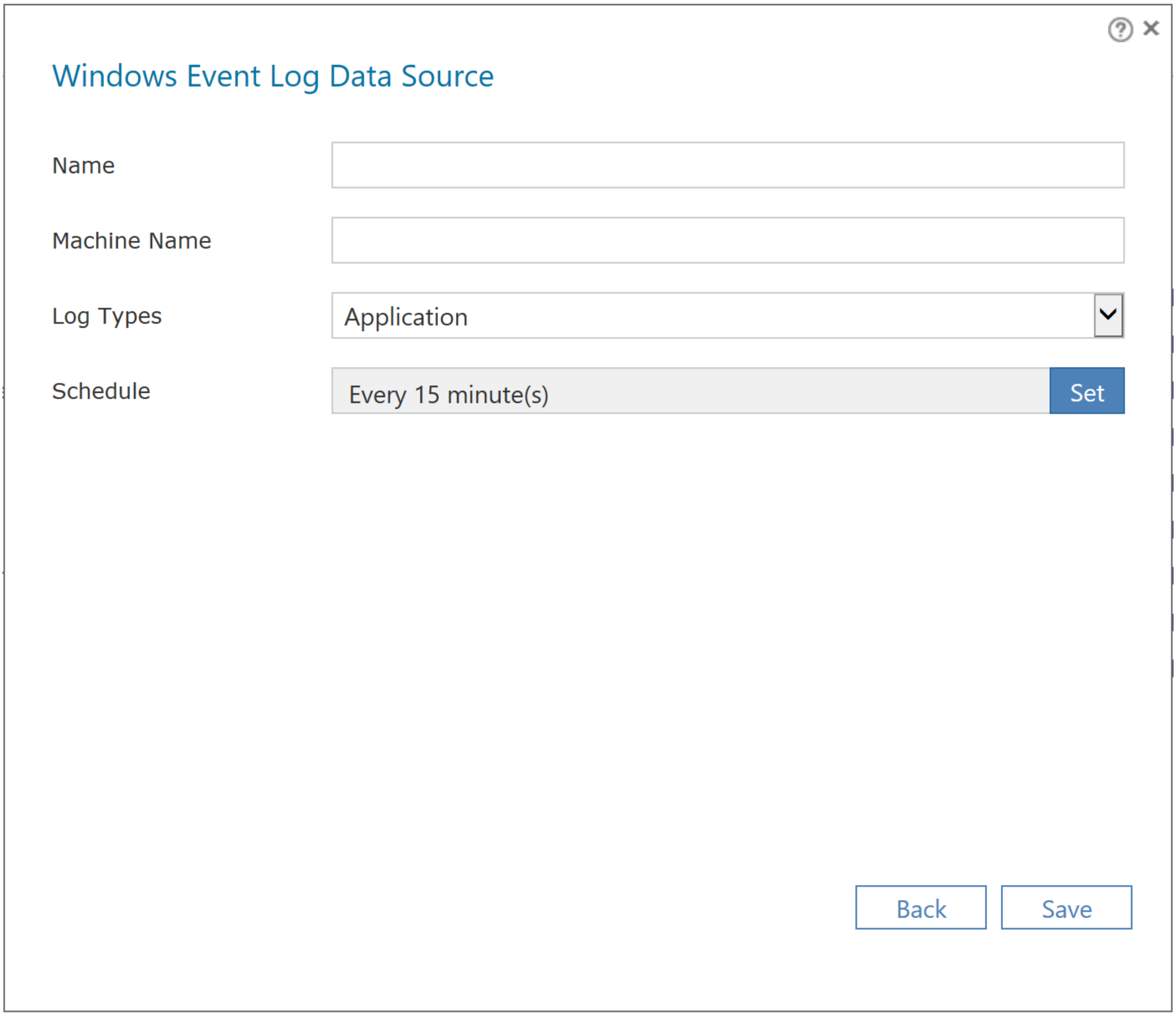
- Start from - If you uncheck “Use Dynamic Start Date” and uncheck “Use todays date for every update”, then you will have the option for selecting the exact date that your Date Table will begin or end and it will never change.

  If you check the box for “Use Dynamic Start Date” then the next option will be to decide how far back from Today, you want to start your Date Table.
- End - If you check the box for “Use todays date for every update”, then your Date Table will always update until today. You can decide that Today’s date is always used for the update of the Date Table.

Windows Event Log

The Windows Event Log source enables instant analysis of all events recorded in the Windows EventLog.

Supported logs are: System, Application and Security.



Windows Event Log Data Source

Name

Machine Name

Log Types: Application

Schedule: Every 15 minute(s)

Name

Give your data source a name

Machine Name

Enter the name of the machine you want to read the event log from.
It is a requirement that the service account for TARGIT Data Service has permissions to read from the eventlog on the machine name entered.

Log Types

The log types specifies what event log to read.

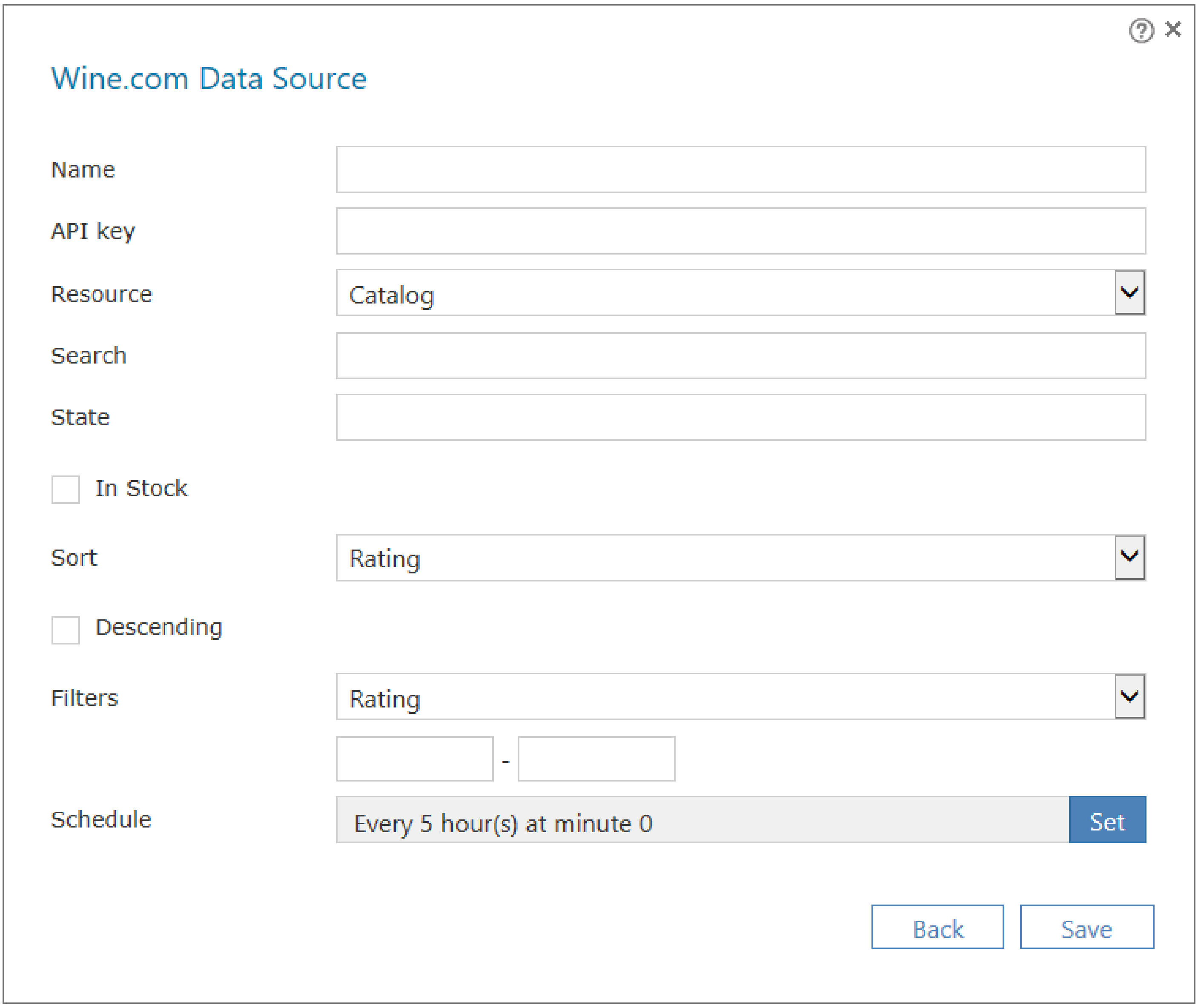
- Application - All application entries
- System - All system logged entries
- Security - All security events

Schedule

Schedule how often you would like to refresh your data from this data source.

Wine.com

With this plugin you can request data from the Wine.com API with an API key.
Signing up for an account with API permissions can be done for free at the webpage https://api.wine.com.



Wine.com Data Source

Name

API key

Resource: Catalog

Search

State

□ In Stock

Sort: Rating

□ Descending

Filters: Rating

-

Schedule: Every 5 hour(s) at minute 0

Name

Give your data source a name

API Key

Enter the key provided by Wine.com in the field

Resource: Catalog

Queries the entire catalog of wine.com.

- Search - Enter the string to search for in the database. A valid string must be entered such as 'red wine' or 'Hess'.
- State - Specify the state in which to search as two letter abbreviation, eg. 'FL' for Florida.
- In Stock - Searches only resources entries where the product is in stock.
- Sort - Choose how you would like the returned data to be sorted:Check 'Descending' to reverse the sort order.
    - Rating - user rating.
    - Vintage - product year/vintage.
    - Price - product price.
    - Popularity - based on user ratings.
    - Winery - name of manufacturer/vineyard.
    - Savings - discount price.
    - Just In - new products.

Resource: Categories

Returns categories of wine from the wine.com database.

- Search - Enter the string to search for in the database. A valid string must be entered such as 'red wine' or 'Hess'.

Resource: Categories

Returns categories of wine from the wine.com database.

Filters

Allows filtering the database result by a variable.

- Rating - Order by user rating
- Categories - By categories
- Price - The price of the product
- Product - By product id

Range

Based on the Filter setting, enter the range 'From' and 'To' in the boxes just below the filters.

Schedule

Schedule how often you would like to refresh your data from this data source.

Cubes

The cube designer is the heart of making data available for consumers.

The left pane of the cube designer shows a list of all available data sources, if a data source isn't in the list a new can easily be added by clicking "Add data source'.
To create a cube drag the data sources from the list onto the workarea and make the relevant relations between the data sources.

Working with data sources dragged to the work area

In the upper right corner of a data source you will find the sigma/sum symbol (Σ) that toggles a table between fact and dimension state and the burger-menu (Ξ) with the following options:

Preview data

Generates a preview of the first 100 rows in the table

Cube Visibility

Controls what dimensions and measures that are visible in the cube on a granular level.
The dialog allows you to control what measures and dimensions are made visible in the cube.

- Max - Maximum value
- Min - Minimum value
- Avg - Average of values

- Cnt - Count of values
- Sum - Sums up values
- Show in folders only - Controls whether measures and dimensions will be structured in a folder within the Data Source SmartPad in TARGIT.
- Dimension - Determines whether a field will be available as a dimension.

For numeric data types aggregation types like Max, Min, Avg, Cnt, Sum are automatically created as well as dimensions
For string data Cnt (counts) and dimensions are available.

- Hide all fields - Hides all measures and dimensions derived from the data source. This over rules settings configured in the cube visibility-dialog.
- Remove table - Removes the table (data source) from the workspace

Sharing your data sources and cubes

While designing TARGIT Data Service we have focused on building a collaborative data discovery platform. This means users can share data sources with each other, collaborate on building cubes and deploy their solutions to a group of users without having to involve the IT department of the company.

When a user has designed a cube or created a data source all that needs to be done is to right-click the cube and click the “Share” item and enter the username or group that the item should be shared with.

For further control the permissions option also found in the right-click menu is available. Here more granular access can be configured (e.g. read only access)

Formats

When retrieving data from a wide range of data sources it sometimes is necessary to manipulate the data in order to match up the data between different sources. This is done by adding a new format for the data source. Cubes do not distinguish between formats or regular data sources.

The format functionality is available on from the data sources overview that is accessible from the “Data Sources” pane on the startup screen. Locate the data source you wish to manipulate and right-click it. In the popup menu click “Create format” and a dialog will appear.

The dialog is split into two sections, the top section shows a preview of the first 5 lines showing the results of manipulations of the data and the bottom has tabs that has different categories of options for manipulating the data.

The preview can be used for creating new calculated columns (+) icon to the right of the preview in addition making selections. The following right-click options are available:

Edit Properties

Allows changing properties for the column. This is described in further detail below.

Unpivot

Unpivots the selected column(s). You can select multiple columns before right-clicking by holding down the ctrl or shift key and left clicking with the mouse.

Unpivot all columns to the right

Can be used when right-clicking on the left-most column of the data set that you want to unpivot with this function. See additional description below.

Rows

Remove duplicate strings

Will return all output as unique rows (distinct values)

Column properties

Formula

You can enter a custom formula and modify the contents of the column to your liking by taking advantage of the functions available.

Destination Type

This specifies the type of data output the field or formula is deriving from the original data source. You can override the automatically detected type and set various properties depending on data type:

- Integer - (no options available)
- String - (no options available)
- Date - Date pattern: Input the mask for how the data in the field is represented. Use the "?" function for format help
  Strip time: Will remove any time stamp from the string and only retain the date portion.

Advanced Settings

Enable Field

Indicates whether the column will be available in the data format

Fill empty values

If the row value is empty and a value exists above the value above will automatically be duplicated. Very useful for importing data from e.g. a pivot-table in Excel

Split by output rows

(Available if a column is unpivoted) Will divide all numeric measure fields with the number of output rows.

Unpivoting Data

There are two types of unpivot functionality where you unpivot selected columns or all columns to the right.

By default TARGIT will recognize that measures not included in an unpivot group is a measure and automatically divide the measure by the number of available columns. This functionality can be toggled on individually for each column by right-clicking the column, choosing edit and unchecking the "Split by output rows"

Unpivot selected columns

Can you unpivot a fixed range of columns by creating a new format, hold down the crtl-key or shift-key and select additional columns to unpivot. After highlighting the columns you want simply right-click one of the selected columns and choose "Unpivot" and an unpivot group will be created.
Additionally this can be done in the Unpivot-tab in the Data Source Format-dialog.

Unpivot to the right

If you have a data source with a dynamically changing amount of columns this functionality can be used to unpivot columns to rows without manual intervention.
An example could be this Excel table:

Customer	1/1/2016	1/2/2016	1/3/2016	...	1/10/2016
A	100	111	211		1111
B	200	112	212		1112
C	300	113	213		1113

The date columns are here dynamically added as the year passes by for e.g. budgeting purposes. Reporting on this in a BI tool is however complicated since the data needs to be unpivoted.
As a user you therefore right-click the data source, choose Create format, right-click the header on the 1/1/2016 cell and choose "Unpivot columns to the right". From that moment on when the Excel sheet is saved TARGIT will automatically recognize the new column and you can now use this as a source for your cube in this format (sample below)

Customer	Date	Value
A	1/1/2016	100

A	1/2/2016	111

Formulas

The formula engine supports more than 100 functions that can be useful for adding or changing contents in a data source.
The syntax for the formulas are in nature similar to Excel®, however does have its own flavor with multiple overloads (the date function can e.g. take up to 7 parameters).
When typing in the formulas context sensitive help will popup and you can additionally take advantage of the classic Ctrl+Space feature also found in Visual Studio that enables you to quickly search through all formulas and column names without having to take your hands of the keyboard.

Basic information about formulas

- Functions are always in the form of FUNCTIONNAME() and can be nested.
- Columns names are referenced with an & (ampersand) followed by their name e.g. &Amount

Below is a couple of samples of formulas

To explain the function we will use the dataset below

- Sample data -

Date	ProductNo	Productname	Amount
1999/12/25	1234	T-Shirt WOW	100.25
2013/12/03	4567	Jeans BUZZ	200.30

- Retrieve the year part of date: - YEAR(&Date)
  Returns 1999 and 2013 for each row
- Concatenate productno and productname with a space between - CONCATENATE(&ProductNo,” “,&Productname) Results in “1234 T-Shirt WOW” and “4567 Jeans BUZZ”
- Add Shipping fee of $11 to the Amount - &Amount+11
  Results in amounts becoming 111.25 nd 211.30.

Date Time

date

(int Year,month,day)

Returns a new date with specified or default parameters.
Example: DATE(2017,12,31) returns a new date (12/31/2017 12:00:00 AM) depending on the computer language.
Another Example: DATE(2017) returns a new date (01/01/2017 12:00:00 AM) depending on the computer language.

Year: Optional. The year (1 through 9999). Defaults to 1.

datefromsimpleweeknum

(int weekNumber)

Returns the first day of the week as date. Defaults to current year on the server. Week one begins on January 1st,
week two begins on January 8th, and week 53 has only one or two days (for leap years).
Example: DATEFROMSIMPLEWEEKNUMBER(2) is the second week's starting date (varies).
weekNumber: Required. The ordinal number of the week.
Weeknumber from -99999 to 99999

datefromweeknum

(int weekNumber)

Returns the first day of the week as date. Defaults to current year and to culture on the server.
Example: DATEFROMWEEKNUM(2) is the second week's starting date (varies).
Example 2: DATEFROMWEEKNUM(1,2018) is the first week's starting date in 2018.

weekNumber: Required. The ordinal number of the week.

datefromweeknumiso

(int weekNumber)

Returns the first day of the week in ISO 8601 format as date. Defaults to current year on the server.
Example: DATEFROMWEEKNUMISO(2) is the second week's starting date (varies).
Example 2: DATEFROMWEEKNUMISO(2,2018) is the second week's starting date in 2018.
weekNumber: Required. The ordinal number of the week.

day

date Value)

Gets the day component of the date represented by value parameter.
Example: DAY(DATE(2016,1,20)) is the day component of the value parameter (20).
Value: Required. The date to get the component from.

durationdays

(date From, date To)

Gets the days component of the from - to period.
Example: DURATIONDAYS(DATE(2016,1,20), DATE(2017,3,23)) is the days component of the period (428).
From: Required. The start date of the period.

durationhours

(date From, date To)

Gets the hours component of the from - to period.
Example: DURATIONHOURS(DATE(2016,1,20,1), DATE(2017,3,23,5)) is the hours component of the period (4).
From: Required. The start date of the period.

durationmilliseconds

(date From, date To)

Gets the milliseconds component of the from - to period.
Example: DURATIONMILLISECONDS(DATE(2016,1,20,1,2,3,400), DATE(2017,3,23,5,8,11,500)) is the milliseconds component of the period (100).
From: Required. The start date of the period.

durationminutes

(date From, date To)

Gets the minutes component of the from - to period.
Example: DURATIONMINUTES(DATE(2016,1,20,1,2), DATE(2017,3,23,5,8)) is the minutes component of the period (6).
From: Required. The start date of the period.

durationseconds

(date From, date To)

Gets the seconds component of the from - to period.
Example: DURATIONSECONDS(DATE(2016,1,20,1,2,3), DATE(2017,3,23,5,8,11)) is the seconds component of the period (8).
From: Required. The start date of the period.

durationtotaldays

(date From, date To)

Gets the total days component of the from - to period.
Example: DURATIONTOTALDAYS(DATE(2016,1,20), DATE(2017,3,23)) is the total days component of the period (428).
From: Required. The start date of the period.

durationtotalhours

(date From, date To)

Gets the total hours component of the from - to period.
Example: DURATIONTOTALHOURS(DATE(2016,1,20,1,0,0), DATE(2017,3,23,5,0,0)) is the total hours component of the period (10276).
From: Required. The start date of the period.

durationtotalminutes

(date From, date To)

Gets the total minutes component of the from - to period.
Example: DURATIONTOTALMINUTES(DATE(2016,1,20,1,2,0), DATE(2017,3,23,5,8,0)) is the total minutes component of the period (616548).
From: Required. The start date of the period.

durationtotalms

(date From, date To)

Gets the total milliseconds component of the from - to period.
Example: DURATIONTOTALMS(DATE(2016,1,20,1,2,3,400), DATE(2017,3,23,5,8,11,500)) is the total milliseconds component of the period (36993968100).
From: Required. The start date of the period.

durationtotalseconds

(date From, date To)

Gets the total seconds component of the from - to period.

Example: DURATIONTOTALSECONDS(DATE(2016,1,20,1,2,3), DATE(2017,3,23,5,8,11)) is the total seconds component of the period (36993968).

From: Required. The start date of the period.

durationworkdays

(date From, date To)

Gets the total workdays component of the from - to period.
Example: DURATIONWORKDAYS(DATE(2016,1,20), DATE(2017,3,23) is the total workdays component of the period (306).
From: Required. The start date of the period.

durationyears

(date From, date To)

Gets the total years component of the from - to period.
Example: DURATIONYEARS(DATE(2016,1,20,1,2,3,400), DATE(2017,3,23,5,8,11,500)) is the year component

of the period (1).
From: Required. The start date of the period.

format

(null Date, null dateFormat)

Returns date in specified format.
Example: FORMAT(DATE(2008, 3, 9, 16, 5, 7), "MM/dd/yyyy") returns 03/09/2008.
Date: Required. The date.

hour

(date Value)

Gets the hours component of the date represented by value parameter.
Example: HOUR(DATE(2016,1,20,9,2,3)) is the hours component of the value parameter (9).
Value: Required. The date to get the component from.

millisecond

(date Value)

Gets the milliseconds component of the date represented by value parameter.
Example: MILLISECOND(DATE(2016,1,20,1,2,3,400)) is the milliseconds component of the value parameter (400).
Value: Required. The date to get the component from.

minute

(date Value)

Gets the minutes component of the date represented by value parameter.
Example: MINUTE(DATE(2016,1,20,1,2,3,400)) is the minutes component of the value parameter (2).
Value: Required. The date to get the component from.

month

(date Value)

Gets the month component of the date represented by value parameter.
Example: MONTH(DATE(2016,12,20,1,2,3,400)) is the month component of the value parameter (12).
Value: Required. The date to get the component from.

quarter

(date Value)

Gets the quarter component of the date represented by value parameter.
Example: QUARTER(DATE(2016,10,20)) is the quarter component of the value parameter (4).
Value: Required. The date to get the component from.

second

(date Value)

Gets the seconds component of the date represented by value parameter.
Example: SECOND(DATE(2016,1,20,1,2,3)) is the seconds component of the value parameter (3).
Value: Required. The date to get the component from.

texttomonth

(string &monthColumn)

Parses the value parameter and returns the month code.
Example: TEXTTOMONTH("oct") is a October month (10).
&monthColumn: Required. The text to be interpreted as month.
valid values: "jan","feb","mar","apr","may","jun","jul","aug","sep","oct","nov","dec"

texttoweekday

(string weekday)

Parses the value parameter and returns the week day code.
Example: TEXTTOWEEKDAY("fri") is a Friday (5).
weekday: Required. The text to be interpreted as week day
valid values: "mon","tue","wed","thu","fri","sat","sun"

weekday

(date Value)

Gets the week day component of the date represented by value parameter.
Example: WEEKDAY(DATE(2016,1,20)) is the week day component of the value parameter (3).
Value: Required. The date to get the component from.

weekdayname

(null dayNumber)

Returns the day name.
Example: WEEKDAYNAME(2) is the second day name of week (varies).
dayNumber: Required. The ordinal number of the day.

weeknumber

(date Date)

Calculates the week number for the date parameter. Defaults first day of week and week rule to current server culture's settings.
Example: WEEKNUMBER(DATE(2016,2,1)) is the week number (5).
Date: Required. The date to calculate week number.

weeknumberiso8601

(date Value)

Gets the week number in ISO 8601 format of the date represented by value parameter.
Example: WEEKNUMBERISO8601(DATE(2016,1,20,1,2,3,400)) is the ISO 8601 week number of the value parameter (3).
Value: Required. The date to get the component from.

Dynamic

timenow

(string zone)

Returns the current time on server in short time string format.
Example: TIMENOW("utc") returns the current server time expressed as the Coordinated Universal Time UTC (varies).
Example 2: TIMENOW() return the current server time.
zone: Optional. Use "utc" to get time as the Coordinated Universal Time

today

(string zone)

Returns the current date on server.
Example: TODAY("utc") returns the current date on the server as the Coordinated Universal Time UTC(varies).
Example 2: TODAY() returns the current date on the server.
zone: Optional. Use "utc" to get time as the Coordinated Universal Time

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Logical

and

(bool logical1)

Returns TRUE if all its arguments evaluate to TRUE; returns FALSE if one or more arguments evaluate to FALSE
Example: AND(TRUE, [...]) results TRUE.
Example: IF(AND(1>0,1>100),1,0) results 0.
logical1: Required. The first condition that you want to test that can evaluate to either TRUE or FALSE.

false

()

Returns the logical value FALSE.
Example: FALSE() returns FALSE.

if

(bool logical_test, Object value_if_true, Object value_if_false)

The IF function returns one value if a condition you specify evaluates to TRUE, and another value if that condition evaluates to FALSE.
Example: IF(1=1,1,0) returns 1 if 1=1, otherwise 0.
logical_test: Required. Any value or expression that can be evaluated to TRUE or FALSE.

isblankorempty

(Object Value)

Converts the value to string and checks whether it is NULL or empty. Returns logical TRUE or FALSE values.
Example: IsBlankOrEmpty("Text") checks whether the string is empty (FALSE).
Value: Required. The object that you want to check.

isdate

(Object Value)

Verifies whether the value object is a date. Returns logical TRUE or FALSE values.
Example: ISDATE(DATE(2016,1,1)) checks whether the object is date (TRUE).
Value: Required. The object that you want to check.

isnegative

(Object Value)

Verifies whether the value is negative number. Returns logical TRUE or FALSE values.
Example: ISNEGATIVE(1) checks whether 1 is negative (FALSE).
Value: Required. The object that you want to check.

isnumber

(Object Value)

Verifies whether the value is number. Returns logical TRUE or FALSE values.
Example: ISNUMBER(1) checks whether 1 is a number (TRUE).
Value: Required. The object that you want to check.

ispositive

(Object Value)

Verifies whether the value is positive number. Returns logical TRUE or FALSE values.
Example: ISPOSITIVE(1) checks whether 1 is positive (TRUE).
Value: Required. The object that you want to check.

istext

(Object Value)

Verifies whether the value is a string. Returns logical TRUE or FALSE values.
Example: ISTEXT("Some text") checks whether "Some text" is text (TRUE).
Value: Required. The object that you want to check.

not

(bool logical)

Reverses the value of its argument. Use NOT when you want to make sure a value is not equal to one particular value.
Example: NOT(FALSE) reverses FALSE into TRUE.
logical: Required. A value or expression that can be evaluated to TRUE or FALSE.

or

(bool logical1)

Returns TRUE if any argument is TRUE; returns FALSE if all arguments are FALSE.
Example: OR(TRUE,[...]) results in TRUE.
Example: IF(OR(1>0,1>100),1,0) results in 1.
logical1: Logical1 is required, subsequent logical values are optional. Should evaluate to either TRUE or FALSE.

true

()

Returns the logical value TRUE.
Example: TRUE() returns TRUE.

Math Trig

abs

(float Number)

Returns the absolute value of a number. The absolute value of a number is the number without its sign.
Example: ABS(-2) returns absolute value of -2 (2).
Example: ABS(-2*-8) returns absolute value (16).
Number: Required. The real number of which you want the absolute value.

acos

(float Number)

Returns the arccosine, or inverse cosine, of a number. The arccosine is the angle whose cosine is number.
The returned angle is given in radians in the range 0 (zero) to pi.
Example: ACOS(-0.5) is an arccosine of -0.5 in radians, 2*pi/3 (2.094395).
Number: Required. The cosine of the angle you want and must be from -1 to 1.

asin

(float Number)

Returns the arcsine, or inverse sine, of a number. The arcsine is the angle whose sine is number.
The returned angle is given in radians in the range -pi/2 to pi/2.
Example: ASIN(-0.5) is an arcsine of -0.5 in radians, -pi/6 (-0.5236).
Number: Required. The sine of the angle you want and must be from -1 to 1.

atan

(float Number)

Returns the arctangent, or inverse tangent, of a number. The arctangent is the angle whose tangent is number.
The returned angle is given in radians in the range -pi/2 to pi/2.
Example: ATAN(1) is an arctangent of 1 in radians, pi/4 (0.785398).
Number: Description

atan2

(float x_num, float y_num)

Returns the arctangent, or inverse tangent, of the specified x- and y-coordinates.
The arctangent is the angle from the x-axis to a line containing the origin (0, 0) and a point with coordinates (x_num, y_num).
The angle is given in radians between -pi and pi, excluding -pi.
Example: ATAN2(1, 1) is an arctangent of the point 1,1 in radians, pi/4 (0.785398)
x_num: Required. The x-coordinate of the point.

ceiling

(float Number)
Returns the smallest integral value that is greater than or equal to the specified double-precision floating-point number.
Example: CEILING(5.6) return 6.
Number: Required. A double-precision floating-point number you want to round.

cos

(float Number)
Returns the cosine of the given angle.
Example: COS(1.047) is a cosine of 1.047 radians (0.500171).
Number: Required. The angle in radians for which you want the cosine.

cosh

float Number)

Returns the hyperbolic cosine of a number.
Example: COSH(4) is a hyperbolic cosine of 4 (27.30823)
Number: Required. Any real number for which you want to find the hyperbolic cosine.

epsilon

()

Represents the natural logarithmic base.
Example: EPSILON() returns 4.94066

exp

(float Number)

Returns e raised to the power of number. The constant e equals 2.71828182845904, the base of the natural logarithm.
Example: EXP(2) is a base of the natural logarithm e raised to the power of 2 (7.389056)
Number: Required. The exponent applied to the base e.

floor

(float Number)

Returns the largest integer less than or equal to the specified double-precision floating-point number.
Example: FLOOR(1.5) rounds 1.5 down to the nearest integer (1)
Example: FLLOR(-1.5) rounds -1.5 down to nearest integer(-2)
Number: Required. A double-precision floating-point number you want to round.

int

(float Number)

Rounds a number down to the nearest integer.
Example: INT(1.5) rounds 1.5 down to the nearest integer (1)
Number: Required. The real number you want to round down to an integer.

ln

(float Number)

Returns the natural logarithm of a number. Natural logarithms are based on the constant e (2.71828182845904).
Example: LN(86) is a natural logarithm of 86 (4.454347)
Number: Required. The positive real number for which you want the natural logarithm.

log

(float Number)

Returns the logarithm of a number to the base you specify. Base is assumed to be 10.
Example: LOG(1000) is a logarithm of 1000 (3).
Number: Required. The positive real number for which you want the logarithm.

log10

(float Number)

Returns the base-10 logarithm of a number.
Example: LOG10(10) is a base-10 logarithm of 10 (1)
Number: Required. The positive real number for which you want the base-10 logarithm.

numeric

(Object Value, string replacement)

Removes all non-decimal characters from the string.
Example: NUMERIC("$1.000") removes the non-decimal characters (1000).
Value: Required. Text in which you want to replace characters.

pi

()

Returns the number 3.14159265358979, the mathematical constant pi.
Example: PI() returns 3.14159265358979.

power

(float Number, float power)

Returns the result of a number raised to a power.
Example: POWER(5,2) is a 5 squared (25)
Number: Required. A double-precision floating-point number to be raised to a power.

rand

()

Returns an evenly distributed random real number greater than or equal to 0 and less than 1.
A new random real number is returned every time the formula is calculated.
Example: RAND() returns a random number between 0 and 1 (varies)

randbetween

(float Bottom, float Top)

Returns a random integer number between the numbers you specify.
A new random integer number is returned every time the formula is calculated.
Example: RANDBETWEEN(1,100) is a new random number between 1 and 100 (varies)
Bottom: Required. The smallest integer RANDBETWEEN will return.

round

(float Value,decimals)

Rounds a decimal value to the nearest integral value.
Example: ROUND(12.123,2) returns a number (12.12)
Value: A decimal number to be rounded.

sign

(float Number)

Determines the sign of a number. Returns 1 if the number is positive, zero (0) if the number is 0, and -1 if the number is negative.
Example: SIGN(-0.00001) is a Sign of a negative number (-1).
Number: Required. Any real number.

sin

(float Number)

Returns the sine of the given angle.
Example: SIN(PI()) is a sine of pi radians (1.2246).
Number: Required. The angle in radians for which you want the sine.

sinh

(float Number)

Returns the hyperbolic sine of a number.
Example: SINH(1) is a hyperbolic sine of 1 (1.175201194)
Number: Required. Any real number.

sqrt

(float Number)

Returns a positive square root.
Example: SQRT(16) is a square root of 16 (4).
Number: Required. The number for which you want the square root.

sum

(Object Number)

The SUM function adds all the numbers that you specify as arguments.
Example: SUM(3, 2) adds 3 and 2 (5).
Number: Required. The first number argument that you want to add.

tan

(float Number)

Returns the tangent of the given angle.
Example: TAN(0.785) is a tangent of 0.785 radians (0.99920).
Number: Required. The angle in radians for which you want the tangent.

tanh

(float Number)

Returns the hyperbolic tangent of a number.
Example: TANH(-2) is a hyperbolic tangent of -2 (-0.96403)
Number: Required. Any real number.

trunc

(float Number)

Truncates a number to an integer by removing the fractional part of the number.
Example: TRUNC(8.9) is an integer part of 8.9 (8)
Number: Required. The number you want to truncate.

Statistical

average

(float Number)

Returns the average (arithmetic mean) of the arguments. Calculates numbers only.
Example: Average(1, 3, 3, 1, "true", "false", "hello,[...]") returns 2.0
Number: Required. The first number for which you want the average.

averagea

(Object Value)

Returns the average (arithmetic mean) of the arguments. Text and logical value FALSE have the value 0; the logical value TRUE has the value 1.
Example: AverageA(1, 3, 3, 1, true, false, "hello,[...]") results in (1 + 3 + 3 + 1 + 1 + 0 + 0) / 7.0 (~1.28)
Value: Required. The first object for which you want the average.

count

(float Number)

The COUNT function counts the number of arguments that contain numbers.
Example: Count(1, 3, 3, 1, true, false, "hello,[...]") returns 4.
Number: Required. The first number you want to count

counta

(Object Value)

The COUNT function counts the number of arguments. Text and logical value FALSE have the value 0; the logical value TRUE has the value 1.
Example: CountA(1, 3, 3, 1, true, false, "hello,[...]") returns 7
Value: Required. The first object you want to count

distinctcnt

(Object object1)

Returns distinct count of the collection of values.
Example: DISTINCTCNT(1,1,2,8,10,5) returns distinct count (5).
object1: Required. The first object that you want to count distinc values based on.

max

(float Number)

Returns the largest value in a list of arguments. Ignores logical values and text.
Example: MAX(1, 3, 3, 1, true, false, "hello") returns 3.
Number: Required. The first object argument for which you want to find the largest value.

maxa

(Object Value)

Returns the largest value in a list of arguments. Text and logical value FALSE have the value 0; the logical value TRUE has the value 1.
Example: MAXA(1, 3, 3, 1, true, false, "hello") returns 3.
Value: Required. The first object argument for which you want to find the largest value.

min

(float Number)

Returns the smallest value in a list of arguments. Ignores logical values and text.
Example: MIN(1, 3, 3, 1, true, false, "hello") returns 1.
Number: Required. The first number argument for which you want to find the smallest value.

mina

(Object Value)

Returns the smallest value in a list of arguments. Text and logical value FALSE have the value 0; the logical value TRUE has the value 1.
Example: MINA(1, 3, 3, 1, true, false, "hello") returns 0.
Value: Required. The first object argument for which you want to find the smallest value.

stdev

(float number1)

Estimates standard deviation based on a sample.

The standard deviation is a measure of how widely values are dispersed from the average value (the mean).
Example: STDEV(1345,1301,1368,1322,1310,1370,1318,1350,1303,1299)
is a standard deviation of breaking strength (27.46392).
number1: Required. The first number argument corresponding to a sample of a population/

stdeva

(Object Value1)

Estimates standard deviation based on a sample. The standard deviation is a measure of how widely values are dispersed from the average value (the mean).
Text and logical value FALSE have the value 0; the logical value TRUE has the value 1.
Example: STDEVA(1345,1301,1368,1322,1310,1370,1318,1350,1303,1299)
is a standard deviation of breaking strength for all the tools (27.46391572).
Value1: Value1 is required, subsequent values are optional.

stdevp

(float Value1)
Calculates standard deviation based on the entire population given as arguments.
The standard deviation is a measure of how widely values are dispersed from the average value (the mean).
Example: STDEVP(1345,1301,1368,1322,1310,1370,1318,1350,1303,1299)
is a standard deviation of breaking strength, assuming only 10 tools are produced (26.05455814).
Value1: Required. The first number argument corresponding to a population.

stdevpa

(Object Value1)

Calculates standard deviation based on the entire population given as arguments, including text and logical values.
The standard deviation is a measure of how widely values are dispersed from the average value (the mean).
Text and logical value FALSE have the value 0; the logical value TRUE has the value 1.
Example: STDEVPA(1345,1301,1368,1322,1310,1370,1318,1350,1303,1299)
is a standard deviation of breaking strength, assuming only 10 tools are produced (26.05455814).
Value1: Value1 is required, subsequent values are optional.

var

(float number1)

Estimates variance based on a sample.
Example: VAR(1345,1301,1368,1322,1310,1370,1318,1350,1303,1299)
is a variance for the breaking strength of the tools (754.2667).
number1: Required. The first object argument corresponding to a sample of a population.

vara

(Object Value1)

Estimates variance based on a sample. Text and logical value FALSE have the value 0; the logical value TRUE has the value 1.
Example: VARA(1345,1301,1368,1322,1310,1370,1318,1350,1303,1299) is a variance for the breaking strength of the tools (754.2667).
Value1: Description

varp

(float number1)

Calculates variance based on the entire population.
Example: VARP(1345,1301,1368,1322,1310,1370,1318,1350,1303,1299) is a variance of breaking strengths for all the tools,
assuming that only 10 tools are produced (678.84).
number1: Required. The first number argument corresponding to a population.

varpa

(Object Value1)

Calculates variance based on the entire population. Text and logical value FALSE have the value 0;
 the logical value TRUE has the value 1.
Example: VARPA(1345,1301,1368,1322,1310,1370,1318,1350,1303,1299)
is a variance of breaking strengths for all the tools, assuming that only 10 tools are produced (678.84).
Value1: Value1 is required, subsequent values are optional.

Text

alphanumeric

(Object Value, string replacement)

Removes all non-alphanumeric characters from the string.
Example: ALPHANUMERIC("$1.000") removes the non-alphanumeric characters (1000).
Value: Required. Text in which you want to replace characters.

char

(int Number)

Returns the character specified by a number.
Example: CHAR(65) is the 65th character in the set (A).
Number: Required. A number between 1 and 255 specifying which character you want. The character is from the character set used by your server.

code

Returns a numeric code for the first character in a text string.
 The returned code corresponds to the character set used by your server.
Example: CODE("A") is the numeric code for A (65).
Text: Required. The text for which you want the code of the first character.

concatenate

The CONCATENATE function joins arguments into one text string.
Example: CONCATENATE("a","b",1) is a string (ab1)
text1: Required. The first text item to be concatenated.

find

(string find_text, string within_text)

Finds one text value within another (case-sensitive) and return the number of the starting position of the first text string from the first character of the second text string.
Example: FIND("bra", "abracadabra") returns (2).
find_text: Required. The text you want to find.

hash

(Object Value1)

Computes a hash value of value parameters.
Example: HASH(100,"Some text", TRUE,[...]) is a hash for given parameters (varies).
Value1: Required. The first object to compute hash for. Subsequent values are optional.

Computes a hash (checksum) for all specified columns. Could be used to anonymize data or create a unique key.

htmltotext

(string htmlString)

Returns inner text of the html node.

Example: htmltotext("http://www.formulas.com/01232017.html")
returns http://www.formulas.com/01232017.html
htmlString: Required. The html string.

jsontotext

(string jsonString, string jsonPath, string outputDelimiter)

Returns text value of JSON object or array based on jsonPath param.
Example: JSONTOTEXT(jsonString, [jsonPath], [outputDelimiter]) returns text value of JSON (varies).
jsonString: Required. The json string.

left

LEFT returns the first character in a text string.
Example:
LEFT("abracadabra") returns (a).
LEFT("abracadabra",4) returns (abra).

Text: Required. The text string that contains the characters you want to extract.

len

(string Text)

LEN returns the number of characters in a text string.
Example: LEN("qwerty") returns (6).
Text: Required. The text whose length you want to find. Spaces count as characters.

lower

(string Text)
Converts all uppercase letters in a text string to lowercase.
Example: LOWER("QWERTY123") returns (qwerty123).
Text: Required. The text you want to convert to lowercase. LOWER does not change characters in text that are not letters.

mid

(string Text, int start_num, int num_chars)

MID returns a specific number of characters from a text string,
starting at the position you specify, based on the number of characters you specify.
Example: MID("QWERTY123",4,2) returns (RT).
Text: Required. The text string containing the characters you want to extract.

proper

(string Text)
Capitalizes the first letter in a text string and any other letters in text that follow any character other than a letter.
Converts all other letters to lowercase letters.
Example: PROPER("this is a TITLE") is a proper case of first string (This is a title).
Text: Required. Text enclosed in quotation marks, a formula that returns text,
or a reference to a cell containing the text you want to partially capitalize.

regex

(string Value, string Pattern)

Evaluates a regular expression on a value parameter and returns the first match.
Example: REGEX("Some text", "Some text") will evaluate the pattern and return the first match (Some text).
Value: Required. Text in which you want to find matches.

regexreplace

(string Value, string Pattern)

Evaluates a regular expression on a value parameter and replaces the matches with empty string.
Example: REGEXREPLACE("Some text", "text") evaluates the regular expression and returns the result (Some).
Value: Required. Text in which you want to replace characters.

replace

(string old_text, int start_num, int num_chars, string new_text)

REPLACE replaces part of a text string, based on the number of characters you specify, with a different text string.
Example: REPLACE("abracadabra", 1, 3, "XYZ") replaces first three letters with XYZ (XYZacadabra)
old_text: Required. Text in which you want to replace some characters.

rept

(string Text, int number_times)

Repeats text a given number of times.
Example: REPT("ABC", 3) repeats ABC 3 times (ABCABCABC).
Text: Required. The text you want to repeat.

right

RIGHT returns the last character in a text string.
Example: RIGHT("abracadabra") is the last letter (a).
RIGHT("abracadabra",4) is the four last letters (abra)
Text: Required. The text string containing the characters you want to extract.

search

(string find_text, string within_text)

The SEARCH function locates one text string within a second text string,
and return the number of the starting position of the first text string from the first character of the second text string.
Example: SEARCH("margin","Profit Margin") is a position of "margin" in "Profit Margin" (8).
find_text: Required. The text that you want to find.

substitute

(string Text, string old_text, string new_text)

Substitutes new_text for old_text in a text string. Use SUBSTITUTE when you want to replace specific text in a text string;
use REPLACE when you want to replace any text that occurs in a specific location in a text string.
Example: SUBSTITUTE("Sales Data", "Sales", "Cost") substitutes Cost for Sales (Cost Data).
Example: SUBSTITUTE("Sales Data", "SalesDK", "Cost") result (Sales Data). SalesDK not found
Text: Required. The text or the reference to a cell containing text for which you want to substitute characters.

t

(Object Text)

Returns the text referred to by value.
Example: T("Rainfall") because the first value is text, the text is returned (Rainfall).
Text: Required. The value you want to test.

text

(float Value)
The TEXT function converts a numeric value to text by current culture.
This function is useful in situations where you want to display numbers in a more readable format,
or you want to combine numbers with text or symbols.
Example: TEXT(1234) formats the number by current culture
Value: Required. A numeric value, a formula that evaluates to a numeric value, or a reference to a cell containing a numeric value.

tostring

(Object Object)

Returns the text representation of the object.
Example: ToString("123") return string representation of the number (123).
Object: Required. The value you want to get string representation for. Numeric values, dates, strings are supported

trim

(Object Text)

Removes all spaces from text except for single spaces between words.
Use TRIM on text that you have received from another application that may have irregular spacing.
Example: TRIM(" First Quarter Earnings ") removes leading and trailing spaces from the text in the formula (First Quarter Earnings).
Text: Required. The text from which you want spaces removed.

upper

(Object Text)

Converts text to uppercase.
Example: UPPER("Total") upper cases the string (TOTAL).

Text: Required. The text you want converted to uppercase.

value

(Object Text)

Converts a text string that represents a number to a number.
Example: VALUE("00312") is a number equivalent of the string (312).
Text: Required. The text you want to convert.

weekdayname

(null dayNumber)

Returns the day name.
Example: WEEKDAYNAME(2) is the second day name of week (varies).
dayNumber: Required. The ordinal number of the day.

Installation

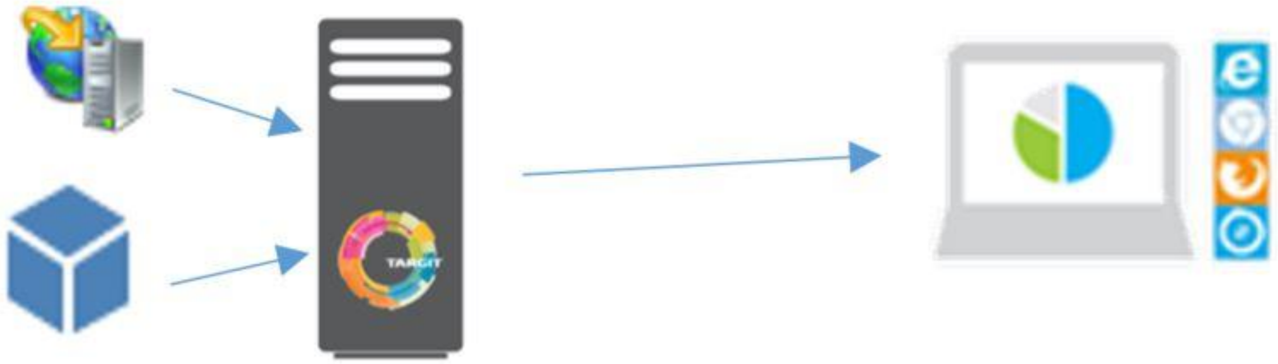
The goal with this guide is to provide you with tools and methods to install and utilize the TARGIT Data Service in your environment.

Please note that installation and configuration requires knowledge of Windows Server, IIS configuration.

Architecture

The TARGIT Data Service will require the ports **9095** (for the administrative interface) and **9090** (for database communications) to be available.

The TARGIT Data Service contains a full IP filter service where connections from other network entities can be limited additionally Windows Security can be applied to minimize access to the administrative interface.



Requirements

The following requirements must be present for the successful installation of TARGIT Data Service:

- TARGIT Decision Suite 2015 or newer
- A newer browser (IE10+, Latest Version of FireFox and Chrome is supported)
- A valid license that includes the Data Discovery-module
- .NET Framework 4.5
- Windows Server 2008 SP2 and newer
- Enabled Windows Features for:
  - WCF Activation over port and HTTP
  - IIS ASP.NET 4.5

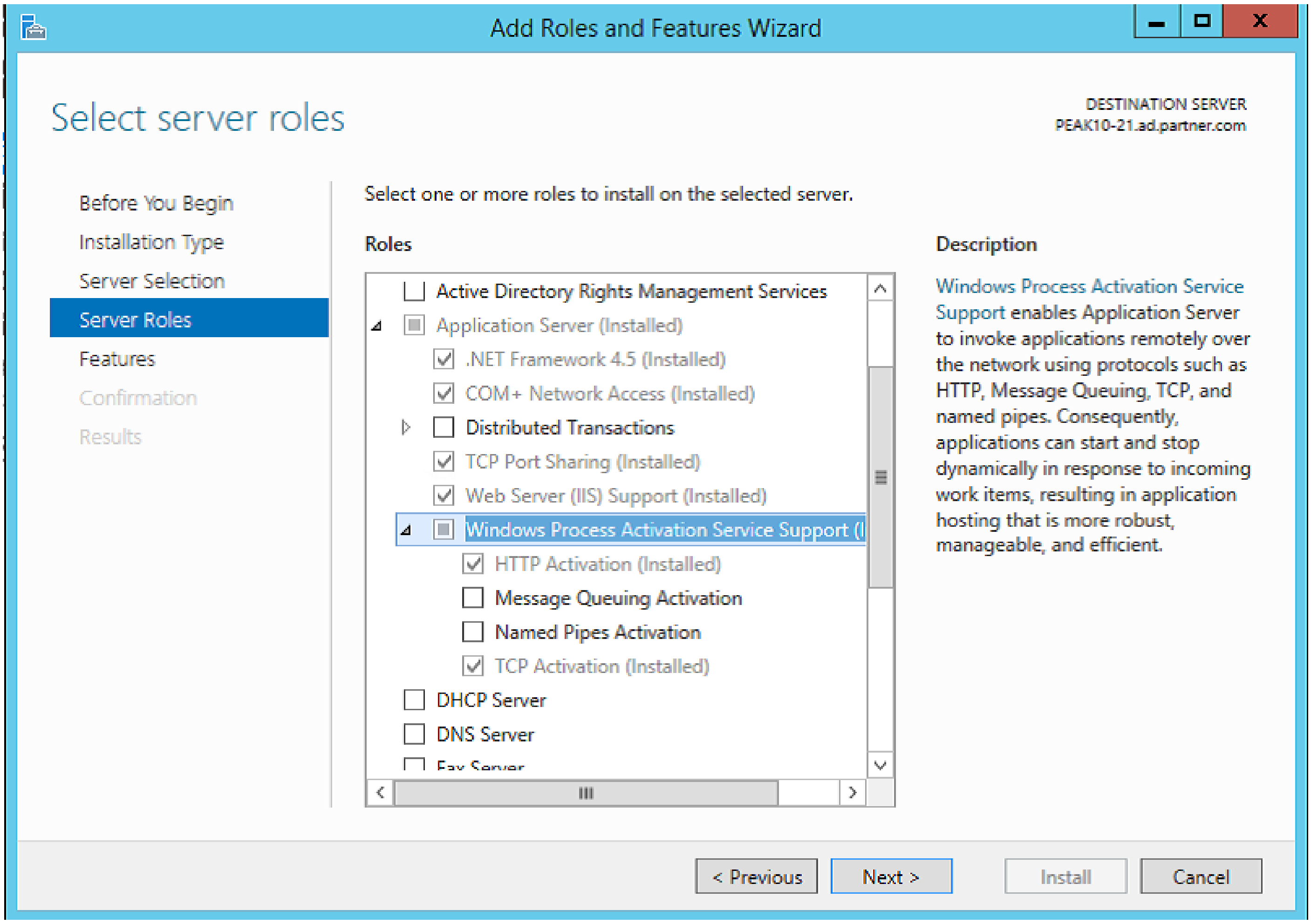
Installing the TARGIT Data Service

1. The install must be performed on the server running TARGIT ANTserver and the “Data Discovery” module must be a part of the license.

2. Ensure you have upgraded the browser on the server to at least IE10 and newer.

Components

3. Ensure the following components (Windows Features) are installed:



Add Roles and Features Wizard

Select server roles

DESTINATION SERVER
PEAK10-21.ad.partner.com

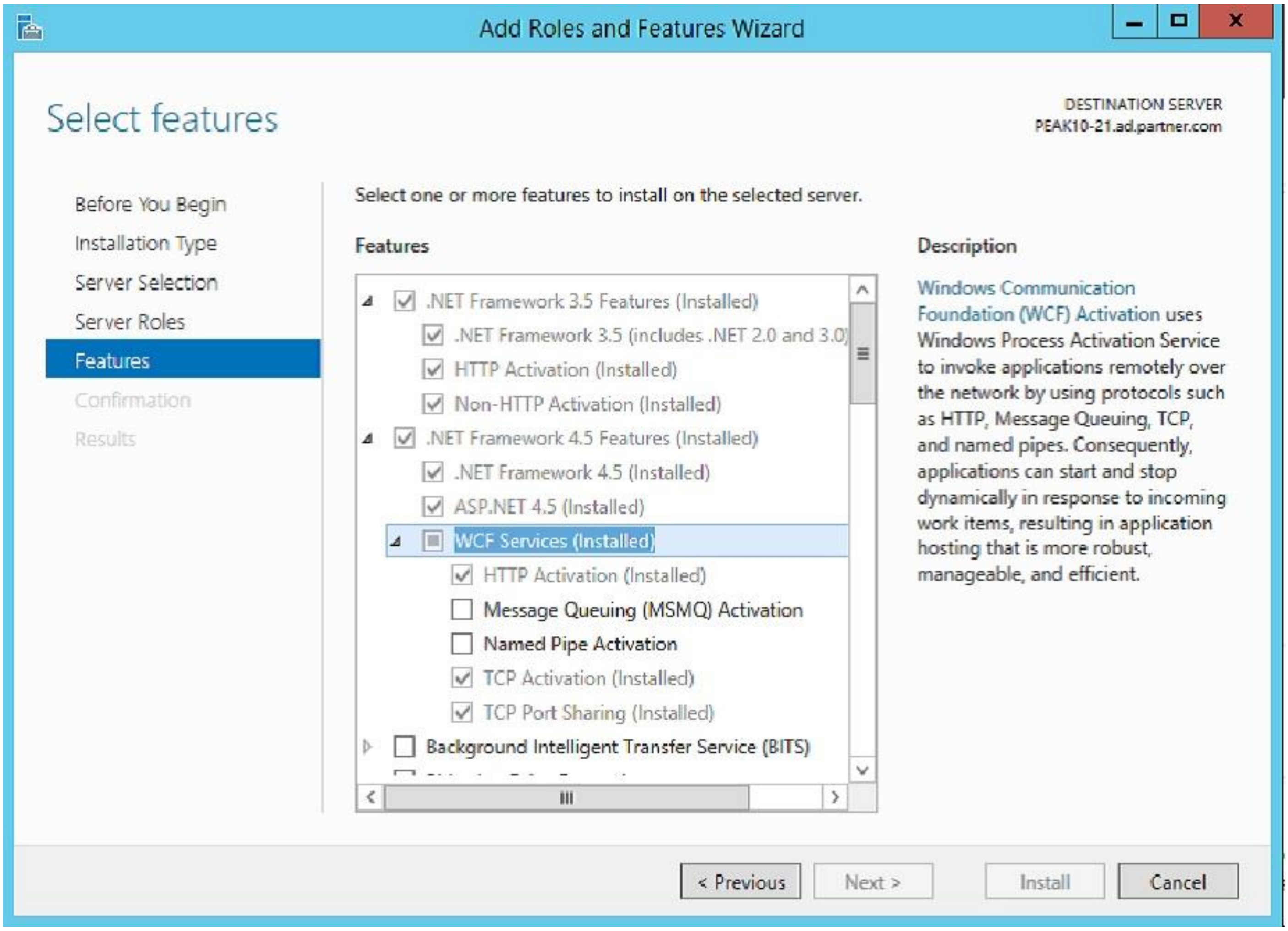
Select one or more roles to install on the selected server.

Roles

- □ Active Directory Rights Management Services
- ▣ Application Server (Installed)
  - ☑ .NET Framework 4.5 (Installed)
  - ☑ COM+ Network Access (Installed)
  - □ Distributed Transactions
  - ☑ TCP Port Sharing (Installed)
  - ☑ Web Server (IIS) Support (Installed)
  - ▣ Windows Process Activation Service Support (I
    - ☑ HTTP Activation (Installed)
    - □ Message Queuing Activation
    - □ Named Pipes Activation
    - ☑ TCP Activation (Installed)
- □ DHCP Server
- □ DNS Server
- □ Fax Server

Description

Windows Process Activation Service Support enables Application Server to invoke applications remotely over the network using protocols such as HTTP, Message Queuing, TCP, and named pipes. Consequently, applications can start and stop dynamically in response to incoming work items, resulting in application hosting that is more robust, manageable, and efficient.



Select features

DESTINATION SERVER
PEAK10-21.ad.partner.com

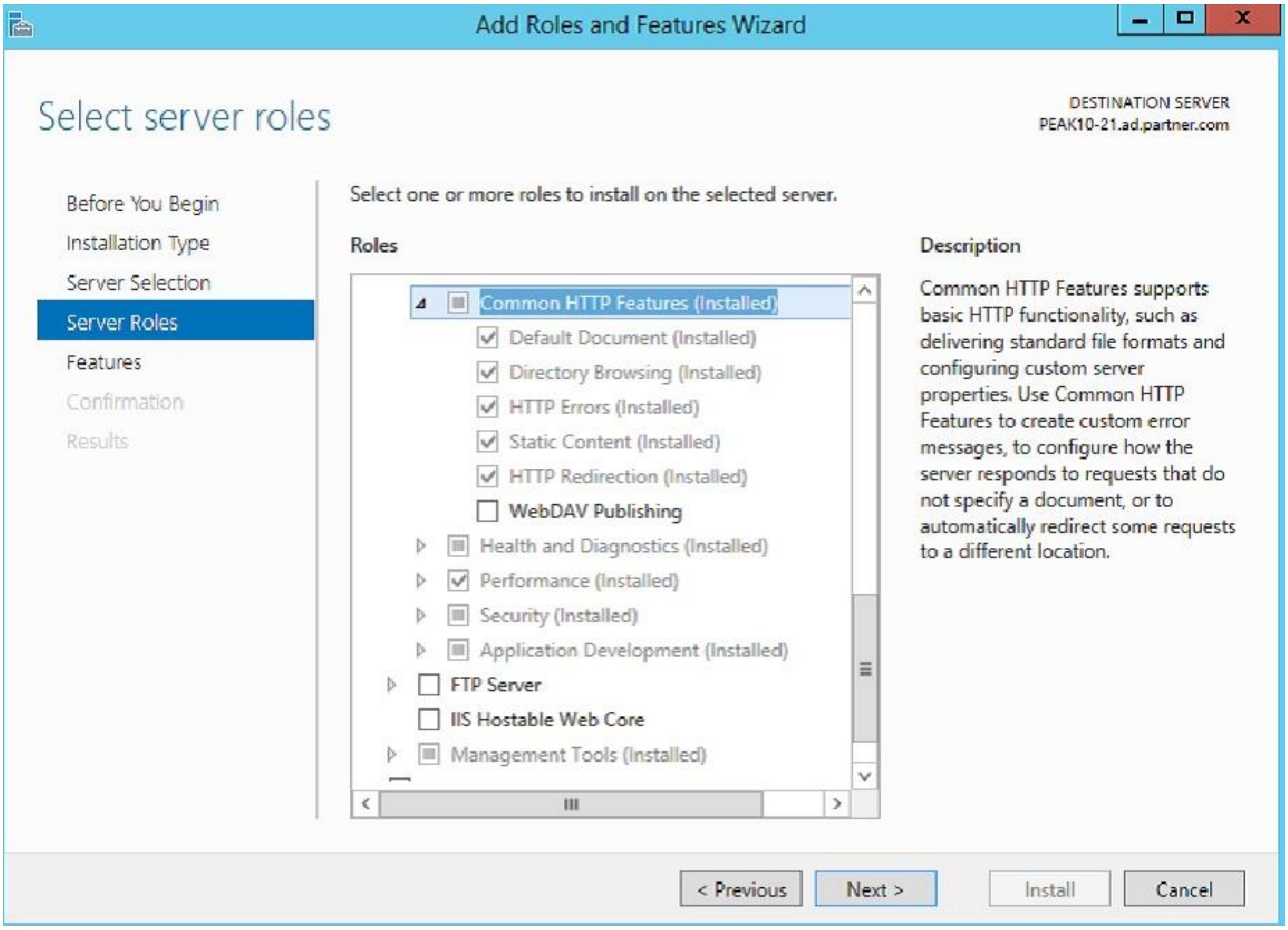
Select one or more features to install on the selected server.

Features

- ☑ .NET Framework 3.5 Features (Installed)
  - ☑ .NET Framework 3.5 (includes .NET 2.0 and 3.0)
  - ☑ HTTP Activation (Installed)
  - ☑ Non-HTTP Activation (Installed)
- ☑ .NET Framework 4.5 Features (Installed)
  - ☑ .NET Framework 4.5 (Installed)
  - ☑ ASP.NET 4.5 (Installed)
  - ■ WCF Services (Installed)
    - ☑ HTTP Activation (Installed)
    - □ Message Queuing (MSMQ) Activation
    - □ Named Pipe Activation
    - ☑ TCP Activation (Installed)
    - ☑ TCP Port Sharing (Installed)
- □ Background Intelligent Transfer Service (BITS)

Description

Windows Communication Foundation (WCF) Activation uses Windows Process Activation Service to invoke applications remotely over the network by using protocols such as HTTP, Message Queuing, TCP, and named pipes. Consequently, applications can start and stop dynamically in response to incoming work items, resulting in application hosting that is more robust, manageable, and efficient.



Select server roles

DESTINATION SERVER
PEAK10-21.ad.partner.com

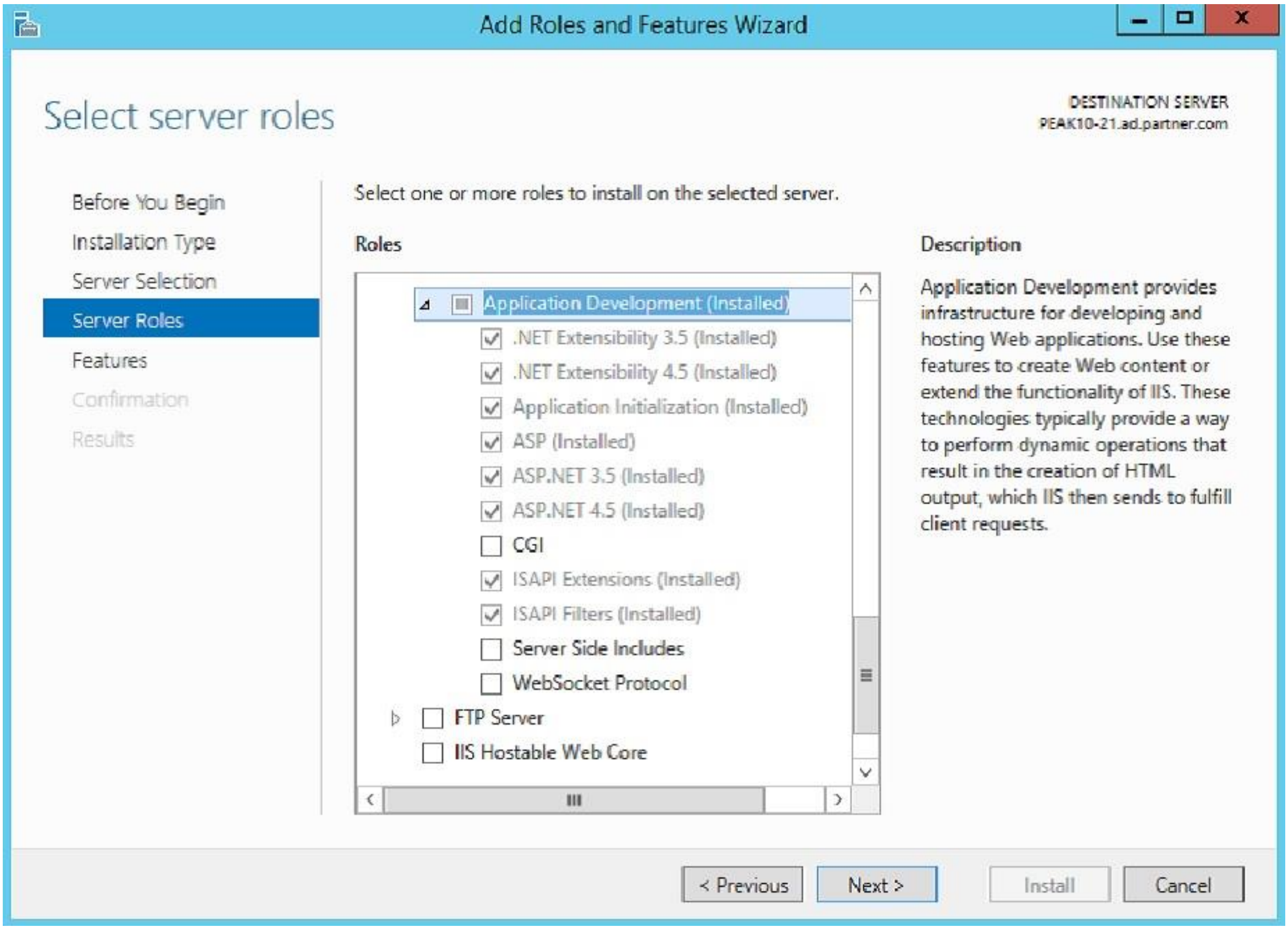
Select one or more roles to install on the selected server.

Roles

- ■ Common HTTP Features (Installed)
  - ☑ Default Document (Installed)
  - ☑ Directory Browsing (Installed)
  - ☑ HTTP Errors (Installed)
  - ☑ Static Content (Installed)
  - ☑ HTTP Redirection (Installed)
  - □ WebDAV Publishing
- ■ Health and Diagnostics (Installed)
- ☑ Performance (Installed)
- ■ Security (Installed)
- ■ Application Development (Installed)
- □ FTP Server
- □ IIS Hostable Web Core
- ■ Management Tools (Installed)

Description

Common HTTP Features supports basic HTTP functionality, such as delivering standard file formats and configuring custom server properties. Use Common HTTP Features to create custom error messages, to configure how the server responds to requests that do not specify a document, or to automatically redirect some requests to a different location.



Add Roles and Features Wizard

Select server roles

DESTINATION SERVER
PEAK10-21.ad.partner.com

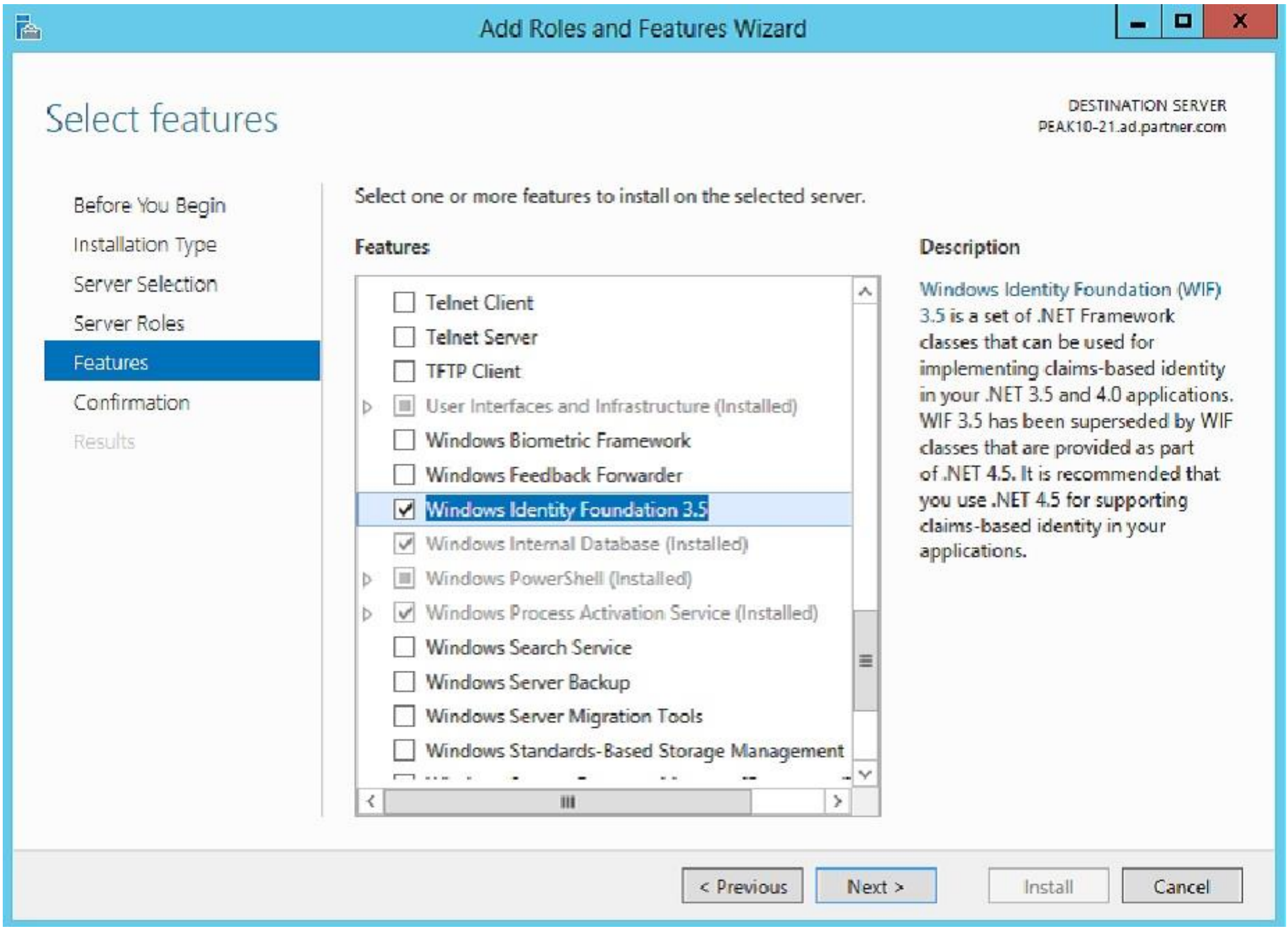
Select one or more roles to install on the selected server.

Roles

- ▣ Application Development (Installed)
  - ☑ .NET Extensibility 3.5 (Installed)
  - ☑ .NET Extensibility 4.5 (Installed)
  - ☑ Application Initialization (Installed)
  - ☑ ASP (Installed)
  - ☑ ASP.NET 3.5 (Installed)
  - ☑ ASP.NET 4.5 (Installed)
  - □ CGI
  - ☑ ISAPI Extensions (Installed)
  - ☑ ISAPI Filters (Installed)
  - □ Server Side Includes
  - □ WebSocket Protocol
- □ FTP Server
- □ IIS Hostable Web Core

Description

Application Development provides infrastructure for developing and hosting Web applications. Use these features to create Web content or extend the functionality of IIS. These technologies typically provide a way to perform dynamic operations that result in the creation of HTML output, which IIS then sends to fulfill client requests.



Select features

DESTINATION SERVER
PEAK10-21.ad.partner.com

Select one or more features to install on the selected server.

Features

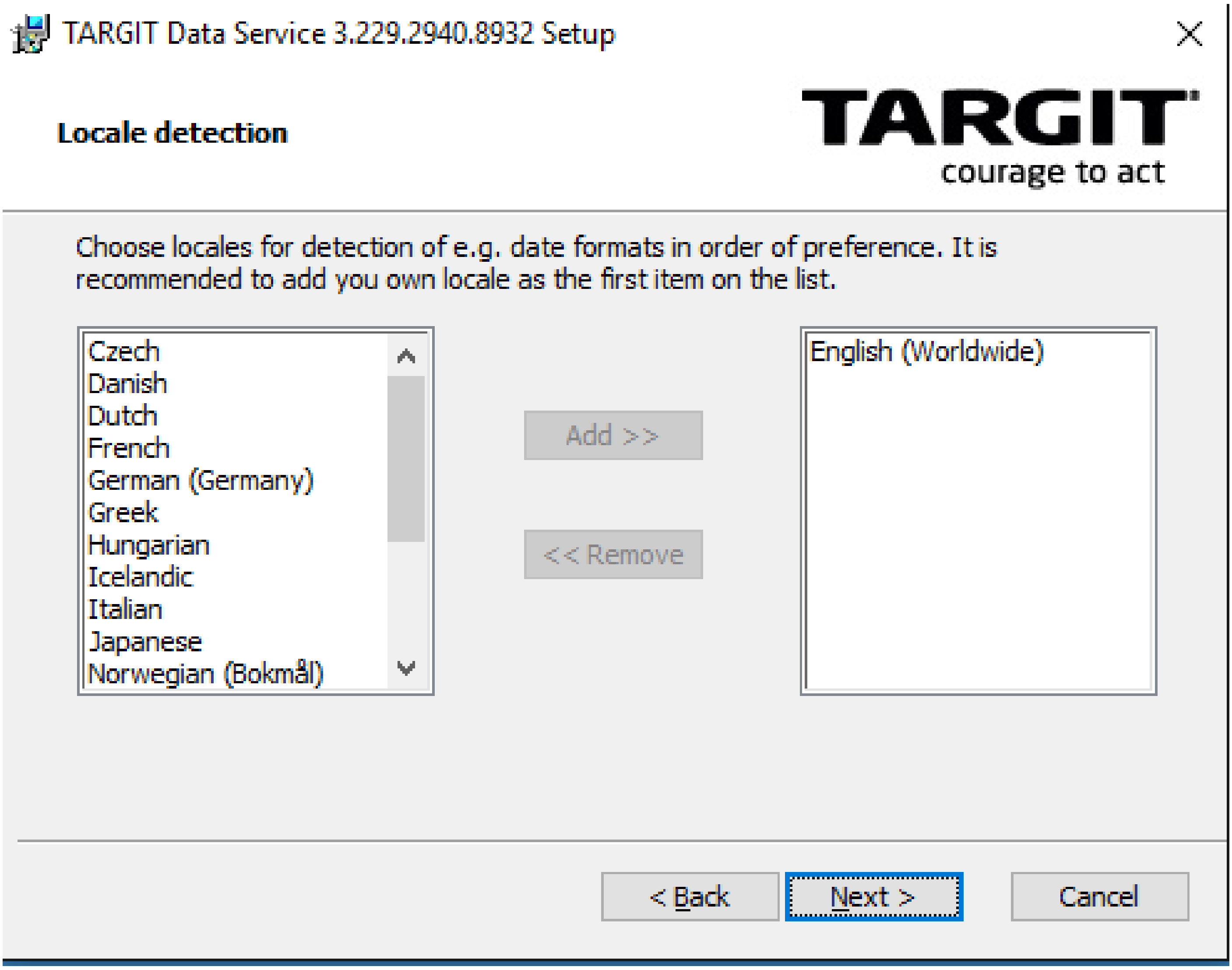
- ☐ Telnet Client
- ☐ Telnet Server
- ☐ TFTP Client
- ▷ ■ User Interfaces and Infrastructure (Installed)
- ☐ Windows Biometric Framework
- ☐ Windows Feedback Forwarder
- ☑ Windows Identity Foundation 3.5
- ☑ Windows Internal Database (Installed)
- ▷ ■ Windows PowerShell (Installed)
- ▷ ☑ Windows Process Activation Service (Installed)
- ☐ Windows Search Service
- ☐ Windows Server Backup
- ☐ Windows Server Migration Tools
- ☐ Windows Standards-Based Storage Management

Description

Windows Identity Foundation (WIF) 3.5 is a set of .NET Framework classes that can be used for implementing claims-based identity in your .NET 3.5 and 4.0 applications. WIF 3.5 has been superseded by WIF classes that are provided as part of .NET 4.5. It is recommended that you use .NET 4.5 for supporting claims-based identity in your applications.

4. Download the TARGIT Data Service installer from the TARGIT Download Center and execute the installer.

5. Choose the appropriate locales for your environment. If you primarily work with English files add English as the first option in the locale selection screen and add additional locales that you would meet, e.g. German. You can add as many as necessary and the parsing of dates etc. will be done according to the list.



TARGIT Data Service 3.229.2940.8932 Setup

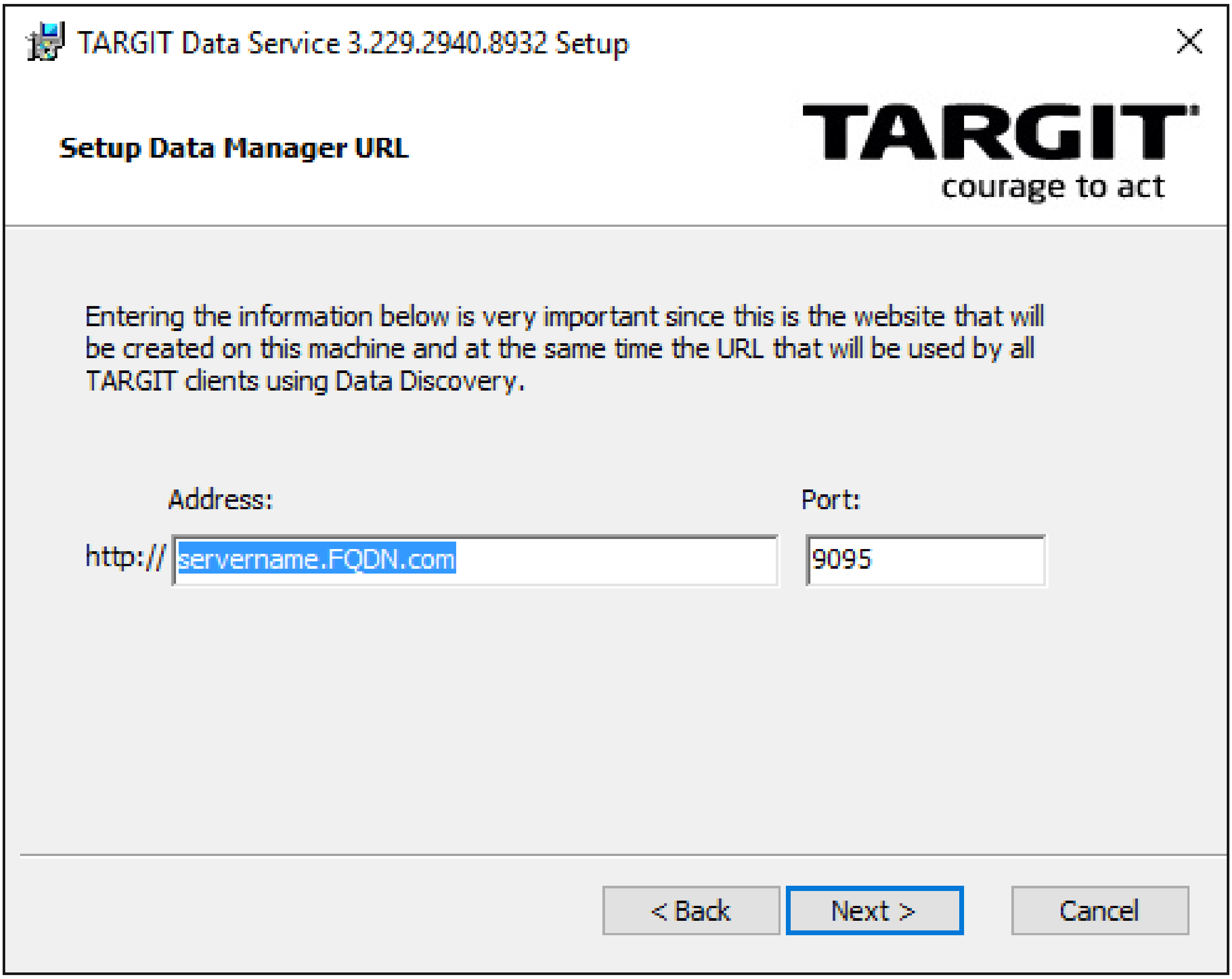
Locale detection

Choose locales for detection of e.g. date formats in order of preference. It is recommended to add you own locale as the first item on the list.

Czech
Danish
Dutch
French
German (Germany)
Greek
Hungarian
Icelandic
Italian
Japanese
Norwegian (Bokmål)

English (Worldwide)

6. When prompted to enter the URL for the administrative interface the "localhost" must be change to the name of the server where TARGIT Data Service resides. This URL is inserted into the connection string to Data Service in TARGIT Management and will be accessed by all Data Discovery-users through the TARGIT Windows Client



TARGIT Data Service 3.229.2940.8932 Setup

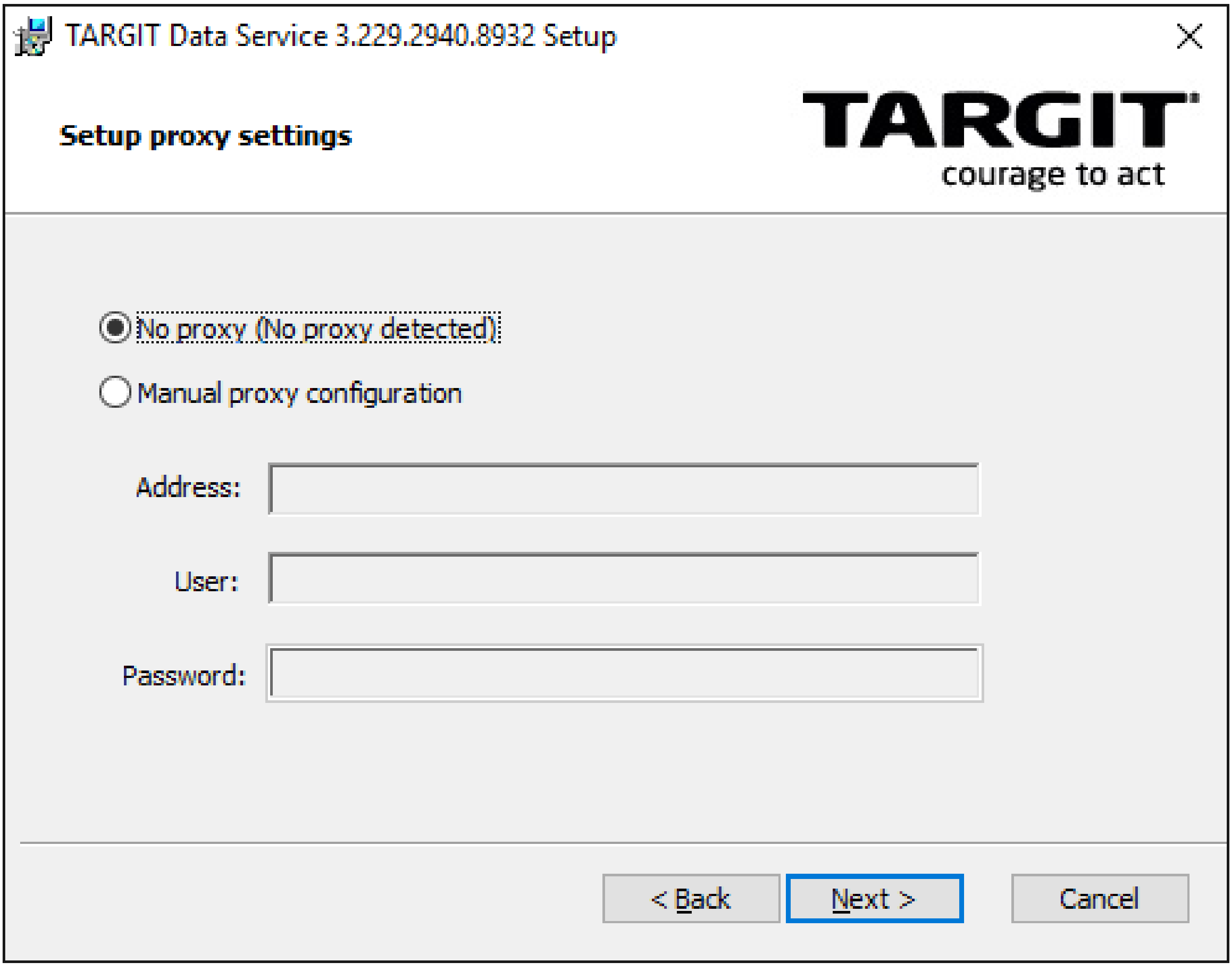
Setup Data Manager URL

Entering the information below is very important since this is the website that will be created on this machine and at the same time the URL that will be used by all TARGIT clients using Data Discovery.

Address: http:// servername.FQDN.com

Port: 9095

7. If a network proxy server is in use this will need to be filled out or external connections such as Quandl or Twitter will not be successful.



TARGIT Data Service 3.229.2940.8932 Setup

Setup proxy settings

● No proxy (No proxy detected)

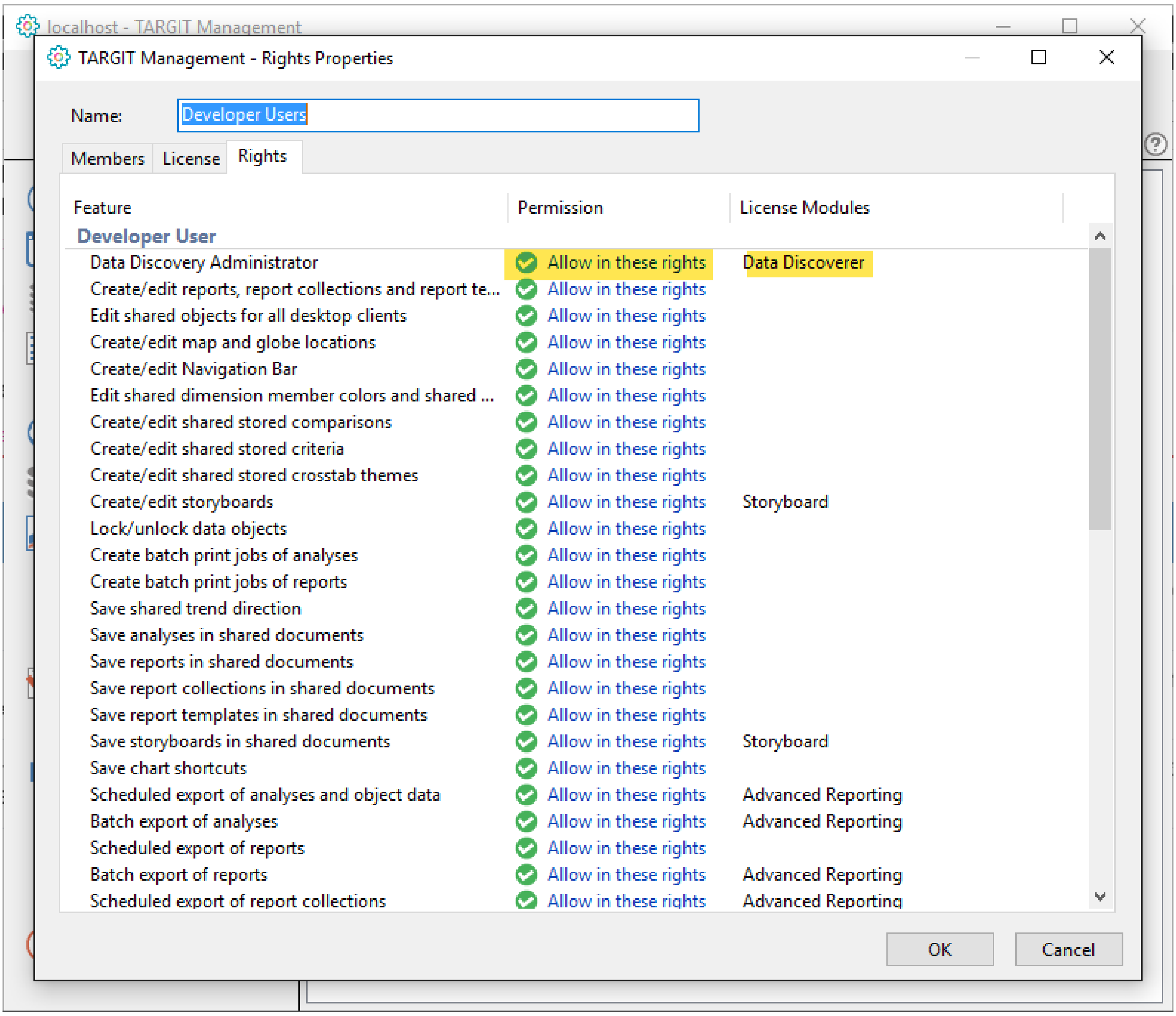
○ Manual proxy configuration

Address:

User:

Password:

8. Once the installation is complete you will need to enable Data discovery administrator rights in Targit Management. If this is not done developer users will only be able to administer their own data sources and cubes.


localhost - TARGIT Management
TARGIT Management - Rights Properties
Members
License
Rights
OK
Cancel

Name: Developer Users

Feature	Permission	License Modules
Developer User		
Data Discovery Administrator	✓ Allow in these rights	Data Discoverer
Create/edit reports, report collections and report te...	✓ Allow in these rights	
Edit shared objects for all desktop clients	✓ Allow in these rights	
Create/edit map and globe locations	✓ Allow in these rights	
Create/edit Navigation Bar	✓ Allow in these rights	
Edit shared dimension member colors and shared ...	✓ Allow in these rights	
Create/edit shared stored comparisons	✓ Allow in these rights	
Create/edit shared stored criteria	✓ Allow in these rights	
Create/edit shared stored crosstab themes	✓ Allow in these rights	
Create/edit storyboards	✓ Allow in these rights	Storyboard
Lock/unlock data objects	✓ Allow in these rights	
Create batch print jobs of analyses	✓ Allow in these rights	
Create batch print jobs of reports	✓ Allow in these rights	
Save shared trend direction	✓ Allow in these rights	
Save analyses in shared documents	✓ Allow in these rights	
Save reports in shared documents	✓ Allow in these rights	
Save report collections in shared documents	✓ Allow in these rights	
Save report templates in shared documents	✓ Allow in these rights	
Save storyboards in shared documents	✓ Allow in these rights	Storyboard
Save chart shortcuts	✓ Allow in these rights	
Scheduled export of analyses and object data	✓ Allow in these rights	Advanced Reporting
Batch export of analyses	✓ Allow in these rights	Advanced Reporting
Scheduled export of reports	✓ Allow in these rights	
Batch export of reports	✓ Allow in these rights	Advanced Reporting
Scheduled export of report collections	✓ Allow in these rights	Advanced Reporting

Configuring network level security

Securing your data

Data access for end users is configured through the TARGIT Management-application and does not differ from configuring security on other connection types. Please refer to the TARGIT Management User Guide.

Filtering browsing of files and folders

An administrator can limit browsing for files or folders in the Data Sources plugins by specifying a filter in the C:\Program Files\TARGIT\TARGIT Data Service\Targit.DataService.Exe.Config file.

These can be used ONCE within the browsing-section

<allow>*</allow>	Allows access to all resources
< deny >*</ deny >	Denies access to all resources

These can appear multiple times as necessary

<allow>c:\resource</allow>	Allows access to a resources
<deny>c:\resource</ deny >	Denies access to a resources

In the example below browsing in all folders are disabled by the <deny>*</deny> and browsing C:\DSTraining ends up being allowed.

Securing communications

The TARGIT Data Service comes with a built in IP filtering functionality that can limit the request to the service. This can be configured by editing the file C:\Program Files\TARGIT\TARGIT Data Service\Targit.DataService.Exe.Config (make a **backup** before editing!)

By default the functionality is disabled but can be enabled by simply un-commented the entries in the configuration file.

Please note this is a Billable Service if you need help configuring this.

By default the filter is set to the name “*Default*” and the corresponding filter with the same name, however the *FilterName* can be changed to meet your filtering needs. To only allow connections for both administrative and queries for the server the TARGIT Data Service is installed with the following settings and must be changed:

1. Remove comments from the <!-- <HttpModule *FilterName*="*Default*" /> --> line (the <!-- and the -->)
2. Change <HttpModule *FilterName*="*Default*" /> to <HttpModule *FilterName*="LoopbackOnly" />
3. Remove comments for the *loopback* section, leaving it like this:

4. Restart the TARGIT Data Service from the Windows Services.

Below are the individual sample configurations – also found in the default configuration file, please note that comments have been removed from all irrelevant places in the sample below:

First section - v2

Text of the first section. - version 2

Second section

Text of the second section.

Third section

Text of the third section.