Senturus Analytics Connector

Installation and Configuration Guide

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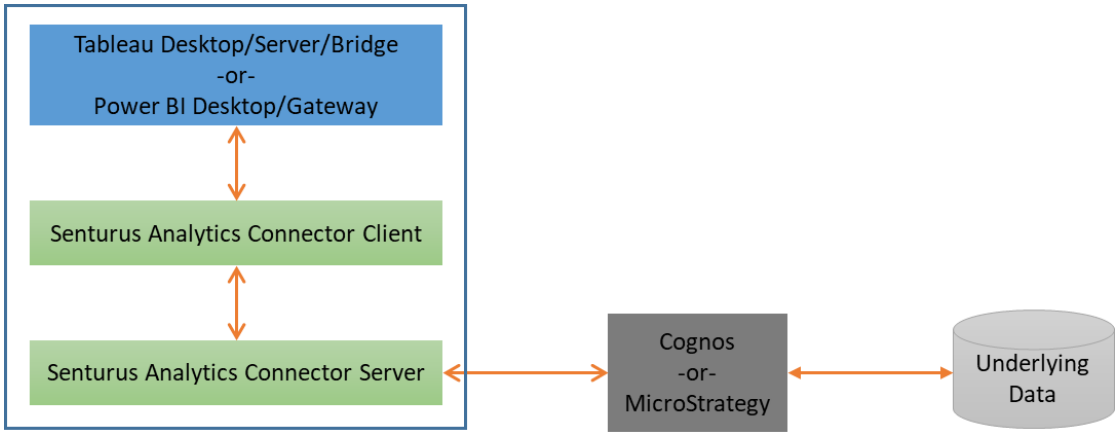
Architecture Overview

The Senturus Analytics Connector supports many different customer environments and use cases. Review the supported architectures below to determine which installation(s) are appropriate for your environment.

Client and Server on One Computer

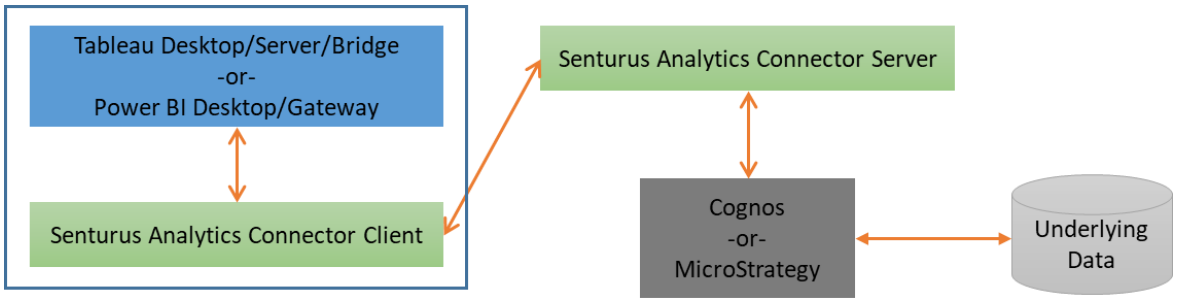
Installing and running Analytics Connector server and client on the same computer lets you setting up an environment quickly without much assistances from your system administrators, thus it is a good choice when you are evaluating Analytics Connector, or you have only a handful users using Analytics Connector.



To install in this mode, follow Server Installation, Data Source Configuration and Service Configuration to install and configure Analytics Connector server on a computer. If you plan to use SQL Server database connection, make sure SQL Server Native Client 11 or above is installed on this computer.

Client and Server on Different Computers

Like any other database servers, installing Analytics Connector server on a centralized computer and installing client alongside applications is a more reliable option for production environment. This allows centralized administration of configuration data and minimal or zero client software to be installed on each client.



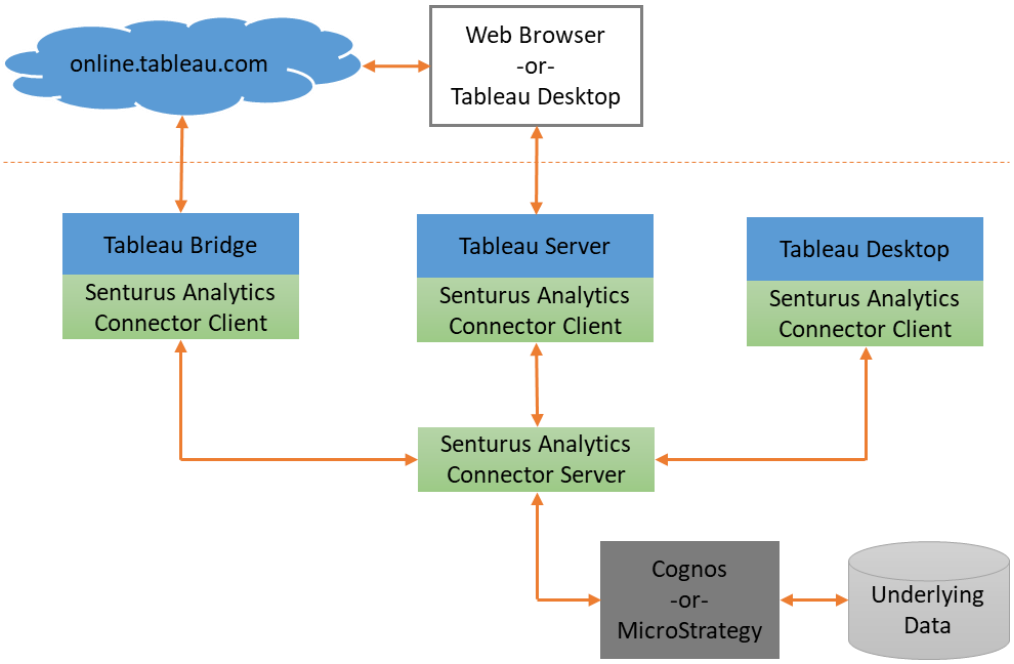
To install in this mode, follow Server Installation, Data Source Configuration and Service Configuration to install and configure Analytics Connector server on a server.

If you want to use Senturus Analytics Connector ODBC driver, or Senturus custom data connector for Power BI (which requires Senturus Analytics Connector ODBC diver), follow Client Installation to install the ODBC client on each client computer. If you plan to use SQL Server database connection, make sure SQL Server Native Client 11 or above is installed on each client computer.

Tableau and Analytics Connector

You can access Analytics Connector server via following options:

- Access Analytics Connector server from Tableau Desktop directly.
- Log in on premise Tableau Server and access pre-defined data sources via a Web browser or Tableau Desktop, and Tableau Server will access Analytics Connector server on your behalf.
- Log in Tableau online and access pre-defined data sources via a Web browser or Tableau Desktop, Tableau online will forward your requests to Tableau Bridge, and Tableau Bridge will access Analytics Connector server on your behalf.



In the second and third cases, it is not necessary to install Analytics Connector client on Tableau Desktop that access the published data sources (TDS) through Tableau Server or Tableau online.

The Server Components can be installed on a Tableau Server, on Cognos server, or on a separate/dedicated computer. By installing on the same computer as Tableau/Cognos reside, you reduce network traffic but increase CPU/RAM usage.

To install in this mode, follow Server Installation, Data Source Configuration and Service Configuration to install and configure Analytics Connector service on a server.

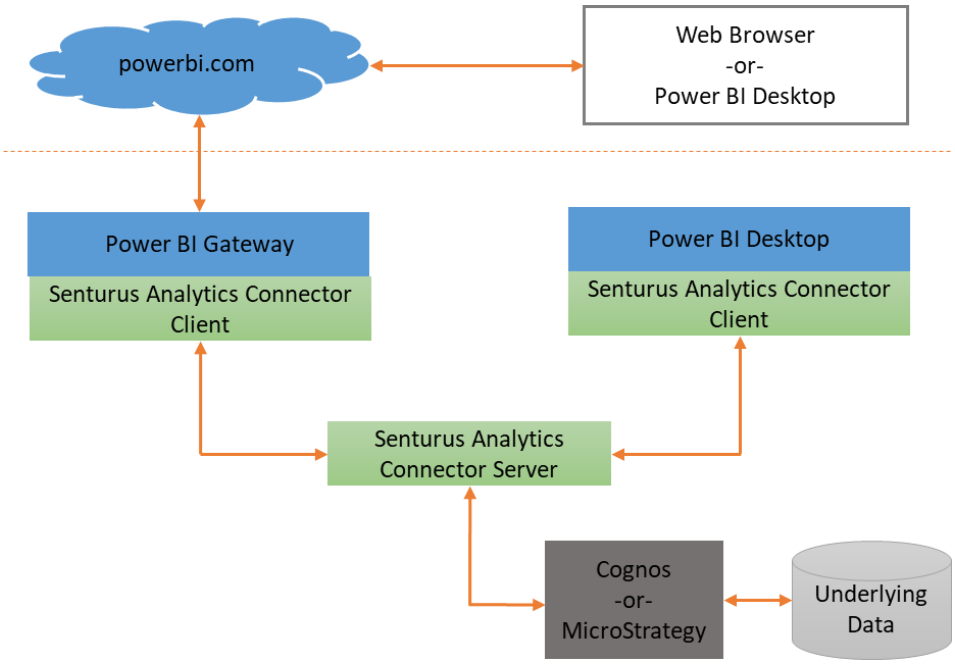
If you plan to use Senturus Analytics Connector ODBC client, then follow Client Installation to install the ODBC client on each computer that runs Tableau Desktop/Server/Bridge. If you plan to

use SQL Server database connection, make sure SQL Server Native Client 11 or above is installed on each client computer.

And finally, follow Using Analytics Connector with Tableau Online if you are using Analytics Connector behind Tableau Bridge.

Power BI and Analytics Connector

In addition to access Analytics Connector directly from Power BI Desktop, you can access it via Power BI online from a web browser or Power BI Desktop. Power BI online will forward your requests to Power BI Gateway which in turn access Analytics Connector on your behalf.



It is not necessary to install Analytics Connector on the local machines where Power BI Desktop is used to access the published data sources (Power BI datasets) through the Power BI service or for users who only view or modify visualizations on the Power BI service using a web browser.

The Server Components can be installed on the Power BI Gateway server, on a Cognos server, or on a separate/decimated computer. By installing on the same computer, you reduce network traffic but increase CPU/RAM usage.

To install in this mode, follow Server Installation, Data Source Configuration and Service Configuration to install and configure Analytics Connector service on a server.

If you plan to use Senturus custom data connector for Power BI (which requires Senturus Analytics Connector ODBC diver), then follow Client Installation to install the ODBC client on each computer that runs Power BI Desktop/Gateway. If you plan to use SQL Server database connection, make sure SQL Server Native Client 11 or above is installed on each client computer.

And finally follow Install and Configure Power BI Gateway.

Requirements

Hardware Requirements

Before installing the Senturus Analytics Connector, please ensure your system meets the minimum hardware requirements:

- I7 or similar modern processor
- 8GB of RAM
- 200MB free disk space for product installation
- 10GB free disk space for temp files

Software Requirements

The Senturus Analytics Connector will run on any currently supported version of Windows (8,10 Desktop, Server 2012, 2012 R2, 2016). It will also run on Linux. We only test against CentOS and RHEL, but it should work on any common Linux distribution since it runs in a JVM.

The Senturus Analytics Connector leverages several software components necessary for its operation. Our installer will check for the existence of these components automatically, but if your machine not connected to the internet or has restrictions, you may need to install these manually. Please refer to the "Install Prerequisites Manually" section for detailed information.

User Permission Requirements

For the end users to connect to Analytics Connector server and utilize configured data sources, they will need the following permissions:

- **Cognos requirements:**
  - Log on permission to Cognos server via specified namespace.
  - Access to the Cognos package(s) and report(s)

- Capabilities of "Specification Execution", "Generate CSV Output" and "Generate XML Output"

Hardware sizing

When estimating hardware requirement for Analytics Server, the number of concurrent users is the key factor. Other than that, you need to consider your Cognos report performance, the network bandwidth among Cognos server, Analytics Connector server and Tableau/Power BI, the hardware differences between Cognos server and Analytics Connector server, etc.

After getting a query from Tableau/Power BI, Analytics Connector server sends a run report request to Cognos server and stream the report output back to Tableau/Power BI. The difference between overall query execution time (seen from Tableau/Power BI) and Cognos report execution time, is the overhead added by Analytics Connector.

We did a performance test using IBM Cognos sample packages, running Cognos server and Analytics Connector server on two separate computers of same hardware. The result shows that Analytics Connector adds no more than 10% overhead on top of Cognos report execution time, which means that Analytics Connector spends 90% CPU time waiting Cognos. So, it is safe to estimate that one CPU can serve at least 5 concurrent users.

Analytics Connector runs within a JVM. It only needs 200M RAM when initially starts up, and each active connection (that connects to Cognos server) costs 50-100MB.[1]

If you have 200 registered users that will be using Analytics Connector, and 20 users will be using it concurrently, you can use following hardware sizing recommendation:

- 20 users * (100 MB/user) + 200 MB = 2.2 GB
- 20 users * (0.2 CPU/user) = 4 CPU

[1] A Power BI desktop report may maintain multiple connections to Analytics Connector server, but these database connections cost much less resources than connections between Analytics Connector server and Cognos. And since Analytics Connector server utilize a Cognos connection pool, so it makes sense to use active user to estimate the hardware requirement than to use the real database connections between Power BI and Analytics Connector server.

Installation

Before Installation

In order to install and configure Analytics Connector server, you will need the following permissions and information:

- Administrator permission on the machine(s) the software will be installed on.
- Cognos requirements:
    - The Cognos version your organization is running (ex. 11.0.12)
    - Cognos Dispatcher URL (ex. http://host:port/p2pd/servlet/dispatch)
    - Cognos Namespace ID (ex. SENTURUS_AD)
    - Cognos CSV output settings
    - Cognos username and password
    - Access to the Cognos package(s) to be configured

To install Analytics Connector client, you will need the following permissions:

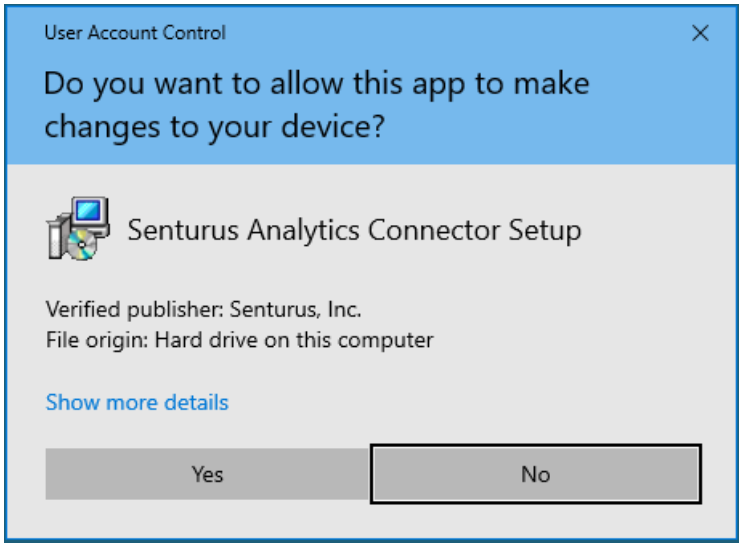
- Administrator permission on the machine(s) the software will be installed on.

Server Installation

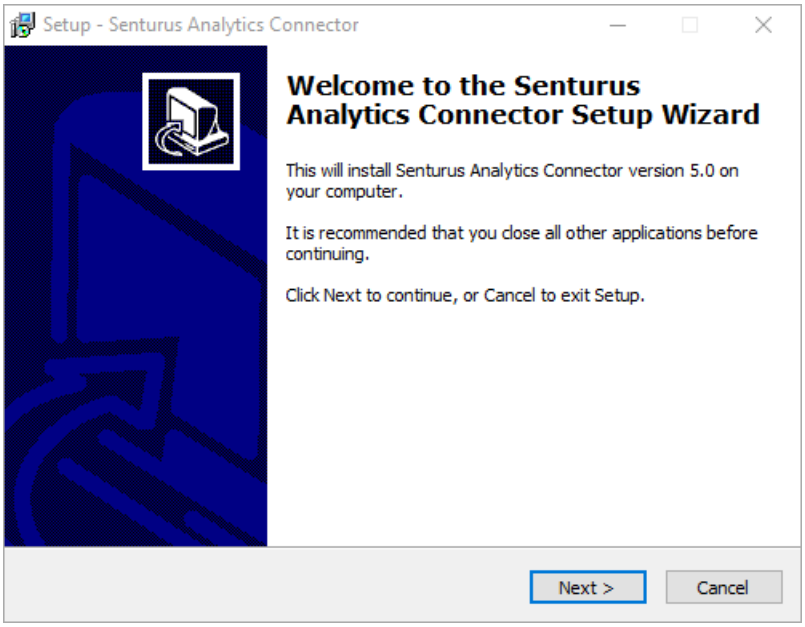
Download the latest version of Analytics Connector installer to the machine where you will be installing it. You can download this installer here: https://www.senturus.net/connector-download/

Once downloaded, run AnalyticsConnector_[version].exe with administrator privilege.

You will be prompted by **User Access Control (UAC)** to allow this app to make changes to your device. Click **Yes** to allow the installer to run.



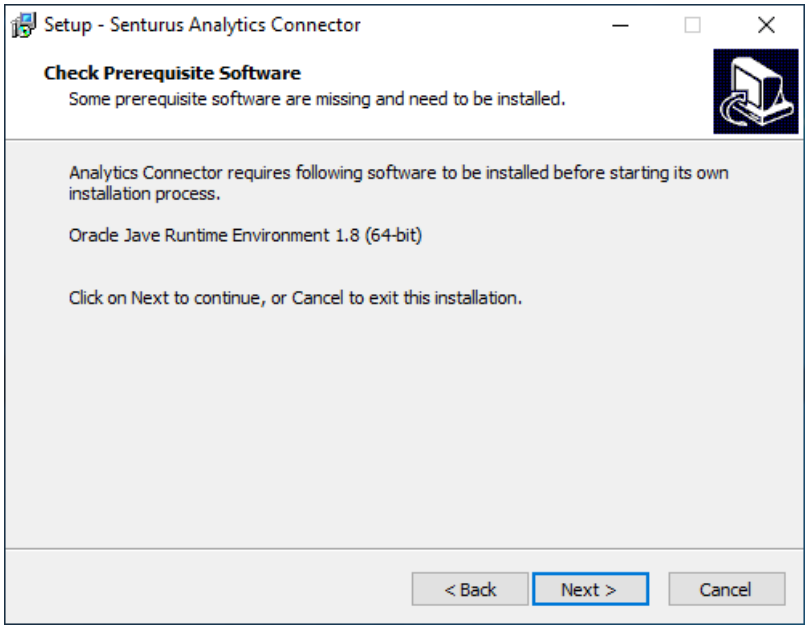
Click **Next** on the welcome page.



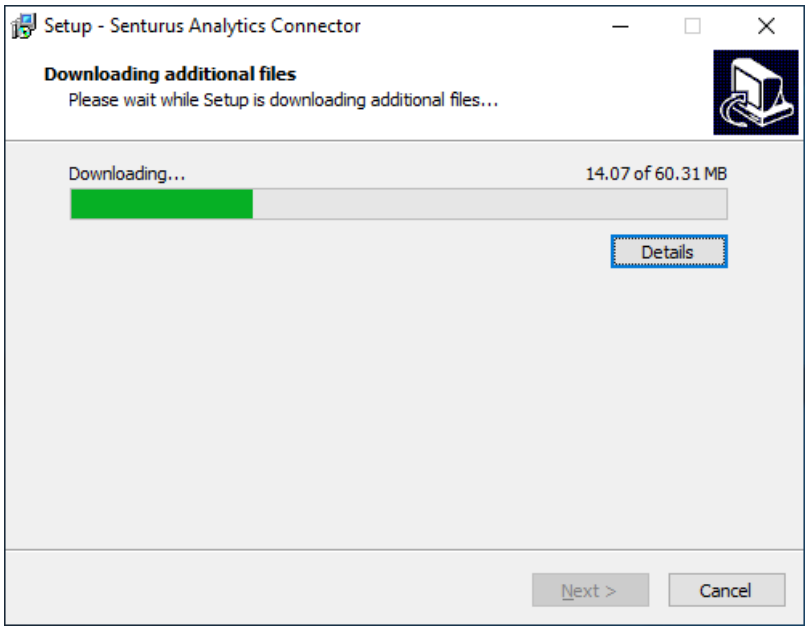
If any prerequisite software is missing, you will be prompted to download and install it. Otherwise, the installer will skip next two steps and jumps to “Select destination location” page directly.

If installer cannot download prerequisite software over internet, you need to install missing prerequisite software manually.

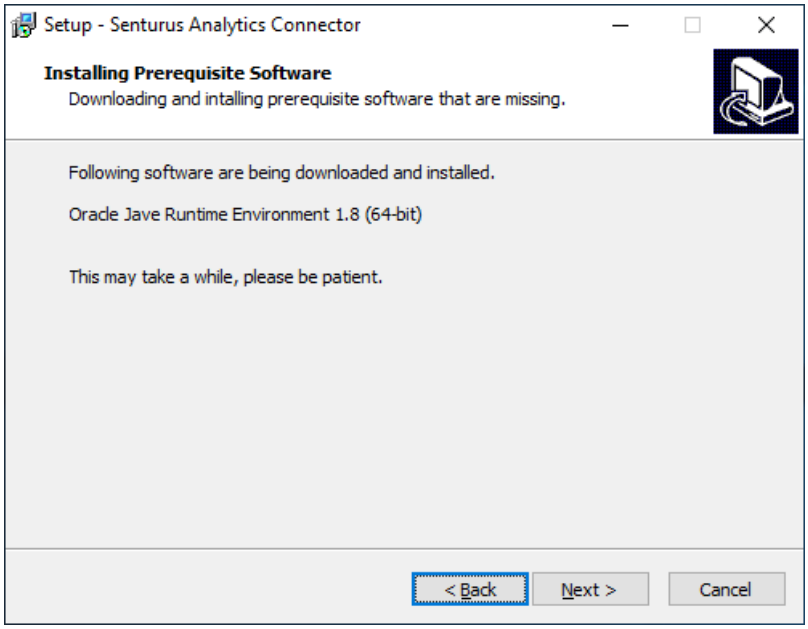
Click **Next** to download and install any missing prerequisites.



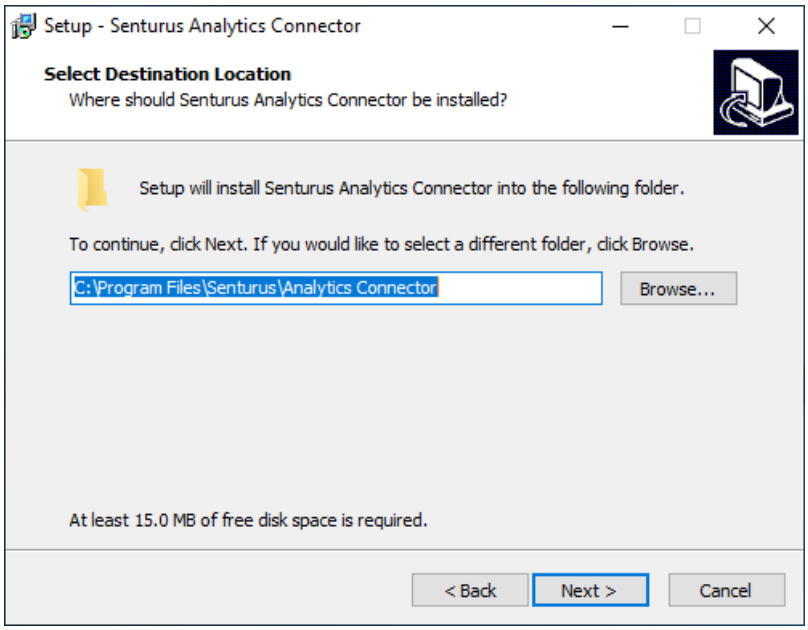
Installer will download prerequisite software and install it/them automatically.



Click **Next** after all prerequite software are installed and Next button become clickable.



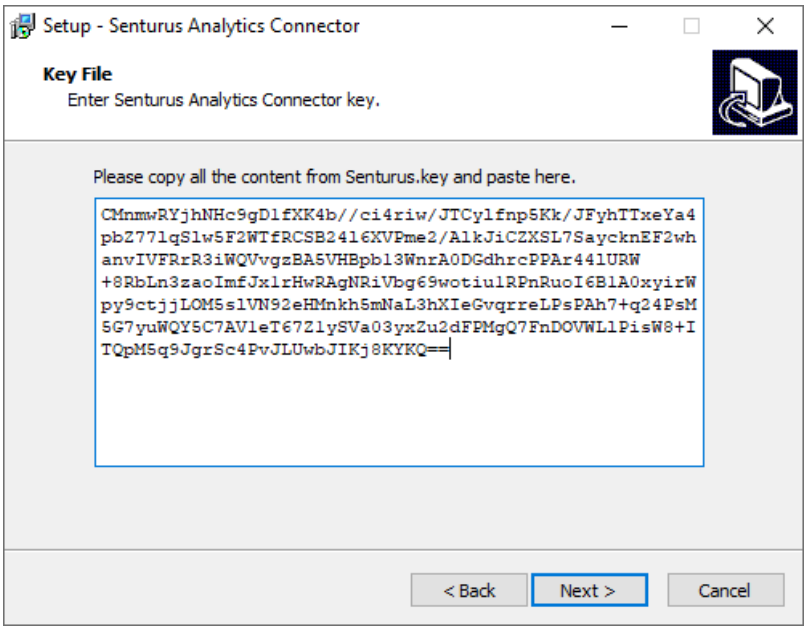
Select an installation directory. The default is *C:\Program Files\Senturus\Analytics Connector*. Click **Next**.



License Key

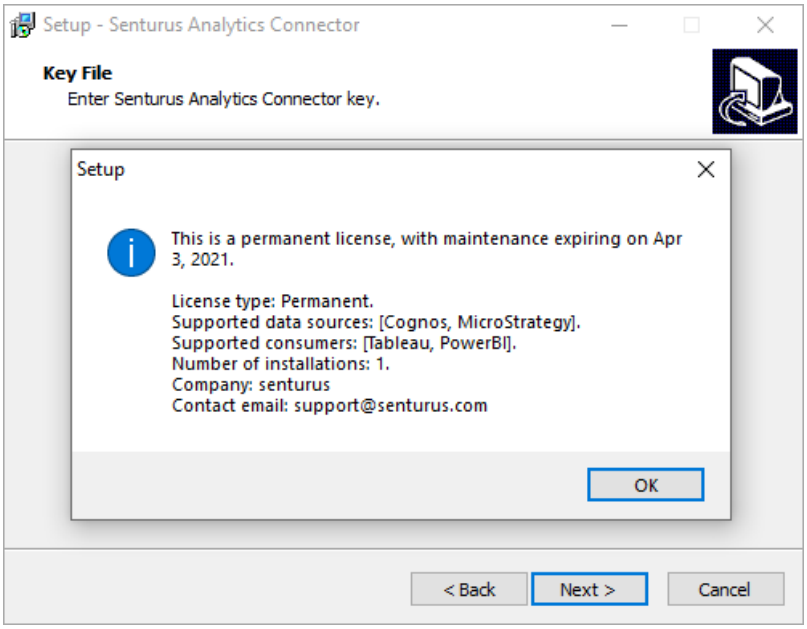
In order to use Analytics Connector, you will need a Senturus.key file from Senturus. A free trial key is available by contacting CustomerSupport@senturus.com. Once purchased, you will receive a key from Senturus tied to your purchased licenses.

Open the key file using a text editor (i.e. Notepad). Copy all the content and paste it into the in **Key File** page input.[2] Click **Next**.

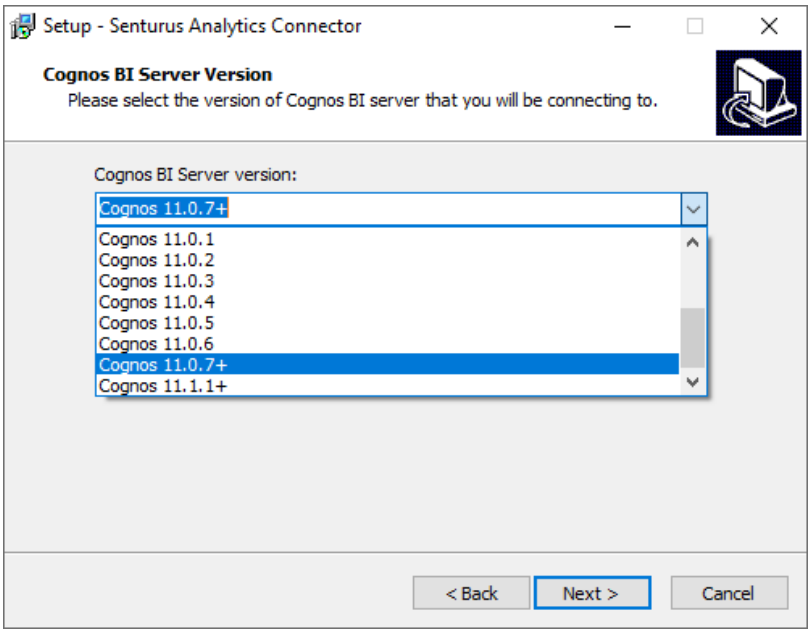


[2] If you are upgrading and already have a Senturus.key file in the installation directory, the installer will read it and automatically populate the content here.

A message window will appear displaying your license key information. Review it and click **OK**.

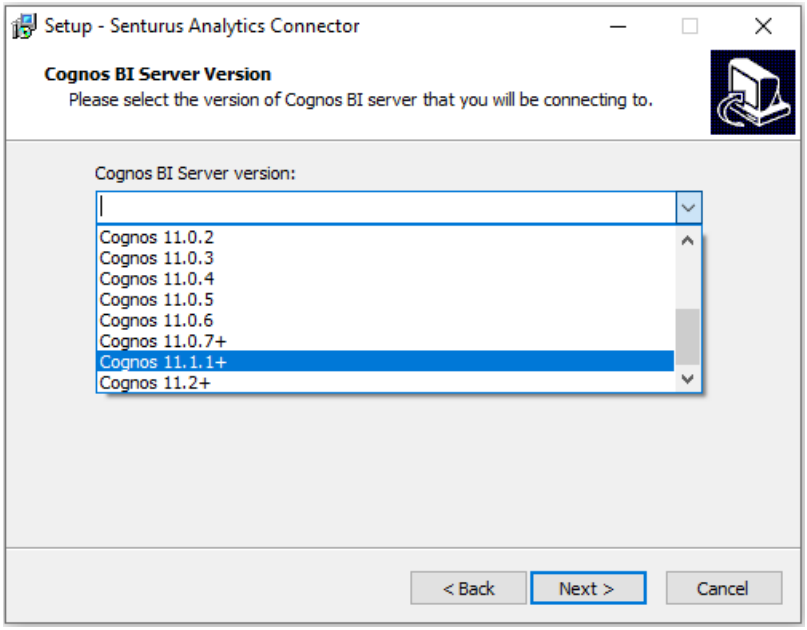


If your license key is for a Cognos data source, the following page will appear. Select the version of your Cognos server. Click **Next**.

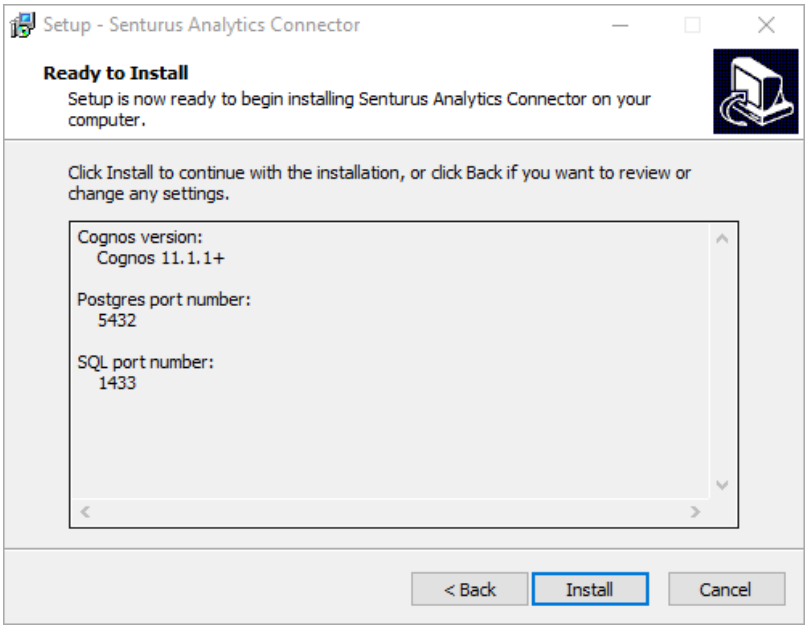


When installing Server Components, you will be prompted to enter two port numbers – Senturus Analytics Connector runs as PostgreSQL server and SQL server and listens on both ports. Make

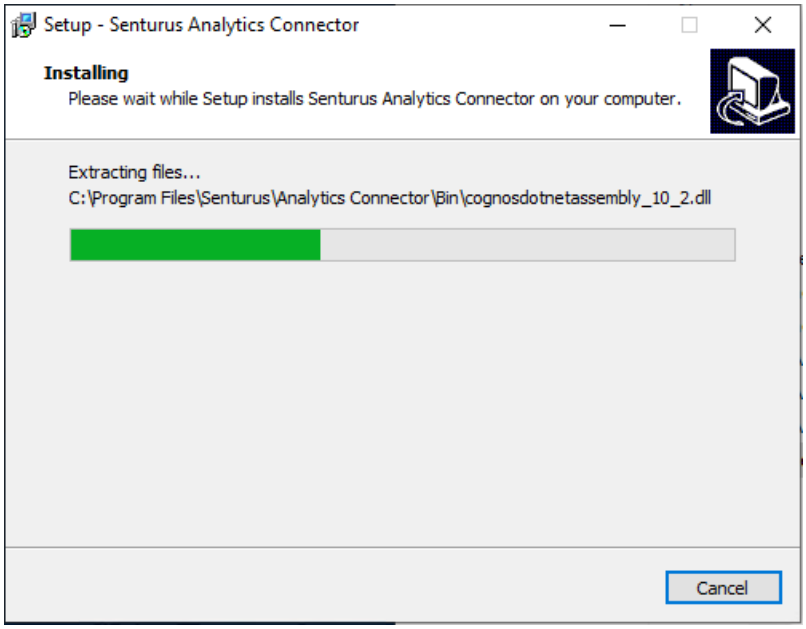
sure this port is not used by other applications/services. Click **Next**.



Review installation options. Click **Install**.

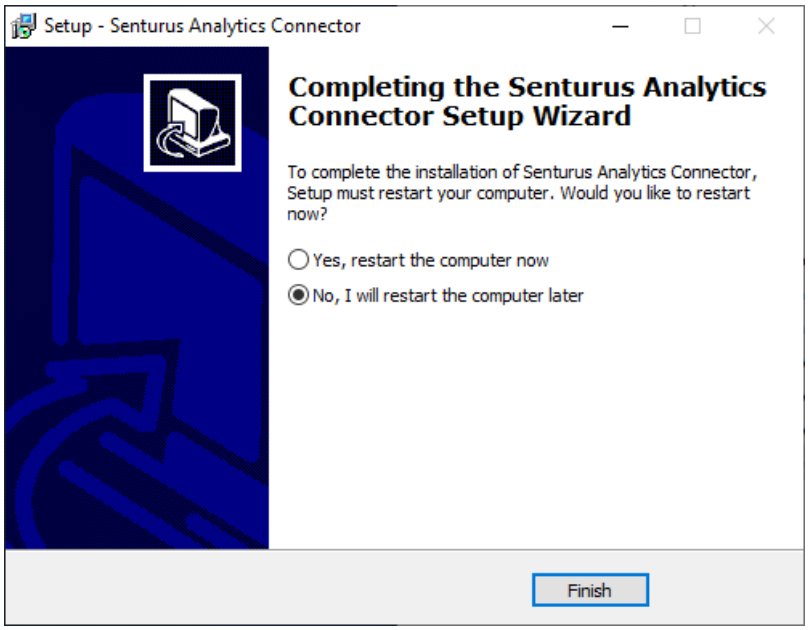


Installer will install Analytics Connector client at the end of installation automatically.



Once complete, the installation completion page will appear. If the installer installed some perquisite software, for example Java/Visual C++ redistributable, it may prompt to reboot your computer. Analytics Connector server can work well without rebooting, so you can choose “No, I will restart the computer later”.

Click **Finish.**



Client Installation

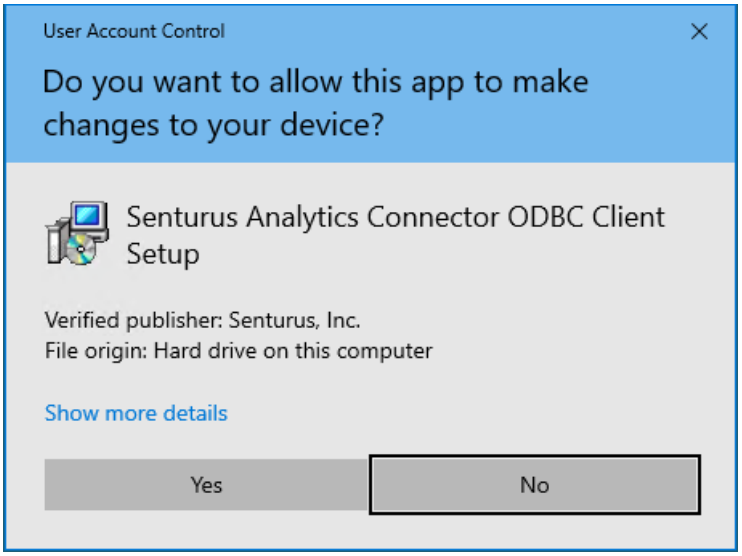
If you plan to use SQL Server database connection, you need to install SQL Server Native Client 11 or above. The download can be found here: https://www.microsoft.com/en-us/download/details.aspx?id=50402

If you want to use Senturus Analytics Connector ODBC driver, or Senturus custom data connector for Power BI (which requires Senturus Analytics Connector ODBC diver), follow steps bellow to install Senturus Analytics Connector client.

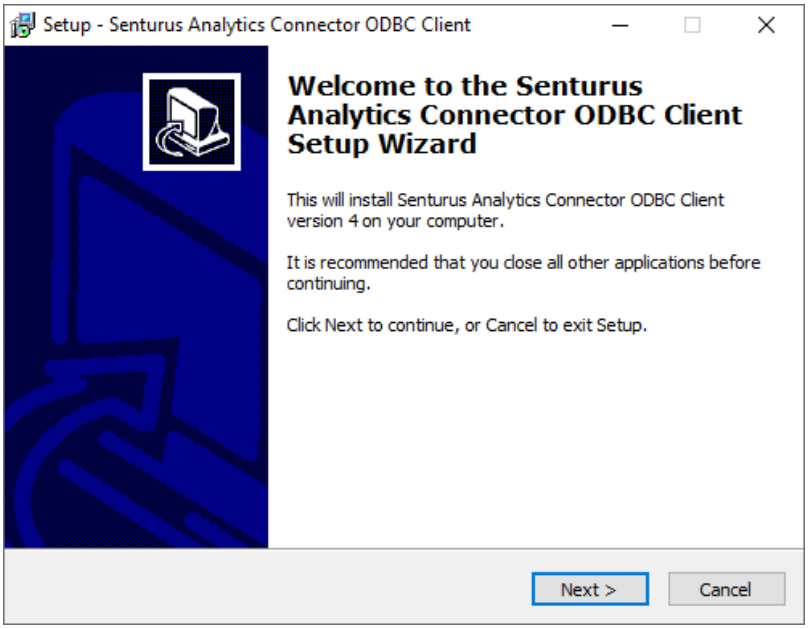
Download the latest version of Analytics Connector ODBC client installer to the machine where you will be installing it. You can download it here: https://www.senturus.net/connector-download/

Once downloaded, run *AnalyticsConnectorODBC_[version].exe* with administrator privilege.

Click **Yes** to allow the installer to run.



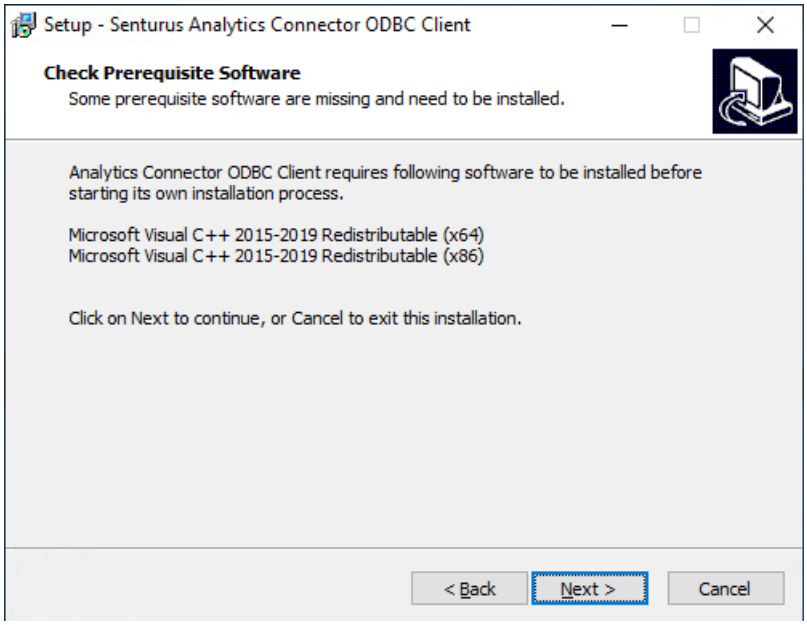
Click **Next** on the welcome page.



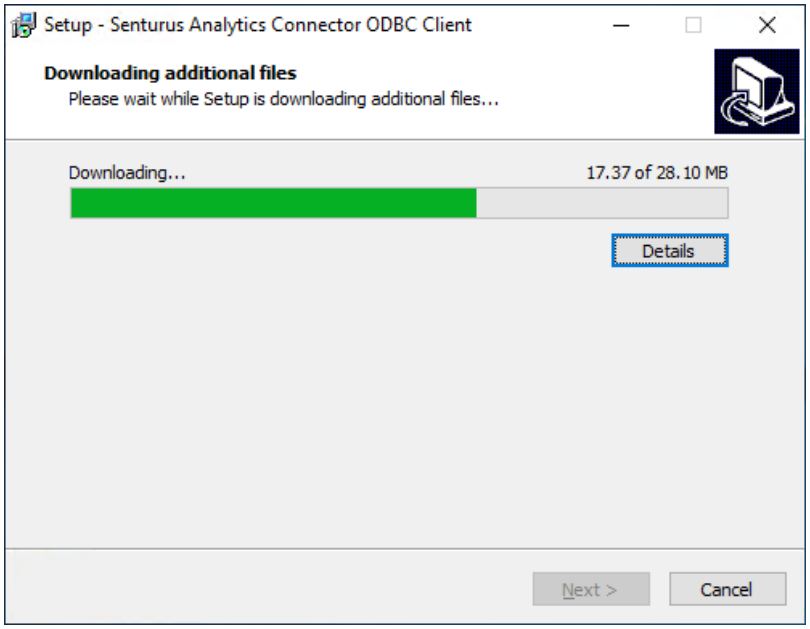
If any prerequisite software is missing, you will be prompted to download and install it. Otherwise, the installer will skip next two steps and jumps to “Select destination location” page directly.

If installer cannot download prerequisite software over internet, you need to install missing prerequisite software manually.

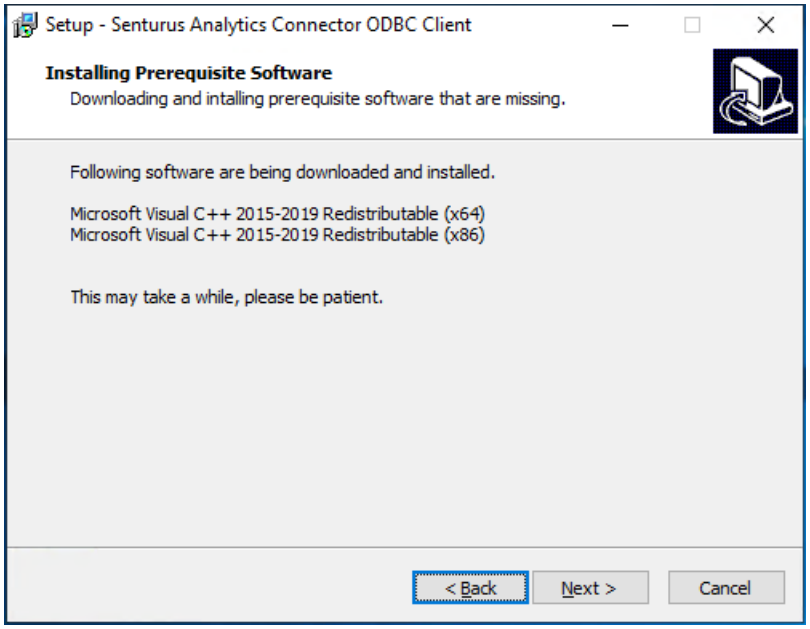
Click **Next** to download and install any missing prerequisites.



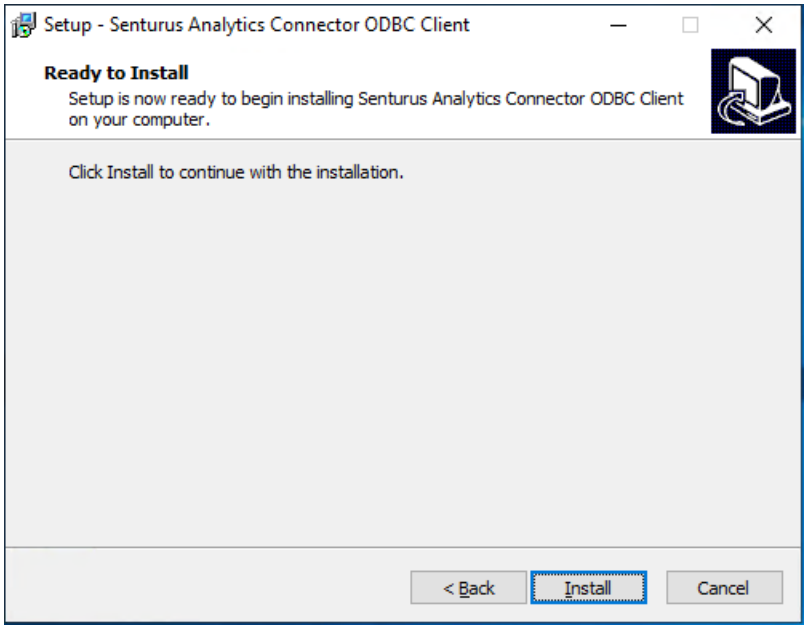
Installer will download prerequisite software and install it/them automatically.



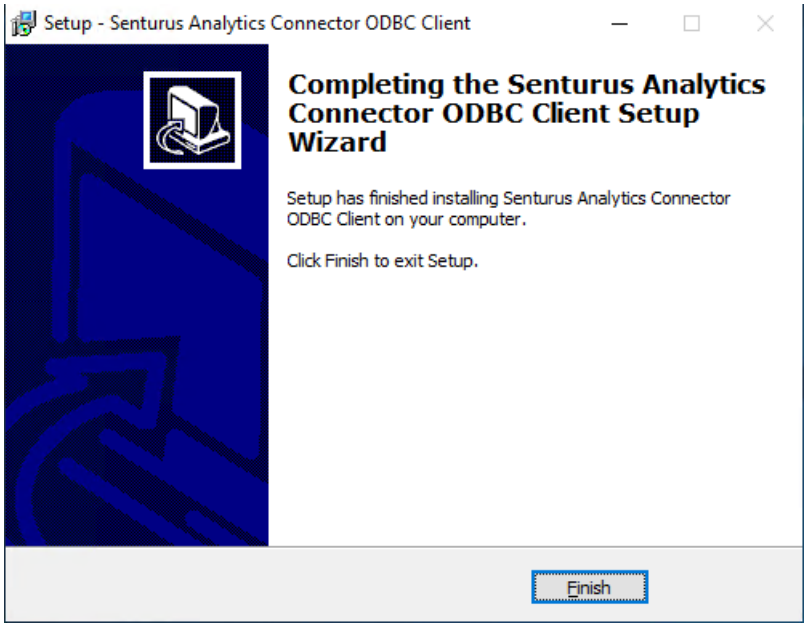
Click **Next** after all prerequite software are installed and Next button become clickable.



Click **Next**.



Click **Finish.**



Install Prerequisites Manually

If you do not have Internet access, or your access to prerequisite installers is blocked, you may need to download and install prerequisites manually before installing Analytics Connector.

For Analytics Connector server, you need:

Java Runtime 1.8 u202 or later (64bit) from https://www.java.com

Microsoft .net Framework 4.5+ from
https://dotnet.microsoft.com/download/dotnet-framework/net45

For Analytics Connector client, you need:

Microsoft Visual C++ Redistributable (64bit) from
https://download.visualstudio.microsoft.com/download/pr/cc0046d4-e7b4-45a1-bd46-b1c079191224/9c4042a4c2e6d1f661f4c58cf4d129e9/vc_redist.x64.exe

Microsoft Visual C++ Redistributable (32bit) from
https://download.visualstudio.microsoft.com/download/pr/0c1cfec3-e028-4996-8bb7-0c751ba41e32/1abed1573f36075bfdfc538a2af00d37/vc_redist.x86.exe

Run Analytics Connector installer on the target computer where you want to install server or client, it will check which prerequisite software are missing. Then download missing software from a computer with internet access, using URL above.

Copy these files to your target computer and install them by running these executables.

Once those prerequisites are installed, you can launch Analytics Connector installer again.

Linux Server Installation

To install Analytics Connector server component on a Linux server, follow the below instructions:

1) Install the Server Components to a Windows system using the Windows installer. Use the Data Source Configuration tool to setup your servers and databases.

2) Create a folder on the Linux Server for Analytics Connector application. Example:

```
> cd /opt
> sudo mkdir analytics-connector
```

3) Transfer the following files and folders from the windows system to the new folder on the Linux server:

   a. Database (folder)

   b. Lib (folder and contents)

   c. Log (folder)

   d. DataSourceConfig.xml (file – configuration information)

   e. Senturus.key (file – license information)

4) Grant Read/Write access to the above directory for the user(s) who will run Analytics Connector server.

5) Install Java Runtime Environment (JRE) 1.8 u202+ on the Linux server (if not already installed).

6) Start Analytics Connector server on the Linux server using the following command:

```
> java -Dsenturus.server_home=/opt/analytics-connector -classpath Lib:Lib/*
-Xms2048m -Xmx8192m com.senturus.server.Server start 5432 1433
```

   If you need to customize JVM and/or Analytics Connector server, add extra parameters. The following command adds JVM trustStore and changes PostgreSQL listening port to 8765:

```
> java -Dsenturus.server_home=/opt/analytics-connector
-Djavax.net.ssl.trustStore=SSL/trustStore
-Djavax.net.ssl.trustStorePassword=changeit
-classpath Lib:Lib/* -Xms2048m -Xmx8192m com.senturus.server.Server start
8765 1433
```

For more information, please refer to Using Service Configuration Utility.

7) (Optional) Create a service that starts Analytics Connector server when the server reboots.

8) (Optional) From a computer where Senturus Analytics Connector client and/or SQL client is installed, create a connection to Analytics Connector server to test the installation.

Linux Client Installation

To install Analytics Connector client component on a Linux server, follow the below instructions:

1) Install the PostgresSQL ODBC driver 11.0+ on the Linux server. Various distros have binaries available at https://www.postgresql.org/download/.

2) Open /etc/odbcinst.ini, copy PostgreSQL section and make an alias named “Senturus Analytics Connector” as bellow:

```
# Senturus Analytics Connector ODBC driver
[Senturus Analytics Connector]
Description = Senturus Analytics Connector ODBC driver
Driver64 = /usr/pgsql-11/lib/psqlodbcw.so  // psql driver path
FileUsage = 1
```

Uninstall Analytics Connector

You can uninstall Analytics Connector server and client in two ways:

1. Use the Windows “Add or Remove Programs” tool.

2. Go to Analytics Connector Installation folder (Typically "C:\Program Files\Senturus\Analytics Connector" for Connector server and "C:\Program Files\Senturus\Analytics Connector ODBC Client" for Connector client and run unins000.exe.

Data Source Configuration

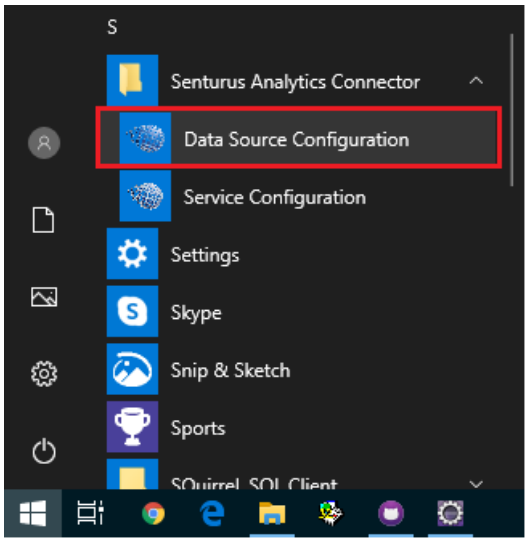
After Analytics Connector server has been installed, the databases need to be configured.

Launching Data Source Configuration Utility

The Data Source Configuration utility modifies the DataSourceConfig.xml file in the Installation folder. This file can be created one time and copied to any other machine where you install Analytics Connector server.

To run the Data Source Configuration utility, either:

Launch the program using the Start Menu



Or run the program located at {Installation Folder}\bin\SenturusDataSourceConfig.exe

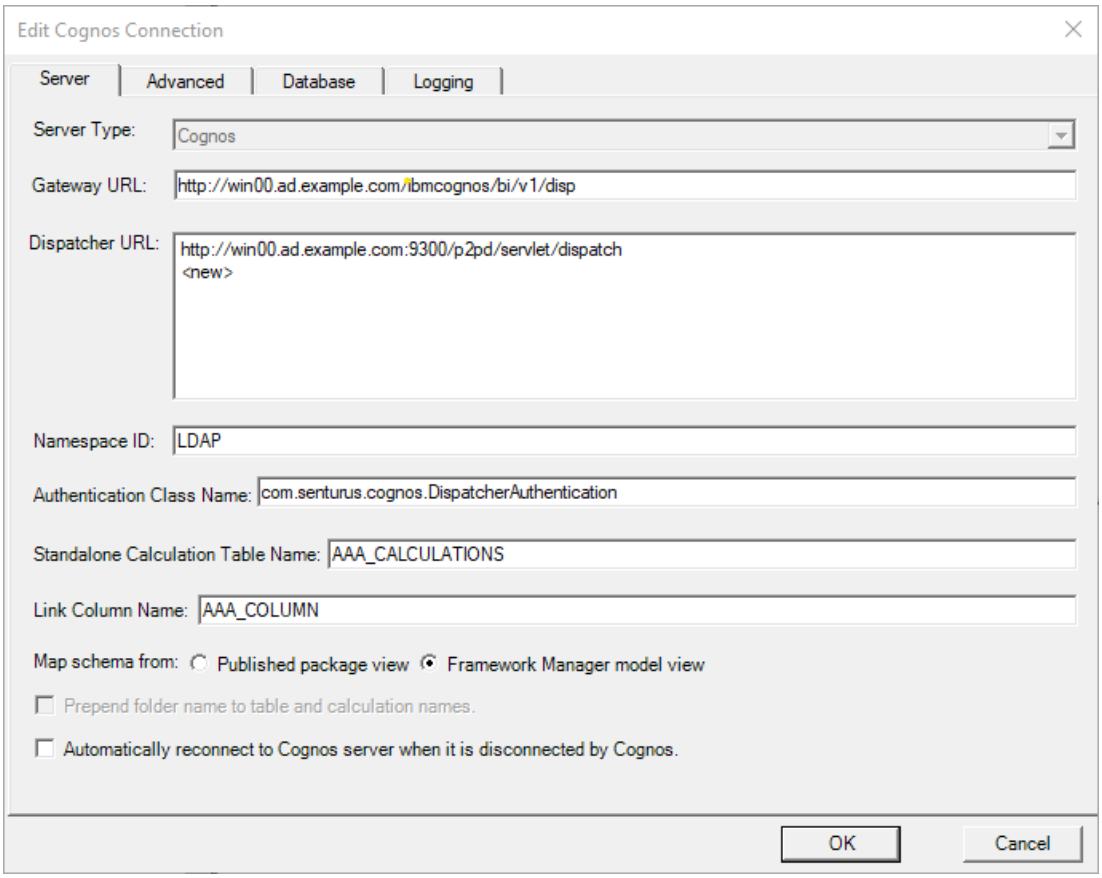
Configuring Cognos

Launching the Data Source Configuration utility displays the **Edit Cognos Connection** window with its four tabs: Server, Advanced, Database and Logging.

Server tab

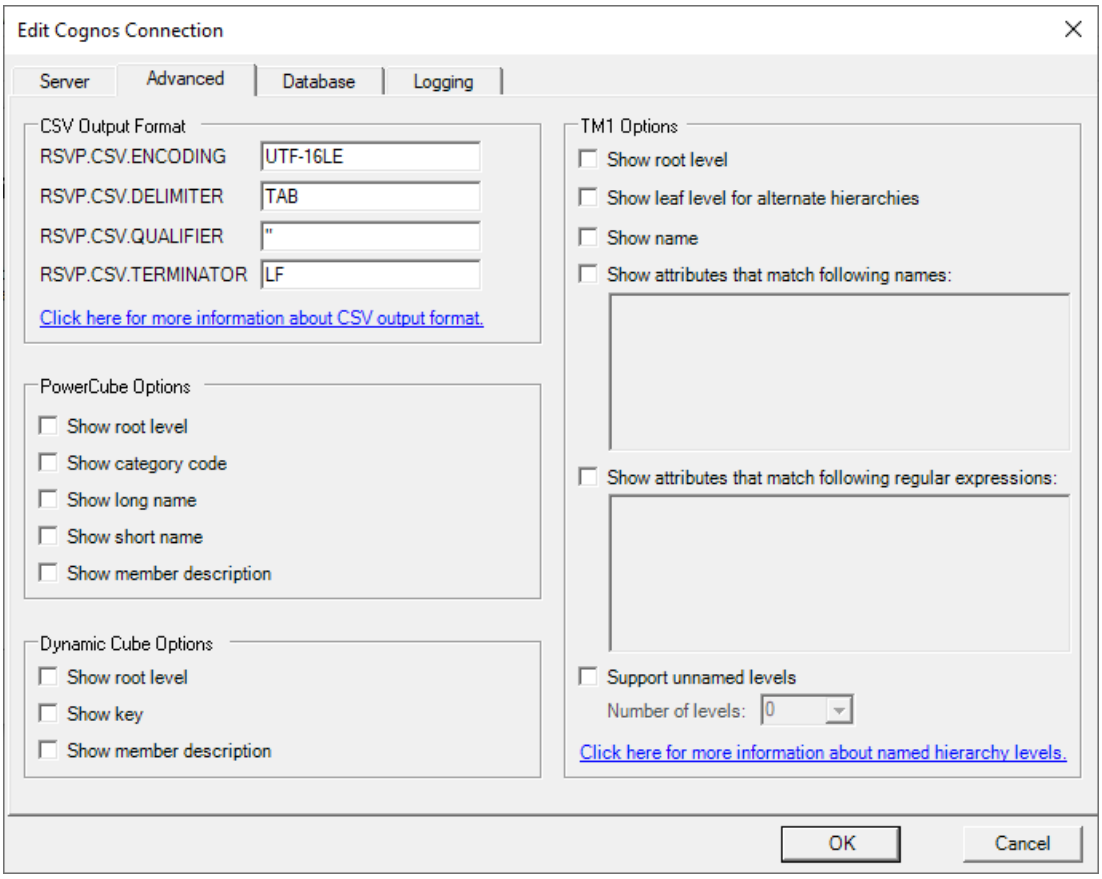
Here you can define Cognos gateway URL, dispatcher URLs, namespace IDs and other options.

The default authentication class is "*com.senturus.cognos.DispatcherAuthentication*". If Cognos users can authenticate themselves via Cognos dispatcher by providing username and password, or you will enable Windows Authentication for Analytics Connector server, you do not need to change the **Authentication Class Name**. If you want to use a custom authentication provider, contact Senturus for help.



Advanced tab

This tab lets you define the CSV output format. It also lets you adjust what attributes to pull from PowerCube, TM1, Dynamic Cube data sources.



CSV Output Format.

When a client application sends a query that selects data from a Cognos package to Analytics Connector server, Analytics Connector server will generate a Cognos report spec, run it against Cognos as CSV, parse the output and finally return dataset to client application. So if you changed the CSV output setting in Cognos, you need to specify the same setting here, otherwise Analytics Connector won't be able parse Cognos CSV outputs. See CSV Settings for details.

Level attributes for PowerCube, Dynamic Cube and TM1

By default, only levels will be mapped to ODBC columns. To show other attributes, check the corresponding options for the data source.

For TM1 level attributes, specify the list of names (separated by comma) or list of regex expressions. For example, to show all names in simplified Chinese, specify "*.*_TC$*" in "*show attributes that match following regular expressions"* text box.

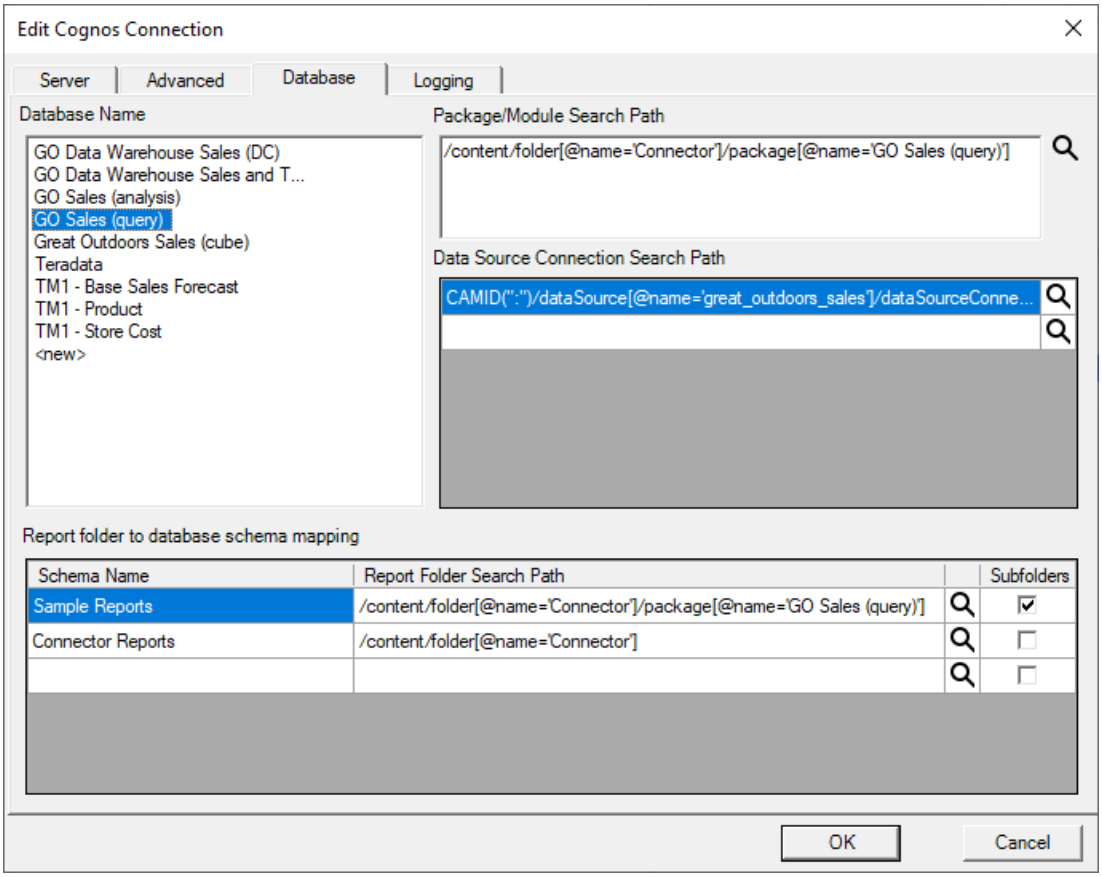
Analytics Connector supports both named and unnamed TM1 hierarchy levels. However, you need to check "*Support unnamed levels*" here, otherwise Analytics Connector will skip all hierarchies without named levels.

In order to detect how many levels are within a hierarchy without named levels, Analytics Connector Analytics Connector needs to send a query to Cognos to detect the depth of levels. This query may significantly increase the connecting time if the hierarchy has many elements. So you can use "*Number of levels*" to control if you want Analytics Connector to run a query detecting number of level (setting it to 0) or use pre-defined number of level for all hierarchies without named levels (setting it to 1 – 9).

For more information regarding TM1 named hierarchy levels, refer to the Using Named Hierarchy Levels with TM1 Dimensions documentation on the IBM Knowledge Center website.

Database tab

This tab lets you define packages to which you want to connect. Packages are represented as databases in Analytics Connector.



To edit an existing database, select the database name in the "*Database name*" list, and edit associated properties. To change the database name, double click on its name.

To delete, select the database name in the "*Database name*" list, and press "delete" key on your keyboard.

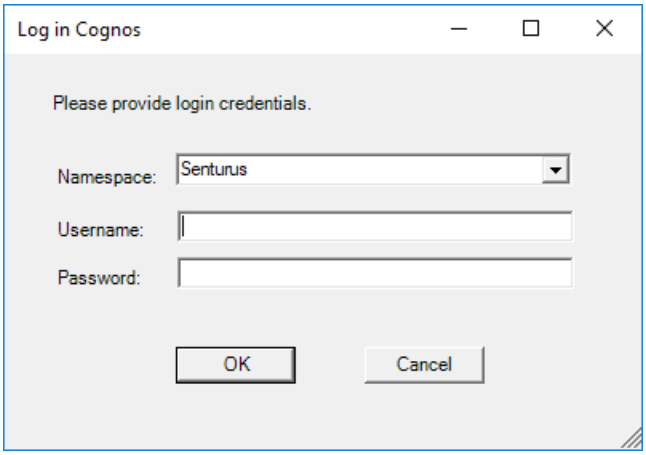
To map a Cognos package or data module to a new database, double click the "*<new>"* entry in the "*Database name*" list and follow steps.

If there are multiple data source connections available for a Cognos package (not uncommon in development and testing environment where developers want to test reports against different environments), you will be prompted to select one when running a Cognos report. In that case, you need to specify "*Data source connection search path*" for the package.

You can give users access to canned Cognos reports (only list style reports are supported) by specifying “Report folder to database schema mapping”. Each folder will appear as a schema, and each report will appear as a table.

When using Cognos 11.0.7 or above, use the search tool to easily find your search path. Select a database, then click the magnifying glass to search for the package, data module, connection or report folder.

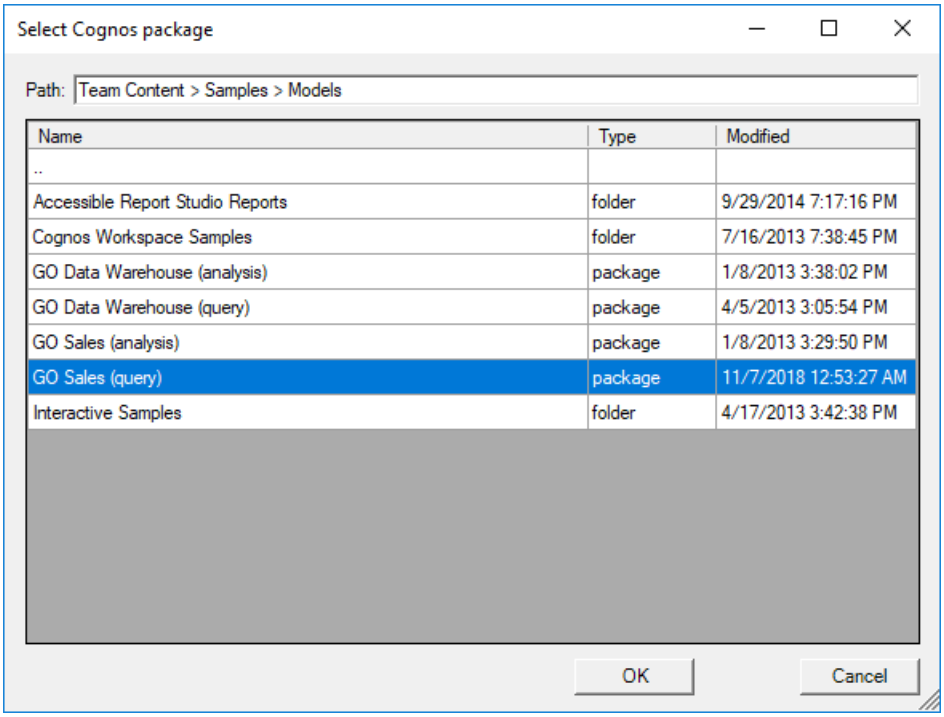
You must first login to Cognos. Select the correct namespace and enter your Username and Password. Click **OK**.



The **Select Cognos package** dialog appears. Navigate to the package by double clicking folders.

Double click the top “..” row to move up a folder. The current path is displayed in the top text box. Select the desired package, module, folder or data source connection, then click **OK.** The search

path will be placed in the related text box on the **Database** tab.



Logging tab

This tab lets you configure the level and number of messages that will be recorded to the log files.

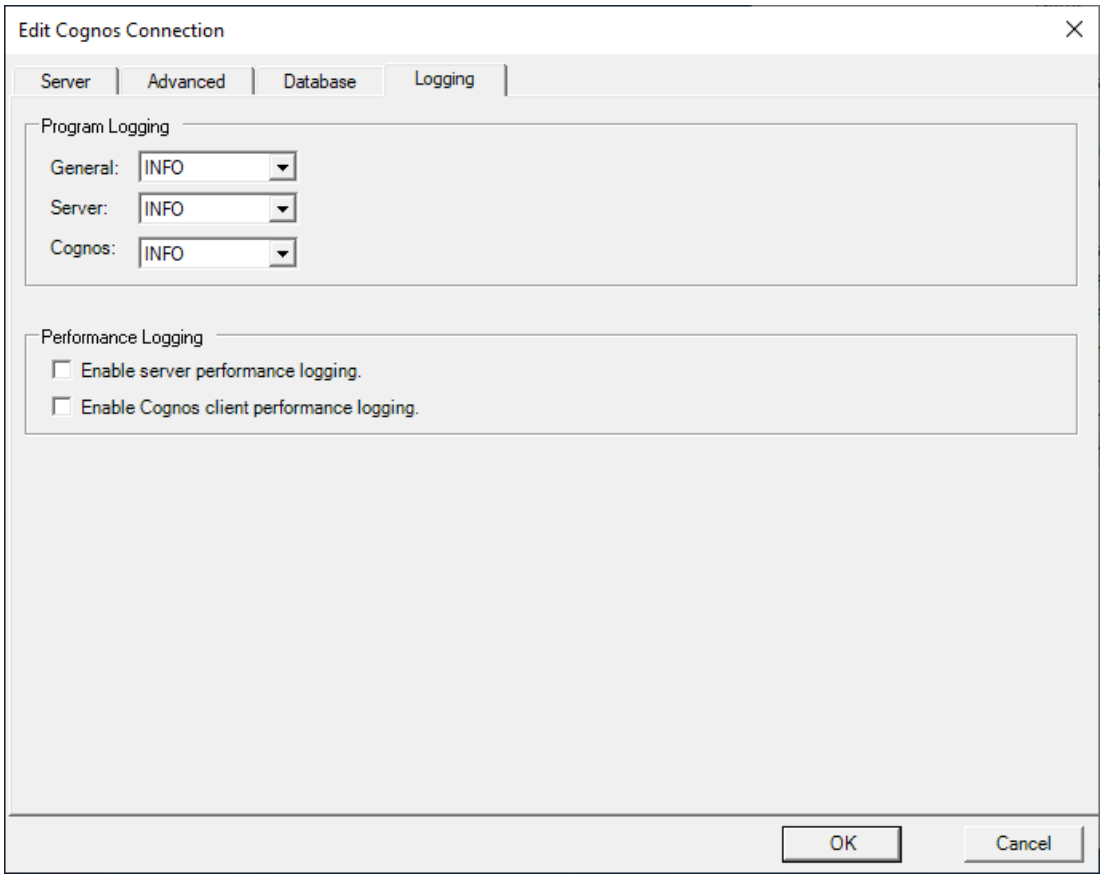
If you set “Server” logging level to DEBUG or TRACE, Analytics Connector server will log each request (including logon, query, etc.) and response.

If you set “Cognos” logging level to DEBUG or TRACE, Analytics Connector server will log each query and corresponding Cognos report spec (under “*<install_root>/Log*” directory). The default level is INFO, whereas Analytics Connector server only log query and report spec when a query failed.

If you enable Performance logging, Analytics Connector will generate performance log under “*<install_root>/Log/Performance*” directory. You can load these .csv files into your own database for analyzing purpose[3]. You can also open prebuilt “*<install_root>/Performance.twb*” or

[3] If you have a SQL Server, you can use “<install_root>/Performance.sql” to create a performance database, then call dbo.import_data to load .csv into performance database.

"*<install_root>/Performance.pbix"* to analyze performance[4]. Lastly, if you have Cognos audit setup, you can open run "*<install_root>/Performance.xml*" in Cognos Reporting tool and execute it. This Cognos report will show you Cognos report execution time of interactive request, including request from Analytics Connector server.



[4] Both Tableau and Power BI reports (Performance.twb and Performance.pbix) query .csv data from "C:\Program Files\Senturus\Analytics Connector\Log\Performance" directory. If you installed Analytics Connector server in different directory, please update Tableau/Power BI report to point data source to your own directory.

Power BI Custom Data Connector

Starting from version 5.0, you can connect from Power BI Desktop and powerbi.com to Analytics Connector via SQL Server database connection.

If you migrated from version 4.x, you may still use Power BI Custom Connector to connect, and all your old reports and data sources will continue working.

If your license includes Power BI as data source, Analytics Connector server installer will create "<install_root>*Power BI*" directory.

Every time you make changes using Data Source Configuration utility, it will generate a new Power BI Custom Connector under "*C:\Program Files\Senturus\Analytics Connector\PowerBI\SenturusDataConnector.mez*" and copy it to "*{user}\Documents\Power BI Desktop\Custom Connectors*".

You need this .mez file in order to use custom connector in Power BI Desktop, and when configuring Power BI Gateway.

Customize SenturusDataConnector.mez

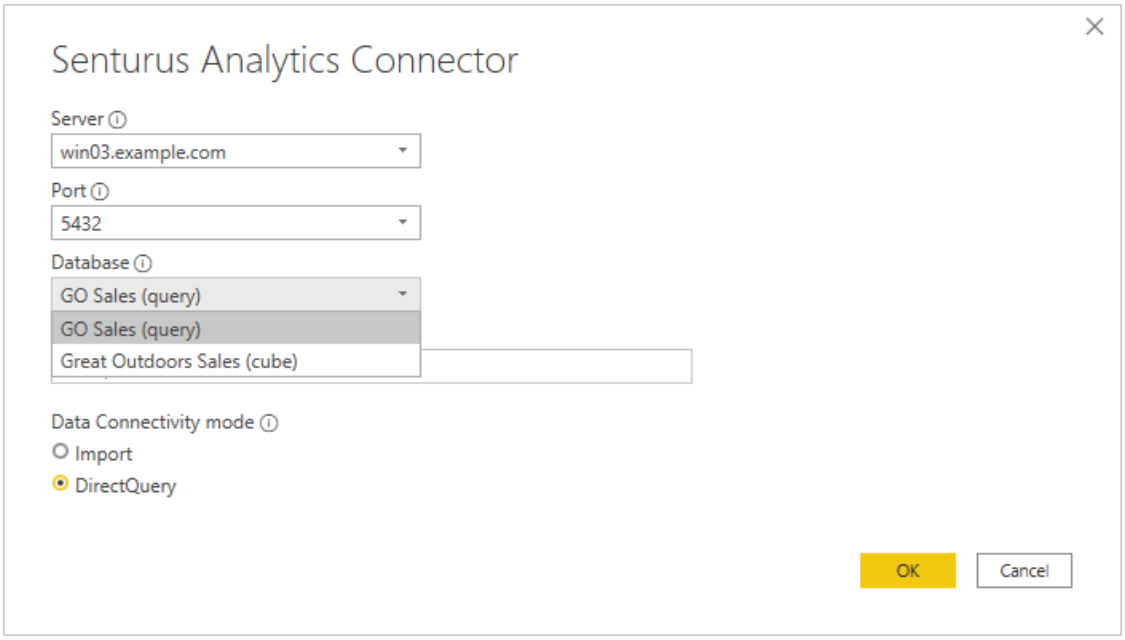
It's SenturusODBC.m (source code is under "<install root>\PowerBI\Source" directory and packaged within SenturusDataConnector.mez) that controls the "Senturus Analytics Connector" dialog when you connect from Power BI Desktop/Gateway to Senturus Analytics Connector Server.

If you have following code in SenturusODBC.m:

```
SenturusAnalyticsConnectorType = type function (
    server as (type text meta [
        Documentation.FieldCaption = "Server",
        Documentation.FieldDescription = "Server Name",
        Documentation.AllowedValues = { "win03.example.com" }
    ]),
    port as (type text meta [
        Documentation.FieldCaption = "Port",
        Documentation.FieldDescription = "Port Number",
        Documentation.AllowedValues = { "5432" }
    ]),
    database as (type text meta [
        Documentation.FieldCaption = "Database",
```

```
        Documentation.FieldDescription = "Database Name",
        Documentation.AllowedValues = { "GO Sales (query)", "Great Outdoors
Sales (cube)",  }
    ]),
```

You will see the dialog like this:



Basically, `Documentation.AllowedValues` defines the drop-down list for each input. If this property is omitted, the corresponding input becomes a free text input.

So if you want to customize this mez, follow steps below:

1. Open “<install root>\PowerBI\Source\SenturusODBC.m” in a text editor and make changes. For example, you want to add one more value to server (so that you can use the same mez to connect to different Senturus Analytics Connector Servers), change port number, add and/or remove databases (custom mez for different groups of users so they will see only databases they have access to), then change the code like below and save it:

```
SenturusAnalyticsConnectorType = type function (
    server as (type text meta [
        Documentation.FieldCaption = "Server",
        Documentation.FieldDescription = "Server Name",
        Documentation.AllowedValues = { "win03.example.com",
"prod.example.com" }
    ]),
    port as (type text meta [
```

```
            Documentation.FieldCaption = "Port",
            Documentation.FieldDescription = "Port Number"

        ]),
        database as (type text meta [
            Documentation.FieldCaption = "Database",
            Documentation.FieldDescription = "Database Name",
            Documentation.AllowedValues = { "GO Sales (query)", "My Package",
}
        ]),
```

Notes: (1) Do not forget to remove comma sign (,) after line Documentation.FieldDescription if you remove Documentation.AllowedValues line. And (2) The allowed values for database field must match database name you defined in Data Source Configuration tool, see Database tab, and it's case sensitive.

2. Go to "<install root>\PowerBI\Source" directory, select all files, right click and select "Send to" / "Compressed (zipped) folder.

3. Rename the newly created .zip into "SenturusDataConnector.mez".

4. Share this new mez with Power BI user and let them save it to "{user}\Documents\Power BI Desktop\Custom Connectors" directory.

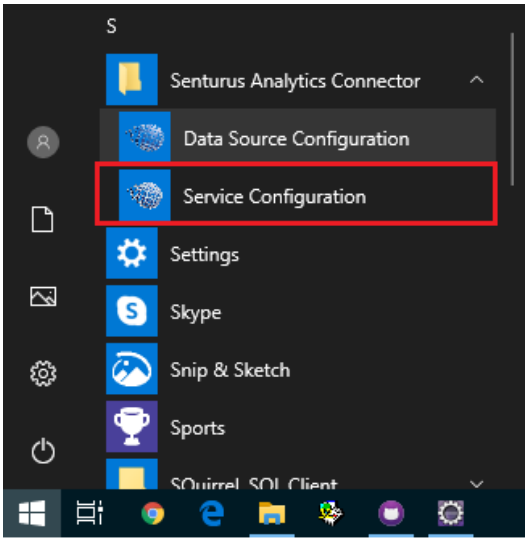
Service Configuration

Service Configuration utility lets you monitors and modifies Windows service "*Senturus Analytics Connector*"

Launching Service Configuration Utility

To run Service Configuration utility, either:

Launch the program using the Start Menu

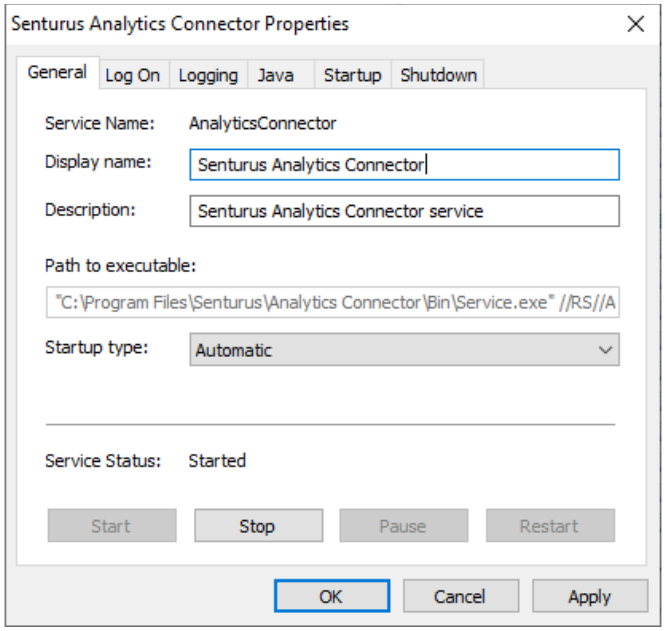


Or run the program located at *{Installation Folder}\bin\AnalyticsConnector.exe*

Using Service Configuration Utility

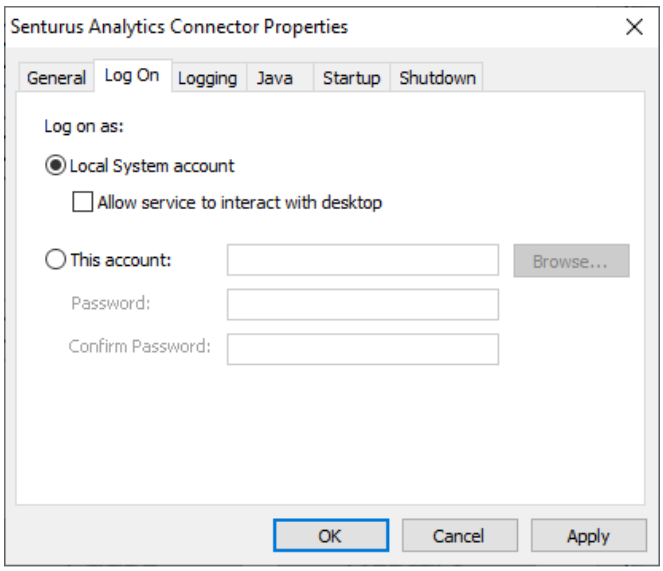
General tab

You can start/stop service, set common Windows service properties.



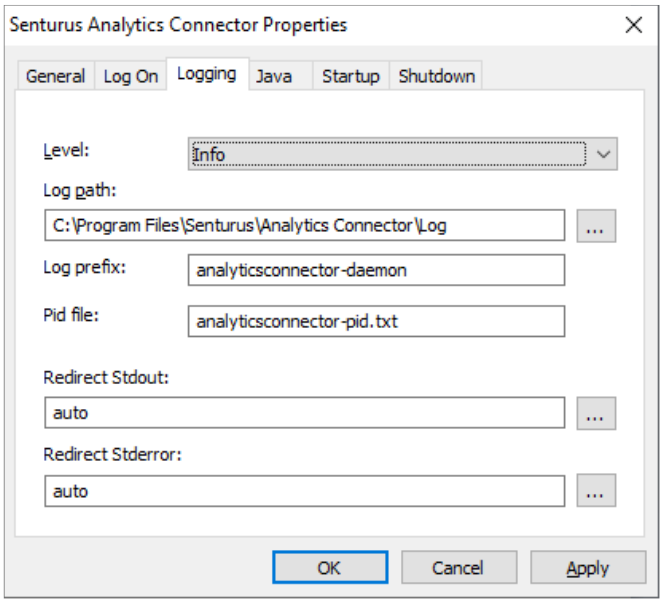
Log on tab

Defines the credential that this service log on as.



Logging tab

Defines Windows service logging. This is different than Logging tab in Data Source Configuration utility.



Java tab

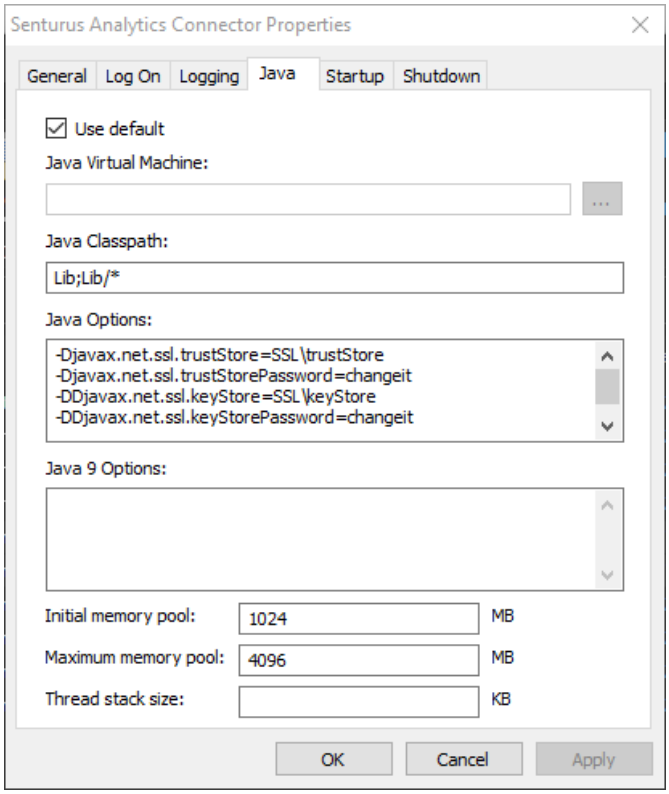
You can specify Java environment within this tab.

You can use the default JRE (the one registered in Windows Registry Table) by checking “Use default” or uncheck it and choose a specific JRE using browse button right to “Java Virtual Machine” text input.

By default, “Java Classpath” is set to “Lib;Lib/*”, these are paths relative {install_root} directory. If you have customized libraries saved in other directories, append them to “Java Classpath”.

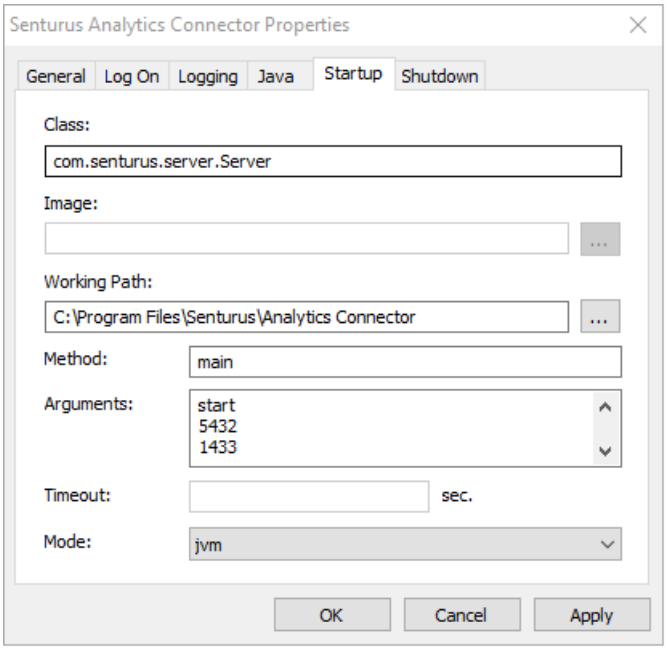
To set some Java runtime options, use “Java Options” text box. For example, to specify SSL certificate stores, HTTP proxies, etc. If you are using JRE9+, you can use “Java 9 Options” text box too.

This tab also lets you define minimum/maximum memory allocation pool for JVM, and thread stack size.



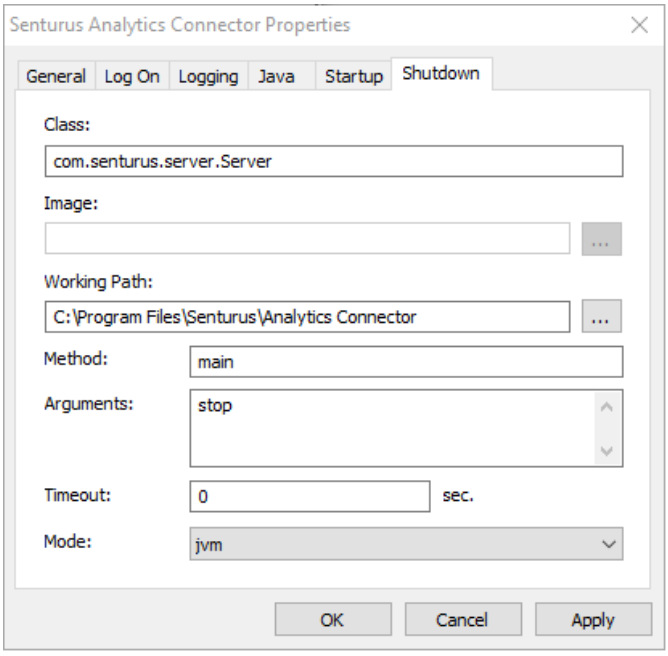
Startup tab

Defines the Java class and argument to start service. If you want to change the ports of Analytics Connector server, change the second line (for PostgreSQL requests, default 5432) and/or third line (for SQL Server requests, default 1433).



Shutdown tab

Defines the Java class and argument to shut service down.



SSL on Analytics Connector Server

If you desire encrypted network traffic between Analytics Connector server and client, perform the following steps to setup an SSL certificate on the server:

1. Ask your certificate administrator to generate a certificate good for SQL server. Detailed requirements can be found at Enable encrypted connections - SQL Server | Microsoft Docs, section “Certificate requirements”.

   One of the special requirements, comparing to common certificates, is the certificate must be issued for server authentication so the **Enhanced Key Usage** property of the certificate should include '*Server Authentication (1.3.6.1.5.5.7.3.1)*' (see below).

2. Obtain the pair of private key and certificate from your certificate administrator and save to a local folder. For example, “C:\Temp\connector_server.key” and “C:\Temp\connector_server.crt”.

3. Convert x509 Cert and Key to a pkcs12 file using OpenSSL (https://www.openssl.org):

```
openssl pkcs12 -export -in C:\Temp\connector_server.crt -inkey
C:\Temp\connector_server.key -out C:\Temp\connector_server.p12 -name
connector_server -CAfile <path_to_JRE>\lib\security\cacerts
```

4. Import the pkcs12 file to your java keyStore:

```
<path_to_JRE>\bin\keytool.exe -importkeystore -srckeystore
C:\Temp\connector_server.p12 -srcstoretype pkcs12 -srcstorepass
changeit -destkeystore C:\Temp\keyStore -deststoretype jks -
deststorepass changeit -destkeypass changeit -alias connector_server
```

   You should see a message like: "Importing keyStore C:\Temp\connector_server.p12 to SSL\keyStore..."

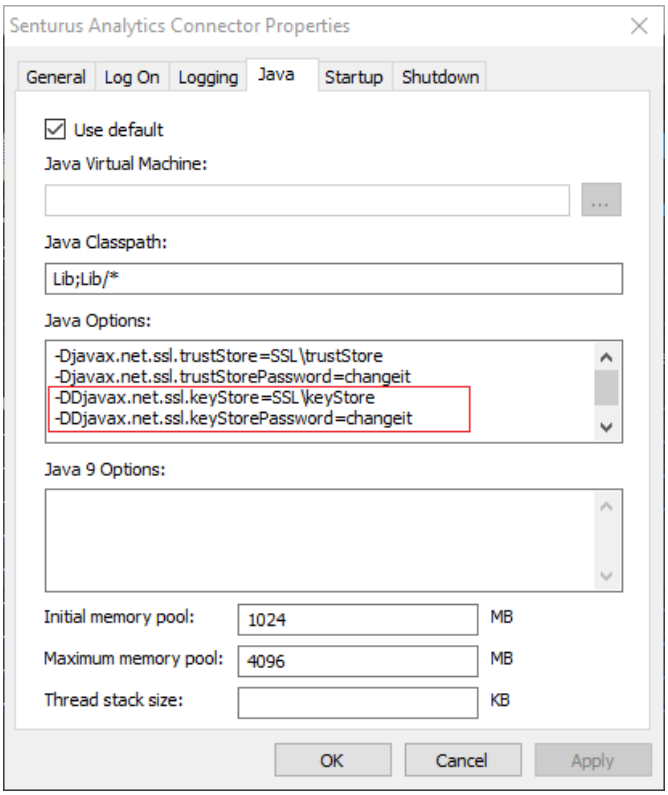
5. (optional) To verify newly created or updated keyStore, execute following command:

```
<path_to_JRE>\bin\keytool.exe -list -v -alias connector_server -
keystore C:\Temp\keyStore -storepass changeit
```

6. Copy keyStore to the SSL Folder under the installation directory, typically “C:\Program Files\Senturus\Analytics Connector\SSL”.

7. Strat Service Configuration utility, go to Java tab, add two Java options:

```
-Djavax.net.ssl.keyStore=SSL\keyStore
-Djavax.net.ssl.keyStorePassword=changeit
```



8. Restart Senturus Analytics Connector service.

SSL on Cognos Dispatcher

If your Cognos dispatcher is SSL enabled, or your Cognos gateway is SSL enabled and you have set authentication class to *NTLMAuthentication/SiteMinderBasicAuthentication*, and your SSL certificate is not signed by a well unknown certificate authority, then you need to configure the trustStore so that Analytics Connector server can communicate with your Cognos server over SSL.

If your certificate is self-signed or you are using the certificate comes with Cognos installation, then you need to configure trustStore here too.

1. Download root SSL certificate from Cognos using Google Chrome and save it into your local drive, for example “C:\Temp\root.cer”.
2. Create “<*install_root*>*SSL*” directory if it does not exist.
3. Open a prompt window, change directory to “<*install_root*>”, execute the following command (you can replace changeit with your secret password):

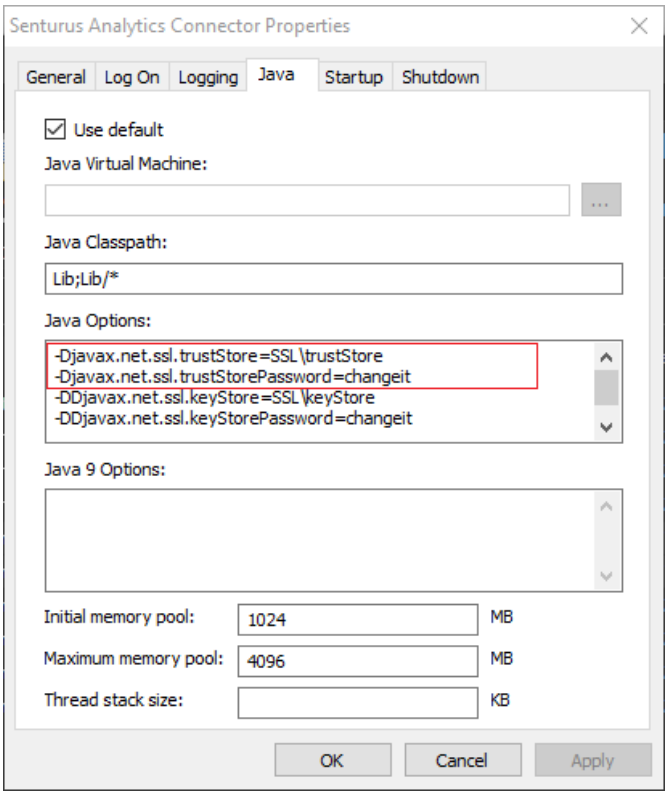
   ```
   JRE\x64\bin\keytool -import -alias root -file C:\Temp\localhost.cer -keystore SSL\trustStore -storepass changeit
   ```

4. Review the information. If it looks correct, type yes and Enter. trustStore should be created under “<install_root>\SSL” directory.
5. (optional) To verify newly created trustStore, execute the following command:

   ```
   JRE\x64\bin\keytool -list -v -alias root -keystore SSL\trustStore -storepass changeit
   ```

6. Strat Service Configuration utility, go to Java tab, add two Java options:

```
-Djavax.net.ssl.trustStore=SSL\trustStore
-Djavax.net.ssl.trustStorePassword=changeit
```



7. Restart Senturus Analytics Connector service.

In order to connect from Data Source Configuration tool to your Cognos, you need to import the root certificate into Windows “Trusted Root Certificate Authorities”. Here is how to do it:

1. Download root SSL certificate from Cognos using Google Chrome and save it into your local drive, for example “C:\Temp\root.cer”.
2. Double click on the certificate to bring up Certificate dialog.
3. Click on “Install Certificate…” button to bring up “Certificate Import Wizard”;
4. Select “Current User” for “Store Location”. Click on Next.

5. Check “Place all certificates in the following store”, click on “Browse…” button, select “Trusted Root Certification Authorities” and click on OK button. Click on Next.

6. Click on Finish. And click Yes button in the pop-up “Security Warning” dialog.

7. You should be prompted that “The import was successful.” Click on OK.

Now you can use browse button in Data Source Configuration tool to select Cognos packages, data modules, etc.

Configure Windows Authentication

Starting from version 5.1, users can log in Analytics Connector server using Windows Authentication. However, this option is only available when they are using SQL Server database connection/connector, and is not available for Analytics Connector ODBC, and custom data connector (for Power BI).

To enable this option, follow steps below:

1. Enable delegation for Analytics Connector server.

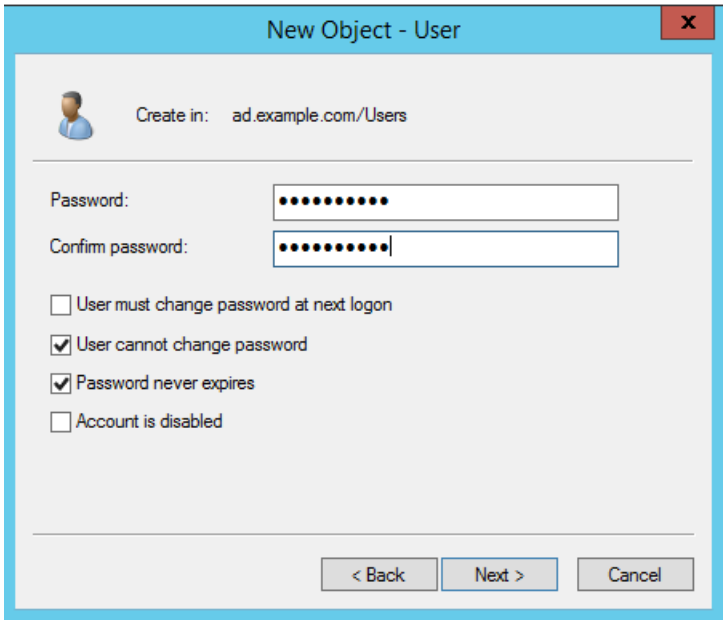
    a. Log in to one of your AD controllers, open "Active Directory Users and Computers" tool.

    b. Select the computer on which Analytics Connector is running, and open Properties dialog. Go to Delegation tab, check "Trust this computer for delegation to any services (Kerberos only)". And click OK.

2. Create a service account.

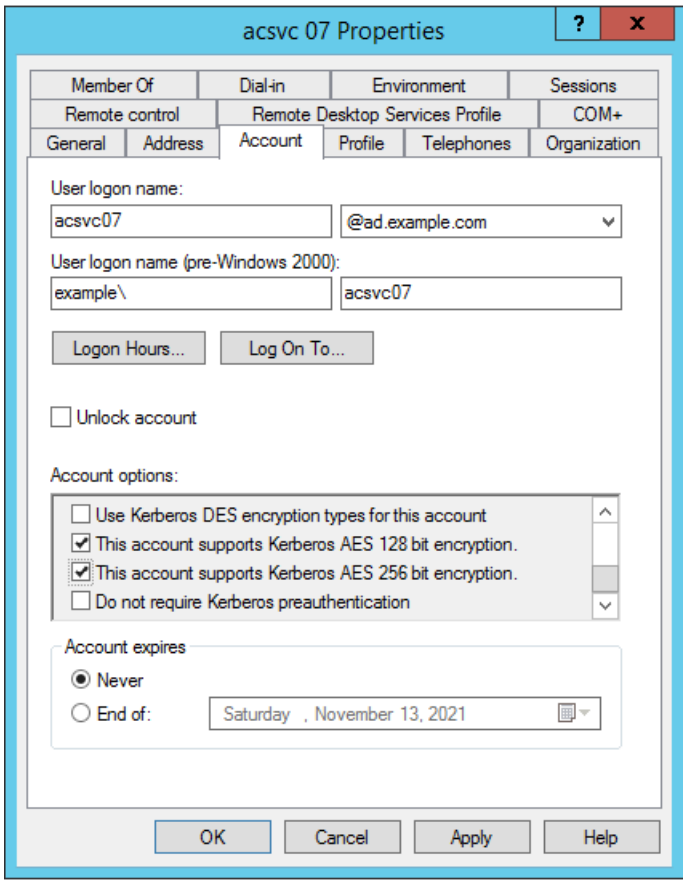
    a. On the same AD controller computer, open "Active Directory Users and Computers" tool.

    b. Create a new user, for example `acsvc07`. Make sure to check "User cannot change password" and "Password never expires" options.



    c. Select the new user, and open Properties dialog. Go to Account tab, then "Account options" box, check "This account supports Kerberos AES 128 bit encryption." and "This account supports

Kerberos AEC 256 bit encryption.”.



3. Create a keytab file.

   a. Still on the same AD controller computer. Open a command prompt and execute this command:

   ```
   ktpass -ptype KRB5_NT_PRINCIPAL -mapOp set -crypto All -princ
   MSSQLSvc/win07.ad.example.com:1433@AD.EXAMPLE.COM -mapUser
   acsvc07@AD.EXAMPLE.COM -pass MyPas$w0rd -out acsvc07.keytab
   ```

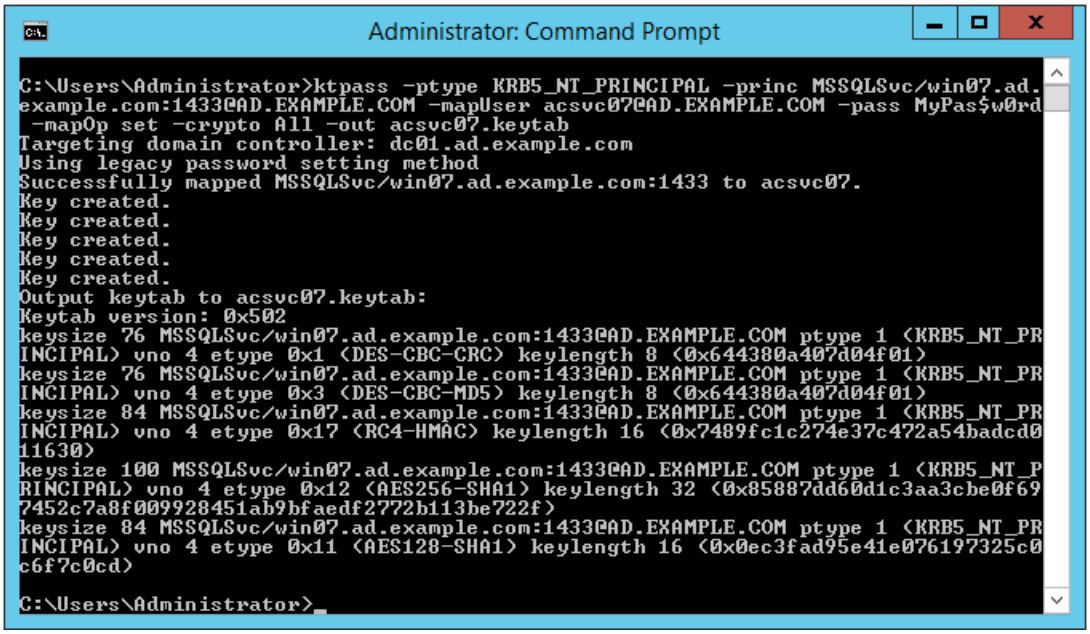
   This command maps a service principal name (SPN) to your AD user and generates a keytab file.

   You need to change the parameters based on your environment:

   (1) `-pric`: Always use “`MSSQLSvc`” as service type, followed by a backslash (`/`), fully qualified DNS name of Analytics Server, a colon (`:`), `1433` (port number), an at sign (`@`), and fully qualified AD (must be in upper case).
   (2) `-mapUser`: This is the user logon name (must be in lower case) followed by a at sign (`@`),

and fully qualified AD (must be in upper case).
(3) `-pass`: The password you set when creating service account user.
(4) `-out`: The keytab file name.

You should get following output.



b. Copy the new keytab file to "C:\Program Files\Senturus\Analytics Connector\Lib" folder on Analytics Connector server.

4. Edit Analytics Connector server configuration files.

a. Log in Analytics Connector server with admin privileges.

b. Open "C:\Program Files\Senturus\Analytics Connector\Lib\krb5.conf" in a text editor, change [realms] and [domain_realm] sections to match your environment. Please note these settings are case sensitive.

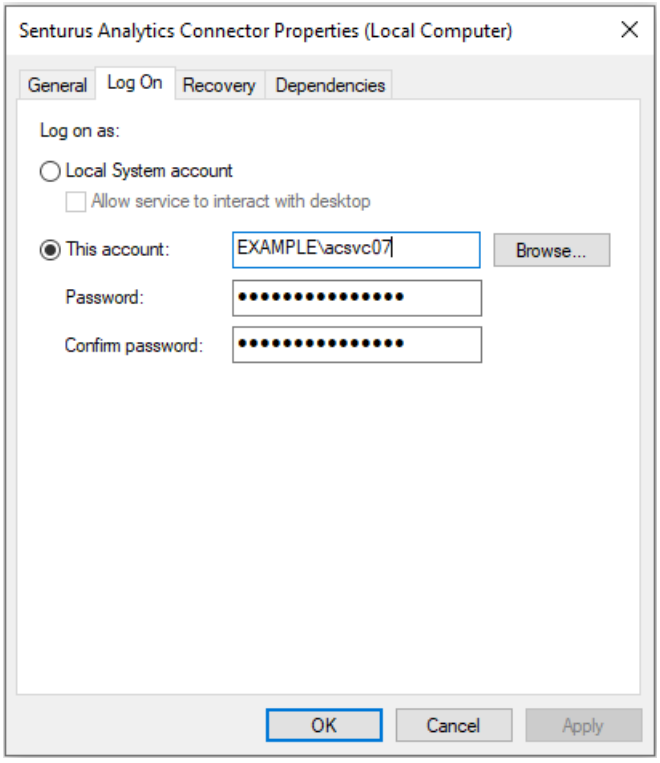
```
[realms]
AD.EXAMPLE.COM = {
    kdc = dc01.ad.example.com
    default_domain = AD.EXAMPLE.COM
}
[domain_realm]
    .ad.example.com = AD.EXAMPLE.COM
```

c. Open "C:\Program Files\Senturus\Analytics Connector\Lib\ ServiceLogin.conf" in text editor, change keyTab (location of keytab file) and principal (SPN created before) properties.

```
ConnectorServiceLogin {
    com.sun.security.auth.module.Krb5LoginModule required
    useKeyTab=true
    keyTab="C:\\Program Files\\Senturus\\Analytics
Connector\\Lib\\acsvc07.keytab"
    principal="MSSQLSvc/win07.ad.example.com:1433@AD.EXAMPLE.COM"
    doNotPrompt=true
    storeKey=true
    debug=false;
}
```

5. Change Senturus Analytics Connector service "Log on" account.

   Stay on the Analytics Connector server. Open Windows Services control, double click on "Senturus Analytics Connector" service, go to "Log On" tab, change the "Log on as:" account to the service account created before and type in password.



6. Restart Senturus Analytics Connector service.

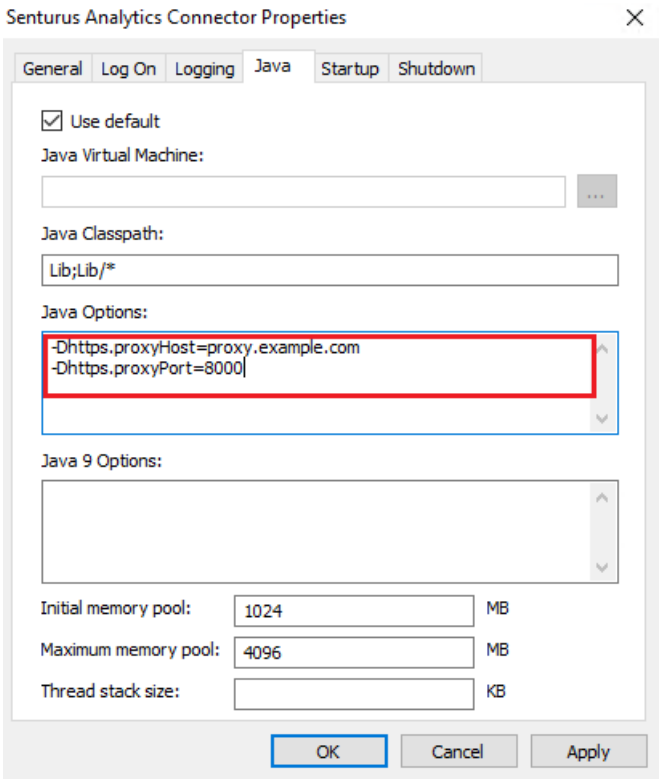
Proxy between Analytics Connector Server and Cognos Server

In case Analytics Connector server needs connecting to Cognos server via a proxy (very common in a secured environment where every outbound internet traffic must go through a proxy), you need to set up proxy settings.

In Service Configuration tool, under Java tab, Java options box, add two lines:

```
-Dhttps.proxyHost=your proxy hostname or ip
-Dhttps.proxyPort=your proxy port
```

If you are using HTTP proxy instead of HTTPS, replace HTTPS with HTTP.



In order to use browse function in Data Source Configuration tool, you need to set Windows proxy settings as well. Please contact your system administrator.

Advanced Topics & Notes

Additional technical information related to Analytics Connector.

Using Analytics Connector with Tableau Online

Senturus Analytics Connector supports for use with Tableau Online, but it requires the use of Tableau Bridge, which must be installed and configured separately. Please refer to https://www.tableau.com/en-gb/products/tableau-bridge for detailed instructions.

In addition, if you are using Senturus Analytics Connector ODBC in your Tableau workbooks/data sources, you will need to install the Senturus Analytics Connector client on the machine running Tableau Bridge. If you are using SQL Server drivers connecting to Senturus Analytics Connector server, then you need to install the same driver on Tableau Bridge computers.

Install and Configure Power BI Gateway

Starting from version 5.0, you can connect from Power BI Desktop and powerbi.com to Analytics Connector via SQL Server database connection.

If you migrated from version 4.x, you may still use Power BI Custom Connector to connect, and all your old reports and data sources will continue working.

You need to install and configure on-premises Power BI Gateway on one of your computers in your local network and create data sources on powerbi.com before your business users can link their reports/datasets data sources.

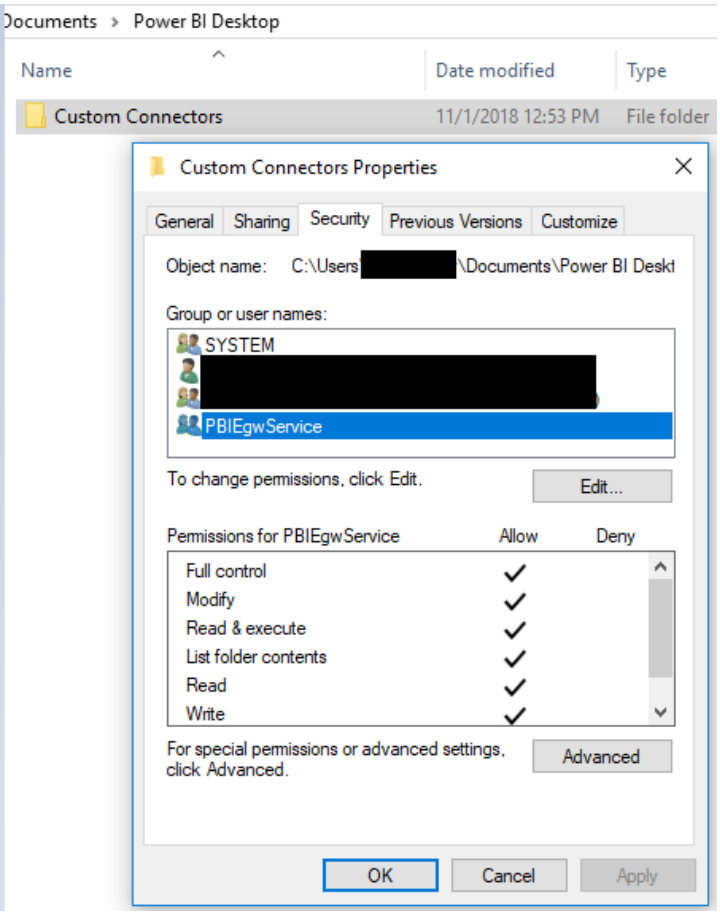
Follow steps bellow to install and configure Power BI Gateway with Analytics Connector.

1. Download and install the latest version of the on-premises Power BI Gateway from Microsoft.
2. Open on-premises Power BI Gateway application and sign in using the Microsoft Account associated with your Power BI Service.

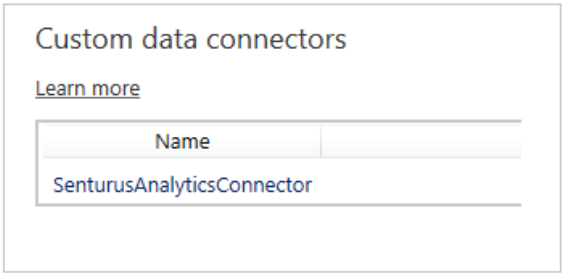
   If you are using Senturus custom data connector (.mez), follow step 3 through 6. Otherwise, jump to step 7.
3. Install Analytics Connector client on the same computer that you installed Power BI Gateway application.
4. Within Power BI Gateway application, go to “Service Settings” tab, take a note of “Gateway service account” option. Your gateway by default will be running as “NT SERVICES\PBIEgwService”.
5. Go to Windows File Explorer, copy the Custom Data Connector “*SenturusAnalyticsConnector.mez*” from “<install_root>\Power BI” to a folder, for example *“C:\Users\Public*\Documents*Power BI Desktop\Custom Connectors*” directory[5]. Make sure your

[5] Please refer to Power BI Custom Data Connector.

Gateway service account has at least read/write/execute permissions.

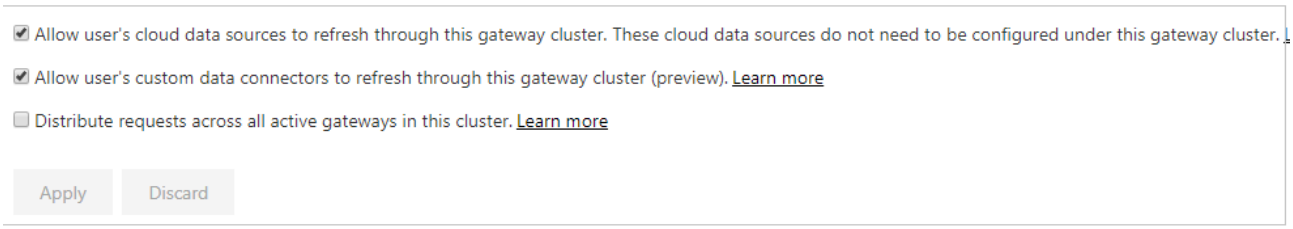


6. Within Power BI Gateway application, go to the Connectors tab, browse to the folder containing the SenturusAnalyticsConnector.mez file. When correctly configured, “Senturus Analytics Connector” will appear in the list of “Custom data connectors”.



7. Sign into Power BI service (https://app.powerbi.com).

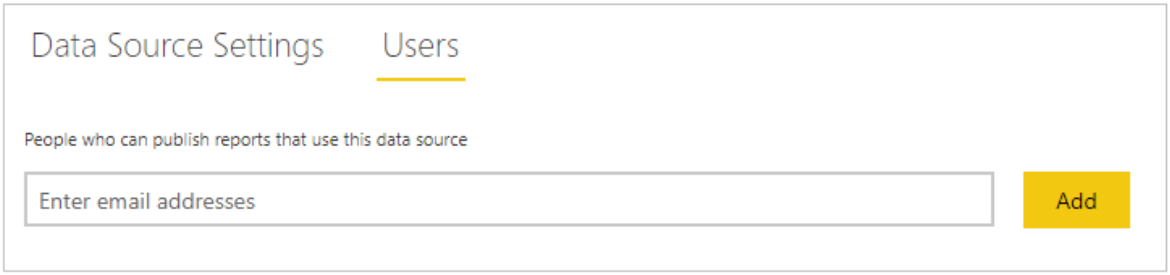
8. Go to Settings → Manage Gateways. Click on the gateway that links to your on-Premises Power BI gateway you set up above. Confirm the below two options are checked:



9. Add a data source to the Gateway: For DataSource Type, select Senturus Analytics Connector if you are using Senturus custom data connector in your Power BI reports, or SQL Server is you are using SQL Server connector.

10. Select Type for the server, database, username and password that the gateway will use to communicate with Cognos.

11. If other users in the organization need to publish reports to Power BI Service using the same data source, you can grant them permission on the Users tab.

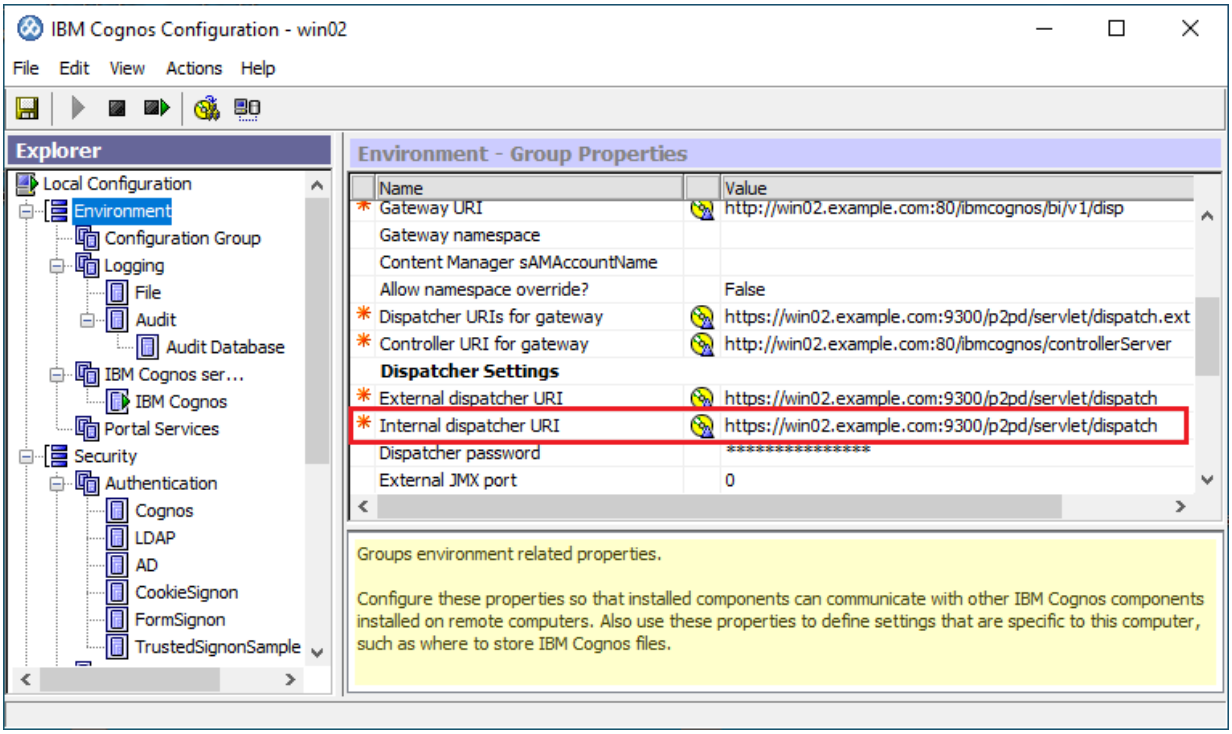


When you (or a user with permission) publish a workbook to the service with the same server and database, the gateway will be able to talk to your on-premises data using the Power BI Enterprise Gateway.

Finding Cognos Installation Information

Dispatcher URI

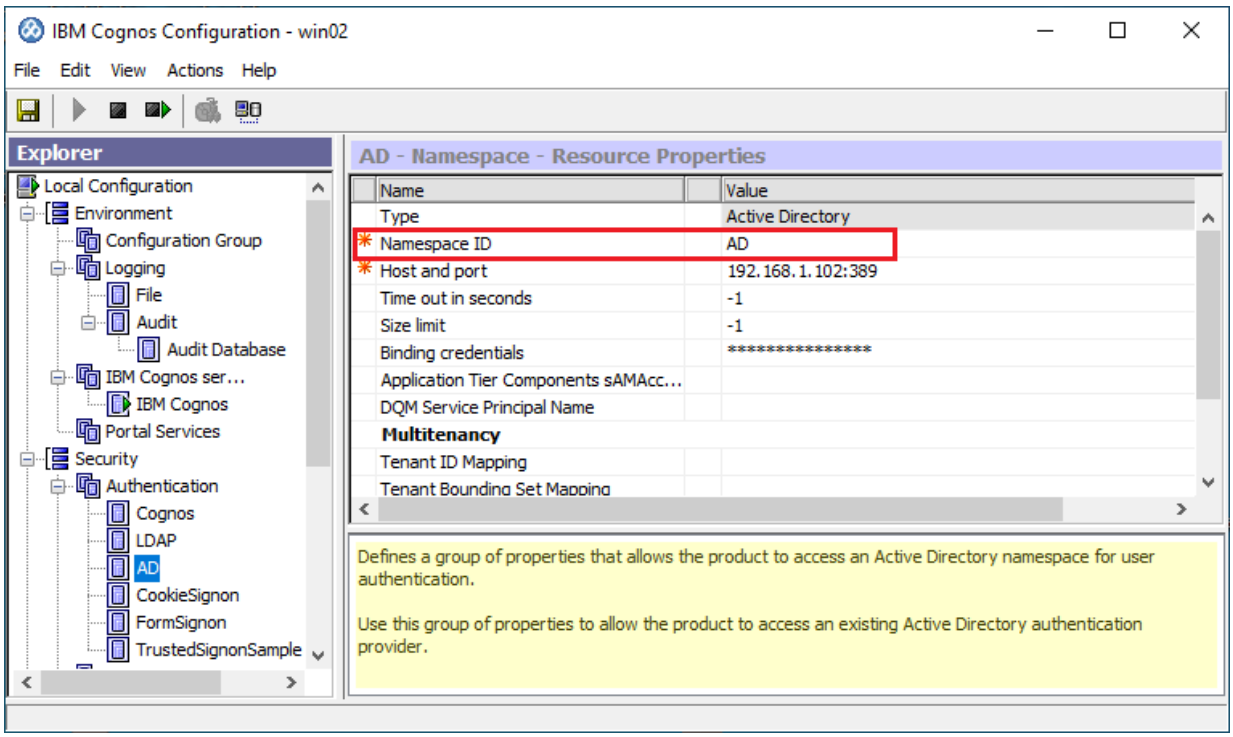
Analytics Connector server communicate with Cognos server via “Internal dispatcher URI”, which can be found in the found in the **Cognos Configuration** application, under **Environment → Internal dispatcher URI**.



Namespace ID

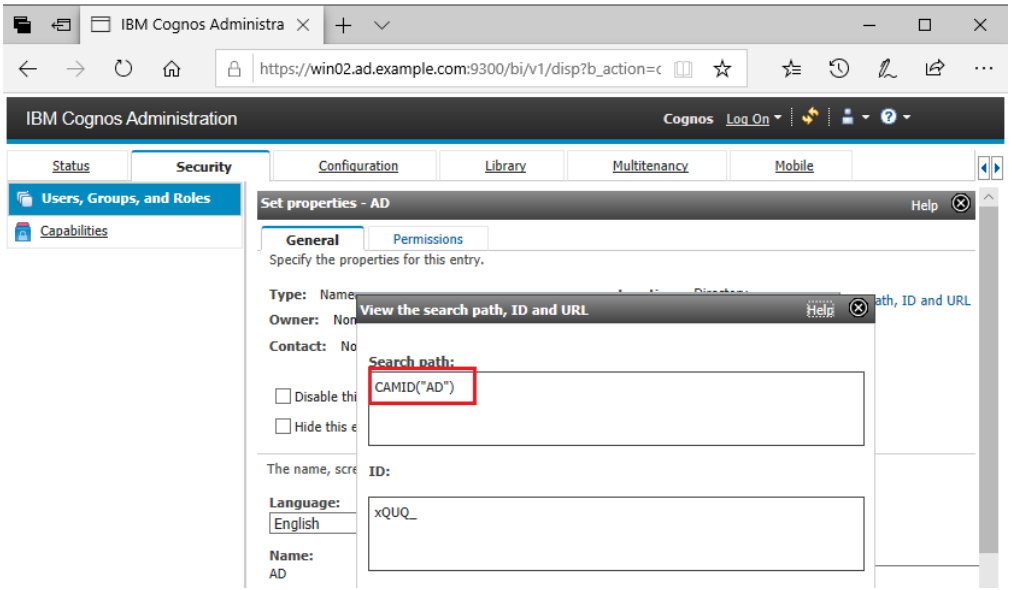
The Cognos namespace IDs are not necessarily the same as the namespace display names.

The Namespace ID value can be found in the **Cognos Configuration** application, under **Security → Authentication → <namespace>**.



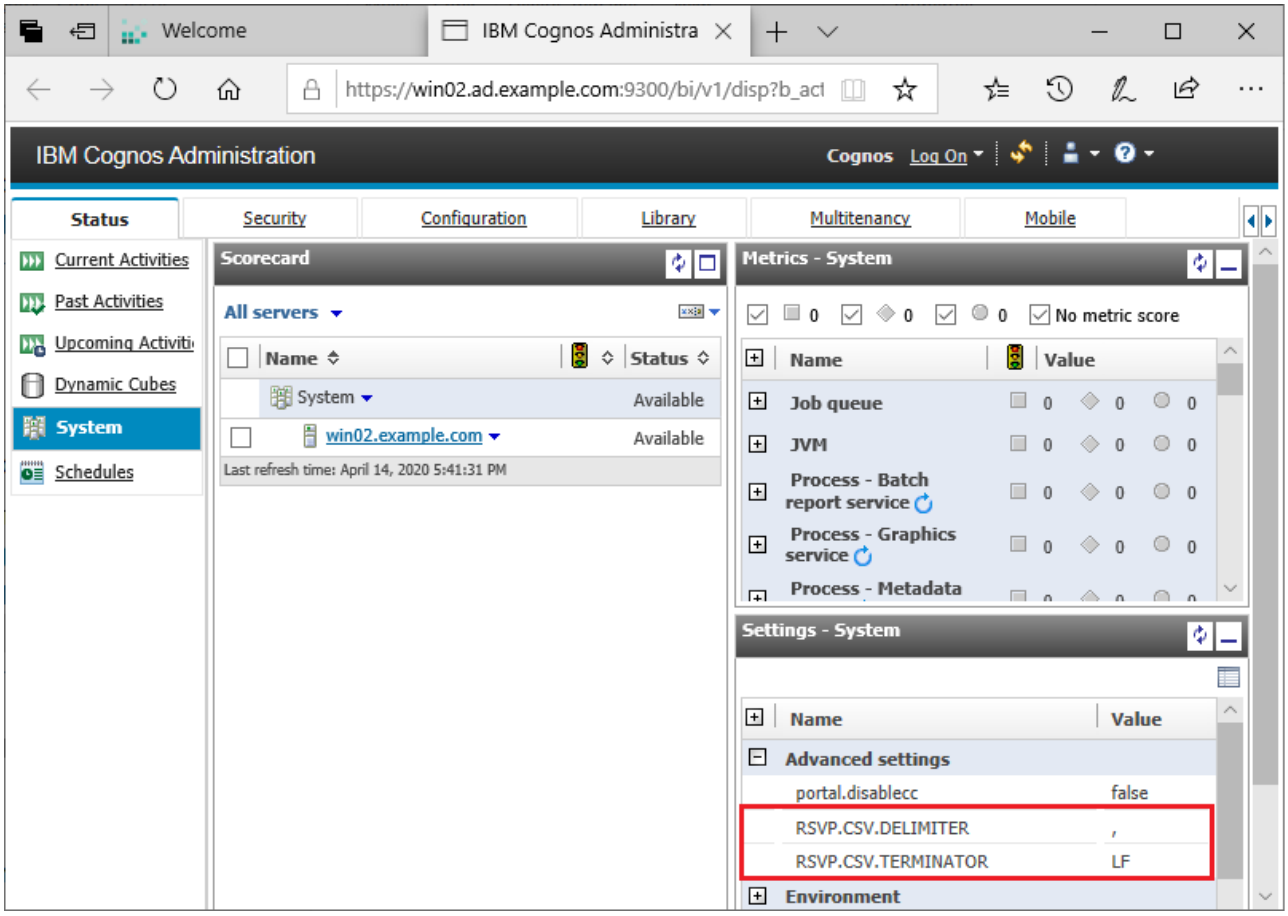
Alternatively, the Namespace ID can be found from the Cognos Adminitration console. Select the **Security** tab, click the **Properties** button ( ) next to the namespace, and click the link to view the Namespace ID (View the search path, ID and URL). The Namespace ID will be displayed in the **Search path** property. For example, **AD** is the Namespace ID you would use from the below

setting.


IBM Cognos Administra
https://win02.ad.example.com:9300/bi/v1/disp?b_action=c
IBM Cognos Administration
Cognos
Log On
Status
Security
Configuration
Library
Multitenancy
Mobile
Users, Groups, and Roles
Capabilities
Set properties - AD
Help
General
Permissions
Specify the properties for this entry.
Type:
Owner:
Contact:
View the search path, ID and URL
Help
Search path:
CAMID("AD")
Disable thi
Hide this e
ID:
xQUQ_
Language:
English
Name:
AD

CSV Settings

Your Cognos CSV settings can be found on the Cognos Administration page, under **Status → System → Settings-System → Advanced settings**.



Dead connections and TCP keepalive

Senturus Analytics Connector server and client connect through TCP connections, and these connections can be idle for very long time.

If these TCP connections are not stable, or your NAT (network address translation) service drops connections if they have been idle for a long time, or when your Power BI Desktop or Tableau Desktop crashed, these connections become dead and need to be removed from Analytics Connector server.

Senturus Analytics Connector server unitizes TCP keepalive to detect dead connections. The default idle timeout setting in most OS is 2 hours. But if you think this is too long, e.g. the dead connections happen too often so you wan to check them earlier, then you need to change OS' keepalive settings.

For Windows, open registry table, navigate to key `HKLM\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters` and add a DWORD field called `KeepAliveTime`, then set the value in milliseconds.

For Linux, it varies by distro, an example can be found here https://tldp.org/HOWTO/TCP-Keepalive-HOWTO/usingkeepalive.html.

Download root SSL certificate from Cognos using Google Chrome

1. Open Google Chrome and navigate to the Cognos gateway or dispatcher.
2. Click on the padlock icon left to the URL in address bar and select Certificate.
3. Go to Certification Path tab, select the root certificate and double click it. If you are using Cognos CA, this is CA certificate instead of CAMUSER.
4. In the new pop-up dialog, go to Details tab, click on “Copy to File…” button.
5. Click on Next in Certificate Export Wizard.
6. Check “DER encoded binary X.509 (.CER)” option and click Next.
7. Click “Browse…” button to bring up Save As dialog.
8. Select directory and type file name. Click on Save.
9. Click on Next.
10. Click Finish. You should get a “export successful” message.

Upgrade and Migrate Analytics Connector Server

If you need to upgrade Analytics Connector server to a newer version or need to upgrade the Cognos SDK version to reflect a Cognos upgrade, uninstall Analytics Connector server first and rerun the installer to the same directory. It's not necessary to upgrade client.

If you want to migrate Analytics Connector server from one computer to another, run Analytics Connector server installer on the new computer, then copy "<*install_root*>*DataSourceConfig.xml*" and "<*install_root*>*SSL*" from old computer to new one. It's not necessary to run Data Source Configuration on the new computer.

If you made some configuration changes using Service Configuration, those configurations (SSL configuration for example) will not be preserved after re-installing Analytics Connector server, so you need to re-do the same changes.

4.X to 5.X Upgrade process

Senturus Analytics Connector version 5 is backward compatible with version 4, so you don't need to update your Tableau and/or Power BI reports and data sources. Only thing you need to do is to uninstall version 4 and install version 5 on the same computer.

However, starting from version 5.0, you can connect from Power BI Desktop and powerbi.com to Analytics Connector via SQL Server database connection. We highly recommend all your new Power BI reports should be done using SQL Server database connection.

3.X to 4.X Upgrade process

There was an underlying technology change between the 3.x and 4.x versions of Analytics Connector that requires a slight adjustment to workbooks. Follow these steps to upgrade from 3.X to 4.X.

Upgrade Tableau Server:

- Save your license key and DataSourceConfig.xml files
- Uninstall Analytics Connector version 3.x
- Install Analytics Connector version 4.X, selecting both Analytics Connector server and Client
- Copy the license key and DataSourceConfig.xml files to the installation folder
- Restart Analytics Connector server service to pick up the file changes

Upgrade Tableau Desktop:

- Uninstall Analytics Connector version 3.x
- Install Analytics Connector version 4.X, selecting only Analytics Connector client component

Upgrade the Tableau Workbooks:

- Open Tableau workbook with Analytics Connector 3.x connections
- Edit the connection(s) in the workbook that rely on the 3.x Analytics Connector. Reconnect to the database, specifying the server name and port while retaining the same database name during the login process.
- Save and Test the workbook.
- Publish the workbook to Tableau Server.

    - Note: Your Tableau Server will need the upgraded Analytics Connector client component installed and configured to talk to the upgraded Analytics Connector server component when the workbook is published.

- Test the published workbook, which will test the upgraded client and server components.
- Repeat the process for additional Tableau Workbooks.