

# Invantive Bridge

*Reference Manual*



# Contents

<b>1</b>	<b>Microsoft Power BI</b>	<b>1</b>
1.1	Configuration .....	1
1.1.1	ADO.NET provider .....	1
1.1.2	Custom Connectors .....	1
1.1.3	Data Source .....	4
1.1.4	License .....	5
<b>2</b>	<b>Microsoft Visual Studio</b>	<b>6</b>
2.1	Configuration .....	6
2.1.1	Preparation .....	6
2.2	Solution .....	7
<b>3</b>	<b>Generic</b>	<b>8</b>
<b>4</b>	<b>Invantive Basics</b>	<b>9</b>
4.1	Configuration .....	9
4.1.1	Customer Service .....	9
4.1.2	OS Platform .....	9
4.1.3	Startup Checks .....	9
4.1.4	Cryptography .....	10
4.1.5	UI Language .....	10
4.1.6	Folders .....	11
4.1.7	Capacity .....	12
<b>5</b>	<b>Invantive SQL</b>	<b>12</b>
5.1	Language .....	13
5.1.1	Compatibility .....	13
5.1.2	Distributed SQL, Databases and Data Containers .....	13
5.1.3	Service Providers .....	13
5.1.4	Partitioning .....	13
5.1.5	Identifiers .....	13
5.1.6	Procedural SQL .....	14
5.1.7	Licensing .....	14
5.1.8	Settings.xml .....	14
5.1.9	Group Functions .....	14
5.1.10	Locking .....	15
5.1.11	Transactions .....	15
5.1.12	Grammar .....	15
5.2	Providers .....	106
5.2.1	Provider Atom10 .....	106
5.2.2	Provider AutoTask .....	106
5.2.3	Provider CbsNI .....	106
5.2.4	Provider Conversion .....	108
5.2.5	Provider DataCache .....	113
5.2.6	Provider DataDictionary .....	118
5.2.7	Provider DocumentCloud .....	121
5.2.8	Provider Dropbox .....	122
5.2.9	Provider Dummy .....	123
5.2.10	Provider DynamicsCrm .....	124
5.2.11	Provider EcbExchangeRates .....	124
5.2.12	Provider Edifact .....	124

5.2.13	Provider ExactOnlineAll .....	125
5.2.14	Provider EzBase .....	134
5.2.15	Provider Facebook .....	135
5.2.16	Provider Freshdesk .....	138
5.2.17	Provider Ftp .....	140
5.2.18	Provider GitLab .....	142
5.2.19	Provider IbmDb2Udb .....	142
5.2.20	Provider InMemoryStorage .....	142
5.2.21	Provider Invantive.Producer .....	148
5.2.22	Provider JIRA .....	150
5.2.23	Provider Kadaster .....	152
5.2.24	Provider KeePass .....	154
5.2.25	Provider LastResort .....	156
5.2.26	Provider LinkedIn .....	161
5.2.27	Provider LoketNL .....	162
5.2.28	Provider Magento .....	164
5.2.29	Provider Mail .....	164
5.2.30	Provider Mendix .....	166
5.2.31	Provider MicrosoftGraph .....	166
5.2.32	Provider MySql .....	166
5.2.33	Provider Nasa .....	168
5.2.34	Provider NmbrsNL .....	170
5.2.35	Provider OAuth UI provider .....	172
5.2.36	Provider Odbc .....	178
5.2.37	Provider OpenArch: OPENARCH (NL) information .....	178
5.2.38	Provider OpenExchangeRates: Open Exchange Rates .....	180
5.2.39	Provider OpenSpendingNL: Openspending.nl .....	182
5.2.40	Provider Oracle: Oracle C driver-based provider .....	184
5.2.41	Provider OracleManaged: Oracle .NET driver-based .....	184
5.2.42	Provider Os: Windows operating system objects .....	185
5.2.43	Provider PayPal: PayPal .....	186
5.2.44	Provider PostgreSQL: PostgreSQL .....	187
5.2.45	Provider RdwNL: RDW (NL) information .....	188
5.2.46	Provider Rss20: RSS version 2.0 .....	190
5.2.47	Provider Salesforce: Salesforce CRM and other applications .....	191
5.2.48	Provider Sftp: Secure FTP .....	194
5.2.49	Provider SilverEssence: SilverEssence .....	194
5.2.50	Provider Slack: Slack .....	194
5.2.51	Provider Snelstart: Snelstart (NL) information .....	194
5.2.52	Provider SqlServer: Microsoft SQL Server .....	195
5.2.53	Provider StackExchange: StackExchange .....	196
5.2.54	Provider SwiftMt940Rabo: Swift MT940 Rabobank .....	199
5.2.55	Provider Teamleader: Teamleader CRM .....	200
5.2.56	Provider TeamViewer: TeamViewer online assistance .....	209
5.2.57	Provider Teradata: Teradata data warehousing .....	210
5.2.58	Provider Ubl20: UBL version 2.0 .....	210
5.2.59	Provider Ubl21: UBL version 2.1 .....	211
5.2.60	Provider Vies: AutoTask service management .....	211
5.2.61	Provider VirusTotal: VirusTotal .....	211
5.2.62	Provider VismaSevera: Visma Sev era project management .....	211
5.2.63	Provider WebService: Invantive Web Service HTTPS data protocol .....	213
5.2.64	Provider Wikipedia: Wikipedia information .....	213
5.2.65	Provider Wmi: Windows Management Instrumentation .....	215
5.2.66	Provider Xaa30: XML Auditfile Afrekensystemen version 3.0 .....	215
5.2.67	Provider Xaa31: XML Auditfile Afrekensystemen version 3.1 .....	215
5.2.68	Provider Xaf10: XML Auditfile Financieel version 1.0 .....	217
5.2.69	Provider Xaf30: XML Auditfile Financieel version 3.0 .....	217
5.2.70	Provider Xaf31: XML Auditfile Financieel version 3.1 .....	217
5.2.71	Provider Xaf32: XML Auditfile Financieel version 3.2 .....	218

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5.2.72	Provider Xas70: XML Auditfile Salaris version 7.0 .....	219
5.2.73	Providers .....	220
<b>5.3</b>	<b>Configuration .....</b>	<b>221</b>
5.3.1	Netw ork .....	221
5.3.2	License .....	221
5.3.3	Logging .....	222
5.3.4	Debugging .....	225
<b>6</b>	<b>Invantive SQL for Windows</b>	<b>225</b>
6.1	Internal Consistency Checks .....	225
6.2	OS Upgrade Checks .....	226
<b>7</b>	<b>Contact Information</b>	<b>226</b>
	<b>Index</b>	<b>228</b>

# 1 Microsoft Power BI

Invantive Bridge can be used in combination with the desktop edition of Microsoft Power BI.

## 1.1 Configuration

This section how to configure Invantive Bridge with Microsoft Power BI.

### 1.1.1 ADO.NET provider

Please follow these steps to access over 60 platforms supported by Invantive SQL from within the desktop edition of Power BI:

- Install Invantive Bridge (the ADO.NET provider) from <https://download.invantive.com/release/msi/Invantive%20Bridge%20for%20Power%20BI%20Users-current.msi>.
- The Invantive ADO.NET provider is installed in the so-called "Global Assembly Cache" of Microsoft Windows.
- Install the Custom Connectors as explained in the next section.

### 1.1.2 Custom Connectors

- Although usable without, we recommend to install the custom connectors for Power BI to add a graphical user experience from <https://download.invantive.com/release/msi/Invantive%20Bridge%20Connectors%20for%20Power%20BI-17.31.82-BETA.msi>.
- Start Power BI.
- Currently (Q1 2019), Microsoft does not seem to accept certifications on custom connectors, so we will have to go through a few additional steps.
- Therefore acknowledge five times the following error till Microsoft finishes of the certification (note that each time the list of Uncertified Connectors is different, but that all start with Invantive):



## Uncertified Connectors

The following connectors have not been certified, and we are unable to verify that they are secure to use:

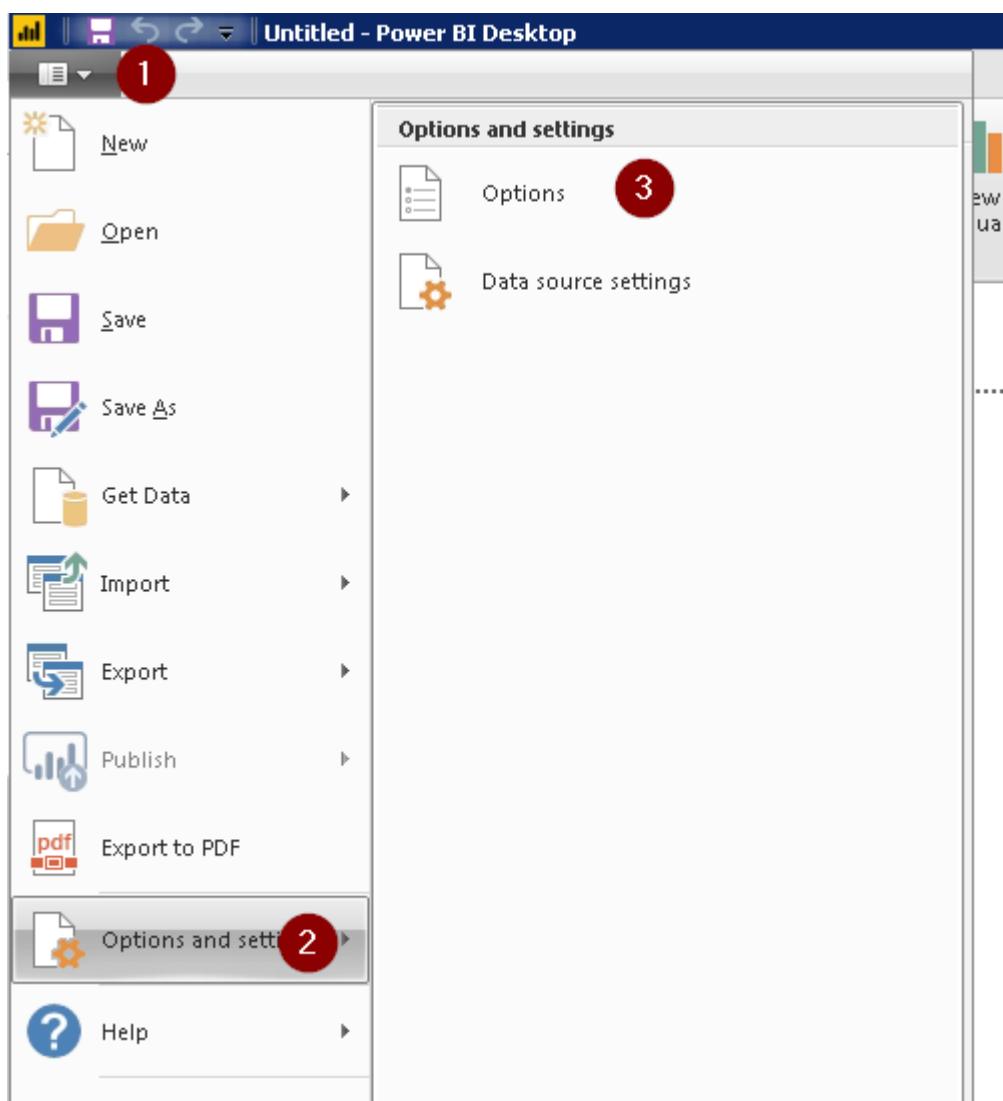
Invantive.Atom10  
Invantive.CbsNl  
Invantive.DocumentCloud  
Invantive.Dropbox  
Invantive.Dummy  
Invantive.DynamicsCrm  
Invantive.EcbExchangeRates  
Invantive.ExactOnline  
Invantive.Facebook  
Invantive.Freshdesk

If they were provided by vendors, please request that they contact Microsoft about the Certified Connector program. If you would still like to use them, please enable a lower data extension setting under the Security tab in the Options dialog, and restart Power BI Desktop.

 OK

### Power BI Uncertified connectors warning

- Go to the Options dialog and select the “Security” tab:



- Configure Data Extensions as follows:

The screenshot shows the "Options" dialog box. The left sidebar lists various global settings, with "Security" selected and highlighted with a yellow border. In the main pane, under "Data Extensions", there is a radio button group:

- (Recommended) Only allow Microsoft certified and other trusted third-party extensions to load
- (Not Recommended) Allow any extension to load without validation or warning

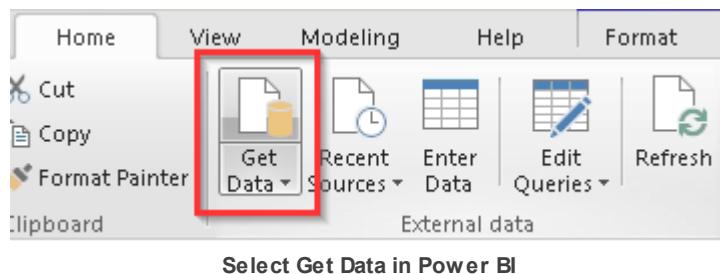
The second option is highlighted with a red rectangle. Below the radio buttons is a link: [Learn more about data extensions](#).

- Select the “OK” button.
- Restart Power BI.

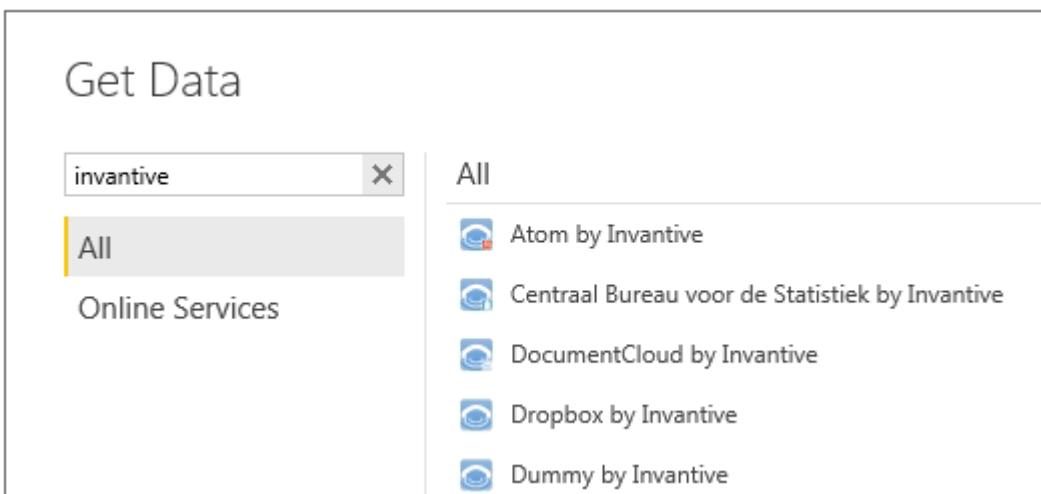
### 1.1.3 Data Source

Execute the following steps to set up an Exact Online data source:

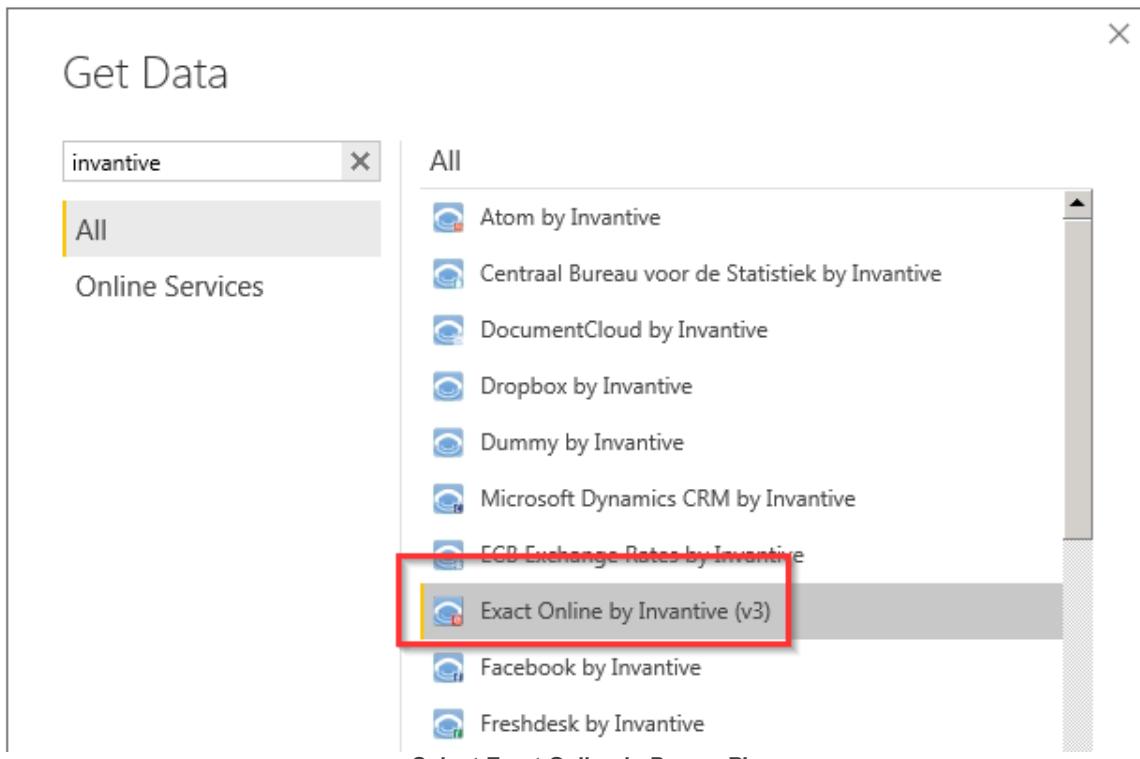
- Choose “Get Data” from the start window or from the Home ribbon:



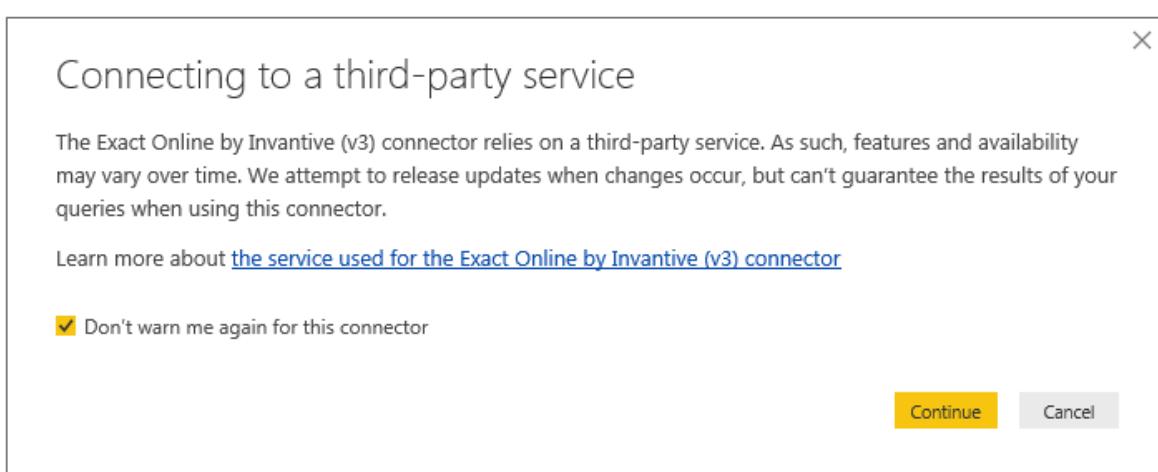
- Enter the prefix “Invantive” in the search filter:



- Select “Exact Online by Invantive (v3)”:



- Select the “Connect” button.
- After a delay, a warning is displayed: Check the box and select “Continue”:



Connecting Power BI to Exact Online warning on third-party service

#### 1.1.4 License

### Trial

By default a trial license valid for 30 calendar days will be installed and used when Invantive Bridge is installed. The user will receive a license error message after 30 days or when the data container was previously used with a trial license.

### Permanent License

The recommended steps to install a license key are:

- Place the text of the license key in a file named 'invantive.lic' in the folder %USERPROFILE%\invantive.
- Or set the environment variable INVANTIVE\_LICENSE\_FILE\_PATH to the full path of the file.
- Restart Microsoft Power BI.

Alternatively, the file path of the license file can also be specified using the connection string key "license-file" of the Power BI data source as in:

```
license-file=h:\invantive\invantive-bridge-license.txt
```

Other driver-specific configuration options such as the client ID or number of parallel requests (requests-parallel-max) can be configured in the connection string too. The available options are listed with the data model of each Invantive SQL connector on <https://documentation.invantive.com>.

## 2 Microsoft Visual Studio

Invantive Bridge can be used in combination with Microsoft Visual Studio and Microsoft .net Standard 2.0 or Microsoft .net Framework 4.7 or newer.

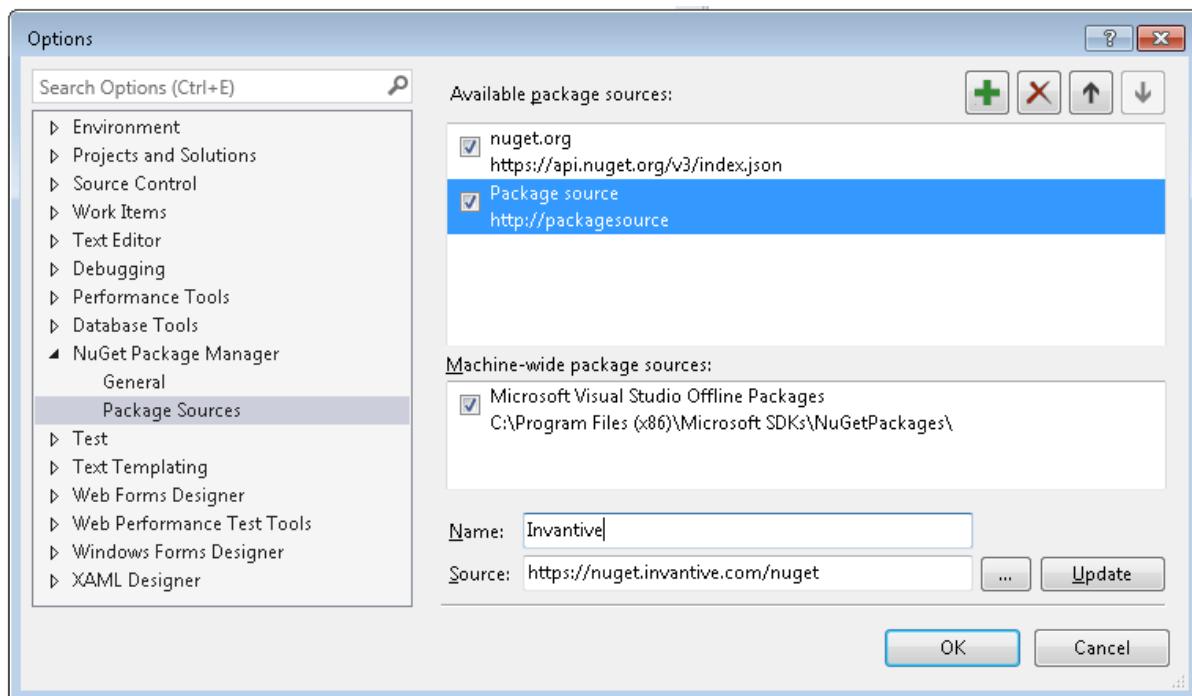
### 2.1 Configuration

This section how to configure Invantive Bridge with Microsoft Visual Studio.

#### 2.1.1 Preparation

For use with Microsoft Visual Studio:

- Make sure you have .NET Framework 4.7 installed.
- Make sure you have .NET standard 2.0 installed by the Windows installer on dot.net core download site.
- Start Visual Studio 2017.
- Add <https://nuget.invantive.com/nuget> as a source to your NuGet package manager:



- Open the solution file edit the folder solutions.
- Change user name / password where applicable in the projects.
- Run a sample project as described in [Solution](#) [7].

## 2.2 Solution

The easiest way to start is to download a sample solution by following these steps:

- Git clone <https://gitlab.com/lnvantive/lnvantive-bridge-samples.git>.
- Open the solution.
- Ensure the NuGet source nuget.invantive.com is configured.
- Change the constants in Program.cs:

```

1  using Invantive.Data;
2  using System;
3  using System.Data;
4  using System.Data.Common;
5  using System.Windows.Forms;
6
7  namespace Invantive.Bridge.Sample.ExactOnline
8  {
9      class Program
10     {
11         static void Main(string[] args)
12         {
13             DbProviderFactory providerFactory = new InvantiveClientFactory();
14
15             using ( IDbConnection connection = providerFactory.CreateConnection())
16             {
17                 /* *** REMEMBER TO CHANGE USER NAME, PASSWORD AND COUNTRY CODE TLD (nl, de, be, co.uk, com, fr, es). ***/
18                 const string EOL_USER = "log on code";
19                 1 const string EOL_PASSWORD = "pwd";
20                 const string EOL_COUNTRY_TLD = "nl";
21
22                 //
23                 // Please note the following:
24                 //
25                 // - On initial use, a bundled 30-day trial license is used automatically. Once that license expires, you
26                 // either a user license or a partner license. OEM, ISV, white label and VAR licenses are also available.
27                 // The location where you have stored the license file can be specified in the connectionstring using
28                 // - During the trial period, a bundled client ID will be used. When you build an application using Invantive
29                 // a custom client ID per se the Exact Online Partner Agreements which you enter into.
30                 // - 2 phase authentication is and will not be supported with the headless OAuth provider. It is only supported
31                 // provider and the OAuth Web provider.
32                 // - When you have any questions, please check http://stackoverflow.com first. Otherwise contact Invantive
33                 // support@invantive.com.
34                 // - The number of tables varies by the platform. On Exact Online there are approximately 750 tables available
35                 // 'select name from systemtables@datadictionary'.
36                 //
37             connection.ConnectionString = $"provider=ExactOnlineAll;apiUrl=https://start.exactonline.{EOL_COUNTRY_TLD}";
38             connection.Open();
39
40             using ( IDbCommand command = connection.CreateCommand())
41             {
42                 command.CommandText = "select fullname from me";
43
44                 string fullName = DataUtility.ConvertToString(command.ExecuteScalar());
45
46                 string msg = $"Hello {fullName}!";
47
48                 MessageBox.Show(msg);
49
50                 //Console.WriteLine(msg);
51             }
52         }
53     }
}

```

- Press F5.

### 3 Generic

There are various settings in the connection string for the Invantive ADO.NET provider on top of the settings that differ per platform.

For the platform-specific settings please consult the platform-specific documentation on <https://documentation.invantive.com>.

The additional (optional) settings are:

- **provider**: the name of the provider to be used. Defaulted by the Custom Connectors on Power BI. A list of provider names can be found using the query 'select \* from sys-tempproviders@datadictionary'. The name of a provider are also listed on the platform-specific documentation on the initial documentation page.
- **license-file**: full path to an Invantive license file, such as h:\cfg\invantive.lic. When not specified, the license file path will be taken from the environment variable INVANTIVE\_LICENSE\_FILE\_PATH and otherwise from a file named invantive.lic in the Invantive configuration folder.

- **database:** full name of the Invantive SQL database to connect to in the format GROUP\NAME. The database must be configured beforehand using settings\*.xml files.
- **onconnect:** an Invantive SQL batch to be executed directly after the connection to the Invantive SQL database has been opened. The batch statement may include multiple SQL statements, separating individual statements using semi-colon as specified by the Invantive SQL grammar.
- **user id:** the log on code to use.
- **password:** the password to use.

The **onconnect** setting is often used to set up the data containers opened. For example, the following SQL statements first select three Exact Online companies and then enable the use of the HTTP disk cache:

```
use 123123, 234234, 3434; set use-http-disk-cache-read true; set  
use-http-disk-cache-write true
```

## 4 Invantive Basics

### 4.1 Configuration

#### 4.1.1 Customer Service

All Invantive products exchanges messages with a central Customer Service node. These messages include:

- error messages for analysis,
- usage statistics for billing.

On Invantive-internal development workstations only, a non-standard Customer Service node can be selected by specifying a deviating URL in the environment variable `INVANTIVE_CS_BASE_URL`.

#### 4.1.2 OS Platform

A variety of Invantive products is available on Windows, Linux and Mac OSX. The list of supported platforms varies per product, depending on the availability of the libraries such as Microsoft .NET Core.

The OS platform is automatically determined by Invantive software, but sometimes can raise bugs given the bleeding edge nature of Microsoft .NET Core. It is possible to overrule the automatic detection of the OS platform by assigning a value to the environment variable `INVANTIVE_FORCED_OS`. The following values are supported:

- `windows`: Microsoft Windows,
- `linux`: Linux,
- `osx`: Mac OSX.

#### 4.1.3 Startup Checks

The Invantive products execute a number of checks at application start to ensure that the environment running the software meets a number of pre-conditions as established by Invantive. These checks can be disabled for analysis purposes and out-of-the-ordinary deployment scenarios.

Support on products is only available when checks are not manually configured.

## All Platforms

The following settings are available on all platforms:

- `INVANTIVE_MIN_GB_FREE_SYSTEM`: minimum amount of free disk space in GB on the system disk during startup. Defaults to 5 GB.

## Microsoft Windows

Configuration of these checks is solely available on the Windows OS platform.

The following environment variables allow manual configuration of the checks by setting them to 'true' or 'false':

- `INVANTIVE_CHECK_SYSTEM_COMPATIBILITY`: validate system compatibility.
- `INVANTIVE_MAINTAIN_VSTO`: re-activate Invantive VSTO add-ins when disabled.
- `INVANTIVE_CHECK_OS_UPDATES`: validate OS updates have been applied sufficiently recent.

### 4.1.4 Cryptography

The Invantive products use cryptographic operations to protect:

- License key
- Invantive Keychain

By default, a key pair is used and stored in the profile of the user for encryption and decryption.

## Windows

On Windows, the encryption is normally done using Windows-managed encryption protocols. The key elements are stored in the roaming profile of the current user.

In some deployment scenarios, a user has only a temporary Windows profile. In that case it is not possible to store a key pair. This is typically signaled by an `itgenlic510` error code.

As an alternative, you can configure the environment variable `INVANTIVE_CRYPTOGRAPHY` to the value "MACHINE" to use a key pair that is stored solely on the device.

By setting the environment variable `INVANTIVE_RSA` to `INVANTIVE`, encryption on Windows is also managed as on other platforms by custom Invantive code at the expense of loss of some security features. Often Windows patches break the functionality of previously Windows-managed encryption keys, typically signaled by a error like "Key not valid for use in specified state". Switching to custom Invantive code will solve this problem.

## Linux, Mac OSX, Android, iPhone, Windows on Parallels

On all other platforms, Invantive offers solely encryption using key elements stored in files in the RSA folder.

### 4.1.5 UI Language

The Invantive products supported approximately ten languages. On first startup, the language of the Windows version will be used when supported. Otherwise US-English is used.

The license decides which from the languages are supported.

Additionally, the user interface language chosen can further be restricted by setting the environment variable `INVANTIVE_ALLOWED_LANGUAGE_CODES` to a comma-separated list of two characters ISO 639-1 codes.

#### 4.1.6 Folders

The Invantive products store configuration and runtime information in a folder hierarchy. This hierarchy is located within the Invantive folder of the user profile. It can be opened in Windows Explorer by entering `%USERPROFILE%\Invantive` in the location bar.

The location of the folder hierarchy can be changed using environment variables. The central location can be changed by setting the environment variable `INVANTIVE_CONFIGURATION_FOLDER` to a different folder.

A number of subfolders can be relocated too:

- `INVANTIVE_CONFIGURATION_BACKUP_FOLDER`: the folder with backups of settings files. Defaults to the master folder plus "Backup".
- `INVANTIVE_CONFIGURATION_CACHE_FOLDER`: the folder with disk cache files. Defaults to the master folder plus "Cache".
- `INVANTIVE_CONFIGURATION_HTTP_CACHE_FOLDER`: the folder with HTTP disk cache files. Defaults to the root cache folder plus "http" and the OS-user and front-end user.
- `INVANTIVE_CONFIGURATION_PERMANENT_CACHE_FOLDER`: the folder with permanent disk cache files such as backups of Swagger specification files. Defaults to the root cache folder plus "permanent" and the OS-user and front-end user.
- `INVANTIVE_CONFIGURATION_INCREMENTAL_DATA_FOLDER`: the folder with permanent incremental data files such as Exact Online sync APIs. Defaults to the root cache folder plus "incdata" and the OS-user and front-end user.
- `INVANTIVE_CONFIGURATION_DATA_CACHE_CACHE_FOLDER`: the folder with Data Cache disk cache files. Defaults to the root cache folder plus "datacache". Disk cache files improve performance of HTTP downloads, but when necessary can be purged.
- `INVANTIVE_CONFIGURATION_LOG_FOLDER`: the folder with log files. Defaults to the master folder plus "Log".
- `INVANTIVE_CONFIGURATION_DATABASES_FOLDER`: the folder with databases files. Defaults to the master folder.
- `INVANTIVE_CONFIGURATION_PLUGINS_FOLDER`: the folder with plugin files. Defaults to the master folder plus "Plugins".
- `INVANTIVE_CONFIGURATION_PROVIDERS_FOLDER`: the folder with provider files. Defaults to the master folder plus "Providers".
- `INVANTIVE_CONFIGURATION_RSA_FOLDER`: the folder with RSA configuration files. Defaults to the master folder plus "RSA".
- `INVANTIVE_CONFIGURATION_TEMPLATES_FOLDER`: the folder with template files. Defaults to the master folder plus "Templates".
- `INVANTIVE_CONFIGURATION_TRACE_FOLDER`: the folder with trace files. Defaults to the master folder plus "Trace".

The values may contain any combination of the following placeholders which will be expanded:

- iid: Invantive Installation ID.
- sessionid: Invantiv session ID.
- frontenduser: name of front-end user (when available).
- osuser: name of operating system user.

A folder can be configured for custom translations which overrule all default translations using the environment variable INVANTIVE\_I18N\_FOLDER.

#### 4.1.7 Capacity

The Invantive products can configure the capacity of various elements using environment variables.

Support on products is only available when checks are not manually configured.

The following settings are available on all platforms:

- INVANTIVE\_DEFAULT\_THREAD\_POOL\_MIN\_WORKER\_THREADS: minimum number of worker threads in default pool. Defaults to twice the number of processors.
- INVANTIVE\_DEFAULT\_THREAD\_POOL\_MIN\_ASYNC\_IO\_THREADS: minimum number of asynchronous I/O threads in default pool. Defaults to twice the number of processors.

## 5 Invantive SQL

One of the most familiar questions at our support desk is "what functions are available" in Invantive UniversalSQL to query data in Exact Online.

This second-generation SQL parser is an extensive implementation of many commonly found SQL constructs from the ANSI SQL standard.

It includes in addition to the features of the first-generation SQL parser also:

- joins,
- outer joins,
- cross joins,
- group functions such as stddev, avg and listagg,
- value functions such as xmlescape and round.

There are two flavors shipped:

- Free version: second-generation SQL parser without joins and some upcoming non-ANSI standard advanced mapping functions for large volume financial analysis and reporting.
- Paid version: identical to the free version but with joins and advanced mapping functions.

The EBNF-grammar in [Grammar](#)<sup>15</sup> depicts the possibilities.

## 5.1 Language

### 5.1.1 Compatibility

The Invantive implementation of SQL is based upon ANSI SQL, extended by aspects from popular SQL implementations such as PostgreSQL, MySQL, Oracle, Teradata and Microsoft SQL Server. It is topped off with Invantive-specific extensions, especially for procedural SQL, distributed SQL and distributed transactions. The basis is to implement functions such that as little as possible changes are necessary to run a SQL statement originating from another SQL implementation on Invantive UniversalSQL. For instance, to retrieve the current time you can use 'sysdate', 'now', 'getdate()' and 'sysdatetime' to name a few. The same holds for the procedural extension Invantive Procedural SQL, which reflects SQL/PSM and makes it easy to port Oracle PL/SQL or PostgreSQL PL/pgSQL statements.

### 5.1.2 Distributed SQL, Databases and Data Containers

It is easy to exchange and/or combine data across the supported platforms with data. To each platform (such as Salesforce or Exact Online Belgium) multiple connections can be active with the same or different platform-specific connection settings. Each open connection to a platform is named a 'data container'.

All opened connections together are named a 'database'.

When multiple data containers have been opened, each one has an alias to refer it by in Invantive UniversalSQL statements. For instance, a connection can be open for two different customer accounts on Exact Online Netherlands aliased as 'eolnl\_comp1' and 'eolnl\_comp55') and one for an Exact Online Belgium custom, aliased as 'eolbe\_my\_new\_company'. The aliases can be freely chosen as long as they are valid identifiers and defined in the databases configuration file 'settings.xml'.

### 5.1.3 Service Providers

A number of special connections are always made, each of which can occur at most once. These are the 'service providers' such as:

- 'datadictionary': metadata of the current database, such as list of tables and executed SQL statements performance.
- 'os': information on the operating system running the SQL engine, such as reading file contents.
- 'smtp': synchronously send mails through SMTP.

### 5.1.4 Partitioning

Especially online platforms have a multi-tenant structure, in which the data is partitioned per customer, company or person. When the data model is identical across tenants, Invantive UniversalSQL considers them 'partitions'. SQL statements can run across multiple or one partitions, often in parallel. This enables consolidation scenarios across partitions (such as Exact Online or Nmbrs companies) as well as high-performance in MPP environments.

The partitions to be used can be specified with the 'use' statement, either through an explicit list of partitions to be selected across data containers, or through a SQL select statement returning the list of partitions to use. Please note that although the 'use' statement resembles the 'use DATABASE' statement on Microsoft SQL Server or PostgreSQL you can on Invantive UniversalSQL have multiple partitions active at the same time in one user session.

### 5.1.5 Identifiers

For identifiers, the regular conventions hold for the set of allowed characters. Depending on the platform, the identifiers are case sensitive or not. In general, it is best to assume that the

identifier are case insensitive. There is no length limit on an identifier imposed by Invantive UniversalSQL.

#### 5.1.6 Procedural SQL

Invantive Procedural SQL (or "PSQL" for short) is a procedural extension on top of Invantive UniversalSQL. It is based on the ISO-standard 9075-4:2016 (SQL/PSM) and extends Invantive UniversalSQL with procedural options like blocks, variables, conditional execution and loops. The procedural code is - together with the Invantive UniversalSQL contained - as a whole into pseudo-code and then executed.

The procedural code does not lean on the procedural options of the platforms being used, so it is easy to retrieve and change data in all supported cloud, file and database platforms. The pre-compiled procedural code does not perform context switches between procedural and SQL logic.

#### 5.1.7 Licensing

The available functionality of Invantive UniversalSQL features is based upon the license features. For instance the free implementation of Invantive UniversalSQL is limited to 1.000 rows and no access to group functions. Please consult the data dictionary contents for your license features.

#### 5.1.8 Settings.xml

The file settings.xml defines for a user or program the list of defined databases. Databases are grouped in 'database groups' for visual display. Database groups have no further functionality. Each database consists of one or multiple data containers.

The file 'settings.xml' is most often found on Microsoft Windows in your '%USERPROFILE%\invantive' folder, such as 'c:\users\john.doe\invantive\settings.xml'. It is shared across all Invantive UniversalSQL product installations for the user.

There are many scenarios to share database specifications across a user community, such as WAN-scenarios with Invantive Web Service, large corporate scenarios using DNS-entries as well as file shares, included files as well as single user solutions. Please involve a consultant when you want to deploy across thousands of users or more.

For user communities of up to 10 users, we recommend that company-specific settings are grouped per role in a separate file named 'settings-ROLE.xml' and placed in the default folder. Invantive UniversalSQL will automatically merge these files in the main settings.xml file.

#### 5.1.9 Group Functions

The Invantive implementation of SQL is based upon ANSI SQL, extended by aspects from popular SQL implementations such as PostgreSQL, MySQL, Oracle, Teradata and Microsoft SQL Server. It is topped off with Invantive-specific extensions, especially for distributed SQL and distributed transactions. The basis is to implement functions such that as little as possible changes are necessary to run a SQL statement originating from another SQL implementation on Invantive UniversalSQL. For instance, to retrieve the current time you can use 'sysdate', 'now', 'getdate()' and 'sysdatetime' to name a few.

Popular group functions such as 'stddev' are available. However, currently you can not combine in one unnested SQL statement both group functions as well as expressions on the variables. In that case use an inner (nested) SQL statement to apply the expressions on the data, and execute the group functions in the outer SQL statement with the syntax 'select group() from ( select ... from ... )'.

### 5.1.10 Locking

An Invantive UniversalSQL statement can work with many traditional and online platforms. There are no locking features on data and objects, since few online and traditional platforms connected provide these and the typical use of distributed transactions leave even less opportunity for data and object locking.

### 5.1.11 Transactions

Invantive UniversalSQL has limited support for transactions. DML is forwarded to a platform and depending on the platform an error can cause part of the work to be registered or everything to be rolled back. Within the SQL engine, multiple changes can be collected and forwarded to the platform at once. For instance, when creating an EDIFACT message you need to combine an invoice header with invoice lines into one EDIFACT message. Collection of multiple changes is done using the 'identified by' and 'attach to' syntax, optionally preceded by 'begin transaction'.

### 5.1.12 Grammar

#### sqlBatch:

```
sqlOrPsqlStatement BATCHSEPARATOR BATCHSEPARATOR  
sqlBatch15 ::= sqlOrPsqlStatement15 ( BATCHSEPARATOR15?  
sqlOrPsqlStatement15 ) * BATCHSEPARATOR15?
```

no references

#### sqlOrPsqlStatement:

```
sqlStatement pSqlStatement  
sqlOrPsqlStatement15  
 ::= sqlStatement15  
 | pSqlStatement102
```

referenced by:

- [sqlBatch<sub>15</sub>](#)

#### sqlStatement:

An Invantive UniversalSQL can retrieve data from many traditional and online platforms. Many platforms also support the use of DML (Data Manipulation Language) statements to change the data contained. On a few platforms you can execute DDL (Data Definition Language) statements to create new data structure or objects such as tables, procedures or sequences.

[selectStatement](#) [insertStatement](#) [updateStatement](#) [deleteStatement](#) [ddlStatement](#) [setStatement](#) [useStatement](#) [transactionStatement](#) [executeFileStatement](#)

```
sqlStatement[15]
  ::= selectStatement[16]
  | insertStatement[45]
  | updateStatement[47]
  | deleteStatement[47]
  | ddlStatement[38]
  | setStatement[42]
  | useStatement[44]
  | transactionStatement[42]
  | executeFileStatement[43]
```

referenced by:

- [pSqlStatement](#)[102]
- [sqlOrPSqlStatement](#)[15]

### **selectStatement:**

A SQL select statement retrieves data from one or multiple data containers. A select statement can be composed of multiple data sets retrieved from many platforms, combined by set operators such as 'union'.

Often the performance of cloud platforms is less than traditional database platforms. With the 'limit' clause a limited number of rows can be retrieved quickly from a table or view after applying sorting as specified by the possibly present 'order by'. An alternative for a 'limit' clause is to use the 'top' clause.

A sequence of Invantive UniversalSQL statements, separated by the semi-colon separator character.

Each statement in the SQL batch will be executed consecutively. Execution will be stopped when an error occurs during execution of a statement.

uniqueSelectStatement setOperatorSelectStatement orderBy limitClause

```
selectStatement[16]
  ::= uniqueSelectStatement[17]
  setOperatorSelectStatement[17]* orderBy[29]? limitClause[22]?
```

referenced by:

- [arithmeticExpression](#)[55]
- [createTableStatement](#)[41]
- [embeddedSelect](#)[22]
- [inSelectStatement](#)[16]
- [insertStatement](#)[45]
- [pSqlForRecordLoopStatement](#)[105]
- [sqlStatement](#)[15]
- [useStatement](#)[44]

### **inSelectStatement:**

A SQL select statement retrieves data from one or multiple data containers. This variant makes this data available to a containing SQL select statement. This feature is also known as an 'inline view'.

```
selectStatement
  inSelectStatement16
    ::= selectStatement16
```

referenced by:

- predicateExpression<sup>52</sup>

### setOperatorSelectStatement:

SQL is based upon a solid mathematical foundation named 'set theory' with some exceptions. The set operators of Invantive UniversalSQL enable you to combine sets of data sets such as merging two sets of data. Please note that SQL actually uses 'bags', which opposed to 'sets', allow duplicates. To change bags of data into sets, either use 'distinct' or the 'union' set operator without 'all'. In general, the extensive use of 'distinct' signals bad database design.

The 'union' set operator returns the union of the data on the left and right side of the union while removing duplicate rows. The 'union all' set operator returns the union of the data on the left and right side of the union without removing duplicate rows. The 'minus' set operator returns all rows from the left side which do not occur in the right side. The 'intersect' set operator returns all rows that occur both in the left and right side.

UNION ALL MINUS\_C INTERSECT uniqueSelectStatement

```
setOperatorSelectStatement17
  ::= ( UNION15 ALL15? | MINUS_C15 | INTERSECT15 )
uniqueSelectStatement17
```

referenced by:

- selectStatement<sup>16</sup>

### uniqueSelectStatement:

Retrieves a data set from one or more data containers.

select executionHints distinct topClause selectList INTO variableList FROM dataSource  
joinStatements whereClause groupBy

```
uniqueSelectStatement17
  ::= select18 executionHints18? distinct21? topClause21?
? selectList35 ( INTO46 variableList21 ) ? FROM15 dataSource17
joinStatements30? whereClause30? groupBy29?
```

referenced by:

- selectStatement<sup>16</sup>
- setOperatorSelectStatement<sup>17</sup>

### dataSource:

A data source can be a table, a table with parameters or a nested select (an 'inline view').

tableOrFunctionSpec embeddedSelect xmlTableSpec csvTableSpec jsonTableSpec aliased

```
dataSource17
  ::= ( tableOrFunctionSpec23 | embeddedSelect22 |
xmlTableSpec24 | csvTableSpec26 | jsonTableSpec25 ) aliased35?
```

referenced by:

- [joinStatement](#)<sup>31</sup>
- [uniqueSelectStatement](#)<sup>17</sup>

### select:

SELECT  
`select`<sup>18</sup> ::= `SELECT`<sup>18</sup>

referenced by:

- [uniqueSelectStatement](#)<sup>17</sup>

### executionHints:

Execution hints allow you to control individually the execution of SQL statements. Whenever possible, the hints will be used. In contrary to other platforms, Invantive UniversalSQL requires a hint to be valid according to the grammar when specified. This reduces the engineering risk that hints become invalid by accident.

EXECUTION\_HINT\_START joinSet noJoinSet ods resultSetName lowCost httpDiskCache httpMemoryCache EXECUTION\_HINT\_END  
`executionHints`<sup>18</sup>  
 ::= EXECUTION\_HINT\_START<sup>15</sup> ( joinSet<sup>20</sup> | noJoinSet<sup>20</sup> |  
 ods<sup>19</sup> | resultSetName<sup>19</sup> | lowCost<sup>21</sup> | httpDiskCache<sup>18</sup> |  
 httpMemoryCache<sup>19</sup> ) \* EXECUTION\_HINT\_END<sup>15</sup>

referenced by:

- [uniqueSelectStatement](#)<sup>17</sup>

### httpDiskCache:

The `http_disk_cache`-hint specifies whether messages may be cached on disk when the provider uses HTTP to exchange data with the backing platform. This typically holds only for cloud-based platforms such as Exact Online, Teamleader or Salesforce. The default setting is false. The first parameter is a boolean whether data may be taken from the disk cache, the second parameter is a boolean whether data retrieved must be stored also in the disk cache and the third parameter is an integer that specifies the number of seconds before a disk cache hit found is considered stale.

The use of the `http_disk-cache`-hint is recommended for data which is known to change seldom such as seeded or reference data. The contents of the disk cache are persistent across Invantive UniversalSQL sessions.

The disk cache is located in the Cache folder of the Invantive configuration folder.

HTTP\_DISK\_CACHE PARENTHESIS\_OPEN booleanConstant COMMA booleanConstant  
 COMMA intervalConstant PARENTHESIS\_CLOSE

`httpDiskCache`<sup>18</sup>  
 ::= HTTP\_DISK\_CACHE<sup>15</sup> ( PARENTHESIS\_OPEN<sup>15</sup>  
 booleanConstant<sup>100</sup> ( COMMA<sup>15</sup> booleanConstant<sup>100</sup> ( COMMA<sup>15</sup>  
 intervalConstant<sup>99</sup> ) ? ) ? PARENTHESIS\_CLOSE<sup>15</sup> ) ?

referenced by:

- [executionHints](#)<sup>18</sup>

### httpMemoryCache:

The http\_memory\_cache-hint specifies whether messages may be cached in memory when the provider uses HTTP to exchange data with the backing platform. This typically holds only for cloud-based platforms such as Exact Online, Teamleader or Salesforce. The default setting is false. The first parameter is a boolean whether data may be taken from the memory cache, the second parameter is a boolean whether data retrieved must be stored also in the memory cache and the third parameter is an integer that specifies the number of seconds before a memory cache hit found is to considered stale.

The use of the http\_memory-cache-hint is recommended for data which is known to change seldom such as seeded or reference data. The contents in the memory cache are forgotten across Invantive UniversalSQL sessions.

The memory cache is located in the Cache folder of the Invantive configuration folder.

HTTP\_MEMORY\_CACHE PARENTHESIS\_OPEN booleanConstant COMMA booleanConstant COMMA intervalConstant PARENTHESIS\_CLOSE

```
httpMemoryCache19
  ::= HTTP\_MEMORY\_CACHE15 ( PARENTHESIS\_OPEN15
    booleanConstant100 ( COMMA15 booleanConstant100 ( COMMA15
      intervalConstant99 )? )? PARENTHESIS\_CLOSE15 )?
```

referenced by:

- [executionHints](#)<sup>18</sup>

### ods:

The ods-hint controls the use of the Invantive Data Cache stored in a relational database. The Invantive Data Cache is also the basis of the Operational Data Store managed by Invantive Data Replicator and the data warehouses managed by Invantive Data Vault. The ods-hint specifies the maximum age data from the data cache eligible for use.

The boolean specifies whether the Data Cache may be used to answer a query. Set it to false to disable use of Data Cache for the duration of the query. Keep it on the default true to use Data Cache.

The interval specifies the period of time during which cached results are considered sufficiently fresh for use, such as '30 minutes'.

When no interval is present, the actual platform is consulted. The default with Invantive Data Cache enabled is to always use the data cache contents when not stale according to the metadata of the data cache. In general, that defaults to a maximum age of 7 days.

ODS PARENTHESIS\_OPEN booleanConstant COMMA intervalConstant PARENTHESIS\_CLOSE

```
ods19
  ::= ODS19 ( PARENTHESIS\_OPEN15 booleanConstant100
    ( COMMA15 intervalConstant99 )? PARENTHESIS\_CLOSE15 )?
```

referenced by:

- [executionHints](#)<sup>18</sup>

### resultSetName:

RESULT\_SET\_NAME PARENTHESIS\_OPEN stringConstant PARENTHESIS\_CLOSE

```
resultSetName [19]
  ::= RESULT_SET_NAME [15] ( PARENTHESIS_OPEN [15]
stringConstant [99] PARENTHESIS_CLOSE [15] ) ?
```

referenced by:

- [executionHints](#) [18]

### joinSet:

Control join approach between two data sources. A column-indexed lookup will be used instead of a full table scan when the number of rows on the left-hand side does not exceed the maximum number of rows specified in the hint. When not specified, a hash lookup will only be used when the number of rows on the left-side does not exceed 5.000.

The actual implementation of a hash lookup depends on the platform on which the data container runs. For instance with OData, a number of requests will be made using an in-construct with a limited number of in-values. With a relation database platform, a native SQL 'in' will be used.

The first identifier is the alias of the table on the right-hand side of the join. The second identifier is the name of the column used to join upon in the right-hand side. The numeric constant specifies upto what number of rows on the left-hand side of the join will allow the join set hint to be used. When the number of rows exceeds the numeric constant, a full table join is made.

The following example takes for instances 5.000 sales invoices from an Exact Online environment with 100.000 sales invoices. Each sales invoice has 4..10 lines. The join does not retrieve all sales invoices nor all invoice lines, but instead fetches the 5.000 sales invoices using the where-clause, and then retrieves the related invoice lines using a column-indexed lookup by invoiceid. Since Exact Online is an OData source, the approximately 30.000 invoice lines will be retrieved in 300 session I/Os each having an in-construct for 100 lines on invoiceid.

```
select /*+ join_set(sil, invoiceid, 10000) */ * from ExactOnlineREST..SalesInvoices sik join
ExactOnlineREST..SalesInvoiceLines sil on sil.invoiceid = sik.invoiceid where sik.status = 50
and sik.InvoiceDate between to_date( :P_RECEIPT_DATE_FROM, 'yyyymmdd') and to_d-
ate( :P_RECEIPT_DATE_TO, 'yyyymmdd')
```

JOIN\_SET PARENTHESIS\_OPEN identifier COMMA identifier COMMA numericConstant  
PARENTHESIS\_CLOSE

```
joinSet [20]
  ::= JOIN_SET [15] PARENTHESIS_OPEN [15] identifier [92]
  ( COMMA [15] identifier [92] ( COMMA [15] numericConstant [100] )? )?
PARENTHESIS_CLOSE [15]
```

referenced by:

- [executionHints](#) [18]

### noJoinSet:

The no\_join\_set hint disables the use of hash-joins. It can be enabled using the join\_set hint.

NO\_JOIN\_SET PARENTHESIS\_OPEN identifier COMMA identifier PARENTHESIS\_CLOSE

```

noJoinSet20
      ::= NO JOIN SET15 PARENTHESIS_OPEN15 identifier92
      ( COMMA15 identifier92 )? PARENTHESIS_CLOSE15

```

referenced by:

- executionHints<sup>18</sup>

### variableList:

```

variableName COMMA variableName
variableList21
      ::= variableName105 ( COMMA15 variableName105 )?

```

referenced by:

- uniqueSelectStatement<sup>17</sup>

### lowCost:

The low\_cost-hint specifies that the select with the hint must be considered a select with low execution costs. Low execution costs trigger early evaluation during parsing. By default, select statements using solely in memory storage, dummy and data dictionary are considered low cost and evaluated early. The evaluation of all others is delayed as long as possible.

The use of the low\_cost-hint is recommended when the select is used with a 'in ( select ... )' syntax and the developer knows beforehand that it will evaluate fast to values and that the use of these values will allow the use of server-side filtering for the outer select.

### LOW\_COST

```

lowCost21  ::= LOW_COST15

```

referenced by:

- executionHints<sup>18</sup>

### distinct:

Addition of the 'distinct' keyword to a SQL select statement de-duplicates the rows returned. Rows are considered duplicates when the values in all selected columns are identical, with two null-values considered equal.

### DISTINCT

```

distinct21  ::= DISTINCT21

```

referenced by:

- aggregateFunction<sup>36</sup>
- uniqueSelectStatement<sup>17</sup>

### topClause:

With the 'top' clause a limited number of rows can be retrieved quickly from a table or view after applying sorting as specified by the possibly present 'order by'.

TOP numericConstant

```
topClause21
  ::= TOP15 numericConstant100
```

referenced by:

- [uniqueSelectStatement](#)<sup>17</sup>

### limitClause:

With the 'limit' clause a limited number of rows can be retrieved quickly from a table or view after applying sorting as specified by the possibly present 'order by'.

LIMIT numericConstant

```
limitClause22
  ::= LIMIT15 numericConstant100
```

referenced by:

- [selectStatement](#)<sup>16</sup>

### embeddedSelect:

An embedded select, also known as an 'inline view', retrieves rows using the specified select statement. These rows are consumed by the outer select as were it the results of retrieving the rows from a table.

Invantive UniversalSQL does not allow grouping rows with expressions as columns. An embedded select is typically used to evaluate expressions to rows with solely constants. After applying the embedded select the group operators can be applied.

parenthesisOpen selectStatement parenthesisClose

```
embeddedSelect22
  ::= parenthesisOpen49 selectStatement16
parenthesisClose50
```

referenced by:

- [dataSource](#)<sup>17</sup>

### tableSpec:

A table specification without parameters. The optional alias after the at-sign specifies a specific data source to be used, such as 'exactonline@eolbe' specifying the use of Exact Online Belgium when 'eolbe' is associated by the database definitions in settings.xml with Exact Online Belgium.

A number of special so-called 'service providers' are always present, such as 'datadictionary' for use by an alias.

fullTableIdentifier distributedAliasDirective

```
tableSpec22
  ::= fullTableIdentifier90 distributedAliasDirective23?
```

referenced by:

- [alterPersistentCacheDropStatement](#)<sup>40</sup>
- [alterPersistentCacheSetTableOptions](#)<sup>41</sup>
- [alterPersistentCacheTableRefreshStatement](#)<sup>40</sup>

- [createTableStatement](#)<sup>41</sup>
- [deleteStatement](#)<sup>47</sup>
- [dropTableStatement](#)<sup>42</sup>
- [insertStatement](#)<sup>45</sup>
- [updateStatement](#)<sup>47</sup>

### tableOrFunctionSpec:

A table specification requiring a comma-separated list of parameters to determine the rows to be retrieved.

Traditional SQL syntax did not provide for parameterized queries, matching set theory. Modern variants such as pipelined table functions allow a stored procedure or other imperative language-based approaches to generate rows based upon parameter values. Many data containers support queries that returns rows based upon parameter values. This holds especially for SOAP web services. Table specifications with parameters ease queries on such data containers.

The optional alias after the at-sign specifies a specific data source to be used, such as 'exactonline@rest..journals@eolbe' specifying the use of Exact Online Belgium when 'eolbe' is associated by the database definitions in settings.xml with Exact Online Belgium.

fullTableIdentifier tableFunctionSpec distributedAliasDirective

```
tableOrFunctionSpec23
  ::= fullTableIdentifier90 tableFunctionSpec23?
distributedAliasDirective23?
```

referenced by:

- [dataSource](#)<sup>17</sup>

### tableFunctionSpec:

A comma-separated list of parametres to determine the rows to be retrieved by a tableOrFunctionSpec.

parenthesisOpen expression COMMA parenthesisClose

```
tableFunctionSpec23
  ::= parenthesisOpen49 ( expression48 ( COMMA15
    expression48 ) * )? parenthesisClose50
```

referenced by:

- [tableOrFunctionSpec](#)<sup>23</sup>

### distributedAliasDirective:

The distributed alias after the at-sign specifies a specific data source to be used, such as 'exactonline@rest..journals@eolbe' specifying the use of Exact Online Belgium when 'eolbe' is associated by the database definitions in settings.xml with Exact Online Belgium.

A number of special so-called 'service providers' are always present, such as 'datadictionary' for use by an alias.

AT dataContainerAlias

[distributedAliasDirective](#)<sup>23</sup>  
 ::= [AT](#)<sup>15</sup> [dataContainerAlias](#)<sup>24</sup>

referenced by:

- [partitionIdentifierWithAlias](#)<sup>45</sup>
- [setIdentifier](#)<sup>42</sup>
- [tableOrFunctionSpec](#)<sup>23</sup>
- [tableSpec](#)<sup>22</sup>

### **dataContainerAlias:**

When multiple data containers have been defined in settings.xml for a database, each one is assigned an alias. An alias typically takes the form of a limited number of characters. The presence of an alias allows Invantive UniversalSQL to precisely determine to what data container forward a request for data.

identifier

[dataContainerAlias](#)<sup>24</sup>  
 ::= [identifier](#)<sup>92</sup>

referenced by:

- [alterPersistentCacheRefreshStatement](#)<sup>39</sup>
- [distributedAliasDirective](#)<sup>23</sup>

### **xmlTableSpec:**

XMLTABLE parenthesisOpen stringConstant null xmlTablePassing xmlTableLiteral xmitableColumns parenthesisClose

[xmlTableSpec](#)<sup>24</sup>  
 ::= [XMLTABLE](#)<sup>15</sup> [parenthesisOpen](#)<sup>49</sup> ( [stringConstant](#)<sup>99</sup> |  
[null](#)<sup>101</sup> ) ( [xmlTablePassing](#)<sup>24</sup> | [xmlTableLiteral](#)<sup>24</sup> )  
[xmlTableColumns](#)<sup>25</sup> [parenthesisClose](#)<sup>50</sup>

referenced by:

- [dataSource](#)<sup>17</sup>

### **xmlTablePassing:**

PASSING expression

[xmlTablePassing](#)<sup>24</sup>  
 ::= [PASSING](#)<sup>15</sup> [expression](#)<sup>48</sup>

referenced by:

- [xmlTableSpec](#)<sup>24</sup>

### **xmlTableLiteral:**

LITERAL expression

[xmlTableLiteral](#)<sup>24</sup>  
 ::= [LITERAL](#)<sup>15</sup> [expression](#)<sup>48</sup>

referenced by:

- xmlTableSpec<sup>24</sup>

### xmlTableColumns:

COLUMNS xmlTableColumSpec COMMA

```
xmlTableColumns25
  ::= COLUMNS15 xmlTableColumSpec25 ( COMMA15
xmlTableColumSpec25 ) *
```

referenced by:

- xmlTableSpec<sup>24</sup>

### xmlTableColumSpec:

identifier dataType PATH stringConstant

```
xmlTableColumSpec25
  ::= identifier92 dataType27 PATH15 stringConstant99
```

referenced by:

- xmlTableColumns<sup>25</sup>

### jsonTableSpec:

JSONTABLE parenthesisOpen stringConstant null jsonTablePassing jsonTableLiteral jsonTableColumns parenthesisClose

```
jsonTableSpec25
  ::= JSONTABLE15 parenthesisOpen49 ( stringConstant99 |
null101 ) ( jsonTablePassing25 | jsonTableLiteral25 )
jsonTableColumns26 parenthesisClose50
```

referenced by:

- dataSource<sup>17</sup>

### jsonTablePassing:

PASSING expression

```
jsonTablePassing25
  ::= PASSING15 expression48
```

referenced by:

- jsonTableSpec<sup>25</sup>

### jsonTableLiteral:

LITERAL expression

```
jsonTableLiteral25
  ::= LITERAL15 expression48
```

referenced by:

- jsonTableSpec<sup>25</sup>

**jsonTableColumns:**

COLUMNS jsonTableColumSpec COMMA  
`jsonTableColumns`<sup>26</sup>  
`::= COLUMNS`<sup>15</sup> `jsonTableColumSpec`<sup>26</sup> ( `COMMA`<sup>15</sup>  
`jsonTableColumSpec`<sup>26</sup> ) \*

referenced by:

- `jsonTableSpec`<sup>25</sup>

**jsonTableColumSpec:**

identifier dataType PATH stringConstant  
`jsonTableColumSpec`<sup>26</sup>  
`::= identifier`<sup>92</sup> `dataType`<sup>27</sup> `PATH`<sup>15</sup> `stringConstant`<sup>99</sup>

referenced by:

- `jsonTableColumns`<sup>26</sup>

**csvTableSpec:**

CSVTABLE parenthesisOpen csvTablePassing csvTableLiteral csvTableOptions csvTableColumns parenthesisClose

`csvTableSpec`<sup>26</sup>  
`::= CSVTABLE`<sup>15</sup> `parenthesisOpen`<sup>49</sup> ( `csvTablePassing`<sup>27</sup> |  
`csvTableLiteral`<sup>26</sup> ) `csvTableOptions`<sup>26</sup> `csvTableColumns`<sup>27</sup>  
`parenthesisClose`<sup>50</sup>

referenced by:

- `dataSource`<sup>17</sup>

**csvTableOptions:**

ROW DELIMITER stringConstant COLUMN DELIMITER stringConstant SKIP\_ LINES numericConstant

`csvTableOptions`<sup>26</sup>  
`::= (` `ROW`<sup>15</sup> `DELIMITER`<sup>15</sup> `stringConstant`<sup>99</sup> `) ? (` `COLUMN`<sup>30</sup>  
`DELIMITER`<sup>15</sup> `stringConstant`<sup>99</sup> `) ? (` `SKIP`<sup>15</sup> `LINES`<sup>15</sup>  
`numericConstant`<sup>100</sup> `) ?`

referenced by:

- `csvTableSpec`<sup>26</sup>

**csvTableLiteral:**

LITERAL expression

`csvTableLiteral`<sup>26</sup>  
`::= LITERAL`<sup>15</sup> `expression`<sup>48</sup>

referenced by:

- [csvTableSpec](#)<sup>26</sup>

### csvTablePassing:

PASSING expression

```
csvTablePassing27
  ::= PASSING15 expression48
```

referenced by:

- [csvTableSpec](#)<sup>26</sup>

### csvTableColumns:

COLUMNS csvTableColumSpec COMMA

```
csvTableColumns27
  ::= COLUMNS15 csvTableColumSpec27 ( COMMA15
    csvTableColumSpec27 ) *
```

referenced by:

- [csvTableSpec](#)<sup>26</sup>

### csvTableColumSpec:

identifier dataType POSITION numericConstant

```
csvTableColumSpec27
  ::= identifier92 dataType27 POSITION15
    numericConstant100
```

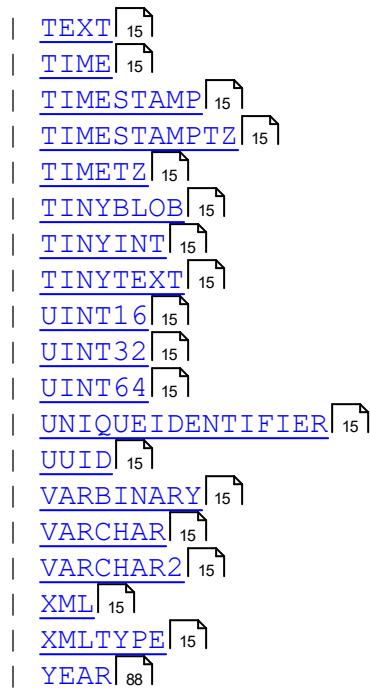
referenced by:

- [csvTableColumns](#)<sup>27</sup>

### dataType:

BFILE BIGINT BIGSERIAL BIT BLOB BOOL BOOLEAN BPCHAR BYTE BYTEA CHAR  
 CHARACTER CLOB DATE DATETIME DATETIMEOFFSET DEC DECIMAL DOUBLE  
 FLOAT FLOAT4 FLOAT8 GUID IMAGE INT INT16 INT2 INT32 INT4 INT64 INT8 INTEGER  
 INTERVAL LONGBLOB LONGTEXT MEDIUMBLOB MEDIUMINT MEDIUMTEXT MONEY  
 NAME NCHAR NUMBER NUMERIC NVARCHAR OID RAW REAL SERIAL  
 SMALLDATETIME SMALLINT SMALLMONEY SMALLSERIAL TEXT TIME TIMESTAMP  
 TIMESTAMPTZ TIMETZ TINYBLOB TINYINT TINYTEXT UINT16 UINT32 UINT64  
 UNIQUEIDENTIFIER UUID VARBINARY VARCHAR VARCHAR2 XML XMLTYPE YEAR

```
dataType[27] ::= BFILE[15]
| BIGINT[15]
| BIGSERIAL[15]
| BIT[15]
| BLOB[15]
| BOOL[15]
| BOOLEAN[15]
| BPCHAR[15]
| BYTE[15]
| BYTEA[15]
| CHAR[15]
| CHARACTER[15]
| CLOB[15]
| DATE[15]
| DATETIME[15]
| DATETIMEOFFSET[15]
| DEC[15]
| DECIMAL[15]
| DOUBLE[15]
| FLOAT[15]
| FLOAT4[15]
| FLOAT8[15]
| GUID[15]
| IMAGE[15]
| INT[15]
| INT16[15]
| INT2[15]
| INT32[15]
| INT4[15]
| INT64[15]
| INT8[15]
| INTEGER[15]
| INTERVAL[15]
| LONGBLOB[15]
| LONGTEXT[15]
| MEDIUMBLOB[15]
| MEDIUMINT[15]
| MEDIUMTEXT[15]
| MONEY[15]
| NAME[15]
| NCHAR[15]
| NUMBER[15]
| NUMERIC[15]
| NVARCHAR[15]
| OID[15]
| RAW[15]
| REAL[15]
| SERIAL[15]
| SMALLDATETIME[15]
| SMALLINT[15]
| SMALLMONEY[15]
| SMALLSERIAL[15]
```



referenced by:

- [csvTableColumSpec](#) [27]
- [jsonTableColumSpec](#) [26]
- [pSqlItemDeclaration](#) [101]
- [xmlTableColumSpec](#) [25]

## groupBy:

Grouping of multiple rows into groups is specified by the groupBy. A group will be introduced for each distinct combination of column values for the columns listed. The values of grouped columns can be used in the select clause. Columns not being grouped upon can only be used within the context of a group function listed as 'aggregateFunction'.

GROUP BY columnList

[groupBy](#) [29] :::= [GROUP](#) [15] [BY](#) [15] [columnList](#) [30]

referenced by:

- [uniqueSelectStatement](#) [17]

## orderBy:

Sort the rows returned as specified by the list of columns. Values are either sorted ascending (the default) or descending.

ORDER BY column sortDirection COMMA

[orderBy](#) [29] :::= [ORDER](#) [15] [BY](#) [15] [column](#) [30] [sortDirection](#) [30]? ( [COMMA](#) [15] [column](#) [30] [sortDirection](#) [30]? ) \*

referenced by:

- [aggregateFunction](#) [36]
- [selectStatement](#) [16]

**sortDirection:**

A sort direction can be either 'asc' for 'ascending' (the default) or 'desc' for 'descending'.

asc desc

```
sortDirection30
  ::= asc35
    | desc35
```

referenced by:

- orderBy<sup>29</sup>

**columnList:**

A comma-separated list of columns.

column COMMA

```
columnList30
  ::= column30 ( COMMA15 column30 ) *
```

referenced by:

- groupBy<sup>29</sup>
- insertFieldList<sup>46</sup>

**column:**

A column is identified by an identifier, possibly prefixed by the name of the table or the alias of the table from which the column is to be taken.

identifier DOT identifier

```
column30   ::= identifier92 ( DOT15 identifier92 ) ?
```

referenced by:

- columnList<sup>30</sup>
- orderBy<sup>29</sup>
- updateValue<sup>47</sup>

**whereClause:**

The where-clause restricts the number of rows in a result set by applying one or more boolean conditions which rows must satisfy.

WHERE booleanExpression

```
whereClause30
  ::= WHERE15 booleanExpression48
```

referenced by:

- deleteStatement<sup>47</sup>
- uniqueSelectStatement<sup>17</sup>
- updateStatement<sup>47</sup>

**joinStatements:**

A list of join statement.

### joinStatement

```
joinStatements30
  ::= joinStatement31+
```

referenced by:

- uniqueSelectStatement<sup>17</sup>

### joinStatement:

A join statement combines two result sets. Only combinations of rows taken from both result sets are returned when they meet the join conditions.

### joinCategory join dataSource joinConditions

```
joinStatement31
  ::= joinCategory31 join32 dataSource17
    joinConditions35?
```

referenced by:

- joinStatements<sup>30</sup>

### joinCategory:

The join category specifies what combinations of rows are considered. The following variants can be used:

- inner join, as indicated by 'join' or 'inner join': an inner join returns all combinations of rows from both result sets that meet the join conditions.
- left outer, as indicated by 'left outer join': a left outer join returns the same rows as an inner join, extended by one row for each row in the left result set having no matching rows in the right result set. Each column that originates from the right result set is assigned a null value.
- right outer, as indicated by 'right outer join': a right outer join returns the same rows as an inner join, extended by one row for each row in the right result set having no matching rows in the left result set. Each column that originates from the left result set is assigned a null value.
- full outer, as indicated by 'full outer join': a full outer join returns the same rows as an inner join, extended by one row for each row in the right result set having no matching rows in the left result set. Each column that originates from the left result set is assigned a null value. The results are also extended by one row for each row in the left result set having no matching rows in the right result set. Each column that originates from the right result set is assigned a null value.
- cross join, as indicated by 'cross join': a cross join returns a Cartesian product of the rows from both result sets. A 'Cartesian product' is a term from set theory, which indicates that all combinations are returned.

### inner joinSubCategory outer cross

```
joinCategory31
  ::= ( inner32 | joinSubCategory32 outer32? | cross33
) ?
```

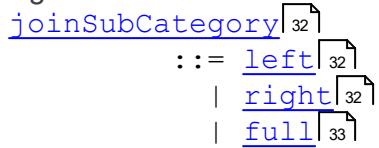
referenced by:

- joinStatement<sup>31</sup>

**joinSubCategory:**

The join sub-category refines the join category. Please see 'joinCategory' for an explanation.

**left** right full



referenced by:

- [joinCategory<sup>31</sup>](#)

**join:**

JOIN

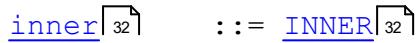


referenced by:

- [joinStatement<sup>31</sup>](#)

**inner:**

INNER

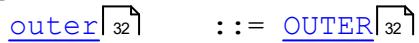


referenced by:

- [joinCategory<sup>31</sup>](#)

**outer:**

OUTER



referenced by:

- [joinCategory<sup>31</sup>](#)

**left:**

LEFT



referenced by:

- [functionExpression<sup>56</sup>](#)
- [joinSubCategory<sup>32</sup>](#)

**right:**

Extracts a substring from a value with the given length from the right side.

**Parameters:**

- Input: Text to extract substring from.
- Length: Maximum length of the substring.

Returns: Substring from the right side of the input. RIGHT

right<sup>32</sup> ::= RIGHT<sup>32</sup>

referenced by:

- functionExpression<sup>56</sup>
- joinSubCategory<sup>32</sup>

**full:**

FULL

full<sup>33</sup> ::= FULL<sup>33</sup>

referenced by:

- joinSubCategory<sup>32</sup>

**cross:**

CROSS

cross<sup>33</sup> ::= CROSS<sup>33</sup>

referenced by:

- joinCategory<sup>31</sup>

**sum:**

Group function to sum together individual numerical values. Occurrences of null are considered 0, unless there are only null values. In that case the outcome is null.

SUM

sum<sup>33</sup> ::= SUM<sup>33</sup>

referenced by:

- aggregateFunction<sup>36</sup>

**product:**

Group function to multiply together individual numerical values. Multiplying large values can quickly exceed the range of the resulting Decimal data type. The product group function is typically used in financial and probability calculations with values near 1.

PRODUCT

product<sup>33</sup> ::= PRODUCT<sup>33</sup>

referenced by:

- aggregateFunction<sup>36</sup>

**min:**

Group function to find the minimum value from a group of numerical values.

MIN

min<sup>33</sup> ::= MIN<sup>33</sup>

referenced by:

- [aggregateFunction](#)<sup>36</sup>

**max:**

Group function to find the maximum value from a group of numerical values.

MAX

max<sup>34</sup> ::= MAX<sup>34</sup>

referenced by:

- [aggregateFunction](#)<sup>36</sup>

**avg:**

Group function to find the average value from a group of numerical values.

AVG

avg<sup>34</sup> ::= AVG<sup>34</sup>

referenced by:

- [aggregateFunction](#)<sup>36</sup>

**stddev:**

Group function to find the standard deviation from a group of numerical values.

STDDEV

stddev<sup>34</sup> ::= STDDEV<sup>34</sup>

referenced by:

- [aggregateFunction](#)<sup>36</sup>

**count:**

Group function to find the number of values from a group of values.

COUNT

count<sup>34</sup> ::= COUNT<sup>34</sup>

referenced by:

- [aggregateFunction](#)<sup>36</sup>

**listagg:**

Group function which concatenates all individual values, separated by the separator when provided and comma plus space otherwise.

**LISTAGG**

listagg<sup>34</sup> ::= LISTAGG<sup>34</sup>

referenced by:

- aggregateFunction<sup>36</sup>

**asc:****ASC**

asc<sup>35</sup> ::= ASC<sup>35</sup>

referenced by:

- sortDirection<sup>30</sup>

**desc:****DESC**

desc<sup>35</sup> ::= DESC<sup>35</sup>

referenced by:

- sortDirection<sup>30</sup>

**joinConditions:****ON booleanExpression**

joinConditions<sup>35</sup>  
::= ON<sup>15</sup> booleanExpression<sup>48</sup>

referenced by:

- joinStatement<sup>31</sup>

**selectList:****selectPart COMMA**

selectList<sup>35</sup>  
::= selectPart<sup>35</sup> ( COMMA<sup>15</sup> selectPart<sup>35</sup> ) \*

referenced by:

- uniqueSelectStatement<sup>17</sup>

**selectPart:****part aliased labeled**

selectPart<sup>35</sup>  
::= part<sup>36</sup> aliased<sup>35</sup>? labeled<sup>36</sup>?

referenced by:

- selectList<sup>35</sup>

**aliased:**

AS alias

aliased<sup>35</sup> ::= AS<sup>15</sup>? alias<sup>92</sup>

referenced by:

- dataSource<sup>17</sup>
- selectPart<sup>35</sup>

**labeled:**

LABEL stringConstant

labeled<sup>36</sup> ::= LABEL<sup>15</sup> stringConstant<sup>99</sup>

referenced by:

- selectPart<sup>35</sup>

**part:**

expression aggregateFunction allColumnsSpec

part<sup>36</sup> ::= expression<sup>48</sup>  
| aggregateFunction<sup>36</sup>  
| allColumnsSpec<sup>36</sup>

referenced by:

- aggregateFunction<sup>36</sup>
- selectPart<sup>35</sup>

**aggregateFunction:**

sum product avg stddev parenthesisOpen distinct min max parenthesisOpen arithmeticExpression count parenthesisOpen distinct part listagg parenthesisOpen distinct arithmeticExpressionList parenthesisClose WITHIN GROUP parenthesisOpen orderBy parenthesisClose

aggregateFunction<sup>36</sup>  
::= ( ( sum<sup>33</sup> | product<sup>33</sup> | avg<sup>34</sup> | stddev<sup>34</sup> )  
parenthesisOpen<sup>49</sup> distinct<sup>21</sup>? | ( min<sup>33</sup> | max<sup>34</sup> )  
parenthesisOpen<sup>49</sup> ) arithmeticExpression<sup>55</sup> | count<sup>34</sup>  
parenthesisOpen<sup>49</sup> distinct<sup>21</sup>? part<sup>36</sup> | listagg<sup>34</sup>  
parenthesisOpen<sup>49</sup> distinct<sup>21</sup>? arithmeticExpressionList<sup>56</sup>  
( parenthesisClose<sup>50</sup> WITHIN<sup>15</sup> GROUP<sup>15</sup> parenthesisOpen<sup>49</sup>  
orderBy<sup>29</sup> )? ) parenthesisClose<sup>50</sup>

referenced by:

- part<sup>36</sup>

**allColumnsSpec:**

allColumnsSpecId allColumnsSpecColumnNamePrefix allColumnsSpecColumnNamePostfix allColumnsSpecLabelPrefix allColumnsSpecLabelPostfix

```

allColumnsSpec36
  ::= allColumnsSpecId37
    allColumnsSpecColumnNamePrefix37?
    allColumnsSpecColumnNamePostfix37? allColumnsSpecLabelPrefix37?
    allColumnsSpecLabelPostfix37?

```

referenced by:

- part<sup>36</sup>

### **allColumnsSpecId:**

alias DOT ASTERIX

```

allColumnsSpecId37
  ::= ( alias92 DOT15 )? ASTERIX15

```

referenced by:

- allColumnsSpec<sup>36</sup>

### **allColumnsSpecColumnNamePrefix:**

PREFIX WITH stringConstant

```

allColumnsSpecColumnNamePrefix37
  ::= PREFIX15 WITH15 stringConstant99

```

referenced by:

- allColumnsSpec<sup>36</sup>

### **allColumnsSpecColumnNamePostfix:**

POSTFIX WITH stringConstant

```

allColumnsSpecColumnNamePostfix37
  ::= POSTFIX15 WITH15 stringConstant99

```

referenced by:

- allColumnsSpec<sup>36</sup>

### **allColumnsSpecLabelPrefix:**

LABEL PREFIX WITH stringConstant

```

allColumnsSpecLabelPrefix37
  ::= LABEL15 PREFIX15 WITH15 stringConstant99

```

referenced by:

- allColumnsSpec<sup>36</sup>

### **allColumnsSpecLabelPostfix:**

LABEL POSTFIX WITH stringConstant

```

allColumnsSpecLabelPostfix37
  ::= LABEL15 POSTFIX15 WITH15 stringConstant99

```

referenced by:

- [allColumnsSpec](#)<sup>36</sup>

### ddlStatement:

```
createTableStatement dropTableStatement alterPersistentCacheStatement
ddlStatement38
  ::= createTableStatement41
  | dropTableStatement42
  | alterPersistentCacheStatement38
```

referenced by:

- [sqlStatement](#)<sup>15</sup>

### alterPersistentCacheStatement:

Besides an in-memory cache valid during the duration of a session, Invantive UniversalSQL offers an integrated cache storing data persistently using an on-premise or cloud relation database such as SQL Server or PostgreSQL. When configured, Invantive UniversalSQL first tries to find sufficiently fresh data in the cache. This reduces the number of data loads from slow data containers such as some cloud platforms. In general, the performance increase when the rows can be fully retrieved from a cache is between a factor 25 and 2.500.

Invantive UniversalSQL itself manages the table structure and table contents in the relation database used as a data cache. On initial use just provide an empty database. Invantive UniversalSQL installs a repository consisting of a few tables. The repository tables have names starting with 'dc\_'.

For each table partition version, a so-called facts table is created. A facts table contains a full copy of the rows retrieved from the data container. Facts tables have names starting with 'dcd\_', followed by a unique hash signaling the table partition version. When necessary, additional database objects are maintained such as indexes to improve performance. As with facts table names, all column names are also hashed based upon an algorithm including the original column name. These facts tables are not intended for direct use using native SQL.

Each facts table has a unique state from the following state, with Ready state signaling the now current version:

- Initializing ('I'): the facts table will be created.
- View creation ('V'): logical views will be created.
- Prepared ('P'): the facts table has been created, but contains yet no rows.
- Seeding ('S'): the facts table is being seeded with the contents of the previously current version.
- Loading ('L'): loading new facts from data container using water shed or another algorithm.
- Ready ('R'): the facts table is available and the current one to be used.
- Obsoleted ('O'): the facts table still exists, but the data has passed its conservation period. Often a newer version is now current.
- Dropped ('D'): the facts table now longer exist, but the metadata is still present in the repository tables.

The persistent cache in the database can be used with native SQL when extended by Invantive Data Replicator. Invantive Data Replicator can create and maintain a database view (a so-called 'partition view') for the now current version of table partition. Similarly, it can cre-

ate an 'overall view', showing the rows across all partitions of the now current versions per partition.

The overall views are typically used for consolidation purposes, bringing together data across multiple companies or persons.

`alterPersistentCacheSetStatement` `alterPersistentCacheDownloadStatement` `alterPersistentCachePurgeStatement` `alterPersistentCacheRefreshStatement` `alterPersistentCacheLoadStatement` `alterPersistentCacheTableRefreshStatement` `alterPersistentCachePartitionRefreshStatement` `alterPersistentCacheDropStatement`

```
alterPersistentCacheStatement38
  ::= alterPersistentCacheSetStatement41
    | alterPersistentCacheDownloadStatement39
    | alterPersistentCachePurgeStatement39
    | alterPersistentCacheRefreshStatement39
    | alterPersistentCacheLoadStatement40
    | alterPersistentCacheTableRefreshStatement40
    | alterPersistentCachePartitionRefreshStatement40
    | alterPersistentCacheDropStatement40
```

referenced by:

- `ddlStatement`<sup>38</sup>

### `alterPersistentCachePurgeStatement`:

`ALTER PERSISTENT CACHE PURGE UNKNOWN OBSOLETE READY DROPPABLE ALL TABLE PARTITION VERSIONS`

```
alterPersistentCachePurgeStatement39
  ::= ALTER15 PERSISTENT15 CACHE15 PURGE15 ( UNKNOWN15 |
    OBSOLETE15 | READY15 | DROPPABLE15 | ALL15 ) TABLE15
    PARTITION15 VERSIONS15
```

referenced by:

- `alterPersistentCacheStatement`<sup>38</sup>

### `alterPersistentCacheDownloadStatement`:

`ALTER PERSISTENT CACHE DOWNLOAD FEED LICENSE CONTRACT CODE stringConstant DATA_CONTAINER stringConstant PARTITION partitionSimpleIdentifier LIMIT numericConstant`

```
alterPersistentCacheDownloadStatement39
  ::= ALTER15 PERSISTENT15 CACHE15 DOWNLOAD15 FEED15
    ( LICENSE15 CONTRACT15 CODE15 stringConstant99 ) ?
    ( DATA_CONTAINER15 stringConstant99 ) ? ( PARTITION15
      partitionSimpleIdentifier45 ) ? ( LIMIT15 numericConstant100 ) ?
```

referenced by:

- `alterPersistentCacheStatement`<sup>38</sup>

### `alterPersistentCacheRefreshStatement`:

ALTER PERSISTENT CACHE FORCE REFRESH DATA\_CONTAINER dataContainerAlias  
PARALLEL numericConstant

```
alterPersistentCacheRefreshStatement [39]
  ::= ALTER [15] PERSISTENT [15] CACHE [15] FORCE [15]? REFRESH [15]
  ( DATA_CONTAINER [15] dataContainerAlias [24]? )? ( PARALLEL [15]
  numericConstant [100] )?
```

referenced by:

- [alterPersistentCacheStatement](#) [38]

### **alterPersistentCacheLoadStatement:**

ALTER PERSISTENT CACHE LOAD

```
alterPersistentCacheLoadStatement [40]
  ::= ALTER [15] PERSISTENT [15] CACHE [15] LOAD [15]
```

referenced by:

- [alterPersistentCacheStatement](#) [38]

### **alterPersistentCacheTableRefreshStatement:**

ALTER PERSISTENT CACHE TABLE tableSpec FORCE REFRESH PARTITION partitionIdentifier PARALLEL numericConstant

```
alterPersistentCacheTableRefreshStatement [40]
  ::= ALTER [15] PERSISTENT [15] CACHE [15] TABLE [15] tableSpec [22]
  FORCE [15]? REFRESH [15] ( PARTITION [15] partitionIdentifier [44] )?
  ( PARALLEL [15] numericConstant [100] )?
```

referenced by:

- [alterPersistentCacheStatement](#) [38]

### **alterPersistentCachePartitionRefreshStatement:**

ALTER PERSISTENT CACHE PARTITION partitionIdentifier FORCE REFRESH PARALLEL numericConstant

```
alterPersistentCachePartitionRefreshStatement [40]
  ::= ALTER [15] PERSISTENT [15] CACHE [15] PARTITION [15]
  partitionIdentifier [44] FORCE [15]? REFRESH [15] ( PARALLEL [15]
  numericConstant [100] )?
```

referenced by:

- [alterPersistentCacheStatement](#) [38]

### **alterPersistentCacheDropStatement:**

ALTER PERSISTENT CACHE DROP TABLE tableSpec PARTITION partitionIdentifier  
PARTITION partitionIdentifier DATA\_CONTAINER stringConstant

```
alterPersistentCacheDropStatement[40]
      ::= ALTER[15] PERSISTENT[15] CACHE[15] DROP[15] ( TABLE[15]
tableSpec[22] ( PARTITION[15] partitionIdentifier[44] )? | PARTITION[15] partitionIdentifier[44] | DATA CONTAINER[15]
stringConstant[99] )
```

referenced by:

- [alterPersistentCacheStatement](#)[38]

### alterPersistentCacheSetStatement:

ALTER PERSISTENT CACHE SET FRESH RETENTION FORWARDED INCOMING MESSAGES METADATA RECYCLEBIN DATA MODEL VERSION numericConstant TOKEN stringConstant LOGICAL OVERALL PARTITION VIEW NAME PREFIX POSTFIX stringConstant MAINTAIN booleanConstant LOAD MY MESSAGES booleanConstant AUTO UPGRADE ONCE alterPersistentCacheSetTableOptions

```
alterPersistentCacheSetStatement[41]
      ::= ALTER[15] PERSISTENT[15] CACHE[15] SET[15] ( ( FRESH[15] | RETENTION[15] FORWARDED[15] INCOMING[15] MESSAGES[15] | METADATA[15]? RECYCLEBIN[15] | DATA[15] MODEL[15] VERSION[15] ) numericConstant[100] | TOKEN[15] stringConstant[99] | LOGICAL[15] ( OVERALL[15] | PARTITION[15] ) VIEW[15] ( NAME[15] ( PREFIX[15] | POSTFIX[15] ) stringConstant[99] | MAINTAIN[15] booleanConstant[100] ) | LOAD[15] MY[15] MESSAGES[15] | booleanConstant[100] | AUTO[15] UPGRADE[15] ONCE[15] | alterPersistentCacheSetTableOptions[41] )
```

referenced by:

- [alterPersistentCacheStatement](#)[38]

### alterPersistentCacheSetTableOptions:

TABLE tableSpec LOGICAL OVERALL VIEW MAINTAIN booleanConstant NAME stringConstant PARTITION VIEW MAINTAIN booleanConstant NAME PREFIX POSTFIX stringConstant STATE OBSOLETE DROPPED PARTITION partitionIdentifier APPROACH COPY TRICKLE SAMPLE

```
alterPersistentCacheSetTableOptions[41]
      ::= TABLE[15] tableSpec[22] ( LOGICAL[15] ( OVERALL[15] VIEW[15] ( MAINTAIN[15] booleanConstant[100] | NAME[15] stringConstant[99] ) | PARTITION[15] VIEW[15] ( MAINTAIN[15] booleanConstant[100] | NAME[15] ( PREFIX[15] | POSTFIX[15] ) stringConstant[99] ) ) | STATE[15] ( OBSOLETE[15] | DROPPED[15] ) | ( PARTITION[15] partitionIdentifier[44] )? APPROACH[15] ( COPY[15] | TRICKLE[15] | SAMPLE[15] ) )
```

referenced by:

- [alterPersistentCacheSetStatement](#)[41]

### createTableStatement:

CREATE orReplace TABLE tableSpec AS selectStatement

```
createTableStatement41
  ::= CREATE15 orReplace42? TABLE15 tableSpec22 AS15
selectStatement16
```

referenced by:

- ddlStatement<sup>38</sup>

### **dropTableStatement:**

DROP TABLE tableSpec

```
dropTableStatement42
  ::= DROP15 TABLE15 tableSpec22
```

referenced by:

- ddlStatement<sup>38</sup>

### **orReplace:**

OR REPLACE

```
orReplace42
  ::= OR52 REPLACE76
```

referenced by:

- createTableStatement<sup>41</sup>

### **setStatement:**

Replaces the value of a provider attribute by a new value.

SET setIdentifier expression

```
setStatement42
  ::= SET15 setIdentifier42 expression48
```

referenced by:

- sqlStatement<sup>15</sup>

### **setIdentifier:**

attributelIdentifier distributedAliasDirective

```
setIdentifier42
  ::= attributeIdentifier91 distributedAliasDirective23?
```

referenced by:

- setStatement<sup>42</sup>

### **transactionStatement:**

beginTransactionStatement rollbackTransactionStatement commitTransactionStatement

```
transactionStatement42
  ::= beginTransactionStatement43
    | rollbackTransactionStatement43
    | commitTransactionStatement43
```

referenced by:

- sqlStatement<sup>15</sup>

### executeFileStatement:

```
FILE_PATH
executeFileStatement43
  ::= FILE_PATH15
```

referenced by:

- sqlStatement<sup>15</sup>

### beginTransactionStatement:

A begin transaction statement initiates a transaction. Invantive UniversalSQL typically provides no transaction logic given the distributed nature and the limitations of the possible platforms. Some platforms enable collection of transaction data, which are to be handed over to the backing platform all together.

BEGIN TRANSACTION

```
beginTransactionStatement43
  ::= BEGIN15 TRANSACTION15?
```

referenced by:

- transactionStatement<sup>42</sup>

### rollbackTransactionStatement:

Forgets all collected transaction data not yet handed over to the backing platform.

ROLLBACK TRANSACTION

```
rollbackTransactionStatement43
  ::= ROLLBACK15 TRANSACTION15?
```

referenced by:

- transactionStatement<sup>42</sup>

### commitTransactionStatement:

Hand over all collected transaction to the backing platform for registration.

COMMIT TRANSACTION

```
commitTransactionStatement43
  ::= COMMIT15 TRANSACTION15?
```

referenced by:

- transactionStatement<sup>42</sup>

**useStatement:**

The use statement enables you to specify which partitions should be accessed by subsequent select, insert, update and delete statements. You can specify one or multiple partitions as a comma-separated list, possibly for a specific data container by appending an at-sign plus data container alias to the partition code. The value 'default' has a special meaning; it specifies to use the partition(s) originally selected when you logged on. The value 'all' also has a special meaning: it selects all partitions available.

For instance, to select partition '35' in the data container with alias 'eolnl' and partition '57345' in the data container with alias 'nmbrsnl', you can execute: 'use 35@eolnl, 57345@nmbrsnl'.

For complex scenarios, you can specify any valid Invantive UniversalSQL select statement which returns one or two columns. Each row from the query specifies one partition to select. The first column specifies the partition code, whereas the optional second column specifies a specific data container alias.

For instance, to select partition '35' in the data container with alias 'eolnl' and partition '57345' in the data container with alias 'nmbrsnl', you can execute: 'use select '35', 'eolnl' from dual@datadictionary union all select '57345', 'nmbrsnl' from dual@datadictionary'.

USE partitionIdentifiersList selectStatement

```
useStatement [44]
  ::= USE [15] ( partitionIdentifiersList [44] |
selectStatement [16] )
```

referenced by:

- sqlStatement [15]

**partitionIdentifiersList:**

partitionIdentifierWithAlias COMMA

```
partitionIdentifiersList [44]
  ::= partitionIdentifierWithAlias [45] ( COMMA [15]
partitionIdentifierWithAlias [45] ) *
```

referenced by:

- useStatement [44]

**partitionIdentifier:**

parameterExpression numericConstant identifier ALL DEFAULT

```
partitionIdentifier [44]
  ::= parameterExpression [53]
    | numericConstant [100]
    | identifier [92]
    | ALL [15]
    | DEFAULT [15]
```

referenced by:

- alterPersistentCacheDropStatement [40]
- alterPersistentCachePartitionRefreshStatement [40]
- alterPersistentCacheSetTableOptions [41]
- alterPersistentCacheTableRefreshStatement [40]

- [partitionIdentifierWithAlias](#)<sup>45</sup>

### partitionIdentifierWithAlias:

partitionIdentifier distributedAliasDirective

[partitionIdentifierWithAlias](#)<sup>45</sup>  
::= [partitionIdentifier](#)<sup>44</sup> [distributedAliasDirective](#)<sup>23</sup>?

referenced by:

- [partitionIdentifiersList](#)<sup>44</sup>

### partitionSimpleIdentifier:

numericConstant identifier

[partitionSimpleIdentifier](#)<sup>45</sup>  
::= [numericConstant](#)<sup>100</sup>  
| [identifier](#)<sup>92</sup>

referenced by:

- [alterPersistentCacheDownloadStatement](#)<sup>39</sup>

### insertStatement:

bulk insert into tableSpec insertFieldList valuesExpression insertFieldList selectStatement  
identifiedByClause attachToClause

[insertStatement](#)<sup>45</sup>  
::= [bulk](#)<sup>45</sup>? [insert](#)<sup>46</sup> [into](#)<sup>46</sup> [tableSpec](#)<sup>22</sup>?  
( [insertFieldList](#)<sup>46</sup> [valuesExpression](#)<sup>45</sup> | [insertFieldList](#)<sup>46</sup>?  
[selectStatement](#)<sup>16</sup> ) [identifiedByClause](#)<sup>47</sup>? [attachToClause](#)<sup>47</sup>?

referenced by:

- [sqlStatement](#)<sup>15</sup>

### valuesExpression:

values\_insertValues

[valuesExpression](#)<sup>45</sup>  
::= [values](#)<sup>46</sup> [insertValues](#)<sup>46</sup>

referenced by:

- [insertStatement](#)<sup>45</sup>

### bulk:

BULK

[bulk](#)<sup>45</sup> ::= [BULK](#)<sup>45</sup>

referenced by:

- [insertStatement](#)<sup>45</sup>

**into:**

INTO  
`into`<sup>46</sup>      ::= `INTO`<sup>46</sup>

**referenced by:**

- [insertStatement](#)<sup>45</sup>

**insert:**

INSERT  
`insert`<sup>46</sup>      ::= `INSERT`<sup>46</sup>

**referenced by:**

- [insertStatement](#)<sup>45</sup>

**values\_:**

VALUES  
`values`<sup>46</sup>    ::= `VALUES`<sup>15</sup>

**referenced by:**

- [valuesExpression](#)<sup>45</sup>

**insertFieldList:**

parenthesisOpen columnList parenthesisClose  
`insertFieldList`<sup>46</sup>  
 ::= `parenthesisOpen`<sup>49</sup> `columnList`<sup>30</sup> `parenthesisClose`<sup>50</sup>

**referenced by:**

- [insertStatement](#)<sup>45</sup>

**insertValues:**

parenthesisOpen insertValuesList parenthesisClose  
`insertValues`<sup>46</sup>  
 ::= `parenthesisOpen`<sup>49</sup> `insertValuesList`<sup>46</sup>  
`parenthesisClose`<sup>50</sup>

**referenced by:**

- [valuesExpression](#)<sup>45</sup>

**insertValuesList:**

arithmeticExpression COMMA  
`insertValuesList`<sup>46</sup>  
 ::= `arithmeticExpression`<sup>55</sup> ( `COMMA`<sup>15</sup>  
`arithmeticExpression`<sup>55</sup> ) \*

**referenced by:**

- [insertValues](#)<sup>46</sup>

### identifiedByClause:

IDENTIFIED BY arithmeticExpression

```
identifiedByClause47
  ::= IDENTIFIED15 BY15 arithmeticExpression55
```

referenced by:

- [insertStatement](#)<sup>45</sup>

### attachToClause:

ATTACH TO arithmeticExpression

```
attachToClause47
  ::= ATTACH15 TO15 arithmeticExpression55
```

referenced by:

- [insertStatement](#)<sup>45</sup>

### updateStatement:

UPDATE FROM tableSpec SET updateValuesList whereClause

```
updateStatement47
  ::= UPDATE15 FROM15? tableSpec22 SET15
    updateValuesList47 whereClause30?
```

referenced by:

- [sqlStatement](#)<sup>15</sup>

### updateValuesList:

updateValue COMMA

```
updateValuesList47
  ::= updateValue47 ( COMMA15 updateValue47 ) *
```

referenced by:

- [updateStatement](#)<sup>47</sup>

### updateValue:

column EQ arithmeticExpression

```
updateValue47
  ::= column30 EQ54 arithmeticExpression55
```

referenced by:

- [updateValuesList](#)<sup>47</sup>

### deleteStatement:

delete FROM tableSpec whereClause

```
deleteStatement47
  ::= delete48 FROM15? tableSpec22 whereClause30?
```

referenced by:

- sqlStatement<sup>15</sup>

### delete:

DELETE

```
delete48  ::= DELETE48
```

referenced by:

- deleteStatement<sup>47</sup>

### expression:

booleanExpression arithmeticExpression

```
expression48
  ::= booleanExpression48
    | arithmeticExpression55
```

referenced by:

- caseElseExpression<sup>49</sup>
- caseWhenThenExpression<sup>49</sup>
- csvTableLiteral<sup>26</sup>
- csvTablePassing<sup>27</sup>
- jsonTableLiteral<sup>25</sup>
- jsonTablePassing<sup>25</sup>
- pSqlAssignmentStatement<sup>103</sup>
- pSqlExecuteImmediateStatement<sup>103</sup>
- part<sup>36</sup>
- setStatement<sup>42</sup>
- tableFunctionSpec<sup>23</sup>
- xmlTableLiteral<sup>24</sup>
- xmlTablePassing<sup>24</sup>

### booleanExpression:

not booleanExpression and or booleanExpression parenthesisOpen booleanExpression parenthesisClose predicateExpression true false

```
booleanExpression48
  ::= ( not51 | booleanExpression48 ( and52 | or52 ) )
booleanExpression48
  | parenthesisOpen49 booleanExpression48
parenthesisClose50
  | predicateExpression52
  | true52
  | false52
```

referenced by:

- [booleanExpression](#)<sup>48</sup>
- [expression](#)<sup>48</sup>
- [joinConditions](#)<sup>35</sup>
- [pSqlElseIfExpression](#)<sup>104</sup>
- [pSqlIfStatement](#)<sup>104</sup>
- [pSqlWhileLoopStatement](#)<sup>105</sup>
- [whereClause](#)<sup>30</sup>

### caseExpression:

```
case caseWhenThenExpression caseElseExpression end
  caseExpression49
    ::= case50 caseWhenThenExpression49+
  caseElseExpression49? end51
```

referenced by:

- [arithmeticExpression](#)<sup>55</sup>

### caseWhenThenExpression:

when expression then arithmeticExpression

```
caseWhenThenExpression49
  ::= when50 expression48 then51 arithmeticExpression55
```

referenced by:

- [caseExpression](#)<sup>49</sup>

### caseElseExpression:

else expression

```
caseElseExpression49
  ::= else51 expression48
```

referenced by:

- [caseExpression](#)<sup>49</sup>

### parenthesisOpen:

PARENTHESIS\_OPEN

```
parenthesisOpen49
  ::= PARENTHESIS_OPEN15
```

referenced by:

- [aggregateFunction](#)<sup>36</sup>
- [arithmeticExpression](#)<sup>55</sup>
- [booleanExpression](#)<sup>48</sup>
- [csvTableSpec](#)<sup>26</sup>
- [embeddedSelect](#)<sup>22</sup>

- [functionExpression](#)<sup>56</sup>
- [insertFieldList](#)<sup>46</sup>
- [insertValues](#)<sup>46</sup>
- [jsonTableSpec](#)<sup>25</sup>
- [now](#)<sup>90</sup>
- [predicateExpression](#)<sup>52</sup>
- [tableFunctionSpec](#)<sup>23</sup>
- [utc](#)<sup>90</sup>
- [xmlTableSpec](#)<sup>24</sup>

**parenthesisClose:**

PARENTHESIS\_CLOSE

```

parenthesisClose50
      ::= PARENTHESIS CLOSE15

```

referenced by:

- [aggregateFunction](#)<sup>36</sup>
- [arithmeticExpression](#)<sup>55</sup>
- [booleanExpression](#)<sup>48</sup>
- [csvTableSpec](#)<sup>26</sup>
- [embeddedSelect](#)<sup>22</sup>
- [functionExpression](#)<sup>56</sup>
- [insertFieldList](#)<sup>46</sup>
- [insertValues](#)<sup>46</sup>
- [jsonTableSpec](#)<sup>25</sup>
- [now](#)<sup>90</sup>
- [predicateExpression](#)<sup>52</sup>
- [tableFunctionSpec](#)<sup>23</sup>
- [utc](#)<sup>90</sup>
- [xmlTableSpec](#)<sup>24</sup>

**case:**

CASE

```

case50      ::= CASE50

```

referenced by:

- [caseExpression](#)<sup>49</sup>

**when:**

WHEN

```

when50      ::= WHEN50

```

referenced by:

- [caseWhenThenExpression](#)<sup>49</sup>

**then:**

THEN  
  then 51        ::= THEN 51

referenced by:

- [caseWhenThenExpression](#) 49

**else:**

ELSE  
  else 51        ::= ELSE 51

referenced by:

- [caseElseExpression](#) 49

**end:**

END  
  end 51        ::= END 51

referenced by:

- [caseExpression](#) 49

**not:**

NOT  
  not 51        ::= NOT 51

referenced by:

- [booleanExpression](#) 48
- [isLikeComparingExpression](#) 55
- [isNullComparingExpression](#) 54
- [predicateExpression](#) 52

**is:**

IS  
  is 51        ::= IS 51

referenced by:

- [isNullComparingExpression](#) 54

**are:**

ARE  
  are 51        ::= ARE 51

referenced by:

- [isEqualComparingExpression](#) 55

and:

AND

and<sup>52</sup> ::= AND<sup>52</sup>

referenced by:

- booleanExpression<sup>48</sup>
- predicateExpression<sup>52</sup>

or:

OR

or<sup>52</sup> ::= OR<sup>52</sup>

referenced by:

- booleanExpression<sup>48</sup>

true:

TRUE

true<sup>52</sup> ::= TRUE<sup>52</sup>

referenced by:

- booleanConstant<sup>100</sup>
- booleanExpression<sup>48</sup>

false:

FALSE

false<sup>52</sup> ::= FALSE<sup>52</sup>

referenced by:

- booleanConstant<sup>100</sup>
- booleanExpression<sup>48</sup>

**predicateExpression:**

arithmeticExpression not in\_ parenthesisOpen arithmeticExpression COMMA inSelectStatement parenthesisClose between arithmeticExpression and arithmeticExpression gt ge lt le eq neq arithmeticExpression isNullComparingExpression isLikeComparingExpression isEqualComparingExpression

predicateExpression<sup>52</sup> ::= arithmeticExpression<sup>55</sup> ( ( gt<sup>53</sup> | ge<sup>53</sup> | lt<sup>53</sup> | le<sup>53</sup> | eq<sup>54</sup> | neq<sup>54</sup> ) arithmeticExpression<sup>55</sup> | not<sup>51</sup>? ( between<sup>54</sup> arithmeticExpression<sup>55</sup> and<sup>52</sup> arithmeticExpression<sup>55</sup> | in<sup>54</sup> parenthesisOpen<sup>49</sup> ( arithmeticExpression<sup>55</sup> ( COMMA<sup>15</sup> arithmeticExpression<sup>55</sup> ) \* | inSelectStatement<sup>16</sup> ) parenthesisClose<sup>50</sup> ) | isNullComparingExpression<sup>54</sup> | isLikeComparingExpression<sup>55</sup> | isEqualComparingExpression<sup>55</sup> ) )

referenced by:

- [booleanExpression](#) [48]

### parameterExpression:

COLON identifier

[parameterExpression](#) [53]  
::= [COLON](#) [15] [identifier](#) [92]

referenced by:

- [arithmeticExpression](#) [55]
- [partitionIdentifier](#) [44]

### gt:

Greater than is a binary operator which returns true when the left value is greater than the right value. When one of both values is null, the outcome is null. Otherwise it is false.

GT

[gt](#) [53] ::= [GT](#) [53]

referenced by:

- [predicateExpression](#) [52]

### ge:

Greater or equal is a binary operator which returns true when the left value is greater than or equal to the right value. When one of both values is null, the outcome is null. Otherwise it is false.

GE

[ge](#) [53] ::= [GE](#) [53]

referenced by:

- [predicateExpression](#) [52]

### lt:

Less than is a binary operator which returns true when the left value is less than the right value. When one of both values is null, the outcome is null. Otherwise it is false.

LT

[lt](#) [53] ::= [LT](#) [53]

referenced by:

- [predicateExpression](#) [52]

### le:

Less or equal is a binary operator which returns true when the left value is less than or equal to the right value. When one of both values is null, the outcome is null. Otherwise it is false.

LE

le<sup>53</sup> ::= LE<sup>53</sup>

referenced by:

- [predicateExpression](#)<sup>52</sup>

eq:

EQ

eq<sup>54</sup> ::= EQ<sup>54</sup>

referenced by:

- [predicateExpression](#)<sup>52</sup>

neq:

NEQ

neq<sup>54</sup> ::= NEQ<sup>54</sup>

referenced by:

- [predicateExpression](#)<sup>52</sup>

like:

LIKE

like<sup>54</sup> ::= LIKE<sup>54</sup>

referenced by:

- [isLikeComparingExpression](#)<sup>55</sup>

between:

BETWEEN

between<sup>54</sup> ::= BETWEEN<sup>54</sup>

referenced by:

- [predicateExpression](#)<sup>52</sup>

in\_:

IN

in<sup>54</sup> ::= IN<sup>15</sup>

referenced by:

- [predicateExpression](#)<sup>52</sup>

**isNullComparingExpression:**

is not NULL

```
isNullComparingExpression54
  ::= is51 not51? NULL101
```

referenced by:

- predicateExpression<sup>52</sup>

### **isEqualComparingExpression:**

are EQUAL

```
isEqualComparingExpression55
  ::= are51? EQUAL15
```

referenced by:

- predicateExpression<sup>52</sup>

### **isLikeComparingExpression:**

not like arithmeticExpression

```
isLikeComparingExpression55
  ::= not51? like54 arithmeticExpression55
```

referenced by:

- predicateExpression<sup>52</sup>

### **arithmeticExpression:**

minus plus arithmeticExpression times divide plus minus concat arithmeticExpression parenthesisOpen arithmeticExpression selectStatement parenthesisClose functionExpression parameterExpression caseExpression fieldIdentifier constant

```
arithmeticExpression55
  ::= ( minus72 | plus73 | arithmeticExpression55
    ( times82 | divide66 | plus73 | minus72 | concat63 ) )
arithmeticExpression55
  | parenthesisOpen49 ( arithmeticExpression55 |
selectStatement16 ) parenthesisClose50
  | functionExpression56
  | parameterExpression53
  | caseExpression49
  | fieldIdentifier91
  | constant98
```

referenced by:

- aggregateFunction<sup>36</sup>
- arithmeticExpression<sup>55</sup>
- arithmeticExpressionList<sup>56</sup>
- attachToClause<sup>47</sup>
- caseWhenThenExpression<sup>49</sup>
- expression<sup>48</sup>
- identifiedByClause<sup>47</sup>
- insertValuesList<sup>46</sup>
- isLikeComparingExpression<sup>55</sup>

- [predicateExpression](#)<sup>52</sup>
- [updateValue](#)<sup>47</sup>

### arithmeticExpressionList:

arithmeticExpression list

```
arithmeticExpressionList56
 ::= arithmeticExpression55 ( list69
    arithmeticExpression55 ) *
```

referenced by:

- [aggregateFunction](#)<sup>36</sup>
- [functionExpression](#)<sup>56</sup>

### functionExpression:

abs acos anonymize ascii asin atan atan2 base64\_decode base64\_encode bit\_length octet\_length camel ceil chr coalesce concat\_func cos covfify compress uncompress dateadd datepart date\_ceil date\_floor date\_round date\_trunc day dayofweek dayofyear dense\_rank double\_metaphone double\_metaphone\_alt exp\_func floor from\_unixtime hour httpget httpget\_text httppost initcap instr jsondecode jsonencode left length levenshtein ln log lower lpad ltrim md5 metaphone metaphone3 metaphone3\_alt microsecond millisecond minute mod month newid number\_to\_speech normalize nvl power quarter quote\_ident quote\_literal quote\_nullable raise\_error random random\_blob rand rank regexp\_instr regexp\_replace regexp\_substr remainder replace repeat reverse right round row\_number rpad rtrim second sin soundex sqrt substr sys\_context tan to\_binary to\_char to\_date to\_number to\_guid to\_hex translate translate\_resources trim trunc unistr unix\_timestamp upper urldecode urlencode user unzip zip xmlcomment xmldecode xmlencode xmlelement xmlformat xmltransform year add\_months zero\_blob parenthesisOpen arithmeticExpressionList parenthesisClose random rand row\_number now utc user

```

functionExpression[56]
  ::= ( abs[57] | acos[58] | anonymize[58] | ascii[59] | asin[59]
  | atan[59] | atan2[59] | base64 decode[60] | base64 encode[60] |
  bit length[61] | octet length[62] | camel[61] | ceil[61] | chr[61] |
  coalesce[62] | concat func[63] | cos[63] | covfefify[63] | compress[63] |
  uncompress[64] | dateadd[64] | datepart[64] | date ceil[64] |
  date floor[64] | date round[65] | date trunc[65] | day[65] |
  dayofweek[65] | dayofyear[66] | dense rank[66] | double metaphone[66] |
  double metaphone alt[66] | exp func[67] | floor[67] | from unixtime[67]
  | hour[68] | httpget[87] | httpget text[87] | httppost[87] | initcap[68]
  | instr[68] | jsondecode[68] | jsonencode[69] | left[32] | length[69] |
  levenshtein[69] | ln[69] | log[70] | lower[70] | lpad[70] | ltrim[70] |
  md5[71] | metaphone[71] | metaphone3[71] | metaphone3 alt[71] |
  microsecond[77] | millisecond[78] | minute[72] | mod[71] | month[72] |
  newid[72] | number to speech[78] | normalize[78] | nvl[73] | power[73] |
  quarter[87] | quote ident[88] | quote literal[88] | quote nullable[88] |
  | raise error[62] | random[73] | random blob[74] | rand[74] | rank[74] |
  regexp instr[75] | regexp replace[75] | regexp substr[74] |
  remainder[76] | replace[76] | repeat[62] | reverse[76] | right[32] |
  round[76] | row number[77] | rpad[77] | rtrim[77] | second[79] | sin[79] |
  soundex[79] | sqrt[79] | substr[79] | sys context[80] | tan[82] |
  to binary[89] | to char[89] | to date[89] | to number[90] | to guid[89] |
  to hex[83] | translate[82] | translate resources[82] | trim[83] |
  trunc[83] | unistr[83] | unix timestamp[84] | upper[84] | urldecode[84] |
  urlencode[84] | user[88] | unzip[85] | zip[85] | xmlcomment[85] |
  xmldecode[85] | xmlencode[86] | xmlement[86] | xmlformat[86] |
  xmlexport[86] | year[88] | add months[60] | zero blob[90] )
parenthesisOpen[49] arithmeticExpressionList[56]?
parenthesisClose[50]
  | random[73]
  | rand[74]
  | row number[77]
  | now[90]
  | utc[90]
  | user[88]

```

referenced by:

- [arithmeticExpression](#)[55]

## abs:

Returns the absolute value of a double-precision floating-point number.

Parameters:

- Input: A number that is greater than or equal to System.Double.MinValue, but less than or equal to System.Double.MaxValue.

Returns: A double-precision floating-point number. ABS

[abs](#)[57]    ::= [ABS](#)[57]

referenced by:

- [functionExpression](#)[56]

**acos:**

Returns the angle of the provided cosine.

Parameters:

- Input: the cosine to get the angle of.

Returns: A number which represents the angle of the provided cosine. ACOS

[acos](#) 58 : := [ACOS](#) 58

referenced by:

- [functionExpression](#) 56

**anonymize:**

Anonymize a text or number. Anonymization is executed such that when the same original value is anonymized within the same session, the anonymized value will be identical. The anonymized value also uniquely matches the original value. With no access to the anonymization map however, the original value can however not be calculated from the anonymized value.

In mathematics, the anonymization function is a bijection: each element of the original set is paired with exactly one element of the anonymized set, and each element of the anonymized set is paired with exactly one element of the original set.

Parameters:

- Value: A text or number to be obfuscated.
- Maximum length (optional): Maximum length in digits for numbers or characters for text of anonymized value. Null means no restriction on maximum length.
- Mapping (optional): algorithm to use. The default algorithm is 'DEFAULT' which maps text values to a range of hexadecimal characters and numbers to a range of numbers. Alternative mappings are described below.

The following anonymization maps are available on installation:

- DEFAULT: the default algorithm.
- IVE-GL-JOURNAL-DESCRIPTION: general ledger journal descriptions: no preferred anonymizations, leave familiar and non-confidential descriptions in original state.
- IVE-GL-ACCOUNT-DESCRIPTION: general ledger account descriptions: no preferred anonymizations, leave familiar and non-confidential descriptions in original state.
- IVE-PSN-FIRST-NAME: person first names: prefer readable alternative first names, anonymize all.
- IVE-PSN-LAST-NAME: person last names: prefer readable alternative last names, anonymize all.
- IVE-ADS-CITY-NAME: address city names: prefer readable alternative city names, anonymize all.
- IVE-ADS-STREET-NAME: address street names: prefer readable alternative street names, anonymize all.

The data dictionary contains the anonymization maps used sofar in the session and their corresponding values:

```
select * from SystemAnonymizationMaps@DataDictionary select * from SystemAnonymizationMapValues@DataDictionary select * from SystemAnonymizationPre-definedMaps@DataDictionary
```

Returns: Anonymized value. ANONYMIZE

[anonymize](#)<sup>58</sup>  
::= [ANONYMIZE](#)<sup>58</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### ascii:

Get the position of a character on database character set.

Parameters:

- Input: character to get position from.

Returns: The position of the character on database character set. ASCII

[ascii](#)<sup>59</sup>  
::= [ASCII](#)<sup>59</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### asin:

Returns the angle of the provided sine.

Parameters:

- Input: the sine to get the angle of.

Returns: A number which represents the angle of the provided sine. ASIN

[asin](#)<sup>59</sup>  
::= [ASIN](#)<sup>59</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### atan:

Returns the angle of the provided tangent.

Parameters:

- Input: the tangent to get the angle of.

Returns: A number which represents the angle of the provided tangent. ATAN

[atan](#)<sup>59</sup>  
::= [ATAN](#)<sup>59</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### atan2:

Returns the angle of the provided tangent.

Parameters:

- First number: the first number to get the angle of.
- Second number: the second to get the angle of.

Returns: A number which represents the angle of the provided tangent. ATAN2

atan2<sup>59</sup> ::= ATAN2<sup>59</sup>

referenced by:

- functionExpression<sup>56</sup>

### **add\_months:**

Add an amount of months to a datetime.

Parameters:

- Date: datetime to ass the months to.
- Months: the amount of months to add.

Returns: A new datetime with the amount of months added. ADD\_MONTHS

add\_months<sup>60</sup> ::= ADD\_MONTHS<sup>60</sup>

referenced by:

- functionExpression<sup>56</sup>

### **base64\_decode:**

Converts the base64\_encoded value back to the binairy value as defined on [Wikipedia](#).

Parameters:

- Input: value to convert back to the original.

Returns: The input decoded back to the binairy value. BASE64\_DECODE

base64\_decode<sup>60</sup> ::= BASE64\_DECODE<sup>60</sup>

referenced by:

- functionExpression<sup>56</sup>

### **base64\_encode:**

Converts a binairy value to base64\_encoded characters as defined on [Wikipedia](#).

Parameters:

- Input: value to convert to base64 characters.

Returns: The input encoded to base64 characters. BASE64\_ENCODE

base64\_encode<sup>60</sup> ::= BASE64\_ENCODE<sup>60</sup>

referenced by:

- functionExpression<sup>56</sup>

**camel:**

Converts provided string to Camel case.

Parameters:

- Input: the string that will be converted to Camel case.

Returns: A string converted to Camel case. CAMEL

camel<sup>61</sup> ::= CAMEL<sup>61</sup>

referenced by:

- functionExpression<sup>56</sup>

**ceil:**

Rounds the input to the largest following integer. Unless an amount of decimals is defined, in which case it rounds to the largest integer number with the amount of decimals or date with the amount of positions.

Parameters:

- Input: A number or datetime to ceil.
- Decimals [optional]: A number to specify how many decimals it may ceil to in case of a number. In case of a datetime, it reflects the number of time positions, ranging from -2 for years to 2 for minutes.

Returns: The ceiling of the input. CELL

ceil<sup>61</sup> ::= CEIL<sup>61</sup>

referenced by:

- functionExpression<sup>56</sup>

**chr:**

Get a character from database character set.

Parameters:

- Input: a numeric value of a character.

Returns: A character from the database character set. CHR CHAR

chr<sup>61</sup> ::= CHR<sup>61</sup>  
| CHAR<sup>15</sup>

referenced by:

- functionExpression<sup>56</sup>

**bit\_length:**

Get the number of bits needed to represent a value. For a blob, this is the number of bits for the bytes of the blob. For all other data types, the value is first converted to a string and then the number of bits of the UTF8 representation is determined.

Parameters:

- Value: value to determine length in bits for.

Returns: number of bits needed to represent the value. BIT\_LENGTH

bit\_length<sup>61</sup>  
 $\text{:= } \underline{\text{BIT\_LENGTH}}$ <sup>61</sup>

referenced by:

- functionExpression<sup>56</sup>

### octet\_length:

Get the number of bytes needed to represent a value. For a blob, this is the number of bytes of the blob. For all other data types, the value is first converted to a string and then the number of bytes of the UTF8 representation is determined.

Parameters:

- Value: value to determine length in bytes for.

Returns: number of bytes needed to represent the value. OCTET\_LENGTH

octet\_length<sup>62</sup>  
 $\text{:= } \underline{\text{OCTET\_LENGTH}}$ <sup>62</sup>

referenced by:

- functionExpression<sup>56</sup>

### repeat:

Get a concatenation of the text by a number of times.

Parameters:

- Text: text to repeat.
- Times: number of time to repeat the text.

Returns: the text repeated a number of times. REPEAT

repeat<sup>62</sup>  
 $\text{:= } \underline{\text{REPEAT}}$ <sup>62</sup>

referenced by:

- functionExpression<sup>56</sup>

### raise\_error:

RAISE\_ERROR

raise\_error<sup>62</sup>  
 $\text{:= } \underline{\text{RAISE\_ERROR}}$ <sup>62</sup>

referenced by:

- functionExpression<sup>56</sup>

### coalesce:

Performs a coalescing operation.

Parameters:

- Left: an object.
- Right: an object.

Returns: the left value if right is empty, otherwise the right value. COALESCE

[coalesce](#) [62] ::= [COALESCE](#) [62]

referenced by:

- [functionExpression](#) [56]

### concat:

Concatenate the left and right values together as a text.

CONCAT\_OP

[concat](#) [63] ::= [CONCAT\\_OP](#) [15]

referenced by:

- [arithmeticExpression](#) [55]

### concat\_func:

Concatenate a list of values together as a text.

CONCAT

[concat\\_func](#) [63]  
::= [CONCAT](#) [63]

referenced by:

- [functionExpression](#) [56]

### cos:

Returns the cosine of the provided angle.

Parameters:

- Input: the angle to get the cosine of.

Returns: A number which represents the cosine of the provided angle. COS

[cos](#) [63] ::= [COS](#) [63]

referenced by:

- [functionExpression](#) [56]

### covfefify:

COVFEFIFY

[covfefify](#) [63]  
::= [COVFEFIFY](#) [63]

referenced by:

- [functionExpression](#) [56]

### compress:

COMPRESS

[compress](#) [63] ::= [COMPRESS](#) [63]

referenced by:

- [functionExpression](#) 

#### uncompress:

UNCOMPRESS

[uncompress](#) 

$::= \text{UNCOMPRESS}$  

referenced by:

- [functionExpression](#) 

#### dateadd:

Adds an amount of time to a date.

Parameters:

- Interval: the date interval to be added.
- Number: the number of intervals to add.
- Date: the date to which the interval should be added.

Returns: The original date with the number of intervals added. DATEADD

[dateadd](#)   $::= \text{DATEADD}$  

referenced by:

- [functionExpression](#) 

#### datepart:

Get the specified datepart from a datetime.

Parameters:

- datepart: a part of a date.
- date: a datetime to get the datepart from.

Returns: a part of a datetime. DATEPART

[datepart](#)   $::= \text{DATEPART}$  

referenced by:

- [functionExpression](#) 

#### date\_ceil:

DATE\_CEIL

[date\\_ceil](#) 

$::= \text{DATE_CEIL}$  

referenced by:

- [functionExpression](#) 

#### date\_floor:

**DATE\_FLOOR**

date\_floor<sup>64</sup>  
: := DATE\_FLOOR<sup>64</sup>

referenced by:

- functionExpression<sup>56</sup>

**date\_round:****DATE\_ROUND**

date\_round<sup>65</sup>  
: := DATE\_ROUND<sup>65</sup>

referenced by:

- functionExpression<sup>56</sup>

**date\_trunc:****DATE\_TRUNC**

date\_trunc<sup>65</sup>  
: := DATE\_TRUNC<sup>65</sup>

referenced by:

- functionExpression<sup>56</sup>

**day:**

Collect the day from a date.

Parameters:

- Input: A dateTime.

Returns: The day as an integer. DAY

day<sup>65</sup> : := DAY<sup>65</sup>

referenced by:

- functionExpression<sup>56</sup>

**dayofweek:**

Collect the day of a week from a date.

Parameters:

- Input: A dateTime.

Returns: The day of a week as an integer. DAYOFWEEK

dayofweek<sup>65</sup>  
: := DAYOFWEEK<sup>65</sup>

referenced by:

- functionExpression<sup>56</sup>

**dayofyear:**

Collect the day of a year from a date.

Parameters:

- Input: A `dateTime`.

Returns: The day of a year as an integer. `DAYOFYEAR`

dayofyear<sup>66</sup>  
: := DAYOFYEAR<sup>66</sup>

referenced by:

- functionExpression<sup>56</sup>

**dense\_rank:**

`DENSE_RANK`

dense\_rank<sup>66</sup>  
: := DENSE\_RANK<sup>66</sup>

referenced by:

- functionExpression<sup>56</sup>

**double\_metaphone:**

`DOUBLE_METAPHONE`

double\_metaphone<sup>66</sup>  
: := DOUBLE\_METAPHONE<sup>66</sup>

referenced by:

- functionExpression<sup>56</sup>

**double\_metaphone\_alt:**

`DOUBLE_METAPHONE_ALT`

double\_metaphone\_alt<sup>66</sup>  
: := DOUBLE\_METAPHONE\_ALT<sup>66</sup>

referenced by:

- functionExpression<sup>56</sup>

**divide:**

Divide one number by the second number.

Parameters:

- first: a number to divide.
- second: a number to divide with.

Returns: the divided output. `DIVIDE`

divide<sup>66</sup>  
: := DIVIDE<sup>66</sup>

referenced by:

- [arithmeticExpression](#)<sup>55</sup>

### exp:

Returns the provided number raised to the specified power.

Parameters:

- Input: the number to raise by the specified power.

Returns: A number which is the provided number raised to the specified power. EXP\_OP

[exp](#)<sup>67</sup> ::= [EXP\\_OP](#)<sup>15</sup>

no references

### exp\_func:

EXP

[exp\\_func](#)<sup>67</sup> ::= [EXP](#)<sup>67</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### floor:

Rounds the input to the smallest following integer. Unless an amount of decimals is defined, in which case it rounds to the smallest integer with the amount of decimals or date with the amount of positions.

Parameters:

- Input: A number or datetime to floor.
- Decimals [optional]: A number to specify how many decimals it may floor to in case of a number. In case of a datetime, it reflects the number of time positions, ranging from -2 for years to 2 for minutes.

Returns: The floor of the input. FLOOR

[floor](#)<sup>67</sup> ::= [FLOOR](#)<sup>67</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### from\_unixtime:

Get the date/time from an integer representing a UNIX epoch time.

Parameters:

- Input: An integer.

Returns: The date/time which the UNIX epoch time represents. FROM\_UNIXTIME

[from\\_unixtime](#)<sup>67</sup> ::= [FROM\\_UNIXTIME](#)<sup>67</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**hour:**

Collect the hour from a date.

Parameters:

- Input: A `dateTime`.

Returns: The hour as an integer. `HOUR`

hour<sup>68</sup> ::= HOUR<sup>68</sup>

referenced by:

- functionExpression<sup>56</sup>

**initcap:**

Changes the first letter of each word in uppercase, all other letters in lowercase.

Parameters:

- Input: Text to convert.

Returns: The input with the first letter of each word in uppercase. `INITCAP`

initcap<sup>68</sup> ::= INITCAP<sup>68</sup>

referenced by:

- functionExpression<sup>56</sup>

**instr:**

Get a number which is a position of the first occurrence of substring in the string.

Parameters:

- String: String to be searched.
- Substring: Text to search for.
- StartPosition [optional]: Position of string to start searching.
- occurrence [optional]: Return the position of the occurrence.

Returns: The position of the substring inside the original string. `INSTR`

instr<sup>68</sup> ::= INSTR<sup>68</sup>

referenced by:

- functionExpression<sup>56</sup>

**jsondecode:**

`JSONDECODE`

jsondecode<sup>68</sup>

::= JSONDECODE<sup>68</sup>

referenced by:

- functionExpression<sup>56</sup>

**jsonencode:**

JSONENCODE  
  jsonencode<sup>69</sup>  
    ::= JSONENCODE<sup>69</sup>

referenced by:

- functionExpression<sup>56</sup>

**length:**

Gets the number of characters in provided string.

Parameters:

- Input: the string to get the length of.

Returns: A number which represents the number of characters in the provided string.

**LENGTH**

length<sup>69</sup>   ::= LENGTH<sup>69</sup>

referenced by:

- functionExpression<sup>56</sup>

**levenshtein:**

Determine the Levenshtein distance between two values as defined on [Wikipedia](#).

**LEVENSHTEIN**

levenshtein<sup>69</sup>  
    ::= LEVENSHTEIN<sup>69</sup>

referenced by:

- functionExpression<sup>56</sup>

**list:**

COMMA  
  list<sup>69</sup>       ::= COMMA<sup>15</sup>

referenced by:

- arithmeticExpressionList<sup>56</sup>

**In:**

Get the natural logarithm of a number.

Parameters:

- Input: a number to get the natural logarithm from.

Returns: The natural logarithm of the input. LN

ln<sup>69</sup>       ::= LN<sup>69</sup>

referenced by:

- functionExpression<sup>56</sup>

**log:**

Get the natural logarithm of a number in a specified base.

Parameters:

- Input: a number to get the natural logarithm from.
- Base [optional]: the base to get the natural logarithm from.

Returns: The natural logarithm of the input in the specified base. LOG

[log](#) 70 ::= [LOG](#) 70

referenced by:

- [functionExpression](#) 56

**lower:**

Converts provided string to lowercase.

Parameters:

- Input: the string that will be converted to lowercase.

Returns: A string converted to lowercase. LOWER

[lower](#) 70 ::= [LOWER](#) 70

referenced by:

- [functionExpression](#) 56

**lpad:**

Pad a string to the left to make it a specified length.

Parameters:

- Input: string to be padded.
- Length: the length the string should be padded to.
- Characters [optional]: Characters to pad with.

Returns: A string padded to the left to a given length with the optional specified characters.

LPAD

[lpad](#) 70 ::= [LPAD](#) 70

referenced by:

- [functionExpression](#) 56

**ltrim:**

Trims characters from the left side of a string.

Parameters:

- Input: the string from to trim characters from the left side.
- (Optional) Chars to trim: the character to trim. Default is " ".

Returns: A string with chars trimmed from the left. LTRIM

[ltrim](#) 70 ::= [LTRIM](#) 70

referenced by:

- [functionExpression](#) 

### md5:

Converts a value to a 128-bit hash value as defined on [Wikipedia](#).

Parameters:

- Input: Text to convert with MD5.

Returns: The input converted with MD5. MD5

[md5](#)  ::= [MD5](#) 

referenced by:

- [functionExpression](#) 

### metaphone:

Converts a value to the Metaphone code as defined on [Wikipedia](#).

Parameters:

- Input: value to convert to metaphone.
- Length: maximum output length of the given input.

Returns: The input converted to metaphone, with a given output length. METAPHONE

[metaphone](#)  ::= [METAPHONE](#) 

referenced by:

- [functionExpression](#) 

### metaphone3:

METAPHONE3

[metaphone3](#)  ::= [METAPHONE3](#) 

referenced by:

- [functionExpression](#) 

### metaphone3\_alt:

METAPHONE3\_ALT

[metaphone3\\_alt](#)  ::= [METAPHONE3\\_ALT](#) 

referenced by:

- [functionExpression](#) 

### mod:

Get the remainder of a divide calculation.

Parameters:

- dividend: a number.
- divider: a number.

Returns: The remainder. MOD

mod<sup>71</sup> ::= MOD<sup>71</sup>

referenced by:

- functionExpression<sup>56</sup>

**minus:**

Subtracts a value from another.

Parameters:

- Value: a number or datetime.
- Subtract: a number or datetime.

Returns: The value minus the subtraction. MINUS

minus<sup>72</sup> ::= MINUS<sup>72</sup>

referenced by:

- arithmeticExpression<sup>55</sup>

**minute:**

Collect the minute from a date.

Parameters:

- Input: A dateTime.

Returns: The minute as an integer. MINUTE

minute<sup>72</sup> ::= MINUTE<sup>72</sup>

referenced by:

- functionExpression<sup>56</sup>

**month:**

Collect the month from a date.

Parameters:

- Input: A dateTime.

Returns: The month as an integer. MONTH

month<sup>72</sup> ::= MONTH<sup>72</sup>

referenced by:

- functionExpression<sup>56</sup>

**newid:**

Creates a new Guid id.

Returns: The new Guid id.

NEWID

newid<sup>72</sup> ::= NEWID<sup>72</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

nvl:

Coalesce all values together.

Returns: All values coalesced together.

NVL

nvl<sup>73</sup> ::= NVL<sup>73</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

plus:

Adding a value to another.

Parameters:

- Value: a number or datetime.
- add: a number or datetime.

Returns: A new value with both values added to eachother. PLUS

plus<sup>73</sup> ::= PLUS<sup>73</sup>

referenced by:

- [arithmeticExpression](#)<sup>55</sup>

power:

Gets a value of a number raised to another.

Parameters:

- Value: a number.
- exponent: a number.

Returns: The value of a number raised to another. POWER

power<sup>73</sup> ::= POWER<sup>73</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

random:

Generates a random number between 0 and 1.

Parameters:

- Seed: Produce a repeatable sequence of random numbers each time that seed value is provided.

Returns: A random number between 0 and 1. RANDOM

random<sup>73</sup> ::= RANDOM<sup>73</sup>

referenced by:

- functionExpression<sup>56</sup>

### **random\_blob:**

Generates a blob with pseudo-random values.

Parameters:

- Length: Produce a blob with this length in terms of bytes.

Returns: A blob with pseudo-random values. RANDOM\_BLOB

random\_blob<sup>74</sup> ::= RANDOM\_BLOB<sup>74</sup>

referenced by:

- functionExpression<sup>56</sup>

### **rand:**

RAND

rand<sup>74</sup> ::= RAND<sup>74</sup>

referenced by:

- functionExpression<sup>56</sup>

### **rank:**

RANK

rank<sup>74</sup> ::= RANK<sup>74</sup>

referenced by:

- functionExpression<sup>56</sup>

### **regexp\_substr:**

Extracts a substring from the given value using regular expression.

Parameters:

- Input: The text to get the substring from.
- Pattern: Regular expression pattern.
- Start position [optional]: The start index from the input.
- Appearance [optional]: Indicating the appearance of the substr operation.
- Match\_parameter [optional]: A text literal that lets you change the default matching behavior of the function.

Returns: The substring from the input. REGEXP\_SUBSTR

[regexp\\_substr](#)<sup>74</sup>  
: := [REGEXP\\_SUBSTR](#)<sup>74</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### **regexp\_instr:**

Determine the position of the regular expression in the given value. Returns 0 when the regular expression is not contained in the given value.

Parameters:

- Input: The text to get the regular expression position from.
- Pattern: Regular expression pattern.
- Start position [optional]: The start index from the input.
- Appearance [optional]: Indicating the appearance of the instr operation.
- ReturnOption [optional]: Select either the first character found or the first character after the occurrence of the pattern.
- Match\_parameter [optional]: A text literal that lets you change the default matching behavior of the function.

Returns: The location of a regular expression pattern in the input. REGEXP\_INSTR

[regexp\\_instr](#)<sup>75</sup>  
: := [REGEXP\\_INSTR](#)<sup>75</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### **regexp\_replace:**

Replaces all occurrences matching the regular expression with the replacement value. The replacement value may contain references to matches in the regular expression by using the dollar-sign ('\$') plus the reference number.

Parameters:

- Input: The text to get the substring from.
- Pattern: Regular expression pattern.
- Replacement [optional]: Text to replace with.
- Start position [optional]: The start index from the input.
- Appearance [optional]: Indicating the appearance of the replace operation.
- Match\_parameter [optional]: A text literal that lets you change the default matching behavior of the function. The available options are 'c' for case-sensitive, 'i' for ignore case, 'n' for single-line, 'm' for multi-line and 'x' for ignore pattern white space.

Returns: The input with every occurrence of the regular expression pattern replaced with the replacement.

REGEXP\_REPLACE  
[regexp\\_replace](#)<sup>75</sup>  
: := [REGEXP\\_REPLACE](#)<sup>75</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**remainder:**

Get the remainder of a divide calculation.

The REMAINDER function uses the round function in its formula, whereas the MOD function uses the floor function in its formula.

Parameters:

- Number1: a number.
- Number2: a number.

Returns: The remainder. REMAINDER

remainder<sup>76</sup>  
: := REMAINDER<sup>76</sup>

referenced by:

- functionExpression<sup>56</sup>

**replace:**

Replaces a string with string in given string.

Parameters:

- Input: the string to replace a string in.
- Old text: the string to be replaced.
- New text: the string which 'Old text' will be replaced with.

Returns: A string with the replaced string. REPLACE

replace<sup>76</sup>  
: := REPLACE<sup>76</sup>

referenced by:

- functionExpression<sup>56</sup>

**reverse:**

Flips the input around.

Parameters:

- Input: text to flip around.

Returns: The text with it's characters in reversed order. REVERSE

reverse<sup>76</sup>  
: := REVERSE<sup>76</sup>

referenced by:

- functionExpression<sup>56</sup>

**round:**

Rounds the input to the closest following integer. Unless an amount of decimals is defined, in which case it rounds to the closest integer number with the amount of decimals or date with the amount of positions.

Parameters:

- Input: A number or datetime to round.
- Decimals [optional]: A number to specify how many decimals it may round to in case of a number. In case of a datetime, it reflects the number of time positions, ranging from -2 for years to 2 for minutes.

Returns: The rounded input. ROUND

[round](#) 76 ::= [ROUND](#) 76

referenced by:

- [functionExpression](#) 56

### row\_number:

ROW\_NUMBER

[row\\_number](#) 77  
 ::= [ROW\\_NUMBER](#) 77

referenced by:

- [functionExpression](#) 56

### rpad:

Rightpad function pads the right-side of a string with a specific set of characters to the given length. When no set of characters given, it will pad with a whitespace.

Parameters:

- Input: Text to be padded.
- Length: The length to make the input to.
- Pad text [optional]: Text to add to the input if the length is larger then the input.

Returns: The padded text, or null if the string cannot be padded. RPAD

[rpad](#) 77 ::= [RPAD](#) 77

referenced by:

- [functionExpression](#) 56

### rtrim:

Trims characters from the right side of a string.

Parameters:

- Input: the string from which to trim characters from the right side.
- (Optional) Chars to trim: the character to trim. Default is " ".

Returns: A string with chars trimmed from the right. RTRIM

[rtrim](#) 77 ::= [RTRIM](#) 77

referenced by:

- [functionExpression](#) 56

### microsecond:

Collect the microsecond from a date.

Parameters:

- Input: A dateTime.

Returns: The microsecond as an integer. MICROSECOND

microsecond<sup>77</sup>  
:= MICROSECOND<sup>77</sup>

referenced by:

- functionExpression<sup>56</sup>

**millisecond:**

Collect the millisecond from a date.

Parameters:

- Input: A dateTime.

Returns: The millisecond as an integer. MILLISECOND

millisecond<sup>78</sup>  
:= MILLISECOND<sup>78</sup>

referenced by:

- functionExpression<sup>56</sup>

**number\_to\_speech:**

NUMBER\_TO\_SPEECH

number to speech<sup>78</sup>  
:= NUMBER TO SPEECH<sup>78</sup>

referenced by:

- functionExpression<sup>56</sup>

**normalize:**

Normalize a file path by replacing all invalid and non-ASCII characters for use in a file path by underscore. After that, the file path is made more readable by various operations such as removal of duplicate whitespace and underscore characters.

Parameters:

- Original file path: path of the file.
- Maximum file name length: length in characters into which the normalized file name must fit.
- Allow path separator: whether to allow the path separator '\' in the normalized file name.  
When not, occurrences are replaced.

Returns: a normalized file path. NORMALIZE

normalize<sup>78</sup>  
:= NORMALIZE<sup>78</sup>

referenced by:

- functionExpression<sup>56</sup>

**second:**

Collect the second from a date.

Parameters:

- Input: A `dateTime`.

Returns: The second as an integer. `SECOND`

second<sup>79</sup> ::= SECOND<sup>79</sup>

referenced by:

- functionExpression<sup>56</sup>

**soundex:**

Converts a value to the Soundex code as defined on [Wikipedia](#).

Parameters:

- Input: Text to that retrieve the soundex value from.

Returns: A text started with a number and followed by 3 digits. `SOUNDEX`

soundex<sup>79</sup> ::= SOUNDEX<sup>79</sup>

referenced by:

- functionExpression<sup>56</sup>

**sin:**

Returns the sine of the provided angle.

Parameters:

- Input: the angle to get the sine of.

Returns: A number which represents the sine of the provided angle. `SIN`

sin<sup>79</sup> ::= SIN<sup>79</sup>

referenced by:

- functionExpression<sup>56</sup>

**sqrt:**

Returns the square root of the provided number.

Parameters:

- Input: the number to get the square root of.

Returns: A number which represents the square root of the provided number. `SQRT`

sqrt<sup>79</sup> ::= SQRT<sup>79</sup>

referenced by:

- functionExpression<sup>56</sup>

**substr:**

Gets a substring from the input.

Parameters:

- Input: text to gather the substring from.
- Start: start position.
- Length: maximum length of the substring.

Returns: The substring from the original input. SUBSTR

substr<sup>79</sup> ::= SUBSTR<sup>79</sup>

referenced by:

- functionExpression<sup>56</sup>

### **sys\_context:**

Text value of a parameter associated with a context.

Parameters:

- context: a namespace.
- parameter: name of the parameter.

Solely the namespace USERENV is available with the following parameter names:

- APPLICATION\_VERSION: version of the client application.
- APPLICATION\_FULL: name and version of the client application.
- APPLICATION\_BUILD\_EXPIRATION\_DATE: build expiration date of the client application.
- AUTHENTICATION\_METHOD: current authentication method.
- CLIENT\_IP\_ADDRESS\_INTERNAL: internal IP address of the client device.
- CLIENT\_IP\_ADDRESS\_EXTERNAL: external IP address of the client device.
- CLIENT\_LOGICAL\_CORE\_COUNT: number of logical processor cores in the client device.
- CLIENT\_MACHINE\_NAME: machine name of the client device.
- CLIENT\_SYSTEM\_64\_BIT: whether the OS is 64-bit on the client device.
- CLIENT\_SYSTEM\_NAME: full OS name running on the client device.
- CLIENT\_SYSTEM\_DIRECTORY: system directory of the client device.
- CLIENT\_SYSTEM\_PAGE\_SIZE: system page size of the client device.
- CLIENT\_VIRTUAL\_MACHINE: whether the client device is a virtual machine.
- CLR\_VERSION\_BUILD: build version of the Common Language Runtime.
- CLR\_VERSION\_MAJOR: major version of the Common Language Runtime.
- CLR\_VERSION\_MAJOR\_REVISION: major revision of the Common Language Runtime.
- CLR\_VERSION\_MINOR: minor version of the Common Language Runtime.
- CLR\_VERSION\_MIN\_REVISION: minor revision of the Common Language Runtime.
- COMPANY\_ID: ID of the company of current user.
- COMPANY\_NAME: name of the company of current user.
- COMPANY\_PHONE: phone of the company of current user.
- COMPANY\_WEB\_SITE: web site of the company of current user.
- DATA\_CONTAINER\_ALIAS: alias of active data container.
- DATA\_CONTAINER\_ID: ID of active data container.
- DATABASE\_DESCRIPTION: description of database.
- DATABASE\_FULL\_NAME: full name of database.
- DATABASE\_VERSION: version of database.

- LANG: ISO abbreviation for the language name of the user. Alternative: USER\_LANGUAGE\_CODE.
- MODULE: name of the client application. Alternative: APPLICATION\_NAME.
- PROCESS\_64\_BIT: whether the OS process on the client device runs as 64-bit.
- PROCESS\_COMMAND\_LINE: command line used to start the OS process.
- PROCESS\_CURRENT\_DIRECTORY: current directory of the OS process.
- PROCESS\_STACK\_TRACE: current stack trace of the OS process.
- PROCESS\_WORKING\_SET: working set of the OS process.
- PROVIDER\_DESCRIPTION: description of active data container.
- PROVIDER\_DOCUMENTATION\_URL: documentation (URL) of active data container.
- PROVIDER\_DOWNLOAD\_IMPLEMENTATION\_URL: download driver (URL) of active data container.
- PROVIDER\_NAME: name of active data container.
- PROVIDER\_SHORT\_NAME: short name of active data container.
- PROVIDER\_TECHNICAL\_DOCUMENTATION\_URL: technical documentation (URL) of active data container.
- SESSION\_USER: log on code of the current user. Alternative: CURRENT\_USER.
- SESSIONID: session ID of current session.
- USER\_DOMAIN\_NAME: Windows domain name of current user.
- USER\_EMAIL\_ADDRESS: email address of current user.
- USER\_FIRST\_NAME: first name of current user.
- USER\_FULL\_NAME: full name of current user.
- USER\_GENDER: gender of current user.
- USER\_HOME\_DIRECTORY: home directory of current user on client device.
- USER\_INTERACTIVE: whether the current user works interactive.
- USER\_PICTURES\_DIRECTORY: pictures directory of current user on client device.
- USER\_FAVORITES\_DIRECTORY: favorites directory of current user on client device.
- USER\_DESKTOP\_DIRECTORY: desktop directory of current user on client device.
- USER\_DOCUMENTS\_DIRECTORY: documents directory of current user on client device.
- USER\_PROFILE\_DIRECTORY: profile directory of current user on client device.
- USER\_LAST\_LOG\_ON: time of last log on of current user.
- USER\_LAST\_NAME: last name of current user.
- USER\_LINKED\_IN: LinkedIn name of current user.
- USER\_MIDDLE\_NAME: middle name of current user.
- USER\_MOBILE\_NUMBER: mobile number of current user.
- USER\_NATIONALITY: nationality of current user.
- USER\_PHONE\_NUMBER: phone number of current user.
- USER\_PICTURE\_URL: picture (URL) of current user.
- USER\_SKYPE: Skype name of current user.
- USER\_TITLE: title of current user.
- USER\_TWITTER: Twitter name of current user.
- USER\_WEB\_SITE: personal web site of current user.

Returns: Value of the parameter in the context namespace. SYS\_CONTEXT

sys\_context [80]  
:= SYS\_CONTEXT [80]

referenced by:

- [functionExpression](#)<sup>56</sup>

### **tan:**

Returns the tangent of the provided angle.

Parameters:

- Input: the angle to get the tangent of.

Returns: A number which represents the tangent of the provided angle. TAN

[tan](#)<sup>82</sup>      ::= [TAN](#)<sup>82</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### **times:**

Multiplies one number by the second number.

Parameters:

- First: a number to multiply.
- Second: a number to multiply with.

Returns: The first number multiplied by the second number. ASTERIX

[times](#)<sup>82</sup>      ::= [ASTERIX](#)<sup>15</sup>

referenced by:

- [arithmeticExpression](#)<sup>55</sup>

### **translate:**

Translate replaces all occurrences of each character in from\_string to its corresponding character in to\_string.

Parameters:

- input: The string to replace a sequence of characters with another set of characters.
- from\_string: The string that will be searched for in the input.
- to\_string: All characters in the from\_string will be replaced with the corresponding character in the to\_string

Returns: the input with all occurrences of each character in from\_string replaced by its corresponding character in to\_string. TRANSLATE

[translate](#)<sup>82</sup>      ::= [TRANSLATE](#)<sup>82</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### **translate\_resources:**

Replace all Invantive-style resources ('{res:...}') by their translation in the current language.

Parameters:

- txt: The string to replace resources in.

Returns: the input with all resources replaced by their translation.

TRANSLATE\_RESOURCES

[translate\\_resources](#)<sup>82</sup>  
: := [TRANSLATE\\_RESOURCES](#)<sup>82</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

trim:

Trims whitespaces from both sides of the provided string.

Parameters:

- Input: the string from which to trim characters.

Returns: A string trimmed from whitespaces from both sides. TRIM

[trim](#)<sup>83</sup>  
: := [TRIM](#)<sup>83</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

trunc:

Calculates the integral part of a number. Unless an amount of decimals is defined, in which case it calculates to the integer with the amount of decimals or date with the amount of positions.

Parameters:

- Input: A number or datetime to truncate.
- Decimals [optional]: A number to specify how many decimals it may truncate to in case of a number. In case of a datetime, it reflects the number of time positions, ranging from -2 for years to 2 for minutes.

Returns: The truncated input. TRUNC

[trunc](#)<sup>83</sup>  
: := [TRUNC](#)<sup>83</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

to\_hex:

TO\_HEX  
[to\\_hex](#)<sup>83</sup>  
: := [TO\\_HEX](#)<sup>83</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

unistr:

Converts a text with unicodes to regular characters.

Parameters:

- Input: text with unicodes.

Returns: The input converted to all regular characters. UNISTR

unistr<sup>83</sup> ::= UNISTR<sup>83</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### upper:

Converts provided string to uppercase.

Parameters:

- Input: the string that will be converted to uppercase.

Returns: A string converted to uppercase. UPPER

upper<sup>84</sup> ::= UPPER<sup>84</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### urlencode:

Decodes a url.

Parameters:

- Url: url to decode.

Returns: The decoded url. URLDECODE

urlencode<sup>84</sup> ::= URLDECODE<sup>84</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### urlencode:

Encodes a url.

Parameters:

- Url: url to encode.

Returns: The encoded url. URLENCODE

urlencode<sup>84</sup> ::= URLENCODE<sup>84</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

### unix\_timestamp:

Get the UNIX epoch time of a date/time.

Parameters:

- Input: A dateTime. Current date/time is used when no value is specified.

Returns: The UNIX epoch time. UNIX\_TIMESTAMP

unix\_timestamp<sup>84</sup>  
    ::= UNIX\_TIMESTAMP<sup>84</sup>

referenced by:

- functionExpression<sup>56</sup>

**unzip:**

UNZIP  
unzip<sup>85</sup>        ::= UNZIP<sup>85</sup>

referenced by:

- functionExpression<sup>56</sup>

**zip:**

ZIP  
zip<sup>85</sup>          ::= ZIP<sup>85</sup>

referenced by:

- functionExpression<sup>56</sup>

**xmlcomment:**

Format a text as an XML comment.

Parameters:

- Input: the input which will be formatted as XML comment.

Returns: A text with the input as XML comment. XMLCOMMENT

xmlcomment<sup>85</sup>  
    ::= XMLCOMMENT<sup>85</sup>

referenced by:

- functionExpression<sup>56</sup>

**xmldecode:**

Returns the XML decoded input.

Parameters:

- Input: the input which will be decoded into XML.

Returns: An object which is the XML decoded input. XMLDECODE

xmldecode<sup>85</sup>  
    ::= XMLDECODE<sup>85</sup>

referenced by:

- functionExpression<sup>56</sup>

**xmlencode:**

Returns the XML encoded input.

Parameters:

- Input: the input which will be encoded into XML.

Returns: An object which is the XML encoded input. XMLENCODE

[xmlencode](#)<sup>86</sup>  
::= [XMLENCODE](#)<sup>86</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**xmlelement:**

XMLELEMENT

[xmlelement](#)<sup>86</sup>  
::= [XMLELEMENT](#)<sup>86</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**xmltransform:**

Applies an XSL style sheet to the XML instance.

Parameters:

- XML: XML type instance to be transformed with the XSL style sheet.
- Style sheet: The XSL style sheet to apply.

Returns: The XML instance with the style sheet applied to it. XMLTRANSFORM

[xmltransform](#)<sup>86</sup>  
::= [XMLTRANSFORM](#)<sup>86</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**xmlformat:**

Pretty-print xml text.

Parameters:

- Xml: xml to pretty-print.

Returns: The pretty-printed XML text. XMLFORMAT

[xmlformat](#)<sup>86</sup>  
::= [XMLFORMAT](#)<sup>86</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**httpget:**

Collects all data from the URL as binary data.

The URL must be publicly accessible. Use the NativePlatformScalarRequest view on cloud applications to directly access their web APIs.

Parameters:

- URL: the URL to collect the data from.

Returns: The collected data as an byte array. HTTPGET

[httpget](#) [87] ::= [HTTPGET](#) [87]

referenced by:

- [functionExpression](#) [56]

**httpget\_text:**

Collects all data from the URL as text.

The URL must be publicly accessible. Use the NativePlatformScalarRequest view on cloud applications to directly access their web APIs.

Parameters:

- URL: the URL to collect the data from.
- Encoding: the encoding from the data to receive, which is by default UTF8.

Returns: The collected data as text. HTTPGET\_TEXT

[httpget\\_text](#) [87] ::= [HTTPGET\\_TEXT](#) [87]

referenced by:

- [functionExpression](#) [56]

**httppost:**

HTTPPOST

[httppost](#) [87] ::= [HTTPPOST](#) [87]

referenced by:

- [functionExpression](#) [56]

**quarter:**

Collect the quarter from a date.

Parameters:

- Input: A dateTime.

Returns: The quarter as an integer. QUARTER

[quarter](#) [87] ::= [QUARTER](#) [87]

referenced by:

- [functionExpression](#) [56]

**quote\_ident:**

QUOTE\_IDENT

quote\_ident<sup>88</sup>: := QUOTE IDENT<sup>88</sup>

referenced by:

- functionExpression<sup>56</sup>

**quote\_literal:**

QUOTE\_LITERAL

quote\_literal<sup>88</sup>: := QUOTE LITERAL<sup>88</sup>

referenced by:

- functionExpression<sup>56</sup>

**quote\_nullable:**

QUOTE\_NULLABLE

quote\_nullable<sup>88</sup>: := QUOTE NULLABLE<sup>88</sup>

referenced by:

- functionExpression<sup>56</sup>

**user:**

Gets the user log on code.

Returns: The user log on code.

USER

user<sup>88</sup>: := USER<sup>88</sup>

referenced by:

- functionExpression<sup>56</sup>

**year:**

Collect the year from a date.

Parameters:

- Input: A dateTime.

Returns: The year as an integer. YEAR

year<sup>88</sup>: := YEAR<sup>88</sup>

referenced by:

- functionExpression<sup>56</sup>

**to\_binary:**

TO\_BINARY  
  to\_binary<sup>89</sup>  
    ::= TO\_BINARY<sup>89</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**to\_char:**

Converts a value into text.

Parameters:

- Input: value to convert.

Returns: The input converted to text. TO\_CHAR

to\_char<sup>89</sup> :::= TO\_CHAR<sup>89</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**to\_date:**

Converts a value into a datetime.

Parameters:

- Input: value to convert.

Returns: The input converted to a datetime. TO\_DATE

to\_date<sup>89</sup> :::= TO\_DATE<sup>89</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**to\_guid:**

Converts a value into a guid.

Parameters:

- Input: value to convert.

Returns: The input converted to a guid.

Converts a value into a number.

Parameters:

- Input: value to convert.

Returns: The input converted to a number. TO\_GUID

to\_guid<sup>89</sup> :::= TO\_GUID<sup>89</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**to\_number:**

TO\_NUMBER

to\_number<sup>90</sup>: := TO\_NUMBER<sup>90</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**zero\_blob:**

Generates a blob with 0-byte values.

Parameters:

- Length: Produce a blob with this length in terms of bytes.

Returns: A blob with 0-byte values. ZERO\_BLOB

zero\_blob<sup>90</sup>: := ZERO\_BLOB<sup>90</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**now:**

The time of the system clock in local time at the device where Invantive UniversalSQL runs.

Returns: current date/time.

NOW GETDATE SYSDATETIME parenthesisOpen parenthesisClose SYSDATE

now<sup>90</sup> : := ( NOW<sup>90</sup> | GETDATE<sup>15</sup> | SYSDATETIME<sup>15</sup> )parenthesisOpen<sup>49</sup> parenthesisClose<sup>50</sup>| SYSDATE<sup>15</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**utc:**

UTC\_DATE parenthesisOpen parenthesisClose GETUTCDATE NOWUTC parenthesisOpen parenthesisClose SYSDATEUTC

utc<sup>90</sup> : := UTC\_DATE<sup>15</sup> ( parenthesisOpen<sup>49</sup>parenthesisClose<sup>50</sup> ) ?| ( GETUTCDATE<sup>15</sup> | NOWUTC<sup>15</sup> ) parenthesisOpen<sup>49</sup>parenthesisClose<sup>50</sup>| SYSDATEUTC<sup>15</sup>

referenced by:

- [functionExpression](#)<sup>56</sup>

**fullTableIdentifier:**

catalogIdentifier DOT schemaIdentifier DOT tableIdentifier

```
fullTableIdentifier[90]
  ::= ( catalogIdentifier[91] DOT[15] ( schemaIdentifier[91]?  
DOT[15] )? )? tableIdentifier[91]
```

referenced by:

- [tableOrFunctionSpec](#)[23]
- [tableSpec](#)[22]

### **catalogIdentifier:**

identifier

```
catalogIdentifier[91]
  ::= identifier[92]
```

referenced by:

- [fullTableIdentifier](#)[90]

### **schemadIdentifier:**

identifier

```
schemaIdentifier[91]
  ::= identifier[92]
```

referenced by:

- [fullTableIdentifier](#)[90]

### **tableIdentifier:**

identifier

```
tableIdentifier[91]
  ::= identifier[92]
```

referenced by:

- [fullTableIdentifier](#)[90]

### **fieldIdentifier:**

alias DOT identifier

```
fieldIdentifier[91]
  ::= ( alias[92] DOT[15] )? identifier[92]
```

referenced by:

- [arithmeticExpression](#)[55]

### **attributIdentifier:**

identifierWithMinus keywordsAsIdentifierOrAlias

```
attributeIdentifier[91]
  ::= identifierWithMinus[92]
    | keywordsAsIdentifierOrAlias[93]
```

referenced by:

- [setIdentifier](#)<sup>42</sup>

### identifierWithMinus:

identifier MINUS identifier INT\_OR\_DECIMAL\_C ESCAPED\_IDENTIFIER  
`identifierWithMinus92`  
`::= ESCAPED_IDENTIFIER15  
| identifier92 ( MINUS72 ( identifier92 |  
INT_OR_DECIMAL_C15 ) ? ) *`

referenced by:

- [attributeIdentifier](#)<sup>91</sup>

### identifier:

ESCAPED\_IDENTIFIER IDENTIFIER keywordsAsIdentifierOrAlias  
`identifier92`  
`::= ESCAPED_IDENTIFIER15  
| IDENTIFIER92  
| keywordsAsIdentifierOrAlias93`

referenced by:

- [catalogIdentifier](#)<sup>91</sup>
- [column](#)<sup>30</sup>
- [csvTableColumnSpec](#)<sup>27</sup>
- [dataContainerAlias](#)<sup>24</sup>
- [fieldIdentifier](#)<sup>91</sup>
- [identifierWithMinus](#)<sup>92</sup>
- [joinSet](#)<sup>20</sup>
- [jsonTableColumnSpec](#)<sup>26</sup>
- [noJoinSet](#)<sup>20</sup>
- [parameterExpression](#)<sup>53</sup>
- [partitionIdentifier](#)<sup>44</sup>
- [partitionSimpleIdentifier](#)<sup>45</sup>
- [schemaIdentifier](#)<sup>91</sup>
- [tableIdentifier](#)<sup>91</sup>
- [xmlTableColumnSpec](#)<sup>25</sup>

### alias:

ESCAPED\_IDENTIFIER IDENTIFIER keywordsAsIdentifierOrAlias  
`alias92`  
`::= ESCAPED_IDENTIFIER15  
| IDENTIFIER92  
| keywordsAsIdentifierOrAlias93`

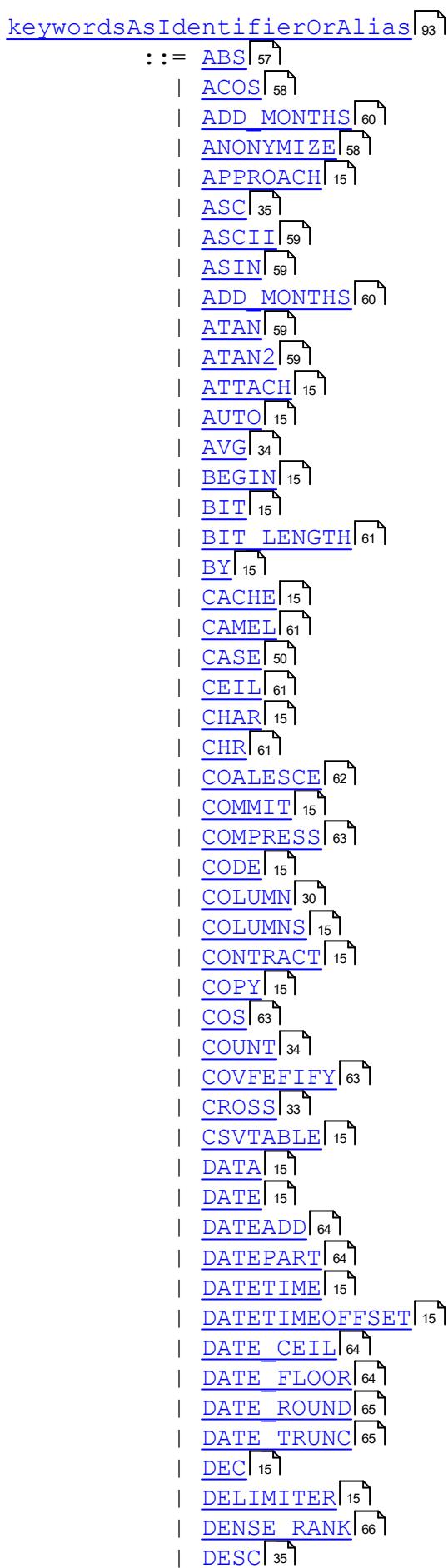
referenced by:

- [aliased](#)<sup>35</sup>
- [allColumnsSpecId](#)<sup>37</sup>

- [fieldIdentifier](#) 91

**keywordsAsIdentifierOrAlias:**

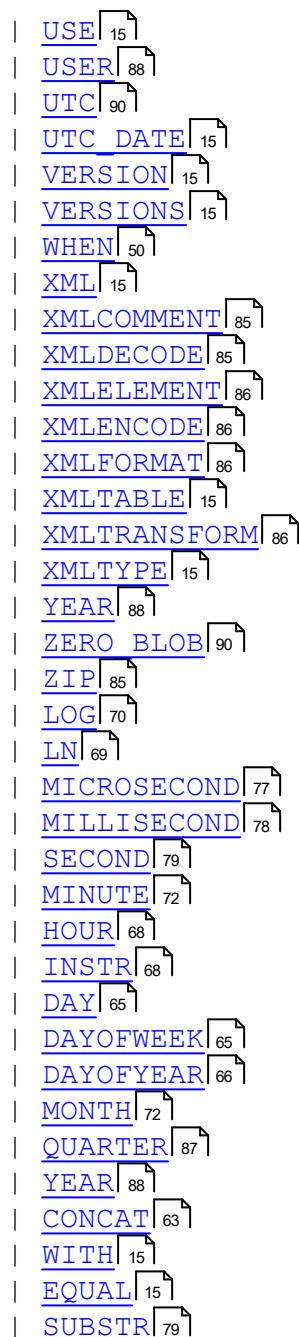
ABS ACOS ADD\_MONTHS ANONYMIZE APPROACH ASC ASCII ASIN ADD\_MONTHS  
ATAN ATAN2 ATTACH AUTO AVG BEGIN BIT BIT\_LENGTH BY CACHE CAMEL CASE  
CEIL CHAR CHR COALESCE COMMIT COMPRESS CODE COLUMN COLUMNS  
CONTRACT COPY COS COUNT COVFEFIFY CROSS CSVTABLE DATA DATE  
DATEADD DATEPART DATETIME DATETIMEOFFSET DATE\_CEIL DATE\_FLOOR  
DATE\_ROUND DATE\_TRUNC DEC DELIMITER DENSE\_RANK DESC DOWNLOAD  
DOUBLE DROPPABLE DROPPED ELSE END EXP FEED FLOOR FORCE  
FORWARDED FRESH FROM\_UNIXTIME FULL GETDATE GETUTCDATE GROUP  
HTTPGET HTTPGET\_TEXT HTTPPOST IDENTIFIED IMAGE INITCAP INCOMING  
INTEGER INTERSECT INTERVAL JOIN\_SET BASE64\_DECODE BASE64\_ENCODE  
JSONDECODE JSONENCODE LABEL LEFT LENGTH LEVENSHTEIN LICENSE LIMIT  
LINES LISTAGG LOAD LOGICAL LONGTEXT LOWER LOW\_COST LPAD LTRIM  
MAINTAIN MAX MD5 MESSAGES METADATA MEDIUMTEXT MIN MINUS\_C MOD MODEL  
MONEY MY NAME NEWID NO\_JOIN\_SET NORMALIZE NOWUTC NUMBER  
NUMBER\_TO\_SPEECH NVL OBSOLETE OCTET\_LENGTH ODS ONCE OUTER  
OVERALL PARALLEL PASSING PARTITION PATH PERSISTENT POSITION POSTFIX  
POWER PREFIX PRODUCT PURGE QUOTE\_IDENT QUOTE\_LITERAL  
QUOTE\_NULLABLE RAISE\_ERROR RAND RANK RANDOM RANDOM\_BLOB READY  
RECYCLEBIN REFRESH REGEXP\_INSTR REGEXP\_REPLACE REGEXP\_SUBSTR  
REMAINDER REPEAT RESULT\_SET\_NAME RETENTION REVERSE RIGHT ROLLBACK  
ROUND ROW ROW\_NUMBER RPAD RTRIM SAMPLE SERIAL SIN SKIP\_SOUNDEx  
SQRT STATE STDDDEV SUM SYSDATETIME SYSDATEUTC SYS\_CONTEXT TABLES  
TAN TEXT THEN TIME TIMESTAMP TINYTEXT TO TOKEN TOP TO\_BINARY TO\_CHAR  
TO\_DATE TO\_GUID TO\_HEX TO\_NUMBER TRANSACTION TRANSLATE  
TRANSLATE\_RESOURCES TRICKLE TRIM TRUNC UNCOMPRESS UNION  
UNIQUEIDENTIFIER UNISTR UNIX\_TIMESTAMP UNKNOWN UNZIP UPDATE UPGRADE  
UPPER URLDECODE URLENCODE USE USER UTC UTC\_DATE VERSION VERSIONS  
WHEN XML XMLCOMMENT XMLDECODE XMLELEMENT XMLENCODE XMLFORMAT  
XMLTABLE XMLTRANSFORM XMLTYPE YEAR ZERO\_BLOB ZIP LOG LN  
MICROSECOND MILLISECOND SECOND MINUTE HOUR INSTR DAY DAYOFWEEK  
DAYOFYEAR MONTH QUARTER YEAR CONCAT WITH EQUAL SUBSTR



| [DOWNLOAD](#) 15  
| [DOUBLE](#) 15  
| [Droppable](#) 15  
| [Dropped](#) 15  
| [Else](#) 51  
| [End](#) 51  
| [Exp](#) 67  
| [Feed](#) 15  
| [Floor](#) 67  
| [Force](#) 15  
| [Forwarded](#) 15  
| [Fresh](#) 15  
| [From UnixTime](#) 67  
| [Full](#) 33  
| [GetDate](#) 15  
| [GetUTCDate](#) 15  
| [Group](#) 15  
| [HttpGet](#) 87  
| [HttpGet Text](#) 87  
| [HttpPost](#) 87  
| [Identified](#) 15  
| [Image](#) 15  
| [InitCap](#) 68  
| [Incoming](#) 15  
| [Integer](#) 15  
| [Intersect](#) 15  
| [Interval](#) 15  
| [Join Set](#) 15  
| [Base64 Decode](#) 60  
| [Base64 Encode](#) 60  
| [JsonDecode](#) 68  
| [JsonEncode](#) 69  
| [Label](#) 15  
| [Left](#) 32  
| [Length](#) 69  
| [Levenshtein](#) 69  
| [License](#) 15  
| [Limit](#) 15  
| [Lines](#) 15  
| [Listagg](#) 34  
| [Load](#) 15  
| [Logical](#) 15  
| [LongText](#) 15  
| [Lower](#) 70  
| [Low Cost](#) 15  
| [Lpad](#) 70  
| [Ltrim](#) 70  
| [Maintain](#) 15  
| [Max](#) 34  
| [Md5](#) 71  
| [Messages](#) 15  
| [Metadata](#) 15

- | [MEDIUMTEXT](#) 15
- | [MIN](#) 33
- | [MINUS C](#) 15
- | [MOD](#) 71
- | [MODEL](#) 15
- | [MONEY](#) 15
- | [MY](#) 15
- | [NAME](#) 15
- | [NEWID](#) 72
- | [NO JOIN SET](#) 15
- | [NORMALIZE](#) 78
- | [NOWUTC](#) 15
- | [NUMBER](#) 15
- | [NUMBER TO SPEECH](#) 78
- | [NVL](#) 73
- | [OBSOLETE](#) 15
- | [OCTET LENGTH](#) 62
- | [ODS](#) 19
- | [ONCE](#) 15
- | [OUTER](#) 32
- | [OVERALL](#) 15
- | [PARALLEL](#) 15
- | [PASSING](#) 15
- | [PARTITION](#) 15
- | [PATH](#) 15
- | [PERSISTENT](#) 15
- | [POSITION](#) 15
- | [POSTFIX](#) 15
- | [POWER](#) 73
- | [PREFIX](#) 15
- | [PRODUCT](#) 33
- | [PURGE](#) 15
- | [QUOTE IDENT](#) 88
- | [QUOTE LITERAL](#) 88
- | [QUOTE NULLABLE](#) 88
- | [RAISE ERROR](#) 62
- | [RAND](#) 74
- | [RANK](#) 74
- | [RANDOM](#) 73
- | [RANDOM BLOB](#) 74
- | [READY](#) 15
- | [RECYCLEBIN](#) 15
- | [REFRESH](#) 15
- | [REGEXP\\_INSTR](#) 75
- | [REGEXP\\_REPLACE](#) 75
- | [REGEXP\\_SUBSTR](#) 74
- | [REMAINDER](#) 76
- | [REPEAT](#) 62
- | [RESULT SET NAME](#) 15
- | [RETENTION](#) 15
- | [REVERSE](#) 76
- | [RIGHT](#) 32

<a href="#">ROLLBACK</a>	15
<a href="#">ROUND</a>	76
<a href="#">ROW</a>	15
<a href="#">ROW_NUMBER</a>	77
<a href="#">RPAD</a>	77
<a href="#">RTRIM</a>	77
<a href="#">SAMPLE</a>	15
<a href="#">SERIAL</a>	15
<a href="#">SIN</a>	79
<a href="#">SKIP</a>	15
<a href="#">SOUNDEX</a>	79
<a href="#">SQRT</a>	79
<a href="#">STATE</a>	15
<a href="#">STDDEV</a>	34
<a href="#">SUM</a>	33
<a href="#">SYSDATETIME</a>	15
<a href="#">SYSDATEUTC</a>	15
<a href="#">SYS_CONTEXT</a>	80
<a href="#">TABLES</a>	15
<a href="#">TAN</a>	82
<a href="#">TEXT</a>	15
<a href="#">THEN</a>	51
<a href="#">TIME</a>	15
<a href="#">TIMESTAMP</a>	15
<a href="#">TINYTEXT</a>	15
<a href="#">TO</a>	15
<a href="#">TOKEN</a>	15
<a href="#">TOP</a>	15
<a href="#">TO_BINARY</a>	89
<a href="#">TO_CHAR</a>	89
<a href="#">TO_DATE</a>	89
<a href="#">TO_GUID</a>	89
<a href="#">TO_HEX</a>	83
<a href="#">TO_NUMBER</a>	90
<a href="#">TRANSACTION</a>	15
<a href="#">TRANSLATE</a>	82
<a href="#">TRANSLATE_RESOURCES</a>	82
<a href="#">TRICKLE</a>	15
<a href="#">TRIM</a>	83
<a href="#">TRUNC</a>	83
<a href="#">UNCOMPRESS</a>	64
<a href="#">UNION</a>	15
<a href="#">UNIQUEIDENTIFIER</a>	15
<a href="#">UNISTR</a>	83
<a href="#">UNIX_TIMESTAMP</a>	84
<a href="#">UNKNOWN</a>	15
<a href="#">UNZIP</a>	85
<a href="#">UPDATE</a>	15
<a href="#">UPGRADE</a>	15
<a href="#">UPPER</a>	84
<a href="#">URLDECODE</a>	84
<a href="#">URLENCODE</a>	84



referenced by:

- [alias](#) [92]
- [attributeIdentifier](#) [91]
- [identifier](#) [92]

#### **constant:**

A constant value with associated data type. The null value is typically associated with the null data type.

stringConstant numericConstant booleanConstant intervalConstant null

```
constant[98] ::= stringConstant[99]
| numericConstant[100]
| booleanConstant[100]
| intervalConstant[99]
| null[101]
```

referenced by:

- [arithmeticExpression](#)[55]
- [pSqlItemDeclaration](#)[101]

### stringConstant:

A constant text value with varchar2 data type.

### STRING\_C

```
stringConstant[99]
 ::= STRING_C[15]
```

referenced by:

- [allColumnsSpecColumnNamePostfix](#)[37]
- [allColumnsSpecColumnNamePrefix](#)[37]
- [allColumnsSpecLabelPostfix](#)[37]
- [allColumnsSpecLabelPrefix](#)[37]
- [alterPersistentCacheDownloadStatement](#)[39]
- [alterPersistentCacheDropStatement](#)[40]
- [alterPersistentCacheSetStatement](#)[41]
- [alterPersistentCacheSetTableOptions](#)[41]
- [constant](#)[98]
- [csvTableOptions](#)[26]
- [intervalConstant](#)[99]
- [jsonTableColumSpec](#)[26]
- [jsonTableSpec](#)[25]
- [labeled](#)[36]
- [resultSetName](#)[19]
- [xmlTableColumSpec](#)[25]
- [xmlTableSpec](#)[24]

### intervalConstant:

A constant interval value, reflecting the time span between two dates. The string constant consists of an integer number and unit of time, taken from the following list:

- Millisecond,
- second,
- minute,
- hour,
- day,
- week, and
- year.

The units may be postfixed with an 's' without changing meaning, like 'years'.

Valid interval values are for example: "5 seconds", "20 hours" and "1 year". There is no support for combined intervals such as "30 minutes and 30 seconds".

#### INTERVAL stringConstant

```
intervalConstant [99]
  ::= INTERVAL [15] stringConstant [99]
```

referenced by:

- [constant](#) [98]
- [httpDiskCache](#) [18]
- [httpMemoryCache](#) [19]
- [ods](#) [19]

#### numericConstant:

A constant numeric value with numeric data type.

#### INT\_OR\_DECIMAL\_C E NOTATION\_C

```
numericConstant [100]
  ::= INT_OR_DECIMAL_C [15]
    | E_NOTATION_C [15]
```

referenced by:

- [alterPersistentCacheDownloadStatement](#) [39]
- [alterPersistentCachePartitionRefreshStatement](#) [40]
- [alterPersistentCacheRefreshStatement](#) [39]
- [alterPersistentCacheSetStatement](#) [41]
- [alterPersistentCacheTableRefreshStatement](#) [40]
- [constant](#) [98]
- [csvTableColumnSpec](#) [27]
- [csvTableOptions](#) [26]
- [joinSet](#) [20]
- [limitClause](#) [22]
- [pSqlForNumberLoopStatement](#) [104]
- [partitionIdentifier](#) [44]
- [partitionSimpleIdentifier](#) [45]
- [topClause](#) [21]

#### booleanConstant:

true false

```
booleanConstant [100]
  ::= true [52]
    | false [52]
```

referenced by:

- [alterPersistentCacheSetStatement](#) [41]
- [alterPersistentCacheSetTableOptions](#) [41]
- [constant](#) [98]
- [httpDiskCache](#) [18]

- [httpMemoryCache](#) 19
- [ods](#) 19

### null:

The "unknown" value null.

### NULL

[null](#) 101      ::= [NULL](#) 101

referenced by:

- [constant](#) 98
- [jsonTableSpec](#) 25
- [xmlTableSpec](#) 24

### pSqlBlock:

A PSQL block is a structure to define procedural logic. It can contain both procedural logic as well as SQL statements like "select".

#### pSqlDeclareSection pSqlBody

[pSqlBlock](#) 101  
  ::= [pSqlDeclareSection](#) 101? [pSqlBody](#) 102

referenced by:

- [pSqlBlockOrStatement](#) 102
- [pSqlStatement](#) 102

### pSqlDeclareSection:

A PSQL declare section defines one or more local variables, which are available in the block and nested blocks.

#### DECLARE pSqlDeclaration

[pSqlDeclareSection](#) 101  
  ::= [DECLARE](#) 15 [pSqlDeclaration](#) 101+

referenced by:

- [pSqlBlock](#) 101

### pSqlDeclaration:

#### pSqlItemDeclaration

[pSqlDeclaration](#) 101  
  ::= [pSqlItemDeclaration](#) 101

referenced by:

- [pSqlDeclareSection](#) 101

### pSqlItemDeclaration:

An item declaration defines one named variable, based upon data type. The initial value can be added as a constant.

variableName dataType ASSIGNMENT\_OPERATOR constant BATCHSEPARATOR  
`pSqlItemDeclaration`<sup>101</sup>  
`::= variableName`<sup>105</sup> `dataType`<sup>27</sup> ( `ASSIGNMENT_OPERATOR`<sup>15</sup>  
`constant`<sup>98</sup> )? `BATCHSEPARATOR`<sup>15</sup>

referenced by:

- `pSqlDeclaration`<sup>101</sup>

### **pSqlBody:**

A PSQL body contains the procedural logic as well as SQL statements. Variables must have been declared beforehand.

BEGIN pSqlStatement END BATCHSEPARATOR  
`pSqlBody`<sup>102</sup> ::= `BEGIN`<sup>15</sup> `pSqlStatement`<sup>102</sup>+ `END`<sup>51</sup> `BATCHSEPARATOR`<sup>15</sup>

referenced by:

- `pSqlBlock`<sup>101</sup>

### **pSqlStatement:**

A number of basic PSQL statements are available.

pSqlAssignmentStatement pSqlExecuteImmediateStatement pSqlIfStatement  
pSqlLoopStatement pSqlNullStatement pSqlBlock sqlStatement BATCHSEPARATOR  
`pSqlStatement`<sup>102</sup>  
`::= pSqlAssignmentStatement`<sup>103</sup>  
`| pSqlExecuteImmediateStatement`<sup>103</sup>  
`| pSqlIfStatement`<sup>104</sup>  
`| pSqlLoopStatement`<sup>104</sup>  
`| pSqlNullStatement`<sup>103</sup>  
`| pSqlBlock`<sup>101</sup>  
`| sqlStatement`<sup>15</sup> `BATCHSEPARATOR`<sup>15</sup>

referenced by:

- `pSqlBlockOrStatement`<sup>102</sup>
- `pSqlBody`<sup>102</sup>
- `sqlOrPsqlStatement`<sup>15</sup>

### **pSqlBlockOrStatement:**

A PSQL block or statement defines a procedural step or a SQL statement to be executed.

pSqlBlock pSqlStatement  
`pSqlBlockOrStatement`<sup>102</sup>  
`::= pSqlBlock`<sup>101</sup>  
`| pSqlStatement`<sup>102</sup>

referenced by:

- `pSqlBlockOrStatements`<sup>103</sup>

## pSqlBlockOrStatements:

pSqlBlockOrStatement

```
pSqlBlockOrStatements [103]
  ::= pSqlBlockOrStatement [102] +
```

referenced by:

- [pSqlElseIfExpression](#) [104]
- [pSqlForNumberLoopStatement](#) [104]
- [pSqlForRecordLoopStatement](#) [105]
- [pSqlIfStatement](#) [104]
- [pSqlWhileLoopStatement](#) [105]

## pSqlNullStatement:

The null-statement is a NOP-statement (No Operator). The use of the null-statement is necessary when a PSQL statement is needed, but no activity needs to be performed such as with an if statement. The null-statement also makes explicit that a developer has considered the actions needed and found that no action applies to a specific scenario. This leads to improved code documentation.

NULL BATCHSEPARATOR

```
pSqlNullStatement [103]
  ::= NULL [101] BATCHSEPARATOR [15]
```

referenced by:

- [pSqlStatement](#) [102]

## pSqlAssignmentStatement:

The assignment statement assign a new value to a variable. To assign the results of a SQL query to a value, use a select ... into ... statement.

variableName ASSIGNMENT\_OPERATOR expression BATCHSEPARATOR

```
pSqlAssignmentStatement [103]
  ::= variableName [105] ASSIGNMENT_OPERATOR [15] expression [48]
    BATCHSEPARATOR [15]
```

referenced by:

- [pSqlStatement](#) [102]

## pSqlExecuteImmediateStatement:

The execute immediate PSQL statement enables the use of SQL statements that are compiled at runtime. For instance dynamic DDL statements can not always be executed on compiled time and the execute immediate enables these.

EXECUTE IMMEDIATE expression BATCHSEPARATOR

```
pSqlExecuteImmediateStatement [103]
  ::= EXECUTE [15] IMMEDIATE [15] expression [48]
    BATCHSEPARATOR [15]
```

referenced by:

- [pSqlStatement](#)<sup>102</sup>

### pSqlIfStatement:

The if-statement performs conditional logic. When the boolean expression after if holds, the PSQL block after the 'then' will be executed. Other branches can be specified using an elsif. Otherwise, and only when specified, the logic after the else is executed.

IF booleanExpression THEN pSqlBlockOrStatements pSqlElsIfExpression ELSE pSqlBlockOrStatements END IF BATCHSEPARATOR

```

pSqlIfStatement104
  ::= IF15 booleanExpression48 THEN51
pSqlBlockOrStatements103 pSqlElsIfExpression104* ( ELSE51
pSqlBlockOrStatements103 )? END51 IF15 BATCHSEPARATOR15

```

referenced by:

- [pSqlStatement](#)<sup>102</sup>

### pSqlElsIfExpression:

ELSIF booleanExpression THEN pSqlBlockOrStatements

```

pSqlElsIfExpression104
  ::= ELSIF15 booleanExpression48 THEN51
pSqlBlockOrStatements103

```

referenced by:

- [pSqlIfStatement](#)<sup>104</sup>

### pSqlLoopStatement:

A variety of PSQL statements for loops are available.

pSqlForNumberLoopStatement pSqlForRecordLoopStatement pSqlWhileLoopStatement

```

pSqlLoopStatement104
  ::= pSqlForNumberLoopStatement104
  | pSqlForRecordLoopStatement105
  | pSqlWhileLoopStatement105

```

referenced by:

- [pSqlStatement](#)<sup>102</sup>

### pSqlForNumberLoopStatement:

This PSQL integer loop statement iterates over a range of integer values, executing PSQL statements for each iterated value. The iterations goes from the first value to the last value in increments of 1. The iterations go backward in decrements of 1 when 'reverse' is specified.

FOR variableName IN REVERSE numericConstant variableName DOT DOT numericConstant variableName LOOP pSqlBlockOrStatements END LOOP BATCHSEPARATOR

```

pSqlForNumberLoopStatement104
    ::= FOR15 variableName105 IN15 REVERSE76?
    ( numericConstant100 | variableName105 ) DOT15 DOT15
    ( numericConstant100 | variableName105 ) LOOP15
    pSqlBlockOrStatements103 END51 LOOP15 BATCHSEPARATOR15

```

referenced by:

- pSqlLoopStatement<sup>104</sup>

### **pSqlForRecordLoopStatement:**

This PSQL result set loop statement iterates over a result set returned by an Invantive UniversalSQL query. The PSQL statements are executed for each record. The record's specific values can be retrieved using the variable.

FOR variableName IN PARENTHESIS\_OPEN selectStatement PARENTHESIS\_CLOSE  
LOOP pSqlBlockOrStatements END LOOP BATCHSEPARATOR

```

pSqlForRecordLoopStatement105
    ::= FOR15 variableName105 IN15 PARENTHESIS_OPEN15
    selectStatement16 PARENTHESIS_CLOSE15 LOOP15
    pSqlBlockOrStatements103 END51 LOOP15 BATCHSEPARATOR15

```

referenced by:

- pSqlLoopStatement<sup>104</sup>

### **pSqlWhileLoopStatement:**

This PSQL while loop statement executes PSQL statements as long as the specified boolean condition evaluates to true at loop end.

WHILE booleanExpression LOOP pSqlBlockOrStatements END LOOP  
BATCHSEPARATOR

```

pSqlWhileLoopStatement105
    ::= WHILE15 booleanExpression48 LOOP15
    pSqlBlockOrStatements103 END51 LOOP15 BATCHSEPARATOR15

```

referenced by:

- pSqlLoopStatement<sup>104</sup>

### **variableName:**

IDENTIFIER

```

variableName105
    ::= IDENTIFIER92

```

referenced by:

- pSqlAssignmentStatement<sup>103</sup>
- pSqlForNumberLoopStatement<sup>104</sup>
- pSqlForRecordLoopStatement<sup>105</sup>
- pSqlItemDeclaration<sup>101</sup>
- variableList<sup>21</sup>

## 5.2 Providers

The providers described here are available on all platforms.

### 5.2.1 Provider Atom10

Atom version 1.0.

Code for use in settings.xml: Atom10

Alias: atom

Status: Production

Available in Editions: Paid, Open Data, Community

### 5.2.2 Provider AutoTask

AutoTask service management.

Code for use in settings.xml: AutoTask

Alias: autotask

Status: Non-production

Available in Editions: Paid

Technical Documentation: <http://severa.visma.com/en/support/severaapi/>

Non-technical Documentation: <http://severa.visma.com>

### 5.2.3 Provider CbsNl

Centraal Bureau voor de Statistiek.

Code for use in settings.xml: CbsNl

Alias: cbsnl

Status: Production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://www.cbs.nl/nl-nl/onze-diensten/open-data/statline-als-open-data>

## Provider Attributes

The following provider attributes are available for CbsNl:

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit.		✓		✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

Generated 11-01-2019 21:08 on version 17.30.0-PROD+1821.

#### 5.2.4 Provider Conversion

Conversion table functions.

Code for use in settings.xml: Conversion

Alias: conversion

Status: Production

Available in Editions: Paid

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
invantive-sql-forward-filters-to-data-containers	Whether to rewrite filters to use the data container's own filter language.	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	forwardfillerstodataacolumns.				
invantive-sql-shuffle-fetch-results-data-containers	whether to shuffle results.	False		✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	esultsetcachedfromdataconnection-tainers.				
invantive-use-cache	Whether to cache the results.	True		✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	esults of a query.				
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0		✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	e - q u e s t .				
requests-parallel-max	M a x - i m u m n u m - b e r o f p a r - a l - l e l d a t a r e - q u e s t s f r o m	32		✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	individual partitions on the data connection - retain.	individual partitions on the data connection - retain.			

### 5.2.5 Provider DataCache

Persistent data cache, data replication or data vault.

Code for use in settings.xml: DataCache

Alias: cache

Abbreviation: idc

Status: Production

Available in Editions: Paid

String-comparison is Case-sensitive: true

Use Catalog in Full Name: true

Use Schema in Full Name: true

Updated: 26-06-2020 06:48 using Invantive UniversalSQL version 20.1.99-BETA+2846.

Technical Documentation: <https://documentation.invantive.com/2017R2/data-cache-data-model/webhelp/index.html>

## Provider Attributes

The following provider attributes are available for DataCache:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
application-prefix-facts	A prefix applied after the environment prefix to every facts table, index and view .	dcd_	✓			
application-prefix-history	A prefix applied after the environment prefix to every history table, index and view .	dcs_	✓			
application-prefix-repository	A prefix applied after the environment prefix to every repository table, index and view .	dc_	✓			
backing-bulk-insert-page-size-bytes	Approximate maximum size in bytes of page when bulk inserting on backing database.		✓	✓	✓	
backing-bulk-insert-page-size-rows	Number of rows to insert per page when bulk inserting on backing database.		✓	✓	✓	
backing-bulk-insert-timeout-sec	Number of seconds after which a bulk insert on backing database times out.	3600	✓	✓	✓	
backing-command-timeout-sec	Number of seconds after which a command on backing database times out.	3600	✓	✓	✓	
backing-connection-string	The connection string for the backing database		✓		✓	
backing-force-case-sensitive-identifiers	Consider identifiers on the backing database as case-sensitive independent of the platform capabilities.	False	✓	✓	✓	
backing-forced-casing-identifiers	Forced casing of identifiers on the backing database. Choose from Unset, Lower, Upper and Mixed.	Unset	✓	✓	✓	
backing-maximum-length-identifiers	Non-default maximum length on the backing database in characters of identifier names.		✓	✓	✓	
backing-maximum-number-of-pooled-connections	Maximum number of concurrent pooled connections on backing database.		✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
tions						
backing-maximum-sleep-acquire-pooled-connection-ms	Maximum time in ms to wait for acquiring a free connection from a pool of connections on backing database.	300000	✓	✓	✓	
backing-maximum-sleep-acquire-un-pooled-connection-ms	Maximum time in ms to wait for acquire a free connection when there is no connection pooling on backing database.	600000	✓	✓	✓	
backing-minimum-connection-timeout-sec	Minimum number of seconds after which a new ly requested connection on backing database times out.	300	✓	✓	✓	
backing-preferred-number-of-pooled-connections	Preferred number of concurrent pooled connections on backing database.		✓	✓	✓	
backing-provider	Name of the Invantive connector for the backing database		✓		✓	
backing-sql-server-connect-retry-count	Number of connect retries on connection failed on the backing SQL Server database (SQL Server only).	60	✓	✓	✓	
backing-sql-server-connect-retry-interval-sec	Interval between connect retries on connection failed on the backing SQL Server database (SQL Server only)..	15	✓	✓	✓	
backing-standardize-identifiers	Rew rite all identifiers on the backing database to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓	
backing-standardize-identifiers-casing	Rew rite all identifiers on the backing database to the platform-specific recommended standard casing when changing a data model on a case-dependent platform.	True	✓	✓	✓	
beta-compress-facts-on-disk	Whether to compress facts in the disk cache.	True	✓	✓	✓	
beta-encrypt-facts-on-disk	Whether to encrypt facts in the disk cache.	True	✓	✓	✓	
beta-store-facts-in-database	Whether to store facts in the database containing the repository.	True	✓	✓	✓	
beta-store-facts-on-disk	Whether to store facts in the disk cache.	True	✓	✓	✓	
beta-use-facts-in-database	Whether to use facts in the database cache.	True	✓	✓	✓	
beta-use-facts-on-disk	Whether to use facts in the disk cache.	False	✓	✓	✓	
bulk-delete-page-size-rows	Number of rows to delete per batch when bulk deleting	10000	✓	✓	✓	
bulk-insert-page-size-bytes	Approximate maximum size in bytes of batch when bulk inserting	10000000	✓	✓	✓	
bulk-insert-page-size-rows	Number of rows to insert per batch when bulk inserting	10000	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
cache-folder	Folder to store Data Cache cache files in.	C:\Users\gle3.WS212\Invantive\Cache\datacache	✓	✓	✓	
default-skip-client-side-cacheable	Whether to skip client-side cacheable tables by default.	True	✓	✓	✓	
default-use-ods	Whether to use the Operational Data Store when no hint is specified.	True	✓	✓	✓	
delete-number-table-partition-versions-per-group	Maximum number of table partition versions selected in the IN-clause for a delete of facts.	50	✓	✓	✓	
development-use-http-disk-cache	Whether to allow use of the disk cache for platform HTTP requests.	False	✓	✓		
drop-backlog-factor	Maximum ratio between number of versions dropped and new versions loaded on refresh.		✓	✓	✓	
environment-prefix-all	A prefix applied to repository, facts and history database tables, indexes and views.		✓			
environment-prefix-facts	A prefix applied to every facts table, index and view.		✓			
environment-prefix-history	A prefix applied to every history table, index and view.		✓			
environment-prefix-logical-view	A prefix applied to every logical view.		✓			
environment-prefix-repository	A prefix applied to every repository table, index and view.		✓			
event-log-entries-delete-page-size-rows	Number of rows to delete per batch on maintaining facts.	1000	✓	✓	✓	
event-log-memory-cache-flush-interval-sec	Maximum interval in seconds between flushes of in-memory cache of event log entries to database.	15	✓			
event-log-memory-cache-size	Size of in-memory cache of event log entries before they are written to the database.	100	✓			
facts-delete-page-size-characters	Number of characters to delete per batch on maintaining facts.	10000000	✓	✓	✓	
facts-delete-page-size-rows	Number of rows to delete per batch on maintaining facts.		✓	✓	✓	
facts-insert-page-size-rows	Number of rows to insert per batch on maintaining facts.		✓	✓	✓	
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓	
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓	
forced-casing-logical-view-column-name	Forced casing of logical view column names. Choose from Unset, Lower, Up-	Unset	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
	per and Mixed.					
forced-casing-logical-view-name	Forced casing of logical view names. Choose from Unset, Lower, Upper and Mixed.	Unset	✓	✓	✓	
forw arded-incoming-messages-delete-max-runtime-sec	Maximum runtime of purge forw arded incoming messages in seconds.	3600	✓	✓	✓	
forw arded-incoming-messages-delete-page-size-rows	Number of rows to delete per batch on maintaining forw arded incoming messages.	10000	✓	✓	✓	
garbage-collection-physical-memory-load-threshold	Percentage of physical memory load above which a full garbage collection is run after replication.	80	✓	✓	✓	
garbage-collection-replication-interval-count	Number of replications after last garbage collection after which a full garbage collection is run.	100	✓	✓	✓	
garbage-collection-replication-minimum-interval-sec	Minimum interval in seconds between two full garbage collections..	30	✓	✓	✓	
invantive-sql-forw ards-filters-to-data-containers	Whether to forw ard filters to data containers.	True	✓	✓	✓	
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓	
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓	
log-native-calls-to-disk	Registers native calls to data container backend as disk files.	False	✓	✓	✓	
log-native-calls-to-trace	Log native calls to data container backend on the trace.	False	✓	✓	✓	
max-delete-facts-parallel	Maximum number of parallel deletes on facts tables.	8	✓	✓	✓	
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓	
maximum-length-logical-view-column-name	Maximum length of logical view column names.		✓	✓	✓	
maximum-length-logical-view-name	Maximum length of logical view names.		✓	✓	✓	
max-messages-per-customer-service-request	Maximum number of messages to download from Customer Service per request.	10000	✓	✓	✓	
max-refreshes-parallel	Maximum number of parallel refreshes.	32	✓	✓	✓	
max-url-length-accepted	The maximum accepted URL length before raising an error.	8000	✓	✓	✓	
max-url-length-desired	The maximum desired URL length.	8000	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
orphaned-facts-delete-page-size-rows	Number of rows to delete per batch on purging orphaned facts during repository upgrade or maintenance.	10000	✓	✓	✓	
partition-slot-based-rate-limit-length-ms	Total length in ms across all slots of a partition-based rate limit.	60000	✓		✓	
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit		✓		✓	
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓	
purge-interval-event-log-entries-minutes	Interval in minutes between completed purges of ancient event log entries.	60	✓	✓	✓	
requested-page-size	Preferred number of rows to exchange per round trip; only effective on limited platforms such as AFAS Online		✓	✓	✓	
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓	
retention-event-log-entries-days	Retention of event log entries in days.	35	✓	✓	✓	
slot-based-rate-limit-length-ms	Total length in ms across all slots of a slot-based rate limit.	60000	✓		✓	
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓	
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓	
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓	
update-number-table-partition-versions-per-group	Maximum number of table partition versions selected in the IN-clause for an update of metadata.	1000	✓	✓	✓	
upgrade-force-execute	Whether to force execution of possible upgrade steps, even when there are no reasons to perform an upgrade.	False	✓			
upgrade-force-repository-version-start	Specifies the repository version to start upgrade from when specified.		✓			
upgrade-force-specials	Execute special operations before the repository is opened.		✓			

## 5.2.6 Provider DataDictionary

Invantive UniversalSQL data dictionary.

Code for use in settings.xml: DataDictionary

Alias: dd

Abbreviation: dd

Status: Production

Available in Editions: Paid

String-comparison is Case-sensitive: true

Use Catalog in Full Name: true

Use Schema in Full Name: true

Updated: 10-09-2020 00:07 using Invantive UniversalSQL version 20.1.206-BETA+2915.

## Connector Attributes

The Data Dictionary connector can be configured using the following attributes:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
bulk-delete-page-size-rows	Number of rows to delete per batch when bulk deleting	10000	✓	✓	✓	
bulk-insert-page-size-bytes	Approximate maximum size in bytes of batch when bulk inserting	10000000	✓	✓	✓	
bulk-insert-page-size-rows	Number of rows to insert per batch when bulk inserting	10000	✓	✓	✓	
connection-string	The connection string for the backing database		✓		✓	
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓	
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓	
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓	
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3.WS212\In- vantive\Cache\http\gle3\share d	✓	✓	✓	
http-disk-cache-ignore-write-errors	Whether to ignore write errors to disk cache.	False	✓	✓	✓	
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓	
invantive-sql-correct-invalid-date	Whether to correct invalid dates.	False	✓	✓	✓	
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓	
invantive-sql-shuffle-fetch-results-data-con-	Whether to shuffle results fetched from data containers.	False	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Connectors File	Set from Log On
tainers						
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓	
log-native-calls-to-disk	Registers native calls to data container backend as disk files.	False	✓	✓	✓	
log-native-calls-to-trace	Log native calls to data container backend on the trace.	False	✓	✓	✓	
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓	
max-url-length-accepted	The maximum accepted URL length before raising an error.	8000	✓	✓	✓	
max-url-length-desired	The maximum desired URL length.	8000	✓	✓	✓	
partition-slot-based-rate-limit-length-ms	Total length in ms across all slots of a partition-based rate limit.	60000	✓		✓	
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit		✓		✓	
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓	
provider	Name of the Invantive connector for the backing database		✓		✓	
requested-page-size	Preferred number of rows to exchange per round trip; only effective on limited platforms such as AFAS Online		✓	✓	✓	
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓	
slot-based-rate-limit-length-ms	Total length in ms across all slots of a slot-based rate limit.	60000	✓		✓	
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓	
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓	
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓	
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	False	✓	✓	✓	
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	False	✓	✓	✓	

### 5.2.7 Provider DocumentCloud

DocumentCloud.

Code for use in settings.xml: DocumentCloud

Alias: docc

Status: Production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://www.documentcloud.org/help/api>

Non-technical Documentation: <https://www.documentcloud.org/home>

## Provider Attributes

The following provider attributes are available for DocumentCloud:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

Generated 11-01-2019 20:08 on version 17.30.0-PROD+1821.

## 5.2.8 Provider Dropbox

Dropbox information.

Code for use in settings.xml: Dropbox

Alias: dropbox

Status: Non-production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://www.dropbox.com/developers>

### 5.2.9 Provider Dummy

Fixed memory provider with fixed data set for regression testing and demos.

Code for use in settings.xml: Dummy

Alias: dummy

Status: Production

Available in Editions: Paid

Updated: 08-02-2019 16:03 using Invantive UniversalSQL version 17.31.26-BETA+1898.

## Provider Attributes

The following provider attributes are available for Dummy:

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
partition-slot-based-rate-limit-length-ms	Length in ms of a partition-based rate limit across all slots.	60000	✓		✓
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit		✓		✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit across all slots.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓

### 5.2.10 Provider DynamicsCrm

Microsoft Dynamics CRM.

Code for use in settings.xml: DynamicsCrm

Alias: dyncrm

Status: Production

Available in Editions: Paid

### 5.2.11 Provider EcbExchangeRates

ECB Exchange Rates.

Code for use in settings.xml: EcbExchangeRates

Alias: ecbexref

Status: Production

Available in Editions: Paid, Open Data, Community

Non-technical Documentation:

[https://www.ecb.europa.eu/stats/policy\\_and\\_exchange\\_rates/euro\\_reference\\_exchange\\_rates/html/index.en.html](https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/index.en.html)

### 5.2.12 Provider Edifact

EDIFACT.

Code for use in settings.xml: Edifact

Alias: edi

Status: Production

Available in Editions: Paid

Technical Documentation: <https://www.unece.org/cefact/edifact/welcome.html>

Non-technical Documentation: [https://www.unece.org/trade/untdid/texts/d421\\_d.htm](https://www.unece.org/trade/untdid/texts/d421_d.htm)

## Provider Attributes

The following provider attributes are available for Edifact:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
edi-extension	{res:itgen_provider_attribute_edi_extension_description}	*.*	✓	✓	✓
edi-input-directories	{res:itgen_provider_attribute_edi_input_directories_description}		✓	✓	✓
edi-output-directory	{res:itgen_provider_attribute_edi_output_directory_description}		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓

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### 5.2.13 Provider ExactOnlineAll

Exact Online (XML, REST and undocumented).

Code for use in settings.xml: ExactOnlineAll

Alias: eol

Abbreviation: eol

Status: Production

Available in Editions: Paid

String-comparison is Case-sensitive: true

Use Catalog in Full Name: true

Use Schema in Full Name: true

Partition Column: division

Updated: 02-12-2019 15:47 using Invantive UniversalSQL version 17.33.216-BETA+2512.

Technical Documentation: <https://support.exactonline.com/community/s/knowledge-base#All-All-HNO-Content-resources-eol-files-homeexactonlinehelpcentre>

## Provider Attributes

The following provider attributes are available for ExactOnlineAll:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
api-client-id	The client ID is a unique identifier of your application. It is generated by registering an application.		✓		✓	✓
api-client-secret	The client secret is to be kept confidential. Such as a password for a logon code, the client secret is the confidential part of an app identified by a client ID. It is needed during the OAuth2 Code Grant Flow together with the refresh token to get access.	***	✓		✓	✓
api-refresh-token	Refresh Token is a security token for the OAuth2 Code Grant Flow. With a Refresh Token and client secret you can retrieve a renewed access token to access protected resources. A Refresh Token and client secret must be stored securely since once compromised allows access to your protected resources.	***	✓		✓	✓
api-redirect-url	The redirect URI is the website a browser session is redirected to after the OAuth2 authentication process has been completed.		✓		✓	✓
totp-secret	Shared secret key to generate one-time password using TOTP RFC 6238. For improved security, manually enter the one-time password asked during login.	***	✓		✓	✓
api-token-url	The token URI is the OAuth2 endpoint to exchange tokens.		✓		✓	
api-url	URL to access the API.		✓		✓	
bulk-delete-page-size-rows	Number of rows to delete per batch when bulk deleting	10000	✓	✓	✓	
bulk-insert-page-size-bytes	Approximate maximum size in bytes of batch when bulk inserting	10000000	✓	✓	✓	
bulk-insert-page-size-rows	Number of rows to insert per batch when bulk inserting	250	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
dow nload-error-400-bad-request-max-tries	Maximum number of tries when Akamai reports that the API server is unavailable during retrieval of data.	30	✓	✓	✓	
dow nload-error-400-bad-request-sleep-initial-ms	Initial sleep in milliseconds between retries when Akamai reports that the API server is unavailable during retrieval of data.	5000	✓	✓	✓	
dow nload-error-400-bad-request-sleep-max-ms	Maximum sleep in milliseconds between retries when Akamai reports that the API server is unavailable during retrieval of data.	60000	✓	✓	✓	
dow nload-error-400-bad-request-sleep-multiplicator	Multiplication factor for sleep between retries Akamai reports that the API server is unavailable during retrieval of data.	2	✓	✓	✓	
dow nload-error-429-too-many-requests-max-tries	Maximum number of tries when the website reports that too many requests have been made during a timeslot of one minute or one day.	10	✓	✓	✓	
dow nload-error-429-too-many-requests-sleep-initial-ms	Initial sleep in milliseconds between retries when the website reports that too many requests have been made during a timeslot of one minute or one day.	5000	✓	✓	✓	
dow nload-error-429-too-many-requests-sleep-max-ms	Maximum sleep in milliseconds between retries when the website reports that too many requests have been made during a timeslot of one minute or one day.	60000	✓	✓	✓	
dow nload-error-429-too-many-requests-sleep-multiplicator	Multiplication factor for sleep between retries when the website reports that too many requests have been made during a timeslot of one minute or one day.	2	✓	✓	✓	
dow nload-error-503-server-unavailable-max-tries	Maximum number of tries when Akamai reports that the API server is unavailable during retrieval of data.	30	✓	✓	✓	
dow nload-error-503-server-unavailable-sleep-initial-ms	Initial sleep in milliseconds between retries when Akamai reports that the API server is unavailable during retrieval of data.	5000	✓	✓	✓	
dow nload-error-503-server-unavailable-sleep-max-ms	Maximum sleep in milliseconds between retries when Akamai reports that the API server is unavailable during retrieval of data.	60000	✓	✓	✓	
dow nload-error-503-server-unavailable-sleep-multiplicator	Multiplication factor for sleep between retries Akamai reports that the API server is unavailable during retrieval of data.	2	✓	✓	✓	
dow nload-error-504-gateway-timeout-max-tries	Maximum number of tries when the website reports a gateway timeout.	10	✓	✓	✓	
dow nload-error-504-gateway-timeout-sleep-initial-ms	Initial sleep in milliseconds between retries when the website reports a gateway timeout.	5000	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
dow nload-error-504-gateway-timeout-sleep-max-ms	Maximum sleep in milliseconds between retries when the website reports a gateway timeout.	60000	✓	✓	✓	
dow nload-error-504-gateway-timeout-sleep-multiplicator	Multiplication factor for sleep between retries when the website reports a gateway timeout.	2	✓	✓	✓	
dow nload-error-argument-exception-max-tries	Maximum number of tries when an argument exception is returned when downloading a blob.	10	✓	✓	✓	
dow nload-error-argument-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when an argument exception is returned when downloading a blob.	1000	✓	✓	✓	
dow nload-error-argument-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when an argument exception is returned when downloading a blob.	60000	✓	✓	✓	
dow nload-error-argument-exception-sleep-multiplicator	Multiplication factor for sleep between retries when an argument exception is returned when downloading a blob.	2	✓	✓	✓	
dow nload-error-internet-download-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.	10	✓	✓	✓	
dow nload-error-internet-download-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.	10000	✓	✓	✓	
dow nload-error-internet-download-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.	60000	✓	✓	✓	
dow nload-error-internet-download-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.	2	✓	✓	✓	
dow nload-error-io-exception-max-tries	Maximum number of tries when a network I/O connection failure occurs during retrieval of data.	10	✓	✓	✓	
dow nload-error-io-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when a network I/O connection failure occurs during retrieval of data.	10000	✓	✓	✓	
dow nload-error-io-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when a network I/O connection failure occurs during retrieval of data.	60000	✓	✓	✓	
dow nload-error-io-exception-sleep-multiplicator	Multiplication factor for sleep between retries when a network I/O connection failure occurs during retrieval of data.	2	✓	✓	✓	
dow nload-error-json-exception-max-tries	Maximum number of tries when an invalid JSON body is returned.	3	✓	✓	✓	
dow nload-error-json-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when an invalid JSON body is returned.	1000	✓	✓	✓	
dow nload-error-json-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when an invalid JSON body is returned.	10000	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
dow nload-error-json-exception-sleep-multiplicator	Multiplication factor for sleep between retries when an invalid JSON body is returned.	2	✓	✓	✓	
dow nload-error-other-exception-max-tries	Maximum number of tries when an unqualified error occurs during retrieval of data.	3	✓	✓	✓	
dow nload-error-other-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when an unqualified error occurs during retrieval of data.	5000	✓	✓	✓	
dow nload-error-other-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when an unqualified error occurs during retrieval of data.	30000	✓	✓	✓	
dow nload-error-other-exception-sleep-multiplicator	Multiplication factor for sleep between retries when an unqualified error occurs during retrieval of data.	2	✓	✓	✓	
dow nload-error-socket-exception-max-tries	Maximum number of tries when the network connection is forcibly dropped during retrieval of data.	10	✓	✓	✓	
dow nload-error-socket-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when the network connection is forcibly dropped during retrieval of data.	10000	✓	✓	✓	
dow nload-error-socket-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when the network connection is forcibly dropped during retrieval of data.	60000	✓	✓	✓	
dow nload-error-socket-exception-sleep-multiplicator	Multiplication factor for sleep between retries when the network connection is forcibly dropped during retrieval of data.	2	✓	✓	✓	
dow nload-error-w eb-exception-max-tries	Maximum number of tries when a web connection failure occurs during retrieval of data.	10	✓	✓	✓	
dow nload-error-w eb-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when a web connection failure occurs during retrieval of data.	10000	✓	✓	✓	
dow nload-error-w eb-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when a web connection failure occurs during retrieval of data.	60000	✓	✓	✓	
dow nload-error-w eb-exception-sleep-multiplicator	Multiplication factor for sleep between retries when a web connection failure occurs during retrieval of data.	2	✓	✓	✓	
dow nload-error-w eb-not-implemented-max-tries	Maximum number of tries when the connection reports not implemented.	1	✓	✓	✓	
dow nload-error-w eb-not-implemented-sleep-initial-ms	Initial sleep in milliseconds between retries when the connection reports not implemented.	5000	✓	✓	✓	
dow nload-error-w eb-not-implemented-sleep-max-ms	Maximum sleep in milliseconds between retries when the connection reports not implemented.	60000	✓	✓	✓	
dow nload-error-w eb-not-implemented-sleep-multiplicator	Multiplication factor for sleep between retries when the connection reports not implemented.	2	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
multiplicator	plemented.					
dow nload-error-w eb-timeout-max-tries	Maximum number of tries w hen the connection reports a timeout.	10	✓	✓	✓	
dow nload-error-w eb-timeout-sleep-initial-ms	Initial sleep in milliseconds btween retries w hen the connection reports a timeout.	5000	✓	✓	✓	
dow nload-error-w eb-timeout-sleep-max-ms	Maximum sleep in milliseconds btween retries w hen the connection reports a timeout.	60000	✓	✓	✓	
dow nload-error-w eb-timeout-sleep-multiplicator	Multiplication factor for sleep btween retries w hen the connection reports a timeout.	2	✓	✓	✓	
dow nload-error-w eb-unauthorized-max-tries	Maximum number of tries w hen the connection reports an unauthorized error.	1	✓	✓	✓	
dow nload-error-w eb-unauthorized-sleep-initial-ms	Initial sleep in milliseconds btween retries w hen the connection reports an unauthorized error.	5000	✓	✓	✓	
dow nload-error-w eb-unauthorized-sleep-max-ms	Maximum sleep in milliseconds btween retries w hen the connection reports an unauthorized error.	60000	✓	✓	✓	
dow nload-error-w eb-unauthorized-sleep-multiplicator	Multiplication factor for sleep btween retries w hen the connection reports an unauthorized error.	2	✓	✓	✓	
encrypt-http-disk-cache	Whether to encrypt the contents of the disk cache w hen used. Disable only w hen performance is a premium above data security.	True	✓	✓	✓	
exact-development-mode	True if w e have to connect to the Exact development instance		✓	✓	✓	
exact-online-url	URL of Exact Online w eb service		✓		✓	
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓	
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓	
hide-empty-columns	Whether to exclude columns w ithout a value from a result set w hen using 'select *'.  With this XML provider, often more than 95% of the columns are empty due to limitations of the XSD specification. Should be enabled in general.	True	✓	✓	✓	
http-disk-cache	Action: provide 'empty' to empty HTTP disk cache.			✓		
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓	
http-disk-cache-directory	Directory w here HTTP cache is stored.	C:\Users\gle3\Invantive\Cache\	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
		http\gle3\shared				
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓	
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓	
http-memory-cache	Action: provide 'empty' to empty HTTP memory cache.			✓		
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓	
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓	
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓	
ignore-document-download-errors	Ignore all errors when fetching the document contents from Exact Online.	False	✓	✓	✓	
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
ignore-http-429-errors	Ignore HTTP 429 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
ignore-http-500-errors	Ignore HTTP 500 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
ignore-xml-errors	Ignore normal errors within the XML returned by the API.	False	✓	✓	✓	
ignore-xml-fatal-errors	Ignore fatal errors within the XML returned by the API.	False	✓	✓	✓	
ignore-xml-no-access-errors	Ignore no access errors within the XML returned by the API.	False	✓	✓	✓	
ignore-xml-warnings	Ignore warnings within the XML returned by the API.	False	✓	✓	✓	
insert-allowed	Allow use of the BETA functionality for inserts	False	✓	✓	✓	
invalid-json-on-get-max-tries	Maximum number of tries when the JSON received on GET is invalid.	10	✓	✓	✓	
invalid-json-on-get-sleep-initial-ms	Initial sleep in milliseconds between retries when the JSON received on GET is invalid.	10000	✓	✓	✓	
invalid-json-on-get-sleep-max-ms	Maximum sleep in milliseconds between retries when the JSON received on GET is invalid.	60000	✓	✓	✓	
invalid-json-on-get-sleep-multiplicator	Multiplication factor for sleep between retries when the JSON received on GET is invalid.	2	✓	✓	✓	
invalid-json-on-post-max-tries	Maximum number of tries when the JSON received on POST is invalid.	1	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
invalid-json-on-post-sleep-initial-ms	Initial sleep in milliseconds between retries when the JSON received on POST is invalid.	10000	✓	✓	✓	
invalid-json-on-post-sleep-max-ms	Maximum sleep in milliseconds between retries when the JSON received on POST is invalid.	60000	✓	✓	✓	
invalid-json-on-post-sleep-multiplicator	Multiplication factor for sleep between retries when the JSON received on POST is invalid.	2	✓	✓	✓	
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓	
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓	
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓	
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓	
limit-partition-calls-left	Minimum number of remaining API calls on a partition towards a hard limit. When below, an error is raised.	500	✓	✓	✓	
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓	
max-url-length-accepted	The maximum accepted URL length before raising an error.	2800	✓	✓	✓	
max-url-length-desired	The maximum desired URL length.	2500	✓	✓	✓	
metadata-cache-max-age-sec	Maximum acceptable age in seconds for re-use of metadata.		✓	✓	✓	
partition-slot-based-rate-limit-length-ms	Total length in ms across all slots of a partition-based rate limit.	66000	✓		✓	
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit	272	✓		✓	
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓	
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	16	✓	✓	✓	
result-set-cache	Action: provide 'empty' to empty.			✓		
simulate-http-400-errors	Simulate HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-400-errors-percentage	Percentage of simulated HTTP 400 errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-403-errors	Simulate HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-403-errors-percentage	Percentage of simulated HTTP 403 errors when exchanging results with the OData	0	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
	endpoint.					
simulate-http-429-errors	Simulate HTTP 429 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-429-errors-percentage	Percentage of simulated HTTP 429 errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-500-errors	Simulate HTTP 500 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-500-errors-percentage	Percentage of simulated HTTP 500 errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-protocol-errors	Simulate HTTP protocol errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-protocol-errors-percentage	Percentage of simulated HTTP protocol errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-timeout-errors	Simulate HTTP timeout errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-timeout-errors-percentage	Percentage of simulated HTTP timeout errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
slot-based-rate-limit-length-ms	Total length in ms across all slots of a slot-based rate limit.	60000	✓		✓	
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓	
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓	
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓	
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓	
update-allowed	Allow use of the BETA functionality for updates	False	✓	✓	✓	
use-batch-insert	Whether to use batch insert.	False	✓	✓	✓	
use-http-disk-cache	Combination of use-http-disk-cache-read and use-http-disk-cache-write.		✓	✓	✓	
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓	
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓	
use-http-memory-cache	Combination of use-http-memory-cache-read and use-http-memory-cache-write.		✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓	
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓	
use-metadata-cache	Whether to use the metadata calculated previously Has only practical use during development on a XML provider.	True	✓	✓	✓	
use-result-cache	Whether to use result sets from previous queries that can answer the current query	True	✓	✓	✓	

## 5.2.14 Provider EzBase

EZ-Base

Code for use in settings.xml: EzBase

Alias: ezbbase

Status: Production

Available in Editions: Paid

## Provider Attributes

The following provider attributes are available for EzBase:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data con-	32	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	tainer.				
result-set-cache	Action: provide 'empty' to empty.			✓	
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-metadata-cache	Whether to use the metadata calculated previously Has only practical use during development on a XML provider.	True	✓	✓	✓
use-result-cache	Whether to use result sets from previous queries that can answer the current query	True	✓	✓	✓
xml-directories	{res:itgen_provider_attribute_xml_directories_description}		✓	✓	✓
xml-extension	{res:itgen_provider_attribute_xml_extension_description}	*.xml	✓	✓	✓
xml-namespaces	Comma-separated list of namespace prefixes and their URI		✓	✓	✓

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## 5.2.15 Provider Facebook

Facebook.

Code for use in settings.xml: Facebook

Alias: facebook

Status: Non-production

Available in Editions: Paid

Technical Documentation: <https://developers.facebook.com/>

## Provider Attributes

The following provider attributes are available for Facebook:

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
api-client-id	The client ID is a unique identifier of your application. It is generated by registering an application.		✓		✓
api-client-secret	The client secret is to be kept confidential. Such as a password for a logon code, the client secret is the confidential part of an app identified by a client ID. It is needed during the OAuth2 Code Grant Flow together with the refresh token to get access.	***	✓		✓
api-redirect-url	The redirect URI is the website a browser session is redirected to after the OAuth2 authentication process has been completed.		✓		✓
api-refresh-token	Refresh Token is a security token for the OAuth2 Code Grant Flow . With a Refresh Token and client secret you can retrieve a renewed access token to access protected resources. A Refresh Token and client secret must be stored securely since once compromised allows access to your protected resources.	***	✓		✓
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantine-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantine-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantine-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

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### 5.2.16 Provider Freshdesk

Freshdesk, customer happiness for exceptional customer service.

Code for use in settings.xml: Freshdesk

Alias: freshdesk

Status: Production

Available in Editions: Paid

Technical Documentation: <https://developer.freshdesk.com/api/#quick-reference>

## Documentation

Authentication

Authentication can be done using one of the following two alternatives:

1. Using the user log on code, password and company also used on the Freshdesk website.
2. Using an API key and company.

Authentication using user log on code and password is recommended for general use. The company is the name before '.freshdesk.com' in the URL used to log on to Freshdesk in a browser.

The API key can be found in the 'Edit Profile' page in Freshdesk, as described on <https://support.freshdesk.com/support/solutions/articles/225435-where-can-i-find-my-api-key>.

### Usage Limits

Invantive UniversalSQL executes API calls to retrieve and upload data. The number of API calls allowed per hour depends on your Freshdesk plan. The default usage limits vary between 1.000 and 5.000 calls per hour. Invantive UniversalSQL ensures that within your session the number of calls allowed per hour is not exceeded.

To get an impression of how Invantive UniversalSQL translates into API calls, please query the data dictionary view 'sessionios', such as with 'select \* from sessionios@datadictionary'.

## Provider Attributes

The following provider attributes are available for Freshdesk:

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
company	{res:itgen_freshdesk_company_description}		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit.		✓		✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

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### 5.2.17 Provider Ftp

FTP.

Code for use in settings.xml: Ftp

Alias: ftp

Abbreviation: ftp

Status: Production

Available in Editions: Paid

String-comparison is Case-sensitive: true

Use Catalog in Full Name: true

Use Schema in Full Name: true

Updated: 23-06-2019 19:40 using Invantive UniversalSQL version 17.33.48-BETA+2173.

## Provider Attributes

The following provider attributes are available for Ftp:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
site	{res:itgen_ftp_site_description}		✓		✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
port	{res:itgen_ftp_port_description}	21	✓		✓	✓
use-ssl	Use SSL for the connection (FTPS).	False	✓		✓	✓
use-passive	Use passive FTP(S) instead of active.	True	✓		✓	✓
use-binary	Use binary mode (true) or ASCII mode (false) transfers by default.	True	✓		✓	✓
timeout-connection-sec	Seconds to wait for a connection attempt to succeed before giving up.	30	✓		✓	✓
timeout-data-connection-sec	Seconds for a data connection to be established before giving up.	30	✓		✓	✓
timeout-data-read-sec	Seconds the data channel should wait for the server to send data.	30	✓		✓	✓
timeout-read-sec	Seconds for data to be read from the underlying stream.	30	✓		✓	✓
socket-poll-interval-sec	Seconds between two poll intervals when enabled.	15	✓		✓	✓
socket-keep-alive	Whether to keep the connection alive by polling.	False	✓		✓	✓
special-connection-type	Special connection types for specialized use.		✓		✓	✓
ssl-protocols	Comma-separated list of SSL protocols, defaults to TLS 1.1 and TLS 1.2.		✓		✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓	
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓	
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓	
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓	
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓	
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓	
max-url-length-accepted	The maximum accepted URL length before raising an error.	8000	✓	✓	✓	
max-url-length-desired	The maximum desired URL length.	8000	✓	✓	✓	
partition-slot-based-rate-limit-length-ms	Total length in ms across all slots of a partition-based rate limit.	60000	✓		✓	
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit		✓		✓	
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓	
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
slot-based-rate-limit-length-ms	Total length in ms across all slots of a slot-based rate limit.	60000	✓		✓	
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓	
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓	
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓	
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓	

### 5.2.18 Provider GitLab

GitLab version control in the cloud or on-premises.

Code for use in settings.xml: GitLab

Alias: GitLab

Status: Production

Available in Editions: Paid

Technical Documentation: <https://docs.gitlab.com/ee/api/>

Non-technical Documentation: <https://gitlab-apps.com>

### 5.2.19 Provider IbmDb2Udb

IBM DB2/UDB.

Code for use in settings.xml: IbmDb2Udb

Alias: db2

Status: Production

Available in Editions: Paid

Additional Driver to install: <https://support.invantive.com/download-driver-ibm-db2>

### 5.2.20 Provider InMemoryStorage

Session-specific temporary storage of result sets.

Code for use in settings.xml: InMemoryStorage

Alias: inmem

Status: Production

Available in Editions: Paid

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
invantive-sql-forward-filters-to-data-containers	Whether or not filters are forwarded to data containers.	True		✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether or not results are shuffled when fetched from data containers.	False	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	os h u f f l e r e s - u l t s f e t c h e d f r o m d a t a c o n - t a i n - e r s .				
invantive-use-cache	Whether to use cache	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	cachetheresultsofaquery.				
pre-request-delay-ms	Pre-request delay in milliseconds	0	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	condssperorre-quest.				
requests-parallel-max	Maximun number of parallel queries	32	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	uses the form individual parameters on the data action container.				

### 5.2.21 Provider Invantive.Producer

Invantive Producer repository.

Code for use in settings.xml: Invantive.Producer

Alias: producer

Status: Production

Available in Editions: Paid

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
models	X M L s p e - c i f i c - a - t i o n o f f o l d e r s w i t h m o d e l p e r p			✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	product				
templates	X M L s p e - c i f i c - a - t i o n o f f o l d e r s w i t h t e m - p l a t e s p e r p r o			✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	duct				

### 5.2.22 Provider JIRA

JIRA, ticketing.

Code for use in settings.xml: JIRA

Alias: jira

Status: Non-production

Available in Editions: Paid

Technical Documentation: <https://developer.atlassian.com/server/jira/platform/rest-apis/>

Non-technical Documentation: <https://jira-apps.com>

## Provider Attributes

The following provider attributes are available for JIRA:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
forced-casing-identifiers	Forced casing of identifiers. Choose from Un-set, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
server	{res:itgen_provider_attribute_jira_server_description}		✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

Generated 11-01-2019 22:00 on version 17.30.0-PROD+1821.

### 5.2.23 Provider Kadaster

Kadaster.

Code for use in settings.xml: Kadaster

Alias: kadaster

Status: Production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://app.swaggerhub.com/api/pdok/brk>

## Provider Attributes

The following provider attributes are available for Kadaster:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
forced-casing-identifiers	Forced casing of identifiers. Choose from Un-set, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

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### 5.2.24 Provider KeePass

Security-sensitive storage of keys.

Code for use in settings.xml: KeePass

Alias: KeePass

Abbreviation: kp

Status: Non-production

Available in Editions: Paid

String-comparison is Case-sensitive: true

Use Catalog in Full Name: true

Use Schema in Full Name: true

Updated: 10-09-2020 00:09 using Invantive UniversalSQL version 20.1.206-BETA+2915.

## Connector Attributes

The KeePass connector can be configured using the following attributes:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
bulk-delete-page-size-rows	Number of rows to delete per batch when bulk deleting	10000	✓	✓	✓	
bulk-insert-page-size-bytes	Approximate maximum size in bytes of batch when bulk inserting	10000000	✓	✓	✓	
bulk-insert-page-size-rows	Number of rows to insert per batch when bulk inserting	10000	✓	✓	✓	
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓	
invantive-sql-correct-invalid-date	Whether to correct invalid dates.	False	✓	✓	✓	
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓	
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓	
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓	
log-native-calls-to-disk	Registers native calls to data container backend as disk files.	False	✓	✓	✓	
log-native-calls-to-trace	Log native calls to data container backend on the trace.	False	✓	✓	✓	
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓	
max-url-length-accepted	The maximum accepted URL length before raising an error.	8000	✓	✓	✓	
max-url-length-desired	The maximum desired URL length.	8000	✓	✓	✓	
partition-slot-based-rate-limit-length-ms	Total length in ms across all slots of a partition-based rate limit.	60000	✓		✓	
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit		✓		✓	
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓	
requested-page-size	Preferred number of rows to exchange per round trip; only effective on limited platforms such as AFAS Online		✓	✓	✓	
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓	
slot-based-rate-limit-length-ms	Total length in ms across all slots of a slot-based rate limit.	60000	✓		✓	
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓	
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓	
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓	

**5.2.25 Provider LastResort**

Provider always available as a last resort for translations.

Code for use in settings.xml: LastResort

Alias: last

Status: Production

Available in Editions: Paid

Code  D e - s c r i p - t i o n	Default Value  W h e t h e r t o r - w a r d f i l - t e r s t o d a t a c o n - t a i n - e r	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
invantive-sql-forward-filters-to-data-containers	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	
	s.					
invantive-sql-shuffle-fetch-results-data-containers	W h e t h e r t o s h u f f l e r e s - u lt s f e t c h e d f r o m d a t a c o n - t a i n - e r	False		✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	s.				
invantive-use-cache	Whether to cache results of a query.	True		✓	✓
pre-request-delay-ms	Pre-request delay.	0		✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	initial-transaction-sper-request-quest.				
requests-parallel-max	Maximum number of parallel requests	32		✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	l e l d a t a r e - q u e s t s f r o m i n - d i - v i d u a l p a r - t i - t i o n s o n t h e d a t a c				

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	on - tainer .				
translations	Folder containing translation files		✓	✓	

## 5.2.26 Provider LinkedIn

LinkedIn.

Code for use in settings.xml: LinkedIn

Alias: linkedin

Status: Production

Available in Editions: Paid

Technical Documentation: <https://developer.linkedin.com/>

### 5.2.27 Provider LoketNI

Loket.nl information.

Code for use in settings.xml: LoketNI

Alias: LoketNI

Status: Production

Available in Editions: Paid

Technical Documentation: <https://helpdesk.loket.nl/hc/nl/articles/206244508>

## Provider Attributes

The following provider attributes are available for LoketNI:

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
environment-code	Environment code. The environment code signals the unique database to use. The code is a small integer. Please append '@test' to use a test environment located at the test data centre.		✓		✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Un-set, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms)	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms)	300000	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-con-	Whether to shuffle results fetched from data containers.	False	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
tainers					
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
partition-slot-based-rate-limit-length-ms	Length in ms of a partition-based rate limit across all slots.	60000	✓		✓
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit		✓		✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
result-set-cache	Action: provide 'empty' to empty.			✓	
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit across all slots.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory to answer the current query	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses in memory	True	✓	✓	✓
use-metadata-cache	Whether to use the metadata calculated previously Has only practical use during development on a XML provider.	True	✓	✓	✓
use-result-cache	Whether to use result sets from previous queries that can answer the current query	True	✓	✓	✓
use-test-environment	OBSOLETE. USE @test INSTEAD.		✓		✓

Generated 04-02-2019 9:03: on version 17.31.23-BETA+1887.

**5.2.28 Provider Magento**

Magento web shop.

Code for use in settings.xml: Magento

Alias: magento

Status: Non-production

Available in Editions: Paid

Technical Documentation: <https://devdocs.magento.com/guides/v2.0/rest/bk-rest.html>

**5.2.29 Provider Mail**

SMTP mail.

Code for use in settings.xml: Mail

Alias: mail

Abbreviation: ml

Status: Production

Available in Editions: Paid

String-comparison is Case-sensitive: true

Use Catalog in Full Name: true

Use Schema in Full Name: true

Updated: 10-09-2020 00:08 using Invantive UniversalSQL version 20.1.206-BETA+2915.

**Connector Attributes**

The Mail connector can be configured using the following attributes:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
bulk-delete-page-size-rows	Number of rows to delete per batch when bulk deleting	10000	✓	✓	✓	
bulk-insert-page-size-bytes	Approximate maximum size in bytes of batch when bulk inserting	10000000	✓	✓	✓	
bulk-insert-page-size-rows	Number of rows to insert per batch when bulk inserting	10000	✓	✓	✓	
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓	
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓	
invantive-sql-correct-invalid-date	Whether to correct invalid dates.	False	✓	✓	✓	
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓	
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓	
log-native-calls-to-disk	Registers native calls to data container backend as disk files.	False	✓	✓	✓	
log-native-calls-to-trace	Log native calls to data container backend on the trace.	False	✓	✓	✓	
mail-body-html	Set whether the mail body is HTML.		✓	✓	✓	
mail-from-email	The default FROM email address.		✓	✓	✓	
mail-from-name	The default FROM name.		✓	✓	✓	
mail-priority	Priority of the mail; negative is bulk, 0 is neutral, positive is urgent.		✓	✓	✓	
mail-reply-to-email	The default REPLY TO email address.		✓	✓	✓	
mail-reply-to-name	The default REPLY TO name.		✓	✓	✓	
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓	
max-url-length-accepted	The maximum accepted URL length before raising an error.	8000	✓	✓	✓	
max-url-length-desired	The maximum desired URL length.	8000	✓	✓	✓	
partition-slot-based-rate-limit-length-ms	Total length in ms across all slots of a partition-based rate limit.	60000	✓		✓	
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit		✓		✓	
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓	
requested-page-size	Preferred number of rows to exchange per round trip; only effective on limited platforms such as AFAS Online		✓	✓	✓	
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓	
slot-based-rate-limit-length-ms	Total length in ms across all slots of a slot-based rate limit.	60000	✓		✓	
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓	
smtp-enable-ssl	Set whether SSL is enabled for SMTP connections.	False	✓	✓	✓	
smtp-host-address	The default SMTP host address to use.		✓	✓	✓	
smtp-host-port-number	The default SMTP host port number to use.		✓	✓	✓	
smtp-minimum-deliver-duration-ms	Minimum deliver duration in milliseconds for the SMTP send plus inserted sleep when SMTP send finished earlier than the minimum.		✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
smtp-password	The default SMTP password to authenticate with.		✓	✓	✓	
smtp-send-timeout-ms	Timeout in milliseconds after which the SMTP send times out.		✓	✓	✓	
smtp-user-name	The default SMTP user name to authenticate with.		✓	✓	✓	
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓	
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓	

### 5.2.30 Provider Mendix

Mendix version control in the cloud or on-premises.

Code for use in settings.xml: Mendix

Alias: Mendix

Status: Non-production

Available in Editions: Paid

Technical Documentation: <https://docs.mendix.com/apidocs-mxdk/apidocs/>

Non-technical Documentation: <https://mendix-apps.com>

### 5.2.31 Provider MicrosoftGraph

Microsoft Graph (as used by Office 365).

Code for use in settings.xml: MicrosoftGraph

Alias: graph

Status: Production

Available in Editions: Paid

Technical Documentation: <https://developer.microsoft.com/en-us/graph>

### 5.2.32 Provider MySql

Oracle MySQL.

Code for use in settings.xml: MySql

Alias: mysql

Status: Production

Available in Editions: Paid

Additional Driver to install: <https://support.invantive.com/download-driver-mysql>

## Provider Attributes

The following provider attributes are available for MySql:

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
command-timeout-sec	Number of seconds after which a command times out.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
maximum-number-of-pooled-connections	Maximum number of concurrent pooled connections.		✓	✓	✓
maximum-sleep-acquire-pooled-connection-ms	Maximum time in ms to wait for acquiring a free connection from a pool of connections.	30000	✓	✓	✓
maximum-sleep-acquire-unpooled-connection-ms	Maximum time in ms to wait for acquire a free connection when there is no connection pooling.	60000	✓	✓	✓
preferred-number-of-pooled-connections	Preferred number of concurrent pooled connections.		✓	✓	✓
prefix-bind-variable-in-list	Prefix for bind variables used in an IN-list	i	✓	✓	✓
prefix-bind-variable-normal	Prefix for bind variables used in all cases except in an IN-list	w	✓	✓	✓
prefix-renamed-columns	Prefix appended to columns whose names occur multiple times in the column list of a query	column	✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	changing a data model on a case-dependent platform.				
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓

### 5.2.33 Provider Nasa

NASA space information.

Code for use in settings.xml: Nasa

Alias: nasa

Status: Production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://api.nasa.gov/>

Non-technical Documentation: <https://api.nasa.gov/>

## Provider Attributes

The following provider attributes are available for Nasa:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantine-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantine-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantine-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

Generated 11-01-2019 21:40 on version 17.30.0-PROD+1821.

### 5.2.34 Provider NmbrsNI

Payrolling and HR management.

Code for use in settings.xml: NmbrsNI

Alias: nmbrs

Abbreviation: nms

Status: Production

Available in Editions: Paid

String-comparison is Case-sensitive: true

Use Catalog in Full Name: true

Use Schema in Full Name: true

Partition Column: COMPANY\_CODE

Updated: 14-05-2020 17:13 using Invantive UniversalSQL version 20.1.36-BETA+2798.

Technical Documentation: <https://api.nmbrs.nl>

## Provider Attributes

The following provider attributes are available for NmbrsNI:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
minimum-length-text	Extend all text columns to this length to allow processing of XML that uses longer text values than the XSD specifies.		✓			✓
api-url	URL of Nmbrs web service		✓		✓	
bulk-delete-page-size-rows	Number of rows to delete per batch when bulk deleting	10000	✓	✓	✓	
bulk-insert-page-size-bytes	Approximate maximum size in bytes of batch when bulk inserting	10000000	✓	✓	✓	
bulk-insert-page-size-rows	Number of rows to insert per batch when bulk inserting	10000	✓	✓	✓	
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓	
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓	
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3.WS212\Invantive\Cache\http\gle3\shared	✓	✓	✓	
http-disk-cache-ignore-write-errors	Whether to ignore write errors to disk cache.	False	✓	✓	✓	
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓	
http-get-timeout-ms	HTTP GET timeout (ms)	300000	✓	✓	✓	
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓	
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓	
http-post-timeout-ms	HTTP POST timeout (ms)	300000	✓	✓	✓	
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓	
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓	
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓	
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓	
max-url-length-accepted	The maximum accepted URL length before raising an error.	8000	✓	✓	✓	
max-url-length-desired	The maximum desired URL length.	8000	✓	✓	✓	
partition-slot-based-rate-limit-length-ms	Total length in ms across all slots of a partition-based rate limit.	60000	✓		✓	
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit		✓		✓	
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓	
requested-page-size	Preferred number of rows to exchange per round trip; only effective on limited platforms such as AFAS Online		✓	✓	✓	
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File	Set from Log On
result-set-memory-cache	Action: provide 'empty' to empty.			✓		
slot-based-rate-limit-length-ms	Total length in ms across all slots of a slot-based rate limit.	60000	✓		✓	
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓	
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓	
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓	
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓	
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	False	✓	✓	✓	
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	False	✓	✓	✓	
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory to answer the current query	True	✓	✓	✓	
use-http-memory-cache-write	Whether to memorize HTTP responses in memory	True	✓	✓	✓	
use-metadata-memory-cache	Whether to use the metadata in memory calculated previously Has only practical use during development on a XML provider.	True	✓	✓	✓	
use-result-memory-cache	Whether to use result sets cached in memory from previous queries that can answer the current query	True	✓	✓	✓	

### 5.2.35 Provider OAuth UI provider

OAuth provider for Windows user-interface integrated OAuth authentication with a pop-up browser.

Code for use in settings.xml: OAuth UI provider

Alias: oauth

Status: Production

Available in Editions: Paid

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
invantive-sql-forward-filters-to-data-containers	Whether or not filters should be forwarded to data containers.	True		✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether or not results should be shuffled when fetched from data containers.	False	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	os h u f f l e r e s - u l t s f e t c h e d f r o m d a t a c o n - t a i n - e r s .				
invantive-use-cache	Whether to use cache	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	cachetheresultsofaquery.				
pre-request-delay-ms	Pre-request delay in milliseconds	0	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	condssperorre-quest.				
requests-parallel-max	Maximun number of parallel queries	32	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
usest sfor omin -di -vi dua lpar -ti -ti ons son th e da t ac on -ta in er .	uest sfor omin -di -vi dua lpar -ti -ti ons son th e da t ac on -ta in er .				

### 5.2.36 Provider Odbc

ODBC.

Code for use in settings.xml: Odbc

Alias: odbc

Status: Production

Available in Editions: Paid

### 5.2.37 Provider OpenArch: OPENARCH (NL) information.

OPENARCH (NL) information.

Code for use in settings.xml: OpenArch

Alias: openarch

Status: Non-production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://www.openarch.nl/api/docs/>

## Provider Attributes

The following provider attributes are available for OpenArch:

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

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### 5.2.38 Provider OpenExchangeRates: Open Exchange Rates.

Open Exchange Rates.

Code for use in settings.xml: OpenExchangeRates

Alias: openexra

Status: Production

Available in Editions: Paid

Technical Documentation: <https://docs.openexchangerates.org/>

Non-technical Documentation: <https://docs.openexchangerates.org/docs>

## Provider Attributes

The following provider attributes are available for OpenExchangeRates:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

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### 5.2.39 Provider OpenSpendingNI: Openspending.nl.

Openspending.nl.

Code for use in settings.xml: OpenSpendingNI

Alias: osnl

Status: Production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://openspending.nl/api/v1/doc>

Non-technical Documentation: <https://openspending.nl/pagina/data>

## Provider Attributes

The following provider attributes are available for OpenSpendingNI:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

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#### 5.2.40 Provider Oracle: Oracle C driver-based provider.

Oracle C driver-based provider.

Code for use in settings.xml: Oracle

Alias: oracle

Status: Production

Available in Editions: Paid

#### 5.2.41 Provider OracleManaged: Oracle .NET driver-based.

Oracle .NET driver-based provider.

Code for use in settings.xml: OracleManaged

Alias: oracle

Status: Production

Available in Editions: Paid

Additional Driver to install: <https://support.invantive.com/download-driver-oracle>

## Provider Attributes

The following provider attributes are available for OracleManaged:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
command-timeout-sec	Number of seconds after which a command times out.		✓	✓	✓
connection-string-self-tuning-add	Should the 'Self Tuning' be added automatically to the connection string?	True	✓	✓	✓
connection-string-self-tuning-value	Value of self tuning to be added to the connection string	True	✓	✓	✓
connection-string-statement-cache-size-add	Should the 'Statement Cache Size' be added automatically to the connection string?	True	✓	✓	✓
connection-string-statement-cache-size-value	Size of the statement cache size to be added to the connection string	250	✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
maximum-number-of-pooled-connections	Maximum number of concurrent pooled connections.		✓	✓	✓
maximum-sleep-acquire-pooled-connection-ms	Maximum time in ms to wait for acquiring a free connection from a pool of connections.	30000	✓	✓	✓
maximum-sleep-acquire-unpooled-connection-ms	Maximum time in ms to wait for acquire a free connection when there is no connection pooling.	60000	✓	✓	✓
preferred-number-of-pooled-connections	Preferred number of concurrent pooled connections.		✓	✓	✓
prefix-bind-variable-in-list	Prefix for bind variables used in an IN-list	i	✓	✓	✓
prefix-bind-variable-normal	Prefix for bind variables used in all cases except in an IN-list	w	✓	✓	✓
prefix-renamed-columns	Prefix appended to columns whose names occur multiple times in the column list of a query	column	✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
return-null-on-ora-22288	Return a null value instead of an exception when Oracle returns ORA-22288 when querying a bfile column	False	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓

## 5.2.42 Provider Os: Windows operating system objects.

Windows operating system objects.

Code for use in settings.xml: Os

Alias: os

Status: Production

Available in Editions: Paid

## Provider Attributes

The following provider attributes are available for Os:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Un-set, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓

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### 5.2.43 Provider PayPal: PayPal.

PayPal.

Code for use in settings.xml: PayPal

Alias: paypal

Status: Production

Available in Editions: Paid

Technical Documentation: <https://developer.paypal.com/docs/>

#### 5.2.44 Provider PostgreSql: PostgreSQL.

PostgreSQL.

Code for use in settings.xml: PostgreSQL

Alias: pg

Status: Production

Available in Editions: Paid

Additional Driver to install: <https://support.invantive.com/download-driver-postgresql>

## Provider Attributes

The following provider attributes are available for PostgreSQL:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
bulk-insert-page-size-rows	Number of rows to insert per page when bulk inserting	1000	✓	✓	✓
command-timeout-sec	Number of seconds after which a command times out.		✓	✓	✓
database	Database to open when connecting.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
maximum-number-of-pooled-connections	Maximum number of concurrent pooled connections.		✓	✓	✓
maximum-sleep-acquire-pooled-connection-ms	Maximum time in ms to wait for acquiring a free connection from a pool of connections.	30000	✓	✓	✓
maximum-sleep-acquire-unpooled-connection-ms	Maximum time in ms to wait for acquire a free connection when there is no connection pooling.	60000	✓	✓	✓
npgsql-log	Whether to log messages of the npgsql provider	False	✓	✓	✓
preferred-number-of-pooled-connections	Preferred number of concurrent pooled connections.		✓	✓	✓
prefix-bind-variable-in-list	Prefix for bind variables used in an IN-list	i	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
prefix-bind-variable-normal	Prefix for bind variables used in all cases except in an IN-list	w	✓	✓	✓
prefix-renamed-columns	Prefix appended to columns whose names occur multiple times in the column list of a query	column	✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓

#### 5.2.45 Provider RdwNI: RDW (NL) information.

RDW (NL) information.

Code for use in settings.xml: RdwNI

Alias: rdwnl

Status: Production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://www.rdw.nl/over-rdw/dienstverlening/open-data>

## Provider Attributes

The following provider attributes are available for RdwNI:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down		✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
	during retrieval of data.				
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

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### 5.2.46 Provider Rss20: RSS version 2.0.

RSS version 2.0.

Code for use in settings.xml: Rss20

Alias: rss

Status: Production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://www.rssboard.org/rss-specification>

## Provider Attributes

The following provider attributes are available for Rss20:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-con-	Whether to shuffle results fetched from data containers.	False	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
tainers					
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
result-set-cache	Action: provide 'empty' to empty.			✓	
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-metadata-cache	Whether to use the metadata calculated previously Has only practical use during development on a XML provider.	True	✓	✓	✓
use-result-cache	Whether to use result sets from previous queries that can answer the current query	True	✓	✓	✓
xml-directories	{res:itgen_provider_attribute_xml_directories_description}		✓	✓	✓
xml-extension	{res:itgen_provider_attribute_xml_extension_description}	*.rss	✓	✓	✓
xml-namespaces	Comma-separated list of namespace prefixes and their URI		✓	✓	✓

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### 5.2.47 Provider Salesforce: Salesforce CRM and other applications.

Salesforce CRM and other applications.

Code for use in settings.xml: Salesforce

Alias: sf

Status: Production

Available in Editions: Paid

Technical Documentation: <https://developer.salesforce.com>

Non-technical Documentation: <https://www.salesforce.com/nl/?ir=1>

## Provider Attributes

The following provider attributes are available for Salesforce:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
api-client-id	The client ID is a unique identifier of your application. It is generated by registering an application.		✓		✓
api-client-secret	The client secret is to be kept confidential. Such as a password for a logon code, the client secret is the confidential part of an app identified by a client ID. It is needed during the OAuth2 Code Grant Flow together with the refresh token to get access.	***	✓		✓
api-redirect-url	The redirect URI is the website a browser session is redirected to after the OAuth2 authentication process has been completed.		✓		✓
api-refresh-token	Refresh Token is a security token for the OAuth2 Code Grant Flow. With a Refresh Token and client secret you can retrieve a renewed access token to access protected resources. A Refresh Token and client secret must be stored securely since once compromised allows access to your protected resources.	***	✓		✓
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-429-errors	Ignore HTTP 429 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
partition-slot-based-rate-limit-length-ms	Length in ms of a partition-based rate limit across all slots.	60000	✓		✓
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit		✓		✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit across all slots.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

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#### 5.2.48 Provider Sftp: Secure FTP.

Secure FTP.

Code for use in settings.xml: Sftp

Alias: sftp

Status: Production

Available in Editions: Paid

#### 5.2.49 Provider SilverEssence: SilverEssence.

SilverEssence.

Code for use in settings.xml: SilverEssence

Alias: silver

Status: Non-production

Available in Editions: Paid

#### 5.2.50 Provider Slack: Slack

Slack

Code for use in settings.xml: Slack

Alias: Slack

Status: Non-production

Available in Editions: Paid

Technical Documentation: <https://api.slack.com>

#### 5.2.51 Provider Snelstart: Snelstart (NL) information.

Snelstart (NL) information.

Code for use in settings.xml: Snelstart

Alias: Snelstart

Status: Non-production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://www.snelstart.nl/api>

### 5.2.52 Provider SqlServer: Microsoft SQL Server.

Microsoft SQL Server.

Code for use in settings.xml: SqlServer

Alias: mssql

Status: Production

Available in Editions: Paid

## Provider Attributes

The following provider attributes are available for SqlServer:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
bulk-insert-page-size-rows	Number of rows to insert per page when bulk inserting	1000	✓	✓	✓
bulk-insert-timeout-sec	Number of seconds after which a bulk insert times out	300	✓	✓	✓
command-timeout-sec	Number of seconds after which a command times out.		✓	✓	✓
connection-string-async-add	Should the 'Async' be added automatically to the connection string?	True	✓	✓	✓
connection-string-async-value	Size of the Async to be added to the connection string	True	✓	✓	✓
connection-string-multiple-active-result-sets-add	Should the 'MultipleActiveResultSets' be added automatically to the connection string?	True	✓	✓	✓
connection-string-multiple-active-result-sets-value	Value of MultipleActiveResultSets to be added to the connection string	True	✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
maximum-number-of-pooled-connections	Maximum number of concurrent pooled connections.		✓	✓	✓
maximum-sleep-acquire-pooled-connection-ms	Maximum time in ms to wait for acquiring a free connection from a pool of connections.	30000	✓	✓	✓
maximum-sleep-acquire-unpooled-connection-ms	Maximum time in ms to wait for acquire a free connection when there is no connection pooling.	60000	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
preferred-number-of-pooled-connections	Preferred number of concurrent pooled connections.		✓	✓	✓
prefix-bind-variable-in-list	Prefix for bind variables used in an IN-list	i	✓	✓	✓
prefix-bind-variable-normal	Prefix for bind variables used in all cases except in an IN-list	w	✓	✓	✓
prefix-renamed-columns	Prefix appended to columns whose names occur multiple times in the column list of a query	column	✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓

### 5.2.53 Provider StackExchange: StackExchange.

StackExchange.

Code for use in settings.xml: StackExchange

Alias: StackExchange

Status: Production

Available in Editions: Paid, Open Data, Community

Technical Documentation: <https://api.stackexchange.com>

Non-technical Documentation: <https://stackexchange-apps.com>

## Provider Attributes

The following provider attributes are available for StackExchange:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
api-client-id	The client ID is a unique identifier of your application. It is generated by registering an application.		✓		✓
api-client-secret	The client secret is to be kept confidential. Such as a password for a logon code, the client secret is the confidential part of an app identified by a client ID. It is needed during the OAuth2 Code Grant Flow together with the refresh token to get access.	***	✓		✓
api-redirect-url	The redirect URI is the website a browser session is redirected to after the OAuth2 authentication process has been completed.		✓		✓
api-refresh-token	Refresh Token is a security token for the OAuth2 Code Grant Flow. With a Refresh Token and client secret you can retrieve a renewed access token to access protected resources. A Refresh Token and client secret must be stored securely since once compromised allows access to your protected resources.	***	✓		✓
api-url	URL to access the API.		✓		✓
authentication-key	The authentication key of the app on Stack-Apps.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

### 5.2.54 Provider SwiftMt940Rabo: Swift MT940 Rabobank.

Swift MT940 Rabobank.

Code for use in settings.xml: SwiftMt940Rabo

Alias: mt940rabo

Status: Non-production

Available in Editions: Paid

Non-technical Documentation: <https://www.sepaforcorporates.com/swift-for-corporates/account-statement-mt940-file-format-overview/>

## Provider Attributes

The following provider attributes are available for SwiftMt940Rabo:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
directories	{res:itgen_provider_attribute_directories_description}	c:\temp	✓	✓	✓
extension	{res:itgen_provider_attribute_extension_description}	*.swi	✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
log-directory	Directory where the text messages are stored	c:\temp	✓	✓	✓
log-text	Whether to log the text messages exchanged to disk	False	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓

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### 5.2.55 Provider Teamleader: Teamleader CRM.

Teamleader is a cloud solution for customer management. Teamleader includes CRM as well as project and tickets. Teamleader can be extended by defining custom fields on several core concepts.

Code for use in settings.xml: Teamleader

Alias: teamleader

Abbreviation: tlr

Status: Production

Available in Editions: Paid

String-comparison is Case-sensitive: true

Use Catalog in Full Name: true

Use Schema in Full Name: true

Updated: 10-09-2020 00:09 using Invantive UniversalSQL version 20.1.206-BETA+2915.

Technical Documentation: <https://apidocs.teamleader.be/>

## Documentation

Authentication

Authentication can be done using one of the following two alternatives:

1. Using the user log on code and password also used on the Teamleader website.
2. Using an API group and API secret.

Authentication using user log on code and password is recommended for general use. The user must have access to all functionality since by default all so-called 'scopes' are requested. The scopes can be manually entered to be able to log in with a restricted accounts. Please provide a space-separated list chosen from companies, contacts, deals, departments, events, invoices, products, quotations, subscriptions, tickets, todos, users.

The API group and secret can be found on [https://app.teamleader.eu/apiwebhooks.php?show\\_key](https://app.teamleader.eu/apiwebhooks.php?show_key).

Usage Limits

Invantive UniversalSQL executes API calls to retrieve and upload data. The number of API calls allowed per 5 seconds is 25. Invantive UniversalSQL ensures that within your session the number of calls allowed per hour is not exceeded.

To get an impression of how Invantive UniversalSQL translates into API calls, please query the data dictionary view 'sessionios', such as with 'select \* from sessionios@datadictionary'.

## Custom Fields

Custom fields for which one value can be entered on an object are added to the table representing the object. For instance, a custom field 'needsaudit' on 'project', will be added as a column 'c\_needsaudit' on the 'project' table. The name of the additional column directly derives from the custom field name. Almost all changes, including adding numbers or reading characters, will result in the data model being changed.

Custom fields which can have no, one or multiple values ('set' custom fields) are reflected in the data model by tables with a name constructed of the object name, an underscore plus the name of the custom field. For example, a custom field named 'Multiple Selection' on 'Task' will add a table 'task\_multipleselection' to the data model.

Custom fields are unique to each Teamleader environment. When the existence of specific custom field is not guaranteed, please use generic solutions like the tables 'CustomFieldDefinitions', 'custom\_fields', 'custom\_field\_options', 'custom\_field', 'Custom\_Fields\_All', 'Custom\_Field\_Types' and their object-specific custom field value tables like 'ticket\_custom\_field\_values\_by\_id'.

## Connector Attributes

The Teamleader connector can be configured using the following attributes:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
force-custom-field-to-string	Whether to force custom field values shown in columns to be represented as string instead of the registered type.	False	✓		✓	✓
scopes	Space-separated and case-sensitive list of scope for OAuth only. Leave empty for all.		✓		✓	✓
api-client-id	The client ID is a unique identifier of your application. It is generated by registering an application.		✓		✓	✓
api-client-secret	The client secret is to be kept confidential. Such as a password for a logon code, the client secret is the confidential part of an app identified by a client ID. It is needed during the OAuth2 Code Grant Flow together with the refresh token to get access.	***	✓		✓	✓
api-refresh-token	Refresh Token is a security token for the OAuth2 Code Grant Flow. With a Refresh Token and client secret you can retrieve a renewed access token to access protected resources. A Refresh Token and	***	✓		✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
	client secret must be stored securely since once compromised allows access to your protected resources.					
api-redirect-url	The redirect URI is the website a browser session is redirected to after the OAuth2 authentication process has been completed.		✓		✓	✓
api-group-authentication	Use API group authentication when true. OAuth otherwise.		✓		✓	
api-scope	The scope to request an OAuth token for.		✓		✓	
api-token-url	The token URI is the OAuth2 endpoint to exchange tokens.		✓		✓	
api-url	URL to access the API.		✓		✓	
bulk-delete-page-size-rows	Number of rows to delete per batch when bulk deleting	10000	✓	✓	✓	
bulk-insert-page-size-bytes	Approximate maximum size in bytes of batch when bulk inserting	10000000	✓	✓	✓	
bulk-insert-page-size-rows	Number of rows to insert per batch when bulk inserting	250	✓	✓	✓	
download-error-400-bad-request-max-tries	Maximum number of tries when OData server reports bad format during retrieval of data.	30	✓	✓	✓	
download-error-400-bad-request-sleep-initial-ms	Initial sleep in milliseconds between retries when OData server reports that the API server is unavailable during retrieval of data.	5000	✓	✓	✓	
download-error-400-bad-request-sleep-max-ms	Maximum sleep in milliseconds between retries when OData server reports that the API server is unavailable during retrieval of data.	60000	✓	✓	✓	
download-error-400-bad-request-sleep-multiplicator	Multiplication factor for sleep between retries OData server reports that the API server is unavailable during retrieval of data.	2	✓	✓	✓	
download-error-422-bad-request-max-tries	Maximum number of tries when OData server reports unprocessable entity during retrieval of data.	30	✓	✓	✓	
download-error-422-bad-request-sleep-initial-ms	Initial sleep in milliseconds between retries when OData server reports unprocessable entity during retrieval of data.	5000	✓	✓	✓	
download-error-422-bad-request-sleep-max-ms	Maximum sleep in milliseconds between retries when OData server reports unprocessable entity during retrieval of data.	60000	✓	✓	✓	
download-error-422-bad-request-sleep-multiplicator	Multiplication factor for sleep between retries OData server reports unprocessable entity during retrieval of data.	2	✓	✓	✓	
download-error-429-too-many-requests-	Maximum number of tries when the website reports that too many requests have	10	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
max-tries	been made during a timeslot of one minute or one day.					
dow nload-error-429-too-many-requests-sleep-initial-ms	Initial sleep in milliseconds between retries when the website reports that too many requests have been made during a timeslot of one minute or one day.	5000	✓	✓	✓	
dow nload-error-429-too-many-requests-sleep-max-ms	Maximum sleep in milliseconds between retries when the website reports that too many requests have been made during a timeslot of one minute or one day.	60000	✓	✓	✓	
dow nload-error-429-too-many-requests-sleep-multiplicator	Multiplication factor for sleep between retries when the website reports that too many requests have been made during a timeslot of one minute or one day.	2	✓	✓	✓	
dow nload-error-502-server-unavailable-max-tries	Maximum number of tries when OData server reports a bad gateway during retrieval of data.	30	✓	✓	✓	
dow nload-error-502-server-unavailable-sleep-initial-ms	Initial sleep in milliseconds between retries when OData server reports a bad gateway during retrieval of data.	10000	✓	✓	✓	
dow nload-error-502-server-unavailable-sleep-max-ms	Maximum sleep in milliseconds between retries when OData server reports that a bad gateway during retrieval of data.	60000	✓	✓	✓	
dow nload-error-502-server-unavailable-sleep-multiplicator	Multiplication factor for sleep between retries OData server reports a bad gateway during retrieval of data.	2	✓	✓	✓	
dow nload-error-503-server-unavailable-max-tries	Maximum number of tries when OData server reports that the API server is unavailable during retrieval of data.	30	✓	✓	✓	
dow nload-error-503-server-unavailable-sleep-initial-ms	Initial sleep in milliseconds between retries when OData server reports that the API server is unavailable during retrieval of data.	5000	✓	✓	✓	
dow nload-error-503-server-unavailable-sleep-max-ms	Maximum sleep in milliseconds between retries when OData server reports that the API server is unavailable during retrieval of data.	60000	✓	✓	✓	
dow nload-error-503-server-unavailable-sleep-multiplicator	Multiplication factor for sleep between retries OData server reports that the API server is unavailable during retrieval of data.	2	✓	✓	✓	
dow nload-error-504-gateway-timeout-max-tries	Maximum number of tries when the website reports a gateway timeout.	10	✓	✓	✓	
dow nload-error-504-gateway-timeout-sleep-initial-ms	Initial sleep in milliseconds between retries when the website reports a gateway timeout.	5000	✓	✓	✓	
dow nload-error-504-gateway-timeout-sleep-max-ms	Maximum sleep in milliseconds between retries when the website reports a gateway timeout.	60000	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
dow nload-error-504-gateway-timeout-sleep-multiplicator	Multiplication factor for sleep between retries when the website reports a gateway timeout.	2	✓	✓	✓	
dow nload-error-argument-exception-max-tries	Maximum number of tries when an argument exception is returned when download a blob.	10	✓	✓	✓	
dow nload-error-argument-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when an argument exception is returned when download a blob.	1000	✓	✓	✓	
dow nload-error-argument-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when an argument exception is returned when download a blob.	60000	✓	✓	✓	
dow nload-error-argument-exception-sleep-multiplicator	Multiplication factor for sleep between retries when an argument exception is returned when download a blob.	2	✓	✓	✓	
dow nload-error-internet-download-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.	10	✓	✓	✓	
dow nload-error-internet-download-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.	10000	✓	✓	✓	
dow nload-error-internet-download-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.	60000	✓	✓	✓	
dow nload-error-internet-download-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.	2	✓	✓	✓	
dow nload-error-io-exception-max-tries	Maximum number of tries when a network I/O connection failure occurs during retrieval of data.	10	✓	✓	✓	
dow nload-error-io-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when a network I/O connection failure occurs during retrieval of data.	10000	✓	✓	✓	
dow nload-error-io-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when a network I/O connection failure occurs during retrieval of data.	60000	✓	✓	✓	
dow nload-error-io-exception-sleep-multiplicator	Multiplication factor for sleep between retries when a network I/O connection failure occurs during retrieval of data.	2	✓	✓	✓	
dow nload-error-json-exception-max-tries	Maximum number of tries when an invalid JSON body is returned.	3	✓	✓	✓	
dow nload-error-json-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when an invalid JSON body is returned.	1000	✓	✓	✓	
dow nload-error-json-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when an invalid JSON body is returned.	10000	✓	✓	✓	
dow nload-error-json-exception-sleep-multiplicator	Multiplication factor for sleep between retries when an invalid JSON body is returned.	2	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Connectors File	Set from Log On
dow nload-error-other-exception-max-tries	Maximum number of tries when an unqualified error occurs during retrieval of data.	3	✓	✓	✓	
dow nload-error-other-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when an unqualified error occurs during retrieval of data.	5000	✓	✓	✓	
dow nload-error-other-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when an unqualified error occurs during retrieval of data.	30000	✓	✓	✓	
dow nload-error-other-exception-sleep-multiplicator	Multiplication factor for sleep between retries when an unqualified error occurs during retrieval of data.	2	✓	✓	✓	
dow nload-error-socket-exception-max-tries	Maximum number of tries when the network connection is forcibly dropped during retrieval of data.	10	✓	✓	✓	
dow nload-error-socket-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when the network connection is forcibly dropped during retrieval of data.	10000	✓	✓	✓	
dow nload-error-socket-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when the network connection is forcibly dropped during retrieval of data.	60000	✓	✓	✓	
dow nload-error-socket-exception-sleep-multiplicator	Multiplication factor for sleep between retries when the network connection is forcibly dropped during retrieval of data.	2	✓	✓	✓	
dow nload-error-w eb-exception-max-tries	Maximum number of tries when a web connection failure occurs during retrieval of data.	10	✓	✓	✓	
dow nload-error-w eb-exception-sleep-initial-ms	Initial sleep in milliseconds between retries when a web connection failure occurs during retrieval of data.	10000	✓	✓	✓	
dow nload-error-w eb-exception-sleep-max-ms	Maximum sleep in milliseconds between retries when a web connection failure occurs during retrieval of data.	60000	✓	✓	✓	
dow nload-error-w eb-exception-sleep-multiplicator	Multiplication factor for sleep between retries when a web connection failure occurs during retrieval of data.	2	✓	✓	✓	
dow nload-error-w eb-not-implemented-max-tries	Maximum number of tries when the connection reports not implemented.	1	✓	✓	✓	
dow nload-error-w eb-not-implemented-sleep-initial-ms	Initial sleep in milliseconds between retries when the connection reports not implemented.	5000	✓	✓	✓	
dow nload-error-w eb-not-implemented-sleep-max-ms	Maximum sleep in milliseconds between retries when the connection reports not implemented.	60000	✓	✓	✓	
dow nload-error-w eb-not-implemented-sleep-multiplicator	Multiplication factor for sleep between retries when the connection reports not implemented.	2	✓	✓	✓	
dow nload-error-w eb-timeout-max-tries	Maximum number of tries when the connection reports a timeout.	10	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
dow nload-error-w eb-timeout-sleep-initial-ms	Initial sleep in milliseconds between retries when the connection reports a timeout.	5000	✓	✓	✓	
dow nload-error-w eb-timeout-sleep-max-ms	Maximum sleep in milliseconds between retries when the connection reports a timeout.	60000	✓	✓	✓	
dow nload-error-w eb-timeout-sleep-multiplicator	Multiplication factor for sleep between retries when the connection reports a timeout.	2	✓	✓	✓	
dow nload-error-w eb-unauthorized-max-tries	Maximum number of tries when the connection reports an unauthorized error.	1	✓	✓	✓	
dow nload-error-w eb-unauthorized-sleep-initial-ms	Initial sleep in milliseconds between retries when the connection reports an unauthorized error.	5000	✓	✓	✓	
dow nload-error-w eb-unauthorized-sleep-max-ms	Maximum sleep in milliseconds between retries when the connection reports an unauthorized error.	60000	✓	✓	✓	
dow nload-error-w eb-unauthorized-sleep-multiplicator	Multiplication factor for sleep between retries when the connection reports an unauthorized error.	2	✓	✓	✓	
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓	
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓	
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓	
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3.WS212\Inventive\Cache\http\gle3\shared	✓	✓	✓	
http-disk-cache-ignore-write-errors	Whether to ignore write errors to disk cache.	False	✓	✓	✓	
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓	
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓	
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓	
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓	
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓	
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
ignore-http-401-errors	Ignore HTTP 401 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
ignore-http-404-errors	Ignore HTTP 404 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
ignore-http-422-errors	Ignore HTTP 422 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
ignore-http-429-errors	Ignore HTTP 429 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
ignore-http-500-errors	Ignore HTTP 500 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
ignore-http-502-errors	Ignore HTTP 502 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
invalid-json-on-get-max-tries	Maximum number of tries when the JSON received on GET is invalid.	10	✓	✓	✓	
invalid-json-on-get-sleep-initial-ms	Initial sleep in milliseconds between retries when the JSON received on GET is invalid.	10000	✓	✓	✓	
invalid-json-on-get-sleep-max-ms	Maximum sleep in milliseconds between retries when the JSON received on GET is invalid.	60000	✓	✓	✓	
invalid-json-on-get-sleep-multiplicator	Multiplication factor for sleep between retries when the JSON received on GET is invalid.	2	✓	✓	✓	
invalid-json-on-post-max-tries	Maximum number of tries when the JSON received on POST is invalid.	1	✓	✓	✓	
invalid-json-on-post-sleep-initial-ms	Initial sleep in milliseconds between retries when the JSON received on POST is invalid.	10000	✓	✓	✓	
invalid-json-on-post-sleep-max-ms	Maximum sleep in milliseconds between retries when the JSON received on POST is invalid.	60000	✓	✓	✓	
invalid-json-on-post-sleep-multiplicator	Multiplication factor for sleep between retries when the JSON received on POST is invalid.	2	✓	✓	✓	
invantive-sql-correct-invalid-date	Whether to correct invalid dates.	False	✓	✓	✓	
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓	
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓	
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓	
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓	
limit-partition-calls-left	Minimum number of remaining API calls on a partition towards a hard limit. When below, an error is raised.	500	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Connectors File	Set from Log On
log-native-calls-to-disk	Registers native calls to data container backend as disk files.	False	✓	✓	✓	
log-native-calls-to-trace	Log native calls to data container backend on the trace.	False	✓	✓	✓	
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓	
max-odata-filters	The maximum number of OData filter elements.	100	✓	✓	✓	
max-url-length-accepted	The maximum accepted URL length before raising an error.	8000	✓	✓	✓	
max-url-length-desired	The maximum desired URL length.	8000	✓	✓	✓	
metadata-cache-max-age-sec	Maximum acceptable age in seconds for re-use of metadata.		✓	✓	✓	
partition-slot-based-rate-limit-length-ms	Total length in ms across all slots of a partition-based rate limit.	60000	✓		✓	
partition-slot-based-rate-limit-slots	Number of slots per partition-based rate limit. Null means no slot-based rate limit		✓		✓	
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓	
requested-page-size	Preferred number of rows to exchange per round trip; only effective on limited platforms such as AFAS Online		✓	✓	✓	
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓	
simulate-http-400-errors	Simulate HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-400-errors-percentage	Percentage of simulated HTTP 400 errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-401-errors	Simulate HTTP 401 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-401-errors-percentage	Percentage of simulated HTTP 401 errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-403-errors	Simulate HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-403-errors-percentage	Percentage of simulated HTTP 403 errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-429-errors	Simulate HTTP 429 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-429-errors-percentage	Percentage of simulated HTTP 429 errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-500-errors	Simulate HTTP 500 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Connectors File	Set from Log On
simulate-http-500-errors-percentage	Percentage of simulated HTTP 500 errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-502-errors	Simulate HTTP 502 errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-502-errors-percentage	Percentage of simulated HTTP 502 errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-protocol-errors	Simulate HTTP protocol errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-protocol-errors-percentage	Percentage of simulated HTTP protocol errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
simulate-http-timeout-errors	Simulate HTTP timeout errors when exchanging results with the OData endpoint.	False	✓	✓	✓	
simulate-http-timeout-errors-percentage	Percentage of simulated HTTP timeout errors when exchanging results with the OData endpoint.	0	✓	✓	✓	
slot-based-rate-limit-length-ms	Total length in ms across all slots of a slot-based rate limit.	6000	✓		✓	
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit	21	✓		✓	
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓	
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓	
use-batch-insert	Whether to use batch insert.	True	✓	✓	✓	
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓	
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓	
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓	
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓	

## 5.2.56 Provider TeamViewer: TeamViewer online assistance.

TeamViewer online assistance.

Code for use in settings.xml: TeamViewer

Alias: teamviewer

Status: Production

Available in Editions: Paid

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
http-get-timeout-ms	HTTP GET timeout (ms)	30000		✓	✓

#### **5.2.57 Provider Teradata: Teradata data warehousing.**

Teradata data warehousing.

Code for use in settings.xml: Teradata

Alias: teradata

Status: Production

Available in Editions: Paid

Additional Driver to install: <https://support.invantive.com/download-driver-teradata>

#### **5.2.58 Provider Ubl20: UBL version 2.0.**

UBL version 2.0.

Code for use in settings.xml: Ubl20

Alias: ubl20

Status: Non-production

Available in Editions: Paid

Technical Documentation: <http://docs.oasis-open.org/ubl/cs-UBL-2.0/xsd/>

**5.2.59 Provider Ubl21: UBL version 2.1.**

UBL version 2.1.

Code for use in settings.xml: Ubl21

Alias: ubl21

Status: Non-production

Available in Editions: Paid

Technical Documentation: <http://docs.oasis-open.org/ubl/cs1-UBL-2.1/xsd/>

**5.2.60 Provider Vies: AutoTask service management.**

AutoTask service management.

Code for use in settings.xml: Vies

Alias: vies

Status: Non-production

Available in Editions: Paid

Technical Documentation: <http://severa.visma.com/en/support/severaapi/>

Non-technical Documentation: <http://severa.visma.com>

**5.2.61 Provider VirusTotal: VirusTotal.**

VirusTotal.

Code for use in settings.xml: VirusTotal

Alias: virustotal

Status: Non-production

Available in Editions: Paid

Technical Documentation: <https://developers.virustotal.com/v2.0/reference/getting-started>

**5.2.62 Provider VismaSevera: Visma Severa project management.**

Visma Severa project management.

Code for use in settings.xml: VismaSevera

Alias: severa

Status: Production

Available in Editions: Paid

Technical Documentation: <http://severa.visma.com/en/support/severaapi/>

Non-technical Documentation: <http://severa.visma.com>

## Provider Attributes

The following provider attributes are available for VismaSevera:

Code	Description	Default Value	Set from Connection String	Set from SQL-Statement	Set from Providers File
api-url	URL of Visma Severa web service		✓		✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms)	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms)	300000	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
result-set-cache	Action: provide 'empty' to empty.			✓	
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory to answer the current query	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses in memory	True	✓	✓	✓
use-metadata-cache	Whether to use the metadata calculated previously Has only practical use during development on a XML provider.	True	✓	✓	✓
use-result-cache	Whether to use result sets from previous queries that can answer the current query	True	✓	✓	✓

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### 5.2.63 Provider WebService: Invantive Web Service HTTPS data protocol.

Invantive Web Service HTTPS data protocol.

Code for use in settings.xml: WebService

Alias: ws

Status: Production

Available in Editions: Paid

### 5.2.64 Provider Wikipedia: Wikipedia information.

Wikipedia information.

Code for use in settings.xml: Wikipedia

Alias: Wikipedia

Status: Non-production

Available in Editions: Paid, Open Data, Community

## Provider Attributes

The following provider attributes are available for Wikipedia:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
api-url	URL to access the API.		✓		✓
dow nload-error-internet-dow n-max-tries	Maximum number of tries when the Internet connection seems down during retrieval of data.		✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
dow nload-error-internet-dow n-sleep-initial-ms	Initial sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-max-ms	Maximum sleep in milliseconds between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
dow nload-error-internet-dow n-sleep-multiplicator	Multiplication factor for sleep between retries when the Internet connection seems down during retrieval of data.		✓	✓	✓
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
http-disk-cache-compression-level	Compression level for the HTTP disk cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-disk-cache-directory	Directory where HTTP cache is stored.	C:\Users\gle3\Invantive\Cache	✓	✓	✓
http-disk-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP disk cache.	2592000	✓	✓	✓
http-get-timeout-ms	HTTP GET timeout (ms).	300000	✓	✓	✓
http-memory-cache-compression-level	Compression level for the HTTP memory cache, ranging from 1 (little) to 9 (intense). Default is 5.	5	✓	✓	✓
http-memory-cache-max-age-sec	Maximum acceptable age in seconds for use of data in the HTTP memory cache.	14400	✓	✓	✓
http-post-timeout-ms	HTTP POST timeout (ms).	300000	✓	✓	✓
ignore-http-400-errors	Ignore HTTP 400 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
ignore-http-403-errors	Ignore HTTP 403 errors when exchanging results with the OData endpoint.	False	✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
join-set-points-per-request	Maximum number of values in a request when executing a join set.	60	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-http-disk-cache-read	Whether to use HTTP responses from previous queries stored on disk to answer the current query.	True	✓	✓	✓
use-http-disk-cache-write	Whether to memorize HTTP responses on disk.	True	✓	✓	✓
use-http-memory-cache-read	Whether to use HTTP responses from previous queries stored in memory that can answer the current query.	True	✓	✓	✓
use-http-memory-cache-write	Whether to memorize HTTP responses from previous queries for use by future queries.	True	✓	✓	✓

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### 5.2.65 Provider Wmi: Windows Management Instrumentation.

Windows Management Instrumentation.

Code for use in settings.xml: Wmi

Alias: wmi

Status: Production

Available in Editions: Paid

### 5.2.66 Provider Xaa30: XML Auditfile Afrekensystemen version 3.0.

XML Auditfile Afrekensystemen version 3.0.

Code for use in settings.xml: Xaa30

Alias: xaa

Status: Production

Available in Editions: Paid

### 5.2.67 Provider Xaa31: XML Auditfile Afrekensystemen version 3.1.

XML Auditfile Afrekensystemen version 3.1.

Code for use in settings.xml: Xaa31

Alias: xaa

Status: Production

Available in Editions: Paid

Technical Documentation:

[https://www.softwarepakket.nl/upload/auditfiles/xaalAuditfileAfrekensystemen\\_3.1.zip](https://www.softwarepakket.nl/upload/auditfiles/xaalAuditfileAfrekensystemen_3.1.zip)

Non-technical Documentation:

[https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile\\_afrekensystemen.php?brnw=6](https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile_afrekensystemen.php?brnw=6)

## Provider Attributes

The following provider attributes are available for Xaa31:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
result-set-cache	Action: provide 'empty' to empty.			✓	
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-metadata-cache	Whether to use the metadata calculated previously Has only practical use during development on a XML provider.	True	✓	✓	✓
use-result-cache	Whether to use result sets from previous queries that can answer the current query	True	✓	✓	✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
xml-directories	{res:itgen_provider_attribute_xml_directories_description}		✓	✓	✓
xml-extension	{res:itgen_provider_attribute_xml_extension_description}	*.xaa	✓	✓	✓
xml-namespaces	Comma-separated list of namespace prefixes and their URI	xaa=http://www.audit-files.nl/XAA/3.1	✓	✓	✓

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### 5.2.68 Provider Xaf10: XML Auditfile Financieel version 1.0.

XML Auditfile Financieel version 1.0.

Code for use in settings.xml: Xaf10

Alias: xaf

Status: Production

Available in Editions: Paid

Technical Documentation:

[https://www.oswo.nl/pluginfile.php/13189/mod\\_folder/content/0/AuditfileFinancieelVersie1.0.zip](https://www.oswo.nl/pluginfile.php/13189/mod_folder/content/0/AuditfileFinancieelVersie1.0.zip)

Non-technical Documentation:

[https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile\\_financieel.php?bronw=6](https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile_financieel.php?bronw=6)

### 5.2.69 Provider Xaf30: XML Auditfile Financieel version 3.0.

XML Auditfile Financieel version 3.0.

Code for use in settings.xml: Xaf30

Alias: xaf

Status: Production

Available in Editions: Paid

Technical Documentation:

[https://www.oswo.nl/pluginfile.php/13189/mod\\_folder/content/0/XAF\\_V3.0.zip](https://www.oswo.nl/pluginfile.php/13189/mod_folder/content/0/XAF_V3.0.zip)

Non-technical Documentation:

[https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile\\_financieel.php?bronw=6](https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile_financieel.php?bronw=6)

### 5.2.70 Provider Xaf31: XML Auditfile Financieel version 3.1.

XML Auditfile Financieel version 3.1.

Code for use in settings.xml: Xaf31

Alias: xaf

Status: Production

Available in Editions: Paid

Technical Documentation:

[https://www.oswo.nl/pluginfile.php/13189/mod\\_folder/content/0/\\_AuditfileFinancieelVersie\\_3.1.zip](https://www.oswo.nl/pluginfile.php/13189/mod_folder/content/0/_AuditfileFinancieelVersie_3.1.zip)

Non-technical Documentation:

[https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile\\_financieel.php?bronw=6](https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile_financieel.php?bronw=6)

### 5.2.71 Provider Xaf32: XML Auditfile Financieel version 3.2.

XML Auditfile Financieel version 3.2.

Code for use in settings.xml: Xaf32

Alias: xaf

Status: Production

Available in Editions: Paid

Technical Documentation:

[http://www.ictplaza.nl/uploads/xml\\_auditfiles/xmlfinancieel/20140402\\_AuditfileFinancieelVersie\\_3.2.zip](http://www.ictplaza.nl/uploads/xml_auditfiles/xmlfinancieel/20140402_AuditfileFinancieelVersie_3.2.zip)

Non-technical Documentation:

[https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile\\_financieel.php?bronw=6](https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile_financieel.php?bronw=6)

## Provider Attributes

The following provider attributes are available for Xaf32:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
result-set-cache	Action: provide 'empty' to empty.			✓	
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-metadata-cache	Whether to use the metadata calculated previously Has only practical use during development on a XML provider.	True	✓	✓	✓
use-result-cache	Whether to use result sets from previous queries that can answer the current query	True	✓	✓	✓
xml-directories	{res:itgen_provider_attribute_xml_directories_description}		✓	✓	✓
xml-extension	{res:itgen_provider_attribute_xml_extension_description}	*.xaf	✓	✓	✓
xml-namespaces	Comma-separated list of namespace prefixes and their URI	xaf=http://www.audit-files.nl/XAF/3.2	✓	✓	✓

Generated 11-01-2019 19:54 on version 17.30.0-PROD+1821.

### 5.2.72 Provider Xas70: XML Auditfile Salaris version 7.0.

XML Auditfile Salaris version 7.0.

Code for use in settings.xml: Xas70

Alias: xas

Status: Production

Available in Editions: Paid

Technical Documentation:

[https://www.oswo.nl/pluginfile.php/13189/mod\\_folder/content/0/AuditfileFinancieelVersie1.0.zip](https://www.oswo.nl/pluginfile.php/13189/mod_folder/content/0/AuditfileFinancieelVersie1.0.zip)

Non-technical Documentation:

[https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile\\_financieel.php?bronw=6](https://www.softwarepakket.nl/swpakketten/auditfiles/auditfile_financieel.php?bronw=6)

## Provider Attributes

The following provider attributes are available for Xas70:

Code	Description	Default Value	Set from Connection String	Set from Set SQL-Statement	Set from Providers File
force-case-sensitive-identifiers	Consider identifiers as case-sensitive independent of the platform capabilities.	False	✓	✓	✓
forced-casing-identifiers	Forced casing of identifiers. Choose from Unset, Lower, Upper and Mixed.		✓	✓	✓
invantive-sql-forward-filters-to-data-containers	Whether to forward filters to data containers.	True	✓	✓	✓
invantive-sql-shuffle-fetch-results-data-containers	Whether to shuffle results fetched from data containers.	False	✓	✓	✓
invantive-use-cache	Whether to cache the results of a query.	True	✓	✓	✓
maximum-length-identifiers	Non-default maximum length in characters of identifier names.		✓	✓	✓
pre-request-delay-ms	Pre-request delay in milliseconds per request.	0	✓	✓	✓
requests-parallel-max	Maximum number of parallel data requests from individual partitions on the data container.	32	✓	✓	✓
result-set-cache	Action: provide 'empty' to empty.			✓	
slot-based-rate-limit-length-ms	Length in ms of a slot-based rate limit.	60000	✓		✓
slot-based-rate-limit-slots	Number of slots of a slot-based rate limit. Null means no slot-based rate limit		✓		✓
standardize-identifiers	Rewrite all identifiers to the preferred standards as configured by standardize-identifiers-casing and maximum-length-identifiers.	True	✓	✓	✓
standardize-identifiers-casing	Rewrite all identifiers to the recommended standard platform-specific casing when changing a data model on a case-dependent platform.	True	✓	✓	✓
trace-native-calls	Trace native calls to data container backend.	False	✓	✓	✓
use-metadata-cache	Whether to use the metadata calculated previously Has only practical use during development on a XML provider.	True	✓	✓	✓
use-result-cache	Whether to use result sets from previous queries that can answer the current query	True	✓	✓	✓
xml-directories	{res:itgen_provider_attribute_xml_directories_description}		✓	✓	✓
xml-extension	{res:itgen_provider_attribute_xml_extension_description}	*.xas	✓	✓	✓
xml-namespaces	Comma-separated list of namespace prefixes and their URI	xas=http://www.audit-files.nl/XAS/7	✓	✓	✓

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## 5.2.73 Providers

The providers described here are available on all platforms.

## 5.3 Configuration

### 5.3.1 Network

The list of available databases is maintained in so-called 'settings.xml' files. These file names all start with 'settings' and end with '.xml'.

## Interactive and OS-Applications

A default file 'settings.xml' is placed in the user's home directory folder 'Invantive' during discovery of databases in interactive or OS-applications. Additional settings files may be placed in this folder too.

## Web Applications

For web applications, the folder App\_Data/Config must contain the settings.xml files. Additional settings files may be placed in this folder too.

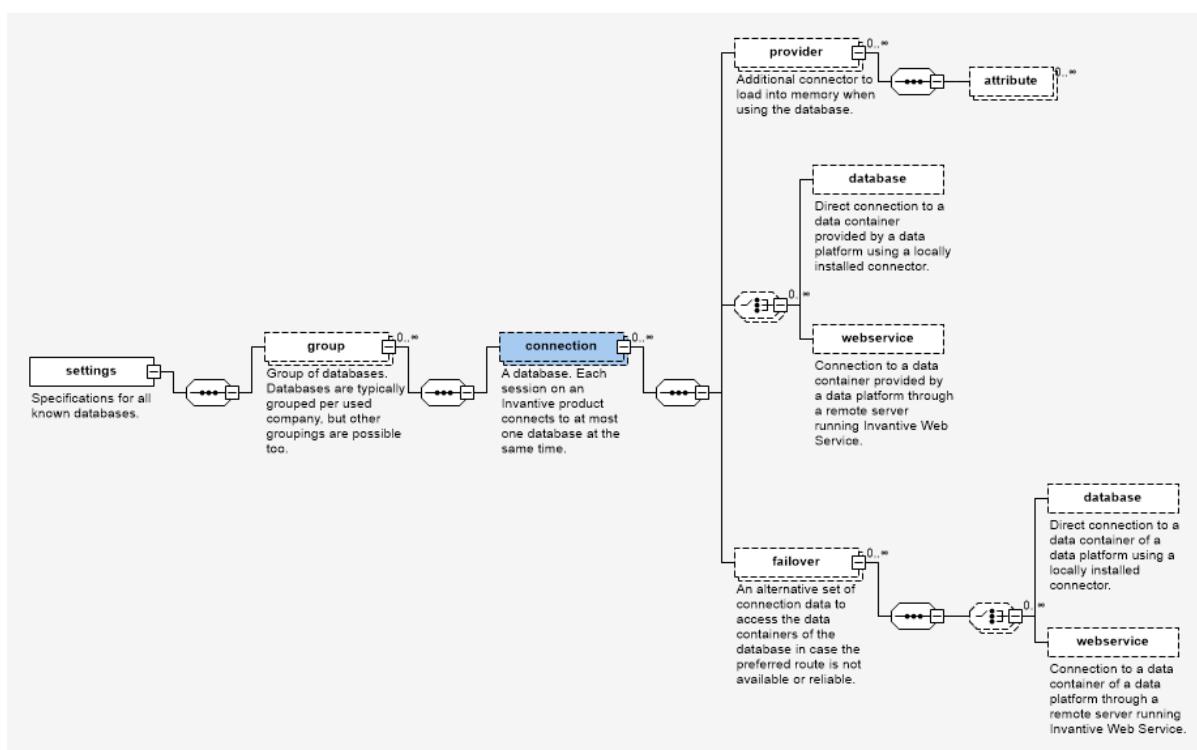
## Additional Locations

Using the environment variable INVANTIVE\_SETTINGS\_FILE\_PATH, you can specify a different file name and path for the default settings.xml file.

Settings.xml is not searched for at other locations.

## Structure

The settings files all have the following structure in XML format; The full specification is available in [xsd format](#) and [online](#).



### 5.3.2 License

The license key controls the availability of functionality, providers and limits of your Invantive products. A license key is associated with a license contract. A license contract has a unique code consisting of a 'L' plus a number. Each license contract can have multiple license keys.

License keys are automatically revoked when they have not been used for three months.

When a license contract concerns a subscription, the contract is automatically ended when it has not been used for three months.

## Interactive and OS-Applications

For interactive and OS-applications, a file named 'invantive.lic' is searched within the user's home directory folder 'Invantive'. The license key for use of Invantive products is normally stored within the product's configuration files after loading it through the user interface of the product.

## Web Applications

For web applications, a file named 'invantive.lic' is searched within the folder 'App\_Data\Config'.

## Additional Locations

Using the environment variable INVANTIVE\_LICENSE\_FILE\_PATH, you can specify a deviating location for the default license file 'invantive.lic'.

### 5.3.3 Logging

#### 5.3.3.1 Trace

During use of the products, a continuous stream of relevant trace messages is being sent to the trace listeners. On Microsoft Windows, you can use the Microsoft program 'dbgview.exe' to see the trace messages.

Trace options are only available when the environment variable 'INVANTIVE\_TRACE\_ACTIVE' is set to any non-empty value.

The trace messages are also stored in trace files when the environment variable 'INVANTIVE\_TRACE\_TO\_FILE' is set to 'true'.

The trace messages are also sent to the stderr when the environment variable 'INVANTIVE\_TRACE\_STDERR' is set to 'true'.

PSQL compilation is also logged when additionally the environment variable 'INVANTIVE\_TRACE\_PSQL' is set to 'true'.

The default location of the trace files is the folder for temporary files on interactive and OS-applications. The default location for web applications is 'App\_Data\Trace'. An alternative folder for trace files can be specified by setting the environment variable 'INVANTIVE\_TRACE\_FOLDER'.

The default number of seconds after which trace files in the trace folder structure are purged is 7 days. This can be altered by setting the environment variable

'INVANTIVE\_TRACE\_DELETE\_AGE\_SEC'. Only files in the configured trace folder are studied for purge; when the trace folder location is changed the software does not study files in the previous locations.

A limited amount of information is sent to the trace when an error occurs. The call stack and the natural key can be sent to trace by setting the environment variable 'INVANTIVE\_TRACE\_OWN\_EXCEPTION\_DETAILS' to 'true'.

## Log to Amazon CloudWatch

The trace can be logged to Amazon CloudWatch by configuring the following environment variables:

- INVANTIVE\_TRACE\_TO\_CLOUDWATCH: change to True to activate logging to CloudWatch
- INVANTIVE\_TRACE\_CLOUDWATCH\_ACCESS\_KEY: the access key as generated on Amazon.
- INVANTIVE\_TRACE\_CLOUDWATCH\_SECRET\_KEY: the corresponding secret key.
- INVANTIVE\_TRACE\_CLOUDWATCH\_REGION: the geographical region to log the messages.
- INVANTIVE\_TRACE\_CLOUDWATCH\_GROUP: the log group to use for logging.

The identity associated with the access key must allow logging to CloudWatch.

Amazon CloudWatch logging is rate limited. Messages may not be logged during periods of intensive activity.

The log format is JSON-based as shown:

CloudWatch > CloudWatch Logs > Log groups > invantive/trace >

Switch to the original interface.

Invantive.Producer.QueryTool 20.1.267-BETA+1812 - 2020/11/05T19.23.39 - ws212\gle3-135688

Log events			<input type="checkbox"/> View as text	<input type="button" value="C"/>	Actions ▾	<input type="button" value="Create Metric Filter"/>			
		Filter events	<input type="button" value="Clear"/>	1m	30m	1h	12h	Custom	<input type="checkbox"/>
	▶   Timestamp	Message							
There are older events to load. <a href="#">Load more</a> .									
▼	2020-11-05T19:23:47.761+01:00	{"Message": "The use of the database \u0027EZ-base\u0027 is licensed.", "MessageCode": null, "Occurred": "2020-11-05T18:23:47.7618813Z", "ThreadId": "...", "Message": "The use of the database 'EZ-base' is licensed.", "MessageCode": null, "Occurred": "2020-11-05T18:23:47.7618813Z", "ThreadId": "1", "SessionId": "PROP-1suselicensed-52baef5d2-4962-453b-b5af-d7498ee4c0db", "PoolIdentityId": null, "CallingProviderAlias": null}							
▶	2020-11-05T19:23:47.761+01:00	{"Message": "Select licensed and allowed databases in the group \u0027Business Apps\u0027 with label \u0027Business Apps\u0027.", "MessageCode": null, "Occurred": "2020-11-05T18:23:47.7618813Z", "ThreadId": "...", "Message": "Select licensed and allowed databases in the group 'Business Apps' with label 'Business Apps'.", "MessageCode": null, "Occurred": "2020-11-05T18:23:47.7618813Z", "ThreadId": "...", "SessionId": "PROP-1suselicensed-52baef5d2-4962-453b-b5af-d7498ee4c0db", "PoolIdentityId": null, "CallingProviderAlias": null}							
▶	2020-11-05T19:23:47.784+01:00	{"Message": "The use of the database \u0027XAA 3.0\u0027 is licensed.", "MessageCode": null, "Occurred": "2020-11-05T18:23:47.7848821Z", "ThreadId": "...", "Message": "The use of the database 'XAA 3.0' is licensed.", "MessageCode": null, "Occurred": "2020-11-05T18:23:47.7848821Z", "ThreadId": "...", "SessionId": "PROP-1suselicensed-52baef5d2-4962-453b-b5af-d7498ee4c0db", "PoolIdentityId": null, "CallingProviderAlias": null}							
▶	2020-11-05T19:23:47.784+01:00	{"Message": "Select licensed and allowed databases in the group \u0027XML Audit Files\u0027 with label \u0027XML Audit Files\u0027.", "MessageCode": null, "Occurred": "2020-11-05T18:23:47.7848821Z", "ThreadId": "...", "Message": "Select licensed and allowed databases in the group 'XML Audit Files' with label 'XML Audit Files'.", "MessageCode": null, "Occurred": "2020-11-05T18:23:47.7848821Z", "ThreadId": "...", "SessionId": "PROP-1suselicensed-52baef5d2-4962-453b-b5af-d7498ee4c0db", "PoolIdentityId": null, "CallingProviderAlias": null}							

## Microsoft Power BI

When used in combination with Microsoft Power BI, please note that Power BI tries to disable all trace logging by third party drivers. Invantive UniversalSQL has limited tracing available through Power BI. To activate: in Power BI go to 'Options and Settings', then 'Options' and choose 'Diagnostics' in the Global group. Place a checkmark next to 'Enable tracing'. This setting will remain effective till you restart Microsoft Power BI.

## Direct Trace

Trace messages generated by Invantive can also be logged to file outside the Microsoft .NET trace mechanism. This is called "direct trace".

The advantages of direct trace are:

- Direct trace starts very early in program execution, even before the normal trace mechanism is activated. It therefore allows analysis of start-up problems.
- Direct trace works independent of the normal trace mechanism. It is therefore available even when the environment manages Microsoft .NET trace, such as with Power BI.

The disadvantages of direct trace are:

- The use of direct trace reduces performance significantly. Therefore only enable direct trace when needed.

To activate direct trace, please set the environment variable 'INVANTIVE\_DIRECT\_TRACE\_FILE\_PATH' to the file path of the intended log file.

It is recommended to include the placeholder '{PID}' in the file name when you expect to run multiple OS-processes with direct trace.

A commonly used setting for INVANTIVE\_DIRECT\_TRACE\_FILE\_PATH is c:\temp\invantive-direct-trace-{PID}.log.

## Mac OSX and Linux

Set the environment variable COMPlus\_DebugWriteToStdErr to write trace messages to the console of Microsoft .NET Core applications:

```
export COMPlus_DebugWriteToStdErr=1
```

Note that the Microsoft .NET Core implementation on Mac OSX and Linux are restrained in the default stack size. On StackOverflowException such as with Exact Online, please increase stacksize first using:

```
export COMPlus_DefaultStackSize=10000000
```

### 5.3.3.2 Execution Log

Every completed execution of an Invantive product appends an entry to the local execution log. The execution log is in XML-format and located by default at %USERPROFILE%\executionlog.xml.

The name and location of the execution log can be altered by placing the full path and file name in the environment variable INVANTIVE\_EXECUTION\_LOG\_FILE.

The root tag `EXECUTIONLOGS` contains an `EXECUTIONLOG` for every execution once finished. The following elements are available:

- VERSION: the record format, always '1'.
- MESSAGEUID: the UID of the message as registered on Invantive Cloud.
- IID: the Invantive Installation ID of the device.
- SESSIONID: the ID of the session.
- LICENSECODE: the code of the subscription contract.
- LICENSEKEYID: the numeric ID of the license key.
- MACHINENAME: the name of the device.
- EXECUTABLENAME: the name and path of the executable.
- APPLICATIONNAME: the name of the Invantive application.
- APPLICATIONVERSION: the version of the Invantive application.
- USERNAME: the name of the operating system user.

- PROCESSID: the ID of the OS process.
- STARTTIMEUTC: the start time of the process (UTC).
- ENDTIMEUTC: the end time of the process (UTC).
- EXITCODE: the exit code of the process.
- EXITLEVEL: the textual description of the exit code.
- EXITMESSAGECODE: the message code associated with the execution exit.
- ISHEADLESS: whether the process ran headless.
- COMPUTERMANUFACTURER: the name of the device's manufacturer.
- COMPUTERMODEL: the model of the device.
- OSVERSION: the version of the operating system.
- PHYSICALMEMORYINBYTES: the number of bytes in the physical memory.

#### 5.3.4 Debugging

Invantive software products contain a number of features to aid analysis of problems.

##### 5.3.4.1 Translations

During use of the products, the user interface is adapted to the user interface language based upon the environment.

The translation involves replacing so-called "resource codes" by their translation.

The translation can be disabled by setting the environment variable 'INVANTIVE\_NO\_TRANSLATE' to a non-empty value.

## 6 Invantive SQL for Windows

The Windows-specific features of Invantive SQL are documented in this section.

### 6.1 Internal Consistency Checks

Invantive SQL executes many internal consistency checks to ensure correctness of the results. Some of these consistency checks are only done during testing phases for reasons such as performance. These checks are automatically checked on testing environments and excluded on production environments.

However, during test or production use you can explicitly disable or enable these checks by setting environment variables to the value 'true' or 'false'. The checks can individually be disabled or enabled, or all together.

To explicitly enable all consistency checks, set the environment variable `INVANTIVE_CHECK_ALL` to true. To explicitly disable all consistency checks, set the environment variable `INVANTIVE_CHECK_ALL` to false.

First determine with help of support the message code to explicitly enable or disable a consistency check. Then set the environment variable `INVANTIVE_CHECK_<message_code>` to the correct value.

## 6.2 OS Upgrade Checks

Invantive SQL executes many internal consistency checks to ensure correctness of the results. A check is made that the device is patched with recent updates upon start on Windows platforms. This check ensures that known security risks will have been fixed within months or else Invantive SQL will not run.

However, for some enterprise environments it can be necessary to explicitly disable or enable these checks by setting environment variables to the value 'true' or 'false'.

To explicitly enable all OS upgrade checks, set the environment variable `INVANTIVE_CHECK_OS_UPGRADES` to true. To explicitly disable it, set the environment variable `INVANTIVE_CHECK_OS_UPGRADES` to false.

The default setting used when no deviating value is configured is true.

## 7 Contact Information

Invantive® BV is distributor of software solutions owned by Invantive® Software BV.

### Location Harderwijk

Biesteweg 11  
3849 RD Hierden  
the Netherlands

Sales: +31 88 00 26 500  
E-mail: [info@invantive.com](mailto:info@invantive.com)  
Web: <https://invantive.com>

Chamber of Commerce: 13031406  
Managing Director: Guido Leenders  
Company domiciled in Roermond (NL).  
Bank: NL25 BUNQ 2098 2586 07, BIC BUNQNL2A  
VAT: NL812602377B01

Founded: 1992  
2012 NAICS: 511210

### Support

Forums: <https://forums.invantive.com>  
Customer Portal: <https://cloud.invantive.com>  
Finance: [finance@invantive.com](mailto:finance@invantive.com)  
Sales: [sales@invantive.com](mailto:sales@invantive.com)  
Opening hours: 9:00 - 17:00 CET Monday to Friday excluding Dutch holidays

[Privacy Policy](#)

### Security incidents

Security incidents: +31 88 00 26 598  
Email: [security@invantive.com](mailto:security@invantive.com)  
Opening hours: 9:00 - 17:00 CET Monday to Friday

Always include your telephone number, your e-mail address and a short description. Please do not give sensitive details until a secure communication channel has been established.

For urgent security incidents please send both an email outside of opening hours and call with number display on. You will be called back as soon as possible.

We use the [threat matrix](#) of NCSC to classify a reported incident. We use the [Responsible Disclosure Guideline](#) of NCSC as basis for our policy.

You will always receive a confirmation of receipt within 1 working day.

We ask you not to share information about the security incident with others until Invantive has had sufficient opportunity to resolve the problem and users have had sufficient opportunity to use a possibly updated version of the software. We ask you to not further use any knowledge of the security incident and to omit any actions made possible after the existence of the security problem.

If you are not satisfied with the handling, we would like to ask you to contact the NCSC.

Published: 06 November 2023

# Index

## - A -

Abs 15  
 Acos 15  
 Add\_months 15  
 ADO.NET provider 1  
 Alias 221  
 All 15  
 AllowConnectionPooling 221  
 AllowConnectionStringRewrite 221  
 Alter 15  
 Amazon 222  
 And 15  
 Anonymize 15  
 api-client-id 125, 135, 191, 196, 200  
 api-client-secret 125, 135, 191, 196, 200  
 api-group-authentication 200  
 api-redirect-url 125, 135, 191, 196, 200  
 api-refresh-token 125, 135, 191, 196, 200  
 api-scope 200  
 api-token-url 125, 200  
 api-url 106, 121, 125, 135, 138, 150, 152, 168, 170, 178, 180, 182, 188, 191, 196, 200, 211, 213  
 App\_Data/Config 221  
 App\_DataTrace 222  
 application-prefix-facts 113  
 application-prefix-history 113  
 application-prefix-repository 113  
 Approach 15  
 Are 15  
 As 15  
 Asc 15  
 Ascii 15  
 Asin 15  
 Atan 15  
 Atan2 15  
 atom 106  
 Atom10 106  
 Attach 15  
 Attach to 15  
 authentication-key 196  
 AuthenticationMode 221  
 Auto 15  
 autotask 106  
 Avg 15  
 AWS 222

## - B -

backing-bulk-insert-page-size-bytes 113  
 backing-bulk-insert-page-size-rows 113  
 backing-bulk-insert-timeout-sec 113  
 backing-command-timeout-sec 113  
 backing-connection-string 113  
 backing-force-case-sensitive-identifiers 113  
 backing-forced-casing-identifiers 113  
 backing-maximum-length-identifiers 113  
 backing-maximum-number-of-pooled-connections 113  
 backing-maximum-sleep-acquire-pooled-connection-ms 113  
 backing-maximum-sleep-acquire-unpooled-connection-ms 113  
 backing-minimum-connection-timeout-sec 113  
 backing-preferred-number-of-pooled-connections 113  
 backing-provider 113  
 backing-sql-server-connect-retry-count 113  
 backing-sql-server-connect-retry-interval-sec 113  
 backing-standardize-identifiers 113  
 backing-standardize-identifiers-casing 113  
 Bank 226  
 Base64\_decode 15  
 Base64\_encode 15  
 Batch 8  
 Begin 15  
 Begin transaction 15  
 beta-compress-facts-on-disk 113  
 beta-encrypt-facts-on-disk 113  
 beta-store-facts-in-database 113  
 beta-store-facts-on-disk 113  
 beta-use-facts-in-database 113  
 beta-use-facts-on-disk 113  
 Between 15  
 Bfile 15  
 Bigint 15  
 Bigserial 15  
 Billing 9  
 Bit 15  
 Bit\_length 15  
 Blob 15  
 Bool 15  
 Boolean 15  
 Bpchar 15  
 Bulk 15  
 bulk-delete-page-size-rows 113, 118, 125, 154, 164, 170, 200

bulk-insert-page-size-bytes 113, 118, 125, 154, 164, 170, 200  
 bulk-insert-page-size-rows 113, 118, 125, 154, 164  
 bulk-insert-timeout-sec 195  
 By 15  
 Byte 15  
 Bytea 15

## - C -

cache 15, 113  
 cache-folder 113  
 Camel 15  
 Case 15  
 cbsnl 106  
 Ceil 15  
 Chamber of commerce 226  
 Char 15  
 Character 15  
 Chr 15  
 Class 221  
 Client ID 5  
 Clob 15  
 CloudWatch 222  
 Coalesce 15  
 Code 15  
 Column 15  
 Columns 15  
 command-timeout-sec 166, 184, 187, 195

Comment 15, 221  
 Commit 15  
 company 138  
 Compatibility 13  
 COMPlus\_DebugWriteToStdErr 222  
 COMPlus\_DefaultStackSize 222  
 Compress 15  
 Compression 221  
 Concat 15  
 Concatenate 15  
 Connection string 5, 8  
 Connectionstring 221  
 connection-string 118  
 connection-string-async-add 195  
 connection-string-async-value 195  
 connection-string-multiple-active-result-sets-add  
 connection-string-multiple-active-result-sets-value  
 195  
 connection-string-self-tuning-add 184  
 connection-string-self-tuning-value 184  
 connection-string-statement-cache-size-add 184

connection-string-statement-cache-size-value 184  
 Connector 221  
 Consistency 225

Contact information 226  
 Contract 15

conversion 108  
 Copy 15  
 Cos 15

Count 15

Covfify 15  
 Create 15

CreatedBy 221  
 CreatedOn 221

CreationDate 221

Cross 15

Cryptography 10  
 Csvtable 15

Custom connector 1, 4  
 Customer portal 226

Customer Service 9

## - D -

Data 15  
 Data Cache 113  
 Data container 13, 221  
 Data Dictionary 118  
 Data extension 1  
 Database 8, 13, 187, 221  
 DataCache 113  
 DataCacheConnectionString 221  
 DataDictionary 13, 118  
 DataDictionaryConnectionString 221

Date\_trunc 15

Dateadd 15

Datepart 15

Datetime 15

Datetimeoffset 15

Day 15

Dayofweek 15

Dayofyear 15

db2 142

dd 118

Debug 225

Dec 15

Decimal 15

Declare 15

Default 15, 221

DefaultPassword 221

default-skip-client-side-cacheable 113

default-use-ods 113

DefaultUserLogonCode 221  
 Delete 15  
 delete-number-table-partition-versions-per-group 125, 200  
 Dense\_rank 15  
 Desc 15  
 Description 221  
 development-use-http-disk-cache 113  
 Direct trace 222  
 directories 199  
 Distinct 15  
 Distributed SQL 13  
 docc 121  
 DocumentCloud 121  
 Double 15  
 Double\_metaphone 15  
 Double\_metaphone\_alt 15  
 Download 15  
 download-error-400-bad-request-max-tries 125, 200  
 download-error-400-bad-request-sleep-initial-ms 125, 200  
 download-error-400-bad-request-sleep-max-ms 125, 200  
 download-error-400-bad-request-sleep-multiplicator 125, 200  
 download-error-422-bad-request-max-tries 200  
 download-error-422-bad-request-sleep-initial-ms 200  
 download-error-422-bad-request-sleep-max-ms 200  
 download-error-422-bad-request-sleep-multiplicator 200  
 download-error-429-too-many-requests-max-tries 125, 200  
 download-error-429-too-many-requests-sleep-initial-ms 125, 200  
 download-error-429-too-many-requests-sleep-max-ms 125, 200  
 download-error-429-too-many-requests-sleep-multiplicator 125, 200  
 download-error-502-server-unavailable-max-tries 200  
 download-error-502-server-unavailable-sleep-initial-ms 200  
 download-error-502-server-unavailable-sleep-max-ms 200  
 download-error-502-server-unavailable-sleep-multiplicat or 200  
 download-error-503-server-unavailable-max-tries 125, 200  
 download-error-503-server-unavailable-sleep-initial-ms 125, 200  
 download-error-503-server-unavailable-sleep-max-ms 125, 200  
 download-error-503-server-unavailable-sleep-multiplicat or 125, 200  
 download-error-504-gateway-timeout-max-tries 125, 200  
 download-error-504-gateway-sleep-initial-ms 125, 200  
 download-error-504-gateway-timeout-sleep-max-ms 125, 200  
 download-error-504-gateway-timeout-sleep-multiplicato r 125, 200  
 download-error-argument-exception-max-tries 125, 200  
 download-error-argument-exception-sleep-initial-ms 125, 200  
 download-error-argument-exception-sleep-max-ms 125, 200  
 download-error-argument-exception-sleep-multiplicator 125, 200  
 download-error-internet-down-max-tries 106, 121, 125, 135, 138, 150, 152, 168, 178, 180, 182, 188, 191, 196, 200, 213  
 download-error-internet-down-sleep-initial-ms 106, 121, 125, 135, 138, 150, 152, 168, 178, 180, 182, 188, 191, 196, 200, 213  
 download-error-internet-down-sleep-max-ms 106, 121, 125, 135, 138, 150, 152, 168, 178, 180, 182, 188, 191, 196, 200, 213  
 download-error-internet-down-sleep-multiplicator 106, 121, 125, 135, 138, 150, 152, 168, 178, 180, 182, 188, 191, 196, 200, 213  
 download-error-io-exception-max-tries 125, 200  
 download-error-io-exception-sleep-initial-ms 125, 200  
 download-error-io-exception-sleep-max-ms 125, 200  
 download-error-io-exception-sleep-multiplicator 125, 200  
 download-error-json-exception-max-tries 125, 200  
 download-error-json-exception-sleep-initial-ms 125, 200  
 download-error-json-exception-sleep-max-ms 125, 200  
 download-error-json-exception-sleep-multiplicator 125, 200  
 download-error-other-exception-max-tries 125, 200  
 download-error-other-exception-sleep-initial-ms 125, 200  
 download-error-other-exception-sleep-max-ms 125, 200  
 download-error-other-exception-sleep-multiplicator 125, 200  
 download-error-socket-exception-max-tries 125, 200  
 download-error-socket-exception-sleep-initial-ms 125, 200  
 download-error-socket-exception-sleep-max-ms 125, 200  
 download-error-socket-exception-sleep-multiplicator 125, 200

download-error-web-exception-max-tries 125, 200  
 download-error-web-exception-sleep-initial-ms 125  
 200  
 download-error-web-exception-sleep-max-ms 125  
 200  
 download-error-web-exception-sleep-multiplicator 125, 200  
 download-error-web-not-implemented-max-tries 125  
 200  
 download-error-web-not-implemented-sleep-initial-ms 125, 200  
 download-error-web-not-implemented-sleep-max-ms 125, 200  
 download-error-web-not-implemented-sleep-multiplicator or 125, 200  
 download-error-web-timeout-max-tries 125, 200  
 download-error-web-timeout-sleep-initial-ms 125, 200  
 download-error-web-timeout-sleep-max-ms 125, 200  
 download-error-web-timeout-sleep-multiplicator 125, 200  
 download-error-web-unauthorized-max-tries 125, 200  
 download-error-web-unauthorized-sleep-initial-ms 125, 200  
 download-error-web-unauthorized-sleep-max-ms 125, 200  
 download-error-web-unauthorized-sleep-multiplicator 125, 200  
 Drop 15  
 drop-backlog-factor 113  
 dropbox 122  
 Droppable 15  
 Dropped 15  
 dummy 123  
 DynamicsCrm 124  
 dyncrm 124

## - E -

EBNF-grammar 12  
 EcbExchangeRates 124  
 ecbexref 124  
 edi 124  
 edi-extension 124  
 Edifact 15, 124  
 edi-input-directories 124  
 edi-output-directory 124  
 Editability 221  
 Else 15  
 Elsif 15  
 Email 226

## - F -

facebook 135  
 facts-delete-page-size-characters 113  
 facts-delete-page-size-rows 113  
 facts-insert-page-size-rows 113  
 Failover 221  
 False 15  
 Feed 15  
 File 221  
 Float 15  
 Float4 15  
 Float8 15  
 Floor 15  
 Folder 11  
 For 15  
 Force 15  
 force-case-sensitive-identifiers 106, 113, 118, 121, 123, 124, 125, 134, 135, 138, 140, 150, 152, 154, 162, 164, 166, 168, 170, 178, 180, 182, 184, 185, 187, 188, 190, 191, 195, 196, 199, 200, 211, 213, 215, 218, 219  
 force-custom-field-to-string 200

forced-casing-identifiers 106, 113, 118, 121, 123, http-disk-cache-directory 106, 118, 121, 125, 135, 124, 125, 134, 135, 138, 140, 150, 152, 154, 162, 1638, 150, 152, 162, 168, 170, 178, 180, 182, 188, 191, 166, 168, 170, 178, 180, 182, 184, 185, 187, 188, 1906, 200, 211, 213  
 forced-casing-logical-view-column-name 113  
 forced-casing-logical-view-name 113  
 ForceDefault 221  
 Forwarded 15  
 forwarded-incoming-messages-delete-max-runtime-set 113  
 forwarded-incoming-messages-delete-page-size-rows 152, 162, 168, 170, 178, 180, 182, 188, 191, 196, 200, 113  
 Free 12  
 Fresh 15  
 freshdesk 138  
 From 15  
 From\_unixtime 15  
 frontenduser 11  
 FTP 140  
 Full 15

**- G -**

GAC 1  
 garbage-collection-physical-memory-load-threshold 113  
 garbage-collection-replication-interval-count 113  
 garbage-collection-replication-minimum-interval-sec 113  
 Getdate 15  
 Getutcdate 15  
 GitLab 142  
 gitlab.com 7  
 Grammar 12  
 graph 166  
 Group 15, 221  
 Group function 14  
 Guid 15

**- H -**

Harderwijk 226  
 hide-empty-columns 125  
 Hint 15  
 Hour 15  
 Http\_disk\_cache 15  
 Http\_memory\_cache 15  
 http-disk-cache 125  
 http-disk-cache-compression-level 106, 118, 121, 125, 135, 138, 150, 152, 162, 168, 170, 178, 180, 188, 191, 196, 200, 211, 213

**- I -**

IBM2Udb 142  
 IconResourceName16 221  
 IconResourceName32 221  
 Identified 15  
 Identified by 15  
 Identifier 13, 15  
 If 15  
 ignore-document-download-errors 125  
 ignore-http-400-errors 106, 121, 125, 135, 138, 150, 152, 168, 178, 180, 182, 188, 191, 196, 200, 213  
 ignore-http-401-errors 200  
 ignore-http-403-errors 106, 121, 125, 135, 138, 150, 152, 168, 178, 180, 182, 188, 191, 196, 200, 213  
 ignore-http-404-errors 200  
 ignore-http-422-errors 200  
 ignore-http-429-errors 125, 191, 200  
 ignore-http-500-errors 125, 200  
 ignore-http-502-errors 200  
 ignore-xml-errors 125  
 ignore-xml-fatal-errors 125  
 ignore-xml-no-access-errors 125  
 ignore-xml-warnings 125  
 iid 11  
 Image 15  
 immediate 15  
 In 15  
 Incoming 15

Initcap 15  
 inmem 142  
 InMemoryStorage 142  
 Inner 15  
 Insert 15  
 insert-allowed 125  
 Instr 15  
 Int 15  
 Int16 15  
 Int2 15  
 Int32 15  
 Int4 15  
 Int64 15  
 Int8 15  
 Integer 15  
 Intersect 15  
 Interval 15  
 Into 15  
 invalid-json-on-get-max-tries 125, 200  
 invalid-json-on-get-sleep-initial-ms 125, 200  
 invalid-json-on-get-sleep-max-ms 125, 200  
 invalid-json-on-get-sleep-multiplicator 125, 200  
 invalid-json-on-post-max-tries 125, 200  
 invalid-json-on-post-sleep-initial-ms 125, 200  
 invalid-json-on-post-sleep-max-ms 125, 200  
 invalid-json-on-post-sleep-multiplicator 125, 200  
 Invantive BV 226  
 Invantive Software BV 226  
 invantive.lic 8, 221  
 Invantive.Producer 148  
 INVANTIVE\_ALLOWED\_LANGUAGE\_CODES 10222  
 INVANTIVE\_CHECK 225  
 INVANTIVE\_CHECK\_ALL 225  
 INVANTIVE\_CHECK\_OS\_UPDATES 9  
 INVANTIVE\_CHECK\_OS\_UPGRADES 226  
 INVANTIVE\_CHECK\_SYSTEM\_COMPATIBILITY 199, 200, 211, 213, 215, 218, 219  
 E\_FOLDER 11  
 INVANTIVE\_CONFIGURATION\_DATABASES\_FOLDER 106, 108, 113, 118, 121, 123, 124, 125, 134, 135, 138, 140, 142, 150, 152, 154, 156, 162, 164, 166, 168, 170, 172, 178, 180, 182, 184, 185, 187, 188, 190, 191, 195, 196, 199, 200, 211, 213, 215, 218, 219  
 INVANTIVE\_CONFIGURATION\_BACKUP\_FOLDER 11  
 INVANTIVE\_CONFIGURATION\_CACHE\_FOLDER 11  
 INVANTIVE\_CONFIGURATION\_HTTP\_CACHE\_FOLDER 11  
 INVANTIVE\_CONFIGURATION\_PROVIDERS\_FOLDER 11  
 INVANTIVE\_CONFIGURATION\_PLUGINS\_FOLDER 11  
 INVANTIVE\_CONFIGURATION\_LOG\_FOLDER 11  
 INVANTIVE\_CONFIGURATION\_FOLDERS 11  
 INVANTIVE\_CONFIGURATION\_RSA\_FOLDER 11  
 INVANTIVE\_CONFIGURATION\_TEMPLATES\_FOLDER 11  
 INVANTIVE\_CONFIGURATION\_TRACE\_FOLDER 11  
 INVANTIVE\_CRYPTOGRAPHY 10  
 INVANTIVE\_CS\_BASE\_URL 9  
 INVANTIVE\_DEFAULT\_THREAD\_POOL\_MIN\_ASYNC\_THREADS 12  
 INVANTIVE\_DEFAULT\_THREAD\_POOL\_MIN\_WORKER\_THREADS 12  
 INVANTIVE\_DIRECT\_TRACE\_FILE\_PATH 222  
 INVANTIVE\_EXECUTION\_LOG\_FILE 224  
 INVANTIVE\_FORCED\_OS 9  
 INVANTIVE\_I18N\_FOLDER 11  
 INVANTIVE\_LICENSE\_FILE\_PATH 5, 8, 221  
 INVANTIVE\_MAINTAIN\_VSTO 9  
 INVANTIVE\_MIN\_GB\_FREE\_SYSTEM 9  
 INVANTIVE\_NO\_TRANSLATE 225  
 INVANTIVE\_RSA 10  
 INVANTIVE\_SETTINGS\_FILE\_PATH 221  
 INVANTIVE\_TRACE\_ACTIVE 222  
 INVANTIVE\_TRACE\_CLOUDWATCH\_ACCESS\_KEY 222  
 INVANTIVE\_TRACE\_CLOUDWATCH\_GROUP 222  
 INVANTIVE\_TRACE\_CLOUDWATCH\_REGION 222  
 INVANTIVE\_TRACE\_CLOUDWATCH\_SECRET\_KEY 222  
 INVANTIVE\_TRACE\_DELETE\_AGE\_SEC 222  
 INVANTIVE\_TRACE\_FOLDER 222  
 INVANTIVE\_TRACE\_OWN\_EXCEPTION\_DETAILS 10222  
 'INVANTIVE\_TRACE\_PSQL 222  
 INVANTIVE\_TRACE\_STDERR 222  
 INVANTIVE\_TRACE\_TO\_CLOUDWATCH 222  
 INVANTIVE\_TRACE\_TO\_FILE 222  
 Invantive-sql-correct-invalid-date 118, 154, 164, 200  
 Invantive-sql-forward-filters-to-data-containers 106, 108, 113, 118, 121, 123, 124, 125, 134, 135, 138, 140, 142, 150, 152, 154, 156, 162, 164, 166, 168, 170, 172, 178, 180, 182, 184, 185, 187, 188, 190, 191, 195, 196, 199, 200, 211, 213, 215, 218, 219  
 invantive-sql-shuffle-fetch-results-data-containers 106, 108, 113, 118, 121, 123, 124, 125, 134, 135, 138, 140, 142, 150, 152, 154, 156, 162, 164, 166, 168, 170, 172, 178, 180, 182, 184, 185, 187, 188, 190, 191, 195, 196, 199, 200, 211, 213, 215, 218, 219  
 invantive-use-cache 106, 108, 113, 118, 121, 123, 124, 125, 134, 135, 138, 140, 142, 150, 152, 154, 156, 162, 164, 166, 168, 170, 172, 178, 180, 182, 184, 185, 187, 188, 190, 191, 195, 196, 199, 200, 211, 213, 215, 218, 219  
 INVANTIVE\_CONFIGURATION\_PROVIDERS\_FOLDER\_IS 15

**- J -**

jira 150  
 Join 15  
 Join\_set 15  
 join-set-points-per-request 106, 121, 125, 135, 138, 150, 152, 168, 178, 180, 182, 188, 191, 196, 200, 213  
 Jsondecode 15  
 Jsonencode 15  
 Jsontable 15

**- K -**

kadaster 152  
 KeePass 154

**- L -**

Label 15  
 Language 10  
 last 156  
 LastResort 156  
 Left 15  
 Length 15  
 Levenshtein 15  
 License 5, 10, 14, 15, 221  
 License contract 221  
 License key 221  
 License-file 5, 8  
 Like 15  
 Limit 15  
 limit-partition-calls-left 125, 200  
 Lines 15  
 linkedin 161  
 Linux 222  
 Listagg 15  
 Ln 15  
 Load 15  
 Locking 15  
 Log 15  
 log-directory 199  
 Logical 15  
 log-native-calls-to-disk 113, 118, 154, 164, 200  
 log-native-calls-to-trace 113, 118, 154, 164, 200  
 log-text 199  
 Loket.nl 162  
 LoketNL 162  
 Longblob 15  
 Longtext 15

Loop 15  
 Low\_cost 15  
 Lower 15  
 Lpad 15  
 Ltrim 15  
**M -**  
 Mac 222  
 magento 164  
 mail 164  
 mail-body-html 164  
 mail-from-email 164  
 mail-from-name 164  
 mail-priority 164  
 mail-reply-to-email 164  
 mail-reply-to-name 164  
 Maintain 15  
 Manual 221  
 Max 15  
 max-delete-facts-parallel 113  
 maximum-length-identifiers 106, 113, 118, 121, 123, 124, 125, 134, 135, 138, 140, 150, 152, 154, 162, 164, 166, 168, 170, 178, 180, 182, 184, 185, 187, 188, 190, 191, 195, 196, 199, 200, 211, 213, 215, 218, 219  
 maximum-length-logical-view-column-name 113  
 maximum-length-logical-view-name 113  
 maximum-number-of-pooled-connections 166, 184, 187, 195  
 maximum-sleep-acquire-pooled-connection-ms 166, 184, 187, 195  
 maximum-sleep-acquire-unpooled-connection-ms 166, 184, 187, 195  
 max-messages-per-customer-service-request 113  
 max-odata-filters 200  
 max-refreshes-parallel 113  
 max-url-length-accepted 113, 118, 125, 140, 154, 164, 170, 200  
 max-url-length-desired 113, 118, 125, 140, 154, 164, 170, 200  
 Md5 15  
 Mediumblob 15  
 Mediumint 15  
 Mediumtext 15  
 Mendix 166  
 Messages 15  
 Metadata 15  
 metadata-cache-max-age-sec 125, 200  
 Metaphone 15  
 Metaphone3 15  
 Metaphone3\_alt 15  
 Microsecond 15

Microsoft .net framework 6  
 Microsoft .net standard 6  
 Microsoft Power BI 1, 222  
 Microsoft Visual Studio 6  
 MicrosoftGraph 166  
 Millisecond 15  
 Min 15  
 minimum-length-text 170  
 Minus 15  
 Minute 15  
 Mod 15  
 Model 15  
 models 148  
 Money 15  
 Month 15  
 mssql 195  
 mt940rabo 199  
 My 15  
 mysql 166

## - N -

Name 15, 221  
 nasa 168  
 Nchar 15  
 NCSC 226  
 Network 221  
 Newid 15  
 NMBRS 170  
 NmbrsNI 170  
 No\_join\_set 15  
 Normalize 15  
 Not 15  
 Now 15  
 Nowutc 15  
 npgsql-log 187  
 NuGet 6  
 nuget.invantive.com 6  
 Null 15  
 Number 15  
 Number\_to\_speech 15  
 Numeric 15  
 Nvarchar 15  
 Nvl 15

## - O -

oauth 172  
 OAuth UI provider 172  
 Obsolete 15

Octet\_length 15  
 odbc 178  
 Ods 15  
 Oid 15  
 On 15  
 Once 15  
 Onconnect 8  
 openarch 178  
 OpenExchangeRates 180  
 openexra 180  
 Opening hours 226  
 OpenSpendingNI 182  
 Operating system 9  
 Or 15  
 oracle 184  
 OracleManaged 184  
 Order 15, 221  
 orphaned-facts-delete-page-size-rows 113  
 os 13, 185  
 osnl 182  
 osuser 11  
 Outer 15  
 Overall 15

**P**

Paid 12  
 Parallel 15  
 Partition 13, 15  
 partition-slot-based-rate-limit-length-ms 113, 118, 123, 125, 140, 154, 162, 164, 170, 191, 200  
 partition-slot-based-rate-limit-slots 113, 118, 123, 125, 140, 154, 162, 164, 170, 191, 200  
 Passing 15  
 PasswordHint 221  
 PasswordLabel 221  
 PasswordMode 221  
 Path 15  
 paypal 186  
 Persistent 15  
 pg 187  
 Pi 15  
 port 140  
 Postfix 15  
 PostgreSQL 187  
 Power 15  
 Power BI 1, 5, 222  
 preferred-number-of-pooled-connections 166, 184, 187, 195  
 Prefix 15  
 prefix-bind-variable-in-list 166, 184, 187, 195

prefix-bind-variable-normal 166, 184, 187, 195  
 prefix-renamed-columns 166, 184, 187, 195  
 pre-request-delay-ms 106, 108, 113, 118, 121, 123, 124, 125, 134, 135, 138, 140, 142, 150, 152, 154, 155, 156, 162, 164, 166, 168, 170, 172, 178, 180, 182, 184, 185, 187, 188, 190, 191, 195, 196, 199, 200, 211, 213, 215, 216, 218, 219  
 Privacy policy 226  
 Procedural SQL 14  
 producer 148  
 Product 15  
 Program.cs 7  
 Provider 8, 106, 118, 220, 221  
 Purge 15  
 purge-interval-event-log-entries-minutes 113  
 result-set-cache 125, 134, 162, 190, 211, 215, 218, 219  
 result-set-memory-cache 170  
 Retention 15  
 retention-event-log-entries-days 113  
 return-null-on-ora-22288 184  
 Reverse 15  
 Right 15  
 Rollback 15  
 Round 15  
 Route 226  
 Row 15  
 Row\_number 15  
 Rpad 15  
 rss 190  
 Rss20 190  
 Rtrim 15

**- Q -**

Quarter 15  
 Quote\_ident 15  
 Quote\_literal 15  
 Quote\_nullable 15

**- R -**

Raise\_error 15  
 Rand 15  
 Random 15  
 Random\_blob 15  
 Rank 15  
 Raw 15  
 rdwnl 188  
 Ready 15  
 Real 15  
 Recyclebin 15  
 Refresh 15  
 Regexp\_instr 15  
 Regexp\_replace 15  
 Regexp\_substr 15  
 Remainder 15  
 RemoteConnectionName 221  
 Repeat 15  
 Replace 15  
 requested-page-size 113, 118, 154, 164, 170, 200  
 requests-parallel-max 5, 106, 108, 113, 118, 121, 123, 124, 125, 134, 135, 138, 140, 142, 150, 152, 154, 156, 162, 164, 166, 168, 170, 172, 178, 180, 182, 184, 185, 187, 188, 190, 191, 195, 196, 199, 200, 211, 213, 215, 218, 219  
 Resource code 225  
 Result\_set\_name 15  
 Salesforce 191  
 Sample 15  
 scopes 200  
 Second 15  
 Security incident 226  
 Select 15  
 Serial 15  
 server 150  
 Service provider 13  
 sessionid 11  
 Set 15  
 Settings 221  
 Settings.xml 14, 221  
 Settings.xsd 221  
 severa 211  
 sf 191  
 sftp 194  
 ShortDescription 221  
 silver 194  
 SilverEssence 194  
 simulate-http-400-errors 125, 200  
 simulate-http-400-errors-percentage 125, 200  
 simulate-http-401-errors 200  
 simulate-http-401-errors-percentage 200  
 simulate-http-403-errors 125, 200  
 simulate-http-403-errors-percentage 125, 200  
 simulate-http-429-errors 125, 200  
 simulate-http-429-errors-percentage 125, 200  
 simulate-http-500-errors 125, 200  
 simulate-http-500-errors-percentage 125, 200  
 simulate-http-502-errors 200

**- S -**

simulate-http-502-errors-percentage 200  
 simulate-http-protocol-errors 125, 200  
 simulate-http-protocol-errors-percentage 125, 200  
 simulate-http-timeout-errors 125, 200  
 simulate-http-timeout-errors-percentage 125, 200  
 Sin 15  
 site 140  
 Skip\_ 15  
 Slack 194  
 slot-based-rate-limit-length-ms 106, 113, 118, 121  
 123, 124, 125, 134, 135, 138, 140, 150, 152, 154, 162,  
 164, 166, 168, 170, 178, 180, 182, 184, 185, 187, 188,  
 190, 191, 195, 196, 199, 200, 211, 213, 215, 218, 219 **T** -  
 slot-based-rate-limit-slots 106, 113, 118, 121, 123,  
 124, 125, 134, 135, 138, 140, 150, 152, 154, 162, 164, 166, 168, 170, 178, 180, 182, 184, 185, 187, 188, 190  
 191, 195, 196, 199, 200, 211, 213, 215, 218, 219 Tan 15  
 Smalldatetime 15  
 Smallint 15  
 Smallmoney 15  
 Smallserial 15  
 SMTP 13  
 smtp-enable-ssl 164  
 smtp-host-address 164  
 smtp-host-port-number 164  
 smtp-minimum-deliver-duration-ms 164  
 smtp-password 164  
 smtp-send-timeout-ms 164  
 smtp-user-name 164  
 Snelstart 194  
 socket-keep-alive 140  
 socket-poll-interval-sec 140  
 Solution 7  
 SortingOrder 221  
 Soundex 15  
 special-connection-type 140  
 SQL 12  
 SqlServer 195  
 SqlTrace 221  
 Sqrt 15  
 ssl-protocols 140  
 StackExchange 196  
 StackOverflowException 222  
 standardize-identifiers 106, 113, 118, 121, 123, 124  
 125, 134, 135, 138, 140, 150, 152, 154, 162, 164, 166  
 168, 170, 178, 180, 182, 184, 185, 187, 188, 190, 191  
 195, 196, 199, 200, 211, 213, 215, 218, 219 Token 15  
 standardize-identifiers-casing 106, 113, 118, 121  
 123, 124, 125, 134, 135, 138, 140, 150, 152, 154, 162  
 164, 166, 168, 170, 178, 180, 182, 184, 185, 187, 188  
 190, 191, 195, 196, 199, 200, 211, 213, 215, 218, 219 Top 15  
 trace-native-calls 106, 121, 123, 124, 125, 134,  
 135, 138, 140, 150, 152, 162, 166, 168, 170, 178, 180,  
 182, 184, 185, 187, 188, 190, 191, 195, 196, 199, 211,  
 213, 215, 218, 219 Transaction 15  
 Starred 221  
 Startup check 9

Translate 15, 225  
 Translate\_resources 15  
 translations 156  
 Trickle 15  
 Trim 15  
 True 15  
 Trunc 15

**- U -**

ubl20 210  
 ubl21 211  
 UInt16 15  
 UInt32 15  
 UInt64 15  
 Uncompress 15  
 Union 15  
 Uniqueidentifier 15  
 Unistr 15  
 Unix\_timestamp 15  
 Unknown 15  
 Unzip 15  
 Update 15  
 update-allowed 125  
 update-number-table-partition-versions-per-group 113  
 Upgrade 15  
 upgrade-force-execute 113  
 upgrade-force-repository-version-start 113  
 upgrade-force-specials 113  
 Upgrades 226  
 Upper 15  
 URL 221  
 Urldecode 15  
 Urlencode 15  
 Usage 9  
 Use 8, 13, 15  
 use-batch-insert 125, 200  
 use-binary 140

use-http-disk-cache 125  
 use-http-disk-cache-read 8, 106, 118, 121, 125, 135, 138, 150, 152, 162, 168, 170, 178, 180, 182, 188, 191, 196, 200, 211, 213  
 use-http-disk-cache-write 8, 106, 118, 121, 125, 135, 138, 150, 152, 162, 168, 170, 178, 180, 182, 188, 191, 196, 200, 211, 213  
 use-http-memory-cache 125  
 use-http-memory-cache-read 106, 121, 125, 135, 138, 150, 152, 162, 168, 170, 178, 180, 182, 188, 191, 196, 200, 211, 213

use-http-memory-cache-write 106, 121, 125, 135, 138, 150, 152, 162, 168, 170, 178, 180, 182, 188, 191, 196, 200, 211, 213  
 use-metadata-cache 125, 134, 162, 190, 211, 215, 218, 219  
 use-metadata-memory-cache 170  
 use-passive 140  
 User 15  
 User id 8  
 User interface language 10  
 use-result-cache 125, 134, 162, 190, 211, 215, 218, 219  
 use-result-memory-cache 170  
 UserLogonCodeHint 221  
 UserLogonCodeLabel 221  
 UserLogonCodeMode 221  
 use-ssl 140  
 use-test-environment 162  
 Utc 15  
 Utc\_date 15  
 Uuid 15

**- V -**

Values 15  
 Varbinary 15  
 Varchar 15  
 Varchar2 15  
 VAT 226  
 Version 15, 221  
 Versions 15  
 VersionUpdateDate 221  
 VersionUpdatedBy 221  
 VersionUpdatedOn 221  
 vies 211  
 View 15  
 virustotal 211  
 VismaSevera 211

**- W -**

Web Service 221  
 WebService 213  
 When 15  
 Where 15  
 While 15  
 Wikipedia 213  
 Windows 225  
 With 15  
 Within 15  
 wmi 215

ws 213

## - X -

xaa 215  
Xaa30 215  
Xaa31 215  
xaf 217, 218  
Xaf10 217  
Xaf30 217  
Xaf31 217  
Xaf32 218  
xas 219  
Xas70 219  
Xml 15  
Xmlcomment 15  
Xmldecode 15  
xml-directories 134, 190, 215, 218, 219  
XmlElement 15  
Xmlencode 15  
xml-extension 134, 190, 215, 218, 219  
Xmlformat 15  
xml-namespaces 134, 190, 215, 218, 219  
Xmltable 15  
Xmltransform 15  
Xmltype 15

## - Y -

Year 15

## - Z -

Zero\_blob 15  
Zip 15

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Auteurs: Jan van Engelen, Michiel de Brieder, Mathijs Terhaag, Tanja Middelkoop, Guido Leenders, Tatjana Daka.

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Invantive B.V.  
Biesteweg 11  
3849 RD Hierden  
the Netherlands

Tel: +31 88 00 26 500  
Fax: +31 84 22 58 178  
[info@invantive.com](mailto:info@invantive.com)  
[invantive.com](http://invantive.com)

IBAN NL25 BUNQ 2098 2586 07  
Chamber of Industry and Commerce  
13031406  
VAT NL812602377B01  
RSIN 8122602377  
Managing Director: Guido Leenders  
Registered office: Roermond