

White Paper

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OneConnect Technical Overview

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ONE CONNECT TECHNICAL OVERVIEW

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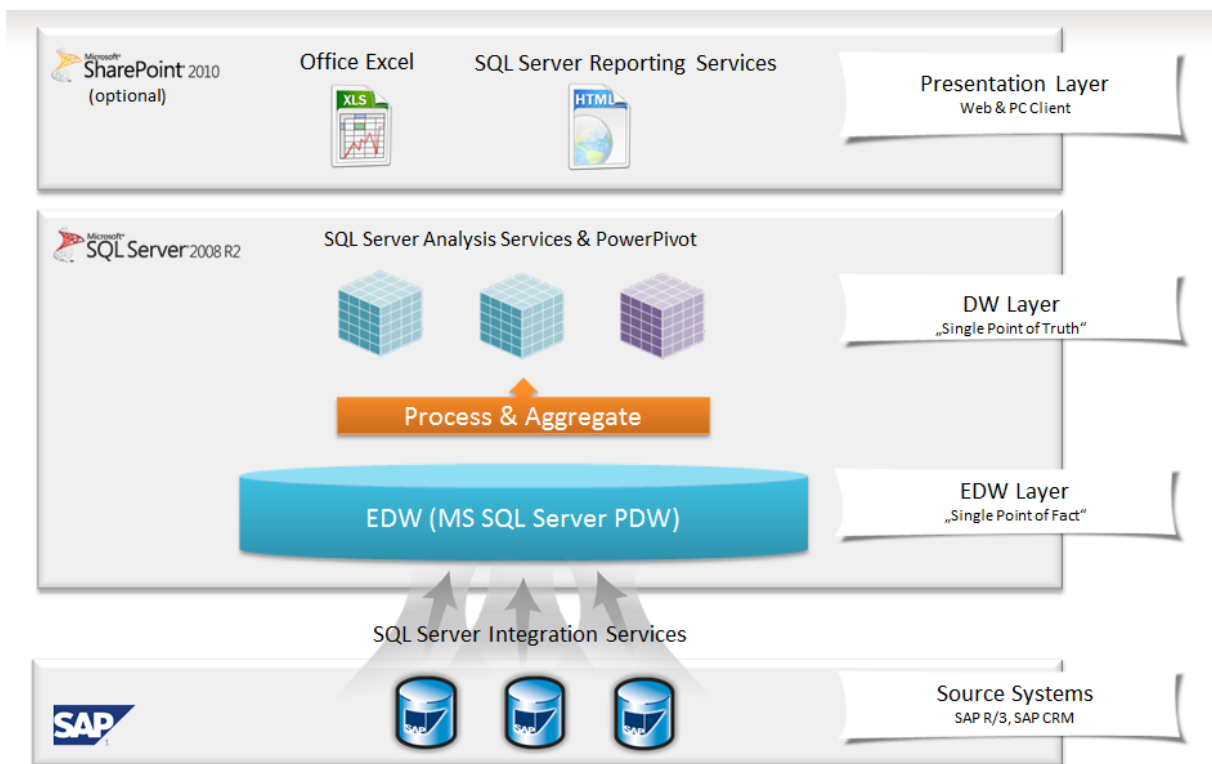
1. Overview

1.1 General

OneConnect is a sophisticated framework that addresses a common problem in data warehouse environments - efficient and reliable connectivity to source systems - especially SAP. The goal of OneConnect is twofold: first to reduce implementation effort and second to enhance the capabilities of the Microsoft SQL Server BI platform when it comes to designing and maintaining connectivity to source systems.

1.2 Architecture

The architecture OneConnect follows had been tested and proven in projects involving several different transactional data sources including SAP, Microsoft Dynamics NAV, Tagetik and others. The architecture includes a staging area, which serves as a single destination for data from the source systems. This initial step brings the data into a central SQL Server environment that acts as a single point of fact for the data warehouse environment.



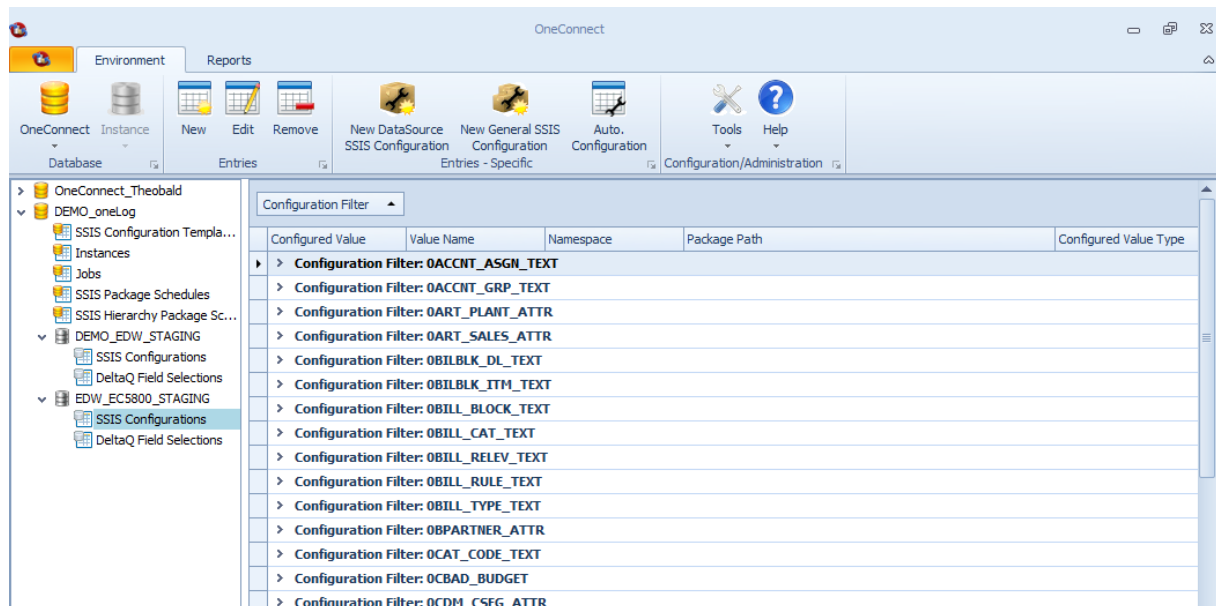
2. User Interface

One of the biggest benefits of using OneConnect is the ability to use pre-built ETL packages. These packages have been developed based on a methodology built upon best practices and many years of experience in ETL projects. They include know-how about specific details of each data source, such as the delta mode for a specific extractor in SAP. These packages move data from the source system to the staging area. The methodology behind OneConnect also extends to new data sources. Template packages are also included, which can be used to build packages based on custom data sources, or

ones that are not included in the set of available pre-built packages. By building packages using OneConnect templates, it is possible to apply a standard methodology to ETL for any existing source system. OneConnect leverages SQL Server functionality like package configurations in Integration Services to streamline package management, which is especially helpful in environments where many packages are utilized. The OneConnect user interface had been developed specifically to make it more possible to manage and maintain configuration information centrally in an intuitive way. This user interface serves as the main environment for administrators and developers who are involved in the process of data extraction to work in. It simplifies ETL by acting as a centralized, specialized environment that is dedicated only to managing and configuring the pre-built and template packages.

In the OneConnect UI, you can:

- Maintain Load Instances. A load instance is required for each source system.
- Maintain OneConnect Instances. A OneConnect Instance represents an environment for managing one or more Load Instances (e.g. “Production”, “Development” or “SAP”, “Dynamics AX”)
- Maintain Configurations
 - Configuration parameters can be maintained centrally and individually (e.g. DeltaMode) for each Data Source
- Monitor ETL processes using reports



The UI is built as a Winforms-based.NET application. It also includes “Theobald XtractIS for OneConnect” software, which provides connectivity to SAP Systems.

3. Interface Software

3.1 Differences between the XtractIS for OneConnect and Theobald XtractIS

OneConnect includes a component called XtractIS for OneConnect, a special edition of XtractIS, which has been developed by Theobald software. XtractIS provides connectivity to SAP, and is based on SAP certified technology. This section describes the differences between XtractIS for OneConnect and the Ultimate Edition of XtractIS, which is the most powerful edition that can be purchased directly from Theobald Software.

3.2 Theobald Editions

A detailed list of the different editions of Theobald XtractIS with prices (not including XtractIS for OneConnect) can be found here, at the Theobald Website:

<http://www.theobald-software.com/de/order/xtractis.htm>

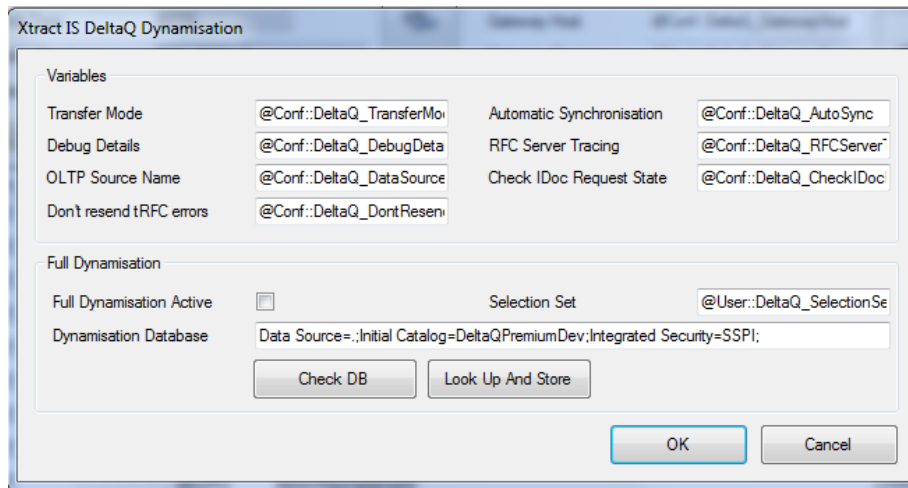
3.3 Additional Functionality in XtractIS for OneConnect

Generally speaking XtractIS for OneConnect can be seen as more enterprise-ready than other XtractIS editions. The list below contains information about specific features that enable XtractIS for OneConnect to better support ETL processes in enterprise environments.

3.3.1 Feature List

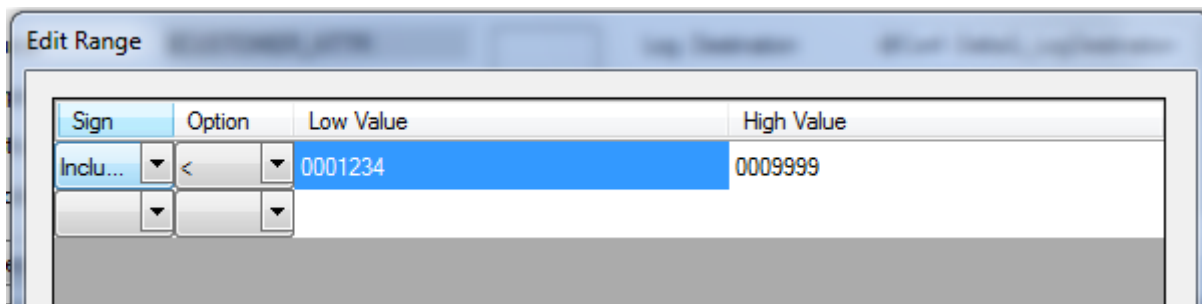
The following features are available in XtractIS for OneConnect, in addition to features in other XtractIS editions. All of these features apply to the DeltaQ Module.

- Dynamic Configuration
 - All of the options in the settings menu are configurable with variables. That means that even after deploying a package the settings can be modified simply by changing variable values in the OneConnect UI. In the Ultimate edition of XtractIS, a complete deployment process is required after modifications have been made to SSIS packages. The following parameters can be edited:
 - Debug details
 - RFC server tracing
 - Check Idoc request state
 - Don't resend tRFC errors automatically
 - Automatic synchronization
 - Transfer mode

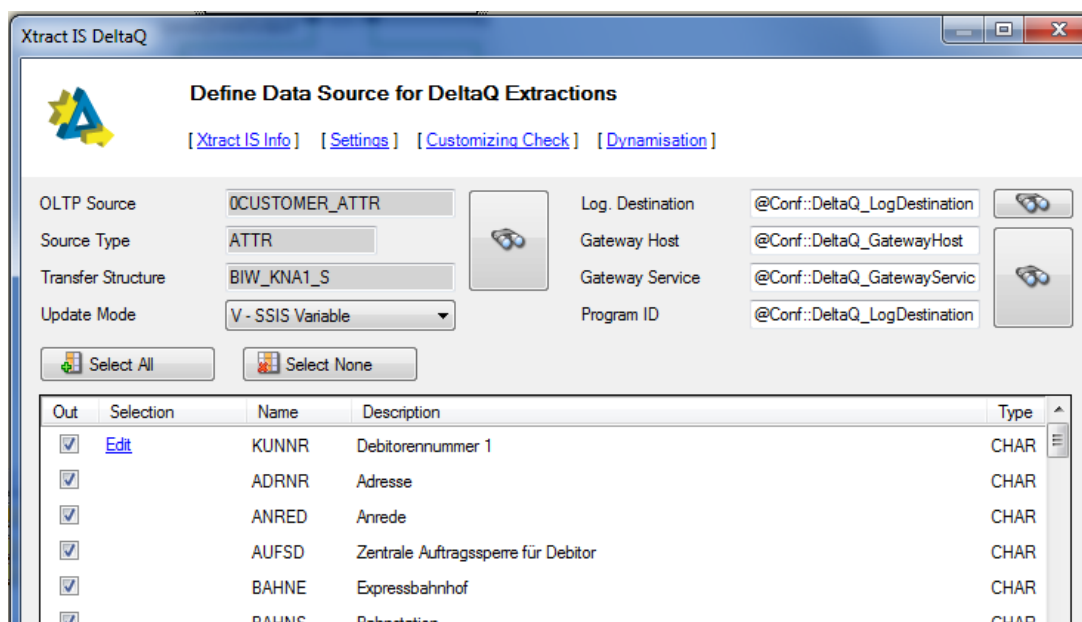


- **Configurable Selection Set**

In addition to the options that can be configured with variables, the selection set can be parameterized using an object variable. The selection set is a feature that makes it possible to set parameters to restrict data that is returned by an extractor. The “normal” Ultimate Edition is able to define selection sets, but only within the SSIS package itself, which requires the package to be re-deployed in order for changes to take effect. With OneConnect it is possible to define these boundaries outside the package using the OneConnect UI. With OneConnect, parameters can be modified more easily, even after deployment.



The features described above can be configured in the “Dynamisation” area in the DeltaQ SSIS component UI. XtractIS for OneConnect is the only edition of XtractIS with these options, which are accessed by clicking the “Dynamisation” link.



- **Parallel Data Access to a RFC Destination**
 With the standard edition of XtractIS DeltaQ only one connection to a SAP System can be established at a time with DeltaQ. If more than one connection is established, packages may conflict and cause instability in the data transfer between SAP and the staging area. It is possible to avoid this issue by creating multiple RFC destinations and running the SSIS packages against different destinations. This approach is inflexible though, since a new queue is created on the SAP side for each RFC-Destination/data source combination. That means that it is not possible to shift one data source from one destination to another without re-initializing the Delta Queue. Parallel data access to a single RFC Destination has been implemented in XtractIS for OneConnect to overcome this limitation. This functionality makes it possible to optimize data transfer by running several SSIS packages in parallel against a single SAP system.

3.3.2 Roadmap

Additional features have been requested for XtractIS for OneConnect that are not available at the time of writing this document. These include:

- **Job Cancelling**
SQL Server Integration Services is loosely coupled with source systems, and this is particularly true for data extractions from SAP via XtractIS. In a future version of XtractIS for OneConnect it may be the case that cancelling an SSIS package will also cancel the corresponding SAP job. Without this feature the SAP job is executed regardless of whether the request on the SSIS side has been cancelled or interrupted, which could create unnecessary load on a SAP source system. Adding the ability to cancel a job will help reduce the load on SAP source systems, which can be especially helpful when implementing near-real time scenarios.
- **Error Handling for Type Conversion**
DeltaQ is able to convert raw data from SAP into the equivalent SQL data types. From time to time, however, there are issues with type conversion that may result in failure of the whole package. In the future another dataflow pipeline may be added that includes all records that could not be converted (as nvarchar data). This would make the process of transferring data from SAP to SQL even more robust.

4. Templates

One of the key aspects of OneConnect is the ability to use pre-built SSIS packages and templates. These packages have been designed and built based on best practices and experience from large enterprise-scale data warehouse projects. The templates and pre-built packages provide include support for monitoring and logging, as well as the additional features included with XtractIS for OneConnect.

Templates have been designed to make it faster and easier to implement SSIS packages for new data sources. The template packages are based on the same best practices as the pre-built packages. Both pre-built and template packages can be modified to suit the specific needs of a specific environment, for example by adding custom fields.

Multiple templates have been developed, and each is specialized to meet the needs of given source system and implementation. All templates can be tailored to meet additional needs such as implementation-specific customizations or support for new source systems. At the time of this writing, the following templates are available:

- SAP – Data Sources
- SAP – Tables
- SAP – Hierarchies
- SAP – Reports
- SAP – BW Queries
- Microsoft Dynamics Navision

5. Logging & Monitoring

OneConnect includes sophisticated logging and monitoring capabilities. Reports display information about jobs, SSIS package execution, and interface communication. The monitoring and logging information is stored centrally in the OneConnect database. OneConnect is shipped with several reports for monitoring data transfers within the system. The reports are available from within the OneConnect user interface and can also be published on a website or in a SharePoint environment.

The screenshot shows the OneConnect interface with a table titled "ETL Logging - Package Overview". The table lists various ETL packages with their execution details. The columns include Start, End, Duration, System, Client, Update Mode, Source Rows, Inserts, Updates, Deletes, No Changes, Error Rows, Messages, System Message, and DeltaQ Message. The packages are grouped by date: 10.02.2012, 09.02.2012, 07.02.2012, and 30.01.2012.

	Start	End	Duration	System	Client	Update Mode	Source Rows	Inserts	Updates	Deletes	No Changes	Error Rows	Messages	System Message	DeltaQ Message
10.02.2012															
EDW_STA_Template	10:47:18	10:47:50	00:00:32	ECS	800	D	22	11	11	0	7,987	0	0	show	show
09.02.2012															
EDW_STA_2LIS_04_P_MATNR	17:53:07	17:54:30	00:01:23	ECS	800	F	89,706	89,706	0	0	0	0	0	show	show
EDW_STA_2LIS_04_P_MATNR	17:50:27	17:51:54	00:01:27	ECS	800	F	89,706	89,706	0	0	0	0	0	show	show
07.02.2012															
EDW_STA_OPP_DOWNTIME	23:22:47	23:23:11	00:00:24	ECS	800	F	0	0	0	0	0	0	0	show	show
30.01.2012															
EDW_STA_Theobald_Connectivity	08:10:14	08:12:00	00:01:46	ECS	800	D							0	show	show

A cube is also included with OneConnect for performing ad-hoc analysis on logging data. A developer or administrator can use this cube to compare job times on the different source systems, or to analyze errors being raised during the ETL process.

6. Business Content

The business content that is available for OneConnect is intended to speed up development and to minimize the effort spent for services during a project. These “solution accelerators” include pre-built extractor packages and cubes. This content already includes important know-how about the data sources in the source system, such as delta configuration. The cubes that are available with OneConnect combine knowledge of the data sources and staging area with best practices for multidimensional design.

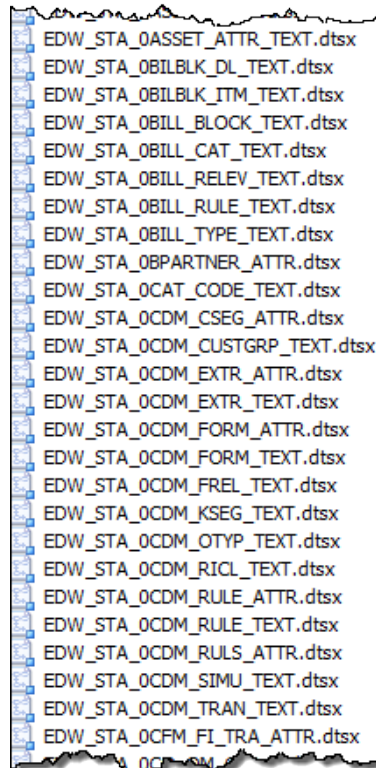
6.1 Extractor Packages

A wide range of packages is currently available. These packages leverage standard DataSources shipped with a SAP system and can be applied “as is” on any standard SAP system. Further configuration is also possible, and enables the packages also include support for changes in in SAP systems that have been customized.

Packages are available for the following SAP modules:

- SD
- MM
- LO
- FI
- CO
- PM
- QM
- PP
- PS

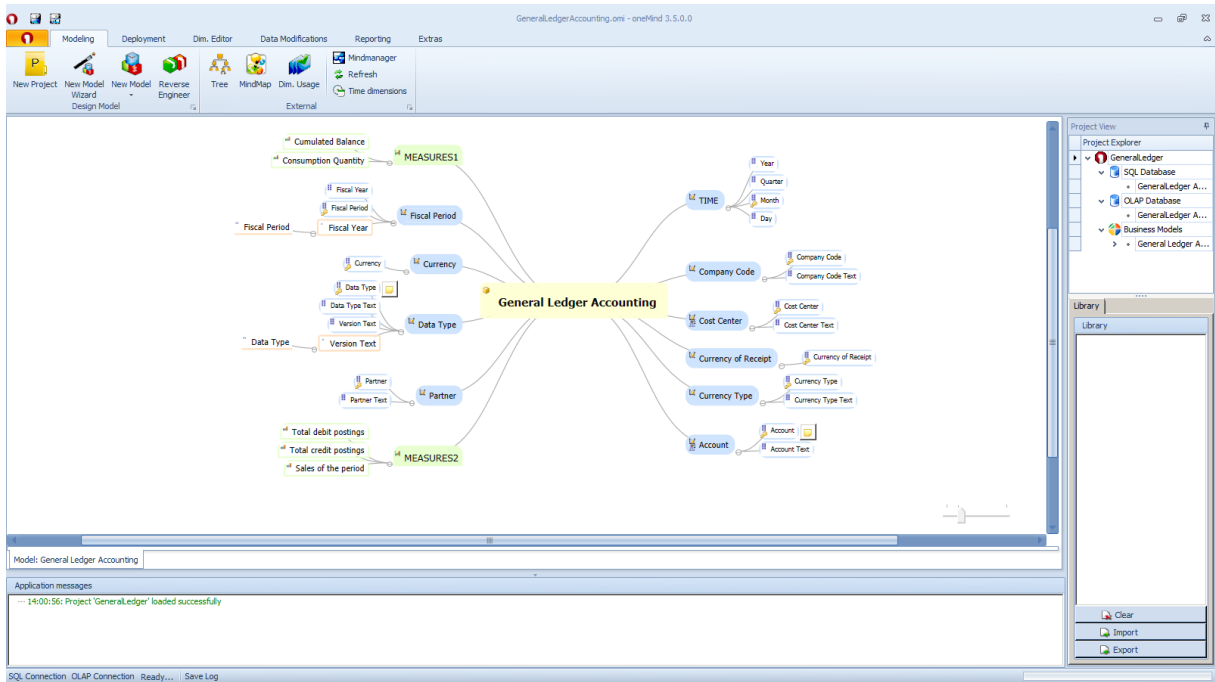
The library of packages continues to grow. At the time of writing more than 300 packages are available. Many of the packages that are available new are the ones most commonly required in real-



life data warehouse projects.

6.2 Cubes

A set of standard cubes is available for use with business content from standard SAP DataSources. These Cubes have been built using oneMind. OneMind is a pmOne product that includes intuitive, graphical cube design and development functionality using mind-mapping techniques. The cubes reflect a standard view of SAP data that can be tailored to a company's specific business needs. Similar to the ETL package templates, which leverage standard SSIS code, the cubes are built entirely on SSAS and other SQL Server technologies and can be easily customized using both OneMind and the Microsoft BI toolset.



Screenshot of OneMind



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