

QlikView

Qlik Connector for use with SAP NetWeaver

Installation and usage guide

Qlik Connector for SAP Version: 6.00 IR, May 2015

Authored by QlikTech International AB

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1 About this document

This document describes the installation and use of the Qlik Connector for use with SAP NetWeaver. The latest version of this document is available through support@qliktech.com.

The SAP connectors described in the document are for use with QlikView version 11 or later and with SAP Netweaver systems as listed in section 3.1.

This document contains the following information:

- | | |
|------------------|--|
| Chapter 2 | Introduction |
| | A brief overview of the SAP connectors and the authorization concept associated with them. |
| Chapter 3 | Connector installation |
| | Detailed instructions on how to install the connectors, the transports, and the authorization roles provided with the connector package. |
| Chapter 4 | Connector configuration |
| | Detailed instructions for the configuration of the user roles for each individual connector. |
| Chapter 5 | Connector clients |
| | Detailed instructions on how to use the connectors within QlikView. |
| Chapter 6 | BW process chain status and QlikView tasks |
| | An example of how to use the BAPI connector to check the status of a Process chain and start the QlikView load when ready |
| Chapter 7 | Important general information |
| | Information on transports/mismatch, the delete function and the update function. |
| Chapter 8 | Secure network communication |
| | Detailed instructions on how to set up secure network communication. |

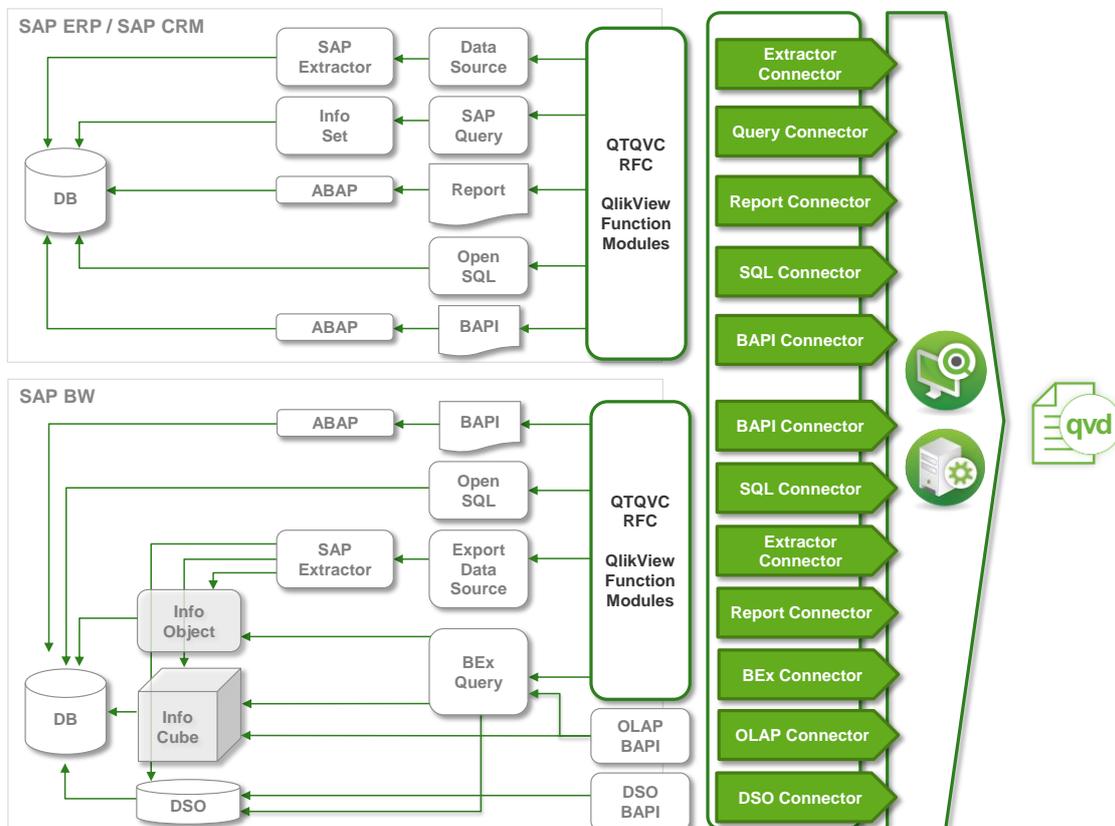
2 Introduction

2.1 Qlik Connector for use with SAP Netweaver®

The certified Qlik connector for use with SAP can connect in a number of different ways to your SAP systems to extract the most value from your existing investment. The information may be stored in a number of different repositories within the SAP architecture, be that in a BI/BW cube, or in ECC R/3, or even a report or query.

The Qlik SAP connector consolidates information from multiple data sources very simply and easily.

- Enables SAP customers to get easy and quick access to all the data stored in different SAP systems.
- SAP data can then easily be combined with Non-SAP data within individual QV-analytical applications.



The connector package consists of eight different connectors:

- SQL connector
- Query connector
- Report connector
- Extractor connector
- BAPI connector
- BEx connector (can only be used on a SAP BW system).

- OLAP connector (can only be used on a SAP BW system).
- DSO/ODS connector (can be used on a SAP BW system).

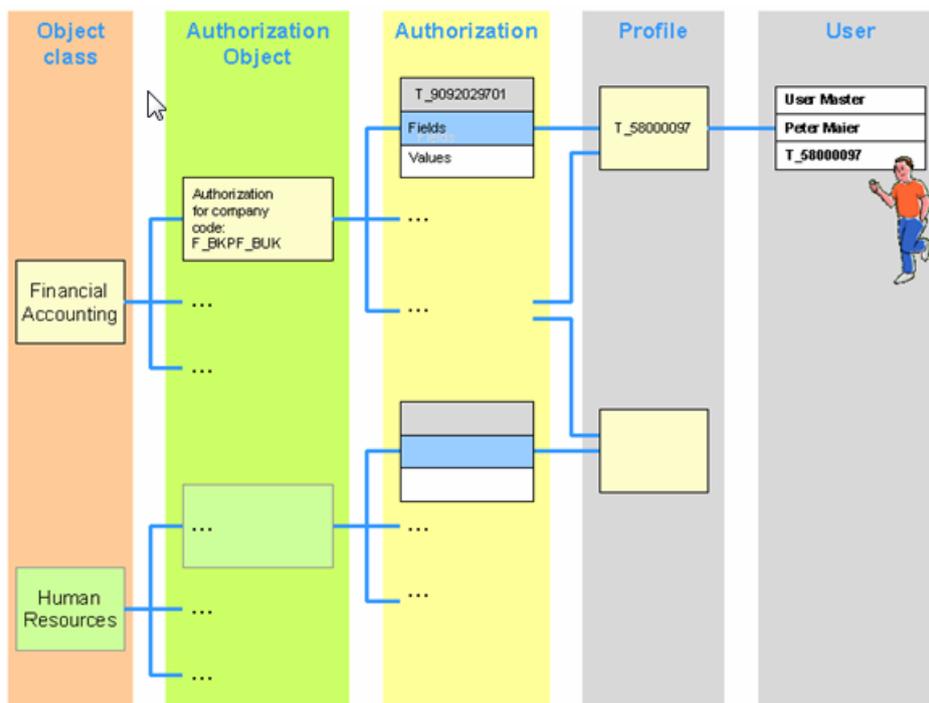
The Qlik components are installed on two different types of computers; the SAP system and the Qlik SAP connector client. The installation procedures for each of these systems are described in Chapter 3.

2.2 Authorization concept

The connectors are intended to be used as back-end components, not to be used by end-users. The authorization for end-users should be setup via the normal QlikView procedures.

Connector-specific SAP Users should be created and these should not be used for other purposes. This will ensure traceability and better control. The connector package includes roles and profiles, but these should be seen as suggestions to be used in development environments. Parts of the development process of the QlikView applications will be to create the necessary authorization in production roles. Changes to the QlikView supplied roles in future versions have to be manually added to the production roles.

An authorization is a permission to perform a certain action in the SAP system. The action is defined by the values of individual fields in an authorization object. When a user logs on to a client in an SAP system, the user's authorizations are loaded in the user context. The user context is located in the user buffer (in the main memory) of the application server.



Several authorizations may be needed to perform an operation in the SAP system. The resulting contexts can be complex. The SAP authorization concept, based on authorization objects, has been introduced to provide an understandable and simple procedure. Several system elements that are to be protected from an authorization object.

The programmer of a function decides whether, where, and how authorizations are to be checked. The program determines whether the user is authorized to perform an activity by comparing the specified authorization object field values in the program to the authorization values in the user master record.

Authorizations can be collected in authorization profiles in order to reduce the maintenance effort that would be required to enter individual authorizations in the user master record. Access authorization changes affect all users with the profile in their master record.

3 Connector installation

QlikSAP_x64Setup.exe is the 64-bit (x64) installation package (.exe) for Windows. The package must be installed on either a SAP system client computer or can be installed on the SAP system server, so that the required transports can be imported.

The package must also be installed on all client computers that will be using the SAP connectors.

3.1 Prerequisites

All of the connectors have the following requirement.

- **QlikView version 11 or later**

Each of the individual connectors has the following installation requirements.

- **SQL Connector** - SAP BASIS system 6.40 or later
- **Query Connector** - SAP BASIS system 6.40 or later
- **Report Connector** - SAP BASIS system 6.40 or later
- **BEx connector** - SAP BASIS system 7.00 or later
- **OLAP Connector** - SAP BW/NetWeaver BI:
 - 3.0B with Support Pack 30 or higher
 - 3.1 with Support Pack 24 or higher
 - 3.5 with Support Pack 16 or higher
 - 7.x with Support Pack 6 or higher
- **DSO/ODS Connector** - SAP BW/NetWeaver BI:
 - 3.0B with Support Pack 30 or higher
 - 3.1 with Support Pack 24 or higher
 - 3.5 with Support Pack 16 or higher
 - 7.0 with Support Pack 6 or higher
- **Extractor Connector** - SAP BASIS system 6.40 or later (ECC5 or later / BW 350 or later)
- **BAPI Connector** - SAP BASIS system 6.40 or later (R/3 4.7 or later)

Note: If there is a firewall between the connector and the SAP system, port 33nn has to be open (where nn = system number of the SAP system).

3.2 Installing the connectors

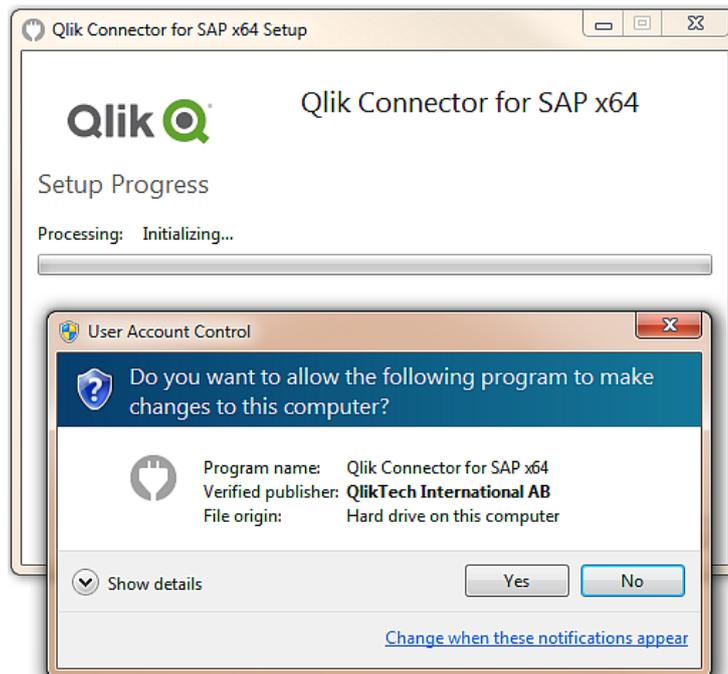
The package includes all the SAP connectors and they are all installed. The package also includes the transports and other required files which are copied to the connector file structure in Windows.

Proceed as follows to install the SAP connectors:

1. Double-click the installation file.



2. Select **I agree...** and then click **Install**.



3. If the User Account Control dialog appears, click **Yes**.



4. Click **Close**.

3.2.1 Windows folders

The different parts of the connector are installed in two different places in the Windows folder structure. The first folder is for the program installation:

C:\Program Files\Common Files\QlikTech\Custom Data\QvSAPConnector.

The second folder is for ScriptBuilder, licenses, and log files:

C:\ProgramData\QlikTech\Custom Data\QvSAPConnector

3.2.2 Installing the Qlik SAP Network Server service

To cater for the option to execute parallel loads, when using the Extractor connector, an additional service has been introduced in the installation package stored in:

C:\Program Files\Common Files\QlikTech\Custom Data\QvSAPConnector.

 Server.exe	03/07/2014 14:31	Application	647 KB
 SrvService.exe	03/07/2014 14:30	Application	659 KB
 SrvService_Console.bat	03/07/2014 14:30	Windows Batch File	1 KB

To install the service:

1. Right-click on the SrvService_Console.bat. Select **Run as administrator**.
2. Select input option **2**.
 - The port option is set to 8680 by default, but can be changed using input option 4.

Start the service with the following steps:

1. Right click on the **Computer** icon and select **Manage**.
2. Select **Service and Applications** and then **Services**.
3. Look for **Qlik SAP Network Server** and select **Start**.

Note: It is only possible to have one service per SAP environment running to avoid a mismatch. For example if a customer has different Develop, Test and Production environments it is recommended to have one

service per environment. However they cannot be installed on the same server, that is, the servers need to have different IP-numbers.

Note: The service has to be stopped during an upgrade of the connectors and the file SrvService.exe should be replaced with the new version before starting the service again.

3.3 Installing the transports

Data extraction and user profile transports are installed in the SAP system. These are available in the following folder on the computer, copied there during the installation of the Qlik SAP connector:

C:\Program Files\Common Files\QlikTech\Custom Data\QvSAPConnector\Transports

There is a separate folder for BEx connector transports:

C:\Program Files\Common Files\QlikTech\Custom Data\QvBexConnector\Transports

The required transports must be copied to the SAP system file structure and then imported.

Data extraction and user profile transports are required for the following:

- SQL Connector
- Query Connector
- BEx connector
- Report Connector
- Extractor Connector
- BAPI Connector

Note: The OLAP connector and the DSO/ODS connector do not require data extraction transports as they use the OLAP BAPI and DSO BAPI respectively.

SAP BASIS System 4.6

Not supported.

SAP BASIS System 6.10 and 6.20

SAP BASIS System 6.10 and 6.20 are not supported in this release. Please use version 5.90 IR of the SAP connectors.

SQL, Report, SAP Query, BAPI and Extractor connectors

- **SAP BASIS System 6.40 – 7.1x**

For these systems, the following transports must be installed in the SAP system:

- E6DK900703 (data extraction)
- E6DK900612 (user profile)

- **SAP BASIS System 7.20 – 7.4x**

For these systems, the following transports must be installed in the SAP system:

- E66K900050 (data extraction)
- E66K900036 (user profile)

Note: The transports must be installed in the above order. The first is cross-client (imported into the Base client), whereas the second is client-specific and has to be imported into all clients where it is to be used.

OLAP and DSO/ODS connectors

Although a data extraction transport is not needed, a user profile transport must be installed in the Business Warehouse SAP system:

- SAP BASIS 6.40 - 7.10X (E6DK900594)
- SAP BASIS 7.20 - 7.4x (E66K900029)

BEx connector

Import the data transport B7DK900056 into the base client (client independent).

Assign the roles QTQVCACCESS, QTQVCADMIN and QTQVCBWACCESS to the QlikView SAP user.

Get the roles QTQVCACCESS and QTQVCADMIN from transport E66K900036 or E6DK900612 and the role QTQVCBWACCESS from transport E66K900029 or E6DK900594. Import the transports into each client where the connector is used (client dependent).

If all role transports for the SQL, Report, SAP Query, BAPI and Extractor connectors of the SAP connector package 6.00 IR are already imported, the roles are available in the SAP system.

If the BEx connector will not be used the preceding steps are not necessary. However, to be able to use the BEx connector, the data transport for the SQL, Report, SAP Query, BAPI and Extractor connectors must be imported as well.

3.4 Authorization

The user profile transports from QlikView contain some predefined roles. These roles are only a proposal and should be adjusted to fit the specific purpose and needs. Remember, if you add authorization objects or change values, you should do so in a new custom role, to avoid these changes being lost when you import new versions of the Connector transports. The QlikView supplied roles and their intended usage are as follows.

- QTQVCACCESS
To be used by SQL, BEx, Report, Query and BAPI Connector Back-end user for doing extraction jobs from QlikView.
- QTQVCADMIN
There are a number of QlikView transactions in the SAP GUI. Most of them require that this role is assigned to the user.
- QTQVCBWACCESS
To be used by OLAP, DSO/ODS and BEx Connectors Back-end user for doing extraction jobs from SAP BI/BW system with QlikView.
- QTQVCEXTRACTOR
To be used by **Extractor Connector** Back-end user for doing extraction jobs from QlikView.
- QTQVCEXTRADM
This role can only be used to activate and generate the extractors in an SAP system. The role is very restricted and can only be used to activate the extractors for later use by the Extractor Connector.
- QTQVCEXTRSETUP
This role can only be used to create, delete, and verify the setup of the number logical system in an SAP system for later use by the Extractor Connector.

3.4.1 QTQVACCESS

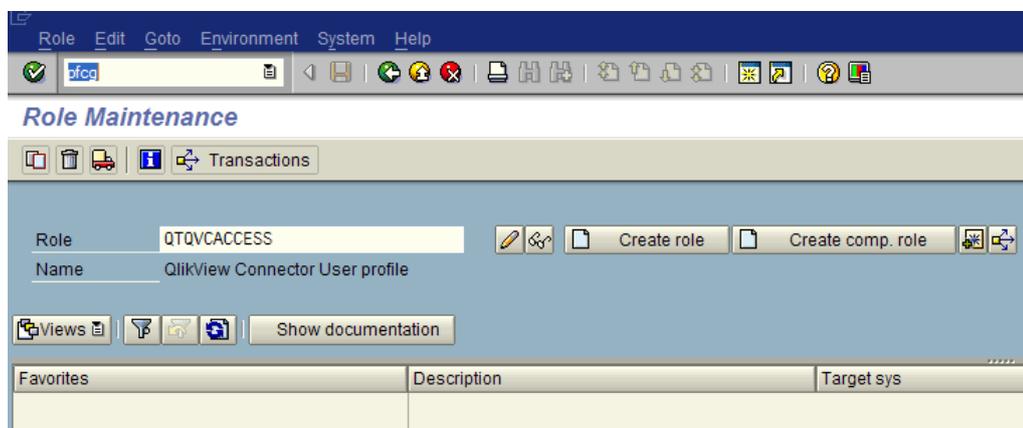
The role QTQVACCESS should be used by the newly created SAP/QlikView user. This role, delivered in the user profile transport gives access to all tables in the SAP system. Refer to section 4.1.1 for instructions on how to create this user.

3.4.2 Table-based Access Control

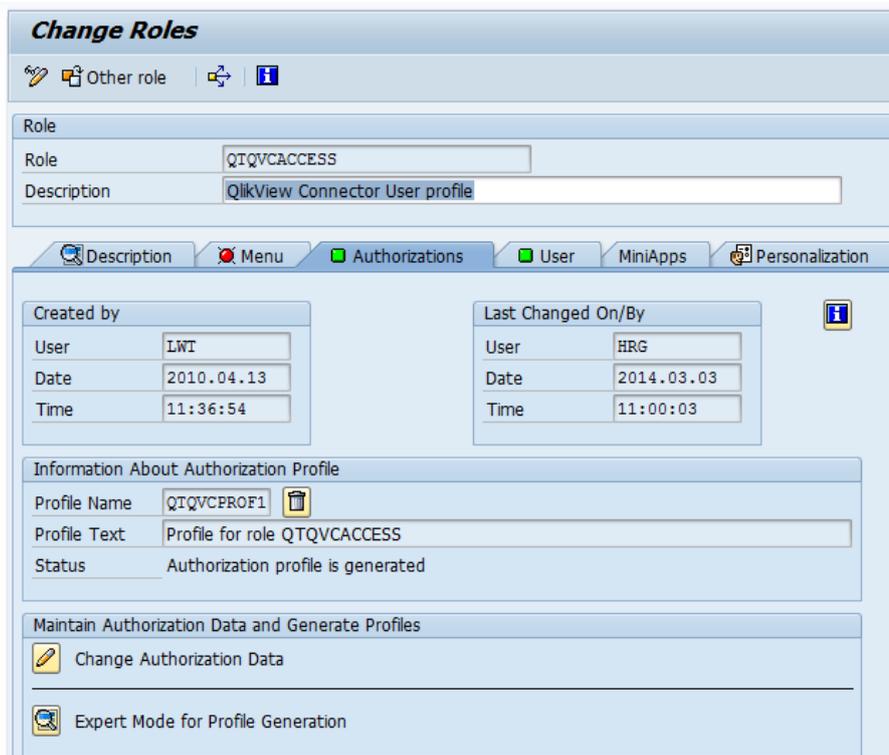
The QTQVACCESS role is only intended to be used in a development environment. In production a copy of this role can be used, where you have restricted access to only the tables that need to be downloaded.

Proceed as follows to configure the table-based access control:

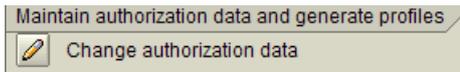
1. Go to transaction PFCG and enter the role QTQVACCESS.
2. Click .



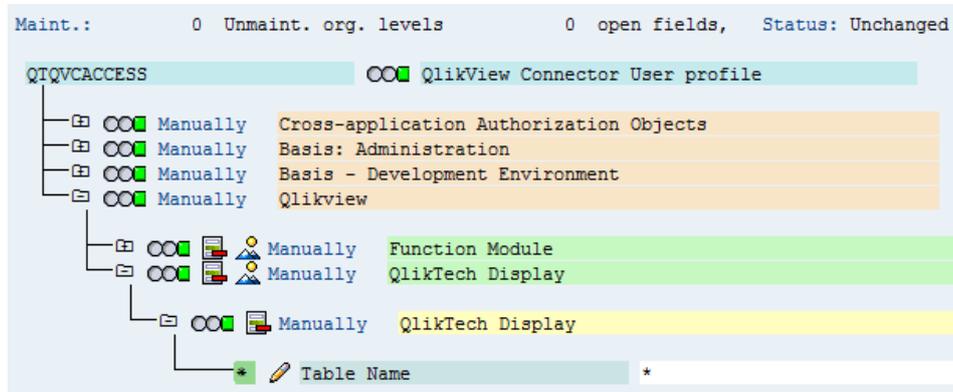
3. Select the **Authorizations** tab.



- Click the Change authorization data icon.

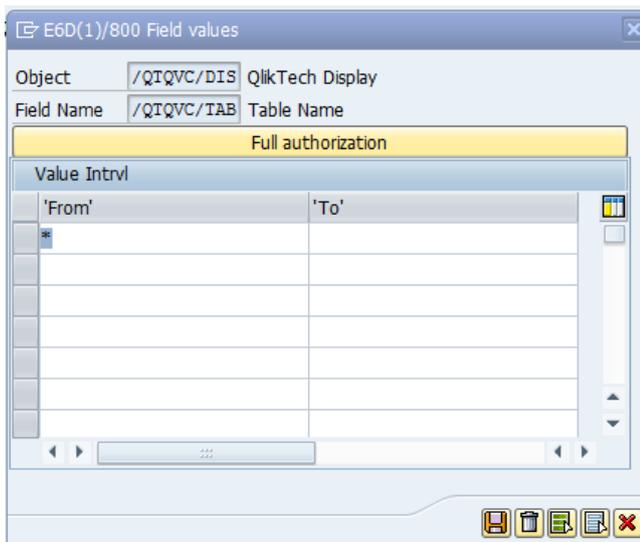


- Expand the tree until the **QlikTech Display>Table name** row is available.



- Click the Pencil icon, , to change the values.

By default, it has the value *, which means all tables are accessible. Single values or ranges of tables can be entered.



3.4.3 Row-based access control

In most cases table-based access restriction is sufficient, but there can be situations where you also want to restrict which rows can be downloaded within a table.

Use the /n/QTQVC/USERCONTROL transaction to define row-based access to specific tables for a user. This transaction is only to be used, if download restriction on row-level is needed. If the tables are empty, the table-based access restriction is used instead (see section 3.4.2). If there is at least one row in this row-based restriction, it takes precedence over the table-based restriction.

Row-Based security, now possible to use position based wildcard(+) when defining table scope. A + character represents any character in that position as follows:

ZAP+++++ (would give access to all tables starting with ZAP)

Z+++ (would give access to all tables starting with Z and having 1-4 characters in the name.)

+++A (would give access to all tables with 4 characters ending with A.

++++ (would give access to all tables with 4 characters or less)

If wildcards are used in **Table Name**, it is not possible to have any value conditions on the field level in the affected tables. Thus the field name always has to contain a star(*) in connection with a wildcard in **Table Name**.

To use this functionality, create an additional Admin user that is allowed to use this transaction. Create the user in the same manner as above, but assign the role QTQVCADMIN instead. The Download users must not have this role assigned.

The screenshot shows the SAP 'Maintainance of Authorizations' transaction. It features two main tables: 'Restriction tables' on the left and 'Restriction users' on the right. The 'Restriction tables' table has columns for TableName, FieldName, and Domain. The 'Restriction users' table has columns for UserName, Domain, Value, and Group. Below the tables are navigation icons and buttons for 'Overview ...' and 'Copy User ...'.

Restriction tables		
TableName	FieldName	Domain
ABNT	*	ALL
D010TAB	*	ALL
SFLIGHT	CARRID	JEO_TEST
SPFLI	COUNTRYTO	LAND1
T000	MANDT	MANDT
T005	LAND1	LAND1
T005	LANDK	LANDK
T005T	*	ALL_T005T
T005T	SPRAS	SPRAS
T100	*	ALL

Restriction users			
UserName	Domain	Value	Group
JEO	ALL	*	1
JEO	JEO_TEST	'AF'	1
LWT	ALL	*	1
LWT	LAND1	'DE'	1
LWT	LAND1	'EN'	2
LWT	LANDK	'D'	1
LWT	LANDK	'E'	2
LWT	SPRAS	'EN'	1
QVCUSER	ALL	*	1
THR	ALL	*	1
THR	ALL_T005T	*	1
THR	LAND1	'DE'	1
THR	LAND1	'EN'	2
THR	LANDK	'D'	1
THR	LANDK	'E'	2

In the left-hand table, **Restriction tables**, define the table to download data from:

- If restriction on row-level is not needed, enter * as **FieldName** and *ALL* as **Domain**.
- Any user assigned to a domain with a * in the **TableName** column has access to all tables.
- To restrict on row-level, enter the **FieldName** for which to make a value-based restriction. The **Domain** field is a free text field. Several field names in different tables can be linked to the same domain (to ease the maintenance of values).

In the right-hand table, **Restriction users**, define per user allowed values per domain:

- If all values are allowed, enter * in the **Value** field and *ALL* in the **Domain** field.
- To restrict, enter one or more values in the **Value** field. Multiple values must be separated by , (comma). Non-numeric values must be enclosed with 'x' (single quotes). Ranges can be specified as BT('a'-'d').
- To restrict on more than one field in a table, create more lines in each table.
- To create OR conditions, use the **Group** field to link the values together in pairs (or triplets).

Example:

(VKORG = 1000 AND SPART = 10) OR (VKORG =2000 AND SPART =20) →
VKORG value=1000 group=1

4 Connector configuration

4.1 Qlik SAP SQL connector user configuration

4.1.1 SAP BASIS system 6.10, 6.20, 6.40, and 7

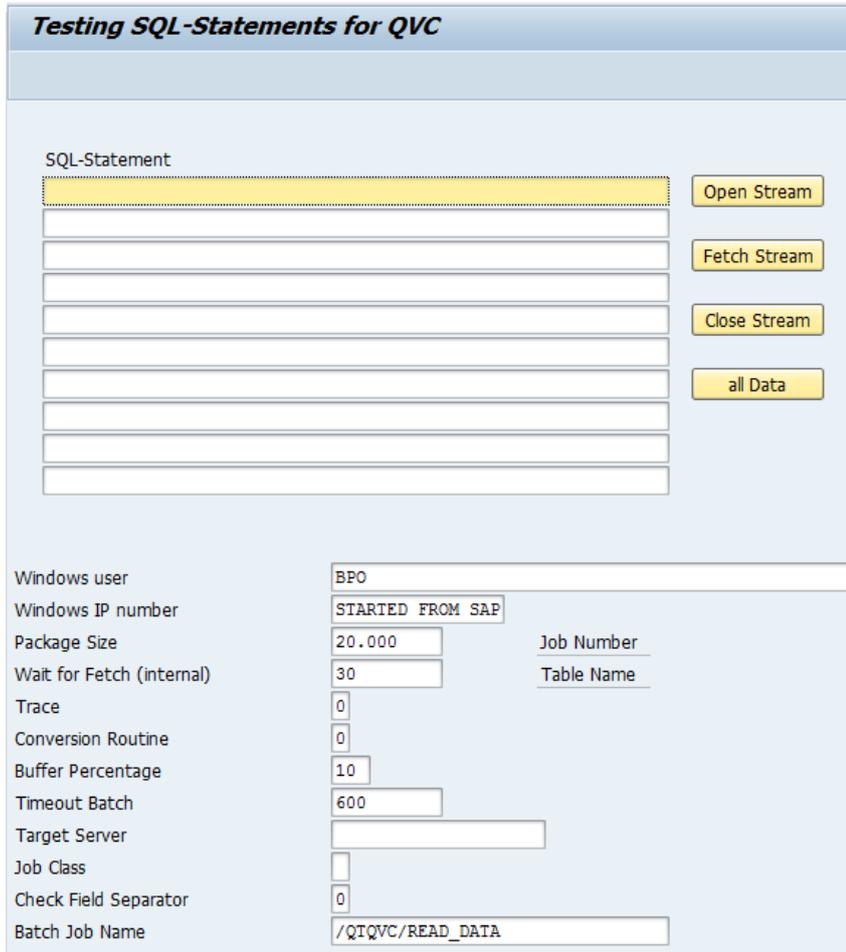
After the transports have been installed in the system, proceed as follows:

1. Create one or more SAP users that will be used for Back-end jobs from QlikView. These users are not intended for QlikView end-users so only a few SAP users should be created. The reason to create several users might be that you want to give them different authorization or for traceability.
 - a. Go to transaction SU01.
 - b. Click **Create (F8)**.
 - c. Give the user a name and a password.
 - d. On the **Logon data** tab, assign the user to **User Type: Service**.
 - e. On the **Roles** tab, add the role *QTQVCACCESS*.
 - f. Click **Save**.
2. If the installation is an upgrade from a previous version and the role *QTQVCACCESS* has been updated, update all users assigned to the role:
 - a. Go to transaction PFCG.
 - b. Enter the role name *QTQVCACCESS* and click **Change Role**.
 - c. On the **User** tab, enter the name of the user(s) created above.
 - d. Click **User comparison**.
 - e. Click **Complete comparison**.
 - f. Click **Save**.

4.1.2 Testing SQL statements

The /QTQVC/SQL transaction allows testing of SQL `SELECT` statements. After installing the transports and creating a user, proceed as follows to test that everything has been correctly installed:

1. Log on with the newly created user and test transaction /n/QTQVC/SQL.



Testing SQL-Statements for QVC

SQL-Statement

Open Stream

Fetch Stream

Close Stream

all Data

Windows user: BPO

Windows IP number: STARTED FROM SAP

Package Size: 20.000

Job Number:

Wait for Fetch (internal): 30

Table Name:

Trace: 0

Conversion Routine: 0

Buffer Percentage: 10

Timeout Batch: 600

Target Server:

Job Class:

Check Field Separator: 0

Batch Job Name: /QTQVC/READ_DATA

2. Enter the SQL statement.
3. Click **Open Stream** to start the job.
Then either:
 - a. Click **Fetch Stream** to display one page of the result. Click **Close Stream** to end the job.
or
 - b. Click **all Data** to execute the complete job and get the runtime statistics.

4.2 Qlik SAP OLAP connector user configuration

A user profile transport for Business Warehouse systems is supplied (see section 3.3).

The user profile transport contains a ready-made role named QTQVCBWACCESS with the content listed in this section.

This is a suggested role only intended to be used in a Development environment. As part of the development process you should create a more restricted role to be used in Production environment.

If importing into SAP BW versions below 7.00, errors/warnings regarding missing objects are received, but these can be ignored.

Alternatively, go to transaction PFCG and proceed as follows to manually create a role with the following access rights:

1. Add the following authorization objects:
 - S_RFC
 - i. ACTVT: 16
 - ii. RFC_NAME: RFC1, RRT0, RSAB, RSOB, SDIFRUNTIME, SYST,OCSB, SYSU, SRTT
 - iii. RFC_TYPE: FUGR
 - S_TABU_LIN
 - iv. ACTVT: Restrict according to customer (* to access all)
 - v. ORG_CRIT: Restrict according to customer (* to access all)
 - vi. ORG_FIELD1: Restrict according to customer (* to access all)
 - vii. ORG_FIELD2: Restrict according to customer (* to access all)
 - viii. ORG_FIELD3: Restrict according to customer (* to access all)
 - ix. ORG_FIELD4: Restrict according to customer (* to access all)
 - x. ORG_FIELD5: Restrict according to customer (* to access all)
 - xi. ORG_FIELD6: Restrict according to customer (* to access all)
 - xii. ORG_FIELD7: Restrict according to customer (* to access all)
 - xiii. ORG_FIELD8: Restrict according to customer (* to access all)
 - S_RS_AUTH
 - i. BIAUTH: OBI_ALL
 - S_RS_COMP
 - i. ACTVT: 03,16, 22
 - ii. RSINFOAREA: Restrict according to customer (* to access all)
 - iii. RSINFOCUBE: Restrict according to customer (* to access all)
 - iv. RSZCOMPID: Restrict according to customer (* to access all)
 - v. RSZCOMPTYPE: Restrict according to customer (* to access all)
 - S_RS_COMP1
 - i. ACTVT: 03, 16, 22
 - ii. RSINFOAREA: Restrict according to customer (* to access all)
 - iii. RSZCOMPID: Restrict according to customer (* to access all)
 - iv. RSZCOMPTYPE: Restrict according to customer (* to access all)
 - v. RSZOWNER: Restrict according to customer (* to access all)
 - S_RS_ERPT
 - i. ACTVT: 03, 16, 22
 - ii. RSERPTID: Restrict according to customer (* to access all)
 - iii. RSZOWNER: Restrict according to customer (* to access all)
 - S_RS_HIER
 - i. ACTVT: 71
 - ii. RSHIENM: Restrict according to customer (* to access all)
 - iii. RSIOBJNM: Restrict according to customer (* to access all)
 - iv. RSVERSION: Restrict according to customer (* to access all)

-
- S_RS_ICUBE
 - i. ACTVT: 03
 - ii. RSCUBEOBJ: DATA, DEFINITION
 - iii. RSINFOAREA: Restrict according to customer (* to access all)
 - iv. RSINFOCUBE: Restrict according to customer (* to access all)
 - S_RS_MPRO
 - i. ACTVT: 03
 - ii. RSINFOAREA: Restrict according to customer (* to access all)
 - iii. RSMPRO: Restrict according to customer (* to access all)
 - iv. RSMPROBJ: DATA, DEFINITION
2. Create one or more download user(s) with the above role. Do not use the same download user as the SQL connector.
 - a. Go to transaction SU01.
 - b. Click **Create (F8)**.
 - c. Give the user a name and a password.
 - d. On the **Logon data** tab, assign the user to **User Type: Service** or **Communications**.
 - e. On the **Roles** tab, add the role just created.
 3. If download users with different access rights to cubes/queries are needed, copy the role created above and change the second role according to the requirements. Create a new user with the second role assigned.

4.3 Qlik SAP BEx connector user configuration

A user profile transport for Business Warehouse systems is supplied (see section 3.3).

The user profile transport contains a ready-made role named QTQVCBWACCESS with the content listed in this section.

This is a suggested role only intended to be used in a Development environment. As part of the development process you should create a more restricted role to be used in Production environment.

Refer to the OLAP connector user configuration in section 4.2 for further information.

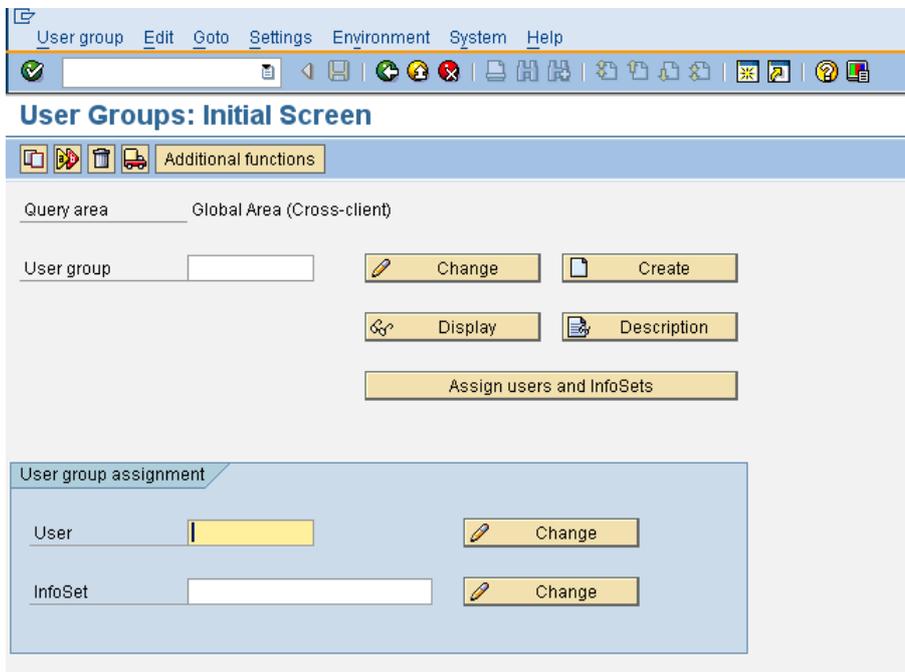
4.4 Qlik SAP Query connector user configuration

Use the same user as defined for the SQL connector (see section 4.1).

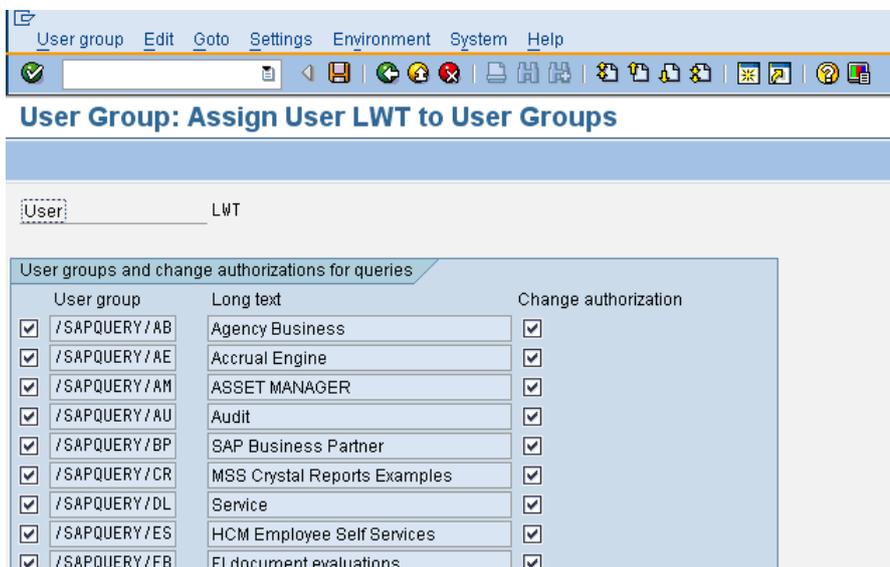
In addition to this; go to transaction SQ03 and provide the user with access to the relevant SAP query user groups. All queries in the user groups assigned are available via the query connector. For some queries, additional authorization may be needed. This is then to be added to an additional role (for example, QTQVACCESS_CUSTOM). In most cases, the connector log reveals the missing authorization. If not, the Infoset definition and/or logical database definition have to be checked.

Proceed as follows to configure the query connector:

1. Go to transaction SQ03.
2. Enter the user ID in the **User** field.



3. Click **Change**.
4. Check all the **User group** boxes that the download user is to have access to.



5. Click **Save**.

4.5 Qlik SAP Report connector user configuration

Use the same user as defined for the SQL connector (see section 4.1).

Each Report can check any number of authorization objects and it is not obvious which objects are used.

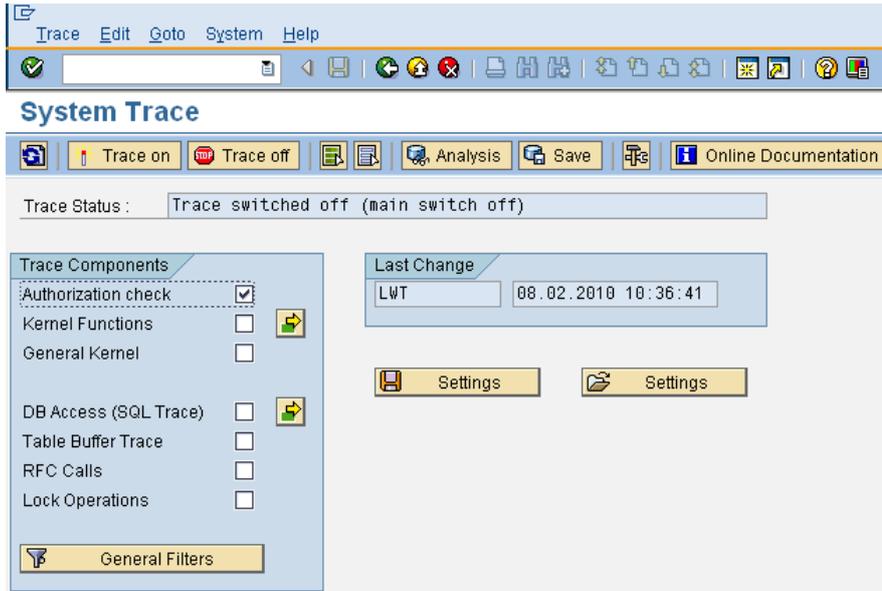
The pre-defined role for the Qlik connector, QTQVACCESS, does not cover the authorization objects that could be used by the reports to be executed. These should be added to an additional role (for example,

QTQVACCESS_CUSTOM), to avoid being over-written when installing new versions of the Qlik supplied transport.

If wide authorization roles are not to be added to the download user, an authorization trace on each report to be used has to be performed.

Proceed as follows to configure the report connector:

1. Go to transaction ST01.
2. Start an authorization trace.



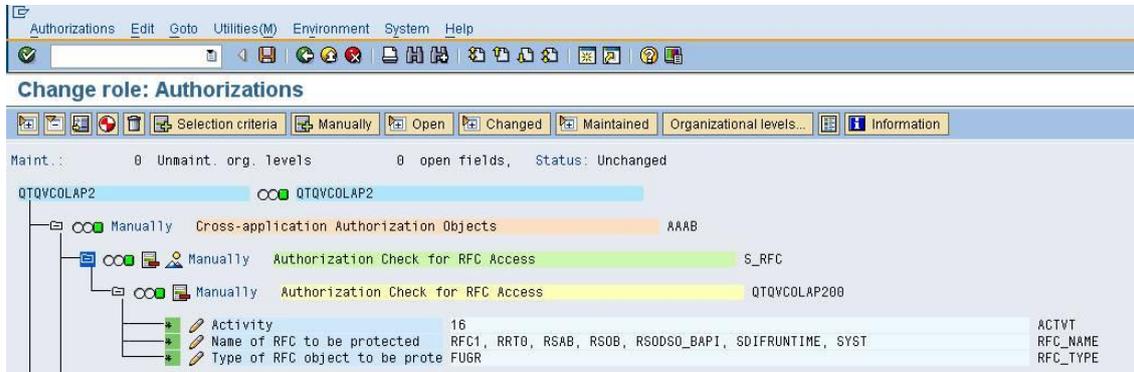
3. Run the report with a user that has sufficient access.
The results show the authorization objects used.
4. Add the authorization objects used to the download user.
5. Go to transaction SU03.
6. Perform a Where Used analysis.

If existing roles are added to the download user instead, do a Where Used analysis on the objects to figure out appropriate roles to add. In addition, change the **User Type** from **Service** to **Communication** to avoid the user from being used to log on with SAPGui.

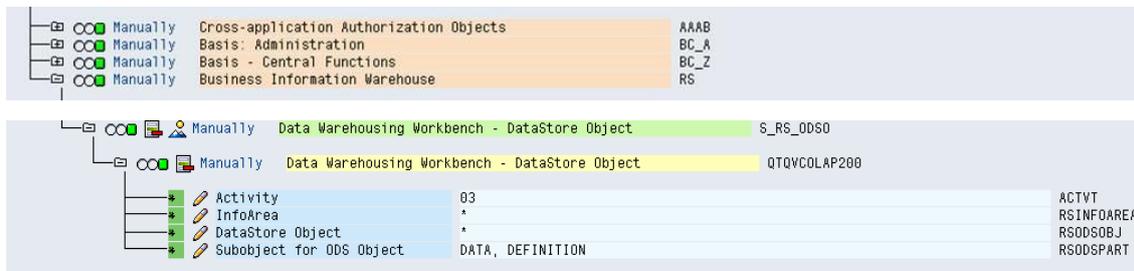
4.6 Qlik SAP DSO/ODS connector user configuration

Use the same role as defined for the OLAP connector (see section 4.2). If manually created you need to add the following items:

- Two additional function groups, RSAB and RSODSO_BAPI



- Authorization object S_RS_ODSO with DATA and DEFINITION



- Use the same download user as the OLAP connector

4.7 Qlik SAP Extractor connector user configuration

The Extractor connector contains two different options.

IDoc method

IDoc (Intermediate Document) is a standard SAP document format. IDocs enable the connection of different application systems using a message-based interface. The use of IDocs has three main aims:

- Structured exchange and automatic posting of application documents.
- Reduction of the varying complex structures of different application systems to one simple structure. For example, the structure of an SAP application document and the structure of the corresponding EDI message according to the UN/EDIFACT standard.
- Detailed error handling before the data is posted in the application.

Transactional RFC (tRFC) method

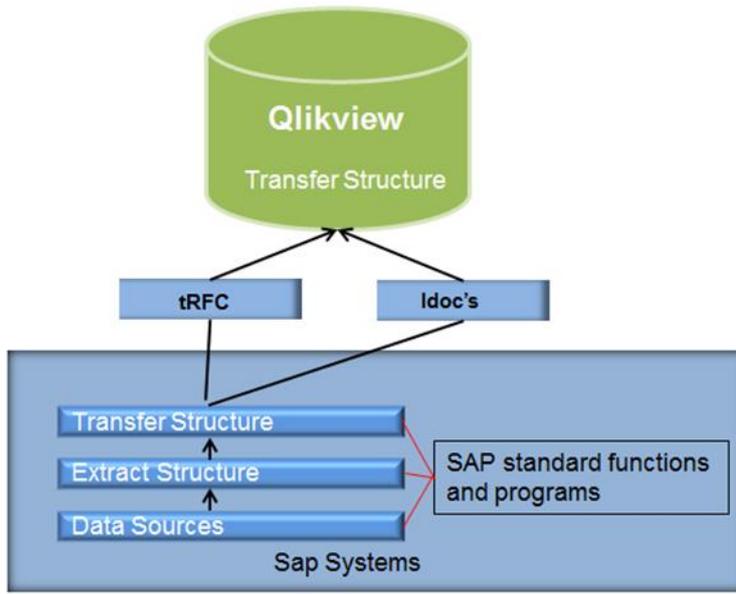
Transactional RFC (tRFC, previously known as asynchronous RFC) is an asynchronous communication method that executes the called function module just once in the RFC server. The remote system does not need to be available at the time when the RFC client program is executing a tRFC. The tRFC component stores the called RFC function, together with the corresponding data, in the SAP database under a unique transaction ID (TID).

If a call is sent, and the receiving system is down, the call remains in the local queue. The calling dialog program can proceed without waiting to see whether the remote call was successful. If the receiving system does not become active within a certain amount of time, the call is scheduled to run in batch.

tRFC is always used if a function is executed as a Logical Unit of Work (LUW). Within a LUW, all calls

- are executed in the order in which they are called
- are executed in the same program context in the target system
- run as a single transaction: they are either committed or rolled back as a unit.

In the SAP ERP system, there are pre-defined data sources available to use for transferring data to SAP BI systems.



The Extractor connector uses these data sources and the standard SAP extract method (IDOC) available from version 5.60 and the extract method tRFC available from version 5.80.

4.7.1 User configuration for SAP BASIS System 6.40, and 7.00 or later

After the transports have been installed in the system, proceed as follows to create new User for the extractor connector (QTQVCEXTRACTOR)

Administrative roles QTQVCEXTRADM can be added to existing Admin users of the SAP system.

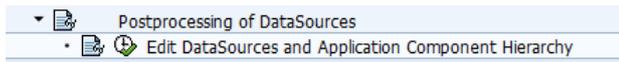
1. Create one or more users:
 - a. Go to transaction SU01.
 - b. Click **Create (F8)**.
 - c. Give the user a name and a password.
 - d. On the **Logon data** tab, assign the user to **User Type: Service**.
 - e. On the **Roles** tab, add the role *QTQVCEXTRACTOR*.
 - f. Click **Save**.
2. If the installation is an upgrade from a previous version and the roles QTQVACCESS/QVEXTRACTOR have been updated, update all users assigned to the role:
 - a. Go to transaction PFCG.
 - b. Enter the role name *QTQVCEXTRACTOR*.
 - c. Click **Change Role**.
 - d. On the **User** tab, enter the name of the user(s) created above.
 - e. Click **User comparison**.

- f. Click **Complete comparison**.
- g. Click **Save**.

4.7.2 Setting up SAP side extractor

A series of standard extractors are delivered within SAP for data transfer to the SAP Business Information Warehouse. If BI/BW is not used, proceed as follows to activate a series of processes within SAP:

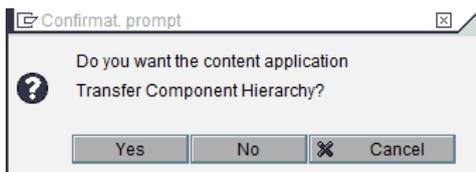
1. In some cases, it has to be set up from the customizing side, which is reached through the SPRO transaction and the **Activate Business Functions** menu.
2. Go to transaction SBIW to transfer and activate the BI/BW DataSources.



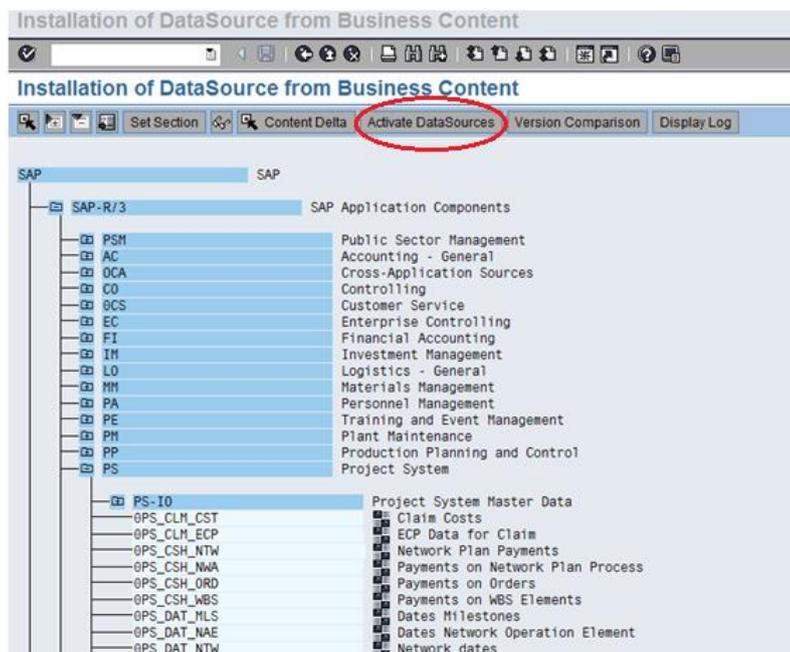
3. Check that the tree hierarchy and data sources are activated.
4. If this is not the case, transfer the **Application Component Hierarchy** and then the **Business Content DataSources**.



- Transfer Application Component Hierarchy:



- Transfer Business Content DataSources: Start by activating the tree hierarchy and then activate each data source to be used.



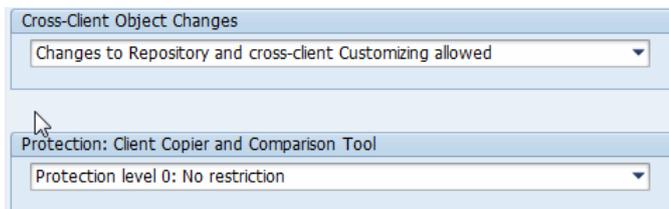
4.7.3 Setting up Qlik SAP extractor

Configuration changes to the clients are required to execute the processes involved in the Qlik extractor (QTQVC/EXTRACTOR_ADM). The SAP client is required to have “changes to repository and cross-client customizing allowed”.

Note: The SAP client must be set to “Open” when processing the administration setup.

Proceed as follows to set up the extractor connector:

1. Go to transaction SCC4.
2. Select **Client**.
3. Change the system to reflect the following options:



The screenshot shows two configuration options in the SAP SCC4 client configuration screen:

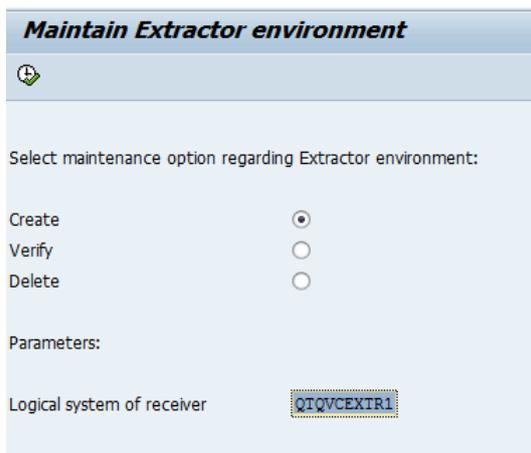
- Cross-Client Object Changes:** A dropdown menu set to "Changes to Repository and cross-client Customizing allowed".
- Protection: Client Copier and Comparison Tool:** A dropdown menu set to "Protection level 0: No restriction".

4. Go to transaction SE03. Double-click **Set System Change Option** under **Administration**.
5. Check that the following options are set to Modifiable:
 - a. **Global Setting**
 - b. **Local Developments** (No Automatic Transport)
 - c. **Customer Name Range**

4.7.4 Setting up Qlik extractor administration

To initiate the capabilities of the Qlik extractor connector, a one-time task is required to create a logical system to receive the generated IDocs/RFC used in the extractor process.

Go to transaction /n/QTQVC/EXTRACTOR_ADM and perform the setup:



The screenshot shows the SAP screen titled "Maintain Extractor environment". It includes a status bar with a green arrow icon and the text "Select maintenance option regarding Extractor environment:". Below this, there are three radio button options: "Create" (selected), "Verify", and "Delete". Under the "Parameters:" section, the "Logical system of receiver" is set to "QTQVCXTR1".

- **Create:**
 - Creates the logical system of the receiver. See the SALE transaction.

- Creates the RFC connection (same name as the logical system).
- Creates the partner profile of type LS (same name as the logical system).
- Creates the Basic IDoc type for data transfer. The name is hard-coded like "ZSQAQTQVCEXTR1".
- **Verify:** Verifies that all necessary components of the extractor environment are configured.
- **Delete:** Deletes all components in the extractor environment.

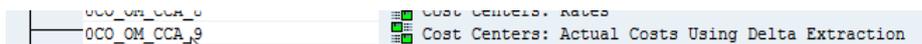
*Note: When selecting a logical system name it has to be one word like **QTQVCEXTR1** and not **QTQVC_EXTR1**. To prevent a mismatch fill the whole field with 10 characters.*

Note: Close the SAP client after the setup.

4.7.5 Activating/generating data sources/extractors

Once the setup is complete and the extractors have been activated in the SAP system, proceed as follows to activate the extractors for use with the Qlik extractor connector:

1. Go to transaction RSA6.
2. Select a DataSource/Extractor in the transaction by high-lighting it and copying the technical name (using **Ctrl+Y** on the keyboard). This can also be done manually.

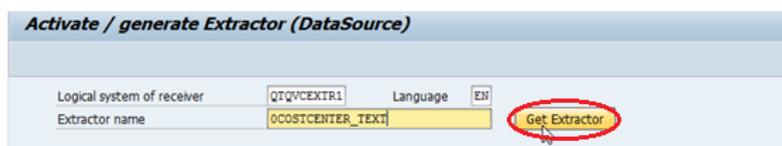


It's also possible to look-up in the dropdown list with filter

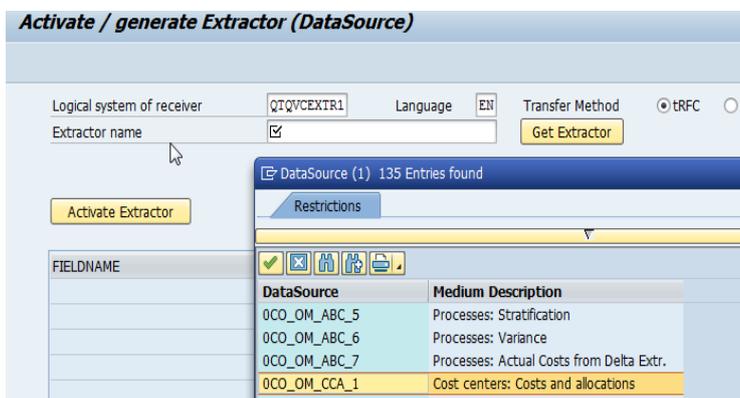
3. Go to transaction /n/QTQVC/Activate.



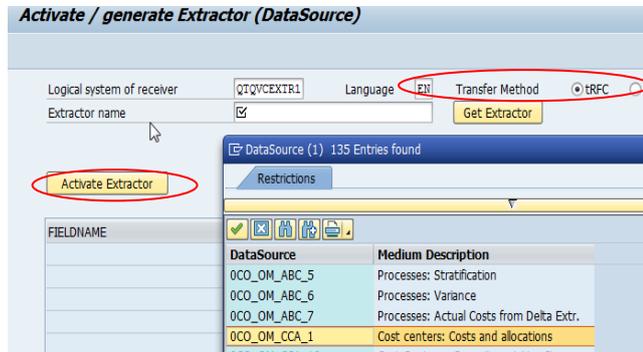
4. Paste the selected extractor in the **Extractor name** field or select an extractor from the dropdown box.
5. Click **Get Extractor**.



Example select from dropdown list



6. Select the field to activate (X) or select all fields.
7. Choose update method tRFC or IDoc
8. Click **Activate Extractor**.



4.7.6 Qlik SAP Extractor connector in BW system

The SAP extractor connector can be used against a SAP BW system. The structure of the BW system differs to that of an SAP ERP system, but the principle is the same.

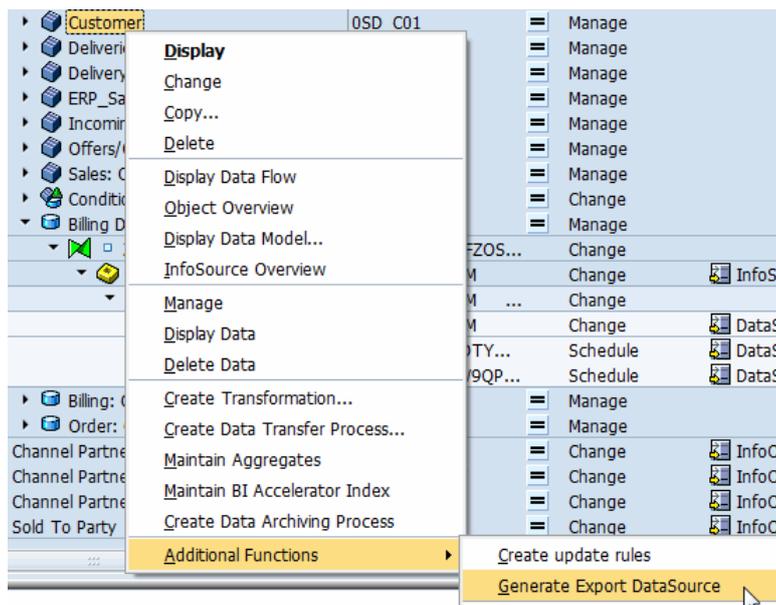
Store the attached Server.exe file on one server, preferably into the same catalogue as the SAP connectors (C:\Program Files\Common Files\QlikTech\Custom Data\QvSAPConnector).

User Configuration is the same as for SAP BASIS System 6.40 and later, see section 4.7.1

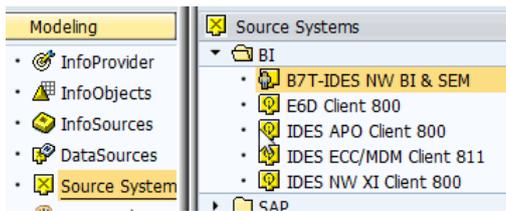
Setting up SAP BW side extractor

Proceed as follows to set up the SAP BW side extractor:

1. Make sure the source to be used is generated as an export data source:
 - a. Go to transaction RSA1.
 - b. Select **Cube** or **DSO/ODS**.
 - c. Right-click and select **Additional Functions>Generate Export DataSource**.



2. Replicate the internal BW setup:
Choose the BI system from **Modeling>Source System**.

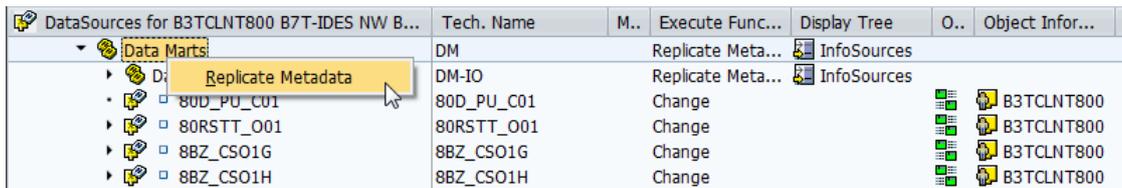


3. Open **Modeling**>**DataSources**.

The internal BI sources are available. In BW, this is referred to as "data marts".

4. Replicate the whole tree or just the data source needed:

Right-click and select **Replicate Metadata**.



After replicating the data marts, the data sources show up as selectable and can be activated for the Qlik extractor connector process.

5. Go to transaction code RSA6 and use it as in the ERP system.

The tree differs slightly from the one in ERP. This is because no pre-defined extractors are used. In BW, the actual data sources are used.



The available sources to be used can be found here. Normally, the technical name starts with "8" followed by "0" for standard ODSs and cubes. The end of the name uses "O" for ODS and "C" for cubes.

Example:



6. The technical name can now be activated using the same method as for the ERP system described previously.

4.7.7 Important issues

SAP services file

If there is no SAP GUI installed on the machine where the connector is to be installed, the SAP system gateway port has to be written manually in the folder

C:\Windows\System32\drivers\etc\services.

Add the following information at the end of the file:

```
sapgw01 - sapgw99 3301/tcp - 3399/tcp #SAP System Gateway Port
```

```
sapdp01 - sapdp99 3201/tcp - 3299/tcp #SAP Dialog Service (dispatcher port)
```

Example:

```
Sapgw01 3301/tcp #SAP System Gateway Port
```

```
Sapdp01 3201/tcp #SAP Dialog Service Port
SAPgw02 3302/tcp # SAP System Gateway Port
Sapdp02 3202/tcp #SAP Dialog Service Port
```

If passing through a message server, an entry may have to be added in the C:\WINDOWS\system32\drivers\etc\services file. Add `sapmsxxx 36nn/tcp`, where `xxx` is the system ID and `nn` is the system number. If it is the last line in the file, add a new line break after the entry.

If there is a firewall between the connector and the SAP system, port `33nn` has to be open (where `nn` = system number of the SAP system).

Restrictions for the IDoc method

If several data sources/extractors have to be loaded at the same time, set up multiple logical systems. Make sure to use the same logical system when loading the deltas.

The total length of an IDoc is 1000 characters. The normal length of an extractor is between 250 and 700, but when using a BW or CRM system with many text fields, the length of the extractor could end up above this. If so, exclude some fields in order to be able to use the extractor. The total length of an activated extractor can be checked using transaction WE30.

Language dependencies

All standard datasources/extractors are maintained in every language. A customized data source is only activated in the log on language, if no action is taken. This has to be taken into consideration when activating a data source in the SAP system.

Custom Namespace

If the data sources in the SAP system are generated with the addition of a custom namespace in the technical name, the namespace needs to be active in SAP transaction RSNSPACE. Otherwise the activation of the extractor will fail.

Finding activated data sources

The relevant activated data sources are found in the SAP system:

- In transaction SE16 in the SAP ERP, the extractors are found in table ROOSOURCE.
- In BW, the table name is RSOLTPSOURCE.

Use transaction WE30 and check the Basic IDoc Type to see which segment that has been activated.

Logistics data sources

In logistics, activities have to be carried out in several areas in order to use the extractors within the SAP Business Information Warehouse.

Start by going to transaction SBIW.

- **Managing extract structures**

This section is used for customization of extract structures in movement data for logistics. The old LIS technique for the transfer information structures has some disadvantages compared to the new technique and is no longer necessary. There are, however, some overlaps between the two techniques, particularly if LIS and BW are to be used in parallel.

- **Initialization**

The initialization must be prepared by OLTP. A setup completes the setup tables, which are then read during the initialization.

To enable the setup to be reset after a termination, assign a name to each background run for the setup. Then, if a setup terminates or a setup from the archive documents is interrupted, the status of the setup at the point of termination can be stored under the assigned name. When restarting the setup using the assigned name, the processing can continue from the point of termination without having to go through the entire process again. Once the run has completed successfully, the in-between status stored in the memory is deleted.

The setup must run in the background.

- **Filling the setup table**

Completing the setup tables is a critical action that must be carried out with caution. For large amounts of data, this can take more than a night and may have to be done over a weekend.

The setup log (transaction NPRT) contains information on setups that have already been carried out.

- **Application-specific setup of statistical data**

This section describes the relevant, application-specific features for applications that can perform statistical setups.

Example: SD-Sales Orders – perform setup

- **Standard settings:** In this activity, selected sales orders are called and the statistical update of the BW extraction structures for sales orders is triggered. The statistical update used here corresponds to the one chosen in the customizing cockpit.
- **Requirements:** Before this activity can be carried out, at least one extraction structure in the application must have been activated.

For more information, consult the SAP resources about the 'Logistics Data Extraction: Customizing Cockpit' transaction (transaction code LBWE).

4.7.8 Migrate extractor environment

First create the Extractor Environment in the unlocked Source system with the existing transaction /N/QTQVC/EXTRACTOR_ADM.

Then check the database table RSBASIDOC in the Source system with transaction SE16. Enter the name of the Extractor Environment Logical System and click **Execute**:

Data Browser: Table RSBASIDOC: Selection Screen

Number of Entries

SLOGSYS to

RLOGSYS to

Table RSBASIDOC Display

Check Table...

SLOGSYS

RLOGSYS

OBJSTAT

BIDOCTYP

TSIDOC3X

TSPREFIX

SRCTYPE

SAPREL

TSTPNM

TIMESTMP

SBWBCRL

RBWBCRL

Then enter the name of the **TSPREFIX** (Transfer structure prefix) from the Source system in the same table in the **TARGET** system like below and click **Execute**:

Data Browser: Table RSBASIDOC: Selection Screen

Number of Entries

SLOGSYS to

RLOGSYS to

OBJSTAT to

BIDOCTYP to

TSIDOC3X to

TSPREFIX to

SRCTYPE to

SAPREL to

TSTPNM to

TIMESTMP to

SBWBCRL to

RBWBCRL to

Width of Output List

Maximum No. of Hits

If a record is found with the same TSPREFIX in the Target system, the transport function cannot be used (a workaround is to create a new Extractor Environment in the Source system to get another TSPREFIX that is not already used in the Target system).

If the prerequisite above is fulfilled, then execute the transaction /N/QTQVC/MIGRATE_ENV in the Source system to put the Extractor Environment into a transport.

Then migrate and import the transport into the correct client in the Target system.

After the import, execute the transaction /N/QTQVC/CONNECT_ENV in the Target system. Enter Logical system of receiver, User name and Transfer structure prefix (found above in the Source system) and click **Execute**:

Store a Connection to QV

Logical system of receiver

User name

Transfer structure prefix

Then go to transaction WE21 (under Transactional RFC) in the Target system and generate a new Port name and save it. RFC destination should contain the Extractor Environment Logical System name:

Port

Description

Version

IDoc rec.types SAP Release 3.0/3.1

IDoc record types SAP Release 4.x

RFC destination

Then go to transaction WE20 and find the partner profile for the **Partner Type** LS and the Extractor Environment Logical System name.

Partner profiles

Partner	Description
MDM55	MDM
MDM_001	MDM
MDM_002	MDM
MDM_003	MDM
MDM_004	MDM
MDM_005	MDM
MDM_006	MDM
MDM_007	MDM
MDM_008	MDM
MDM_009	MDM
MDM_010	MDM
MDM_MIGRAT	MDM
MDS_00_800	Master Data Ma
OMOCLNT800	
P13CLNT800	P13 Client 800
PFS_ID_M	Logical System
PFS_ID_T	Logical System
PRODUCTION	Productive syst
PS_02_200	PS_02_200
QTQVCEXT51	QlikView gener.
QTQVCEXT77	QlikView gener.
QTQVCEXT88	QlikView gener.
QTQVCEXTR1	QlikView gener.
QTQVCEXTR2	QlikView gener.
QWBCLNT705	QWBCLNT705
REC_00_800	DMJ Client 800
RPMCLNT800	xRPM client 800
RPM_00_800	
SALES	Sales system (c
SAPQ30800	Q30 800
SEMCLNT800	..

Partner No. QlikView generated

Partn.Type Logical system

Post processing: permitted agent Classification

Ty. User

Agent Håkan Rönningberg

Lang. English

Outbound parmtrs.

Partner Role	Message Type	Message va...	Me
	RSINFO		
	RSEND		

Inbound parmtrs.

Partner Role	Message Type	Message va...	Me
	RSRQST		

Double click the **Message Type** RSINFO:

Partner profiles: Outbound parameters

Partner No. QlikView generated

Partn. Type Logical system

Partner Role

Message Type

Message code

Message function Test

Outbound Options | Message Control | Post Processing: Per

Receiver port Transactional RFC

Pack. Size

Queue Processing

Assign the Port name which was generated above to **Receiver port**, click **Enter** and **Save**.

Do the same for the **Message Type** RSEND.

The Extractor Environment is ready to use!

4.8 Qlik SAP BAPI connector user configuration

The BAPI connector enables QlikView to call Function Modules or BAPIs (Business Application Programming Interface) in SAP BASIS System 6.40, and 7.00 and later. QA method of a BAPI is implemented as Function module, so the connector makes no distinction of these.

The Function Module has to be Remote-enabled to be used from the Connector.

When the transports have been installed in the system, proceed as follows:

1. Create one or more users:
 - a. Go to transaction SU01.
 - b. Click **Create (F8)**.
 - c. Give the user a name and a password.
 - d. On the **Logon data** tab, assign the user to **User Type: Service**.
 - e. On the **Roles** tab, add the role *QTQVCACCESS*.
 - f. Click **Save**.
2. If the installation is an upgrade from a previous version and the role *QTQVCACCESS* has been updated, update all users assigned to the role:
 - a. Go to transaction PFCG.
 - b. Enter the role name *QTQVCACCESS*.
 - c. Click **Change Role**.
 - d. On the **User** tab, enter the name of the user(s) created above.
 - e. Click **User comparison**.
 - f. Click **Complete comparison**.
 - g. Click **Save**.

To run an authorization-related object in a BAPI, the authorization object has to be adjusted in the *QTQVCACCESS* role. Alternatively, create a complemented role for those running the BAPI connector.

The QlikView log indicates if something is missing in the authorization:

2012-02-27 09:53:23 Error Returned: TYPE='E', ID='M7', NUMBER='120', MESSAGE='You have no authorization for this transaction in plant 3000', LOG_MSG_NO='000000', MESSAGE_V1='3000', ROW='0', SYSTEM='T90CLNT090'

Returned: TYPE='E', ID='M7', NUMBER='121', MESSAGE='You have no authorization for this transaction with movement type 501', LOG_MSG_NO='000000', MESSAGE_V1='501', ROW='0', SYSTEM='T90CLNT090'

4.8.1 Function modules in the SAP system

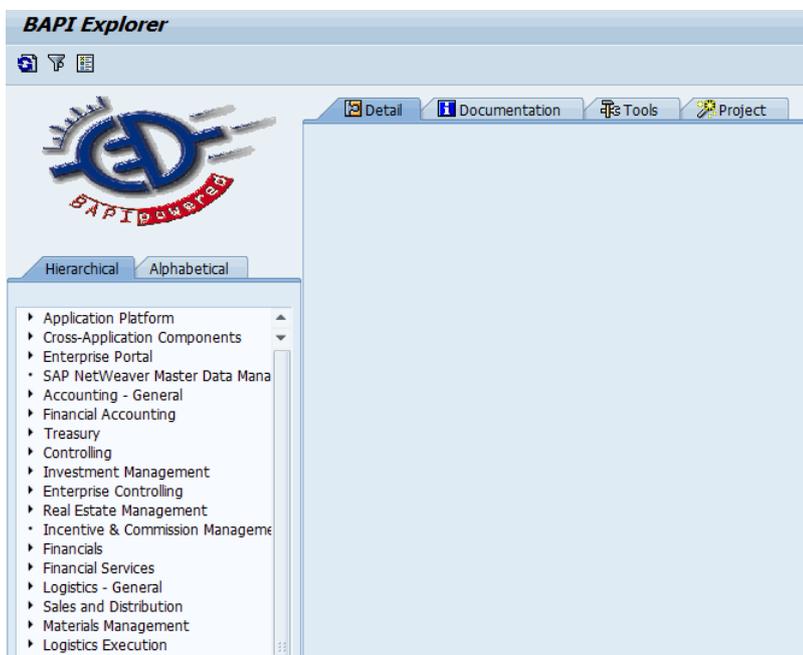
You can find and test Function Modules in SAP in at least two ways:

Use transaction SE37, but difficult to use as a search tool

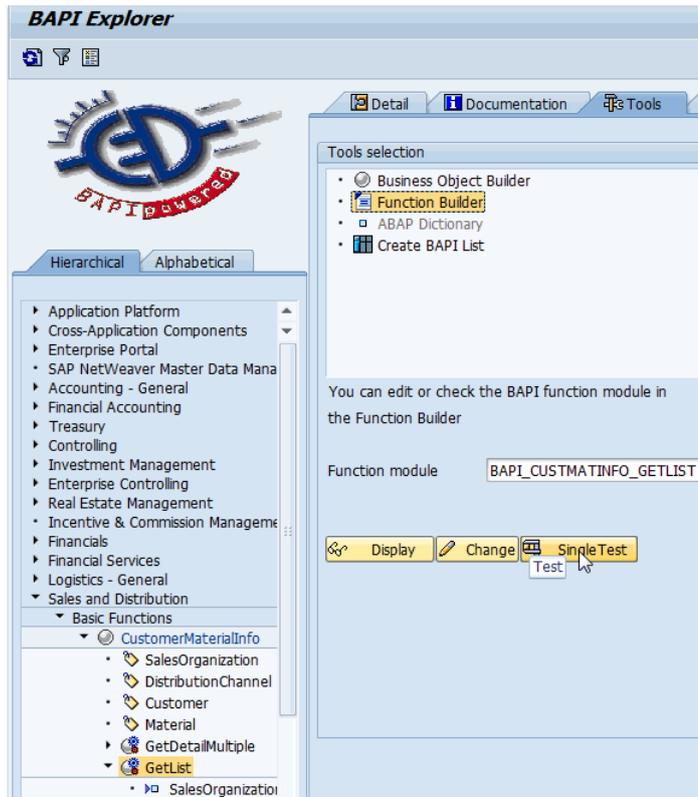
or

use transaction code BAPI to look for available BAPI functions in the SAP system, proceed as follows:

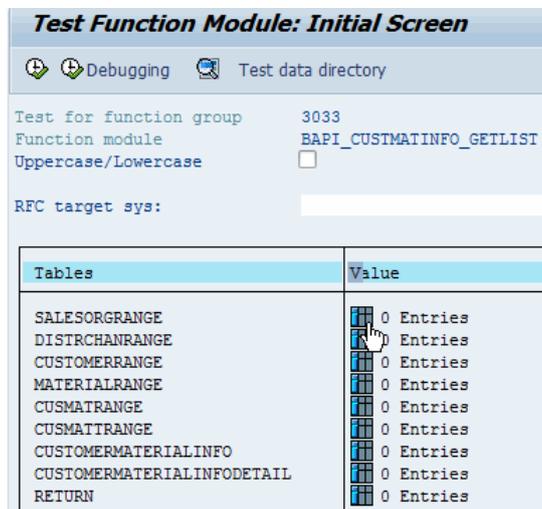
1. The transaction provides an overview of the different areas in the SAP system and the BAPIs that can be used.



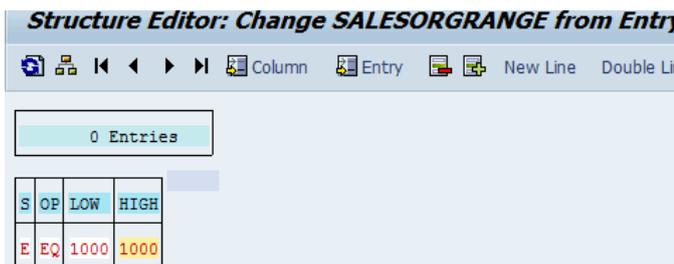
- Select an area and a specific BAPI function for test.



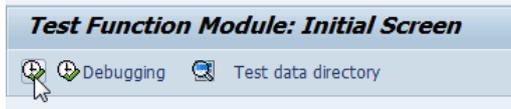
- Click **Single Test** to go to the test of the function screen.



- Enter the values needed to run the function.



- Run the function and wait for the result.



CUSTOMERMATERIALINFO	0 Entries
Result:	24 Entries
CUSTOMERMATERIALINFODETAIL	0 Entries
Result:	24 Entries

Structure Editor: Display CUSTOMERMATERIALINFODETAIL from Entry 1

Column Entry Metadata

24 Entries

SALE	DI	CUSTOMER	MATERIAL	CREATED_BY	CREAT_DATE	SORT_FLD	MAT_NR_CUS	CUS_
1020	22	7778	T-FQ199	HENEKAA	23.12.2002		T-FQ399	Farb
1020	22	7779	T-FQ199	HENEKAA	23.12.2002		T-FQ399	Farb
3000	10	3894	31-M-40	C5055253	04.08.2006		M-40	
3000	10	4130	35-M-40	C5055253	04.08.2006		M-40	
3000	10	4130	M-01	ROSEMANNM	23.02.1999			
3000	10	4130	M-08	ROSEMANNM	23.02.1999			
3000	10	4130	M-10	ROSEMANNM	23.02.1999			
3000	10	CMDS_OEM	CMDS_SUP_MAT	TOMB	15.09.2003		CMDS_OEM_MAT	
3000	10	CMDS_OEM2	CMDS_SUP_MAT	TOMB	15.09.2003		CMDS_OEM_MAT	
3000	10	RFID_CUST	AII_MAT1	I012639	06.04.2006		AII_MAT1	
3000	10	RFID_CUST	AII_MAT2	I012639	06.04.2006		AII_MAT2	
3000	10	RFID_CUST	RFID_CASE1	I012639	06.04.2006		RFID_CASE1	
3000	10	RFID_CUST	RFID_PALLET1	I012639	06.04.2006		RFID_PALLET1	
3000	10	US-CUS9	US-FG1-16G	GRAUENHORST	17.09.2003		US-RAW1	
3020	30	LA0001	64120A-003	LOCKNEY	12.12.2003		CPU CHIP	CHIP
7000	10	BR-S50A00	BR-AS100	DEGASPARE	13.12.2000			
7000	10	BR-S50A00	BR-AS900	DEGASPARE	08.02.2001			

If the result is satisfactory, it can be used in the QlikView script to retrieve the same result.

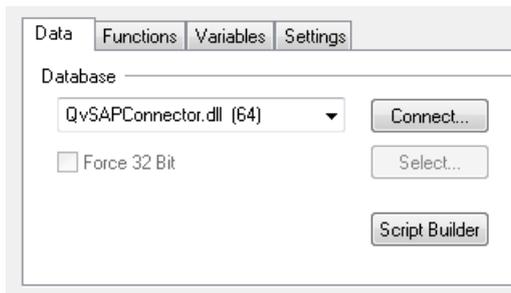
5 Connector clients

5.1 Qlik SAP SQL connector client

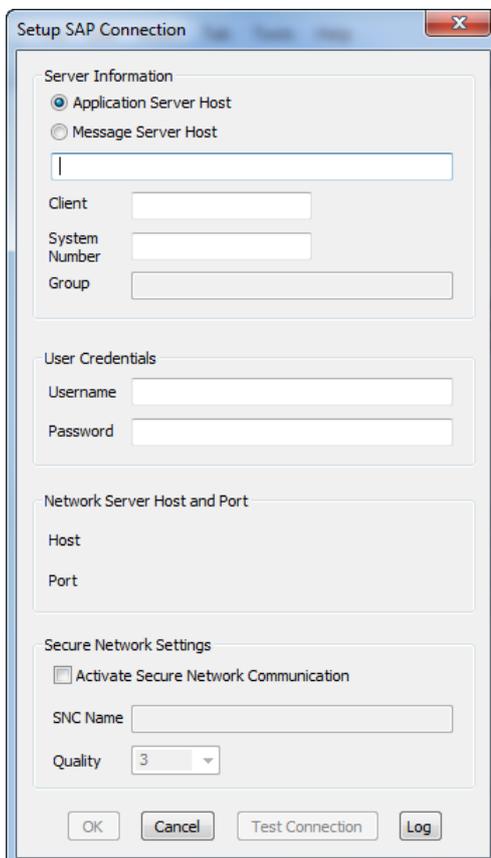
5.1.1 Using the SAP SQL connector

Proceed as follows to start using the SAP SQL connector:

1. Start QlikView.
2. Open the Script Editor.
3. Select the **Data** tab, and then select the `QvSAPConnector.dll` option from the drop-down list.



4. Click **Connect...**
5. Enter the **Application Server Host** address, **Client**, and **System Number** of the target SAP system, or select the **Message Server Host** option and enter the **Message Server Address**, **Client**, **System ID**, and **Group**.



If passing through a message server, an entry may have to be added in the C:\WINDOWS\system32\drivers\etc\services file. Add sapmsxxx 36nn/tcp, where xxx is the system ID and nn is the system number. If it is the last line in the file, add a new line break after the entry.

If passing through an SAP router, paste the router string in the **Host** address field.

In addition, enter the **Username** and **Password** of the user that is to be used for this specific download.

Remember that different users can get different results due to row-based access control.

6. Click **Test Connection** to verify that all fields are correctly filled in.
7. Finally, click **OK** to get a connection string in the script.

Connection string parameters

There are a number of parameters that can be added to the connection string, if needed. Normally, the default values for these parameters are sufficient. Separate parameters with ; (semi-colon) in the connection string:

- ConvRoutine=0/1 (default = 0, on = 1): Indicates that output conversion routines are used. This is commonly used for fields like Material Number (MATNR).
- KeepCasing=0/1 (default/off = 0, but all newly generated connection strings have value 1): Indicates that lowercase characters in the SELECT statement remain lowercase. In previous versions (530 and below), the complete statement is converted to uppercase, thus preventing the use of lowercase characters in Where clause values.
- CheckSeparator=0/1 (default/off = 0): A specific combination of characters is used as field separator in the connector. This combination may occur in a field in the database and cause an error. If that happens, turn on this parameter to make the connector try alternative character combinations. Since this slows down the performance, it is only to be used when necessary.
- Nulldate=0/1 (default/off = 0, but all newly generated connection strings have value 1): If on, date type fields with the value '00000000' are returned as NULL to QlikView.
- RemoveAllBlanks=0/1 (default/off = 0): If on, provides the possibility to get the "old" behavior, where all blanks in fields in SAP containing only blank characters are trimmed. The default behavior leaves one blank character in order to differentiate from NULL fields.
- TargetServer=xxxxxxx: If specified, forces the background job to be executed on the specified application server. The correct name can be found in transaction SM51. The name is case-sensitive.
- JobClass=A/B/C (default = C): Sets the priority for the background job, which can be useful for small jobs that need to be reloaded often.
- BufferPercentage=nn (default = 10): Defines the amount of the free shared memory buffer that can be used by the job. A higher value increases the speed, but also increases the risk for conflicts with other jobs.

Special value 999 for the Bufferpercentage parameter, can now be used to force the Connector to use 10% of the available shared memory, not only a percentage of free shared memory. This should be used if the Connector starts to show deteriorating performance
- TimeOutBatch=n (default = 600 seconds): The number of seconds that the background job waits for the client side to fetch data.

-
- `TimeoutFetch=n` (default = 1200 seconds): The number of seconds spent trying to fetch from SAP without getting any records back.
 - `TimeoutStartBatch=n` (default = 2400 seconds): The number of seconds that the client side waits for the background job to start.
 - `PacketSize=n` (default = 20000): The maximum number of rows that the connector tries to download for each fetch operation. This is re-calculated by the connector and might be reduced automatically, depending of the actual amount of shared memory in the SAP system.
 - `Log=0/1` (default/off = 0, on = 1): If on, writes a log file in the Windows folder:
`C:\Users\{user}\AppData\Local\QlikTech\Custom Data\QvSAPConnector\Log\`
 - `Logpath=xxxx`: Places log files in a subfolder named `xxxx`. The folder is created, if needed. `xxxx` can be any text string that can be a valid part of a folder name in Windows.
 - `LogFile=yyyy`: Names the log file `yyyydate-time-n.txt`. `yyyy` can be any text string that can be a valid part of a filename in Windows.
 - `Trace=0/1` (default/off = 0, on = 1): Turns on/off the trace functionality in SAP programs. The trace information is written in the table `/QTQVC/TRACE`.
 - `BatchJobName=XXX` (default = `/QTQVC/READ_DATA`). `BatchJobName` is the name of the data extraction batch job.
`BatchJobName` can contain up to 32 characters
Can be found in Job Overview (transaction SM37).
 - `RemoveThousandSeparator=0/1` (default/on = 1): If on, removes any kind of thousand separator from the data before sending it to QlikView. Affected data types in SAP are CURR (Currency), QUAN (Quantity) and DEC (Decimal).
 - `ReplaceNullvalue=0/1` (default/on = 1): If on, replaces all 'null' values with ' ' (SPACE) in the data before sending it to QlikView.

5.1.2 Data types in SAP

A field in an SAP database table is assigned to a Data Type. Fields assigned to the following Data Types cannot be downloaded by the SQL connector:

LCHR (Long character string, requires preceding INT2 field)

LRAW (Long byte string, requires preceding INT2 field)

RAWSTRING (Byte String of Variable Length)

5.1.3 ScriptBuilder

ScriptBuilder is a QlikView application, `ScriptBuilder.qvw`, that is used to find tables to download from the SAP system and to generate the script code. We recommend you copy the complete folder to be able to use this application for several SAP systems.

`C:\ProgramData\QlikTech\Custom Data\QvSAPConnector\ScriptBuilder\`

Start with the `ReLoadSAPDD.qvw` application, which downloads data from the data dictionary of the SAP system. Since the content of the dictionary differs for different variants and versions of SAP, this is a necessary first step.

`ReLoadSAPDD.qvw` creates `.qvvd` files that can be loaded to the ScriptBuilder application.

Change the script regarding the connection and language in this application prior to doing a reload.

The Popular Tables and Data Models sheets may refer to tables that do not exist in the version of SAP used.

Detailed usage instructions can be found in the application.

5.1.4 SQL SUBSELECT syntax

The SQL connector has one addition to the standard SAP OPENSQL syntax, `SUBSELECT`. This addition has been developed since `JOIN` or `SUBSELECT` cannot be done with cluster tables. Quite often this is required for tables like `BSEG` or `KONV` in order to do delta loads.

Note that the `SUBSELECT` method cannot be used, if the row-based security concept of the Qlik SAP SQL connector is activated.

The result of the select from the main table is temporarily stored in the ABAP program in an internal table. There is a size limitation to internal tables, so try to avoid `SELECT *` – only select the fields necessary.

The syntax of `SUBSELECT` in the QlikView script is as follows:

```
SQL SUBSELECT BUKRS BELNR GJAHR BUZEI BUZID AUGDT FROM BSEG WHERE BUKRS BELNR GJAHR IN
( SELECT BUKRS BELNR GJAHR FROM BKPF WHERE BLDAT GE '20070101' );
```

Only one `SUBSELECT` is allowed (within the parenthesis).

The `SUBSELECT` can have condition(s).

One or many comparison fields can be passed.

If the `SELECT` of the sub-table returns duplicates, they are removed before selecting from the main table. So, there is no need (and it does not work) to use the `DISTINCT` addition to the `SUBSELECT`.

The comparison field or fields has to match between main and `SUBSELECT`. The field names of the comparison fields do not have to be the same in the main and `SUBSELECT`, but the corresponding fields (of main and `SUBSELECT`) must have the same data types.

To achieve good performance, it is important to provide as many of the key fields in the main table as possible. Try to select them from the sub-table. The most important item to provide is the first key field (after client).

If the `SUBSELECT` fails, the reason can often be found in the log for the job `/QTQVC/READ_DATA` in transaction `SM37`.

Other examples of `SUBSELECT` statements:

```
SQL SUBSELECT KDATU KAWRT KBETR WAERS FROM KONV WHERE KNUMV IN ( SELECT KNUMV FROM VBRK
);
```

```
SQL SUBSELECT CHANGENR TABNAME TABKEY FNAME CHNGIND VALUE_NEW VALUE_OLD FROM CDPOS
WHERE OBJECTCLAS OBJECTID CHANGENR IN ( SELECT OBJECTCLAS OBJECTID CHANGENR FROM CDHDR
WHERE CHANGENR BETWEEN '0000100000' AND '0000300000' );
```

5.1.5 SAP SQL connector log

The SAP SQL Connector Log is a QlikView application that analyzes the usage of the SQL connector and shows the security setup.

The log is located in:

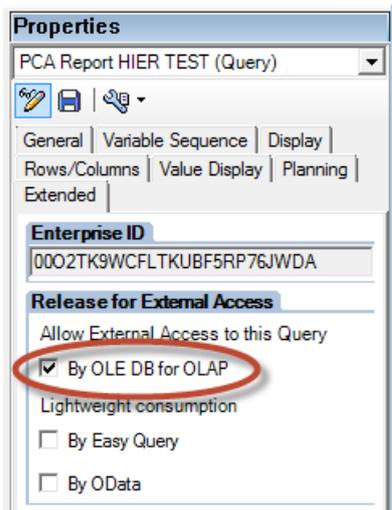
```
C:\ProgramData\QlikTech\Custom Data\QvSAPConnector\SAPConnectorLog
```

Start by adding a connection string to the script and then do a reload from the SAP system.

5.2 Qlik SAP OLAP connector client

5.2.1 Accessing BEx queries

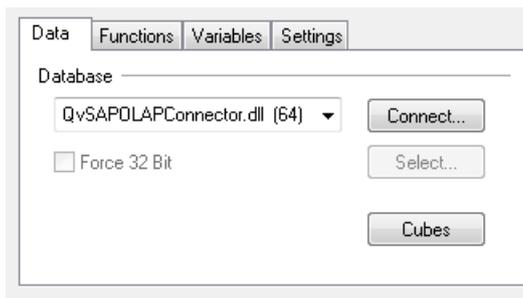
To access BEx queries through the OLAP interfaces, they need to have the following property set in the BEx Query Designer (differs slightly between BEx versions).



5.2.2 Using SAP OLAP connector

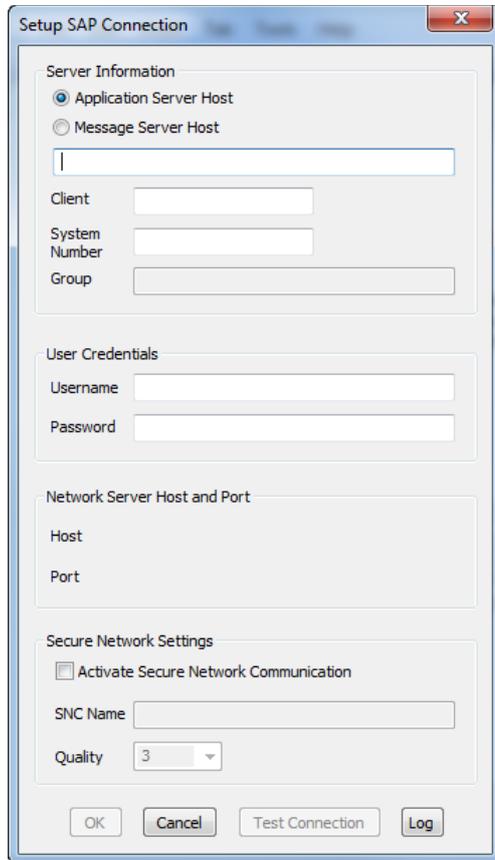
Proceed as follows to start using the SAP OLAP connector:

1. Start QlikView.
2. Open the Script Editor.
3. Select the **Data** tab, and then select the `QvSAPOLAPConnector.dll` option from the drop-down list.



4. Click **Connect...**

5. Enter the **Application Server Host** address, **Client**, and **System Number** of the target SAP system, or select the **Message Server Host** option and enter the **Message Server Address**, **Client**, **System ID**, and **Group**.



If passing through a message server, an entry may have to be added in the `C:\WINDOWS\system32\drivers\etc\services` file. Add `sapmsxxx 36nn/tcp`, where `xxx` is the system ID and `nn` is the system number. If it is the last line of the file, add a new line break after the entry.

If passing through an SAP router, paste the router string in the **Host** address field.

In addition, enter the **Username** and **Password** of the user that is to be used for this specific download.

6. Click **Test Connection** to verify that all fields are correctly filled in.
7. Finally, click **OK** to get a connection string in the script.

Connection string parameters

There are a number of parameters that can be added to the connection string, if needed. Normally, the default values for the parameters are sufficient. Separate parameters with ; (semi-colon) in the connection string:

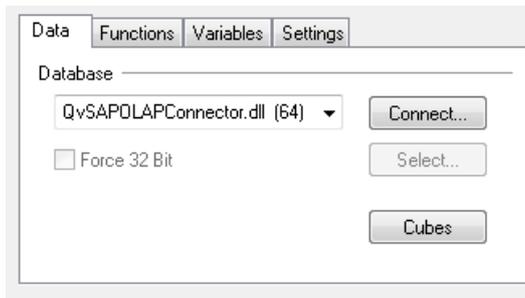
- `Log=0/1` (default/on = 1, off = 0): If on, a log file is created in the Windows folder:
`C:\Users\{user}\AppData\Local\QlikTech\Custom Data\QvSAPConnector\Log\`
- `Logpath=xxxx`: Places log files in a subfolder named `xxxx`. The folder is created, if needed. `xxxx` can be any text string that can be a valid part of a folder name in Windows.
- `LogFile=yyyy`: Names the log file `yyyydate-time-n.txt`. `yyyy` can be any text string that can be a valid part of a filename in Windows.

- `Lang= (EN/DE...)`: The logon user's default language is used by default. For available languages, see table T005. If texts have to be downloaded in multiple languages, the relevant info objects have to be downloaded with separate connection strings.
- `ConsistencyCheck=0/1` (default/on = 1): If on, optimization is done for maximum speed. If this fails due to inconsistent metadata, change this parameter to off and retry.
- `PartitionSize=nnnnnnn` (default = 4000000): Increasing this parameter increases the speed, but also the risk of getting dumps in the SAP system. If many dumps are received, adjust this parameter downwards. In most cases, the download recovers.
- `MinMembersInSlicedCharacteristic=nn` (default = 10): Automatic slicing only chooses among characteristics that have more members than this value. In odd cases, no other suitable characteristic is available, which means this value might have to be lowered.

5.2.3 Defining a query

Proceed as follows to define a query:

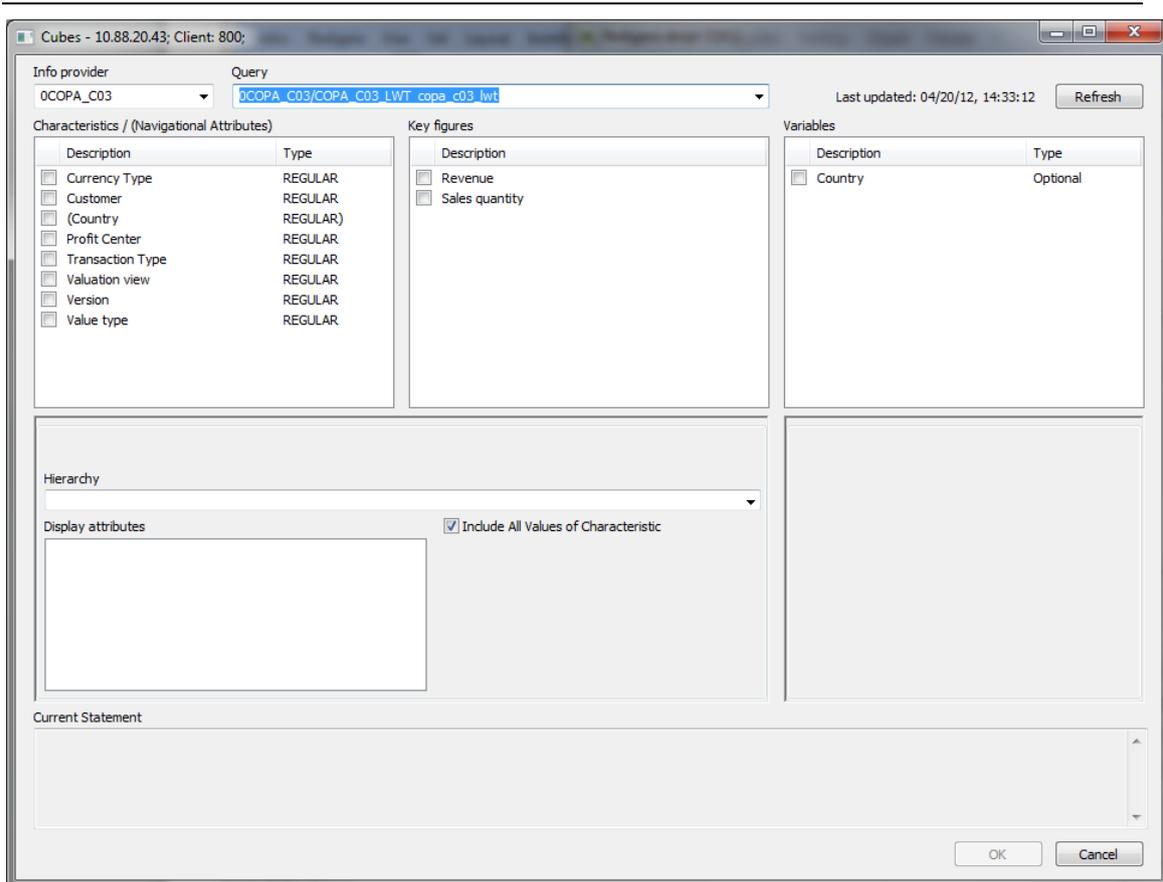
1. Click **Cubes** in the Script Editor.



2. Select an InfoCube in the **Info provider** drop-down list.

The drop-down lists all cubes that have at least one query that allows external access (see the restriction above).

Note: The first item in the drop-down is \$INFOCUBE, which is a top level for all InfoCubes in the system. \$INFOCUBE should not be selected as the Query list then displays Infoproviders instead of queries. Selection of Infoproviders by this means is not supported. You must select an InfoProvider in the drop down list.



3. Select a query in the **Query** drop-down list.

The drop-down lists all queries (that allow external access) built on the selected cube.

4. Select at least one characteristic (or navigational attribute) in the **Characteristics** box to get any rows downloaded. A key figure does not have to be selected.

When selecting a characteristic, the bottom part of the window is populated. If there is more than one hierarchy, select one of them (since only one hierarchy/characteristic can be downloaded). Additional display attributes for the characteristic can also be selected. The default attribute is always downloaded.

Uncheck the **Include All Values of Characteristic** box to display the possible values for the members of the characteristic. Selecting a value generates a slice (filter) with that value. If the box is checked, all members of the characteristic are downloaded.

The **Variables** box contains any variables defined for the selected query. These can be *Optional* or *Mandatory*, *Single-value* or *Ranges*. *Mandatory* variables must be populated.

The generated pseudo-MDX statement can be manipulated manually, but this is generally to be avoided.

```
Select PseudoMDX (
Dimensions (
[0APO_PROD] (),
[0CUSTOMER] (),
[0MATERIAL] (),
[0CALWEEK] ()),
Measures (
[64381YV80FHCMZ26ZQQD1003D].[7A9LKMEDKUB9T6IKWEQ73C3PV], //Base Sales Quantity
[64381YV80FHCMZ26ZQQD1003D].[CD68DKVB8003MALOSAICC8R6F], //Cost of Sales
[64381YV80FHCMZ26ZQQD1003D].[AEAIWVOIFO6I466U6IDWVT3D8], //Discount 1
[64381YV80FHCMZ26ZQQD1003D].[7UBTSBFL7JOPKTEUVINKD4TX6], //Ind. Sales Costs
```

```

[64381YV80FHCMZ26ZQQD1003D].[ETLOUTKELIRDGUSQNJ5CVLRS5], //Net sales
[64381YV80FHCMZ26ZQQD1003D].[CJQ2FSM751JT7SSRRFJ0T8ICL], //Planning Status
[64381YV80FHCMZ26ZQQD1003D].[9X0UTMFZ5VWQT208HAJSLV3QM], //Revenue
From (0CSAL_C02/LWT1));
//*****

```

Note: If using a big volume cube or a BEx query with number key figures, the load has to be split into several loads. Start by separating the characteristics and the key figures into separate qvd files and combine them in QlikView.

5.2.4 Optimizing a query

If dumps are produced in the SAP system or if the performance is slow, there are a number of performance improvements that can be implemented.

By default, the connector suggests the "D" (direct) parameter in the script. This is only intended for small amounts of data, since no slicing is performed.

```

Select PseudoMDX D (
Dimensions (
[BUD_CTRY] (),
[BUD_LOC] (),
[BUD_PROD] (),
[BUD_SECT] (),
[OCALMONTH] ()),
Measures (
[3ZAJ9QPTM5D8U5L9A1RCNSWWE].[05N6UOUENHI2PSWMWNWV0HQS0],
[3ZAJ9QPTM5D8U5L9A1RCNSWWE].[6VMTYSJE733GVSGXA7WME01WO],
[3ZAJ9QPTM5D8U5L9A1RCNSWWE].[AN043YDNYQQUUJIIW73G7SLCX],
[3ZAJ9QPTM5D8U5L9A1RCNSWWE].[AYC6O2WD0MJ1CXERY8AHAKUVC]),
From (ZBUD_CUBE/ZZBUD_LWT));

```

If "D" is removed, automatic slicing is performed. Automatic slicing only works for queries that have an InfoCube as InfoProvider.

The automatic method primarily uses a time characteristic for slicing. If this fails or is missing, the largest characteristic is used instead. If this fails or is too slow, the connector can be forced to slice on a specific characteristic by using the "S" parameter. Check the connector log file for details when the job has failed.

```

Select PseudoMDX (
Dimensions (
[BUD_CTRY] (),
[BUD_LOC] S (),
[BUD_PROD] (),
[BUD_SECT] (),
[OCALMONTH] ()),
Measures (
[3ZAJ9QPTM5D8U5L9A1RCNSWWE].[05N6UOUENHI2PSWMWNWV0HQS0],
[3ZAJ9QPTM5D8U5L9A1RCNSWWE].[6VMTYSJE733GVSGXA7WME01WO],
[3ZAJ9QPTM5D8U5L9A1RCNSWWE].[AN043YDNYQQUUJIIW73G7SLCX],
[3ZAJ9QPTM5D8U5L9A1RCNSWWE].[AYC6O2WD0MJ1CXERY8AHAKUVC]),
From (ZBUD_CUBE/ZZBUD_LWT));

```

To improve performance, it is also possible to download the characteristics and key figures in one load and create separate loads for each characteristic with its attributes and hierarchies. If these separate loads are stored in QVD files, they can be easily merged together using the KEY field of the characteristic:

```

//*** Load Characteristics and Key Figures
LOAD [Country - Country Level 01 (Text)],
[Country - Country Level 01 (Key)],
// [Location - Location Level 01 (Text)],
[Location - Location Level 01 (Key)],
mid([Location - Location Level 01 (Key)],index([Location - Location Level 01

```

```

(Key)],'.[')+1) as [Location_Key], // link to Region hierarchy bottom level
    [Month - Month Level 01 (Text)],
[Month - Month Level 01 (Key)],
[Organization - Organization Level 01 (Text)],
[Organization - Organization Level 01 (Key)],
//    [Product - Product Level 01 (Text)],
        [Product - Product Level 01 (Key)],
mid([Product - Product Level 01 (Key)],index([Product - Product Level 01
(Key)],'.[')+1) as [Product_Key],
[Sector - Sector Level 01 (Text)],
[Sector - Sector Level 01 (Key)],
//    [Calendar Year/Month - Calendar Year/Month Level 01 (Text)],
        [Calendar Year/Month - Calendar Year/Month Level 01 (Key)],
Factor, Cost, Budget, Revenue
FROM D:\Testing\5.2\olap\ZBUD_CUBE_Measures.qvd (qvd);

/** Load Region Hierarchy and Display attributes
LOAD [Location - Regions Level 01 (Text)],
[Location - Regions Level 01 (Key)],
"Location - Regions Level 01 - [1BUD_LOC]",
"Location - Regions Level 01 - [2BUD_LOC]",
"Location - Regions Level 01 - [4BUD_LOC]",
"Location - Regions Level 01 - [5BUD_LOC]",
[Location - Regions Level 02 (Text)],
[Location - Regions Level 02 (Key)],
"Location - Regions Level 02 - [1BUD_LOC]",
"Location - Regions Level 02 - [2BUD_LOC]",
"Location - Regions Level 02 - [4BUD_LOC]",
"Location - Regions Level 02 - [5BUD_LOC]",
[Location - Regions Level 03 (Text)],
[Location - Regions Level 03 (Key)],
mid([Location - Regions Level 03 (Key)],index([Location - Regions Level 03
(Key)],'.[')+1) as [Location_Key], // link to Location
    "Location - Regions Level 03 - [1BUD_LOC]",
"Location - Regions Level 03 - [2BUD_LOC]",
"Location - Regions Level 03 - [4BUD_LOC]",
"Location - Regions Level 03 - [5BUD_LOC]"
FROM D:\Testing\5.2\olap\ZBUD_CUBE_BUD_LOC.qvd (qvd);
LOAD [Product - Product Hierarchy Level 01 (Text)],
[Product - Product Hierarchy Level 01 (Key)],
"Product - Product Hierarchy Level 01 - [1BUD_PROD]",
"Product - Product Hierarchy Level 01 - [2BUD_PROD]",
[Product - Product Hierarchy Level 02 (Text)],
[Product - Product Hierarchy Level 02 (Key)],
mid([Product - Product Hierarchy Level 02 (Key)],index([Product - Product Hierarchy
Level 02 (Key)],'.[')+1) as [Product_Key], // Link to Product
    "Product - Product Hierarchy Level 02 - [1BUD_PROD]",
"Product - Product Hierarchy Level 02 - [2BUD_PROD]"
FROM D:\Testing\5.2\olap\ZBUD_CUBE_BUD_PROD.qvd (qvd);
LOAD
[Calendar Year/Month - Calendar Year/Month Level 01 (Text)],
[Calendar Year/Month - Calendar Year/Month Level 01 (Key)], // link to Calendar
Year/Month
    "Calendar Year/Month - Calendar Year/Month Level 01 - [20CALMONTH]",
"Calendar Year/Month - Calendar Year/Month Level 01 - [20CALMONTH2]",
"Calendar Year/Month - Calendar Year/Month Level 01 - [20CALYEAR]",
"Calendar Year/Month - Calendar Year/Month Level 01 - [20DATEFROM]",
"Calendar Year/Month - Calendar Year/Month Level 01 - [20DATETO]",
"Calendar Year/Month - Calendar Year/Month Level 01 - [20NUMDAY]",
"Calendar Year/Month - Calendar Year/Month Level 01 - [20NUMWDAY]"
FROM D:\Testing\5.2\olap\ZBUD_CUBE_0CALMONTH.qvd (qvd);

```

5.2.5 Delta loads

A special template, `OLAP_delta.qvw`, has been produced as an example of how delta loads can be performed. The procedure is described in a separate document, `OLAPDeltaLoad.doc`. Both can be downloaded from the QlikCommunity user group **SAP** under **Documents**.

Note: If the Infocube have a large amount of data or many dimensions or a lot of restricted/calculated Key Figures a load could timeout.

5.3 Qlik SAP BEx connector client

The BEx connector was initially released with the 5.90 release of the QV SAP connectors. The purpose of the connector is to enable extraction of data from BEx queries in SAP BW.

Both the BEx and the OLAP connector can be used to extract data from BEx queries to QlikView. The difference is the functionality in SAP that is used for query execution.

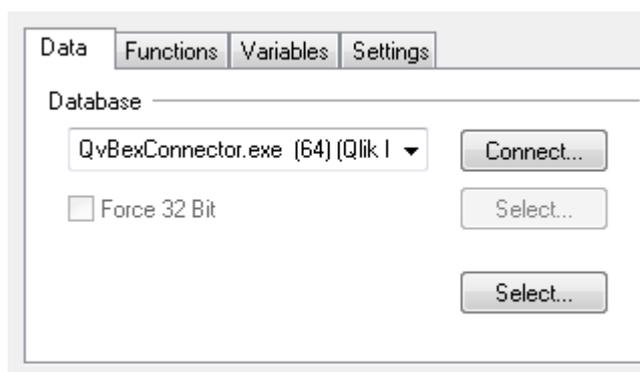
The BEx connector utilizes the BEx query execution functionality that uses the BICS (BI Consumer Services). The OLAP connector formulates an MDX-query and sends it to the MDX interface (MDX BAPI), see section 5.2.

The use of BICS enables the BEx connector to support time dependency in query variables and attributes. It also enables all built in SAP query optimization alternatives to be used. BICS also offers faster query execution than MDX resulting in faster loading of data from SAP to QlikView.

5.3.1 Using the SAP BEx connector

Proceed as follows to use the SAP BEx connector:

1. Start QlikView.
2. Open the Script Editor.
3. Select the Data tab, and then select the QvBexConnector.exe option from the drop-down list.

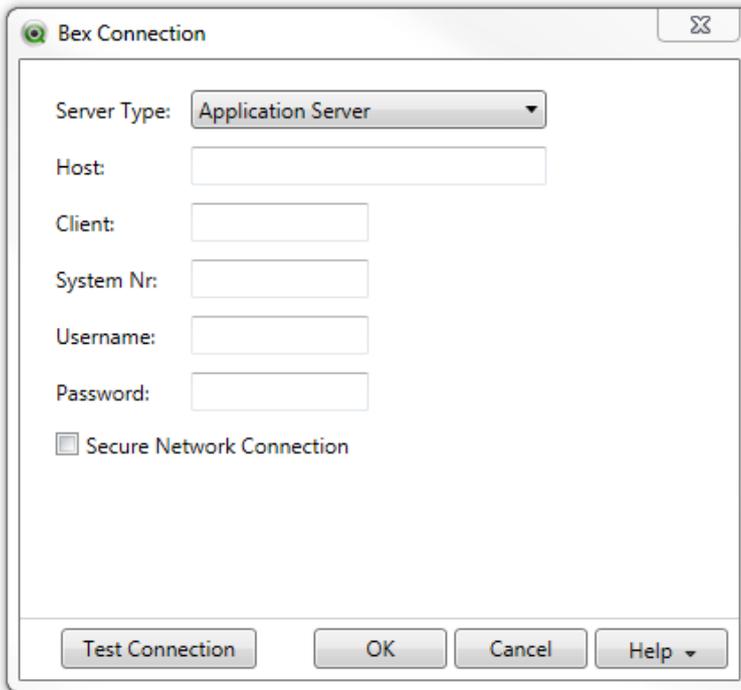


4. Click **Connect...**

-
5. Select the **Server Type**.

*Note: Do not change the **Server Type** once you start to edit the remaining fields as a connection error may result. If this is the case close the **Connect...** dialog and restart the script editor.*

6. Enter the **Host** address, **Client**, and **System Nr** of the target SAP system, or select the **Message** server host option and enter the Message **Host** address, **Client**, **System ID**, and **Group**.



In addition, enter the **Username** and **Password** of the user that is to be used for this specific download.

7. Click **Test Connection** to verify that all fields are correctly filled in.
8. Finally, click **OK** to get a connection string in the script.

There is a default value for a general timeout included in the connection string: "Timeout=3600".

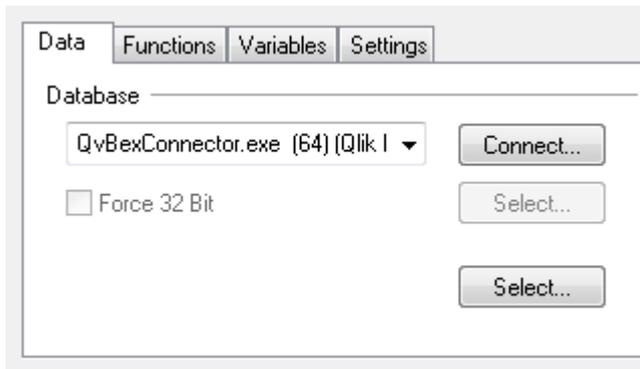
This value is in seconds and can be changed if needed.

5.3.2 Defining a query

Before executing a query for use with the SAP BEx connector, check that the query will complete successfully in the SAP system. Running a query that fails in the SAP system can cause Qlikview to fail.

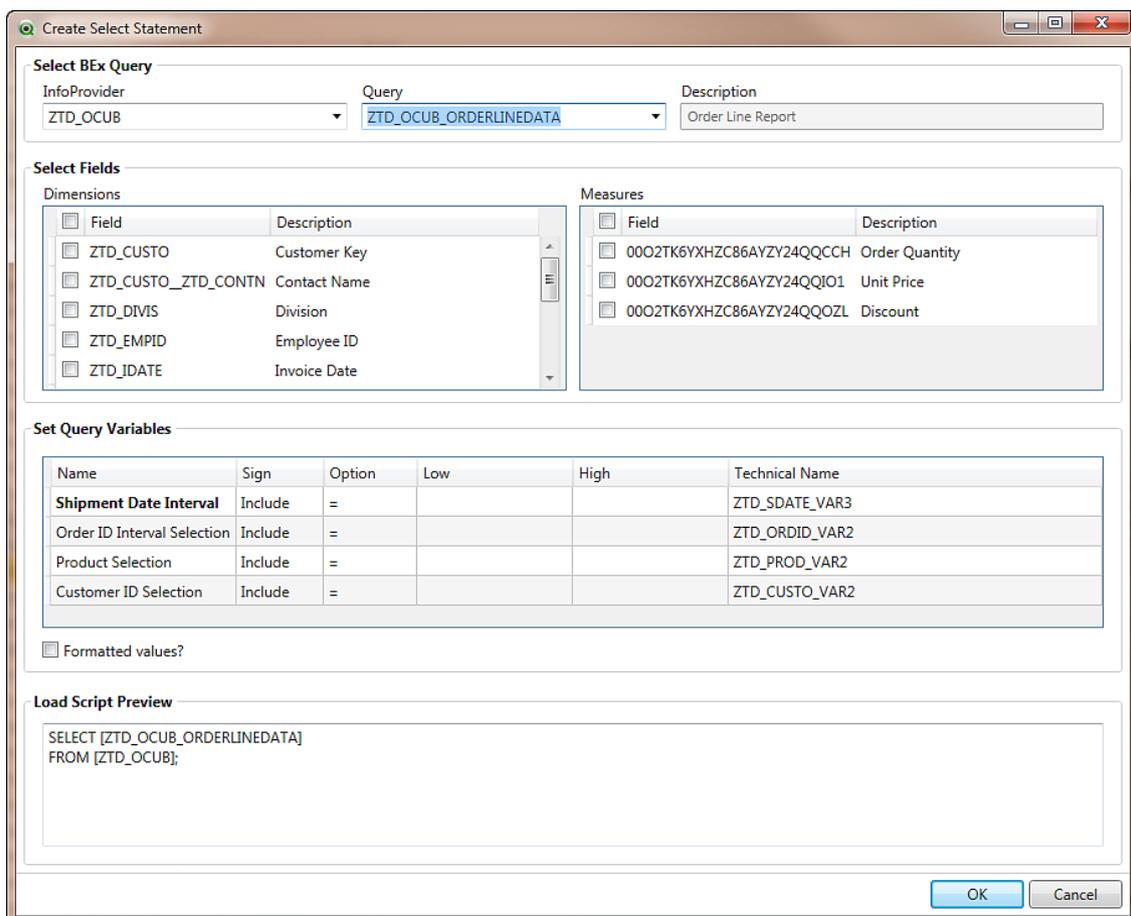
Proceed as follows to define a query:

1. Click **Select** in the Script Editor.



2. Select an Info provider in the **Infoprovider** drop-down list.

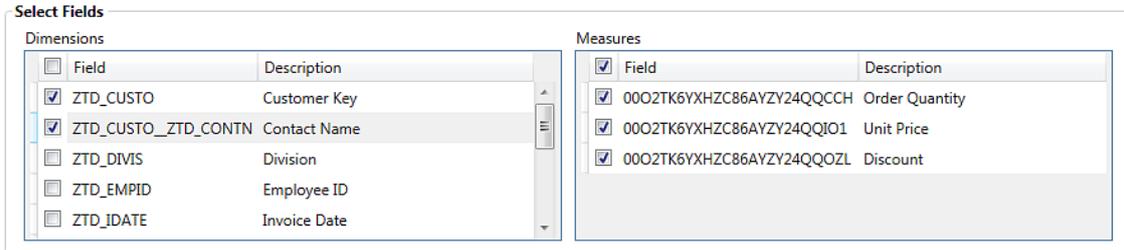
The drop-down lists all providers that have at least one query that allows external access. The name of the Infoprovider can also be entered in the field. The name is filtered as each character is typed.



3. Select a query in the **Query** drop-down list.

The drop-down lists all queries that are in the BW system.

- Select the **Dimensions** and **Measures** that are required. These are added to the script in the Load Script Preview pane at the bottom of the selection dialog.



In order to make the script loadable, at least one dimension must be selected. If one or more dimensions are selected, then at least one of the dimensions must be in either rows or columns. The dimensions cannot all be free characteristics.

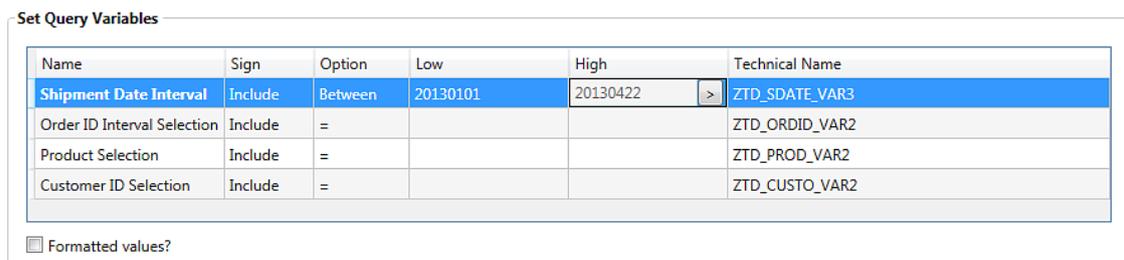
The selected dimension cannot be a navigational attribute that is a free characteristic, otherwise the load will fail. The dimension can be a navigational attribute, if the navigational attribute is placed in the Rows section of the query, and it can be a free characteristic if the free characteristic is not a navigational attribute.

If the BEx query contains a Structure, the Structure will always be included in the result set even though it is not selected as a dimension.

To keep the intended result of exception aggregation, the dimension selection must be the same as in the BEx query rows section (no free characteristics and all dimensions in the rows must be selected in the load script).

Variable names for measures are not supported (the measure will be named with the variable name instead of what the variable would return at execution)

- Set the query variable attributes in the **Set Query Variables** fields. The fields contain the variables defined for the selected query. The **Sign**, **Option**, **Low** and **High** fields contain drop-down menus (where applicable) for defining the selected variable.



Mandatory variables in the query must be populated, otherwise there will be an ABAP runtime error in SAP (visible in transaction ST22) when the QV script is executed. A syntax check is performed in QV to ensure that the mandatory variables are populated, so the user must ensure this when creating the load script. Mandatory variables are marked with bold text and placed at the top of the list of variables in the Set Query Variables section.

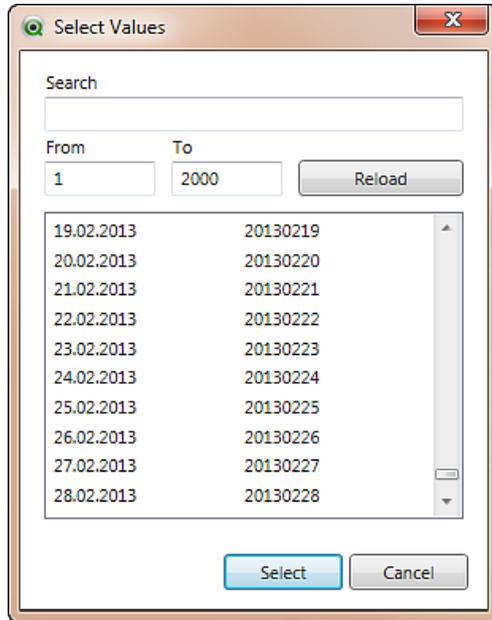
Variables placed in the Default Values section of the BEx query will not be listed in the variables list. To include these in the variables list they must be moved to the Characteristic Restrictions section in the BEx query.

Time dependency

If the query contains a time dependent hierarchy with a date variable or a Key Date, those time variables will be listed in the variables section. If the query contains more than one variable that is used for defining time dependency, the variables will be linked to each other and set to the

same date independent of which one is changed. The date that will be used as default, if Key Date is not actively changed, is today's date. Transfer of explicit values for Key Date, that are set in the BEx query, is not supported.

- To enter attributes click twice on the field. Click on the > button to open up the Select values dialog.



Values can be selected by either entering the value in Search, or by scrolling through the list. If the required value does not fall within the default value range (1 – 2000), the **From** and **To** values can be adjusted.

- Click **Select** to add the variable value to the selected field.

Where a single value variable is to be defined, only one value can be selected in the dialog. If the variable allows multiple values then more than one value can be selected in the dialog. The values will be added to the variable and be visible in the final script.

Where the variable requires an interval to be defined then the **Option** field must be changed to **Between**, otherwise the variable will be set to the Low value only, that is, no interval.

By ticking the **Formatted Values** check-box, all selected measures will have unit or currency incorporated in the loaded data. This means that the data will be interpreted as text and cannot be used for calculations, and so on. See the following example:

Customer nu...	Customer Name	Account group	Quantity	Sales for the ...	10% of Sales
1000007	Caesar Prince		2,000 KG	\$ 24,00	\$ 2,40
1000016	Conan Roy		1,000 KG	83,00 DKK	3,40 SEK
1000022	Dustin Haynes		1,000 KWH	86,00 DKK	8,30 DKK
1000040	Flynn Cruz		1,000 PC	84,00 NOK	8,40 NOK
1000085	Kibo Horn		2,000 KWH	34,00 SEK	8,60 DKK
1000001	Abraham Beasley		2,000 PC	89,00 DKK	\$ 1,00

- Once the variables have been defined, click **OK** to add the query to the load script.

If the **Formatted Values** check box is left unchecked, the measures in the load script can be defined as either Unit or Currency and the script contains both lines required for the definitions. See the following example:

```
LOAD
[OCUSTOMER] as [Customer number],
[ZCUSTNAME] as [Customer Name],
[0002TK6YXHZAI448BA392KKZF] as [Quantity],
[0002TK6YXHZAI448BA392KRAZ] as [Sales for the Period],
```

```
[0002TK6YXHZAI448BA392KXMJ] as [10% of Sales],
[0002TK6YXHZAI448BA392L3Y3] as [10% of Quantity],
[CURRENCY001] as [CURRENCY001 Quantity],
[UNIT001] as [UNIT001 Quantity],
[CURRENCY002] as [CURRENCY002 Sales for the Period],
[UNIT002] as [UNIT002 Sales for the Period],
[CURRENCY003] as [CURRENCY003 10% of Sales],
[UNIT003] as [UNIT003 10% of Sales],
[CURRENCY004] as [CURRENCY004 10% of Quantity],
[UNIT004] as [UNIT004 10% of Quantity];
```

Comment out the lines that are not required.

Default values

Optional variables with default values will still be filtered on the default values, even if the variable has been removed from the script. The default values will be overridden if another value is entered for the variable. To completely remove the filtering from the default values, remove everything but the variable name from the script:

With default values :

```
[NAME=Z_INT_DEF_OPT_ZROWNBR, SIGN=I, OPTION=BT, LOW=0000000001, HIGH=0000000100]
```

Default values removed:

```
[NAME=Z_INT_DEF_OPT_ZROWNBR]
```

Text fields

Uncommenting rows for TEXT fields, see the following example:

```
// Uncomment appropriate lines and move the semicolon
// to load TEXT data for the dimensions that are known
// to include texts:
//[0CHRT_ACCTS__TEXT] as [Chart of accounts TEXT],
//[0CO_AREA__TEXT] as [Controlling area TEXT],
//[0GL_ACCOUNT__TEXT] as [G/L Account TEXT],
//[0GL_ACCOUNT__0INCST_FLAG__TEXT] as [Indicator: Balance Sheet Account TEXT],
//[0PROFIT_CTR__TEXT] as [Profit Center TEXT],
//[0FISCYEAR__TEXT] as [Fiscal year TEXT],
//[0CURRENCY__TEXT] as [Currency key TEXT];
```

Some dimensions have key and text fields, and some have only key fields (not known when the load script is generated). The default is only key fields. Inclusion or exclusion of compounded InfoObjects in the dimension selection will also affect the extracted texts. To access the text field of a dimension, uncomment the Dimension_Name_TEXT line in the load script (or remove the whole load statement that renames the fields and see what the query returns).

If the load script contain fields that are not loaded (that is, if the user uncomments a TEXT field that does not exist) the load executions will result in an error.

Non Navigational Attributes

Non Navigational Attributes are not listed among the dimensions. These have to be added manually to the script.

In the load statement part of the script add a line with the syntax:

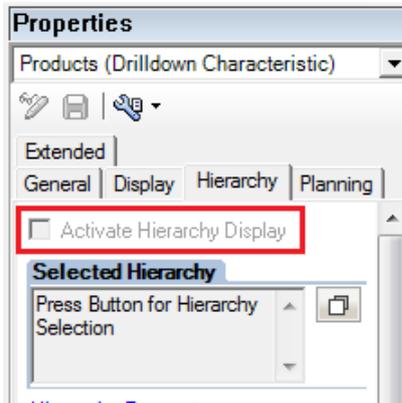
```
[InfoObjectName_AttributeName],
```

So if the desired attribute is the 0MANUFACTOR of info-object 0MATERIAL, the line would look like this:

```
[0MATERIAL_0MANUFACTOR] as [Manufacturer],
```

Hierarchical data

The data is returned as flat data to QlikView. This means that if a dimension is set to hierarchical display, the nodes and leaves will be in the same dimension when extracted to QlikView. To avoid node-names in the dimensions, set the Activate Hierarchy Display option, in BEx query designer, to unchecked:



To preserve the hierarchy display of the data, load the hierarchy separately using the Qlik SAP Extractor connector and join the data by altering the QlikView script (see section 5.7.3).

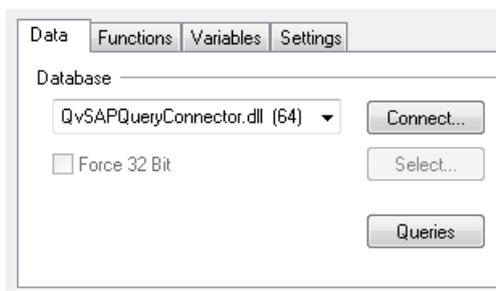
5.4 Qlik SAP Query connector client

5.4.1 Using SAP Query connector

It is strongly recommended to test the query in transaction SQ01 prior to testing it via QlikView. If the query prompts for variable input, create a variant of the query with pre-defined values for the variables.

Proceed as follows to start using the query connector:

1. Start QlikView.
2. Open the Script Editor.
3. Select the **Data** tab, and then select the `QvSAPQueryConnector.dll` option from the drop down list.



4. Click **Connect...**

5. Enter the **Application Server Host** address, **Client**, and **System Number** of the target SAP system, or select the **Message Server Host** option and enter the **Message Server Address**, **Client**, **System ID**, and **Group**.

If passing through a message server, an entry may have to be added in the `C:\WINDOWS\system32\drivers\etc\services` file. Add `sapmsxxx 36nn/tcp`, where `xxx` is the system ID and `nn` is the system number. If it is the last line of the file, add a new line break after the entry.

If passing through an SAP router, paste the router string in the **Host** address field.

In addition, enter the **Username** and **Password** of the user that is to be used for this specific download.

6. Click **Test Connection** to verify that all fields are correctly filled in.
7. Finally, click **OK** to get a connection string in the script.

Connection string parameters

There are a number of parameters that can be added to the connection string, if needed. Normally, the default values for the parameters are sufficient. Separate parameters with ; (semi-colon) in the connection string:

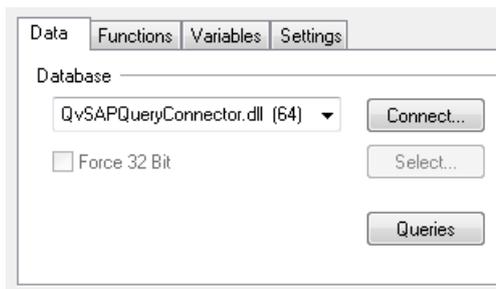
- `Log=0/1` (default/on = 1, off = 0): If on, a log file is created in the Windows folder:
`C:\Users\{user}\AppData\Local\QlikTech\Custom Data\QvSAPConnector\Log\`
- `Logpath=xxxx`: Places log files in a subfolder named `xxxx`. The folder is created, if needed. `xxxx` can be any text string that can be a valid part of a folder name in Windows.

- **LogFile=yyyy:** Names the log file `yyyydatetime-n.txt`. `yyyy` can be any text string that can be a valid part of a filename in Windows.
- **Lang= (EN/DE...):** The logon user's default language is used by default. For available languages, see table T005. If texts have to be downloaded in multiple languages, the relevant info objects have to be downloaded with separate connection strings.

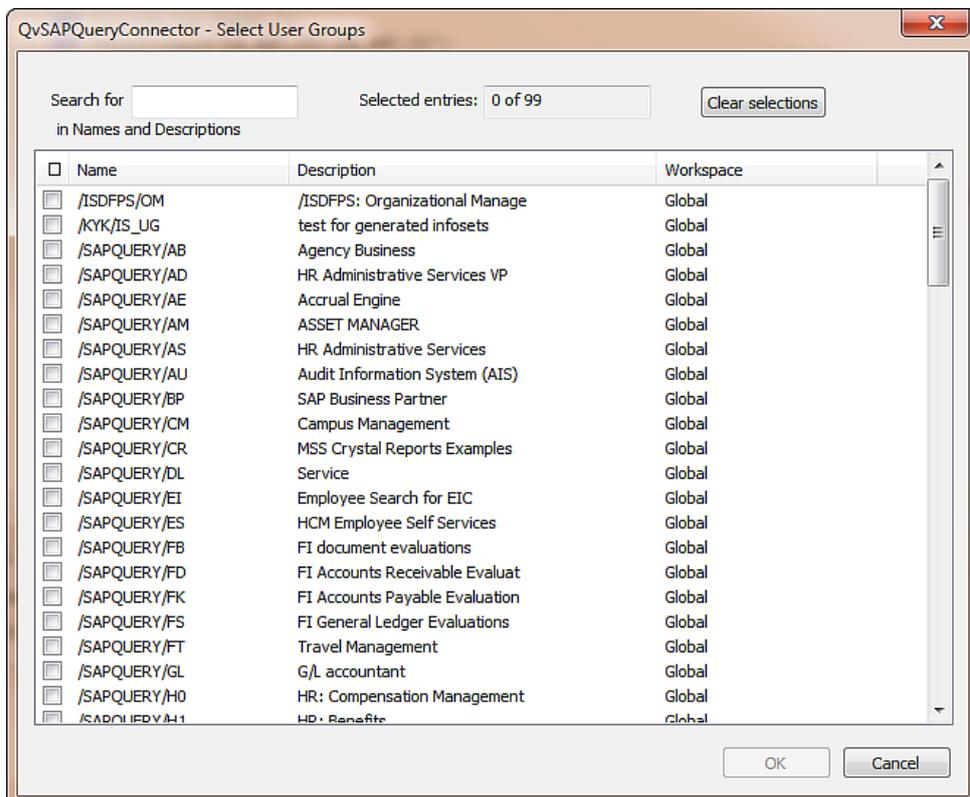
5.4.2 Defining a query

Proceed as follows to define a query:

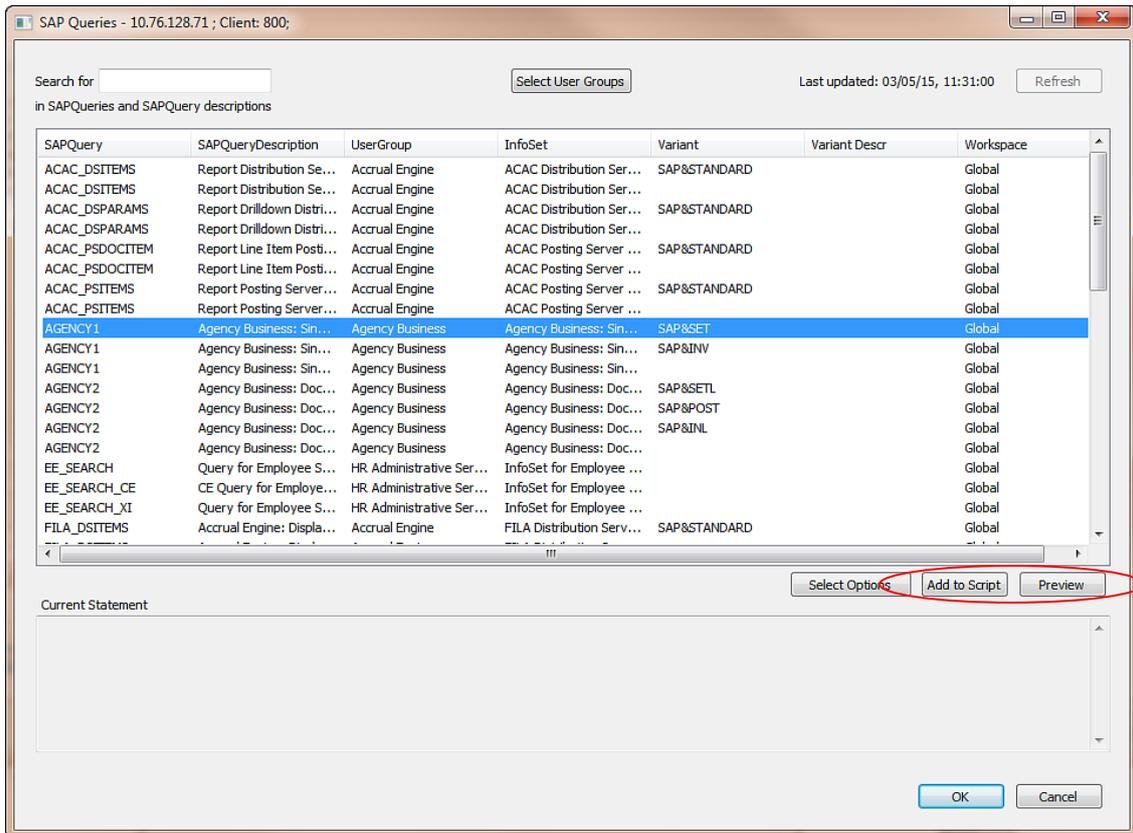
1. Click **Queries** in the Script Editor.



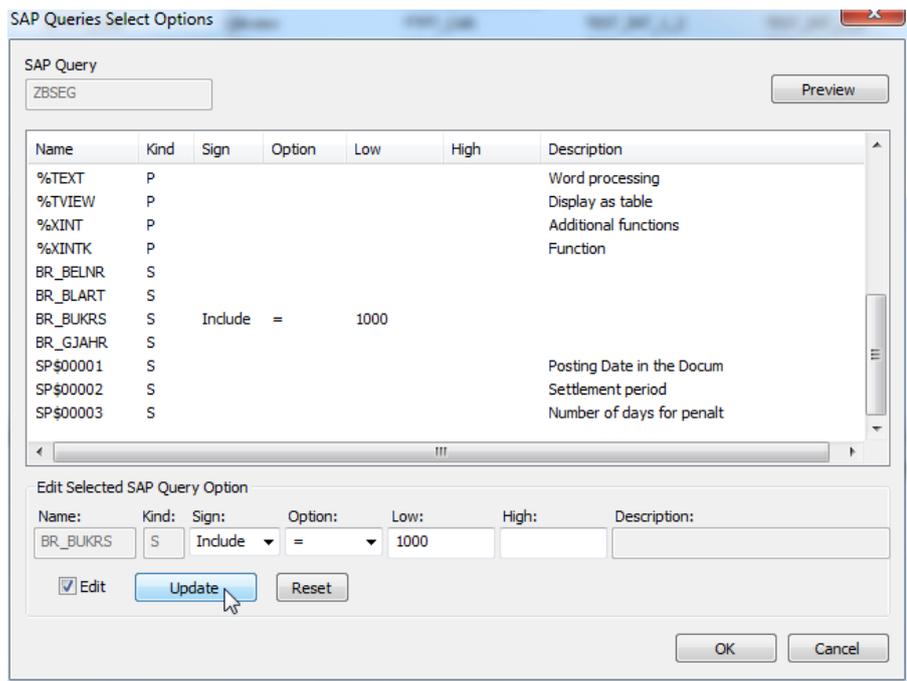
2. Enter the search criteria for the User Groups in the **Search for** field, or select the required groups by checking the boxes next to the group names. The box **Name** can be used to select or deselect all groups. The button **Clear selections** can be used to deselect all groups.



3. Enter the search criteria (query name and/or query description) in the **Search for** field.



4. Select a query and click **Preview** or **Add to Script**. To go back to the previous window to select a different group, click the **Select User Groups** button.
5. It's also possible to choose the **Select Options** button to create a variant



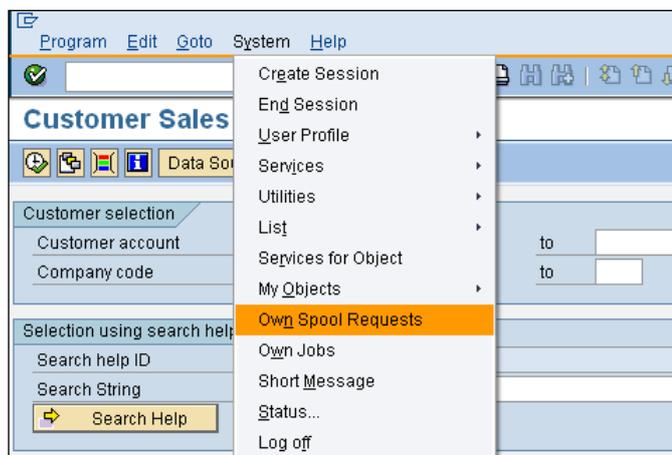
6. Click **OK** to return to the Script Editor with the generated script.

5.5 Qlik SAP Report connector client

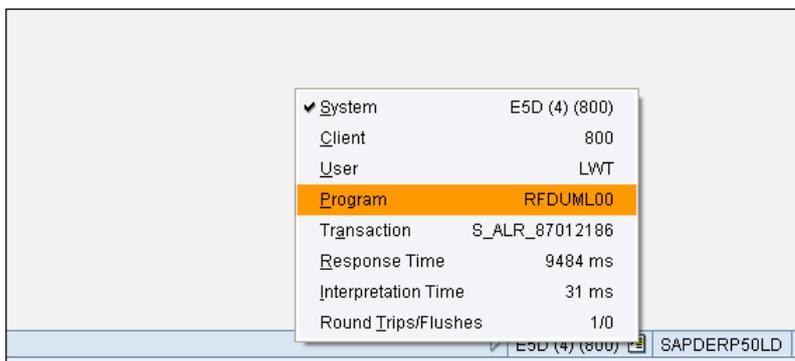
5.5.1 Preparing SAP Report

Some reports in the SAP system cannot be handled by the Qlik SAP report connector:

- Reports where the layout is too complex
- Reports that are too large (the maximum width is 1000 characters)
- Reports that do not create a spool file (which is the output format that the connector retrieves).
To check this, chose **Execute and Print** or **Execute in Background** when running the report and inspect the spool queue afterwards.



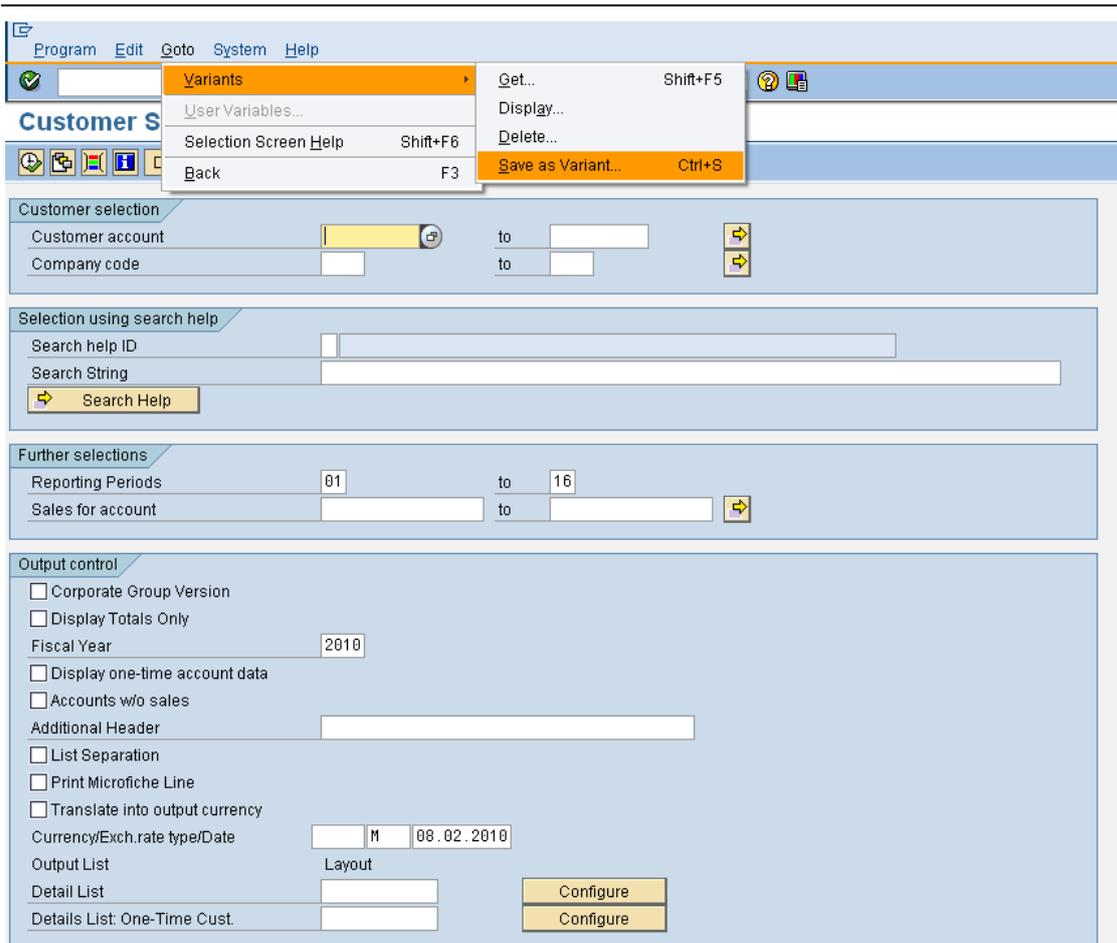
If only the transaction code, but not the report program name, is known, the name can be found by clicking the system icon at the bottom of the SAPGui window, which shows the program name in the highlighted line.



The report can sometimes run without a variant, but in most cases a variant is needed to pre-fill mandatory variables, since these cannot be added through the report connector.

If the report is long-running, it is recommended to create a variant with a limited amount of pages to use during development.

Create a variant when the desired variable values have been entered.

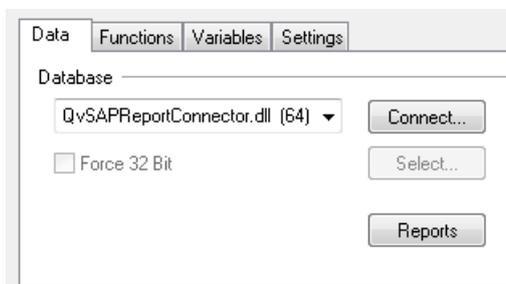


It is strongly recommended to test the report in SAPGui prior to testing it via QlikView.

5.5.2 Using SAP Report connector

Proceed as follows to start using the report connector:

1. Start QlikView.
2. Open the Script Editor.
3. Select the **Data** tab, and then select the `QvSAPReportConnector.dll` option from the drop down list.



4. Click **Connect...**

5. Enter the **Application Server Host** address, **Client**, and **System Number** of the target SAP system, or select the **Message Server Host** option and enter the **Message Server Address**, **Client**, **System ID**, and **Group**.

If passing through a message server, an entry may have to be added in the `C:\WINDOWS\system32\drivers\etc\services` file. Add `sapmsxxx 36nn/tcp`, where `xxx` is the system ID and `nn` is the system number. If it is the last line of the file, add a new line break after the entry.

If passing through an SAP router, paste the router string in the **Host** address field.

In addition, enter the **Username** and **Password** of the user that is to be used for this specific download.

6. Click **Test Connection** to verify that all fields are correctly filled in.
7. Finally, click **OK** to get a connection string in the script.

Connection string parameters

There are a number of parameters that can be added to the connection string, if needed. Normally, the default values for the parameters are sufficient. Separate parameters with ; (semi-colon) in the connection string:

- `Log=0/1` (default/on = 1, off = 0): If on, a log file is created in the Windows folder:
`C:\Users\{user}\AppData\Local\QlikTech\Custom Data\QvSAPConnector\Log\`
- `Logpath=xxxx`: Places log files in a subfolder named `xxxx`. The folder is created, if needed. `xxxx` can be any text string that can be a valid part of a folder name in Windows.

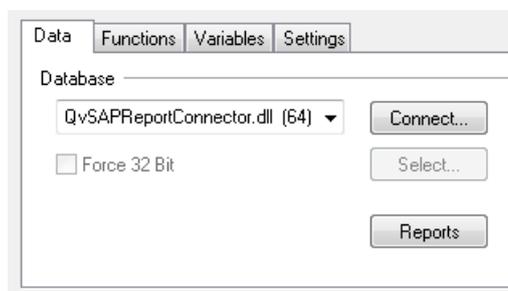
- `LogFile=yyyy`: Names the log file `yyyydatetime-n.txt`. `yyyy` can be any text string that can be a valid part of a filename in Windows.
- `Lang=(EN/DE...)`: The logon user's default language is used by default. For available languages, see table T005. If texts have to be downloaded in multiple languages, the relevant info objects have to be downloaded with separate connection strings.

5.5.3 Defining a report

The report connector tries to retrieve a table that can be imported to QlikView from the spool file. Since reports can have different looks, the QlikView Developer has to assist the connector by defining how to interpret the spool file.

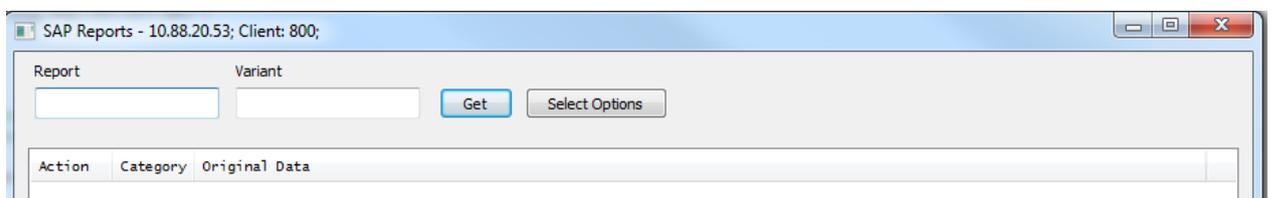
Proceed as follows to define the report:

1. Click **Reports** in the Script Editor.



2. Enter the report program name in the **Report** field and, optionally, a variant in the **Variant** field.

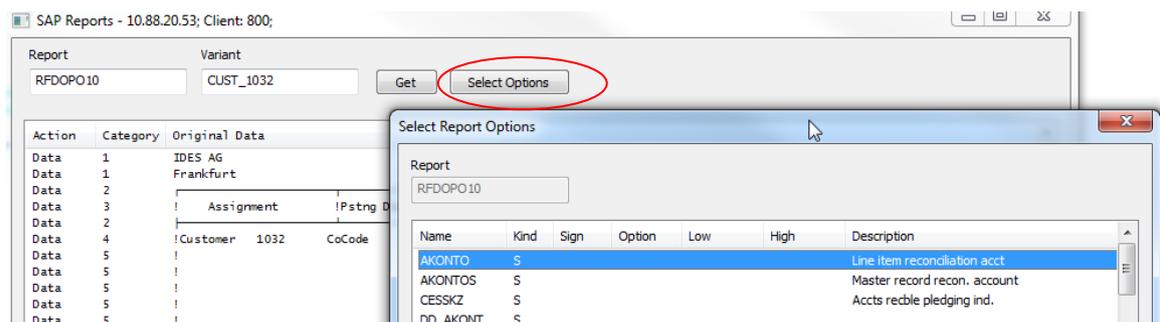
It is not possible to search, so the name of the report must be known, and it is recommended to test the report in SAPGui prior to testing it via QlikView.

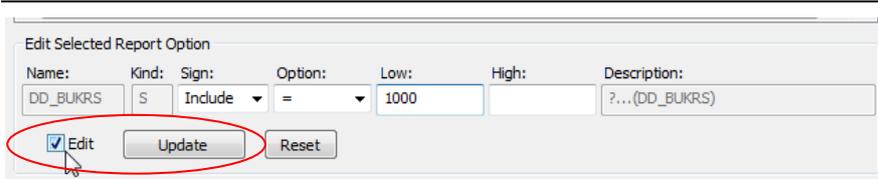


3. Click **Get/Select Options**.

If no variants have been created for the report, it's possible to use **Select Option** to do a selection when running the QlikView report. Do this by highlighting a field name and then tick the **Edit** box, add the required value and click **Update**.

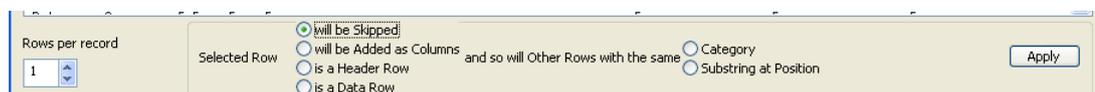
The report is executed and shown in the two major areas of the window. The top area is used to define the rows to skip or consider as data lines or header lines. Sub-header lines can be defined to be added as columns in the major table.





By default, the **Action** column shows all lines as data lines. This can be changed by selecting a line and using the following options:

- The **Category** column can sometimes be used as an identifier for lines that are to be treated in the same way (skipped, header, or added as column), but scroll through the entire list to make sure all lines that have the same category can be treated in the same way.
- If the category cannot be used, look for substring values in certain positions that characterize the type of line.
- **Added as Columns** can be used when there are data values in header lines that are to go into the table. In the example above, Line 1 contains the company name, "IDES AG", which probably changes to other company names in subsequent pages. By using the "add as columns" function and category 1, these lines are added as an extra column to the table.



4. Set the column width.

a. Auto detect column width

There is a new functionality for the Report connector which will 'Auto detect column width'. It will be possible to use this functionality for 'dynamic' reports (using optimized column width) and also for some other reports. However for many reports, the old way of working still has to be used. The connector will find out if it is possible to use the new functionality and enable the option in that case. Then select the option **Auto Detect Column Width** and click **OK**.



The bottom area shows the final result and also defines the columns.

Div.Date	SO Doc	Item	Material	Description	Order qty	SU	Net price	Doc. Date	Name
01.06.2001	5000171	10	HT-1000	Notebook Basic 15	1	PC	960,20	25.05.2001	Doug
01.06.2001	5000140	20	HT-1020	Easy Hand IIII	1	PC	129,16	25.05.2001	Doug
01.06.2001	5000140	30	HT-1042	Laser Allround	1	PC	364,00	25.05.2001	Doug
01.06.2001	5000140	40	HT-1100	Smart Office	1	PC	91,10	25.05.2001	Doug
01.06.2001	5000140	50	HT-1102	Smart Network	1	PC	69,80	25.05.2001	Doug
01.06.2001	5000139	10	HT-1011	Notebook Professional 17	3	PC	2 303,10	25.05.2001	Pete
01.06.2001	5000139	20	HT-1070	Proctra X	1	PC	18,91	25.05.2001	Pete
01.06.2001	5000139	30	HT-1061	Speed Mouse	1	PC	7,09	25.05.2001	Pete
01.06.2001	5000139	40	HT-1037	Flat X-large	2	PC	1 447,00	25.05.2001	Pete
01.06.2001	5000139	50	HT-1100	Smart Office	2	PC	91,10	25.05.2001	Pete
01.06.2001	5000139	60	HT-1050	Deskjet Super Color	2	PC	142,00	25.05.2001	Pete
01.06.2001	5000139	70	HT-1056	Multi Color	2	PC	123,30	25.05.2001	Pete
01.06.2001	5000138	10	HT-1000	Notebook Basic 15	1	PC	960,20	25.05.2001	Alex
01.06.2001	5000138	20	HT-1001	Notebook Basic 17	1	PC	1 253,50	25.05.2001	Alex

The field delimiter can only be used if the column position has the same value for all rows (usually an "|" character). The ruler line automatically shows that a separator has been found.



-
- b. Manually set the column width

If a field separator cannot be found, the positions for the field separators have to be added manually using the **Field delimiter after position** field.

5. Click **OK** to return to the Script Editor with the generated script.

Since all data comes from the spool file, the data types are not known to the connector, which means it cannot modify fields according to data type as the other connectors can. This means that negative field values are shown as in SAP with the minus sign at the end of the field (for example, 12256-) and that date fields are not recognized by QlikView as dates. This can be handled using scripting in the load statement.

- Move the minus sign to the front of the field:

```
if (right([Field1_Amount],1)='- ', (left([Field1_Amount],(len([Field1_Amount])-1)))*-1
// else
, replace([Field1_Amount],',',''))
// end if

as Local_Curr,
```

- Make a date field recognizable as a date:

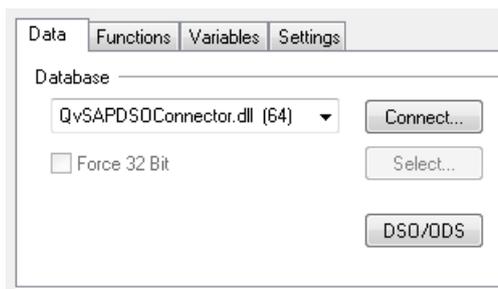
```
date#([Field2_Doc. Date],'DD.MM.YYYY') as [Field2_Doc. Date],
```

5.6 Qlik SAP DSO/ODS connector client

5.6.1 Using SAP DSO/ODS connector

Proceed as follows to start using the DSO/ODS connector:

1. Start QlikView.
2. Open the Script Editor.
3. Select the **Data** tab, and then select the `QvSAPDSOConnector.dll` option from the drop-down list.



4. Click **Connect...**

5. Enter the **Application Server Host** address, **Client**, and **System Number** of the target SAP system, or select the **Message Server Host** option and enter the **Message Server Address**, **Client**, **System ID**, and **Group**.

If passing through a message server, an entry may have to be added in the `C:\WINDOWS\system32\drivers\etc\services` file. Add `sapmsxxx 36nn/tcp`, where `xxx` is the system ID and `nn` is the system number. If it is the last line of the file, add a new line break after the entry.

If passing through an SAP router, paste the router string in the **Host** address field.

In addition, enter the **Username** and **Password** of the user that is to be used for this specific download.

6. Click **Test Connection** to verify that all fields are correctly filled in.
7. Finally, click **OK** to get a connection string in the script.

Connection string parameters

There are a number of parameters that can be added to the connection string, if needed. Normally, the default values for the parameters are sufficient. Separate parameters with ; (semi-colon) in the connection string:

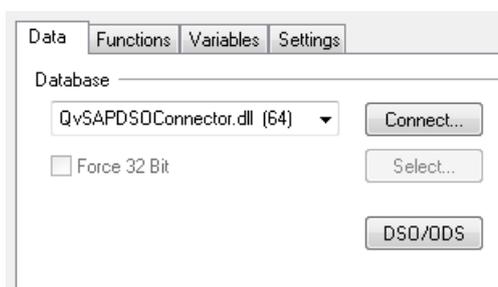
- **ODSMAXROWS**: By default, this parameter is 10 000 000 records. This is to avoid huge memory consumption, which is a problem with this BAPI. The connector stops reading data when reaching the maximum number and returns an error message. Be careful when reading very large tables, since memory consumption may get high.
- **Log=0/1** (default/on = 1, off = 0): If on, a log file is created in the Windows folder:
`C:\Users\{user}\AppData\Local\QlikTech\Custom Data\QvSAPConnector\Log\`

- Logpath=xxxx: Places log files in a subfolder named xxxx. The folder is created, if needed. xxxx can be any text string that can be a valid part of a folder name in Windows.
- LogFile=yyyy: Names the log file yyyydate-time-n.txt. yyyy can be any text string that can be a valid part of a filename in Windows.
- Lang= (EN/DE...): The logon user's default language is used by default. For available languages, see table T005. If texts have to be downloaded in multiple languages, the relevant info objects have to be downloaded with separate connection strings.

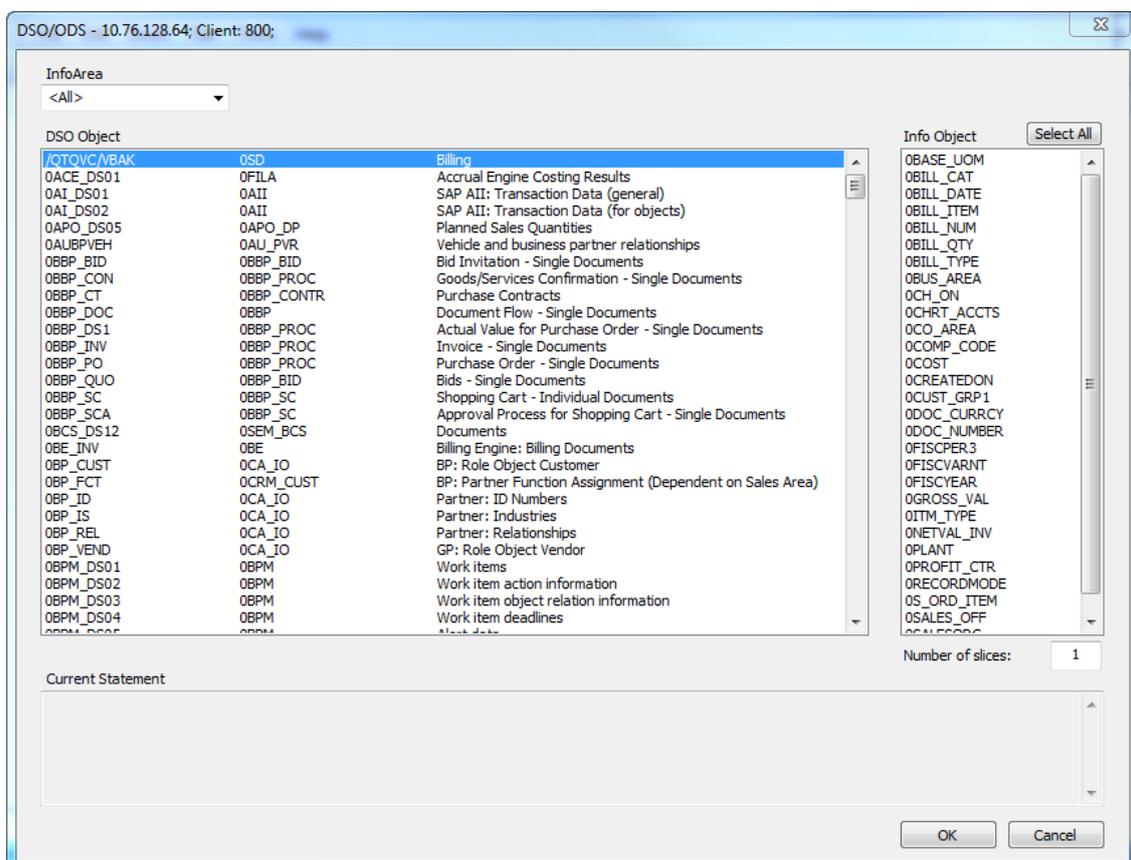
5.6.2 Defining a query

Proceed as follows to define a query:

1. Click **DSO/ODS** in the Script Editor.



2. Select an InfoArea in the **InfoArea** drop-down list or leave it as-is (<All>) to display all InfoAreas.



3. Select a DSO object in the **DSO Object** box.

-
4. Select the fields in the **Info Object** box.

The script appears in the bottom box.

To reduce the memory need, the slice functionality can be used to slice by column (row slicing is not possible). The generated script stores the result in separate QVD files, which have to be merged later on. All QVD files have a common key field to simplify the merge.

No navigational attributes are available.

5. Click **OK** to return to the Script Editor with the generated script.
6. Using the following syntax, a `WHERE` clause can be added manually:

```
WHERE  
ColumnName1 sign option value,  
ColumnName2 sign option value1 value2
```

No display attributes or key characteristics are allowed as columns in the `WHERE` clause.

The following values are valid in the `SIGN` field:

- 'E' = exclude
- 'I' = include

The following values are valid in the `OPTION` field:

- 'EQ' = equal to
- 'GE' = greater than or equal to
- 'LE' = less than or equal to
- 'GT' = greater than
- 'LT' = less than
- 'NE' = not equal to
- 'CP' = contains
- 'BT' = lies between (upper and lower limits)

Conditions for the same column (regardless of the number and sequence in the table) are treated as `OR` operations. Conditions for different columns are treated as `AND` operations.

Example:

```
from OSAL_DS01  
where 0DIVISION I EQ 01;  
  
or  
  
from OSAL_DS01  
where 0CREATEDON I BT 20100101 20101231
```

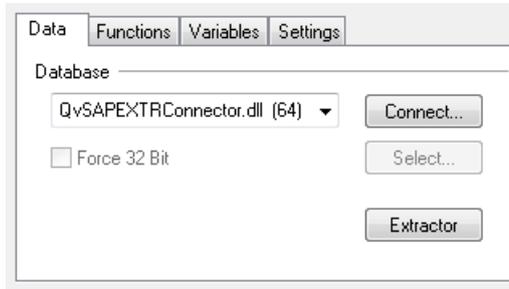
5.7 Qlik SAP Extractor connector client

5.7.1 Using SAP Extractor connector

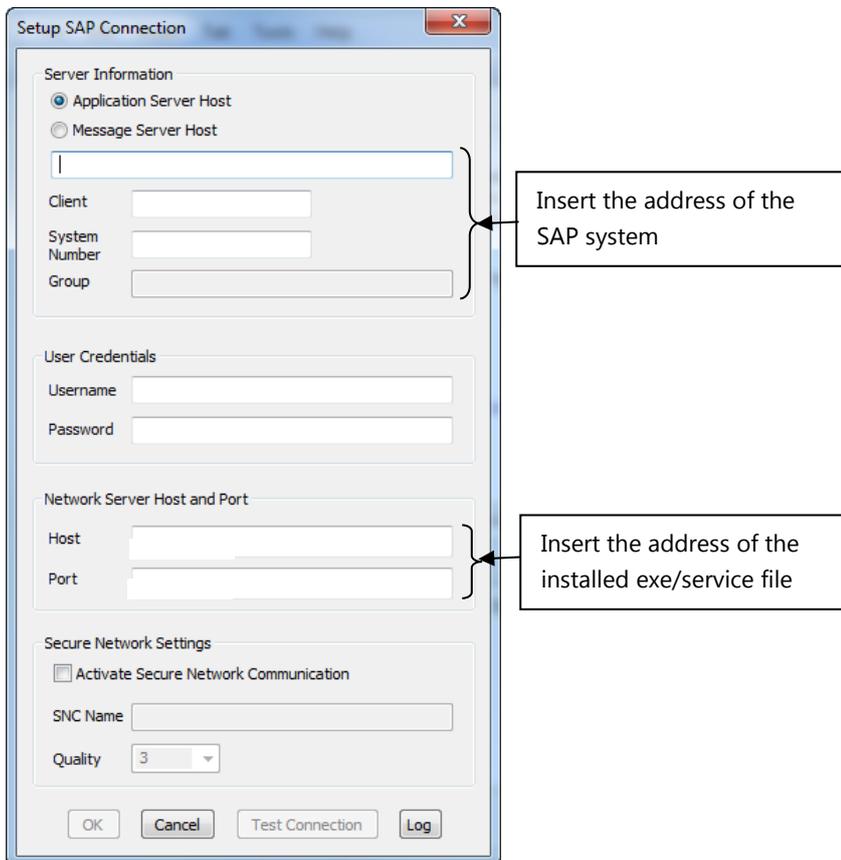
Proceed as follows to start using the extractor connector:

1. Open the QlikView application.
2. Open the Script Editor.

3. Select the **Data** tab, and then select the `QvSAPEXTRConnector.dll` option from the drop down list.



4. Click **Connect...**
5. Enter the following information in the Setup SAP Connection.

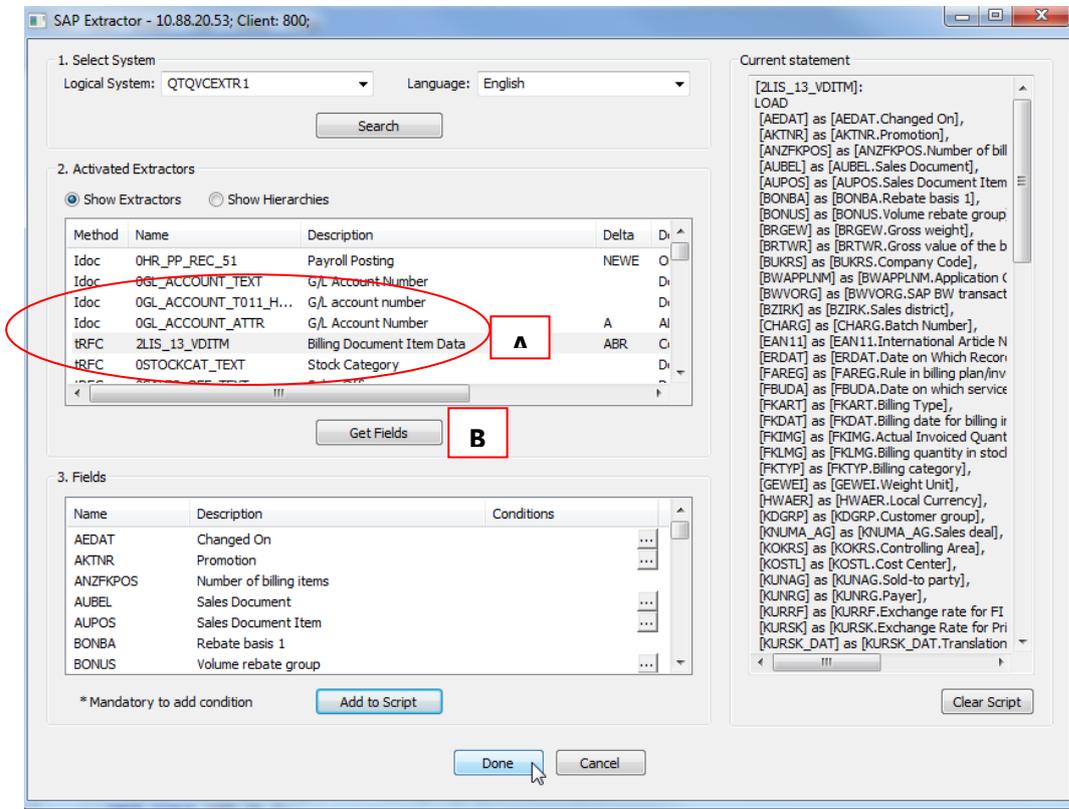


6. Click **Test Connection** to verify that all fields are correctly filled in.
7. Click **OK** to get a connection string in the script.



8. In the script builder, click **Extractor**.
9. Select a system in the **Logical System** drop-down list.
10. Select a language in the **Language** drop-down list.

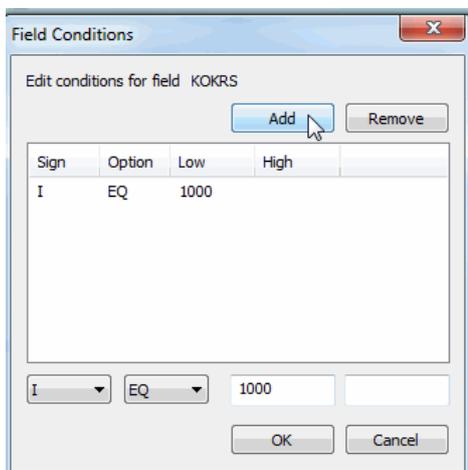
11. Click **Search** to get the activated extractors.
12. Select an extractor in the **Activated Extractors** box (A) and then click **Get Fields** (B).
 - It's possible to see in the left the column, if the extractor is activated as IDoc or tRFC method



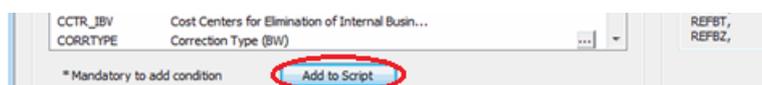
13. To edit the selection to add filters, click the edit button (not all fields are editable).



14. Click **Add** in the pop-up window.



15. Click **Add to Script** to add the selection to the script.



A predefined script is added to the QlikView application:

```
[OCOSTCENTER_TEXT]:
LOAD
[DATEFROM] as [DATEFROM.Valid-From Date],
[DATETO] as [DATETO.Valid-to date],
[KOKRS] as [KOKRS.Controlling Area],
[KOSTL] as [KOSTL.Cost Center],
[LANGU] as [LANGU.Language Key],
[XTMD] as [XTMD.Medium description],
[XTSH] as [XTSH.Short description];
SQL EXTRACTOR OCOSTCENTER_TEXT
TFRMETHOD T // tRFC transfer method ←
//UPDMODE F // full extractor
UPDMODE C // initial extraction, to be followed by delta extraction
//UPDMODE D // delta extraction
//INITRNR <NR> // Resend extraction
//IDOC <NR> // Resend single IDoc
EXIRLANGUAGE E
LOGSYS QTQVCETR2
WHERE
KOKRS I EQ 1000
;
//STORE * FROM [OCOSTCENTER_TEXT] INTO FULL_OCOSTCENTER_TEXT.QVD;
STORE * FROM [OCOSTCENTER_TEXT] INTO INIT_OCOSTCENTER_TEXT.QVD;
//LET vDate=Replace(now(),':','');
//STORE * FROM [OCOSTCENTER_TEXT] INTO DELTA_OCOSTCENTER_TEXT$(vDate).QVD;
DROP TABLE [OCOSTCENTER_TEXT];
```

If you select tRFC, this will show up as a T in the script.

The standard script is a proposal and the functionality to activate has to be uncommented.

In the example above, the selection is initially loaded from the logical system QTQVCETR2 and only for KOKRS (controlling area) 1000. The QVD is stored in the `qvd/init/` folder and the name of the QVD file is `INIT_OCOSTCENTER_TEXT.QVD`.

Note: When changing to tRFC you have to Deactivate old sources and activate again. It is possible to do a mass-deactivation in `/n/QTQVC/DEACTIVATE`.

Note: The Extractor connector is mainly a tool for retrieving data from an ERP system, however It is also useful for a BW system, but can face the same issue with timeouts as the OLAP connector, when trying to load from an InfoCube. Loads from a DSO/ODS do not have this restriction as it is a transparent table in a BW system.

5.7.2 Delta loads

One of the major advantages of the extractor connector is the ability to use delta load capabilities (if allowable in the extractor itself).

To execute a delta load, proceed as follows:

1. Uncomment the required `UPDMODE` statement in the script:

`UPDMODE C` – initial extraction followed by delta load

This creates a QVD file with all of the data through the extractor and also tells SAP that a delta load process is required in the future.

2. Modify the extractor script:

`UPDMODE D` – delta extraction

3. Concatenate the QVD to the output.

Note: When using the delta loads use the same template and the same logical system used for the initialization.

-
4. To do a new initial extraction (UPMODE C) on an existing initial extraction load, delete the data source in this transaction (/N/QTQVC/DELETE_INIT) before the new load starts. Fill in the logical system and then the data source/extractor to delete.
 5. Same procedure as nr 4 has to be performed, when shifting between methods.

Delete Delta Init

Delete Delta Init for:

Logical system of receiver: QTQVCXIR1

Extractor: OMATERIAL_ATTR

Deactivate (/N/QTQVC/DEACTIVATE) the source and then activate (/N/QTQVC/ACTIVATE) it again.

5.7.3 Hierarchy properties

Hierarchy properties are the properties of all hierarchies for a hierarchy basic characteristic, delivered by SAP, and freely definable according to the needs of the customer.

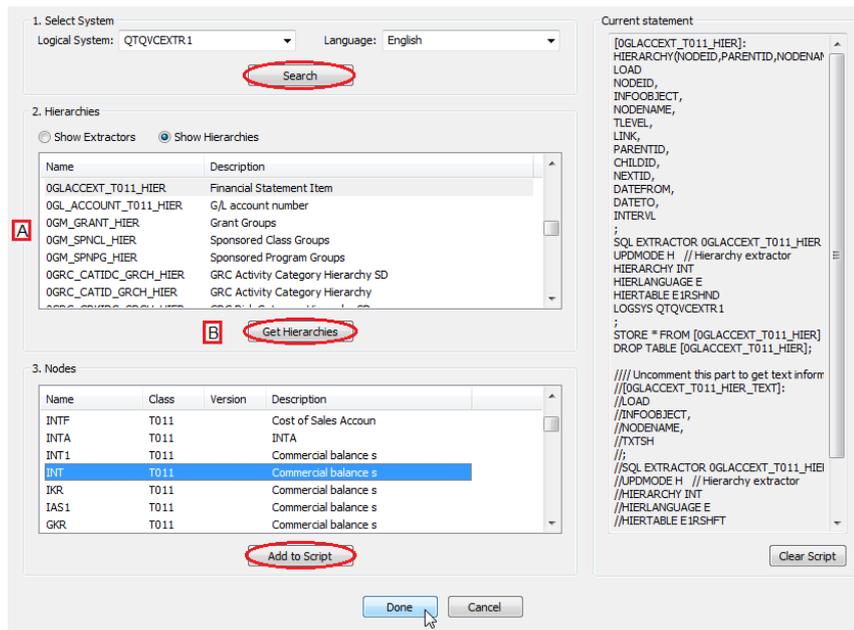
Hierarchy properties are fixed in InfoObject maintenance for a characteristic and valid for all hierarchies that have been created for the characteristic.

During hierarchy maintenance, the hierarchy attributes can be set and, as a result, influence the display and processing of hierarchies in reporting.

Unlike all other data sources in SAP, hierarchies do not have to be activated. When loading a hierarchy, proceed as follows to change the screen view in the pop-up window:

1. Select the **Show Hierarchies** radio button.
2. Select the logical system in the **Logical System** drop-down list.
3. Click **Search**.
4. Select a hierarchy in the **Hierarchies** box (A) and click **Get Hierarchies** (B).

All available options for the selected hierarchy are displayed.



5. Select an option in the **Nodes** box.

6. Click **Add to Script**.

As a result, two statements are added to the QlikView script for the hierarchy load.

- First statement:

```
[0GLACCEXT_T011_HIER];
HIERARCHY(NODEID,PARENTID,NODENAME,,NODENAME,HIERARCHY)
LOAD
NODEID,
INFOBJECT,
NODENAME,
TLEVEL,
LINK,
PARENTID,
CHILDID,
NEXTID,
DATEFROM,
DATETO,
INTERVL
;
SQL EXTRACTOR 0GLACCEXT_T011_HIER
UPDMODE H // Hierarchy extractor
HIERARCHY INT
HIERLANGUAGE E
HIERTABLE E1RSHND
LOGSYS QTQVCEXTR1
;
STORE * FROM [0GLACCEXT_T011_HIER] INTO HIER_0GLACCEXT_T011_HIER.QVD;
DROP TABLE [0GLACCEXT_T011_HIER];
```

- Second statement:

```

/// Uncomment this part to get text information for the hierarchy
//[0GLACCEXT_T011_HIER_TEXT];
//LOAD
//INFOBJECT,
//NODENAME,
//TXTSH
//;
//SQL EXTRACTOR 0GLACCEXT_T011_HIER
//UPDMODE H // Hierarchy extractor
//HIERARCHY INT
//HIERLANGUAGE E
//HIERTABLE E1RSHT
//LOGSYS QTQVCEXTR1
//;
//STORE * FROM [0GLACCEXT_T011_HIER_TEXT] INTO HIER_0GLACCEXT_T011_HIER_TEXT.QVD;
//DROP TABLE [0GLACCEXT_T011_HIER_TEXT];

//*****

```

The first statement uses the QlikView HIERARCHY function to create nodes for each level. To link the hierarchy table to other standard extractors, a function can be deployed to NODENAME, for example:

```
Mid(NODENAME,5,13) as [SAKNR],
```

Each hierarchy requires different manipulation to perform the join operation.

The second load statement provides the option for descriptions of the levels in the hierarchy.

5.7.4 Overview of logs and processes

There are a number of transactions in SAP to monitor the processes involved with the extractor connector:

- To display the processed Idocs, use transaction code WE02:

Selected IDocs											
IDoc Number	Segm...	Sta...	Sta...	Partner	Basic type	Date creat.	Time	Messg...	Direction	Port	
00000000008646...	3	53	000	LS/ /QTQVCEX...	RSREQUEST	16.05.2011	09:17:15	RSRQST	Inbox	TRFC	
00000000008646...	1	03	000	LS/ /QTQVCEX...	RSINFO	16.05.2011	09:18:18	RSINFO	Outbox	A0000000...	
00000000008646...	1	03	000	LS/ /QTQVCEX...	RSINFO	16.05.2011	09:18:18	RSINFO	Outbox	A0000000...	
00000000008646...	20001	03	000	LS/ /QTQVCEX...	ZSQAQTQ...	16.05.2011	09:18:26	RSEND	Outbox	A0000000...	
00000000008646...	20001	03	000	LS/ /QTQVCEX...	ZSQAQTQ...	16.05.2011	09:18:35	RSEND	Outbox	A0000000...	
00000000008646...	20001	03	000	LS/ /QTQVCEX...	ZSQAQTQ...	16.05.2011	09:18:41	RSEND	Outbox	A0000000...	
00000000008646...	20001	03	000	LS/ /QTQVCEX...	ZSQAQTQ...	16.05.2011	09:18:48	RSEND	Outbox	A0000000...	
00000000008646...	20001	03	000	LS/ /QTQVCEX...	ZSQAQTQ...	16.05.2011	09:18:55	RSEND	Outbox	A0000000...	
00000000008646...	20001	03	000	LS/ /QTQVCEX...	ZSQAQTQ...	16.05.2011	09:18:59	RSEND	Outbox	A0000000...	
00000000008646...	20001	03	000	LS/ /QTQVCEX...	ZSQAQTQ...	16.05.2011	09:19:04	RSEND	Outbox	A0000000...	
00000000008646...	20001	03	000	LS/ /QTQVCEX...	ZSQAQTQ...	16.05.2011	09:19:10	RSEND	Outbox	A0000000...	
00000000008646...	1477	03	000	LS/ /QTQVCEX...	ZSQAQTQ...	16.05.2011	09:19:11	RSEND	Outbox	A0000000...	
00000000008646...	10	03	000	LS/ /QTQVCEX...	RSINFO	16.05.2011	09:19:11	RSINFO	Outbox	A0000000...	
00000000008646...	1	03	000	LS/ /QTQVCEX...	RSINFO	16.05.2011	09:19:11	RSINFO	Outbox	A0000000...	

- To follow the process in SAP, use transaction code SM50:

Process Overview														
No.	Type	PID	Status	Reason	Start	Err	Se...	CPU	Time	Report	Cl.	User Names	Action	Table
0	DIA	2788	Running		Yes					SAPLTHFB	800	BPO		
1	DIA	2836	Waiting		Yes	2								
2	DIA	2960	Waiting		Yes									
3	DIA	1532	Waiting		Yes	1								
4	DIA	2944	Waiting		Yes									
5	DIA	2936	Waiting		Yes									
6	DIA	2988	Waiting		Yes									
7	DIA	4020	Waiting		Yes	1								
8	DIA	2976	Waiting		Yes									
9	DIA	564	Waiting		Yes									
10	UPD	548	Waiting		Yes									
11	ENQ	676	Waiting		Yes									
12	BGD	4088	Running		Yes	9			173	SAPLBWO...	800	BPO	Sequential Read	COVP
13	BGD	3836	Waiting		Yes	2								

- To monitor the initialized extractors in an ERP system, use transaction code RSA7: In a BW system you have to use transaction SE16 and Table: ROOSPRMSC to retrieve the same information.

BW Delta Queue Maintenance

St...	DataSource	BW System	Total	Stat.
OO	2LIS_11_VAHDR	B3TCLNT800	10	
OO	OEC_PCA_3	B3TCLNT800	3	P.
OO	OFI_AP_3	B3TCLNT800	1	
OO	1_CO_PA_CO_1000	B3TCLNT800	1	P.
OO	OFI_GL_4	QTQVCEXTR1	1	
OO	ZVBAK_VBRP	QTQVCEXTR2	0	P.
OO	1_CO_PA800IDEA_SD	B3TCLNT800	0	
OO	OPROFIT_CTR_ATTR	QTQVCEXTR1	0	
OO	OMATERIAL_TEXT	QTQVCEXTR1	0	
OO	OMATERIAL_ATTR	B3TCLNT800	0	
OO	OGL_ACCOUNT_ATTR	QTQVCEXTR1	0	
OO	OGL_ACCOUNT_ATTR	B3TCLNT800	0	
OO	OFI_GL_4	B3TCLNT800	0	
OO	OFI_AR_6	B3TCLNT800	0	
OO	OCUSTOMER_ATTR	B3TCLNT800	0	
OO	OCO_OM_CCA_9	QTQVCEXTR1	0	

- The QlikView log is stored in C:\ProgramData\QlikTech\Custom Data\QvSAPConnector\Log:

```

2013-02-20 12:25:46 Progress Connected to SAP with C:\Program Files\Common Files\QlikTech\Custom Data\QvSAPConnector\QvSAPEXTRConnector.dll 5.7
SR1, 10958
2013-02-20 12:25:46 Progress Log: 1
2013-02-20 12:25:46 Progress Logpath:
2013-02-20 12:25:46 Progress LogFile: QvSAPEXTRConnector
2013-02-20 12:25:46 Progress TimeoutDoc: 7200 seconds
2013-02-20 12:25:46 Progress TimeoutSap: 14400 seconds
2013-02-20 12:25:46 Progress TimeoutInit: 900 seconds
2013-02-20 12:25:46 Progress TimeoutActivity: 3600 seconds
2013-02-20 12:25:46 Progress Creation of function /QTQVC/CHECK_RELEASE returned after 00:00:00
2013-02-20 12:25:46 Progress SAP Transport information: version: E6DK900375; date: 20121018; time: 083205; SAP basis: 700;
2013-02-20 12:25:46 Progress Connected
2013-02-20 12:25:46 Progress Statement is: EXTRACTOR 0COSTCENTER_TEXT UPDMODE F EXTRLANGUAGE E LOGSYS QTQVCEXTR1 WHERE KOKRS I
EQ 1000
2013-02-20 12:25:46 Progress EXTRACTOR = 0COSTCENTER_TEXT
2013-02-20 12:25:46 Progress UPDMODE = F
2013-02-20 12:25:46 Progress LOGSYS = QTQVCEXTR1
2013-02-20 12:25:46 Progress EXTRLANGUAGE = E
2013-02-20 12:25:46 Progress Criteria = KOKRS I EQ 1000
2013-02-20 12:25:46 Progress Creation of function RFC_GET_SYSTEM_INFO returned after 00:00:01
2013-02-20 12:25:48 Progress Successfully registered at GWSERV=sapgw07.GWHOST=10.88.20.44.PROGRAM_ID=QTQVCEXTR1
2013-02-20 12:25:53 Progress Creation of function /QTQVC/GET_ACTIVATED_EXTRACTOR returned after 00:00:00
2013-02-20 12:25:57 Progress Creation of function /QTQVC/CREATE_REQUEST_IDOC returned after 00:00:00
2013-02-20 12:27:07 Progress INITNR=REQU_QTQVCEXTR1_20130220122606
2013-02-20 12:27:08 Progress Init successful
2013-02-20 12:27:31 Progress Checking TID 0A58142C0E345124B31D001D
2013-02-20 12:27:31 Progress Executing TID 0A58142C0E345124B31D001D
2013-02-20 12:27:31 Progress Processing IDoc 0000000000856016
2013-02-20 12:27:31 Progress MESTYP=RSINFO;SEGNAM=E2RSHIN;SDATA=REQU_QTQVCEXTR1_20130220122606 2 20130220122711 0
2013-02-20 12:27:31 Progress RQSTATE=1: Data selection started
2013-02-20 12:27:31 Progress Committing TID 0A58142C0E345124B31D001D
2013-02-20 12:27:31 Progress Confirming TID 0A58142C0E345124B31D001D
2013-02-20 12:27:31 Progress Checking if all data has been received
2013-02-20 12:27:31 Progress Not all data has been received
2013-02-20 12:27:31 Progress Checking TID 0A58142C0E2C5124B32C002A
2013-02-20 12:27:31 Progress Executing TID 0A58142C0E2C5124B32C002A
2013-02-20 12:27:31 Progress Processing IDoc 0000000000856017
2013-02-20 12:27:31 Progress MESTYP=RSINFO;SEGNAM=E2RSHIN;SDATA=REQU_QTQVCEXTR1_20130220122606 1 20130220122710 0
2013-02-20 12:27:31 Progress RQSTATE=0: Data request received
2013-02-20 12:27:31 Progress Committing TID 0A58142C0E2C5124B32C002A

```

The QlikView log provides information on which Idocs or TID nr (tRFC) have been created for the request and if the load has been successful.

5.7.5 Error handling

There are a number of methods to monitor the jobs of the extractor connector.

Status table

The download for every extractor can be followed in the status table, /QTQVC/STATUS, which is available in transaction SE16. Possible values for **Job Status**:

Job Status	Short Desc
R	Released
S	Started
F	Finished
A	Aborted
C	Job cancel
K	Keep

For the IDoc transfer method: only a single extraction job at a time can run in a logical system. QlikView returns an error message if you try to run multiple extractors on the same logical system simultaneously.

For the tRFC transfer method: many extraction jobs can run in parallel in a logical system, however the same Extractor cannot run in parallel. QlikView returns an error message if that happens.

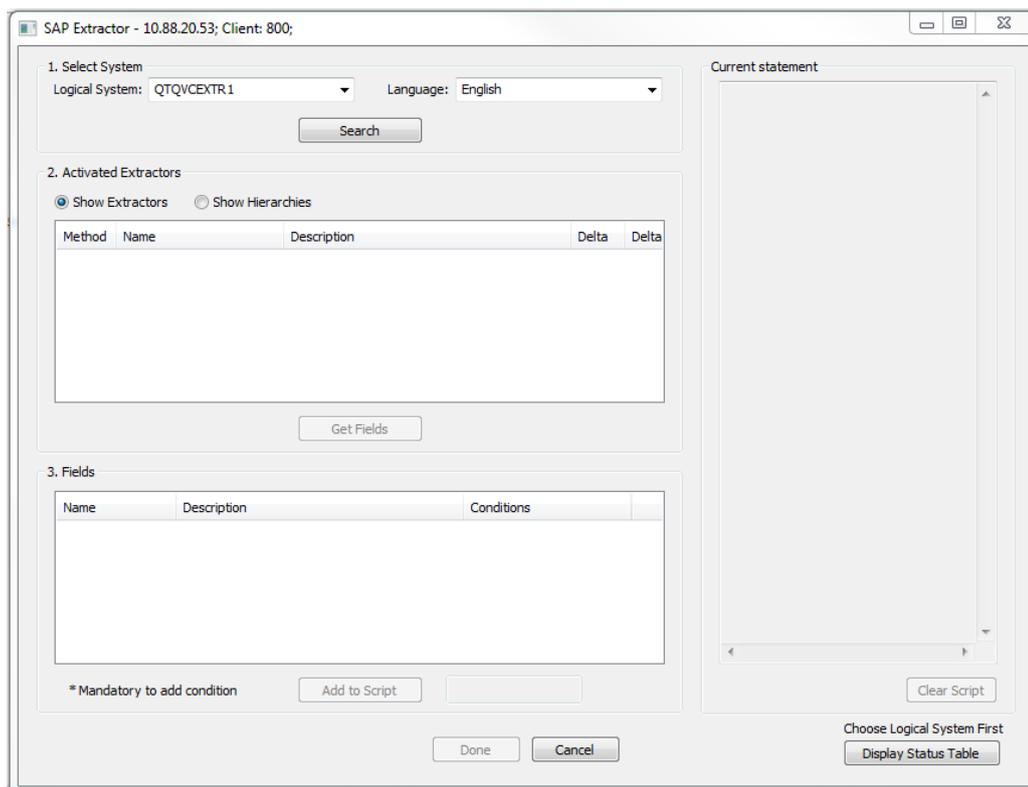
In the event of an extractor job not being able to finalize correctly, the status record contains an "S" for started. See the following for how to cancel such a job from the connector or from the SAP GUI.

Canceling a job from the Extractor connector

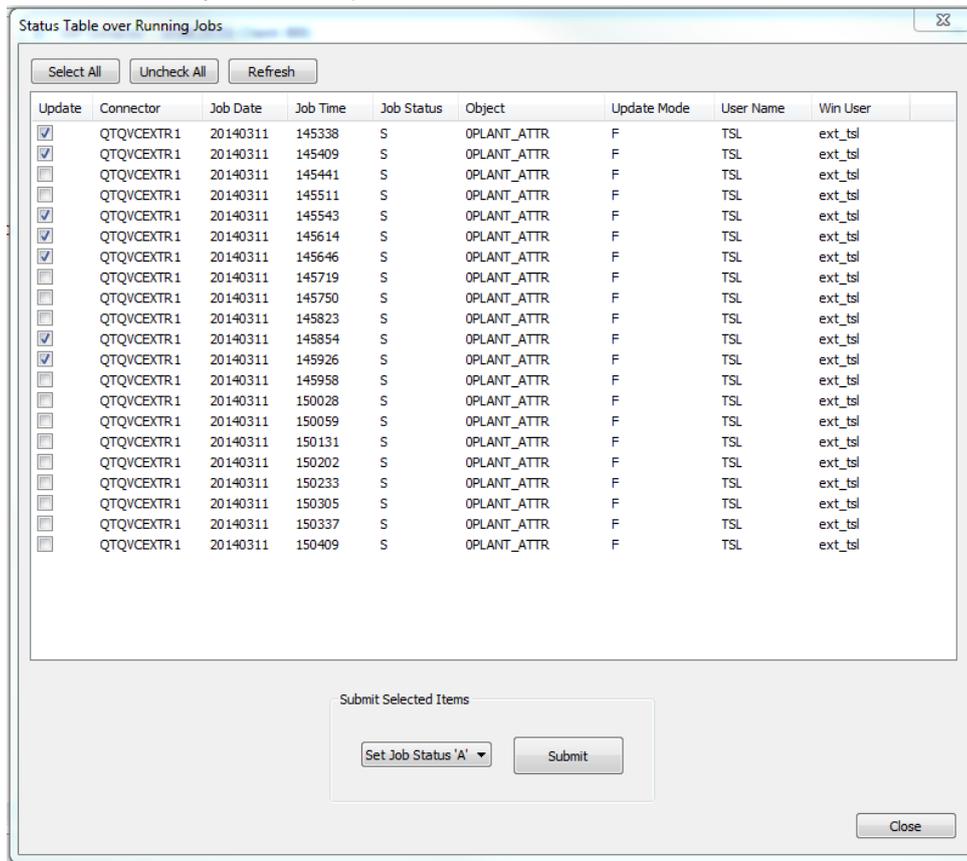
Note: Take care not to end an active and relevant job that is running.

Proceed as follows to cancel a failed extraction job:

1. In the Extractor window, select a Logical System and click **Display Status Table** at the bottom of the window.



2. Select the records you want to update.



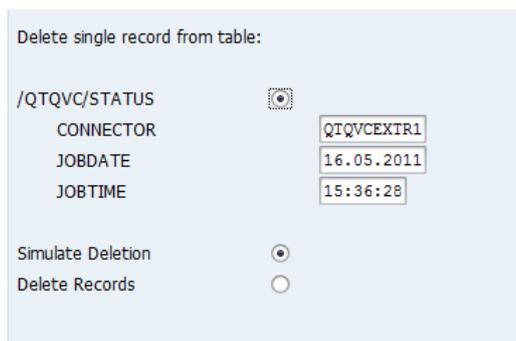
3. Select **Set Job Status** to A (aborted) or **Delete Record(s)** in the button below the list.
4. Click the **Submit** button to perform the changes in the SAP system.

Canceling a job from the SAP GUI

Note: Take care not to end an active and relevant job that is running.

Proceed as follows to cancel a failed extraction job:

1. In the status table, get the job time and date and then go to transaction /N/QTQVC/delete.
2. Select /QTQVC/STATUS in the **Delete single record from table** section.
3. Enter the correct **CONNECTOR**, **JOBDATE** and **JOBTIME**.
4. Run the job in **Simulate Deletion** mode.
5. Run the job in **Delete Records** mode.



Re-send IDocs

If a communication error has occurred for a delta or full load and the IDocs have been produced in the ERP system, the IDocs can be re-sent to QlikView. A new initialization is not needed.

Proceed as follows to re-send the IDocs:

1. Get the INITRNR from the QlikView log file:

```
2011-05-16 11:12:58      Progress Invoked /QTQVC/EXTRACTION_STATUS with MODE=R, JOBNAME=BIREQI
JOBDATE=20110516, JOBTIME=111447, INITRNR=REQU_QTQVCEXTR1_20110516111447, returned STATUS=S
```

2. Open the script builder.
3. Select the extractor with the appropriate delta load.
4. Uncomment the INITRNR row.
5. Replace <NR> with the actual INITRNR, and reload:

```
//INITRNR <NR> // Resend extraction
```

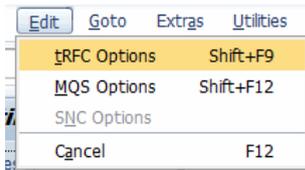
Re-send single IDocs:

It's also possible to re-send a single IDoc. Then use the update mode IDOC and replace the <NR> with the single IDoc number

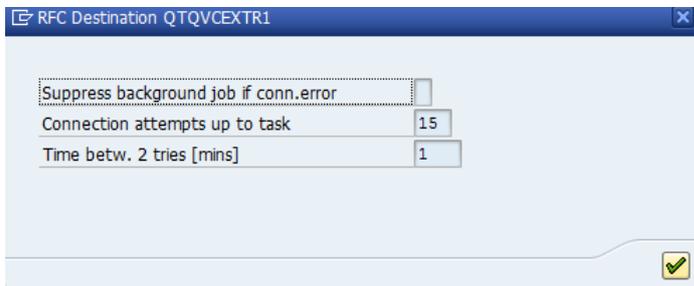
```
//UPDMODE F // full extractor
//UPDMODE C // initial extraction, to be followed by delta extractions
//UPDMODE D // delta extraction
//INITRNR <NR> // Resend extraction
IDOC <NR> // Resend single IDoc
```

Communication Error

If the logical system is correctly set up and the SAP system can be contacted when connecting, the standard setting for tRFC in the logical system setup may have to be changed. This is done in transaction SM59 and TCP/IP connections.



The following figure shows the default settings.



5.7.6 Migrate activated extractors

In the first system in the SAP system landscape, put the activated Extractors that should be migrated into the database table /QTQVC/EXTRACT.

Use the transaction /QTQVC/MIGRATE_PREP:

Put activated Extractors into migration table

Logical system of receiver: Language: Transfer Method: tRFC IDoc

Put selected Extractors into migration table in:
 or

EXTRACTOR	DESCRIPTION	SELECT
/QTQVC/VBAK_VBRP	Billing	X
0ARTICLE_ATTR	Article	
0BILL_CAT_TEXT	Billing Category	X
0BILL_TYPE_TEXT	Billing Type	
0COMP_CODE_ATTR	Company code	X
0COMP_CODE_TEXT	Company Code	
0CO_AREA_ATTR	Controlling Area	X
0CO_PC_ACT_02	Ending Inventory Material Valuation Rec.	X
0CO_PC_ACT_05	Material Valuation Record Prices	X
0CURTYPE_TEXT	Currency Type	X
0CUSTOMER_TEXT	Customer	
0CUST_GROUP_TEXT	Customer Group	
0CUST_SALES_TEXT	Customer	X
0DISTR_CHAN_TEXT	Distribution Channel	X
0DIVISION_TEXT	Division	X
0DOC_CATEG_TEXT	Document cat.	X
0EC_PCA_1	Profit Center: Account Transaction Data	
0EC_PCA_3	Profit Center: Actual Line Items	X
0FI_AP_3	Vendors: Line Items	X
0FI_AR_3	Customers: Line Items	X

Then in the same system in the SAP system landscape, create a Transport request containing activated Extractors for the specific Logical system used above. Perform step 1 in the transaction /QTQVC/MIGRATE_EXTR:

Migrate Activated Extractors

Step 1. Create Transport Request in first system in landscape. Do not create a new Transport Request if there already is one which is not migrated.

Logical system of receiver:
 Transport Owner:
 Target System:

Customizing Request:

Step 2. Migrate Transport Request and import in correct client in next system in landscape.
 Step 3. Check that Extractor environment with the Logical system name used in step 1 is created in this system. In SAP BW systems the Extractor source needs to be generated as Export DataSource, before activated.
 Step 4. Execute this transaction in the same system and press the button below:

For Logical system:

Step 5. Repeat step 2 to step 4 for each subsequent system in landscape.

Then perform step 2 and step 3 described in this transaction.

After doing that, execute the same transaction /QTQVC/MIGRATE_EXTR in the SAP system where step 2 and step 3 were performed. Perform step 4:

The screenshot shows the SAP transaction interface for 'Migrate Activated Extractors'. It is divided into five steps:

- Step 1:** Create Transport Request in first system in landscape. Do not create a new Transport Request if there already is one which is not migrated. Fields include 'Logical system of receiver' (checkbox checked), 'Transport Owner' (HRG), and 'Target System' (checkbox checked). A 'Create Transport Request' button and a 'Customizing Request' field are also present.
- Step 2:** Migrate Transport Request and import in correct client in next system in landscape.
- Step 3:** Check that Extractor environment with the Logical system name used in step 1 is created in this system. In SAP BW systems the Extractor source needs to be generated as Export DataSource, before activated.
- Step 4:** Execute this transaction in the same system and press the button below. A button 'Upload and activate Extractors' is shown, along with a field 'For Logical system' containing the value 'QTQVCXTR1'.
- Step 5:** Repeat step 2 to step 4 for each subsequent system in landscape.

Then perform step 5 in each system in the SAP system landscape.

Some general rules:

The database table /QTQVC/EXTRACT will contain the activated Extractors from the latest execution of the transaction /QTQVC/MIGRATE_PREP, that is the transaction overwrites the previous content in the table for a Logical system. Therefore it is important to execute the transaction /QTQVC/MIGRATE_PREP before executing the transaction /QTQVC/MIGRATE_EXTR which creates the Transport request. When the Transport request is created it is not allowed to change the content of the database table /QTQVC/EXTRACT until the Transport request has been migrated. No new transport request should be created until the last one has been used in all systems in the landscape.

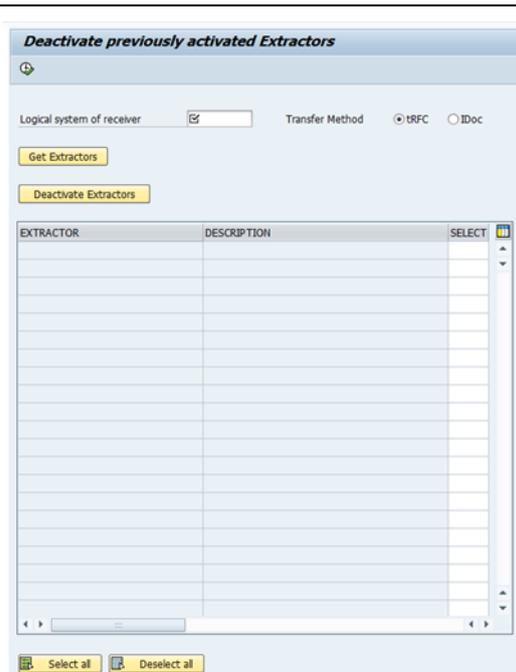
However the database table /QTQVC/EXTRACT is using Logical system as key, so it is possible to put activated Extractors for a different Logical system in the table and to create a separate Transport request in parallel for that Logical system.

When the Extractors are uploaded and activated in the next system in the landscape there is a check that an Extractor is not already activated. If so, there will be a warning in the log file, the activation of the Extractor is skipped and the program continues with the next Extractor from the Transport request. If the user wants to change the fields of an activated Extractor by using this functionality, the Extractor has to be manually deactivated in each system before uploading and activation takes place.

5.7.7 Deactivate an Extractor

Transaction /N/QTQVC/DEACTIVATE

Deactivate previously activated Extractors. Enter Logical system name and Transfer Method and click the **Get Extractor** button. Select Extractor(s) to deactivate and click button **Deactivate Extractors**



Timeouts

There are a few timeout parameters that can be set in the QlikView script in the connection string. If not set in the connection string, each timeout has a default value. All timeout values are given in seconds.

- **TimeoutSAP**

This timeout is used in the SAP part of the Connector. When trying to start a new Extractor job in SAP there is a check to see that no other Extractor job is already started for the given Logical system. An Extractor job in SAP consists of two parts. The first part is an Extraction batch job which creates all IDoc:s or tRFC packages containing the extraction data. The second part is the RFC transfer of the IDoc:s or tRFC packages to QlikView. Sometimes there can be interruptions in the RFC transfer. A number of retries to send the data is then performed. The value in the TimeoutSAP parameter decides how long time SAP should wait to start a new job if there is an ongoing RFC transfer of a previous job. When the number of seconds in the timeout is exceeded, it is likely that there is a permanent error in the previous RFC transfer. The previous job is then regarded as failed (the corresponding record in the SAP status table is set to 'aborted') and the new job is allowed to start.

The default value is 14400 seconds (240 minutes).
- **TimeoutInit**

This timeout is used in the Windows part of the Connector. It decides the maximum time Windows should wait to receive data from SAP about the activated Extractors and Hierarchies possible to use. If the timeout is exceeded, the QlikView job is aborted.

The default value is 900 seconds (15 minutes).
- **TimeoutActivity**

This timeout is used in the Windows part of the Connector. It decides the maximum time Windows should wait to receive data from SAP created by the Extraction job. If the timeout is exceeded, the QlikView job is aborted and the status value in the corresponding record in the SAP status table is set to 'aborted'.

The default value is 7200 seconds (120 minutes).
- **TimeoutData**

This timeout is used in the Windows part of the Connector. It decides the maximum time Windows should wait between the receiving of each data IDoc/tRFC data package. If the timeout

is exceeded, the QlikView job is aborted and the status value in corresponding record in the SAP status table is set to 'aborted'.

The default value is 3600 seconds (60 minutes).

5.7.8 Tips and recommendations

Delta Mechanism

The big advantage of using the SAP Extractor Connector is the delta mechanism, which is built-into some of the standard extractors.

It is also easier to use a pre-defined data source from SAP, as no knowledge is required of the complex table structures in the SAP systems. Most of the data sources and extractors are self-explanatory.

Load Time

A time lag is experienced during the initialization of the connector whilst the SAP processes run.

The amount of time to load from an ERP system is similar to that of the SQL connector. To get good loading performance from a BI/BW system, use the connector against a DSO/ODS source.

Null Value

No null value is allowed in any Objects as the extractor is looking for an empty row to know when to finish loading

QlikView Trim function

When loading from an InfoCube, the positive values of a key figure can end-up as a text in QlikView. To avoid this use the QlikView Trim function in the script as follows:

```
Trim([CREDIT_DC]) as [CREDIT_DC.Credit amount in foreign currency],  
Trim([CREDIT_LC]) as [CREDIT_LC.Credit amount in local currency],
```

Sample Extractors

The following sample extractors are available for use:

- OFI_GL_4 General Ledger: Line Items with Delta Extraction
- OFI_AP_4 Vendors: Line Items with Delta Extraction
- OFI_AR_4 Customers: Line Items with Delta Extraction
- CO_OM_CCA_9 Cost Centers: Actual Costs Using Delta Extraction
- OCO_PC_ACT_02 Material Valuation: Per Ending Inventory
- OCO_PC_01 Cost Object Controlling: Plan/Actual Data
- OEC_PCA_3 Profit Center: Actual Line Items
- PA Personnel Management

...and so on.

Transaction Codes

The following transaction codes are available for use:

- QTQVC/ACTIVATE Activate an Extractor (datasource)
- QTQVC/ACTIVATE Activate an Extractor (datasource)
- /QTQVC/DELETE Delete Database Table Records
- /QTQVC/DELETE_INIT Delete Initialization
- /QTQVC/DEACTIVATE Deactivate Extractor

-
- /QTQVC/EXTRACTOR_ADM Maintain Extractor environment
 - /QTQVC/MIGRATE_ENV Migrate Extractor Environment
 - /QTQVC/CONNECT_ENV Store a Connection to QV
 - /QTQVC/MIGRATE_PREP Put activated Extractors into table
 - /QTQVC/MIGRATE_EXTR Migrate Activated Extractors
 - SE 16 Data Browser
 - /QTQVC/Status
 - /QTQVC/Convert
 - RORQSTPRMS (Protocol table Request)
 - ROOSPRMSC (Control Parameter Per Data Source Channel)
 - ROOSGEN (Generated Objects for OLTP Source)
 - SM50 Process Overview
 - SM37 Background Job
 - RSA6 Post process Data Sources and Hierarchy
 - RSA7 BW Delta queue Maintenance
 - SMGW Gateway Monitor
 - SM58 Transactional RFC
 - SMQ1 qRFC Monitor (Outbound Queue)
 - WE02 IDoc List
 - WE30 IDoc Types

Qlik Network Server File

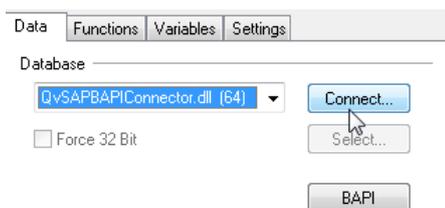
Store the attached `SrvService.exe` file **on one server**, preferably in the same folder as the SAP connectors (`C:\Program Files\Common Files\QlikTech\Custom Data\QvSAPConnector`).

Note: It's only possible to have one `SrvService.exe` running

5.8 Qlik SAP BAPI connector client

5.8.1 Using the SAP BAPI connector

1. Start QlikView.
2. Open the Script Editor.
3. Select the **Data** tab, and then select the `QvSAPBAPICConnector.dll` option from the drop-down list.



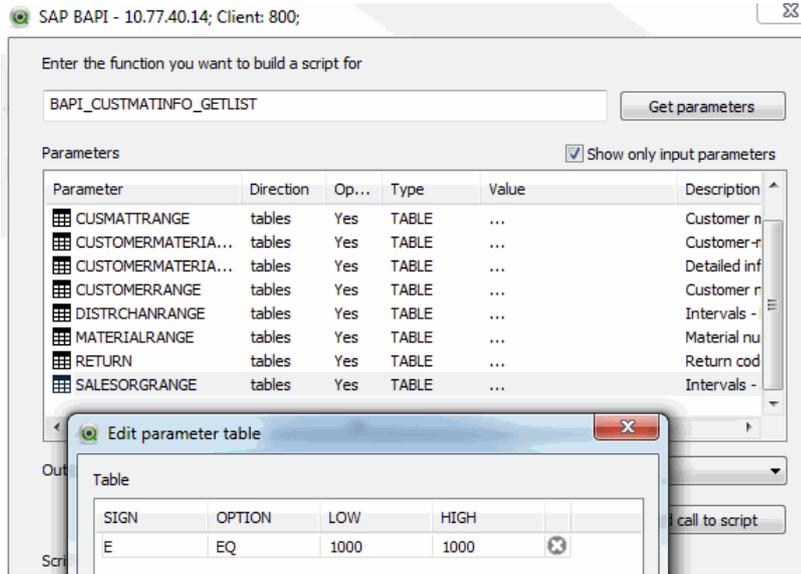
4. Click **Connect...**

- Enter the **Application Server Host** address, **Client**, and **System Number** of the target SAP system, or select the **Message Server Host** option and enter the **Message Server Address**, **Client**, **System ID**, and **Group**.

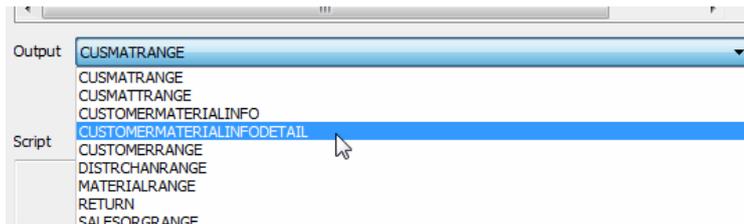
- Enter the **Username** and **Password** of the user that is to be used for this specific download.
- Click **Test Connection** to verify that all fields are correctly filled in.
- Finally, click **OK** to get a connection string in the script.
- In the Script Editor, click **BAPI** to select a function.

- In the pop-up dialog, enter the name of the BAPI function found in the SAP system. Then click **Get parameters**.

11. Enter the parameters needed to run the function.



12. Some Functions return more than one table, but QlikView can only handle one for each statement. Select the output table you want and then click **Add call to script**.



13. Click **OK** to return to the Script Editor with the generated script.

6 BW process chain status and QlikView tasks

6.1 Background

It can be a problem to know when a BW process chain has finished loading data and QlikView can start loading its part. Below is an example of how you can use the BAPI connector to check the status of a Process chain and start the QlikView load when ready.

6.2 BW process chain overview

Process chains are a robust graphical scheduling and monitoring tool to maintain automation, visualization and monitoring of tasks/processes. Typically this is used to update DSOs and InfoCubes.

6.3 How to do it

The Connector transports include a Report program named /QTQVC/PROCESS_STATUS.

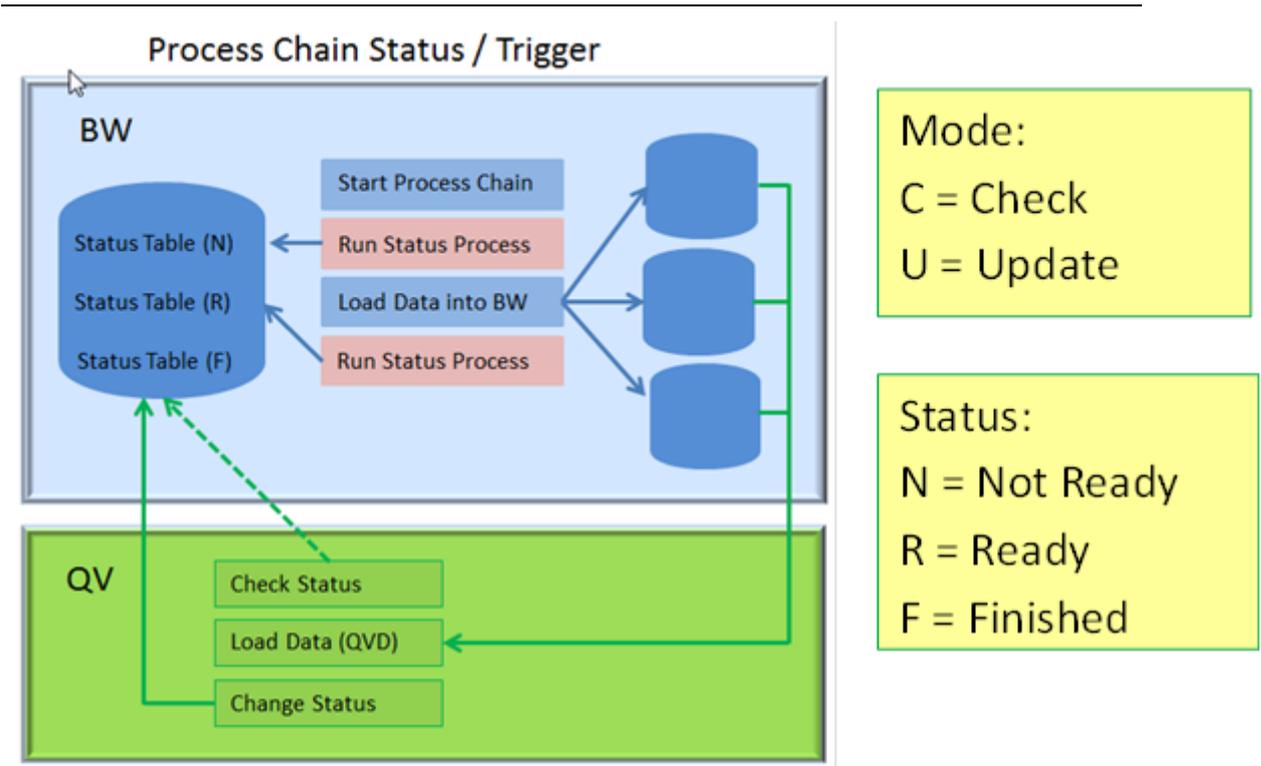
Two variants should be created of the program for each process chain, to be used in the beginning and end of the process chain setting the status of the process. The QlikView script has to be updated with a loop to be able to check the status and finally change the status.

Variant 1 of the Report program sets the indicator to "N" = Not Ready

and

Variant 2 sets the indicator to "R" = Ready. When calling the report program the status is stored in our table /QTQVC/Status.

In the QlikView Script we utilize the BAPI connector to check when there is an "R" in the table, then proceed with normal load, and finally set the status to "F" = Finish when the load is completed. The BAPI connector calls a function module named /QTQVC/PROCESS_STATUS, which in turn calls the report program /QTQVC/PROCESS_STATUS.



Variant to change the indicator to "N"
 The process chain load data to BW
 New variant update the status indicator to "R".
 In the QlikView script the BAPI connector is used to Check the status and if "R",
 QV starts the normal load.
 QlikView update the indicator to "F" using the BAPI connector.

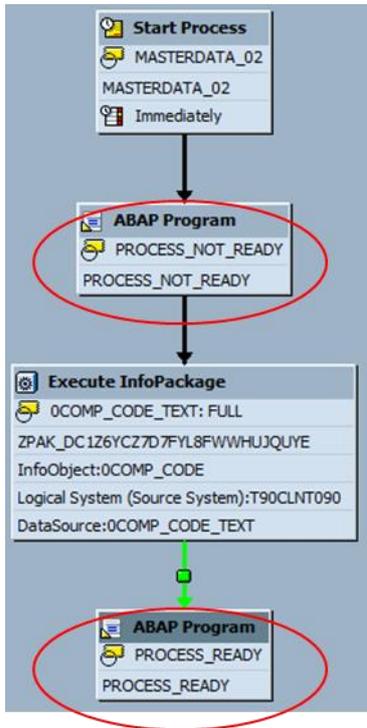
6.4 Setup in SAP BW system

You need to be skilled in creating Report variants and maintaining Process chains to do the following tasks:

Create two variants (N and R) of the program /QTQVC/PROCESS_STATUS, for each process chain.



In the process chain, add this ABAP program with variant at the start and at the end of the chain. The Task ID has to be unique for each process chain.



6.5 Setup in QlikView

You need to schedule the QlikView task to start when the Process chains normally ends.

Script Example:

Add a loop in the beginning of the script, using the BAPI connector to check the Status of the Process chain.

The script will leave the loop when status changes to "R" (Ready) and continue with the normal load of BW data.

When that is finished it should set the status to "F" (Finished) to avoid the same data being loaded twice.

CUSTOM CONNECT TO

```
"Provider=QvSAPBAPIConnector.dll;ASHOST=10.88.20.43;SYSNR=10;CLIENT=800;XUserId=QCWJOBROPLTA;XPassword=OUZKbYRNJbaATYMX;"
```

```
set StatusI='N';
do while StatusI <> 'R'
    //CHECK STATUS
    Out:
    LOAD *;
    SQL {
        "Function":"\QTQVC\PROCESS_STATUS",
        "output":"STATUS_OUT",
        "parameters":
        [
            { "direction":"out", "length":1, "name":"STATUS_OUT", "optional":false,
            "type":"CHAR", "value":" " },
            { "direction":"in", "length":10, "name":"CONNECTOR", "optional":false,
            "type":"CHAR", "value":"PRCHAIN_02" },
            { "direction":"in", "length":1, "name":"MODE", "optional":false,
            "type":"CHAR", "value":"C" },
            { "direction":"in", "length":1, "name":"STATUS_IN", "optional":true,
```

```

"type":"CHAR", "value":" " },
  { "direction":"in", "length":40, "name":"TASK_ID", "optional":false,
"type":"CHAR", "value":"DATA_01" }
]
};
Let Status1=peek('STATUS_OUT' ,-1,'Out');
exit do when Status1='R';
trace 'Waiting for BW process to finalize';
sleep 10000;

loop
//*****
//Load Data
CUSTOM CONNECT TO
"Provider=QvSAPXTRConnector.dll;ASHOST=10.88.20.43;SYSNR=10;CLIENT=800;XUserId=MXMDKRB
OPDAB;XPassword=cHNLSYRNJbaATYcc;";

[80COMP_CODET]:
LOAD
  [COMP_CODE],
  [LANGU],
  [TXTMD];
SQL EXTRACTOR 80COMP_CODET
UPDMODE F // full extractor
EXTRLANGUAGE E
LOGSYS QTQVCEXTR1
WHERE
LANGU I EQ E
;
//STORE * FROM [80COMP_CODET] INTO FULL_80COMP_CODET.QVD;
//DROP TABLE [80COMP_CODET];

//*****

CUSTOM CONNECT TO
"Provider=QvSAPBAPICConnector.dll;ASHOST=10.88.20.43;SYSNR=10;CLIENT=800;XUserId=QCWJOB
OPLTA;XPassword=OUZKbYRNJbaATYMX;";
//UPDATE STATUS
drop table Out;
Out:
LOAD *;
SQL {
  "function":"\\QTQVC\\PROCESS_STATUS",
  "output":"STATUS_OUT",
  "parameters":
  [
    { "direction":"out", "length":1, "name":"STATUS_OUT", "optional":false,
"type":"CHAR", "value":" " },
    { "direction":"in", "length":10, "name":"CONNECTOR", "optional":false,
"type":"CHAR", "value":"PRCHAIN_02" },
    { "direction":"in", "length":1, "name":"MODE", "optional":false, "type":"CHAR",
"value":"Ü" },
    { "direction":"in", "length":1, "name":"STATUS_IN", "optional":true, "type":"CHAR",
"value":"F" },
    { "direction":"in", "length":40, "name":"TASK_ID", "optional":false, "type":"CHAR",
"value":"DATA_01" }
  ]
};
//*****

```

7 Important general information for all connectors

7.1 Transports / Mismatch

The data transport has to be installed in the main client, normally client 000, but the authorization transports are client dependent.

From the 5.70 SR1 release there is a control function to avoid mismatch between the transport and the .dll used. Before this release you need to make sure that the .dll matches the transport.

From the 5.80 SR2 release there is backward compatibility, making it possible to update the Windows part of the connectors without installing the corresponding transports. However, in that case, new functionality dependent on the updated code cannot be used.

7.2 Delete function

Use transaction /N/QTQVC/DELETE.

The screenshot shows the 'Delete Database Table Records' SAP transaction screen. It features a title bar with a green arrow icon. Below the title bar, there are two main sections: 'Delete records from table' and 'Delete records from year'. The 'Delete records from table' section has four radio button options: /QTQVC/CONTROL, /QTQVC/JOB SQL, /QTQVC/TRACE, and /QTQVC/STATUS. The 'Delete records from year' section has a text input field containing '2012'. Below these sections, there is a radio button option /QTQVC/STATUS Single record. Underneath, there is a 'Key for single record:' section with three input fields: CONNECTOR (QTQVCXTR1), JOBDATE (2012.04.03), and JOBTIME (10:57:12). At the bottom, there are two radio button options: Simulate Deletion and Delete Records.

With this transaction it is possible to delete records from the /QTQVC/ tables or a single record from the table /QTQVC/STATUS. For the first four options all records from the specified table and year are deleted at one time. The option **Simulate Deletion** can be used to see how many records will be deleted (no deletion takes place). To delete the records, select the option **Delete Records**.

Click the **Execute** button when the appropriate options have been selected.

The tables /QTQVC/CONTROL and /QTQVC/JOB_SQL contains information about SQL connector jobs. Do not delete records from the current year. Deletion of records older than current year can take place at any time. Although it is not necessary to keep the older records they can be useful for statistical reasons.

The table /QTQVC/TRACE is used to store trace information for the SQL connector. Records are written when the parameter 'Trace=1' is part of the connection string in the QlikView script. The records can be deleted at any time if there is not any trouble shooting taking place.

The table /QTQVC/STATUS contains information about jobs started for all connectors. It is also used for Process chain handling. Do not delete records from the current year.

7.3 Update function

Use Transaction /N/QTQVC/UPDATE

The screenshot shows the 'Update Database Table Records' transaction screen. It has a title bar with a green arrow icon. Below the title bar, the text 'Update single record from table:' is displayed. There are two radio button options:
1. /QTQVC/CONTROL: This option is currently unselected. Below it, the 'Key for single record:' is 'JOBNUMBER' with the value '20120101090000' in a text box. Below that, 'Change value of field below to:' is 'JOBSTATUS' with a checked checkbox.
2. /QTQVC/STATUS: This option is currently selected. Below it, the 'Key for single record:' consists of three fields: 'CONNECTOR' with value 'QTQVCXTR1', 'JOBDATE' with value '2012.04.03', and 'JOBTIME' with value '12:51:01'. Below that, 'Change value of field below to:' is 'JOBSTATUS' with a text box containing the letter 'A'.

With this transaction it is possible to update single records from the tables /QTQVC/CONTROL and /QTQVC/STATUS. To update a record, select the wanted table, enter the key for the record, enter a new value in JOBSTATUS and click the **Execute** button.

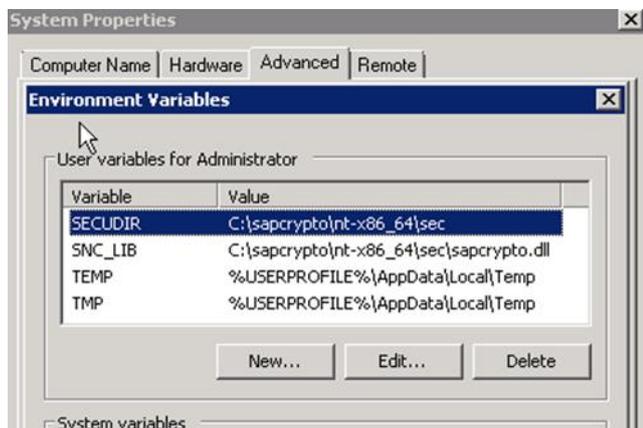
8 Secure network communication

Secure Network Communication (SNC) is the SAP technology used for safe communication between SAP components. If the customer has SNC installed, this can also be used for the RFC communication between the connector and the SAP system.

A cryptographic library must be installed on the connector machine. This is not supplied by QlikTech. The technology is used between SAP components only. For technical details, see the SAP Help Portal: <http://help.sap.com>.

Proceed as follows to set up SNC

1. Open Control Panel > System>Advanced
2. Create a system Variable, SNC_Lib to hold the path to local crypto library



3. Specify the SNC name in the connection dialog, p:C=sncname. In addition, specify the quality of the protection - the available values are specific to the library used.

