



## **QlikView and SAP HANA Connectivity**

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## Contents

1	Overview	3
2	SAP HANA Overview	3
3	Connecting to SAP Netweaver BW on HANA	4
4	Connecting to HANA via ODBC	5
4.1	Source Table/Views	6
4.2	Analytic Views	7
4.3	Attribute Views	10
4.4	Calculation Views	12

## 1 Overview

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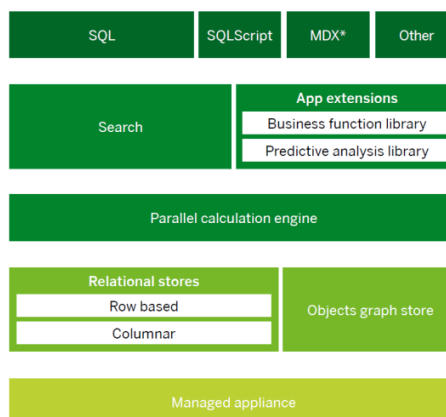
This document provides a technical overview of the connectivity between SAP HANA and QlikView; consideration is given to both SAP Netweaver Business Warehouse connectivity using the QlikView Connector for SAP Netweaver and non Netweaver HANA using the SAP HANA ODBC driver.

## 2 SAP HANA Overview

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From the SAP HANA Datasheet:

“SAP HANA is built on the next generation, massively parallel, in-memory data processing design paradigm to enable faster information processing. This new architecture enables converged OLTP and OLAP data processing within a single in-memory column-based data store with ACID compliance, while eliminating data redundancy and latency.”

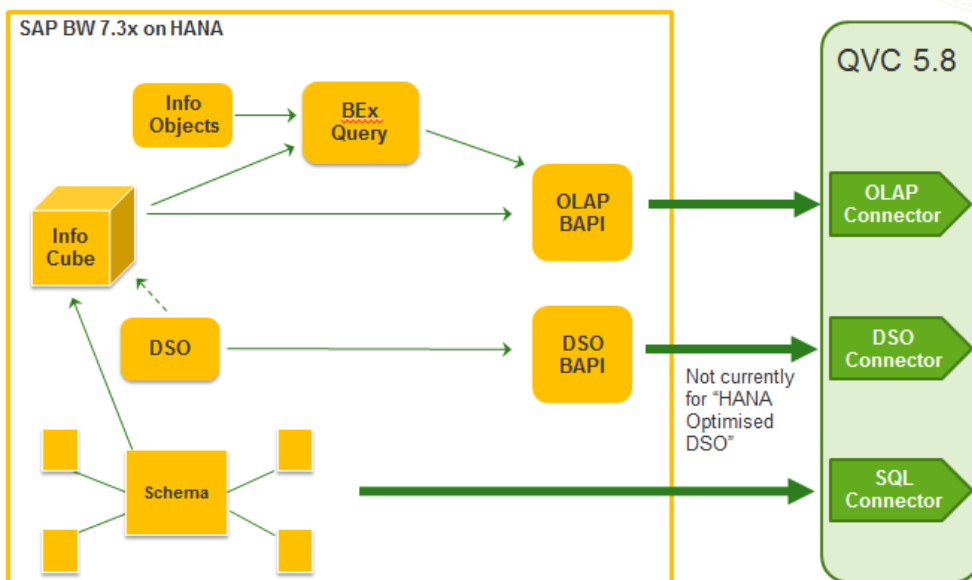


\*MDX = multidimensional expression

At time of writing SAP has approximately 1000 customers running HANA with a mix of SAP Netweaver and non-SAP Netweaver instances and with the advent of Netweaver 7.4 both ERP and BW can be deployed on HANA.

### 3 Connecting to SAP Netweaver BW on HANA

With the SAP Netweaver 7.3 release SAP Business warehouse can be deployed on HANA and retains the same interfaces for connectivity. QlikView has delivered a connector for use with SAP Netweaver for a number of years and its subset of these connectors that can be used to extract data from BW on HANA as shown below:



A limitation exists at time of writing whereby any HANA specific optimised DSO's are not accessible via the DSO connector (non-optimised only).

## 4 Connecting to HANA via ODBC

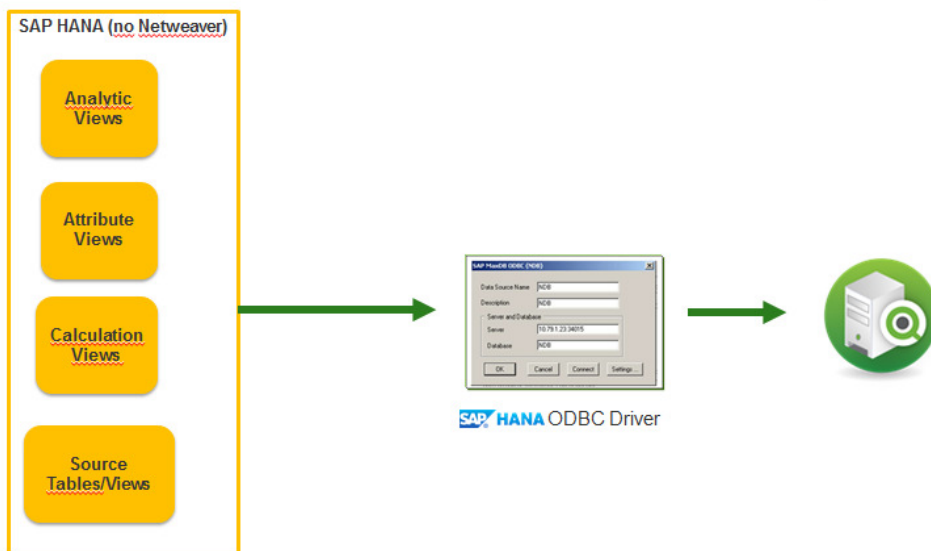
Alongside the Netweaver stack, HANA can be deployed in organisations without SAP ERP or SAP BW. In this environment QlikView can use the ODBC driver SAP provide available with the SAP HANA studio download:

<http://www.sdn.sap.com/irj/scn/go/portal/prtroot/docs/webcontent/uuid/402aa158-6a7a-2f10-0195-f43595f6fe5f>

In addition SAP and amazon provide a cloud based instance, detailed instructions on setting up your own instance is detailed in the blog below:

<http://scn.sap.com/docs/DOC-28294>

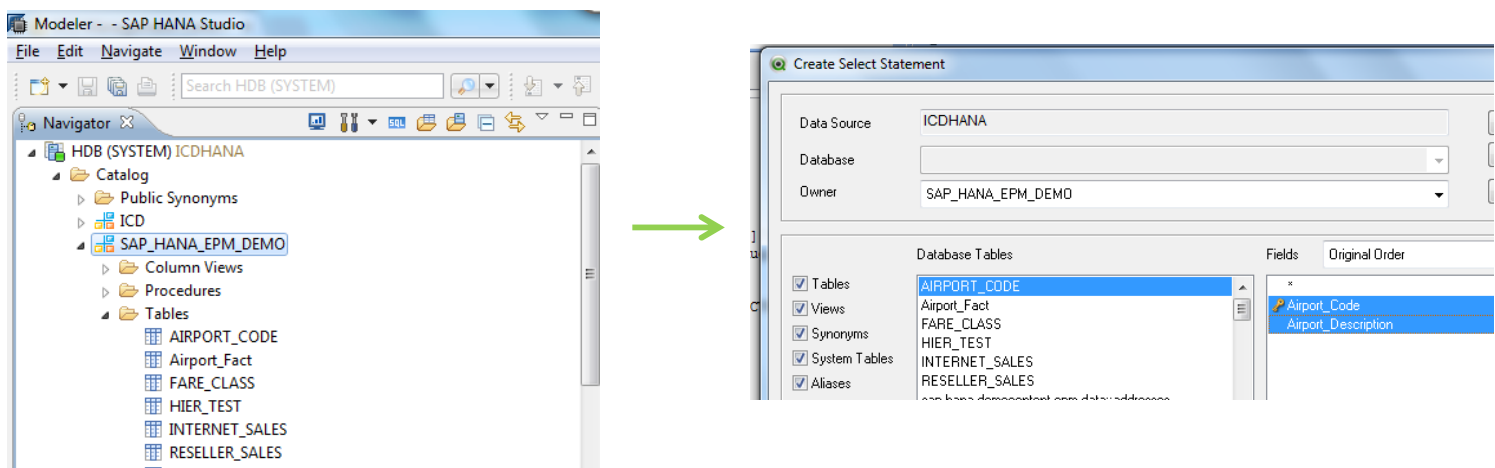
The combination of QlikView and the SAP HANA ODBC driver provides access to a wide array of sources:



Each type of entity is described below in terms of best practice for using within QlikView.

#### 4.1 Source Table/Views

Source tables and views are treated as with any other database entities of this type and are displayed in the standard select wizard within QlikView:



And this generates a standard Load script in QlikView:

```
ODBC CONNECT TO ICDHANA (XUserId is LaaeUJFLTCVKUGJd, XPassword is UDNTbWFMOLYOWSJOCf);

LOAD "Airport_Code",
     "Airport_Description";
SQL SELECT "Airport_Code",
          "Airport_Description"
FROM "SAP_HANA_EPM_DEMO"."AIRPORT_CODE";
```

One key point to note is the use of quotes around all field names not in upper case.

Another key point is an issue with the translation of DECIMAL fields via the ODBC to QlikView interface which will result in an aggregation calculation returning a NULL value. This can be worked around by converting the DECIMAL field to another numeric data-type e.g. DOUBLE:

```

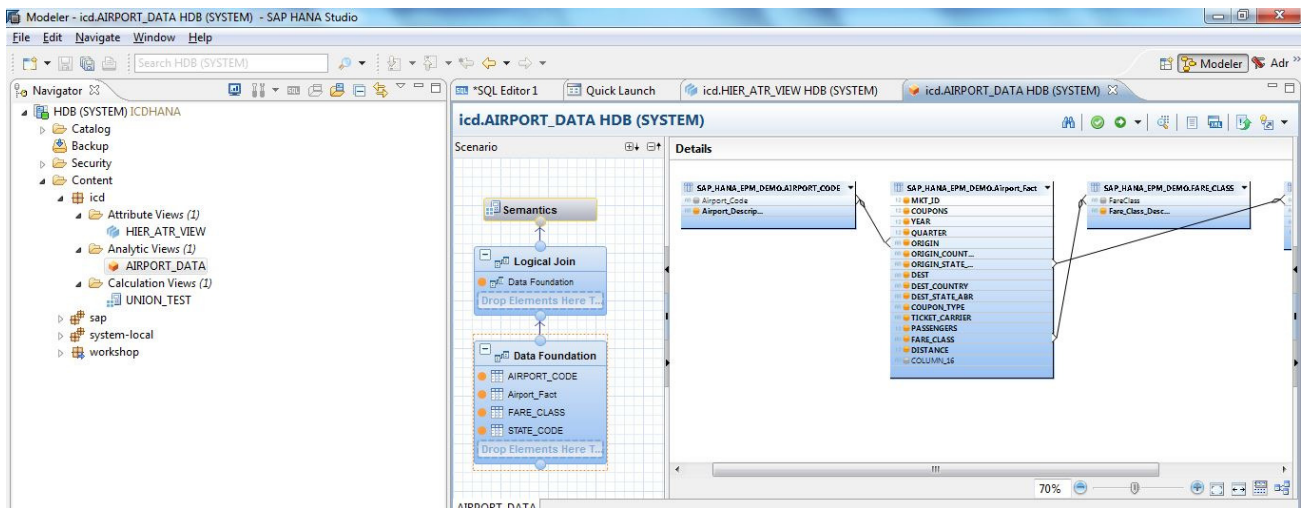
LOAD *;
SQL SELECT
"SalesOrderId",
"CreatedBy",
"CreatedAt",
"ChangedBy",
"ChangedAt",
"NoteId",
"PartnerId",
"Currency",
TO_DOUBLE("GrossAmount") as GrossAmount,
TO_DOUBLE("NetAmount") as NetAmount,
TO_DOUBLE("TaxAmount") as TaxAmount,
"LifecycleStatus",
"BillingStatus",
"DeliveryStatus"
from "SAP_HANA_EPM_DEMO"."sap.hana.democontent.epm.data::salesOrder";

```

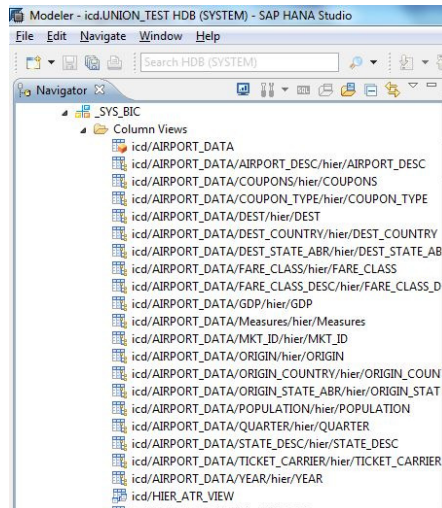
## 4.2 Analytic Views

Analytic views are used to create models in HANA for data which contains measure data, under the covers an analytic view is a star schema with fact and dimension tables.

They can only be accessed via SQL containing aggregation statements. This is an important consideration when building in memory QlikView scripts as they will require one of the following: SUM,MIN,MAX,and COUNT with a GROUP by in the SQL SELECT statement.



The representation of Analytic Views in tables accessible via SQL and ODBC can be found stored in the SYS\_BIC \Column Views area within HANA:



**Note: Column Views will not appear in the select wizard in QV11 as such the script will need to be hand coded this will include Navigator Analytic Views, Attribute View and Calculation Views**

As previously mentioned aggregation statements are required in the SQL SELECT clause in order to successfully retrieve the data from an Analytic View in QlikView for example:

```
LOAD *;
SQL select
YEAR,
QUARTER,
ORIGIN,
DEST,
TICKET_CARRIER,
PASSENGERS
from "_SYS_BIC"."icd/AIRPORT_DATA"
```

Would produce the following error message in QlikView on reload from SAP HANA

**SQL##f - SqlState: S1000, ErrorCode: 7, ErrorMsg: [SAP AG][LIBODBC:HDB][HDB] General error;7 feature not supported: not allowed over OLAP VIEW : search without aggregation or grouping by expression other than view column**





The following is required:

```
LOAD *;
SQL select
YEAR,
QUARTER,
ORIGIN,
DEST,
TICKET_CARRIER,
SUM(PASSENGERS) as PASSENGERS
  from "_SYS_BIC"."icd/AIRPORT_DATA"
  GROUP BY
YEAR,
QUARTER,
ORIGIN,
DEST,
TICKET_CARRIER;
```

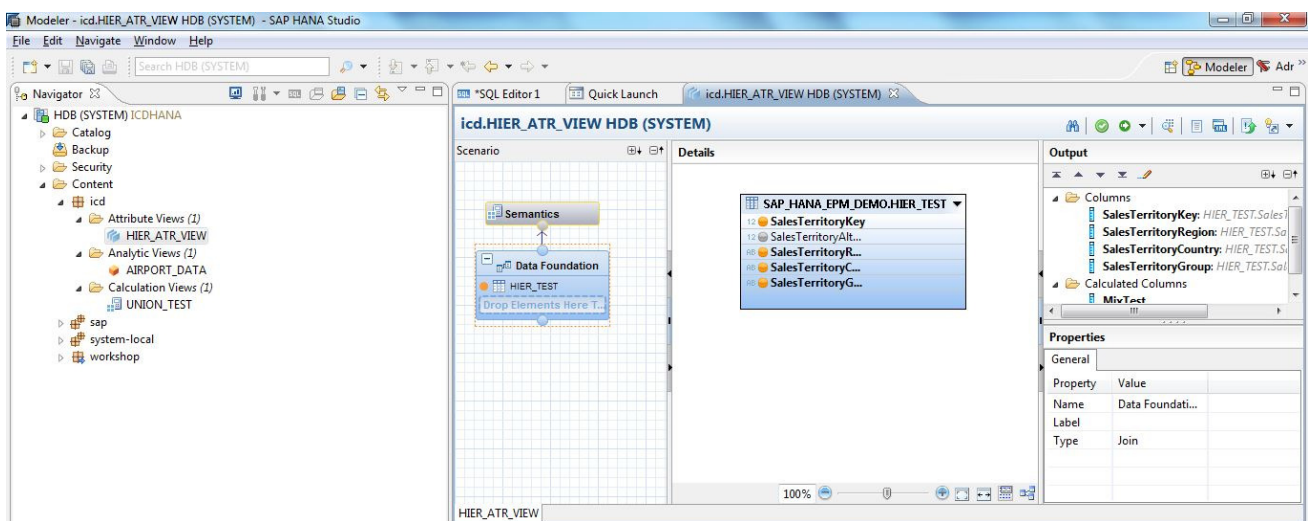
And for Direct Discovery (aggregations are automatic with the chart display of a MEASURE field and only DIMENSION data loaded at reload time):

```
DIRECT QUERY
DIMENSION
YEAR,
QUARTER,
ORIGIN,
DEST,
TICKET_CARRIER
MEASURE
PASSENGERS
  from "_SYS_BIC"."icd/AIRPORT_DATA"
```

Note the syntax shown for Direct Discovery is the updated version to be delivered with 11.20 SR5.

### 4.3 Attribute Views

Attribute views can be thought of as containing dimension data and can be used in analytical and calculation views where entities are relevant. Generally attribute views represent master data. However technically there is no restriction and it's possible to make attribute views on transaction data.



They do not require any aggregation to be performed in the QlikView load statement and will also appear in the SYS\_BIC \Column Views area within HANA. Calculated columns are also supported, the load statement for the view above would be:

```
LOAD *;
SQL SELECT
  "SalesTerritoryKey",
  "SalesTerritoryRegion",
  "SalesTerritoryCountry",
  "SalesTerritoryGroup",
  "MixTest"
from
  "_SYS_BIC"."icd/HIER_ATR_VIEW"
```

**NOTE** the use of quotes as the field names are lower case

Hierarchies are also supported and appear in separate table in the SYS\_BIC \Column Views area within HANA they will require additional manipulation in QlikView as they are stored in a child and parent form with QUERY/RESULT node columns:

The screenshot shows the SAP HANA Column Views interface. On the left, a list of views is displayed, including 'icd/HIER\_ATR\_VIEW/hier/HIER\_AT'. On the right, the 'View Name' is set to 'icd/HIER\_ATR\_VIEW/hier/HIER\_AT'. Below this, a table lists the columns and their properties:

	View Column	Table Column	SQL Data Type	Dim
1	QUERY_NODE	QUERY_NODE	VARCHAR	5000
2	RESULT_NODE	RESULT_NODE	VARCHAR	5000
3	LEVEL	LEVEL	INTEGER	
4	LEVEL_NAME	LEVEL_NAME	VARCHAR	5000
5	ORDINAL	ORDINAL	INTEGER	
6	IS_LEAF	IS_LEAF	INTEGER	
7	QUERY_NODE_NAME	QUERY_NODE_NAME	VARCHAR	5000
8	RESULT_NODE_NAME	RESULT_NODE_NAME	VARCHAR	5000
9	PATH	PATH	VARCHAR	5000
10	PARENTS	PARENTS	VARCHAR	5000
11	CHILDREN	CHILDREN	VARCHAR	5000

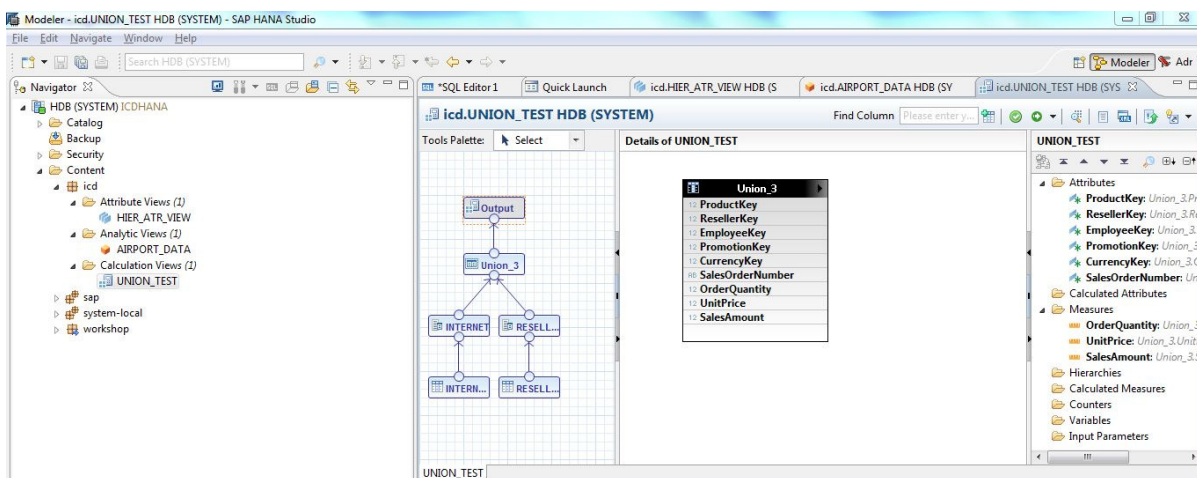
And below is the data from a sample Hierarchy within an Attribute View:

The screenshot shows the SAP HANA Column Views interface. On the left, a list of views is displayed, including 'icd/HIER\_ATR\_VIEW/hier/HIER\_AT'. On the right, the 'View Name' is set to 'icd/HIER\_ATR\_VIEW/hier/HIER\_AT'. Below this, a table lists the columns and their properties:

	QUERY_NODE	RESULT_NODE	LEVEL	LEVEL_NAME	ORDINAL	IS_LEAF	QUERY_NODE_NAME	RESULT_NODE_NAME
1	[All],[(all)]	[All],[(all)]	0	All	1	0	(all)	(all)
2	[SalesTerritoryGroup],[E...	[SalesTerritoryGr...	1	SalesTerritoryGroup	2	0	Europe	Europe
3	[SalesTerritoryCountry],...	[SalesTerritoryCou...	2	SalesTerritoryCou...	3	0	France	France
4	[SalesTerritoryRegion],[...	[SalesTerritoryRe...	3	SalesTerritoryRegi...	4	1	France	France
5	[SalesTerritoryCountry],...	[SalesTerritoryCou...	2	SalesTerritoryCou...	5	0	Germany	Germany
6	[SalesTerritoryRegion],[...	[SalesTerritoryRegi...	3	SalesTerritoryRegi...	6	1	Germany	Germany
7	[SalesTerritoryCountry],...	[SalesTerritoryCou...	2	SalesTerritoryCou...	7	0	United Kingdom	United Kingdom
8	[SalesTerritoryRegion],[...	[SalesTerritoryRe...	3	SalesTerritoryRegi...	8	1	United Kingdom	United Kingdom
9	[SalesTerritoryGroup],[...	[SalesTerritoryGr...	1	SalesTerritoryGroup	9	0	NA	NA
10	[SalesTerritoryCountry],...	[SalesTerritoryCou...	2	SalesTerritoryCou...	10	0	NA	NA
11	[SalesTerritoryRegion],[...	[SalesTerritoryRe...	3	SalesTerritoryRegi...	11	1	NA	NA
12	[SalesTerritoryGroup],[...	[SalesTerritoryGr...	1	SalesTerritoryGroup	12	0	North America	North America
13	[SalesTerritoryCountry],...	[SalesTerritoryCou...	2	SalesTerritoryCou...	13	0	Canada	Canada
14	[SalesTerritoryRegion],[...	[SalesTerritoryRe...	3	SalesTerritoryRegi...	14	1	Canada	Canada
15	[SalesTerritoryCountry],...	[SalesTerritoryCou...	2	SalesTerritoryCou...	15	0	United States	United States

#### 4.4 Calculation Views

Calculation views can be referred as combination of tables, attributes views and analytical views to deliver a complex business requirement. They offer to combine different analytical views into one source of data for reporting.



The diagram above depicts a Calculation View which produces a single table by the UNION of two tables, these also appear in a separate table in the SYS\_BIC \Column Views area within HANA.

The LOAD statement will reflect the types of underlying entities which go to make up the calculation view, if an Analytic View is in the source then aggregation statements will be required as discussed in the previous section.