



SAP BW **on** HANA

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About the Tutorial

SAP Business Warehouse (BW) powered by SAP HANA refers to using BW software suite on top of HANA database. This functionality explores all the key features of HANA database technologies and uses BW as a modeling tool for data modeling and analytical reporting.

BW software supports various databases like Oracle, Microsoft, IBM DB2, Teradata, and many more. BW on HANA suggests that you are using HANA as database for BW data modeling capabilities and no other database is required.

Audience

This tutorial has been prepared for those having advanced level knowledge on SAP BW functions and SAP HANA Native modeling. After completing this tutorial, you will find yourself at a moderate level of expertise in maintaining BW on top of HANA database, and exploring some key capabilities on BW powered by HANA.

Prerequisites

Before you start proceeding with this tutorial, we assume that you are well-versed with basic BW and HANA concepts, like DataStore Objects (DSO), Data Transformations, InfoCubes, Query optimization, HANA Modeling and HANA DB features using HANA Studio. If you are not aware of these concepts, then we recommend that you first go through our tutorials on BW and HANA.

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1. BW on HANA – Overview

SAP Business Warehouse (BW) powered by SAP HANA helps you speed up data analysis by consuming data via a Data Warehouse (DW) for analytical reporting and data analysis. You can achieve key opportunities like real-time data integration and data modeling, and hence real-time BI reporting on large amount of data in the database.

SAP Business Warehouse continues to act like a powerful data warehouse tool to consolidate master data and provide flexible reporting options. With SAP HANA underneath BW system as a database, you can use a combination of DW capabilities with fast in-memory database to achieve performance improvements and exceptional modeling capabilities.

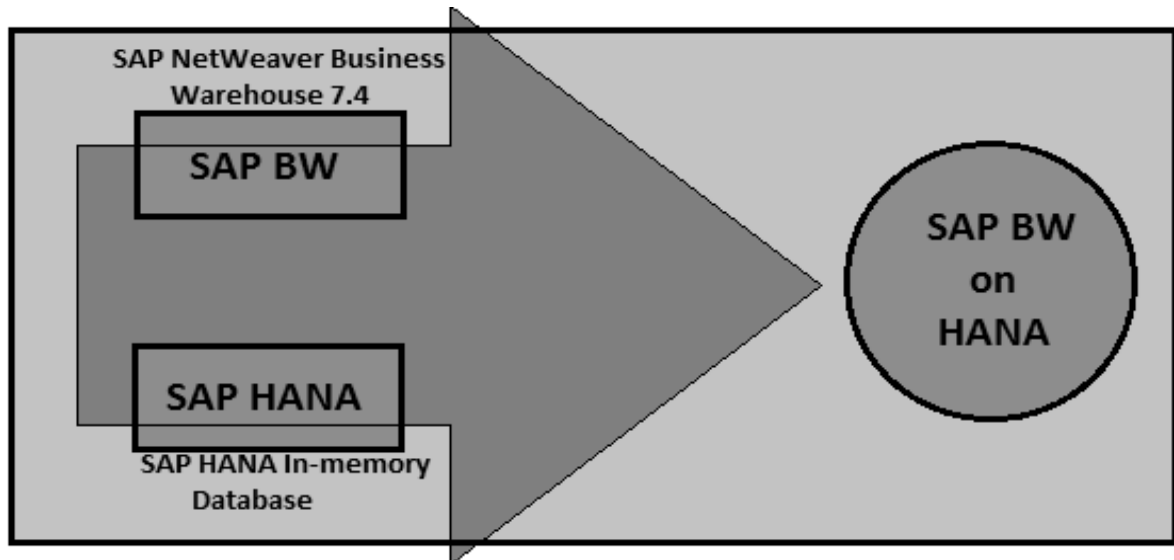
HANA in-memory database is much faster as compared to other common databases like Oracle, SQL Server, and hence DW performs much faster when powered by HANA as database underneath it. It combines the power of both the tools - BW Modeling and HANA in-memory computing engine to process huge amounts of data.

BW on HANA supports various exceptional databases and reporting capabilities that are not possible using other databases - like transformations and DSOs are moved to HANA database to provide much faster processing of data, data load performance, query processing and optimization, exceptional HANA modeling capabilities, etc.

Drawbacks of Using SAP BW with Other Databases

Following are the drawbacks when you use SAP BW with other databases such as Oracle, SQL Server, and IBM DB2.

- **Real-time Reporting** – Using BW with other databases, you can't perform real-time reporting as real-time data is not available in the data warehouse. Data is moved to Business Warehouse in batches and hence is not available for real-time reporting.
- **Implementing Structural Changes** – To implement any structure changes, it is very time consuming and a tough task as compatibility is not available with other DB vendors. To implement any structure changes in Business Warehouse, it takes 2-12 months' time.
- **Report Performance** – You have to perform report performance optimization and tuning for each application.
- **Compatibility** – Data in Business Warehouse is aggregated and materialized and you can't get the data at different granularity level. HANA supports aggregations on the fly when the report is executed.











As mentioned, HANA is much faster as compared to other databases like Oracle and SQL Server. Hence, when you combine HANA capabilities with BW, you get an exceptional data processing and reporting features.

BW on HANA – Key Customers

As per SAP, organizations of all sizes and industries around the world are using the power of SAP HANA platform to transform their business and create new value. It includes a list of companies from all domains and regions who have adapted HANA as database and used in-memory power of HANA database with BW data warehouse features. You can see the list of all organizations who have adapted SAP BW on HANA using the following link.

<https://hana.sap.com/abouthana/customer-stories.html>

<ul style="list-style-type: none"> <input type="checkbox"/> APJ <input type="checkbox"/> EMEA <input type="checkbox"/> GCN <input type="checkbox"/> LAC <input type="checkbox"/> MEE <input type="checkbox"/> NA <p>Product</p> <ul style="list-style-type: none"> <input type="checkbox"/> SAP Apps on SAP HANA <input checked="" type="checkbox"/> SAP BW on SAP HANA <input type="checkbox"/> SAP HANA Enterprise Cloud <input type="checkbox"/> SAP HANA One <input type="checkbox"/> SAP S4HANA 	 <p>Corporación América Consolidating Efficiently with SAP Business Warehouse powered by SAP HANA</p> <p>Read more</p>	 <p>Saipem Improving Reporting and Closing Processes with SAP Business Warehouse powered by SAP HANA</p> <p>Read more</p>	 <p>E.ON Energie Kundenservice Getting the Most Out of Data with SAP Business Warehouse powered by SAP HANA</p> <p>Read more</p>	 <p>Winnovation Helping Companies Make Better Business Decisions With SAP and Lenovo</p> <p>Read more</p>
	 <p>Unistar PRO Sharpening its Competitive Edge with SAP and Lenovo</p> <p>Read more</p>	 <p>NORD DRIVESYSTEMS Group Increasing the Speed of Business with SAP HANA</p> <p>Read more</p>	 <p>Procter & Gamble Reliable, Real-Time Reporting and Better Business Decisions with SAP Software and Services</p> <p>Read more</p>	 <p>CenterPoint Energy Using SAP HANA as the foundation to realize their strategic vision</p> <p>Read more</p>

Procter & Gamble

Procter & Gamble has adapted to SAP BW on HANA with the following business transformations.

- Reliable, real-time reporting and Better Business Decisions with SAP Software and Services.
- 55% database reduction from 36 TB to 16 TB.
- 400% increase in data loading speeds.
- 35,000 business users supported.

CenterPoint Energy

CenterPoint Energy uses SAP HANA as the foundation to realize their strategic vision.

- 10 minutes to create marketing targets, down from four weeks.
- 200% increase in productivity by replacing manual data replications with scheduled data loads into SAP HANA.
- 98.8% faster predictive analytics engine runtime (from 90 seconds to 1 second).
- 15% more calls handled by IVR rather than by agents.

Adidas

Adidas leveraging SAP HANA platform stays ahead of consumer demand utilizing SAP Fashion Management application.

- Complete visibility from the factory to the shop floor and e-commerce channels.
- Point of sale data analysis that provides a better understanding of consumers.
- Significantly faster nightly replenishment and allocation runs.

BW on HANA: Important Transactions

Following are the key transaction codes to be used in BW on HANA system.

RSA1: To open BW workbench

RSMIGRHANADB: To convert in-memory optimized BW

SM59: To configure RFC connection for SLT

Ltr: To configure Trusted RFC

RSPCM: To monitor periodic process chains

RSPC: To view the log for runs of a process chain

RSLIMO: BW Lean Modeler Test UI

2. BW on HANA – BW Basics

SAP BW integrates data from different sources, transforms and consolidates the data, performs data cleansing, and stores data. SAP BW also includes data modeling, administration and staging area.

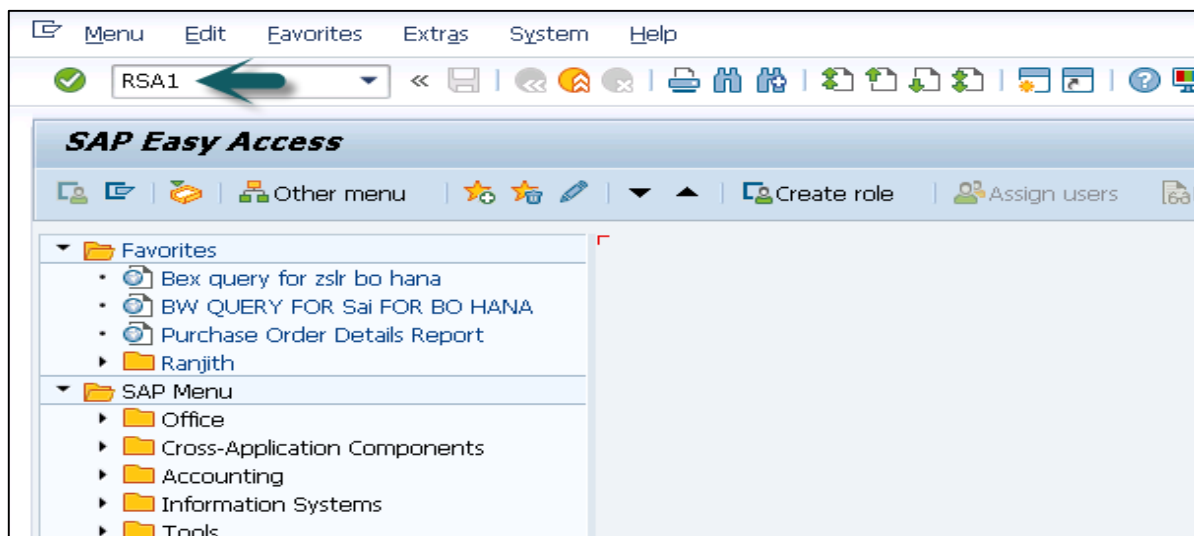
Data in SAP BW is managed with the help of a centralized tool known as SAP Business Intelligence (BI) Administration Workbench. The BI platform provides infrastructure and functions to include:

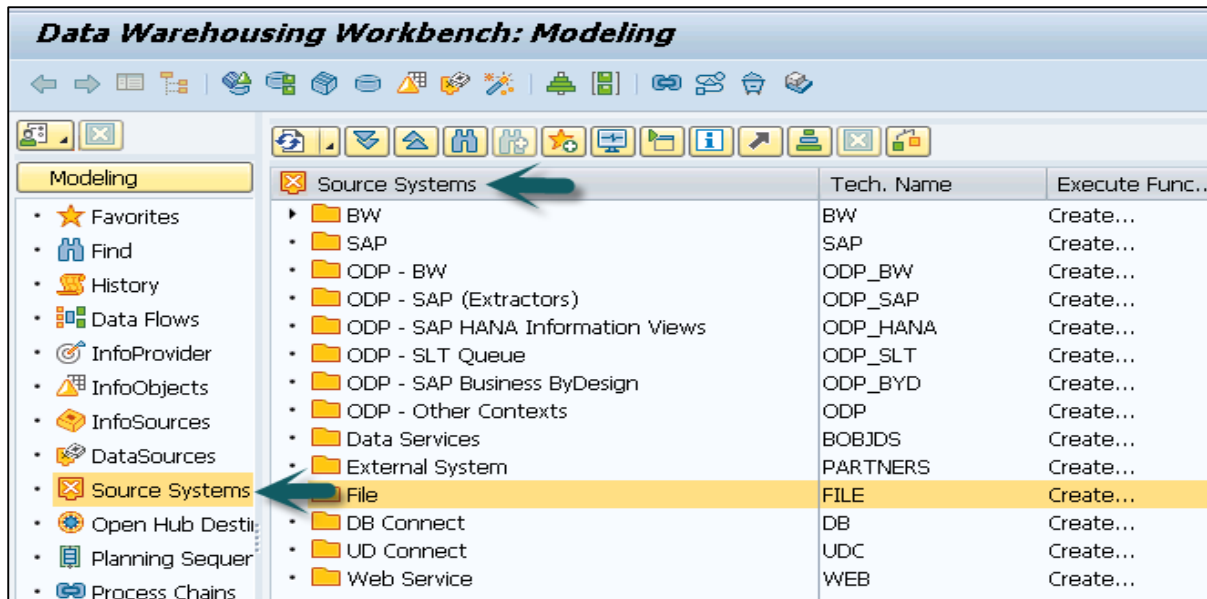
- OLAP Processor
- Metadata Repository
- Process Designer and other functions

Business Explorer (BEx) is a reporting and analysis tool that supports query, analysis, and reporting functions in BI. Using BEx, you can analyze historical and current data to different degree of analysis.

SAP BW is known as open, standard-based tool which allows you to extract data from different systems to BI system. It evaluates the data with different reporting tools and you can distribute this to other systems.

When you go to SAP BI Administration workbench, the source system is defined there. Go to RSA1 -> Source Systems.





As per the type of data source, you can differentiate source systems:

- Data Sources for transaction data
- Data Sources for master data
- Data sources for hierarchies
- Data sources for text
- Data Sources for attributes

You can load the data from any source in the data source structure into BI with an InfoPackage. The target system where the data is to be loaded is defined in the transformation.

DataStore Object

DataStore Object (DSO) is known as a storage place to keep cleansed and consolidated transaction or master data at lowest granularity level. This data can be analyzed using BEx query.

A DSO contains key figures and characteristic fields. Data from DSO can be updated using Delta update or other DataStore objects or master data. DSOs are commonly stored in two-dimensional transparent database tables.

DSO Architecture

DSO component consists of three tables:

Activation Queue

This is used to store the data before it is activated. The key contains request id, package id, and record number. Once activation is complete, the request is deleted from the activation queue.

Active Data Table

This table is used to store the current active data and it contains the semantic key defined for data modeling.

Change Log

When you activate the object, changes to active data are stored in the change log. Change log is a PSA table and is maintained in Administration Workbench under PSA tree.

InfoCube

InfoCube is defined as a multidimensional dataset, which is used for analysis in a BEx query. An InfoCube consists of a set of relational tables which are logically joined to implement star schema. A Fact table in star schema is joined with multiple dimension tables.

You can add data from one or more InfoSource or InfoProviders to an InfoCube. They are available as InfoProviders for analysis and reporting purposes.

InfoCube Structure

An InfoCube is used to store the data physically. It consists of a number of InfoObjects that are filled with data from staging. It has the structure of a star schema.

The real-time characteristic can be assigned to an InfoCube. Real-time InfoCubes are used differently than standard InfoCubes.

3. BW on HANA – HANA Basics

HANA database takes advantage of in-memory processing to deliver the fastest data-retrieval speed, which is enticing for organizations struggling with high-scale online transactions or timely forecasting and planning.

Disk-based storage is still the enterprise standard and the price of RAM has been declining steadily. Thus, memory-intensive architectures will eventually replace slow, mechanical spinning disks and will lower the cost of Data storage.

In-memory column based storage provides data compression up to 11 times, reduces the space to store huge amount of data.

The speed advantages offered by RAM storage system are further enhanced by the use multi-core CPU's multiple CPUs per node and multiple nodes per server in the distributed environment.

Getting Started with SAP HANA Studio

SAP HANA studio is an Eclipse-based tool that runs on development environment and administration tool for working on HANA.

SAP HANA studio is both the central development environment and the main administration tool for HANA system. It is a client tool which can be used to access local or remote HANA system.

It provides an environment for HANA Administration, HANA Information Modeling and Data Provisioning in HANA database.

SAP HANA Studio can be used on the following platforms:

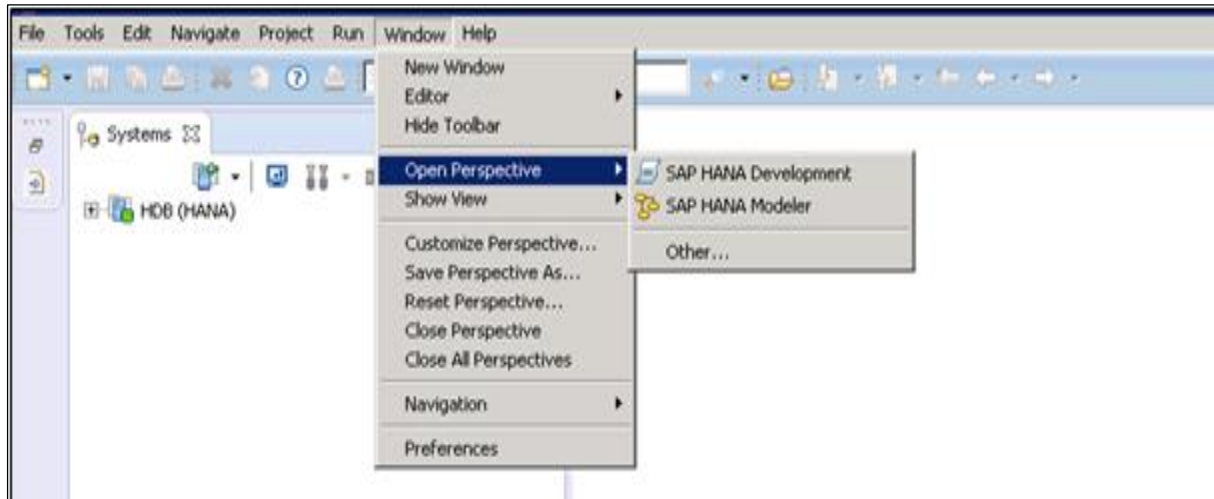
- Microsoft Windows 32 and 64 bit versions of: Windows XP, Windows Vista, Windows 7
- SUSE Linux Enterprise Server SLES11: x86 64 bit

However, in Mac OS, HANA studio client is not available.

Depending on HANA Studio installation, all features may not be available. At the time of Studio installation, specify the features you want to install as per the role. To work on the most recent version of HANA studio, Software Life Cycle Manager can be used for client update.

SAP HANA Studio – A Features

SAP HANA Studio provides a perspective to work on the following HANA features. You can choose the Perspective in HANA Studio using the following path, HANA Studio -> Window -> Open Perspective -> Other



SAP HANA Studio Administration

The toolset for various administration tasks, excluding transportable design-time repository objects. General troubleshooting tools like tracing, the catalog browser, and SQL Console are also included.

SAP HANA Studio Database Development

It provides the toolset for content development. It addresses, in particular, the DataMarts and ABAP on SAP HANA scenarios, which does not include SAP HANA native application development.

SAP HANA Studio Application Development

SAP HANA system contains a small Web server which can be used to host small applications. It provides the toolset for developing SAP HANA native applications, like application code written in Java and HTML.

By default, all features are installed.

HANA Studio Administration View

To perform HANA Database Administration and monitoring features, SAP HANA Administration Console Perspective can be used.

Administrator Editor can be accessed in the following ways:

- From System View Toolbar: Choose Open Administration default button
- In System View: Double-click HANA System or Open Perspective



In the Administration view, HANA studio provides multiple tabs to check the configuration and health of the HANA system. The Overview tab provides General Information such as: the operational status, the start time of the first and last started service, the version, the build date and time, the platform, the hardware manufacturer, etc.

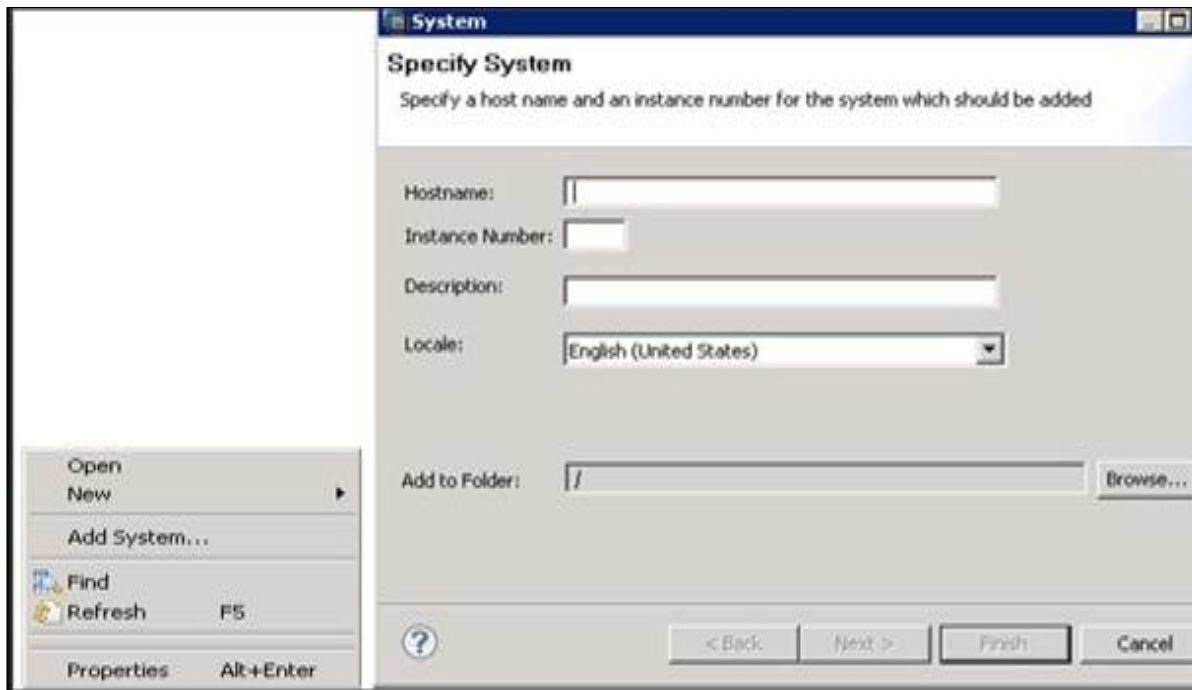
Adding a HANA System to Studio

One or multiple systems can be added to HANA studio for Administration and Information modeling purposes. To add a new HANA system, the host name, the instance number, and the database username and password is required.

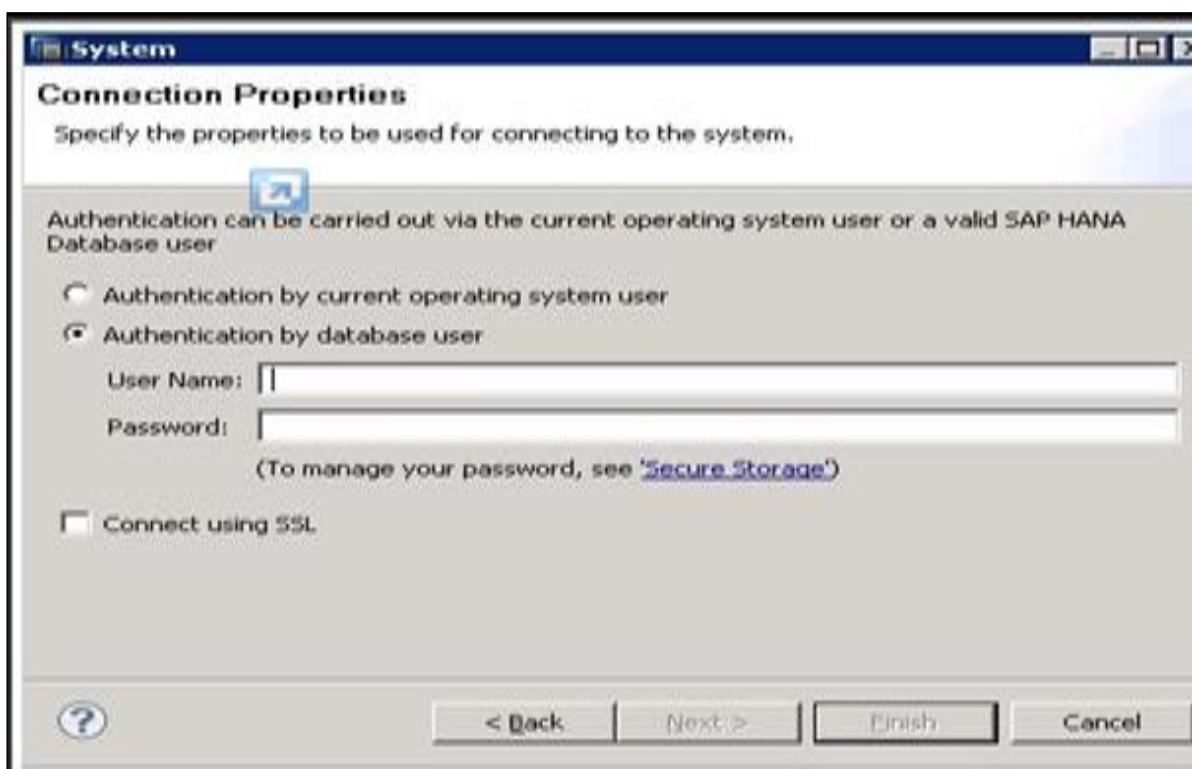
- Port 3615 should be open to connect to Database
- Port 31015 Instance No 10
- Port 30015 Instance No 00
- SSH port should also be open

Following are the steps to add a System to HANA studio:

Step 1: Right-click in the Navigator space and click Add System. Enter HANA system details, i.e. the host name and the instance number. Click next.



Step 2: Enter the database username and password to connect to SAP HANA database. Click Next and then Finish.



Once you click Finish, HANA system will be added to System View for administration and modeling purposes. Each HANA system has two main sub-nodes, Catalog and Content.



Catalog: It contains all available Schemas, i.e. all data structures, tables and data, column views, and procedures, which can be used in the Content tab.

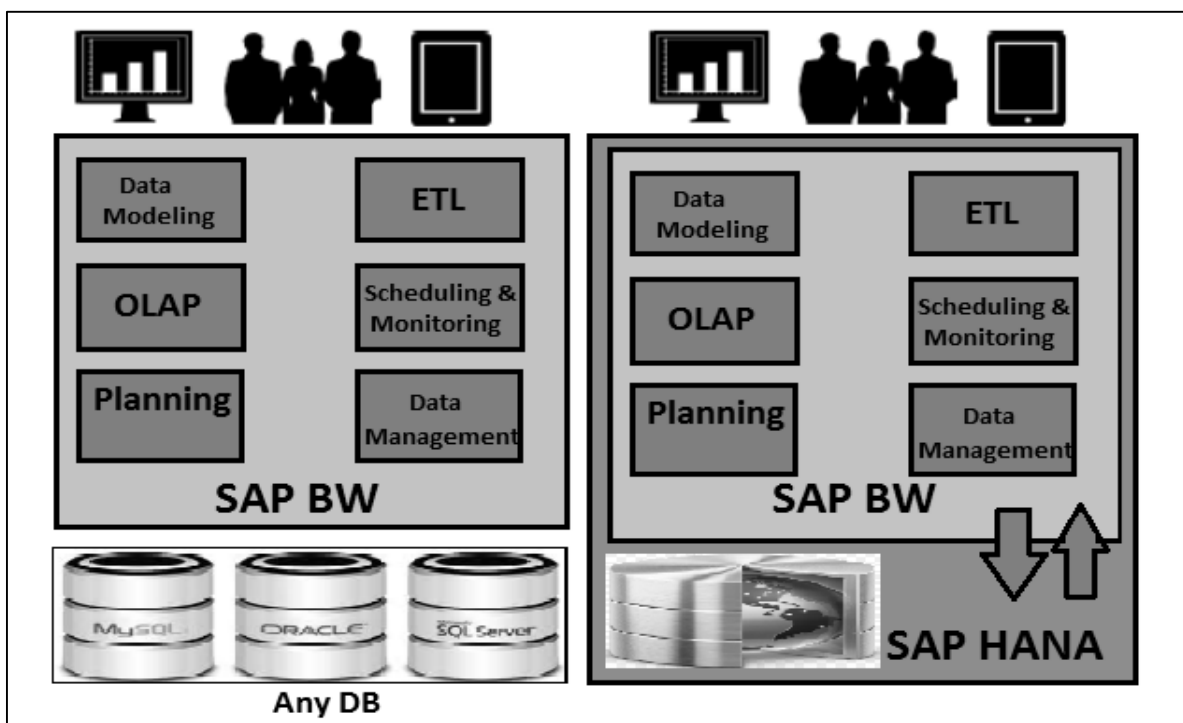
Content: The Content tab contains design time repository, which holds all information of data models created with the HANA Modeler. These models are organized in Packages. The Content node provides different views on the same physical data.

4. BW on HANA – Architecture

When SAP BW is powered by HANA, all the tasks are performed using HANA database optimized techniques. SAP HANA is responsible to perform key tasks related to Data Warehousing delivering excellent performance while performing analytical reporting.

In the following figure, you can see BW on HANA architecture where all the key activities of BW are HANA optimized:

- HANA-Optimized Data Modeling: InfoCubes
- HANA-Optimized Data Modeling: Advanced DataStore Objects
- HANA-Optimized Data Modeling: Composite Providers
- HANA-Optimized Data Staging
- HANA-Optimized Analytic Manager
- HANA-Optimized Analysis Processes

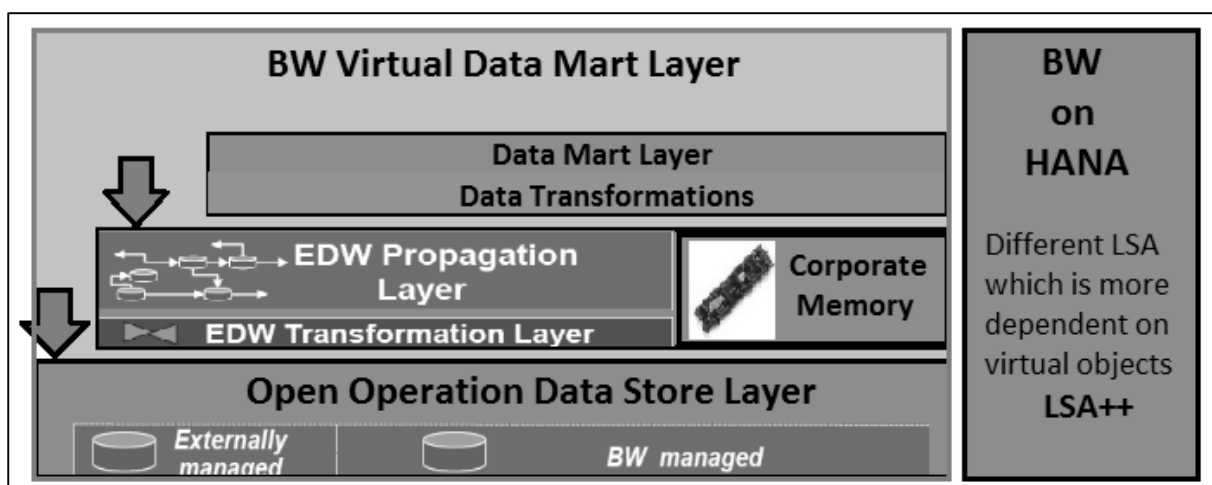


Layered Scalable Architecture (LSA and LSA++)

In SAP BW, LSA makes it more robust, flexible, and scalable solution to perform enterprise data warehousing functions. LSA is the corporate framework for BW to reliably manage the entire data and metadata life cycle:

- Data delivery
- Data modeling
- Data staging
- Authorizations
- Solution delivery

When BW is implemented on SAP HANA, you can create a different LSA which is more dependent on virtual objects. This is known as LSA++ and it consists of three key layers:



Open Operation Data Store Layer

This layer is similar to the data acquisition layer in SAP BW. The open ODS layer is used to integrate data into the Data Warehouse and provides the same functionality as the classic data acquisition layer, but with more flexible data integration possibilities.

Core Data Warehouse Layer

This layer is responsible to perform functions like data transformation, data cleansing and consolidation.

Virtual Data Mart Layer

This layer is responsible to combine the data from other layers and to make it available for reporting purposes. This layer contains all the InfoProviders that combine data using join or union, without saving the result: MultiProvider, Composite Provider, etc. You can use this to access data directly in the SAP HANA database, to allow queries on Composite Provider, Open ODS View. Composite provider allows you to merge the data from BW InfoProviders with HANA Modeling views. Union and Joins are performed in SAP HANA and queries can be run on composite providers, like BW InfoProviders.

End of ebook preview

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