



## SAP BW on HANA 7.5 (BW350H)

Data Warehousing with SAP  
Business Warehouse powered by  
SAP HANA

People matter, results count.

# Agenda – Unit 1: SAP BW and HANA Data Acquisition

- Introducing BW and HANA
- Explaining Data Acquisition in SAP BW
- Explaining SAP HANA Optimized Data Staging
- Comparing & Migrating 3.x to 7.x Data Flow Components
- Introducing Data Replication to HANA using SLT, SDI, and SDA

# Introducing BW and HANA

SAP HANA is used as a database for a SAP system (non-BW), or even for a 3rd party development, like your fancy e-commerce system or your custom-made data warehouse.

SAP BW, on the other hand, is a full-grown BI system, that includes tools for data modeling, ETL, data load management, OLAP engine, data mining, authorization and so on. SAP BW can work on different databases (Oracle, SQL Server) and also on HANA as underlying database.

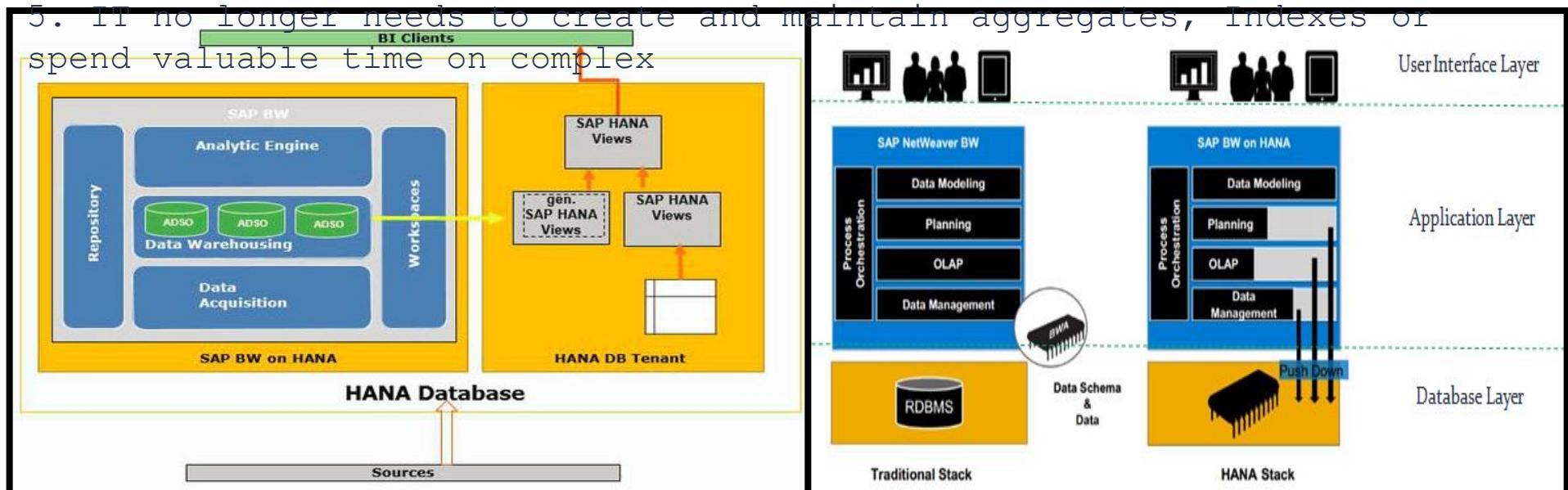
SAP Business Warehouse (BW) on HANA combines the power of both the tools - BW Modeling and HANA in-memory computing engine to process huge amounts of data

It 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.

# Introducing BW and HANA

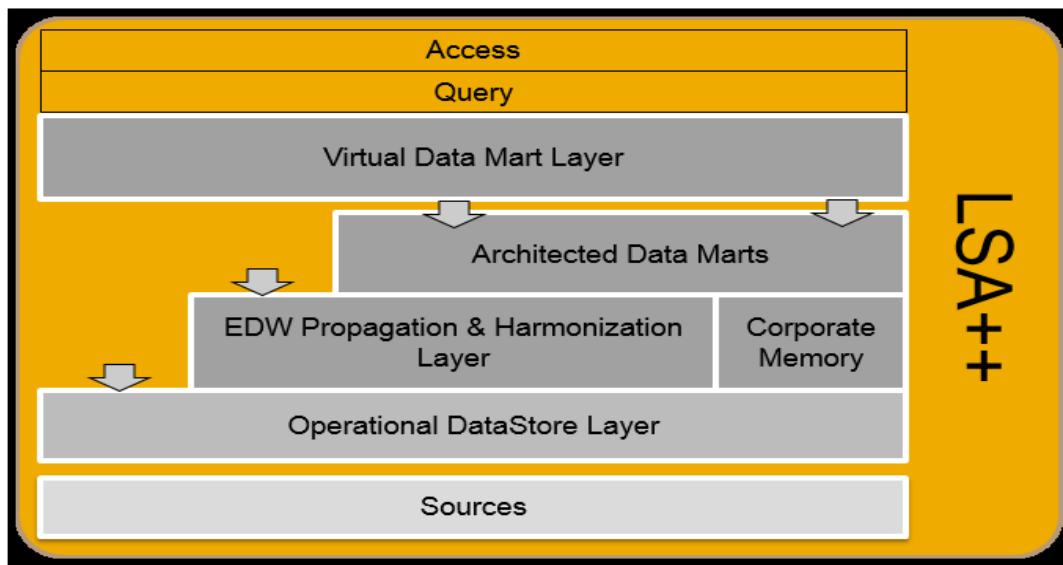
HANA as Primary database for BW and Foundation for New application

1. HANA acts as in memory database used as a primary persistence for BW
2. BW cubes and DSOs are loaded and activated in HANA to dramatically improve Performance
3. BW continues to manage the analytic metadata and data provisioning processes.
4. Database migration Only! The BW application remains Intact
5. IT no longer needs to create and maintain aggregates, indexes or spend valuable time on complex



# Explaining Data Acquisition in SAP BW

The Enterprise Data Warehouse layer consists of the data acquisition layer, the quality and harmonization layer, the data propagation layer and the corporate memory.



## Data Acquisition Layer

- The data acquisition layer allows data to be physically integrated into BW. The layer receives the data from the source and distributes it in the BW system. The layer allows you to fill all targets separately from each other, and even at different times.

# Explaining Data Acquisition in SAP BW

## Quality and Harmonization Layer

- In the quality and harmonization layer, the data is transformed, standardized and stored in DataStore objects.
- The level of transformation required here depends on how different the sources are that the data comes from. No transformations are performed here that affect the business logic.

## Data Propagation Layer

- The data propagation layer serves the applications. This should happen as quickly as possible, which is why you have the option of semantic partitioning in this layer. The data is stored and consolidated in DataStore objects. The data propagation layer provides a basis for further distribution and reuse of data

## Corporate Memory

- The Corporate Memory is filled (separately from the update) in the architected data marts. It contains the complete history of the loaded data. It can be used as a source for reconstructions, without needing to access the sources again.

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# Explaining SAP HANA Optimized Data Staging

## Data Acquisition Layer

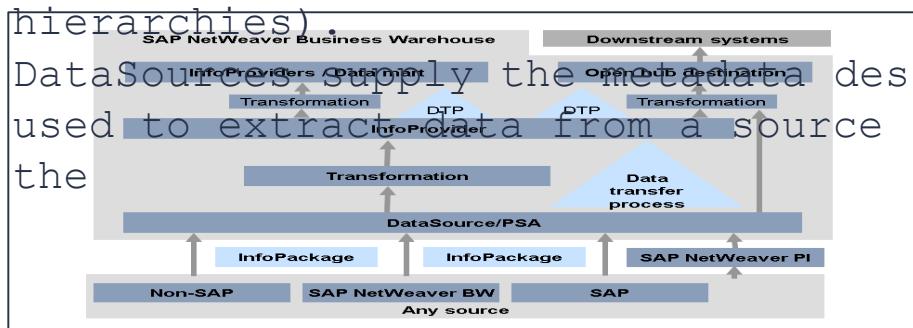
If you are using a SAP HANA database, we recommend that you use the DataStore object (advanced) for the data acquisition layer of the Data Warehouse, and that you use the LSA++ as the basis:

In SAP Business Warehouse, the data acquisition layer is displayed using the following objects:

- DataSource
- Persistent Staging Area (PSA)

### DataSource :

A DataSource is a set of fields that provide the data for a business unit for extraction and data transfer into the BW. From a technical point of view, the DataSource is a set of logically-related fields that are provided to transfer data into the BW in a flat structure (the extraction structure) or in multiple flat structures (for hierarchies).



DataSources supply the metadata description used to extract data from a source system in the

The data can be loaded into the BW system from any source in the DataSource structure using an InfoPackage. You determine the target to transfer the data from the DataSource to during the transformation. You also assign DataSource fields to target object InfoObjects in BW.

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# Explaining SAP HANA Optimized Data Staging

## **DataSource Maintenance in BW**

In DataSource maintenance, you can edit DataSources from SAP source systems. In particular, you can specify which fields you want to transfer into BW. In addition, you can determine properties for extracting data from the DataSource and properties for the DataSource fields. You can also change these properties.

## **Persistent Staging Area**

The Persistent Staging Area (PSA) is the inbound storage area in BW for data from the source systems. The requested data is saved, unchanged from the source system. Request data is stored in the transfer structure format in transparent, relational database tables of the BW system in which the request data is stored in the format of the DataSource. The data format remains unchanged, meaning that no summarization or transformations take place, as is the case with InfoCubes.

# Comparing & Migrating 3.x to 7.x Data Flow Components

Since SAP NetWeaver 7.0, new concepts and technologies are available for the data flow. These include the data transfer process, the transformation and the new DataSource (object type R3TR RSDS). If you want to benefit from these new features while working with an existing data flow, we recommend switching to the new concepts and technology. An interface is available for creating and executing migration projects for automated migration (transaction RSMIGRATE).

The following objects are supported by migration

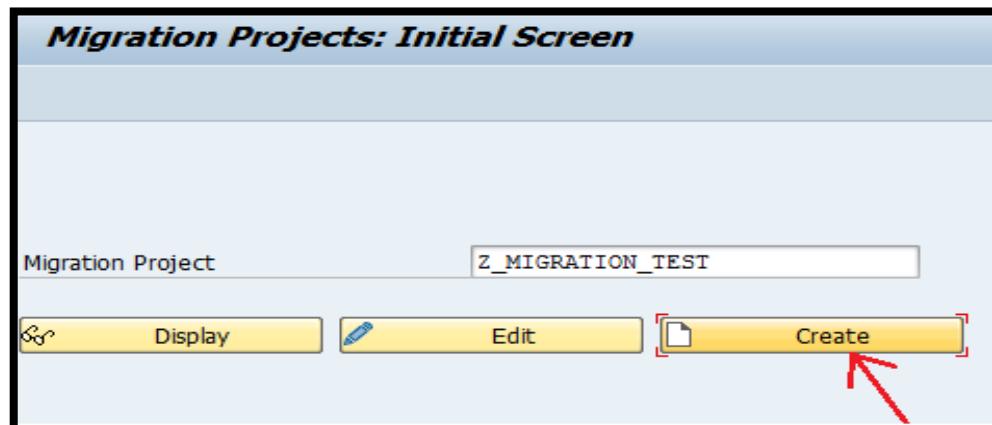
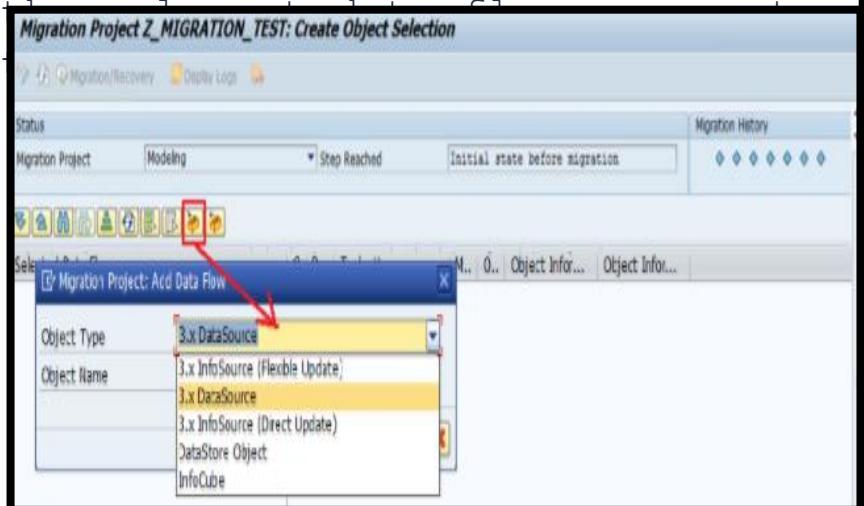
Object	Object Type
3.x InfoSource	R3TR ISTD
Transfer Rules	R3TR ISTS and R3TR ISMP
Update Rules	R3TR UPDR
InfoPackage	R3TR ISIP
VirtualProvider	R3TR CUBE (cubetype=V, cubesubtype=S)
Process Chain	R3TR RSPC
Process Chain Variant	R3TR RSPV
3.x DataSource	R3TR ISFS

To perform the data flow migration, create a migration project. For 3.x objects and 3.x DataSources, InfoSources and transfer and update rules, you can use migration projects to create objects from the new data flow concept and adapt InfoPackages, process chains, process variants and VirtualProviders to the migrated data flow.

# Comparing & Migrating 3.x to 7.x Data Flow Components

## Procedure

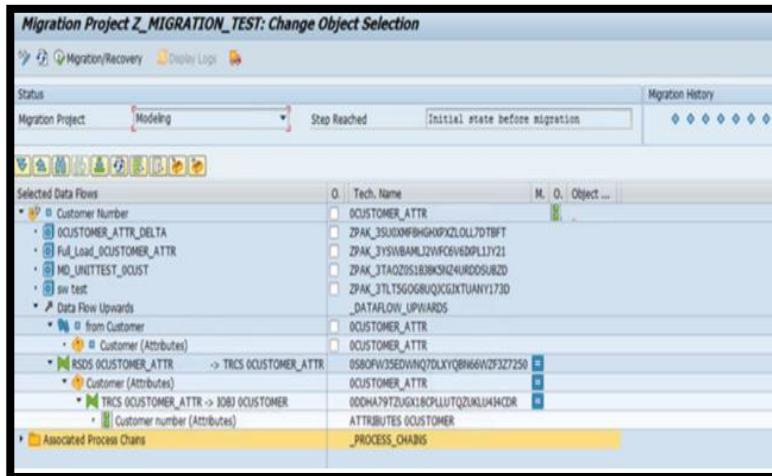
- 1 Create the Migration project in RSMIGRATE t-code. Give the migration project name and click on "Create" button
- 2 From the below screen click on the "Add flow" icon to add



In our case, since we are migrating the 0CUSTOMER data flow, we will select "3.x DataSource" option among the object types and add the data sources (attributes/text/hierarchy) in the "Object name" field one by one as shown in. And click on OK button.

# Comparing & Migrating 3.x to 7.x Data Flow Components

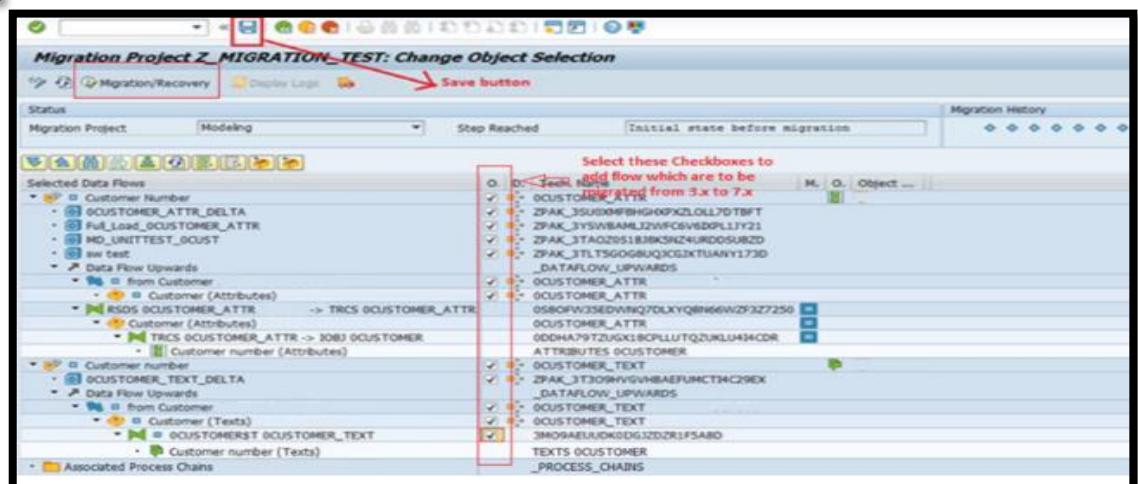
We will get the output as below



Similar to this add the data flow for text Data Source 0CUSTOMER\_TEXT

NOTE: We can add multiple data flows in a single migration project, but it's advisable to add only those flows in same migration project which have common data flows.

3. After adding all the data sources, select the objects from the flow which



# Comparing & Migrating 3.x to 7.x Data Flow Components

4. Once saved, you will see that the "Migration/Recovery" option is enabled. Now click on "Migration/Recovery" option. This will display all the 7 steps to be executed in order to complete the migration process
5. Next, click on "Migrate/Recover" button and proceed, in the last screen shot you can see migration completed

The figure consists of four screenshots illustrating the migration process:

- Screenshot 1: Execute Migration/Recovery** - Shows the "Selection of Steps" and "Dataflows" sections. The "Dataflows" section is highlighted with a red box and contains several checkboxes labeled "Migrate". An arrow points from the "Dataflows" section to the "Migrate" checkboxes.
- Screenshot 2: Migration Project Z\_MIGRATION\_TEST: Change Object Selection** - Shows the "Selected Data Flows" and "Handling of InfoSources" sections. The "Handling of InfoSources" section shows three rows: OCUSTOMER\_ATTR, OCUSTOMER\_ATTR, and OCUSTOMER\_TEXT. The OCUSTOMER\_TEXT row has its "Action" set to "Reuse". A red box highlights the "Migrate" checkboxes in the "Handling of InfoSources" section.
- Screenshot 3: Migration Project Z\_MIGRATION\_TEST: Display Object Selection** - Shows the "Selected Data Flows" and "Handling of InfoSources" sections. The "Handling of InfoSources" section shows three rows: OCUSTOMER\_ATTR, OCUSTOMER\_ATTR, and OCUSTOMER\_TEXT. The OCUSTOMER\_TEXT row has its "Action" set to "Reuse". A red box highlights the "Migrate" checkboxes in the "Handling of InfoSources" section.
- Screenshot 4: Migration Project Z\_MIGRATION\_TEST: Display Object Selection** - Shows the "Selected Data Flows" and "Handling of InfoSources" sections. The "Handling of InfoSources" section shows three rows: OCUSTOMER\_ATTR, OCUSTOMER\_ATTR, and OCUSTOMER\_TEXT. The OCUSTOMER\_TEXT row has its "Action" set to "Reuse". A red box highlights the "Migrate" checkboxes in the "Handling of InfoSources" section.

Annotations in the bottom-left screenshot highlight specific components:

- A red box surrounds the "Data Flow Upwards" section under "Customer Number".
- An orange box surrounds the "Customer (Texts)" section under "Customer number".
- Yellow arrows point from the "Data Flow Upwards" and "Customer (Texts)" sections to the right side of the screenshot, where text says "These are old flows in 3.x".
- Orange arrows point from the same sections to the right side, where text says "These are the migrated flows in 7.x".

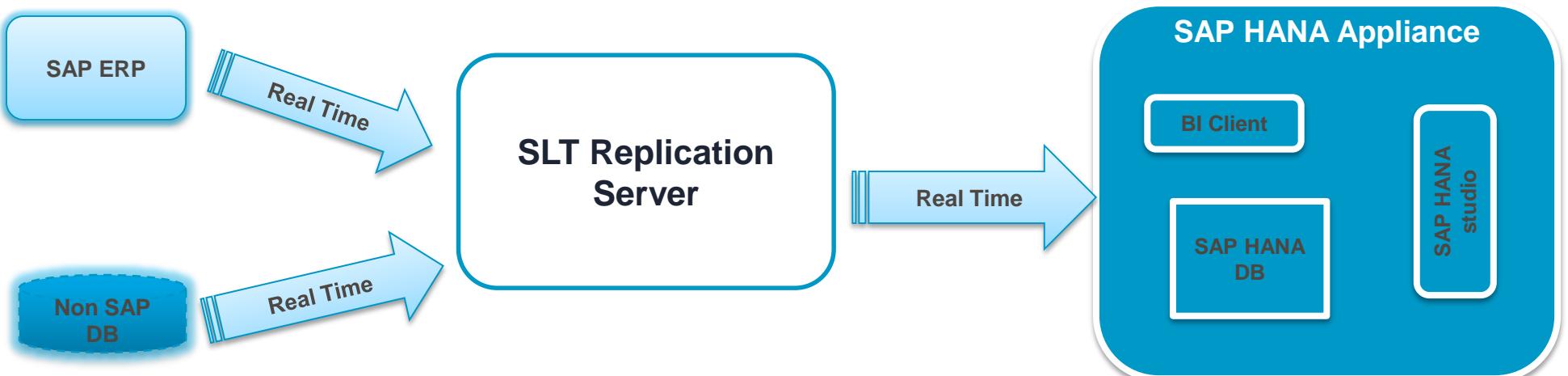
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# What is SLT

SLT stands for SAP Landscape Transformation Replication Server (SLT) running on the NetWeaver Platform. SLT is the ideal solution for all HANA customers who need real-time (and non-realtime) data replication sourcing from SAP ERP or non-SAP systems into HANA.

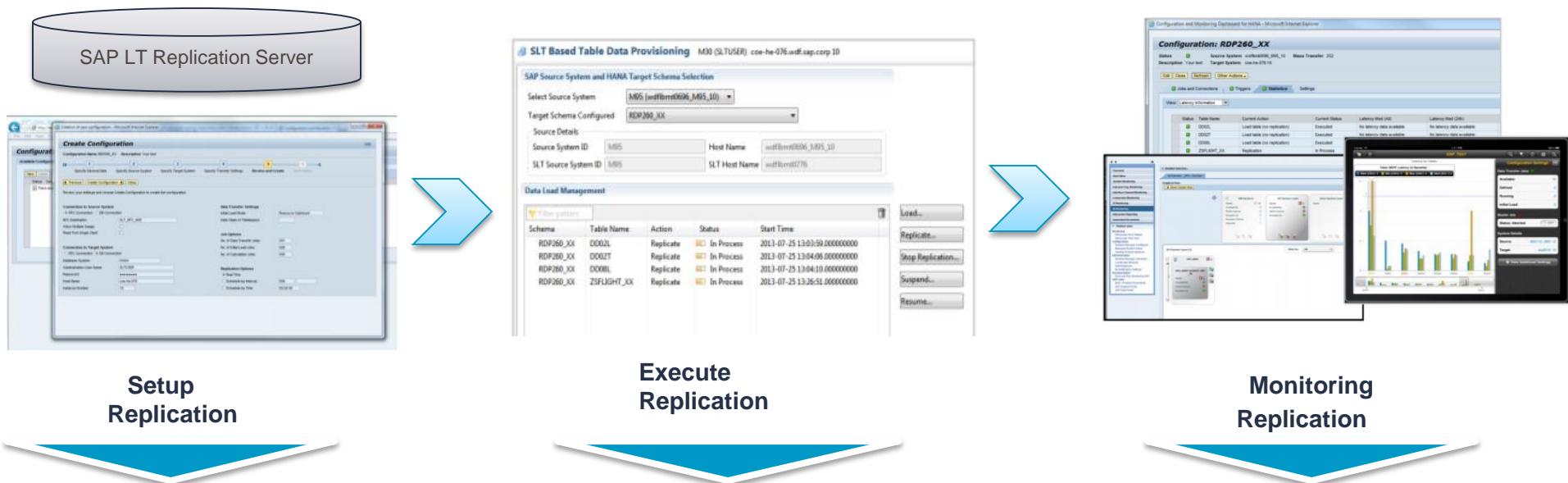
SAP SLT server uses a trigger-based replication approach to pass data from source system to target system.

SLT server can be installed on the separate system or on SAP ECC System.



# SLT - Setup, Execution & Monitoring of a Replication

SAP LT Replication Server (aka 'SLT') is a standard software to move data in real-time between different systems within the same network, wide area networks, or into the cloud to have the information at the right place at the right point of time.

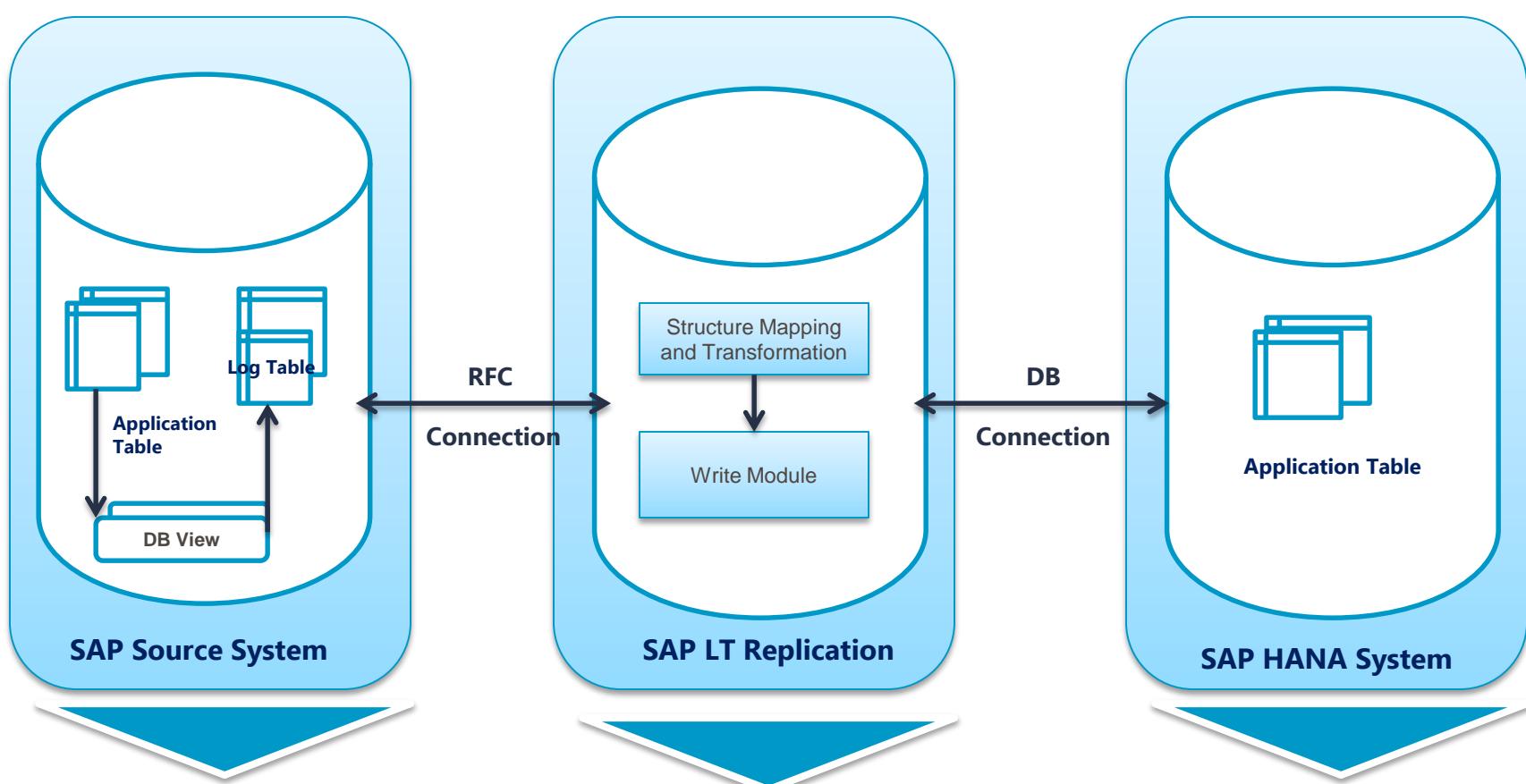


- Real-time or scheduled
- Delta capturing to minimize transfer volume .

- Filtering by using selective criteria
- Adjustment of tables
- Conversion of data, e.g. to make sensitive data anonymous

- Deeply integrated within SAP landscapes to reuse existing installation and monitoring capabilities
- Monitoring with SAP Solution Manager

# SAP SLT Architecture

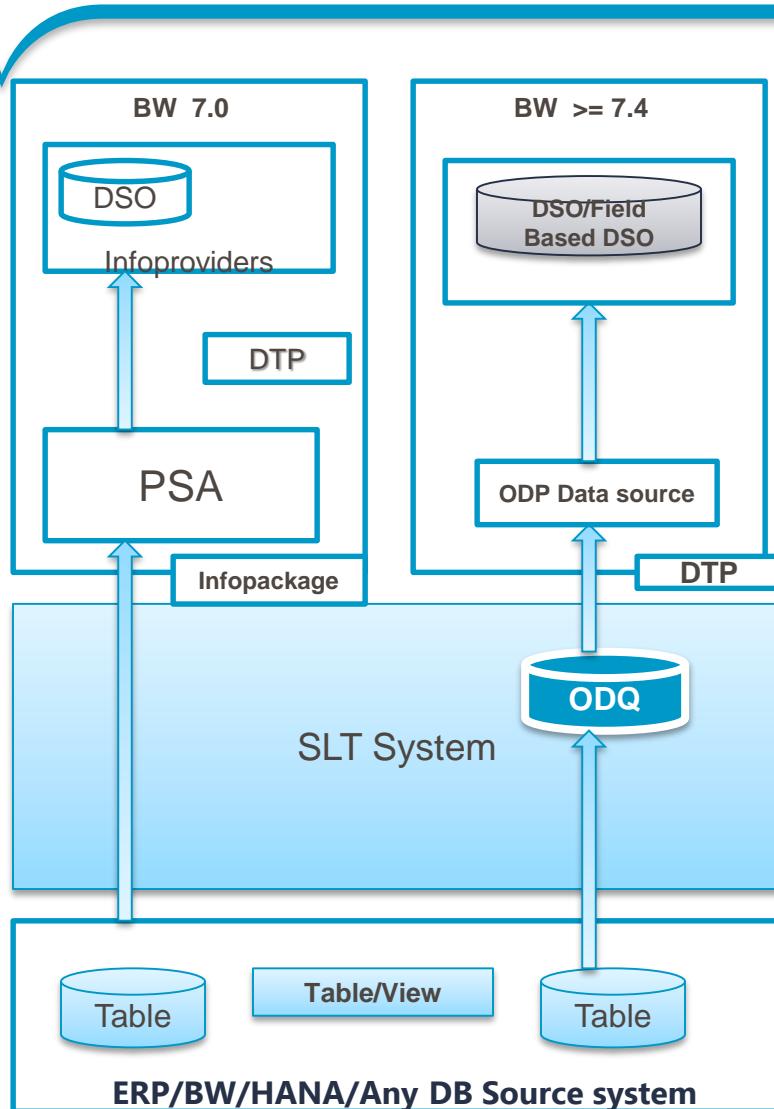


Efficient Initialization of Data Replication  
Based on DB Trigger and delta logging  
Concept ( as with Near Zero Downtime  
approach)

Flexible and reliable replication process. Inc  
Data migration( as used for SAP LT)

Fast Data replication via DB Connect LT  
Replication functionality is fully integrated  
with HANA Modeller UI

# SLT Scenarios for SAP Business Warehouse – Overview of PSA and ODP



## Scenario

SAP LT Replication Server offers 2 scenarios for replicating data into SAP BW. For SAP BW 7.00 onwards, data can be transferred into the PSA layer of BW into Web Service DataSources and then processed into the InfoProviders.

With Support Package SP8 of BW 7.30, the Operational Data Provisioning Infrastructure can be used with SLT, where the data from the source systems is stored and SAP BW is registered as a consumer.

## Value Proposition

Using SAP LT Replication Server to transfer data in real-time into SAP NW BW reduces the amount of overnight data uploads into your BW systems. With SAP LT Replication Server you can perform delta updates on BW DataSources without delta mechanisms, for ABAP-based systems as well as non-ABAP based systems on all SAP supported DB versions (according to PAM).

If you use operational data provisioning, you can load the data directly into the InfoProviders (bypassing the PSA layer) by using a DTP (Data Transfer Process) (as of SAP BW 7.30 SP8). The ODP infrastructure (with delta queues) takes over important services such as monitoring data requests.

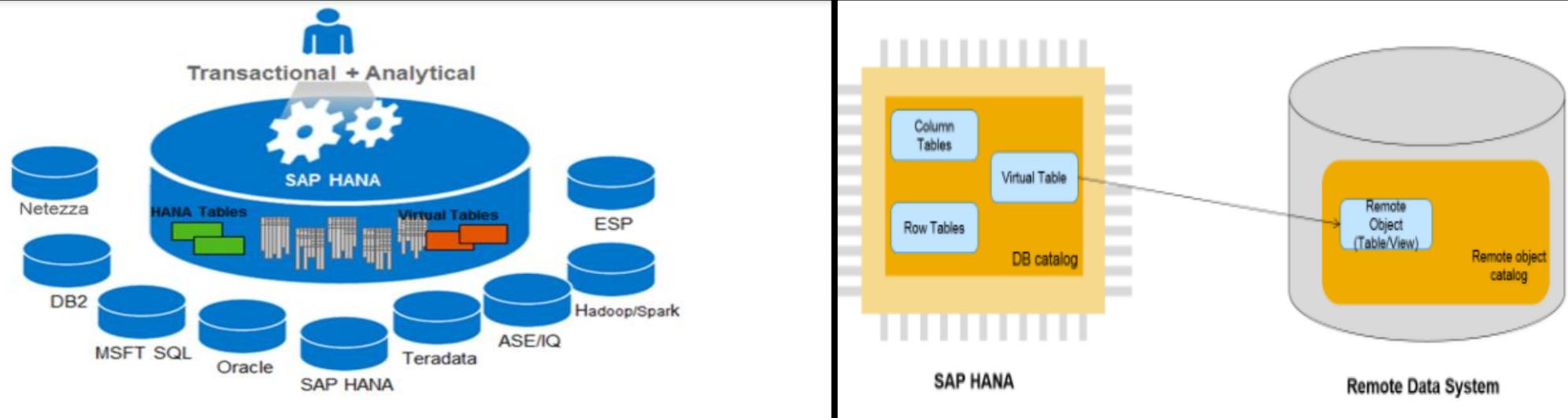
# Benefit of SLT system

- Allows real-time or schedule time data replication.
- During replicating data in real-time, we can migrate data in SAP HANA Format.
- SLT handles Cluster and Pool tables.
- This support automatically non-Unicode and Unicode conversion during load/replication. (Unicode is a character encoding system similar to ASCII. Non-Unicode is encoding system covers more character than ASCII).
- This is fully integrated with SAP HANA Studio.
- SLT have table setting and transformation capabilities.
- SLT have monitoring capabilities with SAP HANA Solution Manager.

# Data Replication to HANA using SDA

## Smart Data Access (SDA)

SAP HANA smart data access enables remote data to be accessed via SQL queries as if they are local tables in HANA, without copying the data into SAP HANA. Not only does this capability provide operational and cost benefits, but most importantly it supports the development and deployment of the next generation of analytical applications which require the ability to access and integrate data from multiple systems in real-time regardless of where the data is located or what systems are generating it.



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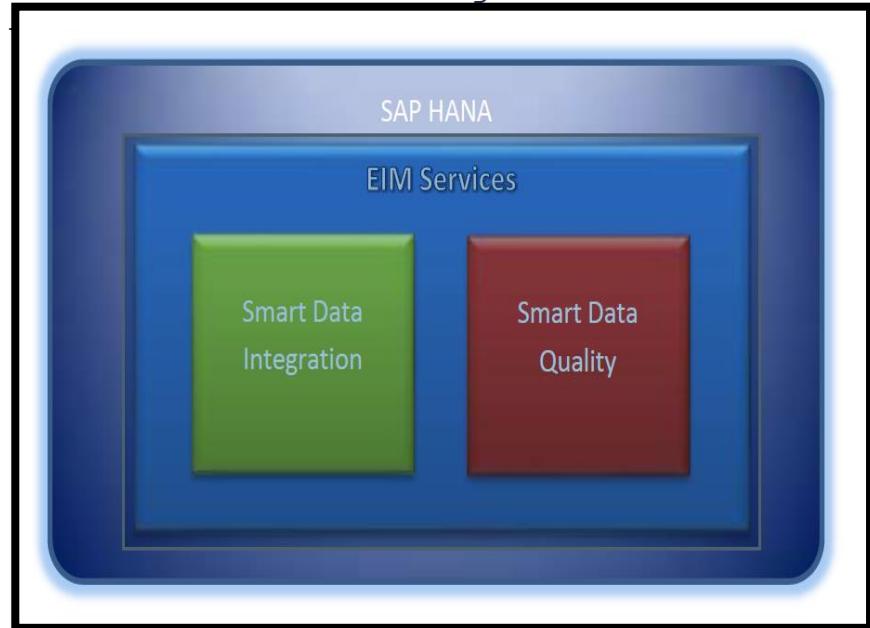
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# Introducing Data Replication to HANA using SLT, SDI, and SDA

## Smart Data Integration (SDI)

SDI helps to replicate the data from the SAP and non-SAP source systems and allows applying the Transformations. It is flexible enough to accept the data of any type and any volume of data. Using SAP HANA web-based development workbench and SAP HANA studio the modeling of the data models can be build. SDI performs faster when

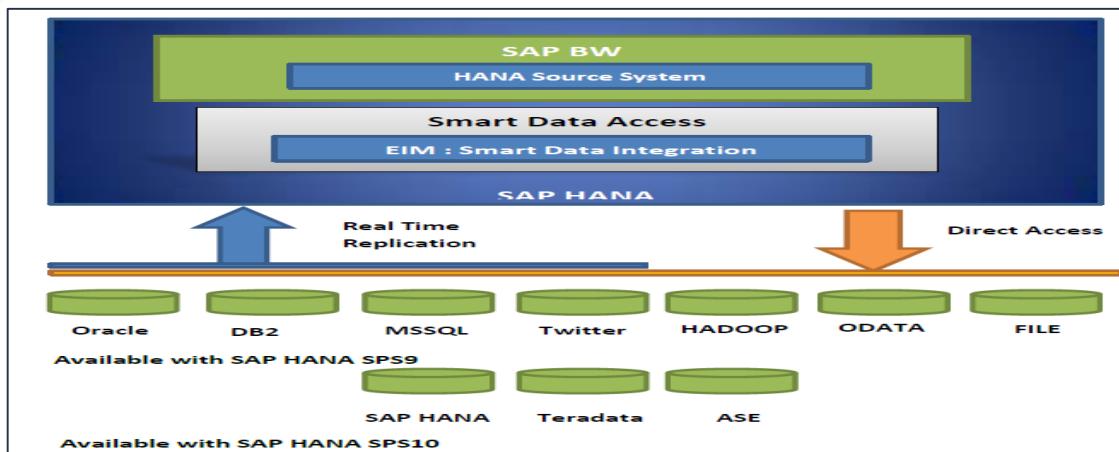


A SAP HANA Smart Data integration for SAP BW with SAP BW 7.5 SP1, BW is enabled to include SAP HANA as one of the source system for pilot Customers. As explained above Smart data integration allows replicating the data and also performing Transformation, so using this SDI adapter the SAP BW is able to connect to SAP HANA sources with SAP HANA source system. From SAP HANA SPS9, SAP SDI for SAP BW extends SAP HANA's smart data access capabilities to perform real time data replication with new sources like Twitter, Oracle,

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DB2, MySQL, Oracle, and File and direct  
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access with On Premise and cloud from SAP

# Data Replication to HANA SDI

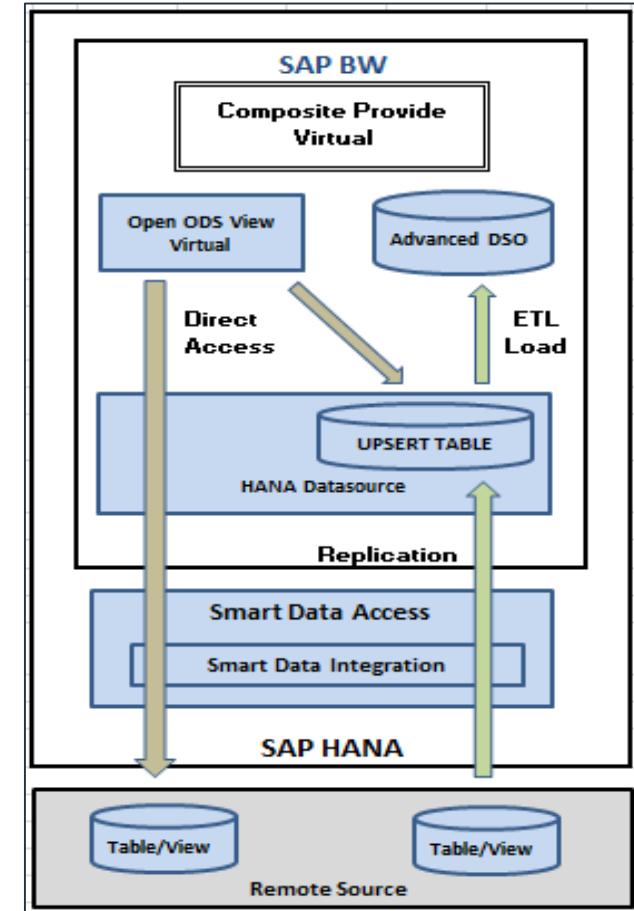


**SAP HANA SDI Capabilities for SAP BW are :**

**Direct Access** SAP HANA SDI has the capability to access any SDI remote source via OpenODSView and Composite provider.

**Real-time Replication** : Real-time replication updates the data into "UPINSERT Table" managed by SAP HANA Data source. The raw/original format data from "UPINSERT Table" will be updated in SAP BW using HANA data types. During ETL loads within BW all the source data types will be mapped to ABAP data types.

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# Agenda – Unit 2 : Data Acquisition with the SAP BW Service API

- Connecting SAP Source Systems to SAP BW
- Displaying the Configuration of the SAP BW Service API
- Modeling Generic DataSources
- Explaining Business Intelligence(BI) Off The Shelf Content
- Loading hierarchies from ECC
- Examining the Transfer of GL Data
- Adapting BI Content DataSources
- Implementing Process Chains

# Connecting SAP Source Systems to SAP BW

## Determine the logical system name of the BW and the SAP source system

Before we begin the setup, we find/get accustomed to the logical names of the systems in the picture. The details can be found in the Table: T000 => Field LOGSYS of the client you are checking. BW source system connection works with the logical system name and therefore a logical system name for the appropriate client is mandatory (BW and source system)

MANDT	MTEXT	....	LOGSYS	MANDT	MTEXT	....	LOGSYS
500	BW productive client		BW_PROD	999	Source System productive client		SRC_PROD

# Connecting SAP Source Systems to SAP BW

Check if the BW has a connection to the SAP source system and vice versa

Table RSBASIDOC => Field SLOGSYS contains the logical system name of the source system and field RTLOGSYS of the BW system You should find t

**Data Browser: Table RSBASIDOC Select Entries 5**

Src. System	DWH System	Stat	Basic type	Number State Transfer Structure 3.x	TP	Sou
████████_HDB	████CLNT100	ACT			H	O
████CLNT100	████CLNT100	ACT	A001		H	M
████FILE	████CLNT100	ACT	E008		H	F
████FILE	████CLNT100	ACT	B003		H	F
████BIC00	████CLNT100	ACT	████002		H	G

In case there is no entry in table RSBASIDOC in the source system and the generated prefix (TSPREFIX) is not used for a different connection, you can restore the connection in BW in case the RFC connection to the source system is ok.

Restoring means that the system will create missing entries in the BW and Source system, **For more details refer Unit 2 Lesson 1.**

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# Displaying the Configuration of the SAP BW Service API

The BW Service API (SAPI) is a technology package in the SAP source system that enables tight integration of data transfer from SAP source systems into the BW system.

The SAPI allows you to

- Make available SAP application extractors as a basis for data transfer into BW
- Carry out generic data extraction
- Use intelligent delta processes
- Access data in the source system directly from BW (VirtualProvider support)

With transaction SBIW, the SAPI provides an implementation guide in the SAP source system that includes the activities necessary for data extraction and data transfer from an SAP source system into BW.

Irrespective of the type of SAP source system, Customizing for extractors comprises activities that belong to the scope of SAPI:

- General settings for data transfer from source systems into BW.
- The option of installing BI Content delivered by SAP
- The option of maintaining generic DataSources
- The option of post processing the application component hierarchy and DataSources on a source system

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# Displaying the Configuration of the SAP BW Service API

## **Steps to maintain control parameter for data transfer:**

In SBIW

Go To General settings.

Maintain control parameter for data transfer.

1. Source system:

Enter logical name of your source system

2. Maximum size of your data package:

Individual data records are transferred to BW in data packages of a variable size. You can use these parameters to set average size for data package. If you do not maintain the data here by default it takes 10,000 k bytes per data package. The amount of memory required does not depend on the setting controlling the size of the data package alone. It also depends on the width of the transfer structure, the memory requirement of the extractor involved and large data package it also depends on the no of records in data package.

# Displaying the Configuration of the SAP BW Service API

## Steps to maintain control parameter for data transfer:

### 3. Maximum no of rows in a data package:

With large data packages, the amount of memory requires depends largely on the no of data records that are being transferred in each particular data package. We use these parameters to set maximum no of rows in a package; by default it takes 100,000 records per data package.

The screenshot shows two windows related to SAP BW Service API configuration:

- Left Window (Display IMG):** A navigation tree under "Data Transfer to the SAP Business Information Warehouse". The "Maintain Control Parameters for Data Transfer" node is highlighted with a red vertical bar.
- Right Window (Change View):** A table titled "Control parameters for data transfer from the source system". It displays one row of data:

Src.system	Max. (kB)	Max. lines	Frequency	Max. proc.	Tgt System
L NT090	20000	20000	10	3	

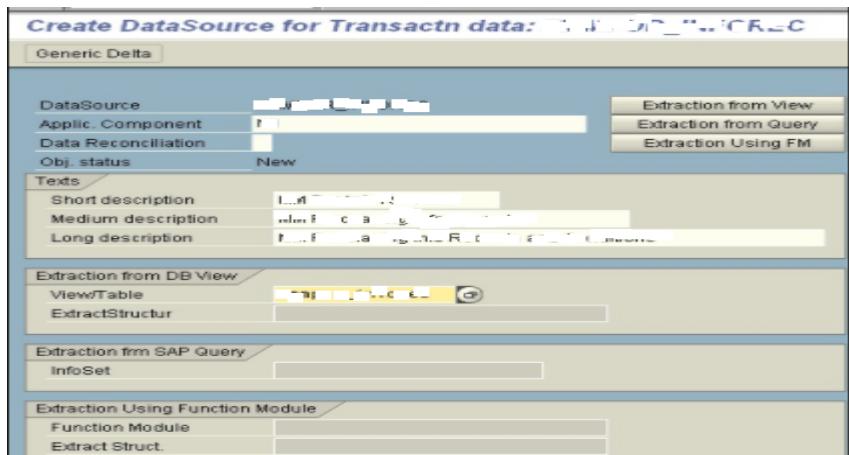
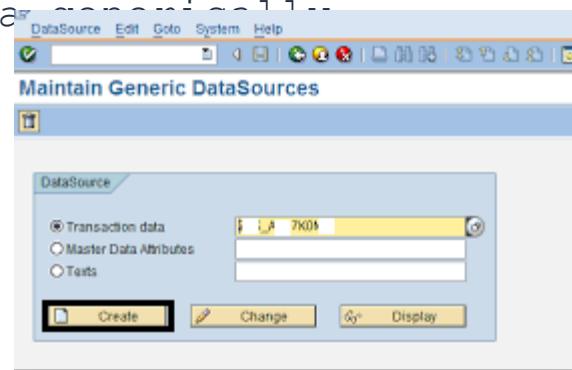
# Modeling Generic DataSources

Regardless of the application, you can create and maintain generic DataSources for transaction data, master data attributes or texts from any transparent table, database view or SAP Query InfoSet, or using a function module. This allows you to extract data

## Procedure :

### Creating Generic DataSources

1. Select the DataSource type and specify a technical name.
2. Choose Create.



3. Choose the application component to which you want to assign the DataSource.
4. Enter the descriptive texts. You can choose any text.
5. Select the datasets from which you want to fill the generic DataSource.
  - a. Choose Extraction from View if you want to extract data from a transparent table or a database view. Enter the name of the table or

# Modeling Generic DataSources

Maintain the settings for delta transfer, as required.

**Delta-Specific Field**

Field Nm	<input type="text"/>			
<input type="radio"/> Time stamp <input type="radio"/> Calend. Day <input checked="" type="radio"/> Numeric Pointer				
<b>Settings</b>				
Safety Interval Upper Limit	<input type="text"/>			
Safety Interval Lower Limit	<input type="text"/>			
<input type="checkbox"/> Real-Time Enabl				
<input checked="" type="radio"/> New Status for Changed Records <input type="radio"/> Additive Delta				

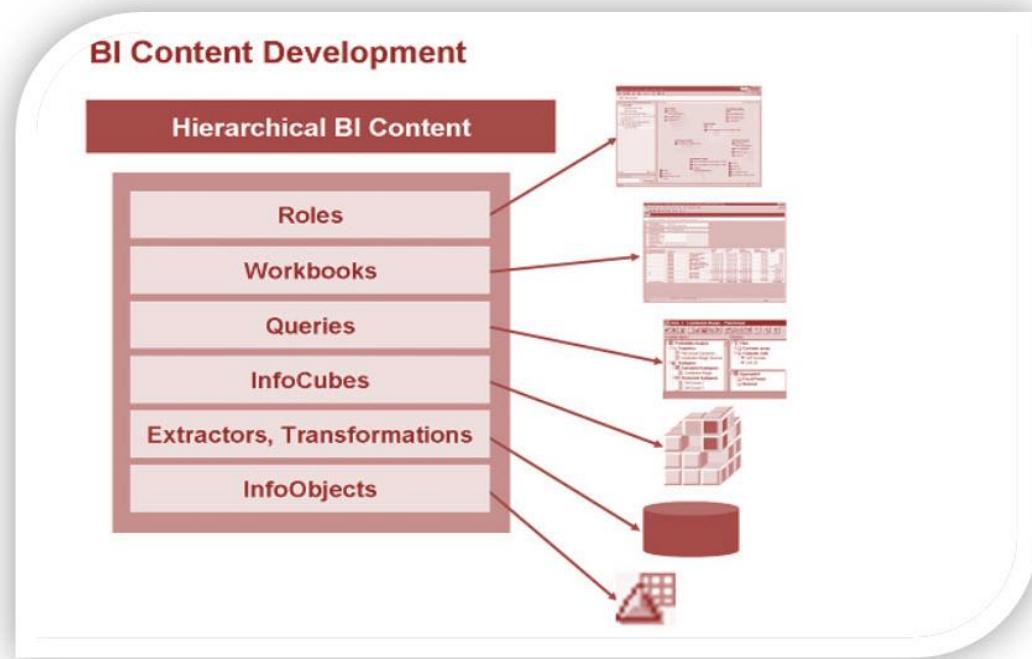
**DataSource: Customer version Edit**

Header Data		Package																																																																															
DataSource	<input type="text"/> DELTA_X_I_DELTA	<input type="text"/>																																																																															
Description	E 11 ZM_JA_S																																																																																
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Delta Update	<input type="checkbox"/>	DataSource for Reconciliation	<input type="checkbox"/>																																																																														
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- Selection** : Data for this field is transferred in correspondence with the selection criteria in the scheduler.
- Hide field** : You set this indicator to exclude an extraction structure field from the data transfer.
- Inversion** : Reverse postings are possible for customer-defined key figures.
- Field only Known in exit**: The Field Only Known in Exit indicator is set for the fields of an append structure; by default these fields are not passed to the extractor from the field list and selection table.

# Explaining Business Intelligence(BI) Off The Shelf Content

BI Content provides selected roles within a company with the information that they need to carry out their tasks. SAP NetWeaver Business Warehouse delivers pre-configured authorization objects under the collective term BI content. To understand this we take an example of a sales manager, who wants all the information like sales, market share, product quality, sales and service cost etc... to enable him to make effective decision. A BI content will bring all this data together in the form of



## Benefits of BI Content

- Be used in particular industries without being modified.
- Be modified, meaning you can customize it to any degree of detail
- Serve as a template or an example for customer-defined Business Content
- Immediate access to interpreted information.
- Ready-to-go reports, data models, extractors, transformations.
- Significant cut down of

# Explaining Business Intelligence(BI) Off The Shelf Content

## Activation of BI Content

Content:

The screenshot shows the SAP Data Warehousing Workbench interface. On the left, the 'BI Content' menu item is highlighted with a red circle labeled '1'. Under 'Object Types', 'Object Types' is also highlighted with a red circle labeled '2'. The central area displays a list of objects categorized by type, such as InfoArea, Application, Role, Workbook, etc. On the right, the 'Collected objects' pane shows a hierarchical tree of selected objects. A red circle labeled '3' highlights the '3.x' node under 'OSD\_001'. Another red circle labeled '1' highlights the 'Start Routine' under 'Routine'. A third red circle labeled '1' highlights the 'Install' button in the toolbar above the list. A tooltip for the 'Install' button says 'Install' and 'Install in Background'. The status bar at the bottom indicates 'CONFIDENTIAL – Please do not share'.

Selected objects and all the objects on which they are dependent are added hierarchically.  
Select / deselect required objects  
Click on "Install" Button

# Loading hierarchies from ECC

If there will be a change in the hierarchy of a company we will need to load those hierarchies in SAP BW.

Two ways of loading hierarchies in BW are as follows:

- Load Hierarchies from ECC.
- Load Hierarchies through Flat file.

Below steps explain how to load Hierarchies in SAP BW from SAP R/3 system with the help of an example. Let us say, we have a requirement of loading hierarchy for Profit Center - OPROFIT\_CTR.

Hierarchies are first to be maintained in ECC. Once hierarchies have been maintained in ECC, we can load it in BW.

To load the hierarchies in BW follow the below steps.

The screenshot shows the SAP BW InfoProvider interface. On the left, there's a tree view under 'InfoProvider' with nodes like 'Profit Center' and 'Profit Center (Hierarchies)'. The 'Profit Center (Hierarchies)' node is selected. On the right, there are four tabs: 'Tech. Name', 'M...', 'Execute Func...', and 'Display Tree'. The 'Tech. Name' tab shows 'OPROFIT\_CTR' with a dropdown menu 'Change' and icons for 'InfoObjects', 'InfoSources', and 'InfoSources'. Below this, there are three more rows for 'ATTRIBUTES\_OPROFIT\_CTR', 'TEXTS\_OPROFIT\_CTR', and '\_DATAFLOW\_UPW...' with similar tabs and icons. At the bottom, there's a detailed table of data with columns 'Tech. Name' and 'Data'.

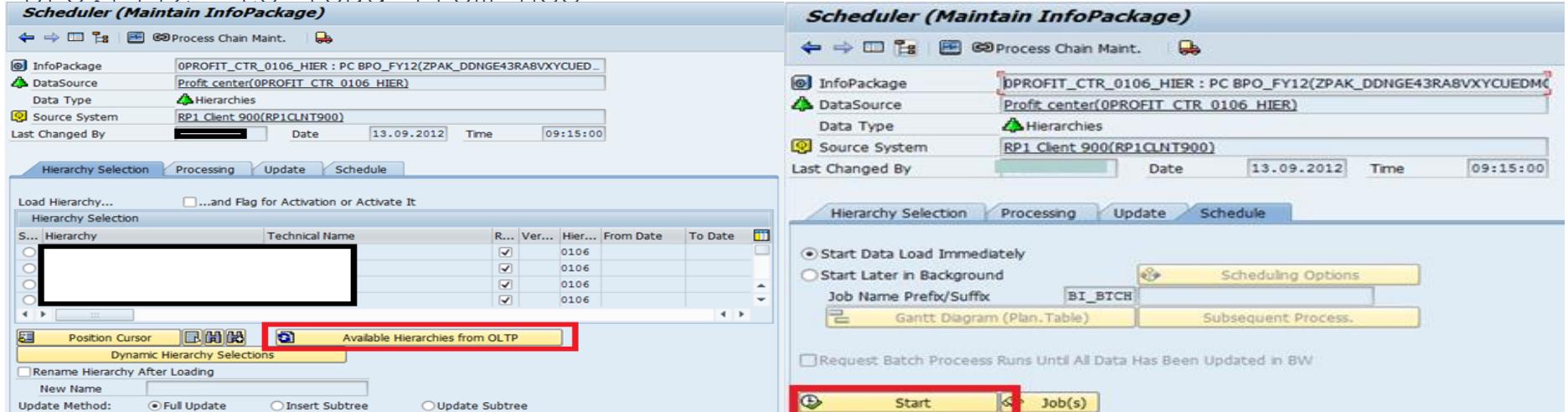
Tech. Name	Data
OPROFIT_CTR	ZPAK_D602CGYK0PP965CGSVW/KV5LR6S ZPAK_D72CQK1SM6ZZV/A64VMV/4ITLLC ZPAK_2Y7TP8PTMYWPW/37N9E2TOK554 ZPAK_9DRY1BRS50TM5FADC5GWIBR80K ZPAK_5TEM2945GEE2X01PWJ59BC21O ZPAK_D1OA6B4GF42256EU867QJOYS ZPAK_D2YNGX1K4Q44XDK2NUW2T71G ZPAK_D3YNGX1K4Q44XDK2NUW2T71H ZPAK_D8WV0UVETRS9IV/C7339P8PVN96 ZPAK_DB60VBMMWV4N6TYPWV4W/67108Q ZPAK_F04E21QOLD19U3UBE9KK04LD4 ZPAK_DDNGE43RA8VXYCUEDMQ79GCBE ZPAK_BADGC3METWN2JL0UL0DUQUW4X
HIERARCHIES_OPROFIT_CTR	
OPROFIT_CTR_HIER	FLATFILE
OPROFIT_CTR_0106_HIER	RP1CLNT900
OPROFIT_CTR_0106_HIER	

Expand the tree Go to the InfoPackage if its already created or create a copy of the InfoPackages if its already existing in a process chain.

# Loading hierarchies from ECC

Go to Hierarchy selection tab click on the button to refresh Available Hierarchies from OLTP.

Once the hierarchies have been refreshed from OLTP, under the hierarchy selection tab of the InfoPackage, check Radio button for the hierarchy which has to be loaded in BW as shown below for Here we have "XYX BPO\_FY12" to load from ECC



Click on Schedule tab, click Start to execute the InfoPackage, once started click monitor button to monitor the execution as shown below.

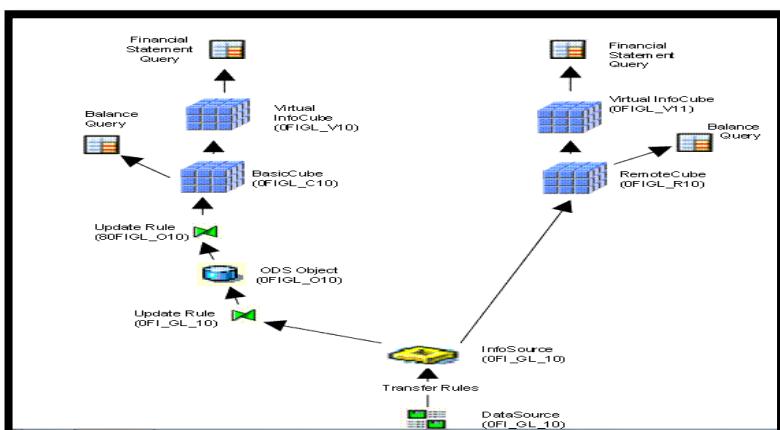
# Examining the Transfer of GL Data

SAP BW Content to support GL

For many years the FI application has needed the functionality to produce multiple financial reports and statements meeting different internal and external (governmental) requirements. Originally this need was realized with many different schemas for storing the data on the tables in ECC. A prime example would be the duplication of records in support of FI-Special ledgers and the general ledger. Over time this multiplicity of storage became unworkable and new GL was developed.

Although this new GL is only slightly newer and more centralized way FI records are stored to support many different legal and internal reporting needs on the ECC, are still referred to as new GL

By now most customers are using the new GL system in ECC. Soon after the



ema for storing ECC FI records. BI content  
**GL Highlights**  
new extractors  
To support reporting in ECC and SAP BW, a hierarchy of GL accounts is used to present the totals. Those of us who do not know FI, recognize this as a balance sheet or income statement information, like assets, liabilities and other terms. The infoobject that stores these extracted ECC or custom-built hierarchies in SAP BW is called OCLACCEXI.

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# Adapting BI Content DataSources

## SAP BW Content to support GL

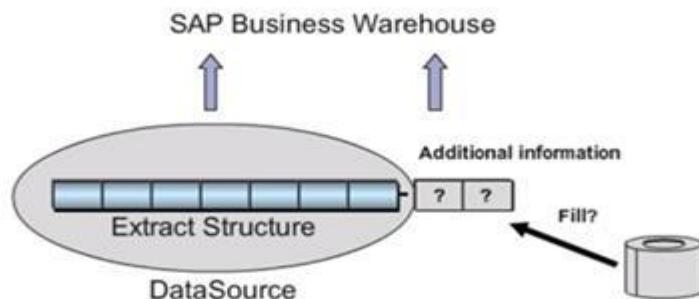
We have already seen that there is a BI content which comes to the customer in a delivered version. This content is installed and we can start using it for the business. The standard content which comes along might not suffice our requirement completely, we can adapt the BI content in order to fulfill the current business requirement.

## When to enhance a DataSource using Extract structure:

- Business Content does not include the field in a DataSource for your

### BI Content DataSources Adaption

Additional information in master data and transaction data (characteristics, key figures) is required for reporting.

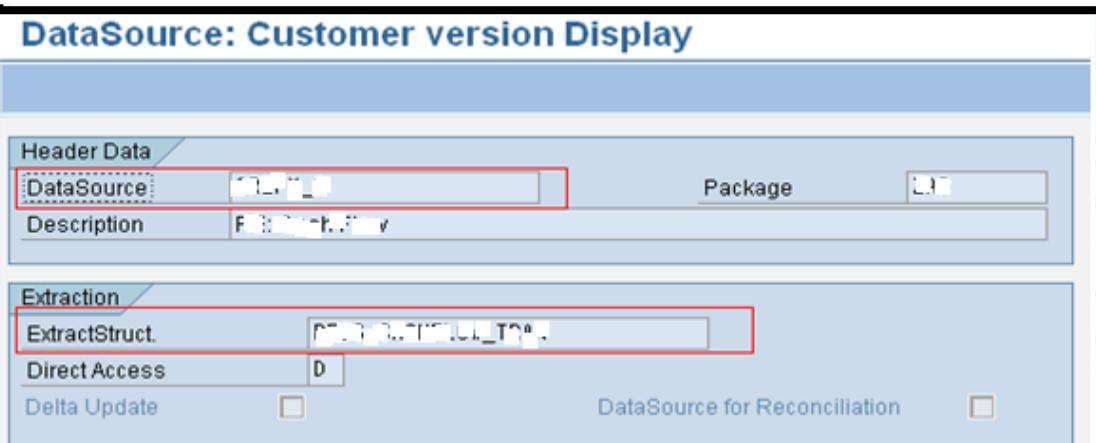
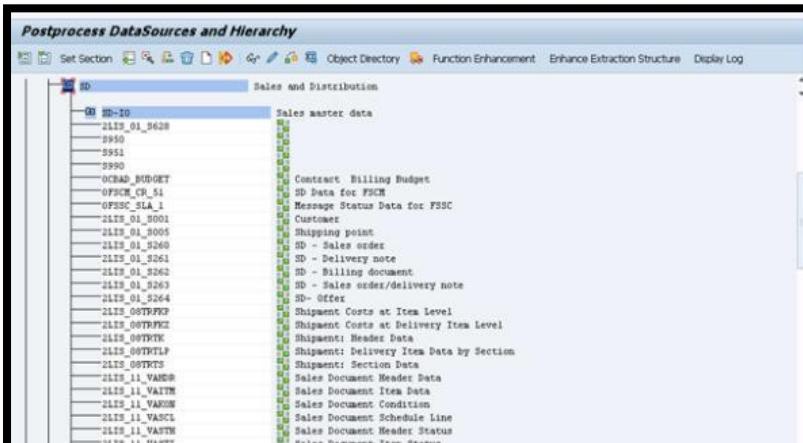


rd transaction, we need more

# Adapting BI Content DataSources

## Steps to enhance/adapt SAP DataSource:

- Step 1:** Go to transaction RSA6 for enhancing a data source using extract structure. Select the data source to be enhanced.
- Step 2:** Choose the data sources which need to be enhanced using extract structure, double click on the extract structure

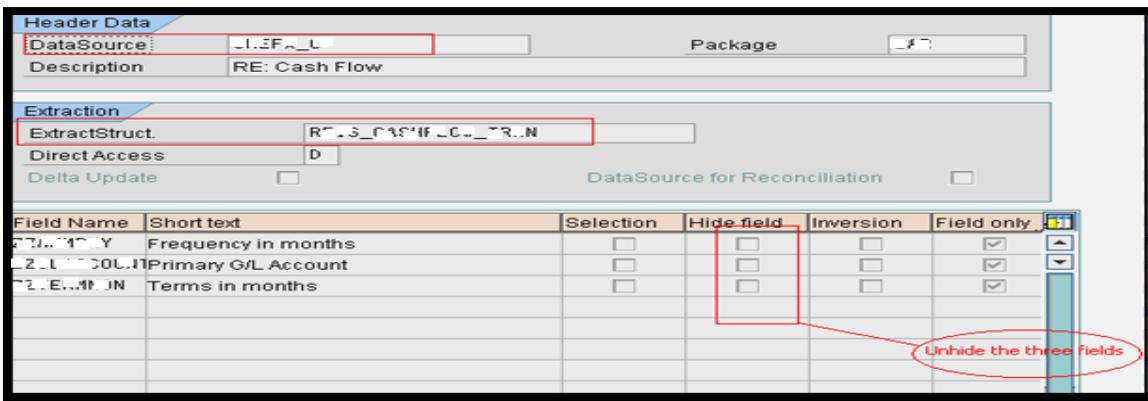


- Step 3:** Now use Append Structure to append new fields
- Step 4:** Now add the required fields.
- Step 5:** Activate the append structure. Go to RSA6 transaction select the data source, Go to change Data Source.

# Adapting BI Content DataSources

## Steps to enhance/adapt SAP DataSource:

**Step 6:** Here, we have the options like 'Select', 'Hide', 'Inversion' and 'Field only' each for a different use.



**Hide field:** Used to exclude an extract structure field from the data transfer. As a result of our action, the field is no longer made available in BW or BI when setting the transfer rules and generating the transfer.

**Inversion** is only possible for certain transactional DataSources. These include DataSources that have a field that is indicated as an inversion field. The value of the key figure is then transferred in inverted form i.e. multiplied by (-1) into BW or BI.

**Field only:** The indicator Field only known in Exit is set for fields of an append structure. By default these fields are not passed onto the extractor from the field list and selection table. Deselect the indicator 'Field Only' to enable the Service API to pass on the append structure field to the extractor together with the fields of the delivered extract

structures in the field list as well as in the selection table.

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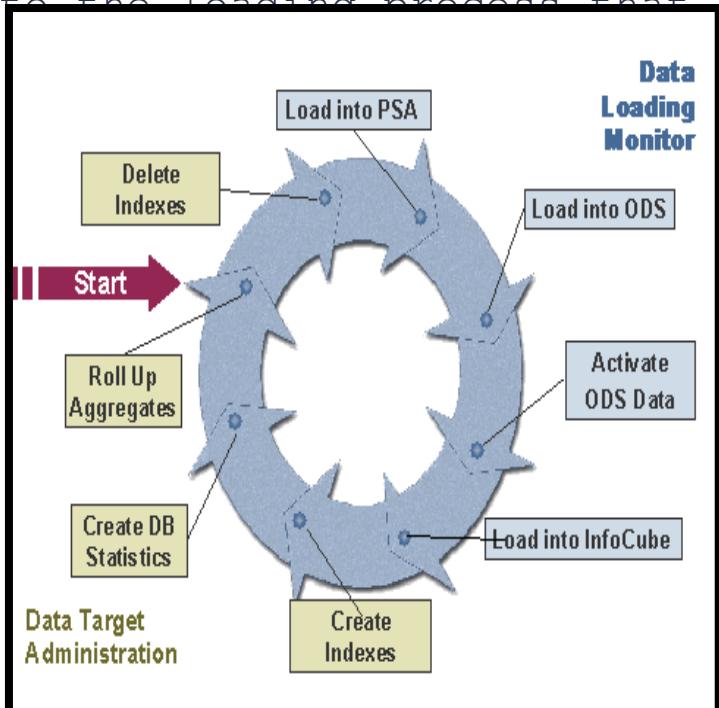
# Implementing Process Chains

## Definition

A process chain is a sequence of processes that wait in the background for an event. Some of these processes trigger a separate event that can start other processes in turn.

## Use

In an operating BW system there are a multitude of processes in addition to the loading processes that occur regularly.



Fundamental principals of the process chain concept are:

## Openness

The abstract meaning of a process as any schedule with a defined beginning and end enables openness with regard to the type of process that can be integrated into a process chain. The principle of openness is applied to the theory behind process chains, in that both user-defined programs and processes can be implemented. In addition, you can include process chains in other process chains, so-called meta chains. In doing so you have the option of integrating process chains from the BW system, in which the meta chain is found,

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Presentation Date

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# Implementing Process Chains

**Process types:** These are the processes that are included in the process chain framework like load process, ABAP, rollup of filled aggregates, etc. The table RSPROCESSTYPES briefs the various process types, their

Data Browser: Table RSPROCESSTYPES Select Entries 41

Table RSPROCESSTYPES  
Displayed fields: 15 of 16 Fixed columns: List width: 0250

Type	Object	Object Type	Event Name	Restatable	Repairable	Icon	Internal Name	No. Max	Category	Display Order	Docu Type	Docu Obj
ABAP	CL_RSPC_ABAP	CL	2	X				05	05	TX	RSPC_ABAP	4F197D38E09C674E10000000
AGGRFILL	CL_RSM_AGRFILL	CL	2	X				20	04	LO		
INFO	CL_RSM_INFO	CL	2	X				05	02	TX	RSPC_INFO	4F197D38E09C674E10000000
ATTRIBCHAN	CL_RSM_ATTRIBCHANGE	CL	2	X				30	01	LO	801A67CEC0721102ACB8000000	
CHAIN	CL_RSPC_CHAIN	CL	2	X				05	07	LO	GF0C0B839AA59649E10000000	
CLEARTEXTS	CL_RSPF_CLEARTEXTS	CL	2	X				20	09	NA	RSFREQ_URL073	
COMMAND	CL_RSM_COMMAND	CL	2	X				20	06	TX	RSPC_COMMAND	0000000000000000
COMPRESS	CL_RSM_COMPRESS	CL	2	X				20	03			
DBSTAT	CL_RSM_DBSTAT	CL	2	X				20	01			
DROPSCHE	CL_RSM_DROPSCHE	CL	2	X				20	00			
DROPTINDEX	CL_RSM_DROPINDEX	CL	2	X				20	01			
EXOR	CL_RSPC_EXOR	CL	1	X				05	04	TX	RSPC_EXOR	
HIERSAVE	CL_RSM_HIERSAVE	CL	2	X				10	03			
INFOLOAD	CL_RSM_INFOLOAD	CL	2	X				20	02			
LOADING	CL_RSM_LOADING	CL	2	X				10	01			
MAIL	CL_RSRA_COMMUNICATION	CL	0					99	00	LO	801A655AE07211024CB8000000	
MOREROWS	CL_RSMD_REPORT	CL	2	X				20	09	LO	C789PE30C3A14C0C10000000	
DISACTIVAT	CL_RSMD_ACTIVATIVATE	CL	2	X				20	07	LO	E00BE33419540967E10000000	
DISPROSES	CL_RSM_DISPROCESS	CL	2	X				10	04	LO	2C749B8B9551104B2BC005000	
OPENHUB	CL_RS_PSPN	CL	2	X				10	05			
OP	CL_RSPC_OP	CL	1	X				05	03	TX	RSPC_OP	
PSEDELETE	CL_RSM_PSEDELETE	CL	2	X				10	02			
PSAPROCESS	CL_RSM_PSAPROCESS	CL	2	X				05	08	TX	RSPC_REMOTE	0007F30E804762E10000000
REMOTE	CL_RSPC_REMOTE_CHAIN	CL	2	X				05	04			
REPAB	CL_RSRA_RSPC_BP	CL	2	X				25	03			
REPA_BP	CL_RSRA_RSPC_BP	CL	2	X				25	02			
REPA_ER	CL_RSRA_RSPC_ER	CL	2	X				25	01			
REDUCDEL	CL_RSM_REDUCDEL	CL	2	X				10	06	LO	F0E5603001BE7920E10000000	
ROLLUP	CL_RSM_ROLLUP	CL	2	X				20	05			

## Maintenance: Views (Coloring of Processes)

- Planning view: Build and change process chains**
  - Grey: unplanned processes
  - Green: planned processes
  - Yellow: planned but unknown processes
  - Red: multiple planned processes
- Check view: Check for errors in design**
  - Green: Error-free processes
  - Yellow: Process with warnings
  - Red: Process with errors
- Log view: Monitoring of process chains**
  - Grey: Not yet run
  - Green: Finished without error
  - Yellow: running
  - Red: broken or failed

**Process variant:** It is the name of the process type with respect to the process chain context. It is the definition of a process type at design time. E.g., the name of the InfoPackage is the variant name for the load process.

**Process instance:** It is the run time object of the process. It is necessary for the communication with the framework and also with the successor processes. It also contains the runtime logs.

**LogID:** It is the runtime instance of the chain.

**Maintenance: Views (Colouring of processes)**

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# Agenda – Unit 3 : Delta Data Flow Management

- Describing Delta Management
- Explaining Terms and Basic Processes of Delta Enabled DataSources
- Configuring the Logistics Data Extraction (LO Cockpit)
- Configuring Generic Delta DataSources
- Learning Data Transfer Process(DTP) Settings

# Describing Delta Management

## **Definition**

The delta process is a feature of the extractor and specifies how data is to be transferred. As a DataSource attribute, it specifies how the DataSource data is passed on to the data target. This can be used to find out certain things, for example which data targets a DataSource is best suited for, and how the update and serialization will be carried out.

## **Use**

The delta process type affects how an InfoProvider is supplied with updated data. When an ODS object is supplied with updated data, the object needs to be serialized so that the data can also be overwritten. Depending on the delta process, the system decides whether to serialize by request or by data package.

# Describing Delta Management

## 0RECORDMODE

- The record mode describes the type of change that a data record contains.
- If a datasource is delta capable, the field ROCANCEL which is part of the datasource, holds the changes from R/3 side.
- This field for the DataSource is assigned to the InfoObject 0RECORDMODE in the BI system.

Record Mo...	Short text
	After-Image
X	Before-Image
A	Add
D	Delete (Key Only)
N	New Image
R	Reverse-Image

e at R/3 side, which its counterpart **After-image** : The record provides an after image, i.e. how does the record look like after the change.

The status of the record after it has been changed, or after data has been added is transferred.

**Before-image 'X'** : The record provides a before image, i.e. what did the record

look like before the change.  
additive image. only the differences  
The status of the record before the  
change is transferred.

**Add 'A'** : The record provides an additive image. only the differences for all the numeric values are available.  
**Delete 'D'** : This recordmode type signifies that the record must be deleted.

**New Image 'N'** : The record provides a new image, i.e. when a new record is created; a new image is set for it.

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# Delta processes for SAP source systems:

There are various delta processes for SAP source systems:

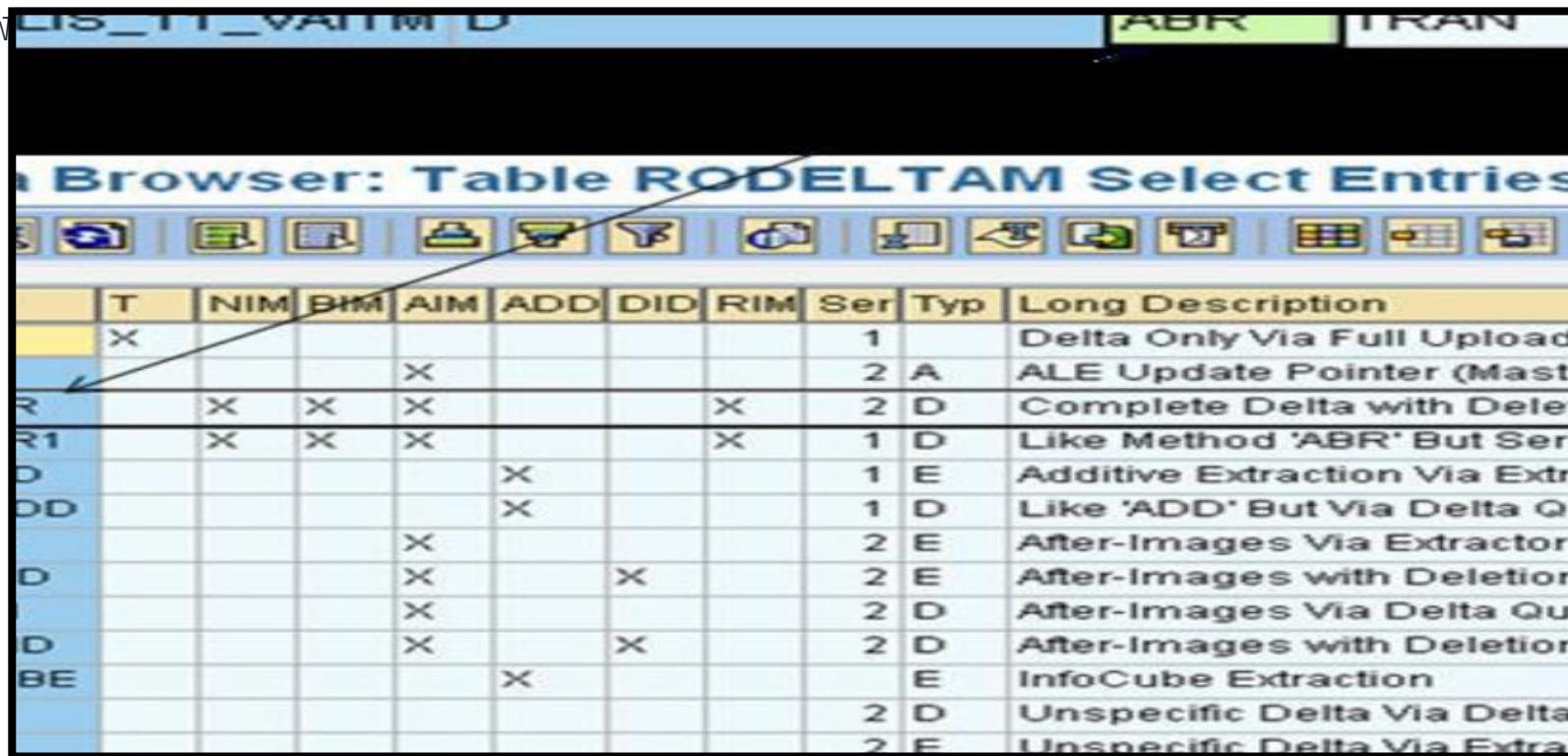
1. Forming deltas with after, before and reverse images that are updated directly in the delta queue. An after image shows the status after the change, a before image the status before the change with a negative sign and the reverse image also shows the negative sign next to the record while flagging it for deletion.
2. The extractor delivers additive deltas that are serialized by request. This serialization is required because the extractor in a request delivers each key once, and changes in the non-key fields are otherwise not copied over correctly
3. Forming deltas with after image, which are updated directly in the delta queue. This serializes data package by package, as the same key can be copied more than once in a request. It does not support direct

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# Explaining Terms and Basic Processes of Delta Enabled DataSources

The delta process (how the data is transferred) for the DataSource is determined in the table ROOSOURCE (in the source system) or in the table RSOLTPSOURCE (in BW for DataSources 3.x) or in the table RSDS (in BW for DataSources) respectively

Properties of the delta process are determined in the table RODELTAM (in BW)

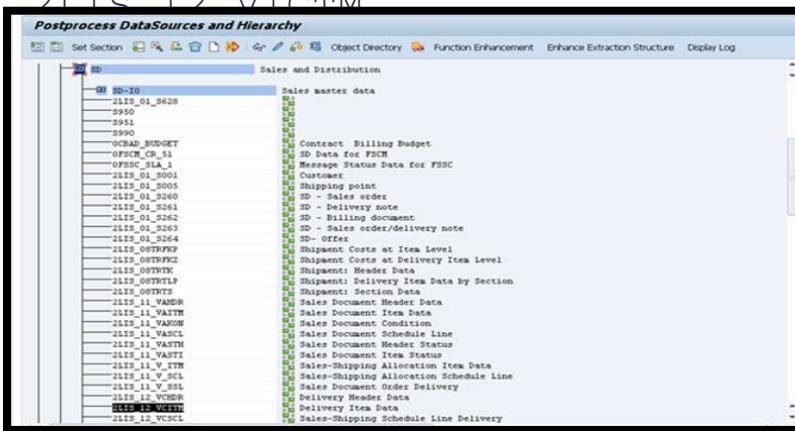


Browser: Table RODELTAM Select Entries									
T	NIM	BHM	AIM	ADD	DID	RIM	Ser	Typ	Long Description
X							1		Delta Only Via Full Upload
R			X				2	A	ALE Update Pointer (Master)
R1	X	X	X			X	2	D	Complete Delta with Delete
D							1	D	Like Method 'ABR' But Ser
DD					X		1	E	Additive Extraction Via Extr
D					X		1	D	Like 'ADD' But Via Delta Qu
D				X			2	E	After-Images Via Extractor
D				X			2	E	After-Images with Deletion
D				X			2	D	After-Images Via Delta Qu
BE				X			2	D	After-Images with Deletion
								E	InfoCube Extraction
							2	D	Unspecific Delta Via Delta
							2	F	Unspecific Delta Via Extr

# Configuring the Logistics Data Extraction (LO Cockpit)

## Steps to extract data from ECC to BW on HANA system through LO Extraction

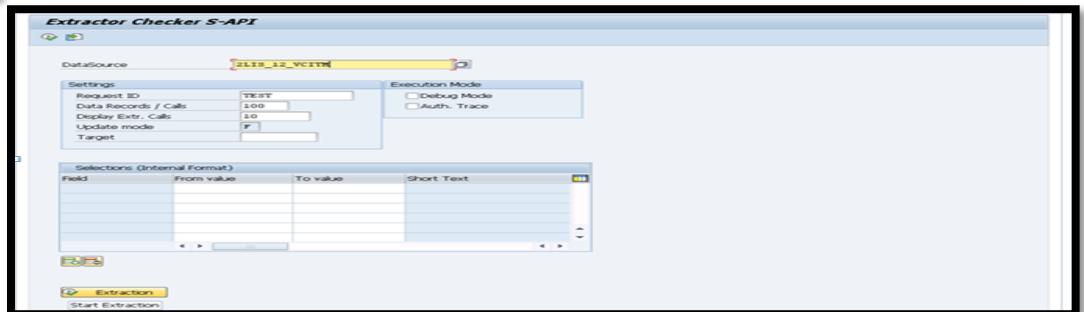
- A) Login to ECC System
- B) Go to /NRSA6 → SAP-R/3 → SD
- C) Check if the needed data sources are activated
- D) Here we will be replicating datasource for Delivery Item Data  
2LIS\_12\_VC1TM



If the datasource is not visible in /NRSA6 (datasource is not active)

E) Go to /NRSA5 and activate the required data source.

F) Go to → /NRSA3 → Extraction  
To check whether the extraction is done



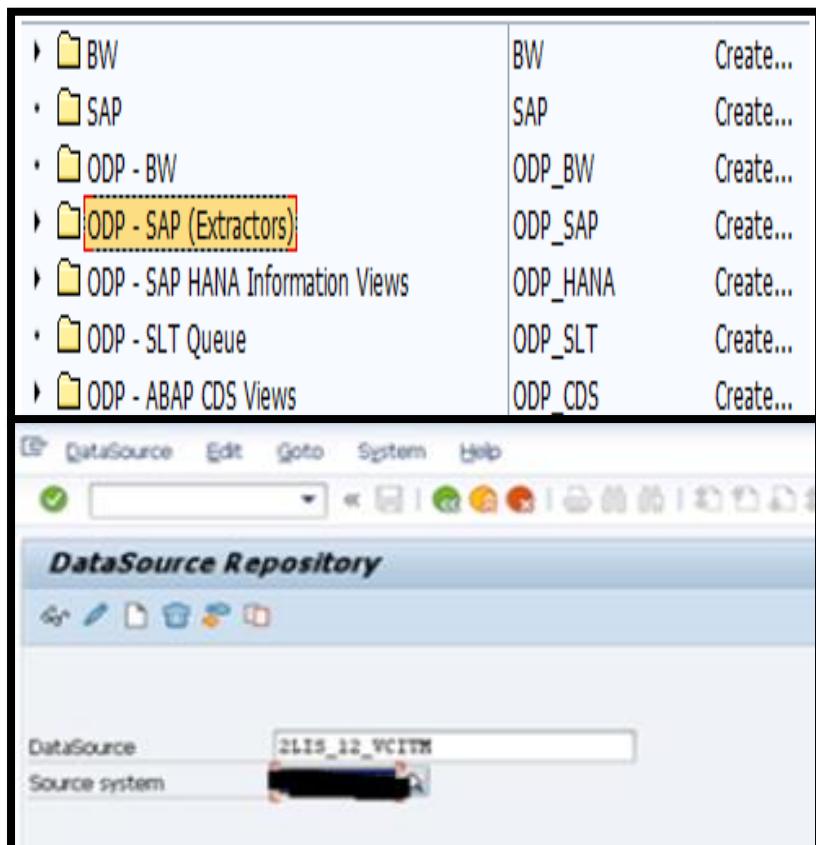
Before performing extraction make sure to delete and fill the setup tables,

**Note :** To fill the setup table through T-code OLI7BW

# Configuring the Logistics Data Extraction (LO Cockpit)

## Steps to extract data from ECC to BW on HANA system through LO Extraction

Establish the source system connection between the BW system and ECC or S/4 HANA. Basis team will create this connection establishment



H) Once the DataSources are activated in ECC system , Go to BW on HANA system and type RSDS

I) Provide the Data Source name that needs to be replicated and the ECC system name from where it is been replicated.

J) Here 2LIS\_12\_VCITM is data source and ECW\_XXX is source system.

K) Click DATASOURCE → REPLICATE

DATASOURCE

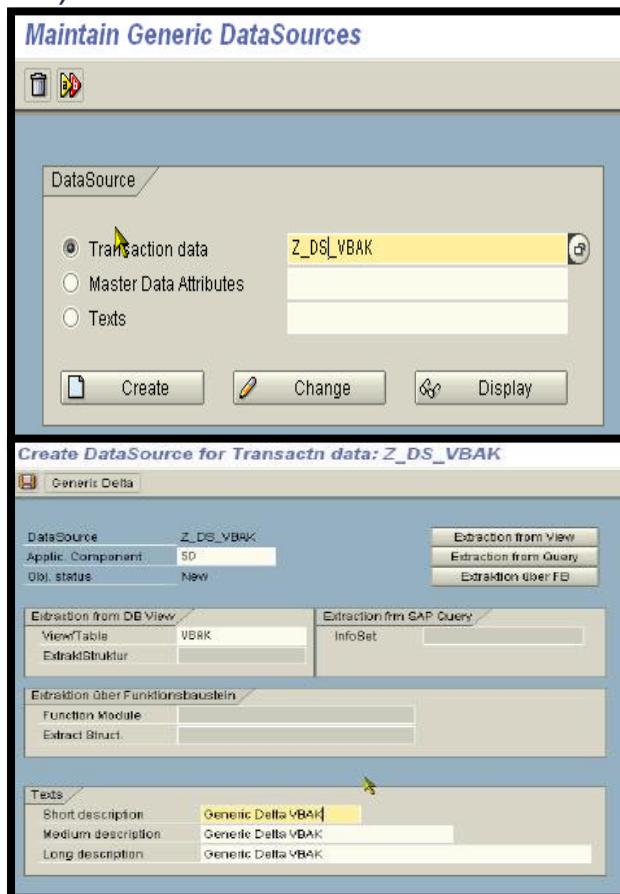
L) Once the replication is done successfully, a message pops up at left



# Configuring Generic Delta DataSources

Extracting data from the VBAK table, the Logistics Extraction Cockpit is the recommended method.

## 1) T-code : RSO2



## Step2: Create a Generic Data Source

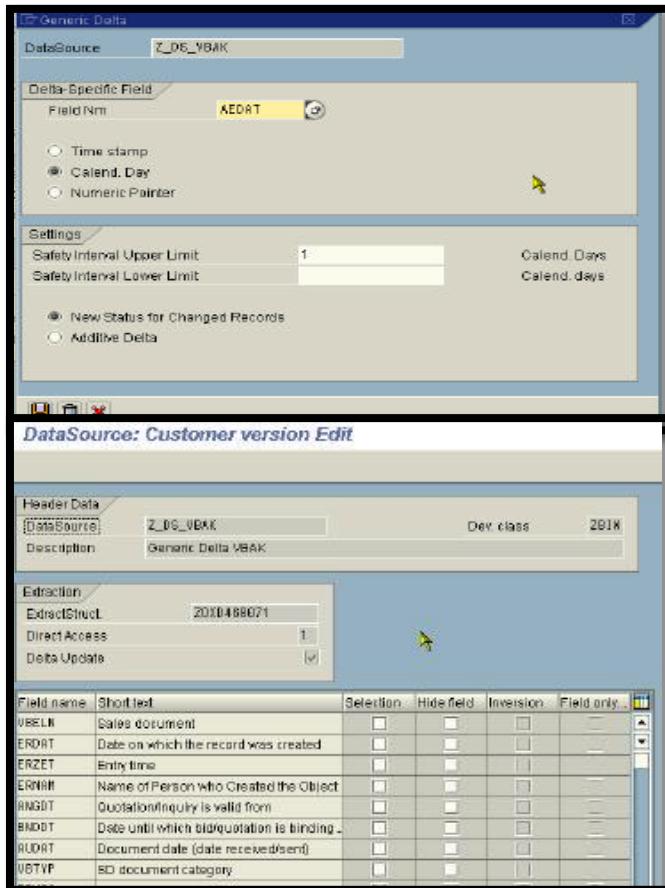
- Select the Data Source type and assign a technical name to it.
- Choose Create The screen for creating a generic Data Source appears.

## Step3:

- Choose an application Component to which the data source is to be assigned.
- Enter the descriptive texts. You can choose these freely.
- Choose Generic Delta.

# Configuring Generic Delta DataSources

Extracting data from the VBAK table, the Logistics Extraction Cockpit is the recommended method.



## Step 4:

- Specify the delta-specific field and the type for this field. Maintain the settings for the generic delta:

- Specify a safety interval.

NOTE: Safety interval should be set so that no document is missed - even if it was not stored in the DB table when the extraction took place. (More Tips at the end of this document)

## Step 5:

Select Delta type:

New status for changed records (I.e. after-image); this can be used with Data target DSO (AIE).

Additive Delta (I.e. aggregated data records) (ADD)

Then choose Save.

## Step 6:

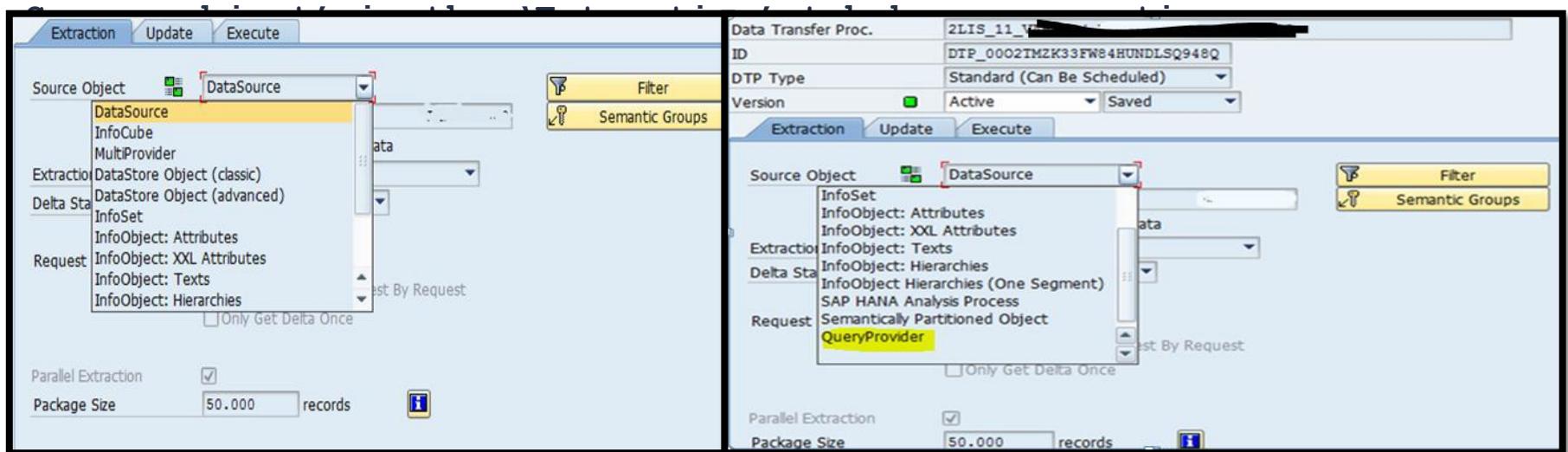
**CONFIDENTIAL – Please do not share**

After step 5 , the screen of step 3 comes

# Learning Data Transfer Process(DTP) Settings

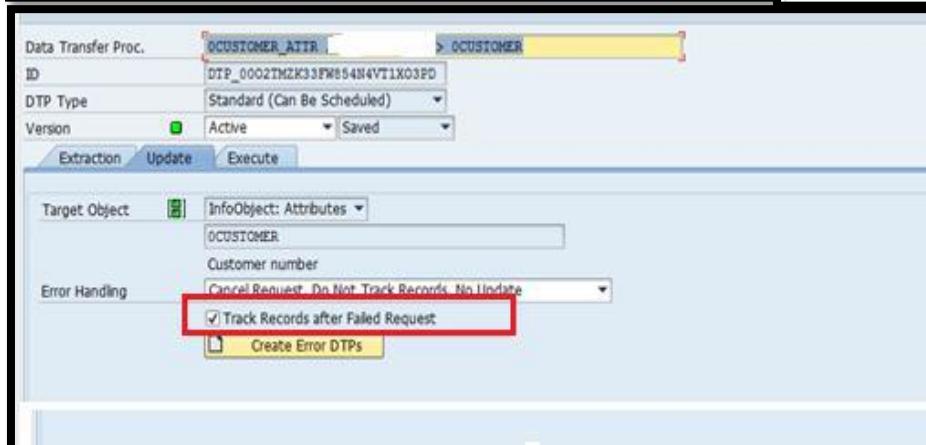
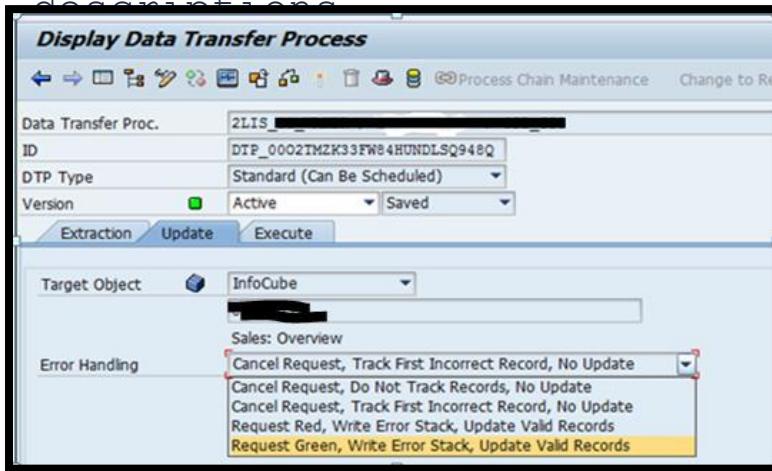
SAP BW 7.5 utilizes the SAP HANA as an underlying database. So, the enhancements in this version are built around the integration between SAP BW and SAP HANA.

Following are the options available in different tabs of Data Transfer Process (DTP) in SAP BW 7.5



# Learning Data Transfer Process(DTP) Settings

Error handling has new descriptions.



The table below has a comparison of error handling options for DTP between SAP BW 7.5 and the prior versions.

Previous Option	Previous Default	New option	New Default
Deactivated	-	Terminate request; no record tracing; no updating	X
No update, no reporting	X	Terminate request; First record with errors is traced; No updating	-
Update valid records, no reporting (request red)	-	Request red; Write error stack; Update valid records	-
Update valid records, reporting possible (request red)	-	Request green; Write error stack; Update valid records	-

The option 'Track Records after Failed Request' can be selected when error handling is set to 'Terminate request; no record tracing; no updating', i.e. when error handling is deactivated. By choosing this we can enable tracing of erroneous records after a request fails. This setting (deactivating error handling) helps performance of data load as there is no tracking of error records during data load process.

CONFIDENTIAL – Please do not share

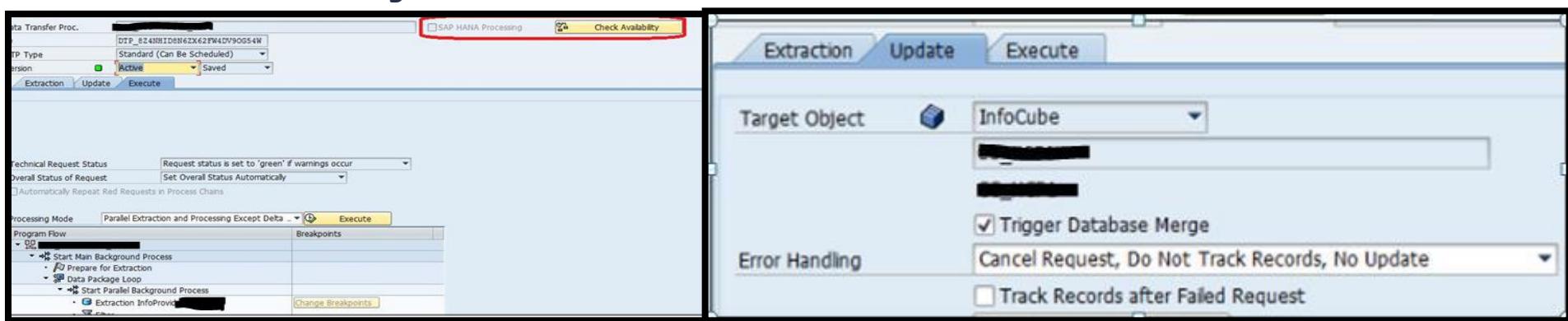
Presentation Title: Date

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# Learning Data Transfer Process(DTP) Settings

The DTP in 7.5 has a new processing mode – SAP HANA Processing. If the BW system is using HANA DB, this mode is seen in the DTP. We check for the availability of this processing mode by clicking on the button. If the corresponding transformations can be processed in HANA DB, this option can be used provided the prerequisites listed below are met.

## SAP HANA Processing mode



**Delta Merge:** There are two storages when HANA DB is used - the main storage and the delta storage (delta index). Changes to data are saved in the delta index.. When a read access happens (example- a query being executed), both the main storage and delta storage are read and the results are merged. These changes are updated to main storage through a delta merge. Only when a threshold value is reached, the delta merge is triggered.

The checkbox 'Trigger Database Merge' in the 'Update' tab of the DTP is selected to enable the delta merge after the data load happens.

# Agenda – Unit 4: Data Acquisition with ODP and SLT

- Describing Data Acquisition with Operational Data Provisioning (ODP)
- Analyzing Operational Delta Queue (ODQ)
- Replicating Data with SAP Landscape Transformation (SLT)
- Learning the Details of Real Time Data Acquisition (RDA)
- Extracting to BW via ODP-SLT

# Data Acquisition with Operational Data Provisioning (ODP)

Operational Data Provisioning provides a technical infrastructure that you can use to support two different application scenarios. The first of these is Operational Analytics for decision making in operative business processes. The other is data extraction and replication

# What is the ODP Framework

It is a infrastructure to unify data exchange between provider and consumers  
Enables extract once deploy many architectures for sources  
Unified configuration and monitoring for all provider and subscriber types  
Time stamp based recovery mechanism for all provider types with configurable data retention periods  
Highly efficient compression enables data compression rates up to 90% in Operational Delta Queue (ODQ)  
Quality of service: „Exactly Once in Order“ for all providers  
Intelligent parallelization options for subscribers in high volume scenarios

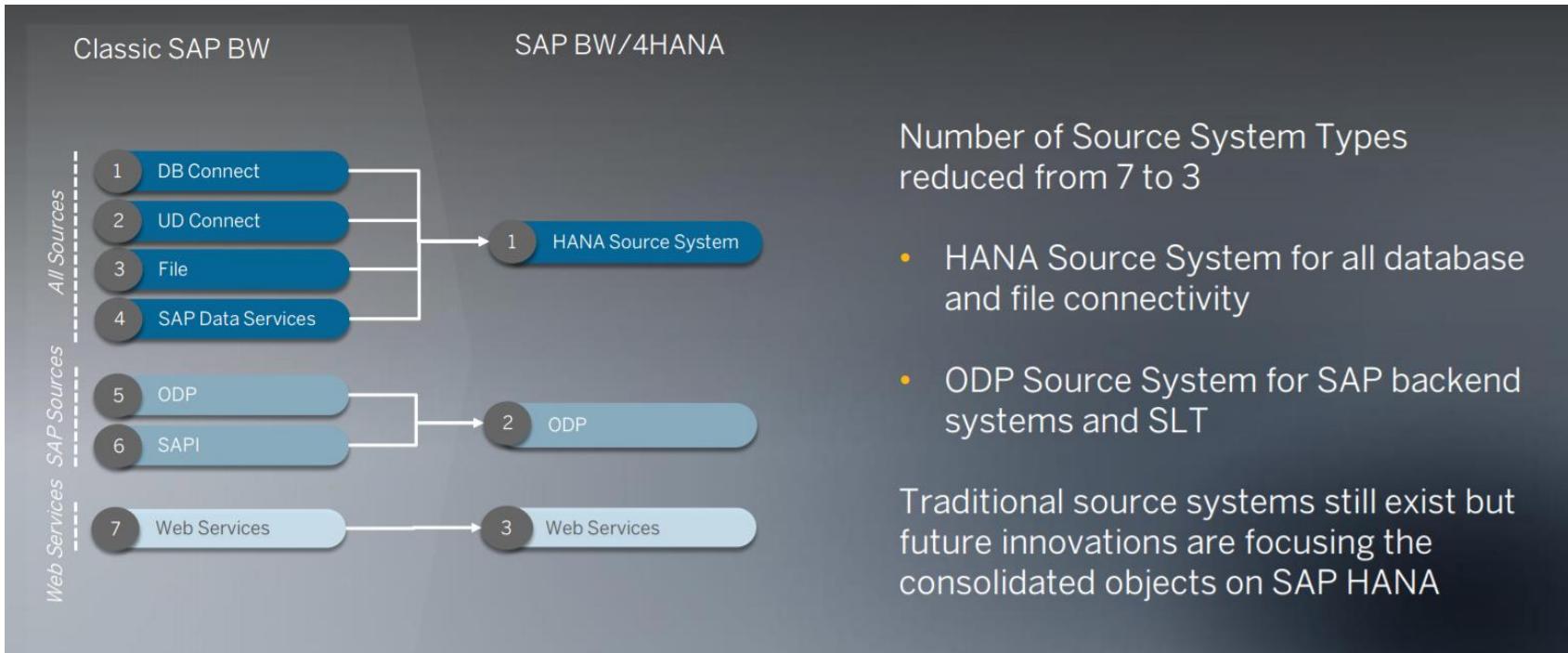
## What are the major use cases with ODP and BW?

Data transfer of extractors SAP ERP (ODQ) a SAP BW

Real-time replication of tables and db-views via SAP SLT (ODQ) a SAP BW

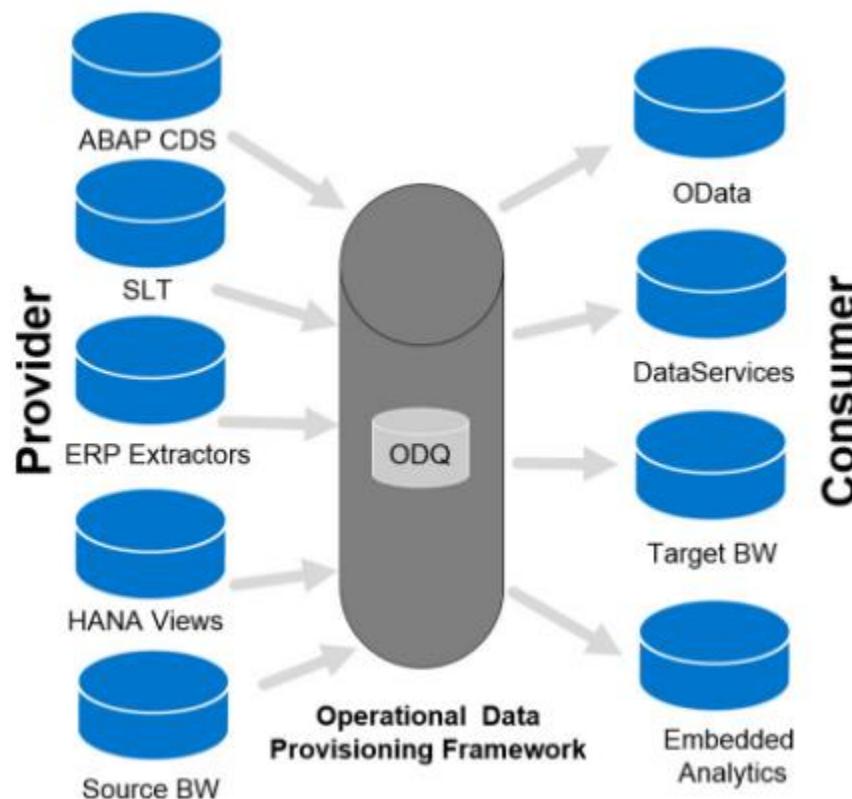
Data transfer between SAP BW (ODQ) a SAP BW

# Simplified Data Integration



# SAP BW – Operational Data Provisioning (ODP) Infrastructure

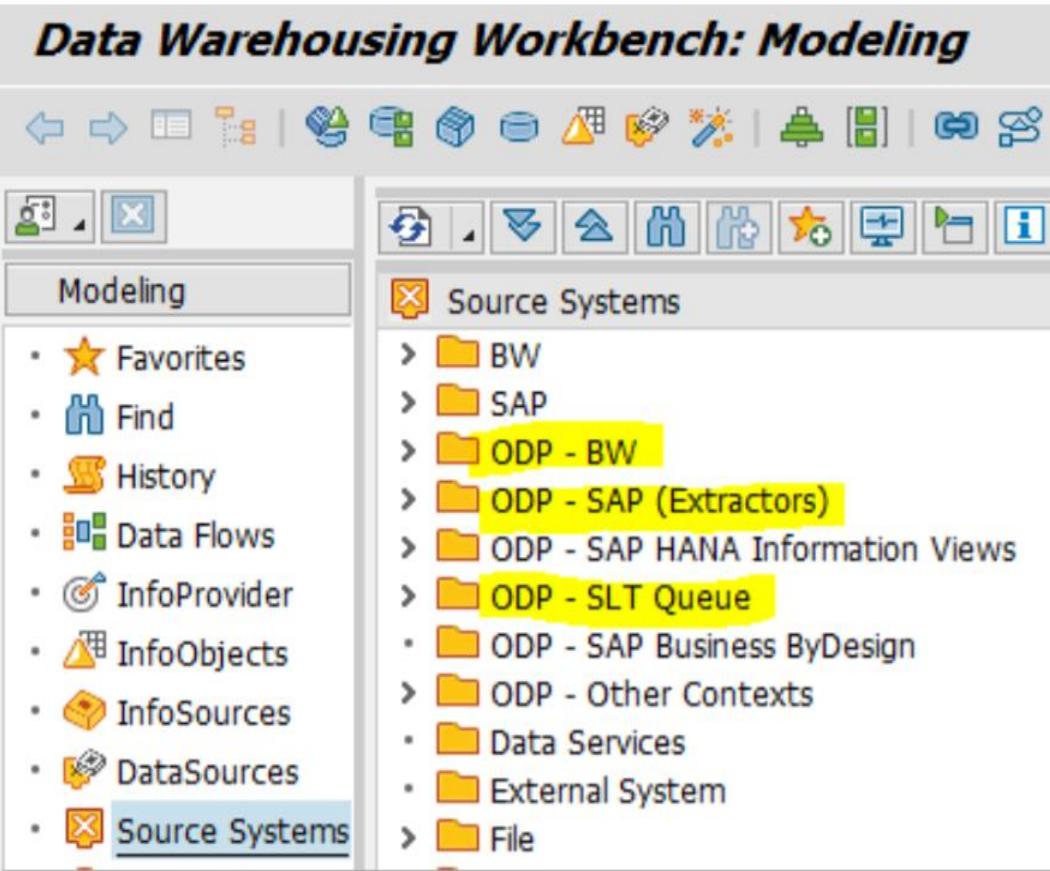
## Main Use Cases for ODP data provisioning



### Unified infrastructure for data provisioning and consumption

- Enables extract once deploy many architectures for sources
- Unified configuration and monitoring for all provider and subscriber types
- Time stamp based recovery mechanism for all provider types with configurable data retention periods
- Highly efficient compression enables data compression rates up to 90% in Operational Delta Queue (ODQ)
- Quality of service: „Exactly Once in Order“ for all providers
- Intelligent parallelization options for subscribers in high volume scenarios

# SAP BW – Operational Data Provisioning (ODP) Infrastructure

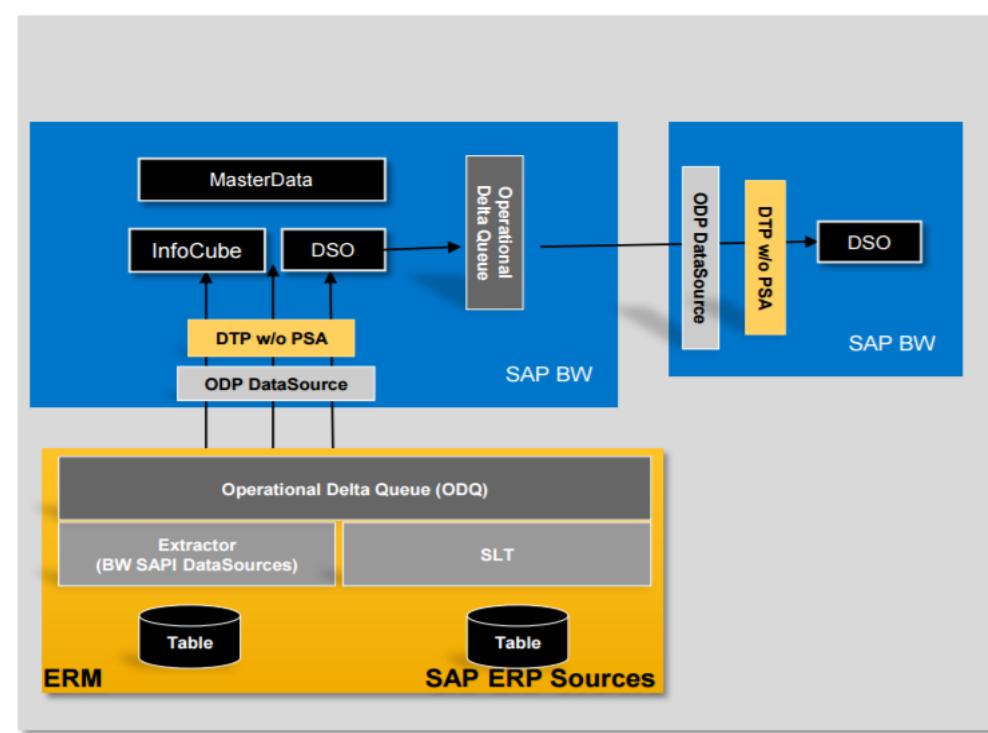
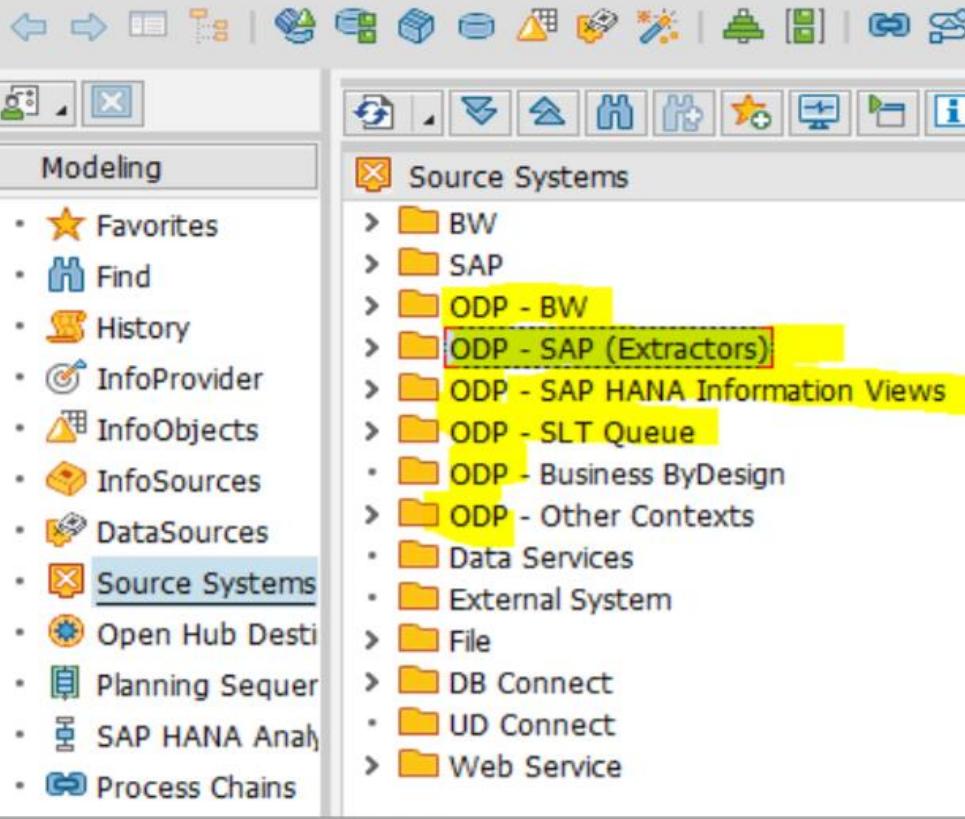
Provider	Subscriber / Consumer
<p><b>Data Warehousing Workbench: Modeling</b></p>  <p>The screenshot shows the SAP Data Warehousing Workbench Modeling interface. At the top, there are two tabs: "Provider" and "Subscriber / Consumer". Below the tabs is a toolbar with various icons. On the left, there is a sidebar titled "Modeling" containing links for Favorites, Find, History, Data Flows, InfoProvider, InfoObjects, InfoSources, DataSources, and Source Systems. The "Source Systems" link is underlined and highlighted with a blue box. The main area displays a navigation tree under the "Source Systems" node. The nodes are: BW, SAP, ODP - BW (highlighted with a yellow box), ODP - SAP (Extractors) (highlighted with a yellow box), ODP - SAP HANA Information Views, ODP - SLT Queue (highlighted with a yellow box), ODP - SAP Business ByDesign, ODP - Other Contexts, Data Services, External System, and File.</p>	

## Main use cases available with BW 7.5

1. ODP based Data Provisioning Aspects for SAP ERP Sources
2. SLT/ODP based real-time replication
3. ODP based data transfer between BW systems
  - ODP is a Net Weaver based Framework, ODQ as persistency resides where the ODP is installed as source
    - Eg. If SLT is installed within the target BW the ODQ would of course also reside there

# New explicit ODP Source System Types

## Data Warehousing Workbench: Modeling



# Given SAP ERP Business Content DataSource

The screenshot shows the SAP Business Content Data Source interface. On the left, there's a navigation tree with sections like 'DataSources for QT6MNNDT002 QT6 Client 002', 'Unassigned Nodes', 'Ulrichs Tests', 'Cost Centers: Costs and Allocations', 'Customer Balances' (which is selected), and 'Customer number'. Below this is a 'Source Systems' section with entries for 'BW', 'SAP' (containing 'HUF Client 100', 'QY4 Client 003'), 'ODP - BW', and 'ODP - SAP (Extractors)' (containing 'BYS:SAPI context for ODP', 'DSN Mandant 900', 'HUFCLNT100 ODP', 'PBS / 000', 'Q3WCLNT003', 'Q93SYSINFO', 'QT6 Client 002', and 'SAPI context for ODP').  
The main area displays a data source named 'OFI\_AR\_20' for 'Customer Balances'. It shows details like 'Source System: QT6MNNDT002 QT6 Client 002', 'Version: Active', and tabs for 'General Info.', 'Extraction', 'Proposal', 'Fields', and 'Preview' (which is selected). A table titled 'Customer Number' is shown with columns: Customer Number, Company Code, Reconciliation Account in General Ledger, Period/year, and Fiscal Year. The table contains five rows of data:

Customer Number	Company Code	Reconciliation Account in General Ledger	Period/year	Fiscal Year
0000000001	0001	0000140000	2010001	2010
0000000001	0001	0000140000	2010002	2010
0000000001	0001	0000140000	2010003	2010
0000000001	0001	0000140000	2010004	2010
0000000001	0001	0000140000	2010005	2010

**ODP capable ERP extractors can be replicated under source system type ODP – SAP (Extractors)**

# BW Dataflow with DTP Extraction from ODP/ODQ

The screenshot illustrates the configuration of a Data Transfer Process (DTP) for extracting data from an Operational Data Provider (ODP) context.

**Left Panel: Display DataStore Object YFIAR20**

- Data Store: YFIAR20
- Version: Active
- Active Version: Executable
- Key Fields (KUNNR, BUKRS, AKONT) are listed in the table.

**Right Panel: Data Transfer Process Configuration**

- Data Transfer Process:** OFI\_AR\_20 / QT6MNDT002 -> YFIAR20
- ID:** DTP\_0008I83HW93E00LYY42VXHXLZ
- DTP Type:** Standard (Can Be Scheduled)
- Version:** Revised (Not Saved)
- Delta Status:** Active
- Extraction Tab:** Selected
- Data Source:** DataSource (OFI\_AR\_20, QT6MNDT002)
- Extraction Mode:** Delta
- Package Size:** 200.000
- Adapter:** Extraction from SAP System by Operational Data Provisioning
- ODP Context:** DataSources Without ESH Modeling
- Operational Data Provider:** OFI\_AR\_20 (Customer Balances)
- Properties:** Transaction Data...

# Operational Delta Queue (ODQ) in SAP ERP

**Monitor Delta Queues**

The screenshot shows the SAP Monitor Delta Queues interface. At the top, there are tabs for 'Queues...', 'Subscriptions...', 'Requests...', and 'Units...'. Below these are fields for 'Provider' (set to 'BW DataSource') and 'Subscriber Type' (set to 'SAP BW'). A 'Subscriber' dropdown is also present. On the left, a list of queues is shown, including 'Customer Balances', 'OFLIGHT\_BOOKING\_DATA', 'Sales Document Item Data', 'ZTK\_DELTA\_ERROR', 'AIED Delta', and 'ODS Delta'. The 'Customer Balances' queue is selected. In the main area, a table displays data for the selected queue:

Queue	Subscrptns	Requests	Units
Cost Centers: Commitme...	0	0	
Cost Centers: Actual Line ...	1	1	
<b>Customer Balances</b>	<b>1</b>	<b>1</b>	
OFLIGHT_BOOKING_DATA	0	0	

A 'Details' dialog box is open for the 'Customer Balances' queue, showing the following information:

Group description	Cell Content
Provider	BW DataSource
Queue	Customer Balances
Queue: Status	1
No. of Subscriptions	1
Number of Requests	1
Provider	DATASOURCE_MODEL
Queue Name	OFI_AR_20
Queue: Status	

**ODP DataSource becomes visible in Operational Delta Queue with the request activation (InfoPackage/DTP) in the subscriber system**

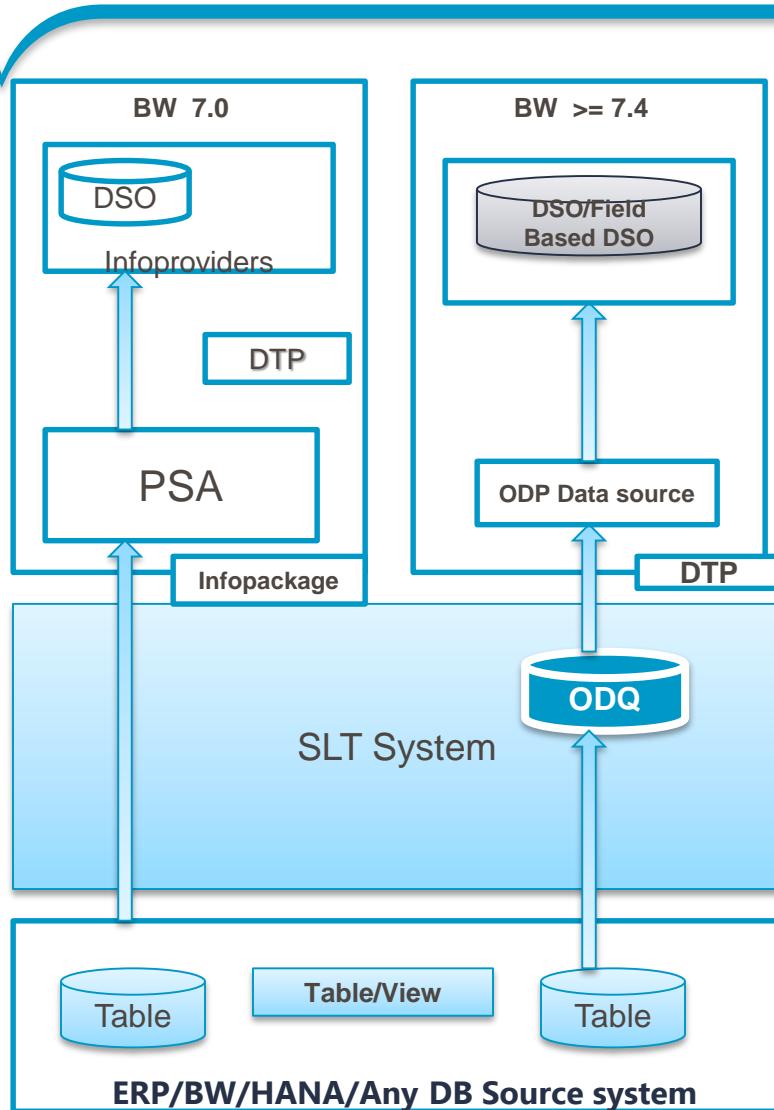
# SAP ERP ODQ Monitor (Transaction ODQMON)

## Example from SAP ERP: ODQ in action ...

Monitor Delta Queues								
Provider	Queue	Subscriber Type	Subscriber	Data Volume				
Queue...		Subscriptions...		Calculated	Actual	Inclusive	Estimated	Estimated
Provider	Queue	Subscriber Type	Subscriber	Units	Rows	Original Size in Bytes	Compressed Size in Bytes	Comp. %
DATA SOURCE MODEL BW	0H_GL_4	BOBJ_DS SAP BusinessObject		1.081	43.913.163	46.824.320.344	1.626.276.068	96,5
	2LIS_11_V_SSL			17.920	9.150.147	2.671.842.924	92.564.176	96,5
	2LIS_11_VAHD			18.743	742.030	2.116.269.560	139.457.257	93,4
	2LIS_11_VAITM			18.928	11.209.404	79.541.930.784	1.634.280.475	97,9
	2LIS_11_VAKON			43.375	207.054.781	1.563.677.706.112	15.978.100.390	99,0
	2LIS_11_VASCL			18.289	8.688.192	65.196.192.768	1.219.600.770	98,1
	2LIS_11_VASTH			18.252	918.756	66.150.432	11.138.413	83,2
	2LIS_12_VCHDR			10.059	782.368	2.401.869.760	112.687.147	95,3
	2LIS_12_VCITM			10.059	7.643.541	48.490.624.104	935.558.525	98,1
	2LIS_12_VCSCL			9.954	7.267.978	47.212.785.088	781.110.535	98,3
	2LIS_13_VDHDR			4.259	457.387	852.569.368	38.761.222	95,5
	2LIS_13_VDITM			4.291	4.988.388	29.052.371.712	670.592.657	97,7
	2LIS_13_VDKON			11.601	104.698.610	556.996.605.200	8.401.877.038	98,5
Grand Total								
14 * 995 * 186.811 * 407.514.745 * 2.445.101.238.156 * 31.642.004.673								

**One common monitor for data provisioning information:**  
Many beneficial information shown: number of units, records, requests, size, compression factor, number of subscriber per queue.

# SLT Scenarios for SAP Business Warehouse – Overview of PSA and ODP



## Scenario

SAP LT Replication Server offers 2 scenarios for replicating data into SAP BW. For SAP BW 7.00 onwards, data can be transferred into the PSA layer of BW into Web Service DataSources and then processed into the InfoProviders.

With Support Package SP8 of BW 7.30, the Operational Data Provisioning Infrastructure can be used with SLT, where the data from the source systems is stored and SAP BW is registered as a consumer.

## Value Proposition

Using SAP LT Replication Server to transfer data in real-time into SAP NW BW reduces the amount of overnight data uploads into your BW systems. With SAP LT Replication Server you can perform delta updates on BW DataSources without delta mechanisms, for ABAP-based systems as well as non-ABAP based systems on all SAP supported DB versions (according to PAM).

If you use operational data provisioning, you can load the data directly into the InfoProviders (bypassing the PSA layer) by using a DTP (Data Transfer Process) (as of SAP BW 7.30 SP8). The ODP infrastructure (with delta queues) takes over important services such as monitoring data requests.

# Real-time Data Replication into SAP BW (PSA) with SAP LT Replication Server

## Scenario

SAP LT Replication Server transfers data in real-time into SAP NW BW, reducing the amount of overnight data uploads into your BW systems. With SAP LT Replication Server you can perform delta updates on BW DataSources without delta mechanisms, for ABAP-based systems as well as non-ABAP based systems on all SAP supported DB versions

BW Native	SLT for BW
Data from SAP-Systems (and via ETL)	Data from SAP and non-SAP Systems
Deltas only from delta-enabled DataSources (ca. 30% of all DataSources, else full loads)	Delta-capability for all (transparent) Tables
Delta-Data is written into delta queue in source system and is transferred with scheduled Info Packages	Real-time Data transfer into PSA
Job per InfoPackage (per DataSource)	Low number of SLT-Jobs
Reporting on hourly or daily basis	Enables correct reporting on minute basis

# ODP/SLT Scenario for SAP Business Warehouse - Overview

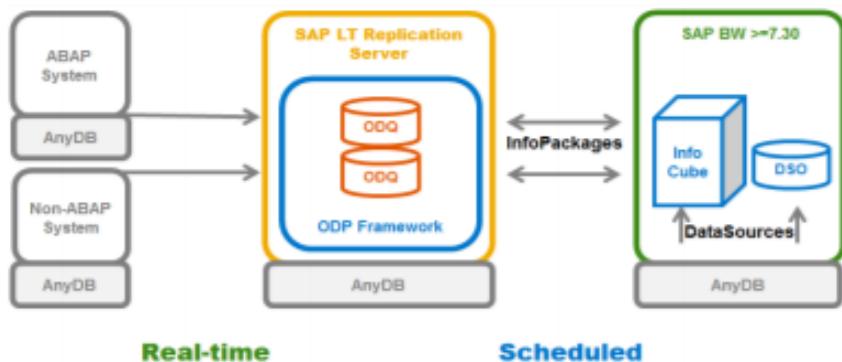
## Scenario

SAP LT Replication Server provides the operational data provisioning infrastructure with source tables of SAP- and nonSAP systems as delta queues. The data from the delta queue can be replicated in SAP BW as a subscriber. A subscriber can have more than one subscription. A queue can also be in multiple subscriptions for the same subscriber.

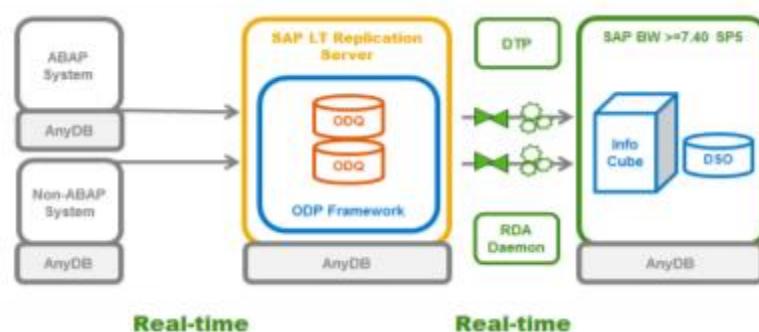
## Value Proposition

If you use operational data provisioning, you can load the data directly into the InfoProviders(bypassing the PSA layer) by using a DTP (Data Transfer Process) (as of SAP BW 7.30 SP8). The ODP infrastructure (with delta queues) takes over important services such as monitoring data requests. The data is stored in a compressed state in the delta queue. A delta request transfers data records from the queue to the subscriber. The data changes to a queue can also be requested by more than one subscriber. The data is retained in the delta queue for a specified time period for recovery purposes.

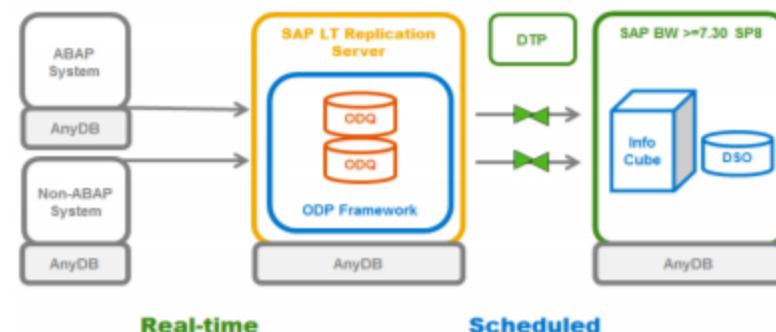
# ODP/SLT Scenario with Subscriber SAP BW



**Option 1:** Setup with Data Transfer via Info Packages into BW PSA possible with SAP BW >= 7.30



**Option 3:** Setup with Data Transfer Process into BW Data Targets and RDA Daemon possible with SAP BW 7.40 SP5

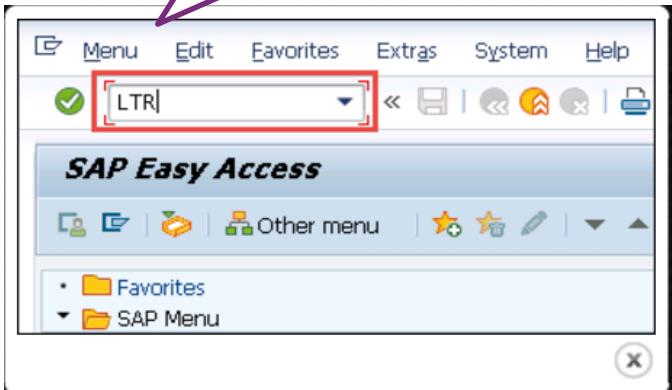


**Option 2:** Setup with Data Transfer Process into BW Data Targets possible with SAP BW >= 7.30 SP8

# Configure SAP SLT Server for SAP Source and Target System

## Step 1)

Login to SAP SLT server,  
and Call transaction "LTR" from **SAP SLT**  
replication server.



## Step 2)

Enter Client / User id /  
password  
`Click on logon tab

The screenshot shows the SAP NetWeaver login screen. At the top, there are two warning messages: 'Protocol cannot be switched to HTTPS, HTTPS is not configured/active' and 'No switch to HTTPS occurred, so it is not secure to send a password'. The main form has fields for 'System' (NWP), 'Client' (100), 'User' (empty), 'Password' (empty), 'Language' (English), and a 'Log On' button. Below the form, there is a footer with 'CAPGEMINI INDIA I & D | HANA CoE | BW 7.5 on Oracle' and 'Support : DL IN HANACOEBASIS'.

## Step 3)

Click on New which will pop up below  
Create Configuration Window



# Configure SAP SLT Server for SAP Source and Target System

## Step 4)

Here you enter the technical name and description for Configuration . The configuration name will be also used as the new schema name that will be created in the HANA system. and click **Next**

Creation of new configuration - Microsoft Internet Explorer

Create Configuration

Specify General Data

Configuration Name: \* RDP260\_XX

Description: Your text

Authorization Group:

Help

1 2 3 4 5 6

Previous Next Close

## Step 5)

New configuration screen will appear, here you specify your source system. For an ABAP based system you connect via RFC connection, for a non-ABAP system you connection via a 2nd DB Connection (SLT supports only SAP supported DB's)and click on **Next**.

Creation of new configuration - Microsoft Internet Explorer

Create Configuration

Configuration Name RDP260\_XX Description Your text

Specify General Data Specify Source System

1 2 3 4 5 6

Previous Next Close

Specify the relevant information in order to connect to the source

System Data

RFC Connection  DB Connection

RFC Destination: \* SLT\_RFC\_M95

Allow Multiple Usage:

Read from Single Client:

## Step 6)

specify all relevant information about the target system. click **NEXT**

Creation of new configuration - Microsoft Internet Explorer

Create Configuration

Configuration Name RDP260\_XX Description Your text

Specify General Data Specify Source System Specify Target System

1 2 3 4 5 6

Previous Next Close

Specify the relevant information in order to connect to the target system

System Data

RFC Connection  DB Connection

Database System: \* HANA

Schema Name: RDP260\_XX

Administration User Name: \* SLTUSER

Password: \*\*\*\*\*

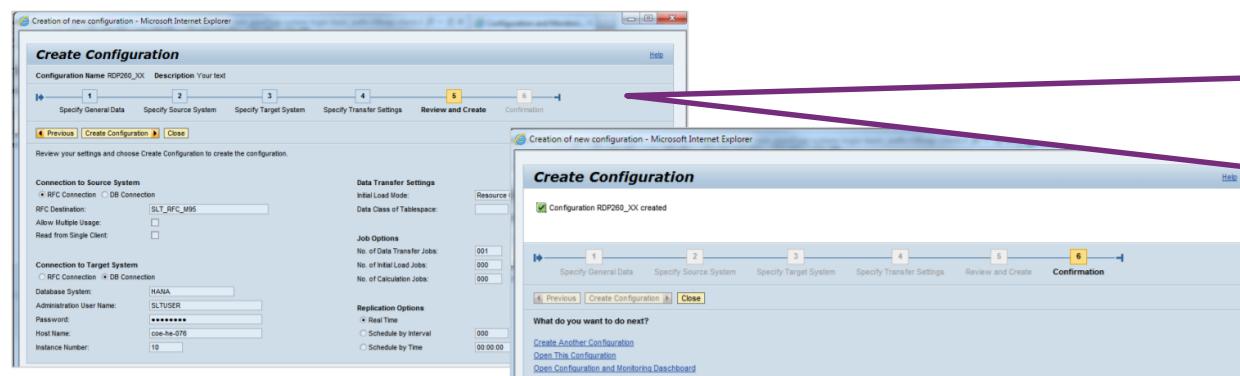
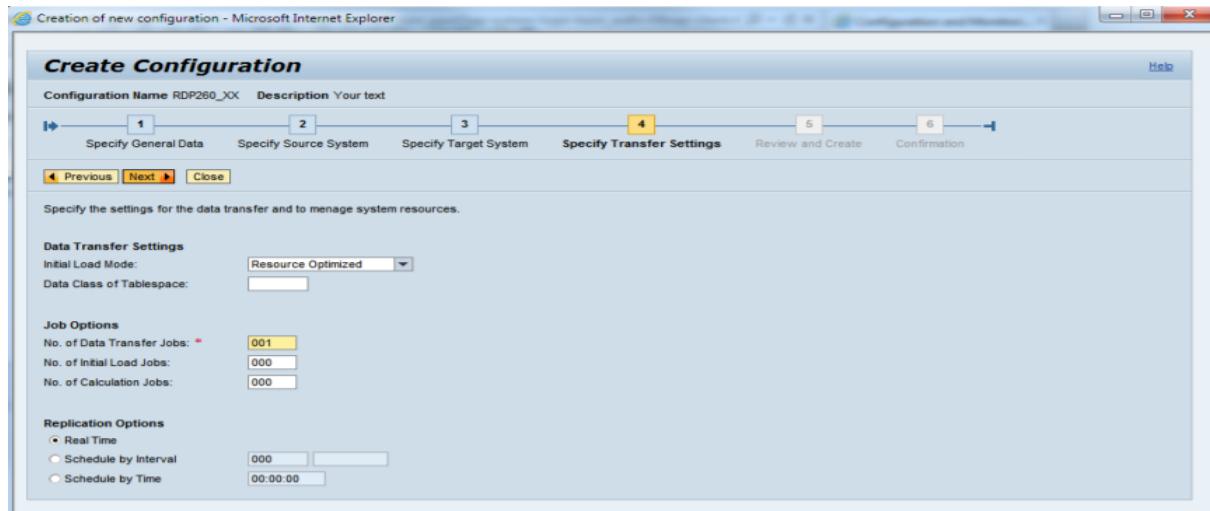
Host Name: \* coe-he-076

Instance Number: \* 10

# Configure SAP SLT Server for SAP Source and Target System

## Step 7)

In this step here, you specify the transfer settings. There are two options for the initial load process - resource optimized or performance optimized. The data class of the table space defines where SLT creates the logging tables on the source system. Administrators can use this option for better monitoring. In the section Job Options, you can define the jobs that are allocated for this configuration at SAP LT Replication Server.



## Step 7)

you review all your settings and start the creation process of the configuration.

# Agenda – Unit 5: Flat File Data Transfer

- Accessing Data from a Flat File
- Loading Flat File Hierarchies
- Using Workspaces for Local Flat File load

# Accessing Data from a Flat File

# Agenda – Unit 6: Additional Data Acquisition Techniques

- Positioning DB Connect
- Positioning Universal Data (UD) Integration
- Explaining XML-Based Extraction
- Acquiring Data Using an XML Based Web Service
- Integrating SAP Data Services and SAP BW
- Positioning HANA SDI capabilities for BW
- Using Workspaces for Local Flat File load

# Positioning DB Connect

# Agenda – Unit 7: Data Mart Interface and OpenHub

- Positioning Data Mart Interface
- Implementing Open Hub Destination
- Exporting an Hierarchy with Open Hub
- Exporting from BW system to NATIVE HANA

# Positioning Data Mart Interface

The data mart interface makes it possible to post data from one info-provider to another.

It can be used in following two ways:

- Exchanging data between multiple BW systems
- Data exchange between BW systems and other SAP systems.
- Data distribution within a BW system (Myself connection)

A BW system makes itself available to another BW system as the source system by

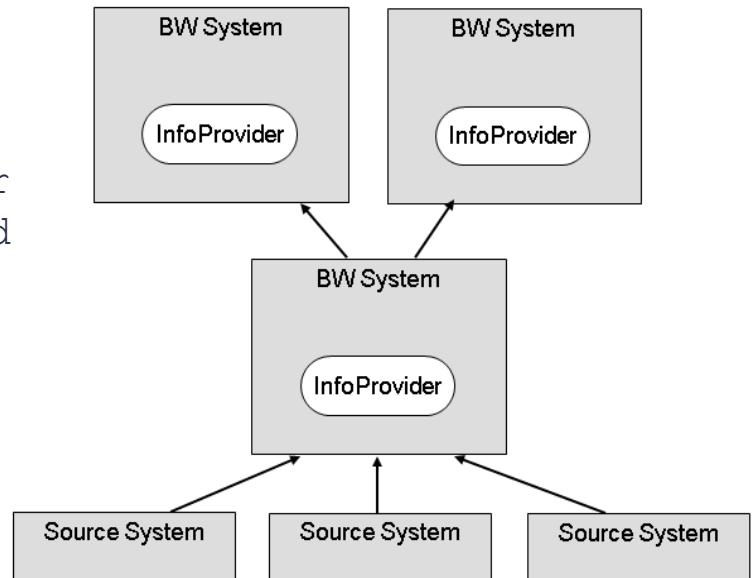
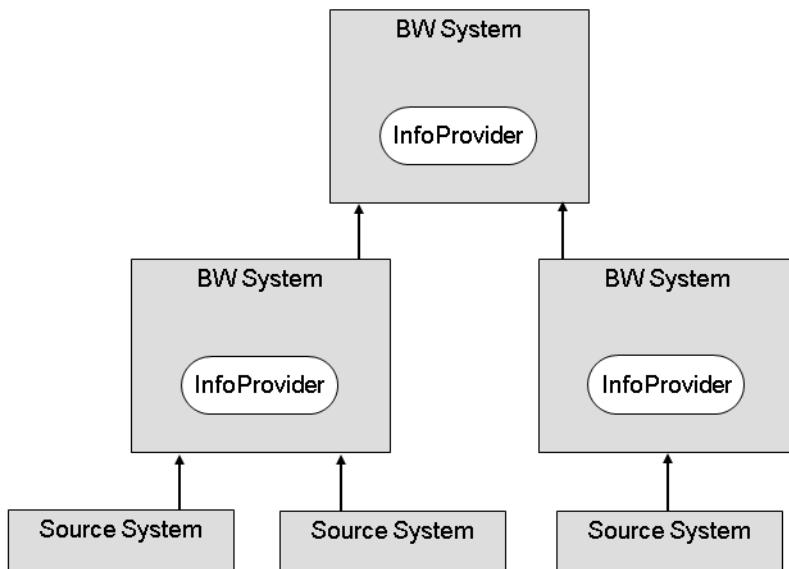
- providing metadata
- providing transaction and master data.

An export DataSources is needed to transfer data from a source BW into a target BW. Export DataSources for InfoCubes and DataStore objects contain all the characteristics and key figures of the InfoProvider. Export DataSources for master data contain the metadata for all attributes, texts, and hierarchies for an Info-Object.

# Cont..

## Replicating Architecture:

If you select this architecture, the data for a BW server is available as source data and can be updated in further target BW systems.

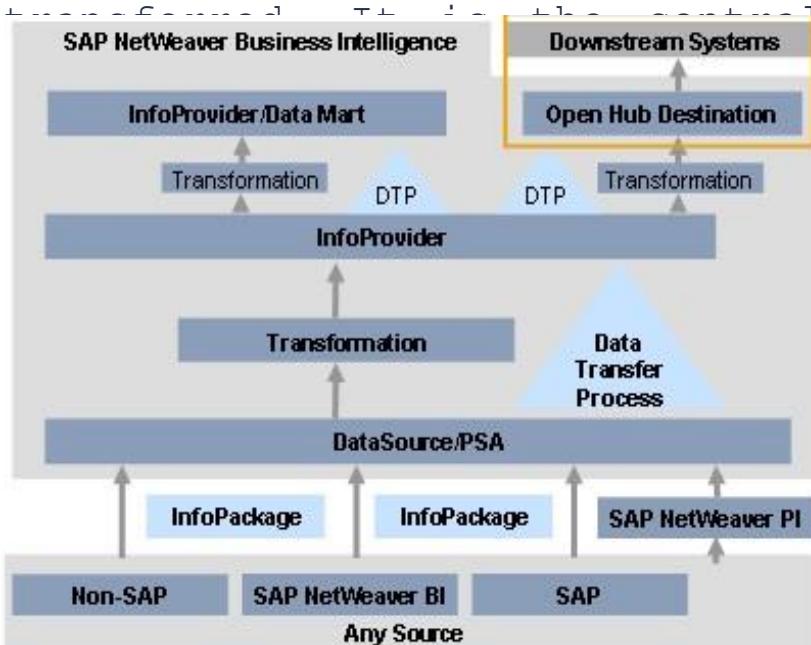


## Aggregating Architecture:

With aggregating architecture, data is grouped together from two or more BW servers, and is then available for further processing.

# Implementing Open Hub Destination

- The open hub destination is the object that allows you to distribute data from a BI system to non-SAP data marts, analytical applications, and other applications. It ensures controlled distribution across multiple systems.
- The open hub destination defines the target to which the data is distributed. It is an object and contains all the important information for the data to be extracted.



- Through the open hub service, SAP BW becomes a hub of an enterprise data warehouse. The distribution of data becomes clear through central monitoring from the distribution status in the BW system.

# Cont..

## Destination type:

The destination type determines the target in which the extracted data is stored. You can choose between the following two targets:

- **DB Tables**

During the extraction, the data can be stored in a DB table. Many non-SAP systems and applications use standard database management systems (such as DB2, Oracle and SQL Server). These platforms provide tools that you can use for direct access to the third-party DB tables generated by the open hub service.

- **CSV Files**

When extracting data to flat files, the only format that is supported is .csv. You can store the csv files on the SAP BI application server or in a local directory.

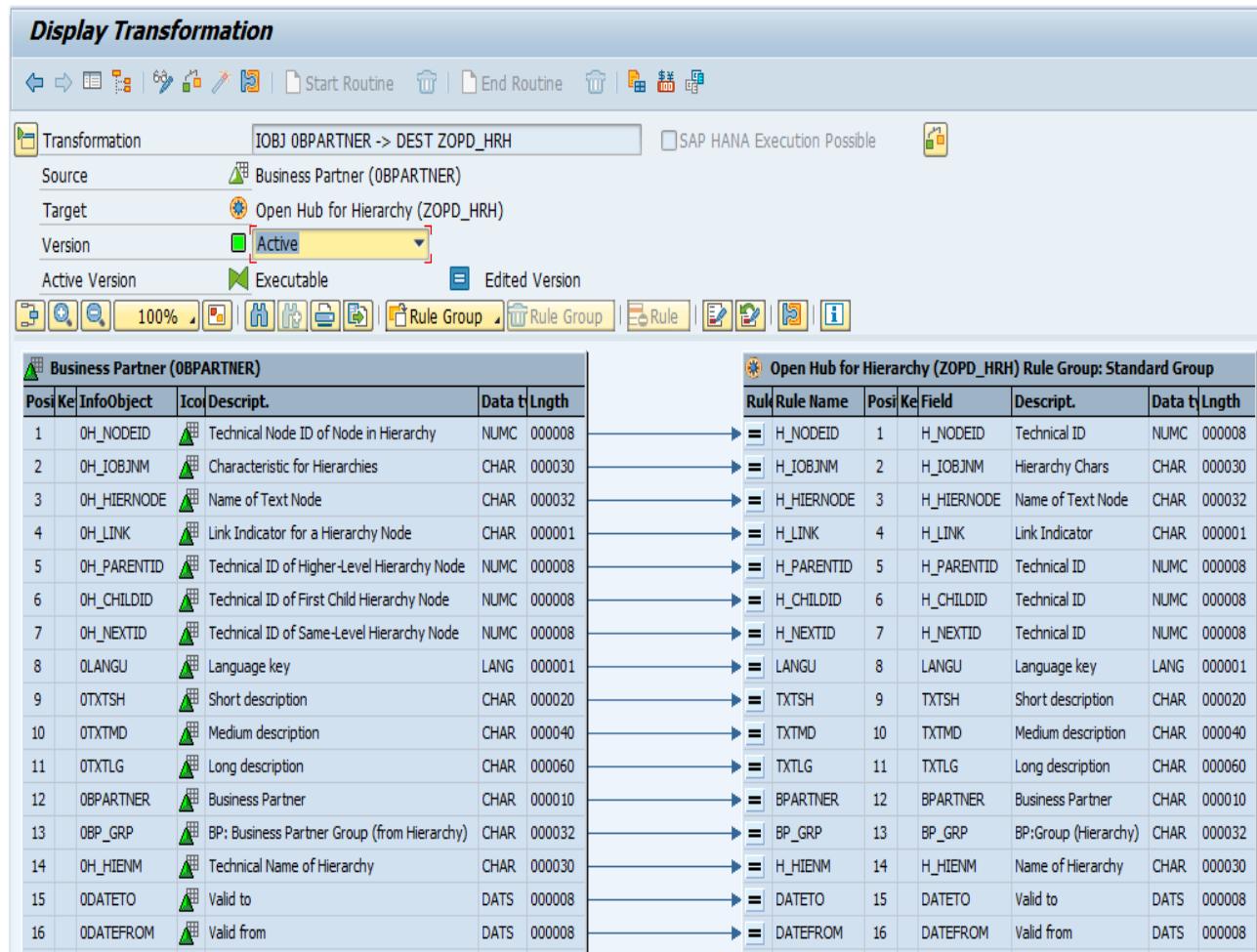
- **Third-Party Tool**

You can extract data to non-SAP systems using the open hub service. Different APIs enable you to connect a third-party tool to the BI system to distribute data to other non-SAP systems.

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# Exporting an Hierarchy with Open Hub

- We can use an Open Hub to export a hierarchy data in the SAP BW system to any external non SAP system. The hierarchy can be exported to a flat file or to a third party tool, as mentioned in the destination type of the Open Hub.
- Create a transformation in Open Hub using an hierarchy IO as template and map hierarchies to Open hub. Activate and load with the help of DTP, which will transfer the hierarchy to the destination folder as



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Presentation Title | Date

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# Exporting from BW system to HANA

- In the current era of advance versions of BW on HANA or native HANA, we may not find the old BW objects like Info-cubes, Standard DSO, and Info-object with master data etc. anymore in future days of data modeling.
- Until all SAP BW projects move to BW on HANA 7.5 (or above) we have the relevance of consuming those BW objects in SAP HANA.
- From BW on HANA 7.3 release we have the feature of consuming BW objects into SAP HANA directly. From BW 7.4 onwards automatic HANA view creation is also available from SAP BW workspace.
- There are 2 ways to use BW objects in HANA Studio
  1. Enabling the checkbox of External HANA view in BW object settings
  2. Manual import of BW objects in HANA Studio

# Cont..

- Info-object as info-provider:

In the master data tab of an info-object, there are options as 'Extended SAP HANA view for Master Data' which enables to generate ATTRIBUTE and ANALYTIC view in HANA.

The screenshot shows the SAP InfoObject configuration interface with the 'Master Data/Texts' tab selected. The interface is divided into several sections:

- Master Data InfoSource / Data Target / InfoProvider**:
  - Application Component:
  - InfoSource with Direct Update
  - InfoArea: NODESNOTCONNECTED (Unassigned Nodes)
  - Characteristic is InfoProvider
  - Char. is Export DS       Permitted for Real-Time Data Acquisition
- Master Data Read Access**:
  - Master Data Access: Default
  - Master Data Read Class:
  - Read Class Parameters:
  - SAP HANA Package:
  - SAP HANA View:
- External SAP HANA View**:
  - External SAP HANA View for Master Data
  - External SAP HANA View for Master Data InfoProvider
- Miscellaneous**:
  - Master Data Maintenance with Authority Check
  - DataStore Object for Check:

# Cont..

- DataStore Object as info-provider:

For DSO a new checkbox is made available in the settings tab 'External SAP HANA View for reporting'. If this flag is set accordingly, an external SAP HANA ANALYTICAL view is generated automatically with the activation.

DataStore Object		Techn. name / value	F...	O...	App...
test		Z_TEST			
Object Information					
Version	In Process				
Save	Saved				
Revised Version	Active Version				
Object Status	Active, executable				
Settings					
Type of DataStore Object	Standard				
SID Generation	During Activation				
External SAP HANA View	External SAP HANA view for reporting	<input checked="" type="checkbox"/>			
Unique Data Records		<input type="checkbox"/>			
Set Quality Status to 'OK' Automatically		<input checked="" type="checkbox"/>			
Options for 3.x Data Flows					
Key fields					
Data Fields					
Navigation Attributes					
Indexes					

# Cont..

- Info Cube as info-provider:

Same as DSO, Analytic view will be created under the analytic folder in HANA with the below mentioned settings in info-cube

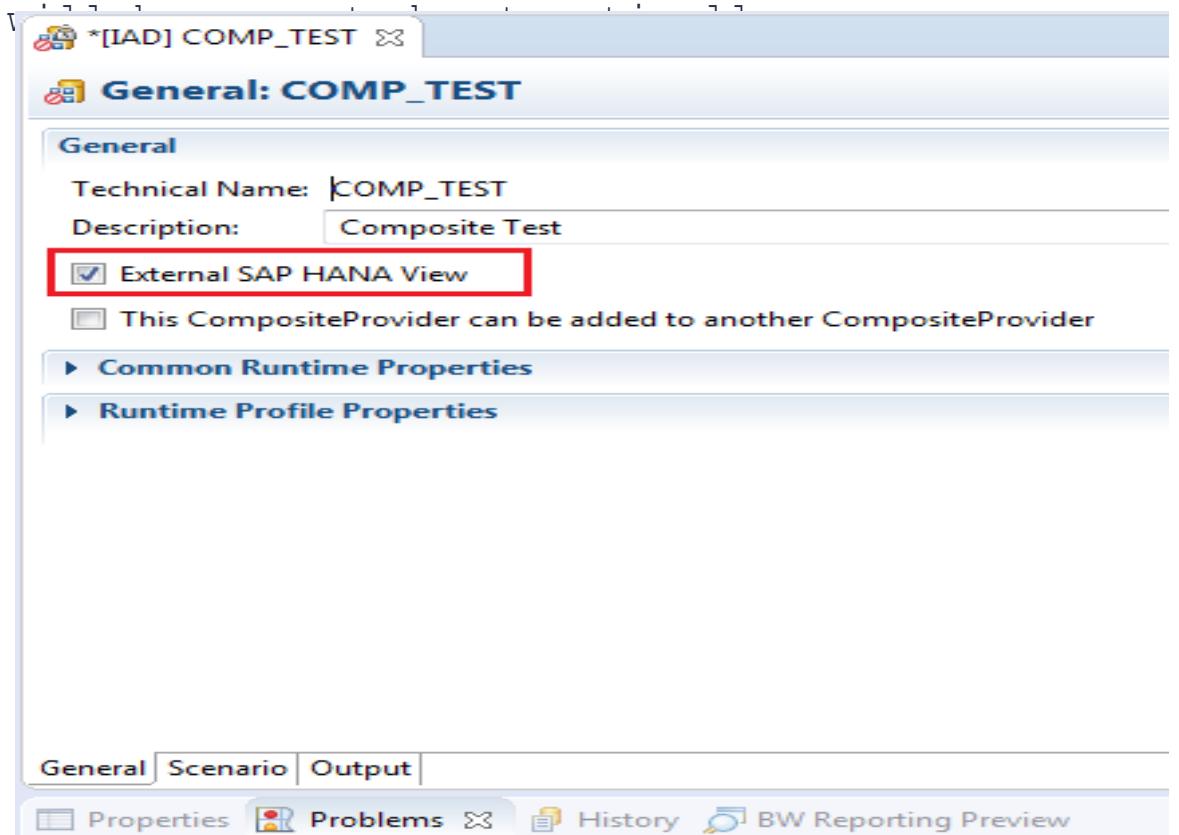
The screenshot shows the SAP Business Content interface for managing InfoCubes. The top navigation bar includes 'Version Comparison', 'Business Content' (selected), and various toolbar icons. The main area displays the 'InfoCube' table with the following data:

InfoCube	Techn. name / value	F...	O...	App...	Dat...	L...	Key ...
Test	TEST_Z						
Object Information							
• Version	In Process						
• Save	Saved						
• Revised Version	Active Version						
• Object Status	Active, executable						
Settings							
• InfoCube Type	Standard InfoCube						
• Subtype	SAP HANA optimized InfoCube						
• External SAP HANA View	External SAP HANA view for reporting	<input checked="" type="checkbox"/>					
Auditable							
Dimensions							
• Data Package	TEST_ZP						
• Time	TEST_ZT						
• Unit	TEST_ZU						
• Dimension 1	TEST_Z1						
Navigation Attributes							
Key Figures							

# Cont..

- Composite info-provider:

At the time of creating Composite Provider from SAP BW modeler perspective of HANA Studio, we have to tick the check box of external SAP HANA view. A calculation view will be created.



# Agenda – Unit 8: Overview of BW Transports

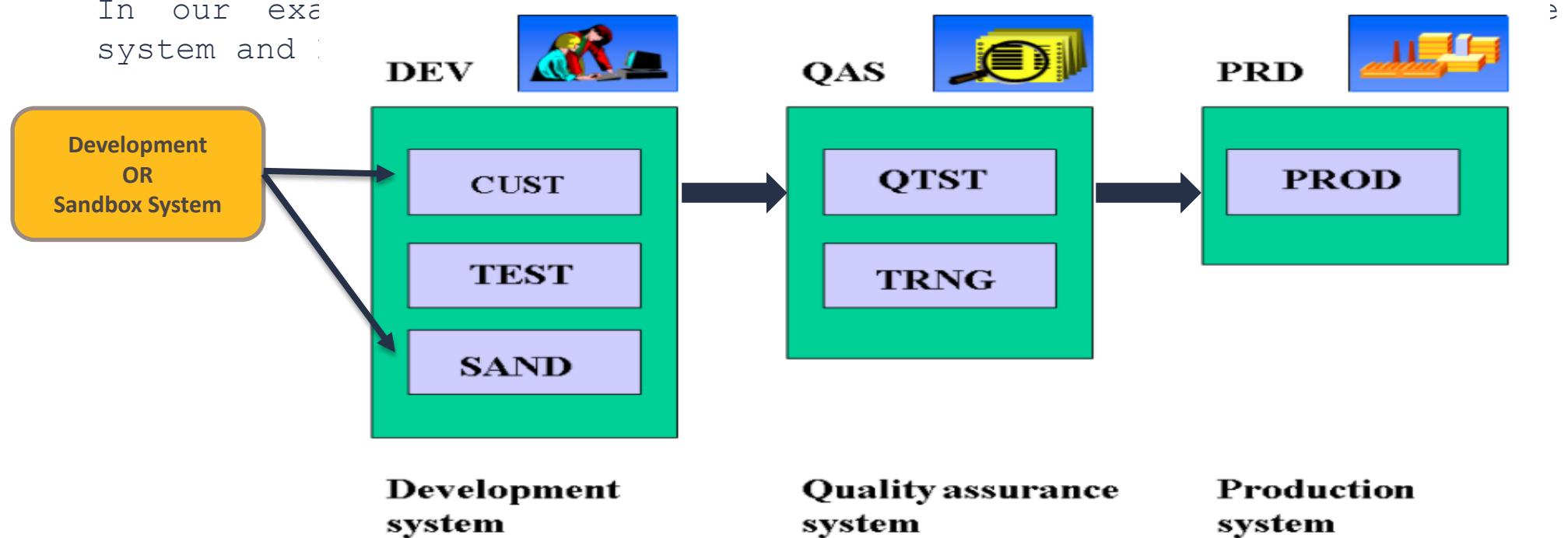
- Overview of Transports in BW
- Transport System Landscape
- Object Version and Metadata
- Transports Management System
- Transports Strategy
- Troubleshooting Transport Strategies

# Transports in SAP BW

- A Transport Request is a package that is used to collect developed objects and move them from one SAP system to another. One question comes here is, why we need Transport request and move objects in other systems.
- In most cases, SAP Business Warehouse (BW) development projects are not carried out in a productive system, rather in one or more development systems, depending on their scope.
- Transports are required because it is not recommended to implement directly in the production environment as it may lead to data flow changes or loss of data and hence Transport Request are required.
- To do this, the standard transport system has been enhanced in BW to provide the BW transport connection. Using the transport connection in your BW development system, you can collect a consistent amount of new or changed BW objects and then transport them using the Change and Transport Organizer (CTO).

# Transport System Landscape

- The system landscape contains all the SAP systems that you have installed. It can consist of several system groups, whose SAP systems are linked by transport routes.
- Let us understand with a basic example of Three-Stage System Landscape. In our example, we have three stages: Development system, Quality assurance system, and Production system.



# Object Version and Metadata

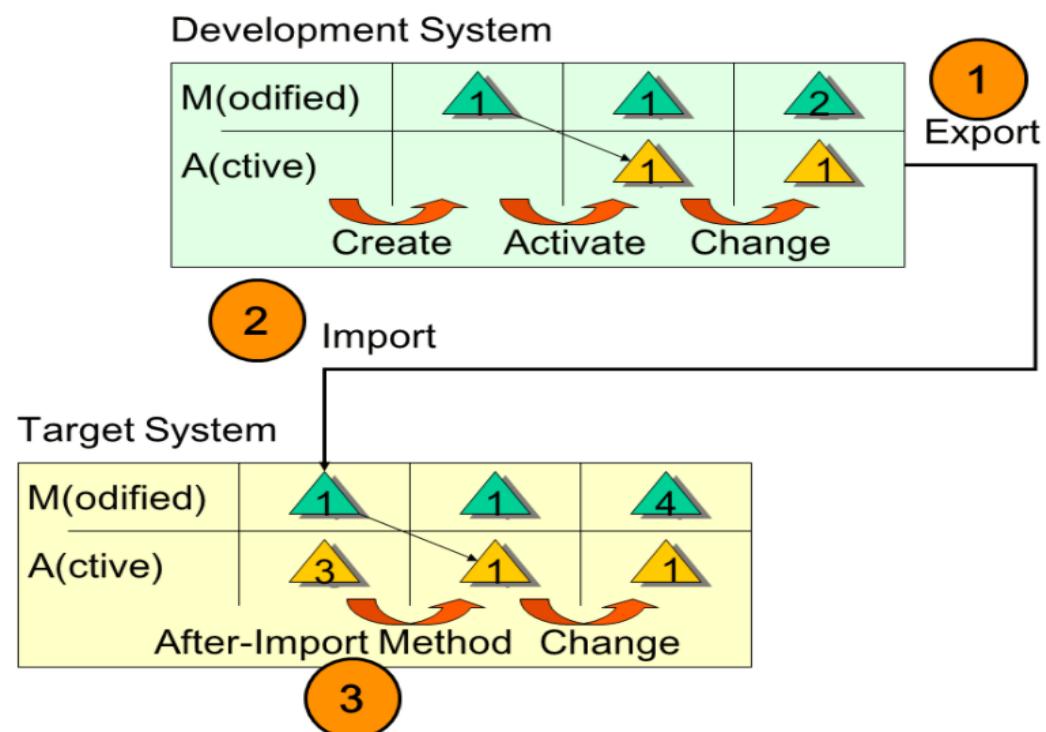
- The BW versioning concept enables you to deliver the BW objects in a system landscape and to use them in a consistent manner.

Version	Meaning
D	Delivery Version
A	Active Version
M	Modified version
T	Transport version for the import of source-system dependent objects

## Use of the Version when Transporting BW Objects:

The figure illustrates the versions during the transport:

- Only those objects that are in the active version are exported from the development system.
- Exported objects are either imported into the target system in either the A version or in the M version, depending on the type.
- After importing, all BW metadata objects are automatically activated using the after-import method RS\_AFTER\_IMPORT.



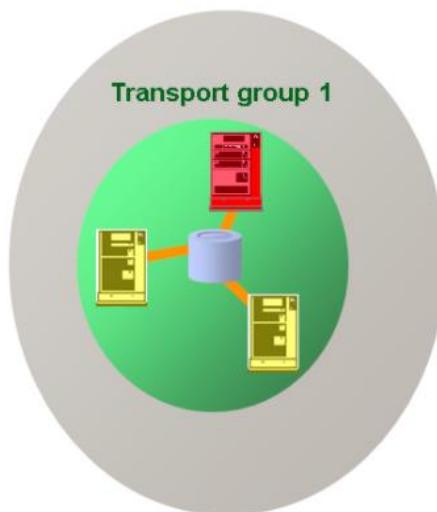
# Transports Management System

- You use the Transport Management System (TMS) to model and manage your system landscape. It provides tools for configuring your system landscape, as well as for organizing, carrying out and monitoring transports.

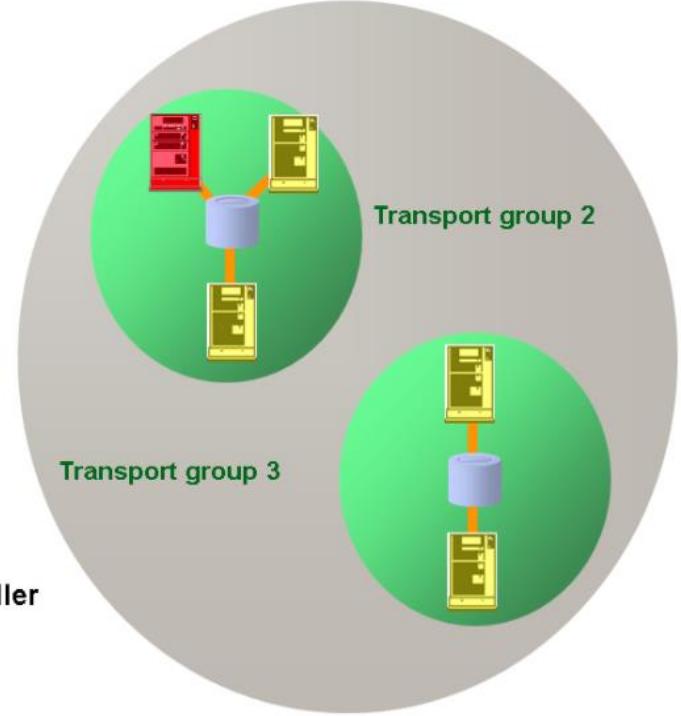
## Configuration of a System Landscape

- All SAP Systems that are subject to the administration of the TMS form a transport domain. This is usually all SAP Systems in the system landscape.
- Certain system settings are the same for all systems within a transport domain, such as the transport routes.
- To achieve this, one SAP System in the transport domain has the reference configuration. The system with

Transport domain A



Transport domain B



# Transport Strategies

- The Change and Transport System provides a range of functions that help you to choose a transport strategy optimally suited to your requirements. We recommend that you follow the transport strategy while you plan and set up your system landscape.

## 1. Client Landscape and Transport Routes:

Before you start an SAP project, you must decide which clients and systems you need.

## 2. Transports Schedules:

If developers work on the same project, all the changes made by the developers must be transported at the same time.

## 3. Quality Assurance:

In case of mass transports, all requests released by the developers are imported into production systems. We can implement TMS Quality Assurance procedure to prevent unchecked changes from being transported.

## 4. Single Imports:

If you want to maintain a production system with specific transports, it is best to import single requests rather than importing all changes waiting for import.

## 5. Transport Workflow:

This method automatically triggers a workflow when you release a change request. The workflow ensures close communication between development and

# Troubleshooting Transport Strategies

- The errors and their possible causes are listed below. Some of the errors should be corrected in the original system and others in the target system of the transport.

## 1. The log for import post processing only displays the message 'Error occurred in object <xyz>.

- The log displays the first object in the list that is processed when the after import function module is called. This is not necessarily the same object in which error occurred.

## 2. The log for import post processing contains messages that indicate that objects are missing.

- The transport request is inconsistent
- A different package is assigned to the missing object than to the dependent object.
- The DataSource is not active in the source system.

## 3. Objects are deleted in the import post processing although they should have been imported.

- The object was transported as a deletion. You can see this from the piece list of the request in that the objects to be deleted are marked with a deletion indicator.

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The background of the slide features a large, dense school of fish swimming in a circular pattern, creating a sense of movement and depth. The fish are silvery-blue and appear to be Barracudas.

# Questions?



People matter, results count.

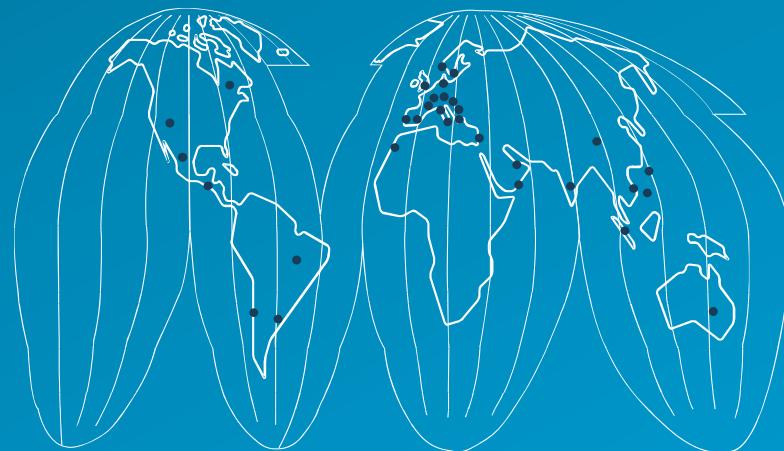


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