

# SAP BW 7.4 – Real-Time Replication using Operational Data Provisioning (ODP)

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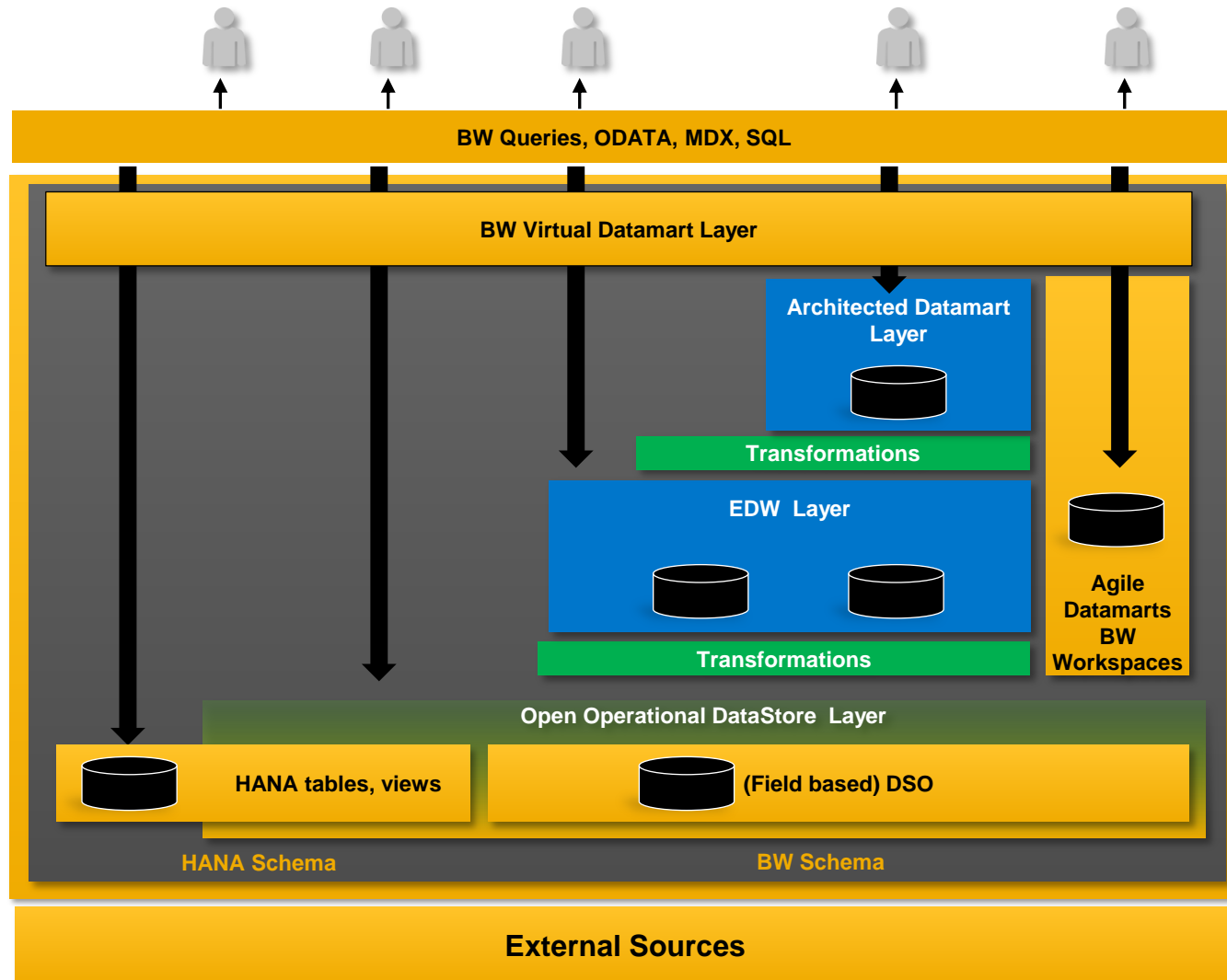


# Agenda

1. **ODP Framework - Basics**
2. ODP based Data Provisioning Aspects for SAP ERP Sources
3. SLT/ODP based Real-time Replication
4. Summary

# SAP BW 7.4 – Overview

Planned with BW 7.4, SP5/SP6 on HANA



## Enhanced Data Modeling

- New overall reference Architecture LSA++
- BW/HANA Smart Data Access providing the logical EDW
- Easy integration of external data models with Open ODS Layer
- Composite Provider for enhanced support of “Mixed Scenarios”
- Common Eclipse based Modeling environment

## Push down further processing logic to HANA

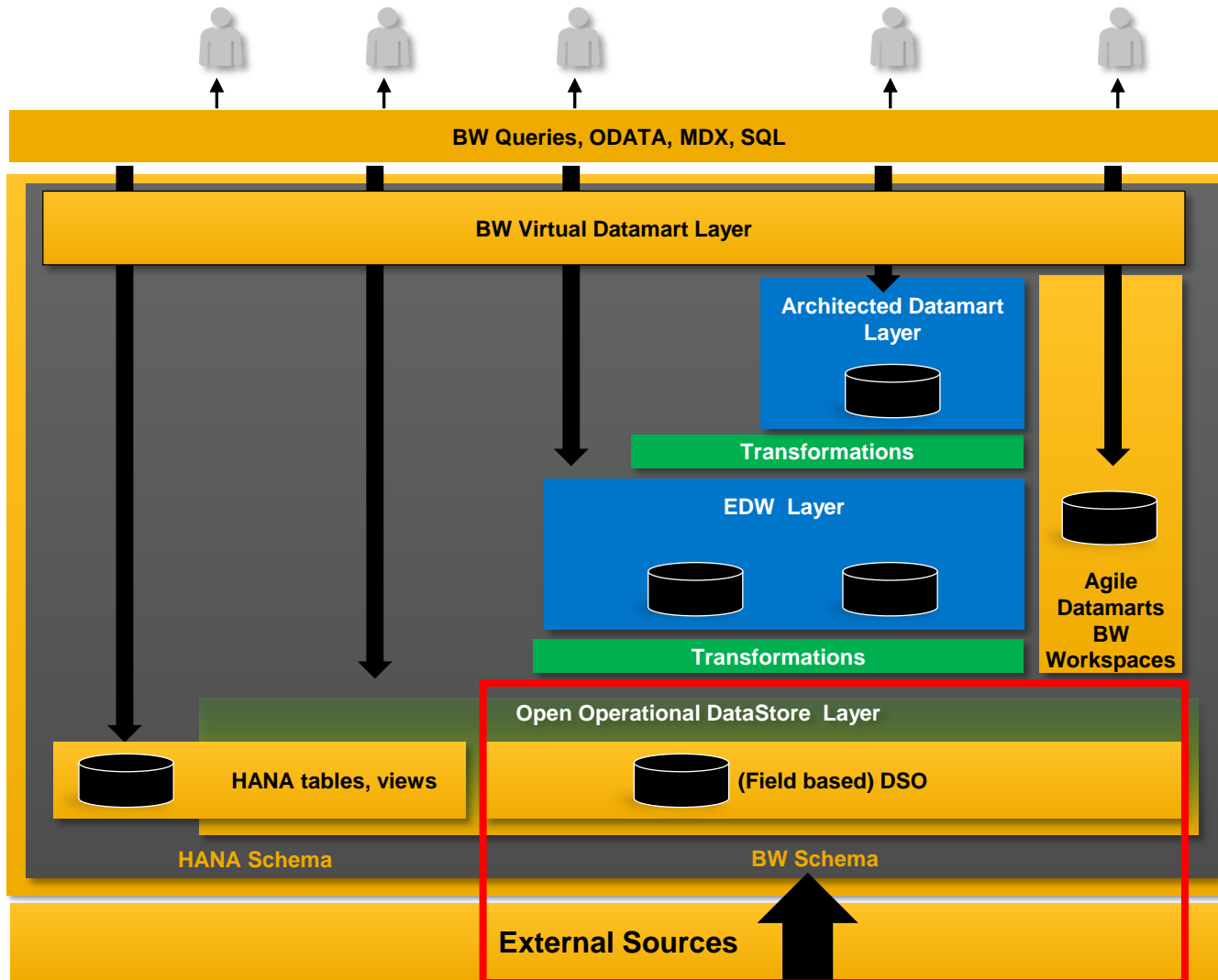
- BW Analytic Manager
- HANA Analysis Processes
- BW Transformations

## New class of Data Provisioning

- BW enhancements for Operational Data Provisioning (ODP) and Operational Delta Queue(ODQ)
- PSA layer obsolete during Data Acquisition
- Simplified SLT handling in BW

# SAP BW 7.4 – Real-time Data Warehousing Aspects

Planned with BW 7.4, SP5/SP6 on HANA



## Enhanced Business Flexibility by providing “the logical EDW”

### Real-time Data Access

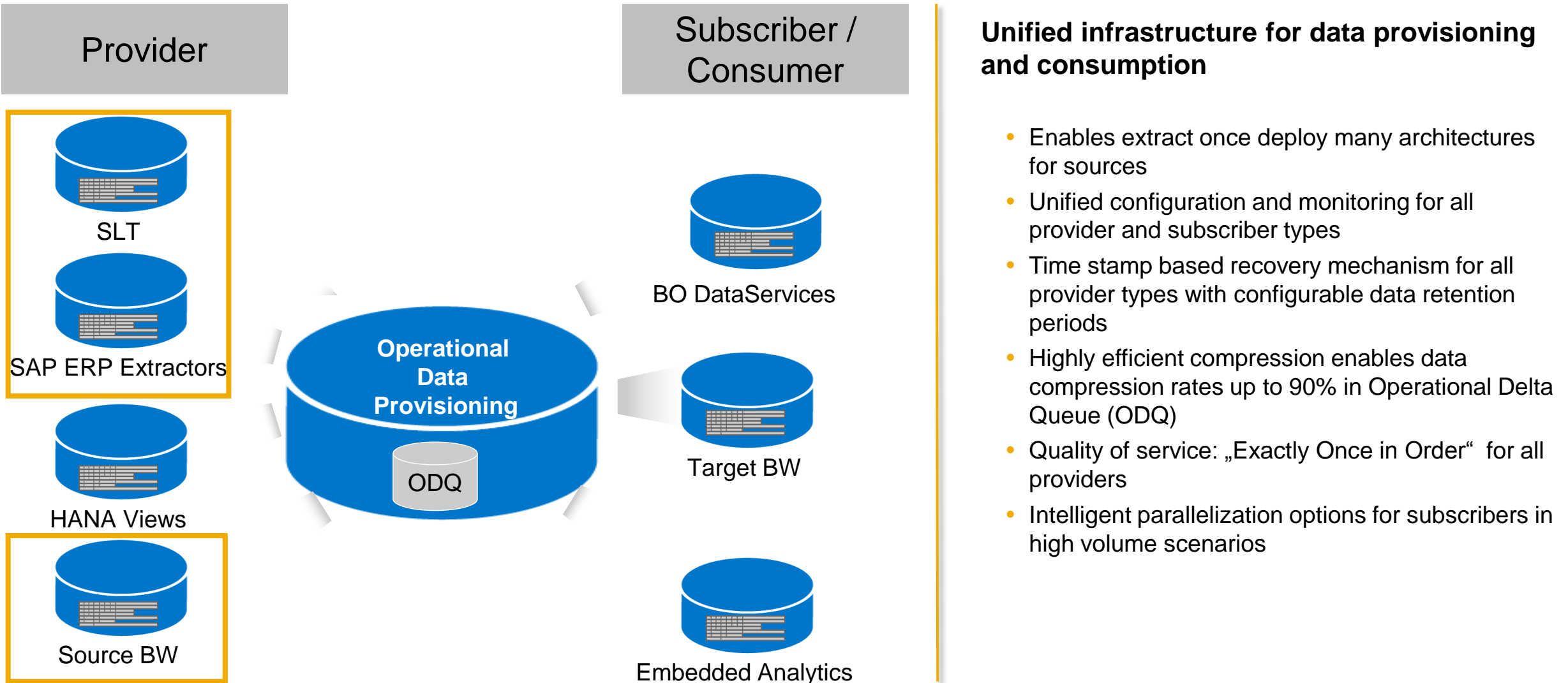
- Direct Data Access accross different source systems
- Direct Meta Data Access during design time for field based modelling

## Lightweight Evolution options into staging scenarios for the EDW layer

- BW enhancements for Operational Data Provisioning (ODP) and Operational Delta Queue(ODQ)
- Real-time Staging Scenarios
  - Reduced latency
  - Reduced footprint (PSA obsolete)
  - RDA Real-time Data Acquisition improved by change notification
  - Real-time Replication into BW via SLT

# SAP BW – Operational Data Provisioning (ODP) Infrastructure

Main Use Cases for ODP data provisioning



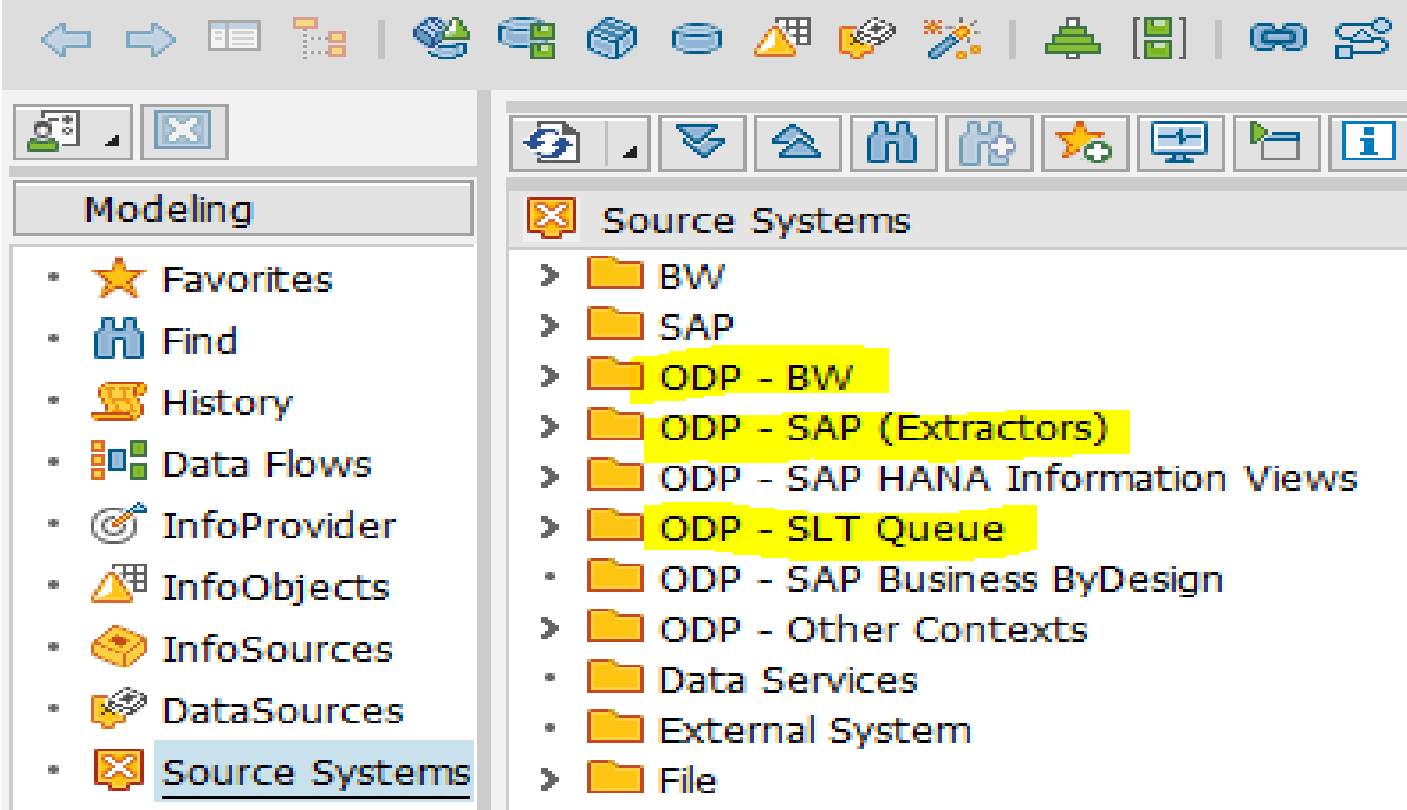
# SAP BW – Operational Data Provisioning (ODP) Infrastructure

Overview about all new ODP based scenarios for BW 7.40

Provider

Subscriber /  
Consumer

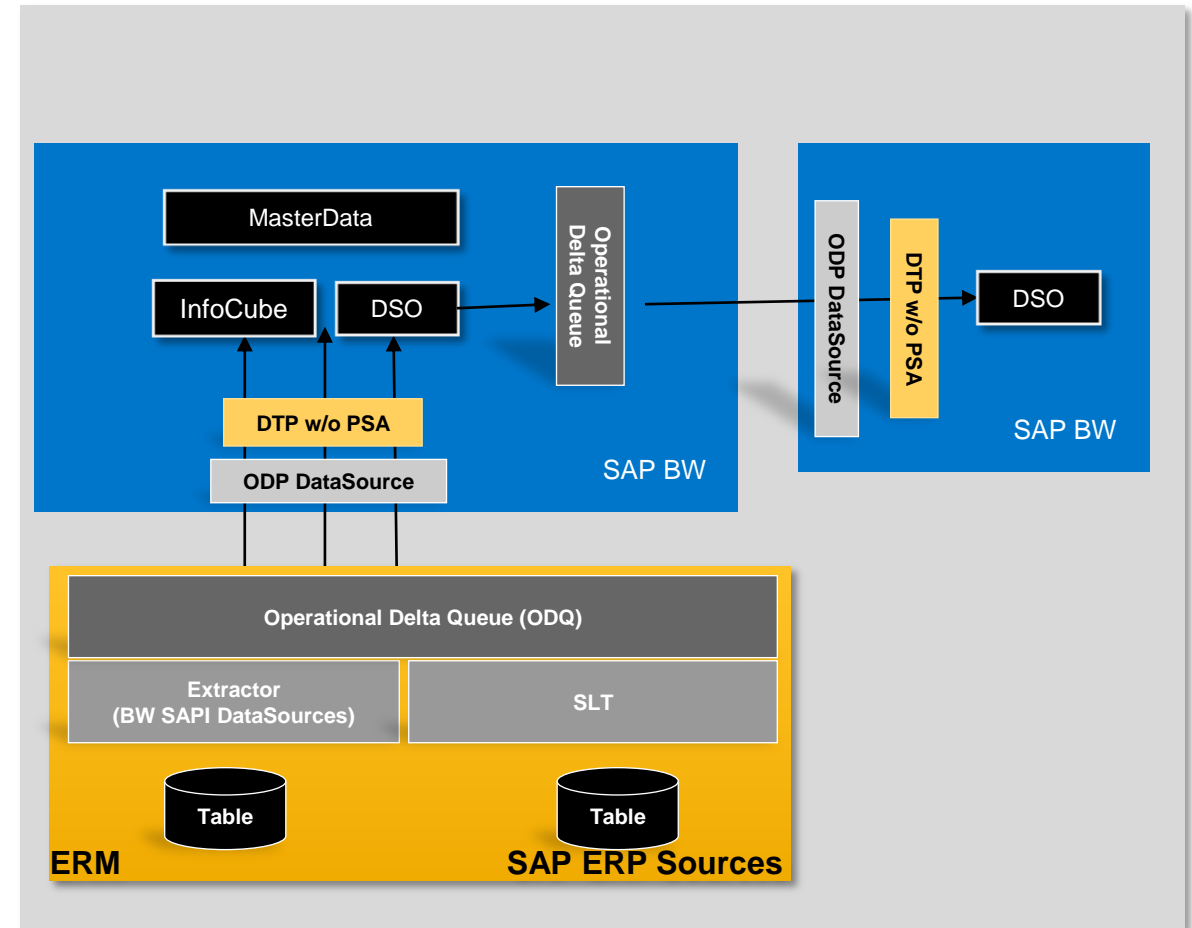
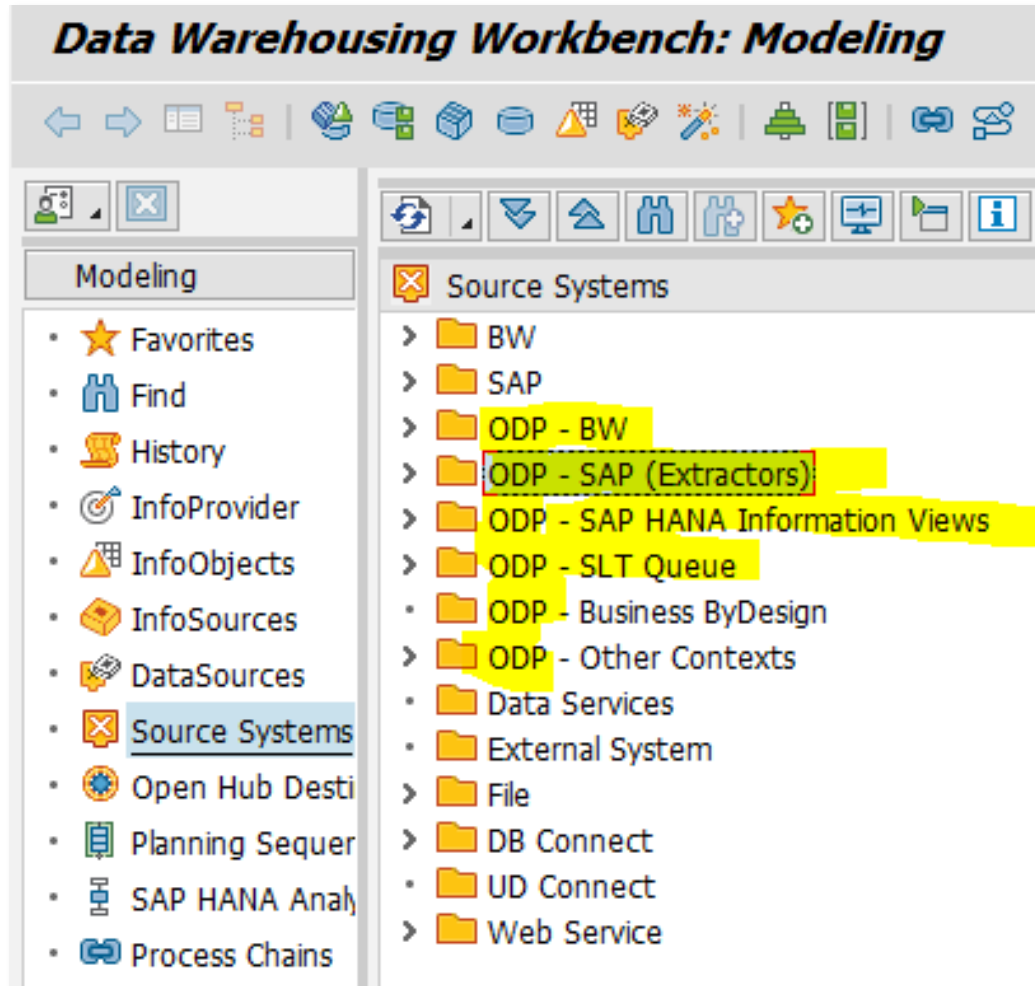
## *Data Warehousing Workbench: Modeling*



## Main use cases available with BW 7.40:

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 NetWeaver based Framework, ODQ as persitency 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 in BW 7.40





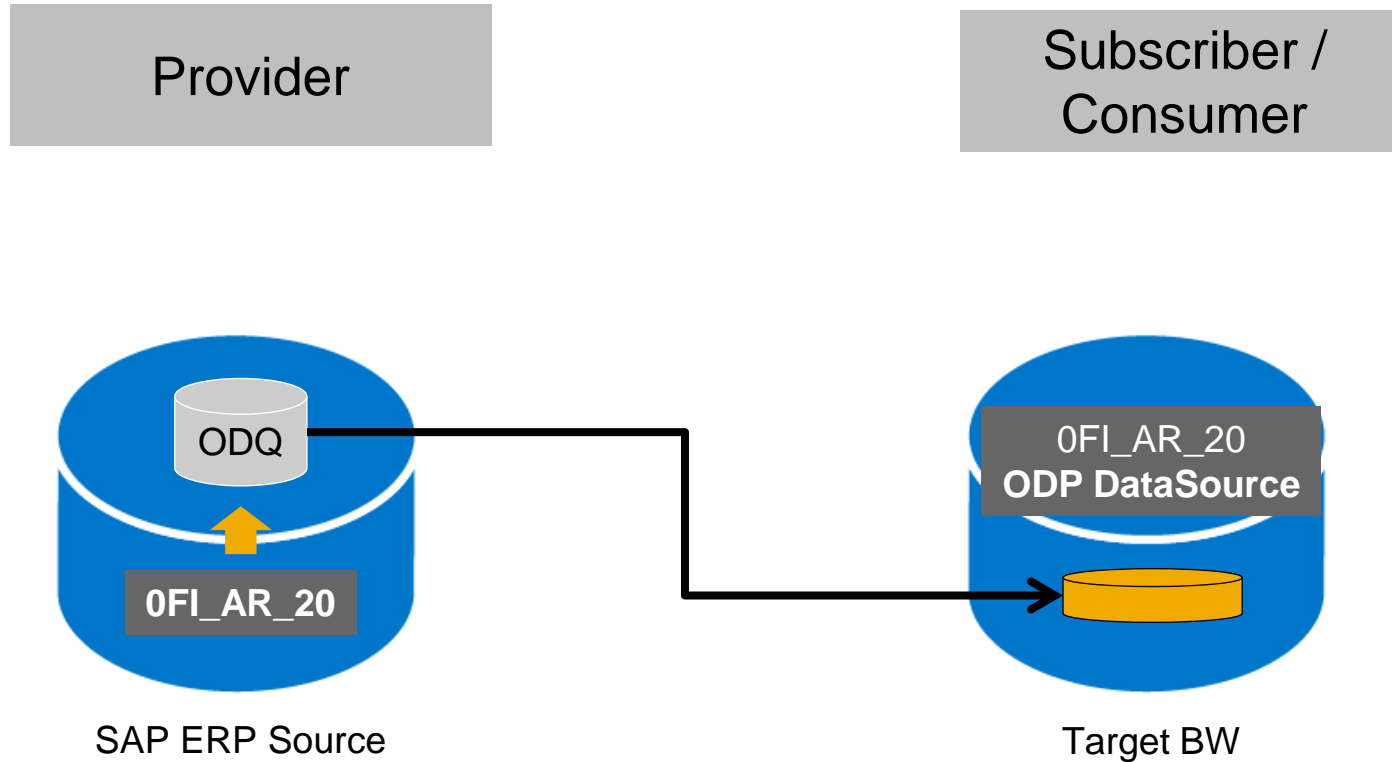


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# SAP BW – Operational Data Provisioning (ODP) Infrastructure

Use Case of ERP Extractors with SAP BW 7.4



**ODQ as new queue for data extraction into SAP BW**

## Simplified data flow

- Data transfer via DTP w/wo PSA table, InfoPackage or direct access scenario via Open ODS View
- Scheduled or real-time data acquisition
- Flexible recovery options

**Direct Update to BW InfoProviders – PSA not required**

# Given SAP ERP Business Content DataSource

The screenshot displays the SAP Business Content DataSource configuration interface. On the left, the 'DataSources for QT6MNDT002 QT6 Client...' tree shows 'Customer Balances' selected. Below it, the 'Source Systems' tree highlights 'ODP - SAP (Extractors)' and lists various source systems, including 'QT6 Client 002'. The main configuration area on the right shows the 'DataSource' as 'OFI\_AR\_20' and the 'Source System' as 'QT6MNDT002 QT6 Client 002'. The 'Version' is set to 'Active'. The 'Preview' tab is active, showing a table of data records.

**DataSource:** OFI\_AR\_20  
**Source System:** QT6MNDT002 QT6 Client 002  
**Version:** Active  
**Active Version:** Executable  
**Edited Version:**

**General Info. | Extraction | Proposal | Fields | Preview**

No. of Data Records: 20

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)**

# Business Content DataSources/Extractors: Customer Balances

... a never ending success story!

## BI Service API: Display DataSource OFI\_AR\_20

General	Extraction	fields
DataSource	OFI_AR_20	
Long Description	Customer Balance	
Medium Description	Customer Balance	
Short Description	Customer Balance	
Last Changed By	ZIMMERER	
Semantic Properties		
DataSource Type	TRAN Transaction	
Appl.Component	FI-AR	
Content Version	603	
Internal Name		

General	Extraction	fields
FieldDefinitions		
Pos.	Field name	Data element
1	KUNNR	KUNNR
2	BUKRS	BUKRS
3	AKONT	AKONT
4	FISCPER	JAHRPER
5	GJAHR	GJAHR
6	PERIO	KKB PERIO
7	KTOPL	KTOPL
8	FISCVAR	RSFISCVAR
9	CURTYPE	RSCURTYPE
10	CURRENCY	RSCURRENCY
11	UM01S	RR_UMSOL
12	UM01H	RR_UMHAB
13	UM01K	RR_KUMSL
14	UM01U	RR_SALES
15	UPDMOD	RODMUPDMOD

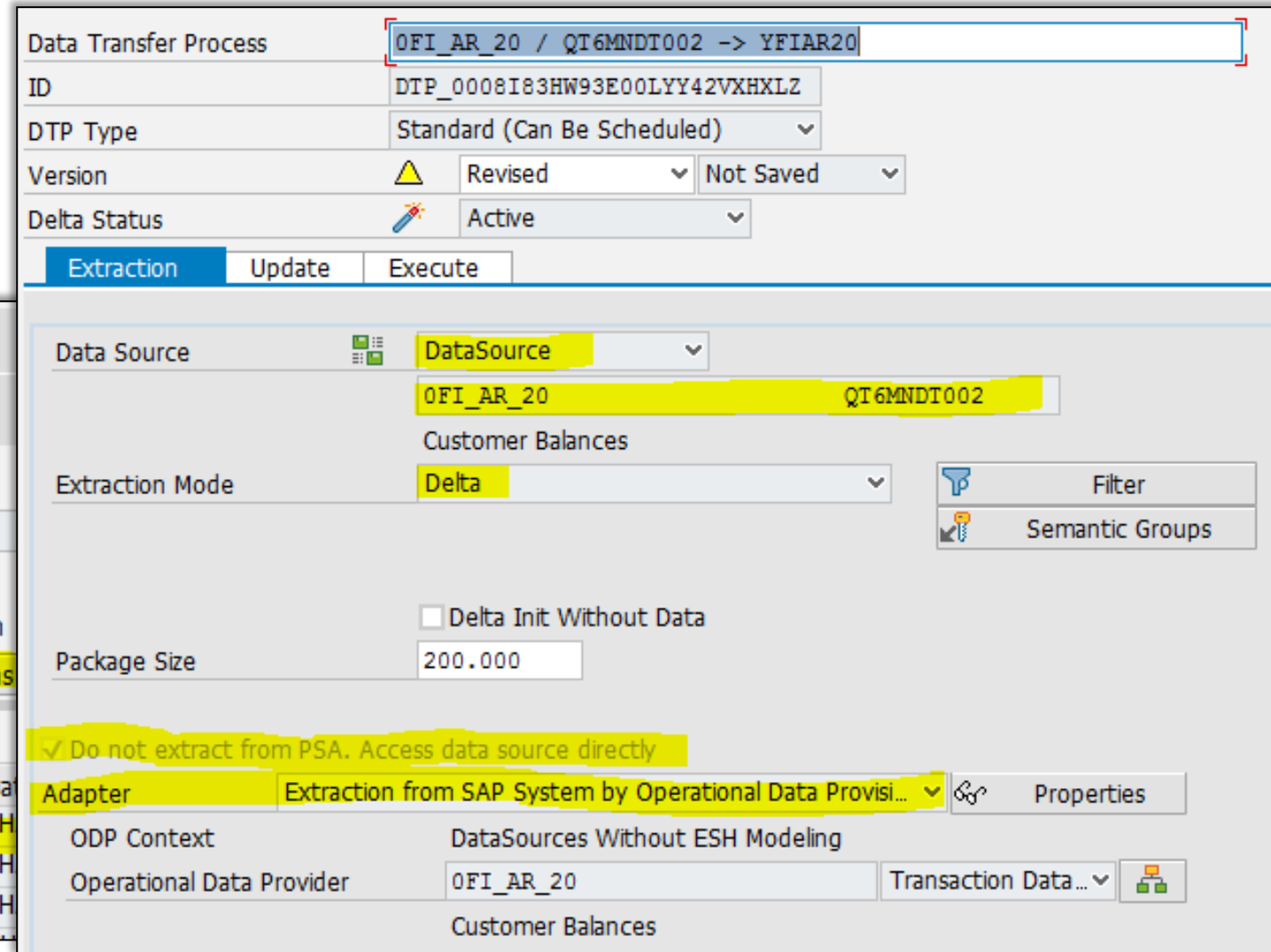
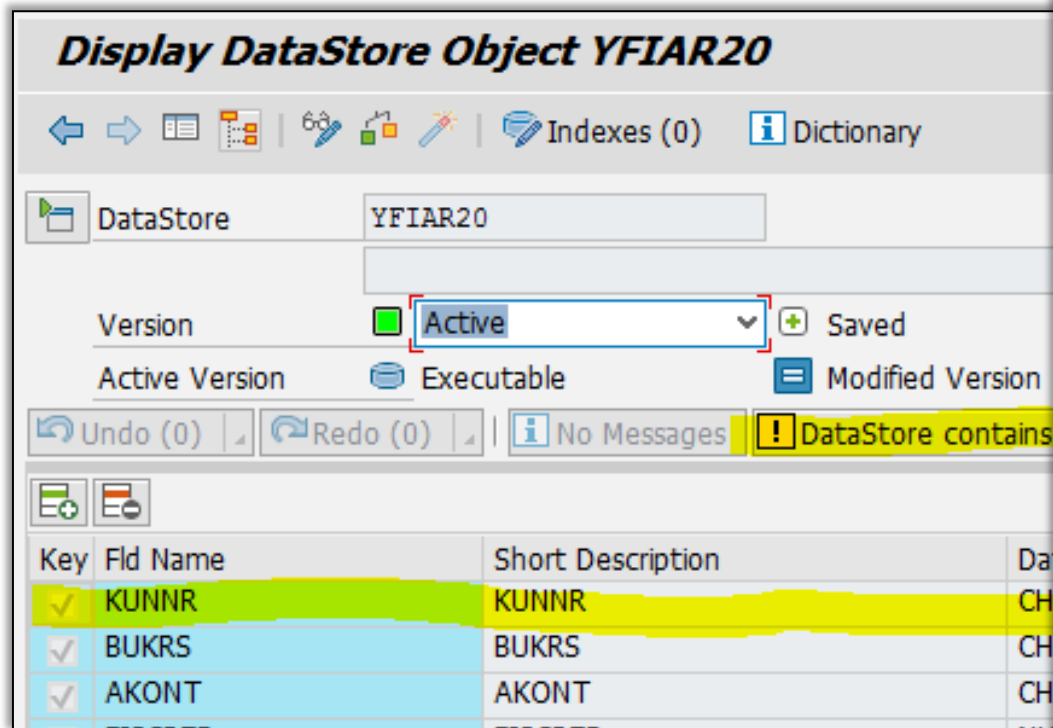
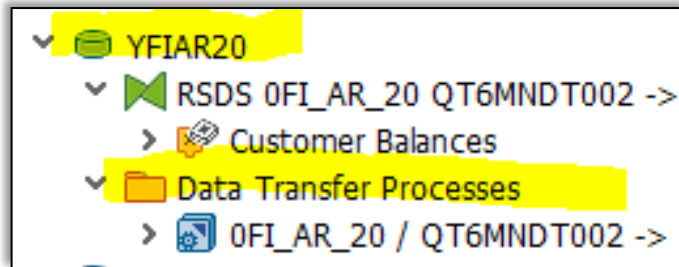
## The extractor itself supports different options:

- Delta handling in various ways
- Direct Access capabilities
- Real-time Data Acquisition (RDA)

Extractor	SREP FIAR 20	Gen. Interface	<input type="checkbox"/>
Extract Structure	DTFIAR_20		
Direct Access	1 supported (without preaggregat...		
Duplicate Records	Undefined	Init. Non.-Cum.	<input type="checkbox"/>
Delta Extraction			
Delta Process	AIE After-Images Via Extractor (FI-GL/AP/AR)		
	Generic Delta	AIE After-Images Via Extractor (FI-GL/AP/AR)	
	ALE Delta	AIM After-Images Via Delta Queue (e.g. FI-AP/AR)	
		AIE After-Images Via Extractor (FI-GL/AP/AR)	
		AIMD After-Images with Deletion Flag Via Delta Queue (e.g. BtB)	
		AIED After-Images with Deletion Flag Via Extractor (FI-GL/AP/AR)	
		A ALE Update Pointer (Master Data)	
		ABR Complete Delta with Deletion Flag Via Delta Queue(Cube-Comp)	
		Delta Only Via Full Upload (ODS or InfoPackage Selection)	
		X Delta Unspecified (Do Not Use!)	
		FILO Delta Via File Import with After-Images	
		FIL1 Delta Via File Import with Delta Images	
		CUBE InfoCube Extraction	
		ADD Like 'ADD' But Via Delta Queue (Cube-Compatible)	
Extraction from Archives			
Archive Link	No Archive Access		



# BW Dataflow with DTP Extraction from ODP/ODQ



# Operational Delta Queue (ODQ) in SAP ERP

**Monitor Delta Queues**

Queues... Subscriptions... Requests... Units...

Provider: BW DataSource Subscriber Type: SAP BW

Queue: Subscriber:

Time Stamp ID: to:

☐ Calculate Data Volume (Extended View) Request Select.

Queue	Σ Subscrip	Σ Requests	Σ Units
Cost Centers: Commitme...	0	0	
Cost Centers: Actual Line ...	1	1	
Customer Balances	1	1	
0FLIGHT_BOOKING_DATA	0	0	
Sales Document Item Data			
ZTK_DELTA_ERROR			
AIED Delta			
ODS Delta			

**Details**

Group description	Cell Content
Provider	BW DataSource
Queue	Customer Balances
Queue: Status	
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 ...

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

Queue	Q	Subscripns	Requests	Units	Rows	Original Size in Bytes	Compressed Size in	Comp. %
0FL_GL_4		1	39	1.081	43.913.163	46.824.320.344	1.626.276.068	96,5
2LIS_11_V_SSL		1	38	17.920	9.150.147	2.671.842.924	92.564.176	96,5
2LIS_11_VAHDR		1	38	18.743	742.030	2.116.269.560	139.457.257	93,4
2LIS_11_VAIDM		1	38	18.928	11.209.404	79.541.930.784	1.634.280.475	97,9
2LIS_11_VAKON		1	1	43.375	207.054.781	1.563.677.706.112	15.978.100.390	99,0
2LIS_11_VASCL		1	38	18.289	8.688.192	65.196.192.768	1.219.600.770	98,1
2LIS_11_VASTH		1	38	18.252	918.756	66.150.432	11.138.413	83,2
2LIS_12_VCHDR		1	93	10.059	782.368	2.401.869.760	112.687.147	95,3
2LIS_12_VCITM		2	92	10.059	7.643.541	48.490.624.104	935.558.525	98,1
2LIS_12_VCSCL		1	0	9.954	7.267.978	47.212.785.088	781.110.535	98,3
2LIS_13_VDHDR		1	194	4.259	457.387	852.569.368	38.761.222	95,5
2LIS_13_VDITM		1	194	4.291	4.988.388	29.052.371.712	670.592.657	97,7
2LIS_13_VDKON		1	192	11.601	104.698.610	556.996.605.200	8.401.877.038	98,5
=		14	995	186.811	407.514.745	2.445.101.238.156	31.642.004.673	

# ODP enabled Extractors

## Requirements



Provider

The ODP interface you must use one of the following releases of ERP and PI\_BASIS (or higher) in your ODQ system (e.g. ERP system as source system):

- PI\_BASIS 2005\_1\_700 SP 24 (part of SAP NetWeaver 7.00 SP 24)
- PI\_BASIS 2006\_1\_700 SP 14
- PI\_BASIS 701 SP 9 (part of SAP NetWeaver 7.01 SP 9)
- PI\_BASIS 702 SP 8 (part of SAP NetWeaver 7.02 SP 8)
- PI\_BASIS 730 SP 3 (part of SAP NetWeaver 7.30 SP 3)
- PI\_BASIS 731 SP 1 (part of SAP NetWeaver 7.03 SP 1 and 7.31 SP 1)
- ERP 6.0 SP 20
- ERP 6.0 EhP 2 SP 10
- ERP 6.0 EhP 3 SP 09
- ERP 6.0 EhP 4 SP 10
- ERP 6.0 EhP 5 SP 05

See SAP Note [1521883 - ODP Data Replication API](#) for further details.



Subscriber /  
Consumer

- Recommended starting release with BW 7.40

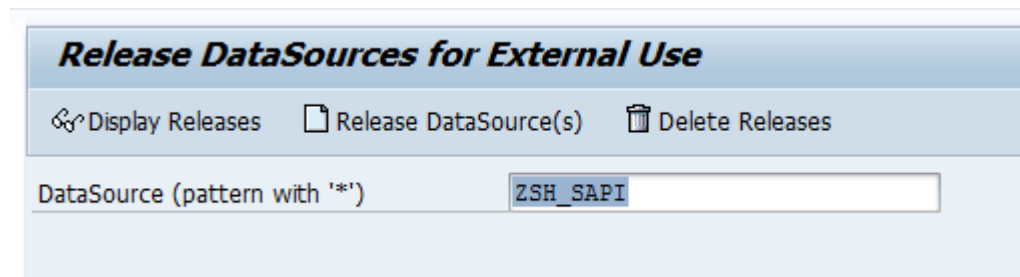


# ODP enabled Extractors

## Enablement

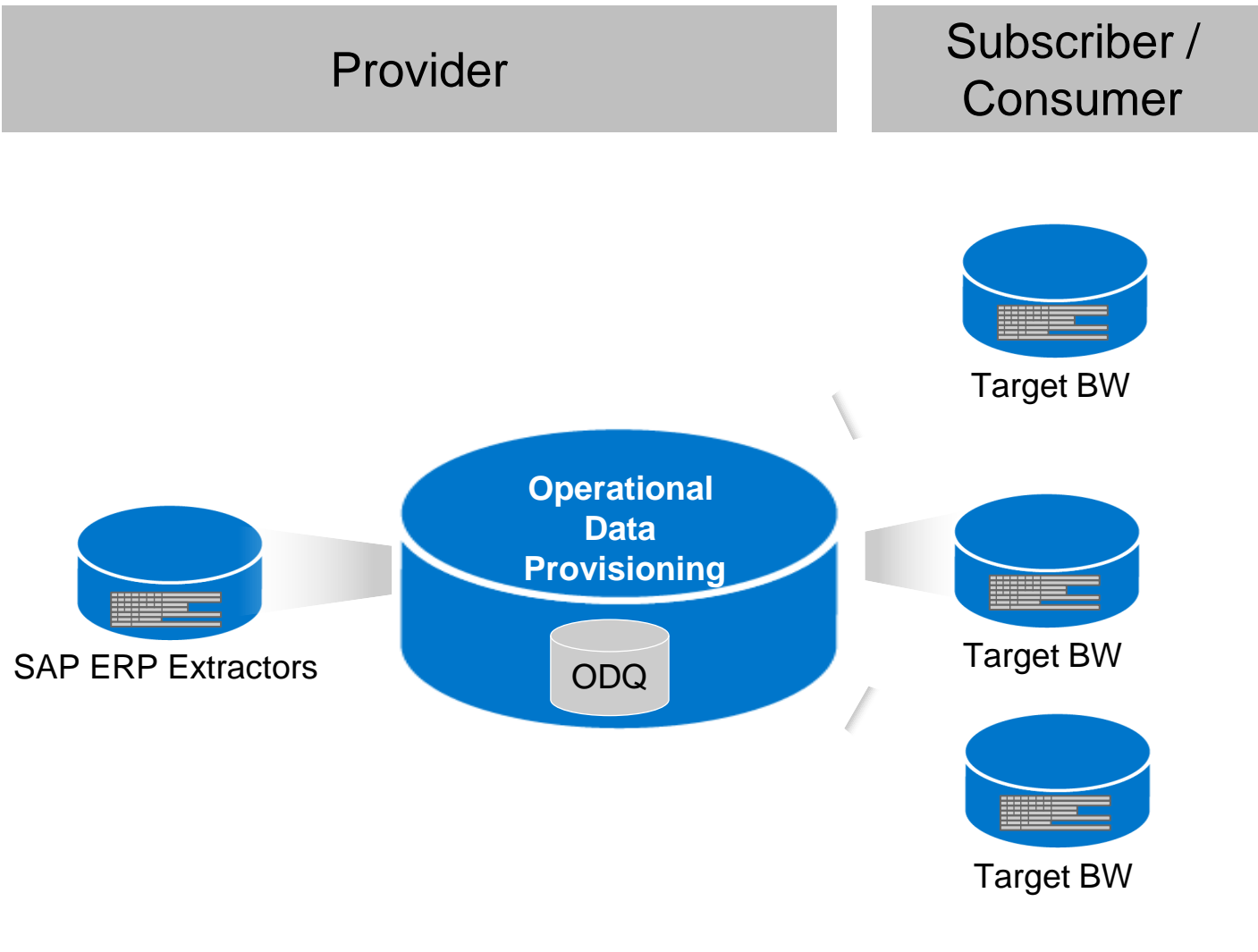
### Enable Extractors for ODP framework

- The SAP Note [Releasing ERP Extractors for ODP API](#) together with SAP Note [1558737 - Data Sources released for ODP data replication API](#) describes which Data Sources have been released for usage with ODP Data Replication API:
  - Examples: 0FI\_GL\_50, 0HR\_PA\_EC\_03, 0MATERIAL\_ATTR, 2LIS\_11\_V\_ITM, '0BPARTNER\_ATTR, '0CO\_OM\_CCA\_1, 0EC\_CS\_3, 0CO\_PC\_ACT\_1
- To use the ODP data replication API for any generic DataSource (extraction methods view extraction or domain extraction) you need to implement SAP Note 1585204.
  - Single Extractors can be released with RODPS\_OS\_EXPOSE



The screenshot shows the SAP transaction 'Release DataSources for External Use'. At the top, there is a title bar with the text 'Release DataSources for External Use'. Below this, there is a toolbar with three icons: a magnifying glass for 'Display Releases', a document icon for 'Release DataSource(s)', and a trash can icon for 'Delete Releases'. Below the toolbar, there is a text input field labeled 'DataSource (pattern with '\*'') containing the text 'ZSH\_SAPI'.

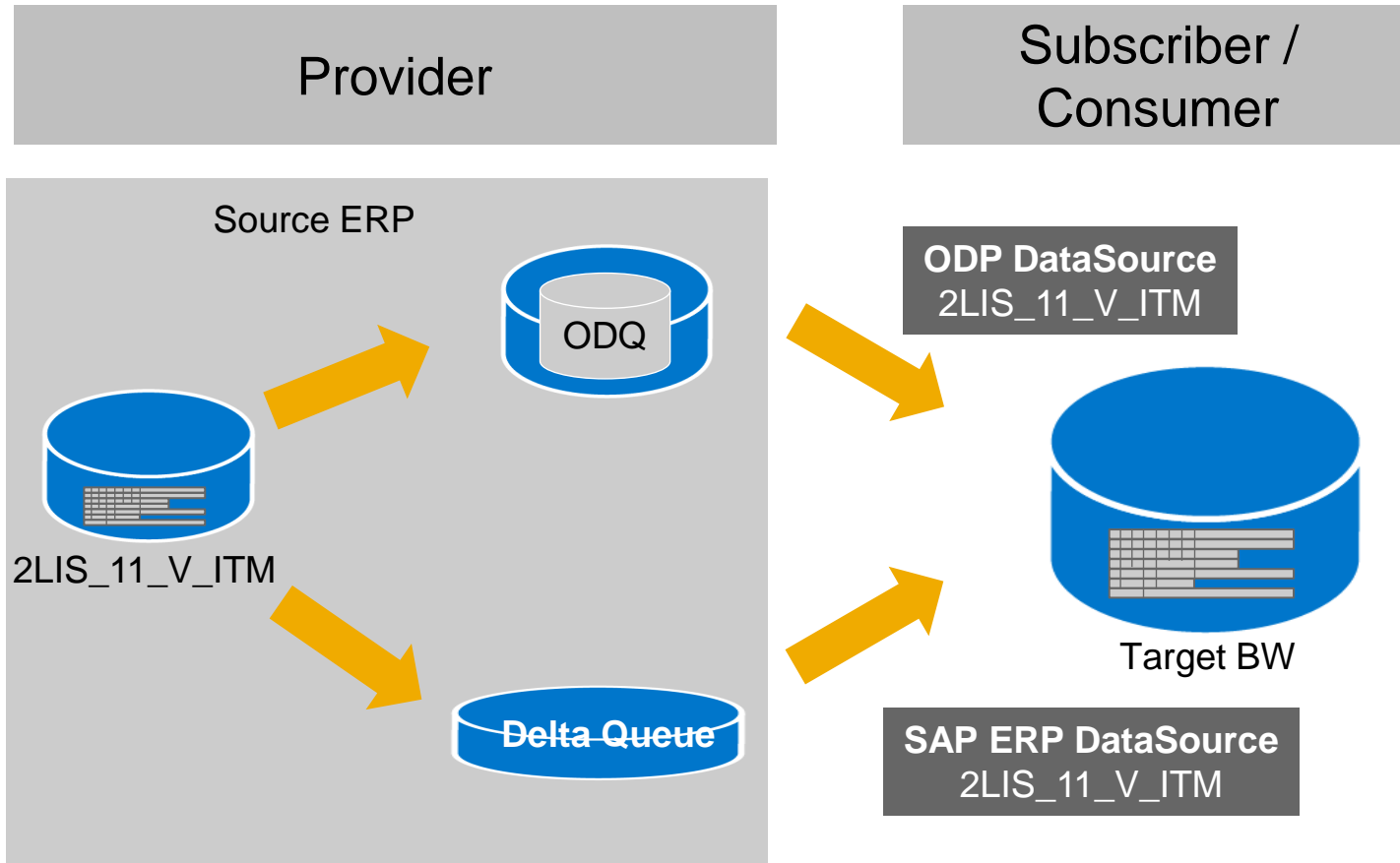
# Example: One queue multiple consumers



## Example showing the flexibility of ODQ

- Automated handling of one queue for multiple subscribers without multiplying the data
- Example: one ERP Extractor, many BW Subscribers (global/local instances)
- Retention period until all subscriber received the data successfully

# Implementation Questions



**Can ODP be deployed in parallel with the traditional delta queue approach?**

Yes it is possible, but multiplies the data.

**Should we change to ODP based extraction with all existing extractors?**

No, but consider ODP as framework for all your future implementations of new data flows into you BW system for ECC and SLT extraction.

# ODP for data extraction from the SAP Business Suite – Results from internal performance testing

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## **ODP allows to skip the PSA layer and load directly with DTP from the source system into a DSO**

- Runtime is reduced by more than 40%
  - Scenario: loading from the Operational Delta Queue (TA ODQMON) in the source system via DTP into a DSO compared to loading from BW Service API Delta Queue (TA RSA7) via InfoPackage into a PSA and then via DTP into a DSO
- Throughput of > 35 Mio records per hour is achieved w/o tuning (three times parallel processing)

## **ODP doesn't change the implementation of application extractors**

- If the extractor is the 'bottle neck' the throughput won't change



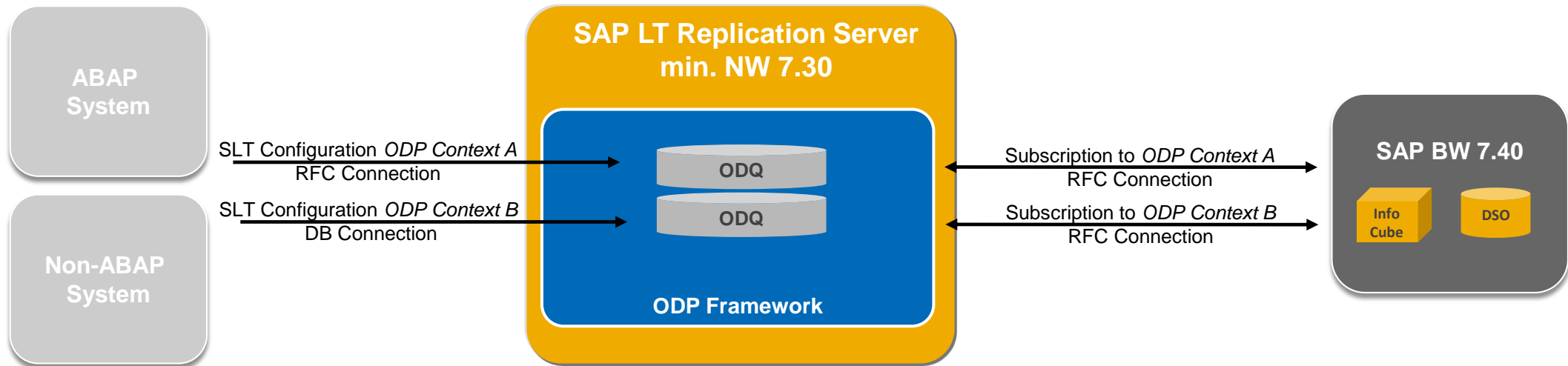


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# Architectural Concept

## Replication from Source systems to ODQ and subscription from SAP BW



**Source Systems**

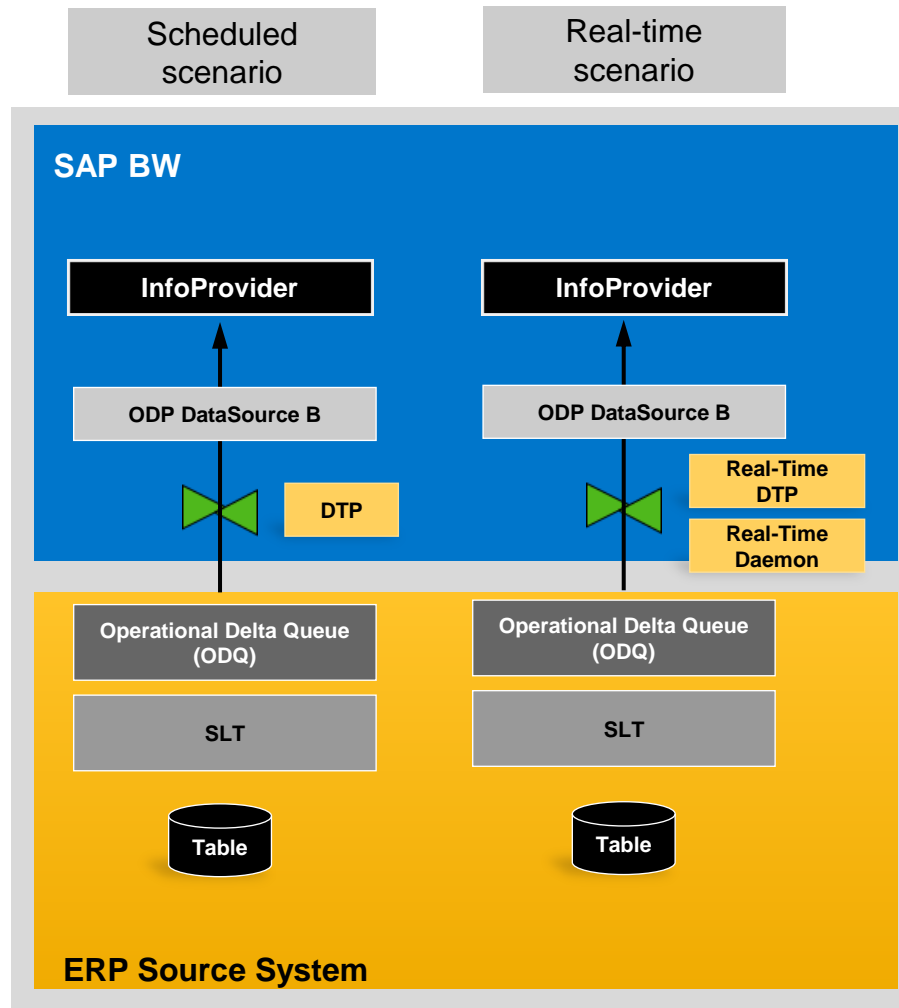
**SAP LT Replication Server**

**Subscriber SAP BW**

SAP LT Replication Server can replicate data from ABAP and non-ABAP source systems into the Operational Delta Queue of the SLT system. Thus, SLT itself acts as the target of the SLT configurations. Data gets replicated as soon as a subscriber requests the data from a data source from an ODP Context. Several subscribers can use the same ODQ as source. SAP BW can use this scenario with scheduled data transfer from ODQ as of SAP BW 7.30. A setup for real-time data transfer with Data Transfer Processes (DTP) into BW Data Targets and RDA Daemon is possible with SAP BW 7.40 SP5.

# Real-time or scheduled replication to SAP BW with SLT

SAP BW 7.4 SP5



## New source system type ODP-SLT

- SLT Real-Time push in Operational Delta Queue (ODQ)
- Direct Update to BW InfoProviders
  - Scheduled or real-time daemon
  - Automatic change notification for daemon
- Set up of SLT replication from SAP BW

## Benefits

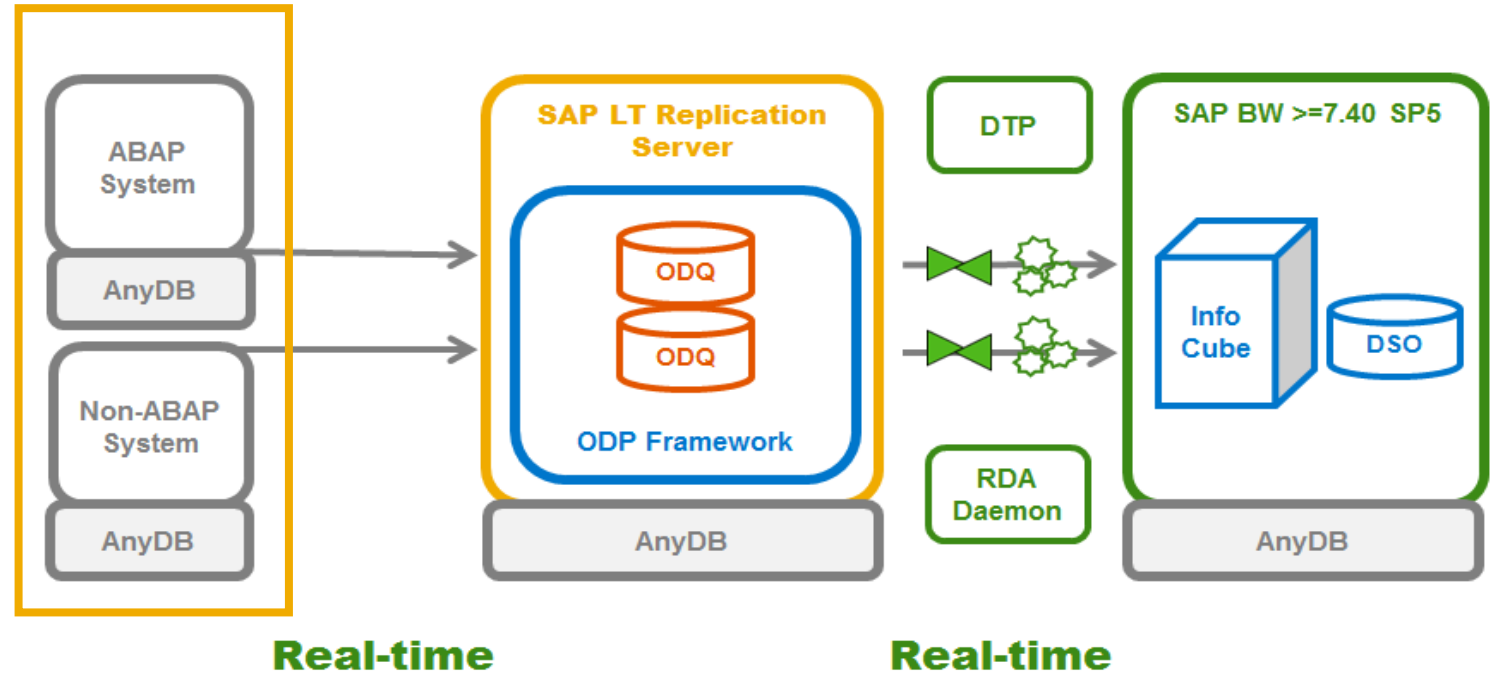
- Simplified data flow
- PSA no longer required
- Consumption of ODQ by multiple subscribers
- Delta handling for Non-SAP sources which are supported by SLT

**Real-time data < 1 min available in BW**

# ODP/SLT Scenario with Subscriber SAP BW

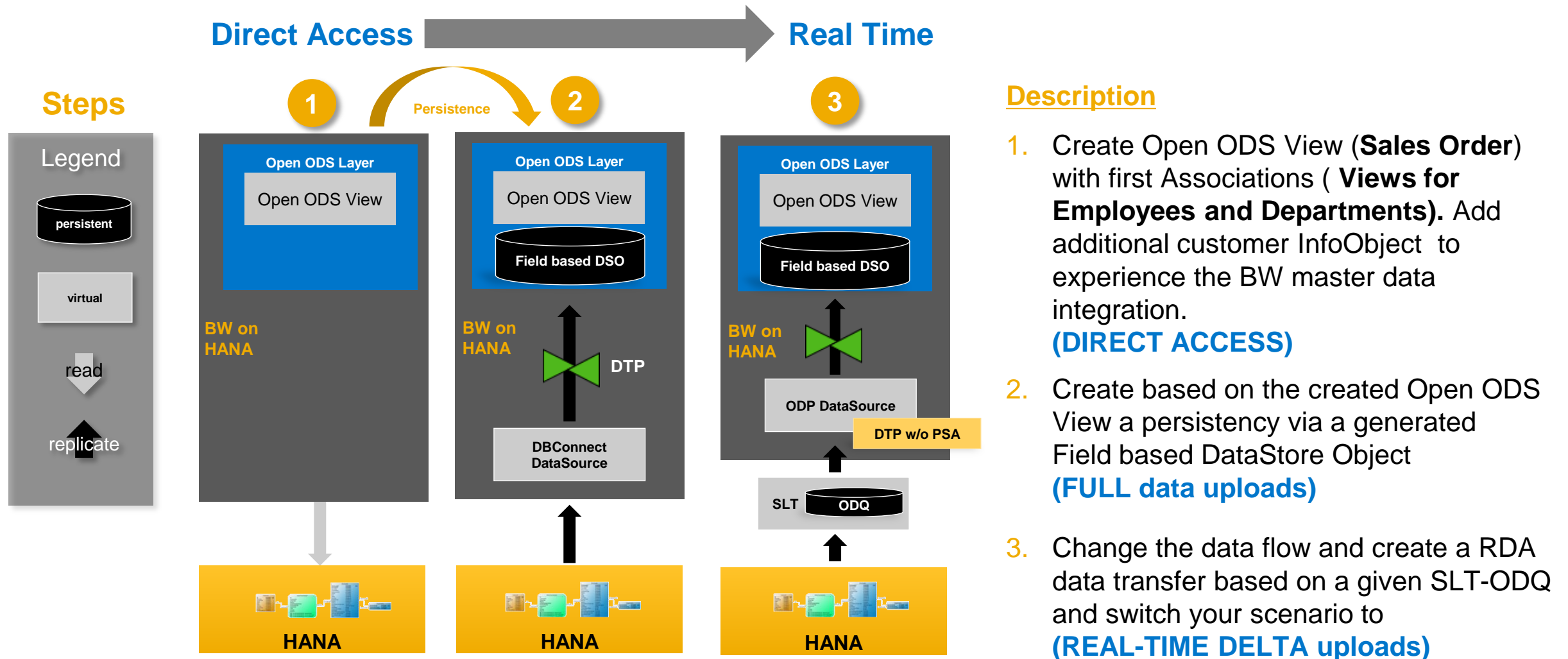
## Scenario in Detail

- Setup with Data Transfer Process into BW Data Targets and RDA Daemon possible with SAP BW 7.4 SP5
- **Non-SAP source system delta handling with SLT**

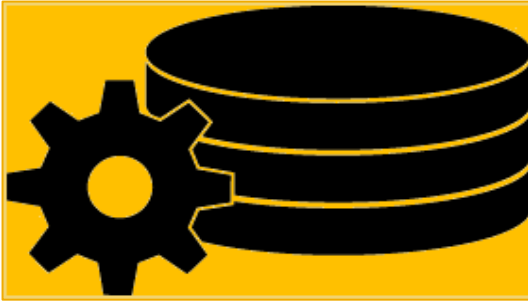




# Example: New SLT/ODP scenarios with SAP BW 7.4



# Technical Requirements for ODP/SLT Scenario with SAP BW



## Source Systems

### Installation:

DMIS 2011 SP6 or

- DMIS 2011 SP3/SP4/SP5 + Note 1863476
- DMIS 2010 SP8/SP9 + Note 1863476

### Basic Configuration:

- Define RFC user with appropriate authorization
- Optional: define separate table space for logging tables

### System Requirements:

- All ABAP-based SAP Systems starting with R/3 4.6C, all supported OS/DB's platforms
- OS/DB restrictions of SAP NetWeaver stack ([service.sap.com/pam](http://service.sap.com/pam))
- Non-SAP: all SAP supported DB versions (with respective SAP Kernel installed on LT Replication Server)

## SAP LT Replication Server

### Installation:

SAP\_Basis (min requirement):

730 SP10 or SP5-9 + Note 1817467  
731 SP8 or SP3-7 + Note 1817467  
740 SP4 or SP0-3 + Note 1817467

### • PI\_Basis (min requirement):

730 SP10 or SP8-9 + Note 1848320  
731 SP9 or SP5-8 + Note 1848320  
740 SP4 or SP2-3 + Note 1848320

- Add-on DMIS 2011 SP6

### Basic Configuration:

- **SAP:** Define RFC connection to source system

### System Requirements:

Sizing of the SLT system depends very much on the amount of data which is stored in ODQ and the planned retention periods.

## Subscriber SAP BW

### Installation:

- PI\_Basis:  
Recommended version (full functionality):  
740 SP5

Limited functionality with:

730 SP10 or SP8-9 + Note 1848320  
731 SP9 or SP5-8 + Note 1848320  
740 SP4 or SP2-3 + Note 1848320

# Reproduction of simple BW Extractors with SLT's View functionality

## View-based SLT delta-transfer technology (with SP06):

**Simple BW Extractors can be rebuilt with Views, if the following prerequisites are fulfilled:**

- Views need to be built which need to contain all relevant tables
- the view relations as well as the primary key of the view need to be designed
- there must be a hierarchy with one main table
- only this main table is triggered/recorded (means the line item tables attached to the main table are not triggered)
- Target is 1 transparent table (there is no data split after SLT transfer e.g. into two or more tables)

The capability is shipped as a framework; content is not part of the shipment!

### **Benefits compared to standard BW Extractors:**

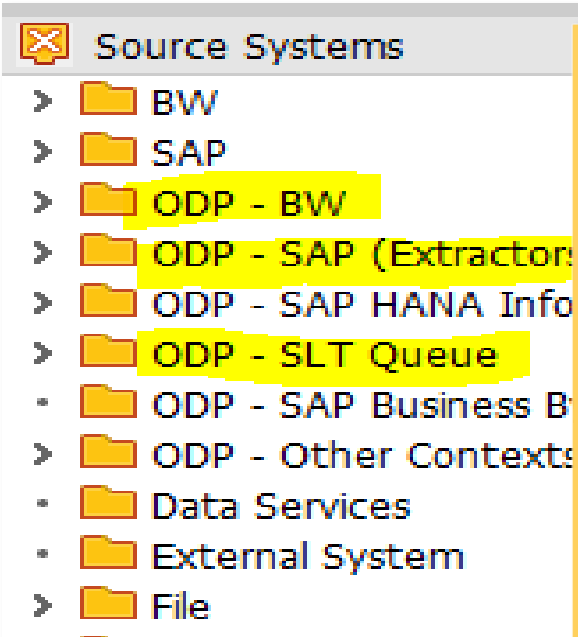
- Can go across clients, reducing number of running processes and setup efforts for each client
- enhances tables with delta capabilities, thus streamlines the dataflow from full to delta for transferred data.



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# Key Points



1. **BW 7.4 provides major enhancements** for Operational Data Provisioning (ODP) and Operational Delta Queue(ODQ) Handling.  
The ODP Framework supports all kind of Source System types.
2. **Highly efficient compression** enables data compression rates up to 90% in the Operational Delta Queue (ODQ) with **configurable data retention periods** per subscriber/consumer.
3. **Layer Reduction** in BW - PSA layer obsolete during Data Acquisition because DTP directly reads from ODQ persistence.
4. Runtime is **reduced by more than 40% (lab results)** loading from the Operational Delta Queue in the source system via DTP into a DSO.
5. **Simplified SLT handling** for BW targets – SLT Replications addresses ODQ instance from where BW takes the data using DTPs and RDA Daemon.
6. **Delta handling for non-SAP sources**, which are supported by SLT.





# Thank you

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