Realtime Replication with ODP

AGS SLO LT, PM TEAM, Dr. Astrid Tschense-Oesterle

March, 2014

Public

Agenda

Operational Data Provisioning (ODP) Infrastructure

SLT for Realtime Replication via Operational Data Provisioning - Overview

- Architectural Concept of ODP
- Sizing Considerations

ODP/SLT Scenario for SAP Business Warehouse

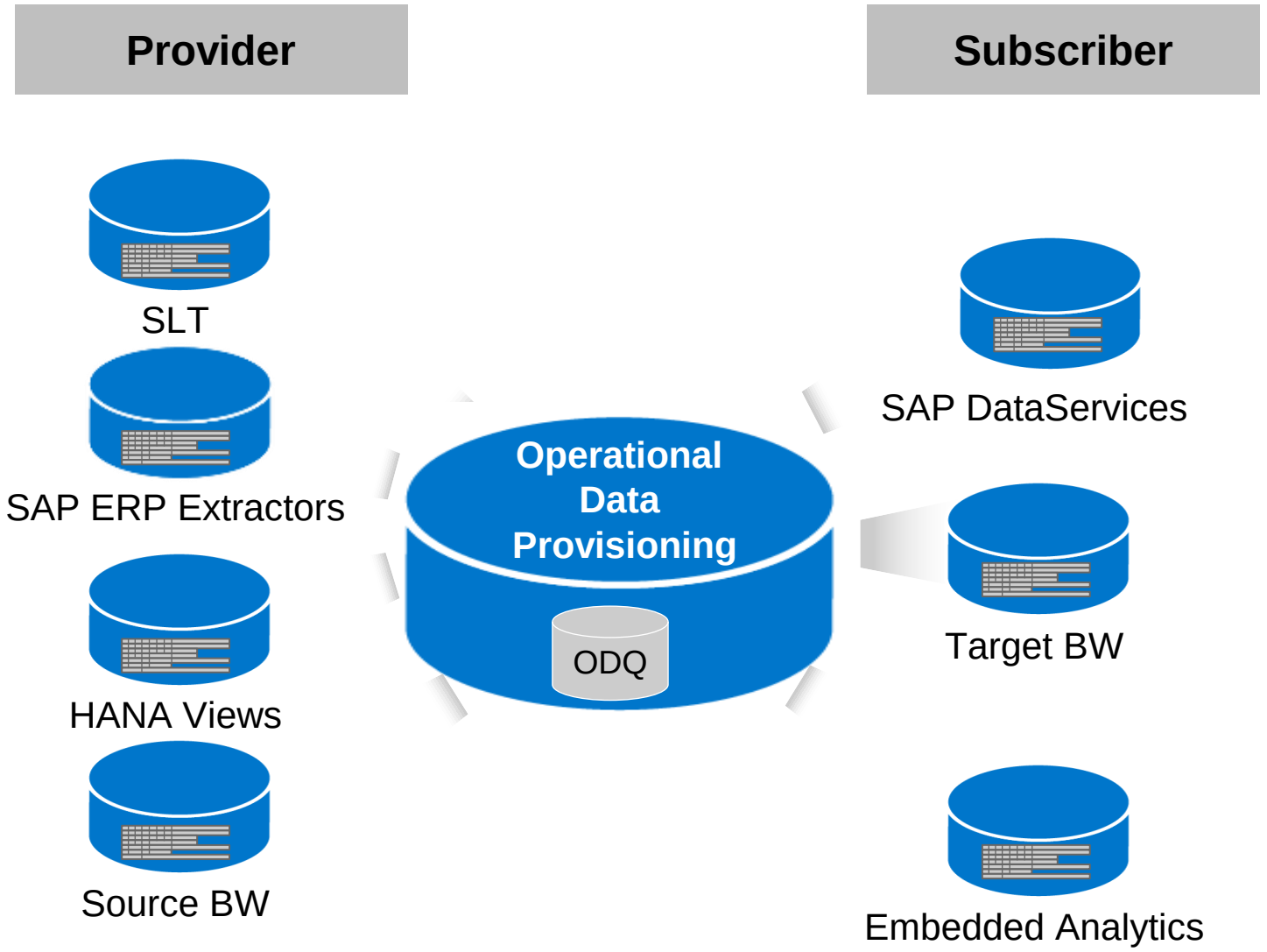
- Architectural Concept: Replication from Source systems to ODQ and subscription from SAP BW
- Technical Setup – Details
- Technical Requirements for ODP/SLT Scenario
- Documentation Links

ODP/SLT Scenario for SAP Data Services

- Architectural Concept: Replication from Source systems to ODQ and subscription from SAP Data Services
- Technical Setup – Details
- Technical Requirements and System Set-Up Information for ODP/SLT Scenario
- Documentation Links

Pricing of the SAP LT Replication Server

Operational Data Provisioning (ODP) Infrastructure



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 LT Replication Server for Real-time Replication via Operational Data Provisioning - Overview

Scenario

SAP LT Replication Server can act as a provider for the **Operational Data Provisioning** Framework (ODP) and stores data from connected SAP systems in this framework in an **Operational Delta Queue** (ODQ). The ODP framework supports extraction and replication scenarios for various target SAP applications (referred to as 'subscribers'). The subscribers retrieve the data from the delta queue and continue processing the data.

Value Proposition

With the ODP/SAP LT Replication Server scenario (in the following called „**ODP/SLT scenario**“), replicated data (initial loads and delta records) of non-ABAP-based systems and ABAP-based systems (as of 4.6C) are available in real-time in a „central place“ and can be consumed by **multiple subscribers** over the ODP interface. The replication can be started by users of the subscribing SAP application. This is a strategic enhancement of SLT to address the needs of other data consumers and enhance their functionality like CDC for SAP Data Services and replacement of batch cycles for data transfer to SAP BW with realtime replication.

Scope

Starting with DMIS2011 SP6, ODP/SLT can be used for both **ABAP- and non-ABAP source systems**. Simple tables are covered as well as **pool- and cluster tables**. A restriction applies for extractors: only extractors without delta mechanism and complex business logic are covered.

Sizing Considerations for ODP/SLT Scenario

	SMALL	MEDIUM	LARGE
Use Case	**A small scenario with** • typically one configuration • with approx. up to 50 tables • weighted table size category S-M • an overall expected throughput of less than 1.000.000 records/hour	**A moderate mid-range scenario with** • Approx ~ 3 different Source Systems (equivalent to 3 LTR Configurations), • and/or up to 200 tables in total; • weighted table size category M-L • an overall expected throughput of less than 10.000.000 records/hour	**A upper mid-range scenario with** • Up to 10 different Source Systems (equivalent to 10 LTR Configurations), • and/or up to 500 tables (in total); • weighted table size category M-XL • an overall expected throughput of up to 50.000.000 records/hour
ODP/SLT System	• 1 configuration with 2 Data Transfer Jobs • Hardware: 2-4 CPU Cores, 8-10 GB Main Memory	• 10 Data Transfer Jobs in total (sum of all configurations) • Hardware: 4-6 CPU Cores, 10-16 GB Main Memory	• 25 Data Transfer Jobs in total (sum of all configurations) • Hardware: 8-10 CPU Cores, 16-32 GB Main Memory
	The DB size of the ODP/SLT system depends on the amount of changed data/hour which is stored in the queue, the frequency of data pull from subscribers and the retention period after which queue space is released.		
Source System(s)	• 1:1 relation to data transfer jobs per source • Reserve 2 BTC work processes for ACL (Access plan calculation), ensure 2 free Dialog work processes for data load/replication • Additional Hardware required: ~ 1 CPU Core (0.5 CPU per data transfer job, APPL & DB)	• 1:1 relation to data transfer jobs per source • sum over all source systems: • Reserve 2-4 BTC work processes for ACL (Access plan calculation), • ensure 10 free Dialog work processes for data load/replication • Additional Hardware required: ~ 5 CPU Core in total (0.5 CPU per data transfer job, APPL & DB)	• 1:1 relation to data transfer jobs per source • sum over all source systems: • Reserve 4-8 BTC work processes for ACL (Access plan calculation), • ensure in sum 25 free Dialog work processes for data load/replication • Additional Hardware required: ~ 12 CPU Core in total (0.5 CPU per data transfer job, APPL & DB)

Agenda

Operational Data Provisioning (ODP) Infrastructure

SLT for Realtime Replication via Operational Data Provisioning - Overview

- Architectural Concept of ODP
- Sizing Considerations

ODP/SLT Scenario for SAP Business Warehouse

- Architectural Concept: Replication from Source systems to ODQ and subscription from SAP BW
- Technical Setup – Details
- Technical Requirements for ODP/SLT Scenario
- Documentation Links

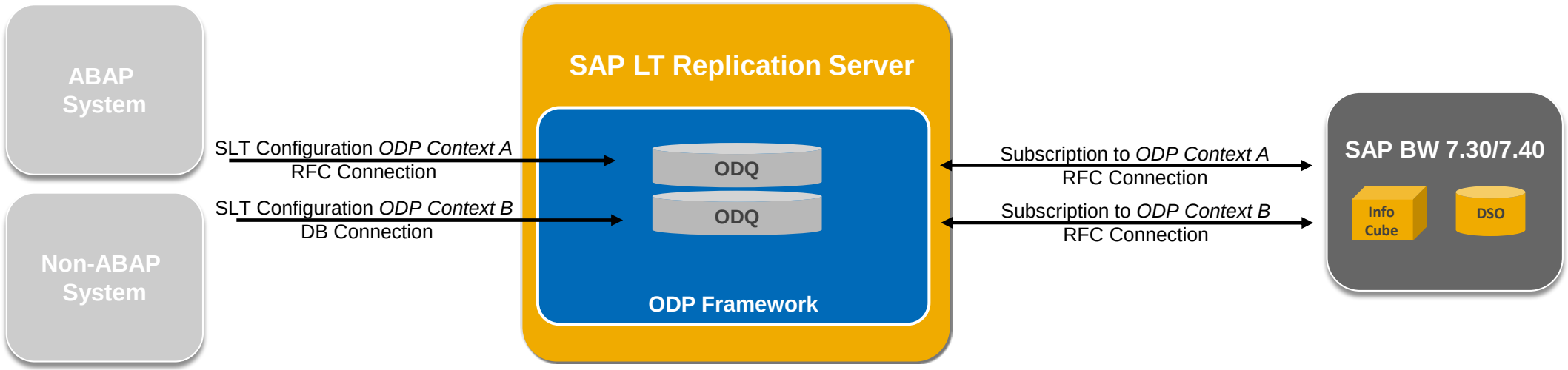
ODP/SLT Scenario for SAP Data Services

- Architectural Concept: Replication from Source systems to ODQ and subscription from SAP Data Services
- Technical Setup – Details
- Technical Requirements and System Set-Up Information for ODP/SLT Scenario
- Documentation Links

Pricing of the SAP LT Replication Server

Architectural Concept

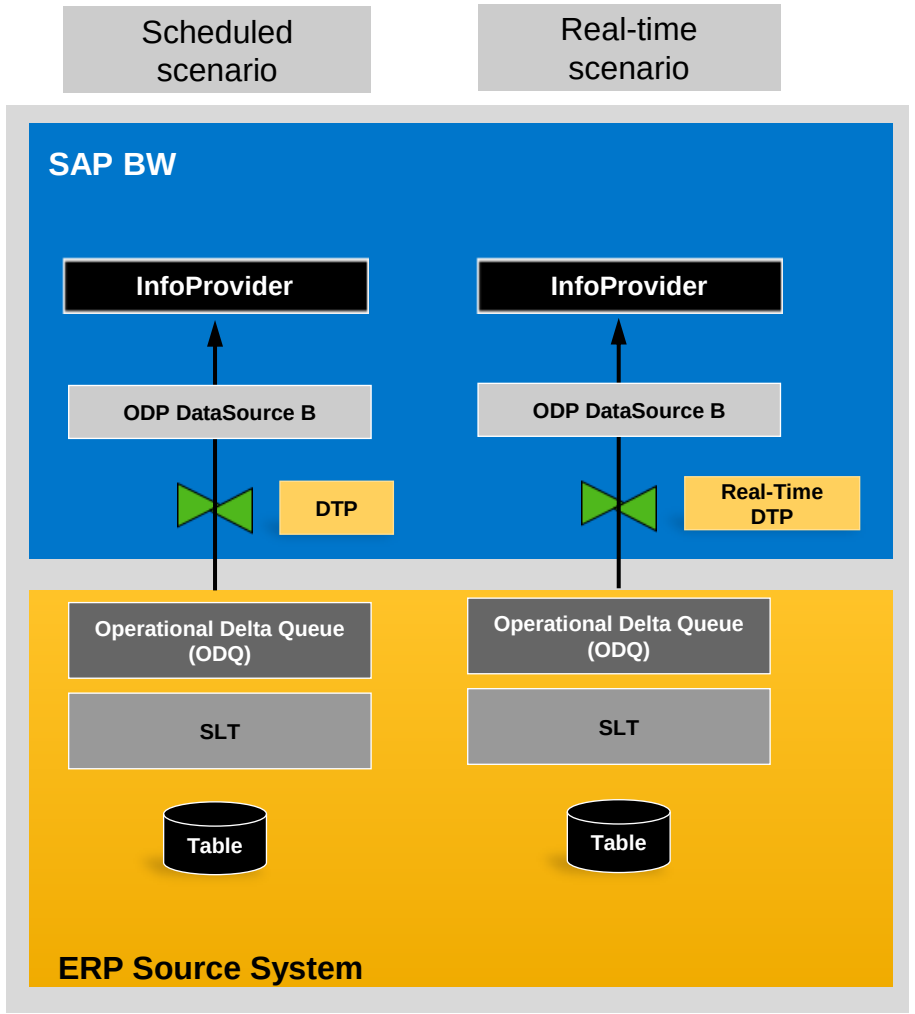
Replication from Source systems to ODQ and subscription from SAP BW



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 BW with SLT

BW 7.4, SP5 on HANA



New source system type ODP-SLT

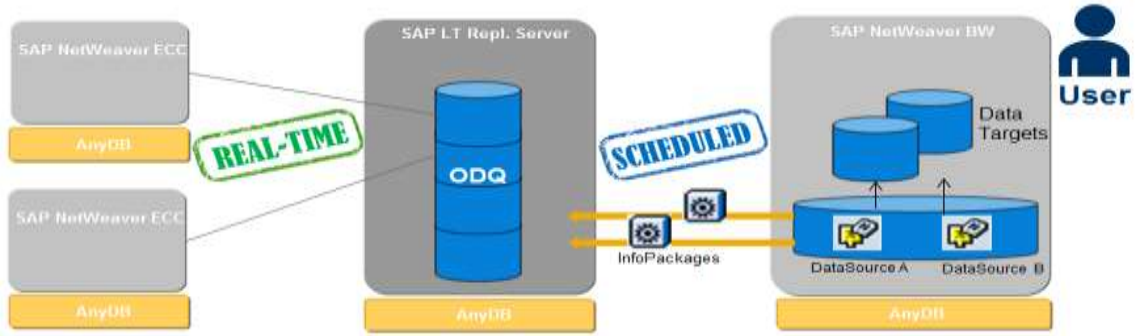
- SLT Real-Time push in Operational Delta Queue (ODQ)
- Direct Update to BW InfoProviders
  - Scheduled or real–time daemon
  - Automatic change notification for daemon
- Set up of SLT replication from SAP BW

Benefits

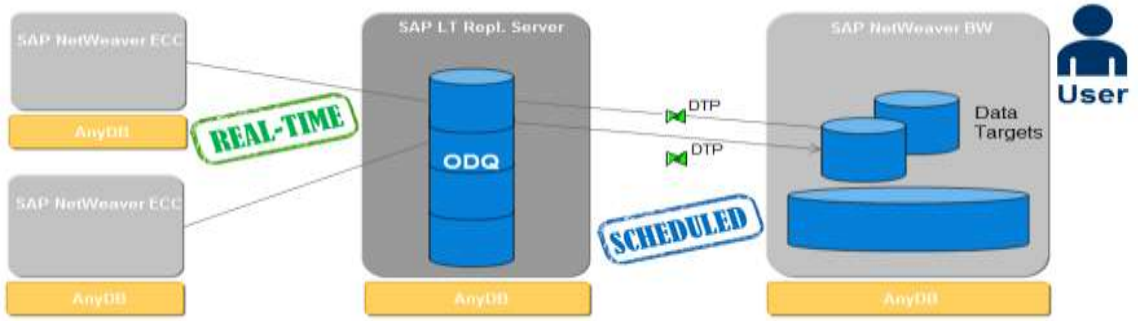
- Simplified data flow
- PSA no longer required
- Flexible recovery options
- Consumption of ODQ by multiple subscribers
- Reduced data latency

ODP/SLT Scenario with Subscriber SAP BW

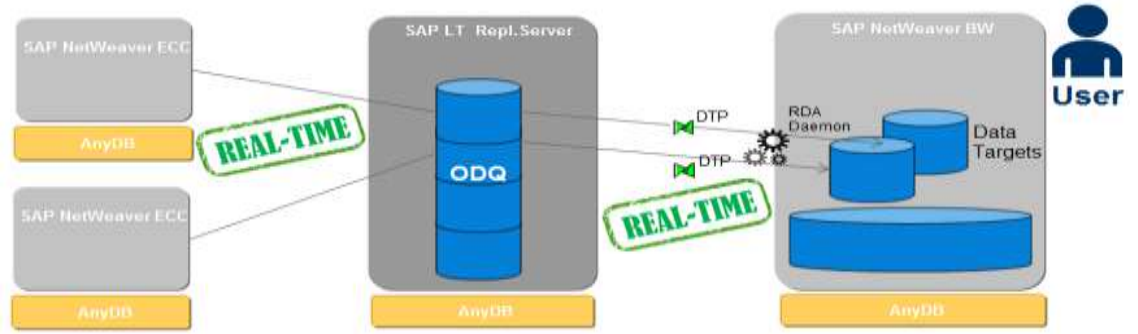
Option 1: Setup with Data Transfer via InfoPackages into BW PSA
possible with SAP BW >=7.30



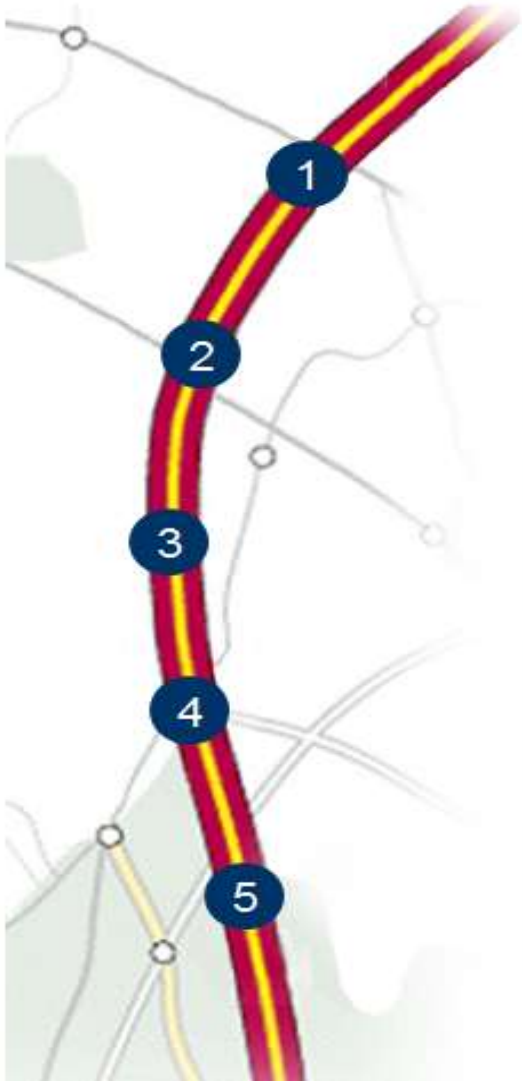
Option 2: Setup with Data Transfer Process into BW Data Targets
possible with SAP BW >=7.30 SP8



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



Roadmap of SAP BW Subscription at ODP/SLT



Create a Configuration for a source system as ODP scenario with a queue alias (ODP context)	***SLT system TA LTR***
Create a source system entry with the same ODP context	***SAP BW system TA RSA1***
Create and activate a DataSource for the data you want to get from a source system table	***SAP BW system TA RSA1***
Create and run an InfoPackage to load and replicate the data into PSA or create a DTP and fill a DSO	***SAP BW system TA RSA1***
Monitor Operational Delta Queues	***SLT system TA ODQMON***

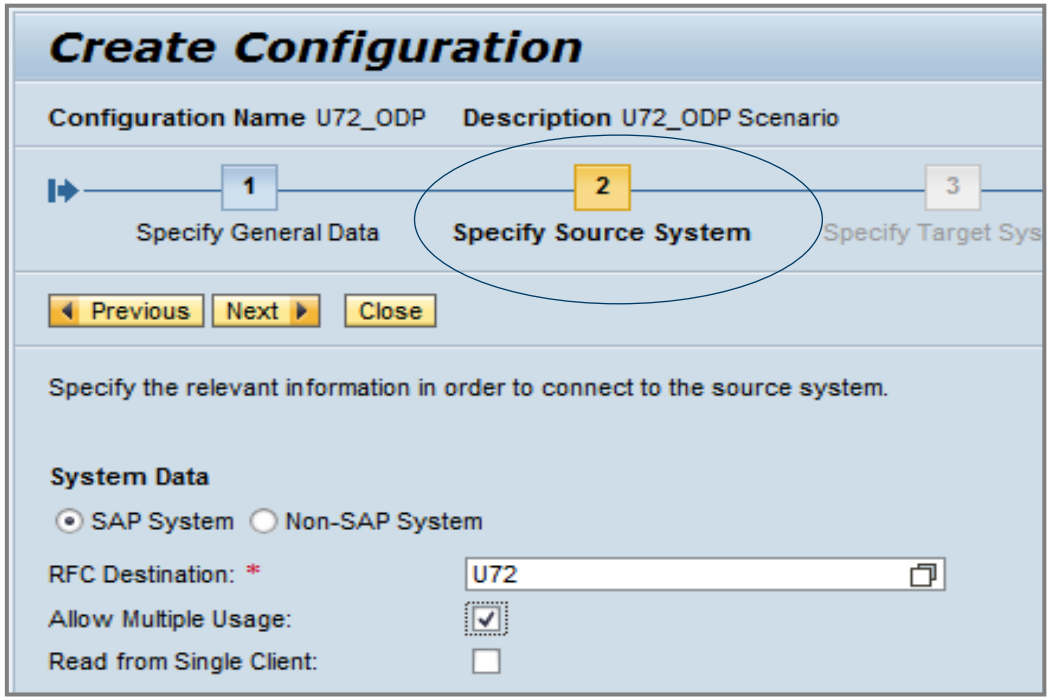
SAP BW: Setup Steps – Details I-A

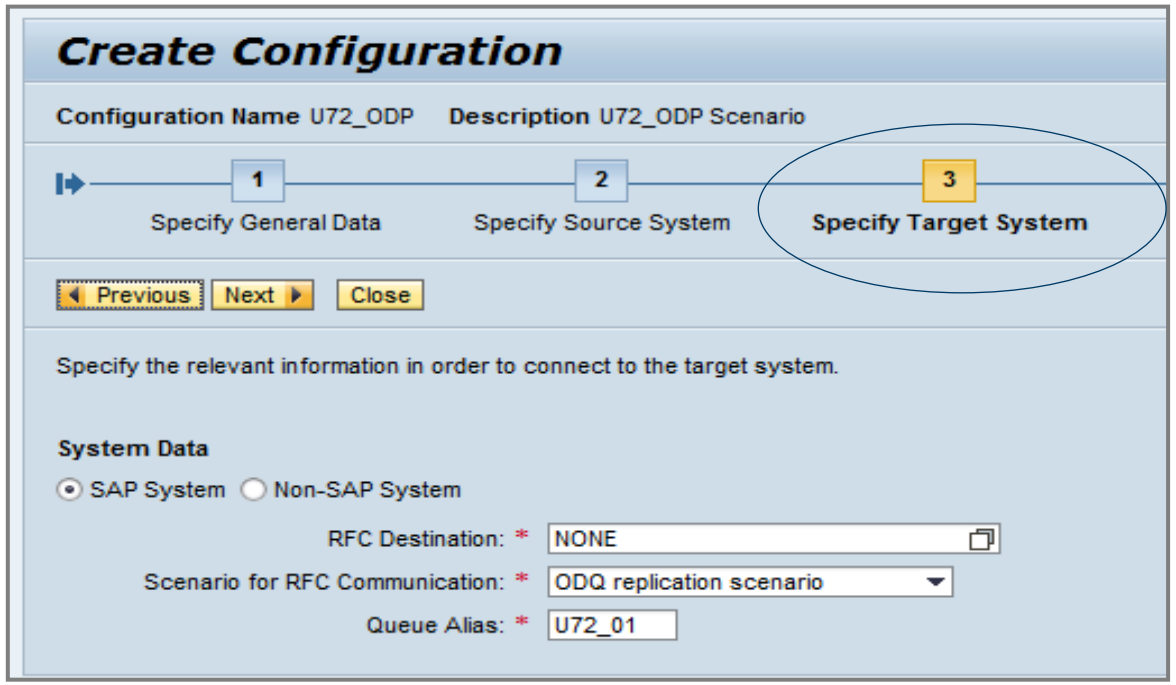
Creation of Configuration (connection between SLT system and source system) in TA LTR:

Prerequisites:

User role SAP_IUUC_REPL_ADMIN in SLT system

Existing RFC connection between source and SLT system with user role SAP_IUUC_REPL_REMOTE





Select the RFC Destination for the Source System
The Target System is the SLT system itself, so the RFC Destination can be „NONE“ (or an RFC connection pointing to the same system)

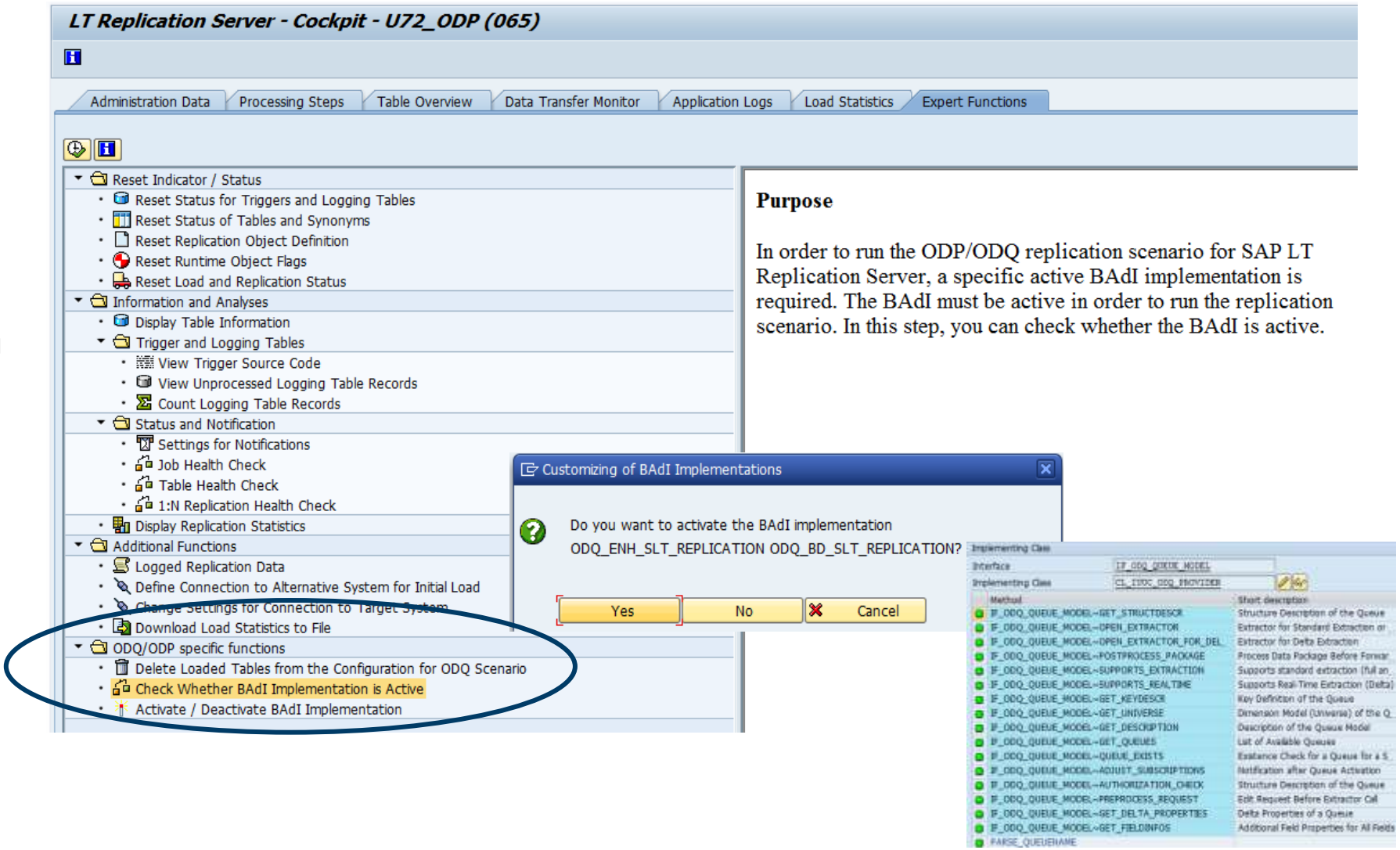
The Scenario is „ODQ replication scenario“
The Queue Alias (6 characters) is the unique ID specifying the ODP Context.

SAP BW: Setup Steps – Details I-B

Activate the ODP-specific BAdI in TA LTRC:

On the Expert Functions tab in the LT Replication Server Cockpit, you have to activate the ODQ BAdI „ODQ_ENH_SLT_REPLICATION“ when you create your first ODQ specific configuration.

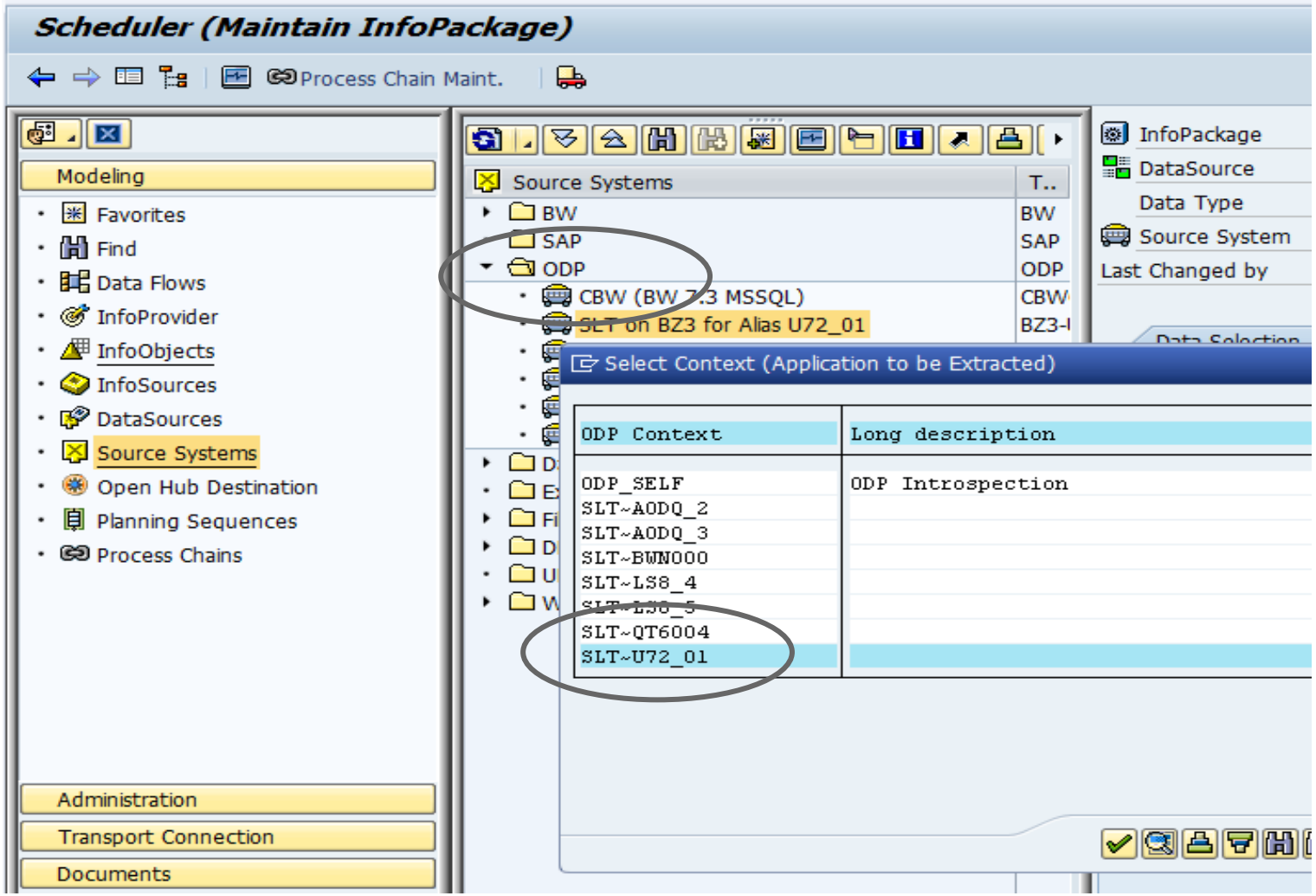
You can also check whether the BAdI is already activated.



SAP BW: Setup Steps – Details II

Create Source System in SAP BW

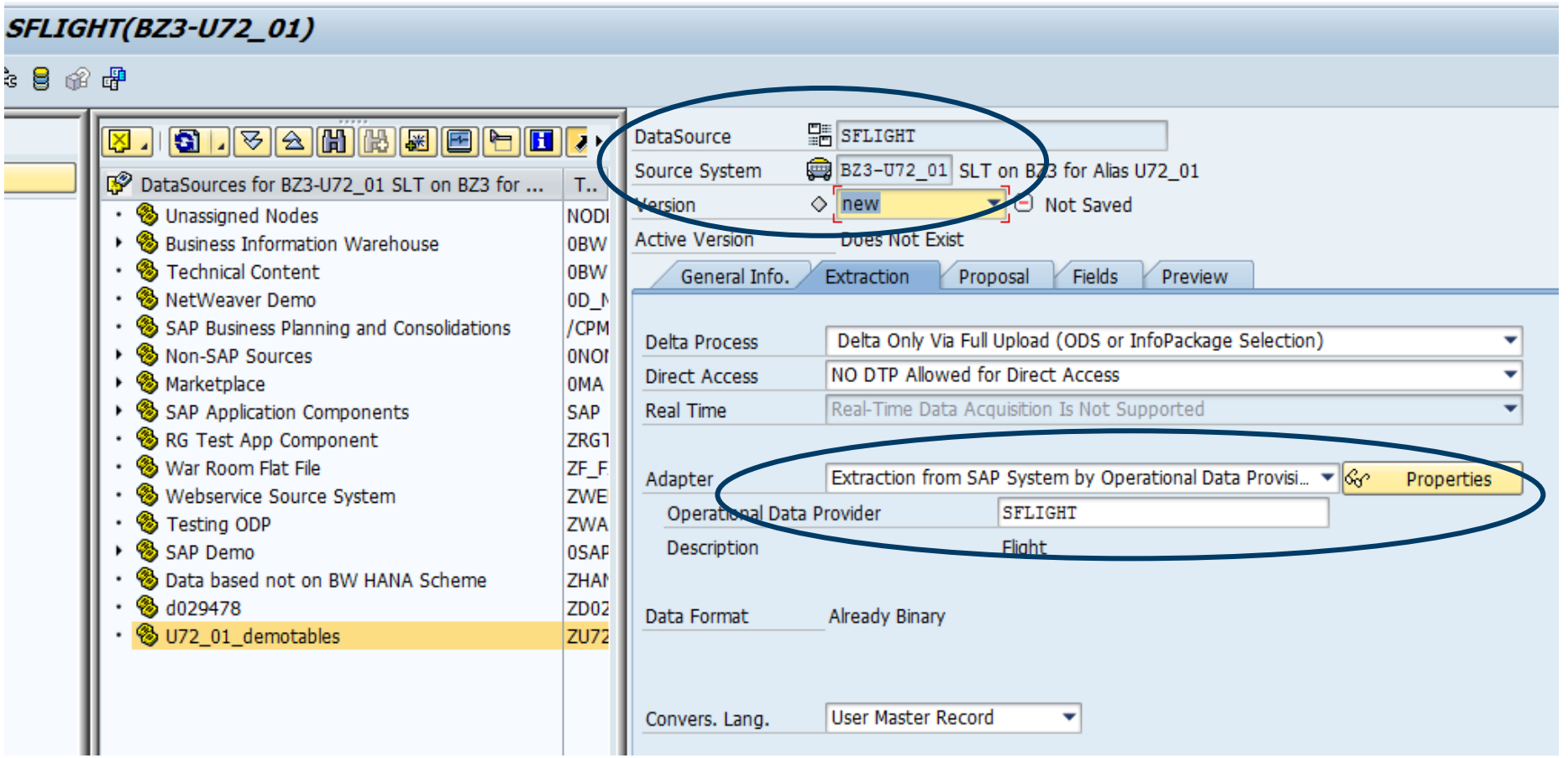
In the subscribing BW system, TA RSA1, create a source system entry with connection to the **SLT system** and the **ODP Context** SLT~[Queue Alias] specified in the SLT target system configuration.



SAP BW: Setup Steps – Details III

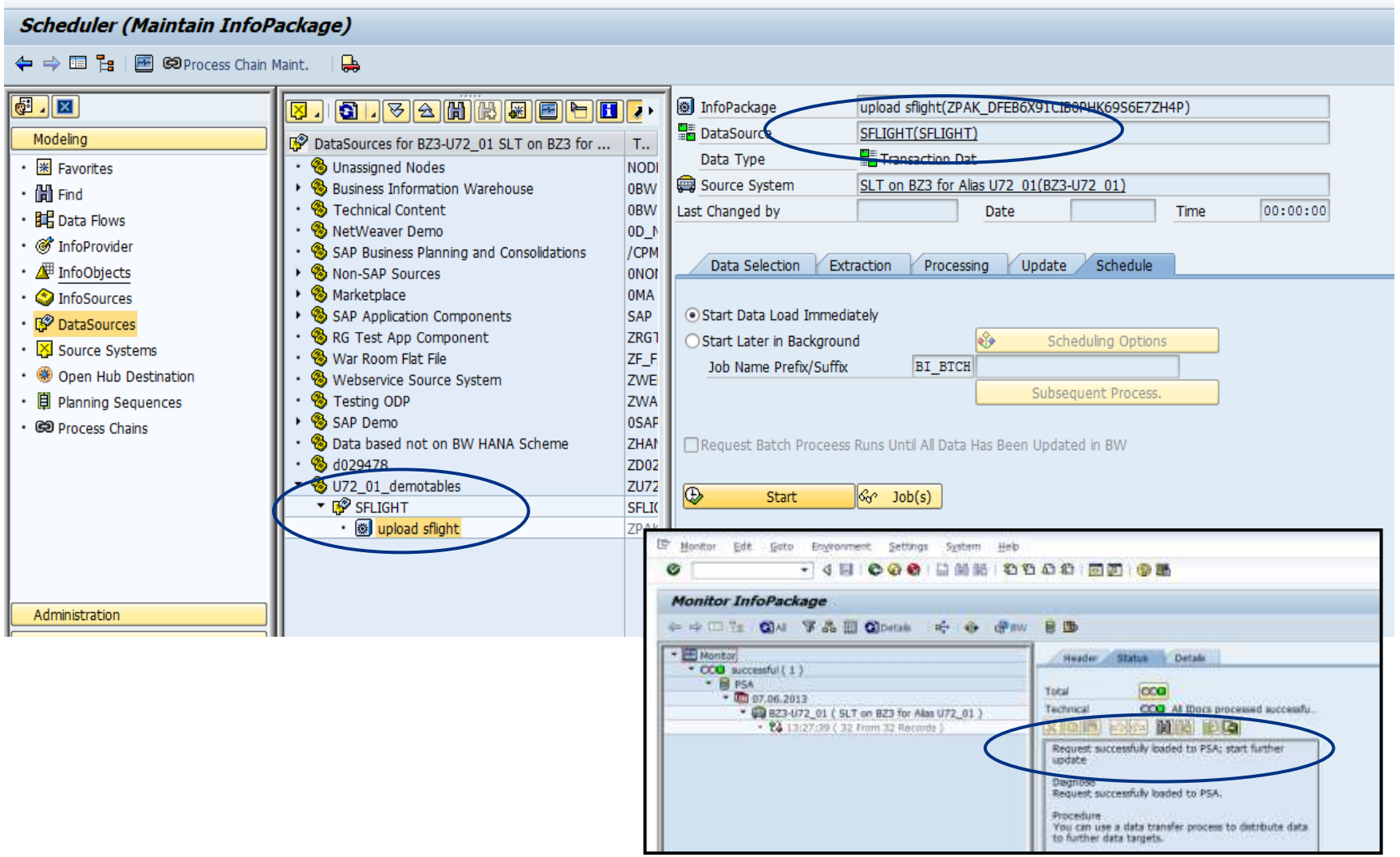
Creation of the DataSource in SAP BW

In the source system view, create and activate a DataSource for the data you want to get from a source system table



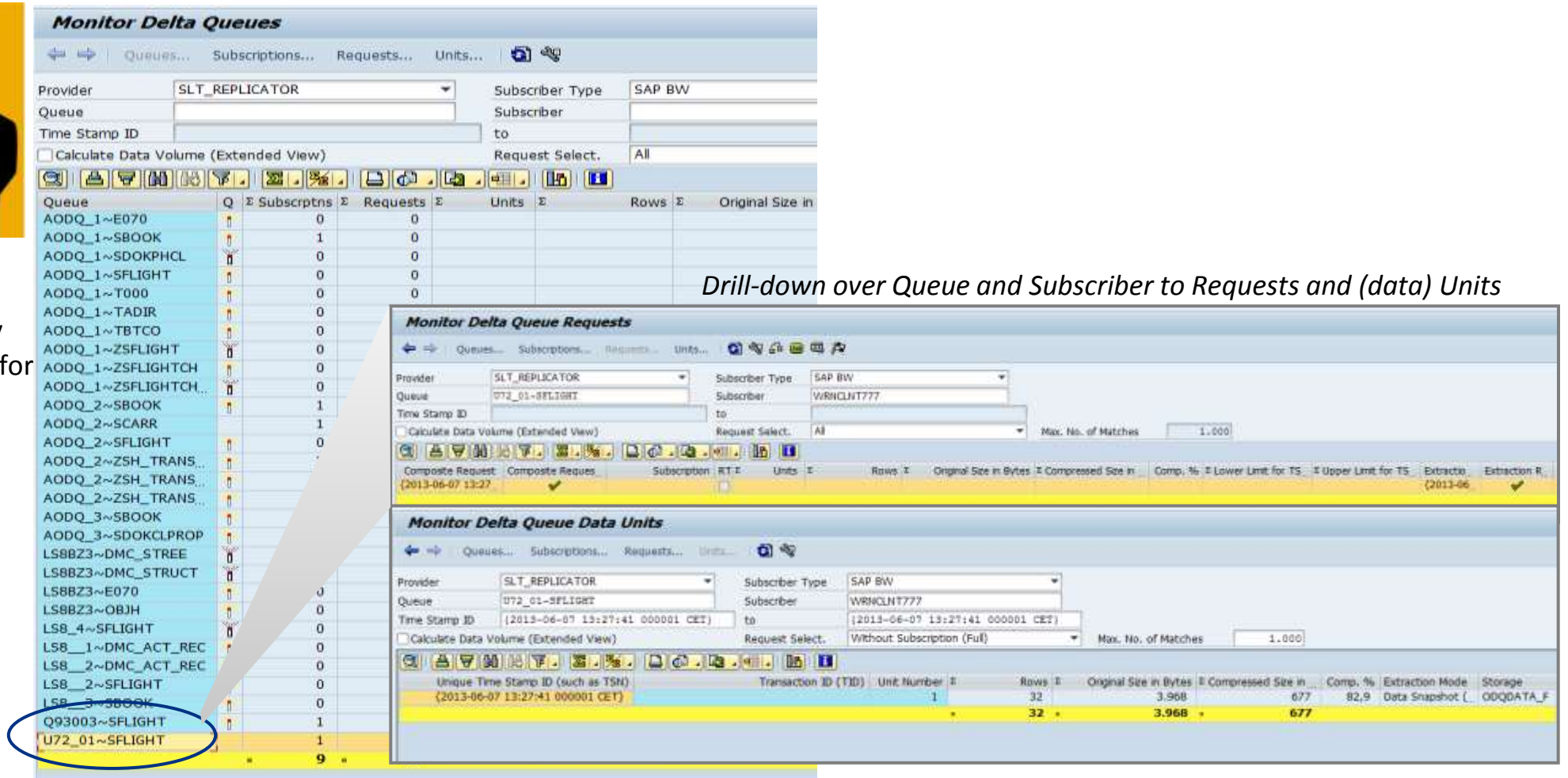
SAP BW: Setup Steps – Details IV

Get the Data from Source Table via SLT/ODP
Create and run an **InfoPackage** to load and replicate the data from ODQ into PSA
OR create a DTP an upload the data to a DSO (7.30 SP8 or higher).



ODQ Monitoring in ODP/SLT System

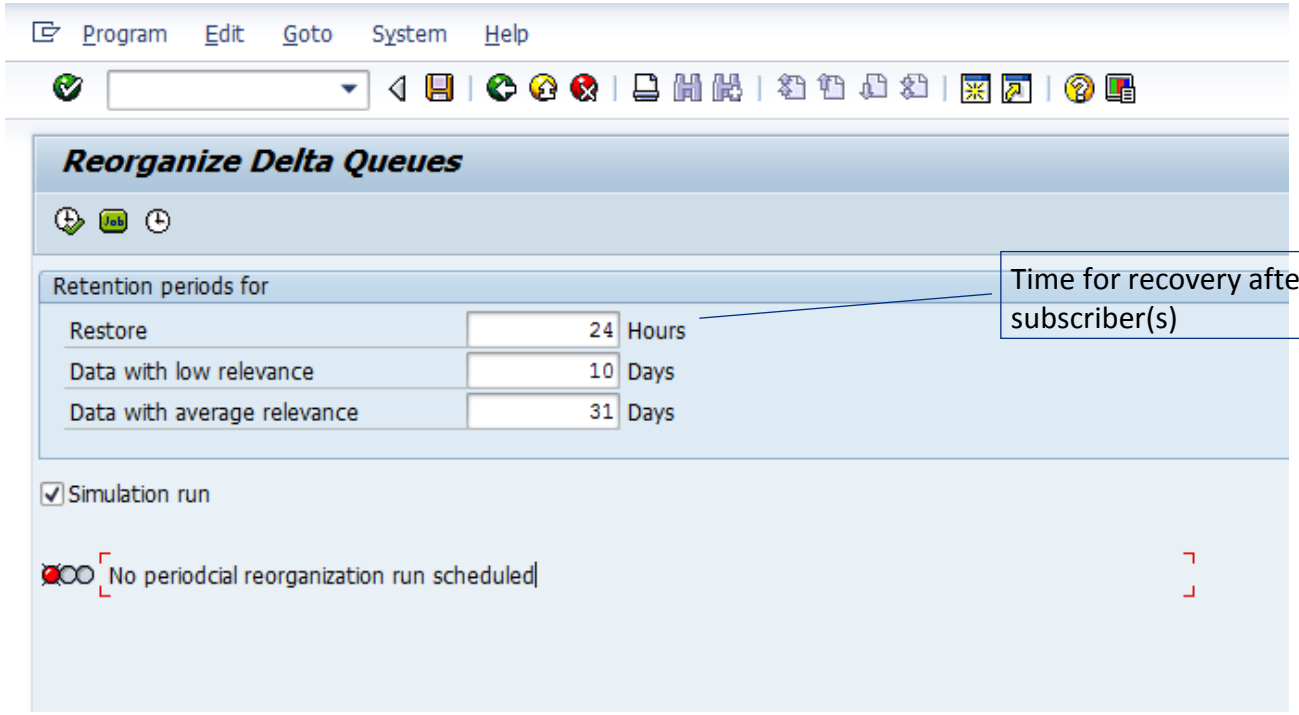
The Delta Queue Monitor (TA ODQMON) integrates the display and request management views for the ODP/SLT scenario.



Drill-down over Queue and Subscriber to Requests and (data) Units

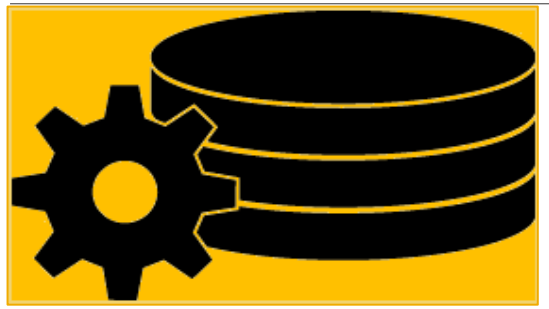
This table is loaded with a compression rate of 82.9%.

ODQ Monitoring in ODP/SLT System



Time for recovery after the data has been retrieved by subscriber(s)

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)
- 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

Documentation Links

Functionality of ODP is documented in the *Online Help* for:

Operational Data Provisioning **- *Introduction***

Monitoring Delta Queues **- *including hints for troubleshooting with the Delta Queue Monitor***

Functionality of SAP BW as subscriber at ODP:

Transferring Data from SLT Using Operational Data Provisioning

Transferring Data with SAP LT Replication Server

Central Note 1972175 - Operational Data Provisioning with SAP LT Replication Server DMIS2011 SP6

Agenda

Operational Data Provisioning (ODP) Infrastructure

SLT for Realtime Replication via Operational Data Provisioning - Overview

- Architectural Concept of ODP
- Sizing Considerations

ODP/SLT Scenario for SAP Business Warehouse

- Architectural Concept: Replication from Source systems to ODQ and subscription from SAP BW
- Technical Setup – Details
- Technical Requirements for ODP/SLT Scenario
- Documentation Links

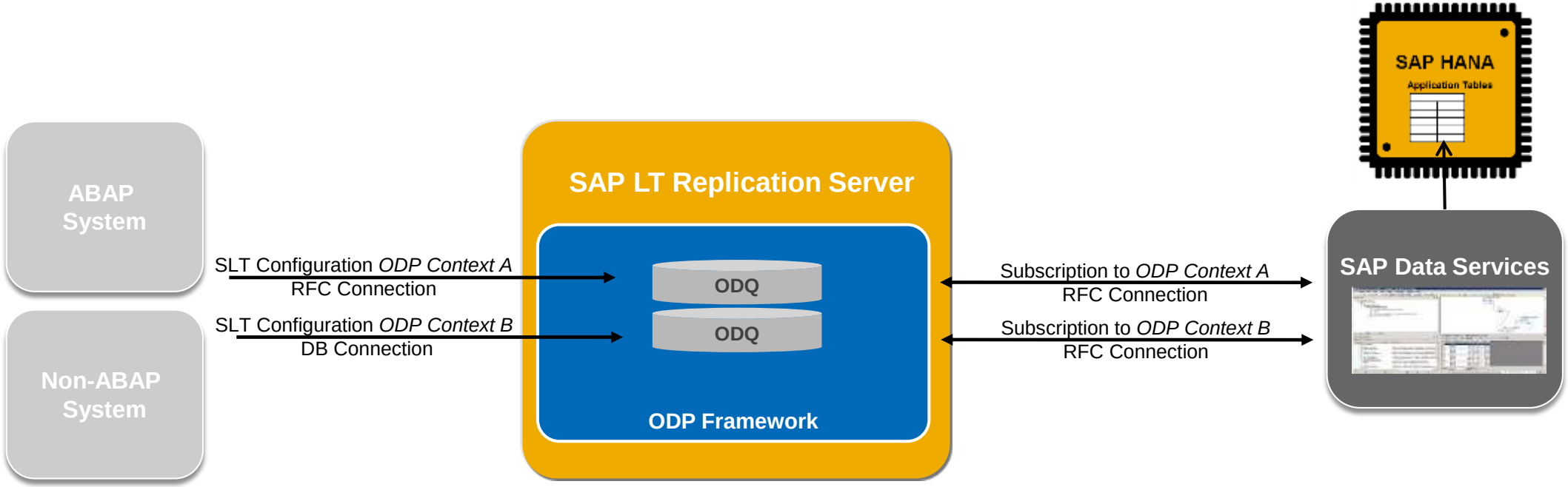
ODP/SLT Scenario for SAP Data Services

- Architectural Concept: Replication from Source systems to ODQ and subscription from SAP Data Services
- Technical Setup – Details
- Technical Requirements and System Set-Up Information for ODP/SLT Scenario
- Documentation Links

Pricing of the SAP LT Replication Server

Architectural Concept

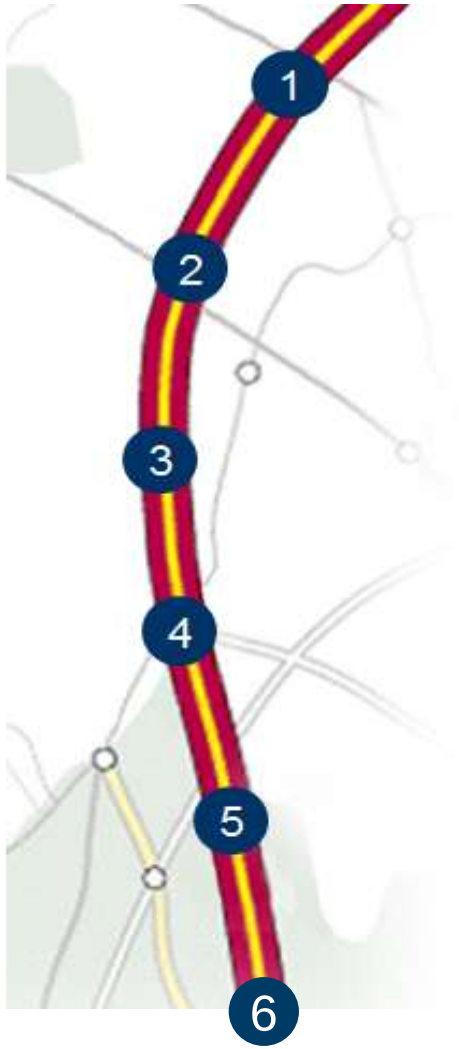
Replication from Source systems to ODQ and subscription from SAP Data Services



Source Systems | **SAP LT Replication Server** | **Subscriber SAP Data Services**

SAP LT Replication Server enhances the established SAP Data Services/ODP scenario (which was implemented for the transfer of source data starting from ECC systems 6.00) with the full SAP system release coverage (4.6 C onwards). As of SAP Data Services 4.2 SP1, the implemented trigger technology of SLT leverages the CDC (Change Data Capturing) scenario of SAP Data Services with real-time data provisioning and delta capabilities for all source tables.

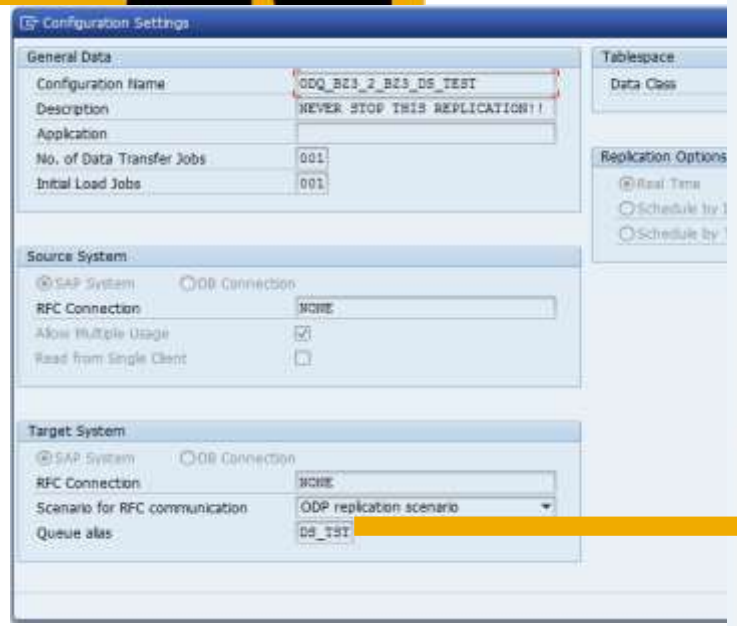
Roadmap of SAP Data Services Subscription at ODP/SLT

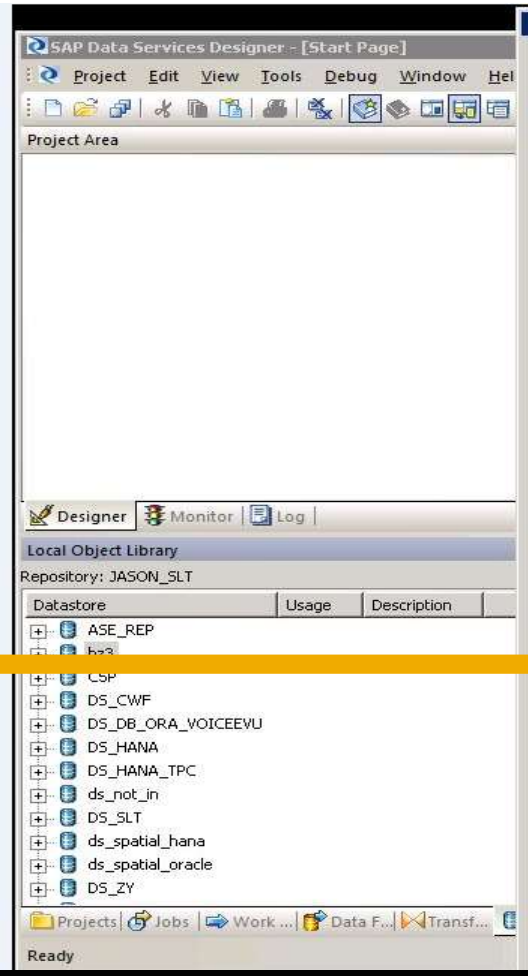


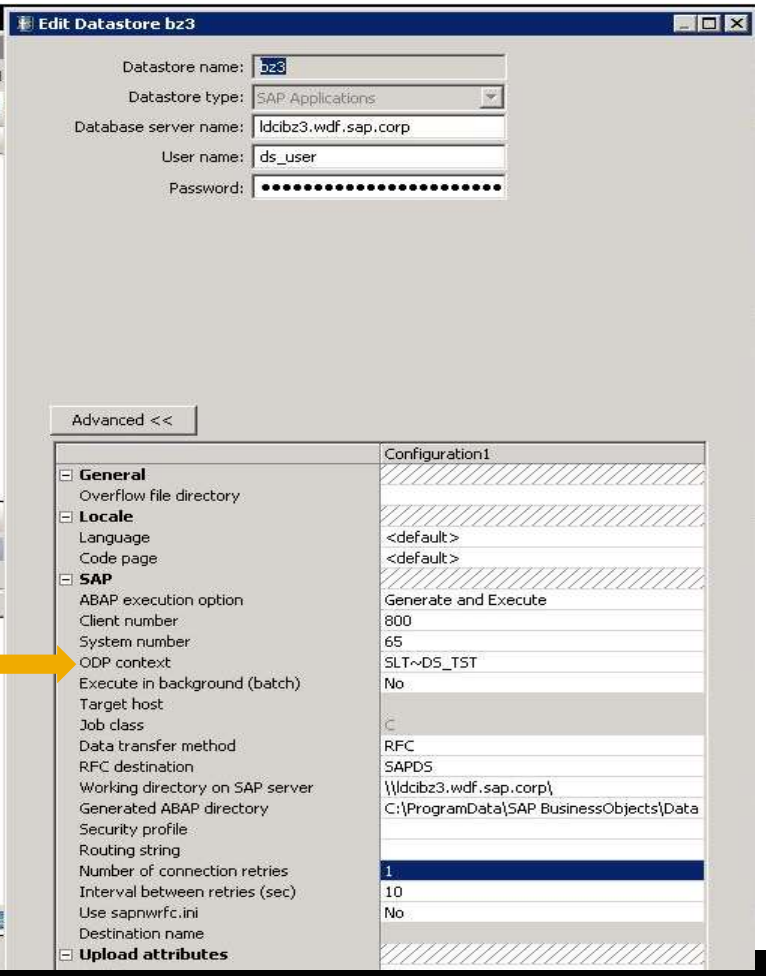
Create a Configuration for a source system as ODP scenario with a queue alias (ODP context)	***SLT system TA LTR***
Select the same ODP context in the SAP DataStore	***SAP DS system***
Specify tables for replication	***SAP DS system***
Display the replicated tables in the Object Library	***SAP DS system***
Monitor the replicated data	***SLT system ODQMON***
Create Data Flow	***SAP DS system***

Setup Steps in Detail (1+2)

1) Create a Configuration for a source system as ODP scenario with a queue alias (ODP context) in the **SLT system**
2) Select the same ODP context in the SAP DataStore definition in the **SAP Data Services Designer**

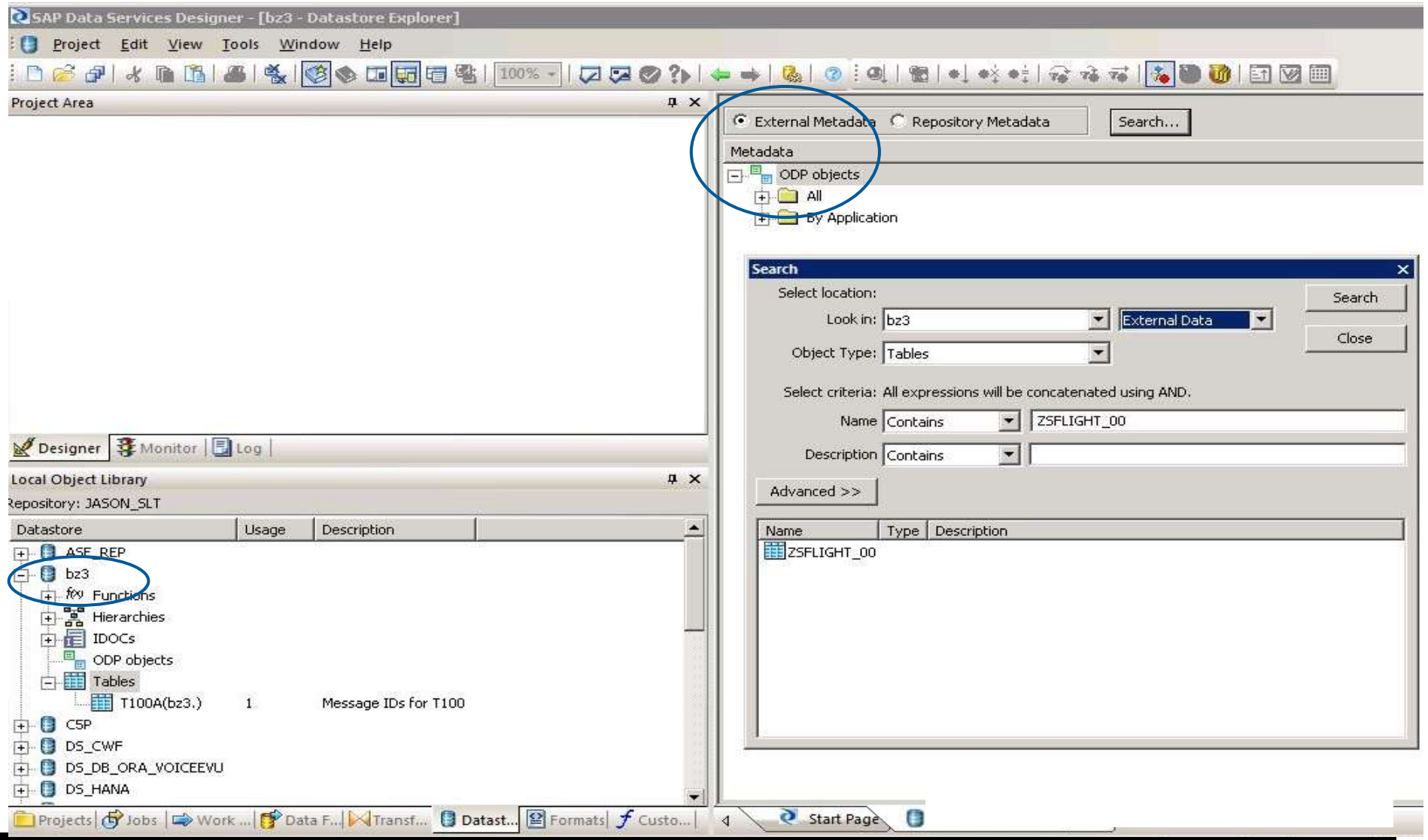






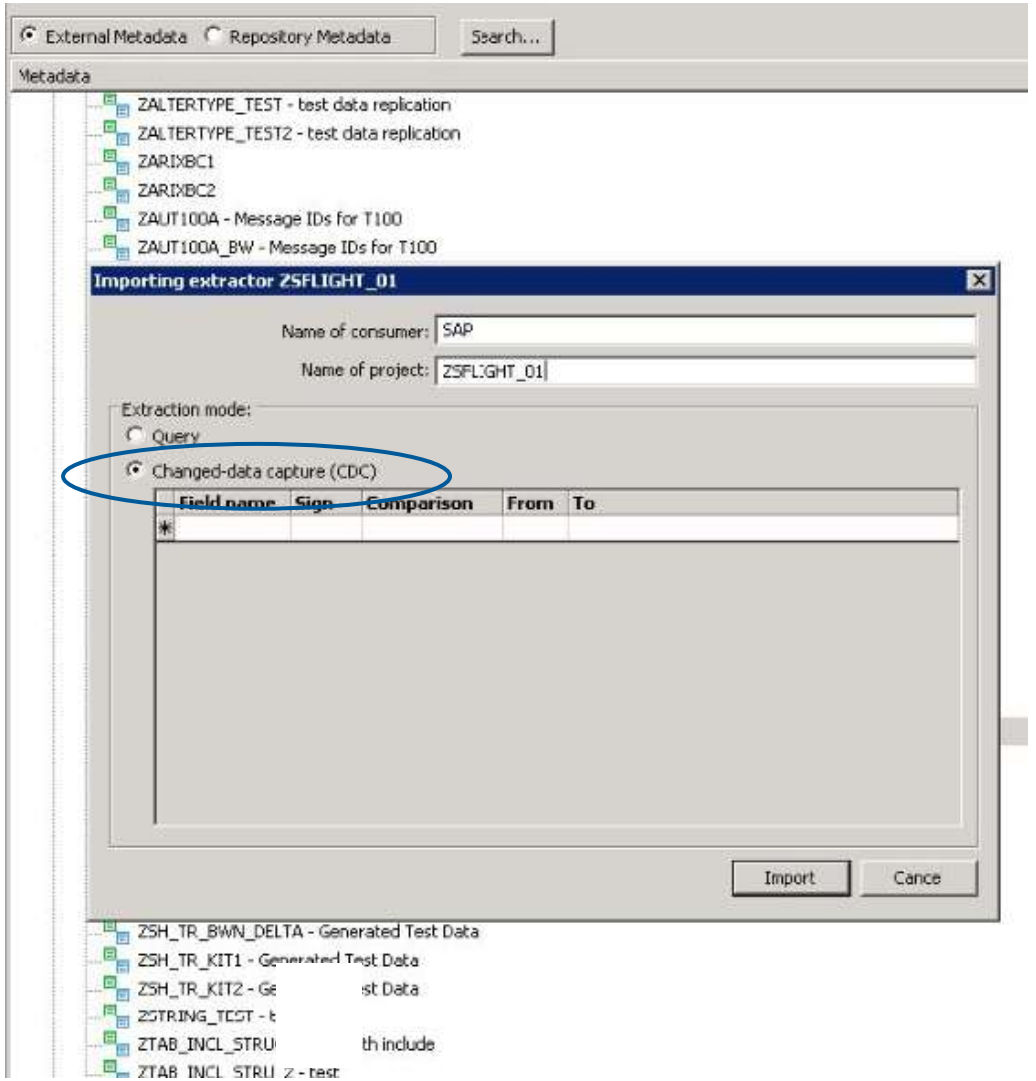
Setup Steps in Detail (3a)

3) Select tables from the ODP objects list (search functionality)



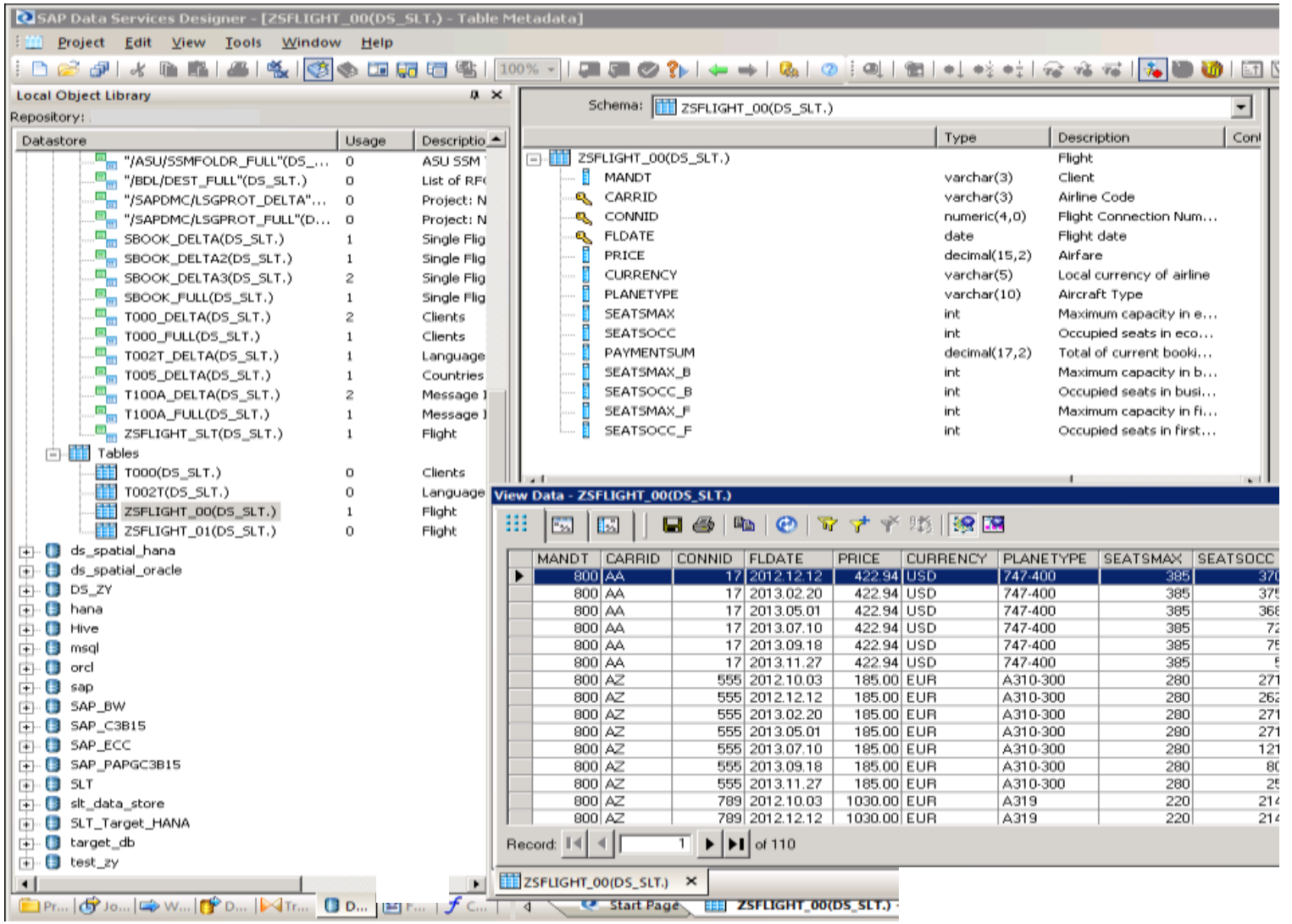
Setup Steps in Detail (3b)

3) Choose Extractor Mode
Changed-Data-Capture (CDC)



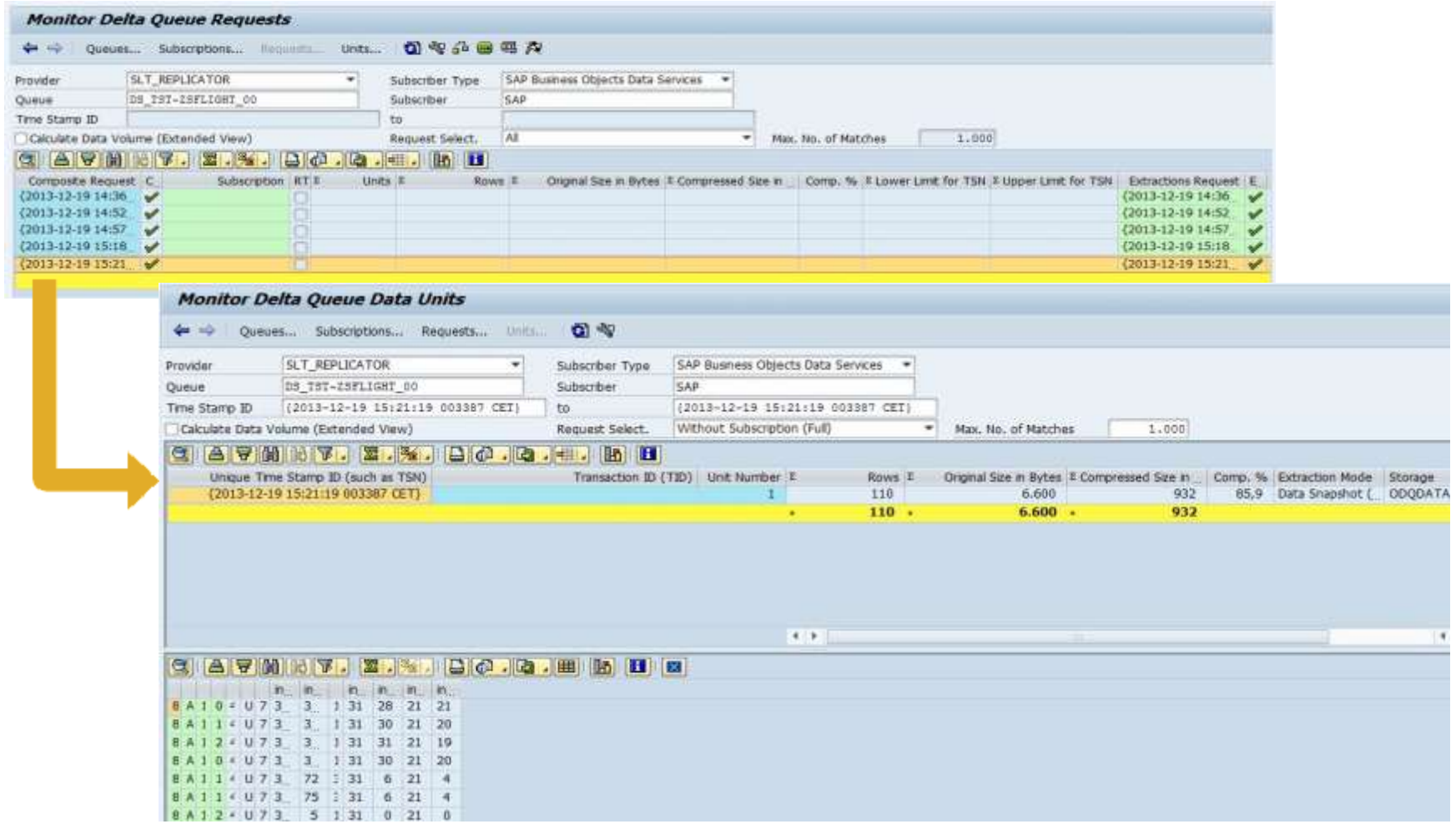
Setup Steps in Detail (4)

4) Preview the data in the Object Library



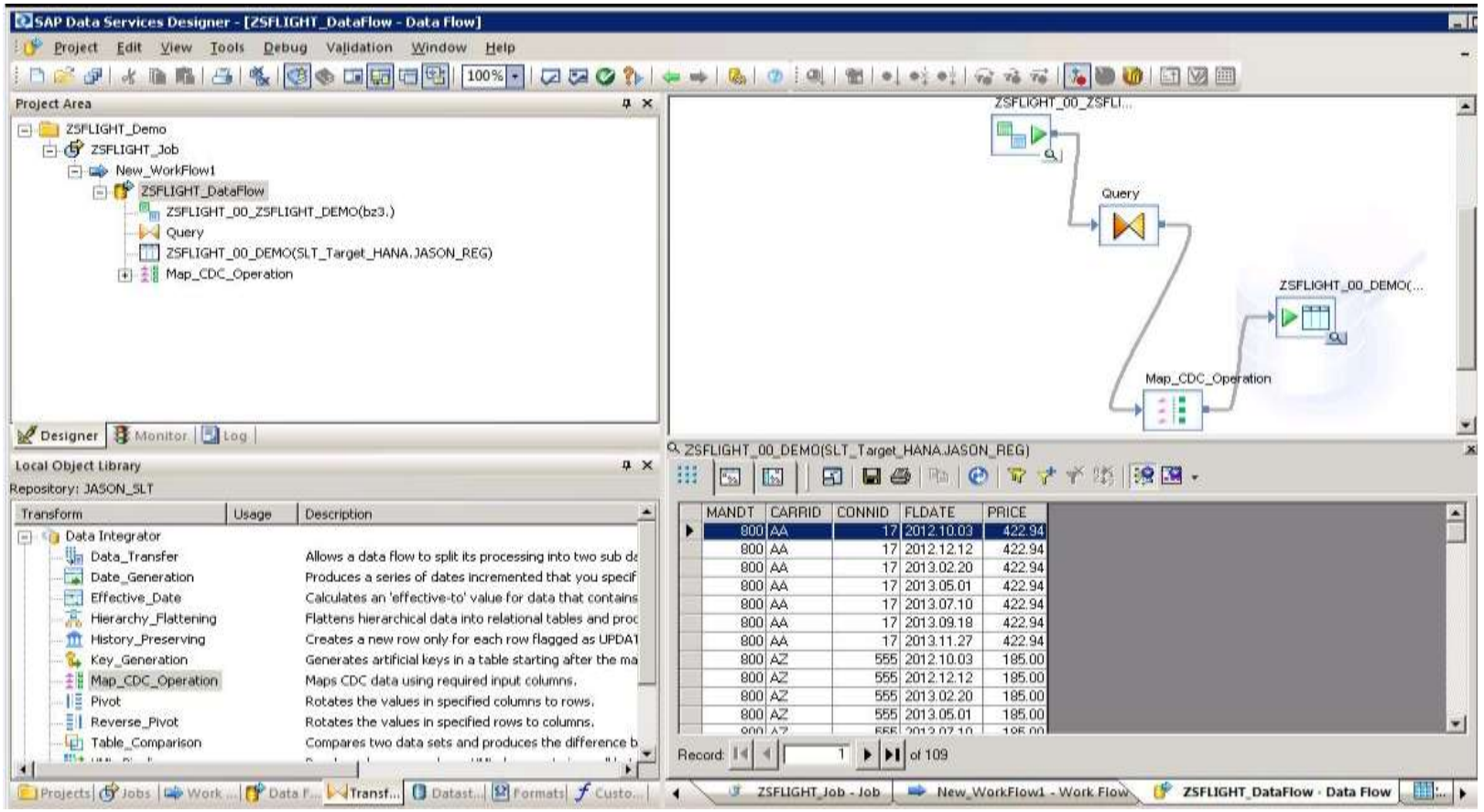
Setup Steps in Detail (5)

5) In the Data Queue Monitor, you can display the queue for the table in replication and the contained data.

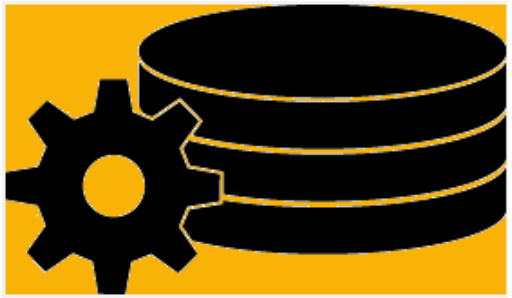


Setup Steps in Detail (6)

6) In the SAP Data Services Designer you define the Data Flow from the Data Source (ODP Object) to the Data Target and the CDC transformation rules.



Technical Requirements for ODP/SLT Scenario with SAP Data Services



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)
- 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 Data Services

Installation:

- SAP Data Services 4.2 SP1 or higher

Documentation Links

Functionality of SAP Data Services is documented on the *Online Help* page:

http://help.sap.com/bods

and in SCN: http://scn.sap.com/community/data-services

For the ODP/SLT scenario with SAP Data Services see the Release Note for SAP Data Services 4.2 SP1

Supplement for SAP Guide

Central Note 1972175 - Operational Data Provisioning with SAP LT Replication Server DMIS2011 SP6

SAP Landscape Transformation Replication Server
Product Licensing for ODP/SLT Scenario

Use Case	License Model Coverage	Required SLT-license
Replication via ODP to HANA scenario	HANA Enterprise edition, HANA Insight/enterprise edition, HANA real-time data edition, HANA EDGE edition, HANA Limited Runtime edition for Applications (LREA), HANA Limited Runtime edition for Applications and SAP BW (LREAB)	-
Replication via ODP to anyTarget: - SAP BW on anyDB via the ODP Framework - SLT Change-Data-Capturing for Data Services to anyTarget	-	Calculation per CPU core: pricing scales with the desired performance for a given data transfer volume and covers all released SLT business scenarios.

New simplified pricing model for SAP LT Replication Server introduced for 2014

Only one single **License Material number: 7016865**

- Can be immediately ordered (via SAP's OnRequest price list) and will be visible on the official SAP price list by end of January 2014.
- required cores can be easily determined by using the SLT Sizing Guide (both a simple T-Shirt size based sizing as well as more detailed formulas are available to determine the required system resources for the relevant use cases)

SAP Landscape Transformation Replication Server

Software Shipment

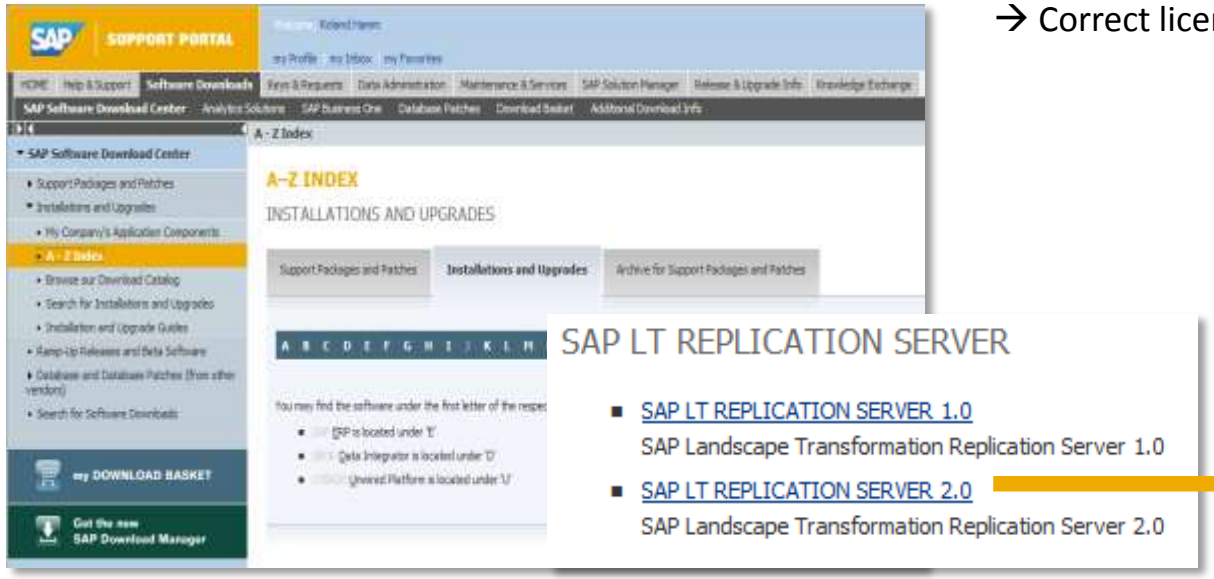
Software Shipment

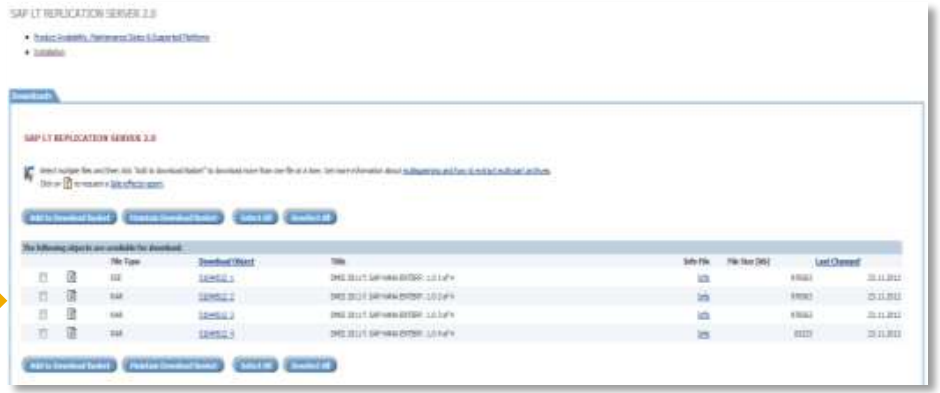
Software Download Access via the Software Download Center within SAP Service Marketplace (**https://service.sap.com/SWDC**).

Multiple Access paths are available:

- Via SAP HANA Enterprise Edition (→additional Components) path
- Via SAP Landscape Transformation Replication Server → (A-Z Index) directly

→ Correct license material assignment is required for the requesting S-User!





SpeedDemos on both Scenarios available for external Demos

Operational Data Provisioning with SLT for SAP BW

External link: http://demo.tdc.sap.com/SpeedDemo/d5b12f54ff68858c

Operational Data Provisioning with SLT for SAP Data Services

External link: http://demo.tdc.sap.com/SpeedDemo/d77f6f76859880ed

Thank you

Contact information:

Astrid.Tschense-Oesterle@sap.com

© 2014 SAP AG. All rights reserved.