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

Dr. Astrid Tschense-Österle, AGS SLO Product Management
Marc Hartz, Senior Specialist SCE
Rainer Uhle, BW Product Management

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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 across 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
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
Overview about all new ODP based scenarios for BW 7.40

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 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 in BW 7.40
Agenda

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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
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!

The extractor itself supports different options:

- Delta handling in various ways
- Direct Access capabilities
- Real-time Data Acquisition (RDA)
BW Dataflow with DTP Extraction from ODP/ODQ
Operational Delta Queue (ODQ) in SAP ERP

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.

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<th>Queue</th>
<th>Subscriptions</th>
<th>Requests</th>
<th>Units</th>
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<th>Compressed Size in Bytes</th>
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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](https://launchpad.support.sap.com/#/notes/1521883) for further details.

**Subscriber / Consumer**

- Recommended starting release with BW 7.40
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
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

**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

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

Legend

- persistent
- virtual
- read
- replicate

Steps

1. Create Open ODS View (Sales Order) with first Associations (Views for Employees and Departments). Add additional customer InfoObject to experience the BW master data integration. (DIRECT ACCESS)

2. Create based on the created Open ODS View a persistency via a generated Field based DataStore Object (FULL data uploads)

3. Change the data flow and create a RDA data transfer based on a given SLT-ODQ and switch your scenario to (REAL-TIME DELTA uploads)

Description

1. Create Open ODS View (Sales Order) with first Associations (Views for Employees and Departments). Add additional customer InfoObject to experience the BW master data integration. (DIRECT ACCESS)

2. Create based on the created Open ODS View a persistency via a generated Field based DataStore Object (FULL data uploads)

3. Change the data flow and create a RDA data transfer based on a given SLT-ODQ and switch your scenario to (REAL-TIME DELTA uploads)
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
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

astrid.tschense-oesterle@sap.com
- AGS SLO Product Management

marc.hartz@sap.com
- Senior Specialist SCE

rainer.uhle@sap.com
- BW Product Management