Extending the Reach of LSA++ Using New SAP BW 7.40 Artifacts
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Agenda

- What is Enterprise Data Warehousing (EDW)?
- Introduction to Layered Scalable Architecture (LSA)
- Migration from LSA to LSA++
- New SAP BW 7.40 Modeling and Provisioning Artifacts
  - Operational Data Provisioning (ODP) and Operational Data Queue (ODQ)
  - Open ODS View
  - Advance DSO
  - Composite Provider
  - Automatic HANA View Generation
- Conclusion
Why Enterprise Data Warehousing (EDW)

- Consolidate the data across the enterprise to get a consistent and agreed view on your data
  - "Having data is a waste of time when you can't agree on an interpretation."
- EDW requires a database + “X”
- SAP BW (BW) is the “X” as EDW with BW provides a flexible and scalable EDW solution
  - Highly integrated tools for modeling, monitoring and managing the EDW
  - Open for SAP and non-SAP systems
EDW vs. Datamarts

- **Very large Data Marts**
  - Internet scale business process (e.g., Ebay, Amazon, ...) generating huge amounts of (sensor) data
  - Fairly modest challenges regarding semantics, consolidation, harmonization, integration with other data

- **Data Mart**
  - Few data sources
  - Data mart type of setup or operational (OLTP) analytics
  - Moderate number of tables
  - Moderate (need for) integrations between data models

- **Extreme large EDW**
  - Extremely high number of scenarios and combinations of scenarios
  - Extremely high data volumes

- **EDW**
  - Mix of scenarios with small and large amounts of data
  - Many (100s to 10000s) of data models
  - Many (100-1000s) different data sources

Complexity: number of scenarios, data models, sources, ...
Layered Scalable Architecture

LSA is the accepted approach for building EDW guaranteeing a consistent, highly available and maintainable data foundation for an agreed interpretation of BI & Reporting.

- Transparency
- Flexibility
- Scalability
- Robustness

Source: SAP
In-Memory Evolution

Data Modeling
- Planning Engine
- Analytic Engine
- Data Manager
- InfoCubes
- DataStore Objects
- EDW Processes

Enterprise Data Warehouse and Data Mart Modeling with SAP NetWeaver BW

Data Persistence at Runtime
- BW 7.0 DB + BWA 7.0
- Filter + aggregation
- BWA instead of aggregates

BW 7.3 DB + BWA 7.2
- First calculation scenarios in BWA
- Multi provider handling and flexible joins
- BWA-only Info Cubes
- BWA reporting for DSOs

BW 7.4 from SP5 on HANA DB
- In Memory planning engine
- Additional calculations in-memory
- Consumption of HANA model in BW
- SAP HANA optimized Info Cubes
- SAP HANA optimized DataStore Object
- HANA data for BW staging

Source: SAP
Journey From LSA to LSA++

- Migrate to Hana - Optimized objects
- Streamline EDW Core
- Enhance Virtualization Layer
- Introduce additional layers
  - Open Operational Data Store
  - Agile Data Mart Layer
- Resulting LSA++
LSA vs. LSA++

- **LSA**
  - No reporting on Propagator.
  - Result of transformations stored in additional persistent Layer, known as Architected Data Mart.
  - Virtualization Layer only on top of Architected Data Mart and only UNION (Multiproviders).

- **LSA++**
  - Reporting on Propagator is allowed.
  - Consequently, necessary transformation are moved from the Business Transformation Layer into Query Design and are thus executed upon query execution.
  - Virtualization layer on top of both Architected Data Marts and Propagator and using UNION (Multiproviders) and JOIN (Composite Provider).
LSA++ Holistic Framework

BI Streamlined: On EDW, Operational BI, Agile BI, Virtualization
LSA ++ Layers and Services
LSA++ Open ODS Layer

Integrate data into the EDW with more Extensive and Flexible options…

Data Sources can be consumed virtually into an Open ODS View

Combined with BW InfoObjects or Models

Generate DataSource from the Open ODS View and ETL data into BW
**LSA++ Open ODS Layer: Services**

- **BW EDW Services**
  - Open ODS Layer as source for persistent EDW providers
  - Open ODS Layer Provider as virtual part of the EDW
- **BW Operational Data Services**
  - Real time replication into BW - SLT
  - Immediate querying on any delivered data – no staging into EDW necessary (Operational BI)
- **Data Modeling**
- **BW Integration Services**
  - Transfer/Consume HANA Modeler schemas in BW and vice versa
EDW Propagation Layer

HANA Optimized DataStore Objects

Greater flexibility due to faster loading and activation times
Greater flexibility as all data is visible in the data propagation layer
Greater flexibility due to queries directly on the data propagation layer
SAP HANA-optimized InfoCubes offer the following advantages:

- Data can be loaded faster because no DIMIDS are required.
- Data modeling is simpler. Multidimensional modeling is not necessary because the dimensions are only used as structuring criteria and do not have any effect on system performance. Aggregates and DB indexes are not required.
Agile BI with WorkSpaces

- BW data models exposed in Workspace, not copied

- Workspace with local data
Advantages of BW workspaces

- Excellent, rapid prototyping tool for business
- Balances flexibility and control
- Better adoption of new solutions as they can be tested well on hand before full scale implementation
- Performance and central access, eliminates long downloads, and maintains information security.
- The BW Workspace Designer runs in a browser and can also be embedded in the SAP Portal. This means that there is no extra software to install.
Streamline the Consistent EDW

- Reducing number of persistent provider, esp. InfoCubes.
- Optimized design and implementation of persistent providers.
- Reducing change impact on persistent providers.

Streamlined consistent EDW core for flexibility and lower TCO/TCD with HANA optimized InfoProviders, Direct data provisioning and real-time master data.
Streamlined EDW: Where are the InfoCubes...?

Obsolete: InfoCubes as Accelerator on Business Transformation Layer DSOs

Source: SAP
Streamlined EDW: Query on granular data

EDW Propagation Layer as Query Target

LSA & BW on RDBMS

LSA++ & BW on HANA

Source: SAP
Virtualization or Persistent Join? What are your options?

Scenario: Multiple Data Store Objects need to be Joined into a single Infoprovers.

- UNION in Multiproviders doesn't correspond to reporting requirements.
- LSA: BW transformation and updating (overwrite of DSO)
- LSA++: Composite Provider
Decision for Composite Provider

Goal: Virtualization of Architectured Data Mart Layer

Granularity/Cardinality vs Transformation/Join logic

- Replace Data Mart
- Investigate
- Keep Data Mart
New Artifacts with BW 7.4
New Artifacts with BW 7.40

- Data Provisioning
  - Operational Data Provisioning through ODQ

- Data Modeling
  - Open ODS View
  - Composite Provider
  - Automatic Generation of HANA Models

- Data Federation
  - Smart Data Access
### SAP BW on RDBMS

- CompositeProvider
- MultiProvider
- InfoSet
- VirtualProvider

### SAP BW 7.4 on HANA

- CompositeProvider
- Open ODS View
- InfoObject
- Advanced DataStore Object

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**SAP BW 7.4 on HANA consolidates existing InfoProviders**

- CompositeProvider as new object to define joins between InfoProviders
- Open ODS View for virtual access to external sources
- InfoObject to model semantically rich master data
- Advanced DataStore Object as the new object for persistence management

**Traditional InfoProviders still exist but future innovations are focused on the consolidated objects of SAP BW 7.4 on HANA**
Operational Data Provisioning
Operational Data Provisioning (ODP)

- Enables extract once deploy many with EOIO Quality of Service
- Time stamp based recovery mechanism with configurable data retention periods
- Highly efficient compression (up to 90%)
- Intelligent parallelization options for subscribers in high volume scenarios
ODP based scenarios for BW 7.40

Main use cases available with BW 7.40:

- ODP based Data Provisioning Aspects for SAP ERP Sources
- SLT/ODP based real-time replication
- ODP based data transfer between BW systems
ODP – HANA Context

- Complementary to DB Connect
- Direct loading of HANA views via DTP into BW infoproviders (PSA optional)
ODP – Extractor Context

- Direct loading into BW infoproviders (PSA optional)
- Scheduled or real-time daemon
- Synchronous RFC instead of ALE/IDOC
- Flexible Recovery
- Multiple Subscribers

Source: SAP
ODQ Monitor (t/c ODQMON vs. RSA7)

![Monitor Delta Queues](image)

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- Total: 14 subscriptions with 995 requests totaling 186.811 rows.
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.

Can we use ODP data replication for a generic datasource? Yes, but you will need to implement SAP note 1585204
Open ODS View

- Represents a view on a source and adds analytic metadata to it.
- Does not have separate storage for transaction data or master data.
- You can specify whether a specific field should be interpreted as a key figure or characteristic.
- Open ODS views are available if the BW system is running on the SAP HANA database.
- Open ODS views cannot be defined for hierarchies.
## Open ODS View – Summary & Options

How to achieve persistent and non-persistent in each of the options…

<table>
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<tr>
<th>Source Access</th>
<th>ERP</th>
<th>HANA</th>
<th>SDA</th>
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<tr>
<td>Direct (Non-Persistent)</td>
<td>Open ODS View on SAP Datasources</td>
<td>Open ODS View on HANA Table/View</td>
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<td>Field-based DSO derived from Open ODS View</td>
<td>1) Field-based DSO derived from Open ODS View 2) HANA Table/View as ODP Datasource</td>
<td>Field-based DSO derived from Open ODS View</td>
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Simplified Modeling: Advanced DSO
Advance DSO

The next generation of Data Store Object is ADSO

- Combines InfoObject and Field based modeling
- One type of InfoProvider with different settings to consolidate DSO and InfoCubes
- The fast, no activation required loading of the Write Only -DSO,
- The 3-table approach in standard DSO’s
- The ‘every characteristic is key’ approach of the InfoCube: Supports upto 120 key fields

ADSO can be used for: Data Acquisition Layer / Corporate memory / Data Propagation or Reporting Layer
Virtualization, Integration, Simplification…
The Power of Composite Providers

- HANA Tables/Views
- BW InfoProviders
- MultiProvider InfoSet
  - Transient provider
  - Virtual provider
- Composite Provider
  - Union & Join
  - Virtual provider
  - Composite Provider
  - SAP HANA
  - Composite Provider is fully processed in HANA
Composite Provider: In LSA++ EDW

Source: SAP
Union between 2 Composite Providers

Join Open ODS Views
Add Nav Attrs

- Modern Eclipse based UI
- Option to include Inventory key figures
- Possibility to include in planning scenarios
Automatic HANA View Generation
Automatic HANA View Generation

Info cube

Settings
- InfoCube Type: Standard InfoCube
- Subtype: SAP HANA-Optimised...
- External SAP HANA view: External SAP HANA...
- Auditable

DSO

Settings
- Type of DataStore Object: Standard
- SID Generation: During Activation
- External SAP HANA view: External SAP HANA...
- Unique Data Records: Set Quality Status to 'OK'

Query

Data Migration
- Data Last Changed in SAP HANA/BIWA Index by: NUMARWADIA
- Changed on: 09/14/2014
- Time of Change: 16:04:28

Info objects

Characteristic: CUSTOMER
- Long Description: Customer number
- Short Description: Customer
- Version: Active

Composite Provider

Description: Test CP
- External SAP HANA View
- External SAP HANA View for Master Data
- workspace Status: Not Assigned to a Workspace
Smart Data Access: Logical EDW

- Smart data access – read access to relational and non-relational sources via ODBC
- Enables access to remote data access just like “local” table
- Supports data location agnostic development
- No special syntax to access heterogeneous data sources
- BW based Analytic Services on external data
SAP BW 7.40 SP8+ provides many new artifacts to:

- Quickly consume external data in a direct or lightweight persistent manner.
- Combine and integrate such external data with existing BW models using union and join operations that are HANA-optimized.
- Provide a new robust provider/subscriber framework for data provisioning with reduced latency and persistency or direct access.
THANK YOU FOR PARTICIPATING

Please provide feedback on this session by completing a short survey via the event mobile application.

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