SAP BW powered by SAP HANA:
Understanding the Impact of HANA
Optimized InfoCubes
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At the end of this session, you will be able to:

• Understand the motivation for HANA Optimized InfoCubes

• Identify the difference in the architecture and structure compared with InfoCubes stored in a relational database

• Describe the conversion process
Agenda

- Motivation
- Introduction
- SAP HANA Optimized InfoCubes
- Inventory InfoCubes
- Conversion
- Use Cases and Limitations
- Summary
Motivation

- Leverage In-Memory technology to implement HANA optimized InfoCubes [flat structures with no Dimension or “E” tables]

  ✓ Accelerate data loads
  ✓ Simplify Data Modeling
  ✓ Allow faster remodeling of structural changes

No adoption of processes, MultiProvider, Queries required
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**General Description**

**Definition**
A HANA optimized InfoCube is a standard InfoCube which is optimized and persisted in the SAP HANA database. It provides all features and functions of InfoCubes in prior releases.

- **The HANA optimized InfoCube consists of these components:**
  - *Fact Table* Only F fact table
  - *Packet Dimension* Only dimension created (for administrative processes)
  - *Master data SIDs* Direct JOIN with the Master Data tables possible

- **Important properties:**
  - All newly created InfoCubes are HANA optimized
  - The assignment of characteristics is purely a sorting option for the Query creation
  - The SIDs are directly written to the fact table
  - Compression / Null value elimination executed as stored procedure¹ on the SAP HANA DB
  - BW Accelerator obsolete

¹ Stored Procedure – Function directly executed on the DB
SAP HANA Optimized InfoCube Design in SAP BW
From snowflake to star schema

Benefits:
Fast data loads (no DIMIDs) → up to 80% time reduction
Dimensions not physically present → simpler modeling and faster structural changes
All processes, all Queries and MultiProviders can remain unchanged
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Standard InfoCube (not SAP HANA optimized)
SAP HANA Optimized InfoCube

Display InfoCube (Active Version)

- InfoCube: DD_DX_C01
- InfoCube type: Standard InfoCube
- Subtype: In-Memory InfoCube

Status Information

- InfoCube: DD_DX_C01
- Dictionary/DB Status: InfoCube Tables
  - /SID/DD_DX_C01: Active
  - /SID/DD_DX_C01F: Not Active

Facts

- MD
- MD
- MD

Real Experience. Real Advantage.
SAP HANA Optimized InfoCube
Tables in the HANA Studio

Dimension table

Fact table
Partitioning of SAP HANA Optimized InfoCubes

• No longer required or allowed (i.e. using a time characteristic to split the data into disjoint partitions)

• Four partitions are automatically created behind the scenes
  • Partition 1 – non-compressed requests
  • Partition 2 – compressed requests
  • Partition 3 – reference points for inventory data
    - Created regardless of inventory/non-cumulative key figures present
  • Partition 4 – historic movements of inventory data
    - Created regardless of inventory/non-cumulative key figures present
Compression of SAP HANA Optimized InfoCubes

- The ability to compress requests remains, i.e., aggregate an interval of requests into Request = 0
  - Especially helpful if expecting a significant size reduction due to many inverse bookings of requests
- Compression not required for query performance reasons
- Compression can still have positive impact on load or merge time
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Inventory Management - 1

- Separation of the different data types to be loaded (reference point, historic values, movements) via 2 different DTPs (if needed, the second one has to be changed in the productive system)
- Extraction via different DTPs
- No functionality (marker update) during compression any more

1. Initial Load

2. Movement
   a. Movement
   b. Historic loads
Inventory Management – 2

- Flag “No Marker Update” is removed from HANA optimized InfoCubes
- Functionality is replaced by DTP Flag “Historic Values”

For More Detail See: https://www.experiencesaphana.com/docs/DOC-1363
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Conversion

Migration von Standard-Objekten zu in-memory optimierten

Zu migrierende Objekt(s)
- Standard InfoCube 0D_DX_C01
- Standard DataStore-Ojekt

Optionen für Migration von DataStores
- Ohne Erhalt des Change Logs
- Change Log rekonstruieren
- Paketgröße für Datentransfer

Allgemeine Einstellungen
- Show application log

Protokoll anzeigen
Converting Standard to SAP HANA Optimized InfoCubes

• After conclusion of database migration – all objects remain the same as they were in previous versions of SAP BW

• To Optimize an InfoCube:
  • Menu: GoTo → “Conversion to SAP HANA Optimized”
  • Via program RSDRI_CONVERT_CUBE_TO_INMEMORY

• The application log is either shown directly or can be found using Tcode “SLG1” using filter “OBJECT = RSDRI, SUBJECT = REFACTOPRING”

• During conversion a lock is set preventing all maintenance and load activity. Querying on the data is allowed

• After conversion there is no need to change any load process, DTPs, Multi-Providers or queries
Conversion Steps and Log Overview

- Create temporary fact table with “flat” structure Z0<InfoCube>
- Read data out of the original fact tables dissolving the star schema and save data in temporary fact table
- Rename package dimension database table TP<InfoCube>

Rename validity table (in case Inventory Management InfoCube) TL<InfoCube>
- Empty the InfoCube tables
- Set InfoCube subtype to “flat”
- Activate the InfoCube (As it is empty the structures and their DDIC description can be adjusted)
- Delete Fact DB-table and rename the temporary one
- Delete Packet dimension table and rename the temporary one
- Delete validity table and rename the temporary one
- Delete temporary DDIC objects
- Create logical index
Post Conversion/Migration Options

- BWA roll-up steps in process chains are no longer needed
  - Will be ignored if not removed

- No longer a need for creating/deleting database indexes in process chains
  - Will be ignored if not removed

- No longer a need for creating/maintaining database statistics in process chains
  - Will be ignored if not removed
Why Do We Still Need InfoCubes?

- No disruption
- Non-cumulative key figures can only be modeled in InfoCubes based on the current levels of SAP HANA functionality
- Integrated Planning can currently only be done on InfoCubes (transactional)
- The external write-interface (RSDRI) only works for InfoCubes
- Data Store Objects have a 16 key maximum currently

NOTE – If the above mentioned items don’t apply to your specific scenarios, tests in SAP labs, as well as live customer production installations have proven InfoCubes can be removed and reporting performance off of DSOs remain the same. However, this should be tested for each of your specific use cases.
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Use cases

All capabilities of BW Accelerator are also available in the SAP HANA.

The loading processes are accelerated because no Dim IDs (and their respective tables) have to be created for the HANA optimized InfoCubes.

The omission of the Dimension tables does not require intensive analysis of characteristic relationships to avoid potential performance bottlenecks.

The acceleration of the data insertion into HANA optimized InfoCubes leads to earlier availability of the data for reporting.
Restriction and Limitations

**Modeling**
- Only standard InfoCubes can hold the property *HANA optimized*
- Inventory Management scenarios based on HANA optimized InfoCubes cannot be included in a SAP BW 3.x dataflow
- All newly created standard InfoCubes in a SAP BW system are HANA *optimized*

**Features**
- The Remodeling Toolbox can not be used
- SAP HANA covers all features of BW Accelerator. Hence, all functionality in the system related to BW Accelerator, is disabled.

**Misc**
- You should not expect performance gains in query runtime compared to a SAP BW system with BW Accelerator.
You should now be able to

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• Describe the Conversion process
Thank you for participating.

Please remember to complete and return your evaluation form following this session.

For ongoing education on this area of focus, visit the Year-Round Community page at www.asug.com/yrc