Introduction to Extracting data from S/4HANA with ABAP CDS-views
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SAP
Agenda – session 1

• A bit of background
• Overview of Architecture
• S/4HANA Cloud vs S/4HANA on Premise
• S/4 HANA on Premise: extracting data to BW/4HANA
• S/4HANA Cloud: extract data to BW/HANA
• Overview of available Content
• Questions
SAP R/1 R/2
Mainframe

1972

SAP R/3
Client/Server

1992

SAP ERP
www / mysap.com

1997

SAP HANA
In Memory

2004

Suite on HANA
Tx/ Apps on Hana

2011

The Digital Core
SAP S/4HANA
using SAP Leonardo

2012/2013

2015

2016

2017

SAP BW 1.0

- Initial Release for SAP Reporting

SAP BW on any DB

- Operational Reporting
- Data warehousing

SAP BW on HANA

- High Performance Data Warehousing
- Strategic Planning Scenarios

SAP BW/4HANA

- Next Generation DW
- Big Data Integration
- Effortless Data Tiering
- Simplified, Modern UX
- Openness to native HANA

Suite on HANA

www / mysap.com

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SAP will continue to innovate and provide industry leading data warehousing technologies with SAP Data Warehouse Cloud, SAP SQL Data Warehousing, and SAP BW/4HANA to enable the Intelligent Enterprise. **SAP Data Warehouse Cloud is not intended to replace any on-premises SAP Data Warehousing solution.**
SAP S/4HANA is **not** an EDW

- SAP S/4HANA is the next generation intelligent ERP and part of an Intelligent Enterprise - sized, tuned, and maintained for optimal performance as transactional system
- A modern simplified architecture, the new user experience (SAP Fiori) and integrated intelligent technologies such as Machine Learning allow for new business processes and even automation
- SAP S/4HANA embedded analytics focuses on fact-driven process handling and embedded decision support inside of transactions - embedded BW only for support of transactional workflows

### SAP BW/4HANA **is** an EDW

- Allows harmonization of all enterprise data (ERP + non-SAP, governance, corporate memory, big data, ...)
- Delivers complete data warehouse tools (rich integrated toolset for data warehousing)
- Provides openness with SAP Analytics and SAP data management (SAP Data Warehouse Cloud, SAP Data Hub/Intelligence, SAP HANA SQL DW, ...) for Big Data and Internet of Things (IoT) use cases, and SAP Analytics which also extend SAP S/4HANA

### Why is SAP BW/4HANA the perfect EDW for SAP S/4HANA?

- Allows best integration capabilities based on common architecture and terminology (e.g. analytical engine, currencies, user maintenance, ABAP, transports, governance, ...)
- Extends seamlessly the business case of SAP S/4HANA including the Out-of-the-box connectivity with native SAP BW/4HANA tools (e.g. ODS, Extraction, ODQ?, etc.)
- Availability of specific business content for SAP S/4HANA (and other Intelligent Suite applications)
Why SAP BW/4HANA for SAP S/4HANA?

Leveraging SAP BW/4HANA you can **natively integrate** the embedded analytics models and data in SAP S/4HANA, e.g. to compare real-time actuals with historical snapshots, planning results or external data.

Please refer to the respective integration blog and How-to-Guide on www.sap.com for further details.

Examples for best-in-class integration are:

- **Out-of-the-box connectivity**
  - Visualize SAP S/4HANA data in SAP BW/4HANA without data structure creation in SAP BW/4HANA
  - Standard Extractors (ABAP CDS and ABAP via S-API), as well as open extensibility

- **Fast time-to-value enterprise-wide Data Mashups using SAP BW/4HANA-native objects** (composite providers, etc.)

- **Strong data historization capabilities** (e.g. easy tracking of slowly changing dimensions)

- **Integrated planning use cases** based on all necessary existing and harmonized data

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**Embedded BW:**

- **SAP does not** recommend using Embedded BW for data warehouse (EDW) use cases!
- **For details,** see SAP Community blog and SAP note 1661202, (e.g. Upgrades and patches, Resource allocation and capacity planning, Workload Management, Backup & Recovery, Lifecycle management, High Availability & Disaster Recovery, Security etc.)
- **Best practice:** The amount of data persisted in the Embedded BW should not exceed 20% of the overall data volume of the system.
- **Embedded BW is not an SAP BW/4HANA**
- **More information** here.
## Analytics with SAP S/4HANA – high level architecture

### SAP S/4HANA

| Visualization | SAP Fiori UI
analytical apps, reports, KPIs,... delivered as part of SAP S/4HANA, extensible by the customer |
| Access | Odata services
Transient analytical queries |
| Modelling | ABAP-CDS-Models
(for analytical and transactional purposes) |
| Persistency | Database tables on SAP HANA |

### Intelligent Technologies

- **SAP BW/4HANA**
  - (for seamlessly extending transactions with data warehousing workflows)
- **SAP Analytics**
  - access SAP S/4HANA data directly via Transient analytical queries
- **SAP Data Warehouse Cloud**
- **Database tables on SAP HANA**
- **Database tables on SAP HANA Cloud**
## Data Integration from SAP S/4HANA (on-premise) to SAP BW/4HANA and SAP BW Comparison

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Service API Extractors</th>
<th>ABAP CDS Views</th>
<th>Table Replication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latency</td>
<td>No / very limited real-time support</td>
<td>Near-real-time support in delta transfer</td>
<td>Always near-real-time</td>
</tr>
<tr>
<td>Reconciliation</td>
<td>Extractors for data transfer and ABAP CDS for embedded analytics</td>
<td>Same data basis for embedded analytics in S/4HANA and for extraction</td>
<td>Reconciliation on table level</td>
</tr>
<tr>
<td>Federation</td>
<td>Very limited support for direct access</td>
<td>Direct access to ABAP CDS View possible</td>
<td>Direct access to table data via HANA Smart Data Acces</td>
</tr>
<tr>
<td>Business Content</td>
<td>Activation step in S/4HANA needed. High coverage (&gt; 6.000 extractors)</td>
<td>Active CDS View is ready to extract. Limited coverage at this time (but planned)</td>
<td>N/A</td>
</tr>
<tr>
<td>Application Logic</td>
<td>Specific advanced logic in ABAP via extractor or application coding.</td>
<td>Support for business logic in ABAP CDS</td>
<td>Application logic modelled in target system</td>
</tr>
<tr>
<td>Delta Types</td>
<td>Depending on extractor → all DataStore Object types supported</td>
<td>After- and Delete-Images → needs Standard DataStore Objects</td>
<td>After- and Delete-Images → needs Standard DataStore Objects</td>
</tr>
<tr>
<td>Cloud Readiness</td>
<td>Service API not cloud ready (e.g. extensibility for extractors)</td>
<td>Full cloud support</td>
<td>Very limited support in cloud context (direct DB access required)</td>
</tr>
</tbody>
</table>
Data Integration from SAP S/4HANA (on-premise) to SAP BW/4HANA and SAP BW

Further Information

- Documentation
  - SAP Note 2500202 (Extractor Whitelisting in S/4HANA)
  - SAP Note 2232584 (Release for ODP) (> 95% extractors are released)
- Documentation
  - How to use ABAP CDS for Data Provisioning in BW
- Documentation
  - Real-Time Replication using Operational Data Provisioning (ODP) >= SAP BW 7.40

*Alternative: replication to HANA Native Table
- Technical framework and connectivity (HTTP / SOAP based) between BW/4HANA and S/4HANA Cloud (communication scenario) available with S/4HANA Cloud 1808
- First wave of ABAP CDS Content for extraction and first version of key user tools for Extensibility with S/4HANA Cloud 1811
- Further ABAP CDS Content for extraction and possibility to extract Custom Business Objects with every release
- Option to create own ABAP CDS extractors with S/4HANA Cloud >= 1908
- Related Documentation
  - Extracting CDS Views to SAP BW/4HANA
  - Creating Source Systems of Type ODP (HTTP)
  - Transferring Data from SAP Systems via ODP (ABAP CDS Views)
ABAP CDS View Extraction
Enhancements to technical architecture with S/4HANA Cloud 1905

- ABAP CDS Views need the “dataExtraction.enabled” annotation (for any extraction)
- Additional annotation for (real-time) delta extraction based on change data capture
  - Combine real-time trigger information on table level (SLT) with data extraction on semantic level (ABAP CDS / ODP)
  - Annotation to define per ABAP CDS View tables and fields relevant for delta recording (change data capture)
    @ANALYTICS.DATAEXTRACTION.DELTA.CHANGEDAT ACAPTURE:
S/4 HANA Cloud – BW On-Premise extraction Overview

Define Inbound Communication using Communication Management
Utilises Standard Communication Scenario SAP_COM_0042

Create Source System of type ODP (HTTP)
Web Service Configuration using Consumer proxy CO_RSDSPX_ODP_IN

Creating Source System of Type ODP(HTTP)
S/4 HANA Cloud Communication Management

- Inbound Communication Process Overview

  - Create Communication User
  - Create Communication System
  - Create Communication Arrangement

- Business Role for Communication Management Configuration: SAP_BR_ADMINISTRATOR

- Communication Management Business Catalog ID: SAP_CORE_BC_COM
SAP BW Creation of ODP(HTTP) Source System

- Create new source system of type ODP-ABAP CDS View
- Provide Source system Name & Description and Choose Continue

- In the following screen select HTTP/SOAP as communication Channel

- Configure Logical Port in SOA Manager
Create new source system of type ODP-ABAP CDS View
Provide Source system Name & Description and Choose Continue

In the following screen select HTTP/SOAP as communication Channel

Configure Logical Port in SOA Manager
Before we can start using CDSVs to bring data to BW, we must make sure that the system where the data resides is available as a CDS Source System in BW.
Create a extraction enabled CDSV

I_COSTCENTERACTIVITYTYPE

The CDS view name, Analytics data Category and SQL view name are needed for the following steps

```java
@ObjectModel.representativeKey: 'CostCtrActivityType'
@endUserText.label: 'Cost Center Activity Type'
@Analytics: {dataCategory: #DIMENSION, dataExtraction.enabled: true}
@VDM.viewType: #BASIC
@AbapCatalog.sqlViewName: 'IFICCActTyp'
@AccessControl.authorizationCheck: #CHECK
define view I_CostCenterActivityType
```
Attach extraction enabled CDSV to dataflow

• Switch to the BW perspective:

• For S-API extractors, we used the option “replicate data sources”. The procedure to make CDSVs available as an extractor on the BW is a bit different.

The SQL view name is required to find the data source, in this case IFICCActType.
Consume the data from the CDSV with BW-MT

- Make sure you are still in the BW Perspective, or switch to it with

Press finish and activate. This ODS view has direct access to the CDSV with this BW datasource. Use "check"
Monitoring Data Load in BW from S/4HANA Cloud

• Monitoring can be done with the BW/4HANA Cockpit
### FAQs for CDS based extraction from colleagues from the field

<table>
<thead>
<tr>
<th></th>
<th>S/4 Cloud</th>
<th>S/4 On Premise</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>How to find extraction CDS views</strong></td>
<td>In View Browser App Restrict to “Released Views and search for @Analytics.dataextraction.enabled:true</td>
<td></td>
</tr>
<tr>
<td><strong>What can I extract</strong></td>
<td>Master Data, Text, Hierarchies &amp; Transactional data</td>
<td></td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>S/4 Scenario SAP_COM_0042 &amp; HTTPS source system in BW</td>
<td>ODP source system of type ABAP CDS using RFC</td>
</tr>
<tr>
<td><strong>Delta Extraction</strong></td>
<td>CDC delta since 1905</td>
<td>CDC Delta since 1909</td>
</tr>
<tr>
<td></td>
<td>Timestamp based delta before 1905</td>
<td>Timestamp based delta before 1909</td>
</tr>
<tr>
<td><strong>Monitoring Data extraction</strong></td>
<td>FIORI app “Operational Data Provisioning Monitor Queues”</td>
<td>Transaction ODQMON</td>
</tr>
<tr>
<td><strong>Enhancement Options</strong></td>
<td>Planned to have an option to include extraction views in “Custom CDS View” app</td>
<td>Customers can create own CDS views</td>
</tr>
<tr>
<td></td>
<td>Few of the delivered views are registered for Field Extensibility</td>
<td></td>
</tr>
<tr>
<td><strong>ODP BADIs</strong></td>
<td>Not applicable</td>
<td>Not possible to enhance using ODP BADIs</td>
</tr>
</tbody>
</table>
The attached excel contains a **snapshot** of available C1 released CDSV 2002. CDS view carrying the extractor annotation. The annotation grants the “extractor” status through annotation, and sometimes it happens that for a certain CDSV this status is revoked. The applicable set of extractors can be found in your own S/4HANA environment. More detailed information can be found in the SAP Support Portal.
Planning the migration from SAP ECC with SAP BW to SAP S/4HANA with BW/4HANA

*Prerequisite: SAP BW/4HANA Sandbox existing
Now: what to do where?

- **SAP BW/4HANA – Core EDW functions**
  - Data replication (for Snapshots, Performance enhancements)
  - Enterprise-wide data harmonization
  - Data governance
  - Data federation/mashing (EDW)
  - LSA modeling
  - SAP and non-SAP data
  - Planning
  - Archiving (for delta comparison)

- **SAP Analytics Cloud**
  - Best visualization
  - Focus on cloud-based source systems (e.g. SAP S/4HANA Cloud, MTE)
  - Data federation/mashing (without EDW harmonization)
  - SAP and non-SAP data
  - Planning
  - Self Service BI

- **SAP S/4HANA embedded analytics**
  - Operational data
  - Real-time data access
  - Transactional decision support
  - KPI-driven process handling

Exceptions (related to visualization preferences, cost, time, ...)

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Questions?

For questions after this session, contact us at eva.szabo@sap.com and dayanand.karalkar@sap.com
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