

Introduction to Extracting data from S/4HANA with ABAP CDS-views

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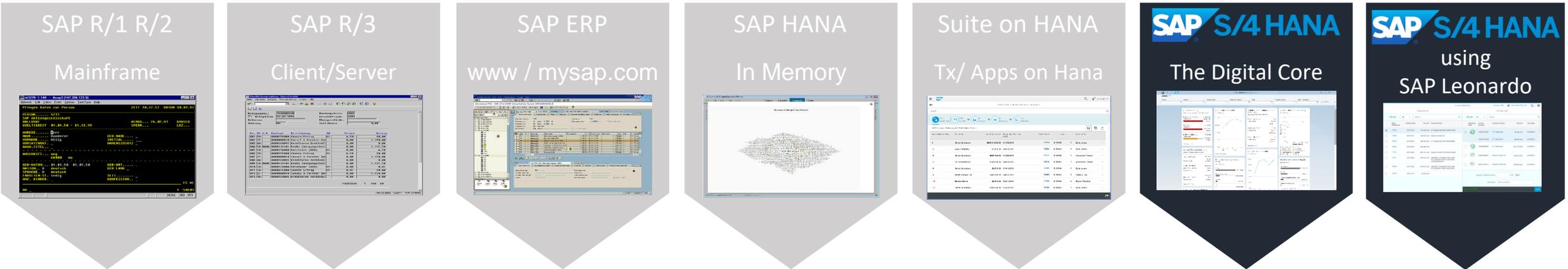
Analytics and Insight – Principal Consultant

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



1972

1992

1997

2004

2011

2012/2013

2015

2016

2017

SAP BW 1.0

SAP BW on any DB

SAP BW on HANA

SAP BW/4HANA

- Initial Release for SAP Reporting

- Operational Reporting
- Data warehousing

- High Performance Data Warehousing
- Strategic Planning Scenarios

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

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

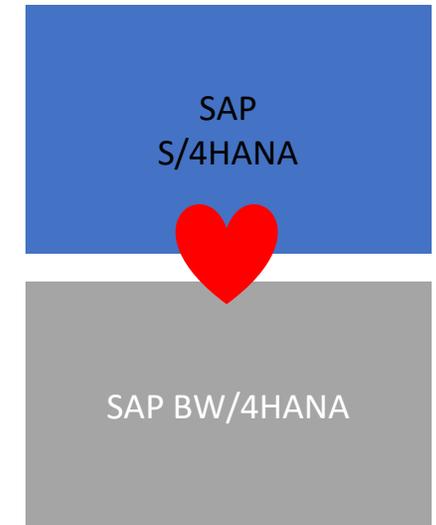
- SAP S/4HANA is the next generation intelligent ERP and part of an Intelligent Enterprise - sized, tuned, and maintained for optimal performance as transactional system
- A modern simplified architecture, the new user experience (SAP Fiori) and integrated intelligent technologies such as Machine Learning 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)



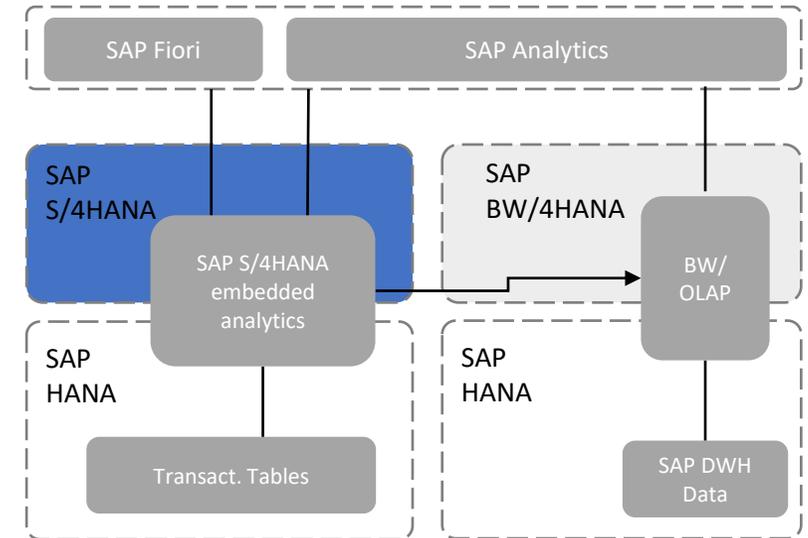
Why SAP BW/4HANA for SAP S/4HANA?

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.

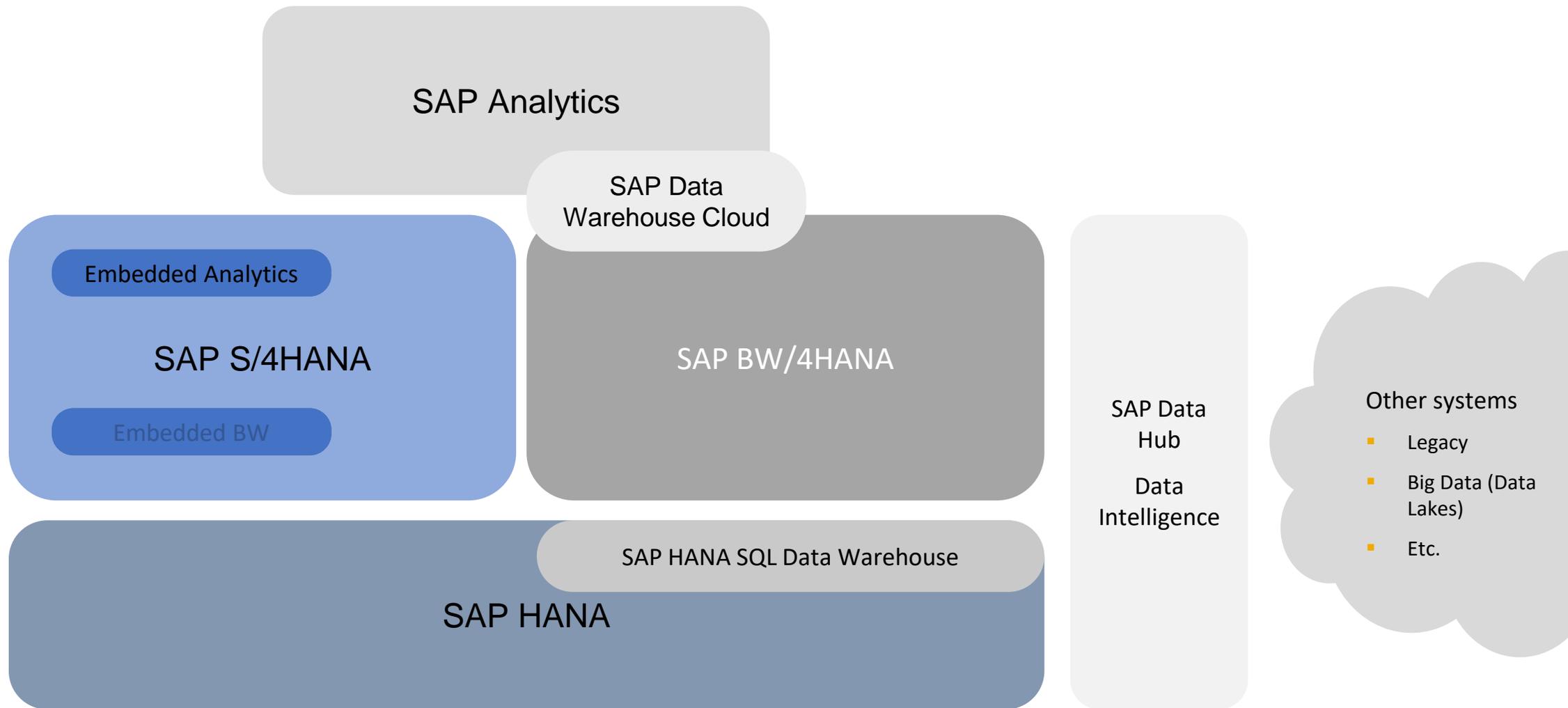
Examples for best-in-class integration are:

- 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

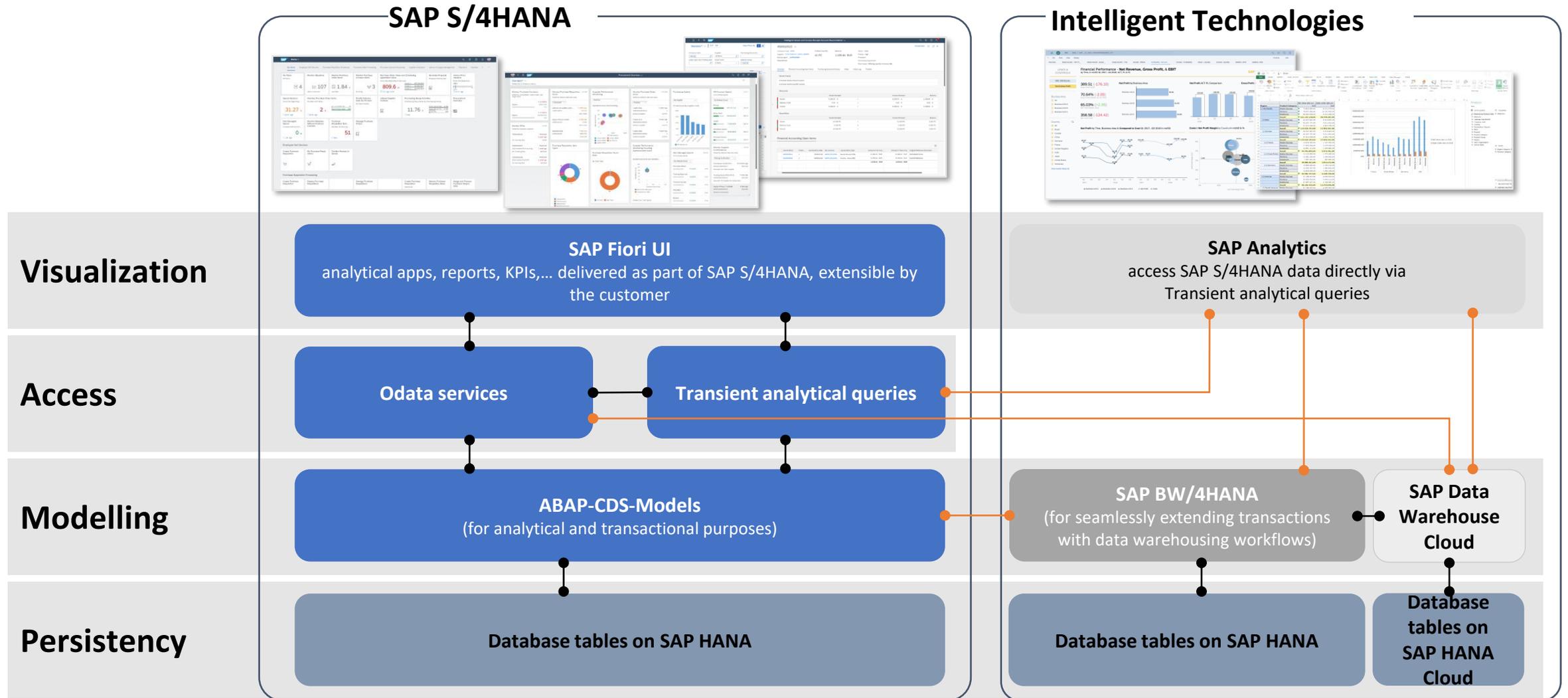


Embedded BW:

- 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](#).



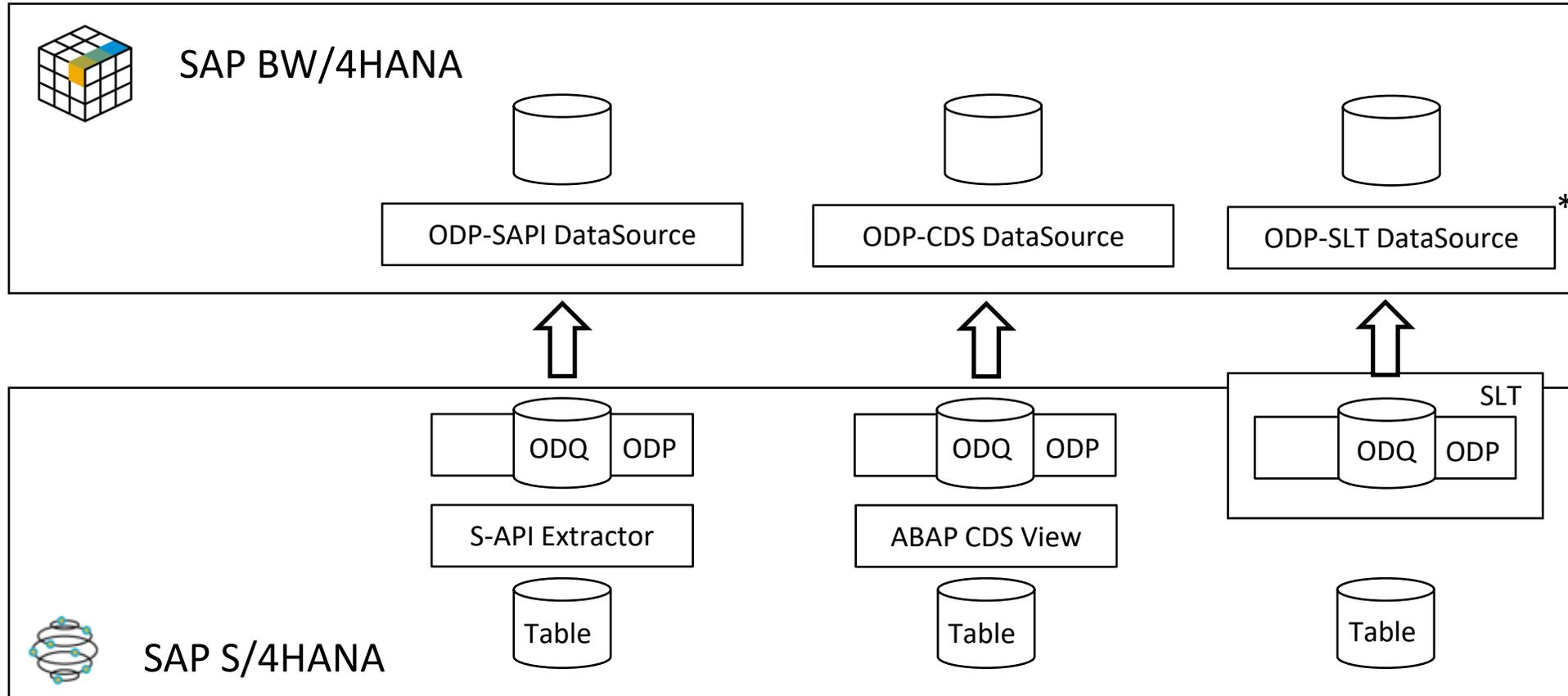
Analytics with SAP S/4HANA – high level architecture



Data Integration from SAP S/4HANA (on-premise) to SAP BW/4HANA and SAP BW Comparison

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

Data Integration from SAP S/4HANA (on-premise) to SAP BW/4HANA and SAP BW



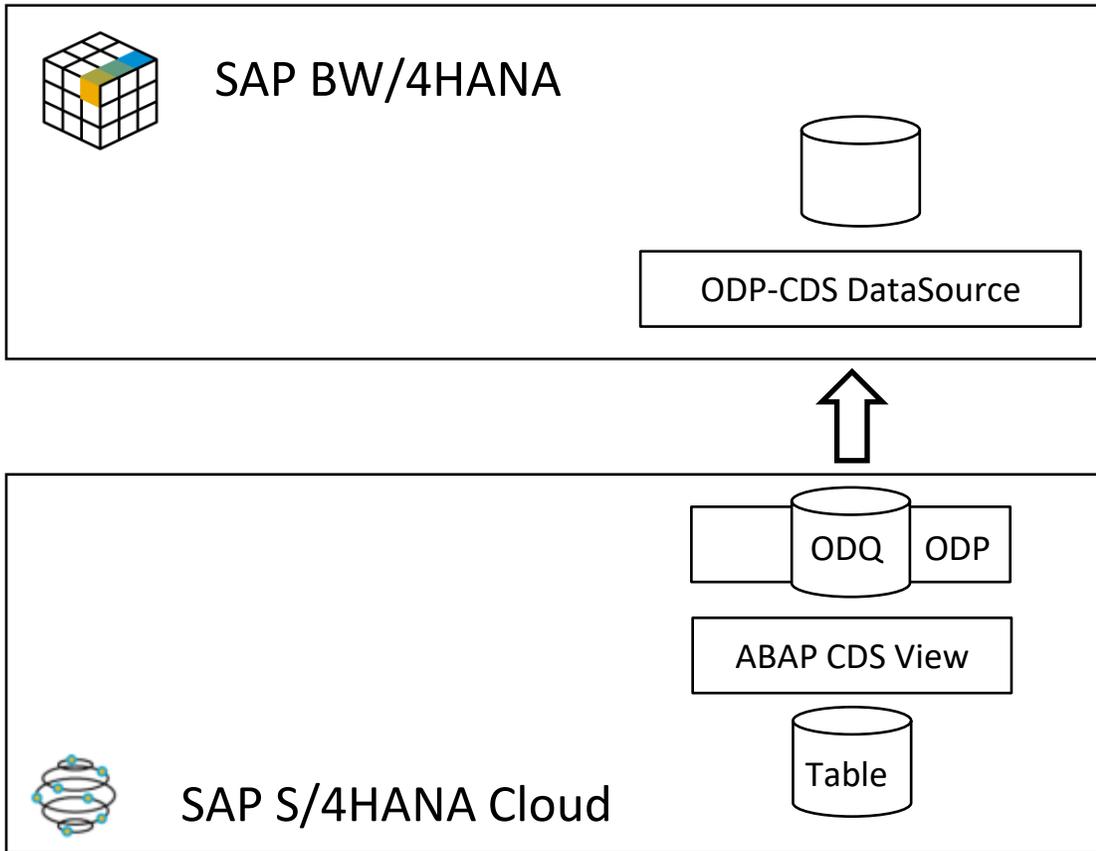
Further Information

- [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](#)

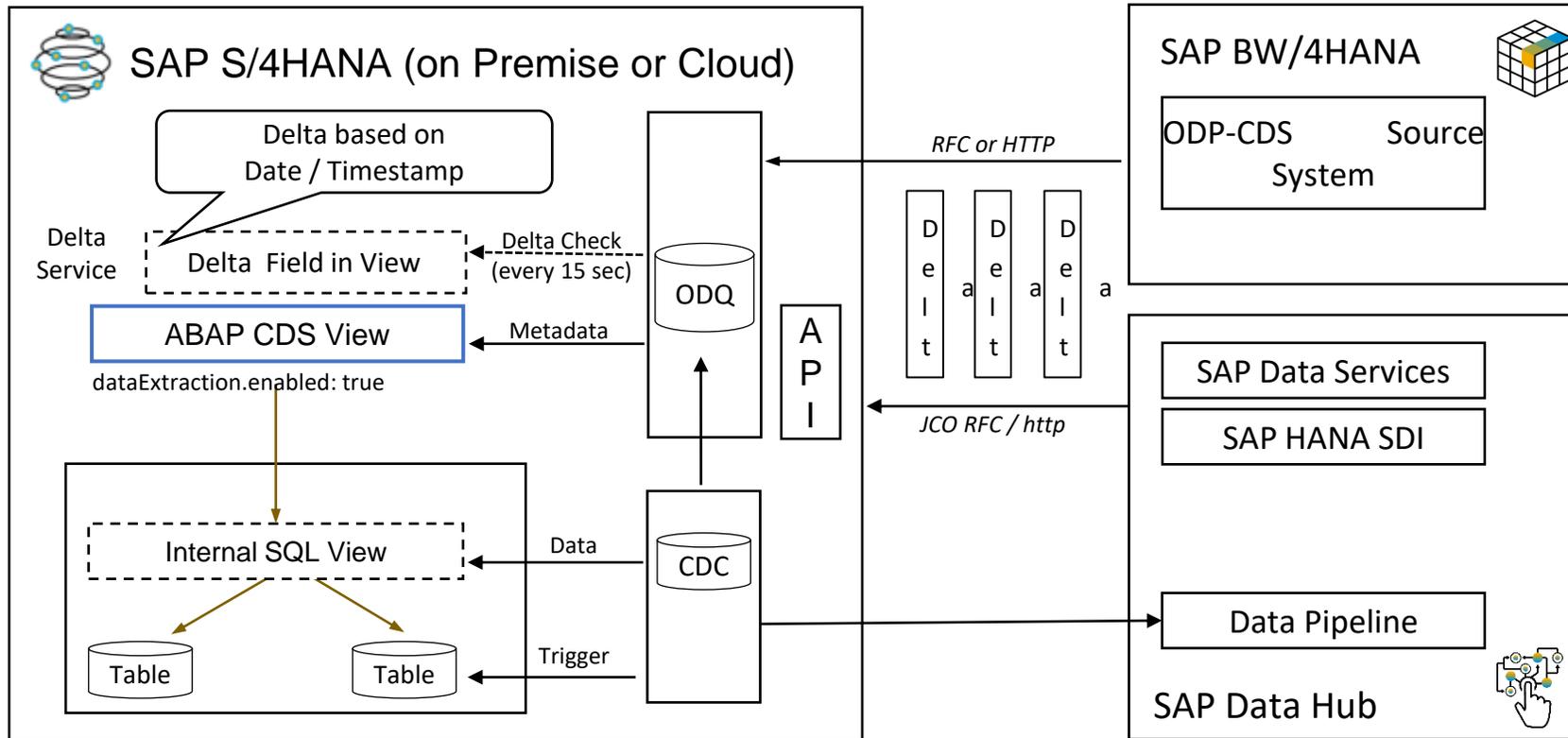
- [Documentation](#)
- [Real-Time Replication using Operational Data Provisioning \(ODP\) >= SAP BW 7.40](#)

* 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.CHANGEDATACAPTURE:

S/4 HANA Cloud – BW On-Premise extraction Overview



HTTPS



Define Inbound Communication using
Communication Management

Utilises Standard Communication Scenario
SAP_COM_0042

[Communication Management](#)

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

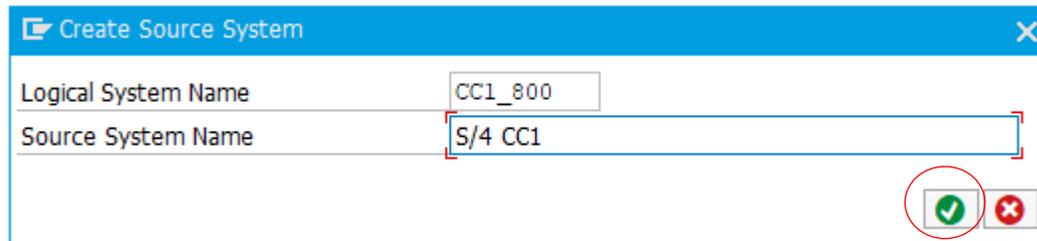


□ **Business Role for Communication Management Configuration: SAP_BR_ADMINISTRATOR**

□ **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



Create Source System

Logical System Name: CC1_800

Source System Name: S/4 CC1

Buttons: [Green Checkmark] [Red X]

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



Select Communication Channel

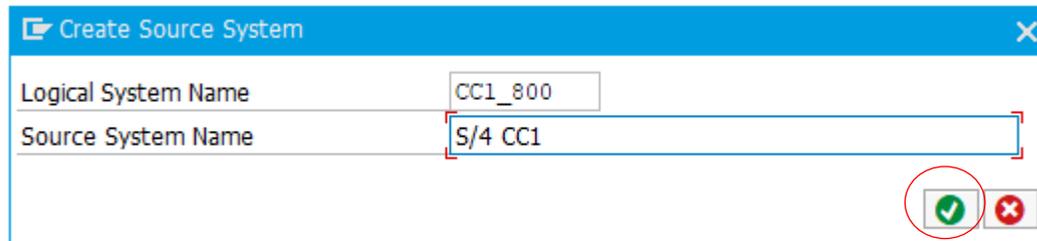
Connect the system using RFC or HTTP/SOAP?

Buttons: [RFC] [HTTP/SOAP] [Cancel]

- ❑ Configure Logical Port in SOA Manager

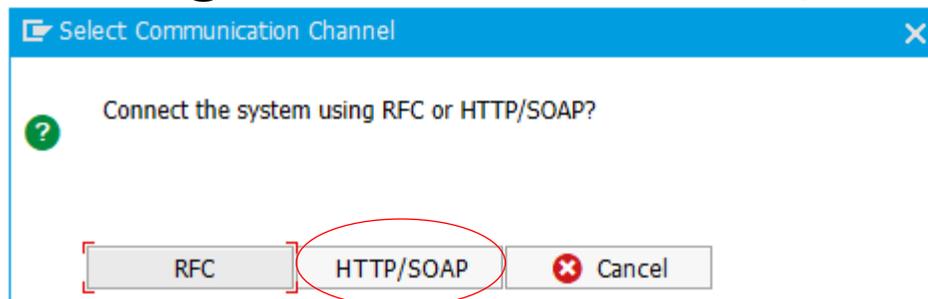
SAP BW Creation of ODP(HTTP) Source System

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



The screenshot shows a dialog box titled "Create Source System". It has two input fields: "Logical System Name" with the value "CC1_800" and "Source System Name" with the value "S/4 CC1". At the bottom right, there are two buttons: a green checkmark button (highlighted with a red circle) and a red 'X' button.

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



The screenshot shows a dialog box titled "Select Communication Channel". It contains the text "Connect the system using RFC or HTTP/SOAP?". Below the text are three buttons: "RFC", "HTTP/SOAP", and "Cancel". The "HTTP/SOAP" button is highlighted with a red circle.

- ❑ Configure Logical Port in SOA Manager

Create a CDS Source system in BW

ODP - BW	ODP_BW
ODP - SAP (Extractors)	ODP_SAP
ODP - SAP HANA Information Views	ODP_HANA
ODP - SLT Queue	ODP_SLT
ODP - ABAP CDS Views	ODP_CDS
ODP - SAP Business ByDesign	ODP_BYD
ODP - Other Contexts	ODP
File	FILE
SAP HANA Local Database Schema	HANA_LOCAL
SAP HANA Smart Data Access	HANA_SDA
SAP HANA Tenant Database Schema	HANA_MDC
Big Data	BIG_DATA

Create Source System

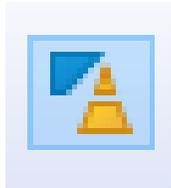
Logical System Name

Source System Name

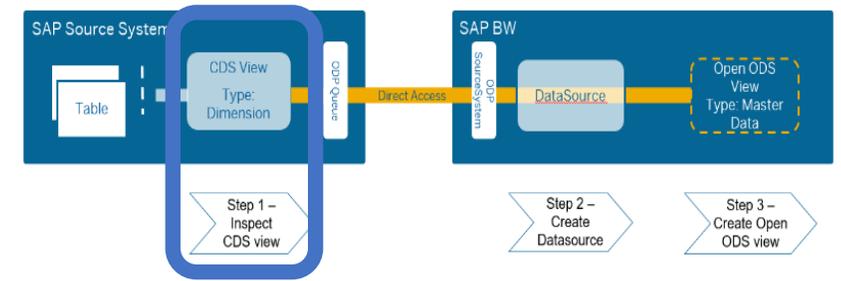
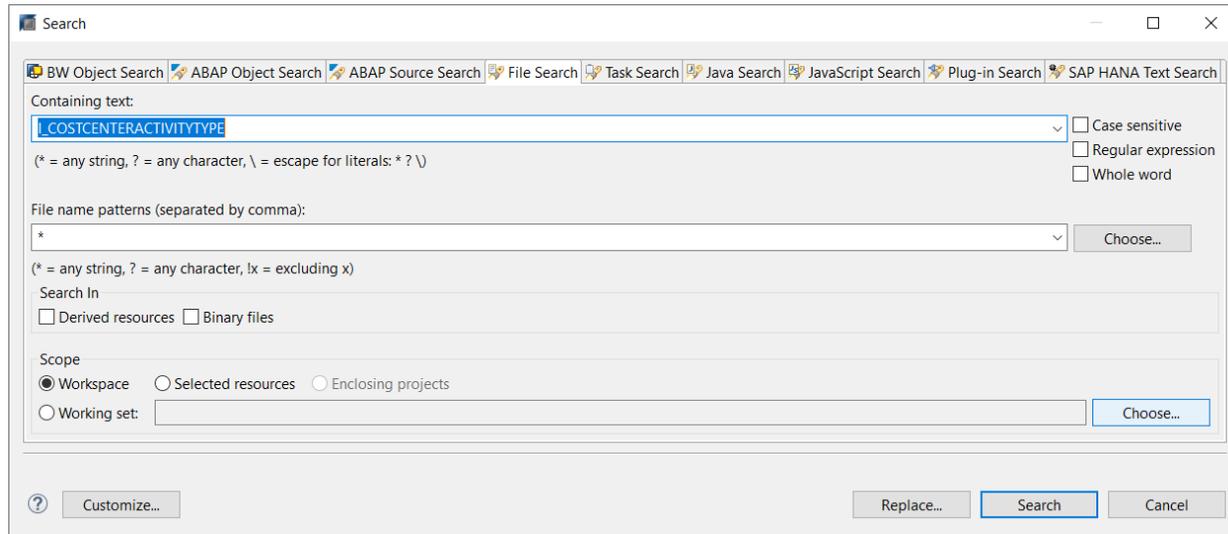
Create ODP Source System

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

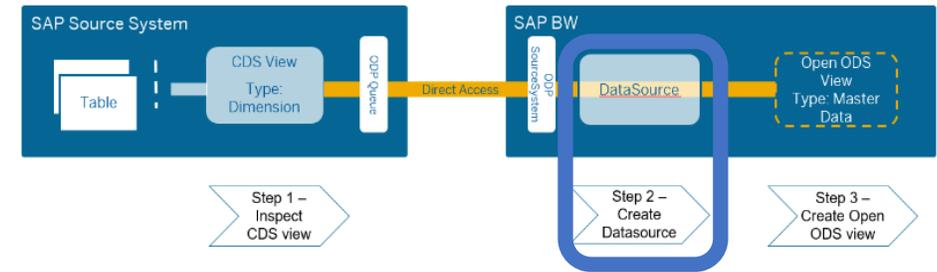


- ▼ QE4_715_szaboev_en [QE4_715_szaboev_en]
- ▼ All Packages (ABAP Package)
 - 📄 I_COSTCENTERACTIVITYTYPE (Data Definition)
 - 👤 I_COSTCENTERACTIVITYTYPE (Data Definition)

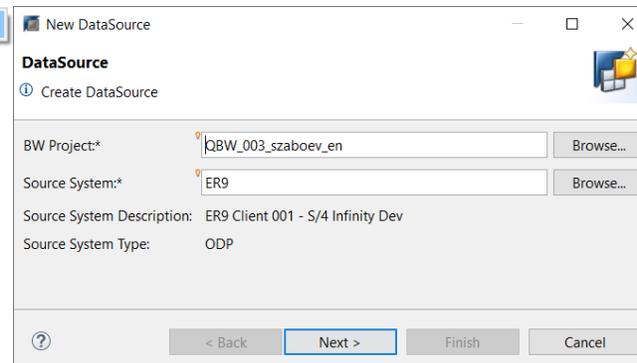
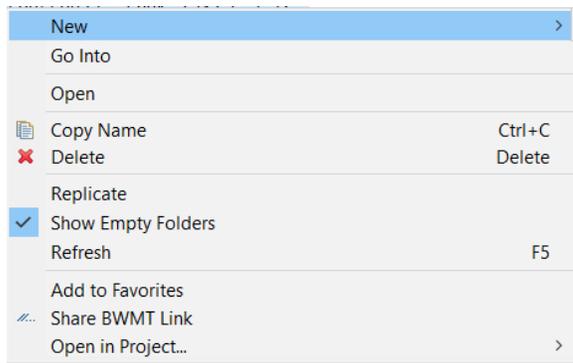
The CDS view name, Analytics data Category and SQL view name are needed for the following steps

```
@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
```

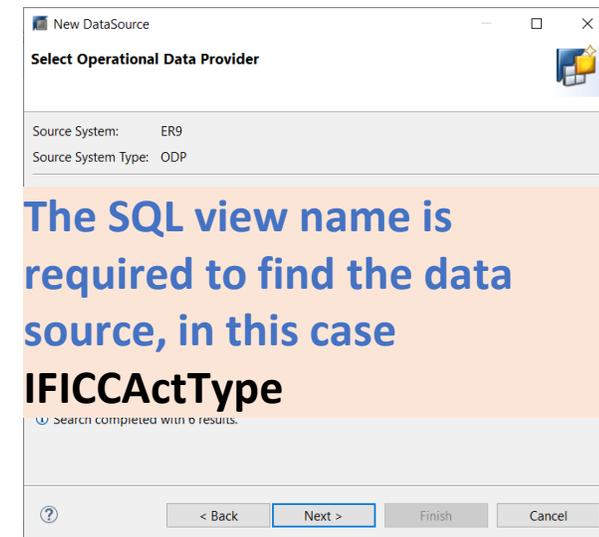
Attach extraction enabled CDSV to dataflow



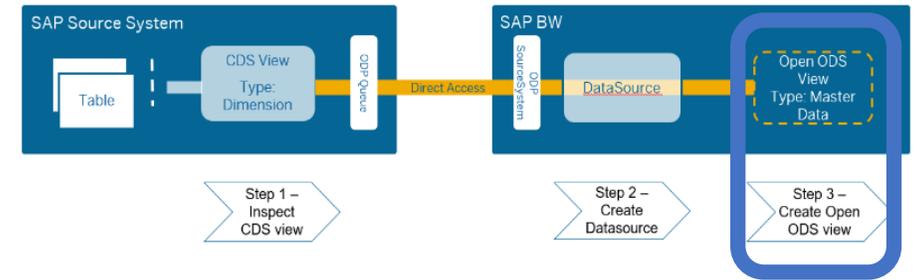
- Switch to the BW perspective:
- For S-API extractors, we used the option “replicate data sources”. The procedure to make CDSVs available as an extractor on the BW is a bit different.



Proposal from Operational Data Provider



Consume the data from the CDSV with BW-MT



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

The screenshot shows the 'New Open ODS View' wizard in SAP GUI. The 'Open ODS View' dialog is open, showing fields for BW Project (QBW_003_szaboev_en), InfoArea (ESAC), Name (CCACTYPE), and Description (Cost Center Activity Type). The 'Semantics' section has 'Master Data' selected. A context menu is visible over the dialog with 'Open ODS View...' selected.

The 'Source Type' dialog box shows the following options:

- DataSource (BW)
- Database Table or View
- DataStore Object (advanced)
- Transformation

The 'New Open ODS View' wizard shows the 'Select a DataSource' step. The search results list several items, with '(IFICCACTCTRL] Cost Center Activity Type (ESAC) [ER9] (IFICCACTCTRL)' selected.

Press finish and activate. This ODS view has direct access to the CDSV with this BW datasource. Use



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

	S/4 Cloud	S/4 On Premise
How to find extraction CDS views	In View Browser App Restrict to “Released Views and search for @Analytics.dataextraction.enabled:true	
What can I extract	Master Data, Text, Hierarchies & Transactional data	
Communication	S/4 Scenario SAP_COM_0042 & HTTPS source system in BW	ODP source system of type ABAP CDS using RFC
Delta Extraction	CDC delta since 1905 Timestamp based delta before 1905	CDC Delta since 1909 Timestamp based delta before 1909
Monitoring Data extraction	FIORI app “Operational Data Provisioning Monitor Queues”	Transaction ODQMON
Enhancement Options	<u>Planned</u> to have an option to include extraction views in “Custom CDS View” app Few of the delivered views are registered for Filed Extensibility	Customers can create own CDS views
ODP BADIs	Not applicable	Not possible to enhance using ODP BADIs

Overview of available Content

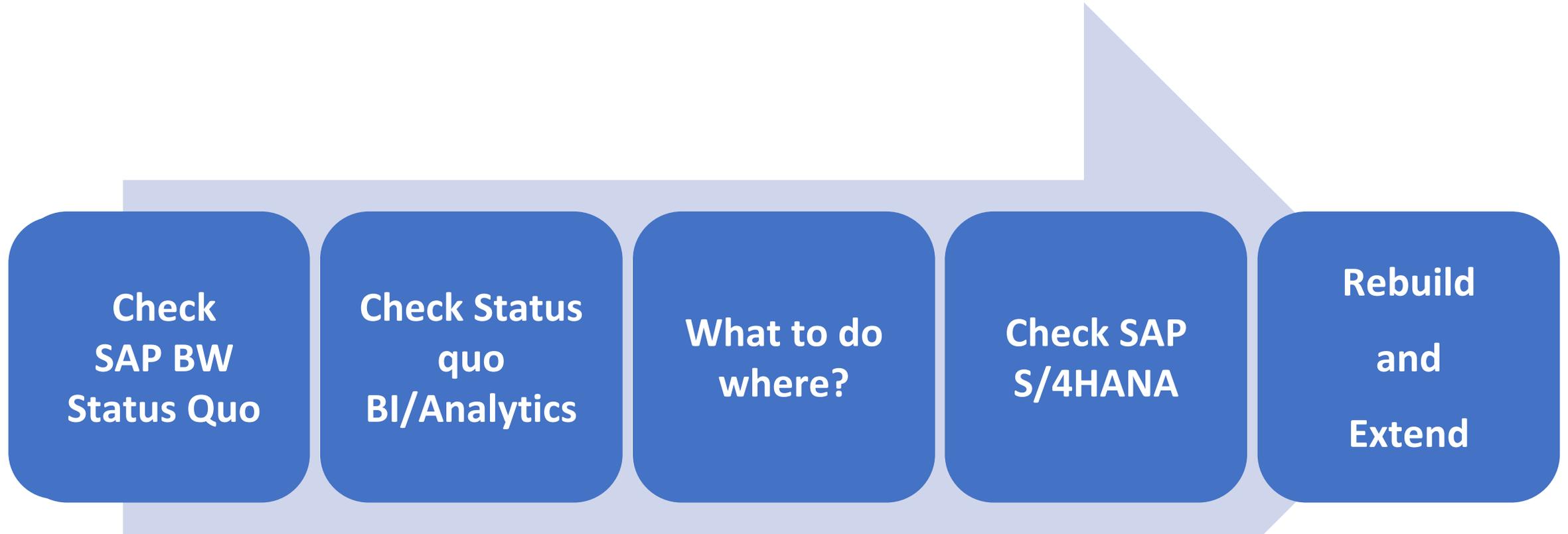
CDS Name	Data Source	CDS Description	Application Component	CDC Enabled
C_BillgDocltnPrcgElmntBscDEX	CSDBDOCITMPEBCDX	'Data Extraction for Billing Doc Item Pricing Element Basic'	SD-ANA	TRUE
C_BillingDocumentItemBasicDEX	CSDBILDOCITMBCDX	'Billing Document Item Basic Extraction Data'	SD-ANA	TRUE
C_FinancialPositionQuery	CFINPOSQ	'Financial Status Query'	FIN-FSCM-TRM	FALSE
C_LiquidityPositionQuery	CLPOSQ	'Cash Position and Liquidity Forecast Query'	FIN-FSCM-CLM	FALSE
C_PurchaseOrderItemDEX	CMMPOITMDX	'Data Extraction View for PO Item'	MM-IS-PU-RPT	TRUE
C_PurchasingOrganizationDEX	CMPURORGDX	'Purchasing Organization Data Extraction'	MM-IS-PU-RPT	FALSE
C_SalesDocltnPrcgElmntDEX	CSDSDOCITMPEDX	'Data Extraction for Sales Document Item Pricing Element'	SD-ANA	TRUE
C_SalesDocumentItemDEX	CSDSLSDOCITMDX	'Data Extraction for Sales Document Item'	SD-ANA	TRUE
C_SalesOrganizationDEX	CSDSALESORGDX	'Sales Organization Data Extraction'	SD-ANA	FALSE
FISVD_HRRP_NODE_DEX	FISVDHRRPNODE	'Extraction view for HRRP_NODE'	FI-GL-IS	TRUE
FISVD_HRRP2SEMTA_DEX	FISVDHRRPSEMTA	'Extraction for semantic tag mapping to hierarchy'	FI-GL-IS	TRUE
I_ABCIndicatorText	IABCINDICTEXT	'ABC Indicator Text'	PM-EQM-EQ	FALSE
I_AccountingClerk	IFIACCCLERK	'Accounting Clerk'	FI-GL-IS	FALSE
I_AccountingDocumentCategory	IFIACCDOCCAT	'Accounting Document Category'	FI-GL-IS	FALSE
I_AccountingDocumentCategoryT	IFIACCDOCCATT	'Accounting Document Category Text'	FI-GL-IS	FALSE
I_AccountingDocumentType	IFIACCDOCTYPE	'Journal Entry Type'	FI-GL-IS	TRUE
I_AccountingDocumentTypeText	IFIACCDOCTYPET	'Accounting Document Type Text'	FI-GL-IS	TRUE
I_AdditionalCustomerGroup1Text	ISDADDLCUSTGRP1T	'Additional Customer Group 1 Text'	SD-BF-ACT	FALSE



CDSV Extr 2002

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, ...) →

Questions?

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

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