DAT161

Integrating SAP S/4 HANA into SAP Data Intelligence

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Agenda

SAP Data Intelligence Overview of Connectivity & Data Integration

- Overview of Connectivity & Integration
- ABAP Integration with SAP Data Intelligence

Outlook

- Pipelines with Resiliency
- Replicating Data with Replication Flows

Deep Dive on Integration of SAP S/4 HANA with SAP Data Intelligence

- Creation of S/4HANA CDS Views
- Integration of Function modules

Hands-on Workshop and Exercise Scenarios

- Integrating S/4HANA CDS Views with SAP Data Intelligence incl. Delta Load
- Integration of a Custom ABAP Operator into SAP Data Intelligence

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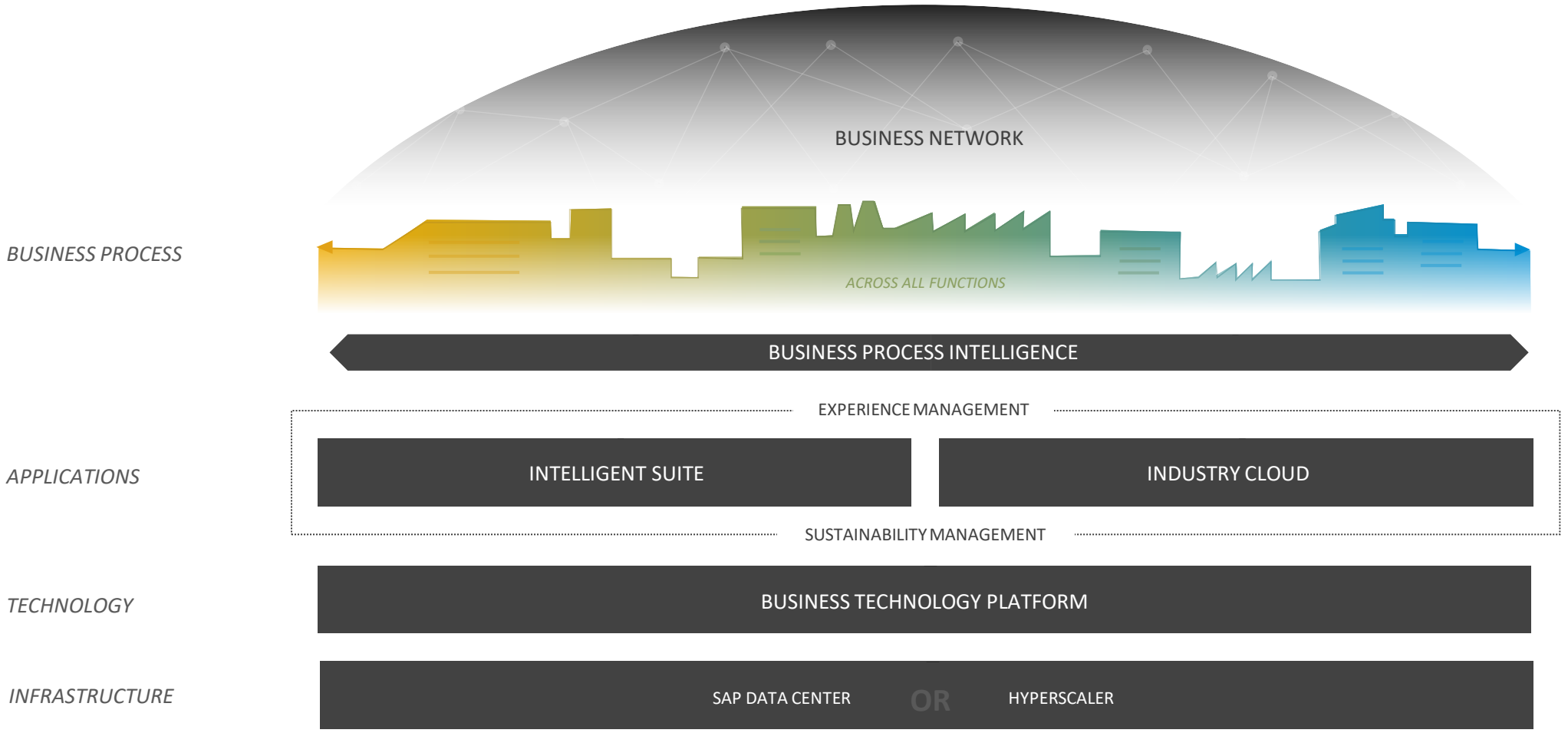
INTELLIGENT ENTERPRISE

Evolved Vision.



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Access to the SAP Data Intelligence environment

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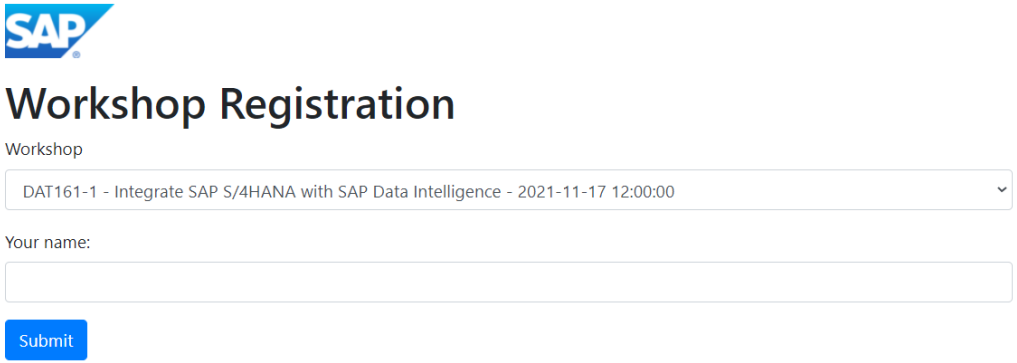
Therefore, SAP provided a specific User Registration Tool:
https://workshop_registration.cfapps.eu10.hana.ondemand.com/register/dat161-1 (Group 1 - Wednesday Session)
https://workshop_registration.cfapps.eu10.hana.ondemand.com/register/dat161-2 **(Group 2 - Thursday Session)**



After having successfully obtained the credentials for the SAP Data Intelligence system, you can login as follows:

- In a Chrome or Firefox Browser, open the following link to the SAP Data Intelligence Cluster: https://vsystem.ingress.dh-93awrk8fy.dh-canary.shoot.live.k8s-hana.ondemand.com/login/?tenant=dat161-1
- The tenant name for workshop is dat161-1 (Group 1) and **dat161-2 (Group 2)**
- User credential as received from the user registration tool described above

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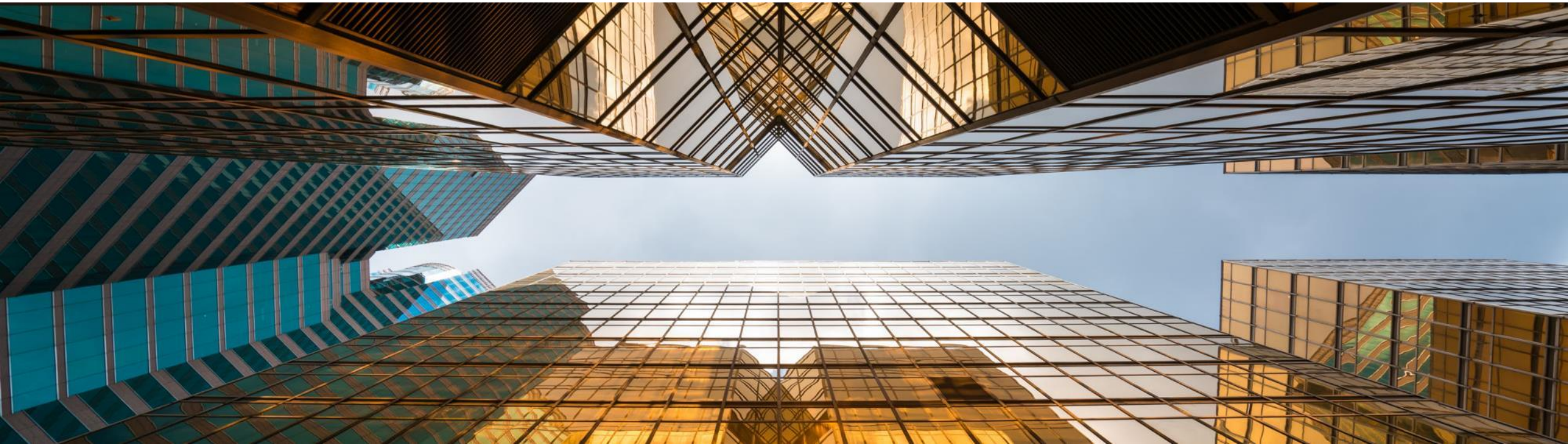
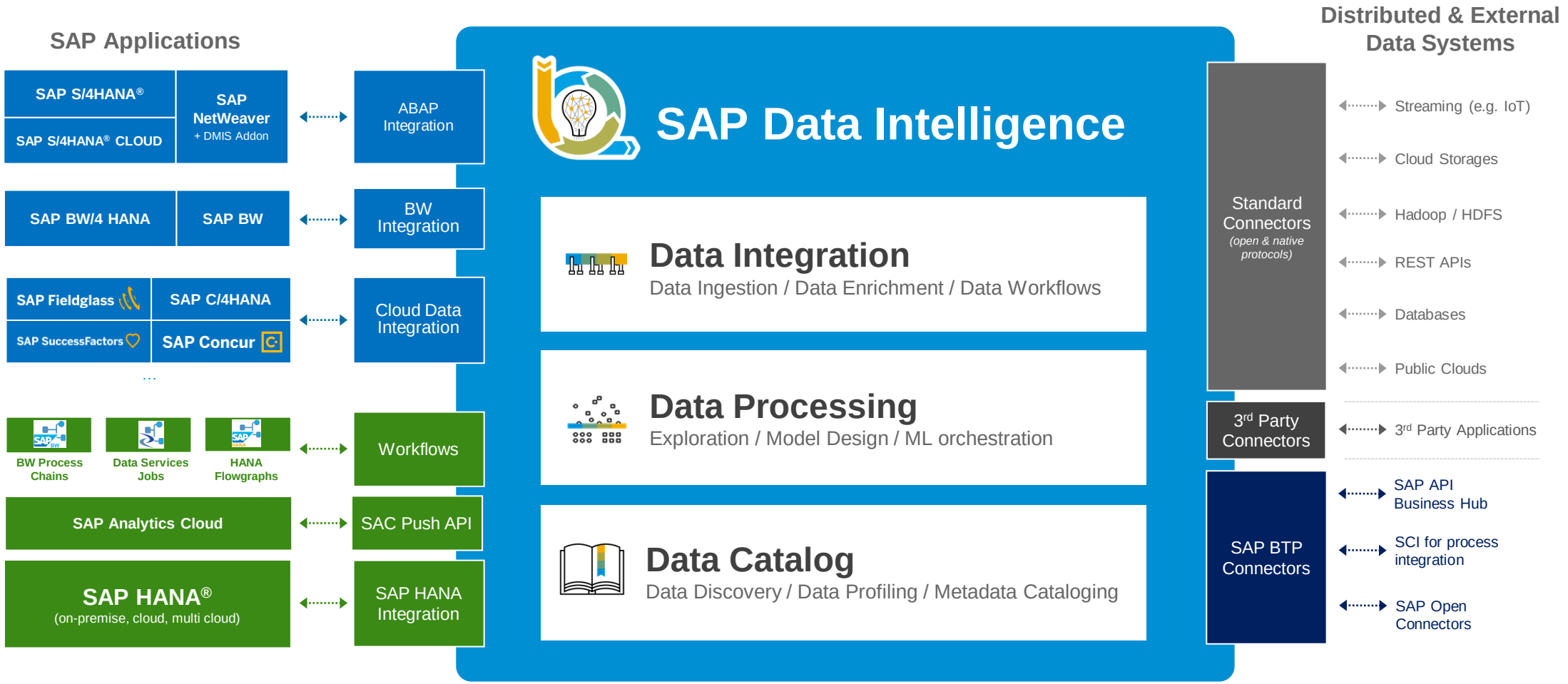
Connectivity & Data Integration

General Overview



SAP Data Intelligence Unified Data Integration for the Intelligent Enterprise



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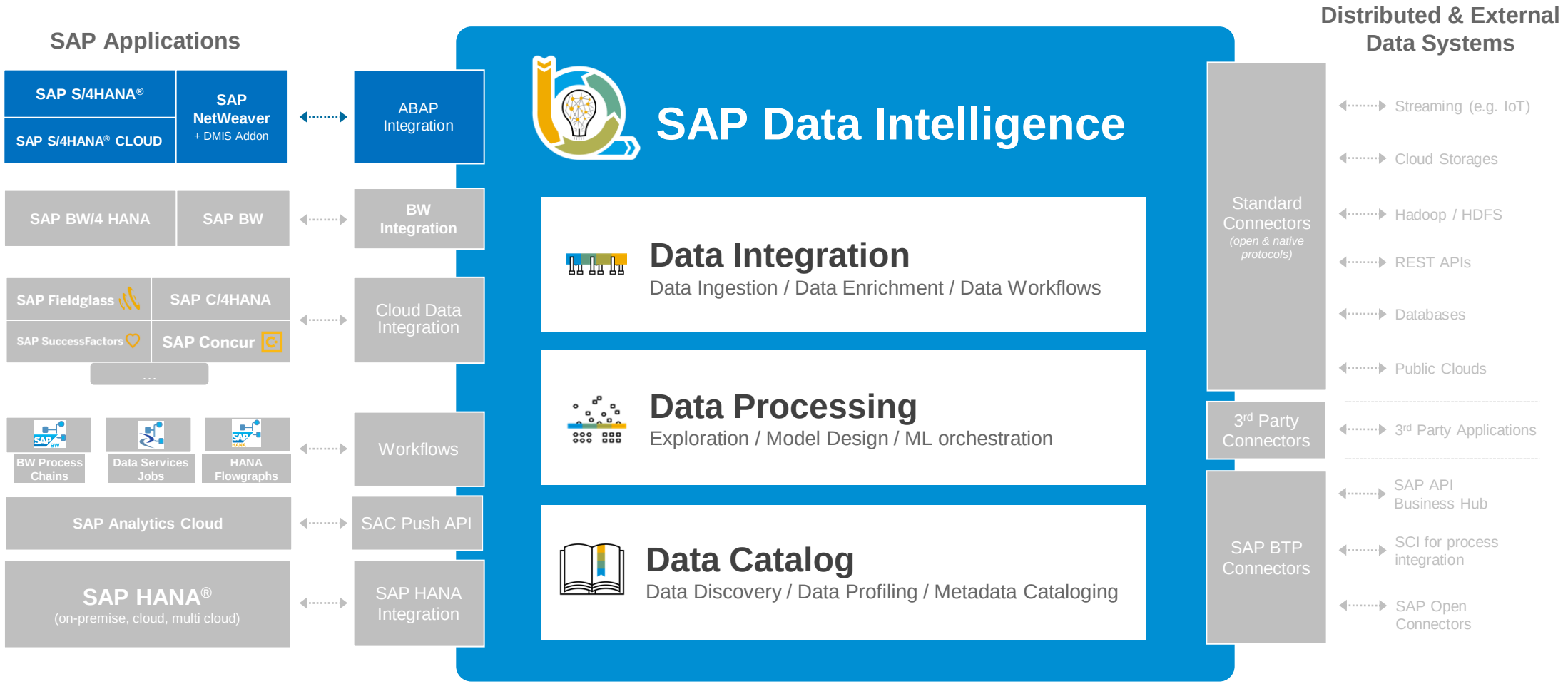
SAP Data Intelligence Unified Data Integration for the Intelligent Enterprise



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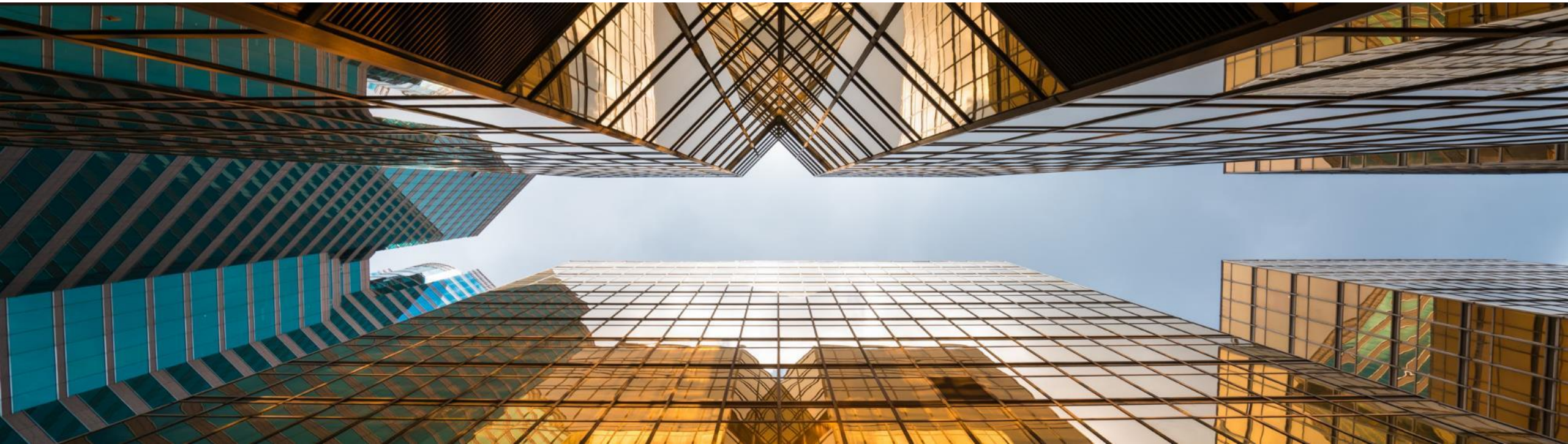
Connectivity & Data Integration

Overview of ABAP Integration



Overview of ABAP Integration in SAP Data Intelligence

Explanation of Terminology in the session

Term	Description
ABAP Pipeline Engine (APE)	Framework being available in the ABAP system that provides the necessary pre-requisites for integrating SAP Data Intelligence with SAP S/4 HANA, SAP Business Suite and SAP Business Warehouse (BW) systems.
Flowagent-based Integration	Flowagent is a component in Data Intelligence that provides access to various source systems via a Data Services (DS) Lite version, e.g. 3rd party databases but also ABAP Legacy systems via the ODP interface that do not have the APE available.
DMIS AddOn	DMIS is the ABAP Addon which is used for the ABAP Integration of SAP Business Suite and SAP BW systems with SAP Data Intelligence leveraging SAP LT Replication Server (SLT) as integration technology.
InA (Information Access Protocol)	Interface on SAP BW systems that provides access to BW data via REST-based HTTP/S protocol (e.g. Queries and InfoProvider objects).

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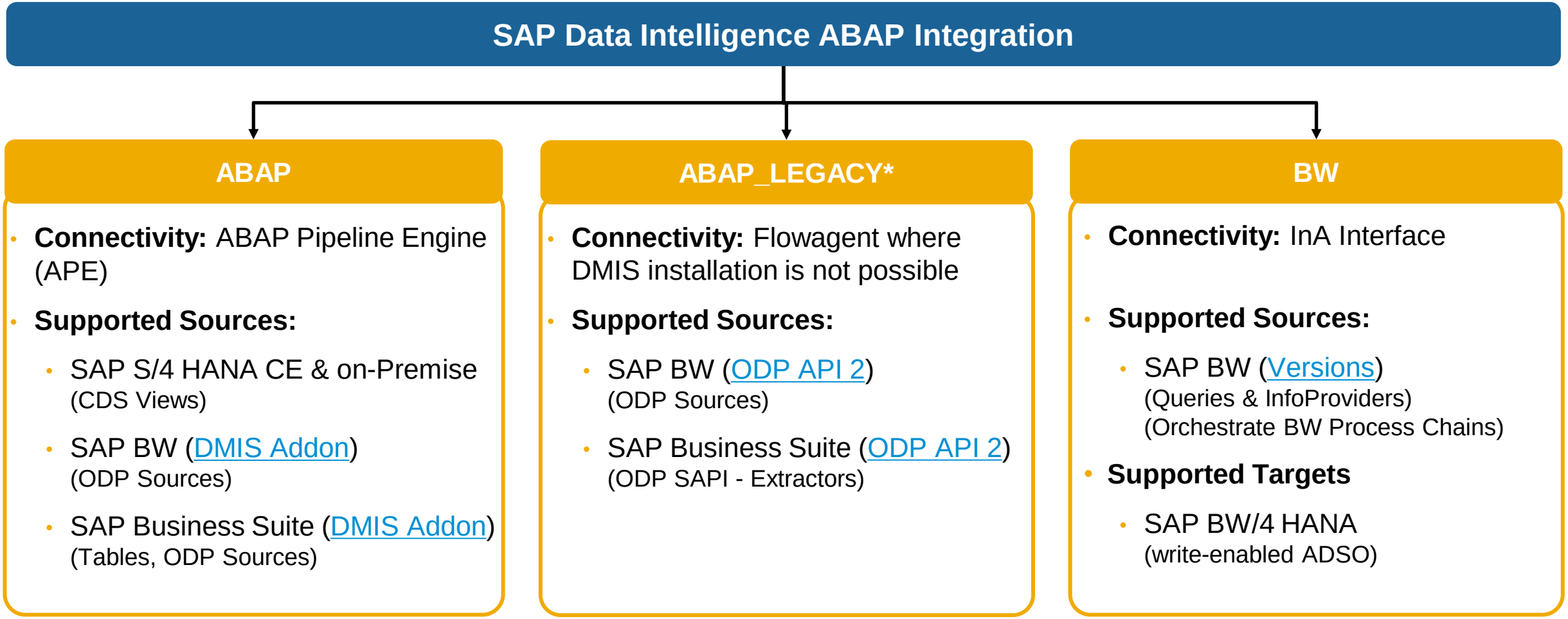
Overview of ABAP Integration in SAP Data Intelligence

Available ABAP Connection Types in SAP Data Intelligence



Detailed List of pre-requisites is available in the appendix of this presentation

* Needs to be activated in SAP Data Intelligence: link

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Overview of ABAP Integration in SAP Data Intelligence

Available Qualities per Connection Type

ABAP

- **Connectivity**
  - Protocols: RFC, WebSocket RFC
  - Message Server Support (DI Cloud)
  - SNC Encryption (DI Cloud)
  - SAP Cloud Connector
- **Metadata Explorer**
  - Search, Publish, Metadata + Enhanced Properties, Data Preview*
- **Pipeline Modeler**
  - Direct Pipeline Ingestion
  - Multiple Operator Versions with different qualities for CDS, SLT, ODP
  - Real-time Data Extraction (where supported by source)

ABAP_LEGACY

- **Connectivity**
  - Protocol: RFC
  - Message Server Support (DI Cloud)
  - SNC Encryption (planned)
  - SAP Cloud Connector
- **Metadata Explorer**
  - Search, Metadata, Data Preview
- **Pipeline Modeler**
  - Direct Pipeline Ingestion (ODP Object Consumer)
  - Integration with Structured Data Operators (SAP Application Consumer)
  - Batch Delta Extraction (where supported by source)

BW

- **Connectivity**
  - Protocol: HTTP/S
  - SAP Cloud Connector
- **Metadata Explorer**
  - Search, Metadata, Data Preview*
- **Pipeline Modeler**
  - Orchestrate BW Process Chains
  - Transfer data to object storage + HANA (Data Transfer)
  - No delta support out of the box (except using ODP via Data Transfer)

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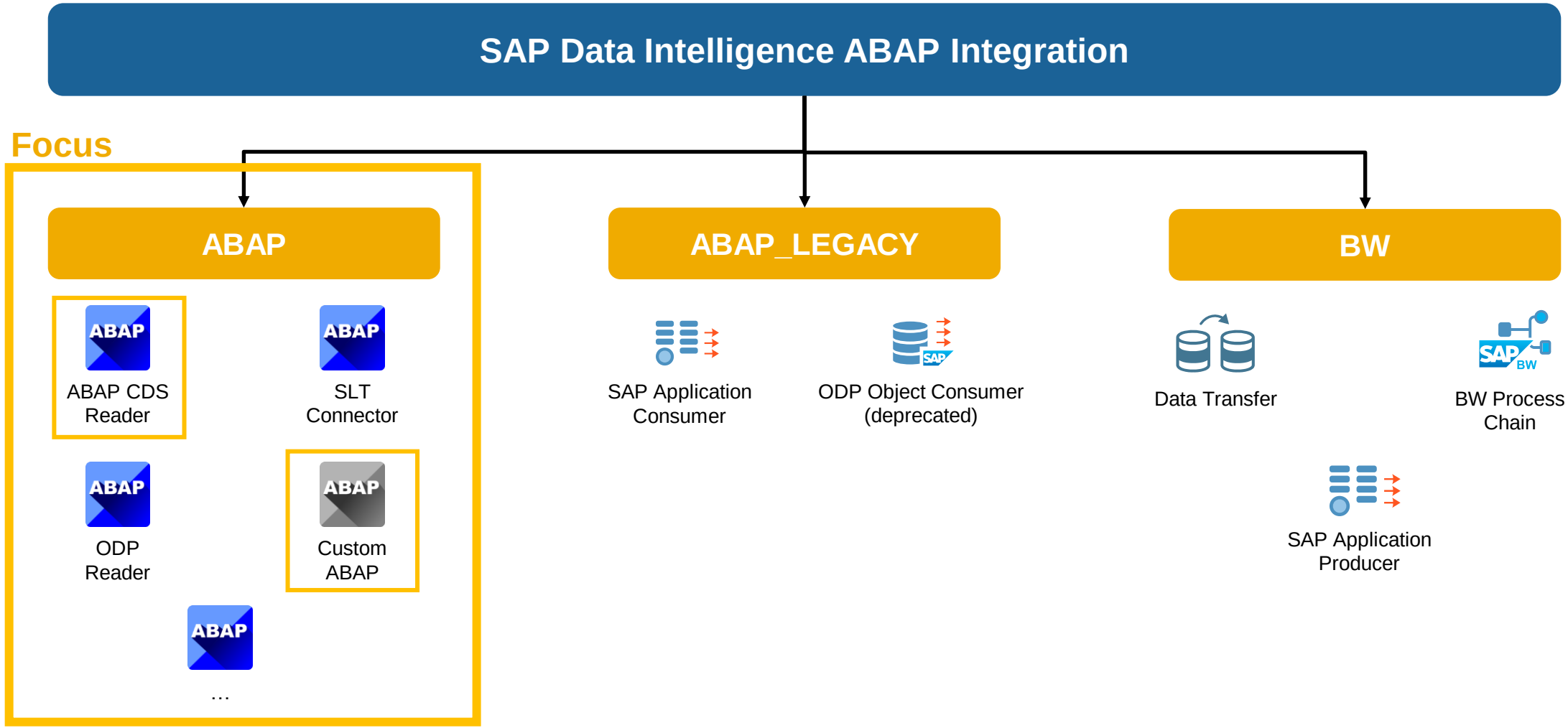
* with limitations

Overview of ABAP Integration in SAP Data Intelligence

Available Operators per Connection Type



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Overview of ABAP Integration in SAP Data Intelligence

Technical Concept - Delivery and Releases

SAP S/4HANA >= 1909 (with TCI)
SAP S/4HANA CE

→ **ABAP Pipeline Engine** included

✗ For all version below 1909 and CE 2002 no (direct) support possible

SAP Business Suite (≥ SAP NetWeaver 7.0)

→ **ABAP Pipeline Engine** comes with **DMIS***

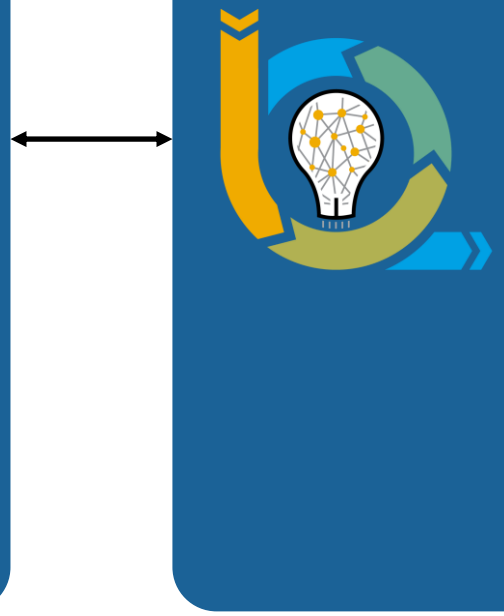
✗ For all version below NW 7.00 no **direct** support possible

→ **Systems with version >= 4.6C can be used via dedicated SLT Server****

SAP Business Warehouse (≥ 7.30 SP14)
SAP BW/4HANA

→ **ABAP Pipeline Engine** comes with **DMIS***

ABAP-based SAP system



SAP Data Intelligence

* Minimum DMIS 2011 SP 17 / DMIS 2018 SP02 depending on NW Release (Note), but it is highly recommended to use DMIS 2011 SP19 / DMIS 2018 SP04 or higher

** Considering SLT version dependency matrix

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Enterprise Application Integration

Unified integration model to consume and interact with SAP S/4HANA & SAP Business Suite systems

Predefined ABAP operators to consume and interact

ABAP CDS Reader	**ABAP CDS VIEW READER**	Operator that supports initial load and delta replication of CDS views.
SLT Connector	**SLT CONNECTOR OPERATOR**	Operator to communicate with SAP LT Replication Server (SLT). Leverage existing replication scenarios to bring data into a SAP Data Intelligence pipelines.
ODP Reader	**ODP READER**	Operator that can read from Operational Data Provisioning out of a SAP Business Warehouse or SAP BW/4HANA into SAP Data Intelligence.
Custom ABAP	**CUSTOM ABAP OPERATOR**	Operator to implement your ABAP custom code that will be executed as part of a pipeline in the connected ABAP system. For example to call a function module.

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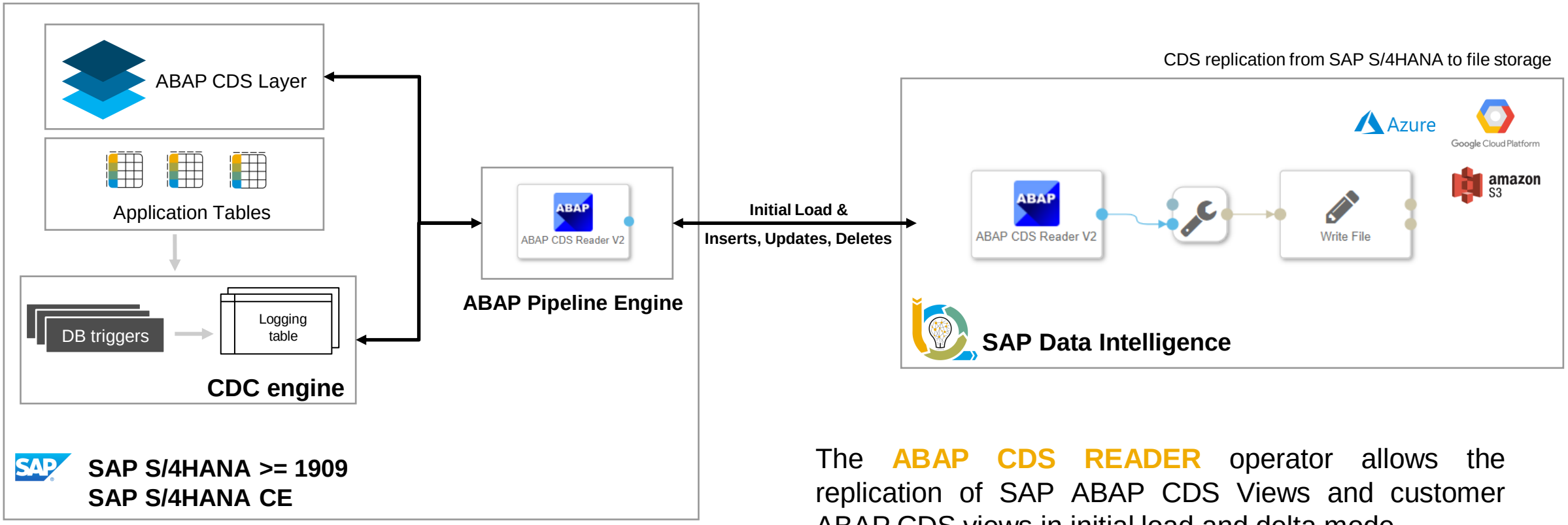
ABAP CDS Reader

Data provisioning for SAP S/4HANA

[CDS View Integration Example]

ABAP CDS is the semantically rich data model in SAP S/4 HANA and allows the consistent representation of a business object like a Business Partner.



The **ABAP CDS READER** operator allows the replication of SAP ABAP CDS Views and customer ABAP CDS views in initial load and delta mode.

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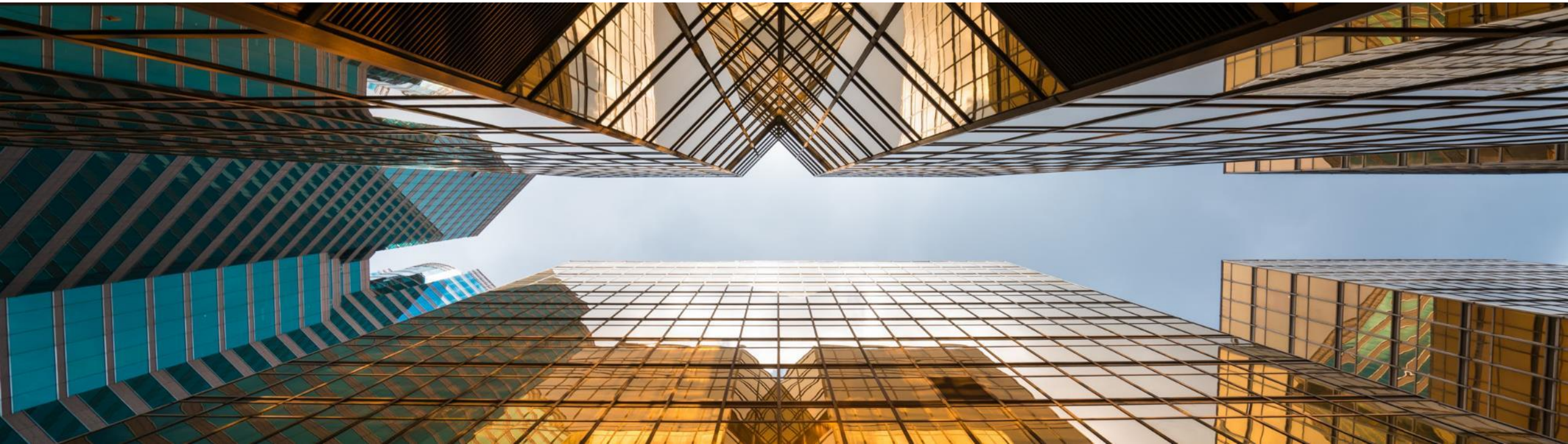
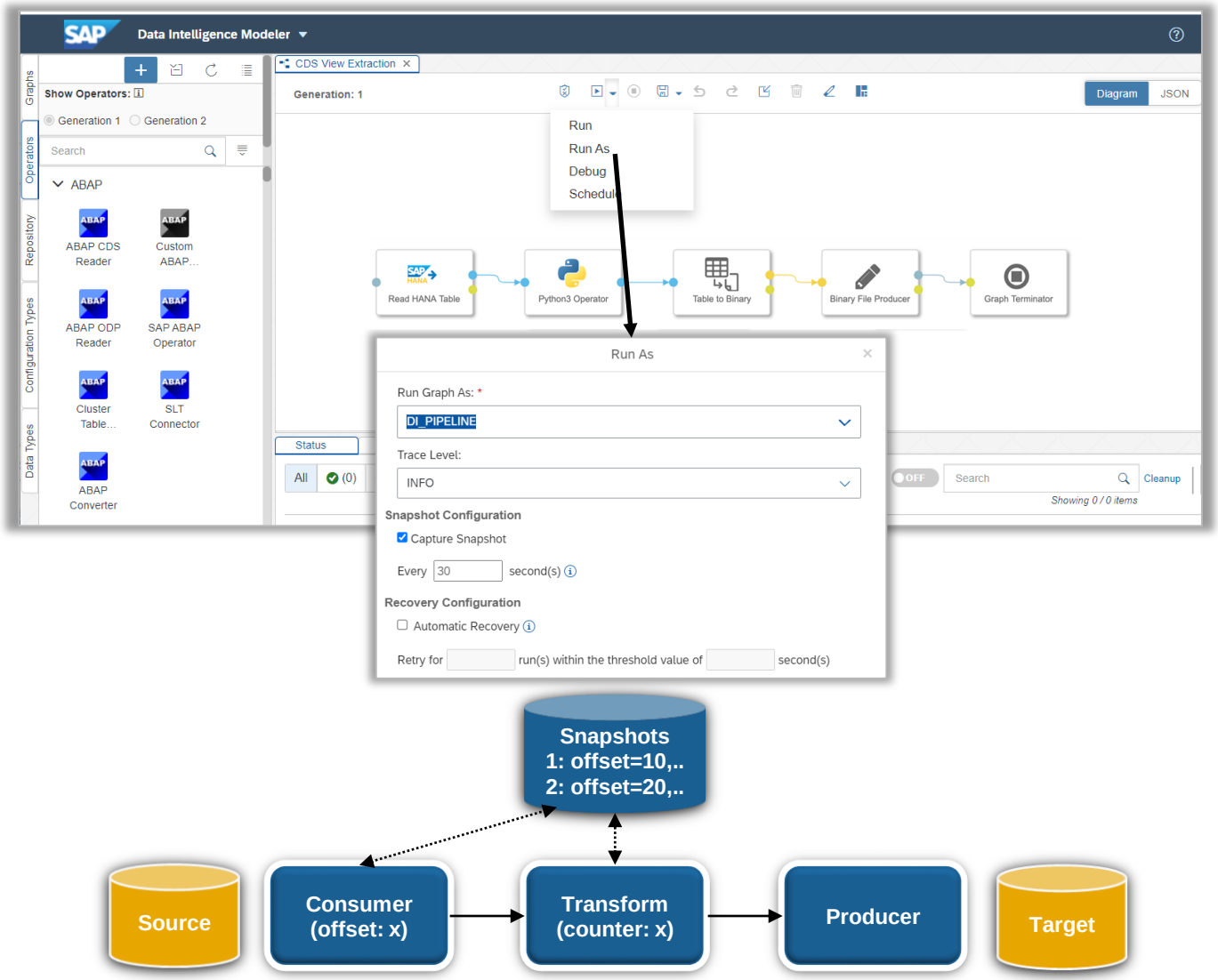
Outlook

What’s next in Connectivity & Integration



Outlook: Resilience Capability in Pipelines

- Operators save their state in form of a snapshot in a user defined interval
- Snapshots will save the state of a pipeline including operators
- Different Delivery Guarantees depending on qualities of target system (Database, Object Store, Kafka etc.)
  - at-least once guarantee or
  - exactly once guarantee
- Pipelines can be restarted & recovered automatically with defined interval & retries
- Resilience will be initially supported by pre-defined operators + step-wise adoption of additional operators in upcoming releases



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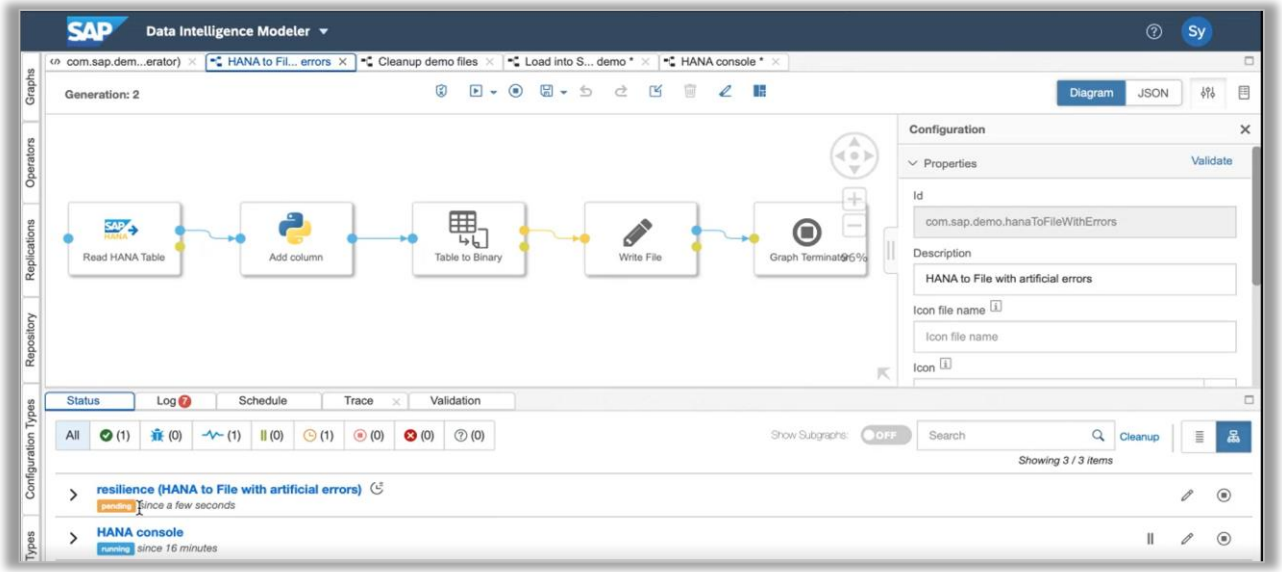
Planned: Subject to Change

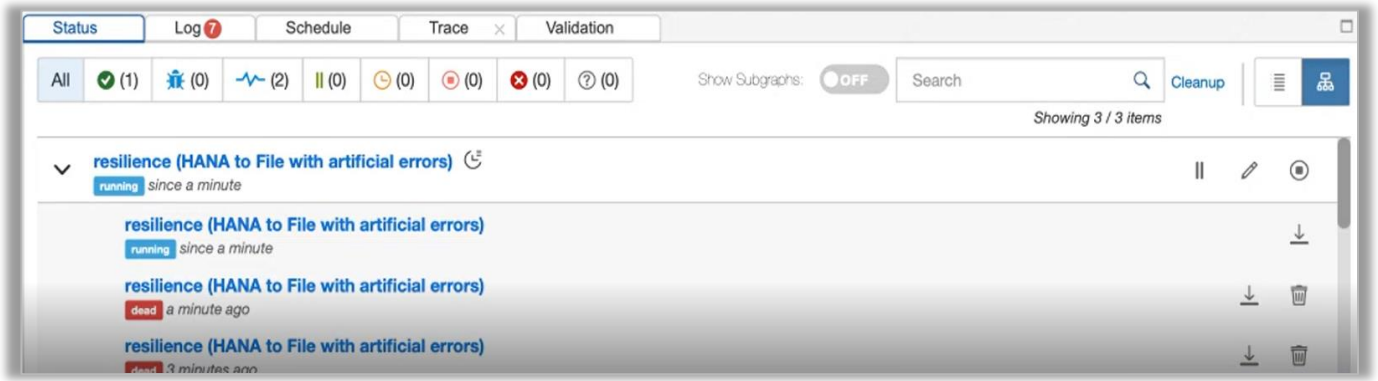
Outlook: Resilience Capability in Pipelines



Example Scenario:

Replicating data from SAP HANA to a Cloud Object Store (S3, GCS, ADL etc.) with enabled resilience for the DI pipeline incl. automatic graph restart in case of a unforeseen graph failure.

Data Intelligence will automatically restart failed graphs in a user defined interval and continue data load process where it stopped including the ability of “pausing & resuming” a graph.



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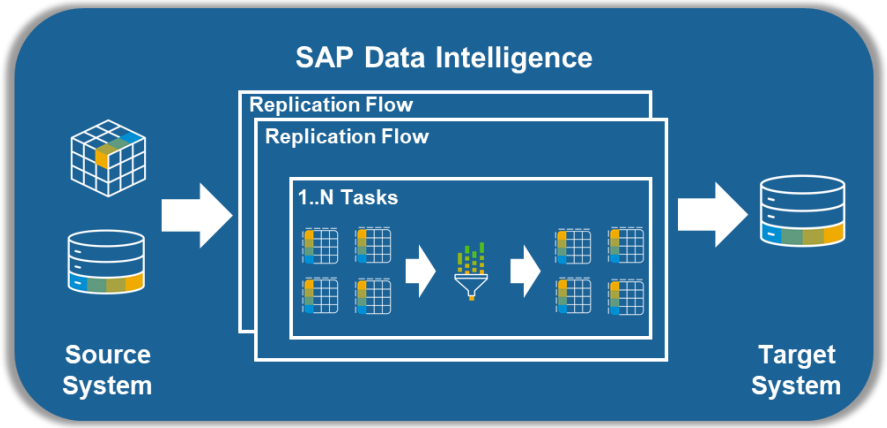
Outlook: Data Replication Enhancements

High-Level Overview & Concept of Replication Flows

Enhancement of Data Replication Use Cases in Data Intelligence

- Model Data Replication from a selected source to a selected target
- Initial Focus on 1:1 replication with simple projections and filters
- Dedicated User Interface for modeling Mass Data Replication
- Lower TCO and TCD for Data Replication
- Support Initial Load as well as Delta Load capabilities



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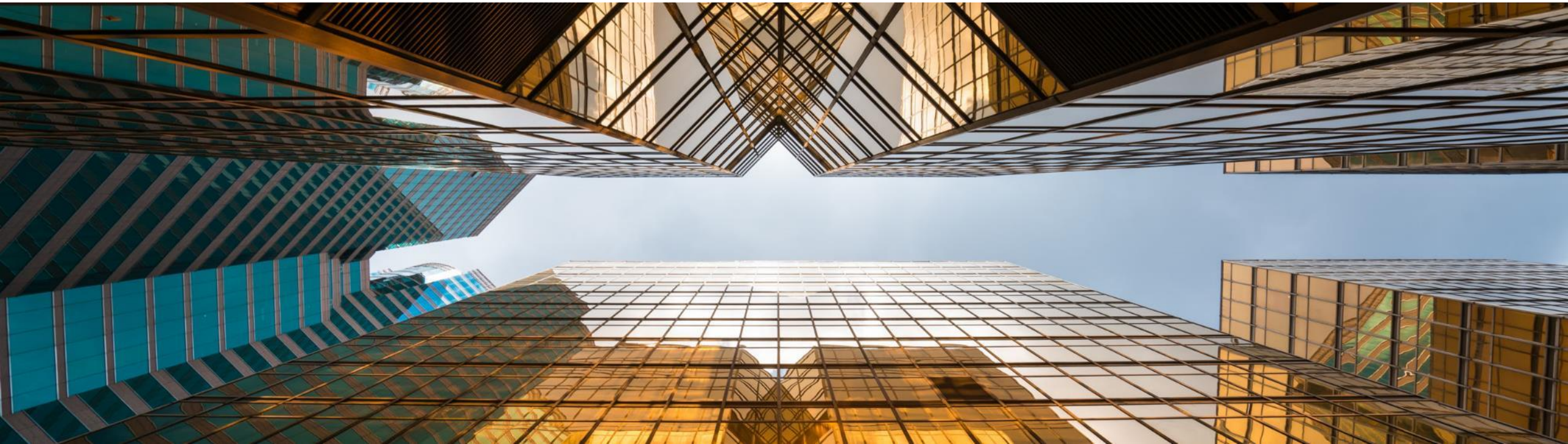
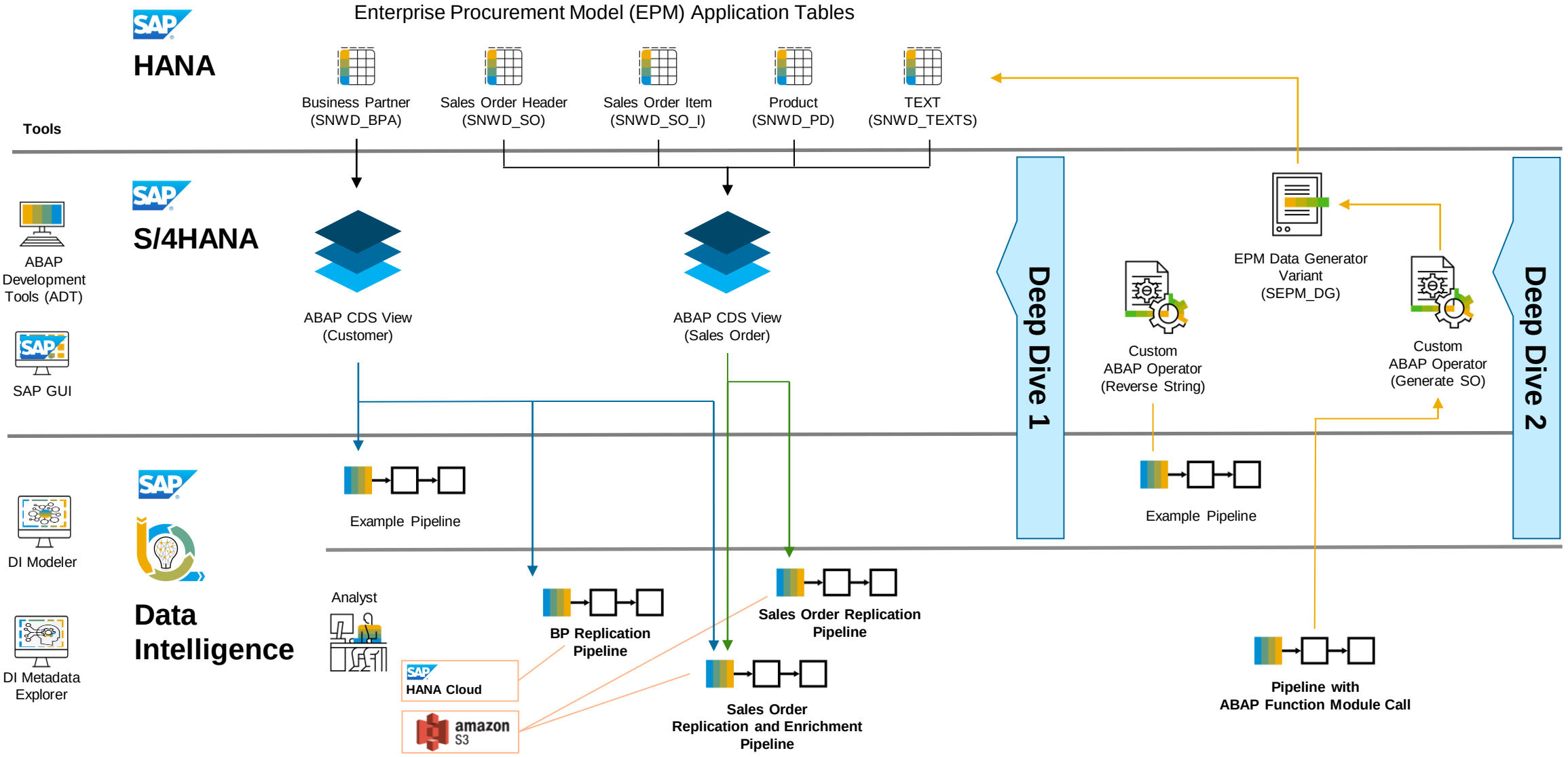
Deep Dive

Integration with SAP S/4 HANA



DAT161 Workshop Scenarios



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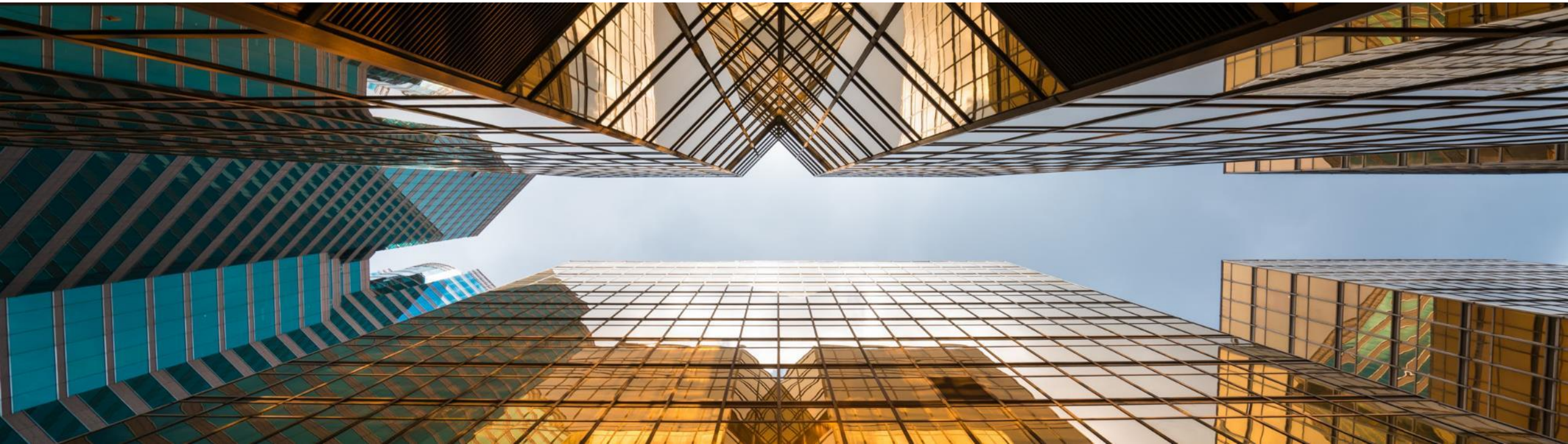
Hands on Session

SAP S/4 HANA CDS View Integration



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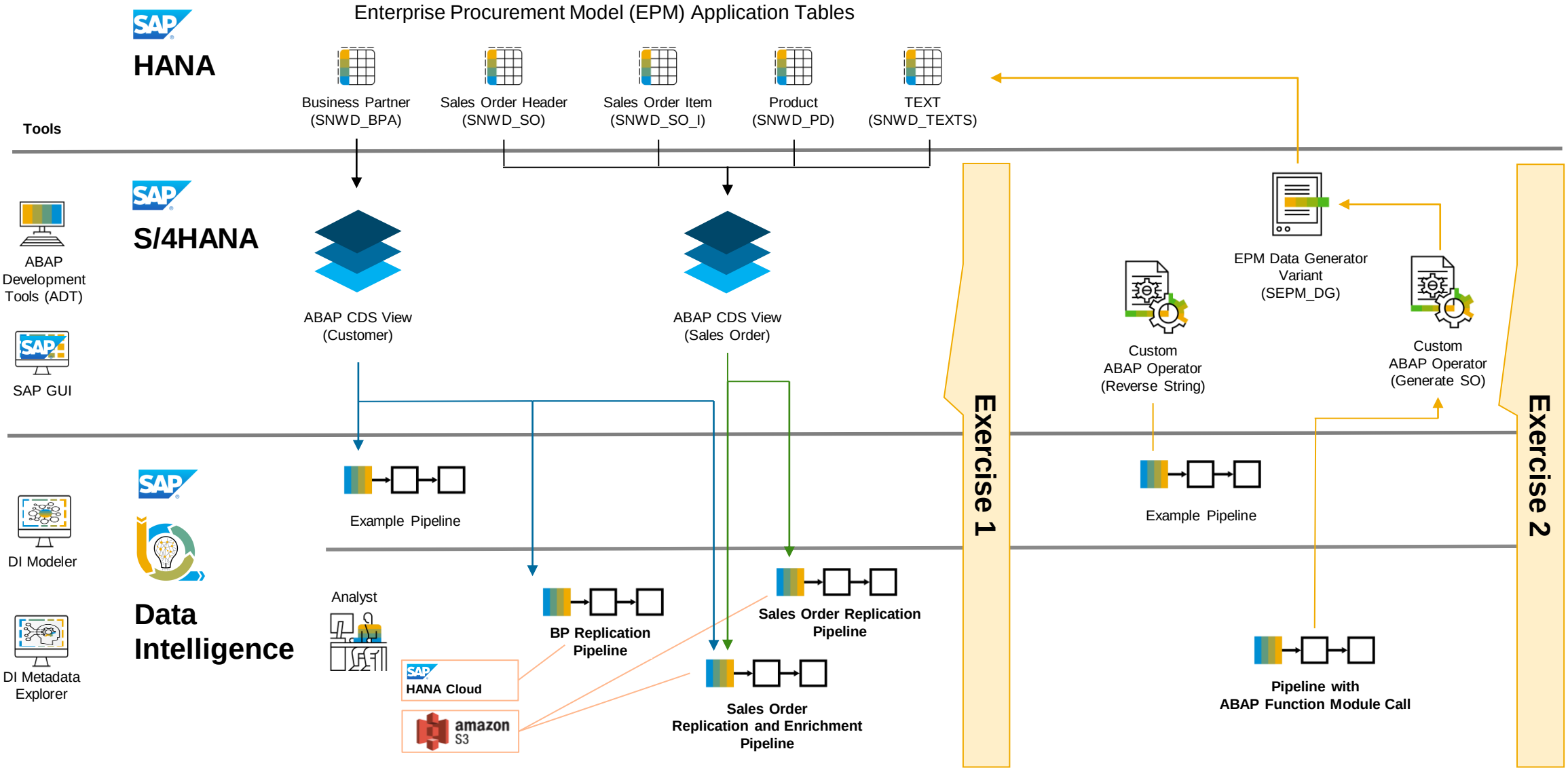

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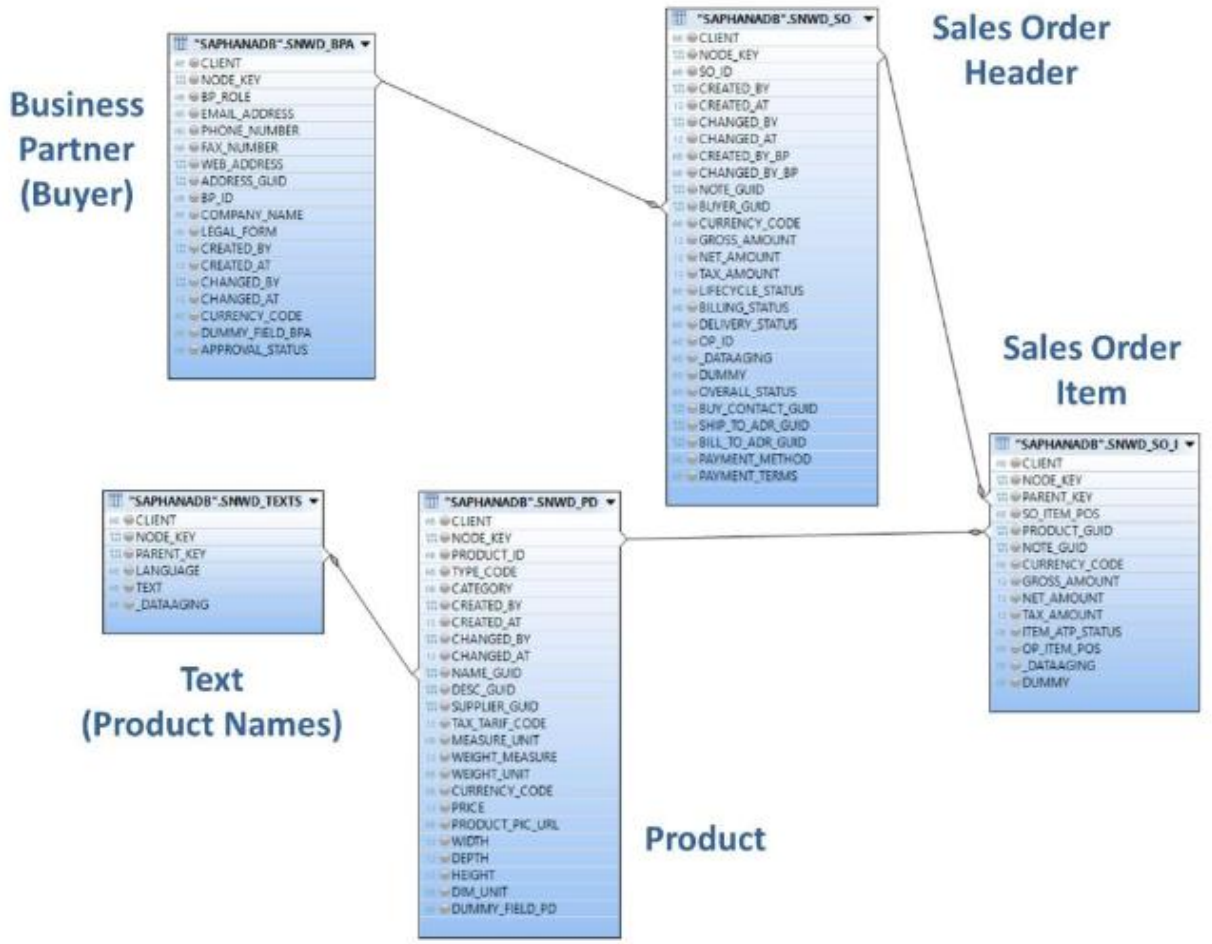
The Enterprise Procurement Model (EPM) in SAP S/4 HANA

The business scenario at the core of EPM is that of a web shop run by a fictive retail company called “ITelO”, which is buying and selling computers and accessories.

Even though EPM also provides several pre-defined CDS Views, which are all linked to each other via associations, we’ll be using the underlying physical tables in our Deep Dive demos and the Hands-On Exercises. Th tables are all starting with the prefix name “SNWD_”.

The relevant tables for our scenario are

- Business Partner (SNWD_BPA)
- Sales Order Header (SNWD_SO)
- Sales Order Item (SWND_SO_I)
- Product (SNWD_PD)
- Texts (SWND_TEXTS)



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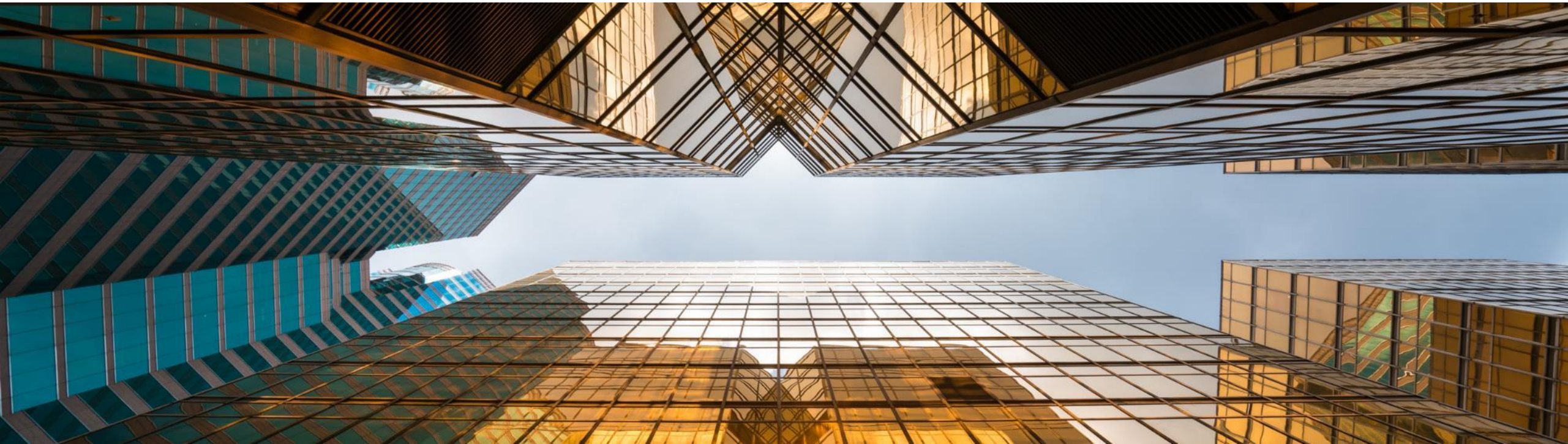
Exercises

Getting started with Hands-On Exercises



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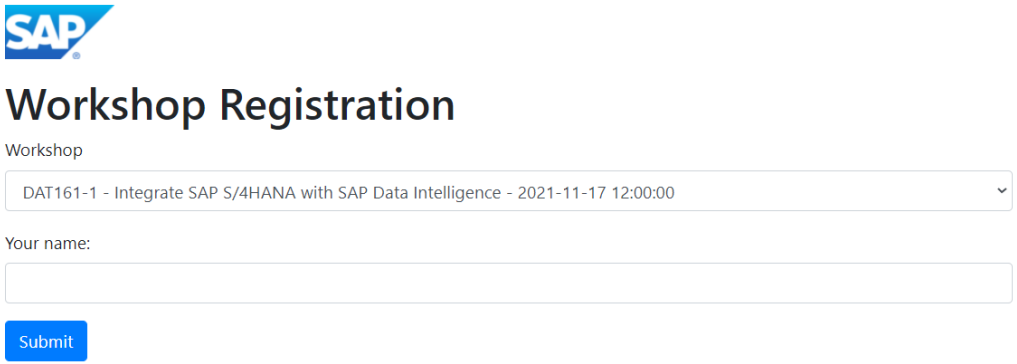

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- The tenant name for workshop is dat161_1 (Group 1) and dat161_2 (Group 2)
- User credential as received from the user registration tool described above
- Participants will also find a step-by-step guidance in the exercise documentation on Github

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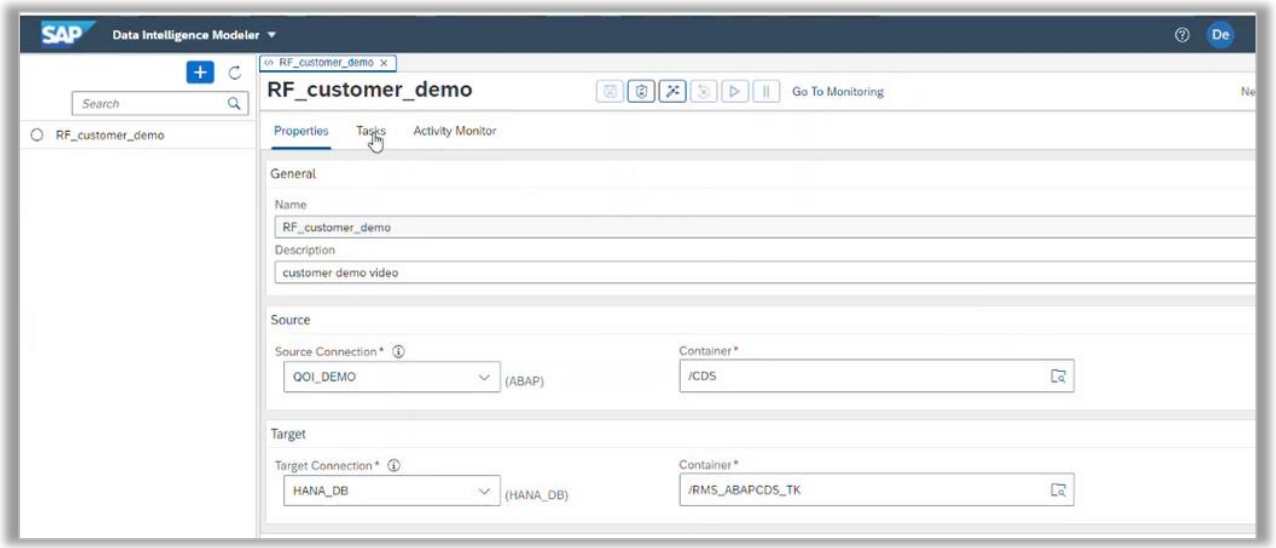
Outlook: Data Replication Enhancements (Lab Preview)

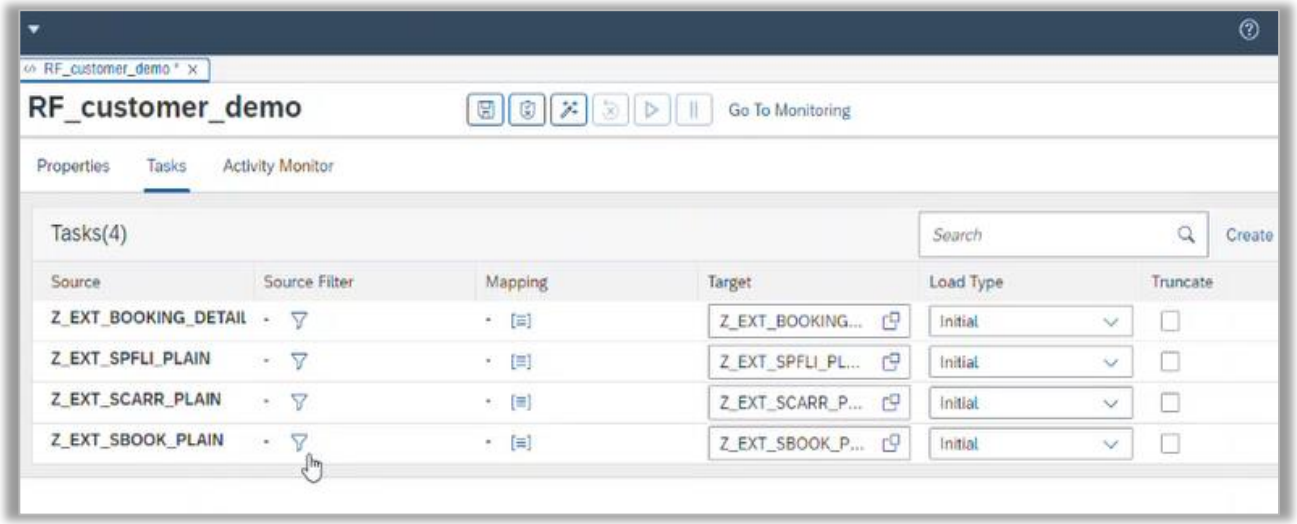


Creating a Replication Flow including the configuration of the following properties:

- name of your Replication Flow,
- a selected source system,
- a selected target system,
- A description (optional) &
- location where the objects are stored (=Container)

For each replication flow, you can add one or several tasks, where as each task consists of:

- a source data set (table, CDS View etc.),
- a target data set (table),
- load type (initial or initial with delta),
- filters and mappings / projections (optional)



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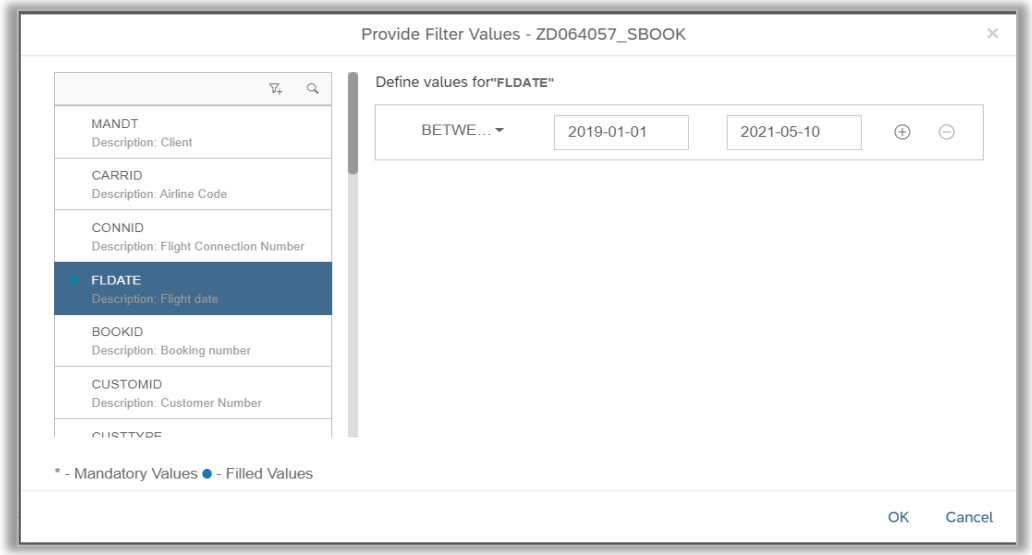
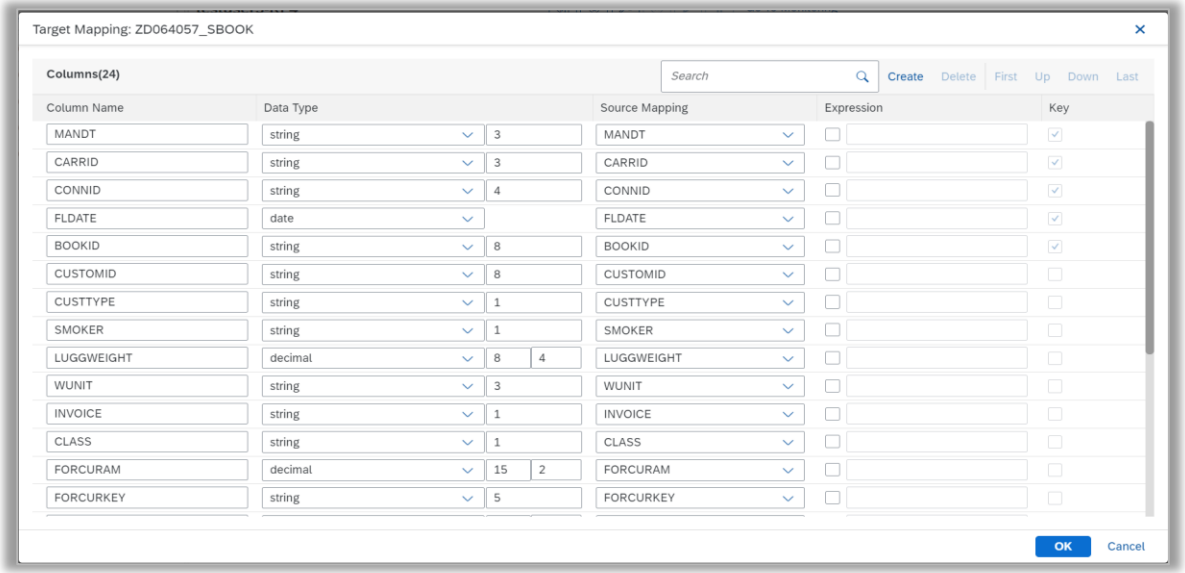
Outlook: Data Replication Enhancements (Lab Preview)



Define Filtering on single or multiple columns using pre-defined operators (e.g. >, <, >=, <=, between etc.) in a simplified user interface.

Perform projections on target data set to adjust default data mapping coming from the data source including add, edit and removal of columns on a dataset-level.



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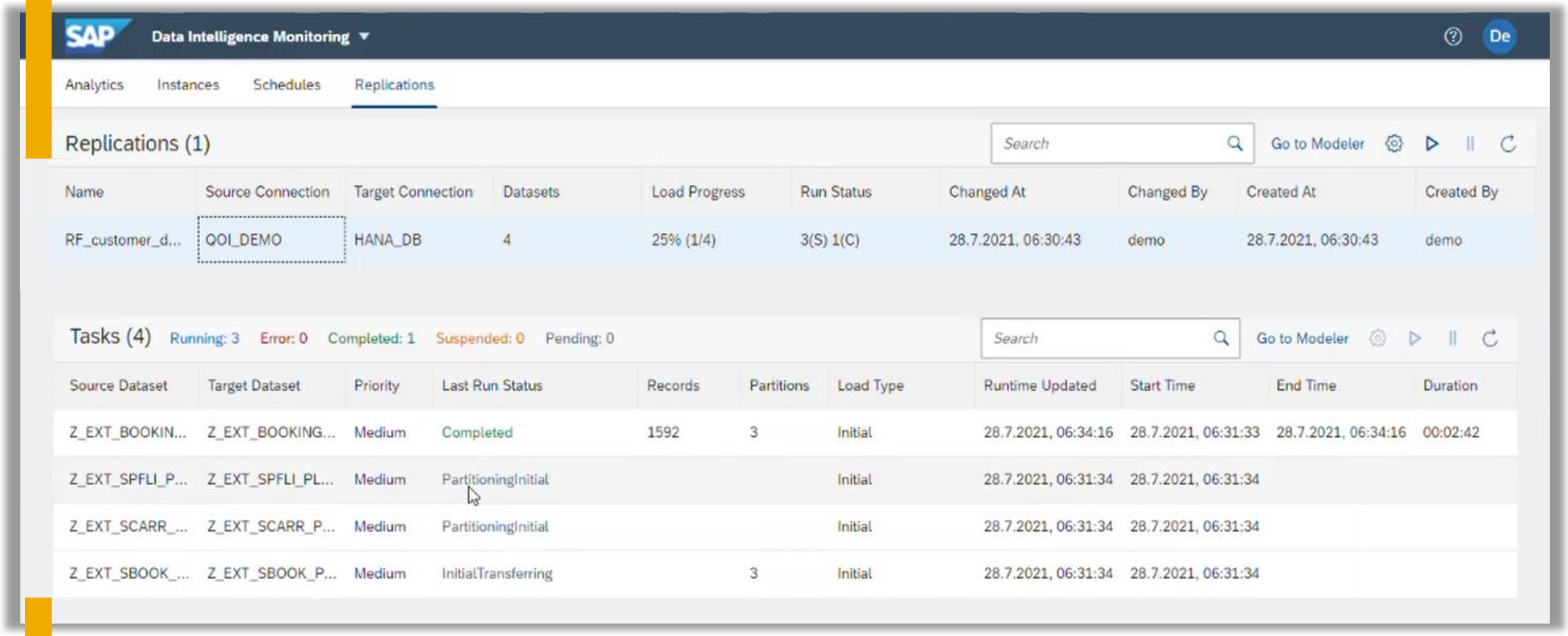
Outlook: Data Replication Enhancements (Lab Preview)

Monitoring of Replication Flows including high-level metrics



Monitoring on Task-level including more detailed information such as data sate name, task run status, partitions, number of records transferred as well as execution time.

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Test our Replication Flow prototype at SAP TechEd

- Testing dates: **November 30th** to **December 2nd** (one week after TechEd)
- Sign up for a 1 hour remote test: https://experience.sap.com/remoteusabilitytesting/#event-6648

Topic: Replication flows can enhance existing data replication capabilities and allow you to more easily create, run, and monitor data replications in the SAP Data Intelligence solution. They can enable you to efficiently move a large number of data sets from a source to a target system.

Preview: Use our latest prototype to solve a fictitious replication challenge. We want to see how well our designs support you in getting your job done. We plan to ask you additional questions to get your candid feedback and further input based on your role and experience.

Target roles: Anyone whose daily work is about modelling data integration, data replication and data transformation or who frequently models data flows between various source and target systems (both SAP as well as third-party software).

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* Pearson VUE, Study Reveals the Ever-Advancing Global IT Industry Requires the Backbone of Certification, 2019.

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Thank you.

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Appendix

Useful Links for SAP Data Intelligence ABAP Integration

Product Help:

- SAP Data Intelligence Cloud Product Help: https://help.sap.com/viewer/product/SAP_DATA_INTELLIGENCE/Cloud/en-US
- SAP Data Intelligence ABAP User Guide: https://help.sap.com/viewer/3a65df0ce7cd40d3a61225b7d3c86703/Cloud/en-US

Blogs:

- ABAP Integration: https://blogs.sap.com/2019/10/29/abap-integration-for-sap-data-hub-and-sap-data-intelligence-overview-blog/
- CDS View Integration: https://blogs.sap.com/2021/01/21/abap-cds-replication-in-data-intelligence/
- SLT Integration: https://blogs.sap.com/2019/10/29/abap-integration-replicating-tables-into-sap-data-hub-via-sap-lt-replication-server/
- Custom ABAP Operator: https://blogs.sap.com/2021/06/01/integrating-abap-function-modules-with-sap-data-intelligence/
- ABAP Connectivity: https://blogs.sap.com/2021/08/19/beginners-guide-how-to-start-with-abap-integration-within-data-intelligence/

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Useful SAP Notes for SAP Data Intelligence ABAP Integration

- Central Note ABAP Integration: https://launchpad.support.sap.com/#/notes/2890171
- ABAP Connection Type: https://launchpad.support.sap.com/#/notes/2835207
- Security Settings in ABAP: https://launchpad.support.sap.com/#/notes/2831756
- SAP S/4 HANA 1909: https://launchpad.support.sap.com/#/notes/2830276
- SAP S/4 HANA 2020: https://launchpad.support.sap.com/#/notes/2943599
- Integration with DMIS 2011 / DMIS 2018: https://launchpad.support.sap.com/#/notes/2999893
- ODP Integration: https://launchpad.support.sap.com/#/notes/2775549

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