Real-Time Data Replication with

SAP Landscape Transformation Replication Server

Overview - Roadmap - Development News

AGS-SLO Product Management, SAP AG

July, 2014

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Agenda

Overview

Basic Concept, Architecture & Main Features

Technical Prerequisites & Sizing

Product Roadmap & Development News

SAP LT Replication Server for BW

More Use Cases

Summary

Overview

SAP Landscape Transformation Replication Server

Product description

SAP LT Replication Server (aka 'SLT') is a standard software to move data in real-time between different systems within the same network, wide area networks, or into the cloud to have the information at the right place at the right point of time.

The software helps to feed analytical systems with up-to-date business information from the productive system landscape, support the acceleration of large volume transactions executed in SAP HANA, enables real-time reporting and minimizes transfer volume for SAP BW and enables the synchronization between different systems.

Replication

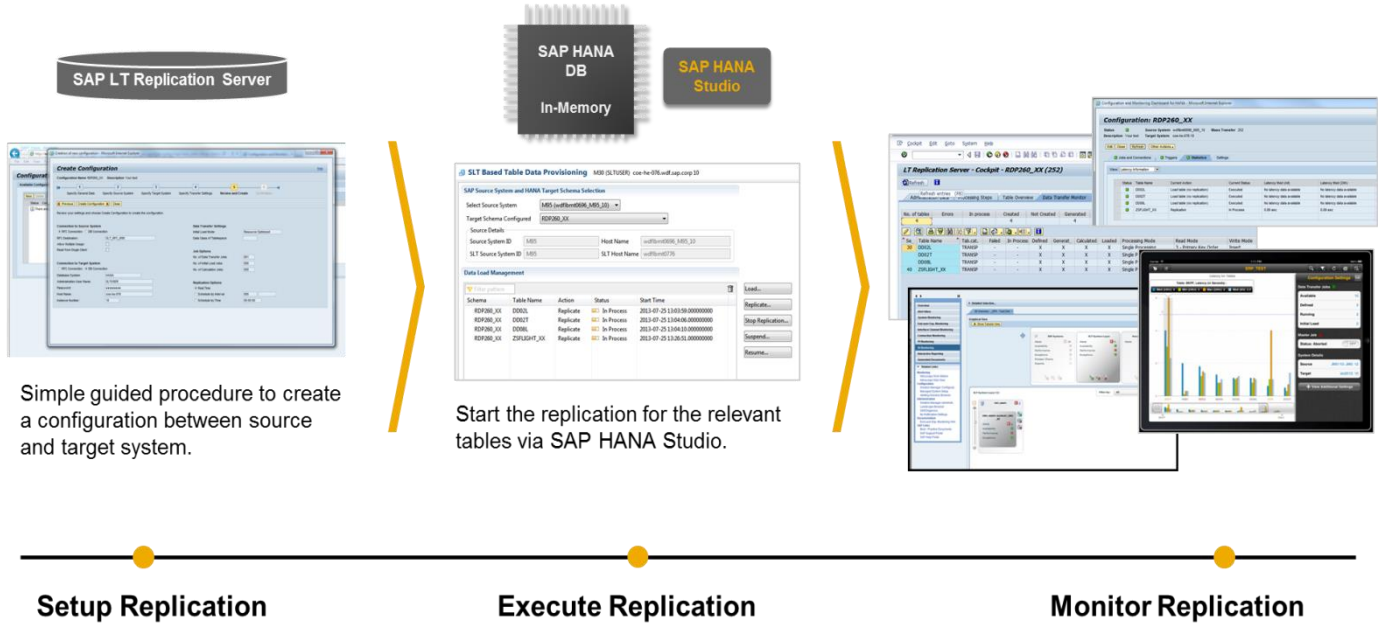
- Real-time or scheduled
- Delta capturing to minimize transfer volume

Transformation

- Filtering by using selective criteria
- Adjustment of tables
- Conversion of data, e.g. to make sensitive data anonymous

Installation & operation

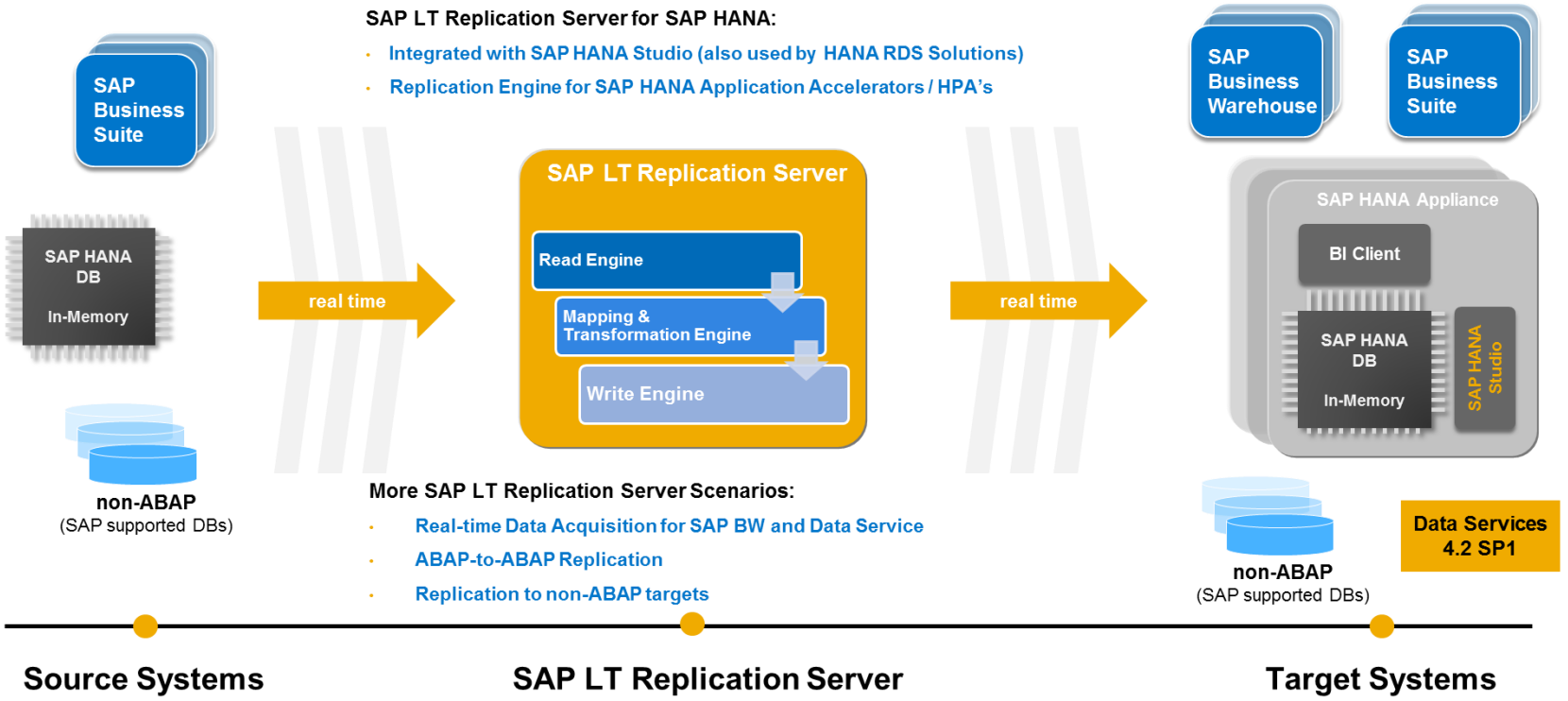
- Deeply integrated within SAP landscapes to reuse existing installation and monitoring capabilities
- Monitoring with SAP Solution Manager 7.1 SP5 onwards



SAP Landscape Transformation Replication Server

Technical Enabler for Multiple Data Provisioning Use Cases

SAP LT Replication Server is used to load and replicate data in scheduled or real-time mode from an ABAP or non-ABAP based source system into SAP HANA, SAP Data Services, SAP BW or any other ABAP based system.



Supported Databases

- MSFT SQL Server Enterprise Edition
- Oracle Enterprise Edition
- IBM DB2 LUW/ UDB (DB6)
- IBM DB/2 zSeries
- IBM DB2 iSeries (former AS/400)
- IBM Informix
- SAP MaxDB
- Sybase ASE
- SAP HANA

SAP LT Replication Server is embedded as middleware in your landscape and can be deployed without disrupting your existing operations. You use the software to feed several target systems with real-time information depending on your business scenarios and requirements.

SAP Landscape Transformation Replication Server

Benchmark Figures

Installed Base	**2874 customer landscapes running with SAP LT Replication Server DMIS 2011**
Highest Initial Load	**26 billion records table (89 hours)**
Most Replicated Tables	**12.000 tables in one landscape, 500 tables in one configuration**
Most connected SAP Systems	**70 connected SAP systems on one SAP LT Replication Server**
Most connected non-SAP Systems	**40 connected non-SAP systems on one SAP LT Replication Server**
Highest Change Rate	**> 20 Mio records per hour per table**

Customer Success Summaries (extract)

Re-allocation & scheduling of available Inventory in real-time

0.5% Monthly revenue increase
Per a 1% increase in the fill rate

Drive profitable decision with real-time analysis for demand planning (sourcing) and sales negotiations (commercial margin)

- €500k Capital working capital reduction within a week

Use real-time information to operate its call centers with greater productivity, a higher first-call resolution rate, and a lower cost per transaction.

5% Cost Reduction
In total overall cost

Real-time decisions regarding the company's long-term development, improving efficiency and lowering costs

- **35% Decrease**
  in Transportation Costs

Real-time decision-making and greater control of the supply chain for better inventory management

- **50% Decrease in inventory**

Reduced IT team engagement time from one day to mere seconds, in financial closing

~$645k in annual
labor cost savings

Snapshots of business profitability available in real time, and enhanced customer service and support

- **25% Monthly revenue increase**
  (estimated increase)

Help Brands Harness the Power of Word-Of-Mouth from social media

+ $17M Revenue
Estimated increase revenue with new customers

Customer Statements

"The most fascinating factor to adopt HANA was the functionality of HANA and SLT which enables real time collaboration."

Fujimoto, Sub-Director Information System Department (Press article „Nikkei Joho Strategy" Oct 5, 2013)

AsahiKASEI

"We use data transformation services and SLT. And I think at this point, we've moved everything to SLT.
SLT is driving all of the real-time [transfer of data] right into HANA.
Quite frankly we didn't think we were able to do this and you guys really did a great job with the SLT product,
because when I talk with my architect folks, they were thrilled with not only how it runs day by day,
but also if something goes wrong, the recovery capabilities of SLT."

Paul Fipps, CIO and Vice President, Business Services, The Charmer Sunbelt Group (Customer Insights, Walldorf 2012)

THE CHARMER SUNBELT GROUP

"The shift to SLT really drove efficiencies in building up the data set by leveraging HANA to overcome some of the challenges of the ECC environment. We didn't have to spend the time it would typically take on architecting what that data model would look like. It's also enabled us to really free up and improve the cycle time of data availability for the business teams. So where in the past you might say that I need to take a segment of [tables] and I am pulling particular fields out of the database for performance reasons, we are now simply taking the entire table."

Justin Replogle, Dir. Business Intelligence, Honeywell (SAPPHIREnow, Orlando 2012)

Honeywell

"To deal with the difficulties associated with transmitting data from older systems, we installed the System Landscape Transformation tool (SLT), which worked out well and solved our problems."

"With the SLT tool, we can take any table to SAP HANA and write a report. It will be quick and efficient. From what we've observed in the proof of concept thus far, these changes are real. If you estimate how much we have invested in SAP HANA or in old technology, there will be an undoubted advantage for SAP HANA. These investments will come back very quickly."

Rinat Gimranov, CIO of Surgutneftegas (insider PROFILES 7/2012)

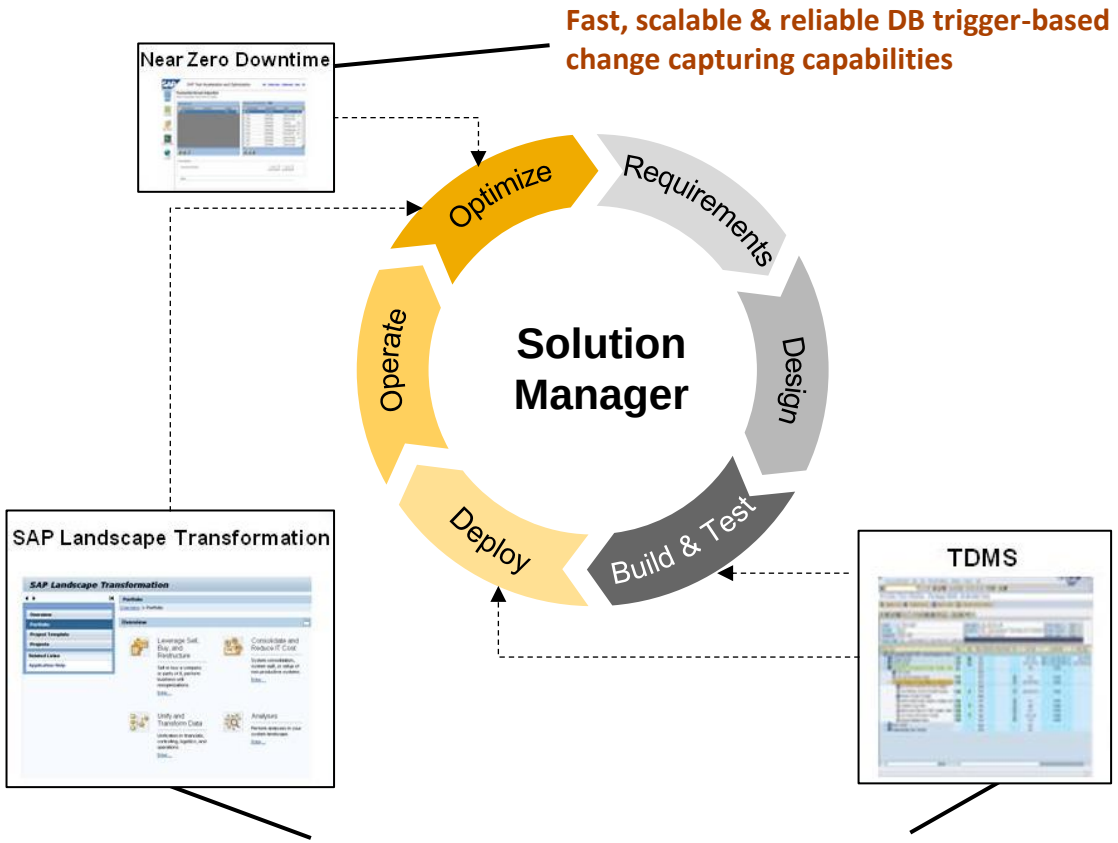
SURGUTNEFTEGAS
OPEN JOINT STOCK COMPANY

SAP Landscape Transformation Replication Server

Leverages proven AGS SLO*) Technologies

- Status December 2013: >400 customers use SAP LT Replication Server in more than 2000 installations
- SLO* technologies have been used since more than 12 years in hundred of projects per year
- Key offerings foster SAP's Application Lifecycle Management concept
- SAP LT Replication Server leverages several SLO technologies

SAP IT Management and Cloud (formerly 'ALM)'

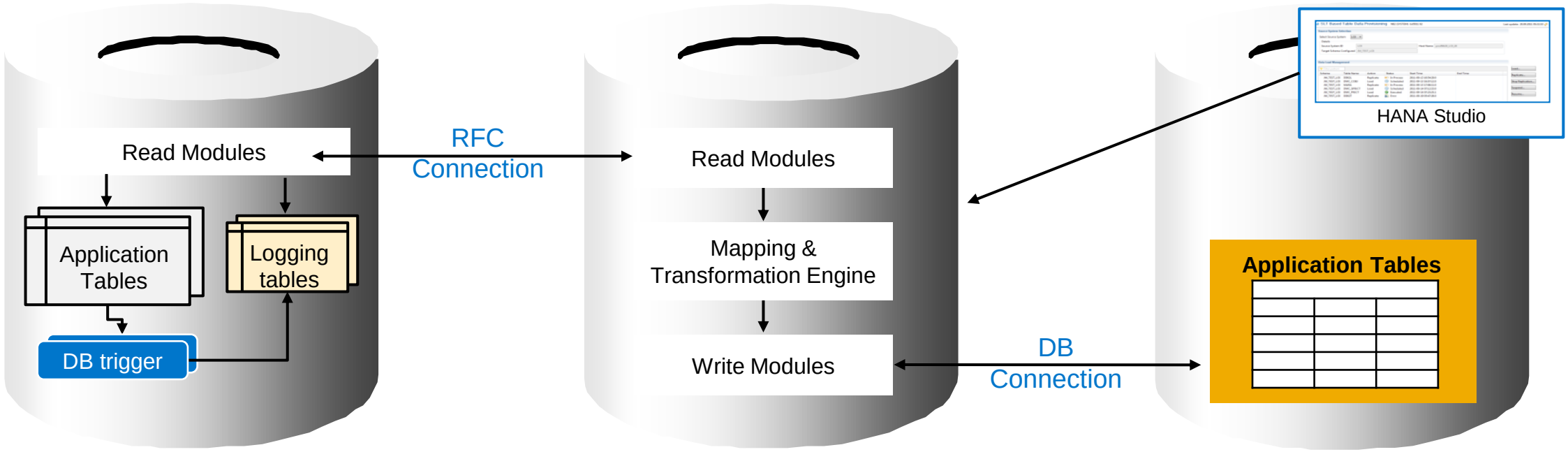


* System Landscape Optimization, SAP Active Global Support

Basic Concept, Architecture & Main Features

SAP ‘LT’ Replication Server: SAP ABAP-based Data Sources

Architecture and Main Building Blocks



SAP Source System

SLT System
(mind. NW7.02); Unicode System

SAP HANA System

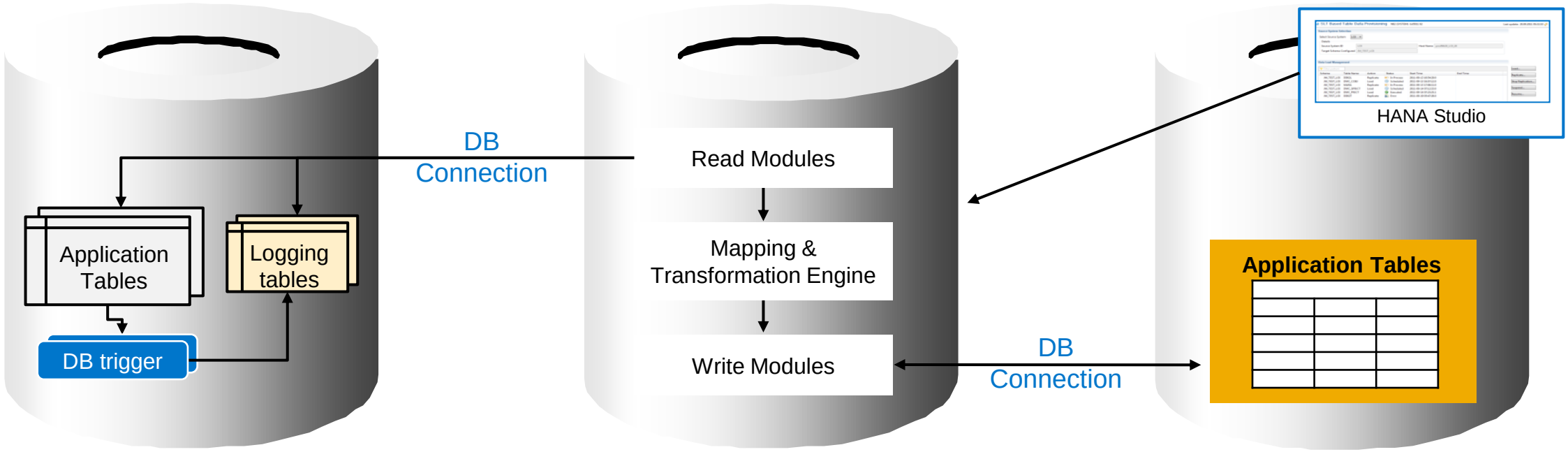
Efficient implementation of data replication via DB trigger based change capturing concept

Highly scalable and reliable replication process, including comprehensive data transformation capabilities on the fly

Fast data replication via DB connection, integration into SAP HANA Studio

SAP ‘LT’ Replication Server: non-SAP Data Sources

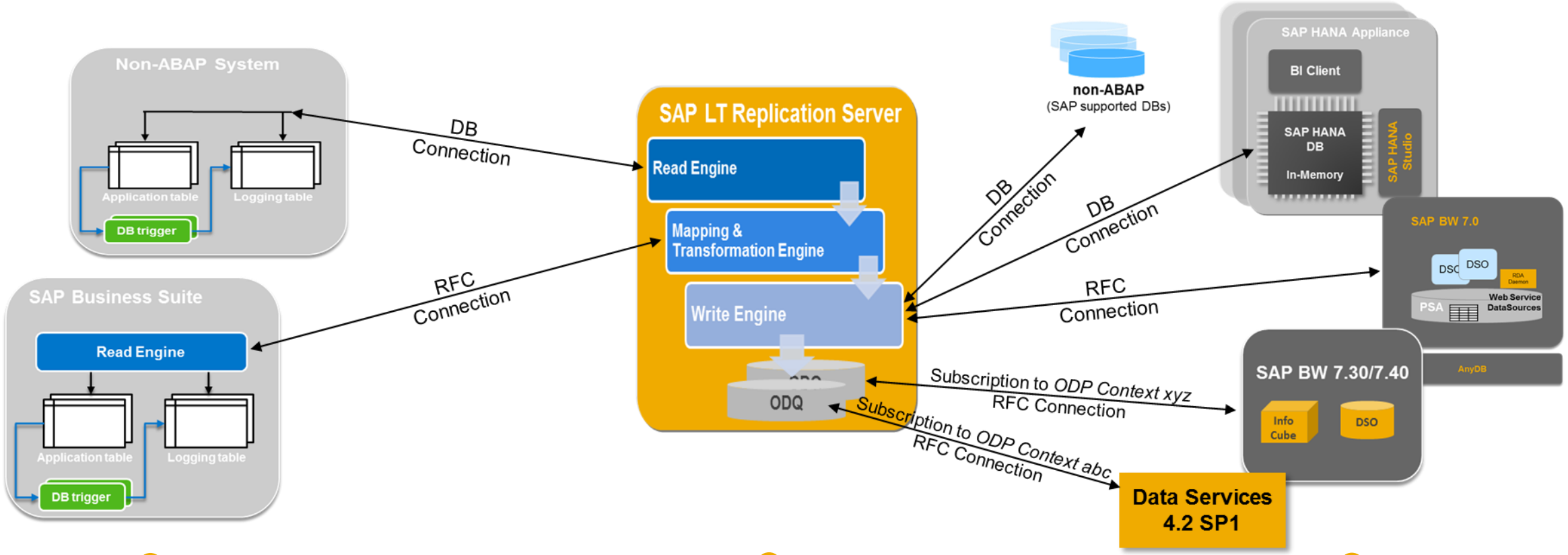
Architecture and Main Building Blocks



From the HANA Studio perspective, non-SAP source replication works as for SAP sources. In a first step, SAP LT Replication Server transfers all metadata table definitions from the non-SAP source system to the HANA system. When a table replication is started, SAP LT Replication Server creates logging tables within the source system. As a difference, the read modules are created in the SAP LT Replication Server. The connection the non-SAP source system is established as a database connection (ODBC).

SAP Landscape Transformation Replication Server

Architectural Concept: Replication from ABAP and non-ABAP source systems



Source System

Efficient implementation of data replication via DB trigger based on change capturing concept

SAP LT Replication Server

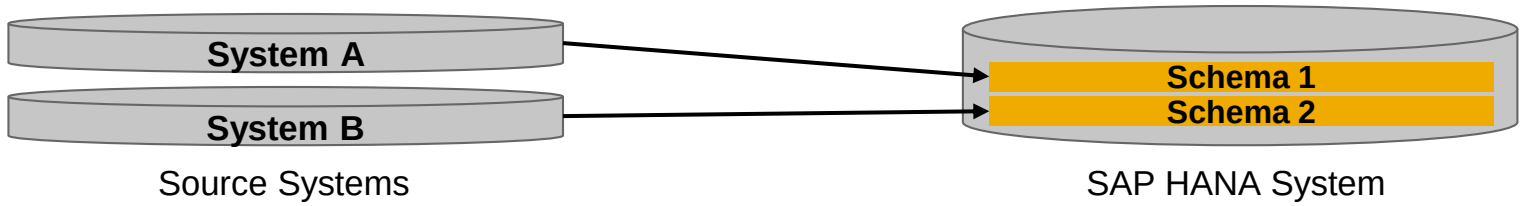
Highly scalable and reliable replication process, including comprehensive data transformation capabilities on the fly

Target Systems

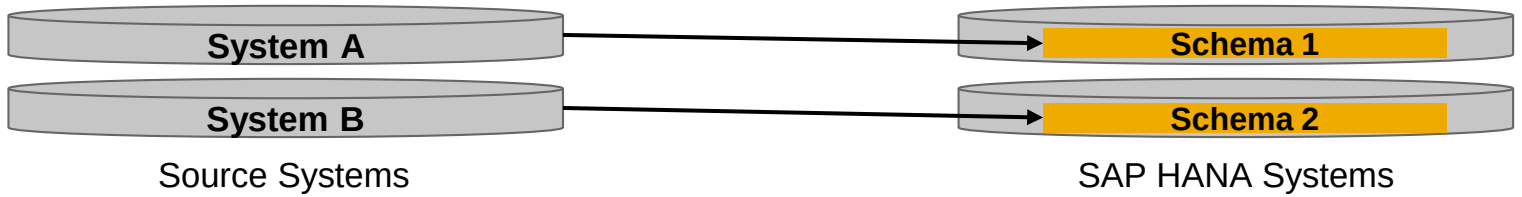
Fast data replication via DB connection, integration into SAP HANA Studio, or via RFC into SAP BW or SAP Business Suite systems

‘SLT’ Replication Concept: Multi System Support

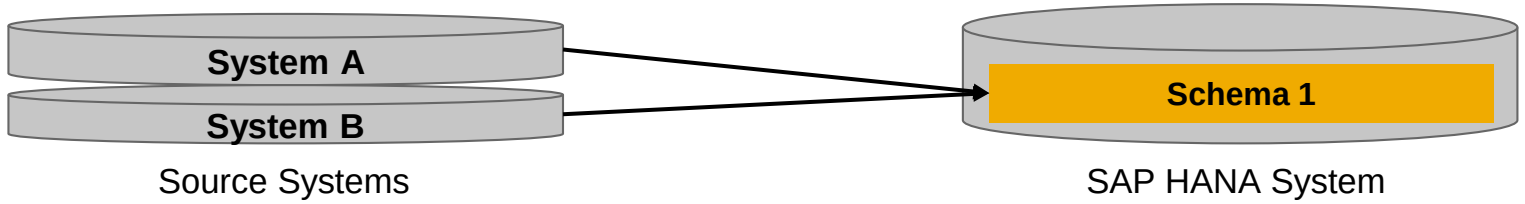
1:1, 1:N and/or N:1 Replication



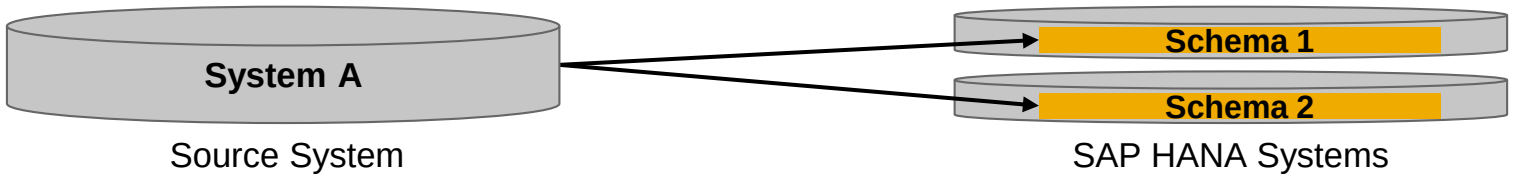
Source systems are connected to separate HANA schema on the same HANA System



Source systems are connected to separate HANA systems. Schema name can be equal or different



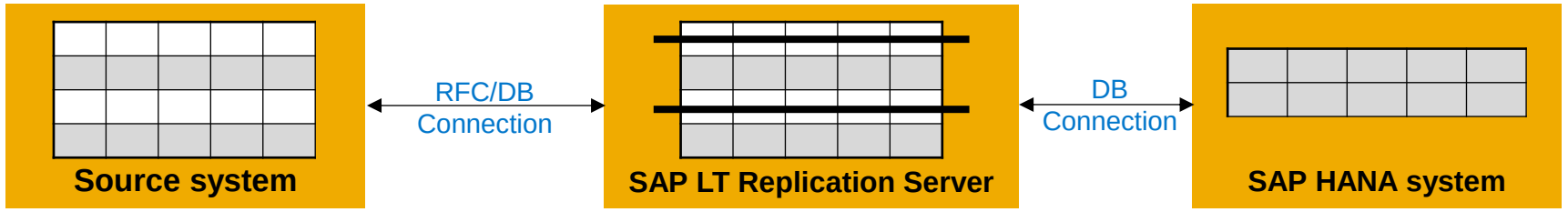
Source systems are connected to same HANA system and also the same schema



SAP source system is connected to separate HANA systems or to the same system with different schema name.

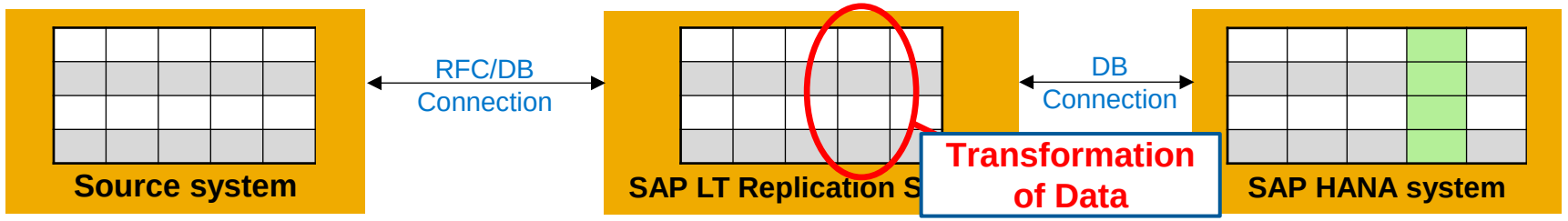
‘SLT’: Data and Structure Transformation Capabilities (1/3)

Reduce Number of Records by Filter



- i.e. Replicating certain data only ➔ Only data of specific years, departments, clients, etc. should be used in HANA.

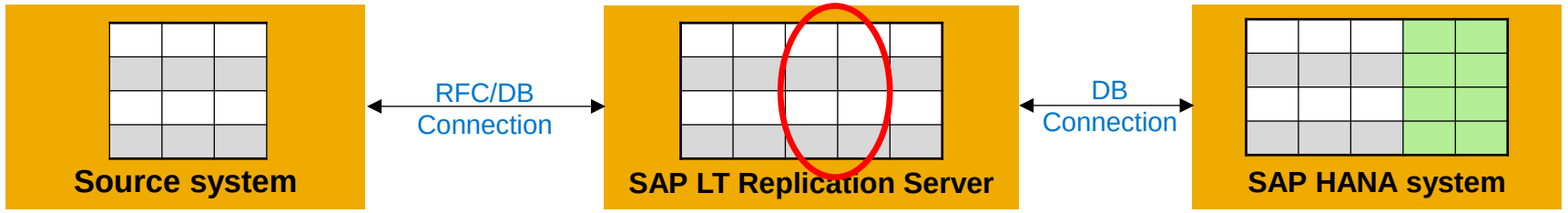
Conversion of Data



- i.e. To make certain fields anonymous ➔ i.e. HR reporting
- i.e. To fill initial fields
- i.e. To convert units or currency, and recalculate amounts and values using coded rules

Adjustment of Target Table Structures

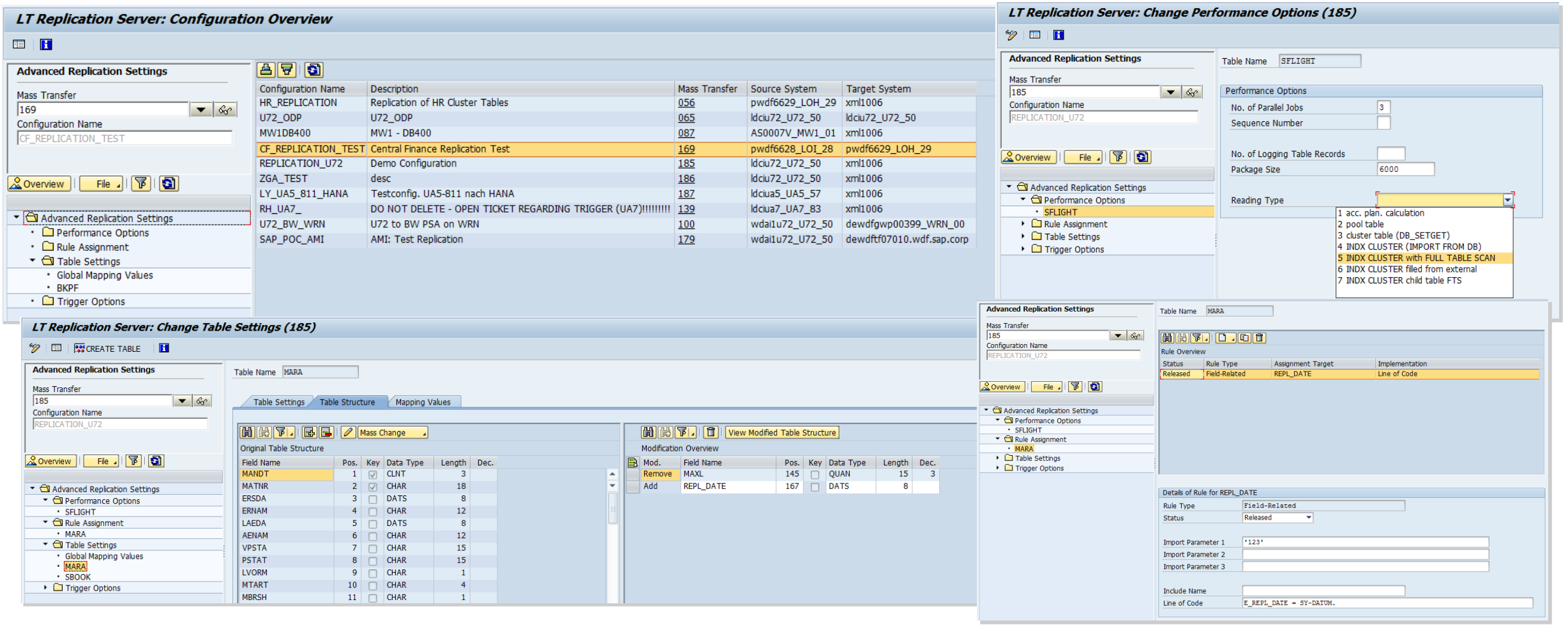
(i.e. extension/reduction/change of table structure and/or adjustment of technical table Setting



- i.e. Remove fields that are required in the HANA system
- i.e. additional fields are required (for example can be calculated/filled during load/replication)
- i.e. merging the same table (i.e. BSEG) from different systems (and create an additional field, for example a client field in order to avoid duplicate entries)

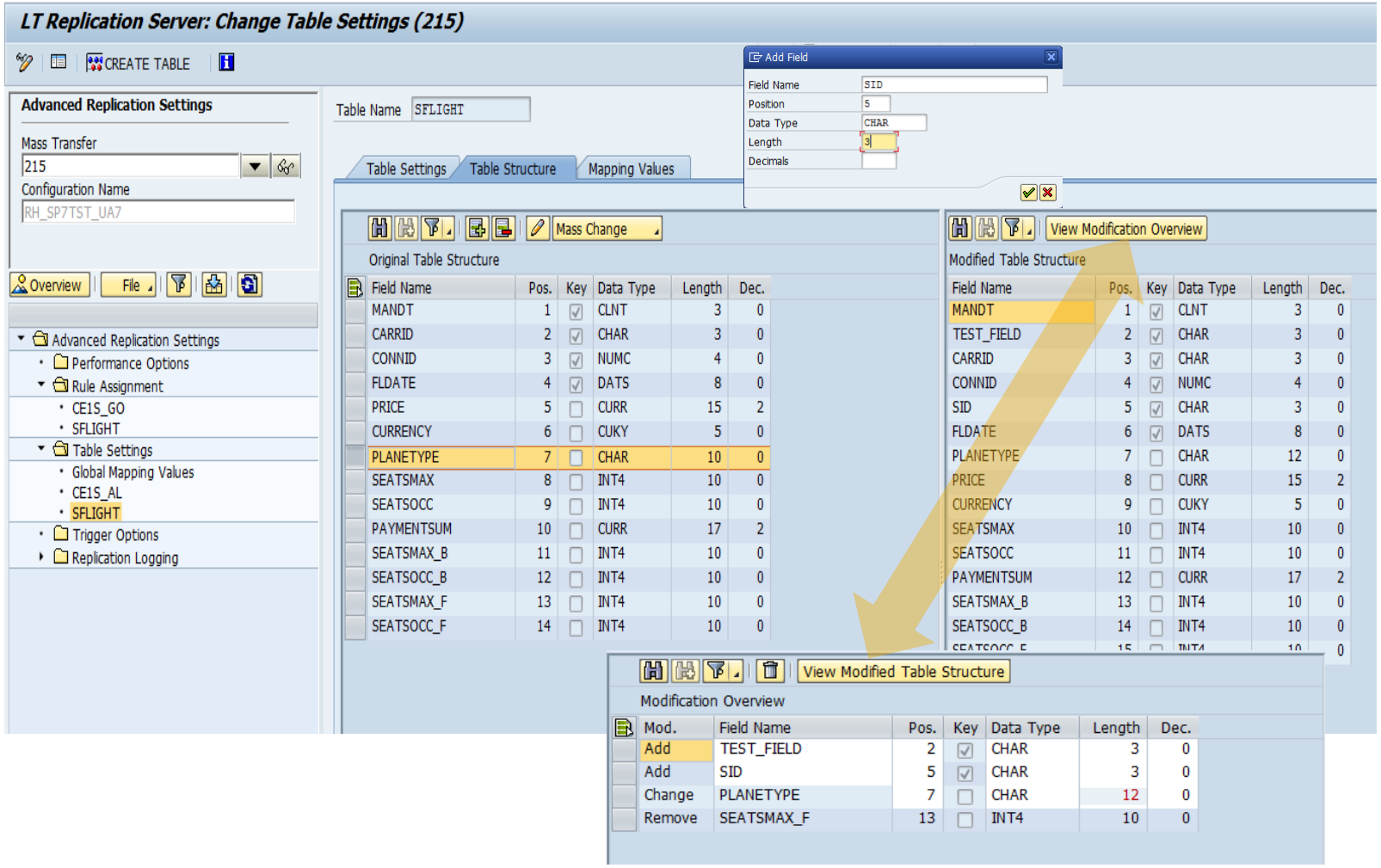
‘SLT’: Data and Structure Transformation Capabilities (2/3)

Advanced Replication Settings UI (transaction LTRS) to define performance optimization options, data structure changes and data filetring & conversion rules.



‘SLT’: Data and Structure Transformation Capabilities (3/3)

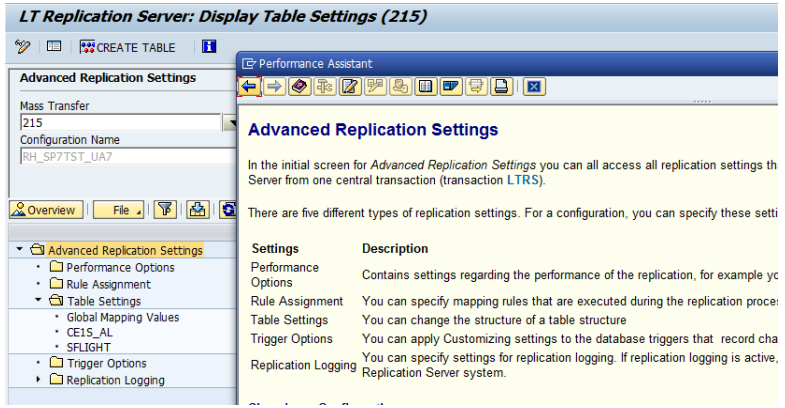
UI to adjust target table structure and technical settings



The transformation capabilities are accessible via the *LT Replication Server: Advanced Replication Settings* UI using transaction

LTRS.

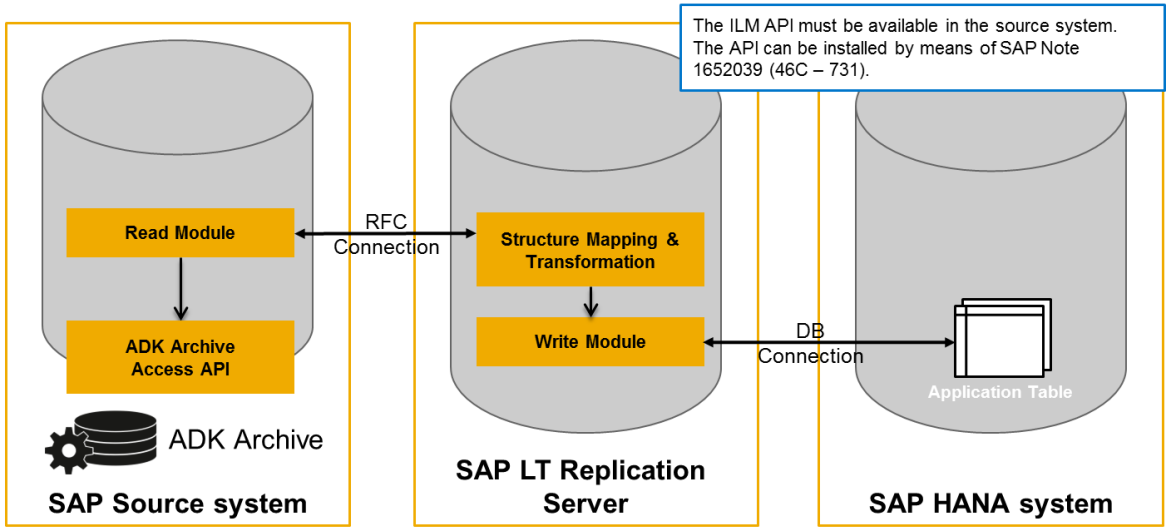
This includes embedded system documentation via the button.

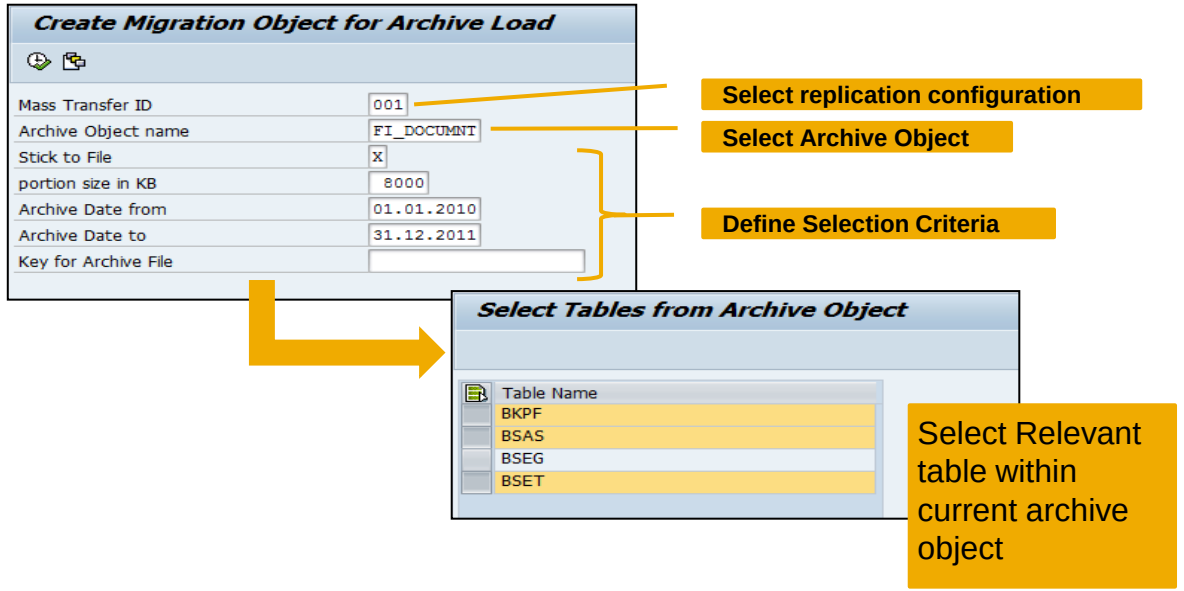


Load Data from SAP Archive

Architecture and Key Building Blocks

Archived data can be selected by the date of the archiving session.



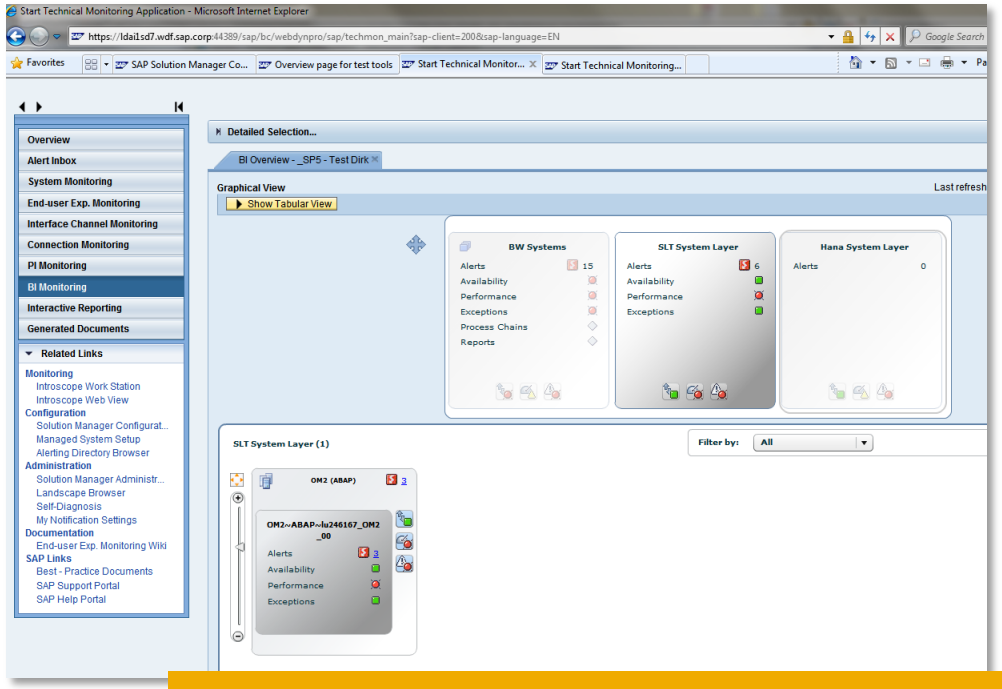


New with DMIS 2011 SP5: Exclude Archive Deletes from being replicated!

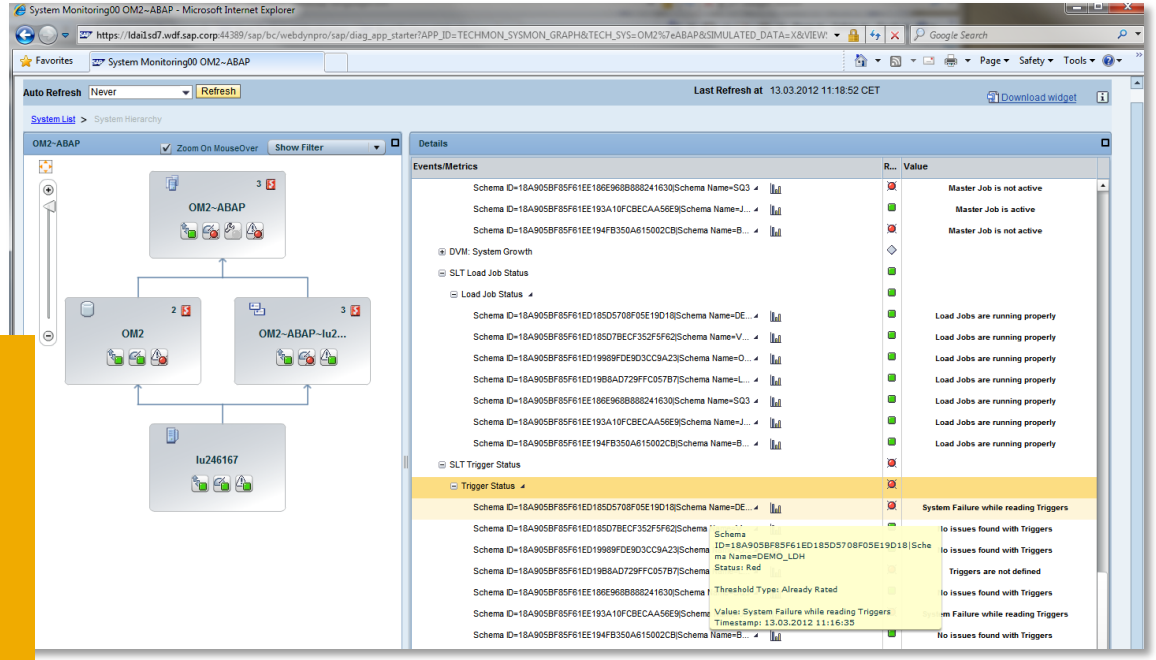
Deletions of a table record due to an archiving process can be excluded from being replicated by the SAP LT Replication Server to the connected target systems of a particular configuration.

- As a **prerequisite the archive process needs to run on a dedicated, separate application server in the source system**. No other data processing should take place on this server, then.
- To accomplish, that these archiving deletions are ignored by the data transfer process the ***flag IGNO_ARCHIVE_DEL*** in table ***IUUC_REPL_CONFIG*** has to be set before triggers are created.
- During the archive process the server on which the archiving is running has to be defined in table ***IUUC_RT_PARAMS: Field IU_PARAMETER = „ARCHSERVER“, Field IU_VALUE = Name of Application Server***.

Monitoring with SAP Solution Manager 7.1 SP5 onwards



SLT related messages and alerts are now visible in SAP Solution Manager 7.1 SP5 onwards



SLT monitoring summarizes the following information per configuration:

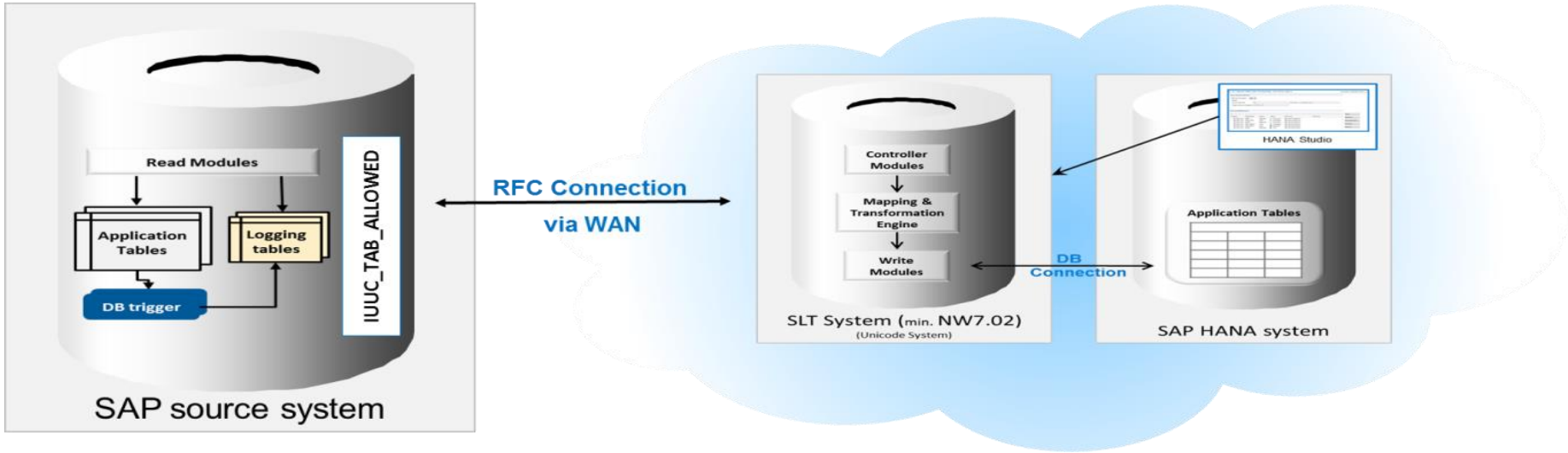
- Connectivity to source and target system
- Status of latency time last 24h replication
- Status of master and load jobs
- Trigger status

SLT und SAP HANA ‘in the Cloud’

Architecture and Integration of SLT into the Cloud Infrastructure

2 possible HANA Inbound Scenarios

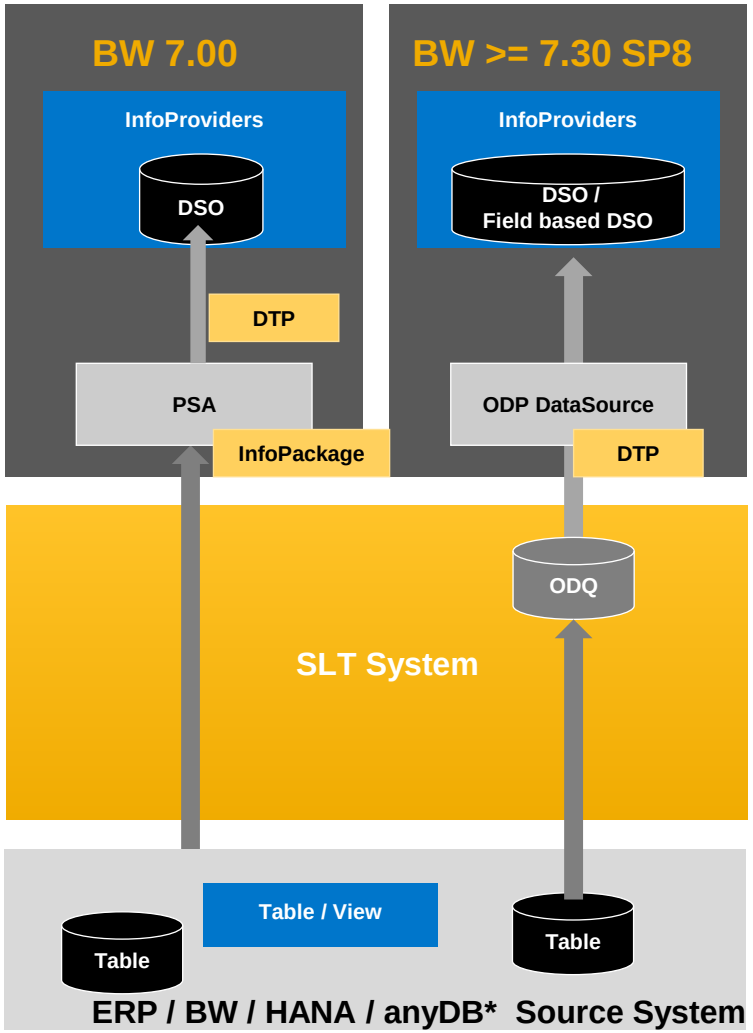
- **SLT located on the on-premise source site** (possible)
- **SLT located besides the SAP HANA system in the Cloud** (recommended)



Managed Access Control:

Via entries in table **IUUC_TAB_ALLOWED** in the SAP-based source systems you can control the access to table data. Only permitted data selections can be loaded/replicated into a cloud based target system.

SLT Scenarios for SAP Business Warehouse – Overview of PSA and ODP



Scenario

SAP LT Replication Server offers 2 scenarios for replicating data into SAP BW. For SAP BW 7.00 onwards, data can be transferred into the PSA layer of BW into WebService DataSources and then processed into the InfoProviders.

With Support Package SP8 of BW 7.30, the Operational Data Provisioning Infrastructure can be used with SLT, where the data from the source systems is stored and SAP BW is registered as a consumer.

Value Proposition

Using SAP LT Replication Server to transfer data in real-time into SAP NW BW reduces the amount of overnight data uploads into your BW systems. With SAP LT Replication Server you can perform delta updates on BW DataSources without delta mechanisms, for ABAP-based systems as well as non-ABAP based systems on all SAP supported DB versions (according to PAM).

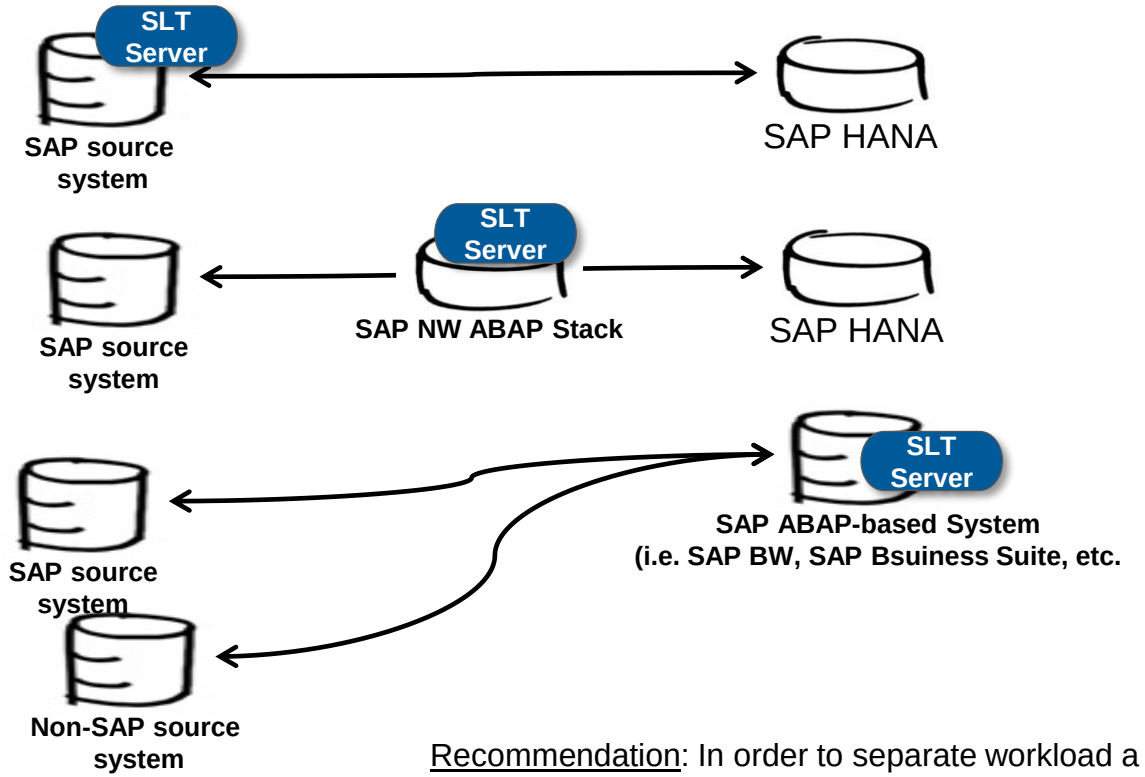
If you use operational data provisioning, you can load the data directly into the **InfoProviders** (bypassing the PSA layer) by using a DTP (Data Transfer Process) (as of SAP BW 7.30 SP8). The ODP infrastructure (with delta queues) takes over important services such as monitoring data requests.

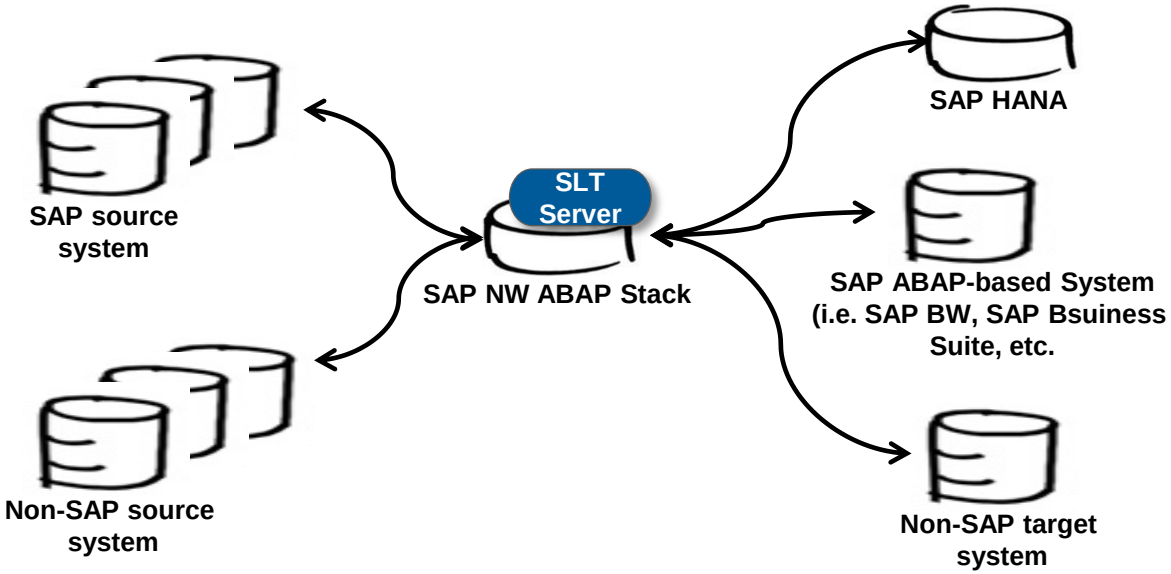
Technical Prerequisites & Sizing

SAP LT Replication Server
Installation options

SAP LT Replication Server is technically an ABAP Add-on to the SAP NW ABAP-Stack. Therefore, several installation options are technically possible:

- On the/a SAP ABAP-based source system, i.e. a SAP Business Suite System (with SAP Basis 7.0.2 or higher)
- On a seperate SAP NW ABAP Stack (Release 7.0.2 or higher)
- On a SAP ABAP-based target system, i.e. a SAP BW or SAP Business Suite System (with SAP Basis 7.0.2 or higher)

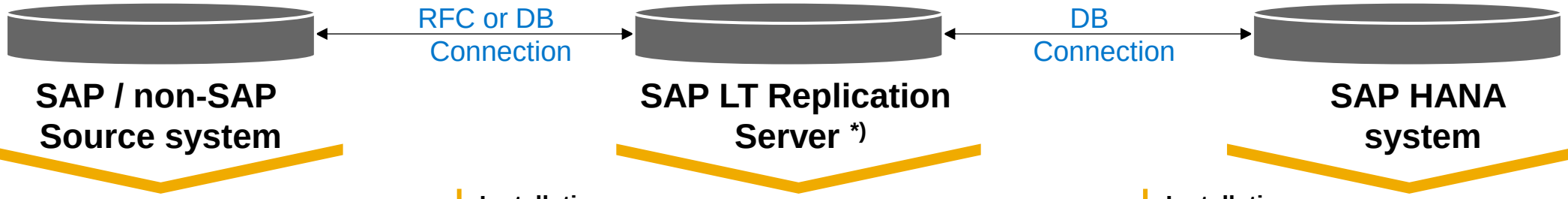




Recommendation: In order to separate workload a separate SLT Server system is the most preferable option for productive use. Especially when to expect high data transfer rates and/or to keep independent patch/release cycles.

Technical Prerequisites and System Set-Up Information

for SAP LT Replication Server (with SAP HANA 1.0 SPS05 or higher)



Installation

- **SAP:** Respective DMIS 2010/2011 version (**DMIS 2011 SP2-7 or equiv.**) ***)
- **SAP:** Minimum SP level requirements may exist **)
- **non-SAP**: no software installation required

Basic Configuration

- Optional: define separate table space for logging tables
- **SAP:** Define RFC user with appropriate authorization
- **Non-SAP:** Create DB user for Secondary DB connection

System Requirements

- **SAP:** All ABAP-based SAP Systems starting with R/3 4.6C, all supported OS/DB's platforms
- **SAP & Non-SAP:** OS/DB restrictions of related SAP NetWeaver stack apply (see at http://service.sap.com/pam)

Installation

- Add-on **DMIS 2011** ***)
  (Latest support pack level: **SP7**)

Basic Configuration

- **SAP:** Define RFC connection to source system
- **Non-SAP:** Define DB connection to source system
- Define DB connection to HANA system
- Define max. number of jobs to be used for data replication

System Requirements

- According to Quick Sizing
- Ensure sufficient number of available background jobs!

Installation

- HANA **SPS3-8:** includes LT replication functionality fully integrated into the UI of the HANA modeler

Basic Configuration

- Create a DB user (if required)

Always apply all related SAP Notes mentioned in Installation Guide, SLT General Note 1605140 and SAP Note 2016511 – *Installation/Upgrade SLT – DMIS 2011 SP7.*

*) SAP LT Replication Server can run on any SAP system with SAP NetWeaver 7.02 ABAP stack or higher, for example on Solution Manager 7.1 or the source system – it does not have to be a separate SAP system!

**) A few new SLT features available since HANA SPS05 may require DMIS_2010 SP09 / DMIS_2011 SP04

***) SAP customers who run other DMIS-based applications can apply DMIS_2010 in the source and SLT system.

SAP LT Replication Server – Software Release Strategy

With HANA SPS05 - SPS07, two versions of SAP LT Replication Server are released

- **SAP LT Replication Server 1.0** (based on Software Component Version DMIS 2010)
- **SAP LT Replication Server 2.0** (based on Software Component Version DMIS 2011)

Technically both DMIS versions include the same coding level (no need for an upgrade)

- DMIS_2011 SP04 and DMIS_2010 SP09 (see also SAP Note 1824710)
- DMIS_2011 SP5 (see also SAP Note 1882433): → **No equivalent DMIS_2010 SP version in parallel!**
- DMIS_2011 SP6 and DMIS_2010 SP10 (see also SAP Note 1958809)

→ SAP Note 1958809

SLT and HANA Compatibility:

Source System	SLT	HANA DB/Studio
DMIS 2010 SP3/4	DMIS 2010 SP4	HANA 1.0 SPS2
DMIS 2010 SP3-10	DMIS 2010 SP5-10	HANA 1.0 SPS3-7
DMIS 2011 SP2-6	DMIS 2011 SP2-6	HANA 1.0 SPS3-7

Current status

- Since HANA SPS05, **DMIS_2011 is released and recommended for all new installations** (both SAP LT Replication Server and SAP source systems).
- SAP customers who run other DMIS-based applications (that require DMIS_2010 in the SAP source system) can use DMIS_2010 in the source and/or SLT system. See also SAP Note 1691975.
- For HANA customers using SLT with DMIS_2010 the switch ("technically" an upgrade) to DMIS_2011 will be a non-disruptive event.

- **The future SP release cycles of DMIS 2011 and DMIS_2010 will be different! → There will be no further code-equal DMIS2010 after SP10 … only bug fixing**

Quick Sizing with SAP SLT Sizing Guide

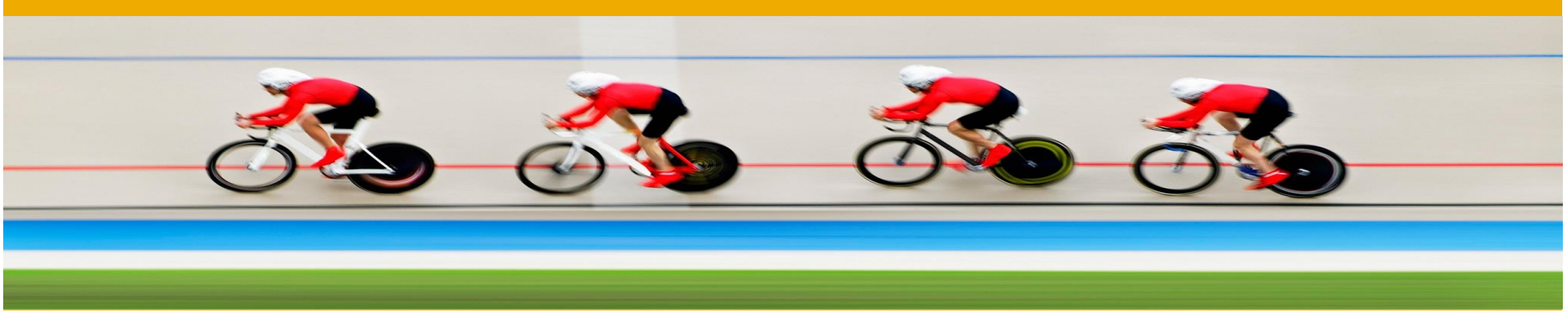
required Information / Input Parameters

You can find more details about sizing for SLT in the official Sizing Guide

- Numbers of configurations
- Numbers of tables per configuration
- Details about each table:
  - Table type [transparent/cluster]
  - Number of records [rowcount]
  - Size of single record (<>1500 bytes/record)
  - Numbers of columns (S: < 150, M: 151...250, L: > 250)
  - Expected change rate [changes per hour]
  - Complex data transformations required [y/n?]
- Max. tolerable initial load time [hours]
- Max tolerable replication latency [sec]
- ODP/SLT Scenario?
- Replication Logging active?

	SMALL	MEDIUM	LARGE
Use Case	**A small scenario with** • typically one configuration • with approx. up to 50 tables • weighted table size category S-M • an overall expected throughput of less than 1.000.000 records/hour	**A moderate mid-range scenario with** • Approx ~ 3 different Source Systems (equivalent to 3 LTR Configurations), • and/or up to 200 tables in total; • weighted table size category M-L • an overall expected throughput of less than 10.000.000 records/hour	**A upper mid-range scenario with** • Up to 10 different Source Systems (equivalent to 10 LTR Configurations), • and/or up to 500 tables (in total); • weighted table size category M-XL • an overall expected throughput of up to 50.000.000 records/hour
ODP/SLT System	• 1 configuration with 2 Data Transfer Jobs • Hardware: 2-4 CPU Cores, 8-10 GB Main Memory	• 10 Data Transfer Jobs in total (sum of all configurations) • Hardware: 4-6 CPU Cores, 10-16 GB Main Memory	• 25 Data Transfer Jobs in total (sum of all configurations) • Hardware: 8-10 CPU Cores, 16-32 GB Main Memory
	The DB size of the ODP/SLT system depends on the amount of changed data/hour which is stored in the queue, the frequency of data pull from subscribers and the retention period after which queue space is released.		
Source System(s)	• 1:1 relation to data transfer jobs per source • Reserve 2 BTC work processes for ACL (Access plan calculation), ensure 2 free Dialog work processes for data load/replication • Additional Hardware required: ~ 1 CPU Core (0.5 CPU per data transfer job, APPL & DB)	• 1:1 relation to data transfer jobs per source • sum over all source systems: • Reserve 2-4 BTC work processes for ACL (Access plan calculation), • ensure 10 free Dialog work processes for data load/replication • Additional Hardware required: ~ 5 CPU Core in total (0.5 CPU per data transfer job, APPL & DB)	• 1:1 relation to data transfer jobs per source • sum over all source systems: • Reserve 4-8 BTC work processes for ACL (Access plan calculation), • ensure in sum 25 free Dialog work processes for data load/replication • Additional Hardware required: ~ 12 CPU Core in total (0.5 CPU per data transfer job, APPL & DB)

With these input parameters you can estimate the appropriate system ressource requirements.
You find all details in the official Sizing Guide.



Product Roadmap

SAP Landscape Transformation Replication Server

Product road map overview - key themes and capabilities

Strategic developments
- Replication from ABAP to ABAP systems (covering the complete SAP Business Suite)
- Data provisioning for SAP BW 7.3 or higher & SAP Data Services 4.2
- Evolved & integrated solution as part of SAP's data management strategy

New features
- 1:N replication for non-ABAP source systems
- Replication logging feature for backup and recovery
- Support of views as source objects
- Filtering option for records in source system

Continuous improvements
- Enhanced monitoring capabilities
- Simplified administration
- Support of replication to non-ABAP systems (today already available as project solution)

TODAY

(Release 2.0 SP6 & SP7)

Strategic developments
- Transactional consistency for complex objects
- Open interface to feed analytical non-ABAP target systems from ABAP source systems

New features
- Templates to manage and reuse settings across tables, configurations, and systems
- Automated parallelization for replication
- Integrated consistency check with automated repair mode
- SAP BW scenario:
  - Alternative for extracting data for certain complex objects
  - Preview mode for test runs

Continuous improvements
- Automated adaption of replication after operational events like NZDT, OS/DB migration or system refresh

Planned Innovations

Strategic developments
- Object-based replication
- Enhanced troubleshooting framework with self-repair functionality
- Alternative for extracting data for almost all complex objects to enable real-time replication and to reduce the transfer volume for SAP BW
- Simulation and debugging engine for transformation rules
- Manage execution, monitoring, or troubleshooting on mobile devices
- Heterogeneous fallback and data synchronization solution for Suite on SAP HANA
- Optimized delta recording for SAP HANA as a source database

Future Direction

SAP LT Replication Server 2.0 – Strategic development

Evolved & integrated solution as part of SAP's Data Management strategy

SAP Data Management foundations

- **Cross-paradigm data access** for new models of value discovery
- **Hyper-performance** on all classes of application and usage scenarios

Benefits

- Execute, record, analyze, and optimize without system limitations
- Embrace and extend across variations of data forms and processing models
- Common modeling, integrated development environment, shared systems management infrastructure, and deployment-independent solutions
- Trusted and unified data environment

SAP LT Replication Server is part of SAP's **data management** strategy and a **cornerstone** of the comprehensive data provisioning solutions **to achieve real-time high volume** data integration.

TODAY

Overview: New Scenario with DMIS 2011 SP6

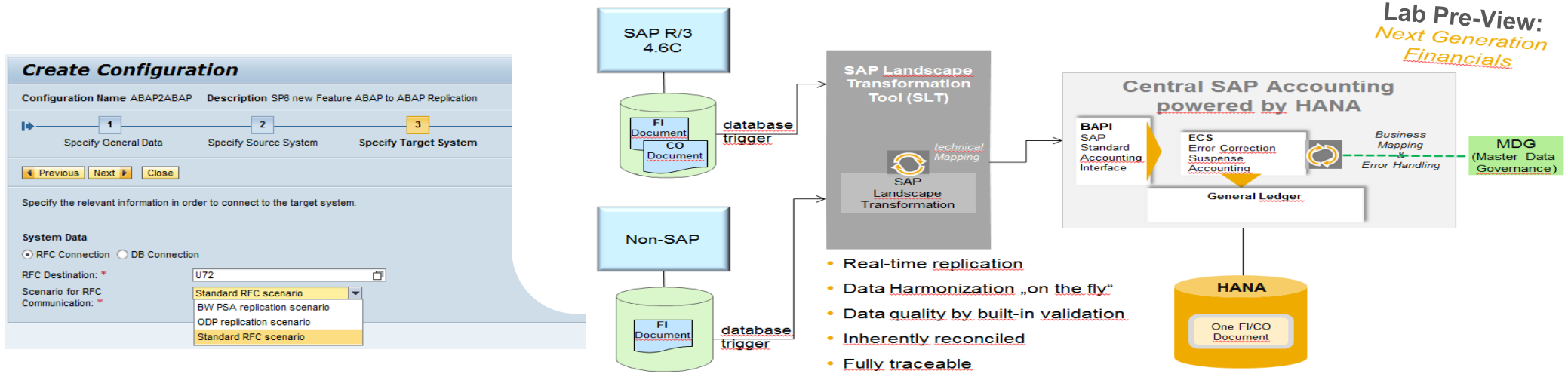
ABAP to ABAP replication

Scenario

Data loading and replication **to any SAP ABAP-based System** (via RFC) is now **available.**

Value Proposition

- Sync your business data in real-time for your SAP Business Suite and/or BW system landscape, while minimizing the necessary data transfer volume
- Easily replace custom built data synchronization applications and benefit from the tight integration into the SAP NetWeaver ABAP Application stack and data model
- Fast growing number of modern SAP Business Suite Scenarios (e.g. SAP Financial Solution) powered by this technology to consolidate data among distributed systems



Extended Scenarios with DMIS 2011 SP6

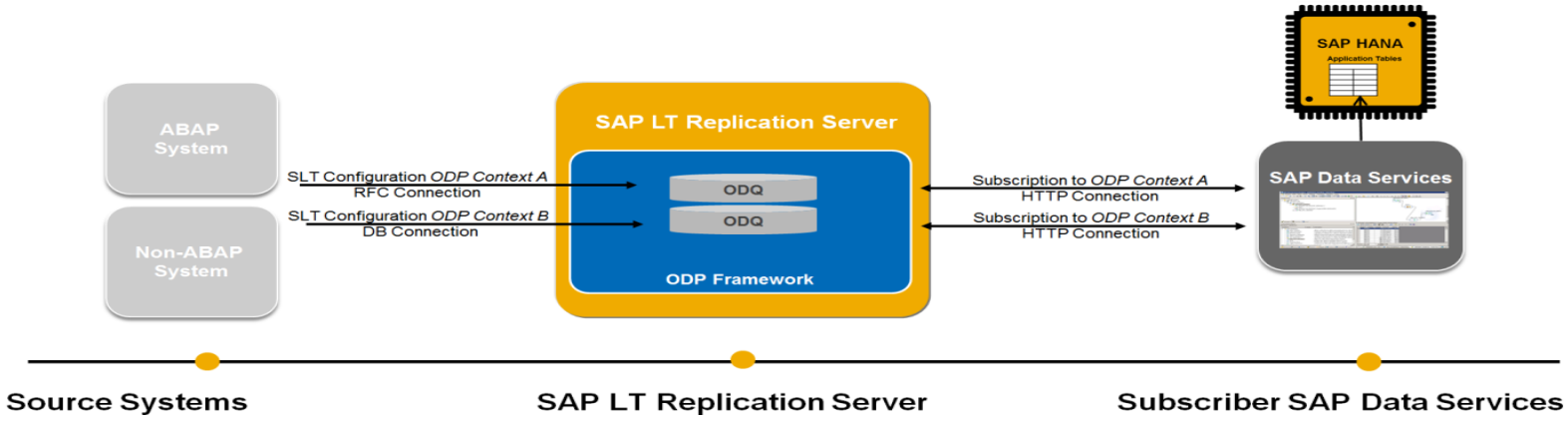
Data Provisioning for SAP Data Services 4.2 SP1

Scenario

SAP Data Services 4.2 SP1 has been integrate with SAP LT Replication Server (SLT) by leveraging the new version of ODP API. The existing extractor interface in Data Services has been replaced with ODP. SAP LT Replication Server enhances the limited change data capturing scenario of SAP Data Services with real-time data provisioning and unlimited delta capabilities.

Value Proposition

- Previously, the change data capturing feature of SAP Data Services was limited on the delta-capability of the data source itself. Now, SAP LT Replication Server enables real-time data provisioning and delta capability for SAP Data Services
- Every source table in ABAP systems starting with 4.6 C as well as data from non-ABAP source systems becomes delta-capable, facilitating the use of the change data capturing scenario of SAP LT Replication Server

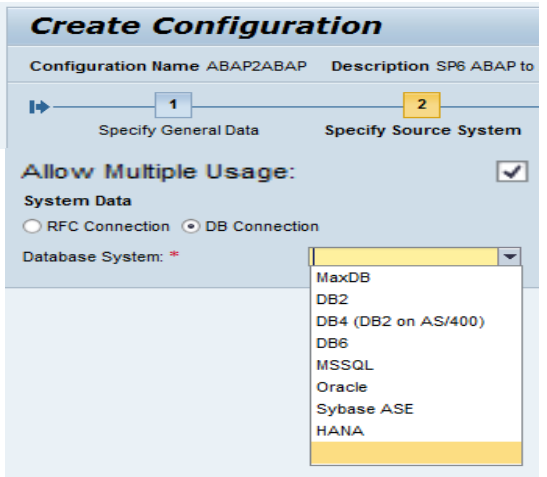


SAP LT Replication Server 2.0 – New features

available with SP6

1:N replication for non-ABAP source systems

- Like with ABAP source systems, up to four target systems can consume one data source.



Replication logging feature

- Replicated records can be logged on the SAP LT Replication Server system to repeat the replication for a certain time period in case replicated records are lost in the target system for example due to a point-in-time recovery.
  → Better support for high availability setups / disaster recovery scenarios

Support of views in source objects

- Smarter data selection options, no need to identify the underlying technical entities of a view

Filtering option for records in source system

- A fast and resource-saving method to reduce the amount of data to be transferred at the time of selection.

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- Simplified administration
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- Open interface to feed analytical non-ABAP target systems from ABAP source systems

New features
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- Automated parallelization for replication
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- SAP BW scenario:
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Today
(Release 2.0 SP6 & SP7)

PLANNED INNOVATIONS

Future Direction

Planned innovations – strategic development

Transactional consistency for complex objects

- To achieve outstanding performance, the replication only processes data on table level without taking any business context into consideration
- This approach is sufficient for most applications that are available for SAP HANA
- For the small number of applications with critical data consistency requirements, the upcoming solution will handle also transactional consistency for complex objects

Open interface to feed analytical non-ABAP target systems from ABAP source systems

- Many customers use solutions developed in-house, legacy, or 3rd party non-ABAP products and solutions to analyze their business data
- SAP LT Replication Server will feed these analytical systems with data in real time, and minimize the transfer volume by transferring only delta data.
- Existing transfer solutions can be replaced

Planned innovations – new features 1/2

General replication features

Templates to manage and reuse settings across tables, configurations, and systems

- Fast and easy way to reuse the settings for tables, fields, mapping values, and transformation rules
- Settings can be activated globally, at configuration and table level, or based on other selective criteria

Automated parallelization for replication

- Observing of the accumulated data transfer volume during the replication
- Automatically decision if a parallelization of the processes is suitable to achieve your required latency times
- Adjustment of the jobs to execute parallel processing automatically operated

Integrated consistency check with automated repair mode

- Integration with the SAP Solution Manager cross-database comparison (CDC) tool to allow consistency checks between source and target systems.
- Inconsistencies will be detected and a repair mode will automatically correct the relevant records to a consistent state

This is the current state of planning and may be changed by SAP at any time.

Planned innovations – new features 2/2

SAP BW scenario specific replication features

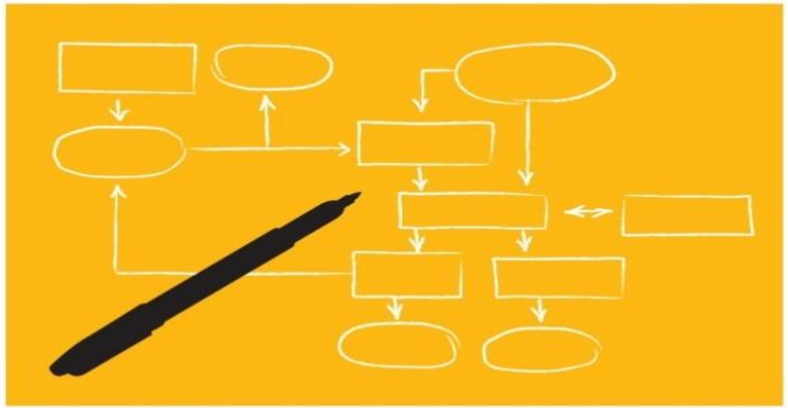
Product capabilities

- One major enhancement for the SAP BW replication scenario is the capability to load and replicate complex objects:
  - On the source side, hierarchical table structures have to be read
  - On target side, function modules must be called

  →Creation of templates in the modelling workbench which can be loaded in the productive migration objects
- Creation of a data preview mode (requesting a limited amount of data) with a generic data-reader module

Key benefits

- Enrichment of functional scope
- Replacement of (certain) BW extractors for SAP BW as target
- Reduce overhead for generating modules and full data transfer for preview



PLANNED INNOVATIONS

This is the current state of planning and may be changed by SAP at any time.

Planned innovations – continuous improvements

Automated adaption of replication after operational events like NZDT, OS/DB migration or system refresh

- Automation of all steps required after a operational event such as a near zero downtime project, OS/DB migration, or a test system refresh
- Adaption of all replication related settings and objects
- All relevant replication objects will work like they did before the operational event.

PLANNED INNOVATIONS

This is the current state of planning and may be changed by SAP at any time.

SAP Landscape Transformation Replication Server

Product road map overview - key themes and capabilities

Today
(Release 2.0 SP6 & SP7)

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FUTURE DIRECTION

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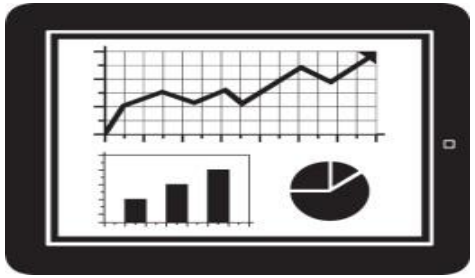
Future direction - strategic developments

Object-based replication

- Replication based on a business object, like sales orders, customers, or contracts
- Easier and object-driven way of building new applications that require real-time information from the productive environment.

Enhanced troubleshooting framework with self-repair functionality

- New user interface will allow a faster and more efficient way of finding and troubleshoot any issues and problems occurring during the load and replication process
- The end user will decide weather the system tries to repair an issue automatically



Simulation and debugging engine for transformation rules

- New transformations rules can be checked for the correct syntax
- Simulation feature will show the result of a rule without loading the complete table to the target system
- Incorrect results can be analyzed by debugging the transformation process to find the issue in the transformation rule.

FUTURE DIRECTION

This is the current state of planning and may be changed by SAP at any time.

Summary

1. SAP LT Replication Server is the best solution for real-time data replication from ABAP and non-ABAP* source systems into SAP HANA, SAP Business Suite, SAP Business Warehouse and SAP Data Services.

2. The change data capturing technology minimizes the transfer volume by transferring only delta data to the target systems.

3. SAP LT Replication Server is embedded in your landscape and can be deployed without disrupting your existing operations.

*SAP NetWeaver supported databases

This is the current state of planning and may be changed by SAP at any time.

Key links for more information

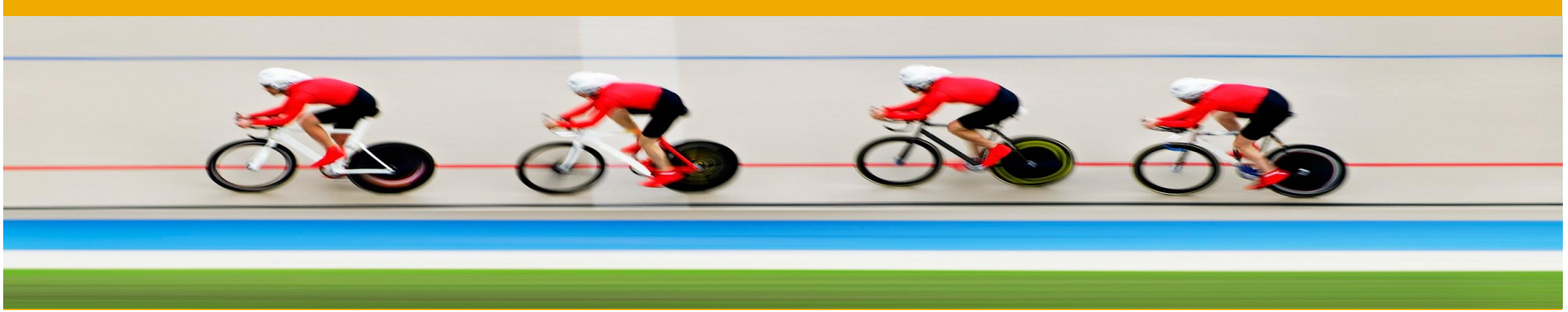
For customers and partners

Key links

- Road maps on SAP Service Marketplace — http://service.sap.com/roadmap
- SAP Community Network — http://scn.sap.com/community/replication-server
- IT Planning Resources — https://service.sap.com/~sapidb/011000358700001160122012E
- Guides — http://service.sap.com/instguides

Where to go to provide product feedback and ideas

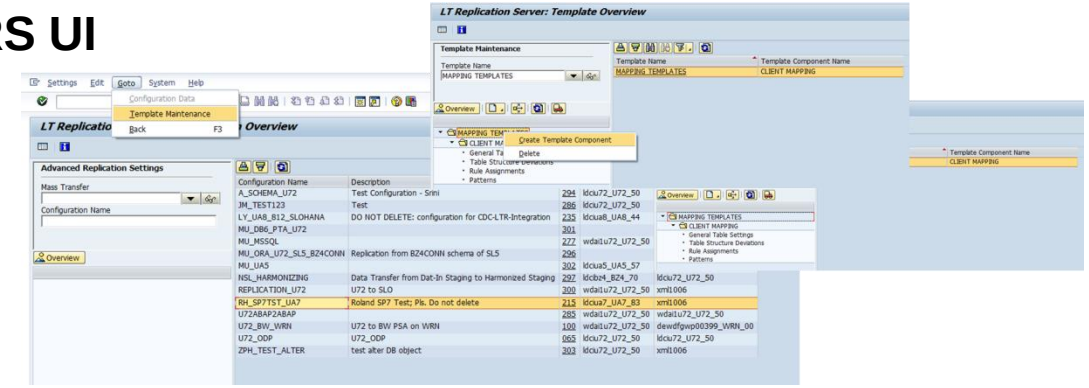
- SAP Idea Place — https://ideas.sap.com
- Influence programs — http://service.sap.com/influence
- SAP User Groups — http://www.sapusergroups.com/



Development News

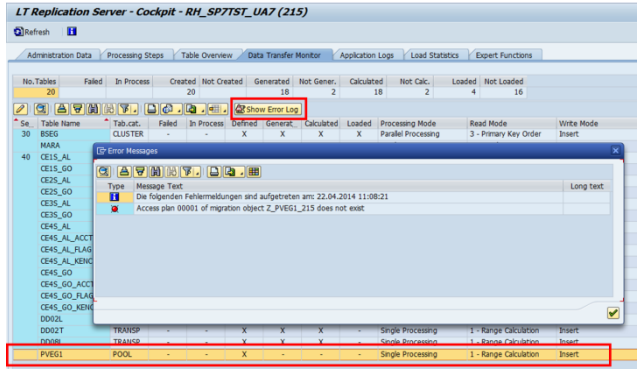
Overview: New Features in DMIS 2011 SP7

- **Replication Setting Templates Maintenance added to LTRS UI**



- **Error Protocol per table in *Table Overview* and *Data Transfer Monitor* tab page in the LT Replication Server Cockpit (transaction *LTCR*)**

- **LTRS: Data Load and Replication via Views (Projection and DB Views possible)**



- **ODP: Parallel processing of one table by multiple subscribers**

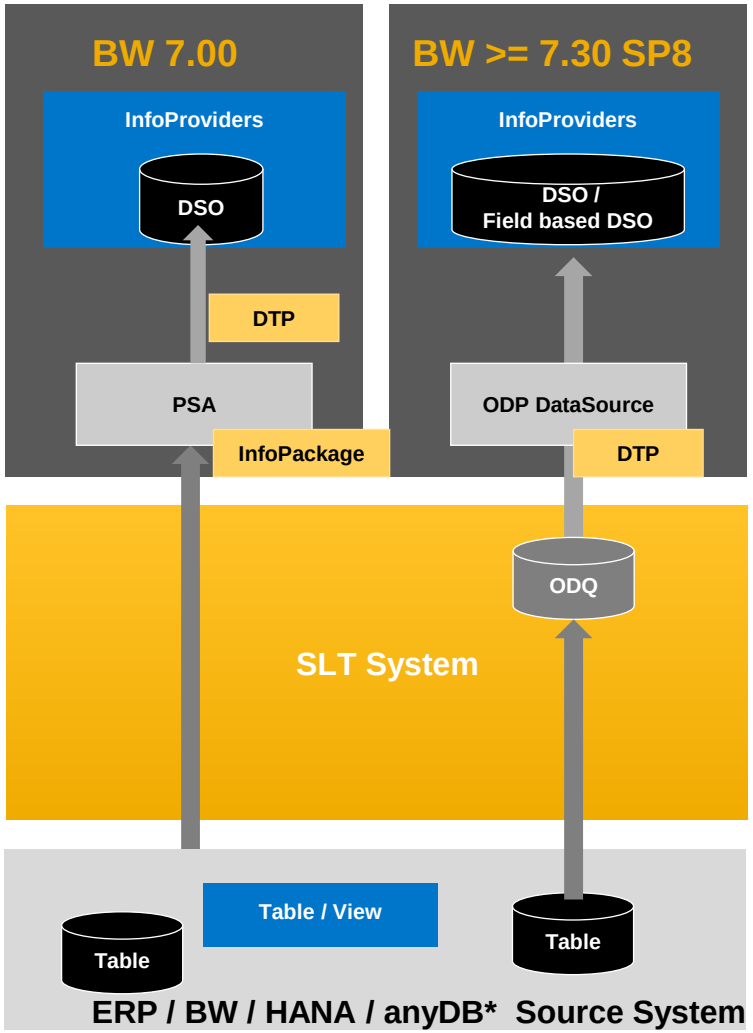
- **Integration of CDC Tool (Cross Database Comparison Tool): erroneous records can be replicated again**

Overview: Corrections/Enhancements with DMIS 2011 SP7

- **‚Suspend' and ‚Resume' function for Initial Load mode**
- **Configurable automatic restart of tables in case trigger is dropped on the source system (e.g. due to complex changes)**
- **Expert Function to enhance target structure (via table deviation) without reloading the table**
- **Internal Name of Logging Table name changed to generic name (S_LOGTAB) to allow reuse of logging table related rules**
- **Housekeeping (improved error messages, optimized cleanup of locks and obsolete entries in control tables)**
- **Operation Delta Provisioning Option:**
  - Proper handling of Cluster Deletes
  - Support automatic adjustment in case of source structure changes
- **Replication Logging:**
  - Authority to display logged data can be controlled per table
  - Adjustment of Replication logging settings on configuration and table level via LTRS UI
    - *General Settings* - To activate logging and to set recording interval in days for all tables
    - *Table-specific Settings* – To control logging & recording interval in days for individual tables
- **Advanced Replication Settings (LTRS):**
  - Index creation on HANA can be controlled individually
  - Specific Triggers can be switched off

SAP LT Replication Server for SAP BW

SLT Scenarios for SAP Business Warehouse – Overview of PSA and ODP



Scenario

SAP LT Replication Server offers 2 scenarios for replicating data into SAP BW. For SAP BW 7.00 onwards, data can be transferred into the PSA layer of BW into WebService DataSources and then processed into the InfoProviders.

With Support Package SP8 of BW 7.30, the Operational Data Provisioning Infrastructure can be used with SLT, where the data from the source systems is stored and SAP BW is registered as a consumer.

Value Proposition

Using SAP LT Replication Server to transfer data in real-time into SAP NW BW reduces the amount of overnight data uploads into your BW systems. With SAP LT Replication Server you can perform delta updates on BW DataSources without delta mechanisms, for ABAP-based systems as well as non-ABAP based systems on all SAP supported DB versions (according to PAM).

If you use operational data provisioning, you can load the data directly into the **InfoProviders** (bypassing the PSA layer) by using a DTP (Data Transfer Process) (as of SAP BW 7.30 SP8). The ODP infrastructure (with delta queues) takes over important services such as monitoring data requests.

Real-time Data Replication into SAP BW (PSA) with SAP LT Replication Server

Scenario

SAP LT Replication Server transfers data in real-time into SAP NW BW, reducing the amount of overnight data uploads into your BW systems. With SAP LT Replication Server you can perform delta updates on BW DataSources without delta mechanisms, for **ABAP**-based systems as well as **non-ABAP** based systems on all SAP supported DB versions (according to PAM).

Value Proposition

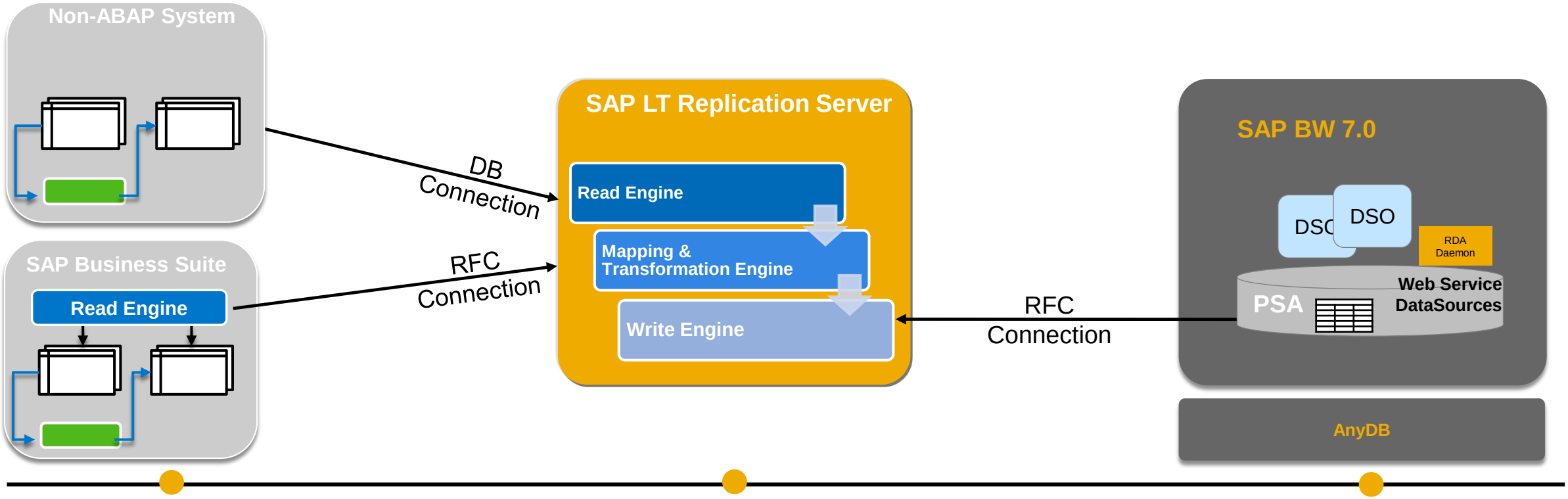
BW native	SLT for BW
Data from SAP-Systems (and via ETL)	Data from SAP and non-SAP Systems
Deltas only from delta-enabled DataSources (ca. 30% of all DataSources, else full loads	Delta-capability for all (transparent) Tables
Delta-Data is written into delta queue in source system and is transferred with scheduled InfoPackages	Real-time Data transfer into PSA
Job per InfoPackage (per DataSource)	Low number of SLT-Jobs
Reporting on hourly or daily basis	Enables correct reporting on minute basis

Scope

Starting with DMIS2011 SP4, SAP LT Replication Server can create WebService DataSources in SAP BW systems with Release 7.00 and higher. Recommended for simple tables (no join or transformation logic included) and data sources (extractors) without delta mechanism and complex business logic.

Architectural Concepts

Replication from ABAP and non-ABAP source system into BW (PSA)



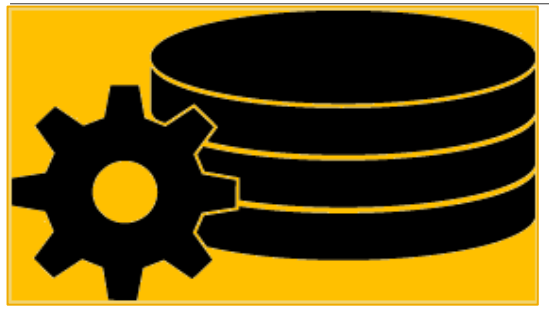
ABAP or Non-ABAP Source System

SAP LT Replication Server

SAP BW on anyDB

SAP LT Replication Server offers real-time data replication from ABAP-based and non-ABAP-based systems into SAP NW BW (7.0 onwards). The data is transferred into Web Service DataSources in the Persistent Staging Area in SAP NW BW and can be processed via SAP BW Real-time Data Acquisition (RDA) Daemon into DataStore Objects (DSO) or master data tables (MD).

Technical Requirements for SLT Scenario with SAP BW (Web Service)



ABAP or Non-ABAP Source System

Installation:
DMIS 2011 SP6 (recommended) or
- DMIS 2011 SP2-P5
- DMIS 2010 SP8/SP9

Basic Configuration:

- Define RFC user with appropriate authorization
- Optional: define separate table space for logging tables

System Requirements:

- All ABAP-based SAP Systems starting with R/3 4.6C, all supported OS/DB's platforms
- OS/DB restrictions of SAP NetWeaver stack (service.sap.com/pam)
- Non-SAP: all SAP supported DB versions (with respective SAP Kernel installed on LT Replication Server)

SAP LT Replication Server

Installation:
SAP_Basis (min requirement):

702

- Add-on DMIS 2011 SP6 (recommended)
- Or DMIS 2011 SP4-5 + Note 1810627

Basic Configuration:

- **SAP:** Define RFC connection to source and target system

SAP BW on anyDB

Installation:

- Respective DMIS_2011 add-on version
- Minimum DMIS_2011 SP level: SP02
- **Apply SAP Note 1808251 (BW specifics!)**

System Requirements:

- SAP BW 7.0: min. SP level – SP17
- SAP BW 7.01 and 7.40: min. SP level – SP00
- SAP BW 7.02 – 7.31: min. SP level – SP01

ODP/SLT Scenario for SAP Business Warehouse - Overview

Scenario

SAP LT Replication Server provides the operational data provisioning infrastructure with source tables of SAP- and non-SAP systems as delta queues. The data from the delta queue can be replicated in SAP BW as a subscriber. A subscriber can have more than one subscription. A queue can also be in multiple subscriptions for the same subscriber.

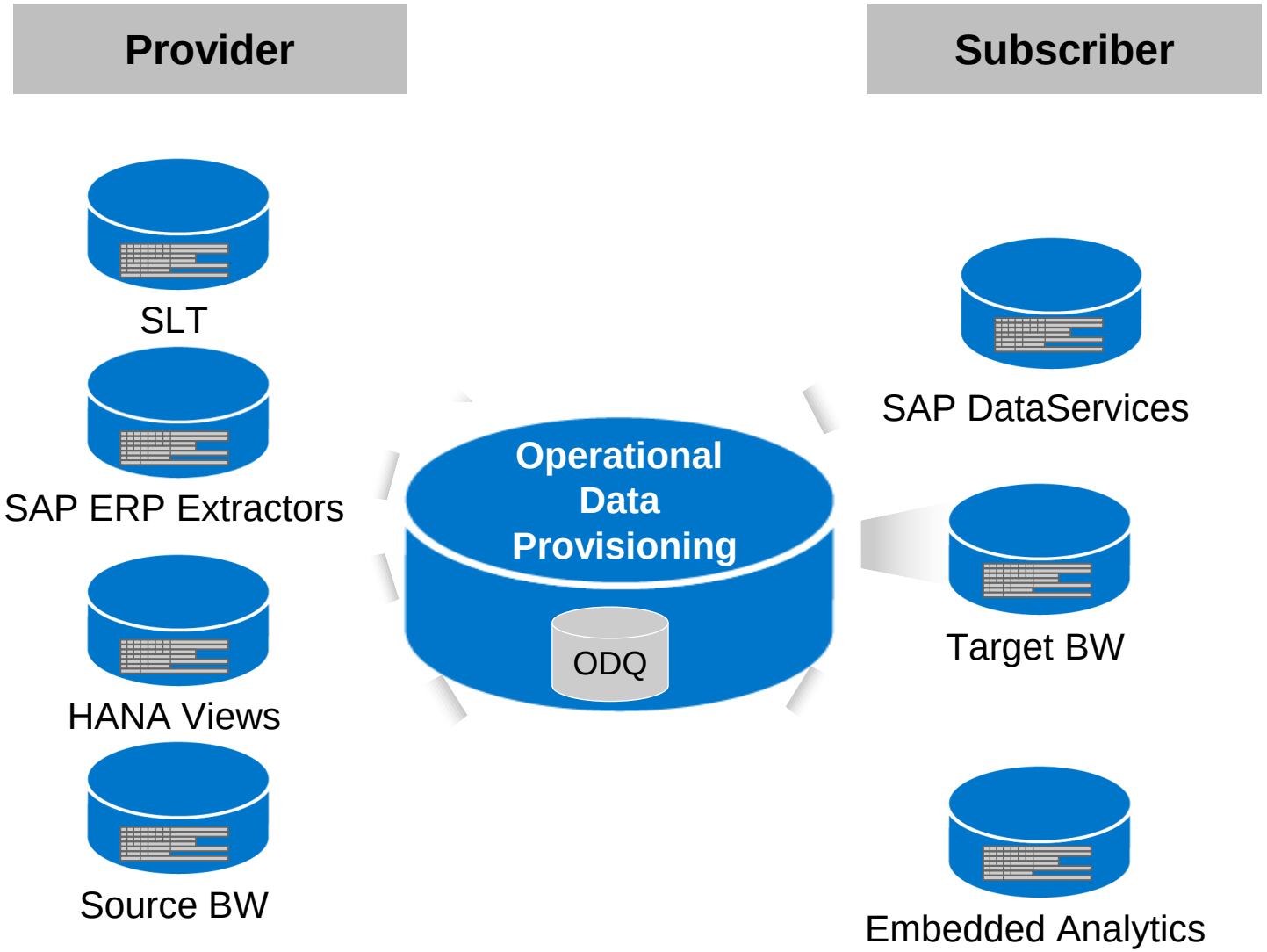
Value Proposition

If you use operational data provisioning, you can load the data directly into the **InfoProviders** (bypassing the PSA layer) by using a DTP (Data Transfer Process) (as of SAP BW 7.30 SP8). The ODP infrastructure (with delta queues) takes over important services such as monitoring data requests. The data is stored in a compressed state in the delta queue. A delta request transfers data records from the queue to the subscriber. The data changes to a queue can also be requested by more than one subscriber. The data is retained in the delta queue for a specified time period for recovery purposes.

Scope

Starting with DMIS2011 SP6, ODP/SLT can be used for both **SAP- and non-SAP source systems**.
Simple tables are covered as well as pool- and cluster tables. A restriction applies for extractors: only extractors without delta mechanism and complex business logic are covered.

Operational Data Provisioning (ODP) Infrastructure

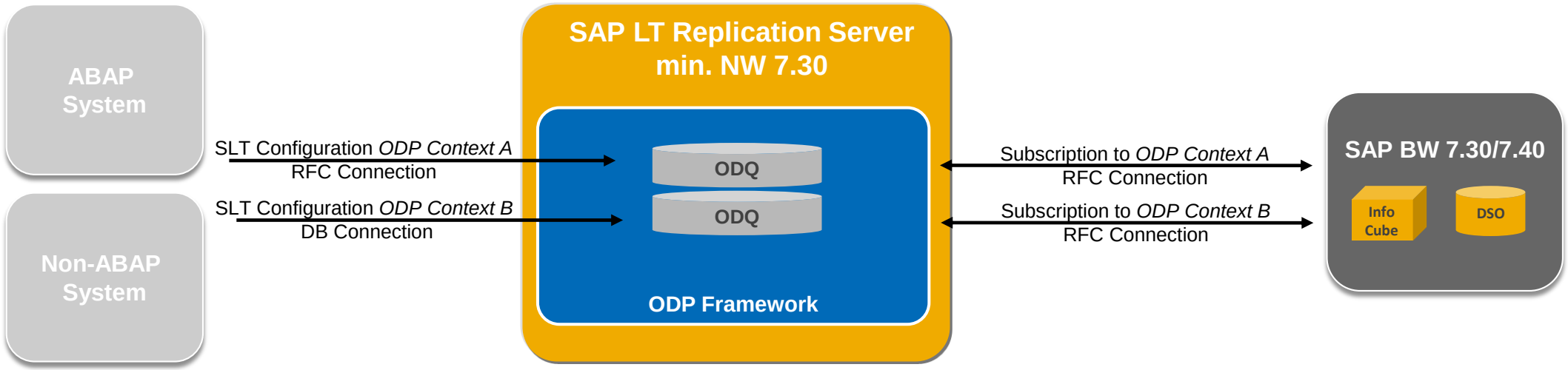


Unified infrastructure for data provisioning and consumption

- Enables extract once deploy many architectures for sources
- Unified configuration and monitoring for all provider and subscriber types
- Time stamp based recovery mechanism for all provider types with configurable data retention periods
- Highly efficient compression enables data compression rates up to 90% in Operational Delta Queue (ODQ)
- Quality of service: „Exactly Once in Order“ for all providers
- Intelligent parallelization options for subscribers in high volume scenarios

Architectural Concept

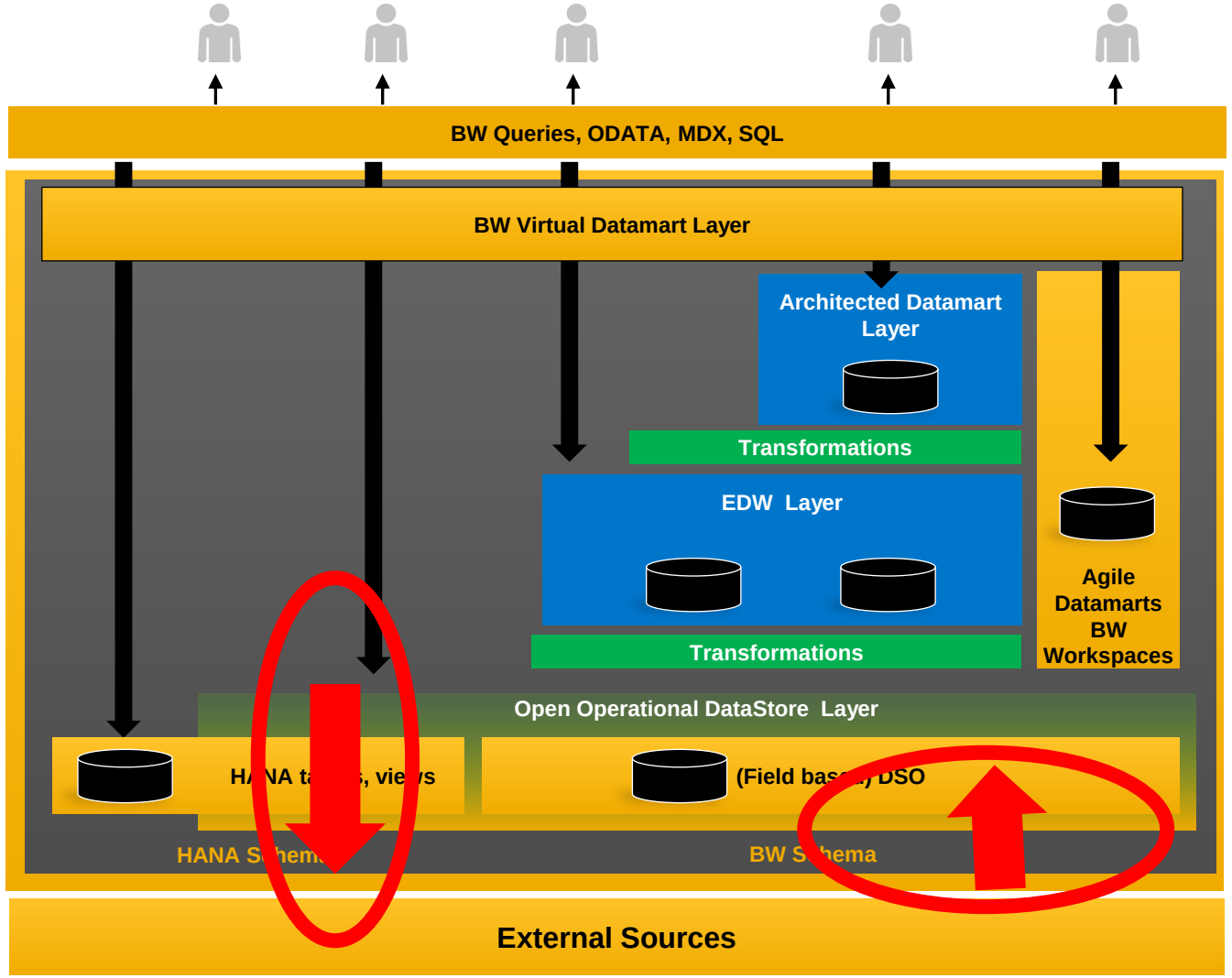
Replication from Source systems to ODQ and subscription from SAP BW



SAP LT Replication Server can replicate data from ABAP and non-ABAP source systems into the Operational Delta Queue of the SLT system. Thus, SLT itself acts as the target of the SLT configurations. Data gets replicated as soon as a subscriber requests the data from a data source from an ODP Context. Several subscribers can use the same ODQ as source. SAP BW can use this scenario with scheduled data transfer from ODQ as of SAP BW 7.30. A setup for real-time data transfer with Data Transfer Processes (DTP) into BW Data Targets and RDA Daemon is possible with SAP BW 7.40 SP5.

BW 7.4 – Real-time Data Warehousing Aspects

BW 7.4, SP5/SP6 on HANA



Enhanced Business Flexibility by providing “the logical EDW”

Real-time Data Access

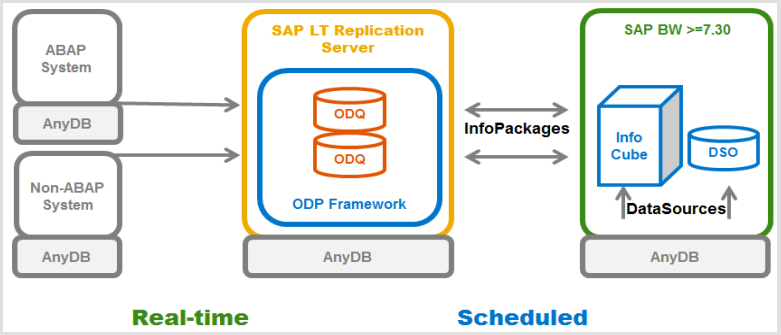
- Direct Data Access accross different source systems
- Direct Meta Data Access **during design time for field based modelling**

Lightweight Evolution options into staging scenarios for the EDW layer

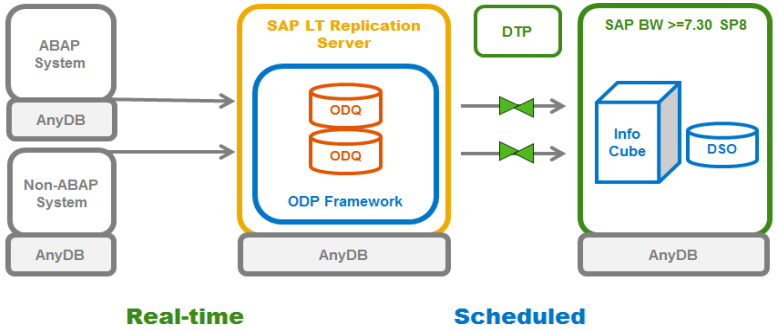
- BW enhancements for Operational Data Provisioning (ODP) and Operational Delta Queue(ODQ)
- Real-time Staging Scenarios
  - Reduced latency
  - RDA Real-time Data Acquisition improved by change notification
  - Real-time Replication into BW via SLT
- Recovery in case of DSO load issues can be achieved on data paket level
- Monitoring the PSA replaced by monitoring the ODQ (TA ODQMON)
- Recovery for more than latest delta load

ODP/SLT Scenario with Subscriber SAP BW

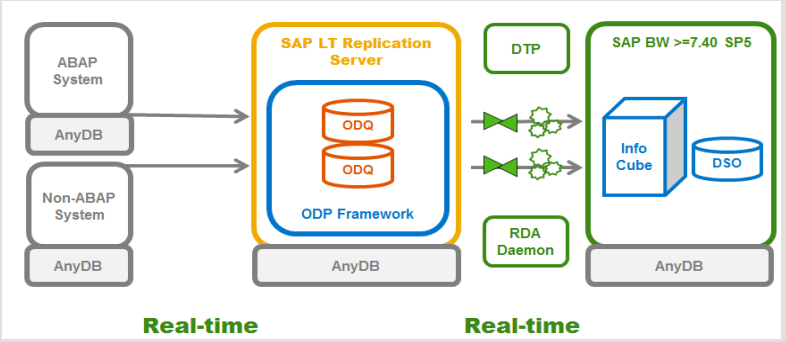
Option 1: Setup with Data Transfer via InfoPackages into BW PSA
possible with SAP BW >=7.30



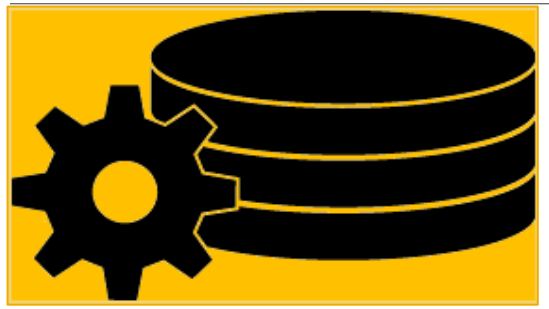
Option 2: Setup with Data Transfer Process into BW Data Targets
possible with SAP BW >=7.30 SP8



Option 3: Setup with Data Transfer Process into BW Data Targets and RDA Daemon
possible with SAP BW 7.40 SP5



Technical Requirements for ODP/SLT Scenario with SAP BW



Source Systems

Installation:
DMIS 2011 SP6 or
- DMIS 2011 SP3/SP4/SP5 + Note 1863476
- DMIS 2010 SP8/SP9 + Note 1863476

Basic Configuration:

- Define RFC user with appropriate authorization
- Optional: define separate table space for logging tables

System Requirements:

- All ABAP-based SAP Systems starting with R/3 4.6C, all supported OS/DB's platforms
- OS/DB restrictions of SAP NetWeaver stack (service.sap.com/pam)
- Non-SAP: all SAP supported DB versions (with respective SAP Kernel installed on LT Replication Server)

SAP LT Replication Server

Installation:
SAP_Basis (min requirement):

730 SP10 or SP5-9 + Note 1817467
731 SP8 or SP3-7 + Note 1817467
740 SP4 or SP0-3 + Note 1817467

- PI_Basis (min requirement):
  730 SP10 or SP8-9 + Note 1848320
  731 SP9 or SP5-8 + Note 1848320
  740 SP4 or SP2-3 + Note 1848320

- Add-on DMIS 2011 SP6

Basic Configuration:

- **SAP:** Define RFC connection to source system

System Requirements:
Sizing of the SLT system depends very much on the amount of data which is stored in ODQ and the planned retention periods.

Subscriber SAP BW

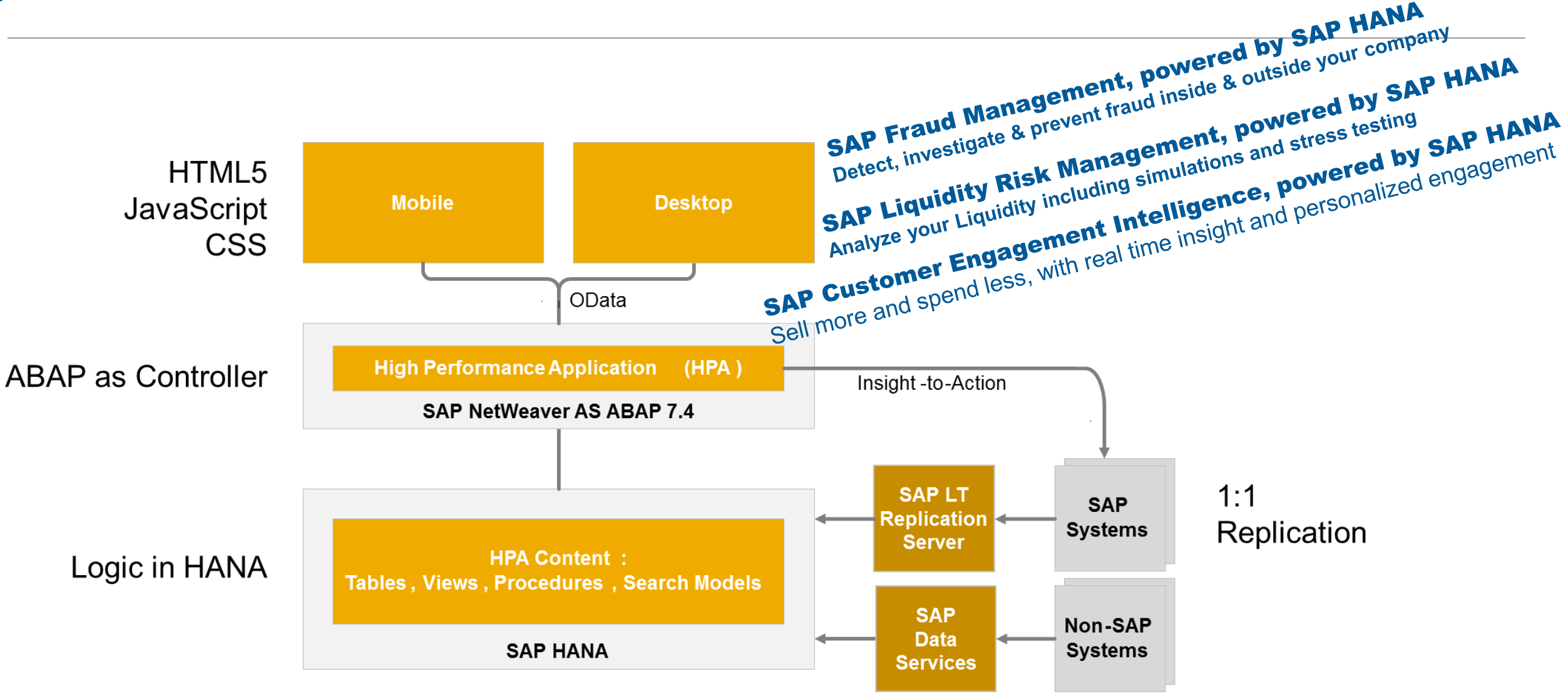
Installation:

- PI_Basis:
  Recommended version (full functionality):
  740 SP5

  Limited functionality with:
  730 SP10 or SP8-9 + Note 1848320
  731 SP9 or SP5-8 + Note 1848320
  740 SP4 or SP2-3 + Note 1848320

Key enabler for more SAP products

1 SAP HANA as platform for High Performance Applications (HPAs)



1 High Performance Applications (HPA), powered by SAP HANA
Shipment related Documentation for Partner & Customers

General Links

- Solution Explorer (HPAs == Capabilities): https://rapid.sap.com/se/executive
- Innovation Discovery (New Features per SPs == Innovations): https://apps.support.sap.com/innovation-discovery/index.html#!page=home

Customer Engagement Intelligence (CEI) 1.1

- Documentation incl. New Features (Release Notes) & Installation Guides
  http://help.sap.com/cei
- Product Availability Matrix (PAM) incl. Browser/OS Support, Software Download
  https://service.sap.com/sap/support/pam?hash=s%3DCustomer%2520Enga%26o%3Dmost_viewed%257Cdesc%26st%3Dl%26rpp%3D20%26page%3D1%26pvnr%3D67838200100900006828%26pt%3Dg%257Cd
- Sizing Guide (currently for CEI 1.0 / update to CEI 1.1 in progress)
  https://websmp204.sap-ag.de/~sapidb/011000358700000373142013E/Sizing_CEI_SP01_final.pdf
- System Landscape Recommendation: https://scn.sap.com/docs/DOC-52495
- Solution Explorer:

Assurance and Compliance Management (ACS) 1.1

- Documentation incl. New Features (Release Notes) & Installation Guides
  Fraud: http://help.sap.com/fra ; Audit: http://help.sap.com/audit
- Product Availability Matrix (PAM) incl. Browser/OS Support, Software Download & Installation/Upgrade/Config Guide
  Software Download
  https://service.sap.com/sap/support/pam?hash=s%3DSAP%2520FRAUD%2520MANAGEMENT%25201.1%26o%3Dmost_viewed%257Cdesc%26st%3Dl%26rpp%3D20%26page%3D1%26pvnr%3D67838200100900006915%26pt%3Dg%257Cd
- Sizing Guide for Fraud: https://websmp204.sap-ag.de/~sapidb/011000358700000364272013E/SAP_Fraud_Management_V1_1.pdf
- Sizing Guide for Audit: tbd.

2 Finance and Controlling Accelerator

Overview

SAP Finance and Controlling Accelerator

Accelerator

Rapid deployment of accelerated finance and controlling with SAP ERP and SAP HANA

Service

Financial Accounting Accelerator

- Reporting in Profit-Center Accounting (EC-PCA)
- Reporting in Asset Accounting (FI-AA)
- Reporting in New General Ledger Accounting (FI-GL)
- Reporting in Special Ledger (FI-SL)
- Direct BI access to SAP ERP / SAP HANA data via data sources

Controlling Accelerator

- Accelerated Profitability Analysis (CO-PA)
- Accelerated enhanced CO line item reporting (CO-OM-CCA)
- In Memory based CO Partner Object Reporting (CO-OM-OPA)
- Accelerated overhead and accrual calculation
- Active Availability Control Monitor for investment programs

Material Ledger Accelerator

- Accelerated Material Ledger Reporting
- Material Ledger Period End Closing
- Direct BI access to SAP ERP / SAP HANA data via virtual Info Provider

Production Cost Analysis Accelerator

- Product Cost Controlling Reports (CO-PC-OBJ)
- Responsibility Reporting

2 CO-PA Accelerator

What Customers Say

Colgate Palmolive

Perform analysis at unparalleled speed with SAP CO-PA Accelerator - going live in just eight weeks

Michael Crowe, Vice President Global Information Technology

Provimi

Optimize profits with SAP CO-PA Accelerator – going live in just three weeks

Jean Charles Valette, Group Controller

BASF

Accelerate response times dramatically and improve data reliability to optimize business

Andrew Pike, CIO Information Services

For more information, please visit our SAP HANA website: **http://www.sap.com/hana/reviews/index.epx**

2 SAP Business Suite Accelerators: SAP HANA as a 2nd Database

With the
Replication of only a few Tables to HANA
and a
Minimum of Program Changes
ERP-processes can be
speed up by SAP HANA.

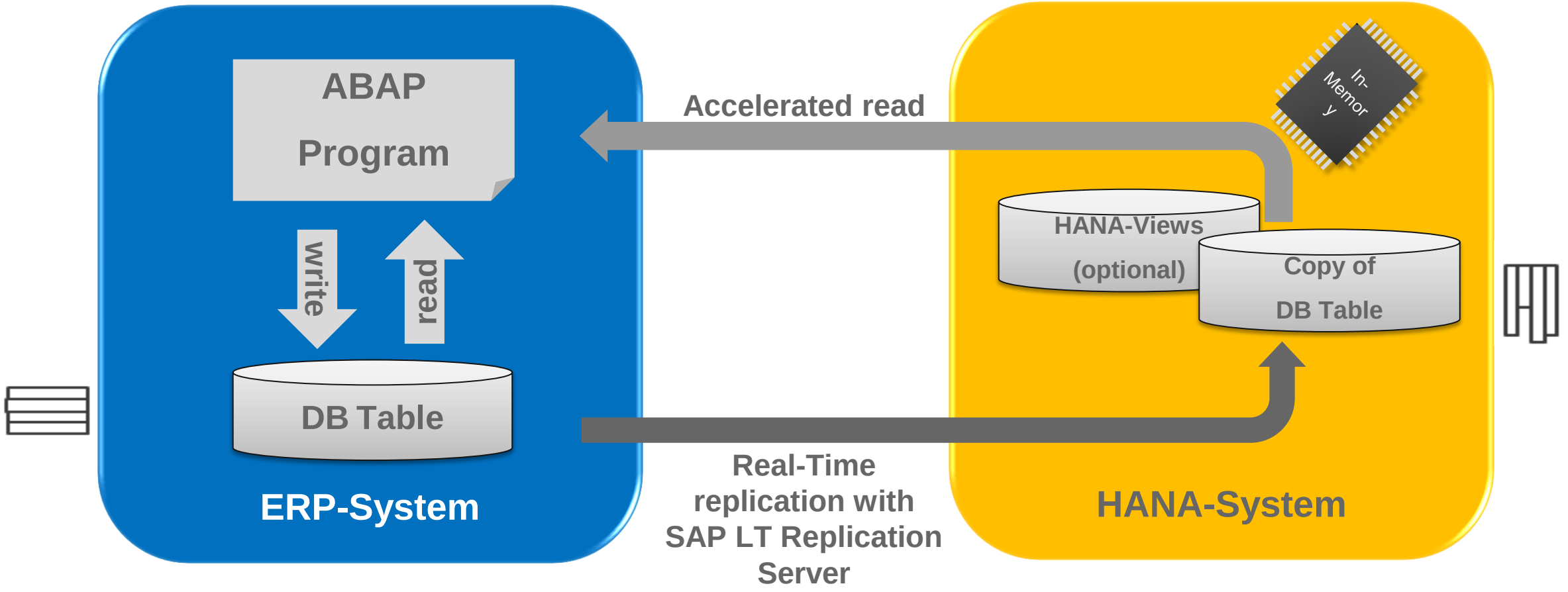
Accessing the HANA Database from ABAP via Open SQL

It can be accessed with a select statement like the conventional DB:

```
*      selection from HANA
       SELECT count(*) FROM zha_flight CONNECTION (dbcon)
        INTO  l_count2
        WHERE carrid   IN carrid
          AND connid   IN connid
          AND fldate   IN fldate
          AND deptime  IN deptime
```

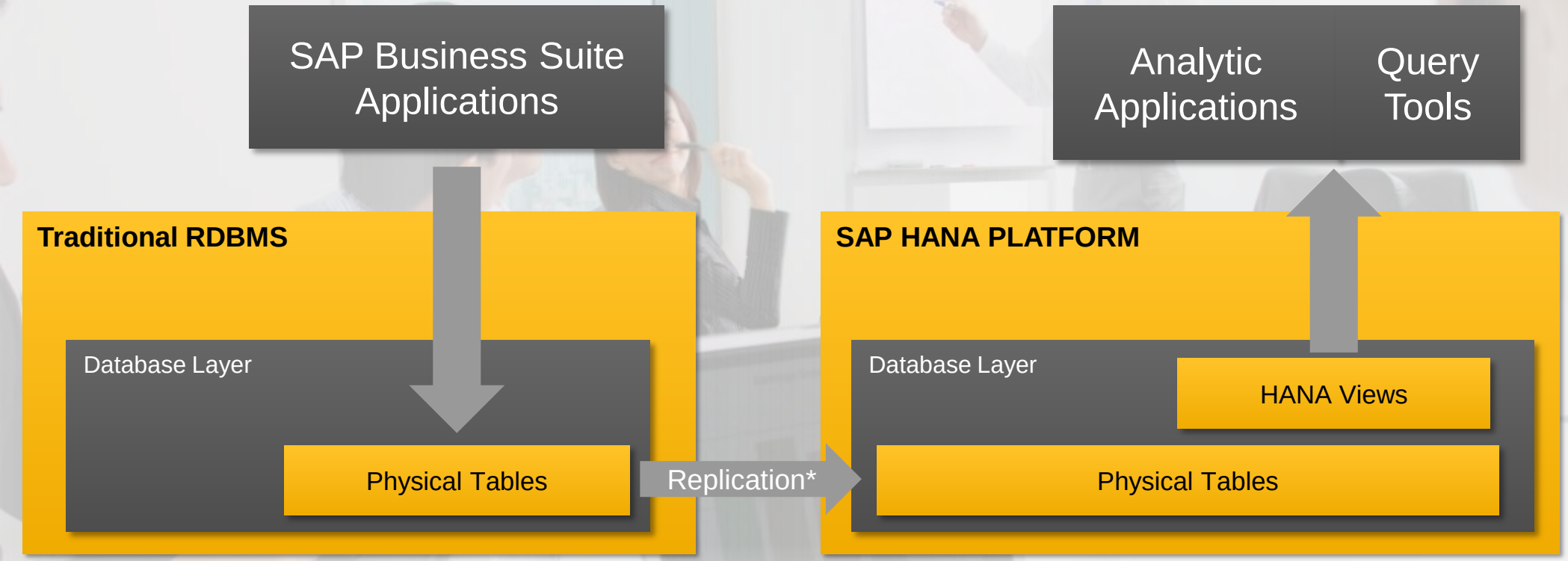
The variable dbcon determines that the select will use the HANA DB

2 Architectural Concept



3 SAP HANA Live architecture

The “HANA Sidecar”

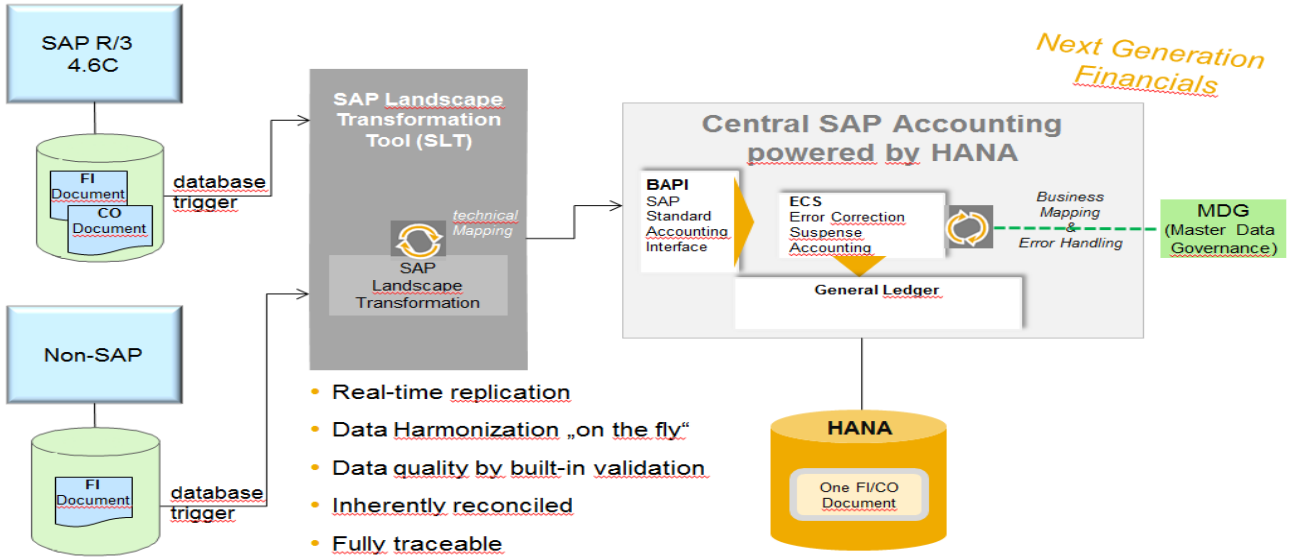


** real-time replication, using SAP Landscape Transformation Replication Server (SLT) technology*

4 SAP Central Finance: SAP Accounting powered by HANA

Main drivers for customers

- **Robust Bridge to Financials powered by SAP HANA**
  - Use SAP Accounting powered by HANA as a central system, leave all other sender systems untouched
  - First use it for reporting only
  - Next move more and more financials transactions to SAP Accounting powered by HANA
- **Central Finance as the better Financial Data Warehouse**
- **Financial Consolidation based on the Central Finance Instance**



- “always trues” from the past
  - Simplify system landscape
  - Reduce TCO
  - Harmonize master data „on the fly“
  - …

Summary and Outlook

SAP LT Replication Server - Benefits

- Allows **real-time** (and scheduled) **data replication**
- Ability to **automatically migrate data into HANA format** while replicating data in real-time
- „**Unlimited“ release coverage** (from SAP R/3 4.6C onwards) sourcing data from ABAP based SAP applications
- **Handling of all SAP ABAP Application Data Structures** (i.e. cluster and pool and HR tables)
- Automatically **non-Unicode to Unicode conversion** during load/replication
- **Data and structure transformation capabilities** (e.g. data filtering, enrich/reduce target table structure, anonymize data, adjust technical table parameters, etc.)
- **Fully integrated with SAP HANA Studio** (Data Provisioning and Data Modeler UI)
- **Enhanced monitoring capabilities** via SAP Solution Manager 7.1 SP5 onwards & mobile app SAP Replication Manager

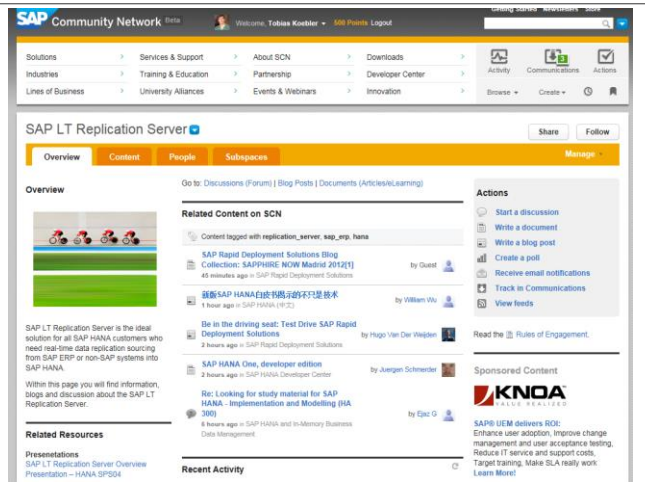
SAP Landscape Transformation Replication Server (aka **“SLT**”) is a perfect choice for all SAP HANA customers who need real-time or scheduled data replication from SAP and NON-SAP sources with the option to accomplish even complex data transformations on the fly.

Information Sources

For Customers and Partners

Web Sites

- SLT @ SAP Service Marketplace: http://service.sap.com/hana
- SLT @ SAP Help Portal: http://help.sap.com/hana
- SLT @ SCN: http://scn.sap.com/community/replication-server
- Some assets linked @ HANA Experience Page



News

Presentations

Videos

How-To Documents

Discussion Forum

SAP LT – important Documents and Links

- New SLT – Introduction Video
- SLT – Overview Presentation
- Installation Guide
- Security Guide
- Operations Guide
- How-To Guide „Advanced Replication Settings“ (see SAP Note 1733714)
- HANA & SLT Sizing; SLT Sizing Guide
- Important SLT Notes: see in SLT General Note 1605140

Training

- HA350: SAP HANA – Data Provisioning
- HA200 SAP HANA - Installation & Administration
- HA300 SAP HANA Implementation and Modeling
- Specific customized training on SLT available on demand

Thank You!

Contact information:

Astrid Tschense-Oesterle
AGS SLO Product Management
astrid.tschense-oesterle@sap.com

Roland Hamm
AGS SLO Product Management
roland.hamm@sap.com

Tobias Koebler
AGS SLO Product Management
tobias.koebler@sap.com

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