DMM164 – SAP Landscape Transformation Replication Server: Real-Time Data Replication

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Public

Speakers

Las Vegas, Oct 19 - 23

- Tobias Koebler
- Roland Hamm

Barcelona, Nov 10 - 12

- Tobias Koebler
- Roland Hamm

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Agenda

Introduction && Use Cases

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Roadmap && Summary

Exercises

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Introduction && Use Cases

SAP Landscape Transformation Replication Server (SLT)

…is positioned for real time (*trigger-based)* data replication from ABAP and non-ABAP sources (SAP NetWeaver supported databases only).

→ Mainly recommended for real-time data replication business scenarios

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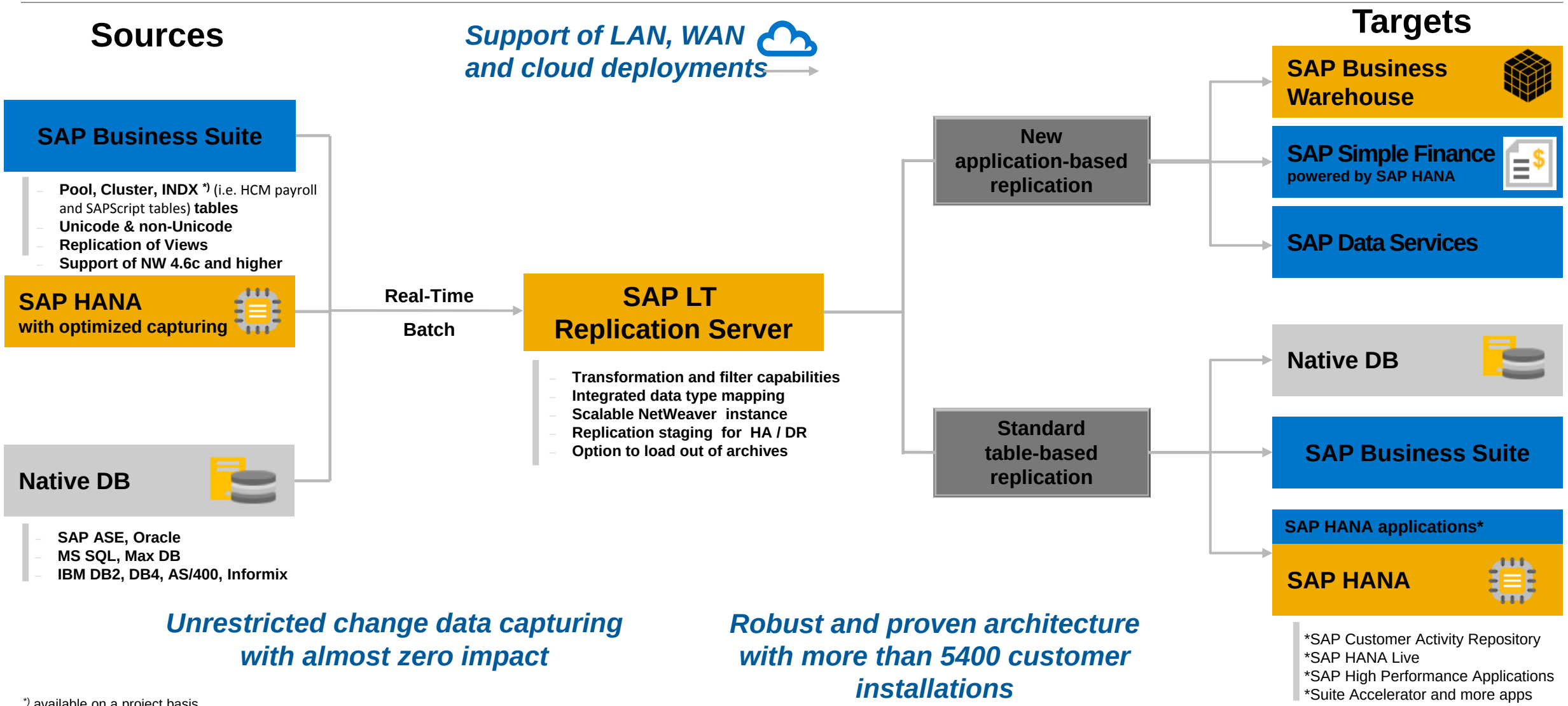
Big Data provisioning with SAP LT Replication Server



Unrestricted change data capturing with almost zero impact

Robust and proven architecture with more than 5400 customer installations

*) available on a project basis

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Customer figures 2015/7

>30k tables
with one SLT

>700 tables
with one configuration

5,416
customer landscapes

>95% data transfer reduction
IS-U /CRM to SAP BW via SLT

70+ ABAP systems
connected with one SLT

26bn records
highest load (89h)

45 non-ABAP systems
connected with one SLT

>20mio records
highest change rate / h / table

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Largest SLT Customer Installation

- 71 ERP geographically distributed systems (some non-SAP) with approx. 21000 tables (financial and logistics) feeding one central HANA database
- overall loaded HANA DB size: - 88 billion records
- Delta Updates from peripheral systems each hour:
  - Inserts - 10M
  - Deletes - 5M
  - Update - 14M
- Data transfer occurs for most applications – Finance, Logistics, Sales
- BSEG with 2 billion records initial loads
- No noticeable Network impact with current set up.
- SLT Server Instance Hardware: 4 Application servers with 64 GB RAM
- HANA database: 10 nodes 5 TB scale-out
  Implementing new hardware which will reduce the landscape requirements to 4 nodes.
- Live with data feed to HANA since 2013
- Data feed change is transparent to end users using existing dashboards

70+ ABAP system
connected with one SLT

>30k tables
with one SLT

500-800 tables
with one configuration

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SLT Customer EnBW

- 41 ERP systems connected to one SAP Business Warehouse (BW on Oracle) using ODP scenario, managed with minimum effort (0.1 FTE)
- Data transfer over SAProuter from SAP IS-U to SAP BW:
  - 200 records per second
  - 108 tables in replication
- Company wide used SLT for data replication from SAP CRM to SAP BW on HANA and add. MSSQL Server
  - 95% data transfer reduction from full loads (350 GB, more than 12 hours every night) to delta loads
  - No noticeable Network impact with current set-up.
- Replacement of CRM extractors with SLT functionality
- Replacement of generic extractors with SLT (Database Views)

41 ABAP systems

connected with one SLT to SAP BW

>95% reduction

of nightly batch load with delta technology

SLT lowers TCO

0.1 FTE to manage
company-wide data replication

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New Main Features

General Availability for scenario data load/replication from SAP source systems to other DBs

- You can now load or replicate data from a connected SAP ABAP based source system to non-ABAP based target systems via a direct database connection. This works for all target systems based on SAP released database platforms according to SAP‘s Product Availability Matrix (PAM) for the underlying SAP NW ABAP Server on which the SLT Server functionality is deployed on.

Add filter and parallelization settings into LTRS UI

- This UI replaces the formerly manual maintenance of table DMC_ACSPL_SELECT

Real-time Preview Mode for SAP BW replication

- New Data Preview in SAP BW for source tables for displaying a small number of records instead of full load for checking purpose

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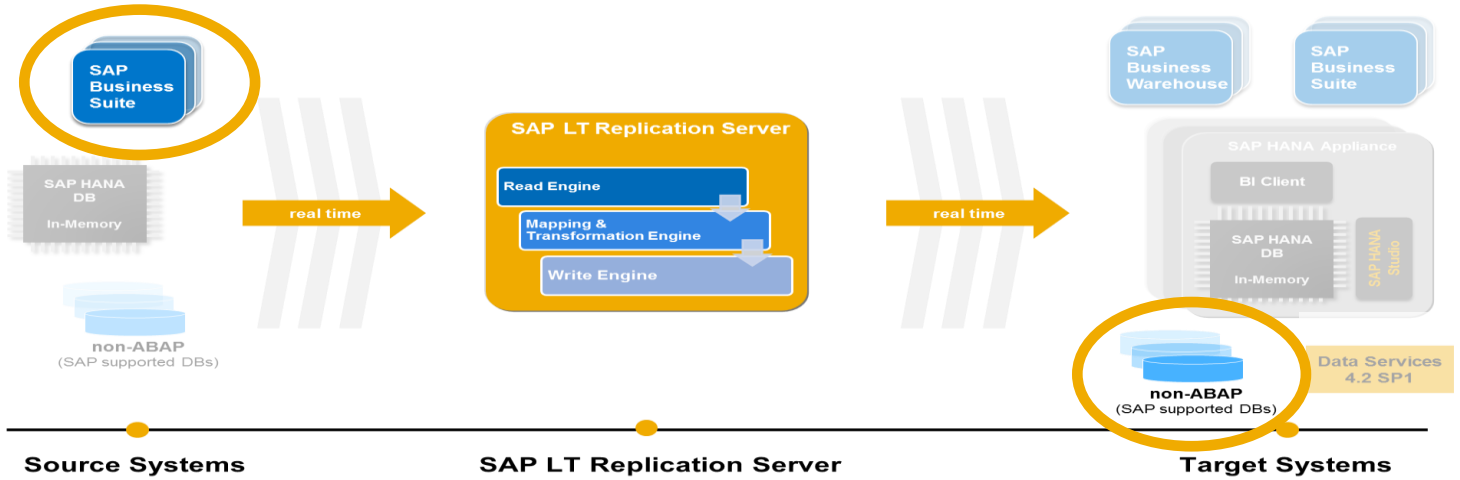
Replication to non-ABAP targets

Scenario

Load or replicate data from a connected SAP ABAP based source system*) to non-ABAP based target systems via a direct database connection. This works for all target systems based on SAP released database platforms according to SAP's Product Availability Matrix (PAM).

Value Proposition

- Offers data provisioning and delta load capability for all tables transferred to non-HANA and non-ABAP based analytical or transactional applications
- Sync your business data in real-time, while minimizing the necessary data transfer volume



*) Data Replication from non-ABAP based source systems to non-ABAP based target systems is still available on project base only. To request a project engagement open a ticket on message component HAN-DP-LTR.

Note: In order to configure a direct database connection for a non-ABAP based target system you can proceed similar to the definition of a direct database connection for a non-ABAP based source systems. The relevant documentation & system help applies for this scenario, too.

Authorization Aspects and User Roles for Non- ABAP Source System:
To access a non- ABAP target system by a database connection, the relevant user must be created with all necessary authorizations in the non- ABAP source system. Contact your system administrator to get a user with the relevant authorizations as described here:

The SLT Server (ABAP) system connects to a specific schema from the database. To perform the replication and initially load a specific table from a given schema, the database user must have privileges for the following actions:

- Selecting from the table
- Creating a table in the given schema (for creating the target table)
- Deleting the target table (in case of restarting a replication after a stop replication)
- Creating synonyms for the specific table
- Deleting the synonyms

Depending on the specific external database system, the process of granting privileges to a user can vary.
For more database specific details read the specific non-SAP Replication related SLT Notes attached to this central note

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Improving the performance of the replication process (1/2)

Scenario and Value Proposition

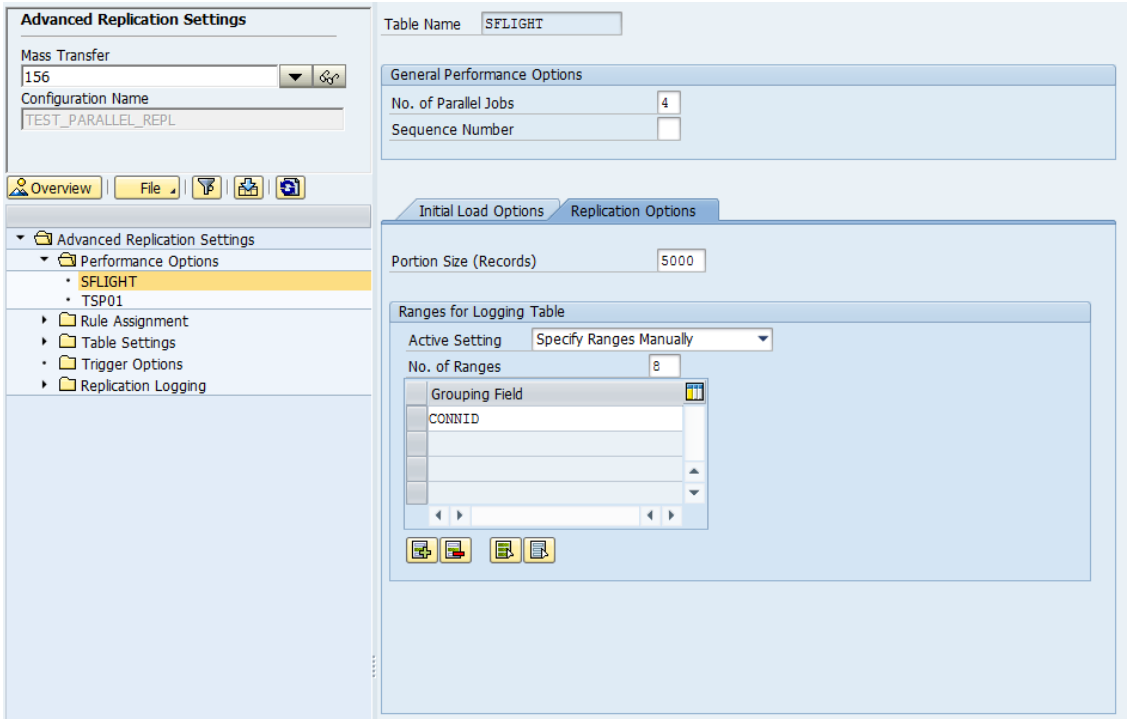
Replication of tables with very high change rates by dividing the logging table content into ranges. Dividing the table into ranges improves performance because multiple jobs can transfer the data for each range at the same time.

You can improve the performance of the replication process for the following scenarios:

- Replication via ODP Framework (SAP BW and SAP DS)
- Replication into PSA storage (SAP BW)
- Replication into a SAP HANA DB schema
- Replication into a SAP ABAP-based system (table based)
- Replication into a SAP ABAP-based system into the Application layer is technically possible, but may be limited by application logic (sequencing issue)
- → **basically all target scenarios are supported**

The feature ‘Specify Ranges Manually’ is available for source systems on the following database platforms:

- ORACLE 11.2 64-Bit
- DB6 (DB/2 10.1 LUW 64-Bit)
- DB4 (DB2/400 V7R1)
- MS/SQL (MS SQL Server 2008/X86_64 & 2012/X86_64)
- SAP HANA 1.00



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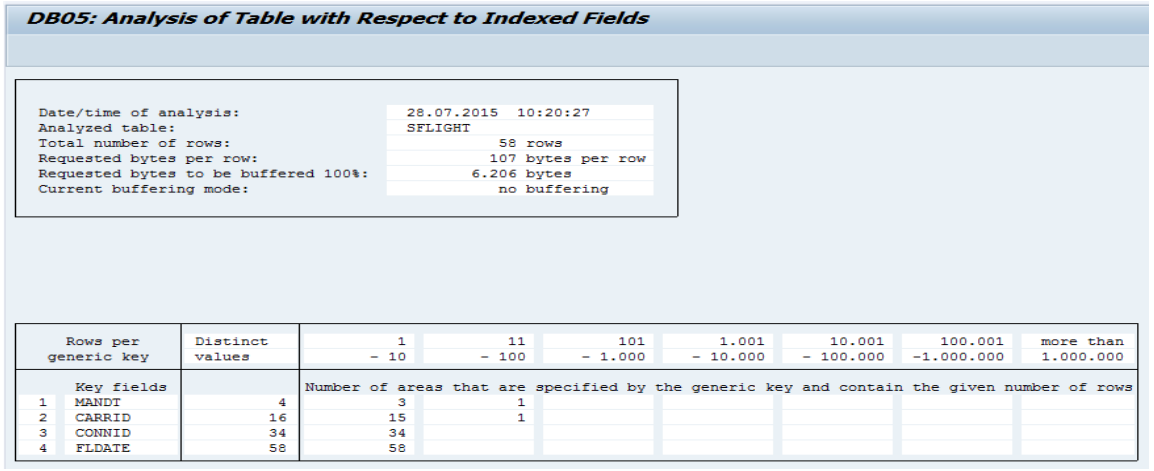
Improving the performance of the replication process (2/2)

There are two options to configure parallel replication on one table:

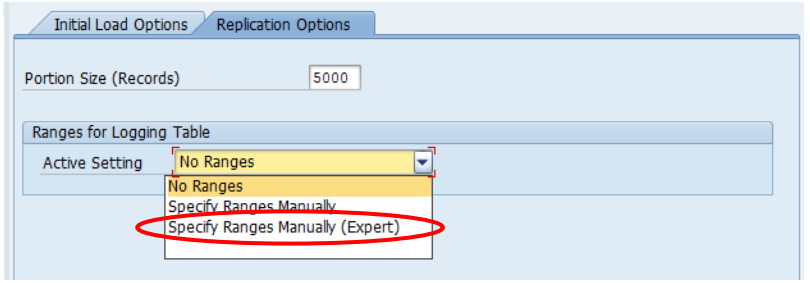
- **Specify Ranges Manually**
  SLT will take care to build equally distributed portions according the specified grouping field(s). Not available on all DB platforms (see previous slide).

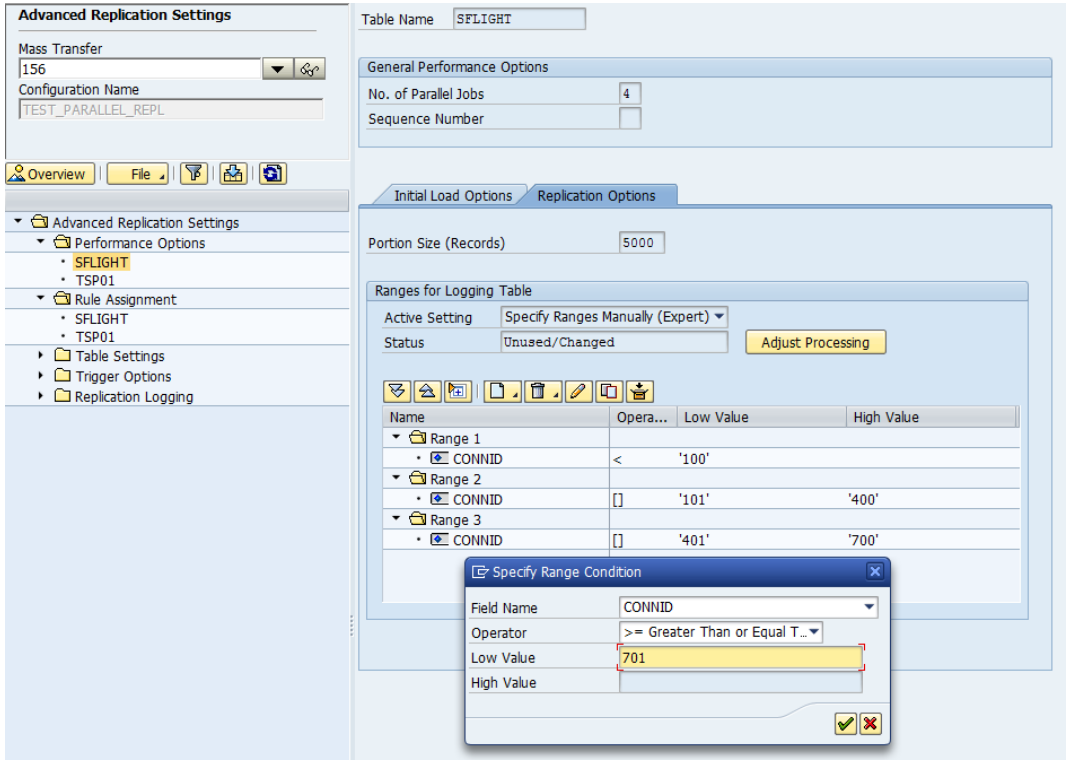
- **Specify Ranges Manually (Expert)**
  You can explicitly define the number of ranges as well as the range conditions for building the portions. This feature is available on all supported DB platforms.

To identify which field can be used for range calculation, transaction DB05 can be used to analyze the distinct values of a table.



For huge tables the analyze should be started in a background task. The result is stored in the spool of background job TABLE_ANALYSIS_<table name>.





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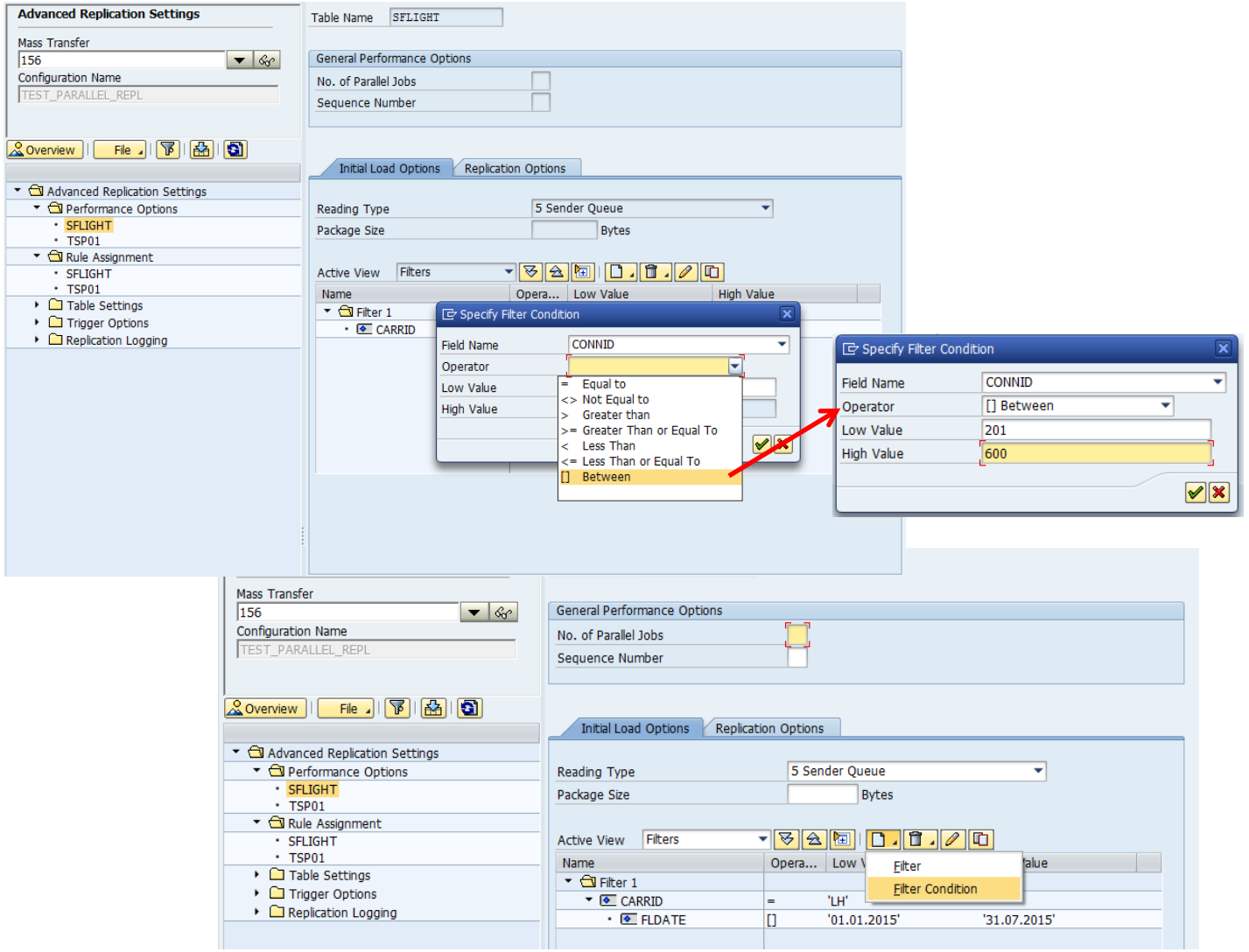
Create Filter for Initial Load

You can further **improve the initial load by filtering the data that is replicated to the target system**, and by dividing the initial load into ranges.

If you only require a subset of the data in your target system, you can improve the performance of the initial load by only transferring the data you need. To do this, you specify **filter conditions** for the table.

Note that if you are using filters and ranges together, you must ensure the data is valid.
For example if you use filters to exclude certain data, then do not create ranges that refer to this data.

Caution
The ranges that you specify must not overlap. If they overlap, the overlapping content will be replicated to the target system more than once.



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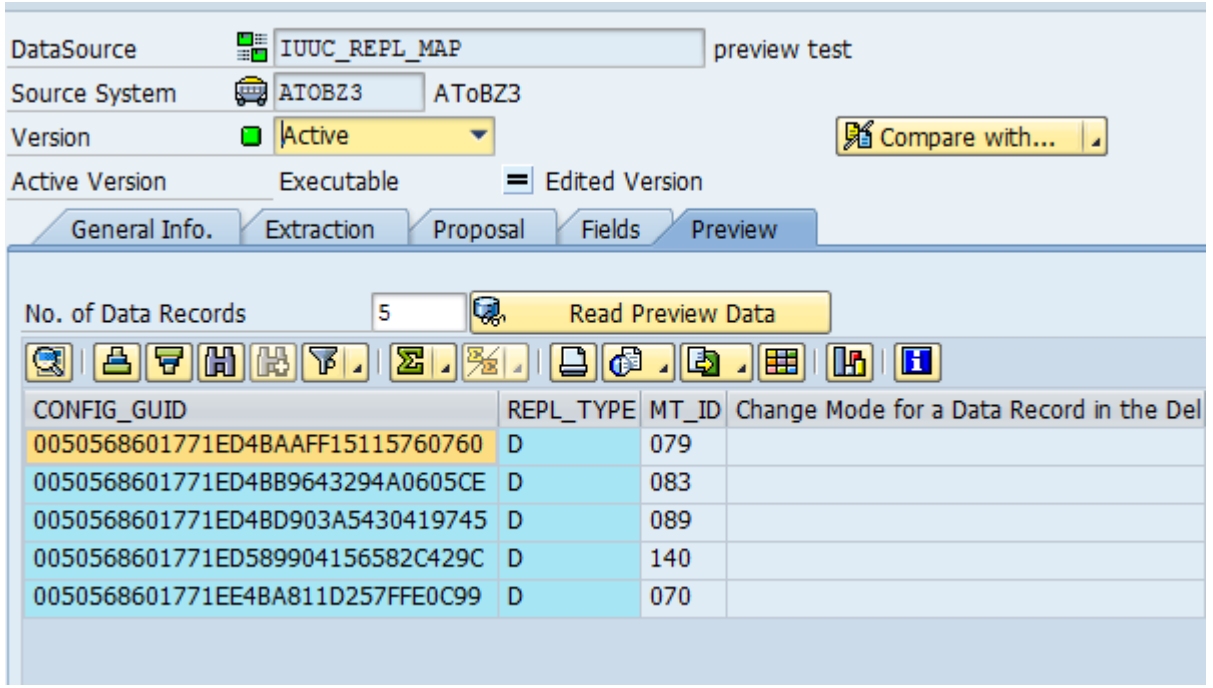
Real-time Preview Mode for SAP BW replication

New Data Preview in SAP BW for source tables:

After activation of a DataSource in SAP BW, a Data Preview can be displayed.

- Use a small number of records instead of full load for checking
- Check if the data is transferred correctly
- Check if changes on the table structure performed in SLT (LTRS) are working
- Check if views are assigned correctly
- No entry in LT Replication Server Cockpit
- No entry in ODQMON
- No creation of infopackage/DTP required for preview



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some more Enhancements & Corrections

- **Optimized Update Trigger for SAP HANA (Revision 91 required)**

  A special implementation of update triggers to increase performance on SAP HANA DB

- **Support of SAP HANA multitenant database containers (introduced with HANA 1.0 SPS9)**

- **LTRS: Additional Validation Checks**

  Additional checks added to the automatic syntax check when trying to set a transformation rule to ‘released’.

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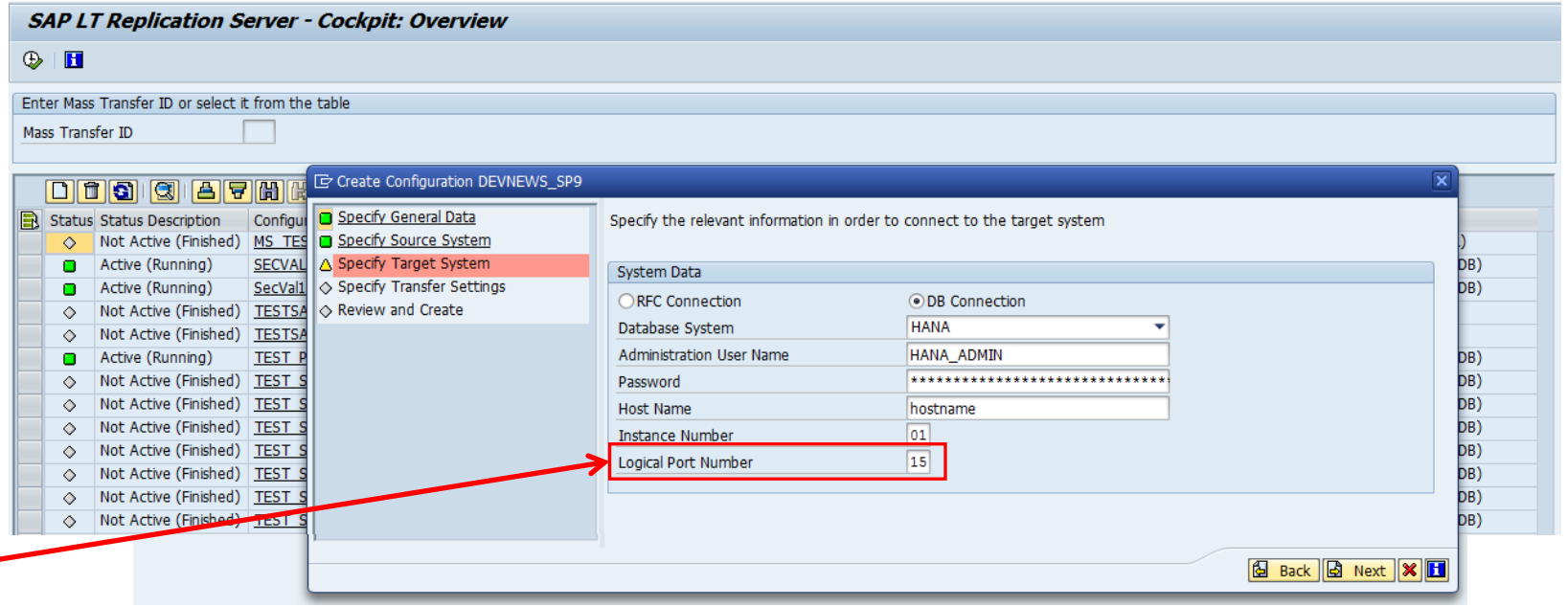
Support of SAP HANA multitenant database containers



Logical Port Number

- If you are replicating data to SAP HANA, and are using a standard SAP HANA deployment scenario (one HANA DBMS, one application, one schema), then you must specify the value '15' in the field *Logical Port Number*.
- If you are replicating data to SAP HANA and are using several databases on one SAP HANA system (multitenant database containers), then you must specify the logical port number of the multitenant database container.
  Note that you can determine the logical port number by logging on to the SAP HANA system, and running the following SQL statement in the SAP HANA studio:
  SELECT SUBSTRING(SQL_PORT,4,2) FROM "SYS"."M_SERVICES" WHERE SERVICE_NAME = 'indexserver'

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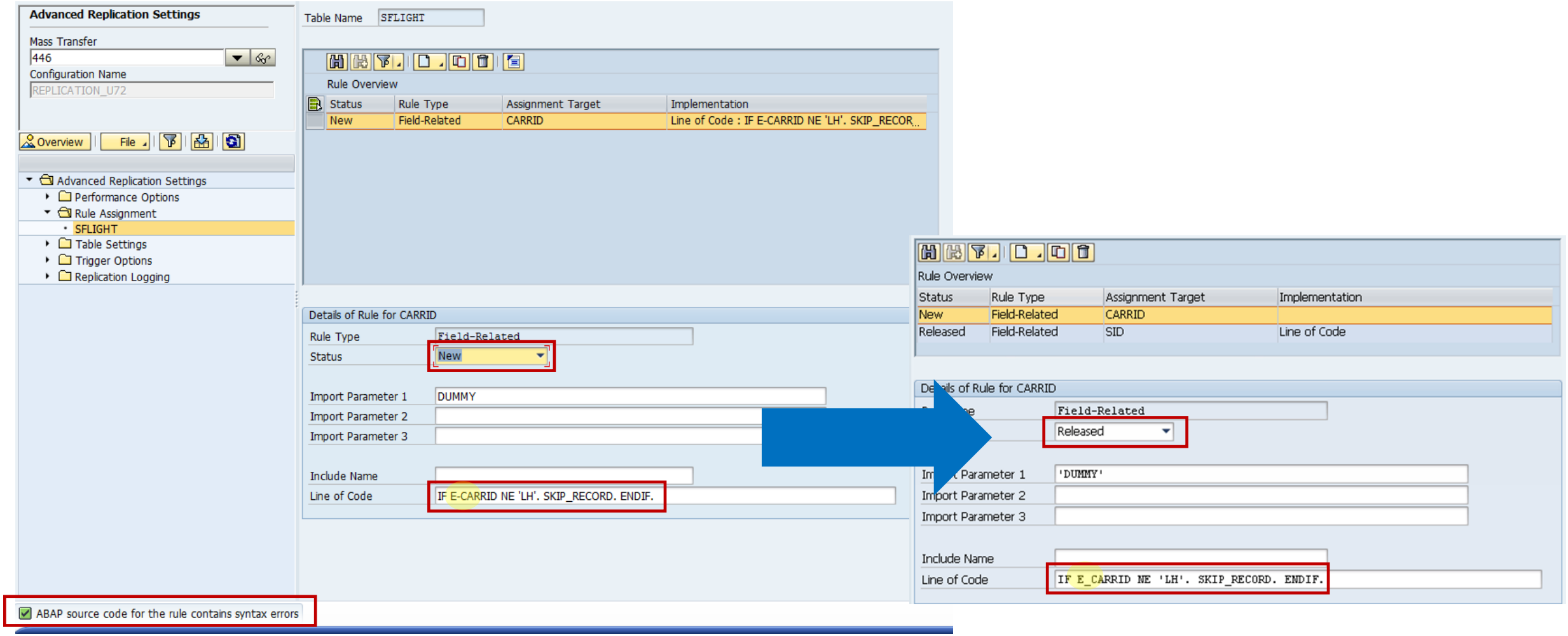
New Features DMIS 2011 SP9

Advanced Replication Settings (LTRS): Enhanced Syntax Check for Rule Definition

Added additional checks to the automatic syntax check when trying to set a rule to released.



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Roadmap && Summary

SAP Landscape Transformation Replication Server

Product road map overview - key themes and capabilities

Today

Strategic developments

- Replication from ABAP to ABAP systems (covering the complete SAP Business Suite)
- Data provisioning for SAP BW & SAP Data Services

New features

- Generic parallel replication for all scenarios available for SAP source systems on most DB platforms
- Templates to manage and reuse configuration settings across tables, configurations, and systems
- Integrated data consistency check with repair mode
- Replication logging capability to support point-in-time recovery
- Support of DB views as source objects (ABAP and non-ABAP sources)
- Filtering option for records in source system
- Optimized delta recording for SAP HANA as a source database

Continuous improvements

- Deeply integrated within SAP landscapes to reuse existing administration and monitoring capabilities, i.e. of SAP Solution Manager, SAP NW Application Server and SAP HANA Studio

Release DMIS 2011 SP8

Planned Innovations

Strategic developments

- Exclusive middleware for application-based replication within modern SAP Business Suite solutions (i.e. Central Finance scenario that is part of SAP Simple Finance)
- Object-based replication of complex SAP Business Objects
- Release of standard scenarios for data replication into native databases (DB platform support according to SAP NW PAM)

New features

- Integration in SAP HANA EIM (Smart Data Integration UI)
- SAP BW scenario: Alternative for extracting data for complex objects to enable real-time replication and to reduce the transfer volume for SAP BW
  - Working on a prioritized list of classical BW extractor logic which can be replaced with SLT replication

Continuous improvements

- Tools and documentation for reconfiguration of replication scenarios after operational events like upgrade, OS/DB migration or system refresh/copy
- Improved performance when replicating from non-ABAP based sources
- Managing different data retention times in source and target systems
- Support of new SAP HANA technology features

Future Direction

Strategic developments

- Consistent replication for complex SAP data objects (continued)
- Transactional consistent replication
- SAP BW scenario:
  Framework to offer an alternative for extracting data for complex objects to enable real-time replication and to reduce the transfer volume for SAP BW (continued)
- Replication to multiple targets: Redesign of 1:N replication capability without limitation of target systems
- Integration of Hadoop / Hive as data source / replication target

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

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Summary

1. SAP LT Replication Server is the ideal solution for real-time data replication 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.

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SCN Community for SAP LT Replication Server

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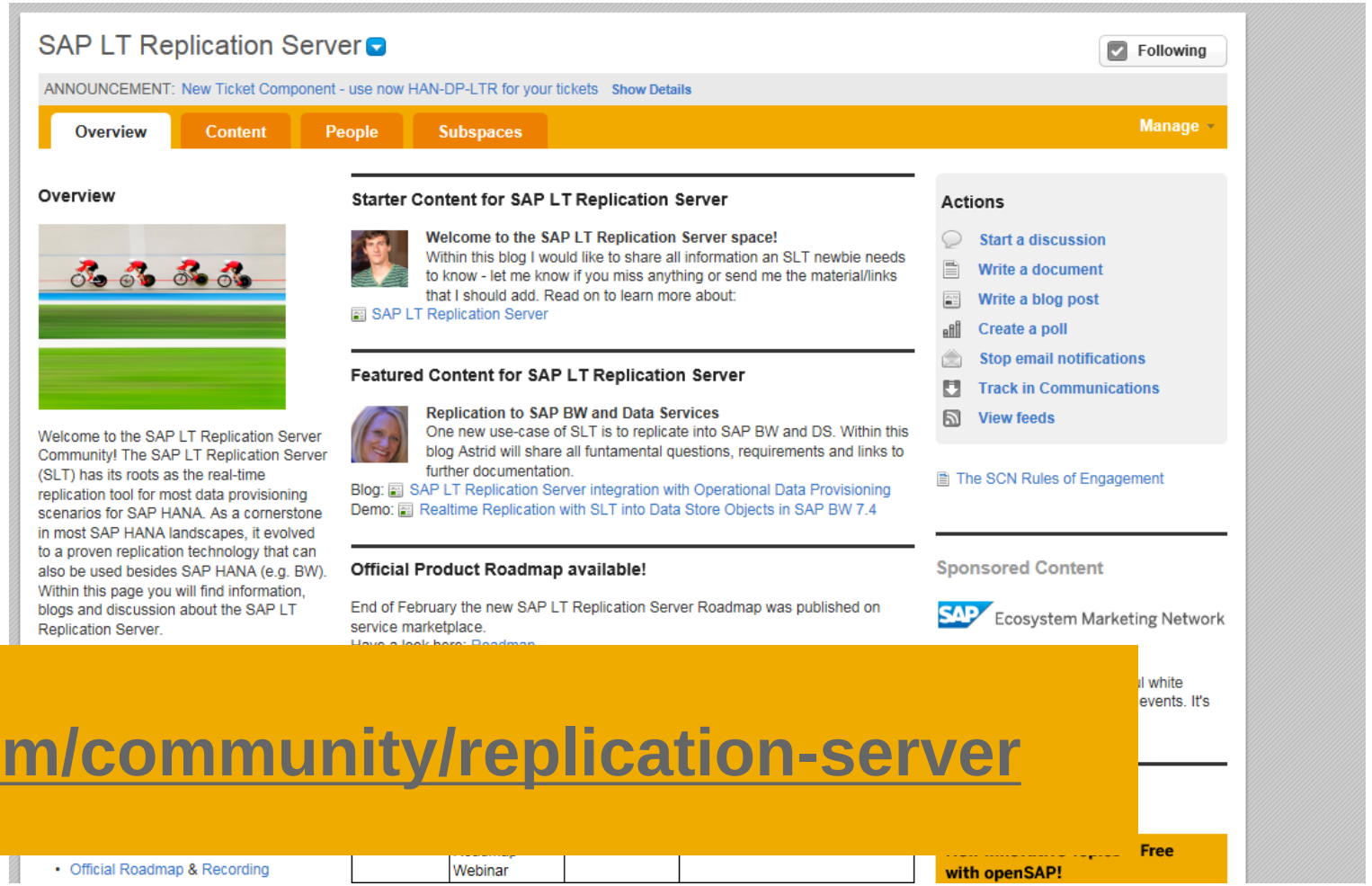

http://scn.sap.com/community/replication-server

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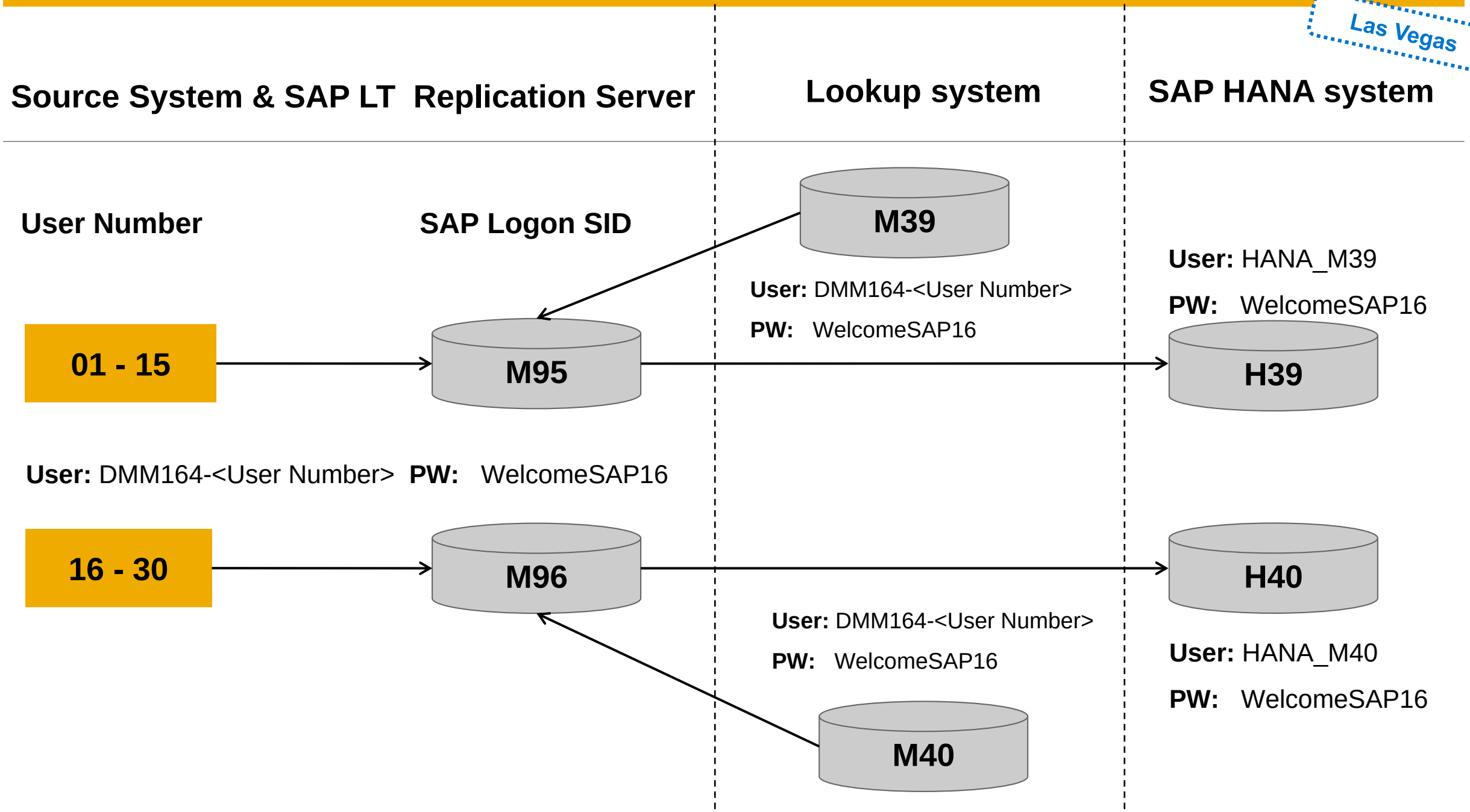
Exercises

Las Vegas



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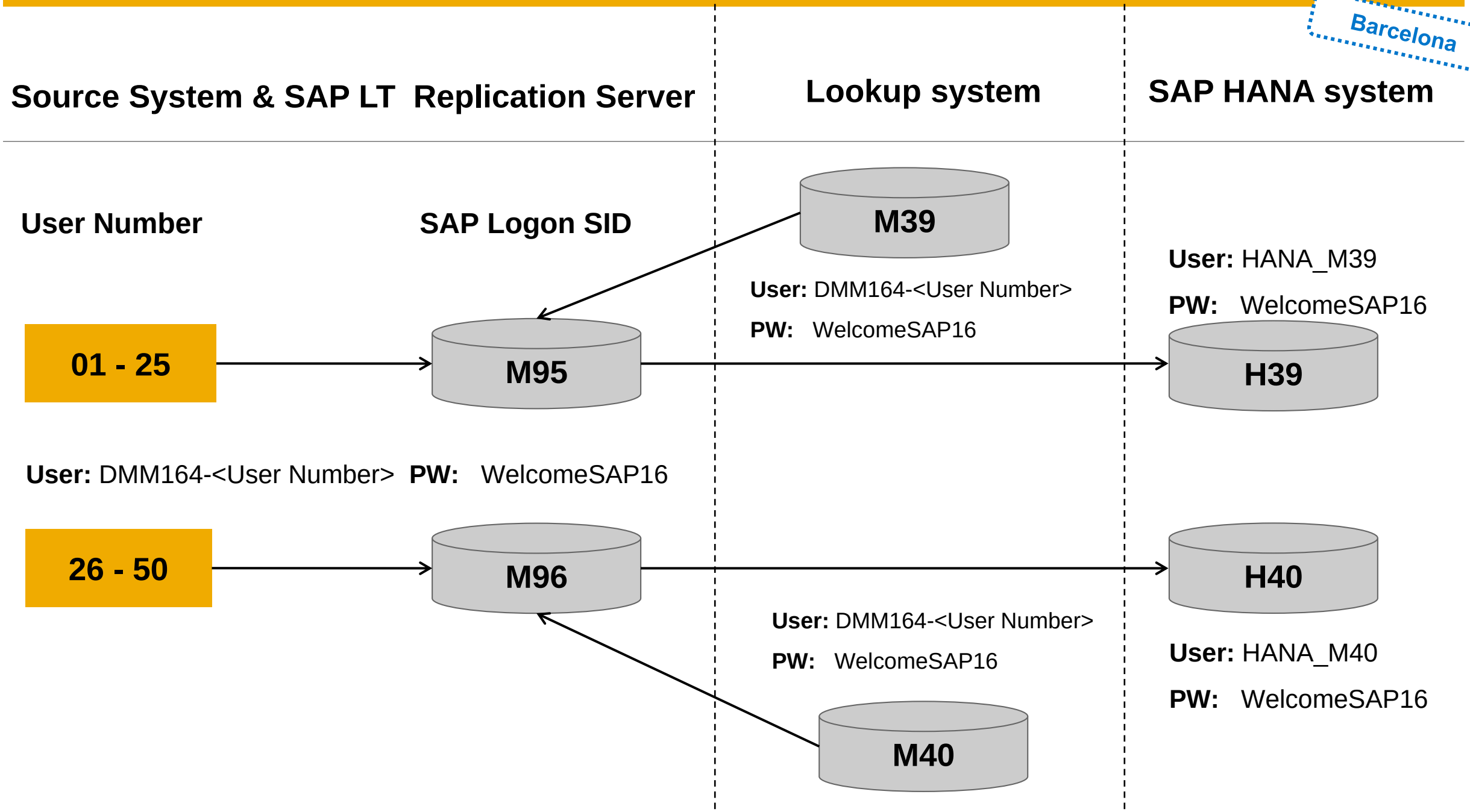

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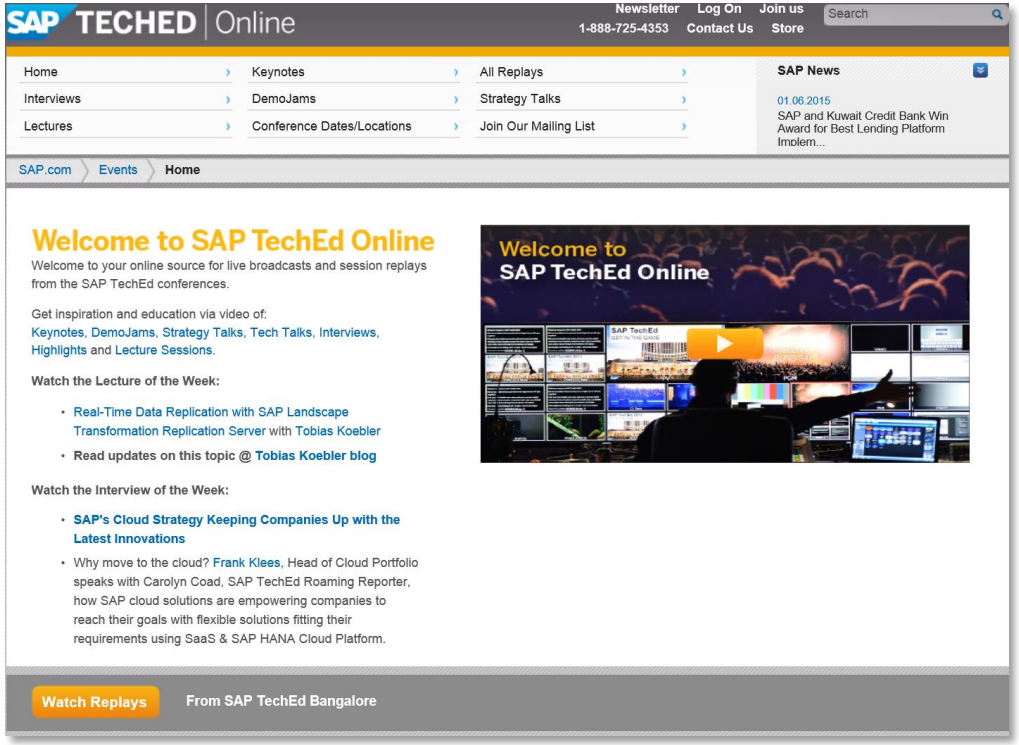

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Further information

Related SAP TechEd sessions:

DMM107 - SAP Landscape Transformation Replication Server: Real-Time Use Cases

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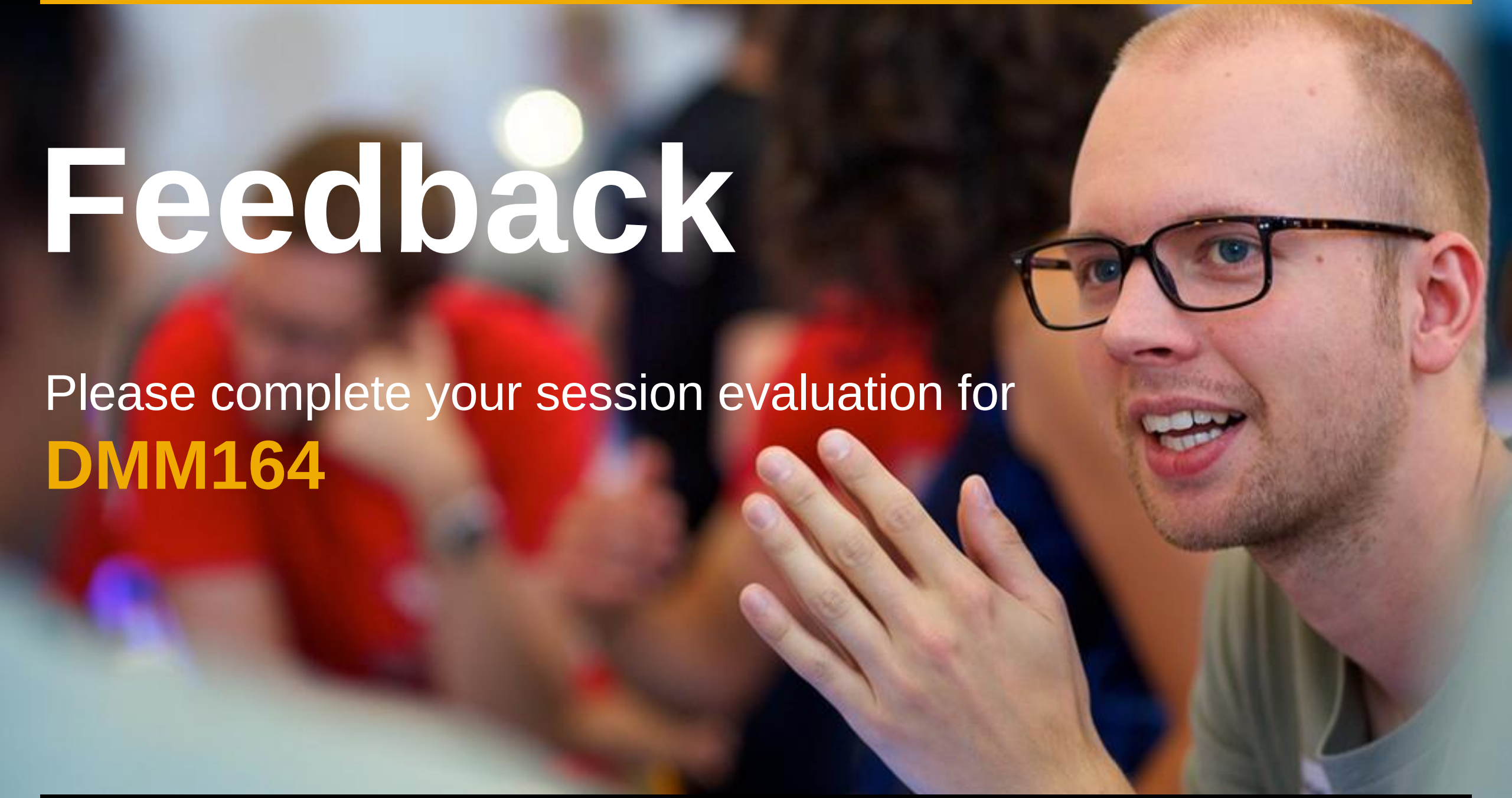

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