



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



Speakers

Las Vegas, Oct 19 - 23

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Barcelona, Nov 10 - 12

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Agenda

Introduction && Use Cases

Development News DMIS 2011 SP09

Roadmap && Summary

Exercises

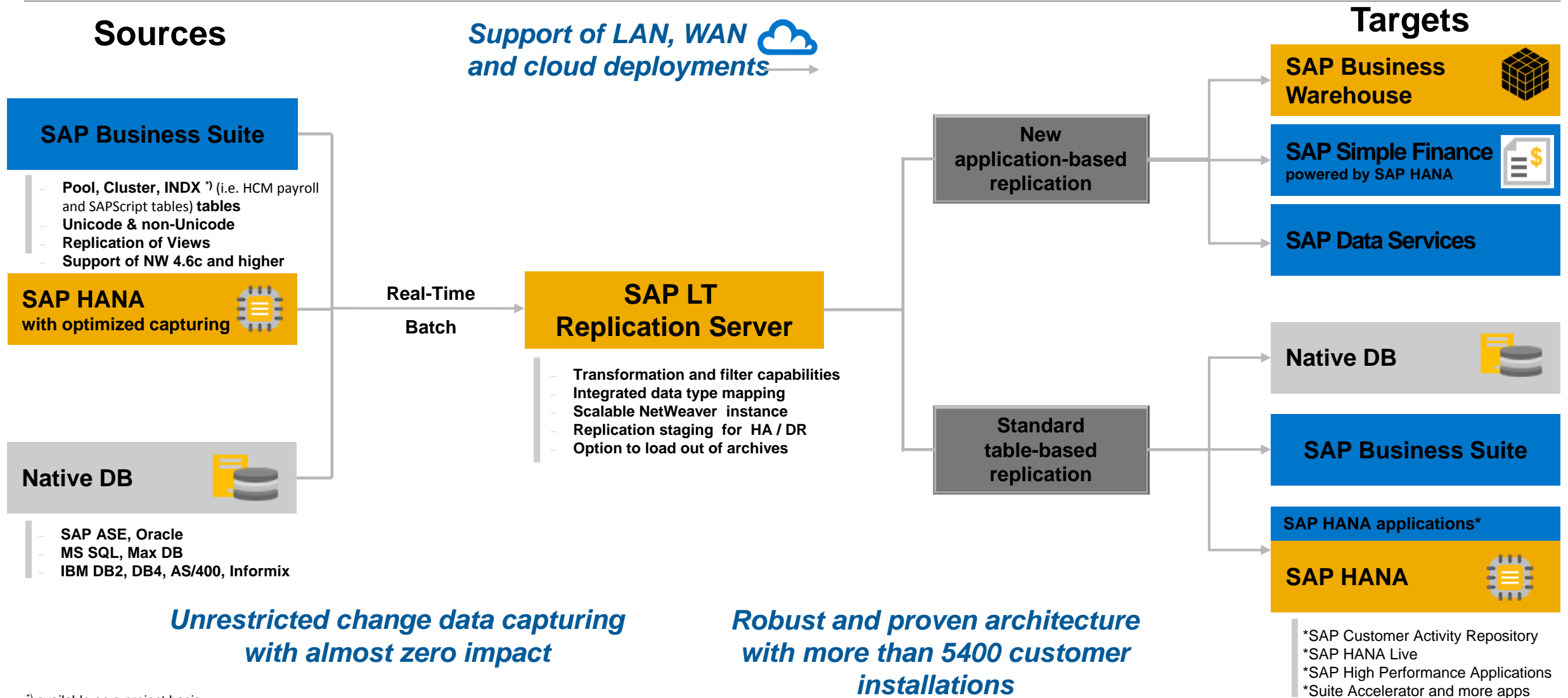
Introduction && Use Cases

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

Big Data provisioning with SAP LT Replication Server



^{*)} available on a project basis

Customer figures 2015/7

5,416

customer landscapes

>30k tables

with one SLT

>700 tables

with one configuration

>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

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

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

Development News

DMIS 2011 SP09

Development News DMIS 2011 SP9

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

Development News DMIS 2011 SP9

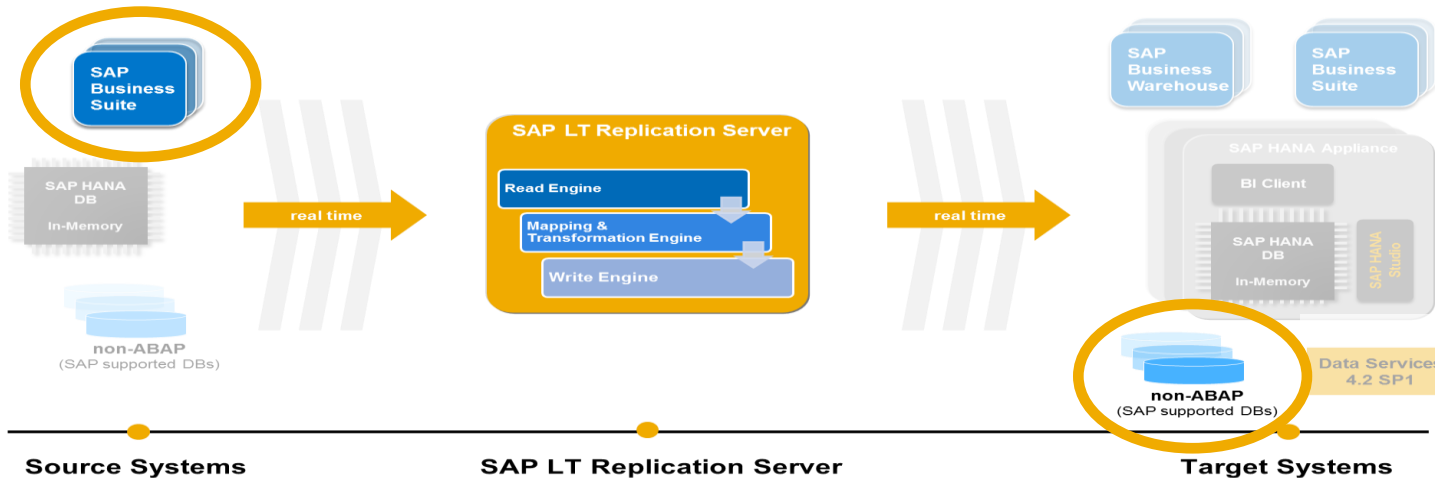
Replication to non-ABAP targets

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

The screenshot shows the 'Advanced Replication Settings' dialog box. On the left, a tree view shows the 'Performance Options' folder expanded, with 'SFLIGHT' and 'TSP01' listed. The main area is divided into two tabs: 'Initial Load Options' and 'Replication Options'. The 'Replication Options' tab is active, showing 'Portion Size (Records)' set to 5000. Below this, the 'Ranges for Logging Table' section is visible, with 'Active Setting' set to 'Specify Ranges Manually' and 'No. of Ranges' set to 8. A list box shows 'CONNID' as the selected grouping field. The top of the dialog shows 'Table Name' as 'SFLIGHT' and 'Configuration Name' as 'TEST_PARALLEL_REPL'.

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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.

DB05: Analysis of Table with Respect to Indexed Fields

Date/time of analysis:28.07.2015 10:20:27
Analyzed table:SFLIGHT
Total number of rows:58 rows
Requested bytes per row:107 bytes per row
Requested bytes to be buffered 100%:6.206 bytes
Current buffering mode:no buffering

Rows per generic key	Distinct values	1	11	101	1.001	10.001	100.001	more than
		- 10	- 100	- 1.000	- 10.000	- 100.000	-1.000.000	1.000.000
Key fields		Number of areas that are specified by the generic key and contain the given number of rows						
1 MANDT	4	3	1					
2 CARRID	16	15	1					
3 CONNID	34							
4 FLDATE	58							

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>.

Initial Load OptionsReplication Options

Portion Size (Records)5000

Ranges for Logging Table

Active SettingNo Ranges

No Ranges
Specify Ranges Manually
Specify Ranges Manually (Expert)

Advanced Replication Settings

Mass Transfer156

Configuration NameTEST_PARALLEL_REPL

OverviewFile

Advanced Replication Settings

- Performance Options
 - SFLIGHT
 - TSP01
- Rule Assignment
 - SFLIGHT
 - TSP01
- Table Settings
- Trigger Options
- Replication Logging

Table NameSFLIGHT

General Performance Options

No. of Parallel Jobs4

Sequence Number

Initial Load OptionsReplication Options

Portion Size (Records)5000

Ranges for Logging Table

Active SettingSpecify Ranges Manually (Expert)

StatusUnused/ChangedAdjust Processing

Name	Opera...	Low Value	High Value
Range 1 <ul style="list-style-type: none">CONNID	<	'100'	
Range 2 <ul style="list-style-type: none">CONNID	[]	'101'	'400'
Range 3 <ul style="list-style-type: none">CONNID	[]	'401'	'700'

Specify Range Condition

Field NameCONNID

Operator>= Greater Than or Equal T_

Low Value701

High Value

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Public

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Development News DMIS 2011 SP9

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.

The screenshot displays the 'Advanced Replication Settings' dialog box for table SFLIGHT. The 'Initial Load Options' tab is active. The 'Reading Type' is set to '5 Sender Queue'. The 'Package Size' is set to 'Bytes'. The 'Active View' is set to 'Filters'. The 'Name' column shows 'Filter 1' and 'CARRID'. The 'Operator' column shows '='. The 'Low Value' column shows '01.01.2015' and the 'High Value' column shows '31.07.2015'. A 'Specify Filter Condition' dialog box is open, showing 'Field Name' as 'CONNID' and 'Operator' as 'Between'. The 'Low Value' is '201' and the 'High Value' is '600'. A red arrow points from the 'Specify Filter Condition' dialog box to the 'Filter Condition' button in the 'Initial Load Options' tab.

Advanced Replication Settings

Mass Transfer: 156
Configuration Name: TEST_PARALLEL_REPL

Overview File [Icons]

Advanced Replication Settings

- Performance Options
 - SFLIGHT
 - TSP01
- Rule Assignment
 - SFLIGHT
 - TSP01
- Table Settings
- Trigger Options
- Replication Logging

Table Name: SFLIGHT

General Performance Options

No. of Parallel Jobs: []
Sequence Number: []

Initial Load Options Replication Options

Reading Type: 5 Sender Queue
Package Size: [] Bytes

Active View: Filters [Icons]

Name: Filter 1
Operator: =
Low Value: 01.01.2015
High Value: 31.07.2015

Specify Filter Condition

Field Name: CONNID
Operator: Between
Low Value: 201
High Value: 600

Specify Filter Condition

Field Name: CONNID
Operator: Between
Low Value: 201
High Value: 600

Mass Transfer: 156
Configuration Name: TEST_PARALLEL_REPL

Overview File [Icons]

Advanced Replication Settings

- Performance Options
 - SFLIGHT
 - TSP01
- Rule Assignment
 - SFLIGHT
 - TSP01
- Table Settings
- Trigger Options
- Replication Logging

General Performance Options

No. of Parallel Jobs: []
Sequence Number: []

Initial Load Options Replication Options

Reading Type: 5 Sender Queue
Package Size: [] Bytes

Active View: Filters [Icons]

Name: Filter 1
Operator: =
Low Value: 01.01.2015
High Value: 31.07.2015

Filter Condition

Development News DMIS 2011 SP9

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

The screenshot shows the SAP BW Data Preview interface. At the top, the DataSource is 'IUUC_REPL_MAP' with a 'preview test' label. The Source System is 'ATOBZ3' and the Version is 'Active'. There is a 'Compare with...' button. Below this are tabs for 'General Info.', 'Extraction', 'Proposal', 'Fields', and 'Preview'. The 'Preview' tab is selected. It shows 'No. of Data Records' as 5 and a 'Read Preview Data' button. Below the button is a toolbar with various icons. A table displays the preview data:

CONFIG_GUID	REPL_TYPE	MT_ID	Change Mode for a Data Record in the Del
0050568601771ED4BAAFF15115760760	D	079	
0050568601771ED4BB9643294A0605CE	D	083	
0050568601771ED4BD903A5430419745	D	089	
0050568601771ED589904156582C429C	D	140	
0050568601771EE4BA811D257FFE0C99	D	070	

Development News DMIS 2011 SP9

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

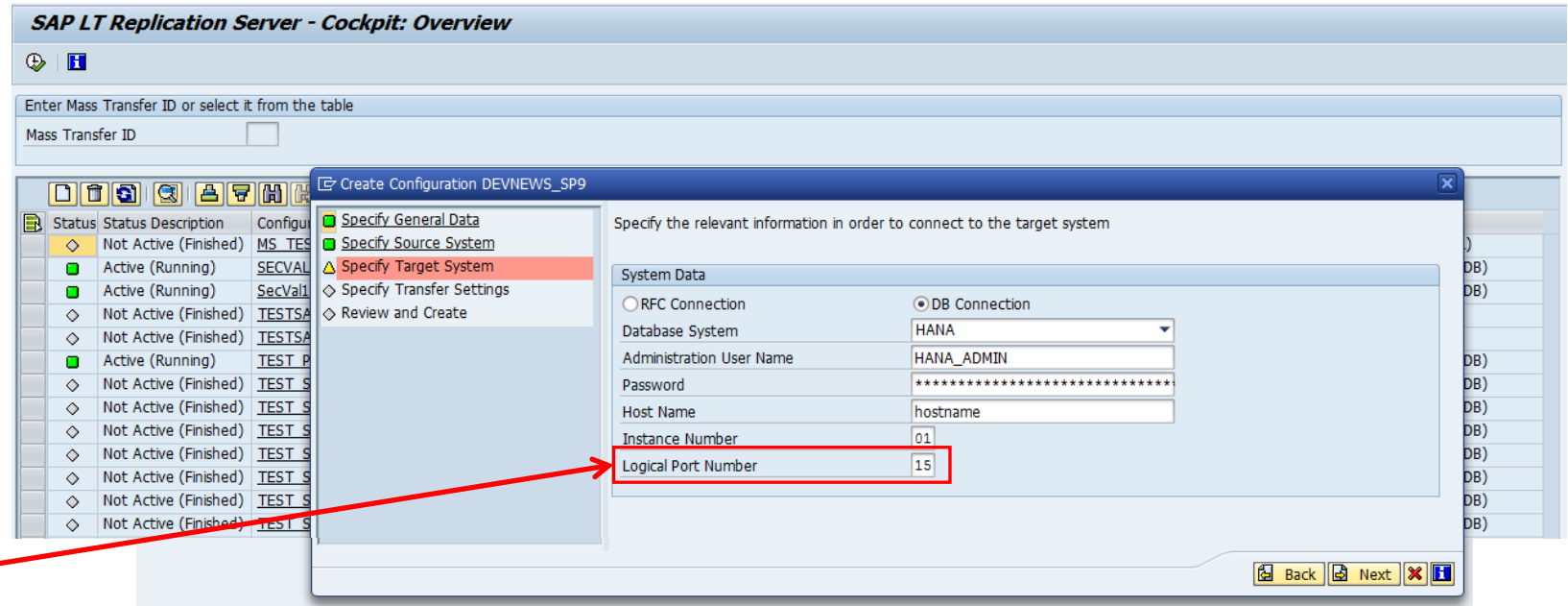
- **Support of SAP HANA multitenant database containers (introduced with HANA 1.0 SPS9)**

- **LTRS: Additional Validation Checks**

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

Development News DMIS 2011 SP9

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'
```

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.

Advanced Replication Settings

Mass Transfer: 446
Configuration Name: REPLICATION_U72

Overview | File | [Icons]

Advanced Replication Settings

- Performance Options
- Rule Assignment
 - SFLIGHT
- Table Settings
- Trigger Options
- Replication Logging

Table Name: SFLIGHT

Rule Overview

Status	Rule Type	Assignment Target	Implementation
New	Field-Related	CARRID	Line of Code : IF E-CARRID NE 'LH'. SKIP_RECOR...

Details of Rule for CARRID

Rule Type: Field-Related
Status: **New**
Import Parameter 1: DUMMY
Import Parameter 2:
Import Parameter 3:
Include Name:
Line of Code: IF E-CARRID NE 'LH'. SKIP_RECORD. ENDIF.

Details of Rule for CARRID

Rule Type: Field-Related
Status: **Released**
Import Parameter 1: 'DUMMY'
Import Parameter 2:
Import Parameter 3:
Include Name:
Line of Code: IF E_CARRID NE 'LH'. SKIP_RECORD. ENDIF.

ABAP source code for the rule contains syntax errors

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

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

Release DMIS 2011 SP8

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

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.

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

SCN Community for SAP LT Replication Server

News

Presentations

Videos

How-To Documents

Discussion Forum

SAP LT Replication Server

☒ Following

ANNOUNCEMENT: New Ticket Component - use now HAN-DP-LTR for your tickets [Show Details](#)

Overview

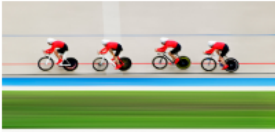
Content

People

Subspaces


Manage

Overview



Welcome to the SAP LT Replication Server Community! The SAP LT Replication Server (SLT) has its roots as the real-time replication tool for most data provisioning scenarios for SAP HANA. As a cornerstone in most SAP HANA landscapes, it evolved to a proven replication technology that can also be used besides SAP HANA (e.g. BW). Within this page you will find information, blogs and discussion about the SAP LT Replication Server.


Starter Content for SAP LT Replication Server



Welcome to the SAP LT Replication Server space! Within this blog I would like to share all information an SLT newbie needs to know - let me know if you miss anything or send me the material/links that I should add. Read on to learn more about:

[SAP LT Replication Server](#)

Featured Content for SAP LT Replication Server



Replication to SAP BW and Data Services
One new use-case of SLT is to replicate into SAP BW and DS. Within this blog Astrid will share all fundamental questions, requirements and links to further documentation.

Blog: [SAP LT Replication Server integration with Operational Data Provisioning](#)
Demo: [Realtime Replication with SLT into Data Store Objects in SAP BW 7.4](#)

Official Product Roadmap available!


End of February the new SAP LT Replication Server Roadmap was published on service marketplace.
[Have a look here: Roadmap](#)

Actions

- [Start a discussion](#)
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- [Write a blog post](#)
- [Create a poll](#)
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[The SCN Rules of Engagement](#)

Sponsored Content

 Ecosystem Marketing Network

[Official Roadmap & Recording](#)

Webinar

Free

with openSAP!

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

Exercises

Source System & SAP LT Replication Server

Lookup system

SAP HANA system

User Number

SAP Logon SID

01 - 15

M95

M39

User: DMM164-<User Number>

PW: WelcomeSAP16

User: HANA_M39

PW: WelcomeSAP16

H39

User: DMM164-<User Number> PW: WelcomeSAP16

16 - 30

M96

User: DMM164-<User Number>

PW: WelcomeSAP16

User: HANA_M40

PW: WelcomeSAP16

H40

M40

Source System & SAP LT Replication Server

Lookup system

SAP HANA system

User Number

SAP Logon SID

01 - 25

M95

M39

User: DMM164-<User Number>

PW: WelcomeSAP16

User: HANA_M39

PW: WelcomeSAP16

H39

User: DMM164-<User Number> PW: WelcomeSAP16

26 - 50

M96

User: DMM164-<User Number>

PW: WelcomeSAP16

User: HANA_M40

PW: WelcomeSAP16

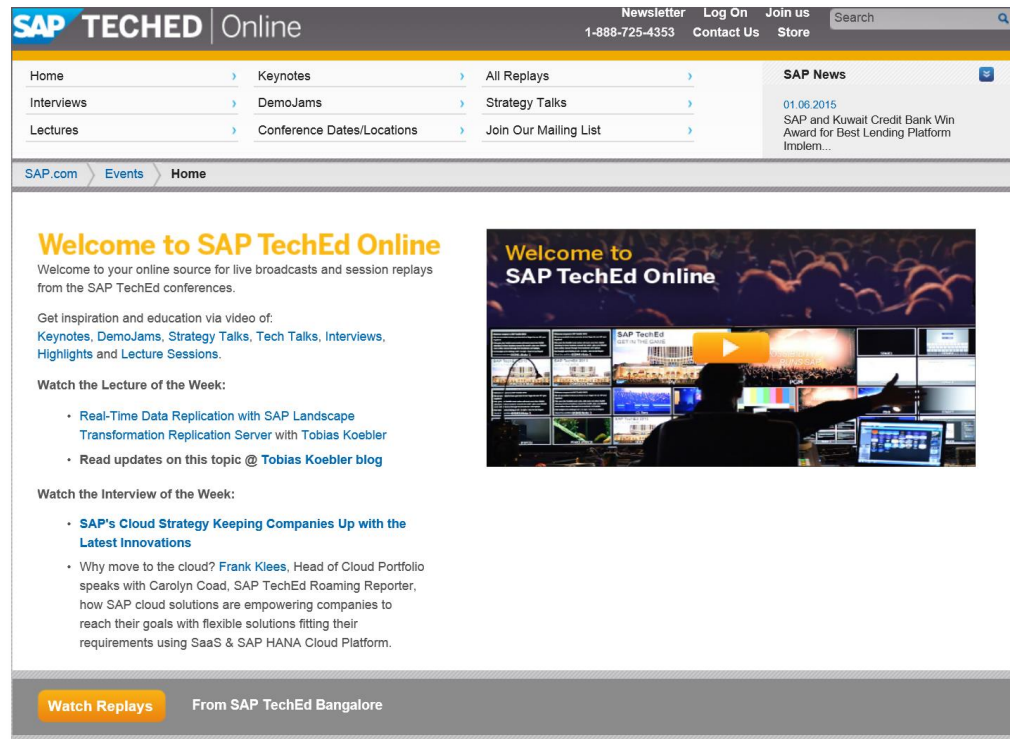
H40

M40

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Further information

Related SAP TechEd sessions:

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

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DMM164



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