

SAP HANA Application Lifecycle Management

SAP HANA Product Management

May, 2014



Agenda

Overview

Model, Develop and Transport an Application

Command Line Tool

Install, Assemble and Configure an Application

Configuration

Prerequisites

Roles & Authorizations

Evolution of HALM

Summary



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An Application's Lifecycle in SAP HANA

New / Labs Preview

Your Product Structure

Define product structure incl. delivery unit and package assignment
View and analyze dependencies for DUs

Your Application

Bundle object changes via automatic recording
Lock objects individually or for teams
Release changes when ready for transport

Your Content

Products or delivery units
Based on changes or complete entities
Using CTS+ or SAP HANA native

Your Product

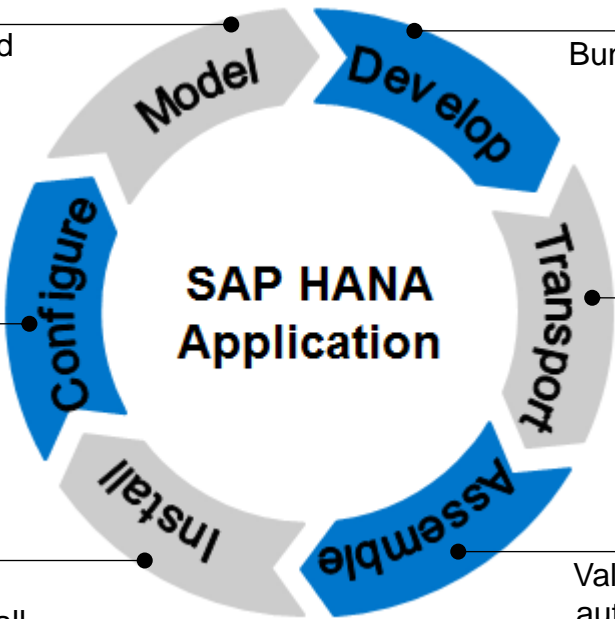
Validate and assemble your product automatically
Ensure consistency
Create patches and release for your application

Your Product

Download from SMP
Install /update /uninstall

Your Application

Configuration
Enable / disable
Activation



Labs Preview

Labs Preview

SAP HANA Application Lifecycle Management

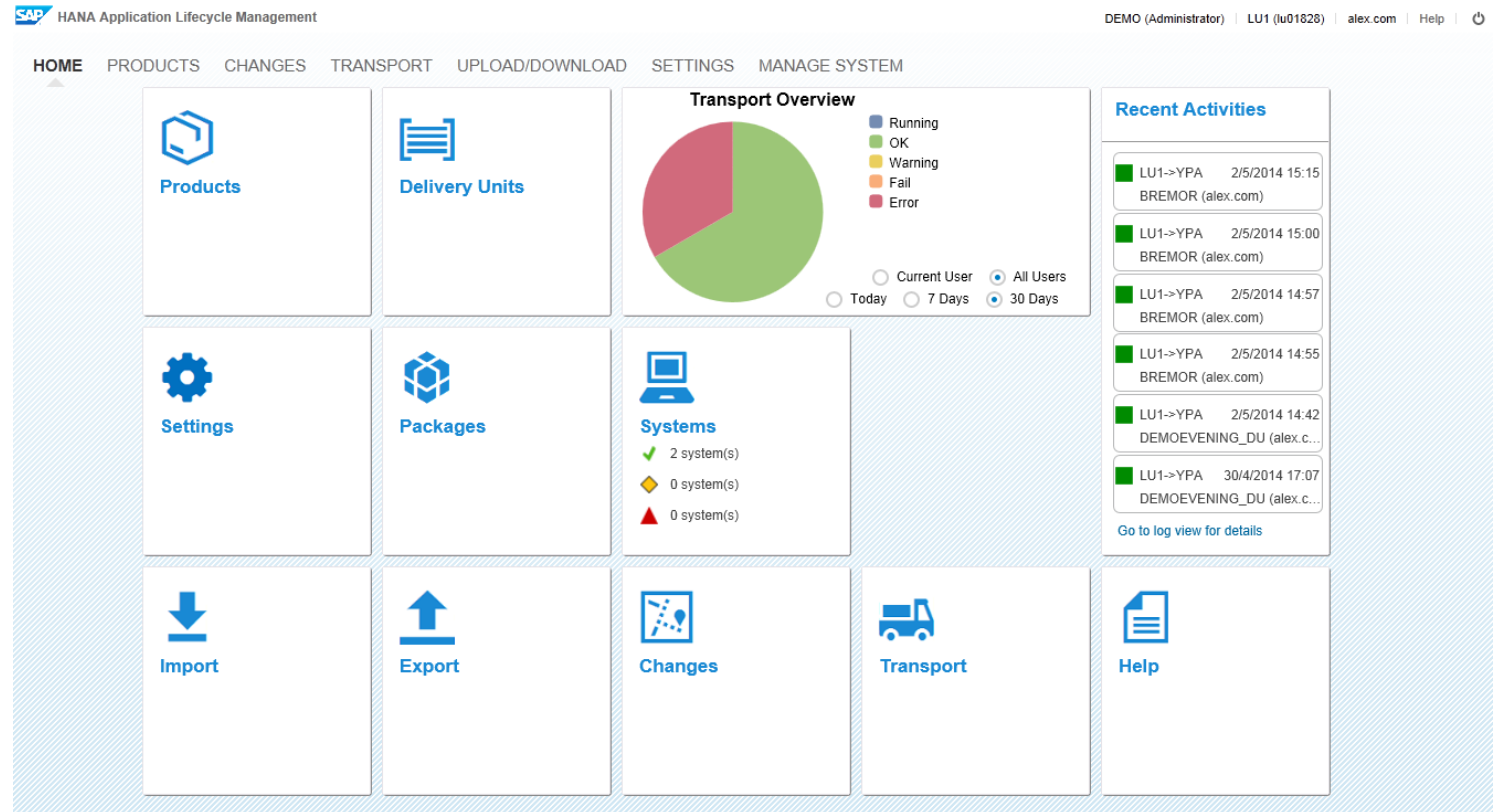
Is part of XS (SAP HANA Extended Application Services)

Is easy to use

Can be configured based on your preferences

Can be launched immediately after SAP HANA installation:
<http://<server>:80<instance>/sap/hana/xs/lm>

Requires role assignment (details later)



Content lifecycle management in SAP HANA

Managing “content” in SAP HANA

SAP HANA content defined:

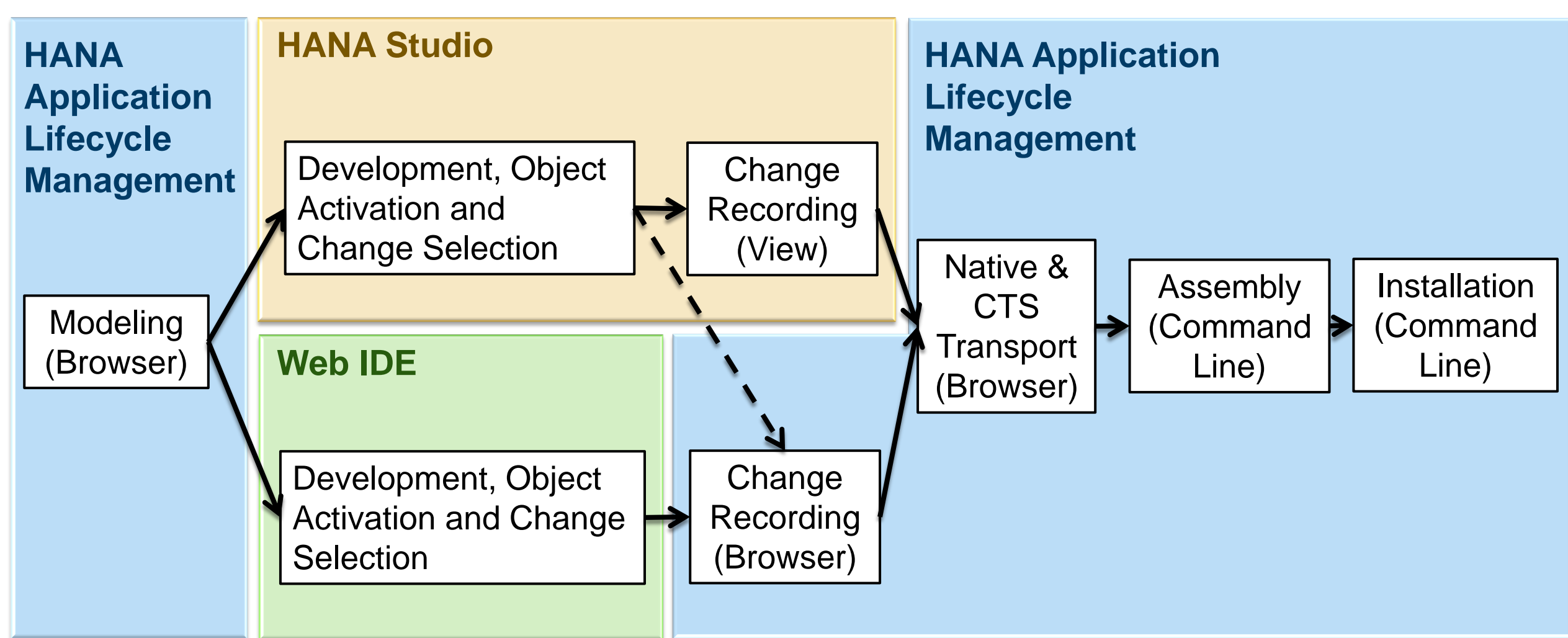
- Not part of the core SAP HANA DB installation itself
- Is delivered by SAP as part of SAP HANA optimized solutions
- Is created in SAP HANA-based development projects (partner, customer)
- Sometimes called “objects” or “artifacts”

Content comprises all kinds of objects, for example:

- Schemas and table definitions defined as HANA Content
- Attribute views, analytic views and calculation views
- Procedures and privileges
- SQLScript, JavaScript and HTML
- Roles and permissions



Flow of Activities: User Interfaces



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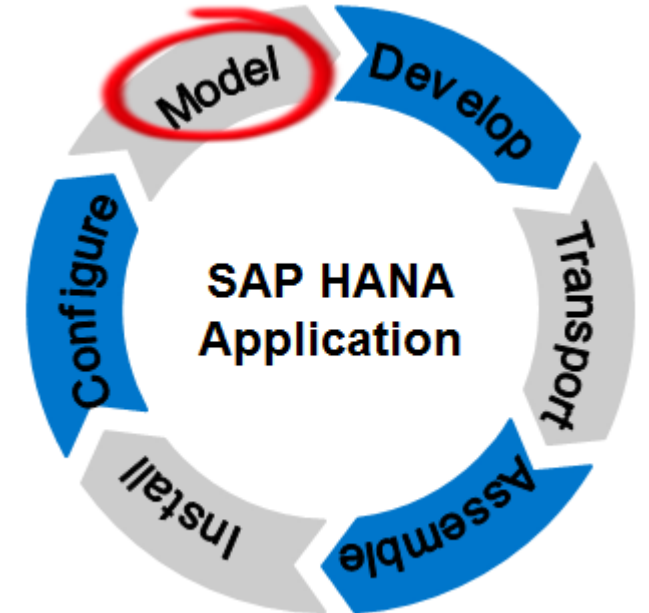


Model

Product

Delivery Unit

Package



Introducing Delivery Units, Packages, and Development Artifacts

Product A

Product Instance Y

Delivery Unit I

Package a

Object 1

Object 2

...

Package b

Object 3

Object 4

...

...

...

...

...

Delivery Unit II

Package d

Object 8

Object 9

Package e

Object 10

Object 11

...

...

...

Product Instance Z

...

...

1 Product : **n** Product Instances : **m** Delivery Units

1 Delivery Unit : **n** Packages

1 Package : **n** Objects

1 Object : **1** Package

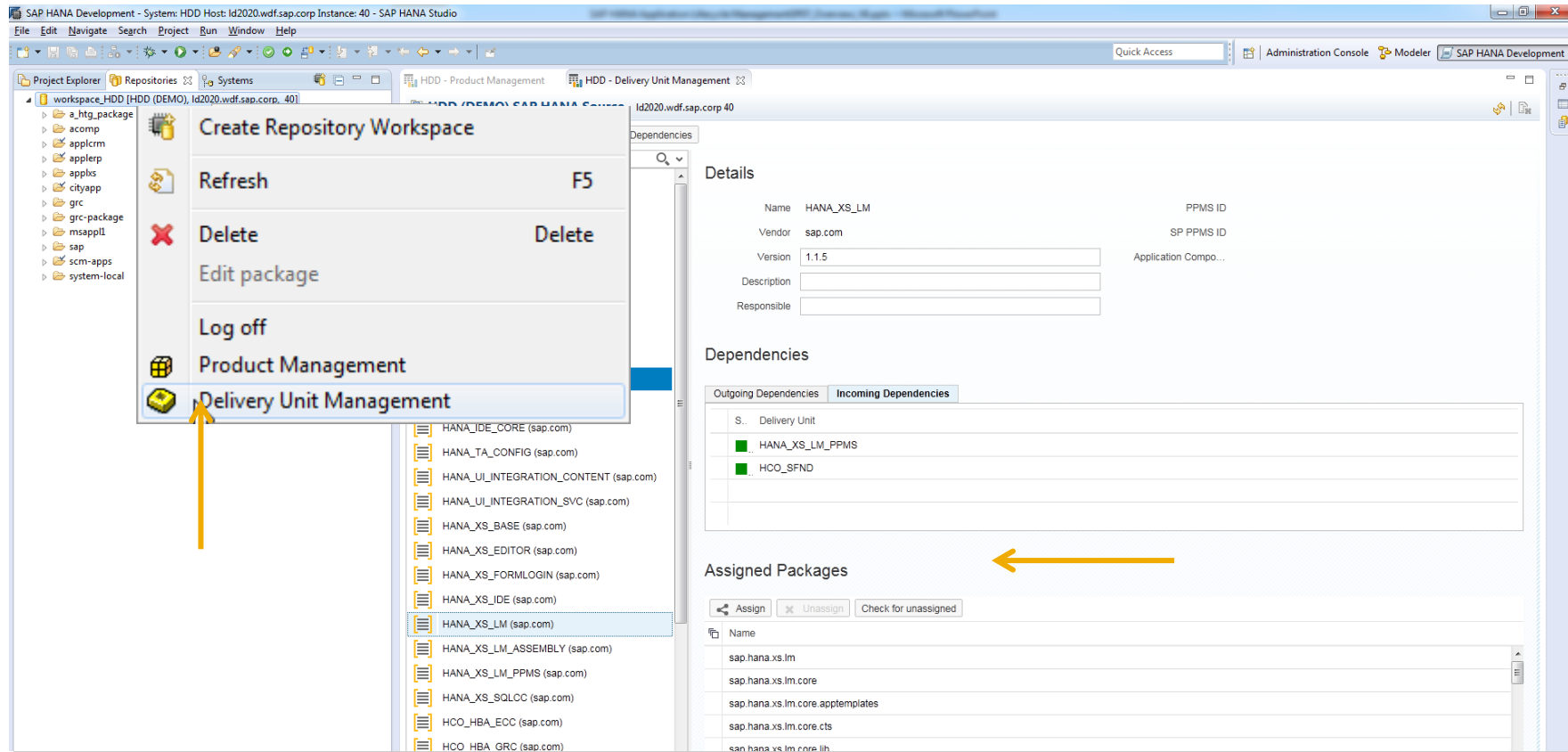
1 Package : **1** Delivery Unit

1 Delivery Unit : **1** Product Instance : **1** Product

Integration into SAP HANA Studio

- **Easy access** to product management capabilities in SAP HANA studio:

Development perspective,
repositories view > right
mouse click on the
workspace >
choose *Product Management*
or *Delivery Unit Management*



Model Product

Product View

A *product* corresponds to an application – which could be an SAP-delivered application, a partner application, or customer application developed on a project basis

The *Product View*

- **Shows installed *products* (i.e. applications) and their metadata in the system**
- **Ability to create, modify, and remove SAP HANA products (meta-data only)**
- **Is used to associate Delivery Units with a product instance and remove them**



Model Product

What & Where

New in SPS08

What to do to create a product

- Go to PRODUCTS → Products
- Define
 - Name
 - Version
 - Description
 - Instance ★

The screenshot displays the SAP HANA Application Lifecycle Management interface. At the top, the navigation bar includes 'HOME', 'PRODUCTS', 'TRANSPORT', and 'UPLOAD/DOWNLOAD'. Below this, a sub-menu shows 'Products', 'Delivery Units', and 'Packages'. A toolbar contains buttons for '+ Create', 'Save', 'Delete', and 'Refresh'. The main area shows a 'New Product' form with the following fields: '*Name' (DemoProduct), 'Vendor' (sap.com), 'Version' (1.0), 'Description' (empty), 'Create Default Instance' (checked), and 'Instance Description' (First Demo Instance). At the bottom of the form are 'Create' and 'Cancel' buttons. To the right, a 'Details' panel is partially visible.

★ = New for SPS08

Model Product Product View

New in SPS08

The screenshot displays the SAP HANA Application Lifecycle Management interface, specifically the 'PRODUCTS' section. The top navigation bar includes 'HOME', 'PRODUCTS', 'TRANSPORT', 'UPLOAD/DOWNLOAD', 'SETTINGS', and 'MANAGE SYSTEM'. Below this, a sub-navigation bar shows 'Products', 'Delivery Units', and 'Packages'. The 'Products' sub-section contains a toolbar with '+ Create', 'Save', 'Delete', and 'Refresh' buttons, and a list of products: 'DemoProduct (sap.com)' and 'Demo_CTS (sap.com)'. The 'Details' section for 'Demo_CTS' shows fields for 'Name' (Demo_CTS), 'Vendor' (sap.com), 'Version' (1.0), and 'Description'. The 'Instances and Assigned Delivery Units' section shows a dropdown for 'Instance' and buttons for 'Assign Delivery Unit' and 'Unassign Delivery Unit'. Under 'Instance 1', a list shows 'DEMO_CTS_DU (sap.com)'. Annotations with lines pointing to specific elements are as follows: 'Actions on products' points to the toolbar; 'List of Products' points to the product list; 'Product metadata section' points to the 'Details' section; 'Assign and unassign delivery units' points to the 'Assign Delivery Unit' and 'Unassign Delivery Unit' buttons; and 'Delivery Units assigned to instances ★' points to the 'DEMO_CTS_DU (sap.com)' entry.

SAP HANA Application Lifecycle Management

HOME PRODUCTS TRANSPORT UPLOAD/DOWNLOAD SETTINGS MANAGE SYSTEM

Products Delivery Units Packages

+ Create Save Delete Refresh

Details

Name Demo_CTS

Vendor sap.com

Version 1.0

Description

Instances and Assigned Delivery Units

Instance Assign Delivery Unit Unassign Delivery Unit

Instance 1

DEMO_CTS_DU (sap.com)

Annotations:

- Actions on products
- List of Products
- Product metadata section
- Assign and unassign delivery units
- Delivery Units assigned to instances ★

Model Product

Assign Delivery Unit

New in SPS08

What to do to assign a delivery unit to a product

- Go to PRODUCTS → Products
- Select your product
- Select an Instance ★
- Assign the delivery unit

The screenshot displays the SAP HANA Application Lifecycle Management (ALM) interface. The top navigation bar includes links for HOME, PRODUCTS, TRANSPORT, UPLOAD/DOWNLOAD, SETTINGS, and MANAGE SYSTEM. The 'PRODUCTS' tab is active, showing a list of products: 'DemoProduct (sap.com)' and 'Demo_CTS (sap.com)'. The 'Demo_CTS (sap.com)' product is selected, and its details are shown on the right. The details include Name (Demo_CTS), Vendor (sap.com), Version (1.0), and Description. Below the details, the 'Instances and Assigned Delivery Units' section shows a list of instances: 'Instance 1' and 'DEMO_CTS_DU (sap.com)'. The 'DEMO_CTS_DU (sap.com)' instance is selected. A modal window titled 'Assign Delivery Units to Product Instance 1' is open, showing a table of delivery units. The table has columns for Name, Vendor, Description, and Assign. The 'Assign' column contains an 'Assign' button for each row. The 'DEMO_CTS_DU (sap.com)' instance is highlighted in the table, and an arrow points from the 'Assign' button in the table to the 'Assign Delivery Unit' button in the 'Instances and Assigned Delivery Units' section.

SAP HANA Application Lifecycle Management

HOME PRODUCTS TRANSPORT UPLOAD/DOWNLOAD SETTINGS MANAGE SYSTEM

Products Delivery Units Packages

+ Create Save Delete Refresh

Details

Name Demo_CTS

Vendor sap.com

Version 1.0

Description

Instances and Assigned Delivery Units

Instance Assign Delivery Unit Unassign Delivery Unit

Instance 1

- DEMO_CTS_DU (sap.com)

Assign Delivery Units to Product Instance 1

Search:

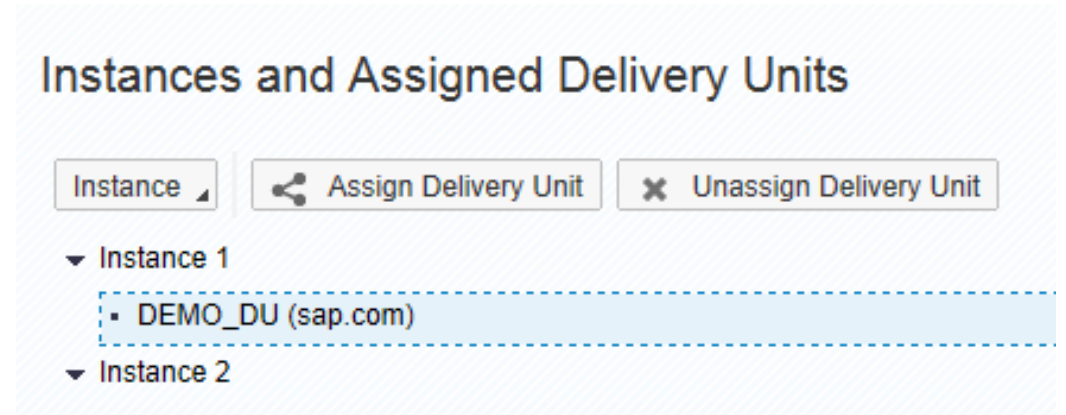
Name	Vendor	Description	Assign
DEMO_DU	sap.com		Assign
DUA_TEST	sap.com		Assign
DUB_TEST	sap.com		Assign
HANA_ADMIN	sap.com		Assign

Model Product

Change Delivery Units assigned

What to do to change a DU assignment

- Unassign
 - Go to the Product Instance the Delivery Unit is currently assigned
 - Choose the DU and unassign it
- Assign
 - Go to the Product Instance to which you would like to assign the DU
 - Click assign to choose the DU



Model Delivery Unit

Delivery Unit View

The Delivery Unit view:

- Shows installed Delivery Units and their metadata
- Ability to create, modify, and remove Delivery Units (metadata only)
- Un-deploy (remove) delivery units
- Assign packages to Delivery Units and unassign them
- View Delivery Unit dependencies and object references causing dependencies

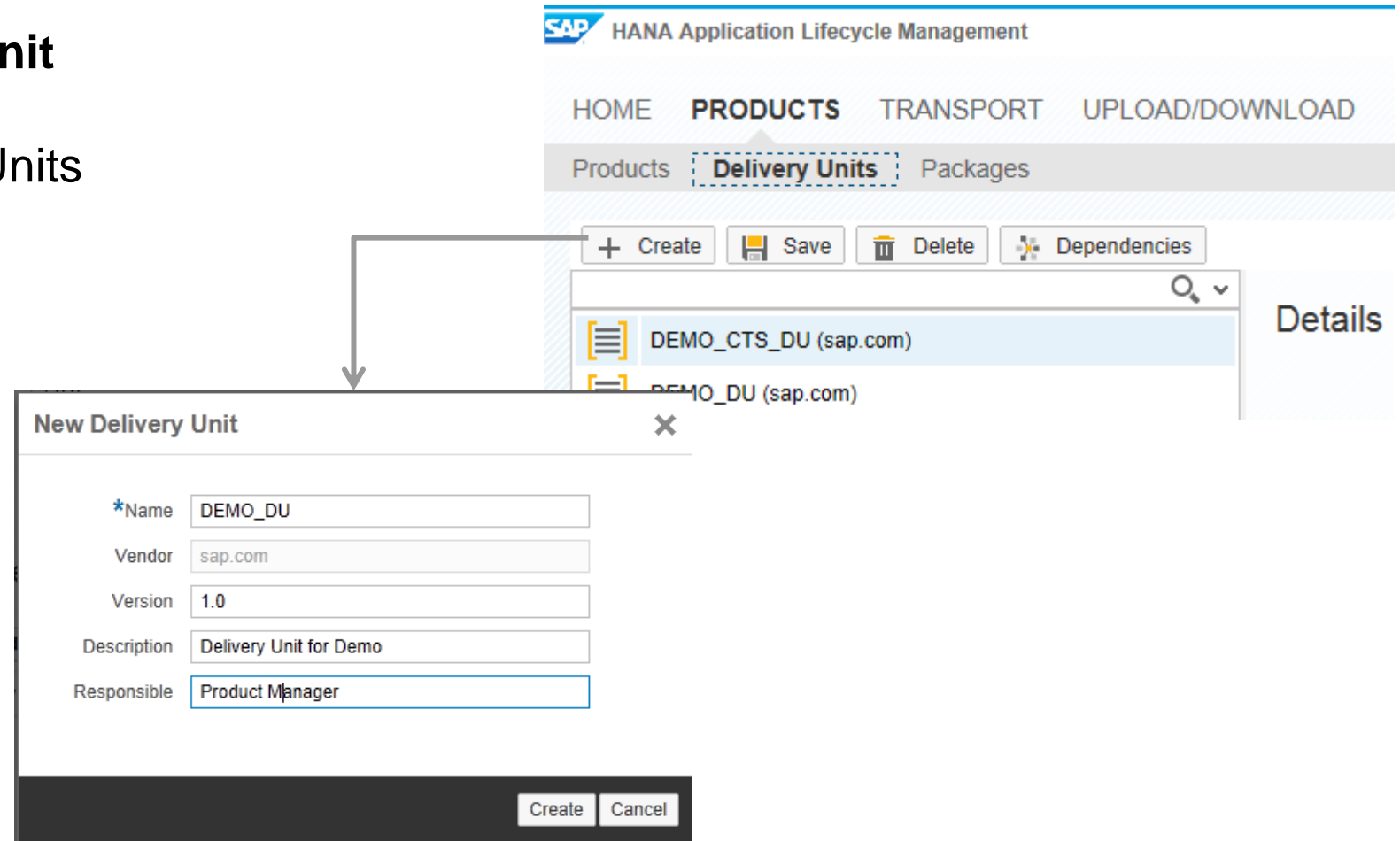


Model Delivery Unit

What and Where

What to do to create a Delivery Unit

- Go to PRODUCTS → Delivery Units
- Define
 - Name
 - Version
 - Description
 - Responsible



Model Delivery Unit

Delivery Units View

The screenshot displays the 'Delivery Units View' in the SAP HANA Application Lifecycle Management interface. The interface includes a top navigation bar with links to HOME, PRODUCTS, TRANSPORT, UPLOAD/DOWNLOAD, SETTINGS, and MANAGE SYSTEM. Below this is a sub-navigation bar with 'Products', 'Delivery Units' (selected), and 'Packages'. A toolbar at the top of the main content area contains buttons for '+ Create', 'Save', 'Delete', and 'Dependencies'. On the left, a list of installed delivery units is shown, with 'DEMO_CTS_DU (sap.com)' selected. The right side of the interface is divided into three sections: 'Details', 'Dependencies', and 'Assigned Packages'. The 'Details' section shows metadata for the selected unit, including Name, Vendor, Version, Description, and Responsible. The 'Dependencies' section has tabs for 'Outgoing Dependencies' and 'Incoming Dependencies', with a table showing 'Status' and 'Delivery Unit'. The 'Assigned Packages' section includes buttons for 'Assign', 'Unassign', 'Check for Unassigned', and 'Original Language', followed by a table with 'Name' and 'demo_cts_pkg'. Annotations with yellow boxes and lines point to various elements: 'Actions on delivery units' points to the toolbar; 'Search field' points to the search icon in the list; 'List of installed Delivery Units' points to the list itself; 'Delivery Unit metadata section' points to the 'Details' section; 'Delivery unit dependencies' points to the 'Dependencies' section; 'Actions on packages' points to the buttons in the 'Assigned Packages' section; and 'Assigned packages' points to the table in the 'Assigned Packages' section.

Actions on delivery units

Search field

List of installed Delivery Units

Delivery Unit metadata section

Delivery unit dependencies

Actions on packages

Assigned packages

Model Delivery Unit

Assign Package to Delivery Unit

What to do to assign a package to a delivery unit

- Go to PRODUCTS → Delivery Units
- Choose your delivery unit (if not pre-selected)
- Assign the package(s) that you created (include sub-packages if needed)
- You can check for unassigned packages

The screenshot shows the 'Assign Packages' dialog box in SAP. The dialog has a title bar with a close button (X). Below the title bar is a table with the following data:

Name
demo_cts_pkg

Below the table is a checkbox labeled 'Select Sub packages' which is checked. At the bottom right of the dialog are two buttons: 'Assign' and 'Cancel'. An arrow points from the 'Assign' button in the 'Assigned Packages' section above to the 'Assign' button in the 'Assign Packages' dialog.

Model Delivery Unit

Check for “forgotten” packages

The screenshot shows the SAP Model Delivery Unit interface. At the top, there's a section titled 'Assigned Packages' with buttons for 'Assign', 'Unassign', 'Check for Unassigned', and 'Original Language'. Below this is a table with one row: 'DemoPackage.xy'. A tooltip points to the 'Check for Unassigned' button, stating 'Check for unassigned sub packages and assign them'. This action opens the 'Assign Packages' dialog, which lists several packages: 'sap.hana.xs.lm."'.settings"', 'sap.hana.xs.lm.assembly', 'sap.hana.xs.lm.core.dest', 'sap.hana.xs.lm.js.controllers', 'sap.hana.xs.lm.js.views', 'sap.hana.xs.lm.nexus', 'sap.hana.xs.lm.ppms', and 'sap.hana.xs.lm.test'. The dialog has 'Assign' and 'Cancel' buttons at the bottom.

Name
DemoPackage.xy

Name
sap.hana.xs.lm."".settings"
sap.hana.xs.lm.assembly
sap.hana.xs.lm.core.dest
sap.hana.xs.lm.js.controllers
sap.hana.xs.lm.js.views
sap.hana.xs.lm.nexus
sap.hana.xs.lm.ppms
sap.hana.xs.lm.test

Packages not assigned to a Delivery Unit

- Lead to issues during product assembly and installation
- Select *Check for Unassigned*, and assign them accordingly

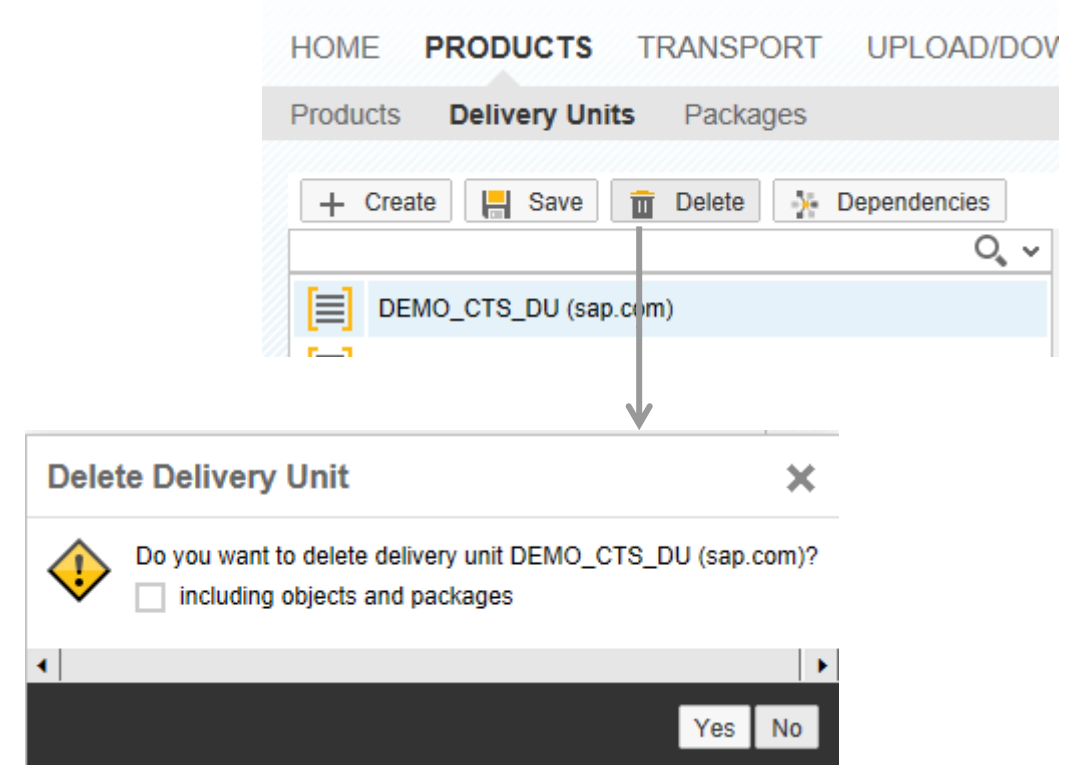
Model Delivery Unit

Uninstalling a Delivery Unit

Delete or uninstall a delivery unit

Deleting means that only the DU metadata will be deleted but all packages and tables remain intact.

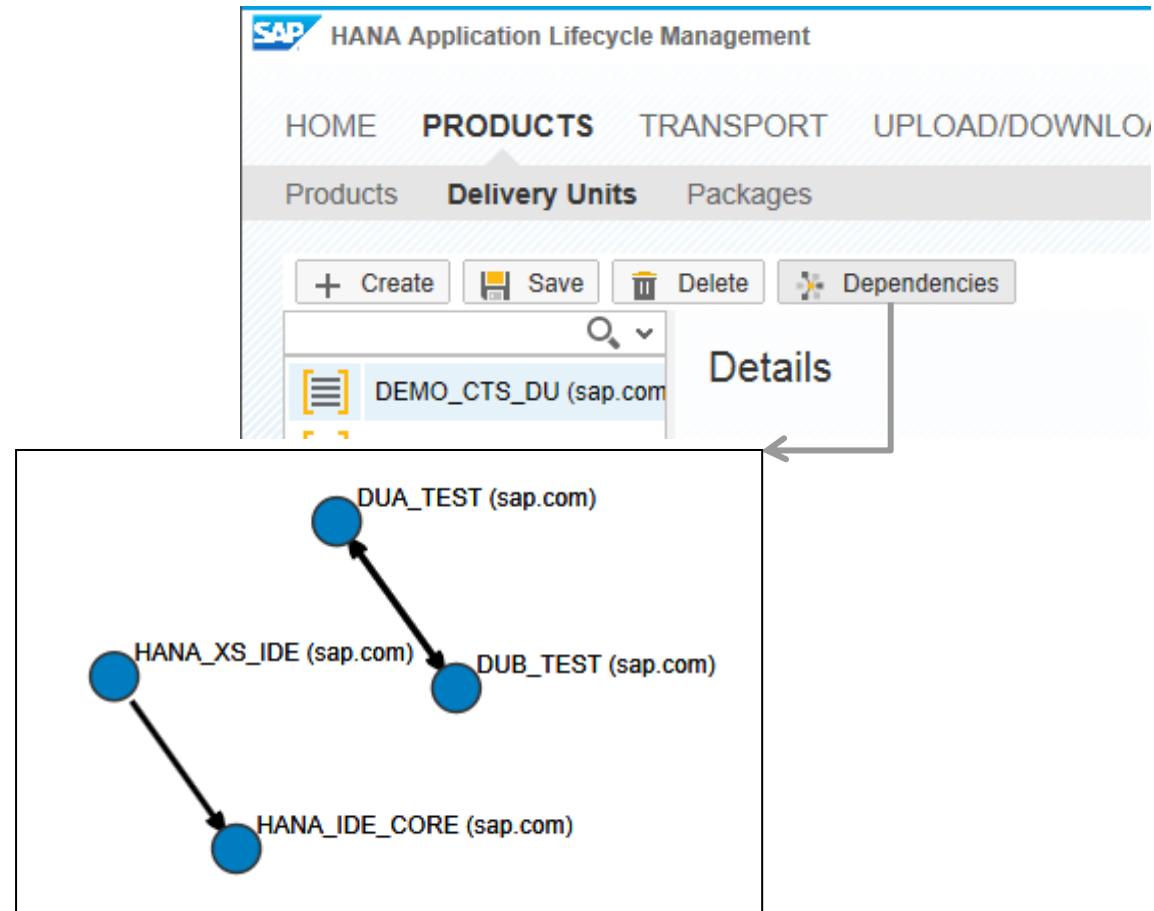
Uninstalling means that all DU metadata and all objects, packages, and possible database tables will be removed.



Dependency Viewer

Graphical tool to display dependencies between delivery units:

- Graphical depiction is interactive – can be rotated and shifted around to provide different perspectives
- Useful for determining which delivery units should be transported together
- Useful for detecting unwanted dependencies, in order to clean them up



Model Delivery Unit

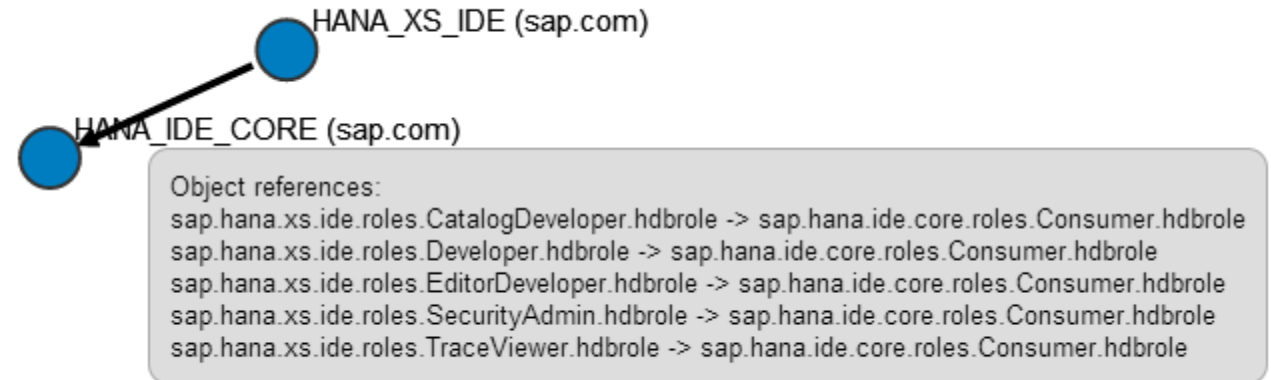
Dependency Viewer – Object References

Move the mouse over a connector to view object references causing the dependency between delivery units.

Dependencies are caused by object references between objects

Example:

- Deliver Unit 1 contains tables
- Delivery Unit 2 contains views referencing the tables of Delivery Unit 1
- Delivery Unit 2 depends on Delivery Unit 1



Model Package: Package View

The Package view

- Shows installed packages, their hierarchy and their metadata
- Allows to create, modify, and delete packages



Package concept

Package

- Every SAP HANA repository object is assigned to a package
- Groups objects that logically “belong together”
- Provides a namespace
 - Each object is uniquely identified by combination of package name, object name, and object type

Package Hierarchy

- Establishes a parent-child relationship between packages
- Used to organize objects

Package Privileges

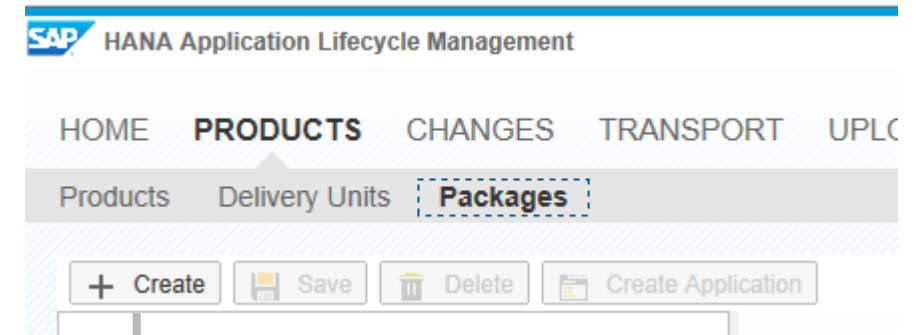
- Define access to objects in package; assign to specific user or role
- Authorizations assigned to a package are implicitly assigned to sub-packages in the hierarchy

Model Package

What & Where

What to do to create a Package

- Go to PRODUCTS → Packages
- Define
 - Name
 - Description
 - Responsible
 - Original Language



The 'New Package' dialog box is shown with the following fields and values:

Field	Value
Path	
*Name	demoPackage
Description	package for demos
Responsible	Developer
Original Language	en

At the bottom right of the dialog box, there are two buttons: 'Create' and 'Cancel'.

Model Package

Package View

The screenshot displays the SAP HANA Application Lifecycle Management (ALM) interface. The top navigation bar includes links for HOME, PRODUCTS, TRANSPORT, UPLOAD/DOWNLOAD, SETTINGS, and MANAGE SYSTEM. Below this, a sub-navigation bar shows Products, Delivery Units, and Packages, with Packages being the active view. On the left, a hierarchical tree view lists packages: Demo_pkg, aaa, demo_cts_pkg, sap (selected and highlighted with a dashed blue border), hana, ui5, system-local, and test. Above this tree is a toolbar with buttons for Create, Save, Delete, and Create Application. On the right, the 'Details' section for the selected 'sap' package is shown, containing fields for Name, Delivery Unit, Vendor, Description, and Responsible, along with read-only fields for Source System, Source Tenant, and Original Language. Three yellow callout boxes with lines pointing to specific UI elements provide annotations: 'Actions for packages' points to the toolbar, 'Hierarchical package view' points to the package tree, and 'Package metadata' points to the details section.

SAP HANA Application Lifecycle Management

HOME PRODUCTS TRANSPORT UPLOAD/DOWNLOAD SETTINGS MANAGE SYSTEM

Products Delivery Units Packages

+ Create Save Delete Create Application

Demo_pkg
aaa
demo_cts_pkg
sap
hana
ui5
system-local
test

Details

Name Source System
Delivery Unit Source Tenant
Vendor Original Language
Description
Responsible

Actions for packages

Hierarchical package view

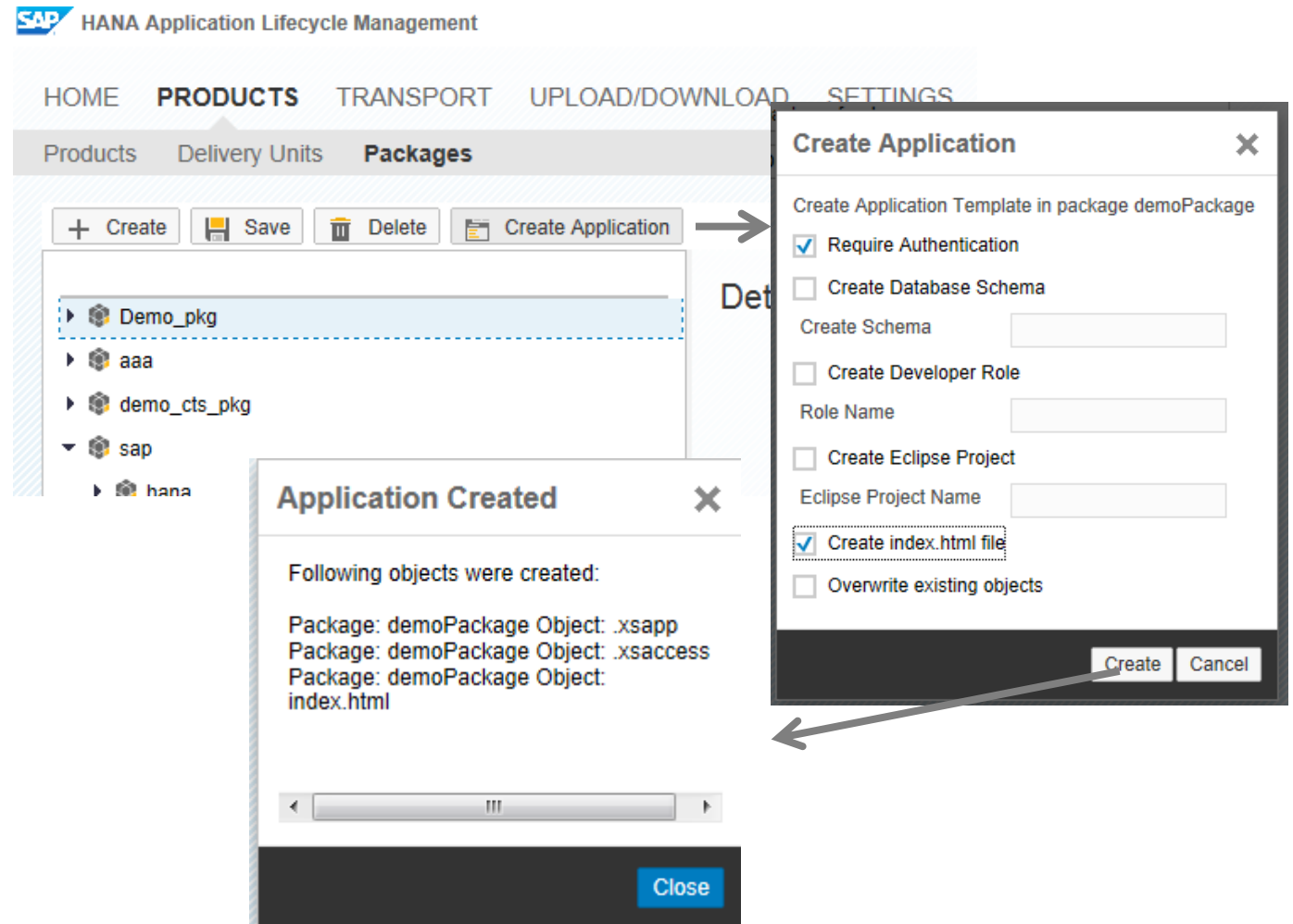
Package metadata

Model Package

Create Application

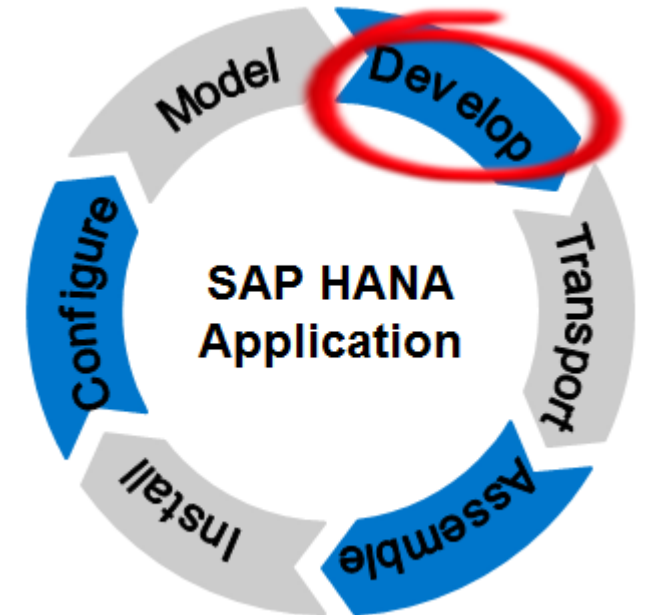
Create an application

- Choose the options that you need
 - Require authentication
 - create a schema
 - developer role
 - create project
 - create index.html
 - overwrite existing objects
- Objects are created automatically, providing a fast start to the application development process.





Develop



Creating Content

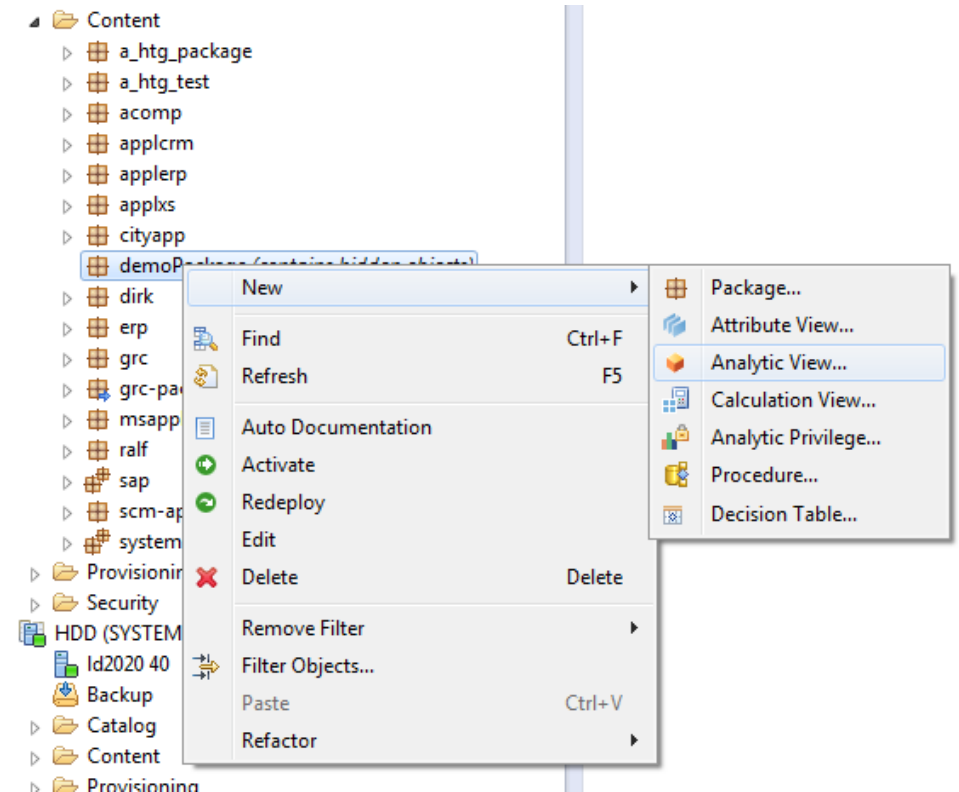
What & Where

Create Content (i.e. development artifacts) in SAP HANA Developer Studio

Example from Modelling view:

- Refresh the *Content* folder in your development system
- Choose your package
- Create your content

Alternatively, you can create SAP HANA Content in the Web IDE



Change Recording in SAP HANA

Change recording ...is the infrastructure to **record changes** during development

Change recording provides:

- Automatic **recording** and **grouping** of object changes
- **Decoupling** of activation and transport
- **Predecessor** calculation of changes

Change Recording...can be enabled as global system setting in your development environment

Change Recording

Concept

Without change recording:

- Delivery Unit transport contains *all* active objects in the packages of that particular DU
- If an object is ready to be transported, its Delivery Unit must be released
 - Some objects in the DU may not be ready for transport yet though, but they automatically get transported anyway

With change recording:

- **Automatic recording of object changes** to a change list when an object is activated
- **Team Development:** Allows a developer (or team) to work on a development artifact and release the “change” only when the artifact is ready to promote to the test system. For developers not contributing to this change the objects are locked
- **Release in two steps:** contributors have to approve first before a change can be released
- **Transport:** Delivery Unit transport contains only objects where their change has been released

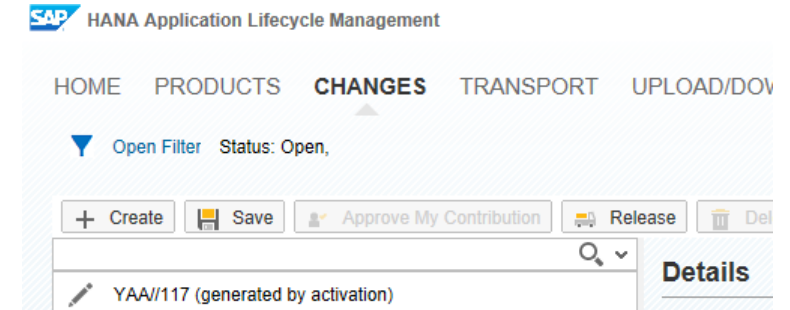
Change Recording

What & Where

New in SPS08

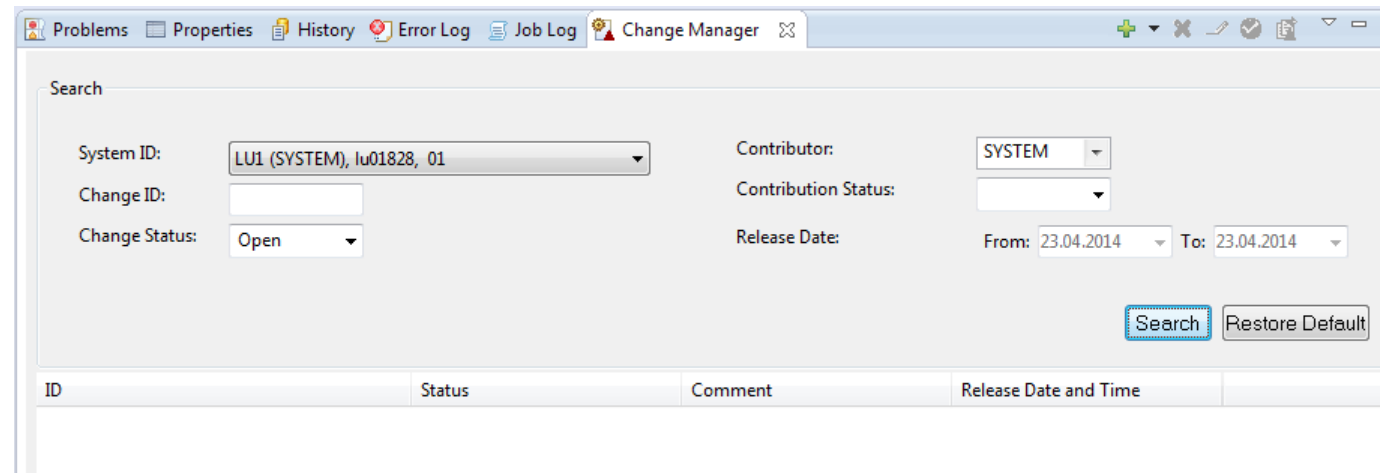
Changes in HALM ★

- Select CHANGES
- Filter results if needed (default filter is applied)
- Work with the changes



Changes in SAP HANA Developer Studio

- Open Change Manager view

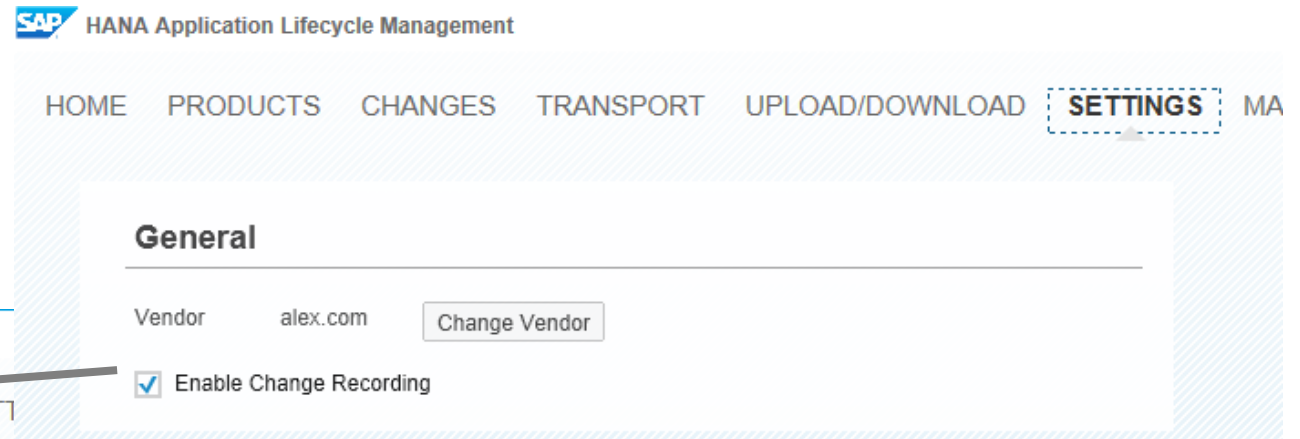
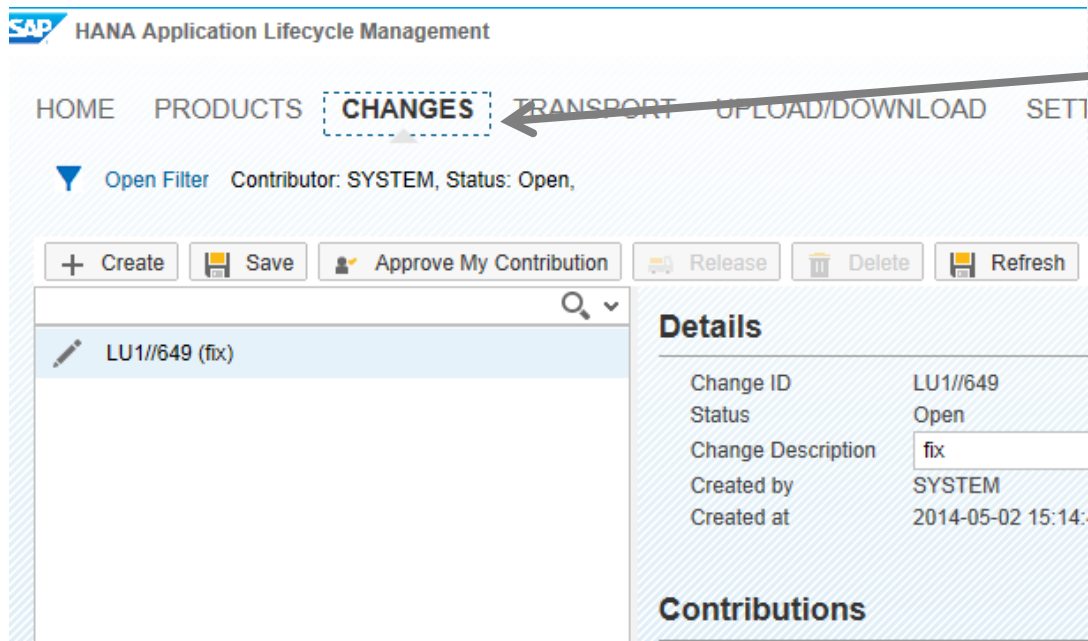


Change Recording

Enable Change Recording

New in SPS08

Setting the option *Enable Change Recording* adds the menu entry **CHANGES** ★



Released Changes for all active objects will be created when Change Recording is first enabled

Change Recording

Changes in HALM

New in SPS08

Actions for changes

List of Changes

Filter Changes

Details for Change

List of Contributors

Changed objects

HOME

PRODUCTS

CHANGES

TRANSPORT

UPLOAD/DOWNLOAD

SYSTEM

Open Filter

Contributor: SYSTEM, Status: Open,

+ Create

Save

Approve My Contribution

Release

Delete

Refresh

YPA/106 (generated by activation)

YPA/211 (generated by activation)

YPA/219 (generated by activation)

YPA/25 (generated by activation)

YPA/289 (generated by activation)

YPA/90 (generated by activation)

Details

Change ID

YPA/106

Status

Open

Change Description

generated by activation

Created by

SYSTEM

Created at

2014-04-24 23:59:16.636000

Contributions

+ Add

Approve

Edit Comment

Remove

Contributor Name	Status	Comment
SYSTEM	open	generated by activation

Objects

Move

Name	Type	Package
TestRepo	xsjs	sap.hana.xs.lm.test

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Public

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Change Recording

- **Automatic recording of object changes** to a change list when doing the object activation
- **Team Development:** Allows a developer (or team) to work on a development artifact and release the “change” only when the artifact is ready to promote to the test system. For developers not contributing to this change the objects are locked.
- **Release in two steps:** contributors have to approve first before a change can be released.

Change Recording

Change Manager View in SAP HANA Studio

Filter for changes

Actions for Changes

Changes that match your selection

Changed Objects

List of Contributors

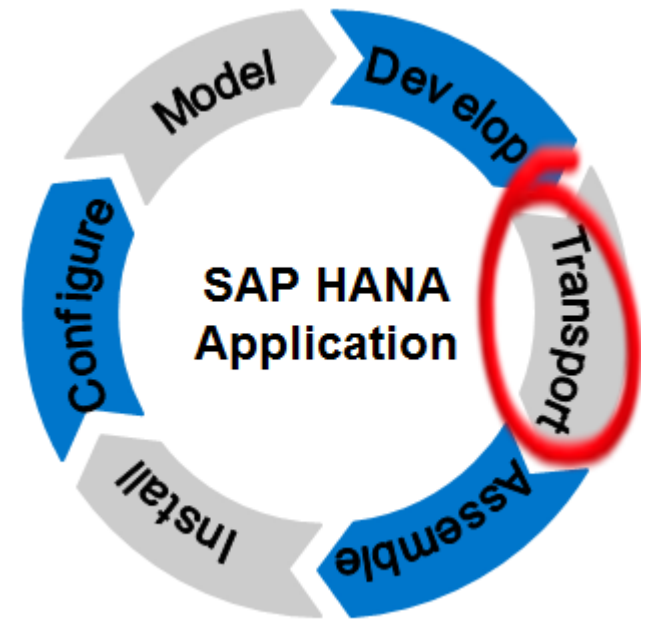
ID	Status	Comment	Release Date and Time
HDD//310	Released	generated by activation	05/12/2013 18:00
HDD//313	Released	DEMO - CHNG #1	05/12/2013 18:20
HDD//316	Released	DEMO - change #2	06/12/2013 09:51
HDD//321	Released	Demo - Change #1	06/12/2013 10:55
HDD//324	Released	Demo - change #2	09/12/2013 13:19
HDD//328	Released	generated by activation	09/12/2013 13:10
HDD//331	Released	Demo - change #2	09/12/2013 13:20
HDD//337	Released	Demo - change #1	09/12/2013 18:56
HDD//341	Released	New Demo - change #1	09/12/2013 14:56
HDD//344	Released	Demo - New change #2	09/12/2013 15:02

Contributors	Status	Comment
DEMO	Approved	Tested with ok. #2

Objects
appls/index.html



Transport



Transport scenarios for SAP HANA content

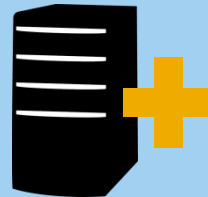
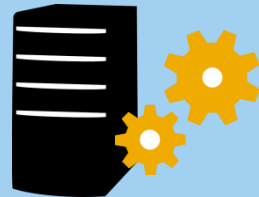
Use case

SAP HANA Source

SAP HANA Target

Transport Management

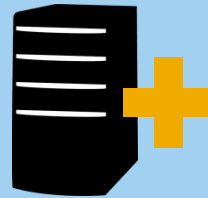
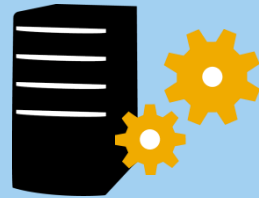
Native SAP HANA content



SAP HANA Application Lifecycle Management

- SAP HANA stand-alone transport management
- No need for ABAP-footprint
- Lightweight and easy-to-use transport tool

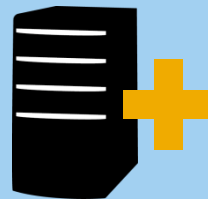
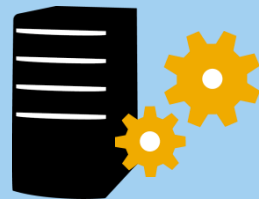
Native SAP HANA content or as part of a solution (BI, Mobile, ...)



Enhanced CTS (CTS+)

- Transported as any other non-ABAP content
- Integrated in existing CTS transport landscape
- Integrated in SAP process tools (ChaRM, QGM)

SAP HANA content exclusively used by ABAP (ABAP for SAP HANA)



HANA Transport Container

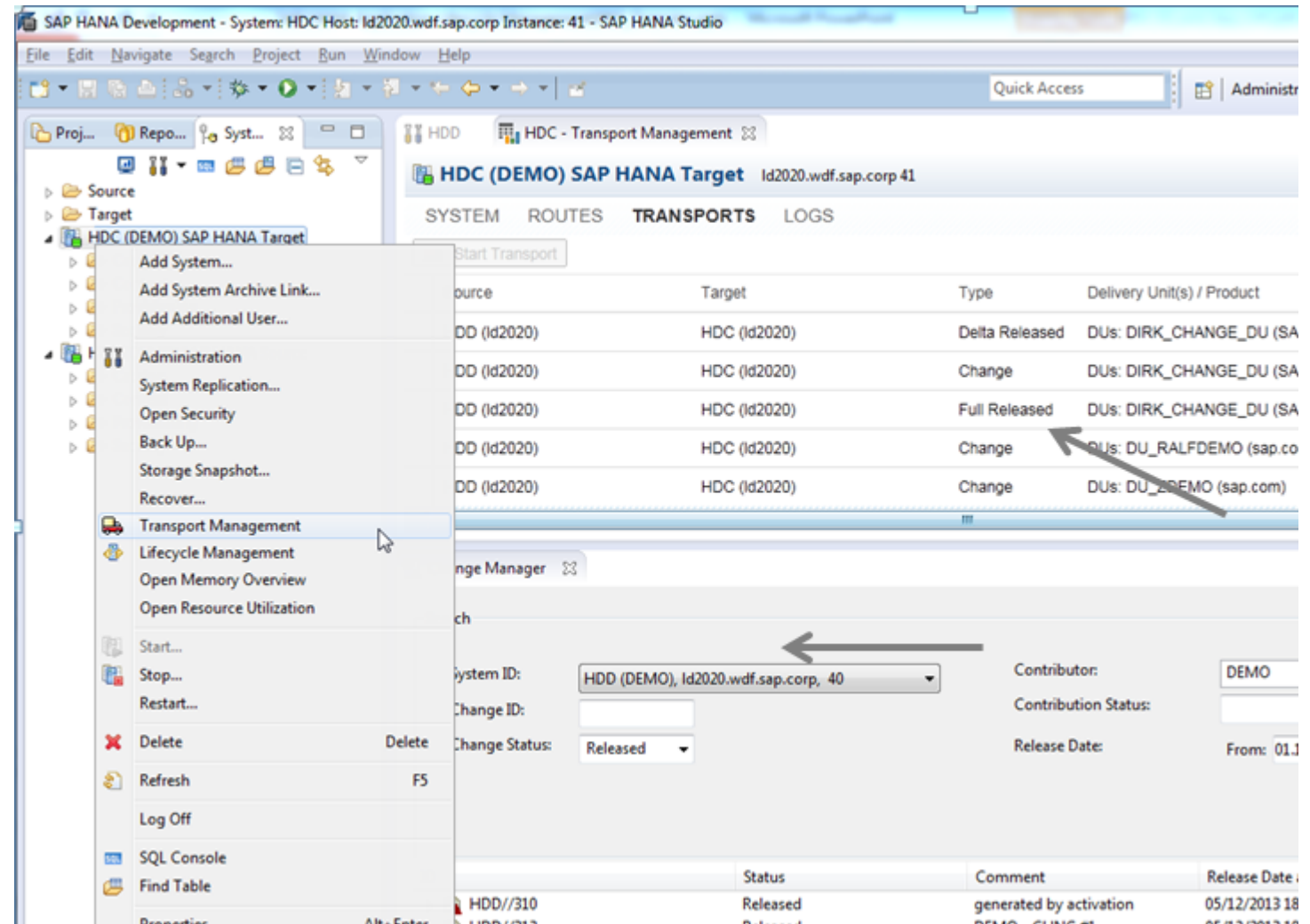
- Transported with standard ABAP transports
- Integrated in existing CTS transport landscape
- Integrated in SAP process tools (ChaRM, QGM)

Transports: Integration into SAP HANA Studio

Easy access to transport management capabilities in SAP HANA studio:

Development perspective,
systems view > right mouse click
on the system

select *Transport Management*
from the menu



Native SAP HANA Content

What and Where (1/2)

Changed in SPS08

What to do to make a system known

- Log on to the target system
- Go to TRANSPORT → System
- Check whether the source system exists

or

- Register the source system

SAP HANA Application Lifecycle Management

HOME PRODUCTS **TRANSPORT** UPLOAD/DOWNLOAD

System Transports Logs

+ Register Refresh Maintain Remove Ping

	SID	Host Name	HTTP(S) Port
	LU3	lu01828	
	LU2	lu01828	

Register System

System Details
Enter system details for registering the system and press the "Next" button.

Host *

XS Engine HTTP(S) Port *

Comment

Next > Finish Cancel

Native SAP HANA Content

What and Where (2/2)

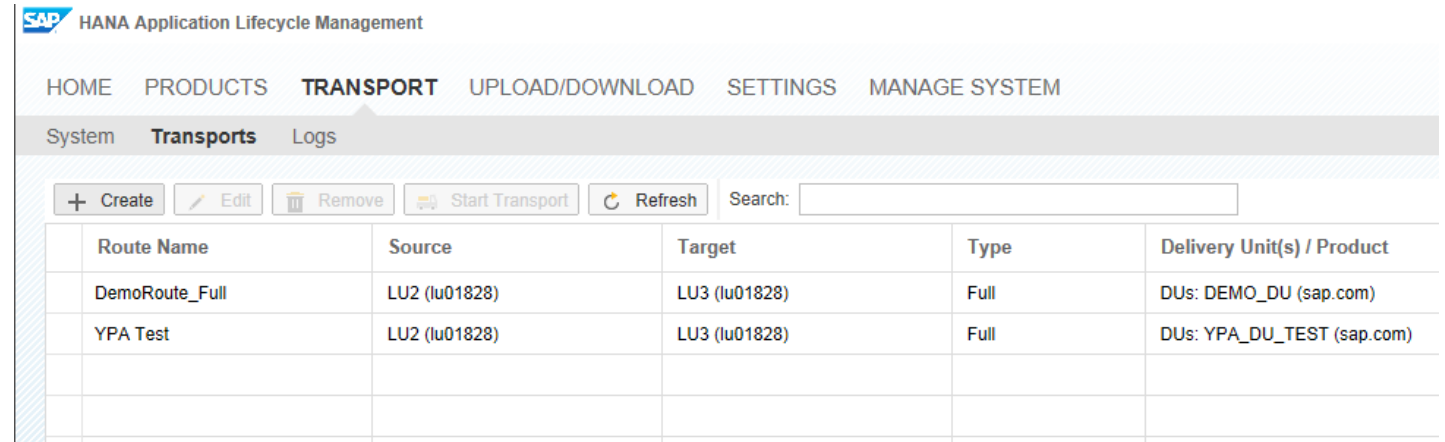
Changed in SPS08

What to do to transport content

- Go to TRANSPORT → Transports
- Create a route covering your needs

or

- Choose the route you need



SAP HANA Application Lifecycle Management

HOME PRODUCTS **TRANSPORT** UPLOAD/DOWNLOAD SETTINGS MANAGE SYSTEM

System **Transports** Logs

+ Create Edit Remove Start Transport Refresh Search:

Route Name	Source	Target	Type	Delivery Unit(s) / Product
DemoRoute_Full	LU2 (lu01828)	LU3 (lu01828)	Full	DUs: DEMO_DU (sap.com)
YPA Test	LU2 (lu01828)	LU3 (lu01828)	Full	DUs: YPA_DU_TEST (sap.com)

Native SAP HANA Content

Basics for Transports

Target Group

- New SAP customers without ABAP-footprint
- SAP customers with the need for a lightweight transport management

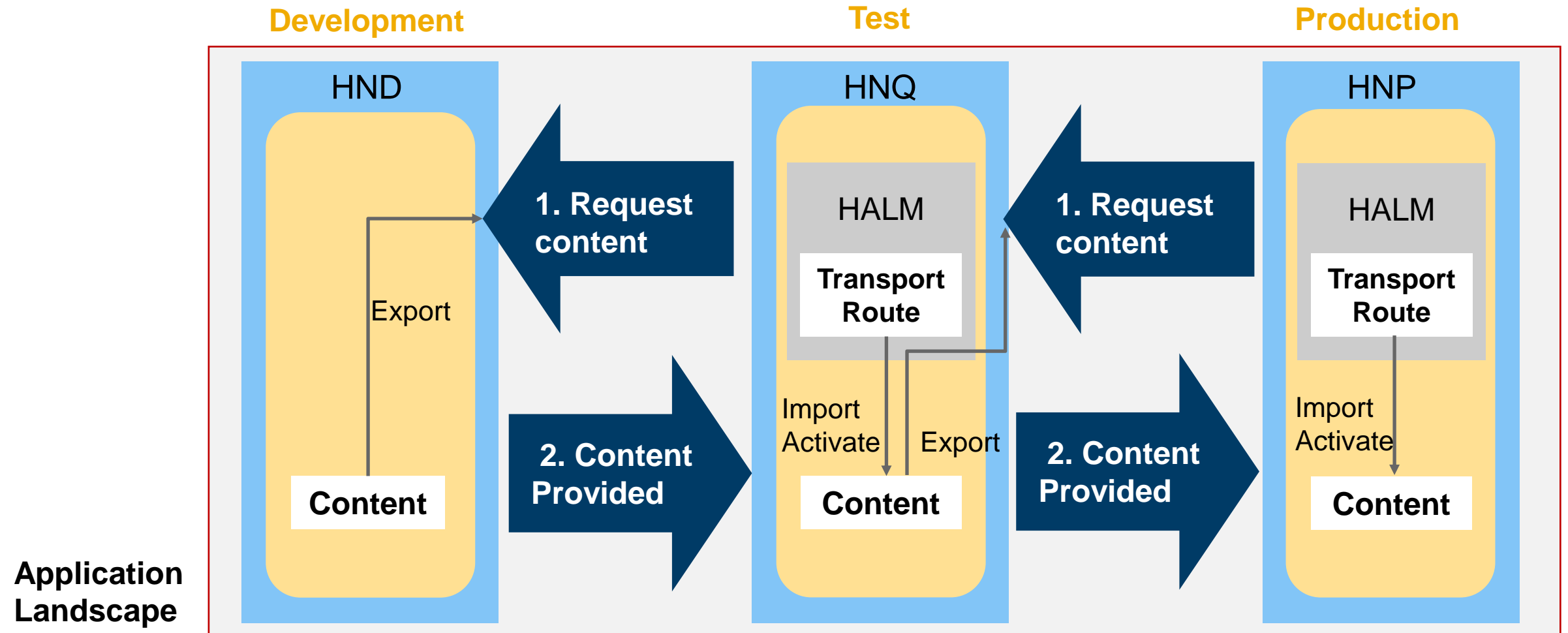
What to use

- Content Creation: SAP HANA Studio (source system)
- Transport: SAP HANA Application Lifecycle Management (target system)

Granularity

- Full Deliver Unit / Product (without Change Recording)
- Full Released Delivery Unit / Product (with Change Recording enabled)
- Change (with Change Recording enabled)

Native SAP HANA Content Transport Landscape



Native SAP HANA Content Configuration

New in SPS08

Configure native SAP HANA Transport ★

- Go to SETTINGS
- Set *Enable Native HANA Transport*

This is the default setting

SAP HANA Application Lifecycle Management

HOME PRODUCTS CHANGES TRANSPORT UPLOAD/DOWNLOAD **SETTINGS** MA

General

Vendor alex.com [Change Vendor](#)

☒ Enable Change Recording

Transport

☒ Enable Native SAP HANA Transport

☐ Enable CTS Transport

Native SAP HANA Content Configuration

New in SPS08

The menu entry TRANSPORT is only available if Native SAP HANA Transport is enabled

SAP HANA Application Lifecycle Management

HOMEPRODUCTSTRANSPORTUPLOAD/DOWNLOAD

SystemTransportsLogs

+ Register

Refresh

Maintain

Remove

Pin

SID	Host Name	HTTP(S) Port
LU3	lu01828	
LU2	lu01828	8002

SAP HANA Application Lifecycle Management

HOMEPRODUCTSCHANGESTRANSPORTUPLOAD/DOWNLOADSETTINGSMA

General

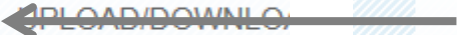
Vendoralex.comChange Vendor

☒ Enable Change Recording

Transport

☒ Enable Native SAP HANA Transport

☐ Enable CTS Transport



Native SAP HANA Content

Create Transport Route

Changed in SPS08

The route management is an essential part transport management.

Route definition for transport on target system:

- Source & target system
- which Delivery Units (multi-select available)
- Select transport all objects (Full Released) or just released changes (Change)
- Select DU Transport or Product Transport

The route definition can be specified in a static way or during each transport.

Create transport route ✕

Name

Source System

Target System

Type

Transport

Delivery Units

Comment

LU3 (lu01828)

☒ Full Released
☐ Change

☒ DU Transport
☐ Product Transport

Create

Cancel

Native SAP HANA Content

Transport based on Changes

- **Transport based on released changes:** only objects which are assigned to a released change are transported
- **Object transport:** Selecting a single change from the list of changes imports only objects involved in this change into the target system –not the full delivery unit.
- **Dependency calculation:** Automatically grabbing depending changes as part of the transport too.

The screenshot displays the SAP HANA Application Lifecycle Management (ALM) interface. The main window is titled 'Edit Transport Route' and contains the following fields:

- Name: DemoRoute_Change
- Source System: LU2 (lu01828)
- Target System: LU3 (lu01828)
- Type: ☒ Change (Other options: Full Released, DU Transport, Product Transport)
- Transport: ☒ DU Transport (Other options: Full Released, Change, Product Transport)
- Delivery Units: A list of delivery units including DEMO_CTS_DU-sap.com, DEMO_DU-sap.com, DUA_TEST-sap.com, DUB_TEST-sap.com, HANA_ADMIN-sap.com, HANA_DT_BASE-sap.com, HANA_IDE_CORE-sap.com, HANA_TA_CONFIG-sap.com, and HANA_TEST_TOOLS-sap.com.
- Comment: (Empty text field)

On the right side, there is a navigation bar with tabs: HOME, PRODUCTS, CHANGES, and TRANSPORT. Below these are sub-tabs: System, Transports (highlighted), and Logs. Action buttons include '+ Create', 'Edit', 'Remove', and 'Start Transport'.

A 'Change Export (1/3)' pop-up window is open, showing a table of changes:

ID	Description	Released Time	Delivery Unit
1000	best ever change 0	Thu Sep 12 2013 04:06:...	RALF_BELGE...
1001	best ever change 1	Thu Sep 12 2013 05:06:...	HANA_XS_LM...
1002	best ever change 2	Thu Sep 12 2013 06:06:...	HANA_XS_LM...
1003	best ever change 3	Thu Sep 12 2013 07:06:...	RALF_BELGE...
1004	best ever change 4	Thu Sep 12 2013 08:06:...	RALF_BELGE...
1005	best ever change 5	Thu Sep 12 2013 09:06:...	HANA_XS_LM...
1006	best ever change 6	Thu Sep 12 2013 10:06:...	RALF_BELGE...

Below the table, there is a section titled 'Objects in the selected Change' with a table showing details for the selected change (ID 1001):

Name	Package	Version	Delivery Unit
dolt.js	sap.hana.xs.lm.test	11	HANA_XS_LM

The pop-up window also includes 'Show Objects' and 'Refresh' buttons, and a 'Back' button at the bottom right.

Transport via CTS+

Basics for Transports

Target Group

- SAP customers with ABAP-footprint and existing CTS transport landscape
- SAP HANA content is handled like any other non-ABAP content

What to use

- Content Creation: SAP HANA Studio (source system)
- Export: SAP HANA Studio (source system)
- Transport: Transport Organizer Web UI (for source system) / STMS (for target system)

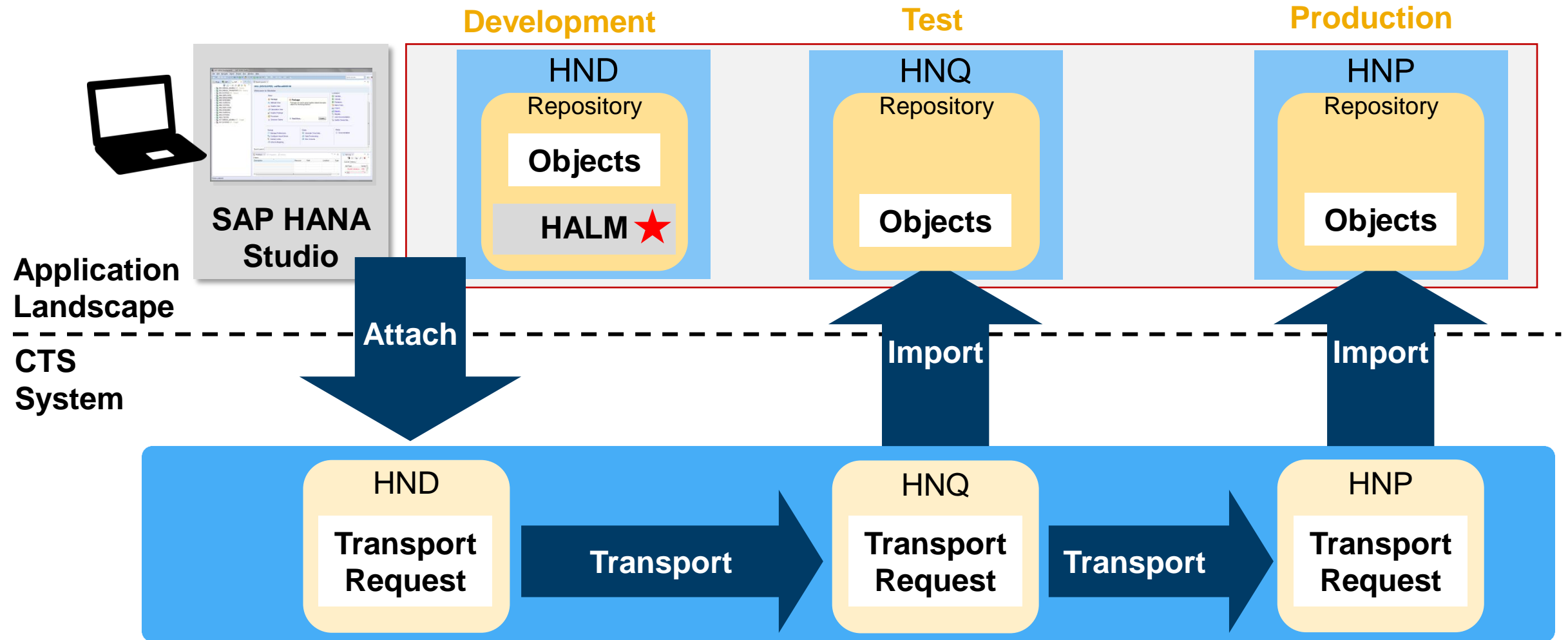
Granularity

- Delivery Unit
- Change

Transport via Change and Transport System (CTS+)

Transport Landscape

New in SPS08



Transport via CTS+ Configuration

New in SPS08

Go to SETTINGS

Select Enable CTS Transport ★

SAP HANA Application Lifecycle Management

HOME PRODUCTS CHANGES CTS EXPORT UPLOAD/DOWNLOAD **SETTINGS** MAN

General

Vendor alex.com Change Vendor

☒ Enable Change Recording

Transport

☐ Enable Native SAP HANA Transport
☒ Enable CTS Transport

CTS Upload System SID: YPA Change

CTS Communication System:

Host	wdflbmd0537
HTTP(S) Port	50000
Comment	auto-generated Export CTS system

Maintain CTS Destination Test CTS Connection

SAP HANA XS Administration Tool

XS APPLICATIONS

Application Obj...

HTTP DESTINATION

GENERAL DATA

Package	sap.hana.xs.im.core.dest
Name	host-1000
Description	
Host	wdflbmd0537
Port	50000
Path Prefix	/001/export_cts_ws

PROXY

☐ Use Proxy

AUTHENTICATION

Authentication Type ☐ None ☒ Basic ☐ SAP Assertion Ticket

User HALMCTS

Enter Data of your CTS System
(Additional Configuration on CTS
System is required)

Transport via Change and Transport System (CTS+) Configuration

New in SPS08

- Menu entry CTS EXPORT is only shown if CTS Transport is enabled
- (Menu entry TRANSPORT is removed)
- Transports can be done on DU or Change level

SAP HANA Application Lifecycle Management

HOME PRODUCTS CHANGES **CTS EXPORT** UPLOAD/DOWNLOAD

Delivery Units Released Changes Logs

↑ Attach to transport request Assign Delivery Units Open Transport Organizer

Name	Vendor
BREMOR	alex.com
DEMOEVENING_DU	alex.com
DEMOMORNING_DU	alex.com

SAP HANA Application Lifecycle Management

HOME PRODUCTS CHANGES CTS EXPORT UPLOAD/DOWNLOAD **SETTINGS** MAN

General

Vendor alex.com [Change Vendor](#)

☒ Enable Change Recording

Transport

☐ Enable Native SAP HANA Transport
☒ Enable CTS Transport

CTS Upload System SID: YPA [Change](#)

CTS Communication System:
Host wdfibmd0537
HTTP(S) Port 50000
Comment auto-generated Export CTS system

[Maintain CTS Destination](#) [Test CTS Connection](#)

Transport via Change and Transport System (CTS+)

What & Where

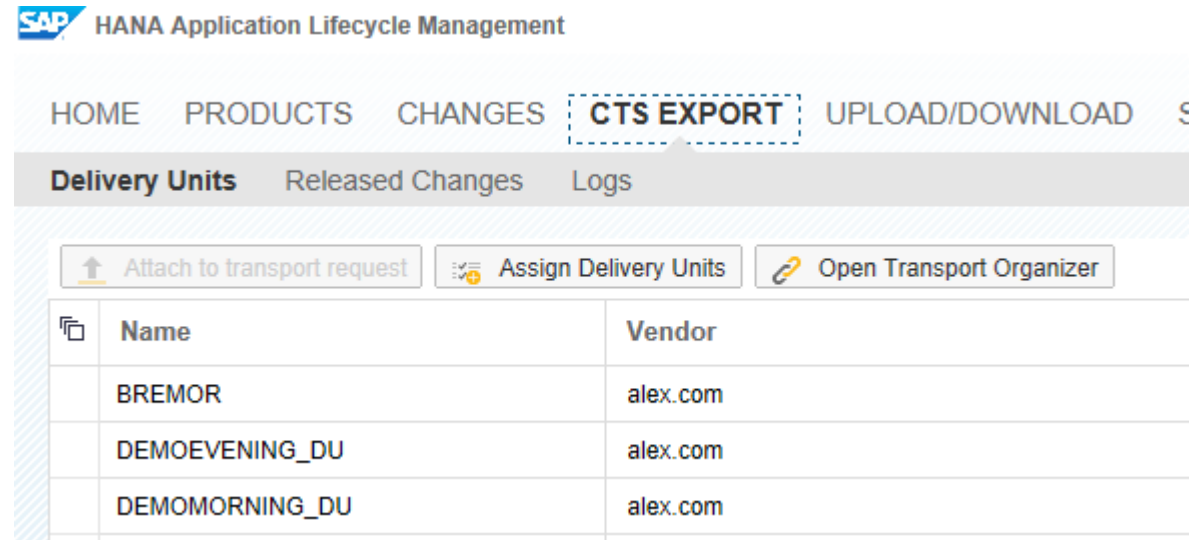
New in SPS08

What to do to transport content

- Log on to the source system
- Go to CTS Export
- Transport Delivery Units

or

- Transport Released Changes



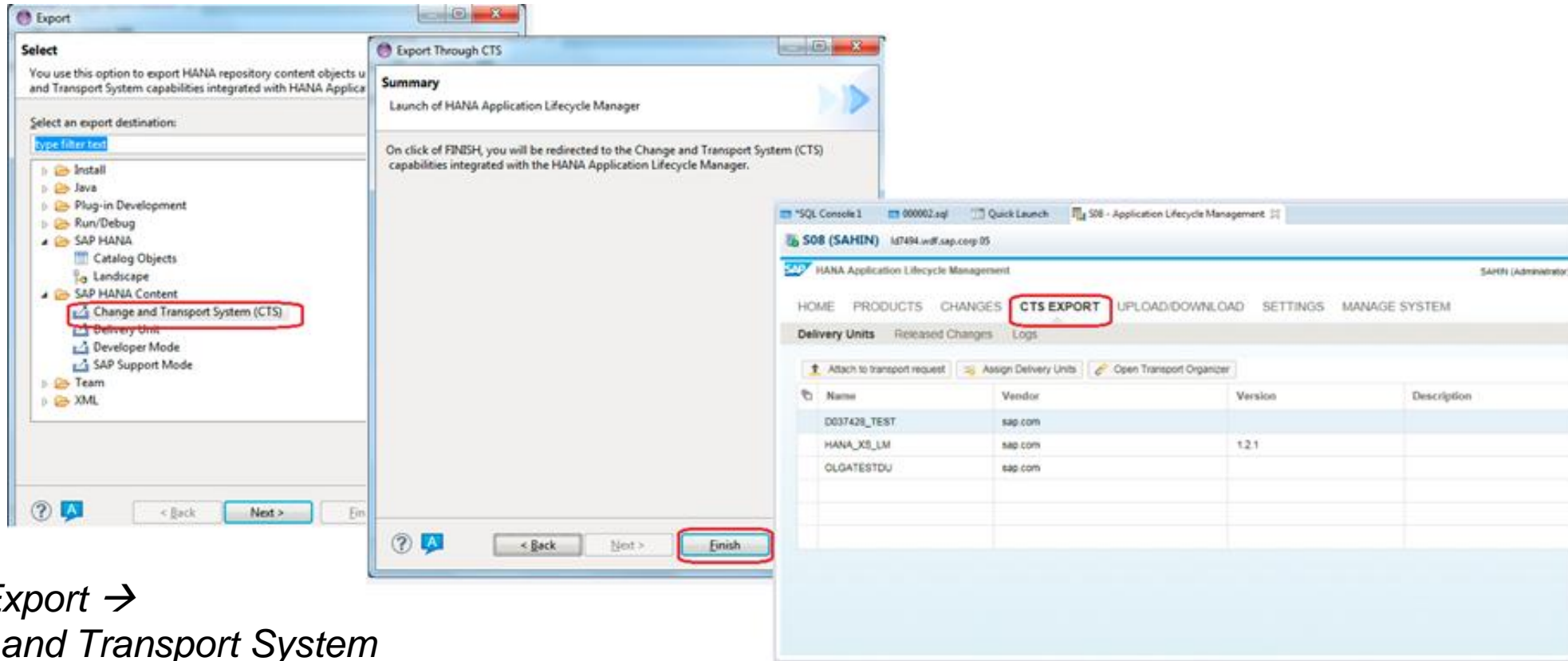
The screenshot displays the SAP HANA Application Lifecycle Management (ALM) interface. The top navigation bar includes links for HOME, PRODUCTS, CHANGES, CTS EXPORT (highlighted with a dashed blue box), and UPLOAD/DOWNLOAD. Below this, a sub-navigation bar shows Delivery Units, Released Changes, and Logs. The main content area features three buttons: 'Attach to transport request' (with an upload icon), 'Assign Delivery Units' (with a checkmark icon), and 'Open Transport Organizer' (with a link icon). A table below lists delivery units with columns for Name and Vendor.

Name	Vendor
BREMOR	alex.com
DEMOEVENING_DU	alex.com
DEMOMORNING_DU	alex.com

Transport via Change and Transport System (CTS+)

Export Process in SAP HANA Studio

Changed in SPS08



File → Export →
Change and Transport System
(CTS)
or Modeler → Export

Choose System

Choose transport via Delivery
Units or Released Changes

Check *Transport Request Details*

Click on *Next*

Select
Attach to Transport Request

Click on *Next* and then *Finish*

Transport via CTS+

Transport Organizer for non-ABAP

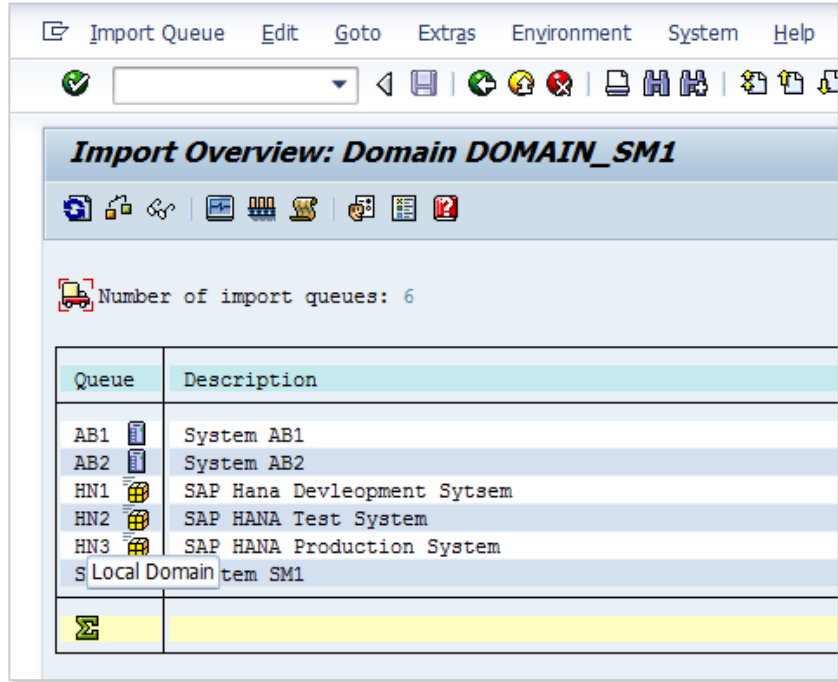
Transport Organizer for non-ABAP is used to:

- Create Transport Requests
- Preselect requests
- Release requests
- Monitor or change content of requests
- Maintain attributes
- Monitor status
- View logs

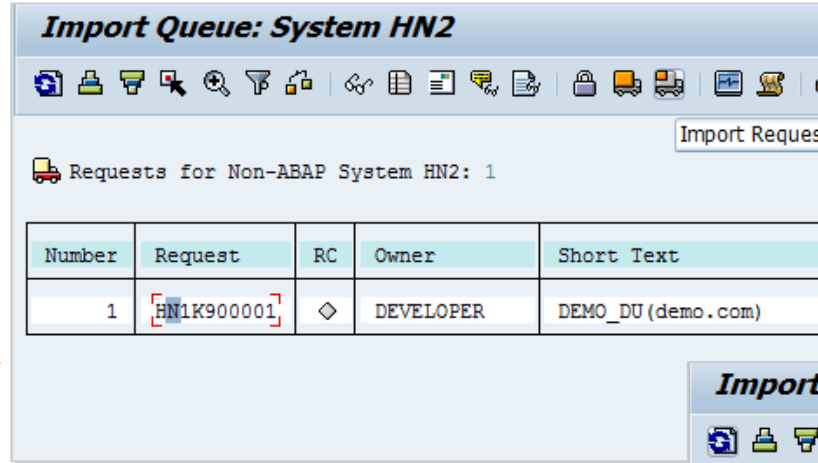
The screenshot displays the SAP Transport Organizer for non-ABAP interface. At the top, the title bar reads "Transport Organizer" with a "Log off SUDROW (SUDROW)" link. Below this, the subtitle is "Transport Requests of System AV2 / Client 001". A status bar indicates "During search 3 transport requests were found" and "Search has been performed". A "Display Message Log" link is present. The main area shows an "Overview: Transport Request" table with columns for "Transport Request Status -> Owner -> Transport Request", "Presele...", "Status", "Owner", and "Description". The table lists three requests: "Transport Request AV2K900001" (Modifiable, Owner OTOADMIN, Description testhdf), "Transport Request AV2K900002" (Released, Owner OTOADMIN, Description testhdf), and "Transport Request AV2K900003" (Released, Owner OTOADMIN, Description testhdf). Below the table, the "Details of Transport Request AV2K900001" section is visible, showing fields for "Description" (testhdf), "CTS Project ID", "Target" (AV1), "Source Client" (001), "Owner" (OTOADMIN), "Status" (Modifiable), and "Last Change Date / Time" (15.07.2013 19:03:31). The interface includes various navigation and action buttons like "Create Request...", "Preselect Request", "Release...", "Delete...", "Collapse", "Expand", "Refresh", and "Personalize...".

Transport via CTS+

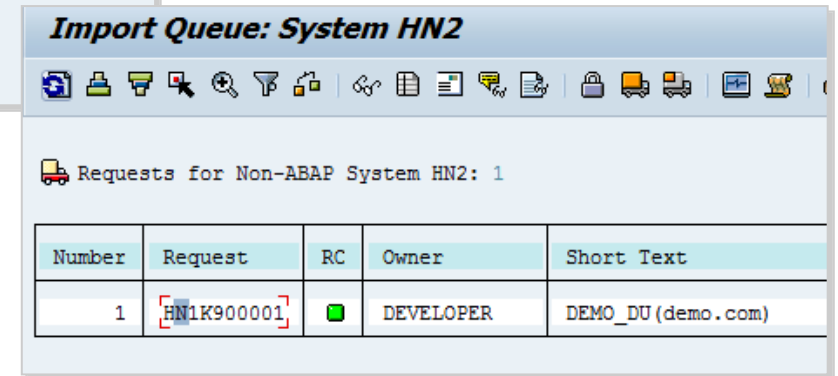
Import Process in TMS



Choose queue of your target system



Import the request(s) and check the result



Agenda

Overview

Model, Develop and Transport an Application

Command Line Tool

Install, Assemble and Configure an Application

Configuration

Prerequisites

Roles & Authorizations

Evolution of HALM

Summary



SAP HANA Database Client Installation

New in SPS08

Command Line Tool

- can be installed locally
- Can run on Server

```
SAP HANA Database Client installation kit detected.

SAP HANA Lifecycle Management - Client Installation 1.00.73.00.390371
*****

Enter Installation Path [C:\Program Files\sap\hdbclient]: c:\MyProgs\SP8HDBClient
Checking installation...
Preparing package 'Python Runtime'...
Preparing package 'Product Manifest'...
Preparing package 'SQLDBC'...
Preparing package 'ODBO'...
Preparing package 'REPOTOOLS'...
Preparing package 'Python DB API'...
Preparing package 'ODBC'...
Preparing package 'JDBC'...
Preparing package 'HALM Client'...
Preparing package 'Client Installer'...
Installing SAP HANA Database Client to c:\MyProgs\SP8HDBClient...
Installing package 'Python Runtime'...
Installing package 'Product Manifest'...
Installing package 'SQLDBC'...
```

Open the Command Line Tool

New in SPS08

hdbalm

Commands:

- product
- admin
- update
- dependencies
- install
- du
- Transport
- log
- help

```
C:\MyProgs\SP8HDBClient>hdbalm
usage: hdbalm [<args>] <command> [<command args>]

Commands are:
product      manage SAP HANA products
help         Print available commands
admin        manage administration
update       Updates a HANA product with the given stack.xml and SAR archives
dependencies View and analyze delivery unit dependencies
install      Installs a HANA product available in zip format
du           manage delivery units
transport    transport management
log          log file viewer

args:
-u <user>, --user==<user>  User name
-h <host>, --host=<host>    XSEngine host
-p <port>, --port=port      XSEngine port
-v, --verbose              writes debug messages to stderr
-s, --https                send request via https
-c, --certs                certificate file when using https
-y, --yes                  non-interactive mode, does not ask questions
-j, --json                 print result as json if successful

The parameters -u, -h, and -p take precedence over environment variables. The
program will query for a password if no password is set in the environment.

Command args are command specific. Use

    hdbalm help <command>

for further details.

The following environment variables are read:

HDBALM_USER      user name
HDBALM_PASSWD    password
HDBALM_HOST      host
HDBALM_PORT      port
```

Command Line Support for Delivery Units

New in SPS08

All operations available from the delivery unit view are available through the command line

In addition a full dependency report is available to show all relevant dependencies between delivery units.

```
C:\halm>halm.py help dependencies
View and analyze delivery unit dependencies.
usage: halm [<args>] dependencies [<command args>]
        [<source du>] [<source du vendor>]
        [<target du>] [<target du vendor>]
command args:
  -f, --full            show full dependency view and analysis
  -r, --references      shows object references between delivery units
  -n, --nirvana         shows nirvana references for a delivery unit
```

notes:

The references command requires source and target du name as well as the DU vendor.

The nirvana command displays object references for objects that are part of a delivery unit to objects which are not part of a delivery unit. When exported it will not be possible to import and activate these delivery units into another system. Those reference therefore pose a serious problem.

With no arguments a list of delivery unit dependencies will be displayed. Each line of the output lists a delivery unit followed by a colon and a command separated list of referenced delivery units. In the following example the delivery unit HANA_XS_LM has references to SAPUI5_1 and HANA_XS_BASE:

```
HANA_XS_LM(sap.com): SAPUI5_1(sap.com), HANA_XS_BASE(sap.com)
```

hdbalm transport

New in SPS08

- list
- start

```
C:\MyProgs\SP8HDBClient>hdbalm help transport
Client to the HANA Application Lifecycle Management transport system.
usage: halm [<args>] transport <transport command>
transport commands:
-----

list

    Lists available transport routes

    usage:
    halm [<args>] transport list

start

    Starts a transport operation on the given transport route. The transport
    type is in accordance with the transport route definition. In case of
    transport type change all released changes that are still not imported to
    the target system are transported.

    usage:
    halm [<args>] transport start [options] <route id>

    Supported options are:
        -t <type>, --type=type    type can be "full" or "delta"
```

hdbalm product

New in SPS08

- list
- get
- create
- delete

```
C:\MyProgs\SP8HDBClient>hdbalm help product
Commands to manage SAP HANA Products.
usage: halm [<args>] product <product command> [<command args>]

product commands:
-----

list
    Lists all products installed in the system

    usage:
    hdbalm product list

get
    get product metadata

    usage:
    hdbalm product get <product name> <vendor name>

create
    Create a product in the system <metadata only>.

    usage:
    hdbalm product create <product name>

delete
    Delete the product <metadata only>. No delivery units are removed
    from the system.

    usage:
    hdbalm product delete <product name> <vendor name>
```

hdbalm dependencies

New in SPS08

```
C:\MyProgs\SP8HDBClient>hdbalm help dependencies
View and analyze delivery unit dependencies.
usage: halm [<args>] dependencies [<command args>]
        [<source du>] [<source du vendor>]
        [<target du>] [<target du vendor>]

command args:
  -f, --full                show full dependency view and analysis
  -r, --references          shows object references between delivery units
  -n, --nirvana             shows nirvana references for a delivery unit

notes:
The references command requires source and target du name as well as the
DU vendor.

The nirvana command displays object references for objects that are part of
a delivery unit to objects which are not part of a delivery unit. When
exported it will not be possible to import and activate these delivery
units into another system. Those reference therefore pose a serious problem.

With no arguments a list of delivery unit dependencies will be displayed.
Each line of the output lists a delivery unit followed by a colon and a
comma separated list of referenced delivery units. In the following example
the delivery unit HANA_XS_LM has references to SAPUI5_1 and HANA_XS_BASE:

HANA_XS_LM(sap.com): SAPUI5_1(sap.com), HANA_XS_BASE(sap.com)
```


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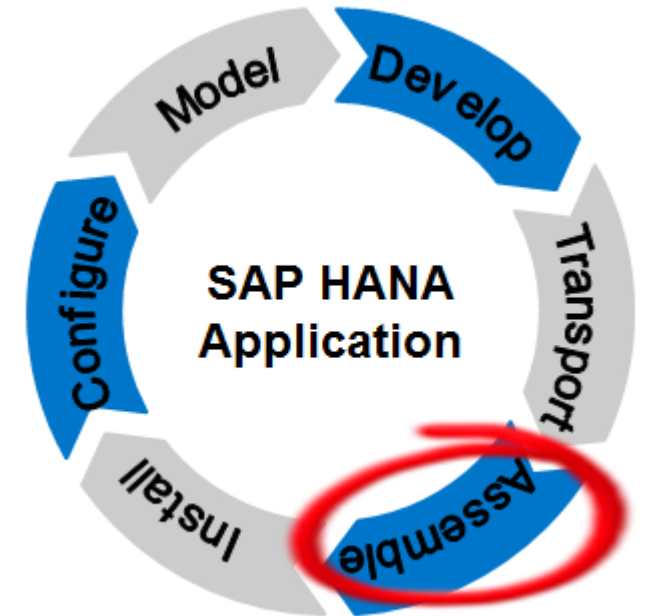
Evolution of HALM

Summary





Assemble



Assemble

What You Should Know

Labs Preview

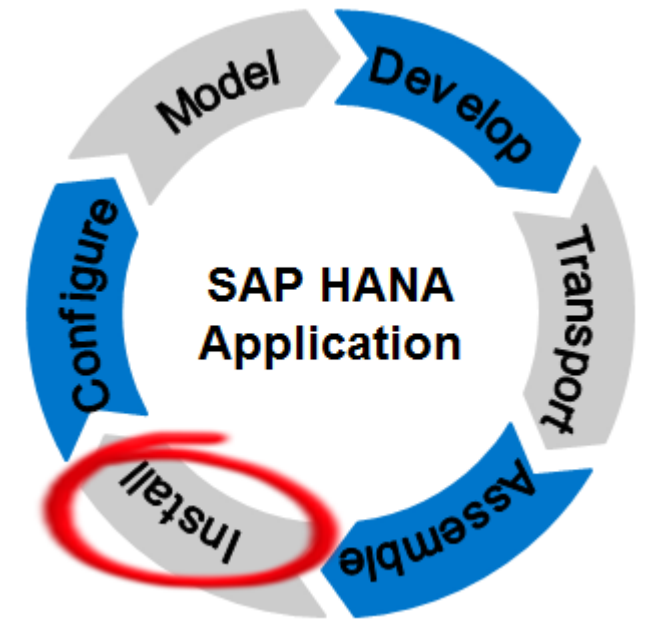
Currently only available for SAP-internal usage

Planned for Customers and partners for a future release

Planned to support you in creating a file out of your product that can be delivered to your (internal or external) customers



Install



Install an Application

New in SPS08

Use Command Line Tool; Install one or several product instances

Checks that all pre-requisites are met for installing the product (correct SAP HANA version, other products as a pre-requisite)

Possibility to select single product instances for installation

Installs all delivery units and creates product metadata

Command line based installation

Installation Transcript

New in SPS08

```
C:\dev\test>hdbalm install SAP_HANA_EXPLORER_WEB.zip

SYSTEM INFORMATION
-----
HOST       : ld2020
PORT       : 8045
USER       : dirk
INSTANCE   : 045

PRODUCT INFORMATION
-----
| NAME      : SAP HANA EXPLORER WEB
| VERSION   : 1.0
| VENDOR    : sap.com

PRODUCT INSTANCES FOR INSTALL
-----
| No. | Instance Id | Product Instance
-----
| 1   | 1           | SAP Lumira Server (EA) 1.0

Validating Product Descriptor.
Validation successful.
```

```
SAP HANA EXPLORER WEB

|          | INSTALLED          | TO BE INSTALLED
-----
|PRODUCT VERSION| NOT YET INSTALLED |1.0
|SP VERSION      | NOT YET INSTALLED |Initial Shipment Stack

SAP Lumira Server (EA) 1.0

INSTALLED VERSION | TO BE INSTALLED | IMPORT | DELIVERY UNIT
-----
|NOT YET INSTALLED | 1.0.000.0       | YES    | HANA_EXP_WEB

Do you wish to continue with the installation for the specified
product?[yes/no]-->yes

Installing Delivery Units.

[...]

Updating Repository Tables.
Update successful.

Installation process is complete.
```

Product Installation

New in SPS08

Install and uninstall products via Command Line tool

Functionality moved from SAP HANA Platform Lifecycle Management to HALM

→ No <SID>adm required any more



hdbalm install

New in SPS08

Command:

install

Optional parameters to

Display product instance information

Install specified Product instance(s)

Required parameter to

Specify installation file location

```
C:\MyProgs\SP8HDBClient>hdbalm help install

Installs all product instances, or selected product instances from the product archive.
The archive location is specified as a command line argument.

usage: hdbalm [<args>] install [<command args>]

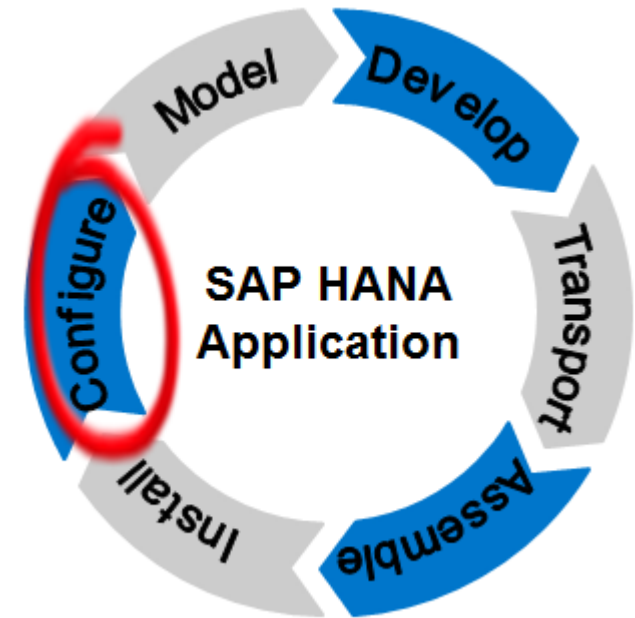
command args:
    <SourceArchive>      <Required parameter> Location where product archive is
present.
    display              <Optional parameter> To display the product instance in
formation.
    <instance list>      <Optional parameter> To do installation for the speci-
ed list of instances for a product

example:
    hdbalm <args> install <SourceArchive>
    hdbalm <args> install <SourceArchive> display
    hdbalm <args> install <SourceArchive> 1,2 <To install instances with ser-
ial no 1 and 2>
    hdbalm <args> install <SourceArchive> 1    <To install instance with seri-
al no 1>
    hdbalm <args> install <SourceArchive> 0    <To install all the instances>
```



Configure

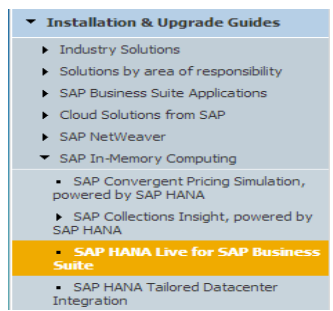
Planned for future releases



Technical Configuration Today

Application Configuration (general)

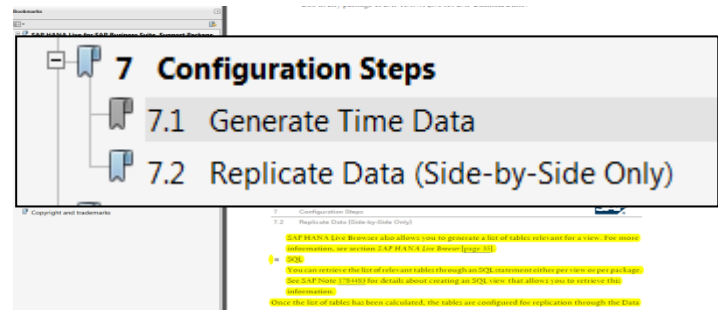
- Typically found on service market place [/instguides](#)



Application Configuration (specific)

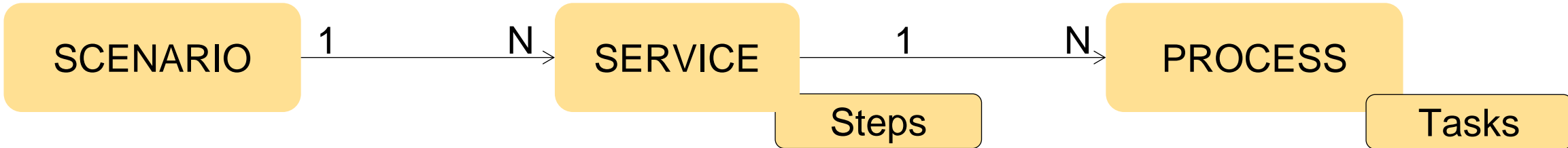
Hana Live Configuration

- Configuration is documented in installation guide
- Manual description of SQL statements to configure application



Configuration Process

- Administrator reads documentation
- Administrator performs tasks



Technical Configuration (planned)

Labs Preview

Lifecycle Experts (Cloud Infrastructure Experts)

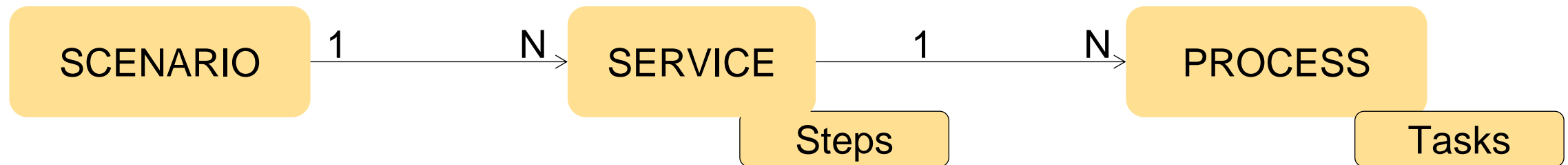
- Defining scenarios
- Documenting scenarios

Application Developer

- Understanding scenarios and their content contribution requirements
- Providing content for configuration automation

Administrators or Orchestration Tools

- Executing configuration services
- Orchestrating end2end and/or cloud processes



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Evolution of HALM

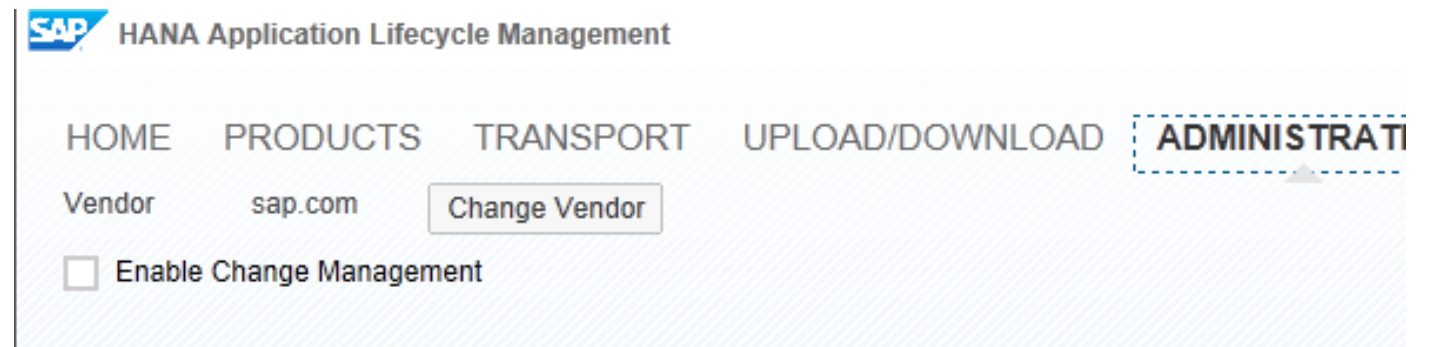
Summary



Set vendor

Vendor must be set before you start creating SAP HANA Content

You can change the vendor later on



Agenda

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Summary



System requirements

- **For SAP HANA Application Lifecycle Management**
 - Part of each SAP HANA shipment as of SAP HANA appliance SP06
- **For Transporting SAP HANA content with enhanced CTS (CTS+)**
 - **CTS+ Domain Controller:** SAP Solution Manager 7.1 SP05 and higher support package levels or SAP NetWeaver 7.31 with SL Toolset 1.0 SP07 and higher support package levels or SAP NetWeaver 7.4 with SL Toolset 1.0 SP07 and higher support package levels
 - **SAP HANA systems:** SAP HANA Appliance SP05 and higher support package levels
- **For Transporting SAP HANA content with HANA Transport Container**
 - SAP NetWeaver 7.40 SP0 and higher support package levels
 - SAP NetWeaver 7.31 SP5 and higher support package levels

Agenda

Overview

Model, Develop and Transport an Application

Command Line Tool

Install, Assemble and Configure an Application

Configuration

Prerequisites

Roles & Authorizations

Evolution of HALM

Summary



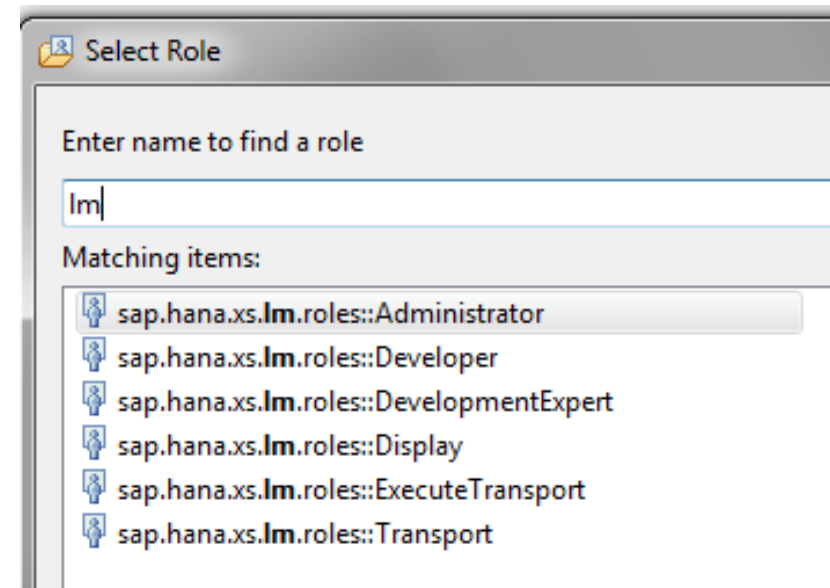
Roles

New in SPS08

The following roles exist for the SAP HANA Application Lifecycle Management:

- Administrator
- Developer
- DevelopmentExpert
- Display
- Execute Transport
- Transport

Additional roles for SAP HANA Repository are required



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Availability of features in SAP HANA

Labs Preview

Model	+Basics in HALM	+ Dependency Viewer	+ Improved UIs	
Develop		+ Change Recording via HANA Studio	+ Change Recording via WebIDE & HALM	
Transport	+ DU/Products via HALM & CTS+ in Studio	+ Change Transport (HANA native)	+ Change Transport (via CTS+)	+ CTS+ without AS JAVA
Assemble				+ For customers and Partners
Install			+ Via CLT	+ via Web UI
Configure				+ Ship configuration + Allow configuration dev

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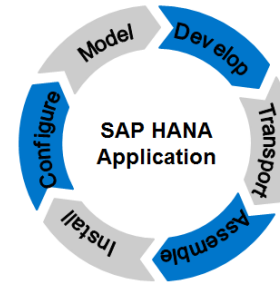
Summary



Key Takeaways for SAP HANA Application Lifecycle Management

What do we provide?

HALM as tool to manage the **Lifecycle of SAP HANA XS Applications**



When?

Available since **SAP HANA 1.0 SPS06**



For whom?

- Easy to use, lightweight application with **native SAP HANA transport** for customers with none or little ABAP footprint, or who simply prefer it's streamlined approach
- Comprehensive transport handling with **CTS+** for customers who prefer to integrate SAP HANA transports into existing promote-to-production processes



Further information

SAP Public Web

<http://www.saphana.com/docs/DOC-4268> > What's new in SAP HANA 1.0 SPS07 for Extended Application Services (XS) and Content Lifecycle Management

<http://scn.sap.com/community/hana-in-memory> >

<http://scn.sap.com/docs/DOC-46119> > SAP HANA Lifecycle Management

<http://scn.sap.com/docs/DOC-49327> > Overview of SAP HANA Content Transport Management

<http://scn.sap.com/docs/DOC-8576#HANA> > How to Configure SAP HANA for CTS+

<http://www.saphana.com/community/about-hana/features#administration/application-lifecycle-management>
> HALM@ saphana.com

SAP Notes

[1920406 - Release Note SAP HANA Application Lifecycle Management SP7](#)

[1998966 – Release Note for SAP HANA Application Lifecycle Management SP8](#)

SAP Internal

<https://wiki.wdf.sap.corp/wiki/display/SDT/HANA+Application+Lifecycle+Management>

Further information

SAP Public Web

SAP HANA Master Guide:

http://help.sap.com/hana/SAP_HANA_Master_Guide_en.pdf

SAP HDB Client Installation Guide:

http://help.sap.com/hana/SAP_HANA_Client_Installation_Update_Guide_en.pdf

SAP HANA Studio Installation Guide:

http://help.sap.com/hana/SAP_HANA_Studio_Installation_Update_Guide_en.pdf

SAP HANA Developer Guide:

http://help.sap.com/hana/SAP_HANA_Developer_Guide_en.pdf

SAP HANA Server Installation guide:

http://help.sap.com/hana/SAP_HANA_Server_Installation_Guide_en.pdf

SAP HANA LCM Tools Reference Guide

http://help.sap.com/hana/SAP_HANA_LCM_Tools_Reference_Guide_en.pdf

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Thank you

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To get the best overview of what's new in SAP HANA SPS 08, read this [blog](#).

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