How-To Guide

How To... Configure SAP HANA for CTS

Applicable Releases:

SAP Solution Manager 7.1 SPS05, SAP Solution Manager 7.2, SAP NetWeaver 7.3 including enhancement package 1, or SAP NetWeaver 7.4

SAP HANA Platform SPS09 to 12 and SAP HANA Platform 2.0 (for SAP HANA Repository (XS classic))

Version 1.3

March 2019

Document History

Document Version	Description
1.3	• Added information about how to configure CTS+ when using the SAP Cloud Platform SAP HANA service in SAP Cloud Platform Neo Environment. The following chapters were added/changed: ○ 5.2 Configuring an HTTP Destination (changed) ○ 7.2.2 Only relevant for SAP HANA Service in SAP Cloud Platform Neo Environment: Connect to CTS Export Web Service (new) ○ 7.2.2.1 Only relevant for SAP HANA Service in SAP Cloud Platform Neo Environment: Configure the Cloud Connector to allow Calls from SAP Cloud Platform to your CTS System (new) ○ Configuring the SAP HANA Source System (changed) ○ Only relevant for SAP HANA Service in SAP Cloud Platform Neo Environment: Import SSL Certificate (new) • Updated documentation links to SAP NetWeaver 7.40 (SAP Solution Manager 7.2)
1.2	Added chapter Configuring the SAP HANA Target Systems
1.1	Added hints for Multitenant Database Containers
1.0	First official release of this guide

Typographic Conventions

Type Style	Description
Example Text	Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options. Cross-references to other documentation
Example text	Emphasized words or phrases in body text, graphic titles, and table titles
`Example text`	File and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.
`Example text`	User entry texts. These are words or characters that you enter in the system exactly as they appear in the documentation.
`<Example text>`	Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.
`EXAMPLE TEXT`	Keys on the keyboard, for example, `F2` or `ENTER`.

Icons

Icon	Description
	Caution
	Important
	Note
	Recommendation or Tip
	Example

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1. Scenario

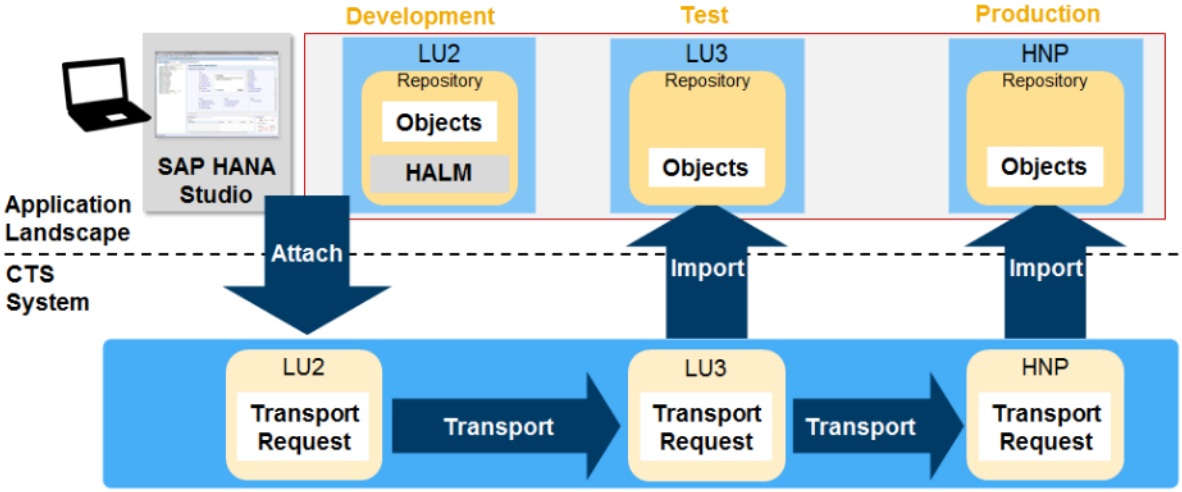
The Change and Transport System (CTS) of ABAP has been enhanced so that it can also be used for transporting non-ABAP objects – known as CTS+ or enhanced CTS. In the remainder of this document, the abbreviation CTS is used for the system where the transport landscapes are configured and for the fact that CTS can also be used for non-ABAP transports.

In this guide, you can find information on how to use CTS together with SAP HANA. This guide shows step by step – including sample screenshots – how the configuration is done. If you already use CTS, for example to manage non-ABAP transports for applications like the SAP Enterprise Portal you might be interested in using the same tool to transport the SAP HANA objects as well. With the integration of SAP HANA into CTS, this is possible. You can model your system landscape for your SAP HANA systems in Transport Management System (TMS) in the same way as for any other non-ABAP application supporting CTS.

This guide is valid if you use SAP HANA on-premise as well as if you use the SAP Cloud Platform SAP HANA service in the Neo Environment. For the SAP HANA service in the Neo Environment, you will find some special configuration settings in this guide. Note that if you want to use CTS+ for the SAP Cloud Platform SAP HANA service in the Cloud Foundry environment, use the How To... Configure SAP Cloud Platform Cloud Foundry for CTS guide.

The following picture shows the systems that are involved in the scenario. The figure shows as an example a three-system landscape consisting of a development, a test, and a production system. This is a basic example. You can set up much bigger or even simpler landscapes in CTS. All the options that you might know from TMS are available for SAP HANA systems as well. You can for example have several systems in a row or more than one target system at once.

In addition, you need a system where CTS is configured. For the set-up described in this guide, you have to use an SAP Solution Manager or SAP NetWeaver. Before SAP NetWeaver 7.40 SP10, also the CTS Plug-In contained in Software Logistics (SL) Toolset has to be installed there. In this guide, we will refer to this system as 'CTS system'.



The figure above illustrates the process of exporting and importing objects with SAP HANA. The front-end is the SAP HANA Studio or (starting with SPS08) the SAP HANA application lifecycle management (HALM). As of SAP HANA studio SPS05, you are no longer required to export the SAP HANA content to the file system and attach it manually to a CTS transport request. It is now possible to export SAP HANA content and attach it to a transport request in one step (referred to as "Close Coupling"). You can start the export from within the SAP HANA Developer Studio or SAP HANA application lifecycle management. You should no longer use the option of exporting content to a file system and attaching manually to a transport request.

The next step is to release the transport request. Depending on your configuration, this is either done automatically or you can do so via the Transport Organizer Web UI. You can then start the import. This is done on the CTS system.

In this guide, we will use a sample landscape consisting of a development system with SID LU2, a test system with SID LU3 and HNP as production system.

Starting with SAP HANA SPS09, you can set up CTS+ for SAP HANA without an AS JAVA. This means that your CTS system now only has to consist of an AS ABAP. The communication between the CTS System and the application (target system) is then based on the HTTP protocol. In the appropriate chapters, you will find information how this has to be configured. If a certain configuration is only required for CTS with or without AS Java, you will find hints in those chapters. For SAP HANA Service in SAP Cloud Platform Neo Environment, the setup is always done without an AS JAVA.

Recommendation

Use CTS+ without AS Java, if you have a system available which is based on SAP NetWeaver 7.40 and that can be used as CTS system (domain controller and communication system). In addition, if system is lower than SAP NetWeaver 7.40 SP10, you have to install at least CTS_PLUG SP15 (taken from SL Toolset SP12) on this system – so make sure that this is possible on the system that you like to use as CTS system.

If you use Change Request Management or Quality Gate Management of SAP Solution Manager based on central CTS, please be aware of the fact that the plug-in distribution from SAP Solution Manager to other systems is only possible if the server plug-in is not installed on that system. So, in our case, you cannot distribute the plug-in to your CTS system any more. You would need to install the plug-in directly on your CTS system. For details, please refer to the Configuration Guide for central CTS: How To… Set Up cCTS for ChaRM and QGM.

You can still use CTS with AS JAVA – this option for configuration is available. You don't have to change your configuration if you update your SAP HANA system to SPS09. If you use SAP Solution Manager as CTS system, to switch to CTS without AS JAVA, you have to use SAP Solution Manager 7.2 running on SAP NetWeaver 7.40.

2. Background Information

- Central note for SAP HANA application lifecycle management in SAP HANA SPS 12, XS Classic: 2283805
- Central note for SAP HANA application lifecycle management in SAP HANA 2.0: 2768258
- Guides for SAP HANA on SAP Help Portal
- Guides for CTS
- SAP Note for installing the SAP CTS Plug-In of SL Toolset: 1665940
- Documentation for CTS including CTS Plug-In
- Central note for CTS+: 1003674
- Central note for SL Toolset: 1563579
- Security for the Enhanced Change and Transport System (CTS+)

3. Prerequisites

To be able to use SAP HANA with CTS as described in this guide, your systems have to fulfill the following prerequisites:

If you would like to configure CTS+ *without* AS JAVA

- CTS System: SAP Solution Manager 7.2, SAP NetWeaver 7.4 and up
- SAP Note 2236955 has to get applied to CTS system.
- For SAP NetWeaver 7.4 lower than SP10: CTS plug-in SP15 installed on the CTS system (taken from SL Toolset 1.0 SP12 at least – always use the newest CTS plug-in available).
- SAP HANA Platform SPS09 and up, SAP HANA 2.0 (SAP HANA Repository), SAP HANA Service in SAP Cloud Platform Neo Environment. For more information, see SAP HANA Service in the Neo Environment.

If you would like to configure CTS+ *with* AS JAVA

- CTS System: at least SAP Solution Manager 7.1 SPS05, SAP NetWeaver 7.3 including enhancement package 1, or SAP NetWeaver 7.4 (AS ABAP and AS JAVA).
- SAP Note 1731044 or SAP Note 1730989 has to be implemented on the host of the CTS Deploy Web Service (for related information, see Configuring the CTS Deploy Web Service).
- For SAP NetWeaver lower than 7.4 SP10: CTS plug-in installed on the CTS system (taken from SL Toolset 1.0 SP04 at least – always use the newest CTS plug-in available).
- SAP HANA Platform: Use the guide that fits for your release of SAP HANA if you would like to configure CTS+. The guides are available in SAP Support Portal under Enhanced Change and Transport System.

4. Restrictions and Recommendations

Recommendations

- Use secure connections for the communication between the SAP HANA studio and the ABAP backend.
  - Details on how to do this on SAP NetWeaver 7.4: Configuring SAP NetWeaver AS for ABAP to Support SSL.
  - Details on how to do this in enhancement package 2 for SAP NetWeaver 7.0 (SAP Solution Manager 7.1) systems: Configuring the AS ABAP for Supporting SSL
  - Details on how to do this in SAP HANA are available in the SAP HANA Security Guide.
- Ensure that all SAP HANA Systems involved in the transport via CTS are enabled for CTS. In chapter Configuring the SAP HANA Source System, it is described how to create a destination from your SAP HANA source system to the CTS system. You have to set the option *Enable CTS Transport* on all target systems as well but do not configure any destination details in there. This is required to be able to use CTS without AS JAVA. But we also recommend to set this option if you use CTS with AS JAVA as, you can thereby prevent that any content is imported into the target systems via e.g. HALM native transport from any another source system which is not part of your system landscape configured in TMS.

Restrictions:

- For SAP NetWeaver lower than 7.4 SP10: You have to use a system as CTS system which has CTS plug-in installed both for CTS with or without AS Java. The CTS plug-in can only be installed on top of SAP Solution Manager or SAP NetWeaver from 7.3 including enhancement package 1 onwards. CTS without AS Java can only be used on systems based on SAP NetWeaver 7.40.

5. Basic configuration for CTS

Before you can use CTS with SAP HANA, you have to configure your CTS system and the SAP HANA development system. This chapter provides a step by step guide. (Remember: You have to install the CTS plug-in if your system is below SAP NetWeaver 7.40/SP10).

The steps in this chapter are necessary to configure CTS+. If you have already configured CTS+ on the CTS system, you can skip this section.

On the CTS system, there are several elements which require configuration.

The Deploy Web Service is needed to start the deployment on the target systems if you configure CTS with AS Java (chapter 5.1 Configuring the CTS Deploy Web Service). The Deploy Web Service is not needed if you configure CTS+ on a CTS system without AS JAVA - –n this case; you have to configure an HTTP destination for each target system in SM59 (chapter 5.2 Configuring an HTTP Destination)

The Transport Organizer is used to manage transport requests for non-ABAP applications.

Documentation for the configuration is available on the SAP Help Portal under Transporting Non-ABAP Objects in Change and Transport System.

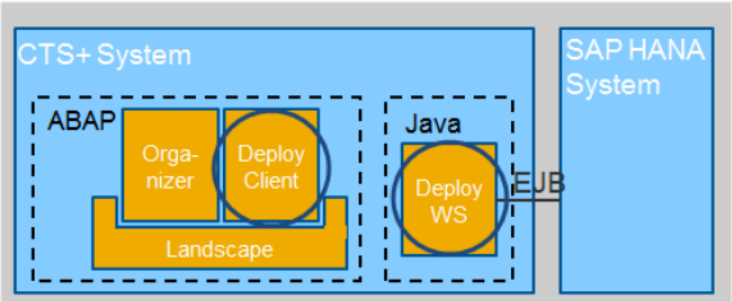
Note

The screenshots shown in this guide are provided for illustration purposes only. You have to adapt the values according to your system data.

5.1 Configuring the CTS Deploy Web Service

Note

If you configure CTS+ on a CTS System without AS Java, the configuration of the Deploy Web Service is not needed. Skip this chapter if this is the case. Instead, you have to configure an HTTP destination. Please refer to chapter Configuring an HTTP Destination for details.



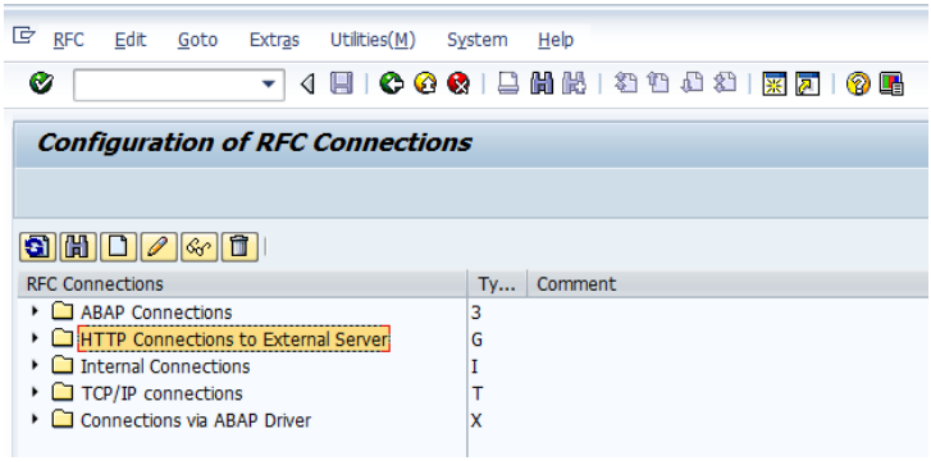
A logical port is required for the communication between the AS ABAP and the AS Java of the CTS system. The default name of the logical port is `CTSDEPLOY`.

Check whether the logical port is already available on your CTS system and if not create it as described in this chapter. If you already use enhanced CTS, for example, for managing SAP Enterprise Portal transports, then this port will most probably already exist.

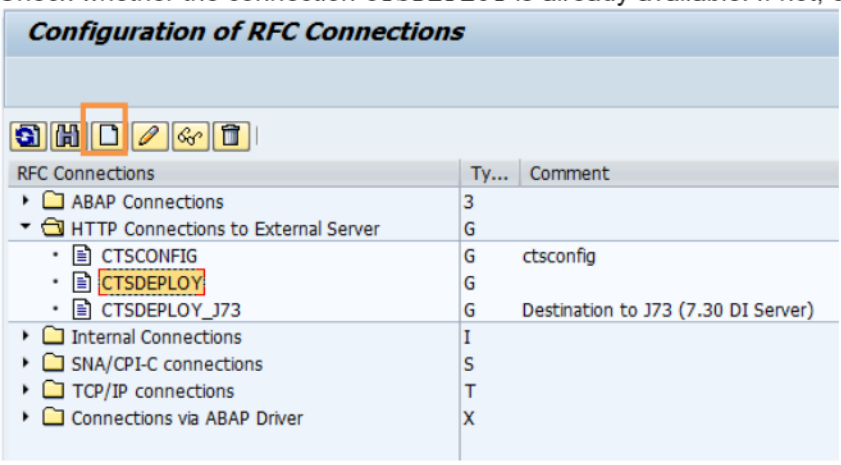
Note

If CTS+ is already in use at your company: CTSDEPLOY is the standard port that should be used to connect the Deploy Web Service client and the Deploy Web Service. However, if you cannot reuse the settings of this port for SAP HANA as well, then you can also create an additional port with a different name (e.g. CTSDEPLOY_HDB). When creating an additional port ensure you use the new name in place of the default name (CTSDEPLOY) anywhere that it appears in the rest of this guide.

1. Log on to the client of your CTS system that you are using for transports (=where the Transport Organizer Web UI runs). Call transaction `SM59` and open the *HTTP Connections to External Server* section.



2. Check whether the connection `CTSDEPLOY` is already available. If not, click on *Create*.

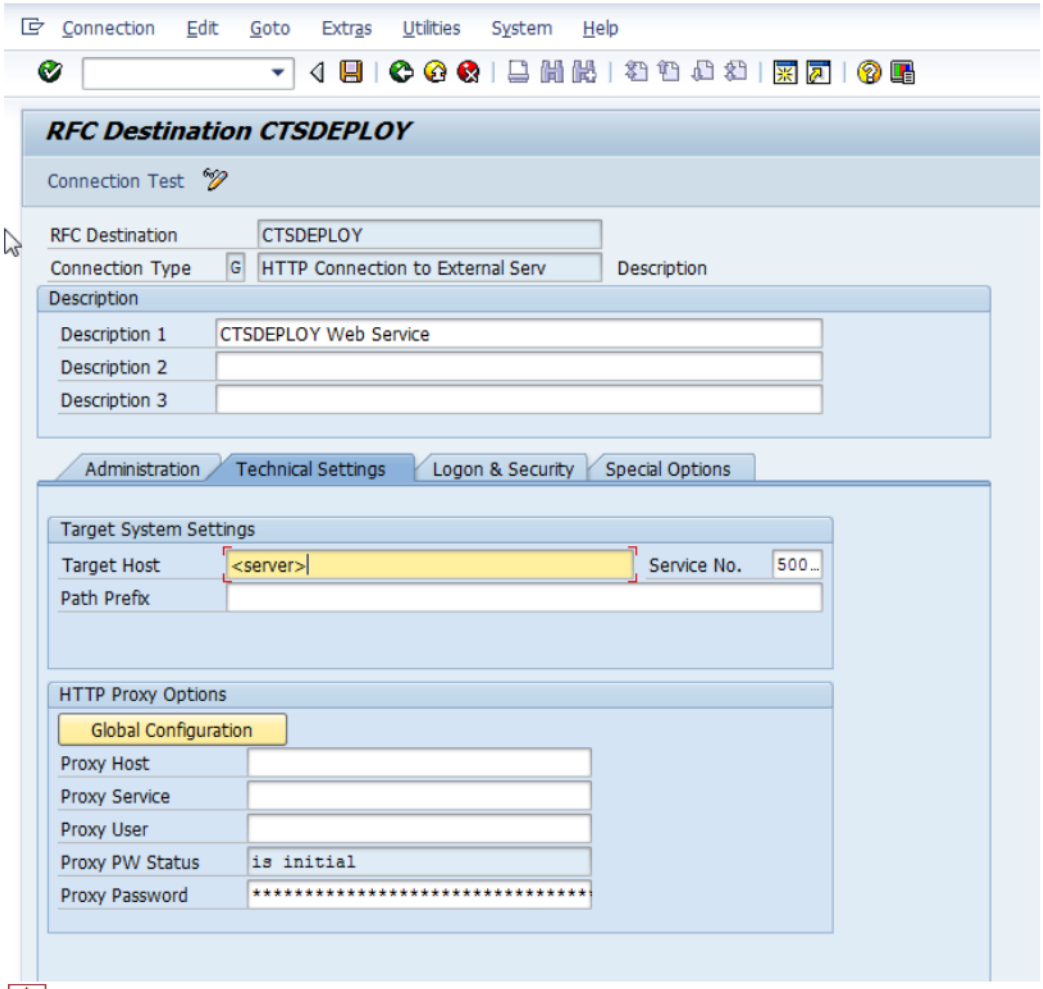


And create it with the following parameter values:

Enter **`CTSDEPLOY`** as *RFC Destination* and a description. As *Target Host*, and *Service No,* enter the respective data of the AS Java of your CTS system (= your server where the Deploy Web Service is running). If you use a dual stack system as CTS system, enter the host name of this system. If you use separated ABAP and Java Stacks, enter the host name of the AS Java that is used for CTS. The *Service No* is the port of the AS Java. This is usually port `5<instance number>00`. Make sure that the *Connection Type* is `G`.

Note

The AS Java used for CTS must be at least on SAP NetWeaver 7.0 Enhancement Package 2, Support Package Stack 5.

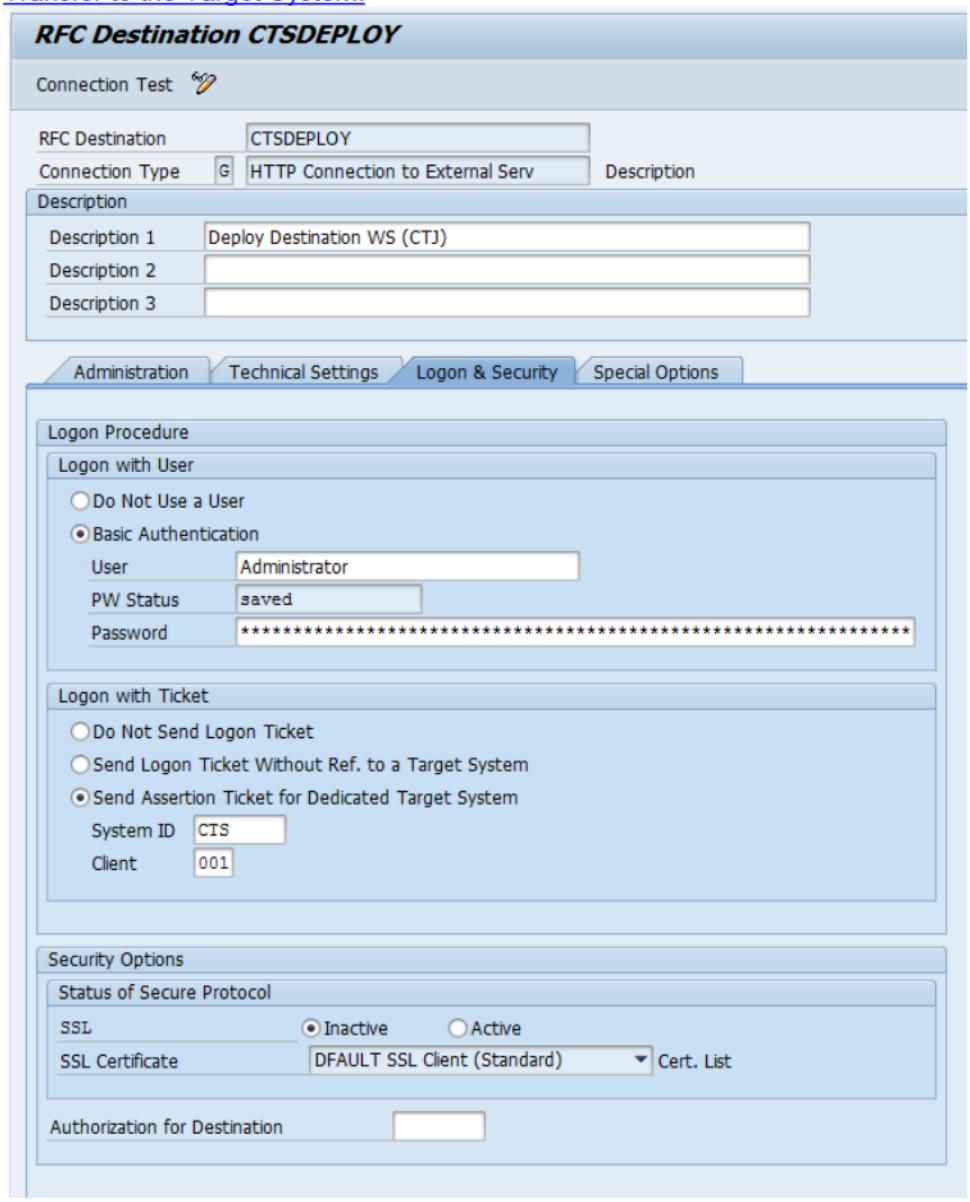


CAUTION

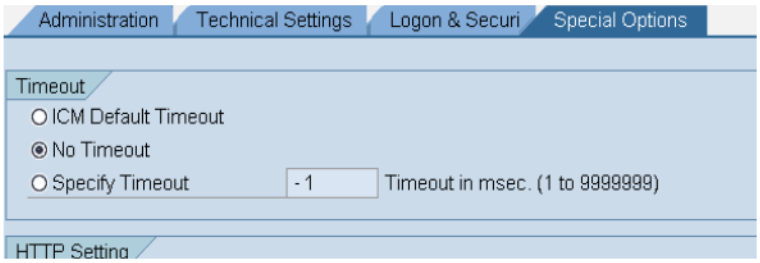
If you use SAP HANA multitenant database containers (MDC), you have to create a separate destination for the tenant DB that is used as a target system. Make sure that the CTS system can reach the respective tenant DBs. If you would like to use CTS+ with MDC, your SAP HANA system has to have Revision 93 installed. Details about how the http-access has to be configured are provided on the SAP Help Portal under Configure HTTP(S) Access to Tenant Databases via SAP HANA XS Classic.
Note that in SAP HANA Studio you also have to configure the URL of your tenant in *System→ Properties →XS Properties*.

3. On the *Logon & Security* tab page, select your *Logon Procedure*. We recommend that you use *Logon with Ticket*. Details can be found in the Security Guide in the chapter Security for the Enhanced Change and Transport System (CTS+). If you use *Logon with a User*, enter a user that exists on the AS Java. Enter the password as well. Details about the permissions that are required can be found on the SAP Help Portal in the chapter Defining a Method for the File

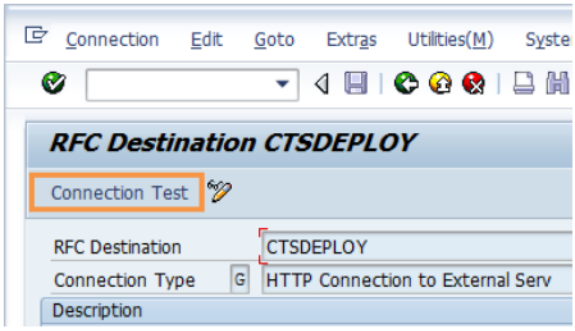
Transfer to the Target System.



4. On the *Special Options* tab page, select *No Timeout*.



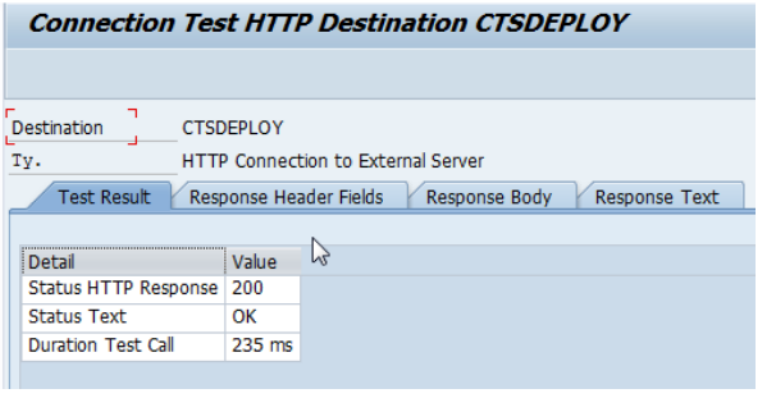
5. Choose *Connection Test*.



The test should end with *Status HTTP Response* = 200

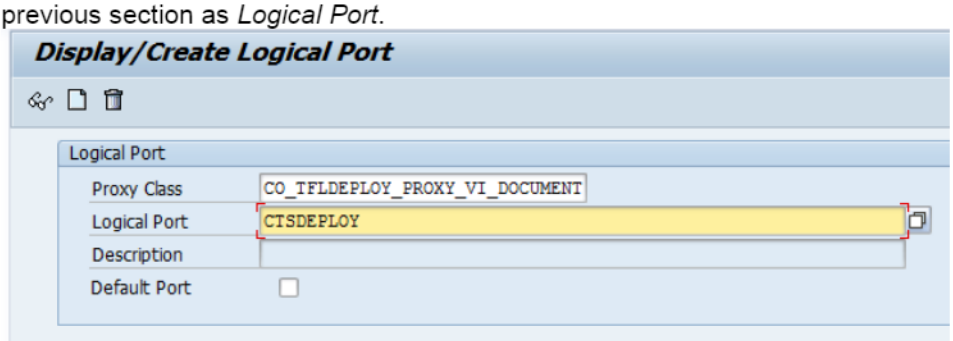
Note

The *Connection Test* only tests the connection to the server without using the specified user.



One logical port is needed for the communication between the AS ABAP and the AS Java of the CTS system: `CTSDEPLOY`. The logical port is delivered by default. Check whether it is available on your system and if not create it.

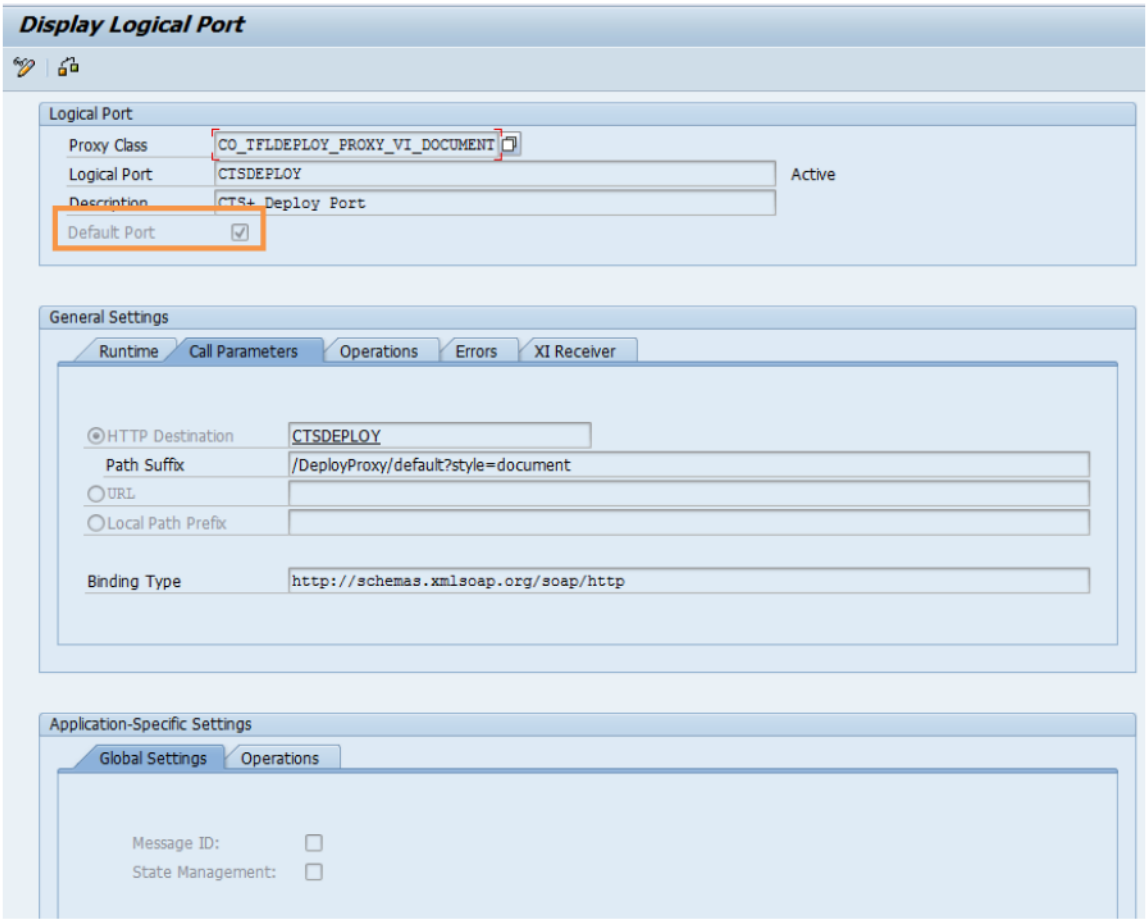
6. Log on to your CTS system in client 000 and call transaction `LPCONFIG`. Confirm the message that the transaction is obsolete.
7. Enter `CO_TFLDEPLOY_PROXY_VI_DOCUMENT` as *Proxy Class* and the destination CTSDEPLOY that you have already specified in the Configuration of RFC Connections in the previous section as *Logical Port*.



8. Click on *Display*. If the logical port does not exist, create it with the parameter values shown on the following screenshot.

CAUTION

Make sure that *Default Port* is selected and that the logical port is active.



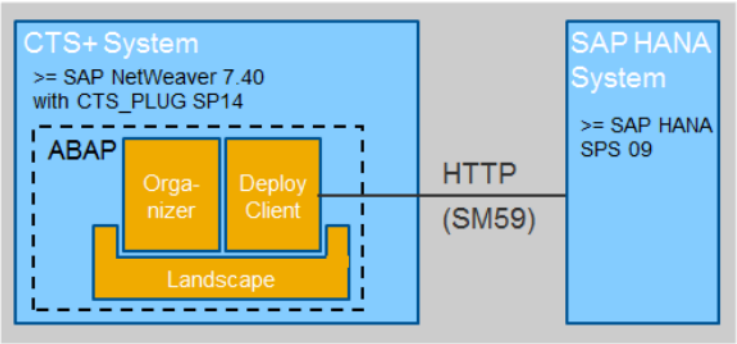
Details about configuring the CTS Deploy Web Service can be found on the SAP Help Portal under Configuring the CTS Deploy Web Service.

5.2 Configuring an HTTP Destination

Note

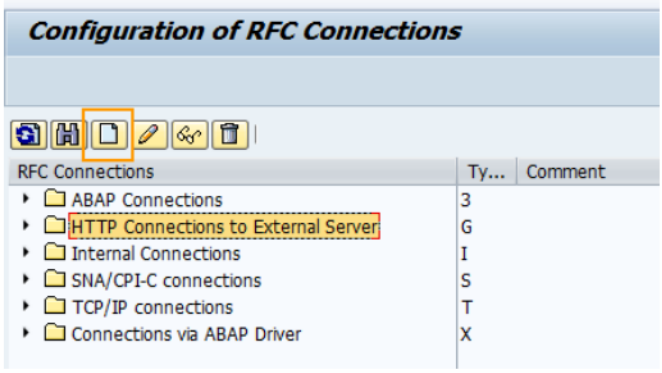
If you configure CTS+ on a CTS System with AS Java, the configuration of the HTTP destination is not needed. Skip this chapter if this is the case. Instead, you have to configure the CTS Deploy Web Service. Refer to the chapter Configuring the CTS Deploy Web Service for details.

If you decided to configure CTS+ on a CTS System without AS JAVA, you have to create an HTTP destination on the CTS system for every SAP HANA target system (every system where you would like to execute imports).



1. Go to transaction SM59.

2. Mark *HTTP Connections to External Server* and choose *Create*.



3. Enter a name in the field *RFC Destination* e.g. LU3_DESTINATION (you need a destination for each target system).

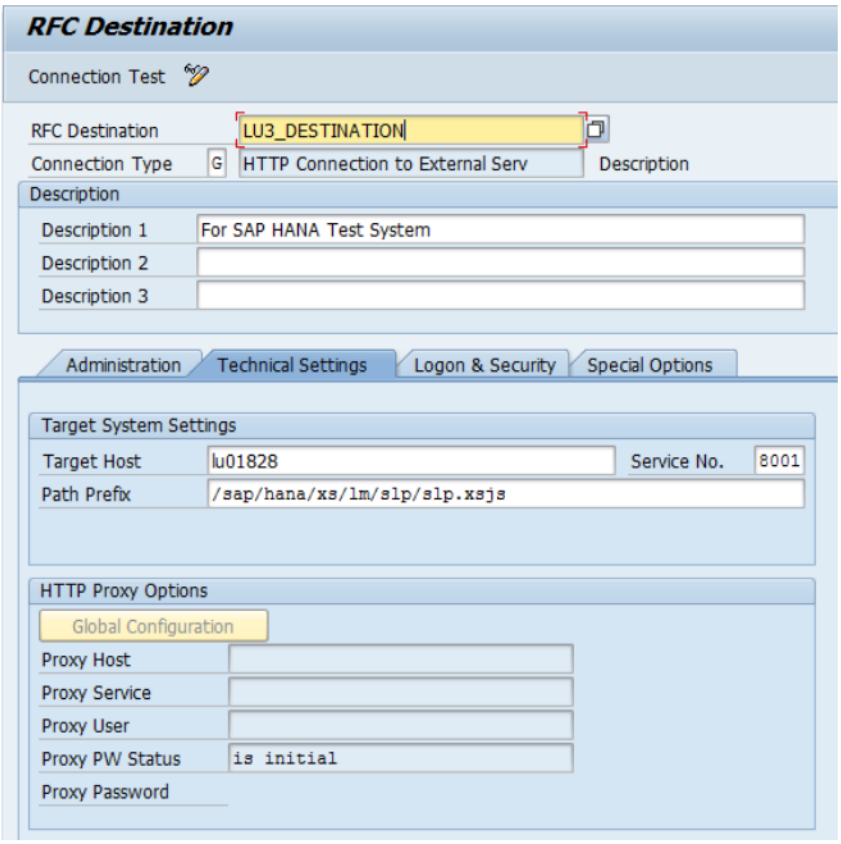
   CAUTION

   The name that you enter in the field *RFC Destination* will automatically be converted into upper case as soon as you save the destination. Later on, you will have to enter the name of the destination when you define the target system in STMS. Make sure that you use the correct writing in there.

4. On the tab *Technical Settings,* enter the details of the target system.

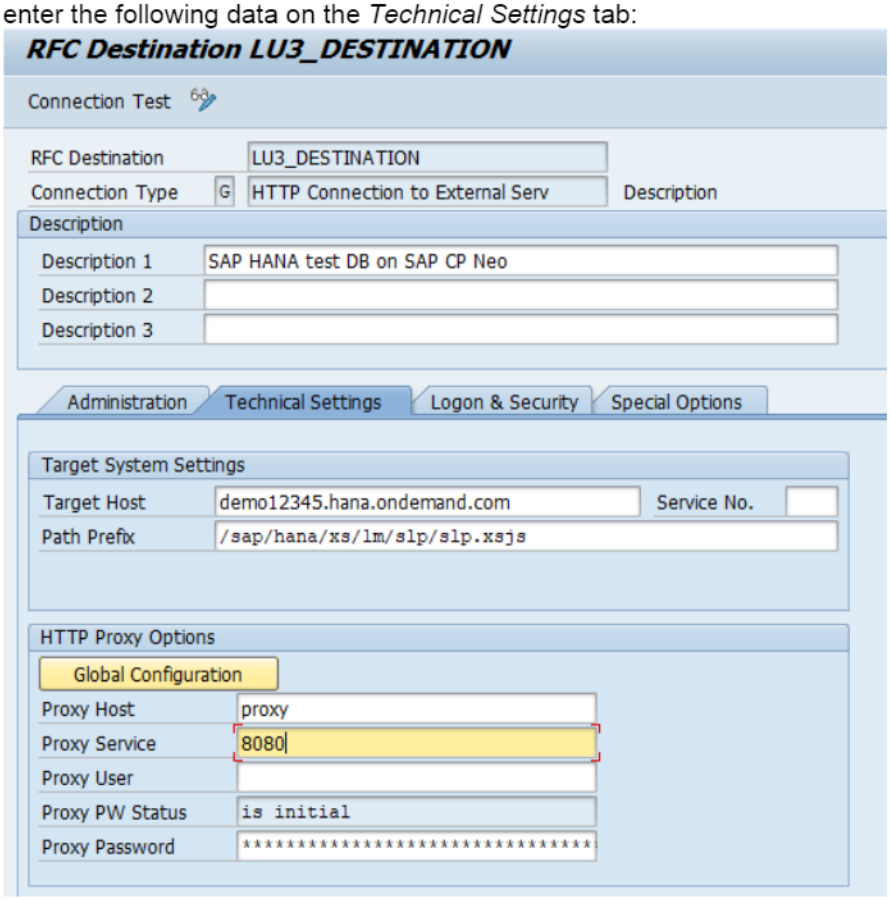
   CAUTION

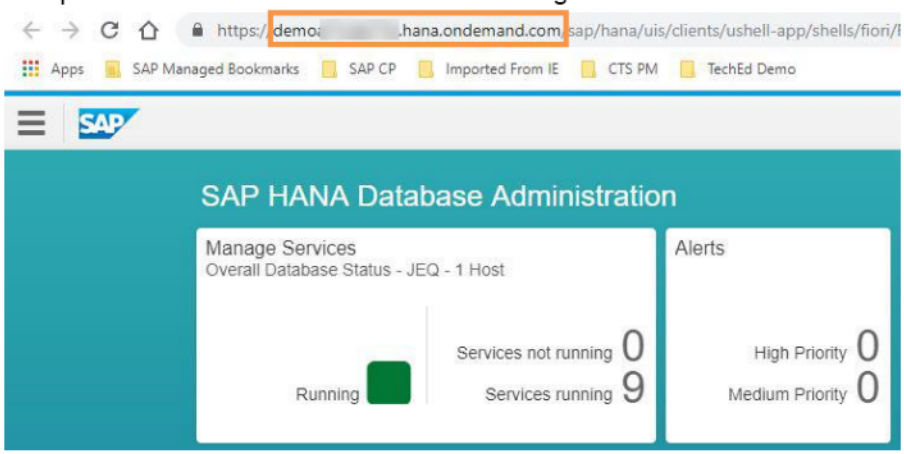
   If you use SAP HANA multitenant database containers (MDC), you have to create a separate destination for the tenant DB that is used as a target system. Make sure that the CTS system can reach the respective tenant DB. If you want to use CTS+ with MDC, your SAP HANA system has to have Revision 93 installed. Details about how the http-access has to be configured are provided on the SAP Help Portal under Configure HTTP(S) Access to Multitenant Database Containers via SAP HANA XS Classic.
   Note that in SAP HANA Studio, you also have to configure the URL of your tenant in *System→ Properties →XS Properties*.



Field	Description
Target Host	Enter the host name of your SAP HANA system as *Target Host*.
Service No.	Enter the HTTP or HTTPS port as *Service No.* (for HTTP, the port is `80<instance number>`) – depending on the security settings of your company.
Path Prefix	Enter `/sap/hana/xs/lm/slp/slp.xsjs` as *Path Prefix*.

If you are configuring CTS+ for SAP HANA Service in SAP Cloud Platform Neo Environment, enter the following data on the *Technical Settings* tab:

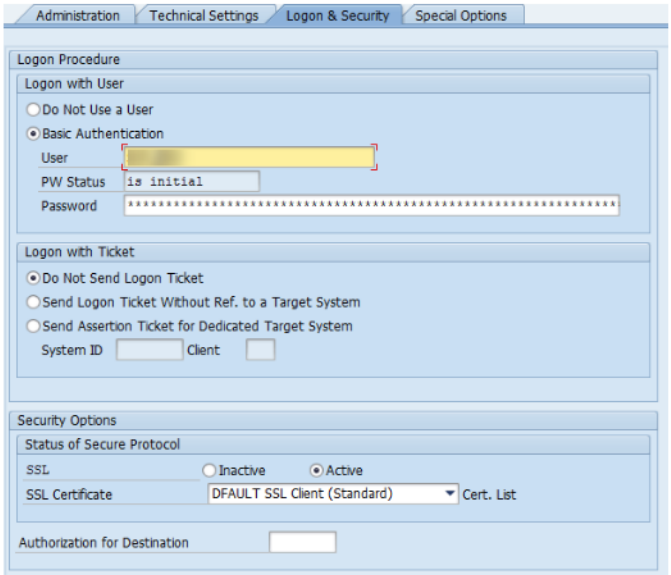


Field	Description
Target Host	Enter the host name of your SAP HANA system as *Target Host*. If you use SAP HANA service in SAP Cloud Platform Neo Environment, you find the *target host* in the URL, for example, in the SAP HANA Database Administration of the SAP HANA database cockpit. Choose your subaccount and then choose *Database Systems*. Click the link to the SAP HANA database cockpit. You will see a URL like on the following screenshot: 

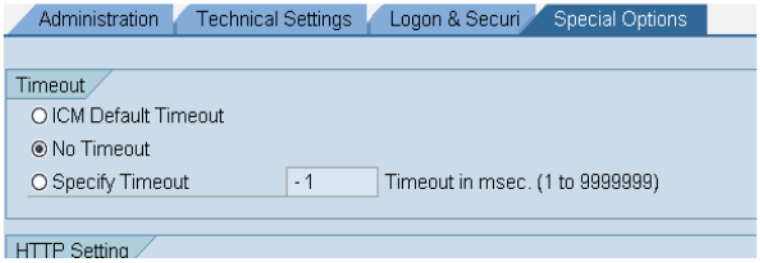
Service No.	You can leave this field empty. You don´t need to enter any port, that is, no value for the *Service No.* field is required.
Path Prefix	Enter `/sap/hana/xs/lm/slp/slp.xsjs` as *Path Prefix*.
HTTP Proxy Options	Configure a proxy from your on-premise ABAP system to SAP Cloud Platform Configure the proxy settings according to your company´s requirements.

5. Go to the tab *Logon & Security* and configure the logon to the target system according to your company´s requirements.

   If you are configuring CTS+ for SAP HANA Service in SAP Cloud Platform Neo Environment, on the *Logon & Security* tab, configure the logon to the target system according to your company´s requirements. But, make sure that you have the *Active* checkbox selected, since you need to use SSL.



6. On the *Special Options* tab page, select *No Timeout*.



7. Repeat these steps for each target system.

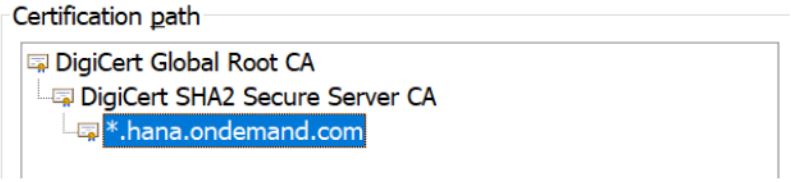
   The user that you enter in here needs to have authorizations to process imports of SAP HANA content. This requires the role `sap.hana.xs.lm.roles::SLP_CTS_deploy.admin`
   More information on the roles is available in the SAP HANA Application Lifecycle Management guide under SAP HANA Application Lifecycle Management Roles.
   Ensure that the user name is entered exactly as it appears in the SAP HANA system. Also, upper and lower case have to match. Users in SAP HANA are written in upper case. So enter the user ID in upper case.

Note

All import processes of SAP HANA content for this target system triggered by CTS use this user name and password by default.

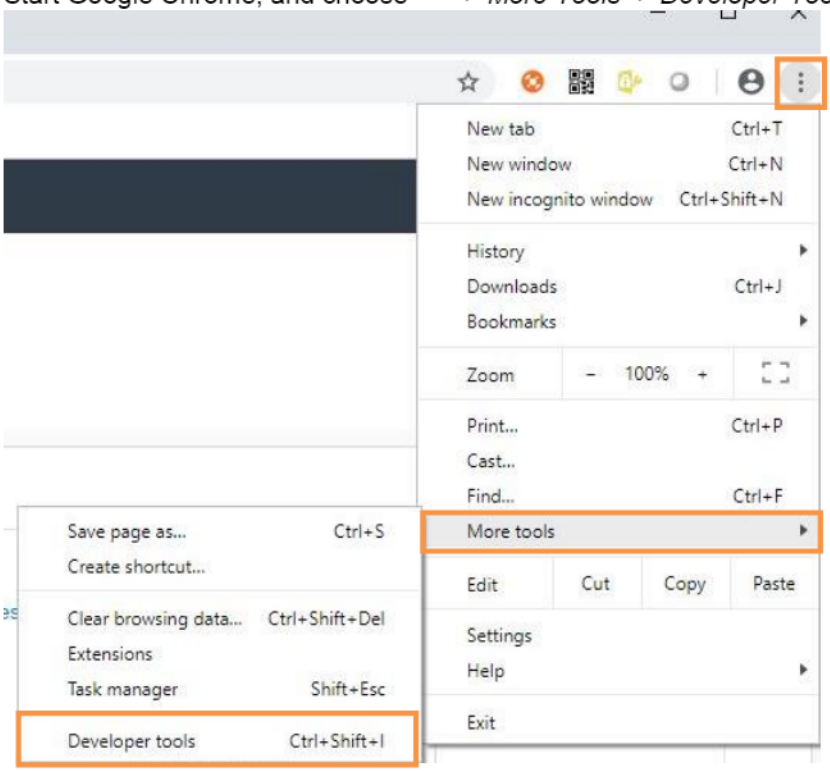
5.3 Only relevant for SAP HANA Service in SAP Cloud Platform Neo Environment: Import SSL Certificate

The CTS system must validate the server certificate in order to ensure the server identity and to prevent man-in-the-middle attacks. This means that the root certificate of the certificate authority that was used to sign the SCP domain certificate needs to be imported. This is the certification path for the hana.odemand.com domain:

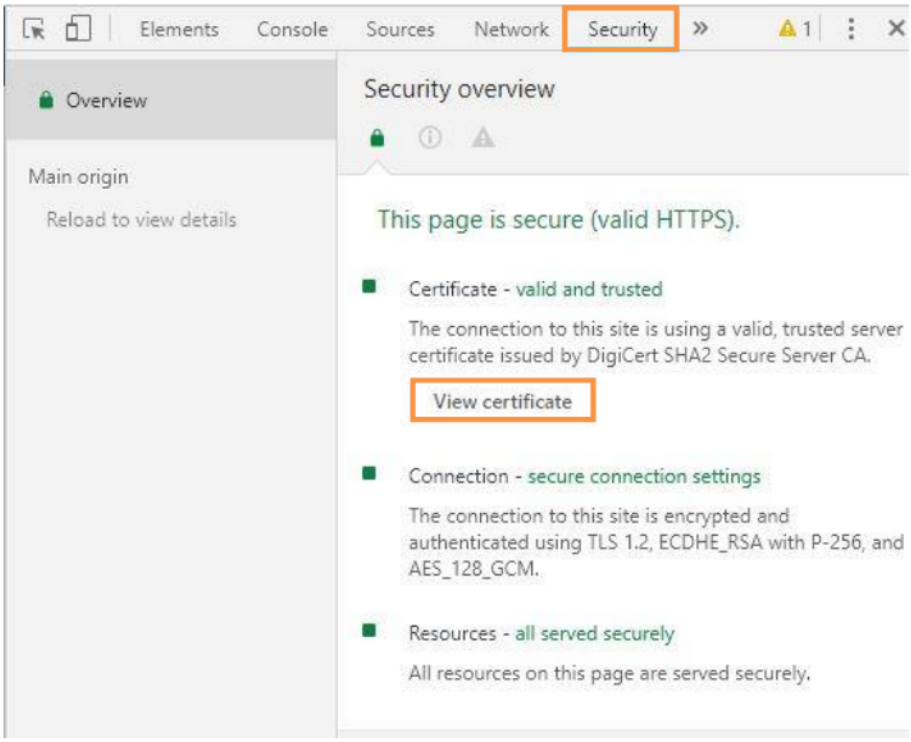


The following is a step-by-step description for exporting the root certificate using Google Chrome and importing it using the transaction STRUST. These steps are exemplary for Google Chrome. However, the certificate can also be exported from another browser, from the operating system, or can be downloaded from digicert (https://www.digicert.com).

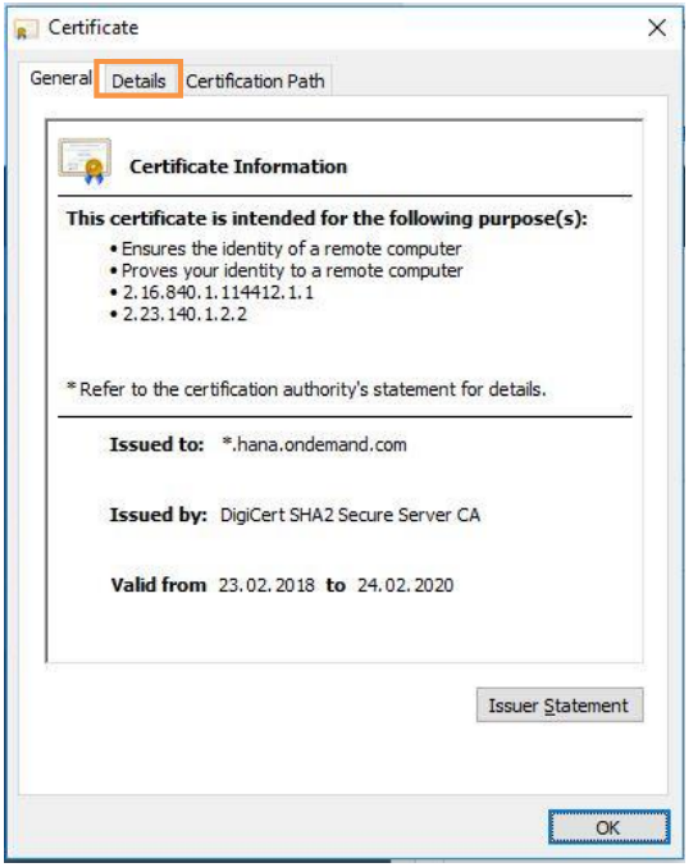
1. Start Google Chrome, and choose ⋮ -> *More Tools* -> *Developer Tools*.



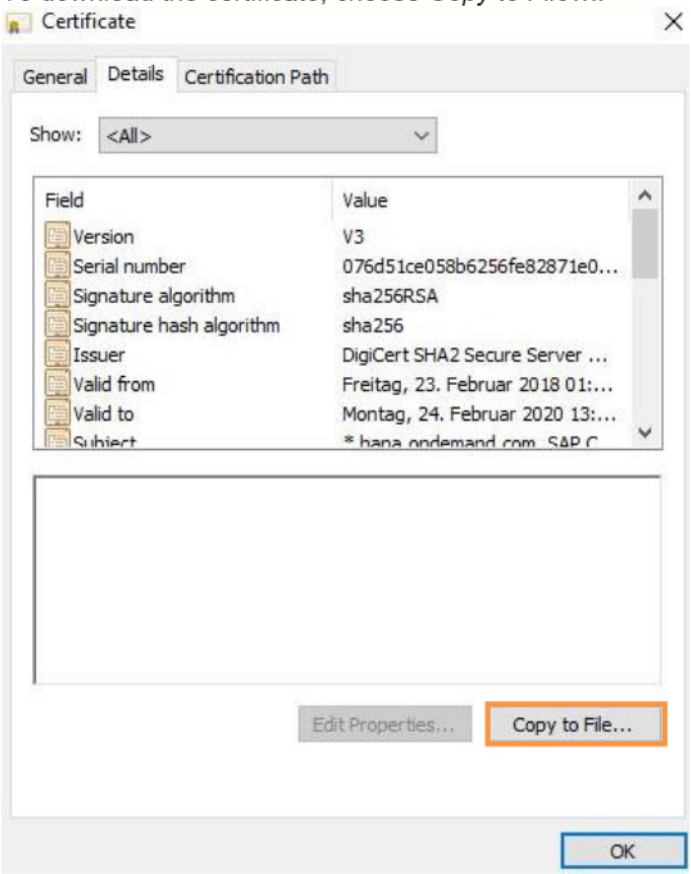
2. Choose *Security* and then *View certificate*.



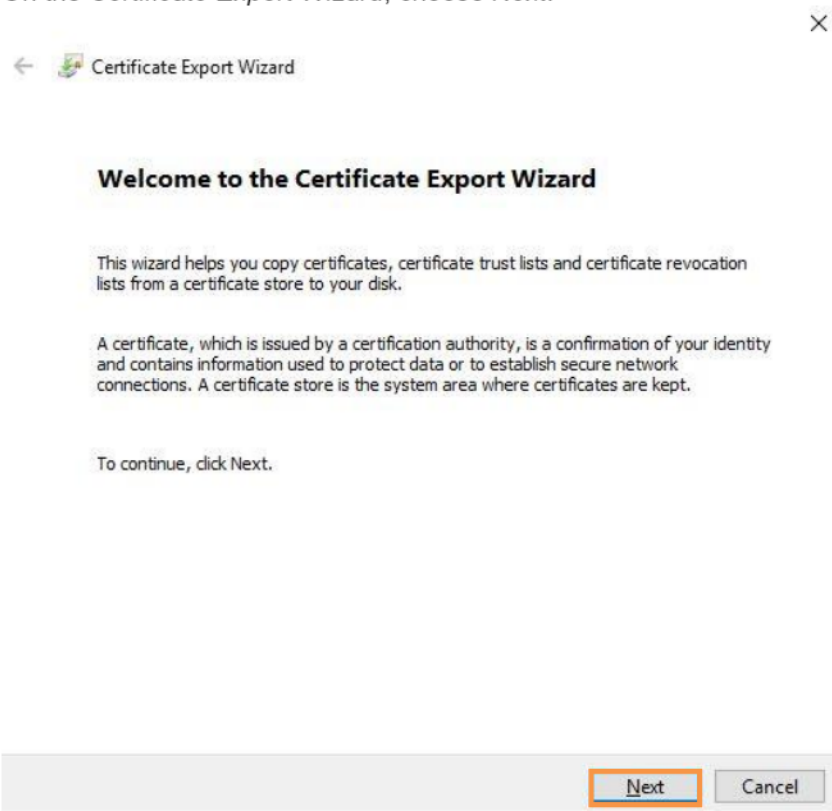
3. On the *General* tab, you see that the certificate is issued to the `*.hana.ondemand.com` domain. Go to the *Details* tab.



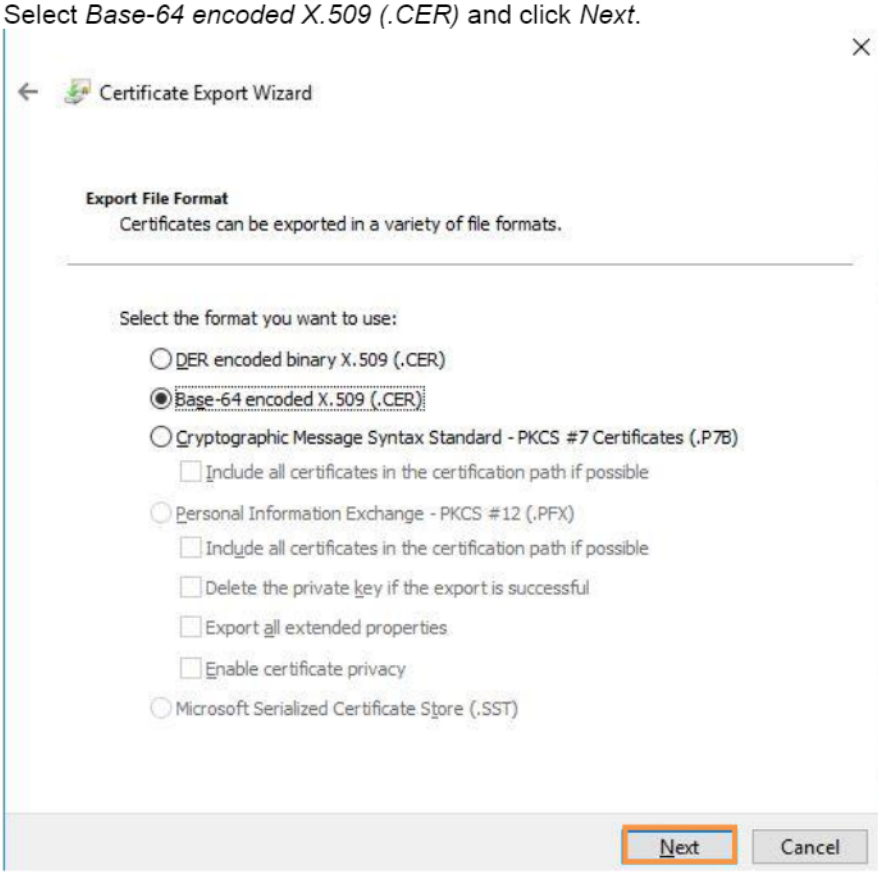
4. To download the certificate, choose *Copy to File*….



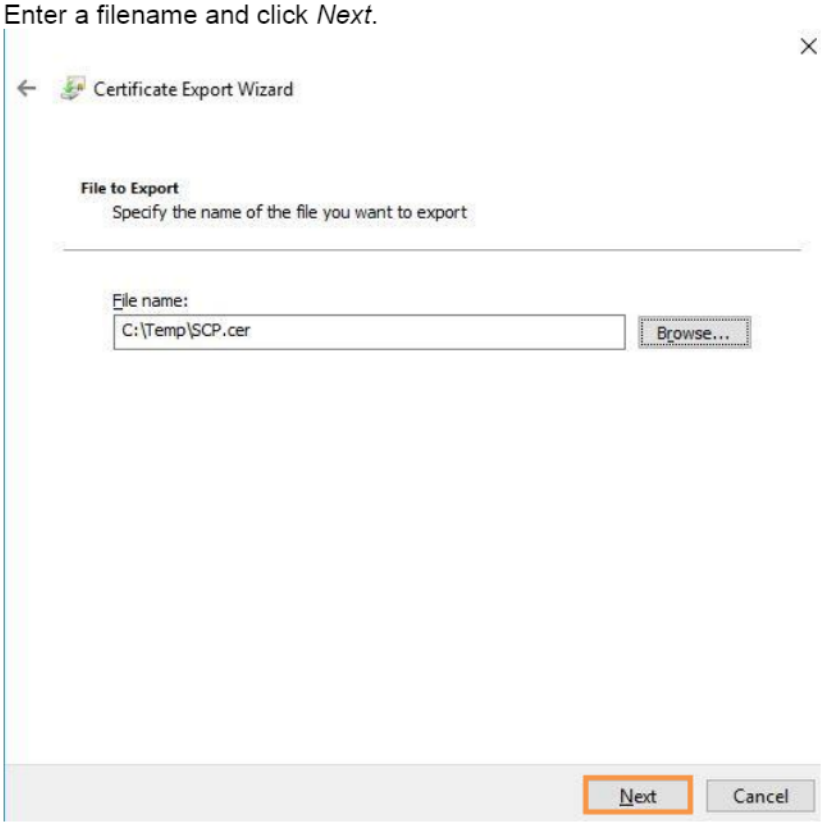
5. On the *Certificate Export Wizard*, choose *Next*.



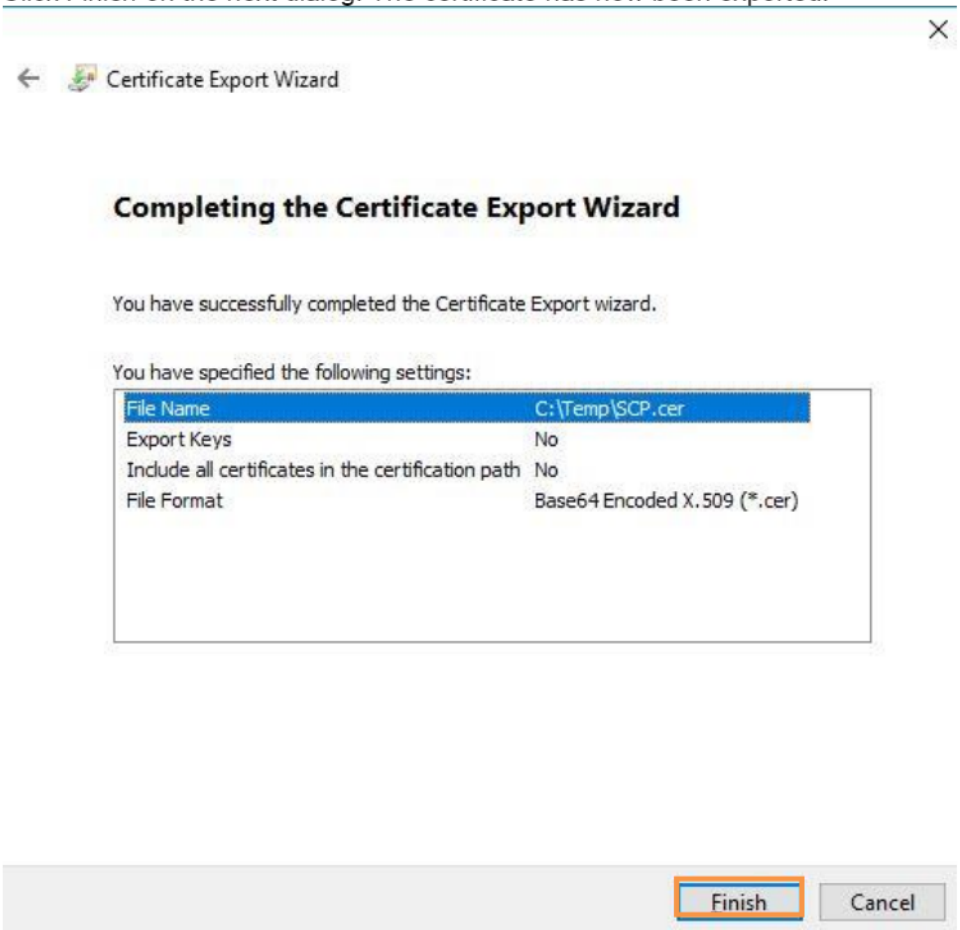
6. Select *Base-64 encoded X.509 (.CER)* and click *Next*.



7. Enter a filename and click *Next*.



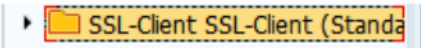
8. Click *Finish* on the next dialog. The certificate has now been exported.



9. Click *OK*.

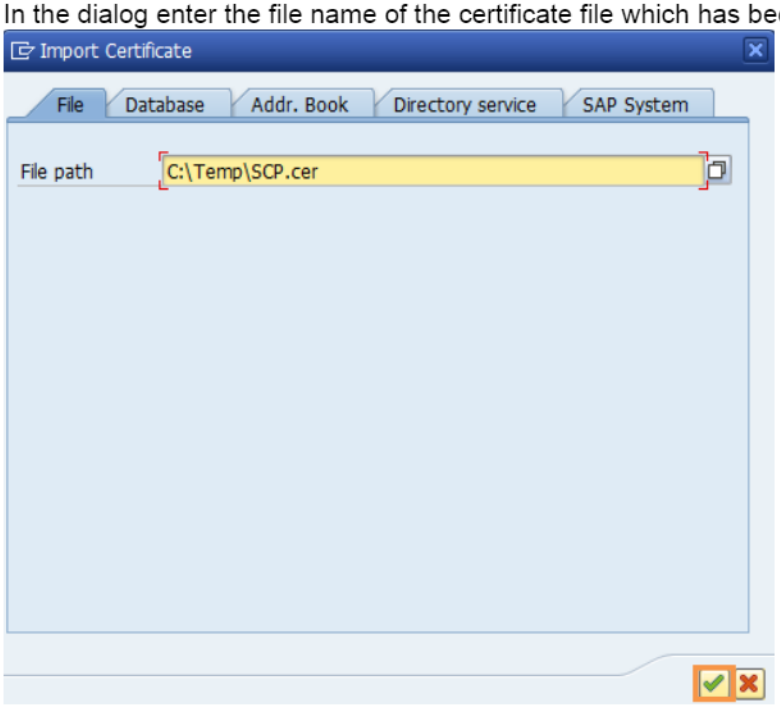
8. Log on to the CTS system and open transaction STRUST. Open the edit mode by clicking on the *Display* <-> *Change* button.

9. Select the certificate list on the left that you have specified in the previous chapter when setting up the HTTP connection.

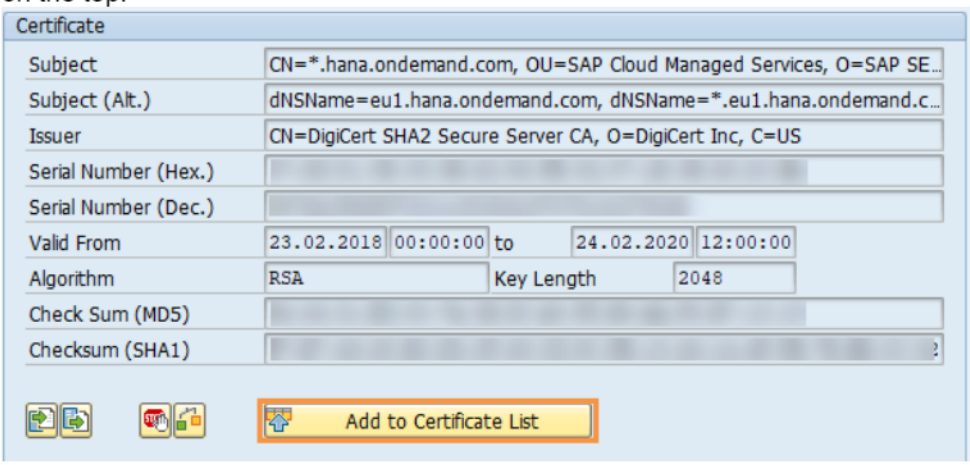


10. Click the *Import Certificate* button on the bottom left.

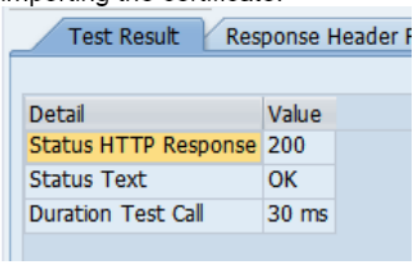
11. In the dialog enter the file name of the certificate file which has been exported in step 6.



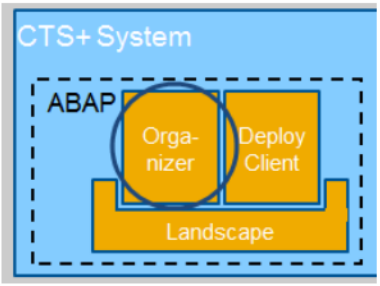
12. Click *Add to Certificate List* and leave the edit mode by clicking the *Display* <-> *Change* button on the top.



13. The connection test for the connection in transaction *SM59* should be successful after importing the certificate.



5.4 Configuring the Transport Organizer Web UI



CTS provides Transport Organizer Web UI, an ABAP Web Dynpro application, which is used to get detailed information about transport requests (e.g. default request, target systems) and to create transport requests and attach objects manually. You have to activate the ICF service CTS_ORGANIZER to run and use this application.

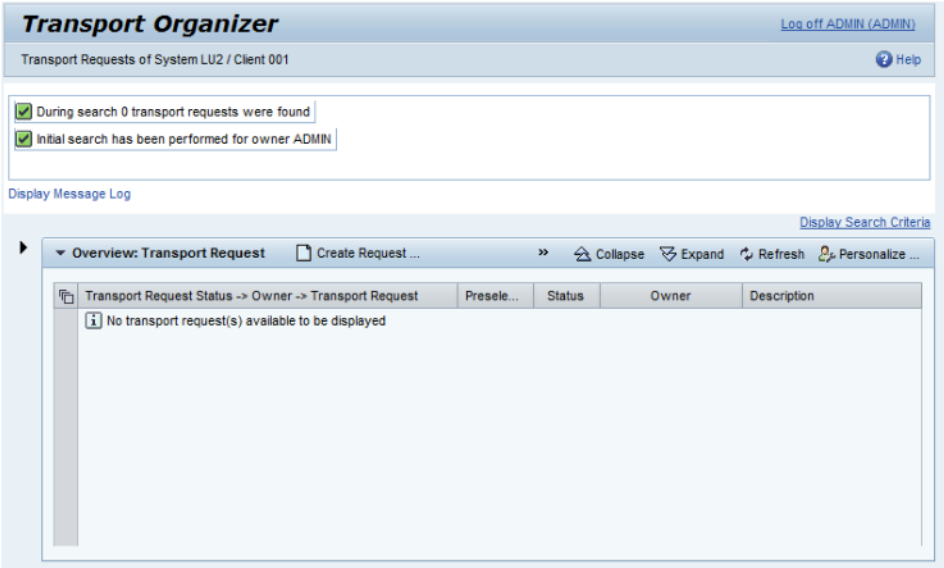
In order to use the Object List Browser to see a detailed list of objects attached to a transport request (as part of one file), you need to activate the Web Service CTS_OBJECTLIST_BROWSER.

For more details, refer to SAP Help Portal under Activating Services for Transport Organizer Web UI.

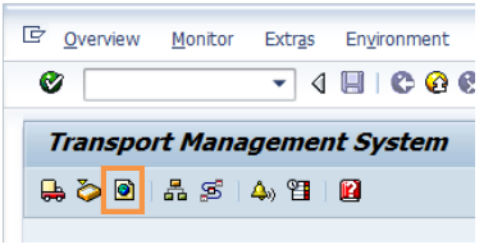
If CTS+ is already in use on the CTS system where you are doing the configuration, the services should already be activated. If not, activate them now.

If you receive error messages when running this application later on or if you don't want to activate all ICF services read the error messages carefully and activate the services named in the error messages via transaction SICF.

The following figure shows the Transport Organizer Web UI.



To open the Transport Organizer Web UI, go to transaction STMS and click on *Transport Organizer Web UI (F7)*.

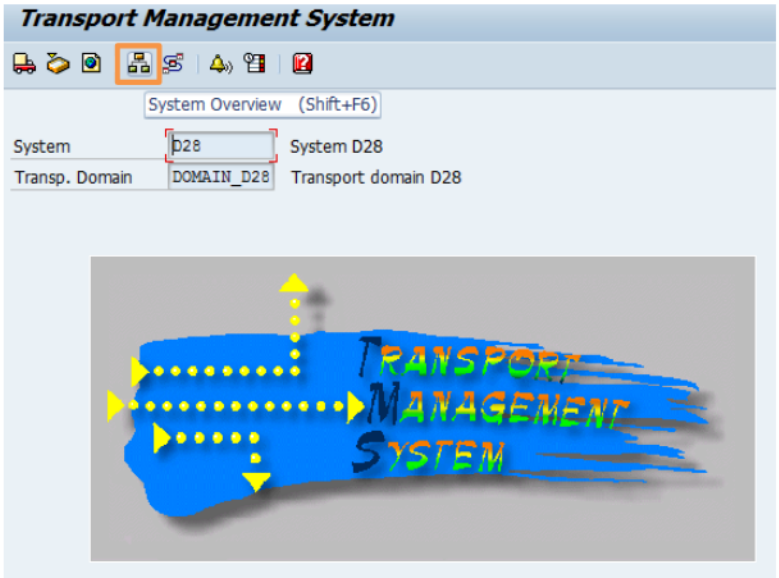
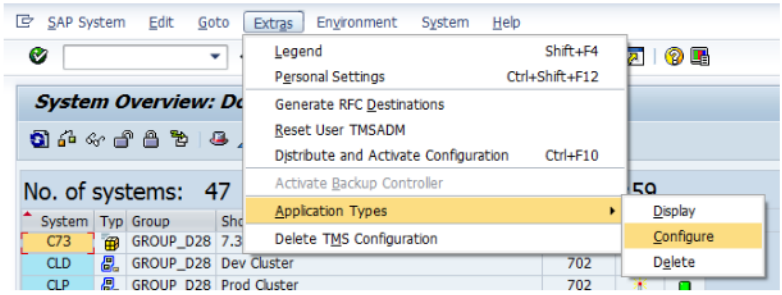
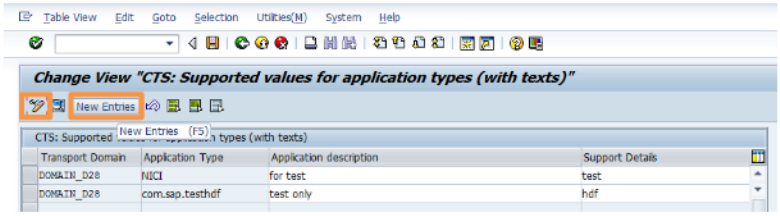


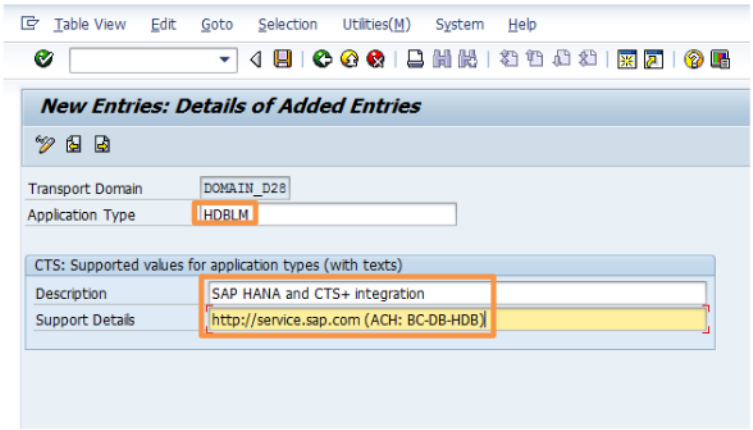
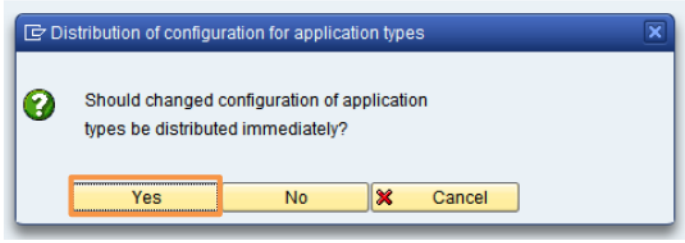
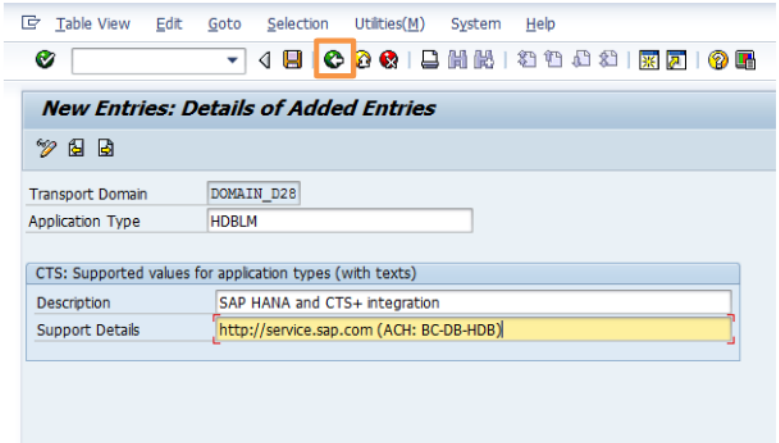
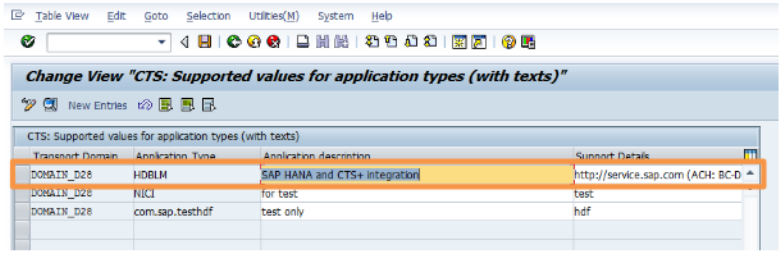
6. Configuring the SAP HANA Application Type

To use CTS with SAP HANA, you have to make the application known in CTS. You need an application type which will then be used as unique identifier for SAP HANA in CTS to do so. For the SAP HANA integration with CTS, the application type HDBLM is used.

More documentation on how to configure application types is provided on the SAP Help Portal under Configuring Source Systems for Further Applications.

The following steps describe how the application type is created and managed in CTS.

Log on to your CTS system (Domain Controller) and open transaction *STMS*. Go to the *System Overview*.	
To create a new application type, go to *Extras* → *Application Types* → *Configure*.	
You can see a list of application types already created in your system. Check if HDBLM is part of the list. Click on *Display -> Change* and then *New Entries* if HDBLM is not yet part of the list.	

On the next screen, you can enter your application type and some details. Use "HDBLM" in here. A description and support details are required to give some details on the application type and on how to get support in case of issues. Use "SAP HANA and CTS+ integration" as *Description* and "http://service.sap.com (ACH: BC-DB-HDB)" as *Support Details*. This is where you can get support in case of issues with SAP HANA transports.	
Save your entry and click *Yes* to distribute the new application type through your landscape.	
The new application type has been saved. Click *Back* to return to the list of application types.	
The new application type HDBLM is now part of the list.	

7. Configuring the SAP HANA Landscape

The configuration of the SAP HANA landscape consists of several steps, which will be detailed in the following chapter.

As an example, we will setup a landscape of three systems as depicted in chapter Configuring the SAP HANA Landscape, i.e. a development system (LU2) as source system, a test system (LU3) and a production system (HNP) as target systems.

1. CTS identifies systems resp. transport nodes via 3-digit System IDs (SIDs).

   Note

   SIDs consist of three characters (letters and / or numbers). They have to be unique within your transport domain, but they may be shared between different applications (i.e. Portal and SLD if they run on same AS JAVA instance).

2. As soon as you know the SIDs for your SAP HANA systems, you can start creating the representations for these systems in TMS and connect them with the help of transport routes.

7.1 Configuring the Transport Landscape in TMS

Create the systems of your SAP HANA landscape as non-ABAP systems in TMS. Their SIDs represent them in TMS.

Note

Although it is not required that you use the real SIDs of the SAP HANA systems we recommend to reuse the SID of the SAP HANA systems also in your TMS landscape. One reason for using different names in TMS landscapes could however be that the SIDs of the SAP HANA systems already exist on your CTS system. You might want to use the option of inventing SIDs if you would like to have separate transport routes for your ABAP and SAP HANA transports in place but in reality, there is only one system landscape available (ABAP systems running on SAP HANA).

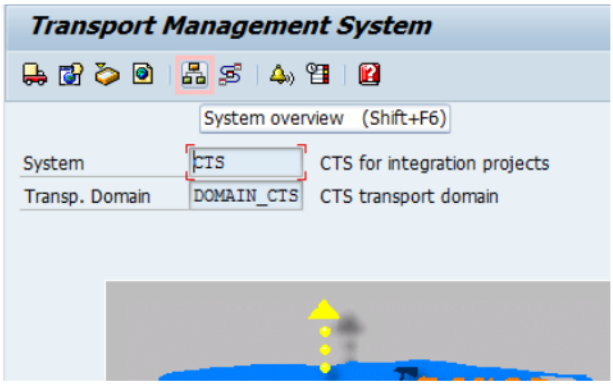
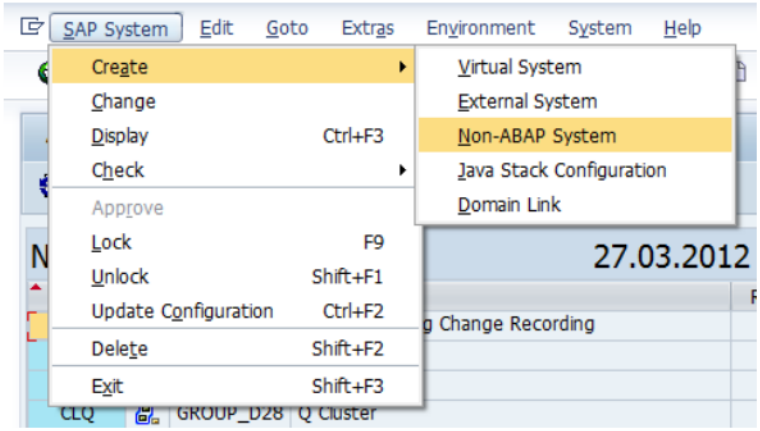
Caution

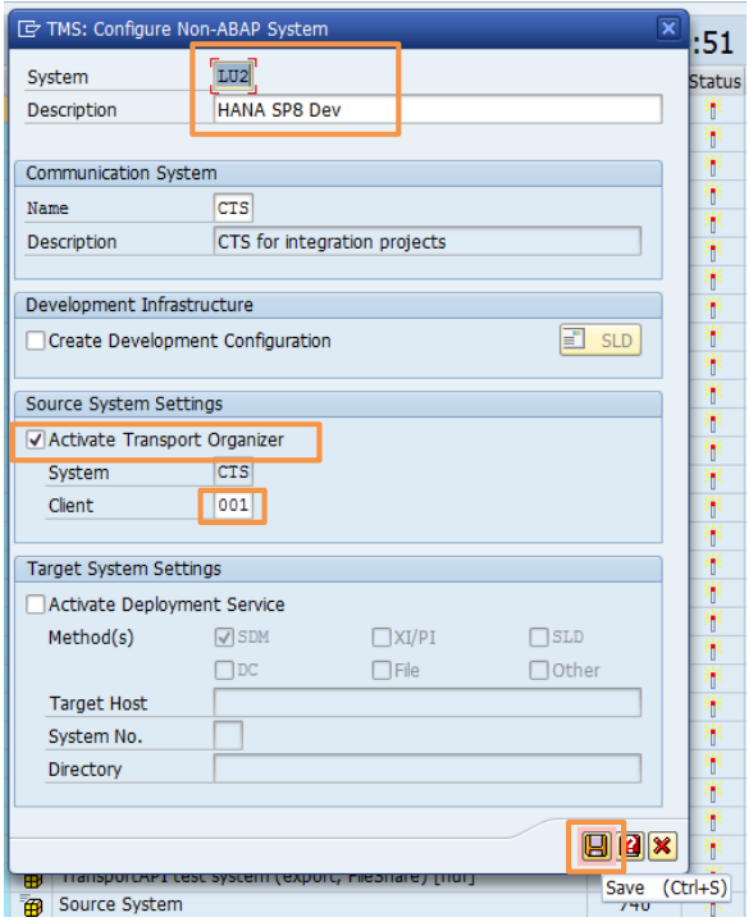
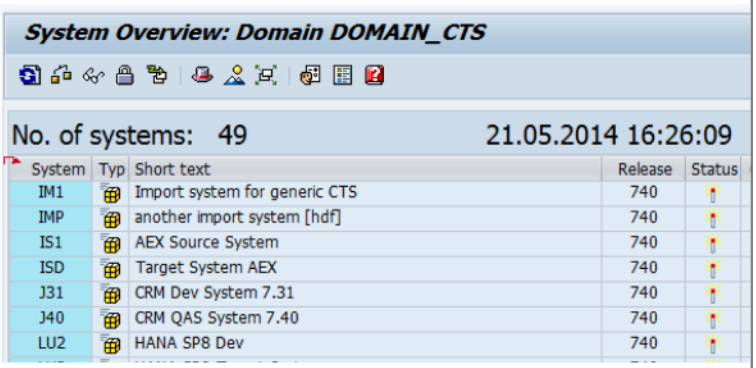
If your SAP HANA system is configured to use SAP HANA multitenant database containers (MDC), you have to invent a SID for each tenant in CTS+. The reason for this is that the containers in SAP HANA are identified by a name that you can choose on your own. It can be up to 256 characters long. In TMS (where you create the representation of your SAP HANA systems to build the transport routes), you can only create systems with an ID of three characters length. If you would like to use CTS+ with MDC, your SAP HANA system has to have Revision 93 installed. Details on MDC are available on the SAP Help Portal under Creating and Configuring Tenant Databases. Note that in SAP HANA Studio you also have to configure the URL of your tenant in *System→ Properties →XS Properties*.

Documentation on how to create non-ABAP systems in TMS is provided on the SAP Help Portal under Defining and Configuring Non-ABAP Systems. This chapter shows how setting up the systems would work in our example.

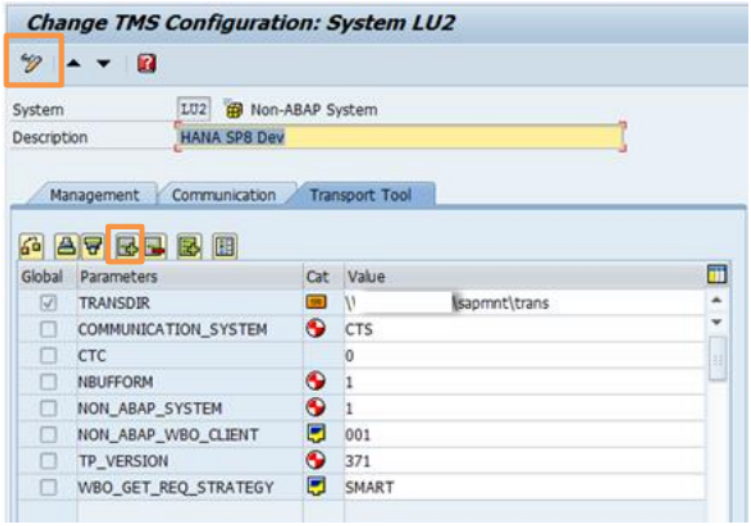
7.1.1 Configuring the Development system (Export system)

Define your SAP HANA development system ('LU2') as source system. You therefore have to select the option 'Activate Transport Organizer' when creating the system representation in TMS.

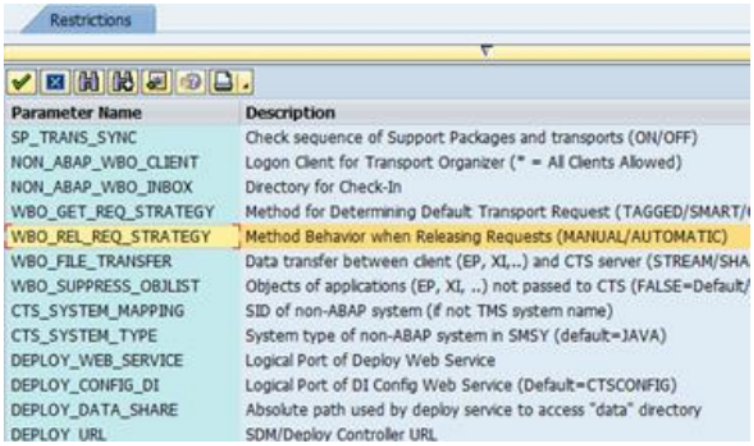
Log on to your CTS System (Domain Controller). Open transaction *STMS* and choose *System Overview*	
Choose *SAP System* → *Create* → *Non-ABAP System*	

Enter the SID of your development system (`LU2` in our example) in the field *System*, a *Description* and choose *Activate Transport Organizer*. Make sure that the *client* where you activated the Web Dynpro CTS_ORGANIZER is selected and then choose *Save*. The system will be created and the system list will show up.	
After having created the development system, you can decide on the Transport Strategy. The Transport Strategy defines whether a transport request is created automatically or e.g. by an administrator and if the request should be directly released or remain open after having attached objects to it. To do so, double-click in the system list on the system LU2 that you just created. Details on the Transport Strategy can be found on the SAP Help Portal under [Choosing a Transport Strategy for Source Systems]().	

In the configuration, go to the tab *Transport Tool* and switch to edit mode. Check whether the parameters WBO_GET_REQ_STRATEGY and WBO_REL_REQ_STRATEGY are already in the list of parameters. If this is not the case, select one row and then choose *Insert Row*.



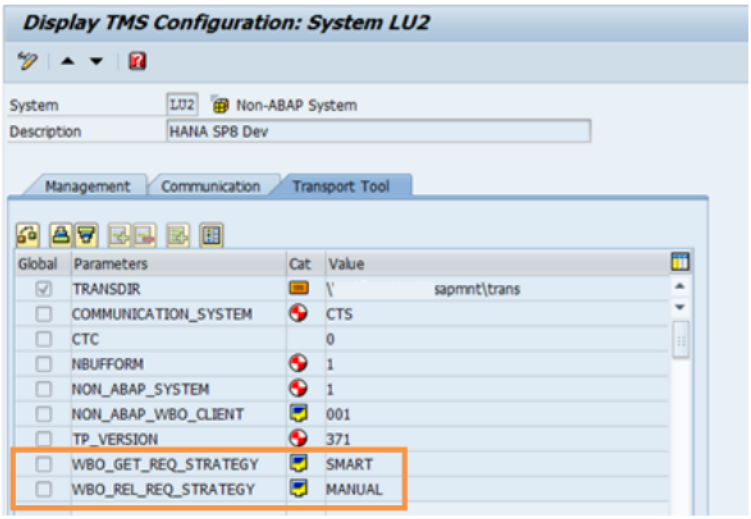
A new row is shown. Choose the input help (F4-help).
Choose the parameter that you would like to add from the F4 help of the newly added row.



You can use the values SMART, TAGGED or CREATE for WBO_GET_REQ_STRATEGY and MANUAL or AUTOMATIC for WBO_REL_REQ_STRATEGY. Refer to the SAP Help Portal for details.

Note

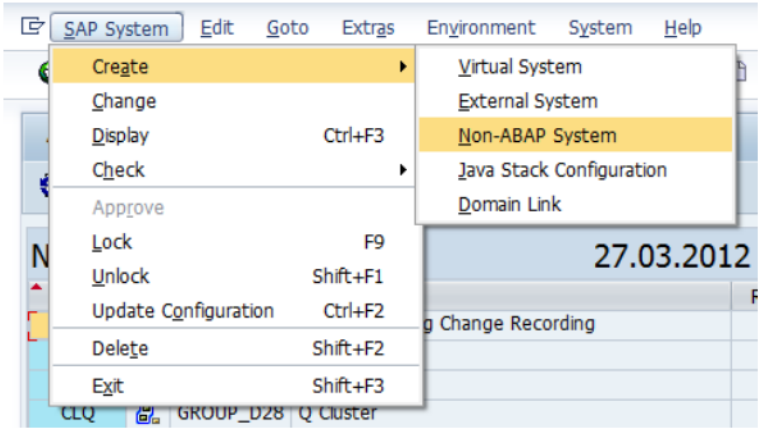
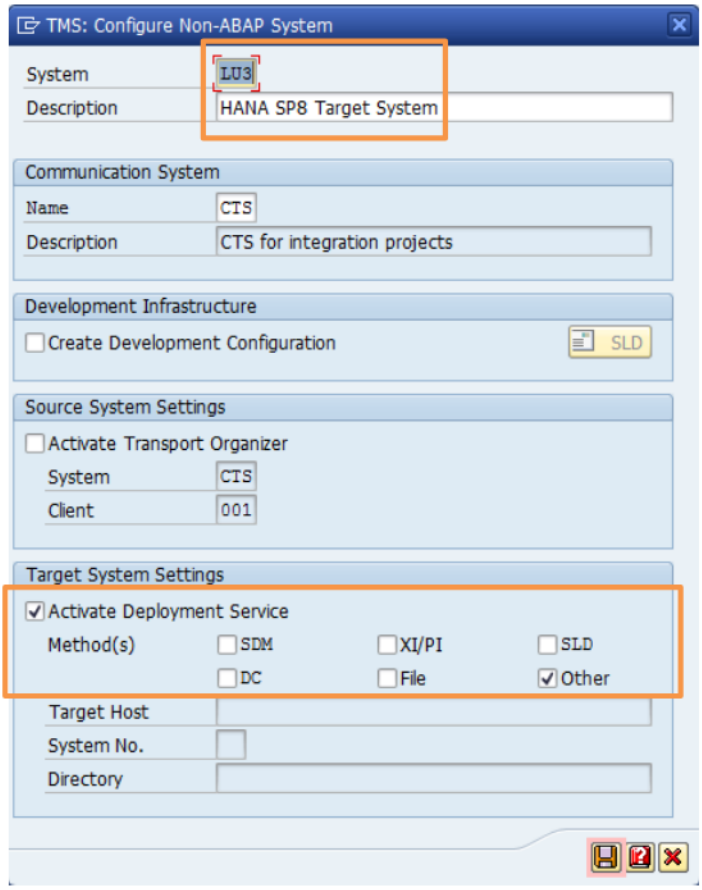
Ensure that the first letter of the value is written with a capital letter.

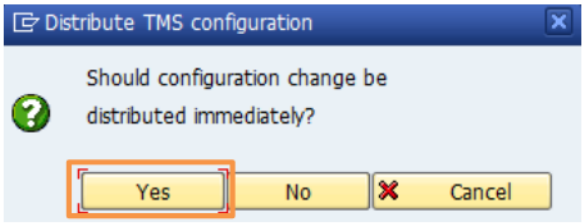
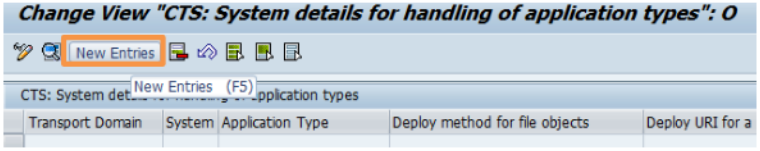
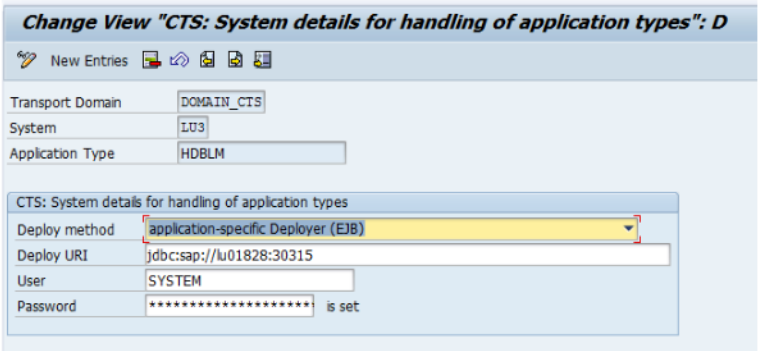
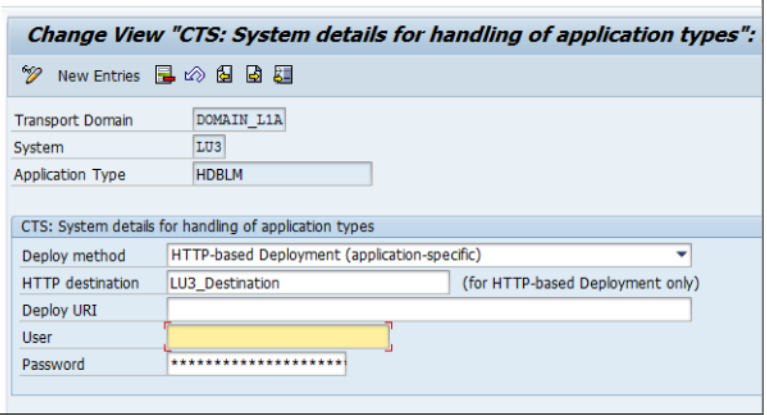


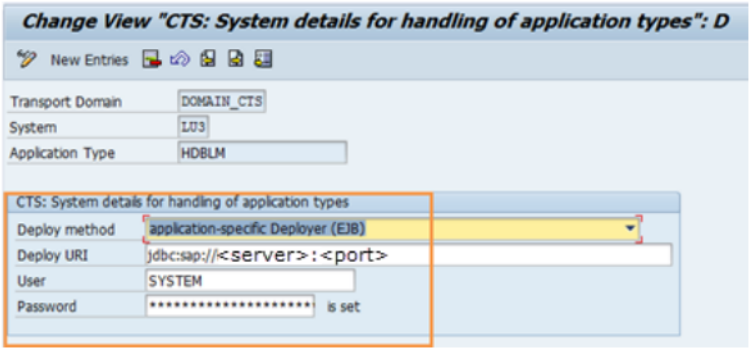
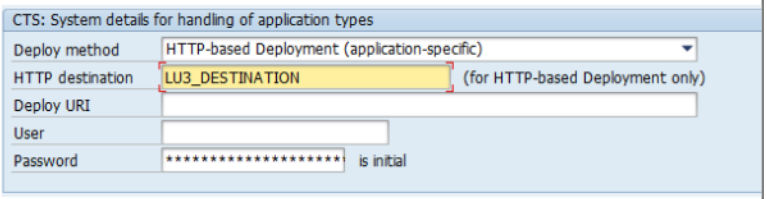
7.1.2 Configuring the Test and Production System (Import Systems)

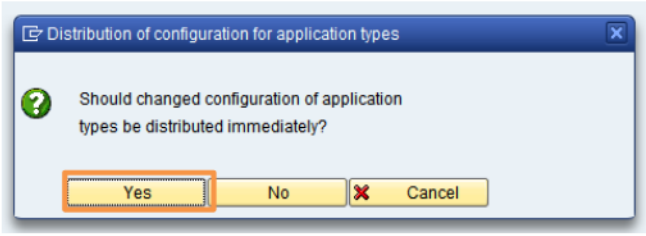
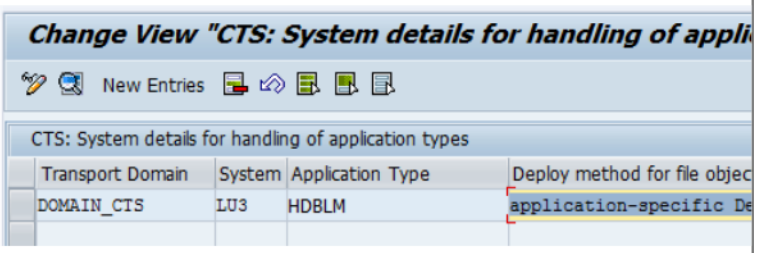
All other systems of your SAP HANA landscape – like e.g. test and production systems ('LU3', 'HNP') have to be defined as target systems. This chapter describes how this is done.

Some of the configuration parts in this chapter depend on whether you use a CTS system with or without AS Java. Carefully read the instructions to make sure that you use the correct configuration for your use case.

Choose *SAP System* → *Create* → *Non-ABAP System*	
When you create a non-ABAP target SAP HANA system which should use this new application type HDBLM, you have to choose *Other* as *Method(s)*, and deactivate the other options. Click *Save*.	

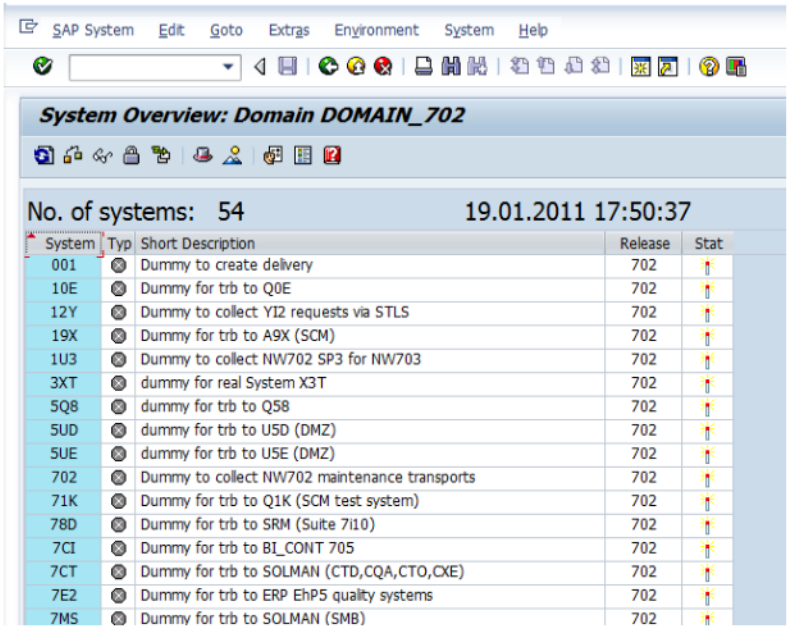
Click *Yes* to distribute the configuration.	
When saving the non-ABAP SAP HANA system, you are asked to define the deployment method for your system. Choose *New Entries*.	
This configuration of the deploy method is closely related to whether you use a CTS system with or without AS Java On the next screen, choose HDBLM as *Application Type* (F4-help):	
For CTS+ with AS Java: choose the *Deployment Method* "application-specific Deployer (EJB)" The deployment of SAP HANA content via CTS+ is in this case triggered via a web service which calls an EJB that runs on the AS Java of the CTS System. The EJB then calls the SAP HANA deployment mechanism.	**For CTS+ with AS JAVA** 
For CTS+ without AS Java, choose `HTTP-based Deployment (application-specific)` as *Deploy method*. **Note** This applies also if the SAP HANA database is running on SAP Cloud Platform Neo Environement (only *HTTP-based Deployment*)	**For CTS+ without AS JAVA** 
The configuration of the deploy method is closely related to whether you use a CTS system with or without AS Java:	

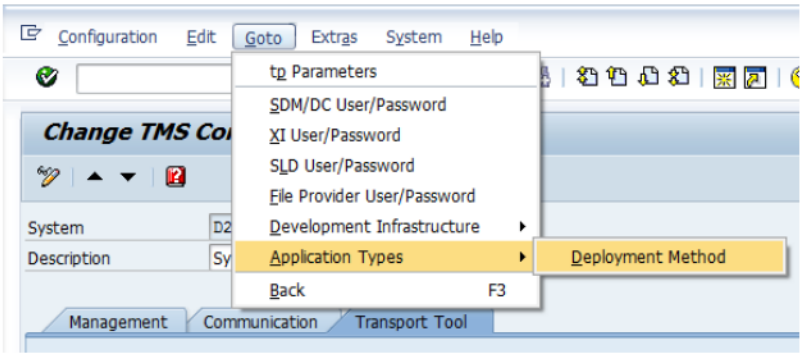
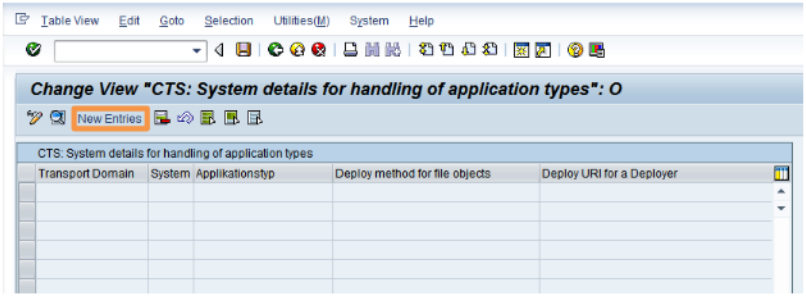
For CTS+ with AS Java: Enter the Deploy URI according to the jdbc-URL of the target system. For example, the URL takes the form: `jdbc:sap://<SAP HANA machine name or IP address>:3<SAP HANA instance number>15`. Create a user account and assign authorizations on the test and production systems. This user needs to have authorizations to process imports of SAP HANA content. This requires the system privilege REPO.IMPORT and the object privilege REPOSITORY_REST with EXECUTE rights. The SAP HANA privileges are documented in the SAP HANA Security Guide on the SAP Help Portal at http://help.sap.com/hana → *SAP HANA Platform* → Security Information Ensure that the user name is entered exactly as it appears in the SAP HANA system. Also upper and lower case have to match. Users in SAP HANA are written in upper case. So enter the user ID in upper case. **Note** All import processes of SAP HANA content for this target system triggered by CTS use this username and password by default.	**For CTS+ with AS JAVA** 
For CTS+ without AS Java: Enter the HTTP destination that you configured for this system before in chapter 5.2 Configuring an HTTP-Destination. Make sure that you use the correct writing – this entry is case-sensitive. Destinations are stored in upper case. **Note** This applies also if the database is running on SAP Cloud Platform Neo Environment.	**For CTS+ without AS JAVA** 

Save your entries and choose *Yes* to distribute the new application type through your landscape.	
Your entry is now saved. Click *Back* to return to the list. You can now see your details for handling the application type HDBLM. Choose *Back* to return to the system.	

Create any other target system that you might need (e.g. here for production system –'HNP') as shown before.

You can also extend the configuration of existing systems to be able to use them with new application types. To do so do the following:

Go to the system overview in TMS and double-click on the system where you would like to extend the configuration.	

In the details of your system, choose *Goto* → *Application Types* → *Deployment Method*	
Choose *New Entries* and proceed as described above for the creation of new systems.	

Note

The parameters DEPLOY_DATA_SHARE and DEPLOY_WEB_SERVICE are not required if you configure CTS+ without an AS Java. Nevertheless, they are automatically added to newly created non-ABAP systems in any case. In case of CTS+ without AS Java, these parameters are simply ignored at runtime. The same is valid for the parameter CTS_FILE_PROVIDER_URI. There is no need to delete these parameters – neither if they were added automatically when you created the system nor if you decide to change the configuration of a certain system from CTS+ with AS Java to CTS+ without AS Java. It might also happen that you use both CTS+ configurations for one system. The transport tool check will only report errors for these parameters if they are used for at least one transport configuration in the respective system.

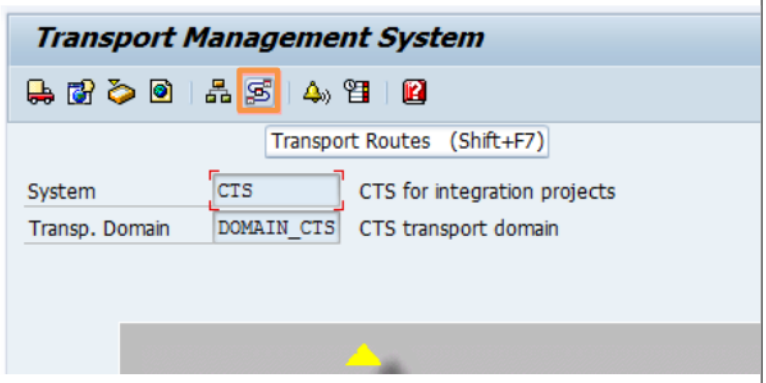
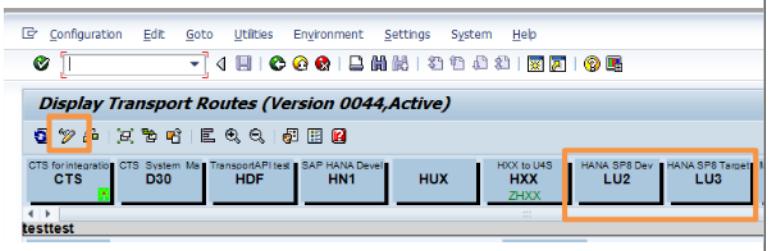
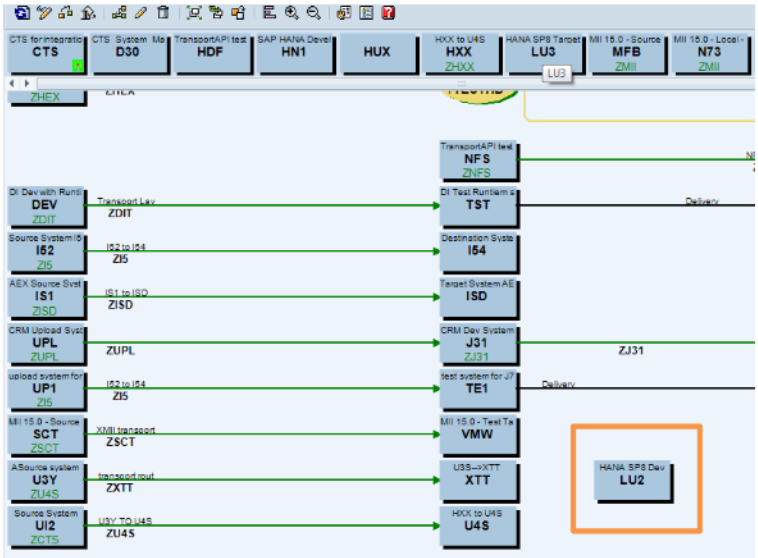
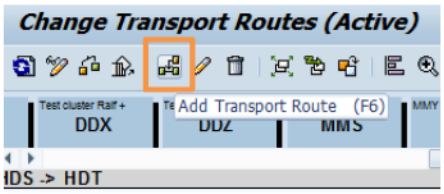
You can check if the SAP HANA system can be reached: Return to system overview, select the target system and check the import settings using *SAP System* → *Check* → *Transport Tool*. To get the details about reported errors for non-ABAP systems, go to transaction SA38 and execute the program RSTMS_NONABAP_SUPPORT (available on SAP NetWeaver 7.40, starting with SP10 or with CTS plug-in from SL Toolset 1.0 SP12).

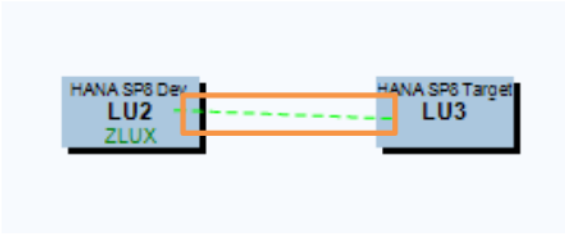
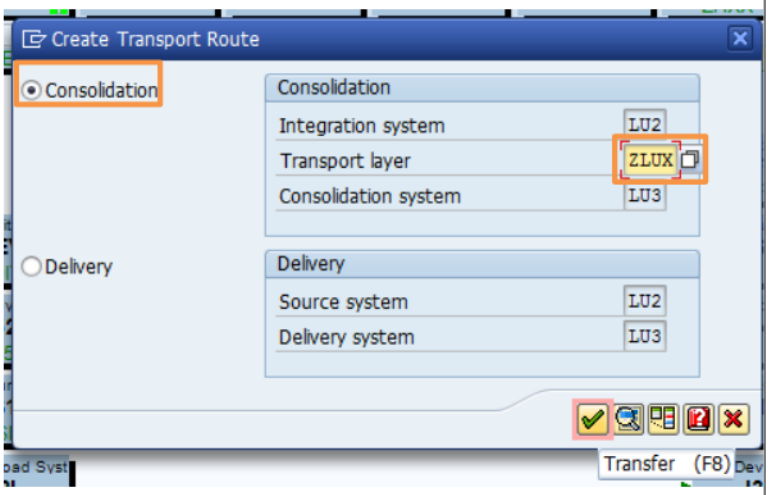
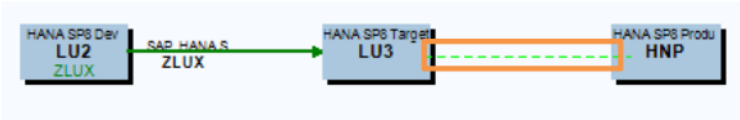
7.1.3 Transport Landscape: Defining Transport Routes

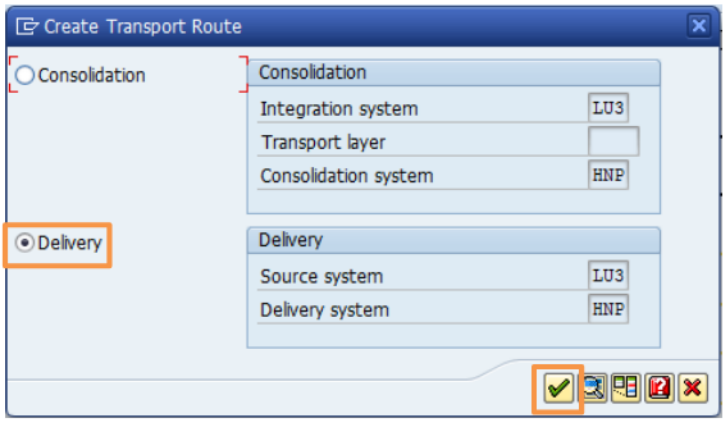
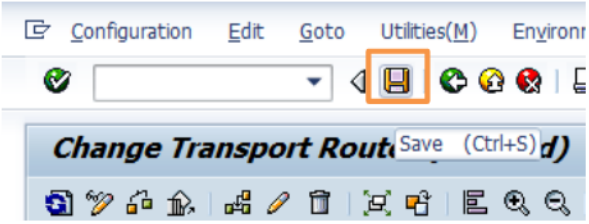
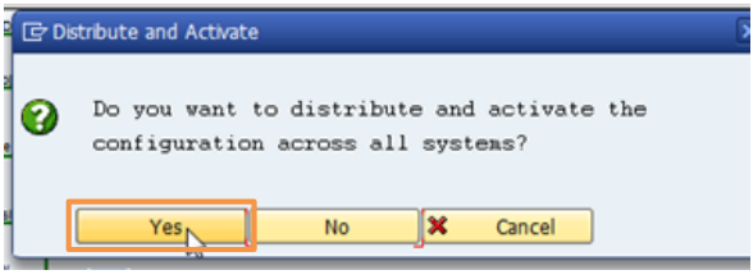
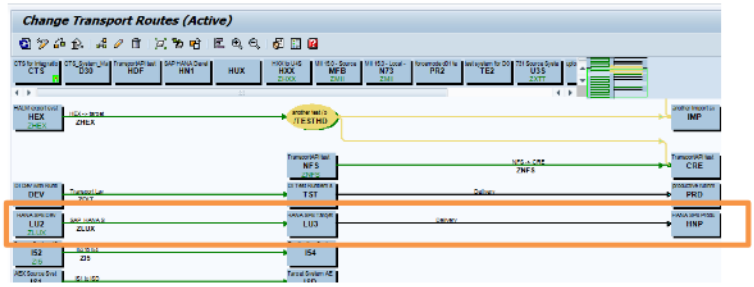
Now that you have created representations for the different systems (LU2, LU3 and HNP in our example) in TMS, you have to connect them with the help of transport routes.

Use client-independent transport routes.

For details on how to configure transport routes in general, take a look at the SAP Help Portal under Configuring Transport Routes.

Log on to your CTS system (Domain Controller). Open transaction *STMS* and go to *Transport Routes*	
The systems LU2, LU3 and HNP that you just created are shown in the upper row of systems. The systems shown in here are not yet connected by transport routes. Switch to *Edit* mode.	
Click on system *LU2* and then click in the area where the transport routes are shown.	
Repeat the previous step for LU3 and HNP	
Choose *Add Transport Route*	

Your mouse pointer is now a pencil. Draw a line from LU2 to LU3	
A dialog box opens up. Make sure that *Consolidation* is selected. A consolidation route is needed to connect a development system to e.g. a test system (from a system where you do an export to a system where you would like to import the transport request). Enter a name for the *Transport Layer*, e.g. ZLUX. The name has to start with a Z. **Note** Create one standard transport layer (this is the default), not two separate ones for SAP- and custom transports as you might know it from configuring transport routes for ABAP systems. Choose *Transfer* when you are done.	
You have to enter a *Short Description* for the Transport Layer in a second window if the transport layer does not yet exist. Choose again *Transfer* when you are done.	
A transport route has been added connecting LU2 with LU3. Now draw a line from LU3 to HNP.	

Choose *Delivery* for this transport route and click on *Transfer*. When you set up a delivery route, you are making sure that all transport requests that are imported into the route's source system are automatically flagged for import into the route's target system. Choose *Transfer* when you are done.	
Save the configuration	
Confirm that you would like to *Distribute and Activate* the configuration	
The transport route for LU2, LU3 and HNP is now part of the configuration	

7.2 Configuration for Export

On the SAP HANA development system, you have to define how remote connection to the CTS communication system is done. This is done with the help of the CTS Export Web Service. This Export Web Service runs on the AS ABAP of your CTS system and needs to be activated. The SID under which the system is known in CTS has to be forwarded to the CTS system whenever a transport request is needed or created. The CTS system has to know for which system it has to create or look for a transport request. The 'name' of a transport request in TMS starts with the SID that is forwarded to CTS for the development system and thereby identifies the transport route etc. to which it belongs.

Note

Users who should be able to execute an export in SAP HANA and attach the exported objects to a transport request in CTS have to have the role SAP_BC_WEBSERVICE_CONSUMER or appropriate permissions for Web Service `EXPORT_CTS_WS` have to be assigned in the user management of AS ABAP of the CTS system. For details, refer to the SAP Help portal under Authorizations and to SAP Note 1003674.

More details and help for analyzing issues with the Export Web Service are provided in SAP Note 2097341.

7.2.1 Activate CTS Export Web Service

You can activate and configure the CTS Export Web Service using the SOA Management web tool.

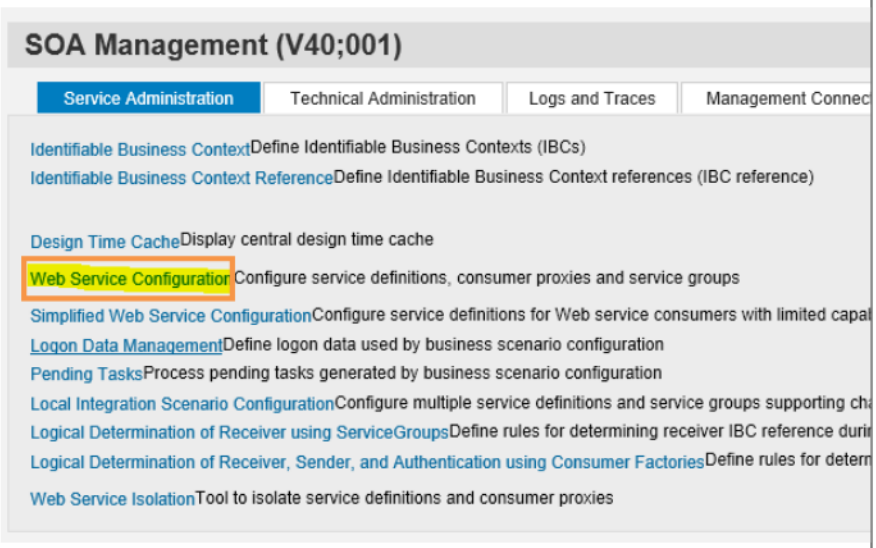
Note

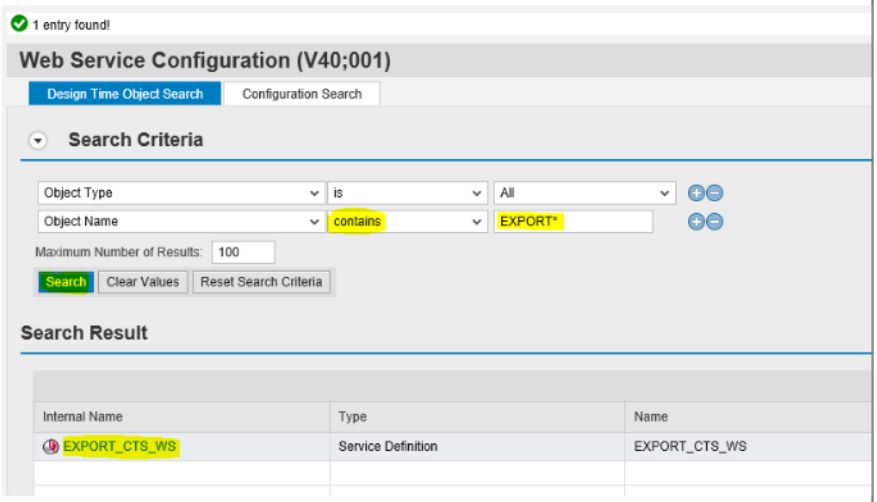
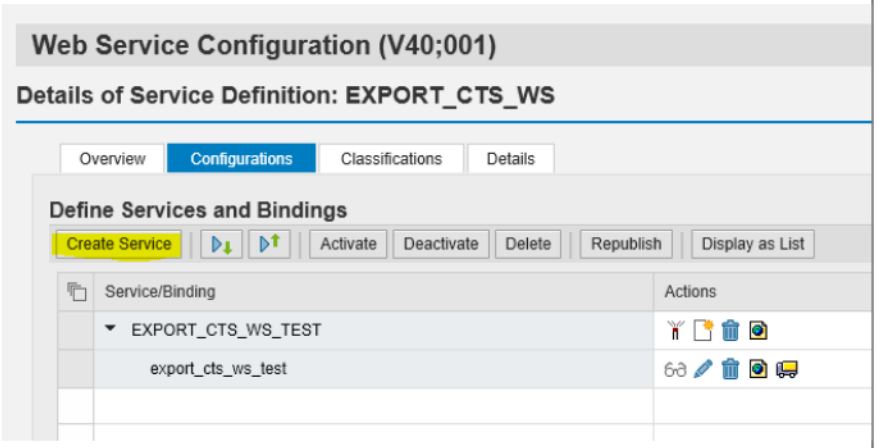
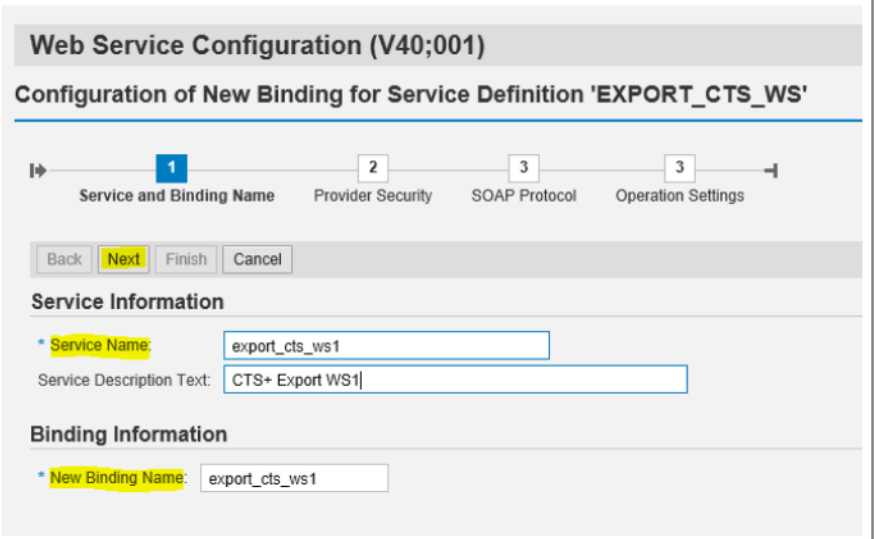
The following procedure and screenshots refer to SOA Management in SAP NetWeaver 7.4, Support Package Stack 18. If you are using SOA Management in another release or Support Package level, refer to the appropriate documentation on SAP Help Portal.

For more information about SOA Management and the configuration of a binding, refer to the following information:

- SAP Help Portal under Configuring a Service Provider.
- ABAP Connectivity Wiki in SAP Community Network, especially How to configure a Service Provider.

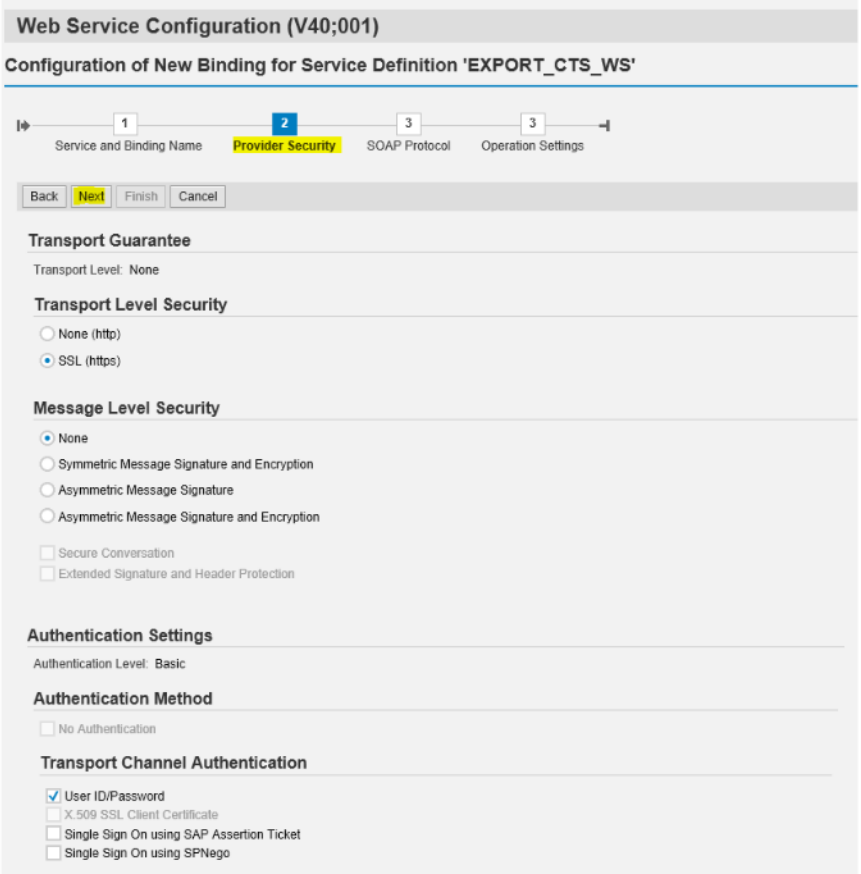
For more information on the changed functions in SOA Management as of SAP NetWeaver 7.02 SP08 and 7.30 SP03 see SAP Note 1575707.

Log on to the CTS System in the client that you have defined when configuring the development system. To start the application, enter the transaction code SOAMANAGER. (For more information about SOA Management and the configuration of a binding, refer to the links in the Note section above.) After the required authentication is done, the SOA Management UI opens in a Web browser. On the *Service Administration* tab, choose *Web Service Configuration*.	

Search for the Service Definition of CTS Export Web Service called `EXPORT_CTS_WS`. Click on the corresponding link of the entry in the *Search Result* section.	
For one service definition (here: EXPORT_CTS_WS), you can define multiple services. For one service, you can define multiple bindings and configure them independently. To create new services and/or bindings choose *Create service*. Note: You can also display or change the settings of existing bindings (and services) by choosing the appropriate icons.	
In the first step of the configuration wizard, you define the *Service Name*, its *Description* and a Binding Name.	

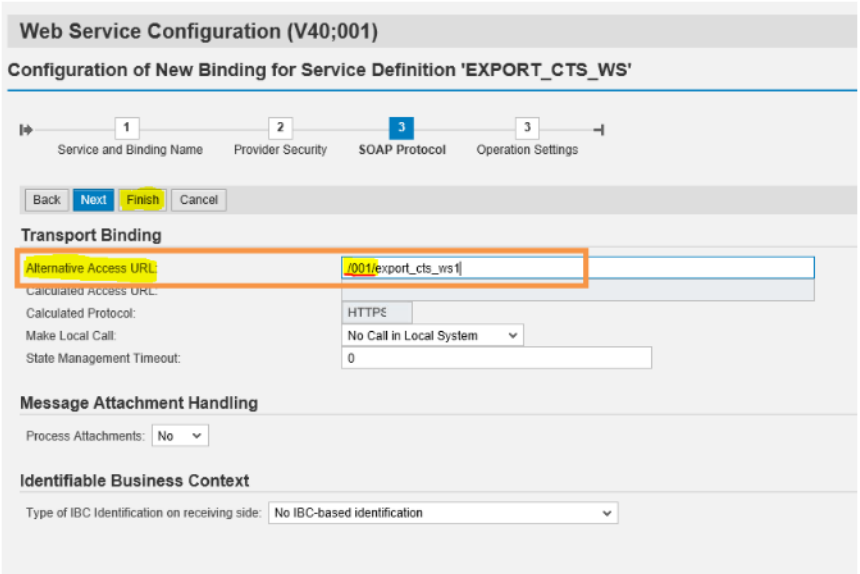
The most important configuration settings are defined in the second step of the configuration wizard: Define the *Provider Security* settings, e.g. in *Transport Level Security* and in *Authentication Settings*, according to your security requirements and depending on what is supported by the connectivity framework of your application.

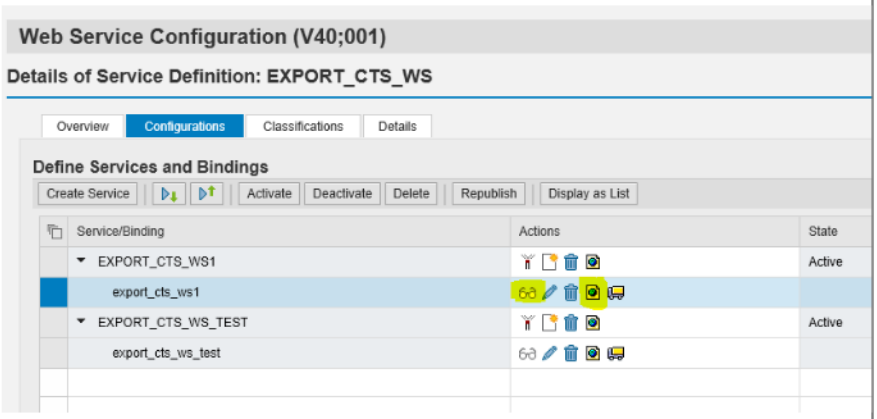
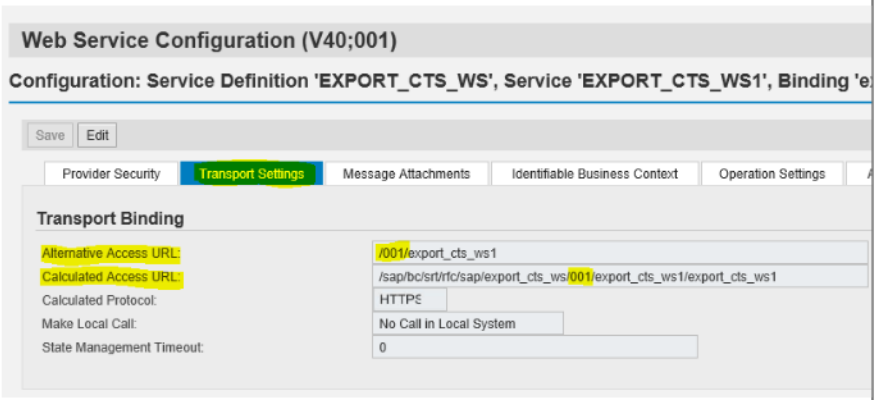
For the SAP HANA service in SAP Cloud Platform Neo environment, the SAP Cloud Connector will be used which supports SSL (https). Therefore, we recommend that you activate *SSL* under *Transport Level Security*. Under *Transport Channel Authentication*, choose *User ID/Password*.



For easier service access, we recommend that you also define the binding alias using the *Alternative Access URL* in the third step of the configuration wizard.

To ensure unique alternative access URLs we recommend that you add the client in which you are logged on to the alias.



After finishing the configuration wizard, a new service and/or binding will be shown. Use the display icon to see the details of your configuration, such as the security settings or the *Calculated Access URL*. Note: Here, you can also access the WSDL of the binding.	
The *Calculated Access URL* is displayed in the *Transport Settings* tab. Make sure that the client used in the *Alternative Access URL* is the same as the one that is contained in the *Calculated Access URL*. If not, switch to *Edit* mode and adjust the value in the *Alternative Access URL* accordingly.	

Note

- Concerning the role assignments of users that use the EXPORT_CTS_WS AS ABAP web service of the CTS system, see the last section of SAP Note 1003674 (on roles like SAP_CTS_PLUS, SAP_BC_WEBSERVICE_CONSUMER)
- If you encounter problems later when using this web service, you can typically find details for errors in the *Application Log* (transaction SLG1) for object `CTSPLUS`, see also SAP Note 2286312 for more details. To be able to view the logs, you must be logged on to the system in the client that hosts the Export Web Service.

7.2.2 Only relevant for SAP HANA Service in SAP Cloud Platform Neo Environment: Connect to CTS Export Web Service

To connect to the CTS Export Web Service, you need to configure the cloud connector in a way that it allows calls from SAP Cloud Platform Neo environment to your CTS system.

Afterwards, you configure the destination in SAP HANA Application Lifecycle Management. For more information, see Configuring the SAP HANA Systems below.

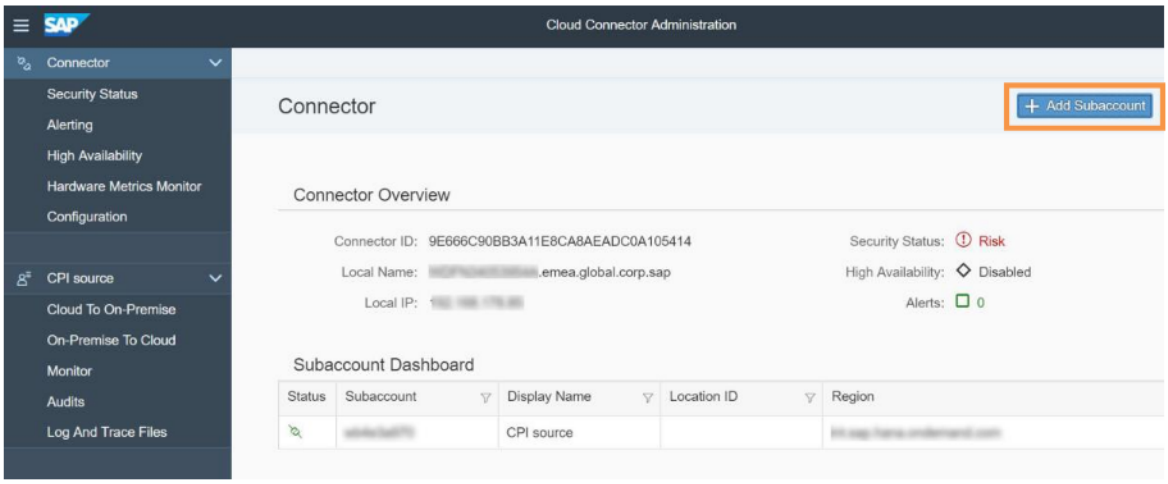
7.2.2.1 Only relevant for SAP HANA Service in SAP Cloud Platform Neo Environment: Configure the Cloud Connector to allow Calls from SAP Cloud Platform to your CTS System

If you do not have the cloud connector installed, install it as described in the SAP Help Portal documentation under Cloud Connector.

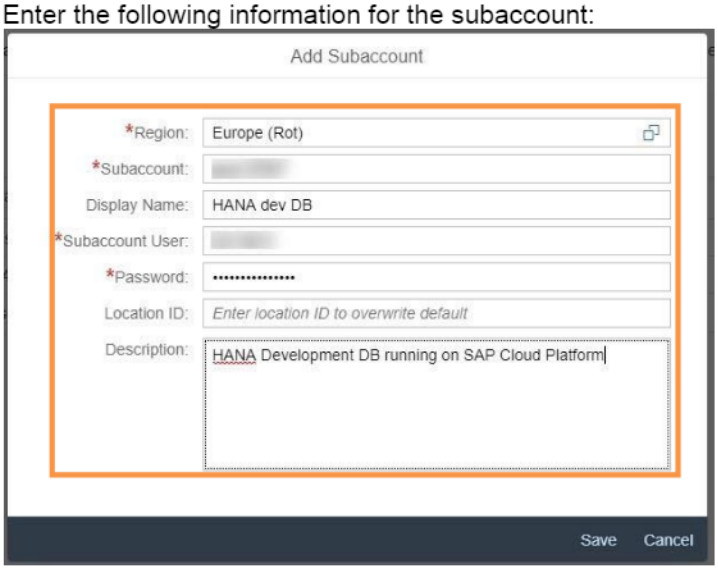
The Cloud Connector serves as a link between SAP Cloud Platform Neo applications and the CTS system. You need to configure the cloud connector for each SCP Neo subaccount from which you want to initiate transports. Usually, this is your development subaccount.

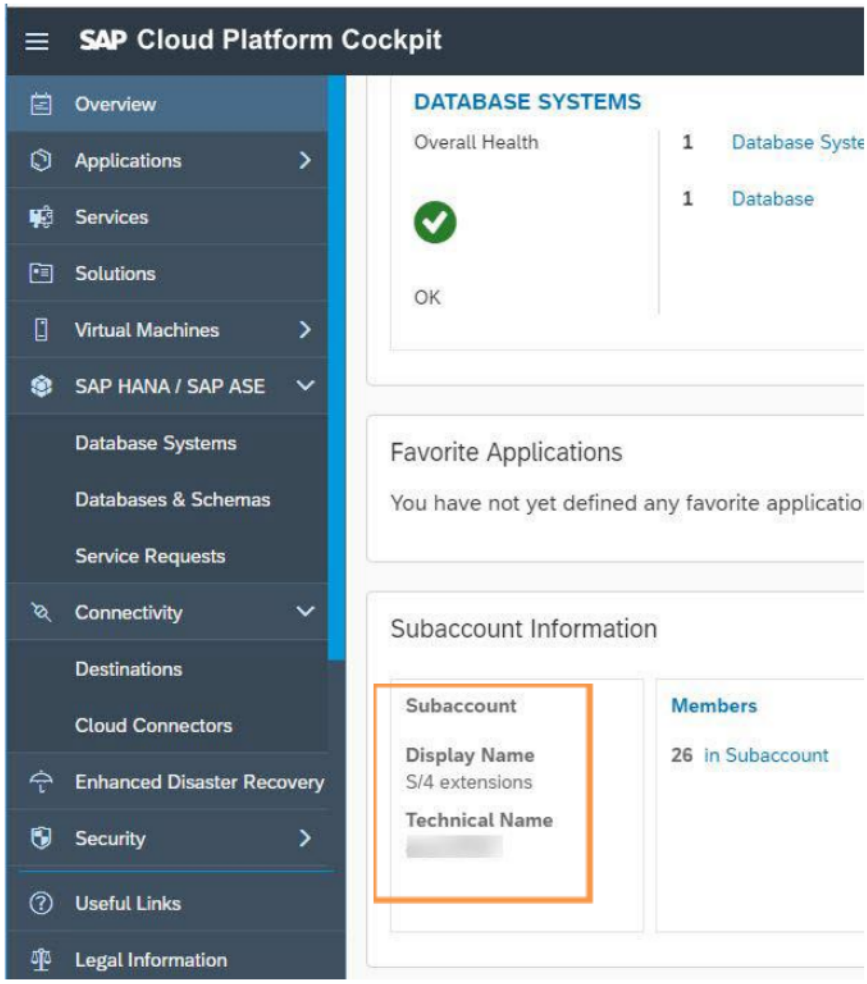
1. Start your Web browser and enter the address of the server on which your cloud connector is running. This is https://<host>:8443 unless you specified a different port during the installation of the cloud connector.
2. Log on to your Cloud Connector with your *Administrator* user and your password.

3. In your *Cloud Connector Administration* under *Connector*, choose + *Add Subaccount*.



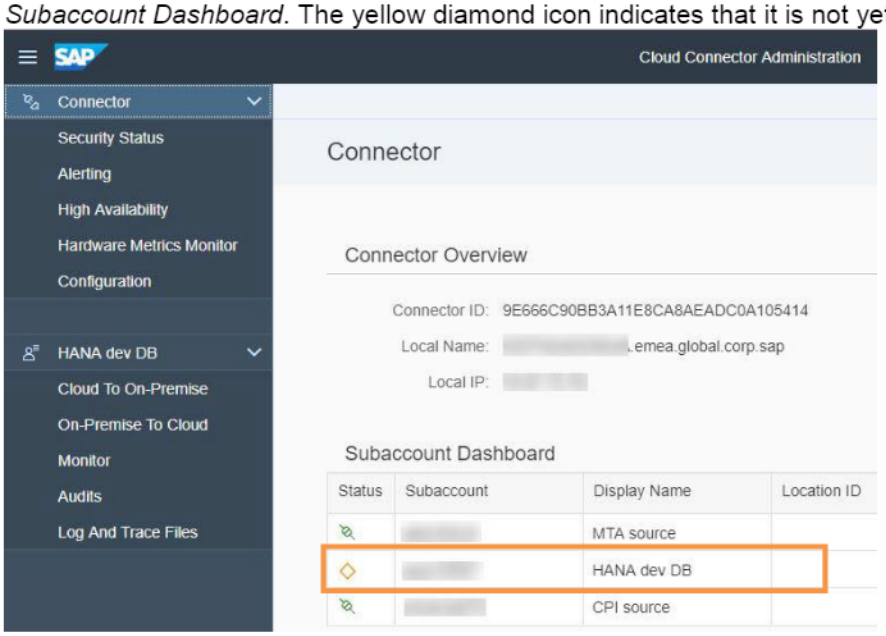
4. Enter the following information for the subaccount:



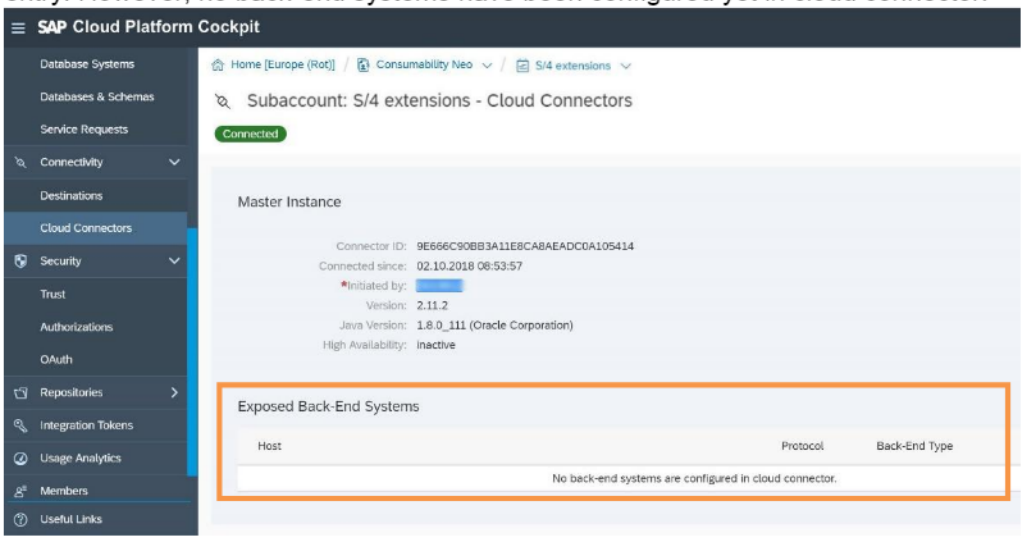
Field	Description
Region	Region in which the subaccount resides. You can select the region from the dropdown box.
Subaccount	Technical Name of your subaccount. You can find it in SAP Cloud Platform Cockpit under *Subaccount Information*. 

Display Name	Optional. You can freely choose a name under which your subaccount will be displayed in the cloud connector. Here, we use *S/4 extensions*.
Subaccount User	User that the cloud connector uses to log on to the subaccount. (The user must exist on the subaccount and must have Cloud Connector Administrator authorization.)
Password	Password of the subaccount user.
Location ID	The *Location ID* needs to stay empty since location IDs are not supported by SAP HANA Application Lifecycle Management. For more information on Location IDs, see Managing Subaccounts.
Description	Description is optional.

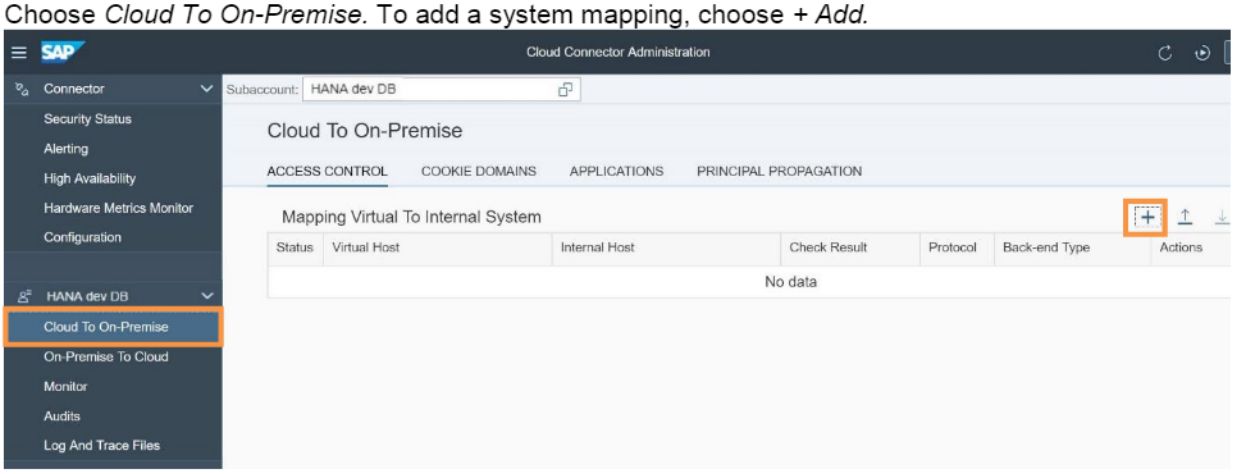
5. In your Cloud Connector Administration, the new subaccount entry is displayed in the *Subaccount Dashboard*. The yellow diamond icon indicates that it is not yet connected.



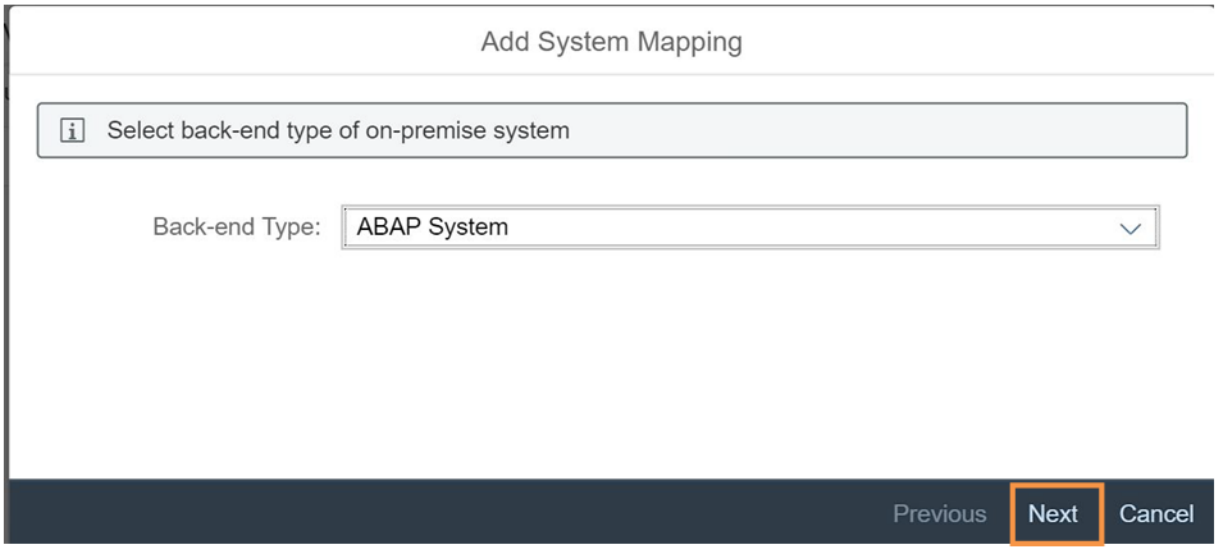
6. In SAP Cloud Platform Cockpit of your subaccount, under *Cloud Connectors*, you have a new entry. However, no back-end systems have been configured yet in cloud connector.



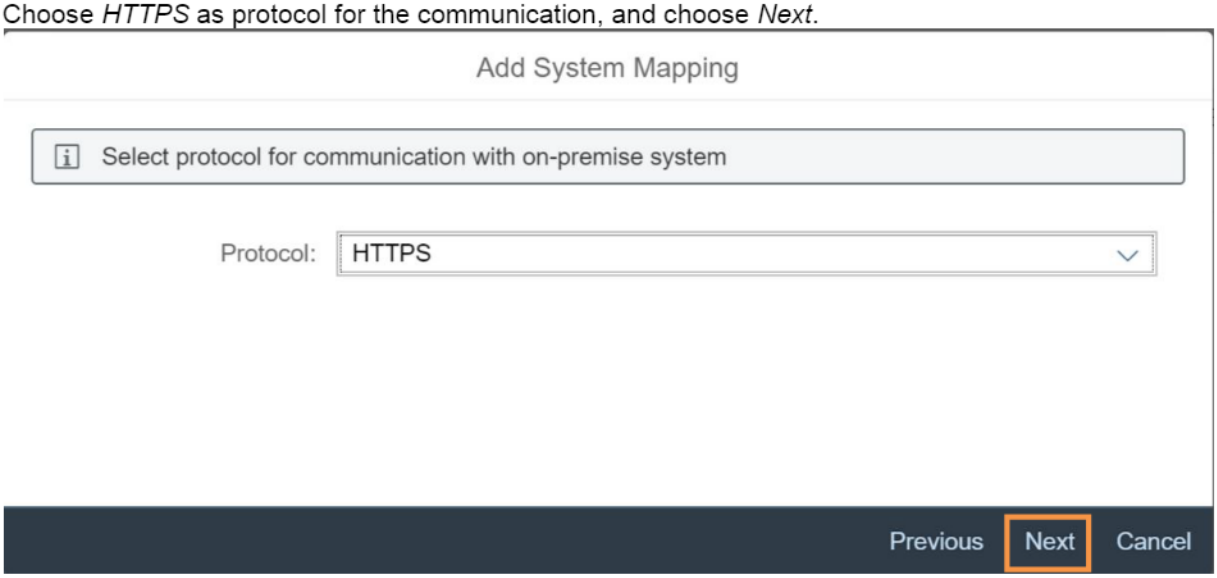
7. As a next step, you have to allow calls to the Export Web Service of the CTS system (back-end system) from your subaccount. You do this in your *Cloud Connector Administration*.
   Your subaccount (here: *HANA dev DB*) is displayed in the navigation area on the left-hand side.
   Choose *Cloud To On-Premise*. To add a system mapping, choose + *Add*.



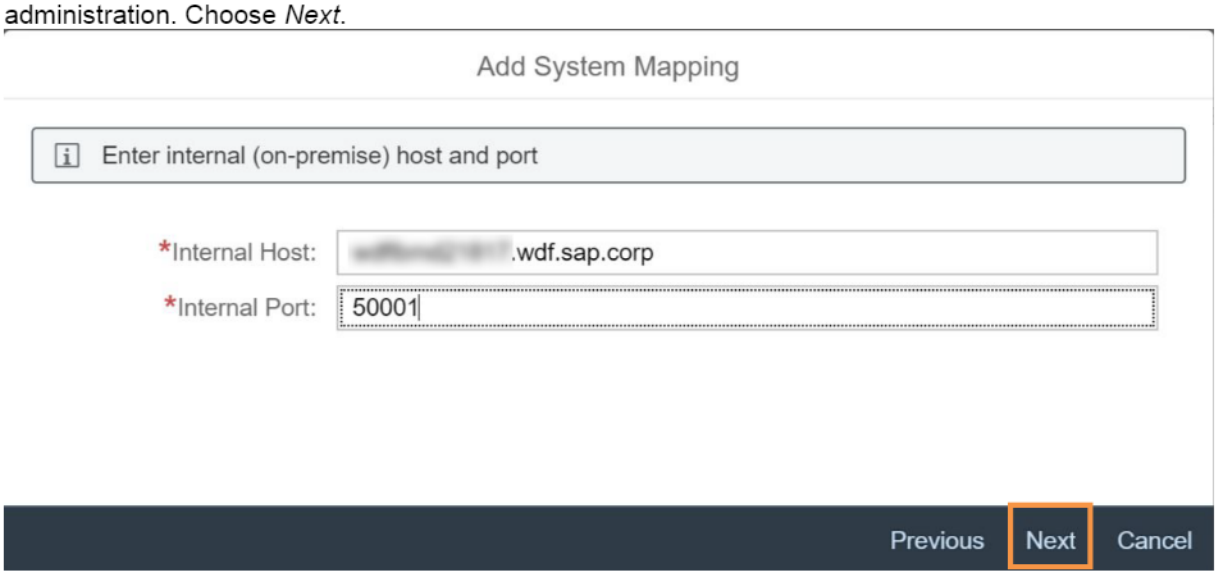
8. On the *Add System Mapping* dialog, leave the *ABAP System* Backend-Type selected, and choose *Next*.



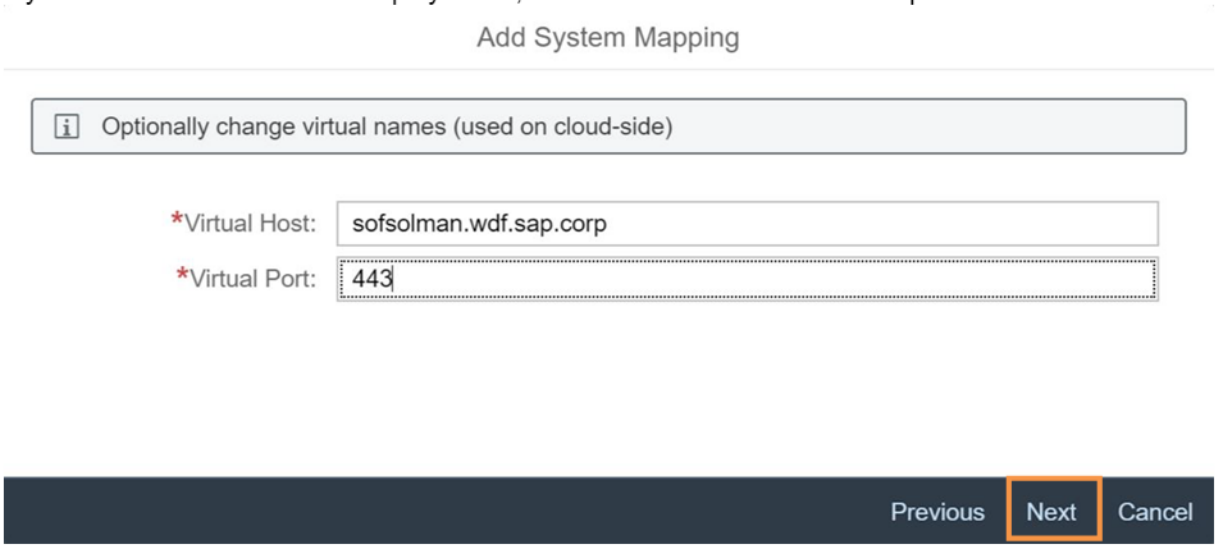
9. Choose *HTTPS* as protocol for the communication, and choose *Next*.



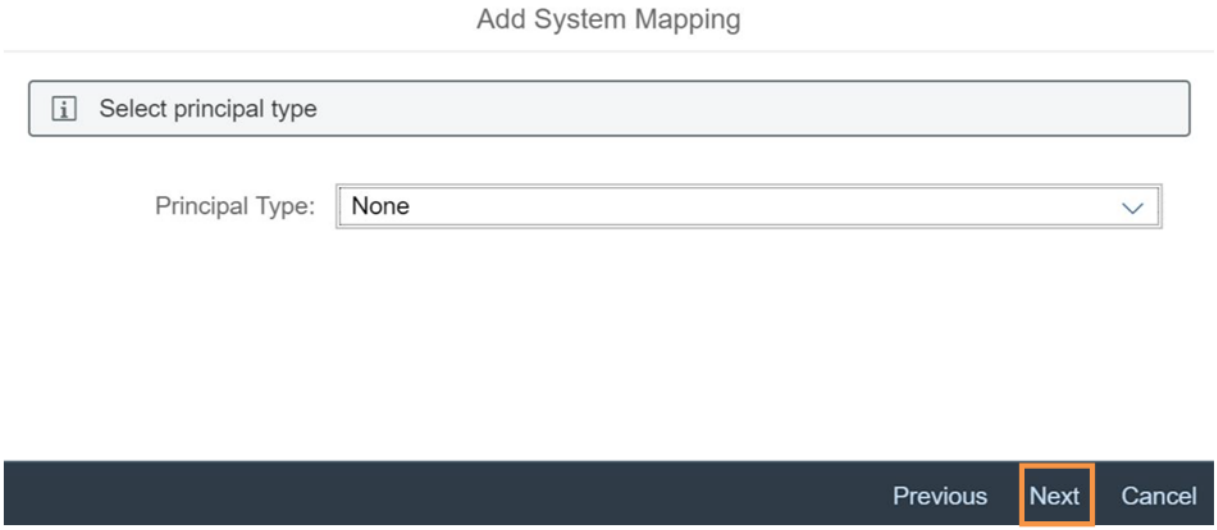
10. Enter an internal (on-premise) host and port. In your CTS system, you can get the names, for example, when you open the Transport Organizer Web UI, or if you ask your system administration. Choose *Next*.



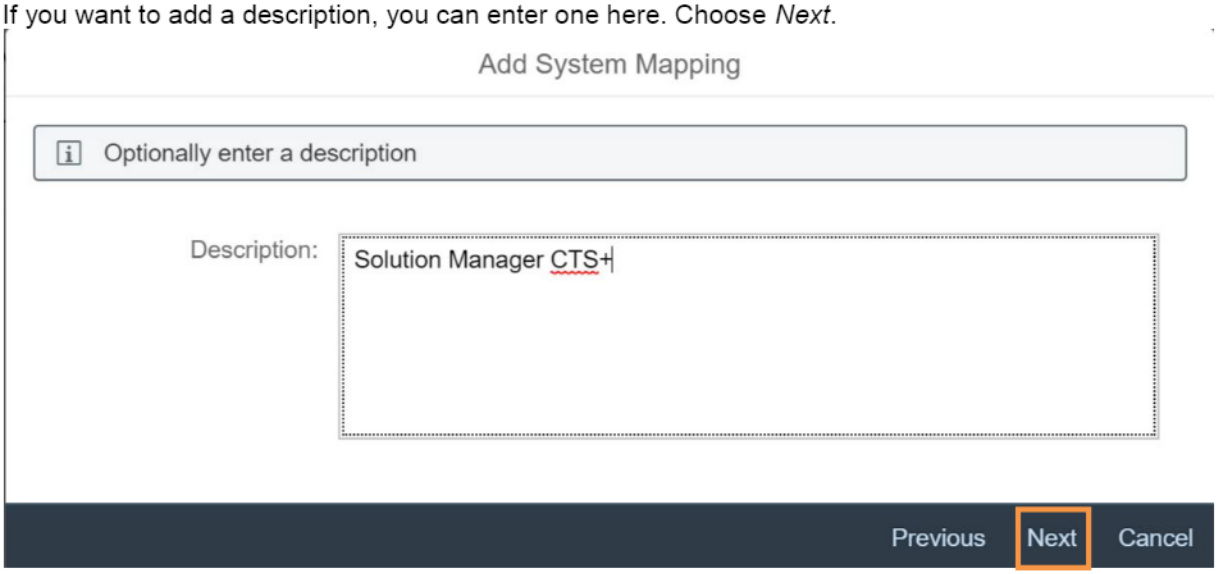
11. If you want to use an external display name, enter a virtual host and a virtual port. Choose *Next*.



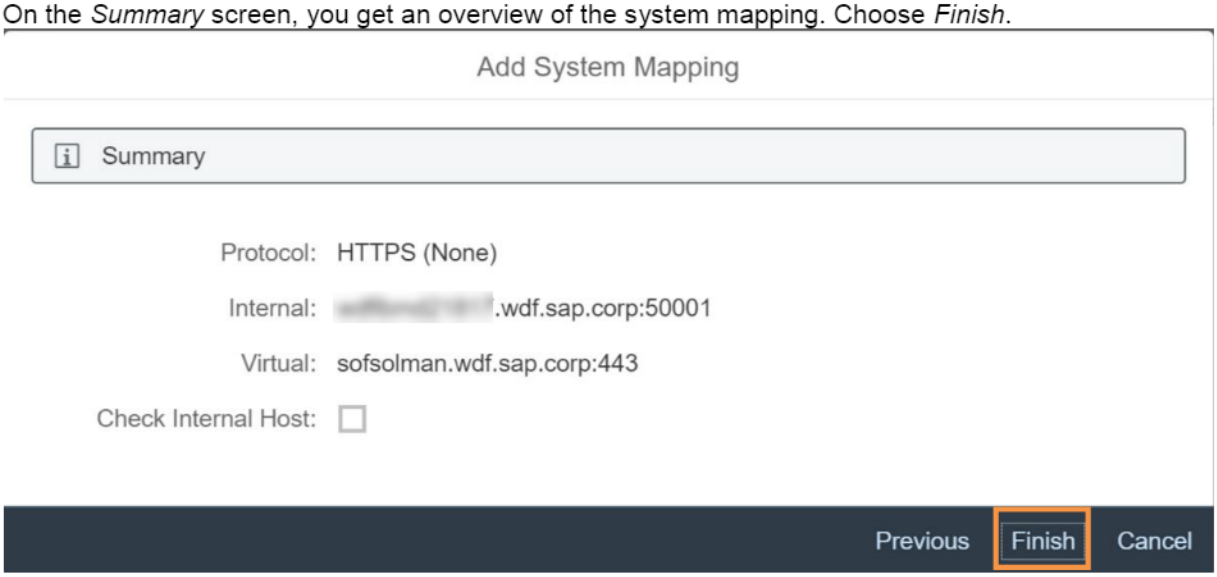
12. You don´t have to select a *Principal Type*. Choose *Next*.



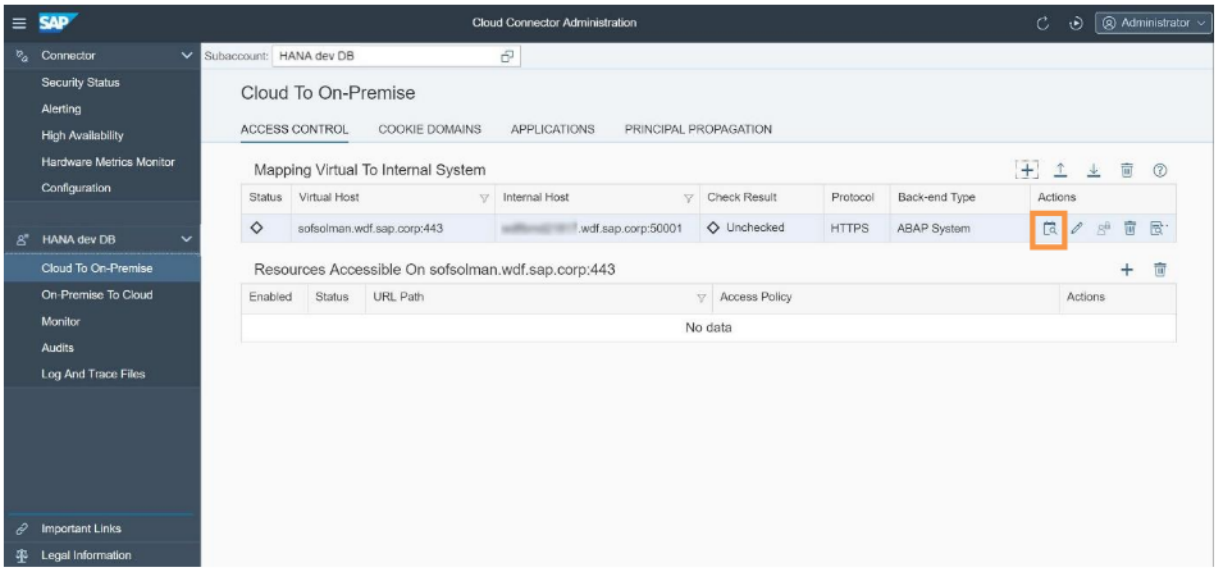
13. If you want to add a description, you can enter one here. Choose *Next*.



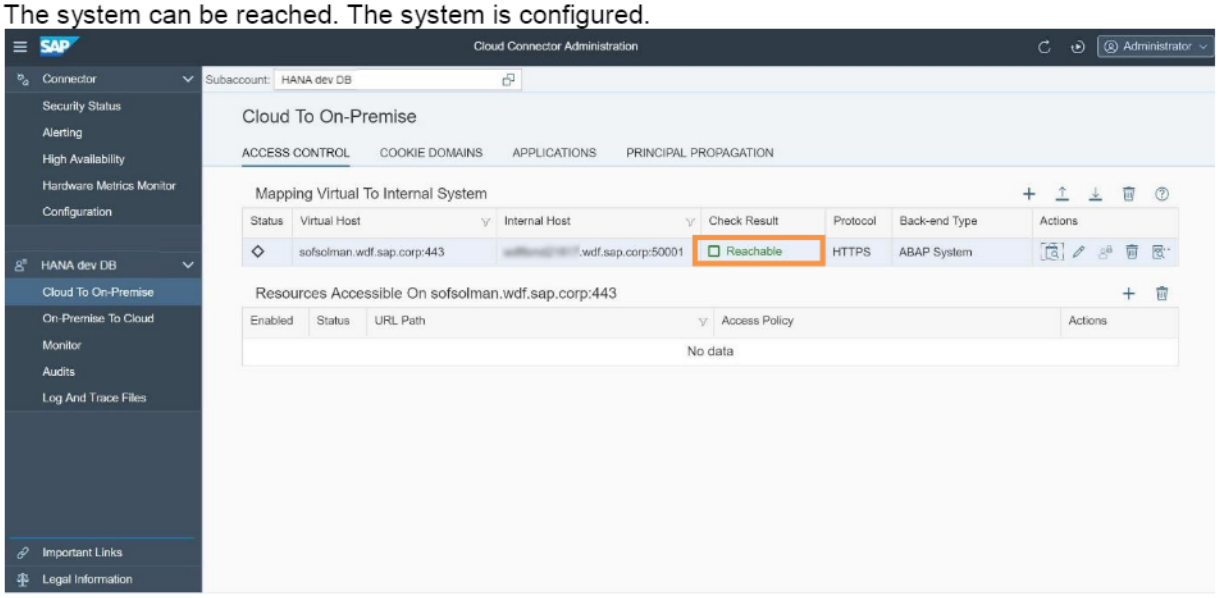
14. On the *Summary* screen, you get an overview of the system mapping. Choose *Finish*.



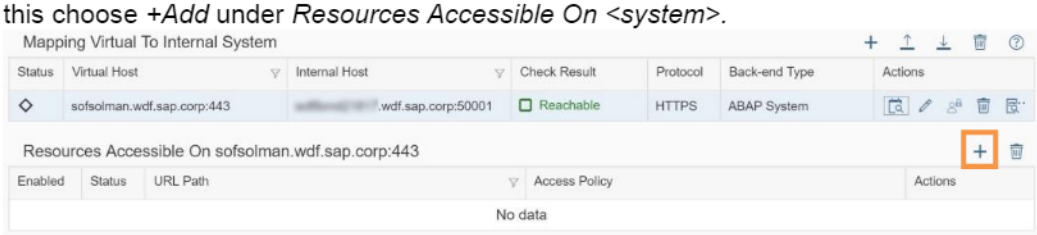
15. The system mapping is displayed. To check the availability of the internal host, click on the relevant icon.



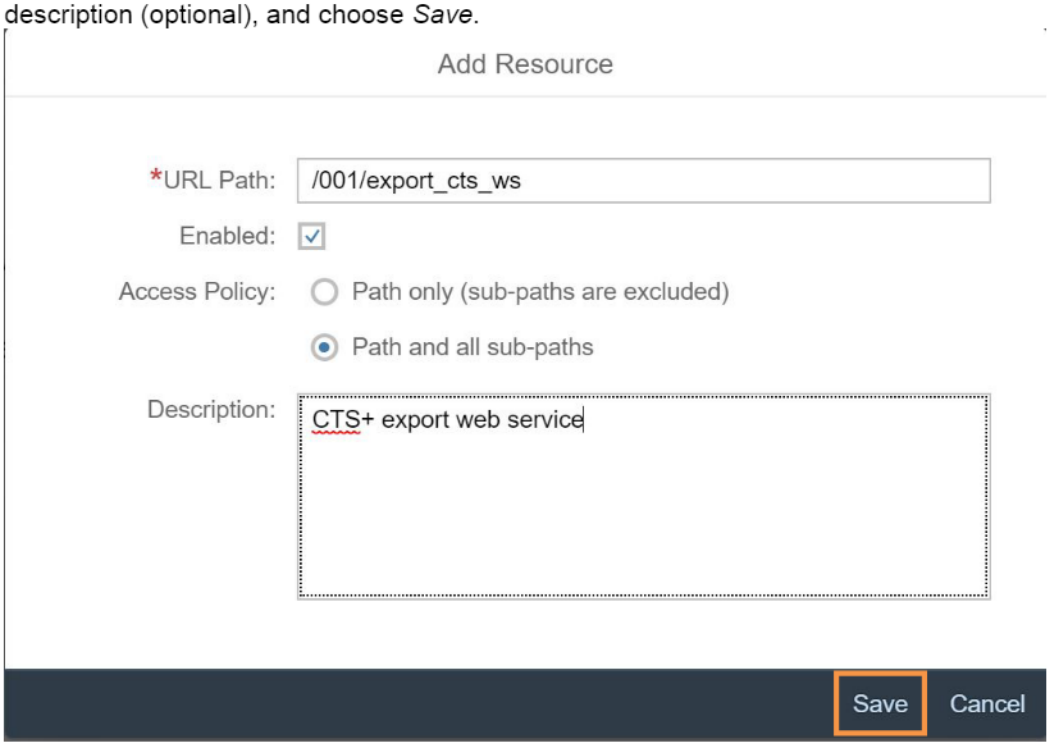
16. The system can be reached. The system is configured.



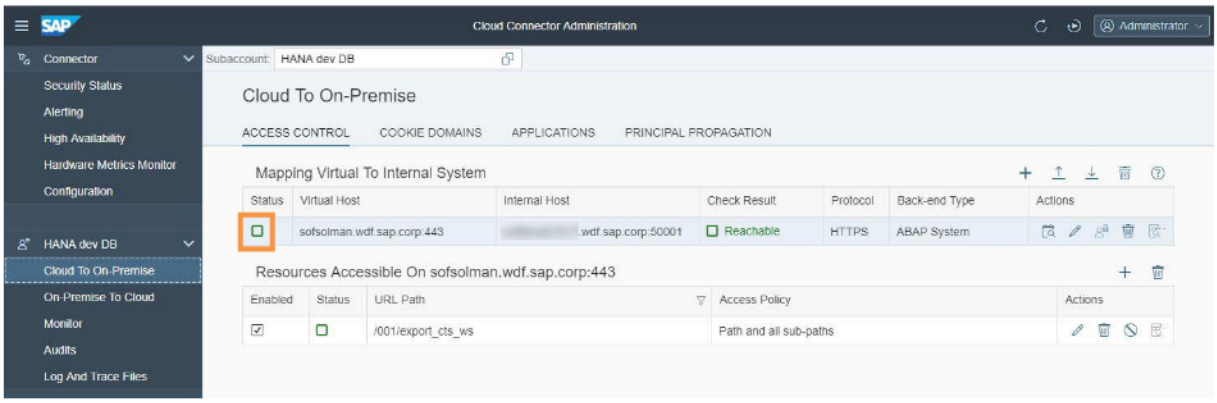
17. As a next step, you need to configure the services that can be reached on this system. To do this choose *+Add* under *Resources Accessible On <system>*.



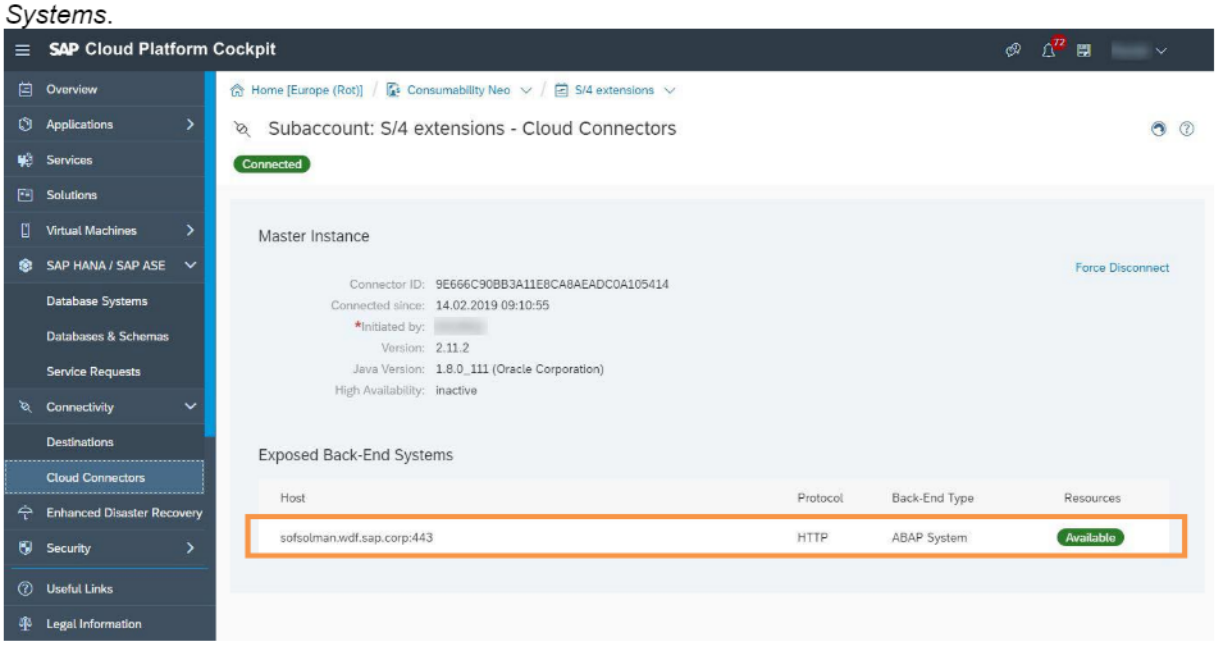
18. Enter the URL that you configured in transaction SOAMANAGER, the access policy and a description (optional), and choose *Save*.



19. The overall status of the mapping has changed to green because a resource was added to the mapping.



20. In your SCP Neo subaccount, the CTS system is now registered under *Exposed Back-End Systems*.



21. Repeat the previous steps for the any other SCP Neo subaccounts from which you want to initiate transports.

See also: Configure Access Control and Configure Access Control (HTTP) in the *SAP Cloud Platform Connectivity* guide on SAP Help Portal.

8. Configuring the SAP HANA Systems

If you configure CTS+ on a CTS System with AS Java, you only have to configure CTS+ on the SAP HANA Source System (Configuring the SAP HANA Source System). Skip chapter 8.2 in this case.

If you use the option of having a CTS+ system without AS Java in place, then you also have to enable CTS+ on the target systems. Refer to chapter Configuring the SAP HANA Target Systems for details, as well.

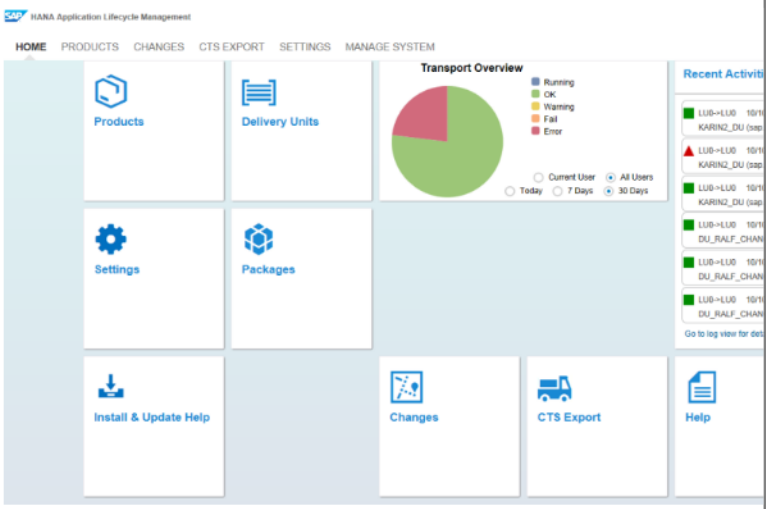
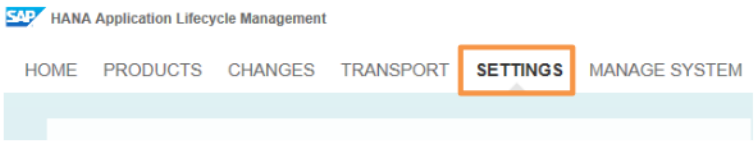
8.1 Configuring the SAP HANA Source System

The systems and the transport route in CTS are now ready. As a last configuration step, you have to configure the connection from your SAP HANA development (source) system to the CTS system. This configuration is done in SAP HANA application lifecycle management (HALM).

CAUTION

If you use Multitenant Database Containers, make sure that you are logged on to the correct tenant. CTS+ settings in HALM are tenant specific. This means that you can also have different settings per tenant.

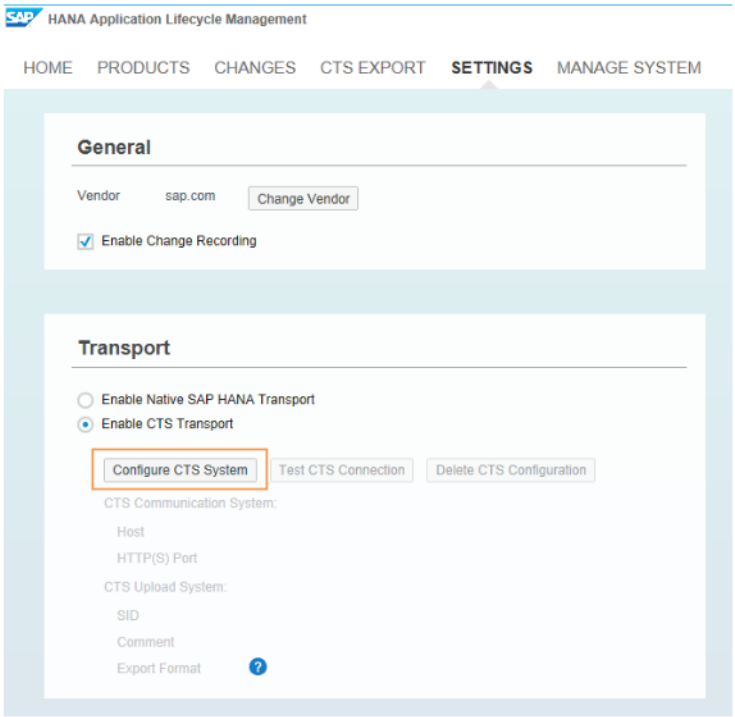
Note that in SAP HANA Studio you also have to configure the URL of your tenant in *System→ Properties →XS Properties*.

Open HALM on your development system. The URL is the following: `http<s>://<server>:80<instance number>/sap/hana/xs/lm` Log on with a user who has the roles *sap.hana.xs.lm.roles:Administrator*, *sap.hana.xs.admin.roles:HTTPDestAdministrator* and *sap.hana.xs.admin.roles:RuntimeConfAdministrator* assigned. For more information about how to access HALM, see the SAP HANA Application Lifecycle Management guide in the *Availability of SAP HANA Application Lifecycle Management* section.	
Choose *SETTINGS*	

Select *Enable CTS Transport* and click *Configure CTS System*.

Note

When you first open this screen, *Enable Native SAP HANA Transport* is selected as the default setting for transports. Changing this setting implies that you cannot use the native SAP HANA Transport in this system until you change the setting back again.



Enter the *Host* and *HTTP(S) Port* of your CTS system.

Enter the *Upload System SID*. The SID of the SAP HANA system where you are currently working on is suggested. Use the SID that you used when creating the development (source) system in TMS. In our example, this is LU2.

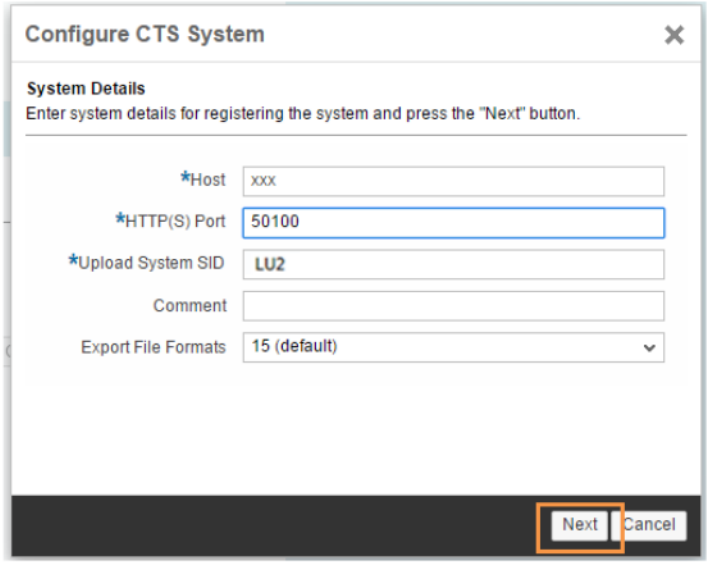
You can enter a comment.

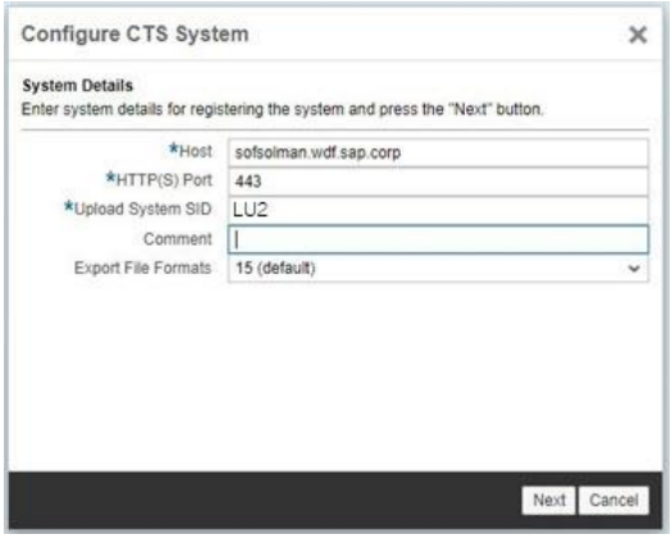
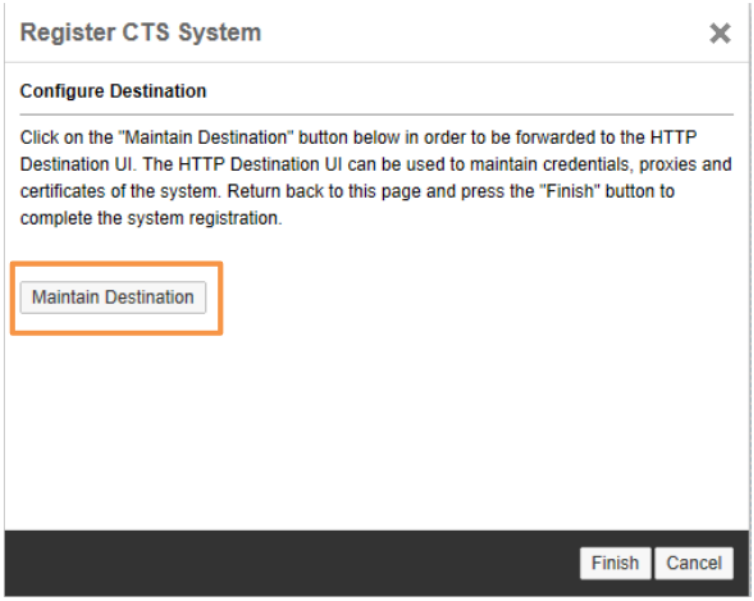
Change the *Export File Format* if needed. If all your systems are on the same release, the default should do the job. Details about the file formats and the version that match with which revision of SAP HANA are provided in SAP Note 1984354.

Click *Next*.

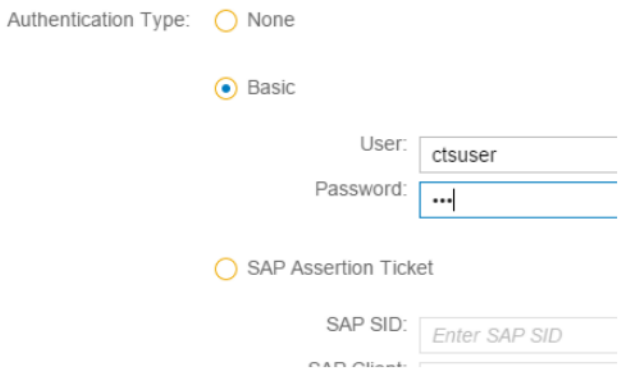
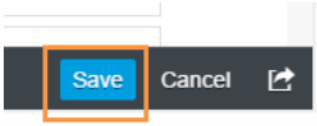
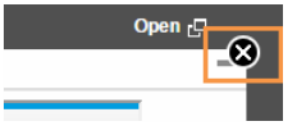
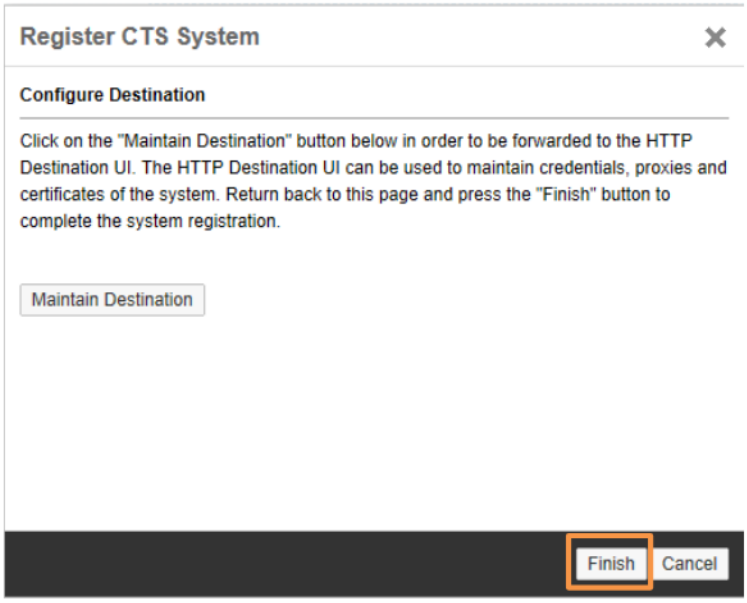
Note

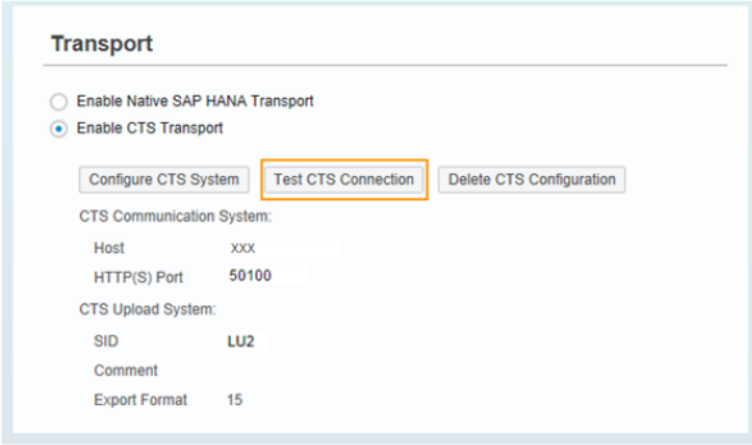
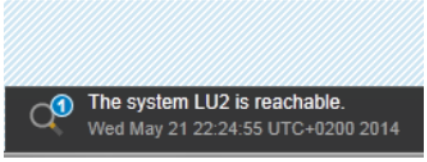
Use the real SID of your development system whenever possible. But you can also invent an SID for your development system. Always enter the SID under which this system is known in CTS in here (the SID that you created when adding the development system to TMS in chapter Configuring the Development



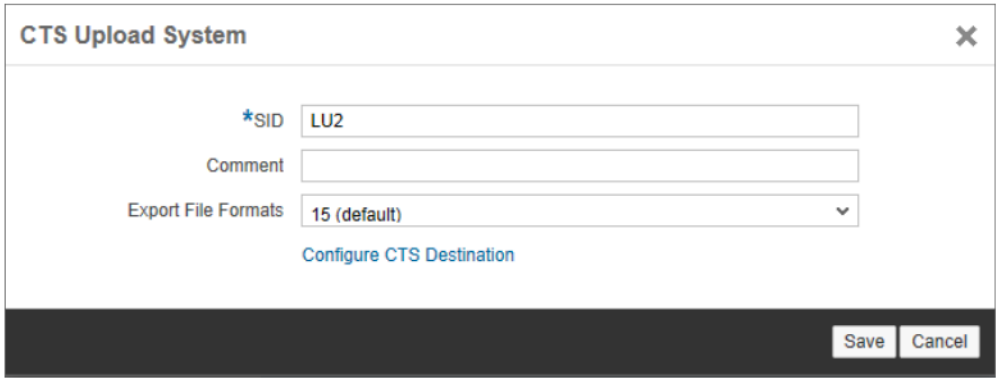
system (Export system). You can think of this configuration as a mapping of the SID that is used in CTS with the real SID of your SAP HANA source system. You execute this configuration on the source / development system – this is the system for which transport requests are created on the CTS system.	
For the SAP HANA Service in SAP Cloud Platform Neo environment: Enter the virtual host of the CTS system, and the *HTTP(S) Port* that you have configured in the cloud connector in chapter Configuring the SAP HANA Source System. In our example, this is `sofsolman.wdf.sap.corp`, and port `443`. For the upload system, use the SID that you used when creating the development (source) system in TMS. In our example, this is LU2. Click *Next.*	
Click *Maintain Destination* Do **not** click *Finish* right now	

A screen to maintain an HTTP destination opens. Check that the data that you already entered (Host and Port of your CTS system) is shown. Enter the Alias that you configured in Activate CTS Export Web Services (e.g. /001/export_cts_ws) as the *Path Prefix* For the SAP HANA service in SAP Cloud Platform Neo environment: As *Path Prefix*, enter the URL path that you configured in the cloud connector (previously configured in transaction SOAMANAGER) in step 17 of chapter Only relevant for SAP HANA Service in SAP Cloud Platform Neo Environment: Configure the Cloud Connector to allow Calls from SAP Cloud Platform to your CTS System). In our example, this is `/001/export_cts_ws`.	General Information · Proxy Details · Authentication Details · OAuth Details Extends: Not Applicable Description: *Enter Description* Host: xxx Port: 50100 Path Prefix: /001/export_cts_ws Timeout: -1
Only for the SAP HANA service in SAP Cloud Platform Neo environment: Set the proxy details as specified on the screenshot. Use the following fixed values: *Proxy Host*: `localhost` *Proxy Port*: `20003` See also: Connectivity for SAP HANA XS (Enterprise Version) under Consuming the Connectivity Service (HANA XS).	General Information · Proxy Details · Authentication Details · OAuth Details Proxy Type: None · HTTP · SOCKS Proxy Host: localhost Proxy Port: 20003 User: *Enter Proxy Username* Password: *Enter Proxy Password*
Maintain the section *Authentication* according to your needs. We recommend that you use *SAP Assertion Ticket*. Make sure that your environment is configured for using SAP Assertion Tickets. Details are available on the SAP Help Portal under Configuring Principal Propagation (Authentication Assertion Ticket). Just entering an SAP SID and an SAP Client on this screen is not sufficient. For more details on configuring Assertion Tickets with SAP HANA, see	HTTP Destination Details SSL Host Check: ✓ Authentication Type: None Basic User: Password: SAP Assertion Ticket SAP SID: CTS SAP Client: 001 SAML

also Configure Outbound SSO with Assertion Tickets. If your environment is not ready for this, you can also start with the *Authentication Type* Basic, for example for testing purposes.	
The *Authentication Type* that you use in here has to fit with what you configure for the CTS Export Web Service (see chapter Activate CTS Export Web Service where the *Provider Security* is configured). *Save* your settings. This automatically tests whether the destination works. You can only save the destination after the test was successful.	
Save your settings	
Close the pop-up window	
Click *Finish*	

The connection details are now shown in the section *Transport*. Click *Test CTS Connection*.	
At the very bottom of your screen, you should receive a message that the system with your SID is reachable.	

To change the CTS configuration, you can use the option *Configure CTS System*. This allows you to change the SID that is used in the CTS system for your SAP HANA development system, to add a comment or to change the export file format.



If you would like to switch to another CTS system, you first have to click on *Delete CTS Configuration*. After that, you can create a new configuration which can then point to your new CTS system.

Note

The *Export File Formats* are taken into consideration in the following cases

- When you export a Delivery Unit in *PRODUCTS* → *Delivery Units* you can choose the file format
- When configuring CTS+, you can choose the export file format for the respective SAP HANA system – this setting will then be used for every export
- If you transport natively via HALM, the format that the target system needs is automatically used (remember: you are starting the transport on the target system)
- When you assemble via the command line tool (hdbalm) you can add the format as a parameter

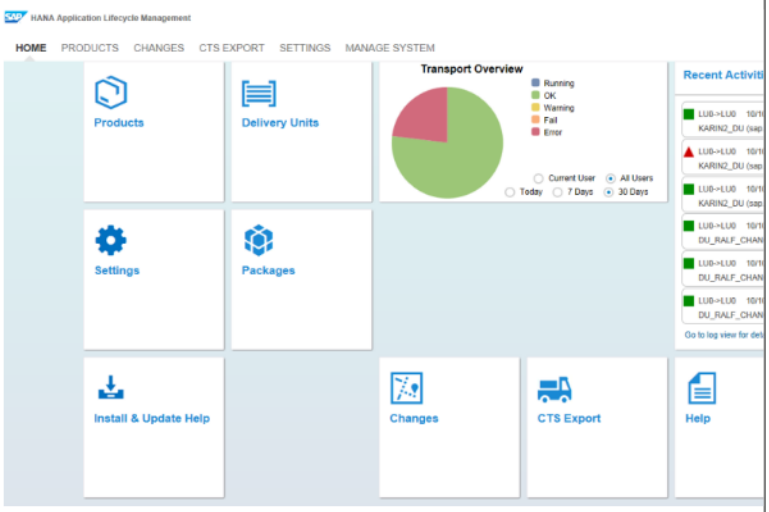
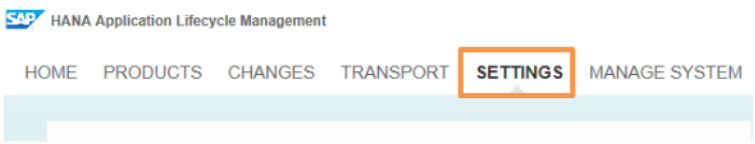
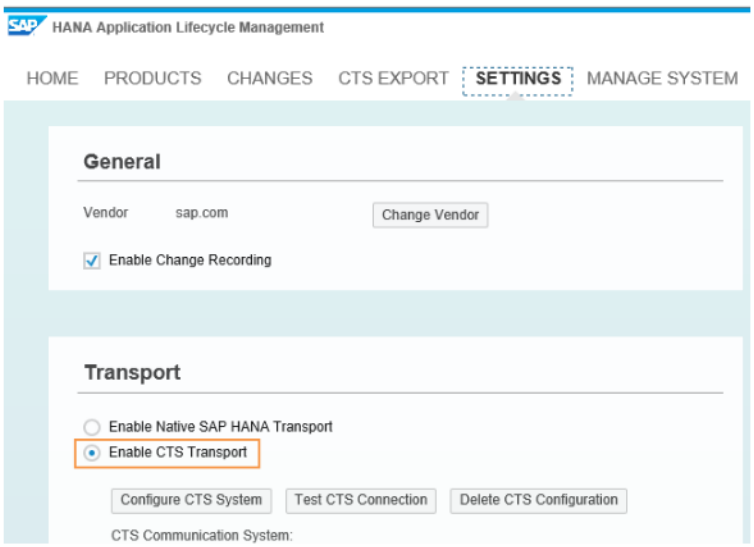
8.2 Configuring the SAP HANA Target Systems

If you use a CTS+ system without AS JAVA, you also have to enable CTS+ on all target systems This configuration is done in SAP HANA application lifecycle management (HALM).

CAUTION

If you use Multitenant Database Containers, make sure that you are logged on to the correct tenant. CTS+ settings in HALM are tenant specific. This means that you can also have different settings per tenant.

Note that in SAP HANA Studio you also have to configure the URL of your tenant in *System→ Properties →XS Properties*.

Open HALM on your target system. The URL is the following: http<s>://<server>:80<instance number>/sap/hana/xs/lm Log on with a user who has the roles *sap.hana.xs.lm.roles:Administrator*, *sap.hana.xs.admin.roles:HTTPDestAdministrator* and *sap.xs.hana.admin.roles:RuntimeConfAdministrator* assigned	
Choose *SETTINGS*	
Select *Enable CTS Transport*. No further configuration is required. Do not click on *Configure CTS System* and do not enter any details for the CTS system or the connection. **Note** When you first open this screen, *Enable Native SAP HANA Transport* is selected as the default setting for transports. Changing this setting implies that you cannot use the native SAP HANA Transport in this system until you change the setting back again.	

Repeat the steps described in this chapter for all your SAP HANA target systems.

9. Using SAP HANA with CTS

If CTS is enabled, you have two options for transports: You can either transport full Delivery Units (DU) based on the active state of the contained objects or – if Change Recording is enabled – only the changed objects per Delivery Unit based on released changes. You can either use SAP HANA application lifecycle management (more details are provided in chapter Transporting Changelists with HALM) or the SAP HANA studio (more details are provided in chapter Transport via SAP HANA Studio) for exporting.

Users who shall be able to execute the export to CTS have to have the role `sap.hana.xs.lm.roles::ExecuteTransport` assigned. More information on the roles is available in the SAP HANA Application Lifecycle Management guide under SAP HANA Application Lifecycle Management Roles.

9.1 Transporting a Delivery Unit with HALM

In this chapter, you can see how the transport of a DU with HALM and CTS works. To transport a Delivery Unit through your system landscape, you have to execute the following steps:

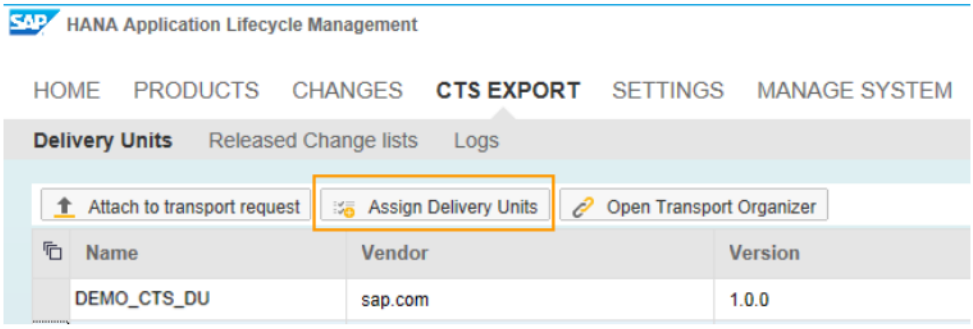
- Assign a Delivery Unit to CTS
- Export the Delivery Unit
- Release the transport request
- Import the transport request

The following chapters describe the different steps in detail.

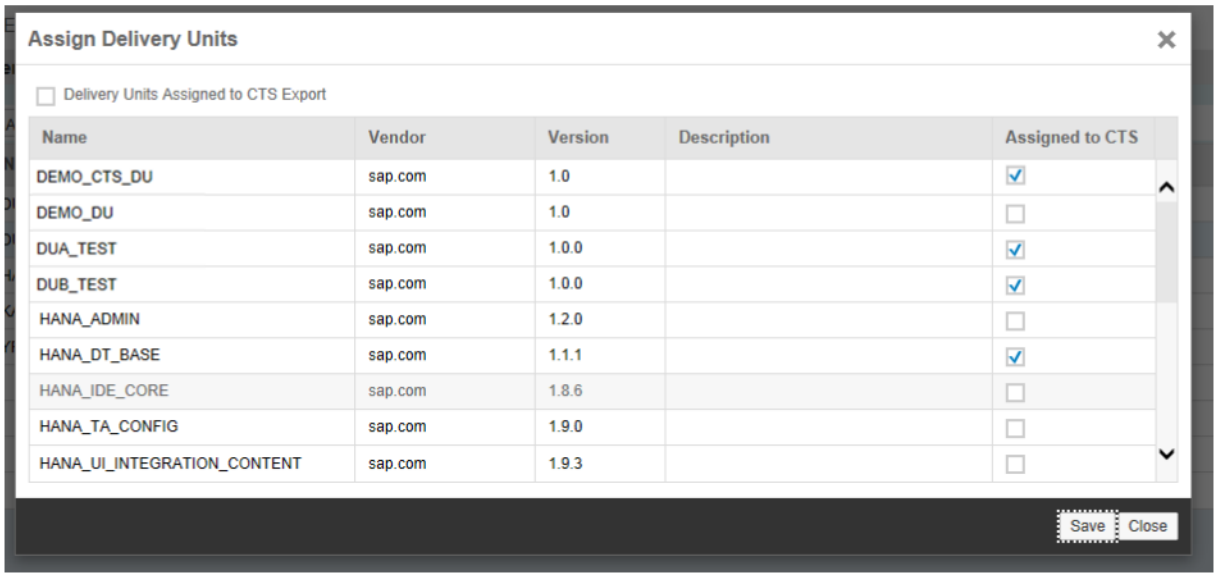
9.1.1 Assign a Delivery Unit to CTS

In the previous chapters, you have configured your CTS system and the SAP HANA system to be able to transport SAP HANA objects with CTS. Nevertheless, you are not yet able to export any object to CTS. You have to execute one additional configuration step; you have to assign Delivery Units to CTS. You can only transport the DU (or released changes) with CTS if the DU is assigned to CTS.

To assign a Delivery Unit to CTS, open HALM on your development (source) system go to *CTS Export → Delivery Units* and click *Assign Delivery Units*.



Set *Assign to CTS* for those DUs that you would like to transport with CTS.



This is a one-time setting. You don't have to execute this step before each transport. Only Delivery Units that are assigned to CTS can be transported. All other DUs cannot be transported any more – not even with HALM native transport.

9.1.2 Export the Delivery Unit

You can now transport a Delivery Unit via CTS.

This section shows how to attach Delivery Units to a transport request. The functionality described in here is available in SAP HANA Application Lifecycle Management as of SAP HANA SPS 08.

The user attaching the SAP HANA content to transport requests should have adequate permissions on the SAP HANA source system. On the CTS system, you can use the authorizations of the delivered role SAP_CTS_PLUS as a template to transport non-ABAP objects

CAUTION

Do not use this role directly. Instead, use it as a template and copy it to your own role (Z_*). For more information on the creation and maintenance of roles in ABAP take a look at the SAP Help Portal under Role Administration.

Note

In addition the role SAP_BC_WEBSERVICE_CONSUMER is required or appropriate permissions for Web Service `EXPORT_CTS_WS` have to be assigned in the user management of AS ABAP of the CTS system. For details, refer to the SAP Help portal under Authorizations and to SAP Note 1003674.

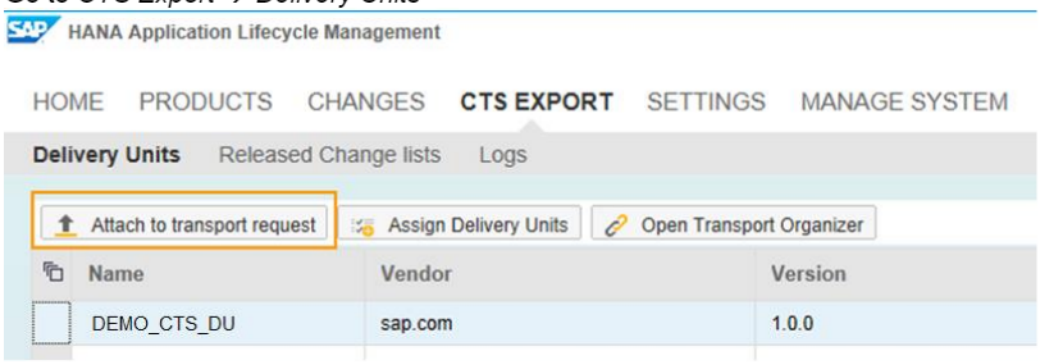
Authorizations that are required in addition for the different releases are listed in the *Known errors section for the release and Support Package level of your communication system in* SAP Note 1003674. Make sure that you also assign these authorizations to this user.

Note

If you have configured the Authentication Type *SAP Assertion Ticket in* Configuring the SAP HANA Source System, all SAP HANA users that should be allowed to attach SAP HANA content to transport requests have to have a corresponding user with the same user ID in the client of the CTS system that you are using for transports (= the client where you activated the Transport Organizer Web UI).

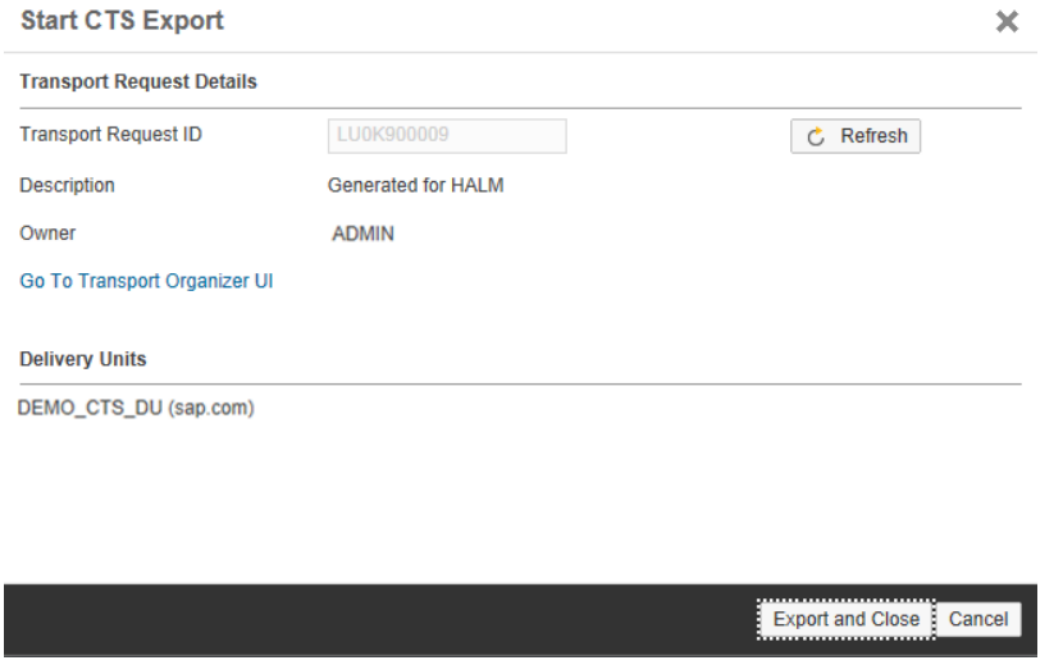
Do the following to export a Delivery Unit to a transport request in CTS:

1. Go to *CTS Export → Delivery Units*



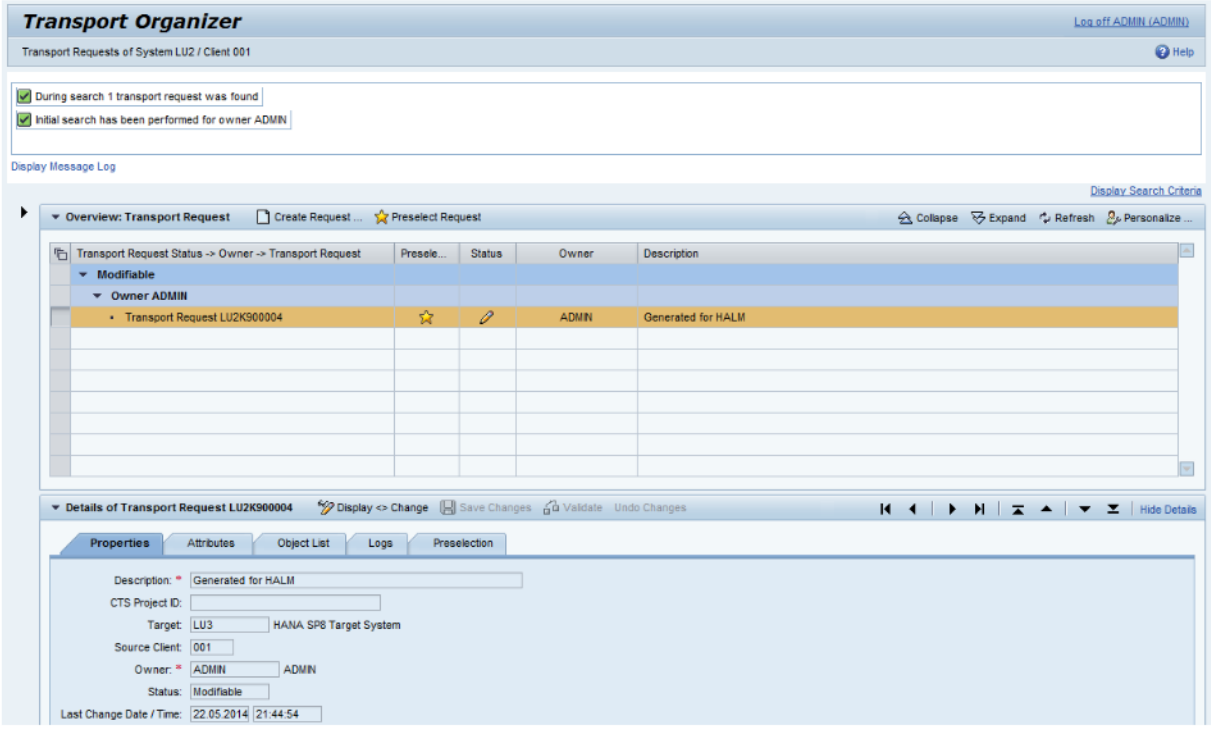
Mark one or several Delivery Units and click *Attach to transport request*.

2. On the pop-up, you can see which transport request is used. In addition, some details for this request are shown.

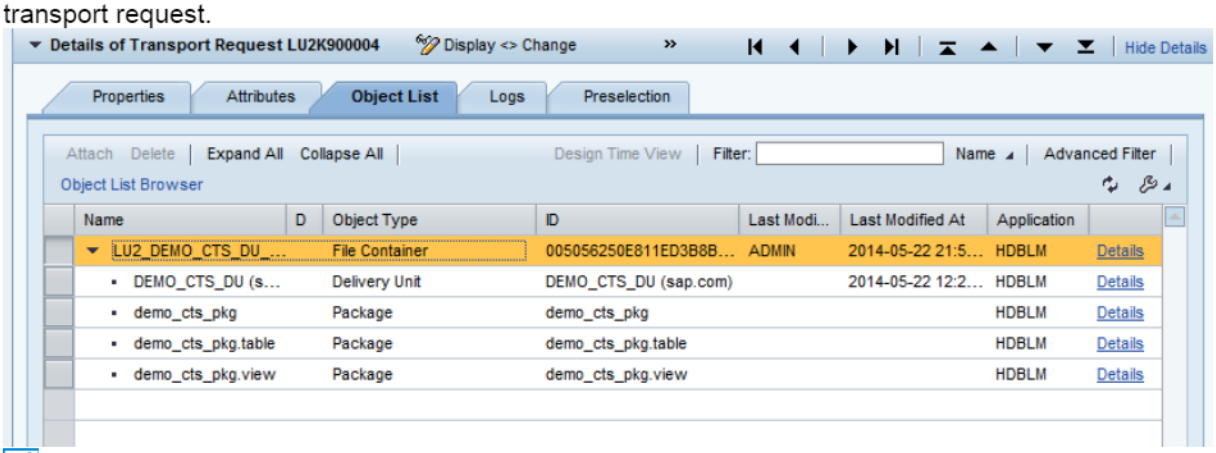


Click on *Go To Transport Organizer UI* if you need to know more details for this request, to change properties, or to preselect, or create another transport request. Return to this screen after you did your changes and click *Refresh*. Click *OK* as soon as the transport request that you need is displayed.

3. The Transport Organizer UI is used to create transport requests, manage existing ones, release them and check and change details like e.g. the object list. For information on Transport Organizer Web UI, see SAP Help Portal under Transport Organizer Web UI (CTS_ORGANIZER).



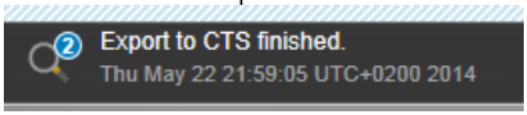
On the tab *Object List*, you can find details on the objects that have been attached to the selected transport request.



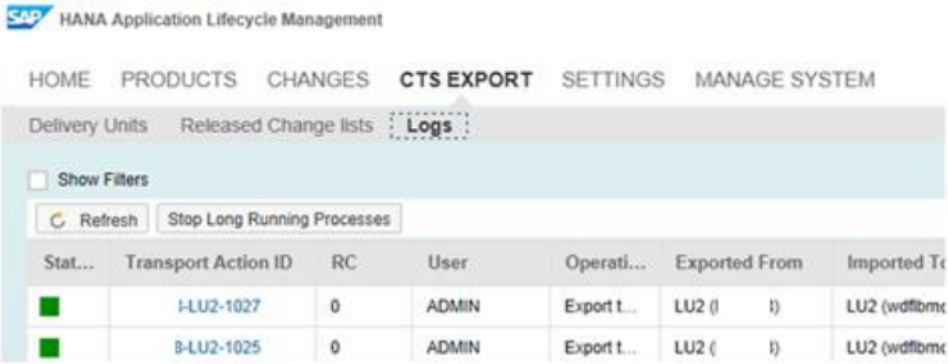
Note

the following is relevant if you use / plan to use Change Recording:
In the Object List, you will always find the Delivery Unit as the leading element. The Changes that you attached to the transport request in HALM are not shown in here anymore. If Changes were exported, the Object List contains the Delivery Unit and the changed objects, not the complete Delivery Unit. You can find information about the change that was used to attach the object to the transport request if you click on *Details* in the row showing the DU.

4. The status of the export is shown at the bottom of the screen.



5. Go to *CTS EXPORT* → *Logs* to check details of your export.



6. Click on your export to view the log.
7. On the pop-up, you can find the log of your export. The log also provides a link to the Transport Organizer UI. You can use it to release the transport request.

Note

If you encounter problems when attaching objects or releasing the request, check whether you can find details for errors in the Application Log (transaction SLG1 on your CTS system) for object `CTSPLUS`.

Note

It depends on the configuration of your source system in TMS whether a transport request is created or an existing one is used (parameter WBO_GET_REQ_STRATEGY – chapter Configuring the Development system (Export system). More details are provided on the SAP Help Portal under Choosing a Transport Strategy for Source Systems.

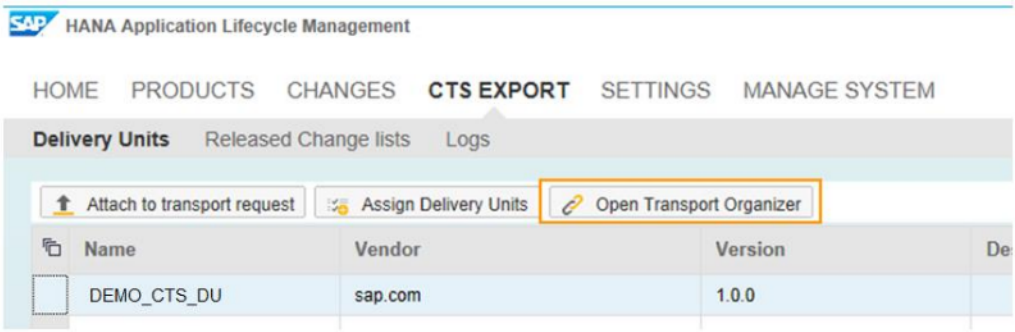
9.1.3 Release the Transport Request

You can use one transport request to transport several Delivery Units. Depending on the configuration of your source system in TMS a transport request is released either automatically or manually (parameter WBO_REL_REQ_STRATEGY). More details are provided on the SAP Help Portal under Choosing a Transport Strategy for Source Systems.

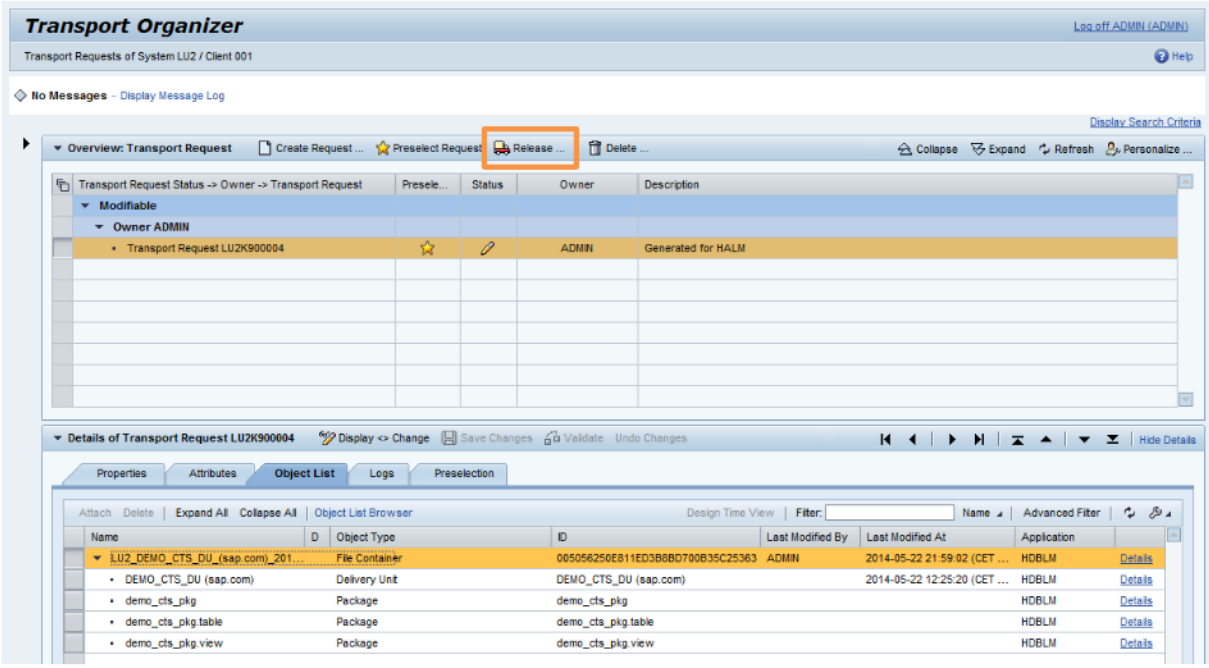
Do the following to release a transport request manually:

1. Open the Transport Organizer UI for your transport request. You can either do so by using the link provided in the export log (last step in previous chapter) or you can go to *CTS EXPORT*

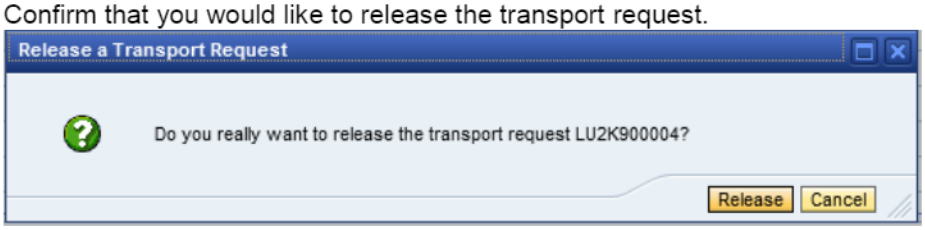
→ *Delivery Units* and click *Open Transport Organizer*



2. Make sure that the correct transport request is marked and click *Release*



3. Confirm that you would like to release the transport request.



The transport request is now part of the import queue of the first target system – LU3 in our example.

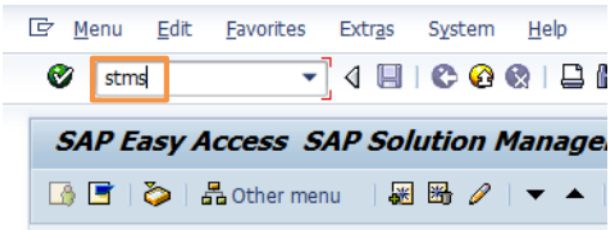
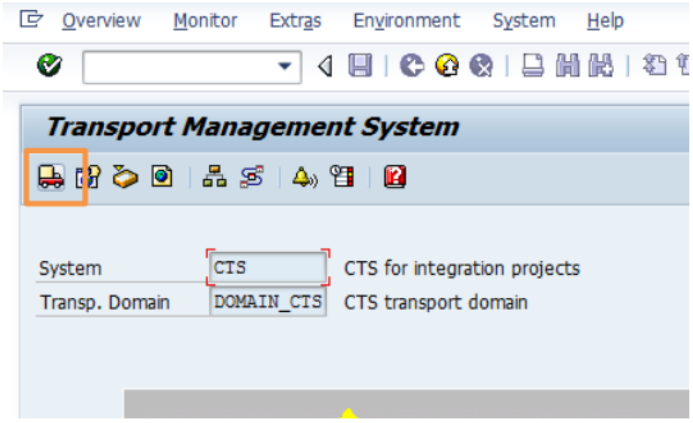
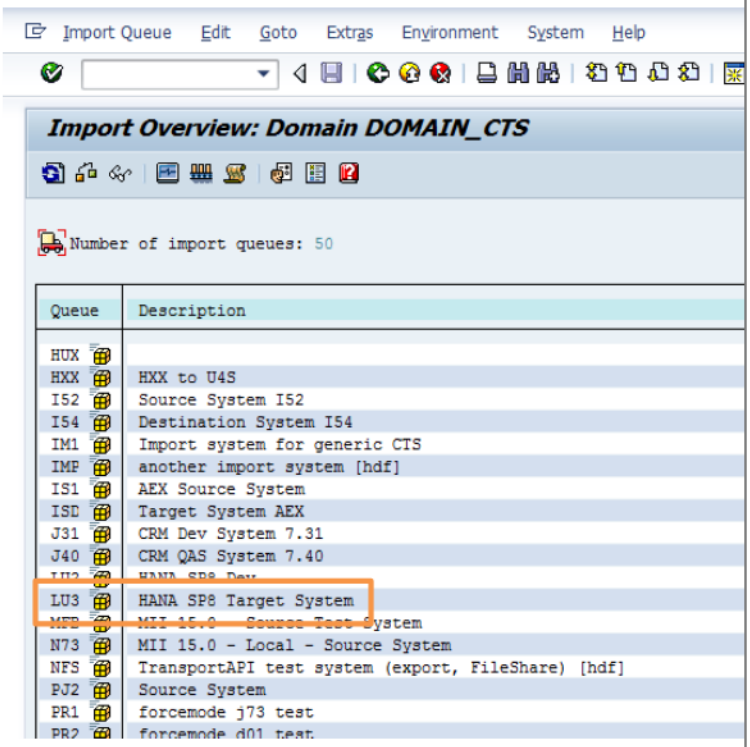
9.1.4 Import the Transport Request

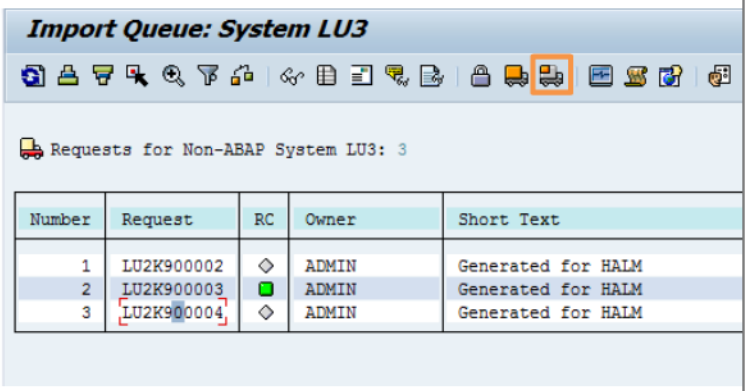
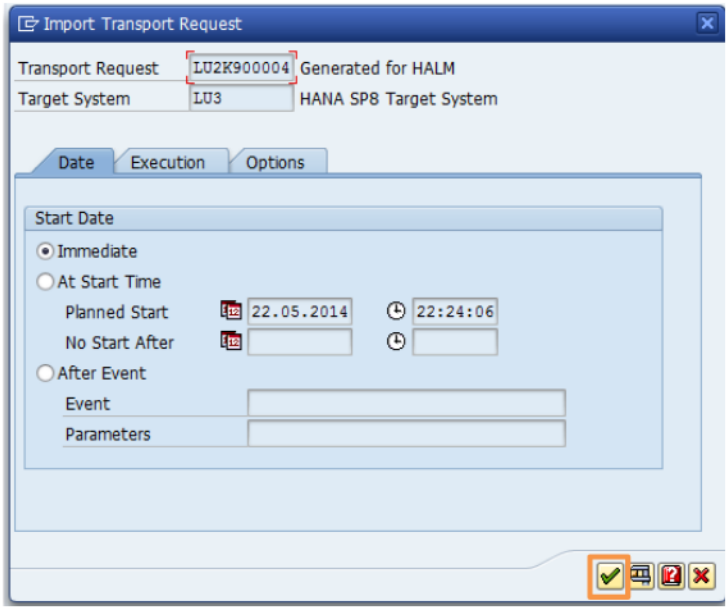
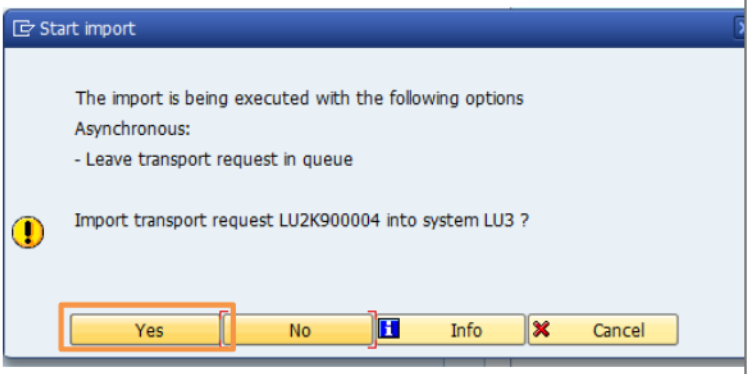
All transport requests that are released become part of the import queue of the first target system. You can now import one, several, or all of them. To do so, you have to log on to the CTS system.

Note

As of CTS Plug-In 2.0 SP02 (SL Toolset 1.0 SP05), a new browser-based Import UI is available. Alternatively, you can use the Import UI to perform the import. For more information, see Performing Imports Using the Import Queue Web UI.

The following procedure describes how to perform the import in the Transport Management System (transaction STMS).

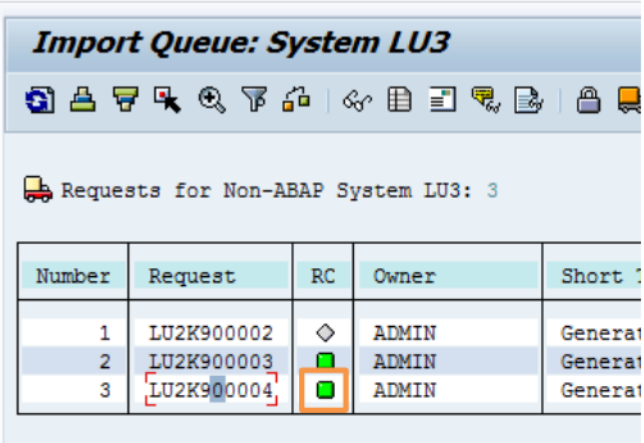
Log on to your CTS system and open transaction *STMS*.	
Choose *Import Overview*	
Double-click on the SID of your target system – LU3 in our example.	

Mark the requests that you would like to import and choose *Import Requests*. If your request is not shown immediately, click *Refresh*.	
Choose *Continue* to start the import immediately or define an appropriate time frame or event when the import should be started and choose *Continue* afterwards.	
Confirm that you would like to import the request (choose *Yes*).	

After having imported a request, a return code will be shown for each request whether the import was successful or not. Take a look into the next chapter to learn more about return codes.

Note

Usually, the deployment of SAP HANA content will include activation of the SAP HANA content. If activation is not triggered, make sure that you have implemented the latest version of SAP Note 1731044 on the host of the CTS Deploy Web Service.



If the import of a transport request was successful, the transport request will become part of the queue of the following system (HNP in our example) and you can import the request into this system using the same procedure as described in this chapter for the test system.

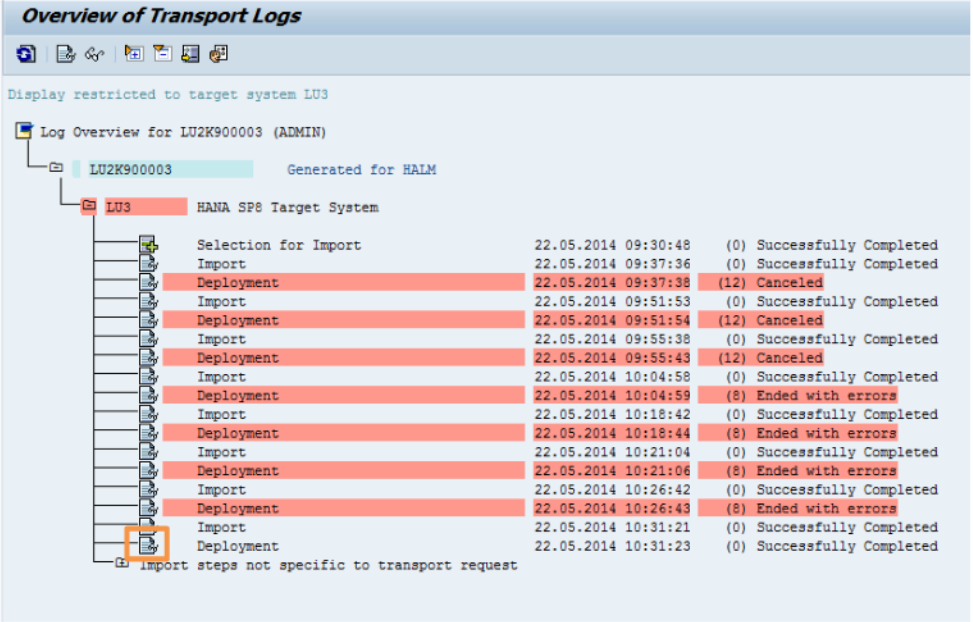
9.1.5 Meaning of Return Codes - Reading the Deployment Log-File on CTS side

Four different return codes can appear in the import queue:

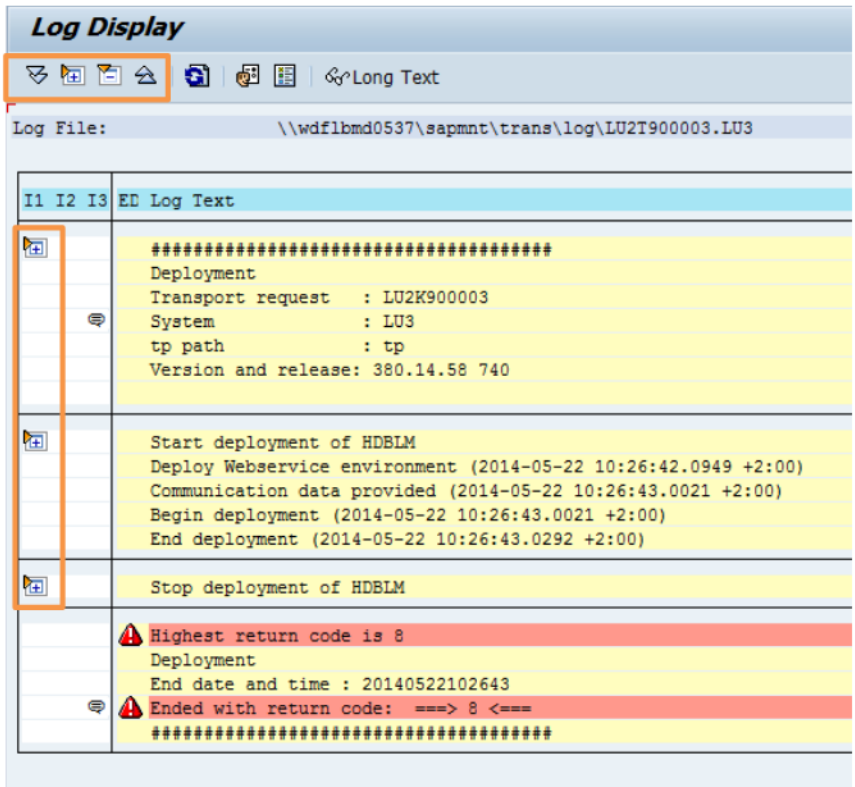
- RC = 0: The import has been successfully completed. Icon in the queue:
- RC = 4: Warning that not everything was ok but import in principle worked. Icon in the queue:
- RC = 8: Errors for the content occurred when importing. A subsequent transport is required. Icon in the queue:
- RC = 12: There were issues with the tool during the import. The request can be imported again after having fixed the issue. Icon in the queue:

You can double-click on the icon for the return code for one transport request to learn more about the import. Especially if the RC is not zero, it might be interesting to find out what went wrong. Clicking on the return code will bring up the overview of the Transport Logs.

You can click on the icon in front of the step *Deployment* to view the deployment log.

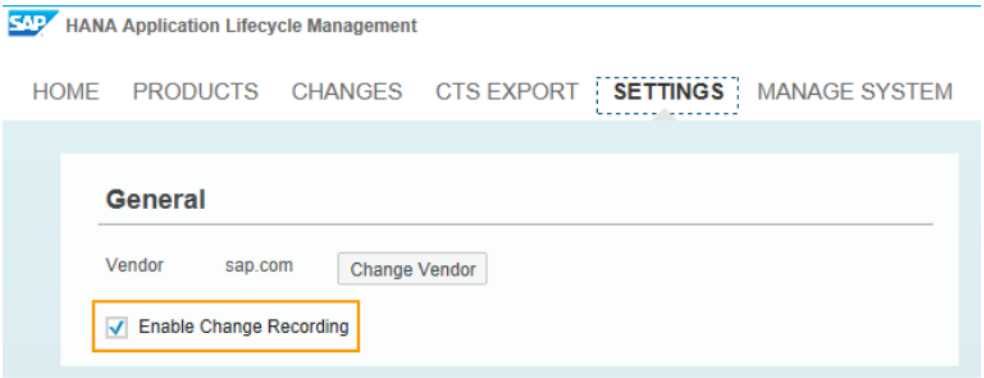


You can see the deployment log. For more details, you can use the expand-buttons.

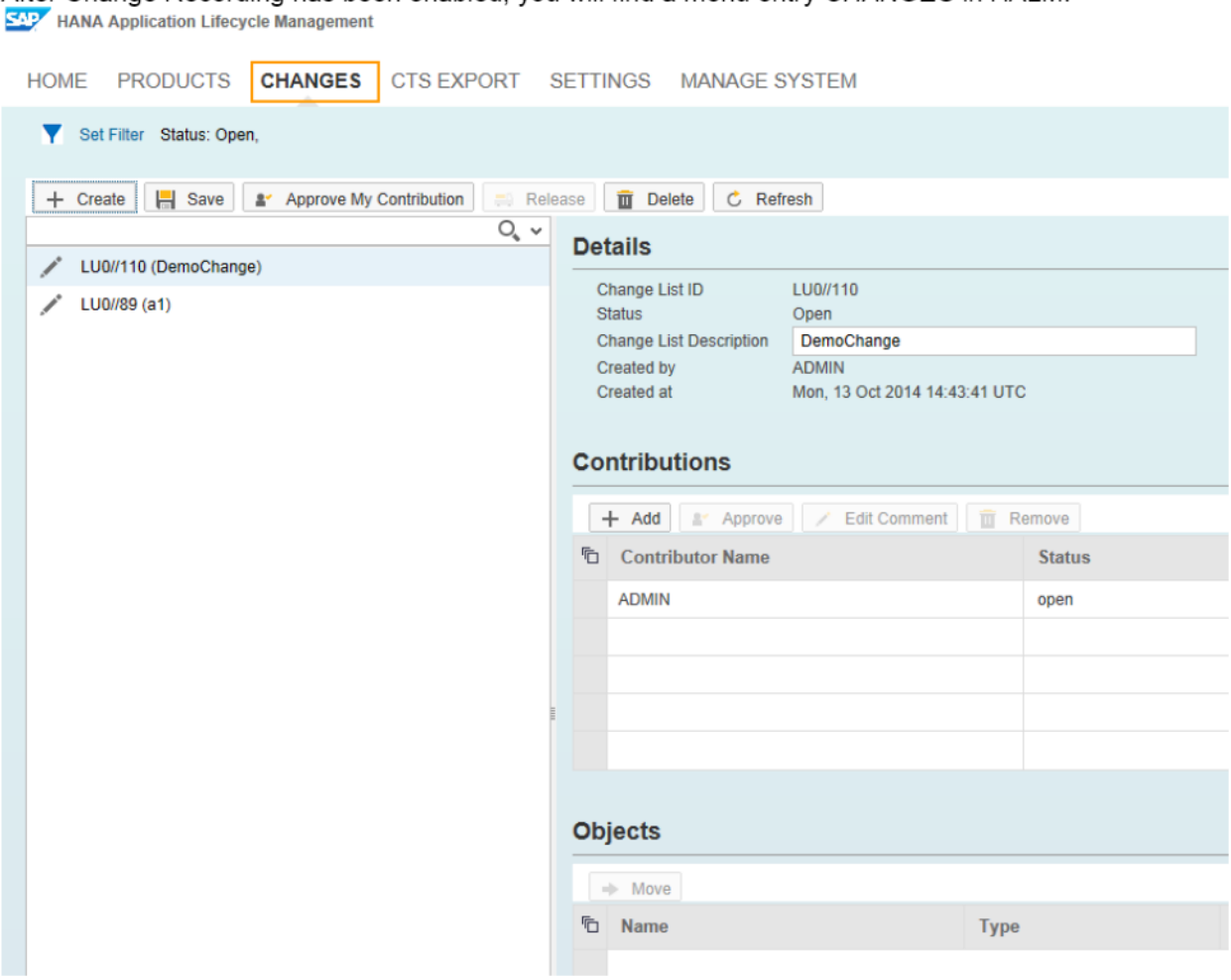


9.2 Transporting Changelists with HALM

Instead of transporting complete Delivery Units as described in chapter Transporting a Delivery Unit with HALM, you can also transport changes via HALM. The prerequiste for this is that Change Recording is enabled in the *SETTINGS* of your SAP HANA System.

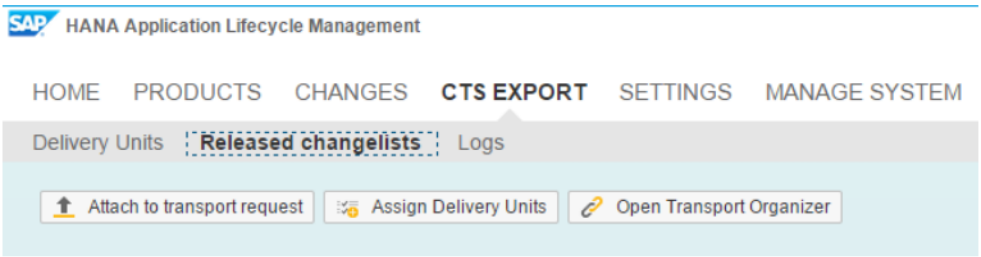


After Change Recording has been enabled, you will find a menu entry *CHANGES* in HALM.



On this page, you can work with the changes. You can create changes, add contributers, check for assigned objects and move obejcts between open changes. When changes are done, you can also use this page to approve the contributions and release changes.

Released changes can then be transported with CTS. To do so, go to *CTS EXPORT → Released Changelists*.



In here, you can attach the released changelists to a transport request. When doing so, a predecessor check is automatically done. If there are changelists which were released earlier than the one that you are about to attach to a transport request you are informed about this fact. Also on this screen, you can assign Delivery Units to CTS. This assignment is a prerequisite for transporting changelists via CTS (refer to chapter Assign a Delivery Unit to CTS for details). The button *Open Transport Organizer* will show the transport organizer which runs on the CTS system and is needed to e.g. create or release transport requests.

Note

If you experience poor performance of SAP HANA Application Lifecycle Management when you choose the *Attach to transport request* button, check SAP Note 2626461 for a way to select only specific DUs.

9.3 Transporting a Delivery Unit with SAP HANA Studio

What is described in the remainder of this chapter is valid for SAP HANA SPS08 Revision 1 and up. Screenshots and texts reflect the behaviour and UI in SPS09.

Note

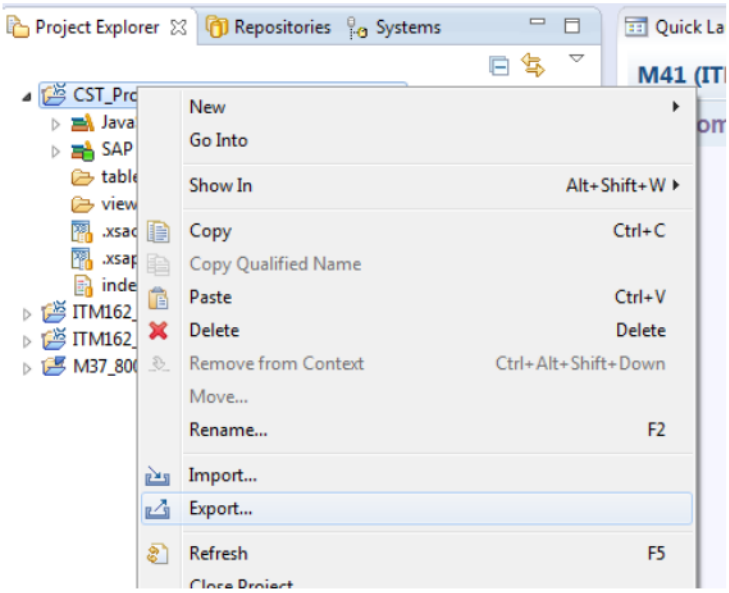
If any of your SAP HANA systems that is involved in the transport, is still on SAP HANA SPS08 revision 80, please refer to the guide Using CTS+ for SAP HANA - What to consider for upgrades to SAP HANA SPS08 and How to Configure SAP HANA for CTS for SAP HANA SPS08 (especially chapter 9). These guides will explain differences and topics to consider when transporting with or without Change Recording in SPS08.

Recommendation

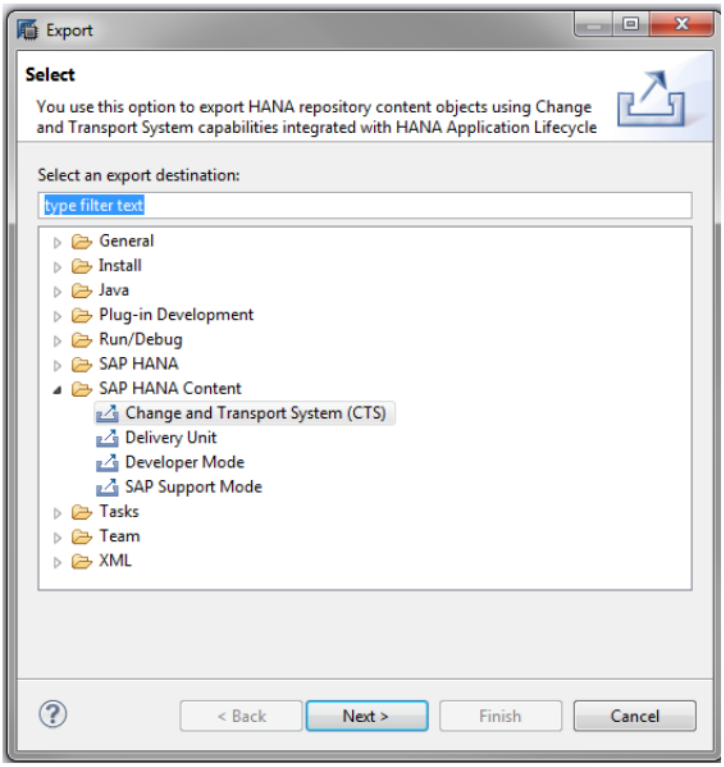
Use SAP HANA application lifecycle management if you would like to execute transports based on released changelists. The chapter Transport Changes via HALM describes how to do this.

Before you can start the export, make sure that the respective Delivery Unit is assigned to CTS. Details are described in the chapter Assign a Delivery Unit to CTS.

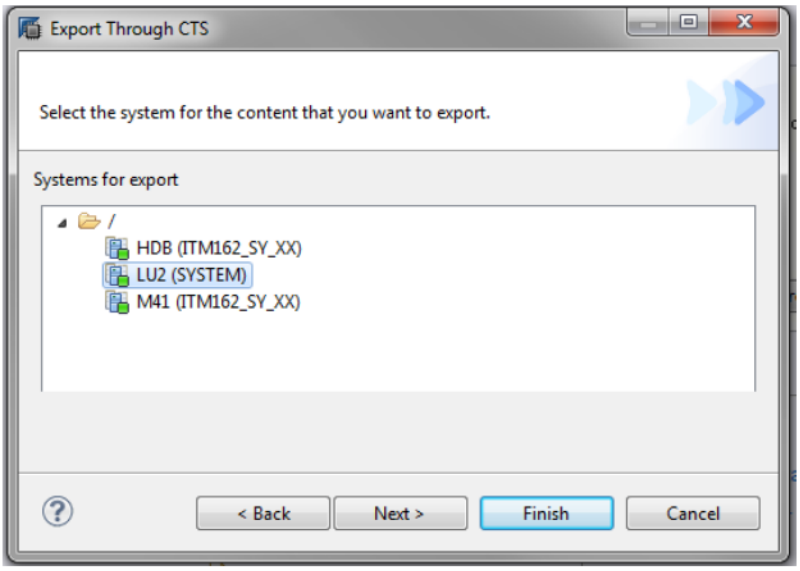
To start the export via CTS in the SAP HANA Development Perspective, click with the right mouse button. Choose *Export*.



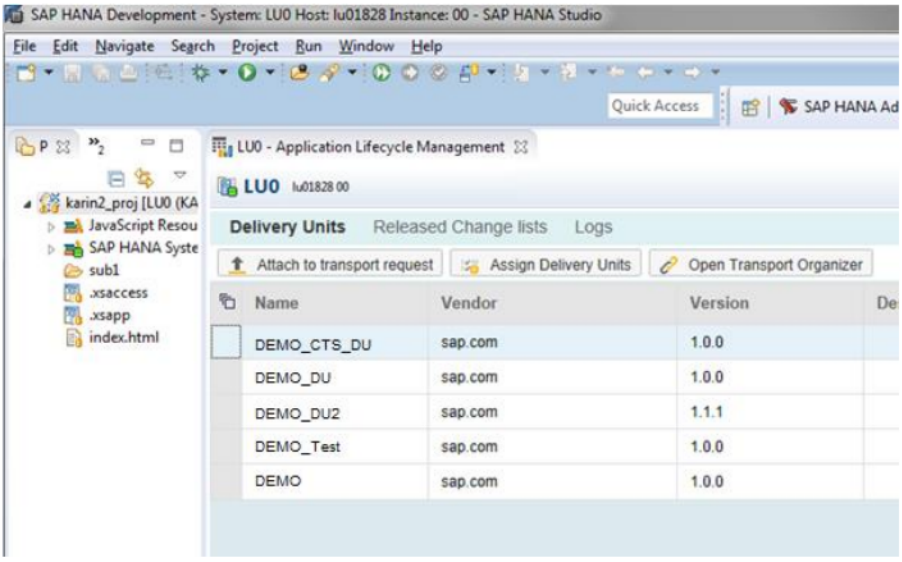
Then choose *SAP HANA Content → Change and Transport System (CTS)* and click on *Next*.



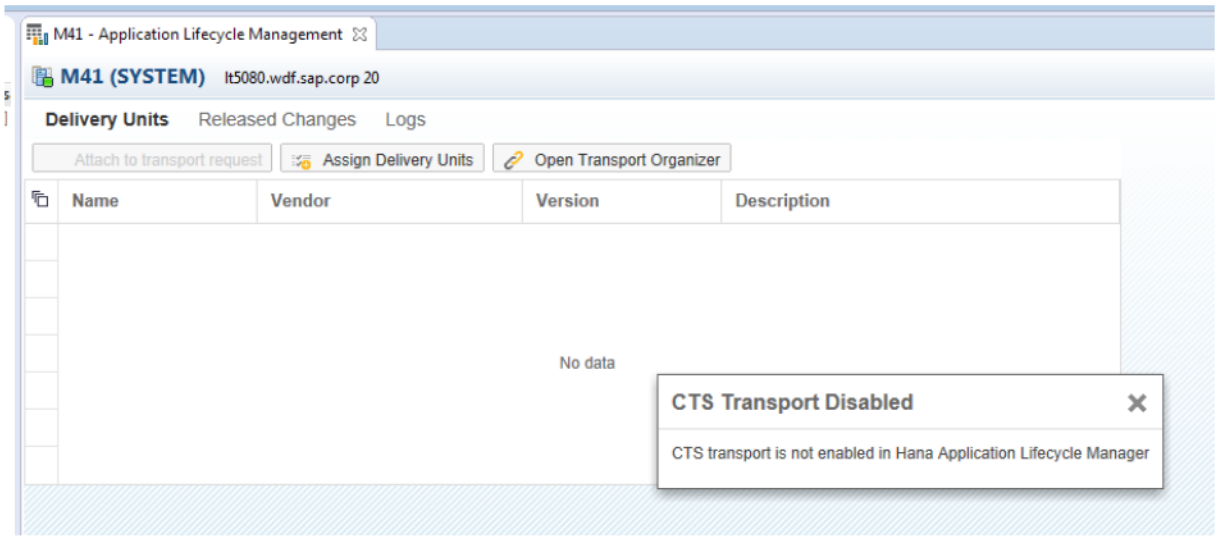
Mark the system for which you would like to do an export and click on *Finish*.



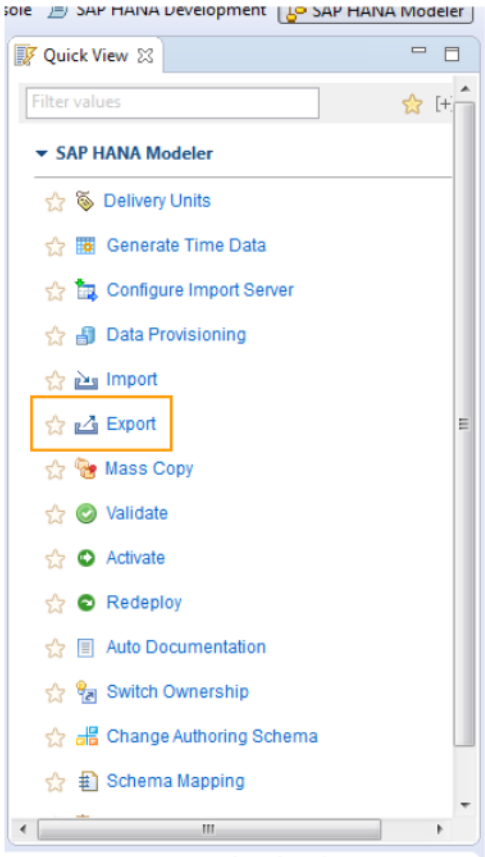
This will open up the SAP HANA application lifecycle management inside the SAP HANA Studio:



If the system that you have chosen is not configured for CTS, a message will be shown that CTS is not available for this system.



To start the export in the Modeler Perspective, click on *Export*:



The following steps are similar to what you have seen before for the Development Perspective.

You can now follow the steps described in chapter Transporting a Delivery Unit with HALM

9.4 Transporting Changelists with SAP HANA Studio

What is described in the remainder of this chapter is valid for SAP HANA SPS08 Revision 1 and up. Screenshots and texts reflect the behaviour and UI in SPS09.

Note

If any of your SAP HANA systems that is involved in the transport, is still on SAP HANA SPS08 revision 80, please refer to the guide Using CTS+ for SAP HANA - What to consider for upgrades to SAP HANA SPS08 and How to Configure SAP HANA for CTS for SAP HANA SPS08 (especially chapter 9). These guides will explain differences and topics to consider when transporting with or without Change Recording in SPS08

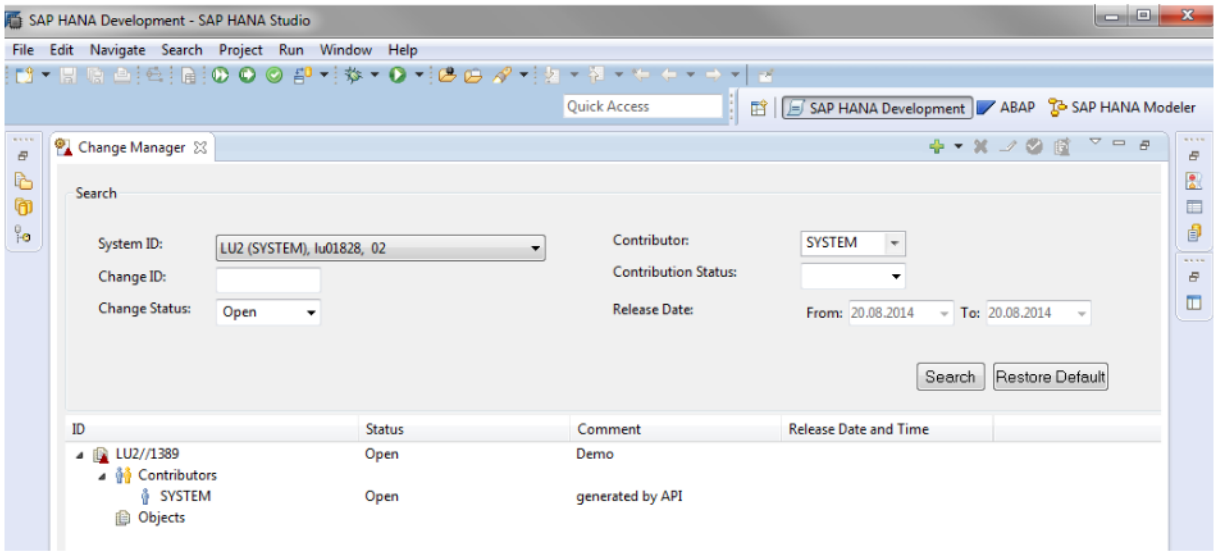
Recommendation

Use SAP HANA application lifecycle management if you would like to execute transports based on released changes. The chapter Transport Changes via HALM describes how to do this.

Before you can start the export, make sure that the respective Delivery Unit is assigned to CTS. Details are described in the chapter Assign a Delivery Unit to CTS.

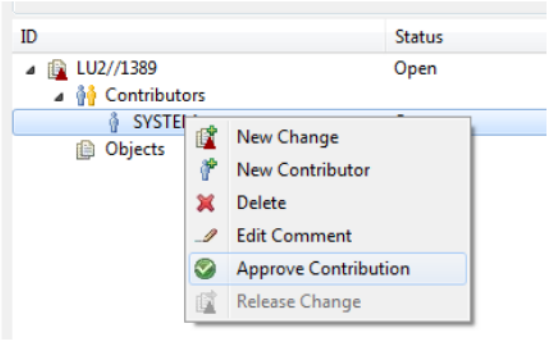
You first have to approve the contributions to a changelist and release the changelist. In the SAP HANA Studio, this is done in the Change Manager view.

In this view, you can search for Changes, view and work on existing ones or create new Changes.

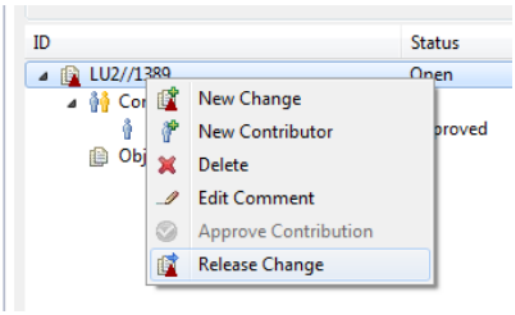


A Change can only be transported after the contributions have been approved and the Change has been released.

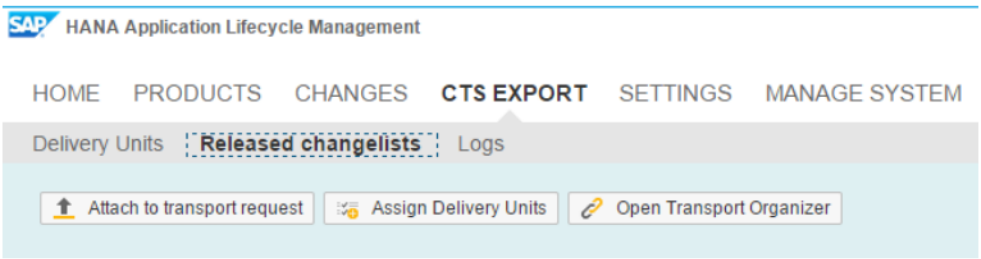
To approve a contribution, click on the respective user ID with the right mouse button and choose *Approve Contribution*.



After all the Contributions have been approved, you can release the Change. Click on it with the right mouse button and choose *Release Change*.

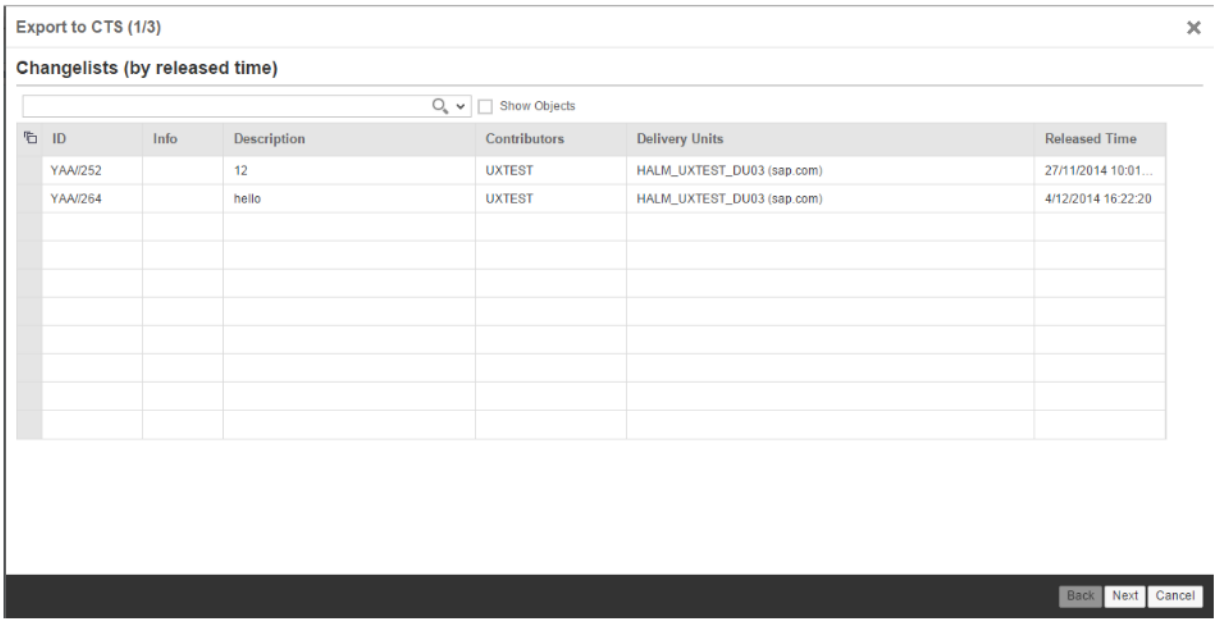


After that you can transport the Change. Use one of the two options described in the previous chapter (SAP HANA Development Perspective or Modeler) to start an export via CTS. In the SAP HANA application lifecycle management, go to the menu entry *CTS EXPORT → Released Changelists*.

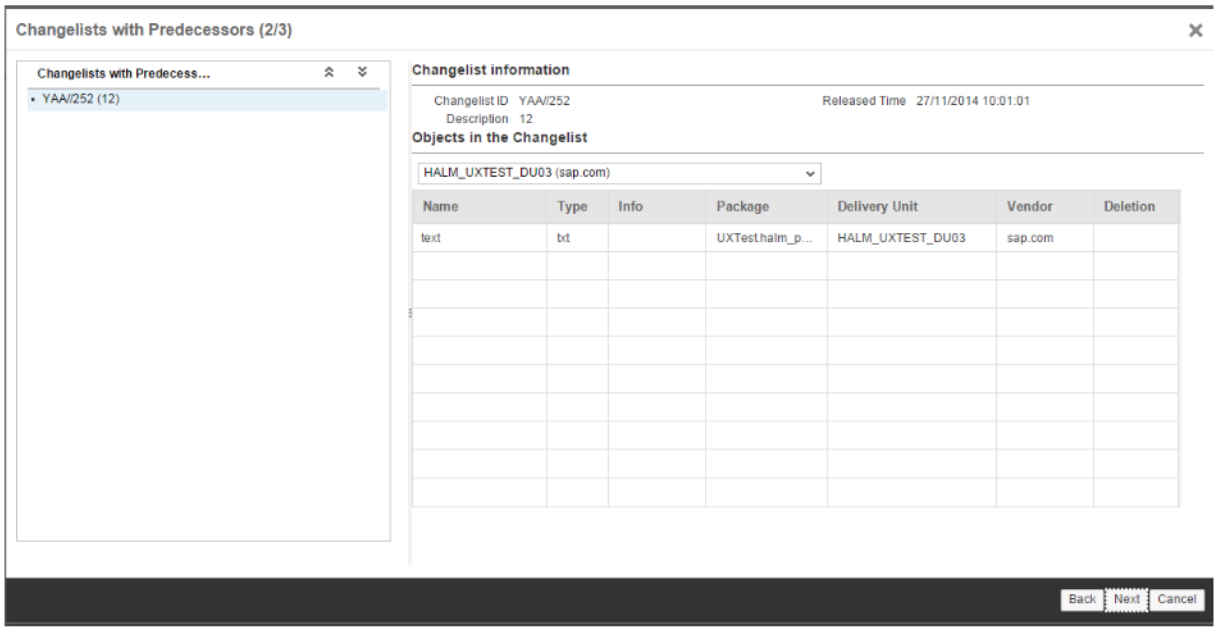


(If the system that you have chosen is not configured for CTS, a message will be shown that CTS is not configured.)

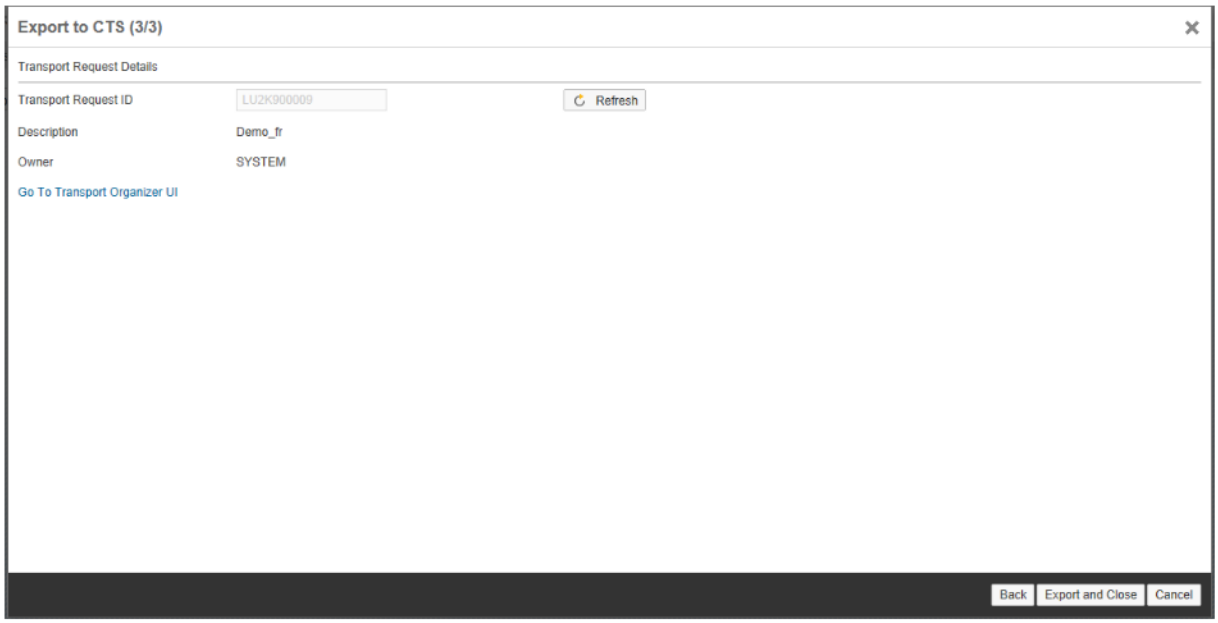
Click on *Attach to transport request* to export a changelist. You will see those changelists that are ready to be transported. On this screen, you can also set the option *Show Objects*. Use this option if you would like to see the objects that are part of this Change. Mark the one (or several) that you would like to transport and click *Next*.



You will find a summary of what you have chosen for export and a list of predecessor changelists if there are some. Click again on *Next*.



A transport request is requested from the CTS system. Depending on your configuration, a new one is created or an existing open one can be reused (this depends on the transport strategy that you have configured in the last step of chapter Configuring the Development system (Export system).



You can use the link *Go To Transport Organizer UI* to find out more about this transport request or to create a new one. Always click *Refresh* on this screen after you finished your changes in Transport Organizer. Click on *Export and Close* when you are satisfied with the transport request.

You can now release the transport request and import it into e.g. your test system. Details are described in chapters Release the Transport Request and following.

10. Appendix

10.1 Other Options for Managing Transports

In some cases, SAP HANA content should be kept together with ABAP, SAP BusinessObjects or Java content. CTS and CTS+ on their own cannot help here. There are tools in SAP Solution Manager that can help you to manage change requests and keep changes done in different systems together. These tools are called Change Request Management and Quality Gate Management (QGM). Details for both are provided on SAP Support Portal -> *Change Control Management*.

If you would like to transport SAP HANA content which is closely related to and exclusively used by ABAP, you can also use SAP HANA Transport for ABAP. For more information, see Transport Scenarios for SAP HANA Content.