How To... Configure SAP HANA for CTS

Applicable Releases:
SAP Solution Manager 7.1 SPS05
SAP HANA Appliance Software SPS05

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## Typographic Conventions

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<table>
<thead>
<tr>
<th>Icon</th>
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<td>Recommendation or Tip</td>
</tr>
<tr>
<td>🔴</td>
<td>Example</td>
</tr>
</tbody>
</table>
Table of Contents

1. Scenario ................................................................................................................................ 2

2. Background Information ..................................................................................................... 4

3. Prerequisites ........................................................................................................................ 4

4. Restrictions and Recommendations ................................................................................. 4

5. Basic configuration for CTS ............................................................................................... 5
   5.1 Configuring the Transport ............................................................................................. 5
      5.1.1 Configuring the CTS Deploy Web Service ....................................................... 6
      5.1.2 Configuring the Transport Organizer Web UI ................................................ 10

6. Configuring the SAP HANA Application Type ................................................................. 12

7. Configuring the SAP HANA Landscape .......................................................................... 14
   7.1 Configuring the Transport Landscape in TMS ............................................................ 14
      7.1.1 Configuring the Development system (Export system) ................................ 14
      7.1.2 Configuring the Test and Production System (Import Systems) ............ 17
      7.1.3 Transport Landscape: Defining Transport Routes ........................................ 21
   7.2 Configuration for Export .............................................................................................. 25
      7.2.1 Activate CTS Export Web Services ............................................................... 25

8. Using SAP HANA with CTS .............................................................................................. 31
   8.1 Attaching Delivery Units to a Transport Request .......................................................... 31
      8.1.1 Configure Connection to CTS Communication System ................................. 31
      8.1.2 Select Objects and Attach to Transport Request ............................................. 32
   8.2 Importing Transport Requests with SAP HANA content ............................................ 41
      8.2.1 Meaning of Return Codes - Reading the Deployment Log-File on CTS side 43
   8.3 Advanced Usage of SAP HANA with CTS+ ................................................................. 44
      8.3.1 Transport Organizer Details ........................................................................... 44
      8.3.2 Tools for managing transports ....................................................................... 45
1. **Scenario**

A while ago, 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. In this guide, we will use the abbreviations HANA or HDB interchangeably, which stands for HANA DataBase. This guide shows step by step – including sample screenshots - how the configuration is done. If you already use CTS, e.g. to manage non-ABAP transports for applications like the SAP NetWeaver Portal or to transport your BW ABAP objects, 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 now possible. You can model your landscape for your SAP HANA systems in Transport Management System (TMS) in the same way as any other non-ABAP application supported by CTS.

The following picture shows the systems that are involved in the scenario. The systems **Source** and **Target** are just examples to illustrate that there are systems where the objects are exported and others where an import has to be executed. CTS does not limit your landscape to one source and one target system. All the options that you might know from TMS are available for SAP HANA systems as well. You can e.g. 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 where the CTS Plug-In contained in Software Logistics (SL) Toolset is installed.

The figure above illustrates the process of exporting (1 and 2 in the figure above) and importing (3 and 4 in the figure above) objects with SAP HANA. The front-end is the SAP HANA Studio. As of SAP HANA studio SP05, 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”). This is now the preferred way of exporting SAP HANA content to a transport request. Afterwards you would then release the transport request. You can now start the import. This is done on the CTS system. As soon as the import is started in TMS, the Deploy Web Service client hands over the SAP HANA content to the
Deploy Web Service. The Deploy Web Service starts the import of the SAP HANA content to the target system (Target) and retrieves the import results.
2. **Background Information**

  - Central note for CTS+: **1003674**
  - Central note for SL Toolset: **1563579**
  - Central note for CTS plug-in: **1665940**

3. **Prerequisites**

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

- CTS System: SAP Solution Manager 7.1 SPS05.
- SAP Note **1731044** has to be implemented on the host of the CTS Deploy Web Service (for related information, see Configuring the CTS Deploy Web Service).
- CTS plug-in installed on the SAP Solution Manager (taken from SL Toolset 1.0 SP04 at least – always use the newest CTS plug-in available)
- SAP HANA Appliance Software SPS05.

4. **Restrictions and Recommendations**

You have to use the SAP Solution Manager as the CTS system. The CTS plug-in can only be installed on top of SAP Solution Manager.

Use secure connections for the communication between the SAP HANA studio and the ABAP backend. Details on how to do this in the SAP HANA studio:

Details on how to do this in CTS systems:
5. Basic configuration for CTS

You have to configure your CTS system and the SAP HANA servers to be able to use CTS. This chapter provides a step by step guide. CTS has to be used on the SAP Solution Manager (remember: you have to install the CTS plug-in).

The steps in this chapter are necessary to configure the Change and Transport System which runs on the Solution Manager system in general. If you have already configured CTS+ on Solution Manager, you can skip this section.

CTS System

Sample Landscape

In the sample landscape shown in the picture above, you can see three SAP HANA systems:
HD1 is the development system – also called export or source system
HT1 is the test system – also called import or target system
HP1 is the productive system – also called import or target system
This landscape is used as an example in the following chapters explaining the configuration.
5.1 Configuring the CTS Deploy Web Service

An RFC connection is required for the communication between the AS ABAP and the AS Java of the CTS system. The default name of the RFC connection is CTSDEPLOY.

Check whether the RFC Connection is already available on your CTS system and if not create it as described in this chapter. If you already use the CTS system for e.g. managing Portal transports, then this RFC connection probably already exists.

**Note**

If CTS+ is already in use at your company: CTSDEPLOY is the standard RFC connection that should be used to connect the Deploy Web Service client and the Deploy Web Service. If this RFC connection is already in use for another use case and this setup cannot be used for SAP HANA as well, then you can also create an additional RFC connection with a different naming (e.g. CTSDEPLOY_HDB)

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 SAP Solution Manager (= your server where the Deploy Web Service is running). The Service No is the port of the AS Java. Make sure that the Connection Type is G.

3. On the Logon & Security tab page, select Basic Authentication and enter a user which has administrative permissions on the AS Java – in here, we are using CTS_RFC as an example.
Enter the password as well.

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.

5.2 Configuring the Transport Organizer Web UI

CTS provides an ABAP Web Dynpro application (CTS_ORGANIZER) 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 certain services 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 http://help.sap.com/saphelp_ctsplug20sm71/helpdata/en/e5/998566c2174196a12b72e7c7af51e7/frameset.htm

If CTS+ is already in use on the SAP Solution Manager 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 .
6. Configuring the SAP HANA Application Type

In order 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: http://help.sap.com/saphelp_ctsplug20sm71/helpdata/en/02/4c3be45416486ea116c5f53831e50a/frameset.htm

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. 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 your customers 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 Basic configuration for CTS, i.e. a development system (HD1) as source system, a test system (HT1) and a production system (HP1) 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 NW AS JAVA instance).

   As an example we will use HD1 (development system), HT1 (test system) and HP1 (production system) in the following.

2. As soon as you know the SIDs for your 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.

Documentation on how to create non-ABAP systems in TMS is provided on the SAP Help Portal: http://help.sap.com/saphelp_ctsplug20sm71/helpdata/en/bf/e4626214504be18b2f1abeeaaf48e4/frame set.htm. 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 (‘HD1’) 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. Open transaction STMS and choose System Overview.
Choose SAP System → Create → Non-ABAP System

Enter the SID of your development system (HD1 in our example) in the field System, a Description and choose Activate Transport Organizer. Select an appropriate client and then choose Save. The system will be created and the system list will show up.
How To… Configure SAP HANA for CTS

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 BD1 that you just created. Details on the Transport Strategy can be found on the SAP Help Portal:

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 must be written with a capital letter.

For details on attaching delivery units to transport requests and the required authorizations, see Attaching Delivery Units to a Transport Request.

7.1.2 Configuring the Test and Production System (Import Systems)
Define your SAP HANA test and production systems ('HT1', 'HP1') as target systems by selecting the option ‘activate deployment service’. Choose the option ‘Other’ as method.
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). 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.
On the next screen, choose HDBLM as Application Type (F4-help). Choose the Deployment Method "application-specific Deployer (EJB)"

Enter Deploy URI according to the jdbc-URL of the target system.

For example the URL takes the form: jdbc:sap://<HANA machine name or IP address>:3<HANA instance number>15.

Create a user account and assign authorizations on the test system 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 SQL 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](http://help.sap.com/hana) → SAP HANA Appliance → Security Information

Enter this User name and Password in here per system.

**Note**

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

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 –‘HP1’) 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.

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### 7.1.3 Transport Landscape: Defining Transport Routes

Now that you have created representations for the different systems (HD1, HT1 and HP1 in our example) in TMS, you have to connect them with the help of transport routes.

Use client-independent transport routes.


In transaction STMS, go to **Transport Routes**

The systems HD1, HT1 and HP1 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 HD1 and then click in the area where the transport routes are shown.

Repeat the previous step for HT1 and HP1

Choose Add Transport Route

Your mouse pointer is now a pencil. Draw a line from HD1 to HT1

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. ZHDB. 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 HD1 with HT1. Now draw a line from HT1 to HP1.

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.
**How To... Configure SAP HANA for CTS**

- Save the configuration

- Confirm that you would like to *Distribute and Activate* the configuration

- The transport route for HD1, HT1 and HP1 is now part of the configuration
7.2 Configuration for Export

On the development system, you have to define how remote connection to the CTS communication system (SAP Solution Manager) is done. The correct SID 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 of the respective development system and thereby identifies the transport route etc. to which it belongs.

7.2.1 Activate CTS Export Web Services

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 7.0 Enhancement Package 2, Support Package Stack 10. If you are using SOA Management in another release or Support Package level, refer to the appropriate SAP Library documentation.

Note that the functions in SOA Management have changed as of SAP NetWeaver 7.02 SP08 and 7.30 SP03. The corresponding documentation is available as of SAP NetWeaver 7.02 SP13 and SAP NetWeaver 7.30 SP09. For more information on the changed functions, see SAP Note 1575707.

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

- ABAP Connectivity Wiki in SAP Community Network, especially How to configure a Service Provider.
Log on to the SAP Solution Manager in the client that you have defined when configuring the development system. (see also: Configuring the Transport Landscape in TMS)

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.
The CTS Export Web Service has the name `EXPORT_CTS_WS`. You can see the WSDL of the service.
You can also define/edit the binding here. The binding contains a runtime configuration, which is needed to implement the service.

As soon as the binding is defined, you can configure it as desired.

For one service, you can define multiple bindings and configure them independently.
The most important configuration settings are defined on the Provider Security tab of the Configuration of Web Service panel (e.g. Communication Security, Authentication Settings).
For easier service access, we recommend that you also define the binding alias using Alternative Access URL. To ensure unique alternative access URLs we recommend that you add the client in which you are logged on to the alias. You can do this in the Transport Settings tab.

**Note**

If you encounter problems when using the web service, you can find details for errors in the Application Log (transaction SLG1) for object CTSPLUS. To be able to view the logs, you must be logged on to the system in the client that hosts the Export Web Service.
8. Using SAP HANA with CTS

8.1 Attaching Delivery Units to a Transport Request

This section shows how to attach delivery units to a transport request. With SP5 SAP HANA Studio supports the so-called “Close Coupling” (automatic export and attachment to a transport request in CTS).

All SAP HANA users that should be allowed to attach SAP HANA content to transport requests have to have a corresponding user in the client of the CTS system that you are using for transports (= the client where you activated the Transport Organizer Web UI). The user attaching the SAP HANA content to transport requests should have adequate permissions on the SAP HANA source system. To transport non-ABAP objects, you can use the authorizations of the delivered role SAP_CTS_PLUS.

⚠️ 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:

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.

8.1.1 Configure Connection to CTS Communication System

In the SAP HANA Studio, you must define a connection to the CTS communication system as configured in Configuring the Development system (Export system). This system hosts the transport requests used to distribute attached SAP HANA content.

To configure the connection, start the SAP HANA Studio, choose Window → Preferences from the menu and go to the Modeler → Attach Delivery Unit to Transport Request (CTS) section. As a shortcut, just type CTS into the filter input field.
For simple server landscapes you can define a single CTS server to use for export. In more complex landscapes a CTS per source system can be defined. Enter the URL to the CTS web service as configured in section Activate CTS Export Web Services. For example, the URL takes the form:

http(s)://<ABAP machine name or IP address>:<WS port>/<binding alias>

(The binding alias is described in 7.2.1). Using the Validate button you can check if the web service is reachable.

8.1.2 Select Objects and Attach to Transport Request

You can export SAP HANA delivery units (DUs) in the SAP HANA Studio. From the Quick Launch view, select Export.”
Select **Delivery Unit** under **HANA Content** and choose **Next**.

Then select the DU you would like to export, set the export location to **Attach to Transport Request**. Choose **Next**.
If you are prompted for a user and a password, enter a valid user for the CTS system and the corresponding password. For details on user and required authorizations, see Attaching Delivery Units to a Transport Request.

In case a target system is not yet configured the wizard allows you to quickly jump to the corresponding preferences page and let you continue afterwards.
Depending on the transport strategy configured in CTS (see Configuring the Development system (Export system)) you may need to create a transport request.

To do this, or if the predefined request does not fit, choose Transport Organizer.
The Transport Organizer will be opened in a web browser. Create a new request or preselect an existing one.

You can also edit other details of the transport request, such as the description.

For more information on Transport Organizer Web UI, see http://help.sap.com/saphelp_ctsplug20sm71/helpdata/en/df/7a1d1a4f0d4805b46c61a0d53cb4c7/frameset.htm.
Continue in the wizard. Choose *Refresh* to update the page. You may enter a comment to give the person who finally triggers the transport additional information.

In the next dialog, check the export details and choose *Finish* to trigger the export of the DU.
The export is done in the background. In the Job Log view you can track the status.

Once finished you can select the History sub-tab of the Job Log view review past exports. To show the details double click on a job entry. The details contain verbose information of the export process including links to the Transport Organizer and directly to the used Transport Request. Details are also valuable in case of a problem.

This will add the selected Delivery Unit to a transport request and you will see the result in the object list of the Transport Organizer Web UI as displayed in the following figure.
On the Object List tab, you can find more details on the attached objects.
After you have added one or several Delivery Units to a transport request, you can release the request. This is also done in the Transport Organizer Web UI. Mark the request that you would like to release and choose **Release**. Depending on the transport strategy configured for your source system in TMS (see **Configuring the Development system (Export system)**), it might also be the case that a transport request is released automatically. After releasing the request it cannot be changed any more. It is no longer visible in the list of **Modifiable** requests in the Transport Organizer Web UI.

For information on Transport Organizer Web UI, see [http://help.sap.com/saphelp_ctsplug20sm71/helpdata/en/df/7a1d1a4f0d4805b46c61a0d53cb4c7/frameset.htm](http://help.sap.com/saphelp_ctsplug20sm71/helpdata/en/df/7a1d1a4f0d4805b46c61a0d53cb4c7/frameset.htm).

**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) for object **CTSPLUS**.
8.2 Importing Transport Requests with SAP HANA content

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 your SAP Solution Manager (the CTS system, where you have configured the Transport Organizer Web UI).

**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 [http://help.sap.com/saphelp_ctsplug20sm71/helpdata/en/4b/b9a1222f504ef2aa523caf6d22d1c9/frameset.htm](http://help.sap.com/saphelp_ctsplug20sm71/helpdata/en/4b/b9a1222f504ef2aa523caf6d22d1c9/frameset.htm).

The following procedure describes how to perform the import in the Transport Management System.

<table>
<thead>
<tr>
<th>Call transaction STMS.</th>
<th>Choose Import Overview</th>
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<tr>
<td><img src="image1" alt="Call transaction STMS." /></td>
<td><img src="image2" alt="Choose Import Overview" /></td>
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</table>
Double-click on the SID of your target system

Mark the requests that you would like to import and choose Import Requests.

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.

### 8.2.1 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: ![green_square]
- **RC = 4**: Warning that not everything was ok but import in principle worked. Icon in the queue: ![yellow_triangle]
- **RC = 8**: Errors for the content occurred when importing. A subsequent transport is required. Icon in the queue: ![red_circle]
- **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: ![red_cross]

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.
8.3  Advanced Usage of SAP HANA with CTS+

8.3.1  Transport Organizer Details

In this chapter, you can find some more details and hints about the information and functionality that is provided with the Transport Organizer Web UI. A detailed documentation is provided on the SAP Help Portal at http://help.sap.com/saphelp_ctsplug20sm71/helpdata/en/df/7a1d1a4f0d4805b46c61a0d53cb4c7/framedset.htm

Object List
In the object list, you can find some information about the SAP HANA delivery unit archive files.
8.3.2 Tools for managing transports

In some cases SAP HANA content should be kept together with e.g. ABAP, BusinessObjects or Java content. CTS and CTS+ on their own cannot help here. There are tools in SAP Solution Manager that can help you managing change requests and keeping changes done in different systems together. These tools are called Change Request Management (ChaRM) and Quality Gate Management (QGM). Details for both are provided on the Service Marketplace at https://service.sap.com/changecontrol.