How-To Guide
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How To... Set Up cCTS for ChaRM and QGM
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1 Business Scenario

In SAP Solution Manager 7.2, you have the option of using the central Change and Transport System (cCTS) infrastructure when setting up change cycles in Change Request Management (ChaRM) or Quality Gate Management (QGM).

New features are available in ChaRM and QGM if cCTS is used. These include the following functions:

- Reassign changes, including modifiable and released transport requests, to other cycles.
- Assign external transport requests
- Prevent conflicts between central transport control (in particular by ChaRM and QGM) and local transport administration (local Transport Management System (STMS))

This guide explains how to set up a cCTS landscape to be able to use the ChaRM and QGM features based on central CTS.

In this guide, we use three-system tracks each consisting of three systems as an example to explain the functionality and terms of cCTS:

- SAP BusinessObjects (BO)
- SAP Business Warehouse (BW)
- SAP ERP (ERP)

For the configuration, we then use just one three-system track to explain the basic configuration in a concise easy to follow way.

1.1 What’s New in ChaRM/QGM on cCTS in SAP Solution Manager 7.2?

The central CTS functions were initially delivered as of SAP Solution Manager 7.1 SP10. In SAP Solution Manager 7.2, some functions were changed and enhanced. The following changed functions in SAP Solution Manager 7.2 have an impact on the configuration of central CTS on SAP Solution Manager:

- **Project management transactions were replaced by functions in SAP Solution Manager:**
  - **Configuration**
    The project management functions that were previously accessible via project management transactions (SOLAR_PROJECT_ADMIN, for example), are no longer used for Change Request Management and QGM. Instead, after having defined your change control landscapes in transaction SLAN, you create change cycles or scenarios. For more information, see Configuring Change Request Management at [http://help.sap.com/saphelp_sm72_sp01/helpdata/en/55/b5804ec50840bb947db20c899874b5/frameset.htm](http://help.sap.com/saphelp_sm72_sp01/helpdata/en/55/b5804ec50840bb947db20c899874b5/frameset.htm).

- **Change Control Management is now available in SAP Solution Manager Configuration (transaction SOLMAN_SETUP) as a scenario with three sub-scenarios:**
  - Change Request Management
  - Quality Gate Management
  - Managed System Setup

  The Managed System Setup scenario is now available for all system-relevant configuration tasks that are required both for Quality Gate Management and Change Request Management. You have to perform this guided procedure for each system in your system landscape that you want to enable for Quality Gate Management and Change Request Management.

- **Uneven System Tracks**
  You can set up change cycles for system tracks that do not consist of the same amount of systems in the tracks. For more information, see Uneven System Tracks.

- **Central CTS**
  Domain links from the central CTS server to the managed systems are no longer necessary.
2 Background Information

Central CTS provides a technical infrastructure for the enhanced flexibility functions in ChaRM and QGM. Central CTS is part of SAP Solution Manager 7.2. For central CTS, you require a "central CTS server" - the SAP Solution Manager system (the managing system) - and systems which are connected to the central CTS server and can be controlled by it – the "managed systems". Entities, known as clusters and collections, are introduced in cCTS.

2.1 System Clusters

System clusters are needed for each system role so that you can bundle systems with the same role from different application landscapes. So, you could, for example, create a development cluster containing the ERP, the BW, and the BO development system, a test cluster containing the ERP, the BW, and the BO test system and a cluster containing the respective production systems.

Clusters are represented by an SID in TMS like any other system, but it is not a real system that you have to install. You have to 'invent' an SID consisting of three letters which does not yet exist in your landscape. You can then add the systems to this cluster.

The following figure shows an example:

Imagine that you have three-system tracks in place – two consisting of ABAP systems and one consisting of non-ABAP systems – and where you want to set up change cycles in ChaRM or QGM to manage software and configuration changes for all three tracks.

You then need one cluster for the three development systems, one for the three test systems, and a third containing the three production systems.

In this guide, we start with a very simple landscape. We will set up three clusters: CDV, CQS, and CPD. As a starting point, we will add only one system to each cluster. You can easily add other systems to the clusters later. In our example, we will use a system track consisting of three SAP NetWeaver AS ABAP systems: N14 as the development system, E07 as the test system, and Z06 as the production system. In addition, we have one SAP Solution Manager with the SID CSM in place.

We assume that the system track N14-E07-Z06 already exists in TMS. In our example, SAP Solution Manager (CSM) is the domain controller for this track.

Note

You can also integrate existing tracks in cCTS if the systems belong to another domain or are the domain controller of another domain (e.g. system E07 in the example above).
2.2 Transport Collections

Transport collections are very similar to transport requests. A collection contains one or more transport requests for one or more of the system tracks that are part of the clusters.

Collections are transported between clusters:

One collection is represented by one change in ChaRM or QGM. If you import a collection, the systems are updated with the requests sequentially. You can also parallelize the deployment into different systems. See chapter Import Sequence and Parallel Deployment for details.

3 Prerequisites

Several systems are involved when you set up ChaRM and / or QGM with cCTS.
You need one system acting as a managing system. This is the instance of SAP Solution Manager where you run ChaRM or QGM. It is called the managing system since the whole process including distributing plug-ins, creating collections and transport requests and starting imports into other systems is executed in the managing system. The clusters are set up here. The systems that SAP Solution Manager controls are called managed systems. These systems are part of the clusters.

The following figure explains what is meant by managing and managed systems:

The following prerequisites concerning the installed software apply:

Managing system:

- SAP Solution Manager 7.2
  The add-on CTS_PLUG is part of the stack.xml that is required when you install or update your SAP Solution Manager. The newest version of CTS_PLUG available on SAP Support Portal is taken by default.

  Note
  Even though the functions of the CTS plug-in are included in the software component SAP_BASIS as of SAP NetWeaver 7.40 SP 10 (which is part of SAP Solution Manager 7.2) the software component CTS_PLUG is still required on SAP Solution Manager in order to make the CTS Service plug-ins available that are required for plug-in distribution as described in chapter Distribute cCTS Plug-Ins.

  Note
  CTS_PLUG is not automatically part of all SAP NetWeaver systems. If you need CTS_PLUG on systems other than SAP Solution Manager, you might have to install and update it manually. CTS_PLUG is only needed on SAP NetWeaver systems other than SAP Solution Manager in very rare cases. For example, if you cannot use your SAP Solution Manager as CTS+ system and you want to use CTS+ with applications which require generic CTS (like SAP BusinessObjects or SAP HANA, for example), you have to install CTS_PLUG on this system.

- If you would like to use parallel deployment: your SAP Solution Manager has to use SAP Basis 7.40 SP17 and you have to install the SAP Note Transport-Based Correction Instruction (TCI) published via SAP Note 2414330 CCTS queued feature for SAP Solution Manager 7.2. (more information on TCIs and how to implement them is available on the SAP Help Portal at https://help.sap.com/viewer/9d6aa238582042678952ab3b4aa5cc71/7.5.5/en-US/d205d69422864604a487c67472cdd4ff.html ). As soon as your managing system is based on SAP NetWeaver 7.40 SP18 or higher, the TCI is not needed any more.

- The SAP Solution Manager system is the domain controller of the domain the SAP Solution Manager system belongs to.

- ChaRM/QGM (without cCTS) is configured on SAP Solution Manager
• The R3trans version on SAP Solution Manager is from 29.05.13 or later.
• tp version 380.10.14 or higher is available on SAP Solution Manager. If parallel deployment is needed (see chapter Import Sequence and Parallel Deployment for details on parallel deployments), tp version 380.41.08 or higher is required.

Managed systems
• SAP NetWeaver 7.50 SAP_BASIS SP00 and higher
• SAP NetWeaver 7.40 SAP_BASIS SP02 and higher
• SAP NetWeaver 7.31 SAP_BASIS SP01 and higher
• SAP NetWeaver 7.30 SAP_BASIS SP01 and higher
• SAP NetWeaver 7.11 SAP_BASIS SP09 and higher
• SAP NetWeaver 7.02 SAP_BASIS SP06 and higher
• SAP NetWeaver 7.01 SAP_BASIS SP07 and higher
• SAP NetWeaver 7.00 SAP_BASIS SP14 and higher

Note
Check SAP Note 1665940 for up-to-date release information. Refer to the documentation on the SAP Help Portal for details on how to update the plug-ins. We recommend that you do not install CTS_PLUG on managed systems without a real business need (e.g. this system has to be a domain controller / communication system for CTS+).

• The TMS landscape is configured for all managed systems.

Note
If managed systems within the same transport track belong to different transport domains, you must define the transport routes for these systems both in the source domain and in the target transport domain. Otherwise, the transport group adjustment does not work and, therefore, you cannot perform transports.

• If a managed system is not part of the SAP Solution Manager domain and if the domain(s) of the managed systems do not have domain links to the SAP Solution Manager domain, you must initially import the transport requests of the CTS Service plug-ins manually into the managed systems before you can automatically distribute them. The manual import is described in SAP Note 1688276. More information on domain links is available in the SAP Library.

• If you would like to parallelize deployment: Plug-Ins from CTS_PLUG 2.0 SP 23 or higher have to be distributed to all systems where you would like to deploy in parallel.

• tp version 380.13.49 or higher is available on the managed systems. If you would like to use parallel deployment, tp-version 380.44.35 is required on the managed systems.

• The R3trans version from 12.11.11 or later is available on the managed systems.

Recommendation
Check SAP Note 2116545 for recommendations about which tp and R3trans versions you can use if you require further improvements, both in SAP Solution Manager and the managed systems.

• All managed systems have been set up to be used in ChaRM and/or QGM. (See http://help.sap.com/saphelp_sm72_sp01/helpdata/en/45/51fbdbd4941803e10000000a1553f7/frameset.htm.) In short, it is important that SAP Solution Manager Managed Systems Configuration was performed for the managed systems in transaction SOLMAN_SETUP.

Note
The communication system for the non-ABAP systems (CTS+-System) has to be configured in Managed Systems Configuration in transaction SOLMAN_SETUP. The RFC destinations are required to distribute the plug-ins.
• All managed systems need to have a trust relationship to the managing system (SAP Solution Manager). This is done in **SOLMAN_SETUP**.

  ![Note]
  
  See SAP Note **128447** on how to set up a trusted relationship. (Managed system = trusting system, cCTS Server / SAP Solution Manager = trusted system)

• SAP NetWeaver Business Client is configured. See [http://help.sap.com/saphelp_nw74/helpdata/en/03/ecbaf844b450a9314a5683b75ed80/frameset.htm](http://help.sap.com/saphelp_nw74/helpdata/en/03/ecbaf844b450a9314a5683b75ed80/frameset.htm) for details

  ![Note]
  
  You can start by setting up the SAP NetWeaver Business Client for HTML (see [http://help.sap.com/saphelp_nw74/helpdata/en/4c/5bdc2197817511e10000000a42189b/frameset.htm](http://help.sap.com/saphelp_nw74/helpdata/en/4c/5bdc2197817511e10000000a42189b/frameset.htm) for details). This is sufficient if you have not been using SAP NetWeaver Business Client up to now and it does not require a rollout of software to the clients.

### Further Information

• Collective Note: central CTS with SAP Solution Manager 7.2: [2231041](#)

• Central SAP Note for CTS Plug-in: [1665940](#)

• Standard documentation about ChaRM and QGM (including cCTS documentation) in the SAP Library: [http://help.sap.com/saphelp_sm72_sp01/helpdata/en/2b/614e1cb8204f35b477eac703073589/frameset.htm](http://help.sap.com/saphelp_sm72_sp01/helpdata/en/2b/614e1cb8204f35b477eac703073589/frameset.htm)

• **What's New in cCTS/ Charm / QGM**

• Standard documentation about CTS (including CTS plug-in functions) in SAP NetWeaver 7.40 in the SAP Library: [https://help.sap.com/saphelp_nw74/helpdata/de/3b/dfba3692dc635ce10000000b38f839/frameset.htm](https://help.sap.com/saphelp_nw74/helpdata/de/3b/dfba3692dc635ce10000000b38f839/frameset.htm)

• Required/recommended expertise or prior knowledge:
  - Basic knowledge of ABAP Change and Transport System (CTS)
  - Basic knowledge of Enhanced Change and Transport System (CTS+)
  - Basic knowledge of SAP Solution Manager ChaRM and/or QGM

### 4 Details on CTS_PLUG

  ![Note]
  
  Even though the functions of the CTS plug-in are included in the software component SAP_BASIS as of SAP NetWeaver 7.40 SP 10 (which is part of SAP Solution Manager 7.2) the software component CTS_PLUG is still required on SAP Solution Manager in order to make the CTS Service plug-ins available that are required for plug-in distribution as described in chapter **Distribute cCTS Plug-Ins**.

From SAP Solution Manager 7.1 SP 5 CTS_PLUG is a required component that includes the following components:

- CTS Bootstrapper plug-in
- CTS Server plug-in
- CTS Service plug-in

The following figure shows SAP Solution Manager with CTS_PLUG installed and some managed systems with the CTS Service plug-in. The CTS Server plug-in is automatically installed during the installation of SAP Solution Manager or the update/upgrade to SAP Solution Manager 7.1 SP 05 or
higher. You can distribute the CTS Service plug-ins to the managed systems using the central CTS Configuration UI which is described later in this guide.

4.1 CTS Bootstrapper Plug-in

The CTS bootstrapper plug-in runs on the managing and managed systems, including communication systems for non-ABAP systems and provides a low-level communication infrastructure. The bootstrapper plug-in is required for the plug-in management on the managed system. It is, for example, needed if you validate your managed systems from SAP Solution Manager to find out whether plug-ins are available on the system in an up-to-date version. The bootstrapper plug-in is distributed to the managed systems using the central CTS Configuration UI.

4.2 CTS Server Plug-in

As of SAP NetWeaver 7.4 SP10, the server plug-in functions are delivered with support packages of the software component SAP_BASIS. Since SAP Solution Manager 7.2 is based on SAP NetWeaver 7.4 SP12, the functions are already included in the SAP Solution Manager system (cCTS Server/managing system). This comprises the following capabilities:

- **Central CTS Configuration UI for basis configuration of cCTS**
  - Managing system clusters
  - Validating the current cCTS landscape settings, for example checking for cluster definitions, TMS parameters of managed systems, RFC destinations of managed systems, and tp/R3trans versions
- Version check for newer versions of server and service plug-ins and updates of them
- Handling of cluster and collections
- Technical layer for ChaRM/QGM for all transport-related tasks
- Downgrade protection

Note

ChaRM and QGM based on cCTS are available starting with SAP Solution Manager 7.1 SP10. In previous releases, CTS_PLUG is required to be able to use Downgrade Protection in ChaRM (QGM supports Downgrade Protection starting with SP10) or for some functions in CTS+, such as using CTS+ for your own application (a.k.a. ‘generic CTS’).
4.3 CTS Service Plug-Ins

The CTS Service plug-ins run on the managed systems and are required to enhance the managed system.

The CTS Service plug-ins are distributed to the managed systems using the *central CTS Configuration UI*.

The CTS Service plug-ins contain helper functions that allow you to control and monitor the transport functions (Change and Transport System - CTS) of SAP systems "from outside". These help functions include the following features:

- Communication infrastructure, such as the option to use trusted RFC connections
- Monitoring functions, such as extracting the import state of a transport request in a specific system
- Analysis functions for overtakers and downgrading transport requests (analysis of object lists of transport requests, calculation of intersecting requests, and evaluation of inverted sequence of transport requests)
- Option to connect to central Change and Transport System
- Detail improvements, such as ensuring a complete import history
- The Service plug-in is independent of SAP NetWeaver releases or SP deliveries. You can import it at any time – even during production usage of the system. It does not require a restart.

The Service plug-in is release-specific, but you do not have to make sure that the right version is distributed to your managed system. If the release of the managed system is supported, the distribution mechanism guarantees that the right version is distributed.

5 Step-by-Step Procedure

In this chapter, we configure an existing system landscape for cCTS. We make systems ready for use with cCTS, create clusters and assign the systems to the cluster.

5.1 System Landscape Example

In this guide, we configure a standard three-system track. In this case, we have one SAP Solution Manager system (CSM) and three ABAP systems (N14, E07, and Z06) in place.

For the three ABAP systems, the TMS Landscape has already been configured in the SAP Solution Manager domain in the following way:

N14 is the development system, E07 is used as test system and Z06 is the production system. The system track is as shown in the following figure:

For cCTS we enhance this track by introducing three clusters:

- CDV for development
• CQS for quality assurance
• CPD for production

In this example, each of the clusters contains only one system.

Clusters can and should contain multiple systems. We recommend that you create the largest clusters possible. Refer to the chapter Best Practices for detailed recommendations. To keep the configuration simple and not to repeat too many steps too often, we are setting up simple clusters initially.

How will we get there?
The setup of the system track is done in the following order:
1. Enable cCTS UIs (central CTS Configuration UI, CTS Transport Log Viewer)
2. Create favorites for the cCTS UIs
3. Use central CTS Configuration UI to validate systems and perform the recommended steps
   o Define TMS parameters
   o Distribute cCTS Service plug-ins
   o Create clusters and assign systems
     ▪ Create the development cluster (CDV)
     ▪ Create the quality cluster (CQS)
     ▪ Create the production cluster (CPD)
   o Define RFC destinations
     ▪ Deploy destinations
4. Connect the clusters
5. Define import targets for clusters
6. Distribute configuration changes

5.2 System Landscape Setup

5.2.1 Prerequisites

All prerequisites as described in chapter Prerequisites are met.

The user who is executing the steps described in this guide needs to have administrator permissions on the SAP Solution Manager (such as permission to enable services in SICF and create destinations in SM59).

For transport-related tasks, the user who is executing the steps described in this guide needs to have copies of the following roles assigned:
• On the cCTS Server (SAP Solution Manager)
  o SAP_BC_TRANSPORT_ADMINISTRATOR
• On the managed systems
  o SAP_BC_TRANSPORT_OPERATOR for the step cCTS Service plug-in distribution
  o SAP_BC_TRANSPORT_ADMINISTRATOR if the managed system is not in the SAP Solution Manager domain.
5.2.2 Enable cCTS UIs

In this step, we activate the services that are required to call cCTS. After completing this step, you can open the following UIs:

- Central Change and Transport System – Configuration (cCTS Configuration UI):
  This UI is needed to configure cCTS. You use it to create clusters, assign systems to a cluster, and define various parameters. We use this UI in several configuration steps in this guide.

- CTS Transport Manager:
  This UI is available in display mode only. You can use it, for example, to view import queues of clusters and systems and to view the current configuration.

Do the following to activate the required services:
1. Log on to the production client on your SAP Solution Manager and start transaction SICF.
2. Choose Execute (F8).
3. In the text field for ServiceName, enter CTS*.
4. Choose Apply.
5. In the result list select cts_configuration and use the context menu entry Activate Service to activate the service for the Central CTS Configuration UI.

**Note**
If you execute the Change Request Management configuration in SOLMAN_SETUP, the services CTS_ORGANIZER, cts_configuration, cts_configuration_plugin_mgmt, cts_logviewer, cts_import_history, cts_zenui_manager and cts_zenui_transports are automatically activated. This is done in the step Change Control Management → Change Request Management or Quality Gate Management: 1. Perform Basic Setup → 1.1 Check Prerequisites. Activate Services is then shown in the list of Automatic Activities.
6. Repeat the previous step for the services `cts_zenui_manager`, `cts_logviewer`, `cts_import_history`, and `cts_zenui_transports`. These services are needed to use the CTS Transport Manager and for the emergency mode. For details about the emergency mode, refer to the chapter Troubleshooting.

5.2.3 cCTS Configuration UI in SAP Solution Manager Configuration (SOLMAN_SETUP)

The cCTS Configuration UI can be called as part of the Managed System Setup guided procedure in SAP Solution Manager Configuration (transaction SOLMAN_SETUP).

1. Call transaction SOLMAN_SETUP.
2. Expand the section Change Control Management and then go to Managed System Setup.
3. Under step '4 Configure Transport Management', choose '4.3 Configure Central CTS'.
4. Choose Edit to switch to change mode. (In the screenshot below, change mode was already selected. The Edit button has changed into the Read-Only button.) Then go to the Configure Central CTS Infrastructure row and click Open URL.

5. The cCTS Configuration UI opens.

5.2.4 Create Favorites for the cCTS UIs

The cCTS UIs can also be accessed using a transaction code or by creating a favorite.

The transaction codes are

- SZENCONFIG for cCTS Configuration UI
- SZENTMS for CTS Transport Manager

If you want to use a favorite, execute the following steps to create it:

1. Log on to the production client of your SAP Solution Manager.
2. Open the context menu on the node Favorites, select Add other objects and double-click on Web Dynpro Application.
3. In the dialog box, enter
   a. CTS_CONFIGURATION as Web Dynpro Application, and decide on a Description for your favorite, for example cCTS Configuration UI. Do not enter anything for Application Config.
   b. CTS_ZENUI_MANAGER as Web Dynpro Application, and decide on a Description for your favorite, for example CTS Transport Manager. Do not enter anything for Application
4. Press **Continue (Enter).**
5. Try out your new favorite.
   The central CTS Configuration UI or CTS Transport Manager should open.
   a. In the cCTS Configuration UI, you should see all systems that are either configured in the SAP Solution Manager transport domain or in any other transport domain linked to the SAP Solution Manager transport domain.

   ![Central Change and Transport System - Configuration](image)

   **Note**
   If the central CTS Configuration UI does not open (for example, the browser reports *HTTP 500 Internal Server Error*), check that Web Dynpro is activated. ([http://help.sap.com.saphelp_nw74/helpdata/en/46/d28dfa34bb12bee10000000a1553f7/content.htm](http://help.sap.com/saphelp_nw74/helpdata/en/46/d28dfa34bb12bee10000000a1553f7/content.htm) - *Using WDA Applications*).
b. In CTS Transport Manager, you can view the collections, see the current transport status including locks; and view the configuration

![CTS Transport Manager](image)

5.2.5 Validate Systems and Perform the Recommended Steps

To prepare systems for cCTS, some new TMS parameters are needed, dedicated RFC connections must be created and the cCTS Service plug-in and the Bootstrapper plug-in must be distributed. This is all checked when you press Validate for a system in the central CTS Configuration UI. The following screenshot provides a typical example.

![Central Change and Transport System - Configuration](image)

Note

In the System Distribution Status column, you will only see a symbol different from the grey diamond if the system either belongs to the same domain or is domain controller of the foreign domain.

If you click on the link See details in the first column, you will see a detailed list of the errors and an explanation how to fix them for the respective system. We will make use of this in the next few steps.
In the next few steps, you first set TMS parameters for the managed systems to define the mode in which the systems operate. Then you distribute plug-ins to the managed systems to enable the required remote functions on this system. After the managed systems have been prepared, you create the clusters and finally define RFC destinations needed by cCTS and that are not part of SAP Solution Manager setup. If a managed system is too old to be used within cCTS you see the message *Release not supported* when you click *See details*.

### Note

If you perform the steps in the order described in this chapter, you need a user in client 000 of the managed systems. If this is a problem, you can change the order and start with the chapter *Create Cluster and Assign Systems*. After creating the clusters, you can then execute the step *Distribute cCTS Plug-Ins*. Now the plug-in distribution only requires a user in the client that you named. Be aware that executing the steps in this order might lead to you building the cluster and only afterwards finding out that you cannot use a system with cCTS when distributing the plug-ins.

#### 5.2.5.1 Define TMS Parameters

If you want to use a system with ChaRM or QGM based on cCTS, some additional parameters must be defined in TMS.

There are two new parameters in TMS that are needed in this case - OPERATION\_MODE and MANAGED\_SYSTEM.

The operation mode defines to which extent the managed system is controlled. The parameter OPERATION\_MODE defines whether imports are executed locally in the TMS of the respective system (the communication system in the case of non-ABAP systems) or controlled centrally by the managing system. It currently only makes sense to use one of the following values for this parameter:

- **CONTROLLED\_DYNAMIC** (imports are controlled centrally)
- **QUEUED\_DYNAMIC** (imports are controlled centrally; parallel deployment is done. This value is relevant if you use parallel deployment in SAP Solution Manager 7.2 with the TCI published in SAP Note 2414330)
- **PROPOSED\_DYNAMIC** (imports are executed in the local systems. This value is relevant if you used parallel deployment in SAP Solution Manager 7.1 already – see chapter Appendix 2 – Parallel Deployment with Operation Mode PROPOSED\_DYNAMIC ) The reminder of this chapter does not consider the setup of parallel deployment as it was done in SAP Solution Manager 7.1, any more – it explains how the setup has to be done in SAP Solution Manager 7.2. If PROPOSED\_DYNAMIC is not mentioned as a possible value for the OPERATION\_MODE anymore, this does not mean that you have to change your configuration. The configuration as it was done for SAP Solution Manager 7.1 is still possible and can be used. Nevertheless, we recommend switching to the new option with QUEUED\_DYNAMIC.

We recommend that you choose the value depending on your needs concerning import sequence and parallel deployment. For more information, see Import Sequence and Parallel Deployment.

The parameter MANAGED\_SYSTEM can have the values *false, partly, and true*. It defines whether a system is managed completely by the managing system (*true*), whether local actions in TMS are still possible (*partly*), or whether the system is not controlled by a managing system at all (*false*). The default is *false*. So, if you decide to use a system with ChaRM or QGM based on cCTS, you have to set this parameter to PARTLY.

These parameters must be set for all managed systems, ABAP and non-ABAP. For non-ABAP, you set them on the CTS+ system (the domain controller). Do not set the parameters for the CTS+ system itself (if you do not want it to become part of a cluster, too).

1. Log on to the production client of SAP Solution Manager
2. Open the central CTS Configuration UI. Make sure that you are on the tab *Systems not yet assigned to a cluster*. Validate all systems that you want to use in a cluster later. To do this, select all necessary systems and choose *Validate*.

3. In the results list find the line with the development system (N14) and choose *See details* in the column *Status*. A dialog box shows the validation results. You can see what is already OK and the errors and a description of how to fix them.

First, set the TMS parameters for the development system. After that, you will distribute the plug-ins and finally we will create the cluster to fix the *Cluster assignment error*. 
As shown in the *Long Text of the Selected Status Message* for the source system N14, two TMS parameters need to be defined, `MANAGED_SYSTEM` and `OPERATION_MODE`. Close the dialog box.

4. If the development system is part of the SAP Solution Manager transport domain, you can set the parameter on the central CTS Configuration UI. If the development system is part of a foreign transport domain (with or without domain links to the SAP Solution Manager transport domain), continue with step 7.

Choose the link *TMS parameters invalid* in the row of the development system N14. A dialog box opens where you can see the current values for the relevant TMS parameters.

![TMS Parameter Configuration](image)

**Note**

For non-ABAP systems used as development systems, the parameter `NON_ABAP_WBO_CLIENT` must have been set in STMS. Usually this was already done when configuring CTS+.

5. Select *Display <> Change* to switch to edit mode and then select the following data in the dropdown boxes:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>MANAGED_SYSTEM</code></td>
<td>PARTLY</td>
</tr>
</tbody>
</table>
**OPERATION_MODE** \hspace{1cm} \textit{CONTROLLED\_DYNAMIC or QUEUED\_DYNAMIC}

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANAGED_SYSTEM</td>
<td>PARTLY</td>
</tr>
<tr>
<td>OPERATION_MODE</td>
<td>\textit{CONTROLLED_DYNAMIC or QUEUED_DYNAMIC}</td>
</tr>
</tbody>
</table>

**CAUTION**

You always have to set `MANAGED\_SYSTEM = PARTLY` and `OPERATION\_MODE = \textit{CONTROLLED\_DYNAMIC or QUEUED\_DYNAMIC}`.

6. Choose \textit{Save Changes} to set these parameters and then continue with step 10.

7. To define these parameters in a system that is not part of the SAP Solution Manager transport domain, log on to the domain controller of your development system, start transaction STMS, and open the system overview:

8. Switch to edit mode and add the following data:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANAGED_SYSTEM</td>
<td>PARTLY</td>
</tr>
<tr>
<td>OPERATION_MODE</td>
<td>\textit{CONTROLLED_DYNAMIC or QUEUED_DYNAMIC}</td>
</tr>
</tbody>
</table>
How To... Set Up cCTS for ChaRM and QGM

Step-by-Step Procedure

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CAUTION

You always have to set MANAGED_SYSTEM = PARTLY and OPERATION_MODE = queued CONTROLLED_DYNAMIC or QUEUED_DYNAMIC.

Note

If you use the F4-help to add a parameter to this list, it might be the case (depending on the release and the plug-in status) that the parameters MANAGED_SYSTEM and OPERATION_MODE are not in the list. If this is the case in your system, add the parameters by writing them in the column Parameters manually.

9. Save your changes and distribute them.

10. Redo steps 3 to 9 for the quality assurance system (E07) by first using See details in the central CTS Configuration UI and then setting the missing TMS parameters for your QAS system. Depending on whether the system is part of the SAP Solution Manager transport domain or part of a foreign transport domain, either use the central CTS Configuration UI or use STMS of the system’s domain controller to set the parameters.

For the QAS system, the following two TMS parameters need to be defined:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANAGED_SYSTEM</td>
<td>PARTLY</td>
</tr>
<tr>
<td>OPERATION_MODE</td>
<td>queued, CONTROLLED_DYNAMIC or QUEUED_DYNAMIC</td>
</tr>
</tbody>
</table>
11. Finally, repeat steps 3 to 9 for the production system (Z06). The TMS parameter settings that need to be made are the same as for the QAS system (E07).

12. After performing a validation in the central CTS Configuration UI, the system should no longer display error messages for TMS Parameters.

5.2.5.2 Distribute cCTS Plug-Ins

To distribute the Bootstrapper and the cCTS Service plug-ins to the managed system select the link Plug-In not up-to-date. The user executing this function needs to have role SAP_BC_TRANSPORT_OPERATOR assigned in the source system (cCTS server/managing system) and target system (managed system). A trusted destination to client 000 is used for the distribution. Therefore, the user also needs to have authorization for S_RFCACL in the target system in client 000.

- **Note**
The user in client 000 is not required if you assign the systems to a cluster before distributing the plug-ins (see above). After you have done this, the plug-in distribution only requires a user in the client that you named.

- **Note**
If the managed system is not part of the SAP Solution Manager domain and there is no domain link to it, you must initially distribute the plug-ins manually to this system as described in SAP Note 1688276.
Note

The permission S_RFCACL is not part of SAP_ALL and SAP_NEW. Also, users that have these permissions need additional permissions to be able to distribute the plug-ins. In TMS Alert Viewer, you see the error message No authorization to log on as a Trusted System.

Refer to the SAP Library at http://help.sap.com/saphelp_nw74/helpdata/en/48/8d1c6eae444e6ee10000000a421937/frameset.htm for more information about how to set permissions for S_RFCACL.

Perform the plug-in distribution.

Caution

One result of the plug-in validation might also be that tp and R3trans are too old. In this case, you must update these tools first and then restart distribution of the plug-ins. To learn more how to do this, click on More Information in the section Transport Tools ‘tp’ and R3trans’ and check SAP Note 19466.

Validate your systems again after executing the distribution for all three systems. The central CTS Configuration UI should now only report the error No cluster assignment exists when you click See details.
for each system.

### Central Change and Transport System - Configuration

![Central Change and Transport System](image)

#### Validation of system... has been scheduled.
- Plug-in has been distributed successfully in system ZTS.
- Validation of system SST has been scheduled.

#### Validation completed.
- Search result and work area.
- Create a new command for plug-in.
- TNS parameters for plug-in.
- Change plug-in configuration.
- Create plug-in configuration.
- Create plug-in configuration.
- Create plug-in configuration.
- Create plug-in configuration.

---

### Note

Plug-ins can only be distributed to systems where CTS_PLUG is not installed. CTS_PLUG might be installed on systems that you use as CTS+ systems for your non-ABAP systems. CTS_PLUG is required on the CTS+ system for three use cases:

- If you use CTS+ for your own applications (also known as 'generic CTS')
- If you use the new Import Queue Web UI.
- If you use the new Transport Organizer Web UI (CTS_ORGANIZER) and not CTS_BROWSER to manage your non-ABAP transport requests.

If you need to update the plug-ins in a system where CTS_PLUG is installed, download CTS_PLUG from SAP Service Marketplace and install it using the appropriate tool (SPAM, SAINT...).

If you use different systems as domain controller and communication system for your non-ABAP systems (CTS+ case), the distribution installs the plug-ins in the communication system. Plug-ins are not needed on the domain controller.

---

### Important

Refer to SAP Note 1688276 for details on how to update the plug-ins – especially if the procedure described in this chapter causes issues for you. Do not install CTS_PLUG manually from SL Toolset on a managed system without a real business need.

### 5.2.5.3 Job Scheduling

If you would like to use parallel deployment – so if you used queued_dynamic as operation mode for some of your systems in the previous chapter, you have to schedule jobs for the execution of the imports. How you schedule these jobs depends on whether you use domain links or not. If you use domain links, you can schedule the jobs centrally in transaction SZENCONFIG.

If you do not use domain links, you have to schedule these jobs in the managed systems for which you set the operation mode to queued_dynamic. Nevertheless, you can view these jobs in transaction SZENCONFIG on your managing system.

#### Scheduling Jobs in SZENCONFIG

If you use domain links, you can schedule the jobs for the systems that use operation mode queued_dynamic in transaction SZENCONFIG on your SAP Solution Manager.

To do so, open the configuration for the TNS parameters (see chapter Define TMS Parameters for details).

1. As soon as you change the value for the `OPERATION_MODE` to `QUEUED_DYNAMIC`, you will see the message that a job is missing in the section below. Click on `Create` to configure a job for the...
2. This will automatically create the job. Make sure that the message *Job schedule exists and is valid* is shown.

Scheduling Jobs in Managed Systems

If you do not use domain links, you have to schedule the jobs on the managed systems – so the following task has to be done on each managed system for which you have set the operation mode to queued_dynamic.
1. Log on to the managed system. Open transaction SA38.

2. **Execute the program** `SCTS_SCHEDULE_IMPORT4QUEUED`

3. You have different options when executing the program:
   - You can decide on the priority – C: Regular Priority (*job class C is the regular job class*) should be sufficient for this job
   - You can decide to delete existing jobs first
   - You can decide to schedule a new job
   - The default settings should be fine if you do this configuration for the first time.

4. You will get an additional pop-up that tells you about the amount of deleted jobs. After you confirmed the message, you should see a message in the message area that the job was scheduled successfully.

5. Repeat all these steps on every managed system where you would like to execute parallel imports (for which you have set the operation mode to queued_dynamic) and where you cannot use domain links.

If you configured your systems and jobs in SAP Solution Manager 7.1 to be able to use parallel deployment by the help of the operation mode PROPOSED_DYNAMIC and scheduled jobs, you can continue to use this configuration after an update to SAP Solution Manager 7.2. There is no need for an immediate reconfiguration. Therefore, you can still find the details for this configuration in this guide. Nevertheless, there is a better integrated solution for parallel deployment in SAP Solution Manager 7.2. With this solution, the import into the managed systems is more robust and better monitored. You can now use the operation mode QUEUED_DYNAMIC. Prerequisite is that you apply the TCI provided in 2414330 [CCTS queued feature for SAP Solution Manager 7.2](https://launchpad.sap.com/), distribute the plug-ins from VTS_PLUG SP23 or higher to all your managed systems and use the correct tp versions on your managed and managing systems (see chapter [Prerequisites](https://launchpad.sap.com) for details)
5.2.5.4 Create Clusters and Assign Systems

In this step, you are going to create the three clusters for development (CDV), quality assurance (CQS), and production (CPD).

Create the Development Cluster

1. In the central CTS Configuration UI, choose Cluster → Create Cluster.

In the dialog box, enter a Cluster ID, for example, CDV and a Description, for example, Cluster for development.

Note

The cluster ID is a three-letter SID like any system in TMS. You can choose any combination of three letters (and numbers). The SID must be unique within the domain and all linked domains.

The SIDs of all systems in the transport landscape must also be unique. This applies especially to systems in which transport requests are created (development systems) or where they are passed on to further systems (test systems). Only in exceptional cases is it possible to have the same SID for systems that are end points of transport routes (production systems) and it is only possible if the systems with the same SID are not part of the same domain.

To make this cluster a source cluster, you need to select the Source Cluster checkbox and select a Client. The selected client is used to create collections for this cluster. Usually, this is the client of the ABAP communication system of the cluster (SAP Solution Manager) in which cCTS (and, for example, ChaRM) is used productively.

Finally, select your development system in the system list to add this system to the cluster. For ABAP-based systems, you must select a client. If the parameter CTC is set to 1 in the TMS configuration (and this is required by ChaRM and QGM), you are forced to do this. For non-ABAP systems, you do not have to set a client.
Note
To develop in more than one client of an ABAP system, you can add the ABAP system more than once and use different clients. Available clients can be selected from a drop-down.

Note
If non-ABAP systems are added to a development cluster, the client is set automatically. The client used is the one set as NON_ABAP_WBO_CLIENT in the TMS system configuration of the non-ABAP system on the CTS+ system. Usually this was already done during CTS+ setup.

Note
For virtual or external systems: You must enter a client if extended transport control is active for the system (parameter CTC is set to 1 to allow transports of client specific data). You can either select one of the clients that exist in the system (or in the communication system) or enter any other client. You cannot enter a client if extended transport control is turned off for the system (CTC=0). This option is useful if you want to prepare the cluster assignment for systems or clients which do not yet exist.

Choose Check to check your entries.

2. You can either distribute your configuration immediately after creating the cluster or do it after you have created all the clusters that you need. We recommend doing this at the end (after creating the
cluster CPD in our example). So, deselect the option *Distribute Configuration* for now.

3. If the check is successful, choose *Create*.
4. The cluster with the selected system is created and should be visible in the central CTS Configuration UI. Switch to the *Clusters* tab to see the cluster.

![Central Change and Transport System - Configuration](image)

**Note**

After a cluster has been created, validation starts automatically (if you did not make a different setting in the *Personalization* of the cCTS Configuration UI) to check whether all configurations for cCTS were made. As we prepared the systems already in the previous chapter, only errors with respect to cluster usage are shown. So, there might be errors shown in the *RFC Connections* column since systems need an additional destination when used within a cluster. We will check and fix this in the next chapter.

**Note**

For non-ABAP systems, the *RFC connections* to their communication systems are checked. Also, for *Plug-in Distribution* the communication system of the non-ABAP system is used, and the CTS Services Plug-in must be distributed to this system.
Create the Quality Cluster

1. In the central CTS Configuration UI, choose **Cluster → Create Cluster**.
2. In the dialog box, enter a **Cluster ID**, for example, **CQS**, and a **Description**, for example, **Cluster for Quality Assurance**. Since this cluster is a target cluster, do not select the **Source Cluster** checkbox this time. Select your quality assurance system in the system list to add this system to the cluster (E07 in our example). For ABAP-based systems, you must select a client. If the parameter **CTC** is set to 1 in the TMS configuration (and this is required by ChaRM and QGM), you are forced to do this. For non-ABAP systems, you do not have to set a client.

![](Central%20Change%20and%20Transport%20System%20-%20Configuration.png)

3. Choose **Check** to check your entries.
4. If the check is successful, choose **Create**.
5. The cluster with the selected system is created and should be visible in the central CTS Configuration UI. Like before, an automatic validation will start. Do not worry about the **RFC connections missing** error; we will fix it in the next chapter.

Create the Production Cluster

1. In the central CTS Configuration UI, choose **Cluster → Create Cluster**.
2. In the dialog box, enter a **Cluster ID**, for example, **CPD**, and a **Description**, for example, **Cluster for production**. Do not select the checkbox **Source Cluster**. Finally, select your production system in the system list to add this system to the cluster. For ABAP-based systems, you must select a client. If the parameter **CTC** is set to 1 in the TMS configuration (and this is required by ChaRM and QGM), you are forced to do this. For non-ABAP systems, you do not have to set a client.
3. Choose Check to check your entries.
4. This time leave the option Distribute Configuration after Creating a new Cluster selected so that the new cluster configuration is distributed.
5. If the check finishes successfully, choose Create.
6. The cluster with the selected system is created and should be visible in the central cCTS Configuration UI. Like before, an automatic validation starts. Do not worry about the RFC connections invalid error. We will fix it in the next chapter.

After creating all three clusters each with one system assigned, the central CTS Configuration UI should show them as on the following screenshot.

To make sure that the distribution status is OK (the wrench icon should disappear) – click Refresh.

5.2.5.5 Define RFC Destinations

After the clusters are created, new RFC connections missing errors are shown for some systems. This is because cCTS needs destinations from the cCTS Server to the managed systems.
Three different destinations are required:

- Transport organizer destination to each source system (N14 in our example): required for working with transport requests (creating, deleting, and changing transport requests).
- Import destination to all managed systems (N14, E07 and Z06 in our example): Required for importing the CTS Service plug-ins
- Deploy destination to target systems (E07 and Z06 in our example): The import process of a transport collection needs this destination to import transport requests that are assigned to a transport collection.

The Transport Organizer destinations and the import destinations were created during configuration of the managed systems in SOLMAN_SETUP and are reused here. The deploy destination must be created manually.

Note

For non-ABAP systems, the RFC connections to their communication systems are checked. For plug-n-distribution, the communication system of the non-ABAP system is used. The Service plug-in is needed in the communication system. If you distribute the plug-ins for a non-ABAP system, the plug-ins are transported to the communication system.

Now the central CTS Configuration UI should only report an error that the deploy destination is missing. To create this destination, you use the central CTS Configuration UI to validate the cluster definitions and use the online help to define the deploy destination.

The validation result for a target system might be as follows after having chosen See details:

Deploy Destination

Note

The Deploy Destination is needed only once per system. The definition of the destination contains the client. This does not mean that you have to define a deploy destination per client.

1. To define the deploy destination, log on to your SAP Solution Manager (cCTS Server) and start transaction SM59.
2. Create a new ABAP Connection for E07 (the first target system) with a name matching the template TMSDPL@<SID>.<DOMAIN>, choose the Connection Type ABAP Connection, enter a Description and specify the Target Host and the System Number.

Caution
The name (TMSDPL@<SID>.<DOMAIN>) is case-sensitive. So, make sure that you use the same domain name as is used in TMS.

3. On the tab Logon & Security, you must enter a user with appropriate permissions. To create this technical user, proceed as follows:
   a. Log on to the managed system in which you want to create the technical user. Make sure to use the same client as you plan to use for the deploy destination
   b. Go to transaction SU01 and create a technical user (for example, CCTSTRANS) with the user type System and assign the following roles:
      i. A copy of SAP role SAP_BC_TRANSPORT_OPERATOR (make sure that the profile is generated).
      ii. A new role that you create yourself (for example, Z_TRANS_RFC_ACL). This role must contain the authorization object S_RFCACL with the following settings.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>16</td>
</tr>
<tr>
<td>RFC client or domain</td>
<td>000</td>
</tr>
<tr>
<td>RFC same user ID</td>
<td>N</td>
</tr>
<tr>
<td>RFC information</td>
<td>*</td>
</tr>
<tr>
<td>System ID</td>
<td>&lt;SID of your SAP Solution Manager&gt;</td>
</tr>
<tr>
<td>RFC transaction code</td>
<td>*</td>
</tr>
<tr>
<td>RFC User</td>
<td>DDIC</td>
</tr>
</tbody>
</table>

Refer to the SAP Library at http://help.sap.com/saphelp NW74/helpdata/en/48/8d1c6eae444e6ee100000000a421937/frameset.htm for more information about how to set permissions for S_RFCACL.
Note

The user DDIC is entered in here by intention. This is not an example. Using the user DDIC for this authorization check is aligned with SAP's security policy.

4. Select the Logon & Security tab and set Language to EN, set Client to your standard client (for example, 001), set User to any user name, e.g., CCTSTRANS as described in the previous step and select Yes for Trust Relationship. The entered user (for example, CCTSTRANS) needs to exist (at least as a service user) in the target system in the entered client and needs to have the permissions assigned as described in the previous step.

![RFC Destination Configuration](image)

Note

You can choose any Client that suits your landscape, security policy, and user policy. But please keep in mind that the user CCTSTRANS must exist in the chosen client.

5. Save the destination.
6. Repeat steps 1 to 5 for all target systems for which RFC connections missing is reported.

Important

If you receive the error message You are not authorized to logon to the target system (error code 0) when testing your destination, this is not an issue since the deployment is not performed with the user that you are currently logged on with. If you receive the return code 1002, refer to SAP Note [2264239](https://support.sap.com/).

Repeat the validation for all clusters in the central CTS Configuration UI after you have defined all destinations which were mentioned as missing. As a result, the status should be green for all clusters.
Important

The cCTS Configuration UI does not perform any consistency checks on whether, for example, there are only systems with the same role (in LMDB) assigned to a cluster or whether all systems that belong to a development cluster have a consolidation route to the following system in the track. These routes are not required by cCTS. Nevertheless, they should be in place in case you want to be able to work without clusters.

5.2.6 Connect the Clusters

To enable transports between clusters, you need to define transport routes between the clusters. This is done in the same way as for systems in transaction STMS. You use SAP Solution Manager (cCTS Server) for this configuration. In the menu, choose Overview → Transport Routes.
Define a consolidation transport route from the development cluster (CDV) to the quality cluster (CQS) and a delivery transport route from the quality cluster (CQS) to the production cluster (CPD). The result should look like the following screenshot:

Note
Note that you must have configured the transport routes for the individual systems of the cluster as described in the Prerequisites section. This is especially important if managed systems within the same transport track belong to different (linked) transport domains.

CAUTION
A transport layer should be added automatically when you create the consolidation route. Make sure that this is the case.

5.2.7 Define Import Targets for Clusters
As a last step, you need to define import targets on the target clusters so that the transport requests are imported into the correct system of the cluster. This is also done in the transport routes view in transaction STMS.

1. Call transaction STMS and choose Overview → Transport Routes from the menu.
2. Switch to edit mode.
3. Double click a target cluster, for example, the quality cluster CQS.
4. In the dialog box, select the Import Targets tab.
5. Choose Insert Row.
6. Specify the necessary data defining which transport requests from which system are imported into which system. In our example, requests from N14 client 001 are imported into E07 client 001. Therefore, the Import Targets in our example look like the following:
Important

The Request Source must always be the development system, in this example N14.

Note

Only enter a client for source and target systems, if you use extended transport control and if you want to make sure that the developments of one specific client in the source system reach a specific client in the target system. In all other situations, especially for non-ABAP systems, do not enter any client. You should maintain the clients in here as you did before in the configuration UI in chapter Validate Systems and Perform the Recommended Steps.

Note

If you develop in more than one client of an ABAP system, you can add the ABAP system more than once with different clients.

Note

If you want to enter a system which is neither part of the SAP Solution Manager domain nor of a linked domain, you cannot use the value help to select the data for the system. You must enter the data manually into the table.
7. Repeat steps 3 to 6 for the remaining target clusters, for example the production cluster CPD.

![Image](image_url)

💡 Important

The request source must always be the development system, in this example N14.

8. Save your changes.

5.2.8 Distribute the Configuration Changes

Perform this task once you have completed the configuration steps for all the systems that you want to use with central CTS. To distribute the configuration to all the systems in the transport domain, go to STMS on your SAP Solution Manager, choose Transport Routes, and then choose Distribute and Activate (F8).

![Image](image_url)

As an alternative, you can start the distribution in the central CTS Configuration UI using Distribute Configuration.

![Image](image_url)

>Note

If systems from foreign domains (with or without domain links) are part of the cluster, you must perform the configuration distribution on the domain controller of these systems.

This was the last step needed to configure a cluster track in cCTS.

If ChaRM and/or QGM are already configured completely, you can now start setting up your first change cycle which uses the cCTS infrastructure.

There are no new or changed configuration steps within ChaRM or QGM in SOLMAN_SETUP that are required before you can start using cCTS. When setting up a change cycle / scenario for ChaRM or QGM, you can choose to use the cCTS Infrastructure for this cycle / scenario.
5.3 Enhance cCTS Landscape to Support External Transport Requests (optional)

This section describes how to configure cCTS to include external transport requests in your transports. This may be necessary if you want to use developments from other systems in the current development system and if these developments are part of a transport request.

If you have an external transport request of this type, you import this request into your development system by adding it to the queue manually. You can then assign the external transport request to a change document in ChaRM or to a project in QGM. Refer to the chapter Executing transports of external requests for details.

In this section, we will enhance the landscape example so that you have the option to transport external transport requests created in a system with SID D28. The enhancements include:

- Creating a delivery route from the development system (N14) to the quality system (E07) so that the transport request D28K9… becomes part of the queue of the quality system E07 after it is imported into N14
- Define import targets on quality cluster CQS and on production cluster CPD. Add D28 as a source system (collections can now contain requests that have been created in system D28 even if this system is not one of the systems that are part of the clusters). To learn how to define import targets, see the chapter Maintain Import Targets for Clusters.

⚠️ Important

Only external requests which have their source system ID in the name are supported. External requests created with the Add-On Assembly Kit (SAPK* requests) are imported using the official tools (SPAM, SAINT…).

⚠️ Important

External requests are added to the queue of the following system after they were imported into the development system. You can then add the request to a change document in ChaRM or a change in QGM.

More details for QGM on this topic are available at [http://help.sap.com/saphelp_sm72_sp01/helpdata/en/70/c871fbdb454634b4b15813b7aeef971/frameset.htm](http://help.sap.com/saphelp_sm72_sp01/helpdata/en/70/c871fbdb454634b4b15813b7aeef971/frameset.htm)


Create a Delivery Route from Development System to Quality System

1. Log on to the domain controller of the system track where you want to use external transport requests. In our example, we want to add transport requests coming from D28 to the landscape N14-E07-Z06. Domain controller of this track is SAP Solution Manager (CSM). Call transaction STMS and choose Overview → Transport Routes from the menu.
2. Define a delivery route from the development system (N14) to the quality system (E07)

![Delivery Route Diagram]

3. Your result should look like the following screenshot.

![Screenshot of Delivery Route]

**Note**

In older versions of CTS, you might get an error while creating the delivery route because there is no consolidation route to the development system yet. To overcome this, you need to do the following: First create a dummy system, for example, DUM, as a virtual system. Afterwards, create a consolidation route from DUM to N14. Finally create the delivery route from N14 to E07.

![Diagram with Dummy System]

**Define Import Targets on the Quality Cluster**

To define the import targets on the quality cluster, execute the steps as described in the section [Define Import Targets for Cluster](#) of this guide. Add an import target from the external system to the quality system. (In this example, D28 is the external system and E07 is the quality system.) Finally, the import targets on CQS look like the following figure:

![Import Targets Diagram]
Note

The *Source Client* must not be set for the *Request Source* system in the case of external transport requests.

Note

If the system is neither part of the SAP Solution Manager domain nor of a linked domain, you cannot use the value help to select the data for the system. You must enter the data manually into the table.
Define Import Targets on the Production Cluster

As in the step before an import target is needed from the external system D28 to the production system. In our example, the result looks as follows:

![Image](image_url)

- **Note**
  The *Source Client* must not be set for the *Request Source* system in the case of external transport requests.

- **Note**
  If the system is neither part of the SAP Solution Manager domain nor of a linked domain, you cannot use the value help to select the data for the system. You must enter the data manually into the table.

This completes the setup for external request support. You can now attach transport requests starting with *D28K*… to the queue.

Execute Transports of External Requests

External transport requests are usually handled in full by ChaRM or QGM. See the documentation there. Roughly, the process is as follows:

1. Log on to your development system (or CTS+ communication system), go to STMS and open the queue of your development system. Make the external request known in the queue of the development system.
   - This can be done in the import queue of the development system using the menu *Extras* → *Other Requests* → *Add*.
2. Import the external request into the development system using the import queue of your development system in STMS.
3. Go to the SAP Solution Manager where you run ChaRM/QGM. Add the request to a change. This adds this request to a collection.
4. Transport the change.

6 Working with ChaRM/QGM

Now that the cCTS infrastructure is configured, you can use it for ChaRM and QGM.
Note
As of SAP Solution Manager 7.2, what was known as a project in SAP Solution Manager 7.1 has been replaced by a new entity, called change cycle. For more information, see https://help.sap.com/viewer/8b923a2175be4939816f0981b73856c7/7.2.06/en-US/62e1d853e9a21e4ee10000000a423f68.html

6.1 Roles Required for cCTS in ChaRM and QGM
To work with ChaRM and QGM, template roles exist that you can assign to your SAP Solution Manager users, such as developer, IT operator, transport administrator roles, for example. For more information, see the following topics in the Security Guide for SAP Solution Manager 7.2 for your support package on the SAP Service Marketplace at https://service.sap.com/instguides -> SAP Components -> SAP Solution Manager -> Release 7.2 -> 4 Operations: Application-Specific Security Guide:
- ChaRM: 7.5.4.3.3 CTS-Integration User Roles in the SAP Solution Manager
- QGM: 7.3.4.3 Central CTS-Integration User Roles in the SAP Solution Manager

6.2 Create a Change Cycle in ChaRM or a Scenario in QGM
You create change cycles for ChaRM in SAP Solution Manager Change and Release Management (open the Fiori Launch Pad and click on the respective tile). For each change cycle, you can select whether you want to use the central CTS infrastructure. For QGM, the entity is not called change cycle, but scenario instead.

Note
This topic will describe how to enable a ChaRM change cycle for the use of cCTS. For more information on how to set up a scenario for QGM, see Setting Up Quality Gates and Assigning Phases (http://help.sap.com/saphelp_sm72_sp01/helpdata/en/ba/41da6d057f42c9ae01d64926763007/frameset.htm) in the SAP Solution Manager documentation.

1. You create a new cycle for ChaRM or a scenario for QGM (click the respective tile in Fiori Launch Pad). As a prerequisite for this, the landscape must have been set up (logical component groups must already be defined, and branch assignment must be done), and you must have chosen a system and a client for which you want to create a cycle in the branch.
2. In the Web Client UI (SAP Solution Manager IT Service Management), choose Change Request Mgmt from the navigation area, and choose Change Cycle to create a new change cycle. The subsequent steps include, selecting the type of change cycle (for example, continual cycle, and phase cycle) and afterwards entering the relevant data for the selected cycle type, such as, selecting a landscape, and a branch. For more information, see http://help.sap.com/saphelp_sm72_sp01/helpdata/en/62/e1d853e9a21e4ee100000000a423f68/frameset.htm. When you switch the status of a created change cycle, you must assign a task list to it. For more information, see Task List http://help.sap.com/saphelp_sm72_sp01/helpdata/en/a7/a6db53df35c223e100000000a44538d/frameset.htm or Creating Task Lists http://help.sap.com/saphelp_sm72_sp01/helpdata/en/61/80d953facf4d59e100000000a4450e5/content.htm.

3. In the 2 Define Scope step of the guided procedure for creating task lists, you have the option to configure that you want to use the central Change and Transport System for this cycle. To enable
cCTS, select the corresponding check box.

**Phase Cycle: 8000015522 - Create Task List**

4. In the next step, you can check the cluster assignment. Since you decided to use cCTS, you have to select the system clusters that you want to use. SAP Solution Manager already performed a cluster check and suggests clusters that fit best with the logical components that you chose before. (This is not shown in this guide.)

**Note**

You have the option of choosing different clusters for each logical component. However, we recommend that you leave the proposed cluster selection unchanged.
5. In step 4 Complete, choose Create to create the task list assigned to the cycle to enable its use for cCTS.

You can now use the change cycle with the cCTS infrastructure. There are no further differences from an administrative perspective. You can now generate the task list. The result looks a bit different if you use cCTS. There are additional entries in the task list for the clusters. Refer to the SAP Library at http://help.sap.com/saphelp_sm72_sp02/helpdata/en/a7/a6db53df35c223e10000000a44538d/content.htm for details about task lists.

7 Best Practices

7.1 Naming Clusters
Name your clusters carefully. It would be good to have an element in the SID that characterizes them as clusters (for example, all start with ‘C’).

7.2 Designing Clusters
Create clusters that are as big as possible (maximum clusters). Minimize the number of clusters. Refer to chapter Maintenance Landscapes for special recommendations concerning clusters for maintenance landscapes.

7.3 Planning Landscapes
Up to now, we only considered a very simple cluster track. We created three clusters that each contained one system to keep explanations of the configuration simple. Cluster tracks in your own environment might look different.

7.3.1 Sample Scenario 1: Four-Cluster Track / One System per Cluster
One example of a very common cluster track is to have a four-system track. The four-system track scenario looks as follows

This scenario is like the three-system track example in this guide and contains only one more system:
- ERD as the development system
• ERQ as the quality assurance system
• ERT as the pre-production system
• ERP as the production system

As usual all these systems are connected by regular system transport routes. To enable them for cCTS you define a cluster for each system, like the example described earlier:

• CD1 as the development cluster
• CQ1 as the quality assurance cluster
• CT1 as the test cluster
• CP1 as the production cluster

All clusters are also connected with transport routes. (One consolidation route, from CD1 to CQ1, and two delivery routes, from CQ1 to CT1 and from CT1 to CP1).

The TMS parameters for all systems should be set to:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANAGED_SYSTEM</td>
<td>PARTLY</td>
</tr>
<tr>
<td>OPERATION_MODE</td>
<td>CONTROLLED_DYNAMIC or QUEUED_DYNAMIC</td>
</tr>
<tr>
<td>NON_ABAP_WBO_CLIENT</td>
<td>&lt;source client&gt;</td>
</tr>
</tbody>
</table>

The parameter NON_ABAP_WBO_CLIENT is only needed for the source system, ERD, if it is a non-ABAP system.

The import targets of the cluster should be set in the following way:

**CQ1**

<table>
<thead>
<tr>
<th>Request Source</th>
<th>Source Client</th>
<th>Target System</th>
<th>Target Client</th>
<th>Target Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERD</td>
<td>&lt;source client&gt;</td>
<td>ERQ</td>
<td>&lt;target client&gt;</td>
<td>&lt;domain name&gt;</td>
</tr>
</tbody>
</table>

**CT1**

<table>
<thead>
<tr>
<th>Request Source</th>
<th>Source Client</th>
<th>Target System</th>
<th>Target Client</th>
<th>Target Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERD</td>
<td>&lt;source client&gt;</td>
<td>ERT</td>
<td>&lt;target client&gt;</td>
<td>&lt;domain name&gt;</td>
</tr>
</tbody>
</table>

**CP1**

<table>
<thead>
<tr>
<th>Request Source</th>
<th>Source Client</th>
<th>Target System</th>
<th>Target Client</th>
<th>Target Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERD</td>
<td>&lt;source client&gt;</td>
<td>ERP</td>
<td>&lt;target client&gt;</td>
<td>&lt;domain name&gt;</td>
</tr>
</tbody>
</table>

The source and target client must be set for all ABAP systems.

**7.3.2 Sample Scenario 2: Four-Cluster Track/Multiple Systems per Cluster**

Most companies use more than just one application, with each application consisting of a three or four-system track. So, you might have to set up something like the following figure:
One SAP Solution Manager change cycle covers development for ERP, BW, and BO for which transport requests need to be transported together.

In addition, this cluster setup can also be used for SAP Solution Manager cycles that only use two of the three logical components, for example, just ERP and BW.

### 7.3.3 Sample Scenario 3: Uneven System Tracks

As of SAP Solution Manager 7.2, so-called uneven system tracks are fully supported within one change cycle. You can create clusters where not every system track consists of the same amount of systems and use logical components with an unequal amount of systems within one change cycle. The following figures show what this means:

*Change Cycle One* shows the situation which was already available in SAP Solution Manager 7.1. An uneven cluster was set up. But only the logical components that consisted of the same amount of systems, could be used within one change cycle.

As of SAP Solution Manager 7.2, you can also use the setup shown in *Change Cycle Two*. You can use a system track that consists of two systems and a system track that consists of three systems together in one change cycle. Of course, you can also use all three tracks of the cluster in the same change cycle.

### 7.4 Import Sequence and Parallel Deployment

With the parameter `OPERATION_MODE`, you can define how the transport requests that are part of a change are imported into the different systems of the target cluster.

In SAP Solution Manager 7.2, the configuration of parallel deployment is done in a different way than in SAP Solution Manager 7.1. Nevertheless, the configuration as done in SAP Solution Manager 7.1 is still...
possible and valid. You don’t have to change the configuration only because you upgraded your SAP Solution Manager system. You can find the details on the configuration as it was done in SAP Solution manager 7.1 in the Appendix: Appendix 2 – Parallel Deployment with Operation Mode PROPOSED_DYNAMIC

We recommend that you use operation mode QUEUED_DYNAMIC for parallel deployment if you are on SAP Solution Manager 7.2

Using the operation modes, you can influence the sequence in which target systems are supplied with imports and whether these deployments take place in parallel or sequentially.

The following options are available:

7.4.1 Configuration Option 1: Completely Parallel Deployment

Imports into all target systems take place in parallel

All systems of the cluster have the operation mode: QUEUED_DYNAMIC

Prerequisite: You have no requirements concerning the import sequence. This means that it is not important that imports into specific systems of the cluster take place before imports into other systems of the cluster.

Advantage:

- Minimum overall duration of the import.
- Import will be done for all systems that are available.

You can use the operation mode QUEUED_DYNAMIC for all systems in your cluster. This reduces import times to a minimum. With the import times that we took as an example in the previous chapter, this means that the import now only takes five minutes in total – the longest time that the import for one system landscape took.

7.4.2 Configuration Option 2: Sequential Deployment

Imports into all target systems take place one after the other

All systems of the cluster have the operation mode: CONTROLLED_DYNAMIC

Prerequisite: You have no requirements concerning the duration of the import or the transport volume.

Advantage: Configuration effort is lower in this mode. You don’t have to schedule jobs in the managed systems.
The picture above shows as an example the systems of two clusters. Cluster DEV consists of the systems BOD, BWD and ERD. Cluster QAS consists of the systems BOT, BWT and ERT. Imagine that a change containing transport requests for all three system landscapes is to be imported. Then in the example above, at first, all transport requests for BOT are imported. This takes five minutes. Only after this import is finished, the import of transport requests into system BWT is started. This takes two minutes. And again, only after this import is finished, the import of the transport requests relevant for system ERT is started. This takes three minutes. All in all, the complete import of the change into the QAS cluster takes therefore ten minutes.

For this option, you have to set the parameter OPERATION_MODE to CONTROLLED_DYNAMIC for all systems of a cluster.

7.4.3 Configuration Option 3: Partly Parallel Deployment

**Parts of the imports take place in parallel, and the remaining imports take place one after the other**

The systems of a cluster can have different operation modes (CONTROLLED_DYNAMIC and QUEUED_DYNAMIC).

**Advantages:**

- Systems that have very high transport volumes or which are not always available can have operation mode: QUEUED_DYNAMIC. With this, a long-running import into these systems does not delay the imports into the other systems.
- Using different operation modes enables controlling the import sequence. Imports into systems that have the operation mode CONTROLLED_DYNAMIC assigned are done before the imports that have operation mode QUEUED_DYNAMIC.
- Also, if imports are only done for some systems in the cluster (because you have set a filter), the same is still valid: First imports are done for systems with controlled dynamic and afterwards for
systems which are using queued mode.

If we take again the import times of the previous chapters as an example but this time have different operation modes in use, the resulting import time for the complete change is now eight minutes. This is the sum of import times of all system that use operation mode CONTROLLED_DYNAMIC plus the longest import time of all systems using QUEUED_DYNAMIC.

7.5 How to Change Existing Landscapes

From time to time your transport landscape may change – maybe a new system is installed that you want to include in your system track, or you want to exchange your pre-production system by a more recent copy of your production system to test with more up-to-date data. In this case, you also have to change the clusters that you created. In this chapter, we will look at some possible scenarios and how to handle the landscape changes.

When making changes to your cluster landscape, bear in mind the following important points:

- You can change systems or clusters within one change cycle. But you cannot make changes to any development or production system or cluster. Only make changes to systems in between, for example, test or pre-production systems.
- When you change systems or clusters, take care of the import queue of the changed system or cluster. Ideally, import all transports that are in the import queue of the system/cluster to be changed. If there are still transports in the import queue and you cannot import them, make sure that they are dealt with properly depending on the use case.
- You cannot delete an entire system track that was defined for an existing change cycle. You can only change single systems within a track which are neither development nor production systems.

The following steps are the recommended overall steps when changing the tracks. Refer to the different detail chapters below for specific details.

1. If possible, close all change cycles in ChaRM and QGM that use the respective cluster track.
2. If you cannot do this and you need to redefine the landscape within a change cycle, follow the important points mentioned above.
3. Inform users that you are changing the clusters. Make sure that no one creates new projects while you change the cluster track, for example, by revoking the respective permissions temporarily.
4. If you want to add a system to a cluster or create a new one, configure the respective systems (distribute plug-ins, set TMS parameters...).
5. Change the clusters as needed. Remember to define the Import Targets in TMS for added systems and clusters.
6. Distribute your configuration changes throughout the full transport landscape (including linked domain controllers if you use domain links, or foreign domain controllers).
7. Make sure that the landscape changes are also reflected in the configuration of SAP Solution Manager, e.g. the logical components, solutions, and branches may need to be adapted. Synchronization with LMDB takes place automatically if your SAP Solution Manager system is your domain controller. If SAP Solution Manager is not the domain controller, use transaction RZ70 in your domain controller to synchronize the configuration.

8. If you have closed the change cycles, create new ones.

9. If you have not closed the change cycles, adapt the existing change cycle. To do this, open the change cycle, switch to Edit mode and choose More → Redefine Landscape as shown in the following screenshot.

![Redefine Landscape](image)

**Note**

In this chapter, we only describe what has to be done from a cCTS configuration perspective. In addition, make sure that you adapt the SAP Solution Manager configuration to your changes.

### 7.5.1 Add a System to a Cluster

**CAUTION**

You cannot add any development or production systems within a change cycle.

If you want to add a system to an existing cluster, we distinguish the following cases:

**You want to add a system that was previously missing to an uneven cluster track.**

For example, you may want to add a quality system to a system track that previously didn’t have any quality system in an uneven cluster landscape.

To add a single system to a cluster, proceed as follows:

1. If possible, close all change cycles that use the respective clusters and the respective logical component. If you cannot close the change cycle, respect the important points described under How to Change Existing Landscapes.

2. Make sure that the systems are ready to be added to a cluster (use Validate in cCTS Configuration UI).

3. Inform users that you are extending the clusters.
   - No new transport collections are to be created while extending the landscape.
   - No transports are to be executed while extending the clusters.

4. To extend a cluster, proceed as follows:
   a. Use the cCTS Configuration UI to add the system to the cluster and perform the required configuration steps.
   b. Maintain the import targets in Transport Management System.

**You want to add a system track to a cluster**

For example, you may currently be using clusters consisting of BW and ERP systems. Your company may have decided to use BO as well. The BO development, test, and production systems now have to become part of the respective clusters.

You can perform the configuration tasks that are required to add a new system track to an existing cluster, add the new track, and use it while the change cycle is open.
7.5.2 Remove a System from a Cluster

⚠️ CAUTION
You cannot remove any development or production systems within a change cycle.

⚠️ CAUTION
Do not remove the system from LMDB or the TMS system list at first. This will cause inconsistencies during runtime.

1. Make sure that all collections are transported into the last cluster of the transport route – at least the ones that contain transport requests for the system that you are going to delete.
2. If possible, close all change cycles that use the respective clusters and the respective logical component. If you cannot close the change cycle, respect the important points described under How to Change Existing Landscapes.
3. Delete the respective rows from the Import Targets in STMS.
4. Remove the systems from the clusters in the cCTS Configuration UI.
5. Optional: if a system shall be removed from your landscape completely (e.g. LMDB removal, system deprecation, or TMS removal of non-ABAP systems) you can now do so.

7.5.3 Exchange a System in a Cluster

⚠️ CAUTION
You cannot exchange any development or production systems within a change cycle.

You can exchange systems that are neither development nor production systems by removing a system from a cluster and adding the new system to the cluster as described above.

7.5.4 Change the SID of a Cluster

It is not possible to rename a cluster. If you really need to change the SID of a cluster, refer to the chapter Substitute a cluster.

7.5.5 Substitute a Cluster

⚠️ CAUTION
You cannot substitute any development or production clusters within a change cycle.

1. Make sure that all collections are transported into the last cluster of the transport route. If not all the transport collections were imported into the last cluster of the landscape, you must prepare the import queue of the new cluster in a correct way.
2. In the cCTS Configuration UI, create a new cluster that contains the same systems as the cluster that you want to substitute. Configure exactly the same import targets.
3. If possible, close all change cycles that use the respective clusters and the respective logical component. If you cannot close the change cycle, respect the important points described under How to Change Existing Landscapes.
4. Re-configure the transport routes between the clusters to include the new cluster. That is, delete the transport routes to the old cluster and create new ones for the new cluster.
5. If required, copy the cluster import queue of the old cluster to the new cluster.

7.5.6 Add a Cluster

⚠️ CAUTION
This chapter does not describe the procedure for adding a development or a production cluster (and assigning a new role to the existing development or production cluster). It is not possible to exchange the development and production systems or clusters.
If you want to add a cluster to your landscape, for example, because you want to introduce pre-production systems in your cluster track, make sure that the following prerequisites are met:

- You must set up the systems that you want to include in the new cluster using system copies of the required systems. In addition, if not all transport requests were imported into the last systems of the system tracks, you must prepare the import queues of the new systems in a correct way.
- You can then bundle the systems in a new cluster. That is, you can configure the cluster and the import targets, and add the cluster to the system landscape.
- If not all the transport collections were imported into the last cluster of the landscape, you must also prepare the import queue of the new cluster. You do this by copying the import queues of all clusters that are behind the new cluster. First, you add the collections of the last cluster, and then the collections of the penultimate cluster, and so on, until you reach the new cluster. If you added a pre-production system in front of the production system, you just need to copy the import queue of the production system.

To add a cluster, proceed as follows

1. If possible, close all projects that use the respective cluster landscape if you need the new cluster immediately. If you cannot close the change cycle, respect the important points described under How to Change Existing Landscapes.
2. Import all collections at least into the cluster that is going to be the one following the cluster that you are going to add.
3. Use the cCTS Configuration UI to prepare the systems (distribute plug-ins, maintain TMS parameters and RFC connections) and create the cluster.
4. Add the systems to the transport routes in TMS.
5. Adapt the cluster transport routes in TMS.
6. Maintain the import targets (for the new cluster).
7. If not, all transport collections were imported into the cluster following the new one, copy the cluster import queue as described above.

### 7.5.7 Delete a Cluster

If you have to delete a cluster, execute the following steps:

1. Import all collections in the last cluster of the landscape – in most cases, this should be the one containing the production systems (and import all transport requests into the respective systems). If not all the transport collections were imported into the last cluster of the landscape, you must take care of the collections that are in the import queue of the cluster to be deleted. We recommend that you forward these transport collections to the import queues of the clusters that are - according to the delivery routes of the cluster - behind the cluster to be deleted.
2. If possible, close all change cycles in ChaRM and QGM that use the respective cluster. If you cannot close the change cycle, respect the important points described under How to Change Existing Landscapes.
3. Adapt the cluster transport routes in TMS.
4. Delete cluster in cCTS Configuration UI.

### 7.6 Maintenance Landscape

When we look at maintenance landscapes, there are two different aspects to consider. One is that you need to maintain your existing software that is used productively by your end-users and the other one is that you might develop new functionality from time to time. When you develop something new, you should separate this from the software that is used productively. Nevertheless, you still need systems where you can fix the existing software and transport these fixes to the production system. As a consequence, this means that you need systems for maintenance and systems for new development. This is valid both for system tracks and for cluster tracks. In this chapter, we will take a look on how the cluster setup could look like for these two requirements: Retrofit for bringing fixes from your maintenance landscape to your development landscape and Cutover for setting the new development productive (and with this, move it to maintenance).
Recommendation

We recommend that you set up clusters as big as possible (*maximum clusters*) for both the maintenance landscape and the landscape used for new implementations. Your landscapes should then look like the following figure.

![Maintenance Landscape Diagram]

These landscapes can now be used both for maintenance and for implementing new functionality.

7.6.1 Retrofit

To merge the software changes and fixes that you have performed in the maintenance landscape into the new development landscape, SAP assists you with the retrofit. A retrofit system landscape would look like this – for one application.

![Retrofit Diagram]


From a technical point of view, retrofits are done between single systems. Still you can leverage retrofits in cluster tracks as well.
If you want to use this track (and others) with ChaRM based on cCTS, we recommend setting up five clusters.

Note
Retrofit can only be used with ChaRM and not with QGM. If you use QGM and want to use retrofit as well, use QGM for your project landscape and ChaRM for your maintenance landscape. Within this scenario, you can retrofit changes from the maintenance landscape into the project landscape.

7.6.2 Cutover
Whenever you decide to develop something new, you can start doing so in the implementation landscape (remember to integrate fixes or changes done in the maintenance landscape into the implementation landscape with the help of a retrofit).

When your development is finished, and you decide to set the new functionality live, you should use the mechanisms of cutovers to integrate the new software in the maintenance landscape.

More details for cutovers are provided in the whitepaper Two Value Releases per Year on the SAP Service Marketplace in chapter 3 MANAGE DUAL TRACK LANDSCAPE FOR MULTI-PROJECT SUPPORT.

7.7 Logical Component vs. Cluster
Any logical components that you configured in the past remain as they are. If you did not use ChaRM or QGM beforehand, you have to define logical components as described in the SAP Solution Manager documentation. System clusters do not replace logical components.

Clusters combine systems with the same role (for example, development or production systems of the different applications). Logical components combine all systems with different roles of one application (for example, test, development, and production SAP ERP systems).
8 Troubleshooting

If there are problems during the setup, always carefully check the error messages displayed. In many cases, there are links next to the short text of the error message which give you more details and even possible solutions. If the information is not sufficient, check the TMS Alerts in the TMS Alert Viewer.

The viewer is available in the cCTS Configuration UI:

Alternatively, you can start transaction STMS and navigate to Monitor → TMS Alerts → TMS Alert Viewer. If there is an exception reported such as RFC system error in system/destination <SID> No authorization to logon as trusted system (Trusted RC=2), make sure that the user who gets the error has S_RFCACL permission assigned in the system.

- When checking the deploy destination (Utilities → Test → Authorization Test), the following error message is OK.
It only means that the user that you are currently logged on with does not have the authorization to use the destination. But later, when you use ChaRM or QGM with cCTS, this destination is not called by the user who is logged on.

The connection test should work fine:

### 8.1 Plug-in distribution fails

**Note**

This chapter names the most common reasons why plug-in distribution can fail. There may be other reasons depending on your configuration.

- Plug-in distribution fails with the error message “Transport control program tp ended with error code 0203”: Check whether the tp in the target system is on a version specified in the prerequisites section of this guide or in SAP Note 1665940.

- The import destination required for plug-in distribution exists, but it has not been configured correctly. The system only checks that the destination exists. 
  **Solution:** Check that the import destination was correctly configured, and that the user has sufficient authorizations on the managed system. To do this, check the Managed System Configuration in transaction SOLMAN_SETUP.

- The user that is used to import the CTS plug-ins in the managed system does not have sufficient authorizations on the managed system. 
  **Solution:** If the import destination uses 'Trust Relationship', the user must have the authorization object S_RFCACL in the managed system. For more information on S_RFCACL and 'Trust Relationship', see SAP Note 128447.

- Communication problems occur between the CTS server and the managed system.
  **Solution:** Check for any communication issues.

### 8.2 Distribution of the TMS configuration seems to be inconsistent

This section is relevant if you have more than one domain controller in your setup. If you have a setup like this and see wrench icons in the cCTS Configuration UI, you might have to distribute your configuration across the different domain controllers.

If you have changed the TMS configuration on one domain controller of your landscape, it is not sufficient to distribute the configuration on this domain controller; you also have to distribute the configuration on any other domain controller involved (even if you did not change anything there).

To do this, go to the System Overview in STMS on the domain controller where you did **not** change the configuration and choose **Distribute and Activate TMS Configuration**.

Use the option **Distribute Only to Systems Without Current Configuration** and set the option **Distribute**
8.3 Configuration to be kept synchronized

Configuration in multiple locations is involved if you use ChaRM/QGM based on cCTS. Make sure that landscape data, system roles, parameters, and so on are synchronized in the following places:

- LMDB: System roles
- SMSY (maintenance is done in LMDB as well in the meantime but make sure that the configuration you defined is also visible in SMSY)
- STMS: Import targets and transport routes
- cCTS Configuration UI: system – cluster assignments

8.4 Collections missing in import queue of target cluster

If collections do not show up in the import queue of the target cluster, check if they are only exported locally. If this is the case, check whether there is a default transport layer maintained for the consolidation route.

If the default transport layer is missing, the import target for a collection cannot be set when you release the collection.

For more details on transport layers, refer to the SAP Help Portal at https://help.sap.com/viewer/c238d694b825421f940829321fa326a/latest/en-US/4ec218e26e391014adc9ffe4e204223.html?q=transport%20layer

8.5 Import Queue Web UI

The Import Queue Web UI can be used if you want to have a Web UI for viewing logs for imports. You can find the Import UI as part of the CTS Transport Manager in the section Transport.

Note

You can use the Import Queue Web UI for executing ABAP and non-ABAP imports (and viewing logs) if you use CTS and if have the CTS plug-in installed, or if SAP NetWeaver 7.4 SP 10 or higher is installed on the system in question. Details are available on the SAP Help Portal at: http://help.sap.com/saphelp_nw74/helpdata/en/4b/b9a1222f504ef2aa523caf6d22d1c9/frameset.htm.

If you want to use the Import Queue Web UI with all its functions for managing transports for ABAP and non-ABAP, the following services have to be activated in transaction SICF:

- CTS_ZENUI_ENTITY_QUEUE
- CTS_IMPORT_HISTORY
If you use ChaRM and QGM, imports are executed automatically as soon as you switch a change to the next step or open the respective quality gate. In this case, you do not use the Import Queue Web UI.

8.6 Emergency Mode

If for some reason, you cannot use ChaRM/QGM to execute imports, you can activate the emergency mode of Import Queue Web UI to execute imports on a cluster level. To do this, you have to switch off the import locks for the respective cluster(s).

1. Go to transaction STMS and open the TMS parameters for the cluster where you want to execute imports.
2. On the Transport Tool tab, add the parameter `watch_importlocks` with the value `false`. To turn off emergency mode again, remove the parameter `watch_importlocks`.

Note

If you use the emergency mode of the Import Queue Web UI, you can execute imports on a cluster level. This means that you are going to import collections. As a consequence, this means that all the transport requests that are part of the collection(s) are imported synchronously into the respective target systems. You cannot start the imports into the different target systems separately. This is different from using import options in ChaRM and QGM where you start an import per system (or this is done using a job).

For more information, see Performing Imports in System Clusters at [http://help.sap.com/saphelp_sm72_sp02/helpdata/en/c2/1499539de1ce46e10000000a44538d/content.htm](http://help.sap.com/saphelp_sm72_sp02/helpdata/en/c2/1499539de1ce46e10000000a44538d/content.htm).

In case SAP Solution Manager is down you need to follow the procedure described in the chapter Import into clients outside of ChaRM / QGM.

8.7 Managed Systems with CTS_PLUG installed

In the following situation, the automatic update mechanisms for the CTS Service plug-ins described in the chapter Distribute cCTS Plug-ins cannot be used:

- if your SAP Solution Manager 7.2 system is on a support package level of software component SAP_BASIS lower than SP 13 and
- if you have software component CTS_PLUG installed on a system that you want to manage using SAP Solution Manager.

In this situation, you must update CTS_PLUG on these systems by importing the respective support packages of CTS_PLUG as described in SAP Note [1665940](http://help.sap.com/saphelp_sm72_sp02/helpdata/en/c2/1499539de1ce46e10000000a44538d/content.htm). As an alternative, you can also implement the correction instructions contained in SAP Note [2204782](http://help.sap.com/saphelp_sm72_sp02/helpdata/en/c2/1499539de1ce46e10000000a44538d/content.htm) to enable plug-in distribution into these systems. After this is done, validate the system again from within cCTS Configuration UI.
8.8 Required TMS parameters

The following TMS parameters have to have a defined value for the systems that you want to use with ChaRM/QGM based on cCTS. The requirements are not different from ChaRM/QGM without cCTS which means these parameters are not explained in the standard configuration chapter earlier in this document.

In the system parameters in STMS, set the transport strategy to *Single Transports*. This is required by ChaRM and QGM. It is not a matter of using cCTS or not.

8.9 Import Targets

Make sure that you use the development systems (and their clients) as source systems in each cluster, not only in the first cluster after the development cluster.

If the request source system is not set correctly, transport requests are not imported.
8.10 RC 5000+x in Import Log

Using cCTS, you can see the special return code 5000+x (e.g. 5004) in the import logs of your import. You find it in the import steps Deployment or Check Deployment. When you go to the details of the step Check Deployment, you can find more details about what it means.

Basically, RC=5000+x is a combined return code made up from the value 5000 and the maximum return code of all import steps that were executed as part of an unfinished import step.

- 5000 means that the import step was not executed completely and will only be completed with a subsequent import call. This is because that when working with ChaRM/QGM, it is possible to import only parts of the collection into a subset of systems (using the cCTS feature of system filtering together with ‘operation_mode=controlled_dynamic’ in the managed systems). In this case the return code for the Deployment step as well as for the Check Deployment step is at least 5000.
- x is the maximum return code of all import steps of the transport requests which have been imported so far.

These two pieces of information are combined into a simple addition. Therefore, for example, RC=5004 means: The import of the collection was already executed partly, the maximum return code so far is 4.

As soon as the return code for Check Deployment is a final return code (< 5000), this return code is also set as final return code for the Deployment step. This ensures that completed collection imports are displayed as completed in the cluster import queue and in the cluster import history.

8.11 Could not validate

If you receive the error message Could not validate after the validation, use the link See Details.

You might see the following:

Here, you are asked to go to TMS Alert viewer to get all the details.

One reason that you might find in the Alert Viewer is that the user TMSADM is locked or does not have the same password on the managing system and the system that you validated.
Refer to SAP Note 1658362 to learn more about how to change the password for TMSADM.

8.12 Import into clients outside of ChaRM / QGM

If you use an ABAP system with several clients, it might happen that one or more clients are part of your cluster configuration and therefore receive transports via cCTS and other clients are not part of this configuration but nevertheless transports should be ‘importable’. If a system is controlled via ChaRM or not is defined on system level, not on client level. If you release a change in ChaRM, the transport requests are forwarded to the respective systems and are part of the buffer. For the clients that are part of the ChaRM configuration, the import is then done automatically.

For clients outside ChaRM, this import is not triggered. If you need to import transport requests into such clients, you need to do so manually with special import options:

1. Open the import queue of the respective system.
2. Mark the respective request and choose Extras → Activate Inactive Requests.
3. Make sure that the respective transport request is still marked and import it.
4. Make sure that the option *Leave Transport Request in Queue for Later Import* is set.

With this, you can make sure that the import will later on also be part of an ‘import all’ and that the correct transport sequence is set.

If you go for this immediate import, you have to do so whenever you import the transport request in any system of your landscape. This behavior is not saved / kept as an attribute if the transport request.

9 Appendix

9.1 Appendix 1 – Different Landscape Setup

If your CTS+ Communication System is not the SAP Solution Manager where you use ChaRM/QGM with cCTS

Starting with SAP NetWeaver 7.31 SP2, you can also use systems based on this release as a CTS+ system (domain controller and communication system). It is no longer a requirement to use the SAP Solution Manager as a CTS+ system if you want to use the option to integrate your own applications into CTS+ (generic CTS) or if you want to use CTS+, for example, for SAP Business Objects Lifecycle Manager. As a prerequisite, you either must install CTS_PLUG on the CTS+ system, or your system is already on SAP NetWeaver 7.4 SPS 10 or higher.

It might also be the case that you use an SAP NetWeaver system on a lower release as a CTS+ system if you use CTS+, for example, for SAP NetWeaver Portal or Process Integration. In this case, CTS_PLUG cannot be installed (and it is also not required for this use case).

If one of the above options applies to your landscape, you must consider some special configuration topics:

- On the CTS+ communication system, at least the CTS Service plug-in is required
- The TMS parameters `OPERATION_MODE` and `MANAGED_SYSTEM` must be set for each non-ABAP system that is (or should become) part of a cluster on the domain controller of the non-ABAP system. It is not a requirement to set these parameters for the domain controller or communication system.
- An RFC destination from the SAP Solution Manager to the communication system is needed. This destination is created if you configure the CTS+ system in `Managed Systems Configuration` in SOLMAN_SETUP in SAP Solution Manager.
9.2 Appendix 2 – Parallel Deployment with Operation Mode PROPOSED_DYNAMIC

9.2.1 Job Scheduling with Operation Mode PROPOSED_DYNAMIC

If you configured your systems and jobs in SAP Solution Manager 7.1 to be able to use parallel deployment by the help of the operation mode PROPOSED_DYNAMIC and scheduled jobs, you can continue to use this configuration after an update to SAP Solution Manager 7.2. There is no need for an immediate reconfiguration. Therefore, you can still find the details for this configuration in this guide. Nevertheless, there is a more sophisticated solution for parallel deployment in SAP Solution Manager 7.2. You can now use the operation mode QUEUED.

You need to schedule a job in each managed system which has the operation mode PROPOSED_DYNAMIC. The purpose of the job is to import the transport requests and deploy their content that were added to the local import queue by the import of a transport collection in parallel to the deployment into other systems. (For information on when to set operation mode PROPOSED_DYNAMIC, see Import Sequence and Parallel Deployment.)

In each system, schedule a job for the program SAP_TMS_IMPORT_CCTS as described in the Job Scheduling Explained documentation at https://help.sap.com/saphelp_nw74/helpdata/en/4b/2bbeee4c594ba2e10000000a42189c/content.htm.

Schedule the job in recurring intervals. If it is important that transports are imported into the systems of the cluster as quickly as possible, schedule a short frequency (e.g. 15 minutes). If it is important that the imports into the different systems take place in a specific sequence, schedule the jobs - time-shifted - with a longer frequency (e.g. every day: system A at 22 o’clock, system B at 23 o’clock, system C at 24 o’clock).

For each managed non-ABAP systems, you have to schedule the jobs in the relevant communication system. In this case, you require a variant for the program SAP_TMS_IMPORT_CCTS in which the parameter SYSID has the value <SID of the non-ABAP system>.

9.2.2 Import Sequence and Parallel Deployment

With Sap Solution Manager 7.1, you had to use the operation mode PROPOSED_DYNAMIC to enable parallel deployment. This configuration is still possible in SAP Solution Manager 7.2. But we recommend that you now use operation mode QUEUED.

Nevertheless, if you still use the option as provided in SAP Solution manager 7.1 you can find the details in this chapter.

Using the operation modes, you can influence the sequence in which target systems are supplied with imports and whether these deployments take place in parallel or one after the other.

9.2.2.1 Configuration Option 1: Completely Parallel Deployment

Imports into all target systems take place in parallel

All systems of the cluster with the operation mode: PROPOSED_DYNAMIC

Prerequisite: You have no requirements concerning the import sequence. This means that is not important that imports into specific systems of the cluster take place before imports into other systems of the cluster.

Advantage: Minimum overall duration of the import.

9.2.2.2 Configuration Option 2: No Parallel Deployment

Imports into all target systems take place one after the other

All systems of the cluster have the operation mode: CONTROLLED_DYNAMIC

Prerequisite: You have no requirements concerning the duration of the import or the transport volume.

Advantage: Complete import logs in import step deployment (T) at the level of transport collections.
9.2.2.3 Configuration Option 3: Partly Parallel Deployment

Parts of the imports take place in parallel, and the remaining imports take place one after the other.

The systems of a cluster can have different operation modes (CONTROLLED_DYNAMIC and PROPOSED_DYNAMIC).

Advantages:

- Systems that have very high transport volumes or which are not always available can have operation mode: PROPOSED_DYNAMIC. This has the result that a long-running import into these systems does not delay the import into the other systems.
- Import sequence: Systems into which you want the imports to take place first, have operation mode CONTROLLED_DYNAMIC. The prerequisite for this is that the jobs in the systems with operation mode: PROPOSED_DYNAMIC were adequately scheduled (as described under Job Scheduling with Operation Mode PROPOSED_DYNAMIC).