# SIEMENS

# Preparation Guide of SAP S/4HANA® Teamcenter Gateway for SAP S/4HANA Edition

# Contents

# Preface

This documentation cannot be used as a substitute for consulting advice, because it can never consider the individual business processes and configuration. Despite our best efforts it is probable that some information about functionality and coherence may be incomplete.

**Issue: November 2018**

**Legal notice:**

**Trademark notice:**

# 1. Introduction

The Teamcenter Gateway for SAP S/4HANA **(T4S4)** software solution is a general purpose integration software that provides data and process integration between Teamcenter® by Siemens Product Lifecycle Management Software Inc. and SAP S/4HANA® by SAP AG.

T4S4 provides a wide range of interactive and workflow functions to transfer and synchronize data between Teamcenter and SAP S/4HANA®.

# 2. Supported SAP Products

Please see: **How to obtain the SAP GUI release and patch level information**

The latest information on supported products is available in the readme file *Teamcenter_Gateway_for_S4HANA_18.2_README_for_Teamcenter_ *.txt*. It can be downloaded from **GTAC** from Teamcenter and TeamcenterRapid Start / Integrations directory.

Teamcenter Gateway for SAP S/4HANA 18.2 supports SAP S/4HANA® on-premise edition 1610 and 1709.

> Caution:
>
> SAP S/4HANA® is not supported by Teamcenter Gateway for SAP Business Suite! Teamcenter Gateway for SAP S/4HANA is offered for this platform.
>
> Please also see **https://launchpad.support.sap.com/#/notes/147519** for supported products.
>
> SAP GUI for Windows Support Deadlines:
>
> - 7.40: Full support up to January 9th, 2018. Restricted support until June 30th, 2018. No extended support is offered
>
> - 7.50: Full support up to April 9th, 2019. Restricted support until September 30th, 2019. No extended support is offered.

# 3. Software Prerequisites to Run Teamcenter Gateway for SAP S/4HANA

## 3.1 Legal Information

SAP does not allow their software partners to ship files owned by SAP. As a result, some of the files T4S4 requires to communicate with SAP are not included in the T4S4 installation package and need to be obtained directly from **SAP ONE Support Launchpad** or with the help of your SAP support partner.

In order to download software from the **SAP ONE Support Launchpad**, a valid web login with user and password is necessary.

## 3.2 How to Obtain the SAP and SAP GUI Release and Patch Level Information

**SAP Version**

In the main menu point System – Status, check the point "Component version".

**SAP GUI Version:**

In the SAP logon window, click on the icon in the upper left corner (where you may minimize and close windows by default) and select "About SAP logon". Then a new window opens that shows the information. Example from a SAP GUI 7.40 with patch level 0:
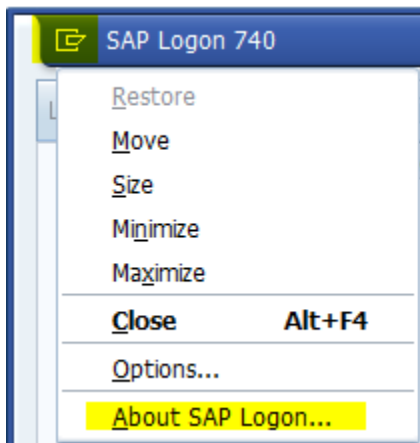
## 3.3 Netweaver RFC SDK

Depending on the SAP system configuration those file versions may be different. Unfortunately T4S4 cannot check which are the correct files, so in case of a problem with SAP communication (in most cases in DIR handling only) please ask your SAP specialist for help and provide the correct files. The SAP RFC SDK can be downloaded from the **SAP ONE Support Launchpad**

The corresponding files have to be copied into the GS bin directory (*<T4x_GS_ROOT>\bin64*):

- libsapnwrfc.dll (.so)

- libsapucum.dll (.so)

- libicudecnumber.dll (.so)

For more details, please read *<T4x_GS_ROOT>\bin64\readme.sapnwrfclib*

> Caution:
>
> If the Netweaver runtime library files are missing, the GS will not start.
>
> As the GS can still use some SAP JCO functionalities, it additionally may require the JCO runtime libraries.

If the correct version of the files can´t be clearly identified, the best possibility to find the correct package is downloading several packages from SAP and checking if the T4S4 transaction is successful. In order to avoid a long search, first check the following in the SAP GUI: **How to obtain the SAP GUI release and patch level information**. Then try downloading only the packages from SAP with similar descriptions.

## 3.4   JCO (Java Connector) Libraries

Using JCO may not be necessary for the basic T4S4 functionality. Examples where JCO may be necessary are:

- Some T4x web services.

- A couple of not yet migrated standard T4S4 functions are still using the JCO adapter at the moment, this are in the following areas:
  Routing Change
  Material Batches
  iPPE
  Project System
  Manufacturing functionality, especially Routing Transfer .

- Any customer specific functionality using JCO (reading or writing SAP fields that are inaccessible by the default SAP mechanisms).
  In previous T4S versions, custom SAP functions where called via JCO. This will still be the case until the code has been replaced with generated code for the NW interface.

- Some T4S4 features use the SAP JCO adapter without telling it explicitly.

T4S4 uses SAP JCO Release 3.0.9 (or higher) for all platforms. This version can be downloaded on the SAP Service Marketplace. Depending on the hardware and OS platform (Windows, UNIX, Linux), you need a different JCO package. This Java process is independent from the Java process started with Teamcenter, it may use completely different environment settings.

The system hardware determines the package where to take the SAP JCO library files from. In Linux/ UNIX, the command `uname  -a` tells some details. As not every hardware is certified with Teamcenter, you may refer to the **hardware and software certifications** to exclude some hardware packages.

Required files:

- sapjco3.dll (.so)

- sapjco3.jar

- sapjco3.pdb

For more details, please see *<T4x_GS_ROOT>\bin64\readme.sapnwrfclib*.

Caution:

The Java version used in your machines determines whether the 32-bit or 64-bit libraries are used. Depending on the Java version, it might be necessary to use the 32-bit JCO package even on a 64-bit system. In a command shell, enter `java -version`. Check the output: if it does not state anything about 64 bit, it is a 32-bit Java version and needs the 32-bit JCO package. The minimum required Java version for SAP JCO is JSE 1.7.0.

## 3.5   SAPftp and SAPhttp

T4S4 may use the SAP tools SAPftp and SAPhttp for doing the check-in of original files to a SAP DIR. The SAPftp and SAPhttp programs can be downloaded on the **SAP ONE Support Launchpad**. The corresponding files must be copied into the T4S bin directory *<T4x_GS_ROOT>\bin64*. They have to match the ones in used by your SAP system. This can be checked in a command shell as follows:

Example: **C:\temp>C:\PLM\T4S_Apps\bin64\sapftp.exe –V**

```
SAPFTP Unicode
(#) $Id: //bas/753_REL/src/krn/ftp/ftpmainnw.c#3 $ SAP
(#) $Id: //bas/753_REL/src/krn/ftp/ftpnw.c#1 $ SAP
@(#) $Id: //bas/753_REL/src/krn/ftp/ftpcmdnw.c#1 $ SAP
SAP release: 753 SAP release no: 7530
```

For more details, please see *<T4x_GS_ROOT>\bin64\readme.sapnwrfclib*

## 3.6   SAP GUI for HTML Support

T4S4 also supports the so called SAP GUI for HTML for a set of display functions (which can be configured via the corresponding T4S Gateway Menu preference). The functionality is based on the Internet Transaction Server (ITS) of the SAP system. More details can be found in the corresponding SAP documentation. This chapter gives an overview of the relevant basic configuration steps.

### 3.6.1   Services for the SAP GUI for HTML

With the SAP transaction `SICF` it is possible to validate the status of the following services:

- /sap/public/bc/its/mimes

- /sap/bc/gui/sap/its/webgui

Both have to be activated.

Create/Change a Service

## Create/Change a Service

| Path | /default_host/sap/public/bc/its/ |
| Service Name | mimes | ⬡ Service (Active) |
| Lang. | English | ➡ Other Languages |

### Description

| Description 1 | MIME Repository |
| Description 2 | |
| Description 3 | |

**Service Data** | Logon Data | Handler List | Error Pages | Administration

### Service Options

☐ Web Service

☐ Do Not Include Inherited Settings

| Load Balancing | |
| SAP Authoriz. | |
| Session Timeout | 00:00:00 (HH:MM:SS) |
| Compression | Yes |

### Interactive Options

| GUI Link | Not specified | GUI Configuration |
| Support Accessibility | Not specified | |

### 3.6.2 Internet Transaction Server Configuration

Use transaction SE80 to validate the ITS configuration:

Utilities > Settings > Internet Transaction Server (Tab) > Publish (Tab).

Selecting "Integrated ITS" restricts the publication in the next step to the integrated Internat Transaction Server.

### 3.6.3 Internet Services SYSTEM and WEBGUI

For the SAP GUI for HTML it is necessary that the "Internet Services" SYSTEM and WEBGUI are published. By this they can be called by a web browser. This status check of the internet services can be managed via the SAP transaction code SE80. If needed the services can be published by the context menu > Publish > Complete Service.
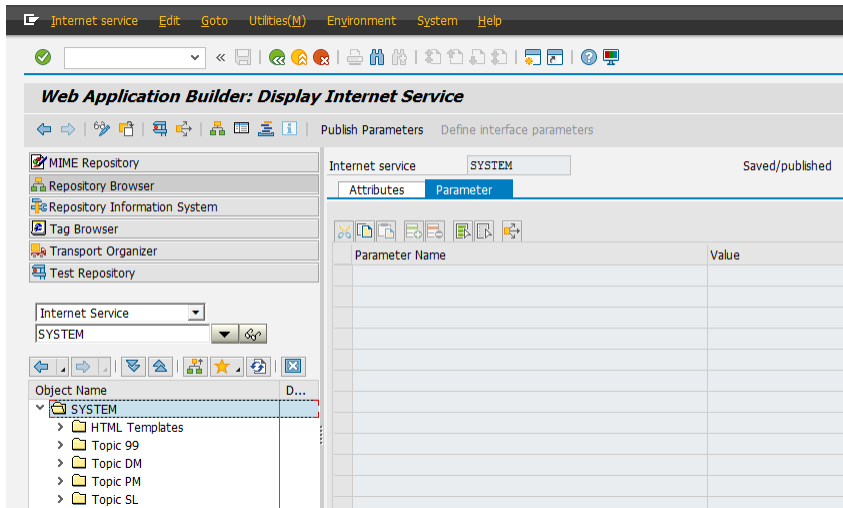
## 3.7 SAP Transactions via the SAP Portal Support

Beside the T4S4 support for the SAP GUI for HTML it is also possible to call the corresponding display transactions via the SAP Portal iView URL. This chapter will show the configuration steps that are necessary to enable the feature.

> Caution:
>
> The SAP system configuration requires special SAP permissions.
>
> Please ask your SAP service provider for the SAP Portal iView URL which can be used in a web browser.
>
> The following SAP web link shows details how to handle that functionality from SAP directly. It needs a login with a SAP customer account: http://scn.sap.com/docs/DOC-52102

For testing purposes, it should be possible to call the SAP Transaction iView directly via the following URL pattern:

```
http://<portal_host>:<portal_port>/irj/portal?NavigationTarget=
ROLES://portal_content/<ContenFolder>/sap_transaction_iview&System=
<ABAP_System_Alias>&TCode=[*]<TCode>
%20<param_name1>=<value1>;<param_name2>=
<value2>&GuiType=<GuiType>
```

The following table shows the definition of the used placeholders (variables) and their corresponding meaning:

| Variable | Description |
|---|---|
| <ContentFolder> | The folder name that was used during the preparation of the iView copy, e.g `TESIS` |
| <ABAP_System_Alias> | The ABAP backend system alias as defined in the portal, e.g.`de_tesis_ET2_800` |
| <TCode> | The SAP transaction code. If preceded by a * it will be executed immediately, e.g. `*MM03` |
| <param_name1> | The name of the first parameter for the transaction screen (optional), e.g. `RMMG1-MATNR` |
| <value1> | The value for the first parameter of the transaction screen, e.g.`P-100` |
| <GuiType> | The SAP GUI type to use. This can be either `WebGui` (SAP GUI for HTML) or `WinGui` (SAP GUI for Windows). The value is case sensitive! |

In this example the transaction MM03 (Material Master Display) is started within the SAP Portal for the material P-100 using the SAP GUI for HTML representation of the transaction:

```
http://sap1.xy.de:55000/irj/portal?NavigationTarget=ROLES://
portal_content/
TESIS/
sap_transaction_iview&System=de_tesis_ET2_800&TCode=*MM03%20RMMG1-MATNR=
P-100&GuiType=WebGui
```

The required T4S4 configuration for the specific SAP system is described in the **Teamcenter Gateway for SAP S/4HANA - Configuration Guide**, chapter *Configure the T4S Gateway Menu Options*.

## 3.8   SAP OSS Notes (Patches)

Depending on the implemented functionality and use cases, it might be required to implement certain OSS notes in order to fix known in SAP:

- **https://launchpad.support.sap.com/#/notes/**

- **https://support.sap.com/software/patches.html**

The following functionalities are affected:

- All

- Material Master

- Document Info Record File Transfer

- Routing

- Project BOM / WBS BOM / Functional Location BOM

- Characteristic / Product Configurator / Class Sync

## All

The following Package must be implemented:

2408634 - Incompatible change of function module RFC_GET_SAP_SYSTEM_PARAMETERS

## Material Master

The following OSS Notes fix issues with Material Master functionality:

- Add note for mandatory OSS note 2340659 for the OLD_MAT_NO issue.

- Add note for mandatory OSS note 2406960 for the material number conversion issue.

- Add note for recommended OSS note 2400601 and 2406960.

- Add note for mandatory OSS note 2340659 (BAPI_MATERIAL_SAVEDATA OLD_MAT_NO issue).

- Add note for mandatory OSS note 2287625 (Changed behavior of material mapping at interfaces for extended material number functionality).

## Document Info Record File Transfer

The following OSS notes are known to create problems with original file check-in and may have to be removed:

- 1692988

- 1605054

## Routing

If released for the target SAP, the following OSS notes must be implemented in order to ensure that the SAP Routing Create and the T4S Routing Change code works as expected:

| | |
|---|---|
| **1481676** | EWB: Component assignment creates incorrect PLMZ entries |
| **1734785** | EWB: Error during component assignment (change states) |
| **1946879** | EWB: The task list sequence is incorrectly saved (reference node) |

**1388025**      Reassigning component assignment to parallel sequence

**1915244**      Lange Laufzeit oder Dump bei der Synchronisierung (3) (this patch is not mandatory, but recommended)

**1966556**      RCA: Error caused by SAP Note 1915244 (this note must be installed when note 1915244 is in the system)

The following notes are not required by the Routing Create/Change APIs, but recommended for general use (SAP GUI):

**2118418**      Inconsistent Component Allocation from CEWB due to incorrect entry in PLZU Table

**2106108**      Multiple Component Allocations for a single BOM component to the same sequence or parallel sequence.

## Project BOM / WBS BOM / Functional Location BOM

If a special BOM type (e.g. Project BOM - also known as WBS BOM, Functional Location BOM or Equipment BOM) is changed by T4S in SAP using a change number, all BOM lines will be referenced with the change number even though they have not been changed.

Download and implement SAP OSS note 1992647: CSAI_BOM_MAINTAIN: All positions are updated with the new change number even though only one position is changed.

## Characteristic / Product Configurator / Class Sync

If released for the target SAP, the following OSS notes must be implemented in order to ensure that T4S characteristic transfers (e. g. class sync, product configurator, ...) work as expected:

OSS Note 1684377 (BAPI: Long runtime III): Due to an error in SAP Notes 1640511 and 1604614, the system may not recognize changes to characteristics correctly.

## Checking the Implementation of OSS Notes

First you need to open the SAP Transaction `SNOTE`. Then you can download the Note in your repository (this may take a while):
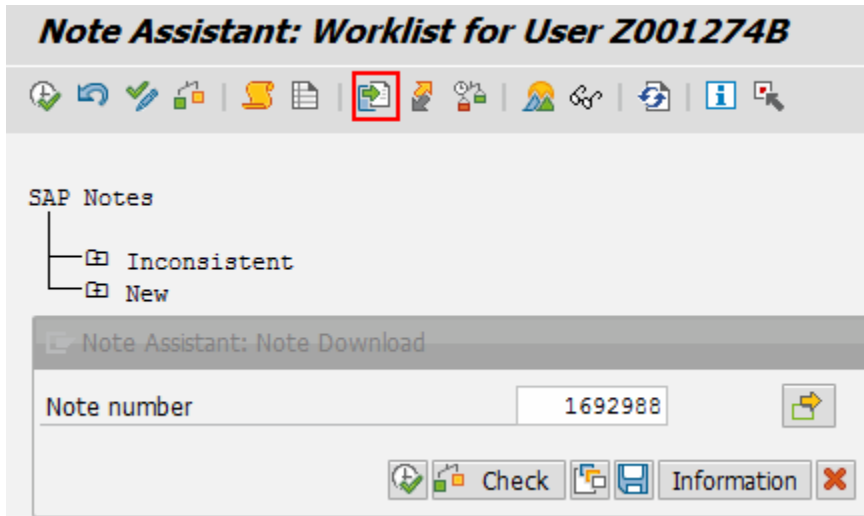
After that you can find it with the Note Browser:
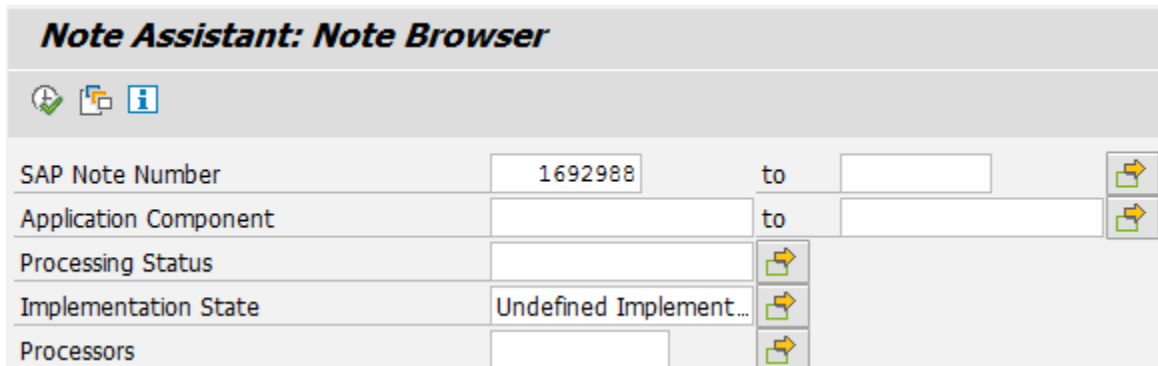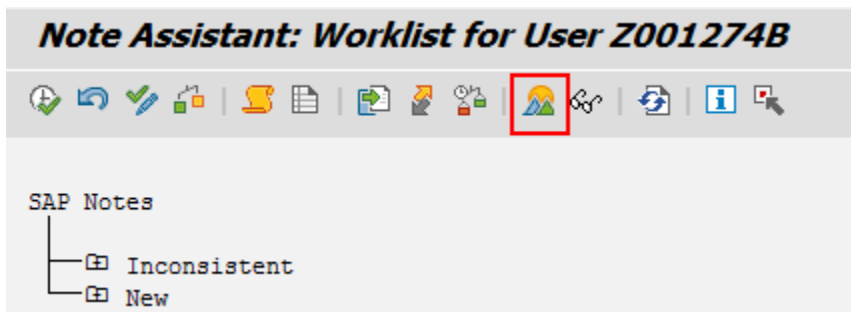
# 4. SAP Function Calls Used and Permissions Required

## 4.1 SAP Function Calls Used and Permissions Required by Teamcenter Gateway for SAP S/4HANA

**Mandatory Functions**

The following RFC access permissions are needed in any case:

- function group SYST

- RFC_PING

- SYSTEM_RESET_RFC_SERVER

- SCSI_GET_SYSTEM_INFO

- RFC_GET_FUNCTION_INTERFACE

**Overview of Functions**

A complete overview of SAP functions that could be called can be found in the **T4S4 API Reference** under *List of SAP Function Groups and Functions used by T4S4*:



The calls are grouped by permissions.

**List of actually Used Function Calls**

T4S4 provides a log file that lists all actually used function calls after they have been used. Ideally you get all SAP permissions for the T4S4 user(s) during development. Then after development is complete, you can extract a list of functions from the log and give it to your SAP administrator to limit the SAP permissions for the testing phase.

In the BGS Admin UI you will find the logfile *sys/sap_function_calls.log*. It contains a list off all called SAP functions. Please see *Configure T4x BGS Using BGS Admin UI* in the **Teamcenter Gateway - Installation Guide** on how to login to the Admin UI. Please use the help function of the Admin UI for more details.

Caution:

The logfile does not list the following "connector internal" calls:

- RFC_PING

- RFC_GET_FUNCTION_INTERFACE

- DDIF_FIELDINFO_GET

- SYSTEM_RESET_RFC_SERVER

## 4.2  UCON Blacklist

The UCON Blacklist prevents external applications such as T4S to work properly with SAP S/4HANA®. Siemens PLM Software provides a SAP Transport Package with wrapper functions. This way T4S can be re-enabled to communicate with SAP. It is not required to expose the RFC function modules by disabling the UCON Blacklist.

With SAP S/4HANA® version 1511 SP02 and higher, SAP uses the UCON Blacklist functionality to block certain RFC function modules. The reason for this is that many API calls (BAPIs) have been changed, and may not be backwards compatible. So the result could be that inconsistent or wrong data is being committed to the database. In order to avoid such an issue without even being recognized by the client caller (e.g. T4S4), this blacklist was introduced to block all APIs which have been changed in an incompatible way.

T4S4 Version 18.2 and higher is fully compatible with the above mentioned API changes done by SAP. However the UCON Blacklist prevents external applications such as T4S4 to work properly with SAP S/4HANA®.

When a blocked remote enabled function module (RFC FM) is called from an external client on a SAP S/4HANA® system, an error is raised and shown to the caller with the following error text:

```
"UCON RFC Rejected; Called Function :<RFC FM NAME>; Caller SID :<SID of
Client>; Caller Program :<Caller program from which RFC call is made>".
```

Example from T4S4:

```
Error Message: RFC code = 4 (RFC_ABAP_MESSAGE) :: Incompatible Call
Rejected, see note 2295840; Called Incompatible
Function :RFC_GET_SAP_SYSTEM_PARAMETERS; Caller Program :nwpipe; Caller
Dest. :demchdc81!
```

More information and a list of BAPIs being blocked by this blacklist can be downloaded via the following OSS note:

# 2259818 - RFC enabled Function Modules with incompatible signature change compared to its version in ERP are blocked from external access

## Importing and enabling the UCON Transport Packages

All required information can be found in the readme file that comes with the Transport Packages:

*<T4x_GS_ROOT>\var\template\t4s\sap\TransportPackages\UCON\readme.txt*

It can be located in the T4S4 GS installation package that is available on **GTAC**.

# 5. SAP Transport Packages for Teamcenter Gateway for SAP S/4HANA Functionality

In order to implement enhanced SAP ABAP functionality provided by Siemens Industry Software, T4S4 offers SAP transport packages to add the required additional functionality to SAP.

A complete description of the Transport Packages can be found in the file *<T4x_GS_ROOT>\var\template \t4s\sap\TransportPackages\readme.txt*. You will find the transport packages in the directory *<T4x_GS_ROOT>\var\template\t4s\sap\TransportPackages*.

The complete list of Transport Packages is documented in the **T4S4 API Reference**:

T4S4 > List of SAP Function Groups and Functions used by T4S4

> Caution:
>
> Same as the T4S4 code itself, the ABAP code T4S4 provides in the SAP transport packages may change. If you are using such an ABAP please make sure to update it as well when T4S4 is updated.
>
> In order to check if you already have the latest package, do the following: In both your T4S4 installations (the new and the old one), go to the directory *<T4x_GS_ROOT>\var\template\t4s\sap \TransportPackages*. Open each zip file that contains an ABAP you implemented in your SAP (e.g. TESISPLM_T4S_MISC.zip). Find there one file *K900\*.ET1* and one file *R900\*.ET1* each (e.g. the two files K900123.ET1 and R900123.ET1). If you find exactly the same file names in the old and the new T4S4 version, then everything is OK. If the number in the name (representing the ABAP version number of this specific ABAP code), in the new T4S4 installation is higher than in the old one, you have to update the ABAP in SAP to the new one.

# 6. Set Up to Trigger Data Transfer From SAP to Teamcenter

## 6.1 Overview

Common use case examples:

- An object or a structure is created first in SAP and needs to be transferred to Teamcenter.

- Information on a SAP object is changed and needs to be updated on the corresponding Teamcenter object.

The Z-Table is a transparent custom table in the SAP database. It is used for cases where data transfer needs to be triggered from within SAP to Teamcenter. Creating an entry for an object in the table is usually triggered by a SAP event like "save material master data". On this event a user exit or some other BADI functions catches the object data and can use ABAP functions to create an entry for that object.

- Import Transport Package TESISPLM_T4S_ZPTC
  The Z-Table and ABAP functions to maintain it are provided by Siemens PLM. The Transport Package `TESISPLM_T4S_ZPTC` to create Z-Table and ABAP functions is stored here: *<T4x_GS_ROOT>\var\template\t4s\sap\TransportPackages\TESISPLM_T4S_ZPTC.zip*
  All the functions and the database table itself are created within the namespace `/TESISPLM/`.

> Caution:
>
> Only the `_INT`/`_INTERN` functions should be used within SAP user exists or BADIs as they will not perform additional RFC authority checks.

- Set Up the Number Range
  Please see **Table Definition /TESISPLM/ZPTC**.

- Configure the Event-Trigger (User-Exit)
  Please see **SAP Event Trigger**.

- Configure the Trigger Script and Import Mapping
  This is described in the Chapter **Configure the Data Import** in **Teamcenter Gateway for SAP S/4HANA - S/4HANA Preparation Guide**.

## 6.2   Table Definition /TESISPLM/ZPTC

**Table attributes**

| Description | Production Trigger Cache |
|---|---|
| Delivery Class | A |
| Maintenance | Check "Table maintenance allowed" |

**Table Fields**

| Fields | Key | Int. | Field Type | Data Type | Length | Dec. places | Check Table |
|---|---|---|---|---|---|---|---|
| MANDT | X | X | MANDT | CLNT | 3 | 0 | T000 |
| ID | X | X | INT4 | INT4 | 10 | 0 | |
| OBJECT_TYP | | | CHAR10 | CHAR | 10 | 0 | |
| OBJECT_ID | | | CHAR80 | CHAR | 80 | 0 | |
| OBJECT_DESC | | | CHAR255 | CHAR | 255 | 0 | |
| REASON1 | | | CHAR255 | CHAR | 255 | 0 | |
| REASON2 | | | CHAR255 | CHAR | 255 | 0 | |
| STATUS_E2S | | | CHAR1 | CHAR | 1 | 0 | |
| ERROR_MSG1 | | | CHAR255 | CHAR | 255 | 0 | |
| ERROR_MSG2 | | | CHAR255 | CHAR | 255 | 0 | |
| ERROR_MSG3 | | | CHAR255 | CHAR | 255 | 0 | |
| DELETED | | | CHAR1 | CHAR | 1 | 0 | |
| CREATED_DATE | | | DATE_ | DATS | 8 | 0 | |
| CREATED_TIME | | | TIME_ | TIMS | 6 | 0 | |
| CREATED_USER | | | ERNAM | CHAR | 12 | 0 | |
| CHANGED_DATE | | | DATE_ | DATS | 8 | 0 | |
| CHANGED_TIME | | | TIME_ | TIMS | 6 | 0 | |
| CHANGED_USER | | | AENAM | CHAR | 12 | 0 | |

**Table Settings**

| Data Class | APPL1 |
|---|---|
| Size Category | 9 |
| Buffering | Check "Buffering not allowed" |

**Number Range for Indexes**

> Caution:
>
> The database table doesn´t contain out of the box configured indexes. Adding such indexes is a customization step based on the individual use cases the table should be used for.

To assign IDs automatically on creation of table entries we need to define a number range object in SAP. Please follow these steps:

1.   Create the Number Range Object ZPTC (Transaction SNRO)

    Number Length Domain: /TESISPLM/ZPTC

    Number range transaction: ZPTC

    Warning %: 5

    Buffer: 1

2.   Create an interval (Transaction ZPTC):

    Number: 01; From number: 0000000001; To number: 2147483640 (not external)

## 6.3   Z-Table ABAP Functions

The following functions are required with the Z-Table. Please also see SAP Function Calls Used and Permissions Required.

**/TESISPLM/ZPTC_INSERT**

   To insert one line into the table

**/TESISPLM/ZPTC_INSERT_INTERN**

   To insert one line into the table - internal, not remote enabled call without RFC authority check - should be used for SAP user exits calls only.

**/TESISPLM/ZPTC_UPDATE**

   To update one line of the table.

**/TESISPLM/ZPTC_UPDATE_INTERN**

   To update one line of the table - internal, not remote enabled call without RFC authority check - should be used for SAP user exits calls only.

**/TESISPLM/ZPTC_DELETE**

   To delete one line of the table.

**/TESISPLM/ZPTC_DELETE_INTERN**

To delete one line of the table - internal, not remote enabled call without RFC authority check - should be used for SAP user exits calls only.

**/TESISPLM/ZPTC_GET_DETAIL**

To read one complete line of the table.

**/TESISPLM/ZPTC_GET_DETAIL_INT**

To read one complete line of the table - internal, not remote enabled call without RFC authority check - should be used for SAP user exits calls only.

**/TESISPLM/ZPTC_DYN_SEARCH**

To read the ids of the table which fulfill a given pattern.

**/TESISPLM/ZPTC_DYN_SEARCH_INT**

To read the ids of the table which fulfill a given pattern - internal, not remote enabled call without RFC authority check - should be used for SAP user exits calls only.

**/TESISPLM/ZPTC_DYN_DELETE**

To delete the lines of the table which fulfill a given pattern.

**/TESISPLM/ZPTC_DYN_DELETE_INT**

To delete the lines of the table which fulfill a given pattern - internal, not remote enabled call without RFC authority check - should be used for SAP user exits calls only.

**/TESISPLM/ZPTC_DYN_SEARCH**

To read the ids of the table which fulfill a given pattern.

**/TESISPLM/ZPTC_DYN_SEARCH_INT**

To read the IDs of the table which fulfill a given pattern - internal, not remote enabled call without RFC authority check - should be used for SAP user exits calls only.

**/TESISPLM/ZPTC_DYN_DELETE**

To delete the lines of the table which fulfill a given pattern.

**/TESISPLM/ZPTC_DYN_DELETE_INT**

To delete the lines of the table which fulfill a given pattern - internal, not remote enabled call without RFC authority check - should be used for SAP user exits calls only.

## 6.4  SAP Event Trigger

All transfers of data to Teamcenter will be event triggered only. There is currently no option to provide interactive user actions to initiate data transfer in SAP GUI. Therefore you need to extend available user exits on user actions or else activate BADI in a desired way.

## Example on User-Exit Modification

SAP provides user exists on some objects and actions. Please read the SAP documentation to find the required user exit to support your use case.

This example explains the modification of the user exit on a Material Master save action (transaction `MM01` or `MM02`). The code checks if an entry in ZPTC for this Material Master already exists. The function `/TESISPLM/ZPTC_INSERT` is used to create an entry. Otherwise the existing entry will be updated by `/TESISPLM/ZPTC_UPDATE`:

```
Enhancement (SMOD): MGA00001
  UserExit: EXIT_SAPLMGMU_001
  Include: ZXMG0U02

  Code (Example):

  data: r1(18) type c,
    r2(18) type c,
    l_matnr type zptc-object_id,
    l_description(255) type c,
    l_blnDouble type string,
    l_id_update(18) type c,
    l_matnr_long(255) type c,
    l_str_zptc type ZPTC,
    l_mara type MARA.

* Map Information we need from the Material
  l_matnr = wmara-matnr.
  l_description = 'Triggered by MM user exit!'.
  l_matnr_long = l_matnr.

* just some defaults
  l_blnDouble = 'false'.
  l_id_update = ''.

* Check if the Object exists already in the Table
  clear l_str_zptc.
  Select SINGLE * INTO l_str_zptc FROM ZPTC
  where STATUS_E2S = '' and
        DELETED = '' and
        OBJECT_TYP = 'MATERIAL' and
        OBJECT_ID = l_matnr.
  if not ( l_str_zptc is initial ).
    l_id_update = l_str_zptc-id.
    condense l_id_update no-gaps.
    l_blnDouble = 'true'.
  endif.
```

```
* H -> New material; V -> Changed material
* if wstat-AKTYP = 'V'.
  if l_blnDouble = 'false'.
    CALL FUNCTION '/TESISPLM/ZPTC_INSERT_INTERN'
* for old installation function name is 'Z_M2S_ZPTC_INSERT'
      EXPORTING
        obj_typ = 'MATERIAL'
        obj_id = l_matnr
        obj_desc = l_description
        reas1 = ''
        reas2 = ''
        stat_e2s = ''
        err1 = ''
        err2 = ''
        err3 = ''
      IMPORTING
        e_return = r1
        e_id = r2.
* if the entry exists already in the table
* (but was not modified yet), we update the entry
  else.
    l_description = 'Updated by MM user exit!'.
    CALL FUNCTION '/TESISPLM/ZPTC_UPDATE_INTERN'
  * for old installation function name is 'Z_M2S_ZPTC_UPDATE'
      EXPORTING
        I_ID = l_id_update
        I_OBJ_TYP = ''
        I_OBJ_ID = ''
        I_OBJ_DESC = l_description
        I_REA1 = ''
        I_REA2 = ''
        I_STAT_E2S = ''
        I_ERR1 = ''
        I_ERR2 = ''
        I_ERR3 = ''
        I_DEL = ''
        I_RESET = ''
      IMPORTING
        E_RETURN = r1.
  endif.
* endif.
```

# A. Glossary

## A

### ABAP
ABAP is a proprietary programming language of the SAP AG.

## B

### BAPI
The Business Application Programming Interface allows external programs to access objects and business processes in SAP.

## C

### Change Master
The Engineering Change Master (ECM) contains the metadata to a change number.

### Characteristic
An characteristic is an attribute of a SAP class.

## D

### Data Carrier
Please see Vault.

### DIR
DIR is the abbreviation for a SAP Document Info Record.

### Document Key
A Document Info Record is identified by the combination of Document Type, Document Number, Document Part and Document Version.

### Document Structure
A Document Structure is like a Bill Of Materials for Documents.

## F

### File Stream
Method of transfer to send an original to SAP.

# I

## Inspection Plan
Glossary description for Inspection Plan

## iPPE
Integrated Product and Process Engineering is a SAP S/4HANA® module that can be used to mange products with many variants.

# J

## JCO
The Java Connector is an interface to SAP S/4HANA®. In the context of T4S4 it is now mostly replaced by the Netweaver RFC interface.

# K

## KPro
Kpro stands for Knowledge Provider. See also Data Carrier.

# M

## MM
MM is the abbreviation for a SAP Material Master.

# N

## NetWeaver RFC SDK
The NetWeaver RFC SDK contains libraries for 3rd party applications to connect to SAP S/4HANA®. It can be obtained from the SAP ONE Support Launchpad.

# O

## Object Link
A relation between SAP objects like Material Master and Document Info Record.

## Object Management Record
Belongs to a SAP Change Number and Documents changes of one particular SAP object like a Material Master.

## Original

A representation of a file in SAP.

## OSS Note

The OSS Note is an online patch service for SAP. The patch can be identified by the OSS Notes number.

## P

## Patch Level

The version of SAP S/4HANA®. Please also see **How to Obtain the SAP and SAP GUI Release and Patch Level Information**
**Teamcenter Gateway for SAP S/4HANA - S/4HANA Preparation Guide**.

## PIR

PIR is an abbreviation for a SAP Purchase Info Record.

## Portal Transaction

This means that a T4S4 transfer to SAP that is not triggered by a workflow handler but via the T4S4 Gateway Menu.

## R

## Revision Level

Used to show changes with reference to a change to a SAP Material Master or Document Info Record.

## RFC

Remot Function Call (SAP).

## S

## SAP GUI

This is the application for SAP S/4HANA®.

## SAP Logon

This is the application that a user needs to start the SAP GUI for a particular system. It may also refer to the process of logging in to SAP in Teamcenter via T4S4.

## SAP Portal iView URL

Can be used to show sap content in a browser window.

# T

## T4S 4-Tier Client (SAP Lite)

The T4S4 4-Tier Client or SAP Lite is a stripped down GS. It´s only purpose is to open the SAP GUI on a Teamcenter 4-Tier Client.

## T4S Gateway Menu

A Teamcenter menu item that is provided by T4S4 to enable Portal Transactions to SAP and provide connectivity options.

## Transaction Code

A Transaction Code is a quick access code for a Transaction in the SAP GUI:
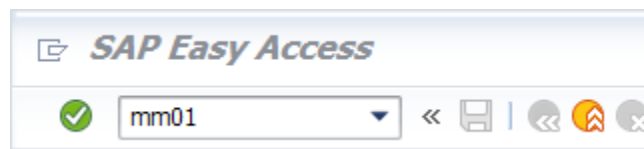


## Transport Package

A file that contains functions that can be imported to SAP

# U

## User Exit (SAP)

A User Exit is a code for a program that is called if an object like an MaterialMaster has been changed or updated. In the context of T4S it is often used to initiate the process to trigger a transfer from SAP to Teamcenter.

# V

## Value Set

A Value Set is the SAP term for a list of selectable values for a characteristic.

## Vault

The Vault is a server where a SAP DocumentInfoRecord original is stored. A synonym is also Data Carrier.

# W

## WBS

WBS is an abbreviation for a SAP Work Breakdown Structure.

# Z

## ZPTC

This is the short name for a Z-Table with the name /TESISPLM/ZPTC, used to trigger a transfer from SAP.

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## About Siemens PLM Software

Siemens PLM Software, a business unit of the Siemens Industry Automation Division, is a leading global provider of product lifecycle management (PLM) software and services with 7 million licensed seats and 71,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software works collaboratively with companies to deliver open solutions that help them turn more ideas into successful products. For more information on Siemens PLM Software products and services, visit www.siemens.com/plm.