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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.

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1. Introduction

This guide should be used to determine the steps necessary for migrating an Active Integration Gateway (AIG) product from an earlier installation.

The specifics depend on the circumstances and the details of the implementation already in place. Therefore, this guide is meant to provide a list of steps to take along with hints regarding the specifics of those steps. In addition, this guide provides information about the AIG Migration Tool provided to assist with e.g. migrating mapping files.

Thorough testing of the resulting configuration is highly recommended to ensure that AIG works properly in the new environment.
2. Preparation of the Upgrade

Teamcenter related Preparations

Teamcenter Workflows

Create Backups of your Teamcenter Workflows that include T4x Handlers.

Teamcenter Gateway Preferences

In many cases there will be a backup XML file with the T4x Preferences Configuration, that is managed by the customer. Preferably this configuration file will be used for the migration.

If this is not the case, you may export the T4x Preferences from Teamcenter. The Teamcenter Gateway Preferences can be found under the category Teamcenter Gateway. Please check if all Preferences starting with T4* are managed under that category. If not, you may want to export all Teamcenter Preferences and edit the XML file, so that only T4x Preferences remain and are assigned to the correct category.

Teamcenter Installation

• Be sure all Teamcenter processes including TAO and Poolmanager (Servermanager) are stopped before proceeding. The database and FMS services do not matter.

• Run clearlocks -verbose in a Teamcenter or T4x command shell.

• Delete the local RAC cache, e.g. %USERPROFILE%\Teamcenter\RAC (this is the default location)

• Delete all the old T4x.jar files in <TC_ROOT>/portal/plugins. Same with the language dependent T4x error message files in <TC_ROOT>/lang/textserver.

AIG related Preparations

• Check version of the additional files that are not part of the OOTB Package (e.g. for SAP JCO, SAP Netweaver, JDBC, ...) and download new versions of these files if necessary.

• In case you have customer specific AIG dll's or other custom AIG functions installed, please ask first how to handle them for the AIG upgrade. Maybe they have to be upgraded for the new AIG version (needs to be done by AIG software development), maybe they are not needed anymore because that specific functionality had been implemented in the AIG standard functionality.

• Taking screenshots of the configuration in the BGS and GS Admin UI can help you to restore your settings in the new installation.
• Stop the AIG processes and services.

• Make a backup of the existing AIG installation directories if necessary.

• For proper Admin UI handling, be sure to use a **supported web browser** as defined in the *Active Integration - Installation Guide*, enable JavaScript, delete the web browser cache and cookies, then restart the web browser.
3. Migration of the Installation

AIG related Steps

• Install, initialize and configure AIG as described in the Active Integration - Installation Guide.

• Copy the additional files that are not part of AIG (e.g. for SAP JCO, SAP Netweaver, JDBC, ...) if not already done via Deployment Center.

• Copy the customer specific AIG libraries or other custom AIG functions to the installation if necessary.

• If any customer specific mapping code is used that replaces a standard AIG function by overriding its original mapping code, be sure to check if it is needed any more at all. Migrate your mapping to the new AIG version using the AIG Migration Tool and copy it to the installation. Make sure, that you are using the correct folder structure. For more information see Restructuring AIG Mapping Directory. Recompile and deploy the mapping.

• Copy any custom test scripts back to <GS_ROOT>/var/test.

• With 19.1 credentials to connect to any enterprise application are no longer stored in the mapping directly. Instead a so-called credentials alias is used in the mapping. Using this alias, the GS can fetch the required credentials from the BGS database when needed. To make this work properly, the credentials have to be stored in advance with the exact same alias using the product-specific script to store, test and manage credentials for the enterprise applications involved.

Restructuring AIG Mapping Directory

Caution:
In previous versions the AIG Mapping files may have been directly stored in the directory <GS_ROOT>/var/mmap. With AIG 11.2.2 this directory contains now sub folders.

If sub folders are missing in directory <GS_ROOT>/var/mmap we recommend doing the following steps:

• Create the corresponding sub folders <AIG>_mapping_config (based on your product) and t4x_mapping_config under <GS_ROOT>/var/mmap.

• Move the existing files from <GS_ROOT>/var/mmap to the corresponding sub-directories.

• Copy the template files from <GS_ROOT>/var/template/mmap/t4x_mapping_config to <GS_ROOT>/var/mmap/t4x_mapping_config.

• Remove all statements beginning with source -relax t4x from the product specific mapping config file <AIG>_mapping_config.sd because now they belong into the AIG product independent mapping config file t4x_mapping_config.sd
• Remove all statements beginning with `source -relax <AIG>_mapping_config` from the product specific mapping config file `<AIG>_mapping_config.sd`. Such settings were used in special AIG installations only, not by default, and now they are not needed anymore at all because AIG loads all existing files `_mapping_config.sd` automatically.

• Adapt the mapping config source file `<GS_ROOT>/var/mmap/t4x_mapping_config/ t4x_mapping_config.sd` to your needs. Especially the statements `source -relax` ...

**Teamcenter related Steps**

• Update the T4x templates using Teamcenter Environment Manager (TEM).

• If required, adapt the data model as desired using Teamcenter BMIDE (only needed in special cases, e.g. for implementing new functionality using Teamcenter BMIDE settings). In order to incorporated changes to the Teamcenter data model, please follow the instructions in the *Installation Guide*.

• Restart Teamcenter and import your migrated Teamcenter Gateway preferences.

• Migrate all Teamcenter workflows which are using deprecated T4x workflow handlers (see Teamcenter Workflow Migration).

• Stop Teamcenter and all its processes again.

• Regenerate the Portal registry XML files by executing `<TC_ROOT>/portal/registry/genregxml`.

**Teamcenter Workflow Migration**

Due to clearing up deprecated T4x functionality some T4x workflow handlers are no longer available and therefore Teamcenter workflows using this workflow handlers have to be migrated. This can be done with the Teamcenter workflow utility `migrate_wfHandlers`. T4x provides the `wf_t4x_handler_migration.xml` mapping input file to convert handler names and arguments via this utility as part of the `<t4x>` feature. Call the Teamcenter workflow utility like this:

```
migrate_wfHandlers -v -mapping_file=%TC_ROOT%\install\<t4x> \wf_handler_migration\wf_t4x_handler_migration.xml
```

More details about the `migrate_wfHandlers` utility can be found in the Teamcenter documentation (Administering > Teamcenter > Utilities Reference > Workflow utilities).

---

1 <AIG> should be replaced with product specific prefix like t4ea, t4o, t4s etc.
4. AIG Migration Tool

General Information

AIG provides a tool facilitating the migration from earlier AIG versions. This tool can help you, but it is not able to perform all of the necessary steps. You will have to test the results thoroughly in the new environment. Therefore, you should have read the previous chapters before using the tool and fine-tune its results appropriately.

With the AIG Migration Tool you are able to

- migrate AIG mapping files
- migrate AIG test scripts
- migrate .xml files containing Teamcenter preferences
- create Teamcenter style sheets for the AIG Transfer Window and the corresponding preferences

Caution:
- The oldest AIG version supported by the current AIG migration tool is AIG 10.1

How to Use the AIG Migration Tool

This describes how to use the AIG Migration Tool in the most convenient way.

- Create a migration directory (e.g. C:\<AIG>_migration).

- Copy the file <AIG>_migtool of your GS installation (<AIG-GS-ROOT>\var\script\<AIG>_migtool) into this new directory.

- Copy all the files to migrate (*.sd, *.tcl, *.xml) into this new directory.

- Create a sub-directory to store the result files (e.g. C:\<AIG>_migration\new). Only the content of this directory will be modified by the AIG Migration Tool.

- Set up a T4x command shell with the new AIG environment (for further details see the Generic Configuration Guide). Change to the migration source directory (in our example, C:\<AIG>_migration).

- Run the AIG Migration Tool with the command tps <AIG>_migtool -l automig.log -o new.
Your files in the source directory (in our example \texttt{C:\AIG\_migration}) will not be changed and therefore no existing data will be corrupted. The processed results will be stored in the target directory stated with the \texttt{-o} option in the current directory (in our example \texttt{C:\AIG\_migration\new}).

In order to have the Migration Tool writing every single modification into log files, use the additional parameter \texttt{-l}. This will write the log files \texttt{automig.log.diff} and \texttt{automig.log.txt} into the current directory (not the new directory stated with \texttt{-o}) allowing you to check every modification.

The whole process may take a few minutes. It will show a progress bar for every single file it processes.

Please note that:

- The Migration Tool can be called from anywhere and the input files may be located in any directory (specify with the option \texttt{-i} like input), but it is recommended to use the way described here.

- Use the help parameter \texttt{-h} for more details on the options.

- If there should be an error message be sure to start it from the correct (new) AIG environment and that no AIG process from the same installation is running. Then try again.

\begin{quote}
Caution:
The Migration Tool does not only replace preferences and preference values, but it also deletes obsolete ones.
\end{quote}

\section*{Create Teamcenter Style Sheets}

The AIG Migration Tool can create the style sheets for the AIG Transfer Window and the corresponding preferences as well. In earlier AIG versions, preferences \texttt{<AIG \_<object\_type>ListOfDisplAttributes4*} defined the data to show in the AIG Transfer Window. Now this is done using style sheets (for further details see the \textit{Generic Configuration Guide}). If one of your input files is a preferences export file containing such preferences, call the Migration Tool with the additional option \texttt{-stylesheets} (may be abbreviated as \texttt{-ss}) as in the following example

\begin{verbatim}
tps \texttt{<AIG>_migtool -l automig.log -o new -f -ss new_stylesheets}
\end{verbatim}

The options \texttt{-l} and \texttt{-f} in this example are optional, but \texttt{-o} is mandatory with and without style sheets. In this example, the Migration Tool will create the style sheet files (the actual style sheet XML files and a style sheet preferences file) in the directory \texttt{new_stylesheets}, and the same output as in the previous examples.

As from version 10.0 upwards, Teamcenter modified some details regarding the preferences handling, the AIG Migration Tool must reflect that difference. Therefore the new parameter \texttt{-tc} has been introduced. This allows values 10 or higher (two digits) with or without decimals. In the current version, the Migration Tool does not care about the decimals (so for example \texttt{-tc 10} is handled in the same way.
as \texttt{-tc 10.1}), but if Teamcenter will introduce more version specific differences, this difference may become important in later AIG versions.

A correct call with Teamcenter 10 could be:

\texttt{tps \langle AIG\rangle\_migtool \textendash l automig.log \textendash o new \textendash tc 10}

The main difference is that since Teamcenter 10.0 each preference needs a non-empty element \texttt{preference\_description} as well as \texttt{protectionScope} and \texttt{envEnabled}. So if the Migration Tool is invoked with the option \texttt{-tc 10}, it will do the following:

- If a \texttt{<preference>} element in the input file does not contain a \texttt{<preference\_description>} element it will be added with the value "No description available for this preference". If the element \texttt{<preference\_description>} exists but is empty the same value will be inserted into the element.

- If a \texttt{<preference>} element in the input file does not contain a \texttt{<protectionScope>} attribute it will be inserted with the value \texttt{Site}.

- If a \texttt{<preference>} element in the input file does not contain a \texttt{<envEnabled attribute>} it will be inserted with the value \texttt{false}.

\textbf{Fine-tune the Results of the AIG Migration Tool}

After the automatic processing, you have to check the results thoroughly:

- Be sure that the preferences file is in correct XML style. This may be checked with any XML editor or with the standard Teamcenter tool preferences\_manager (adding the option \texttt{-preview} will only display the result of the preference modifications without doing an update to the database), e.g.

  \begin{verbatim}
  preferences\_manager \textendash u=infodba \textendash p=<pw> \textendash g=dba \textendash mode=import \textendash file=preferences.xml \textendash scope=SITE \textendash preview \textendash action=OVERRIDE
  \end{verbatim}

- If you want to rerun the AIG Migration Tool, you may notice that it will not write any files if one or more of the target files already exist. Then you may

  - delete the contents of the target directory,
  - use another target directory, or
  - force the AIG Migration Tool to overwrite the files by adding the option \texttt{-f}:
    \texttt{tps \langle AIG\rangle\_migtool \textendash l automig.log \textendash o new \textendash f}
Caution:
Here are common pitfalls to be avoided:

• If the migration replaced a function, make sure that the parameters of the function are replaced correctly.

• If customer specific mapping code is used that replaces a standard AIG function by overriding its original mapping code, be sure to check if it is still needed. If true, adapt it to the new AIG version. These functions can be found by checking their namespaces.

• For SAP related AIG products it is recommended to replace custom JCO calls with Netweaver calls.

• Carefully read the contents of the automig.log.diff file and act accordingly to the comments.
A. Glossary

A

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

**Admin**
is the term used in this document for people who install and configure Teamcenter and its components. This is in contrast to the "user" role.

**Admin UI**
Web based administrative user interface of the GS and BGS.

**AIG**
The entire Active Integration Gateway product family.

**AIG_ROOT**
Please see **GS_ROOT** and **BGS_ROOT**. This term is used if something is true for both the GS and BGS.

**AI-Object**
Application-Interface Object

**API**
Application Programming Interface.

**Apps**
See "GS".

**AppServer**
Application Server.

B

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

**BGS**
Basic Gateway Service.
**BGS_ROOT**
The installation directory of the Basic Gateway Service (e.g. C:\Siemens\BGS).

**BMIDE**
Teamcenter Business Modeler IDE (Integrated Development Environment)

**BOM**
A Bill Of Materials is a list of the parts or components and their quantities that are required to build a product.

**BOM Header**
A BOM Header is the top item of a BOM. BOMs can have multiple levels, so this often means the top item of the actual level.

**BOP**
The Bill Of Process describes a manufacturing process and lists the operations and steps with all their instructions, consumed materials, resources, work places and machines.

**C**

**CCObject**
Collaboration Context Object

**CEP**
Camstar Enterprise Platform

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

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

**CIO**
Camstar Interoperability

**CLM4S**
Closed Loop Manufacturing for SAP S/4HANA®

**D**

**Data Carrier**
Please see Vault.
**Dataview**
The Dataview is an extension to the Teamcenter RAC and is deployed as part of the TEM installation process of the Teamcenter Gateway. The Dataview is used to display the real-time data of external applications, associated with Teamcenter objects.

**Dataview mark-up**
is the language understood by the Dataview. The Dataview receives messages written in this language from the T4x server. Such messages can be formatted as XML or JSON. Normally users do not see such messages. They may however appear in log files or error messages. The so called prop mapping (e.g. `t4s_prop_mapping_template.sd`) contains TCL commands that compose messages in the Dataview mark-up.

**DCD**
Data Collection Definition

**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.

**E**

**EA**
stands for Enterprise Application, any software or set of computer programs used by business users to perform various business functions in context of current integration's portfolio with Teamcenter.

**ECN**
The Engineering Change Notice can also be called an Engineering Change Note, Engineering Change Order (ECO), or just an Engineering Change (EC).

**EPM**
Enterprise Process Modeling

**EWI**
Electronic Work Instructions
**F**

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

---

**G**

**Gateway Menu**
An additional menu item of the Teamcenter Gateway software available in the Teamcenter RAC.

**GRM**
The Generic Relationship Management provides a general way in which two objects can be associated via a relationship.

**GS**
Gateway Service, manages the communication between Enterprise Applications.

**GS_ROOT**
The installation directory of the Gateway Service (e.g. C:\Siemens\GS).

**GUI**
Graphical user interface.

**GUID**
Globally Unique Identifier

---

**I**

**IDGEN**
The IDGEN is a mechanism to get an external ID from the ERP system when assigning a Teamcenter ID.

**Inspection Plan**
Contains characteristics to be inspected in an operation and equipment to be used.

**iPPE**
Integrated Product and Process Engineering is a module that can be used to manage products with many variants.

**ITK**
The Integration Toolkit (ITK) is a set of software tools provided by Siemens PLM Software that you can use to integrate third-party or user-developed applications with Teamcenter.
J

JCO
The Java Connector is an interface to . In the context of it is now mostly replaced by the Netweaver RFC interface.

JDBC
Java Database Connectivity is an application programming interface (API) for the programming language Java, which defines how a client may access a database.

Job
Teamcenter Gateway features asynchronous transfer. This data transfer is managed via a Job.

Job Pool
The Job Pool contains all finished and unprocessed Jobs. It is managed by the BGS.

Job Server
The Job Server on the Basic Gateway Service (BGS) manages the Job and distribute them to the Job Agent for processing.

JSON
JavaScript Object Notation is a lightweight data-interchange format.

K

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

L

LOV
List of Values

M

Mapping
The mapping is part of the T4x configuration. It contains the code that controls the behavior of the data transfer between Teamcenter and the ERP system.

1 JSON.org
MFK
Multi-key functionality in Teamcenter.

MM
MM is the abbreviation for a SAP Material Master.

MOM
Manufacturing Operations Management

N
NCN
Non-Conformance Notification

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

O
Object Key
The Object Key is a string that contains the ID of an Enterprise Application object. If the identifier is a combination of multiple keys, then the Object Key is a combination of those keys in a defined order and format.

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.

OOTB
Out of the box

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.
PIR
PIR is an abbreviation for a SAP Purchase Info Record.

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

R

RAC
stands for Rich Application Client also referred to as rich client or portal.

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

RFC
Remote Function Call (SAP)

S

SAP
SAP S/4HANA® / SAP Business Suite®

SAP GUI
This is the application for the SAP Business Suite® and 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 .

SAP Portal iView URL
Can be used to show sap content in a browser window.

Session Log
Shows one log file for each Teamcenter session. Written if T4x transactions are executed

SSL
Secure Sockets Layer.
T

T4O_ROOT
Please see GS_ROOT

T4S 4-Tier Client (SAP Lite)
The 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.

T4x
The entire Teamcenter Gateway product family.

TAO
The ACE ORB is a open-source and standards-compliant real-time C++ implementation of CORBA based upon the Adaptive Communication Environment (ACE).

TargetTypeName
This is the T4x internal name for the transaction type. E.g. MaterialMaster or DocumentInfoRecord.

TC
Teamcenter

TCL
is a high-level, general-purpose, interpreted, dynamic programming language.

TCPCM
Teamcenter Product Cost Management

TCPCM4S
Teamcenter Product Cost Management Gateway for SAP S/4HANA

TEM
Teamcenter Environment Manager

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

---

**SAP Easy Access**

- [mm01]
Transaction Log
The Transaction Log is a T4x logfile on the BGS. It contains log information for a specific T4x transaction.

Transfer Window
The Transfer Window triggers transactions via the Gateway Menu.

Transport Package
A file that contains functions that can be imported to SAP.

U

UOM
UOM stands for Unit of Measure.

URI
Unified Resource Identifier: a generalized form of a resource locator (URL) and resource name (URN), which just identifies a resource, but is not necessarily sufficient to locate (find) the resource. URIs are often used to identify configurations in Java and other languages. See [https://en.wikipedia.org/wiki/Uniform_Resource_Identifier](https://en.wikipedia.org/wiki/Uniform_Resource_Identifier) for more details.

URL
Unified Resource Locator: a string with a certain format, allowing to load a resource from a network. URLs are a specific form or URNs.

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.

User Log
The User Log is a T4x logfile on the BGS. If you define a customized logchannel, the information is written into a User Log of that name.

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.

X

**XML**
Extensible Markup Language is designed to store and transport data in a format that is both human- and machine-readable.

**XRT**
stands for XML Rendering Template, also known as XML Rendering Stylesheet. These are XML documents stored in datasets that define how parts of the Teamcenter user interface are rendered. They are used for the Rich Client as well as the Active Workspace.

Z

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

**Z-Table**
"Z" is a well-known prefix name for custom tables in the SAP world. A special table used with is the table /TESISPLM/ZPTC.
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