



Upgrade Guide | PUBLIC

Software Update Manager 2.0 SP22 (incl. Database Migration Option)

Document Version: 1.0 – 2025-02-10

Conversion to SAP S/4HANA or SAP BW/4HANA using SUM: ABAP Systems on UNIX and Linux

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Document History

Document: Conversion to SAP S/4HANA or SAP BW/4HANA using SUM 2.0 SP22

The following table provides an overview of the most important document changes.

⚠ Caution

Before you start, make sure that you have the latest version of this document. You can find the latest version on the SAP Support Portal at <http://support.sap.com/sltoolset>. Choose tab *System Maintenance*, then the scenario *System Conversion to SAP S/4HANA using SUM 2.0 SP22*.

Version	Date	Description
1.0	2025-02-10	Initial version

1 Before you start

1.1 About this Document

This document deals with the conversion to SAP S/4HANA or SAP BW/4HANA using the **Software Update Manager (SUM) 2.0 SP22** including its database migration option (DMO).

Scope

This document describes the use of the Software Update Manager tool for the following scenarios:

- Conversion of an SAP ERP system to an SAP S/4HANA on-premise system or SAP S/4HANA Private Cloud Edition
- Conversion of an SAP BW system to an SAP BW/4HANA

Furthermore, it covers specifics of the database migration option of the Software Update Manager, when you want to migrate a source database, which is not SAP HANA, to SAP HANA database in the course of the conversion.

For details about the different transition paths to SAP S/4HANA, see the appropriate SAP Note for the conversion to S/4HANA using SUM mentioned in [Required SAP Notes \[page 12\]](#).

This document contains mainly parts of the *SUM guide* and the *DMO guide*, which are relevant in particular for the conversion scenario. They have a special focus on ABAP technology, target release SAP NetWeaver 7.5 or higher, and target database SAP HANA. For the complete SUM and DMO guides, see [Other Required Documentation \[page 14\]](#).

⚠ Caution

Note that the conversion guide only exists in parallel to the SUM guide and the DMO guide. Its content does not claim to be complete with regard to a system conversion with SUM. For the sake of completeness, all three guidelines need to be considered.

How to Use this Document

The document is structured as follows:

- Chapter 1 - Introduction
Information about using this document, new features if available, and some naming conventions for the document.
- Chapter 2 - Basic Concepts
Short introduction into the concepts of upgrade, DMO, and conversion.

- Chapter 3 - The Software Update Manager tool
Introduction into the SUM tool and some additional tools
- Chapters 4 to 8 - Update and Conversion Process
These chapters contain detailed information about planning, preparing, and performing the update and conversion procedure, and about follow-up activities. You can also find additional information about the database migration option of the Software Update Manager.

📘 Note

If this document contains information for more than one operating system, database or product release, texts that apply to one or more of these aspects are marked with bars. The types of bars are the following:

- With regular thickness when they are only valid for individual paragraphs within the topic
- In bold and placed directly below the title of a topic when they are valid for the entire content of the topic

1.2 New Features

The following table lists important new functions and improvements in the current version of the Software Update Manager 2.0 and the two previous versions.

New Features for the Individual SUM Versions

Feature	Description	Availability
Automated SAP Note Implementation	As of release 758, and in systems where the corresponding TCI is implemented, the transaction <code>SNOTE</code> allows the automated implementation of SAP Notes. For more information, see Important Entries for the Extraction Roadmap Step [page 145] → SAP Note Implementation (CHECK4NOTES_TOOL)	SUM 2.0 SP20
Removal of installed languages	The guide contains now also a procedure for removing already installed languages from the system. For more information, see Removing or Excluding Languages [page 74] .	SUM 2.0 SP20
Data Transition Validation	A new chapter about data transition validation has been added. For more information, see Data Transition Validation [page 66] .	SUM 2.0 SP21
Check for Database Triggers	The check for database triggers has been revised. For more information, see Checking for Database Triggers Switched or Modified by SUM During Technical Downtime (Phases RUN_CHECK_DB_TRIGGER_*) [page 159] .	SUM 2.0 SP21

Feature	Description	Availability
Backup No Longer Requested for Database Migration Option	For the Database Migration option, the Software Update Manager will no longer request database backup actions during the phase Preparation of SAP System for Downtime (DOWNCONF*). For more information, see Important Entries for the Preprocessing Roadmap Step [page 167] .	SUM 2.0 SP22
New CRR Control Center View	The <i>Real-Time Replication Rate</i> and <i>Total Changes Monitor</i> view display graphs that indicate the change replication rate per hour and the total changes per hour. For more information, see SUM Utilities (Extended UI) [page 39] .	SUM 2.0 SP22
Changes to SAP Notes Implementation Step (CHECK4NOTES_TOOL)	If you perform an extended prerequisite check of your source system, you do not need to implement the listed SAP Notes during the SAP Notes Implementation step (CHECK4NOTES_TOOL). For more information, see Important Entries for the Extraction Roadmap Step [page 145] .	SUM 2.0 SP22

1.3 Naming Conventions

Term	Comment
ABAP system and AS instance	<p>An ABAP system is an installed software system that comprises one or more application server instances (AS instances), a central services instance (ASCS instance), and a database schema.</p> <p>An AS instance is an administrative unit that combines components of an SAP system running on one physical host.</p> <p>For more information, see https://help.sap.com/docs/SAP_NETWEAVER. Navigate to ABAP Platform <version> > Application Server ABAP Infrastructure >.</p>

Term	Comment						
Downtime	<p>The time during which you cannot use the system productively. The duration of the downtime depends on the selected scenario strategy and additional factors, including:</p> <ul style="list-style-type: none"> • Hardware • Modifications and enhancements of SAP Objects • Customer developments • Add-on software • Integration of Support Packages <p>The following a distinction is made between the following types of downtime:</p> <table border="1" data-bbox="804 792 1394 1167"> <tbody> <tr> <td data-bbox="804 792 1007 815">Business downtime</td> <td data-bbox="1107 792 1378 882">The total time during which the SAP system is not available to users.</td> </tr> <tr> <td data-bbox="804 904 1007 927">Technical downtime</td> <td data-bbox="1107 904 1378 1016">The time during which the SAP system is not available due to processing routines in the system.</td> </tr> <tr> <td data-bbox="804 1039 1059 1061">SUM technical downtime</td> <td data-bbox="1107 1039 1378 1151">The time during which the system is not available due to processing during the SUM run.</td> </tr> </tbody> </table> <p>The SUM technical downtime is part of the technical downtime, which in turn is part of the business downtime.</p>	Business downtime	The total time during which the SAP system is not available to users.	Technical downtime	The time during which the SAP system is not available due to processing routines in the system.	SUM technical downtime	The time during which the system is not available due to processing during the SUM run.
Business downtime	The total time during which the SAP system is not available to users.						
Technical downtime	The time during which the SAP system is not available due to processing routines in the system.						
SUM technical downtime	The time during which the system is not available due to processing during the SUM run.						
ID for the SAP system release	<p>In this document, "<rel>" stands for the relevant SAP system release, without a decimal point, such as "740". If an enhancement package has been installed in the system, the last digit indicates the enhancement package version, such as "731" for SAP enhancement package 1 for NetWeaver 7.3.</p>						
SAP system	<p>In this document, the term "SAP system" is used for SAP NetWeaver systems as well as for SAP application systems. "SAP" is also used as a synonym for "SAP NetWeaver" or "SAP application" in terms such as "SAP start profile" or "SAP system language".</p>						

Term	Comment
SAP system ID (SAPSID/sapsid)	<p>In this document, the SAP system ID is abbreviated as “SAP-SID” or “sapsid”.</p> <p>The spelling (such as upper or lower case) depends on the development environment. However, for various reasons, both spellings can be encountered in a single guide. One hundred percent accuracy is not ensured.</p> <p>Note: If “<sapsid>” is used, your SAP system ID has to be in lowercase letters, for example, “prd”. If “<SAPSID>” is used, you have to write in uppercase letters, for example “PRD”.</p>
Software Update Manager, SAPehpi, and SAP upgrade tools	<p>The Software Update Manager evolved from the previous SAP Enhancement Package Installer and SAP upgrade tools. The tool has been renamed to reflect its broader use.</p> <p>However, note that on a technical level, the name of the executable <code>SAPup</code> is still in use, for example, in the log files or in commands.</p>
Solaris and Oracle Solaris	<p>As of operating system version 10, Solaris has been renamed to “Oracle Solaris”. However, the former name “Solaris” may occur in this document as well.</p>
SUM directory and <update directory>	<p>In this document, “SUM directory” and “<update directory>” are used as synonyms when referring to directory <code><path to SUM directory>/SUM</code>.</p>
update	<p>In this document, the term “update” is used as a collective term for all the software logistics processes that you can perform using the Software Update Manager (such as performing release upgrades, installing enhancement packages, or updating a system with support package stacks).</p>

1.4 Required SAP Notes

This section informs you about the SAP Notes in addition to this guide, which are important for the conversion.

Use

To prepare and perform the update of your SAP system and the conversion to SAP S/4HANA, you require some additional information that is not included in this document. This information is in a range of SAP Notes in SAP Support Portal (<http://support.sap.com/notes>), some of which you have to read before you start with the preparations. Check the notes before you start with the preparations.

→ Recommendation

See also the PDF documents, which are attached to some notes, for a graphical representation of the supported update and upgrade paths.

Central SUM Note and the SAP Notes for your source database:

SAP Note Number	Description
3474726	Central Note - Software Update Manager 2.0 SP22

ⓘ Note

The additional SAP Notes for the databases are listed in this central SUM Note.

SAP Note for the DMO

SAP Note Number	Description
3512565	Database migration option (DMO) of SUM 2.0 SP22

ⓘ Note

For additional SAP Notes that are relevant for DMO, see the section *Preparation* of the *DMO Guide*.

SAP Note for the Conversion to S/4HANA or SAP BW/4HANA using SUM

SAP Note Number	Description
3512557	Add. info on converting to S/4HANA or SAP BW/4HANA using SUM 2.0 SP22

1.5 Other Required Documentation

Before, during and after the conversion with SUM, you may require any additional SAP documentation.

The following table contains a list of SAP products that are important for the conversion to SAP S/4HANA or SAP BW/4HANA, and the paths on the Help Portal to the relevant documents.

Additional SAP documentation

Product and Relevant Documents	Path
SAP NetWeaver 7.5 or higher	
<ul style="list-style-type: none"> • <i>Upgrade Master Guide</i> • <i>Master Guide</i> • <i>Upgrade and Update Guide</i> 	Open the page <i>ABAP Platform and SAP NetWeaver</i> using the link https://help.sap.com/docs/SAP_NETWEAVER and navigate to <i>SAP NetWeaver Platform</i> . Select your version (SAP NetWeaver 7.5 or higher) and choose the tab <i>Implement</i> .
SAP Business Suite	
<ul style="list-style-type: none"> • <i>Upgrade Master Guide</i> • <i>Master Guide</i> • <i>Upgrade and Update Guide - <SAP Application> <Release> <Technology></i> (product-specific information) • <i>Installation Guide – <SAP application> <Release> <Technology></i> 	Open the page <i>SAP ERP</i> using the link https://help.sap.com/docs/SAP_ERP . Select your version and choose the tab <i>Implement</i> .
Software Logistics Toolset	
<ul style="list-style-type: none"> • SUM Guide: <i>Updating SAP ABAP Systems on <operating system>: <source database></i> • DMO Guide: <i>Database Migration Option for Target Database SAP HANA</i> 	Open the page <i>Software Logistics Tools</i> using the link https://support.sap.com/en/tools/software-logistics-tools.html and choose the tab <i>System Maintenance</i> . Expand then the wanted system maintenance scenario.
<ul style="list-style-type: none"> • <i>System Copy Guide for Systems Based on SAP NetWeaver 7.1 & Higher</i> 	Open the page <i>Software Logistics Tools</i> using the link https://support.sap.com/en/tools/software-logistics-tools.html and choose the tab <i>System Provisioning</i> . Expand then system provisioning scenario <i>Copy a System using Software Provisioning Manager</i> .
SAP S/4HANA	
<ul style="list-style-type: none"> • <i>Installation Guide</i> • <i>Upgrade Guide</i> • <i>Conversion Guide</i> 	Open the page <i>SAP S/4HANA</i> using the link https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE . Select your version and choose then Implement > Guides .
SAP BW/4HANA	
<ul style="list-style-type: none"> • <i>Master Guide</i> • <i>Conversion Guide</i> 	Open the page <i>SAP S/4HANA</i> using the link https://help.sap.com/docs/SAP_BW4HANA . Select your version and choose then Installation and Upgrade .

2 Introduction

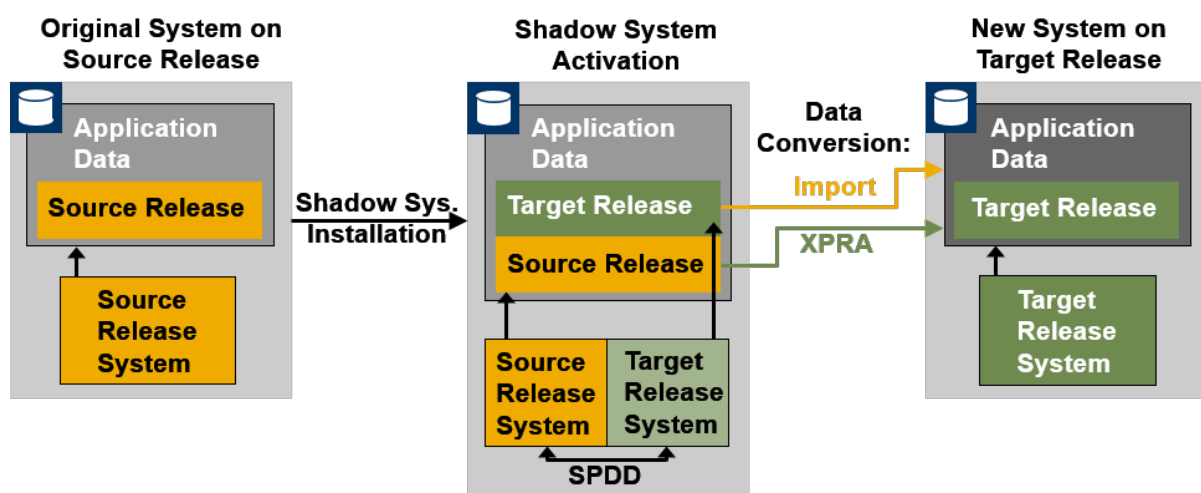
2.1 Basic Concepts

2.1.1 Technical Details of the Upgrade Procedure

SAP systems are upgraded with the System Switch Upgrade procedure. This procedure installs an instance of the target release, the shadow system, in parallel with the current source release system in the same database. The parallel system contains all the software of the target release and is used to perform actions on the target release while the source release is still in production operation.

Operating two instances in parallel places increased demands on free space in the file system, in the database, and on the system resources. No precise guidelines can be given for the duration of an upgrade. The duration of the shadow system installation depends on a great extent on the amount of data, the database system, and the hardware and can take several hours. Although the system can still be used in production operation, consider a possible performance decrease during this shadow system installation process. If necessary, some parameters in the production system must be adjusted to enable you to operate the production and the shadow systems in parallel.

The following figure shows the process flow of the upgrade with the major steps of the process.



Process Flow of a System Switch Upgrade

The complete upgrade procedure is divided into roadmap steps. In these roadmap steps, the following actions take place:

- [Get Roadmap](#)
The Software Update Manager analyzes the source system and the database, and it collects by means of a dialog sequence the needed information for the wanted scenario to assemble the roadmap.
- [Extraction](#)
The Software Update Manager extracts the required software.

- **Configuration**
In this roadmap step, you enter information required for the upgrade procedure such as information about software components, add-ons, and support packages that you want to include as well as information about the shadow system.
- **Checks**
The Software Update Manager checks if the operating system and database version of your source release match the requirements of the target release. It also checks some application-specific requirements.
- **Preprocessing**
In the *Preprocessing* roadmap step, the Software Update Manager creates the shadow system. This roadmap step requires only few user entries. And during the roadmap step, both the substitution table import and the shadow system operation start.
When the roadmap step is finished and you choose *Next*, the downtime starts.
- **Execution**
This roadmap step runs without any user interaction. While the processes of the *Execution* roadmap step are running, the system is in downtime. The switch to the new system takes place in this roadmap step. The Software Update Manager converts application tables and data to match the target release layout. In addition, it switches the SAP kernel.
- **Postprocessing**
The Software Update Manager saves the log files and prompts you to start with certain follow-up activities.
- **Finalization and Summary**
The Software Update Manager removes files and directories that are no longer required and completes the upgrade. Moreover, it displays a feedback form on the SUM UI and prompts you to send your feedback to SAP for technical analysis. For more information, see [Evaluating the Software Update Manager \[page 186\]](#).

2.1.2 The DMO Concept

This section describes the idea behind the database migration option of the Software Update Manager.

The DMO feature helps you avoiding landscape changes (SID, host name) and allows the combination of all relevant steps for the in-place migration to the target database (Unicode Conversion, Update, and Migration) in one tool.

A further benefit of DMO is its comfortable and fast reset functionality, provided that the source database remains consistent throughout the procedure.

Assuming that you run your SAP system on anyDB, and you want to update the SAP system and to migrate the anyDB to the wanted target database, several steps such as

- Dual-stack split
- Database update of anyDB
- Update of your SAP software
- Database migration to target database

can be necessary. The processing sequence is based on the *shadow system* functionality of SUM. A shadow system basically consists of a *shadow instance* and a *shadow repository*:

- The shadow instance is an additional ABAP instance that is created by SUM on the application server on which the SUM was started. It is used to prepare steps executed during the downtime.
- The shadow repository exists on target product version level. This means that the shadow instance must use the target kernel to create the shadow repository with potentially new object types.

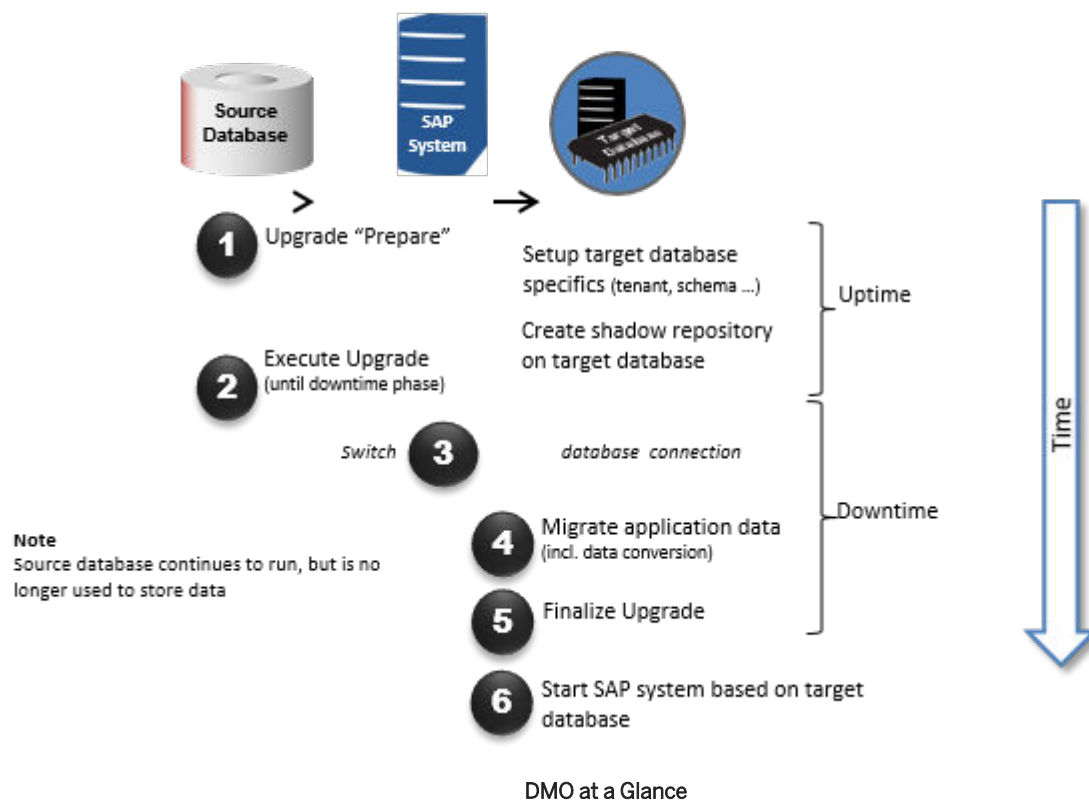
The most important steps of the processing sequence are as follows:

1. During the uptime, the target database is being set up (such as tenant, schema) on the target database host.
2. Also during uptime, the shadow repository is being created on the target database.
3. The downtime starts. The application tables are migrated from the source database host to the target database host by means of R3load processes.
4. The SUM switches from the SAP source system kernel to the SAP kernel for the target system.
5. After the migration of the application data (including data conversion), the update is finalized and the SAP system runs again in uptime on the target database.

The source database continues to run, remains consistent, and application tables are not modified. It remains as a fallback database for the [Reset Option \[page 194\]](#) throughout the complete DMO procedure. After the successful DMO procedure however, it cannot be used anymore as a productive database for an SAP system in parallel with the target database.

The following figure shows the different phases of the DMO during the procedure.

DMO phases during the procedure



For more information about the DMO, see the following blogs in the SAP Community:

- [Database Migration Option \(DMO\)](#)
- [DMO: technical background](#)

2.1.3 Standard SUM versus SUM with DMO

Consider the following main differences to the standard SUM procedure, that is, the system update without combined database migration in a one-step procedure:

- Different prerequisites
Supported are all database versions listed in the Product Availability Matrix (PAM) of the source release and all operating system versions listed in the PAM of the target release.

⚠ Caution

See also the latest SAP Note for DMO mentioned in [Required SAP Notes \[page 12\]](#) for the current prerequisites and restrictions.

This note involves information regarding

- operating systems and databases
- minimum support packages
- source and target releases

- Download directory
One of the first DMO dialogs in the browser is the question where the stack configuration file `stack.xml` is located. SUM presumes that this file is part of the download directory, so there is no separate question about the location of the download directory. The download directory includes the kernel and software files that were downloaded after using the *Maintenance Planner*.
- Additional Steps
The database migration is an additional part of the DMO procedure compared to the standard update procedure of the SUM. Therefore, you must provide specific information for the migration and for the target database during the DMO procedure, such as a migration key. Or you must provide the SAP HANA database client archive.
Technically, SUM creates the shadow repository on the target database and triggers the `R3LOAD` to export and import the application data.
- Easy reset
An easy reset to the source database is possible, as long as the source database and the SUM directory (of the existing update) exist. Do not perform a reset in a productive environment after the users started working on the new system based on the new database.
- Password restrictions for SAP HANA database
Currently, the password restrictions for users on SAP HANA database are different to those of the SUM. Take that into consideration when creating users for the SAP HANA database. Hint: Start the password with a capital letter and use alphanumeric characters only.

2.1.4 Conversion to SAP S/4HANA with SUM

This section covers some basic information about the conversion to SAP S/4HANA using Software Update Manager.

What Is SAP S/4HANA?

SAP S/4HANA is the next-generation business suite. It is a new product fully built on the most advanced in-memory platform today – SAP HANA – and modern design principles with the SAP Fiori user experience (UX) and a new role-based user experience concept. SAP S/4HANA delivers massive simplifications (data model, user experience, decision making, business processes, and models) and innovations (Internet of Things, Big Data, business networks, and mobile-first) to help businesses run simple in the digital economy.

SAP S/4HANA offers a business scope that is similar in terms of coverage, functionality, industries, and languages as the SAP Business Suite 7. Within this scope, SAP S/4HANA also includes the transformational simplifications delivered with SAP S/4HANA Finance (SAP Accounting powered by SAP HANA) as well as a planned integration with SuccessFactors Employee Central and Ariba Network.

The S/4HANA system conversion is based on the switch upgrade procedure within SUM (see also [Technical Details of the Upgrade Procedure \[page 15\]](#)), optionally with database migration option (DMO) if the source system is not yet on SAP HANA database (see also [The DMO Concept \[page 16\]](#)).

Framework Conditions for SAP S/4HANA

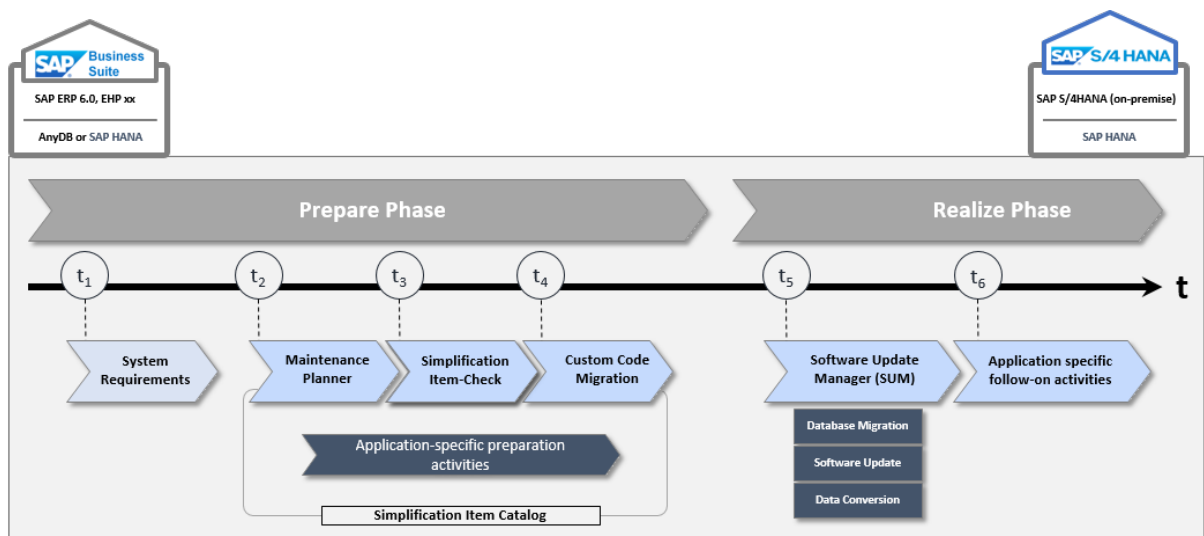
- **SAP HANA only:** SAP S/4HANA runs on SAP HANA database only. You may have your source SAP ERP system still on another database. The Software Update Manager offers additionally the migration from any database to SAP HANA database during the conversion.
- **Unicode only:** SAP S/4HANA runs with Unicode only. Therefore, you need to migrate to Unicode first before you start the conversion to SAP S/4HANA.
An integrated non-unicode to unicode conversion together with the conversion to SAP S/4HANA is not available. The database migration option of the Software Update Manager offers an integrated unicode conversion only for target releases not higher than SAP ECC 6.0 EHP 7.
- **Start Release:** The lowest start release for the one-step conversion is SAP ECC 6.0 EHP 0 Unicode. If your system is on a lower release, we recommend carrying out an upgrade to SAP ECC 6.0 EHP 7 first. If the system is on non-Unicode, we recommend an upgrade to SAP ECC 6.0 EHP 7 with DMO including Unicode migration. For both scenarios, you have a two-step procedure.
The lowest supported start release for the upgrade and DMO to SAP ECC 6.0 EHP 7 is SAP R/3 4.6C.
- **Conversion with or without DMO?**
For the conversion to SAP S/4HANA, you have two options depending on the source database:
 - SAP HANA database to SAP HANA database
If you run a system already on an SAP HANA database, you carry out the conversion using the Software Update Manager without the database migration option.
 - Any database to SAP HANA database
If you run a system on a database other than SAP HANA, you carry out the conversion using the Software Update Manager with the database migration option.

→ Tip

For a graphical representation of the supported update and upgrade paths, see also the PDF documents that are attached to the SAP Notes for SUM, DMO, and for the conversion with SUM. These SAP Notes are listed in [Required SAP Notes \[page 12\]](#).

Conversion to SAP S/4HANA

The conversion process to SAP S/4HANA consists of two main phases: the *Prepare* phase and the *Realize* phase. The following figure gives an overview of the tools, the phases, and the activities involved in the process:



Prepare Phase

Before starting the realization phase of the conversion process, you have to check the **Simplification List**, and you have to carry out some preparatory activities.

System Requirements: Before deciding to convert your SAP ERP system to SAP S/4HANA, there are preparatory activities to ensure that you know what the conversion entails. Start with high-level planning for the system requirements. You need to be aware of system requirements, start releases, conversion paths, and data volume. Take into account that system landscape adaptations are performed and make sure that your current SAP system is suitable for the conversion.

Once you have completed your high-level planning, you can continue with the conversion preparation. SAP provides a process for converting to SAP S/4 HANA. There are several components and tools to help with this process:

- **Maintenance Planner:** The Maintenance Planner checks the system with regard to business functions and add-ons. It is a pre-requisite for the system conversion to SAP S/4HANA.
- **Simplification Item-Check (SI-Check):** You run the SI-Check to identify the simplification items relevant for your upgrade project. We recommend to do this early in the project, to get an overview of the upgrade scope.
- **Custom Code Check:** Based on the Simplification list concept, you need to check your custom code against the SAP S/4HANA simplifications before converting to SAP S/4HANA.

Realize Phase

Note

Pre-Checks using SUM

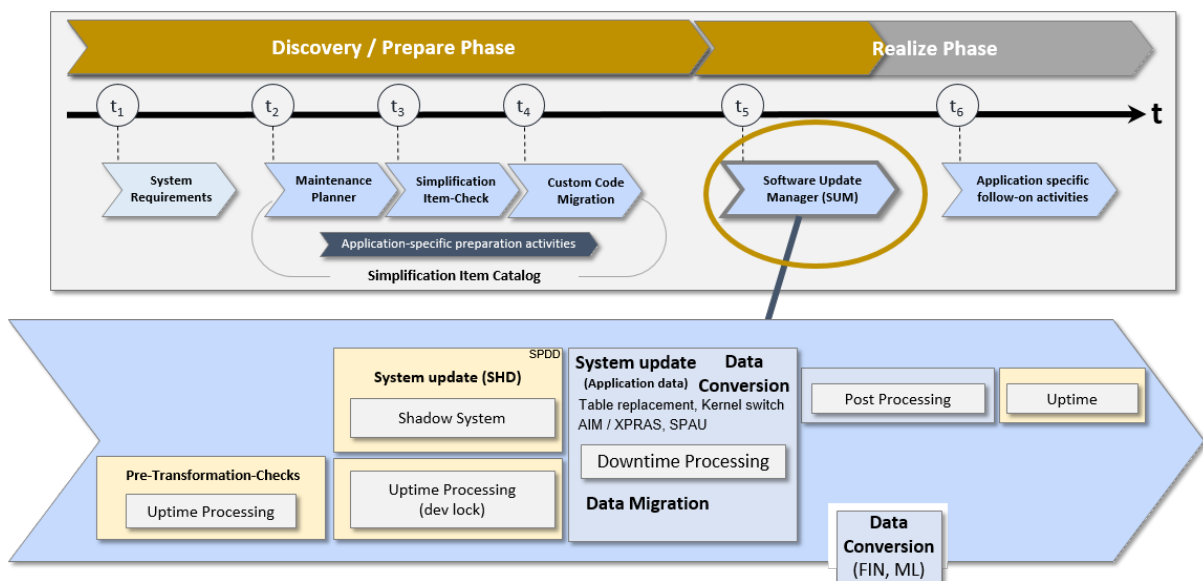
You can use the Software Update Manager to check whether the prerequisites for performing a conversion are met. Two pre-checks are available:

- Prerequisite Check
- Prerequisite Check Extended

For more information, see [Checking the Prerequisites for the Conversion with SUM \[page 131\]](#).

You have completed the abovementioned activities, and you have implemented all the adaptations required to ensure that your system and your custom code are suited to SAP S/4HANA. You can now run the **Software Update Manager**, either with or without DMO. After the SUM run, there are cross-application and application-specific post-conversion **follow-up activities** that may be required.

The following figure gives an overview of how the Software Update manager is embedded in the conversion process:



Note

System conversion with SUM in a nutshell:

Realize Phase of the system conversion.

If your source system runs already on SAP HANA database, you use the Software Update Manager without database migration option.

If your source system runs on any other database than SAP HANA, you use the tool with database migration option.

More Information

- For more information about the conversion process, see the *Conversion Guide for SAP S/4HANA* on the SAP Help Portal at <http://help.sap.com/s4hana> ► *You use the Software Update Manager as tool for the process of transitioning <S/4HANA version>* ► *Product Documentation* ► *Conversion Guide* ▾. The guide explains the conversion process with which you can move from your existing SAP Business Suite to SAP S/4HANA as next-generation business suite.

Note

This guide, which you are currently reading, focuses mainly on the Software Update Manager tool and its database migration option.

- See also the blog in the SAP Community about the technical aspects of Software Update Manager (SUM) for a System Conversion: [System Conversion to SAP S/4HANA: SUM is the tool](#) 📄.
- We also recommend the blog in the SAP Community about the short introduction into the SAP S/4HANA System Conversion: [SAP S/4HANA System Conversion – At a glance](#) 📄.

2.1.5 Downtime-Optimized Conversion to SAP S/4HANA

Besides the standard approach for the conversion to SAP S/4HANA, there is also a downtime-optimized approach.

The basic idea behind the downtime-optimized conversion to SAP S/4HANA is that you can update and migrate your SAP system in just one procedure, and thus significantly reduce your business downtime. The downtime-optimized conversion procedure executes part of the data conversion in the uptime processing, which significantly reduces the overall business downtime. The main benefit of this approach is the reduction of technical downtime.

The downtime-optimized conversion feature is delivered with the Software Update Manager tool as a part of the Software Logistics Toolset (SL Toolset). For more information about this approach, see the SAP Support Portal at <https://support.sap.com/en/tools/software-logistics-tools> 📄. Choose the tab *System Maintenance*, then select the system maintenance scenario *System Conversion to SAP S/4HANA using SUM 2.0*. Here you have access to the current guide, the corresponding SAP Note, and further information.

Note

The *Downtime-Optimized Conversion to SAP S/4HANA* requires an SAP expert who has successfully completed the corresponding training course ADM329.

2.2 The Software Update Manager

2.2.1 The Software Update Manager 2.0 in Brief

The Software Update Manager is the tool for the software maintenance of your SAP systems. In the following, you get a short overview about the tool.

The Software Update Manager is part of the *Software Logistics Toolset (SLToolset)* and a multipurpose tool that supports various software maintenance processes, such as:

- Performing release upgrades
- Installing enhancement packages
- Applying Support Package Stacks
- Applying Feature Package Stacks
- Installing add-ons
- Updating single components
- Performing system conversions to SAP S/4HANA or SAP BW/4HANA

Note

For clarity and readability, the term “update” is used in this document for all supported processes.

The Software Update Manager 2.0 supports among others the following system maintenance processes that are relevant with regard to SAP S/4HANA or SAP systems based on SAP_BASIS 750 and higher:

- Converting SAP systems to S/4HANA
- Upgrading or Updating to SAP Business Suite 7 Innovation 2016 based on SAP NetWeaver 7.5 or higher
- Upgrading or Updating to SAP NetWeaver 7.5 or higher
- Applying Support Packages Stacks to systems based on SAP NetWeaver 7.5 or higher




If your source database is another database than SAP HANA, you have to perform in addition a database migration to SAP HANA database, since SAP S/4HANA runs on this database only. To smooth the way to the SAP HANA target database, SAP introduced a one-step procedure that combines the system update and the database migration. This is provided with the *Database Migration Option (DMO)* feature of the SUM tool (see also [The DMO Concept \[page 16\]](#)).

The main benefits of DMO are:

- Simplified migration steps
- System update and database migration combined in one tool
- Reduced business downtime
- The source database remains consistent, thus a fast fallback is possible


For more information about the SUM tool and the Software Logistic Toolset, you may see the following blogs in the SAP Community:

- [Software Update Manager \(SUM\): introducing the tool for software maintenance](#)
- [The Delivery Channel for Software Logistics Tools: “Software Logistics Toolset 1.0”](#)

See also the SAP Support Portal at <http://support.sap.com/sltoolset>  *System Maintenance*  *Software Update Manager (SUM) for <version>*  to find the latest version of the tool, the appropriate documentation and SAP Note.




2.2.2 SUM User Interface (SUM UI)

The user interface of the Software Update Manager (SUM UI) is based on SAP Fiori.

For more information about SAP Fiori, see on sap.com <http://www.sap.com/fiori>  or the SAP Help Portal https://help.sap.com/viewer/p/SAP_FIORI_OVERVIEW.

- [Prerequisites \[page 24\]](#)
- [Structure and Elements \[page 24\]](#)
- [Additionally Displayed Information \[page 25\]](#)


Prerequisites

- If you want to use the Secure Hypertext Transmission Protocol (HTTPS) for [Starting or Restarting the Software Update Manager \[page 123\]](#): You have configured a secure socket layer (SSL) for SAP Host Agent as described in the SAP Host Agent documentation at https://help.sap.com/viewer/host_agent  *SAP Host Agent Configuration*  *SSL Configuration for the SAP Host Agent* .
- Supported web browsers:
 - Microsoft Edge (latest release, not using compatibility view)
 - Microsoft Internet Explorer 11 (not using compatibility view)
 - Google Chrome (latest release)
 - Mozilla Firefox (latest release)

→ Recommendation

We strongly recommend that you always use the latest available web browser release.

ⓘ Note

Note that future versions of the Software Update Manager no longer support Internet Explorer 11, as this browser is deprecated. For more information, see [the corresponding blog in the SAP Community](#) .

Structure and Elements

If you want to use the Secure Hypertext Transmission Protocol (HTTPS) for : You have configured secure socket layer (SSL) for SAP Host Agent as described in the SAP Host Agent documentation at SAP Host Agent ConfigurationSSL Configuration for the SAP Host Agent .

Check the profile of user <SID>ADM and make sure that the following group profiles are also entered under Supplemental groups:

<SID>OWNER

R3GROUP

Supported web browsers:

Microsoft Edge (latest release, not using compatibility view)

Microsoft Internet Explorer 11 (not using compatibility view)

Google Chrome (latest release)

Mozilla Firefox (latest release)

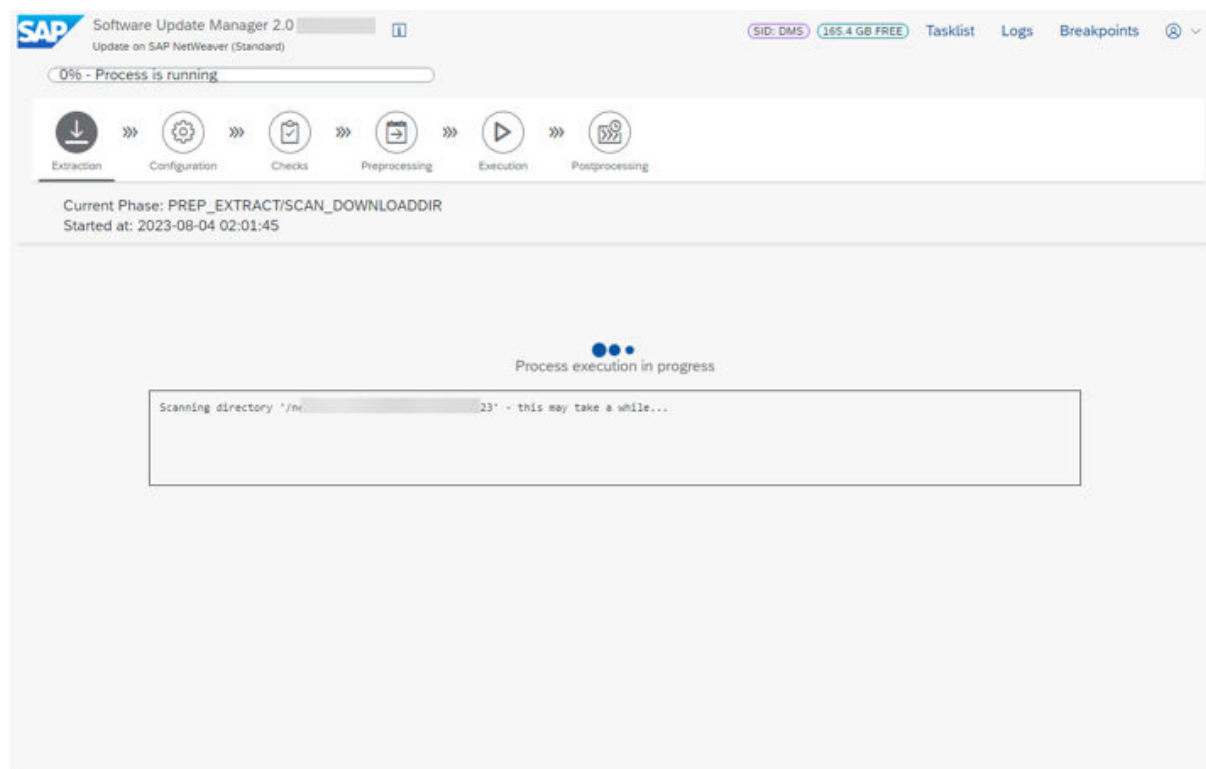
We strongly recommend that you always use the latest available web browser release.

Note that future versions of the Software Update Manager no longer support Internet Explorer 11, as this browser is deprecated. For more information, see the corresponding blog in the SAP Community.

Additionally Displayed Information

Progress Display From the SAPConsole.log File

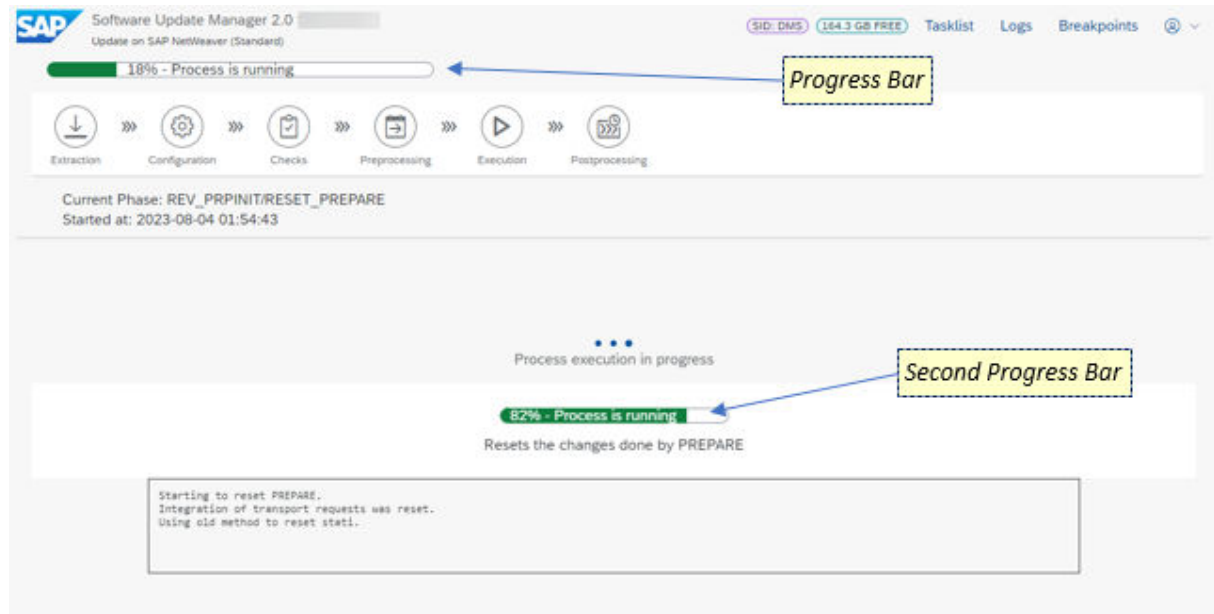
If the Software Update Manager is in a normal process execution and, for example, no dialog or other information is displayed, the message `Process execution in progress` is displayed on the SUM UI. Example:



Below this message you often see a box containing the progress information of the file `SAPupConsole.log` with regard to the currently running phase. It allows you to see which processes are currently running in the background by the Software Update Manager. Example:

Second Progress Bar

The duration of the different phases within a roadmap step can vary significantly. If long-running phases start within the roadmap step, a second progress bar is displayed on the UI. It is only valid for the current phase and supports you in estimating the progress of a long-running phase. Example of a second progress bar:



Note

When you hover the mouse over the progress bar, a tooltip opens with further information. Beside the process state and the current time stamp, the estimated remaining runtime of the SUM procedure is displayed. The estimated runtime is displayed with the following format: mm:ss or hh:mm:ss. The abbreviation *ETA* means: Estimated Time of Arrival.

Additional Progress Information in Table Form

In some phases, updates are carried out that take different lengths of time depending on the data volume, database performance, or other factors. For example, this can be updates in target database tables.

And in some of these phases, additional progress information is displayed in tabular form below the second progress bar for a more detailed overview. Example:

The screenshot shows the SAP Software Update Manager (SUM) 2.0 SP20111 interface. At the top, it displays 'SAP Software Update Manager 2.0 SP20111' and 'S/4HANA FND Conversion using DMO (Downtime-optimized)'. A progress bar indicates '56% - Process is running'. Below this, a navigation bar shows icons for Extraction, Configuration, Checks, Preprocessing, Execution, and Postprocessing. The current phase is 'MAIN_MIGOPT/SUBMOD_SFM_UPTIME/RUN_SFM_TOUCH', started at '2024-03-04 08:07:45'. A second progress bar shows '0% - Process is running' with the task 'Touching table rows to fill shadow columns'. Below this, a table provides a detailed overview of the task's progress.

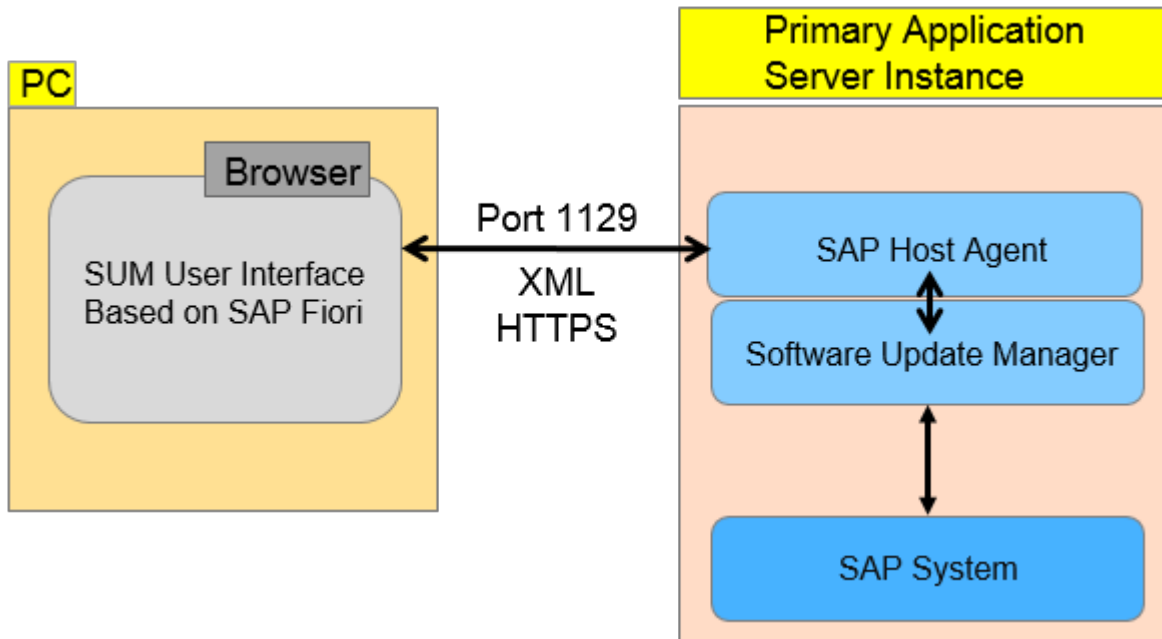
Task	Current	Total	Percentage
/1CRR/S215	330	2000	16.5
/1CRR/S218-3	330	679	48.6
/1CRR/S218-2	330	663	49.8
/1CRR/S218-1	330	658	50.2

2.2.3 SUM UI: Communication with Back-End Processes

This chapter deals briefly with the technical background of the SUM UI.

To display the SUM UI correctly, it is necessary that Software Update Manager is known to the SAP Host Agent so that both can communicate with each other. For more information, see [Registering SUM in SAP Host Agent \[page 121\]](#).

You start the SUM user interface (UI) by entering the URL, which is relevant for your platform technology, in the address bar of a browser. This action connects the browser with the Software Update Manager by means of the SAP Host Agent. You can connect from a client machine, or from the same host. By default, the SUM UI uses the standard protocol HTTPS (for a secure connection) and port 1129 of the SAP Host Agent. SUM then calls internally the relevant executables, which carry out the update steps.



Communication Between the Browser and the Instance Where SUM is Running

Note

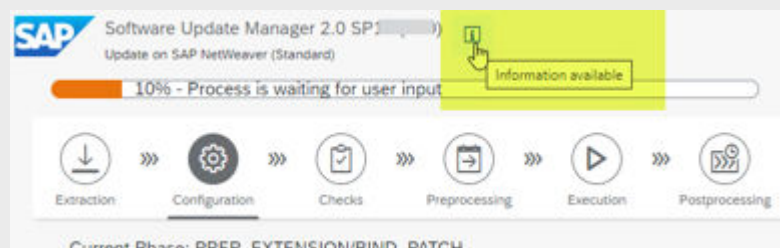
The Software Update Manager internally calls the `SAPUP` executable. Technically, `SAPUP` is started twice, which is visible in the process list. One entry with `gt=httpchannel` represents the `SAPUP` handling the requests coming from the SAP Host Agent. The second `SAPUP` with parameter `guiconnect` triggers tools such as `R3trans`, `tp`, or `R3load`.

2.2.4 SUM UI: Flags

This section describes the flags that can be displayed during an update.

In the middle upper part of the SUM UI, next to the tool version title and the scenario information, flags with different shapes and colors can appear under certain conditions.

Example



Currently, three flags are available. Sometimes two of them or all appear at the same time side by side.

- [Checks . log flag \[page 29\]](#)

- [Failed Buckets Notification flag \[page 30\]](#)
- [Aborted Daemon Processes flag \[page 29\]](#)

Checks.log Flag

The checks.log flag reflects the content of the file `checks.log` related to the current roadmap step. Depending on the type of the entry with the highest severity, the flag has a different shape and color. It can be of type information (= green or blue square), warning (= yellow or orange triangle), or error message (= red circle).



You can click the flag to open a dialog box with a list of the current log file entries. You are also warned with this flag against P-messages stored in the `longpost.log` file. For more information, see [Solving P-Errors \[page 216\]](#).

You can select an entry and click the right arrow to get detailed information about the entry. Moreover, you can hide single messages in the list. Hidden messages can be restored.

Example

The screenshot shows the SAP Software Update Manager (SUM) interface during a 'Checks' step. A dialog box is open, displaying a list of log entries with various severity icons (red circle, yellow triangle, blue square). The entries include 'Background Job SUPG_SAMPLE_CALL Failed', 'Missing SAP Notes', 'Stack Modification Check', 'Information About the Underlying Product', 'Content of Download Directory', 'ASCS Setup Detected', 'Information about High Availability System', and 'Information of phase ADDON_INFO'. A 'Hide this message' tooltip is visible over the 'Content of Download Directory' entry. In the background, a red error banner states 'Scanning the download directory failed with the following error: Mandatory stack archives missing: 18!'. The download directory path is shown as '/usr/sap/KB1/download/'.

Failed Daemon Processes Flag

This flag occurs in form of a red triangle if you perform one of the following features of the Software Update Manager:

- Downtime-optimized Database Migration Option (downtime-optimized DMO)
- Near-Zero Downtime Maintenance (nZDM)

The related tooltip *There are failed daemon processes!* informs you about the aborted or failed daemon processes of the `SAPUP` executable.

When you click the icon, a new browser window with the [SUM Utilities \(Extended UI\) \[page 39\]](#) opens in which *Process Control Center* is displayed directly. The detailed process overview lists the aborted daemon processes, and you can select and restart a process.

Failed Buckets Notification Flag

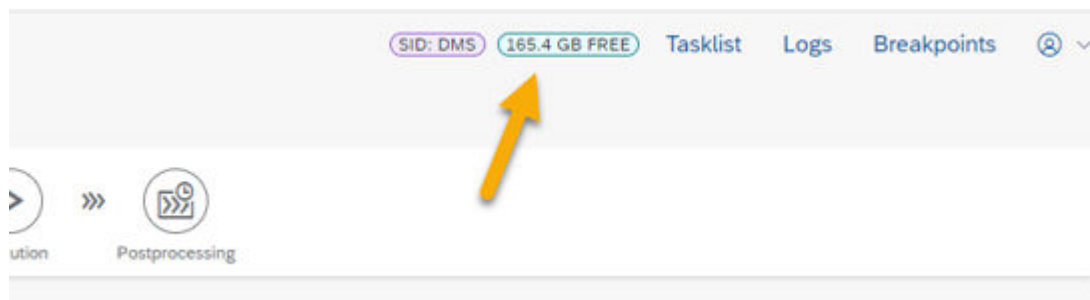
This flag is relevant when you are executing the Database Migration Option (DMO) of the Software Update Manager, and failed buckets occur. A flag in the form of a red triangle appears with the tooltip *There are failed process buckets!*

When you click the icon, a new browser window with the [SUM Utilities \(Extended UI\) \[page 39\]](#) opens. The *Process Control Center* is displayed directly and allows you to monitor and maintain the buckets.

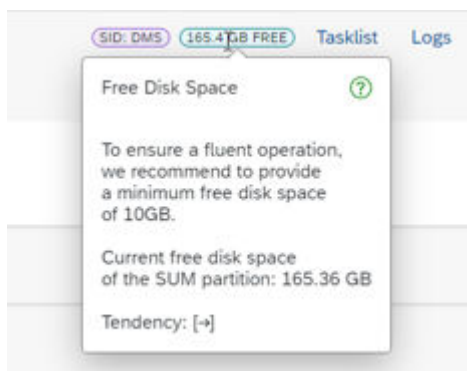
2.2.5 SUM UI: Free Disk Space Information

This feature concerns the indication of the current free disk space and the tendency, and it warns you by colors when the disk space falls below a certain limit.

An information label is permanently displayed on the left-hand side of the menu bar. In the label, the current free disk space on the SUM partition is displayed. Example:



When you hover over the label, you get a tooltip with a more detailed information and in addition a tendency indicator and, if applicable, a warning. Example:



Depending on the defined thresholds, the label can get different colors:

- More than 10 GB: The information label is displayed in **green** color.
- 10 GB and lower, down to 5 GB: The information label is displayed in **orange** color. In the tooltip, you see the warning `You should consider increasing the SUM partition size!`.
- 5 GB and lower: The information label is displayed in **red** color. In the tooltip, you see the warning `You should urgently increase the SUM partition size!`.

2.2.6 SUM UI: Menu Bar

This section describes the different menu items that are available on the right side at the top of the SUM user interface.

The following menu items are covered in detail:

- [Task List \[page 32\]](#)
- [Logs \[page 32\]](#)
- [Breakpoints \[page 34\]](#)
- [User Menu \[page 35\]](#)

📘 Note

A slider on the left side of the *Tasklist*, *Logs*, or *Breakpoints* display allows you to change its size.

Tasklist

Task Type	Status	Phase	Description	Logfile
		EXTRACT		
		PREP_EXTRACT		
		BEGIN_PRE	Checks upgrade dir...	PHASE_BEGIN.LOG
		SUMASK	Ask for general SU...	SUMASK.LOG
		TOOLCHECKVERS_CONS...	Determines the rel...	TOOLVERSCHK.LOG
		TOOLCHECK_PREIMP_E...	Determines and ch...	TOOLCHECK.LOG
		SCAN_DOWNLOADDIR	Initial scan of down...	SCANDOWNLOAD.LOG
		INITTOOL_PROTECT	Protects some setti...	PHASE_INITTOOL.LOG
		SCANDIR_INI	Scans the downloa...	SCANDIRINI.LOG
		PREIMP	Preimport of tools ...	PREIMP.LOG

This option displays the phase list of the Software Update Manager, including existing phase descriptions, based on the `phase1.lst.xml` file. You can use the list to display the status of the current, previous, and subsequent phases of the procedure. The icons used in the *Task Type* and *Status* columns are described in the legend available in the user menu. Alternatively, you can hover over the icons to open a tooltip with the description.

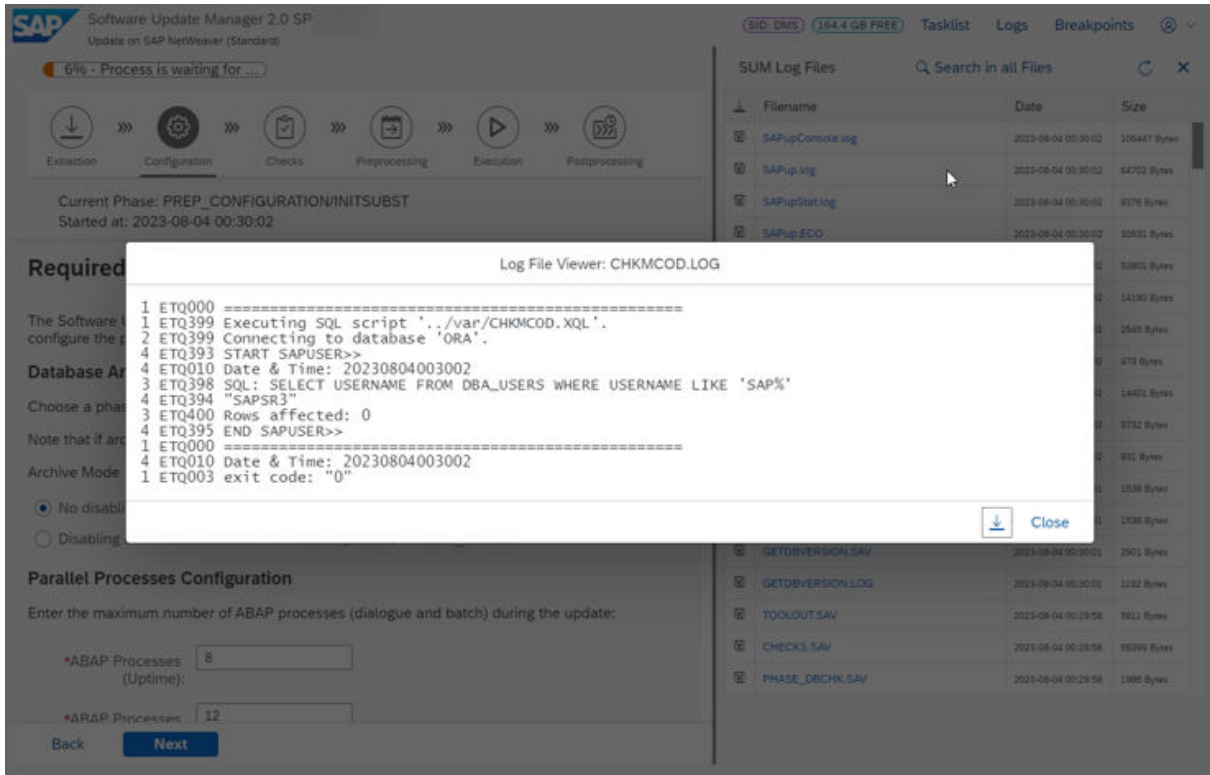
Click a phase name in column *Logfile* to open the log file viewer with the content of the related log file, which is mentioned in the far right column, provided that the file already exists.

Logs

Filename	Date	Size
SAPup.log	2023-08-03 16:33:44	5214 Bytes
SUMASK.LOG	2023-08-03 16:33:44	2647 Bytes
CHKSYPWD.LOG	2023-08-03 16:33:44	2592 Bytes
SAPupConsole.log	2023-08-03 16:33:43	7779 Bytes
CHKSYPWD.SAV	2023-08-03 16:33:43	3713 Bytes
SAPupStat.log	2023-08-03 16:33:05	409 Bytes
SQLSTMTSTD.OUT	2023-08-03 16:33:05	3400 Bytes
CHECKS.LOG	2023-08-03 16:33:05	282 Bytes
SELROADMAP.LOG	2023-08-03 16:33:05	8879 Bytes
CONFCHK_KRNL.LOG	2023-08-03 16:33:05	792 Bytes

You can open an overview of the available log files for the current step or phase. Furthermore, you can sort the list ascending or descending by names or date, and you can download a file directly.

Click a file name in row *Filename* to open the log file viewer with the content of the related log file. In addition, you can download the log file. Example of a log file content in the viewer:



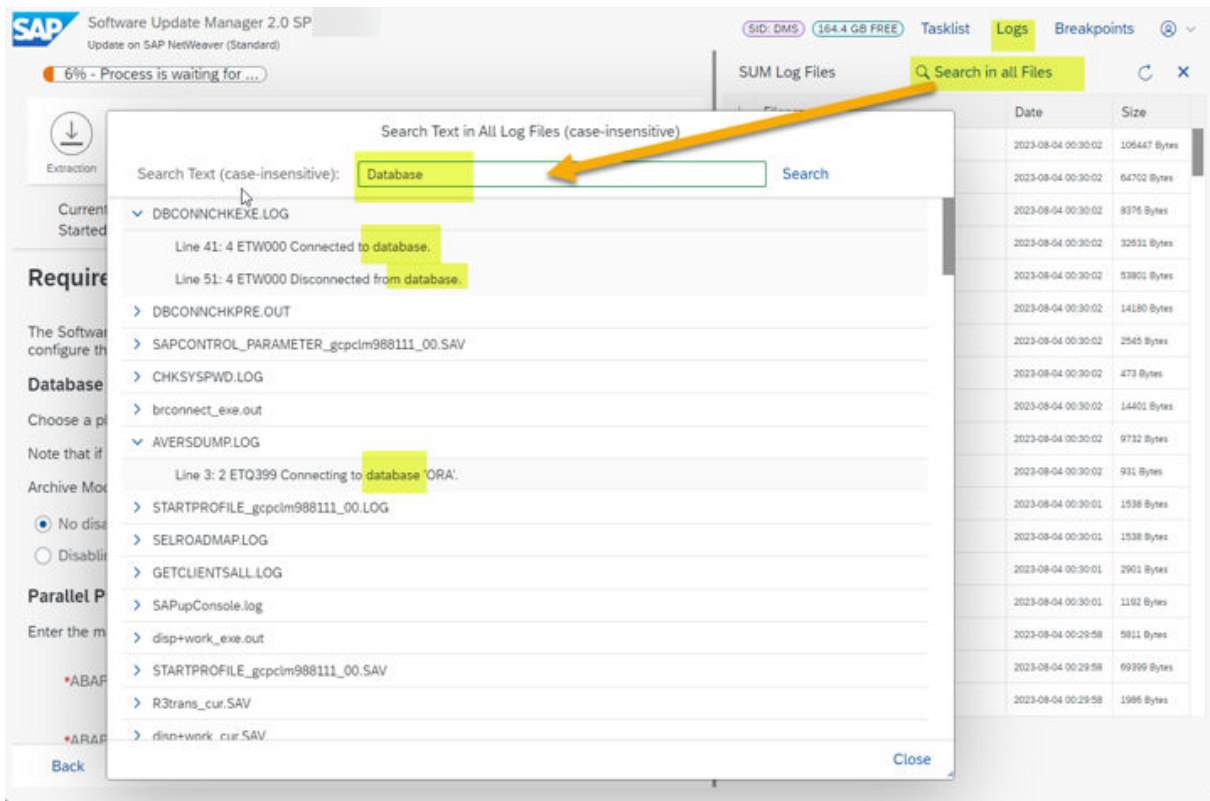
Note

- Alternatively, you can access the log files on file system level in directory `<SUM directory> \ abap \ log`. Some phases or steps generate log files in subdirectories of the log directory, so you can still need file system access to analyze them.
- `.sar` files cannot be displayed in the log viewer because of their binary content. However, they can be downloaded, too.

Text search in log files

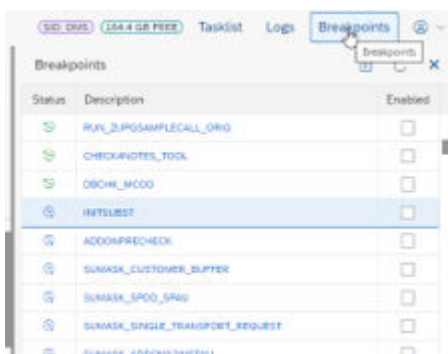
The log window offers you also the option to search the log files for character strings. You can use the button *Search in all Files* for this purpose. A second window opens in which you can enter the wanted search expression, for example: **database** or **error**. Note that the search is case-insensitive. As a result you get a list of log files names that contain the searched character string. You can expand each line to get a more detailed listing of the lines in which the string you are looking for occurs.

Example of a search for entries with **database**:



If you double-click a line, the file viewer opens and displays the content of the file around the line found. The searched string is highlighted. If you click **OK** in the file viewer, it is closed and the results list is displayed again.

Breakpoints



SUM offers the possibility to use breakpoints, which allow you to pause the update procedure at a specified point. A list of the breakpoints is displayed. You can click the header **Description** to get a dropdown list with sort- and filter options. The icons for the breakpoint status are described in the legend.

A further feature allows you to switch on or off the single-step mode by means of a button **Stop Next Phase** to pause the procedure at every next phase.



For more information, see [Breakpoints During the Update \[page 128\]](#).

User Menu



In the upper right corner of the SUM UI, you find the user menu. Use this menu to get support or more information, reset the update, or log out from the browser session. Depending on the status of the update procedure, different options are offered.

Help

If you choose this option, a context-sensitive online help is displayed in a new tab with the content of the related SUM guide. Ideally, the topic related to the dialog from which you open the help window is shown.

If there is no appropriate help available, the table of contents of the SUM guide is shown automatically. You can jump from here to the content that is relevant for you.

Note

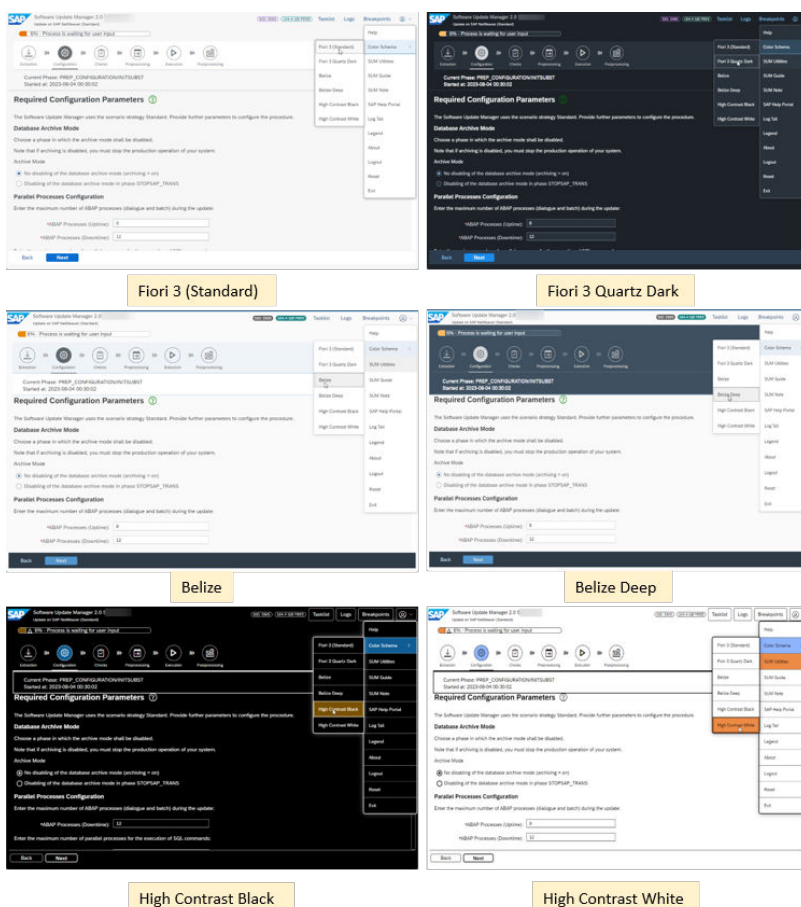
Alternatively, you can use the **F1** button to open the help window.

The question mark icon next to a heading or title on the SUM interface indicates that there is a context-sensitive help topic.

Color Schema

The option *Color Schema* offers you themes that you can use with the SAP Fiori-based user interface. You can choose between the following themes:

- *Fiori 3 (Standard)*
- *Fiori 3 Quartz Dark*
- *Belize*
- *Belize Deep*
- *High Contrast Black*
- *High Contrast White*



Utilities

Opens a new window with an extended user interface. For more information, see [SUM Utilities \(Extended UI\) \[page 39\]](#).

SUM Guide

Opens the entry page for the SUM 2.0 guides in a new web browser window. Here you can filter for database and operating system to get the related SUM 2.0 guide.

SUM Note

Opens a new web browser window, in which the central SAP Note for the current Software Update Manager version is displayed. The source of the SAP note is the SAP Support Portal.

SAP Help Portal	Opens the SAP Help Portal in a new web browser window, which contains SAP product documentation and other related information such as SAP Notes, product availability information, and community content.
Log Tail	Opens the log tail viewer for selected log files. In a pop-up window, the chosen log file is reloaded and displayed at short time intervals. You can pause the display to check some log lines.
Legend	The legend explains the meaning of the icons that are used for <ul style="list-style-type: none"> • the different phase types and status in the task list • the different breakpoint status
About	Displays information about the current version of the Software Update Manager, the Software Logistics Protocol, and the Software Logistics UI Client.
Logout	Logs you off the current browser session. Note that the update procedure itself continues running in the background. To log on again, proceed as described in Starting or Restarting the Software Update Manager [page 123] .
Reset	Note that this option is not always available in the menu. It sets the system to a state that allows the update procedure to be restarted from the beginning. This option is only available during resettable phases. However, it is available at the end of a successful update procedure without DMO. For more information, see Resetting the Update [page 127] .
Exit	Note that this option is not always available in the menu. It stops and exits the current update process and displays the initial dialog of the SUM user interface (" <i>Tool start required</i> "). If you choose <i>Exit</i> during this dialog, you also terminate the <code>SAPUP</code> process on the server and stop SUM completely. An appropriate message on the SUM UI appears, and you can close the web browser page. Alternatively, you can restart the Software Update Manager again by refreshing the web browser page or by clicking on the link in the message. You can continue from the point where you chose <i>Exit</i> .
Cleanup	Note that this option is not always available in the menu. It cleans up the <code>SUM</code> directory and terminates all running <code>SAPUP</code> processes on the server. An appropriate message on the SUM UI appears, and you can close the web browser page. In this way, the Software Update Manager has been stopped completely so that using <i>Exit</i> is not necessary anymore. This option is only available at the end of a successful update procedure or after you have chosen <i>Reset</i> . At the end of a successful update procedure, a cleanup prevents the execution of a reset afterwards. On the other hand, after a reset has finished successfully, the cleanup is obligatory. See also Resetting the Update [page 127] .

2.2.7 SUM UI: Buttons

During the update, the buttons *Back*, *Next*, and *Cancel* are displayed depending on the current step or phase and dialog.

If you encounter an issue during the update procedure such as aborts or errors, the Software Update Manager displays in some cases the buttons *Repeat* or *Init* or both. *Init* basically means that the current phase will be initialized again and restarted. However, this varies depending on the phase.

Due to several restrictions or limitations only certain processes of a phase might be repeated again and not the whole phase. If you choose *Repeat*, the current process within a phase will be repeated from the point where update procedure stopped.

2.2.8 SUM UI: Mandatory Input Elements

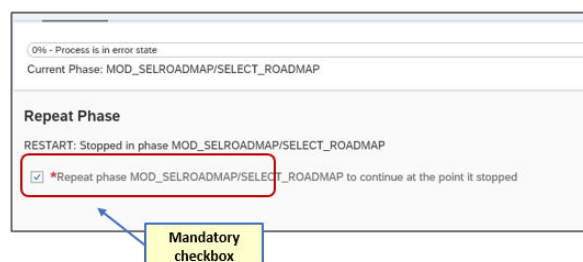
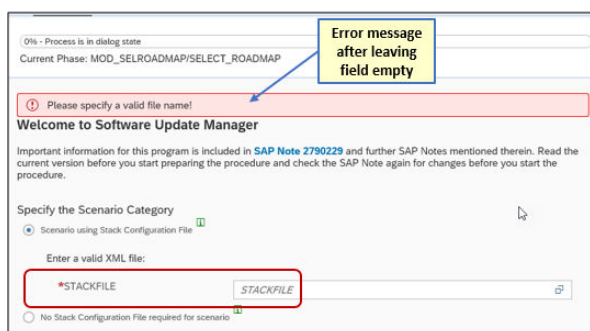
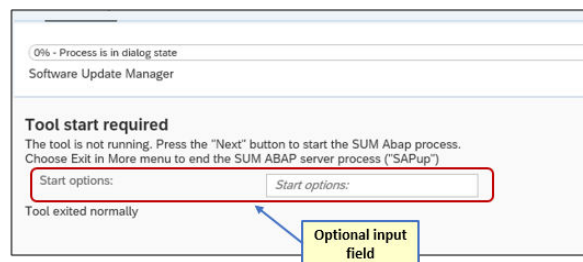
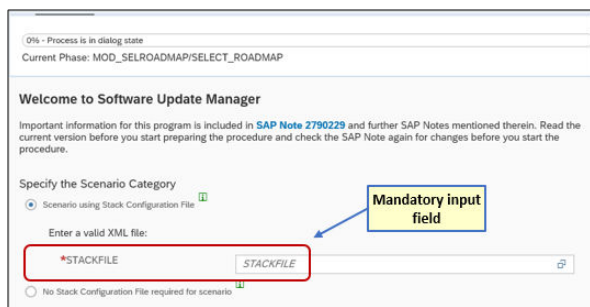
This chapter briefly deals with some input fields in the dialogs.

During the procedure with the Software Update Manager, you encounter a sequence of dialogs. They contain divers elements such as input fields, radio buttons, or checkboxes. These elements require your input such as a file name or a password, or your action such as ticking a checkbox or selecting a radio button.

Input fields or checkboxes are in general of type optional or mandatory. They can be distinguished by a little star ("asterisk") in front of the label of a checkbox or an input field, which indicates a mandatory input element. If you come across such an element, you must enter the required input, or you must tick the checkbox to proceed with the SUM procedure.

If an element is left empty, a warning is displayed, or the *Next* button is grayed out. The Software Update Manager thus prevents the next step.

In the following, you see examples for an optional input field, a mandatory input field, and a mandatory checkbox:



2.2.9 SUM Utilities (Extended UI)

The Software Update Manager Utilities (SUM Utilities) extend the SUM user interface and provide an easy way to configure, monitor, and analyze the SUM run.

To open the SUM Utilities, choose *Utilities* from the user menu on the [SUM UI: Menu Bar \[page 31\]](#). A new web browser window opens with an "extended user interface" that offers you various additional options:

The screenshot shows the SAP Software Update Manager Utilities interface. The top bar includes the SAP logo, 'Software Update Manager', and 'SID: DMS'. A user menu is open in the top right corner, showing options: Help, Color Schema, SUM Guide, SUM Note, SAP Help Portal, and Exit. The main content area is titled 'Software Update Manager Utilities' and contains a 'Welcome' message and 'Navigation Items' section. The 'Navigation Items' section lists several utility functions:

- **SUM Parameters:** adapt your configuration
- **SUM Analysis:** display the phase runtimes (UPGANA.XML visualization)
- **Database Statistics:** display certain statistics about the SAP HANA database
- **Process Control Center:** monitor and control parallel processes and process buckets (during migration phases)
- **DMO Migration Preparation:** visualize the migration preparation procedure
- **DMO Migration Post Analysis:** display the R3load process utilization chart (after finished migration phases)

Note

The menu item *Database Statistics* is only relevant for SAP Hana database.

The options in detail:

Navigation	Description
SUM Parameters	<p>This option enables you to adapt the configuration of your SAP system by processing the following parameters:</p> <ul style="list-style-type: none">• SUM Process Parameters such as the number of ABAP processes, SQL processes, or <code>R3TRANS</code> processes. For more information, see Process and Tool Parameters [page 60]. Further options are:<ul style="list-style-type: none">• Control of the ABAP batch job execution. That is, you can specify a dedicated server, or you let the system decide where to run the jobs.• Decision on the reconfiguration of the temporary instance or the shadow instance. This is especially relevant when you have chosen the scenario strategy Downtime-optimized. The temporary instance is affected when you have selected the downtime-optimized Database Migration Option. The shadow instance, on the other hand, is affected when you work with the near-Zero Downtime Maintenance (nZDM). To monitor the reconfiguration, use the CRR Control Center which is mentioned in the following section Process Control Center.• SUM Shadow System Parameters (such as the instance number)• SUM Migration Parameters (such as the migration key)• SUM Passwords Each dialog with a password request is displayed here again. This can be passwords for<ul style="list-style-type: none">• user <code>DDIC</code>• SAP Service user (<code>SAPServiceSID</code>)• shadow system user <code>DDIC</code>• database user <code>SYSTEM</code>• shadow database user <code>SYSTEM</code>• SUM Migration Passwords (such as system user password for the target database. The password concerns the database migration and refers to the password for the database user <code>SYSTEM</code> of the target database)

ⓘ Note

In each dialog box, you can enter a new password that overwrites the existing password.

Note, however, that you do not change the password in your SAP system, but only the password that the Software Update Manager uses to communicate with your SAP system.

Navigation	Description
SUM Analysis	<p>SUM Analysis</p> <p>This option visualizes the <code>UPGANA.XML</code> file, which contains detailed information about the update procedure and the runtime of the different phases. See also in the appendix of the SUM guide the section A.1 SUM Analysis. You can download the file in form of a raw xml-file.</p>
Database Statistics	<p>This option displays certain statistics about the SAP HANA database, such as CPU, memory, or disk usage.</p>
Process Control Center	<p>For more information, see the following table.</p>
DMO Migration Preparation	<p>This option is relevant if you are executing the database migration option (DMO) of the Software Update Manager. For more information, see the DMO guide.</p>
DMO Migration Post Analysis	<p>This option is relevant if you are executing the database migration option (DMO) of the Software Update Manager. For more information, see the DMO guide.</p>

Process Control Center

With the [Process Control Center](#), you can monitor and handle running processes. It consists of the following options:

[Charts Control Center \(Process and Load Monitor\)](#)

On the view [Evolution of Parallel Processes](#), you can monitor the `R31oad` processes that run in parallel during phase `EU_CLONE_MIG_*_RUN`. The moving graph shows in real time the number of currently running `R31oad` processes depending on the time. By moving the horizontal slider, you can dynamically increase or decrease the total number of `R31oad` processes.

The following [Process Buckets](#) table provides you with information about the status of each `R31oad` process pair, that is, export and import processes. If an `R31oad` process fails, you can analyze the appropriate log file and restart the `R31oad` process pair provided that the issue is solved. For the restart, select the appropriate row and choose *Reschedule* in the top-right corner of the table.

Note that during the update procedure the SUM UI can inform you about failed buckets by means of the *Failed Buckets Notification Flag* (see also [SUM UI: Flags \[page 28\]](#)). The flag disappears after you have restarted failed buckets successfully.

Shows the current status of the *Change Recording & Replay (CRR)* procedure during the uptime. .

This information is relevant among other things for the *downtime-optimized Database Migration Option*. For more information about the downtime-optimized DMO, see the *Planning* section of the *DMO Guide*.

- **Current Replication Status**

This view gives you an overview of the ABAP-based and the R3load-based replication status. If both the ABAP-based and the R3load-based replication status are used in parallel, the system provides a total CRR status.

If the CRR status is 75% and higher and the indicator *Ready for Downtime*: displays a *Yes*, you can enter the downtime and continue with the update.

- **ABAP Replication Monitor**

This monitor displays the number of background processes that are used for the replication in the shadow instance. You can set the number of background processes by using the plus or minus button or by entering a number directly. Afterwards, you must accept the change to save the new number of processes.

Note

The number of background processes is limited to the value of parameter `ABAP PROCESSES (UPTIME)` that was defined during the *Configuration* roadmap step. The maximum number of processes that can be used for replication depends on the actual available background processes during the start of the replication.

The list shows all tables currently processed by the ABAP-based replication and gives additional information. It is possible to use predefined filters for *Planned*, *Idle*, *Running*, and *Failed* table entries. Click the *Show Logfile* button to get more information about the replication processing.

- **R3load Replication Monitor**

You can start and stop the R3load replication process and dynamically adjust the number of parallel R3load replication processes. The list displays the tables currently being replayed and their status and progress.

Additionally, you see a list of running buckets from which you can navigate to the individual log files. The list also allows you to filter for failed processes to restart them. This feature is described in the DMO guide. Note that with R3load replication, you can restart individual buckets instead of stopping and starting the whole R3load replication.

- **Real-Time Replication Rate and Total Changes Monitor**

This is relevant for the following system maintenance scenarios:

- near-zero downtime maintenance (nZDM)
- downtime-optimized database migration

This view displays graphs that indicates the change replication rate per hour and the total changes per hour. The displayed values are based on aggregated statistical data from the R3load processes.

*Process Control
Center (Background
Process Monitor)*

This view displays all registered background processes and its status. In addition, you can start, stop, or kill such a background process.

The Software Update Manager starts background processes, for example, for the replication. They run in parallel beside the `SAPUP` work process. In general, all registered background processes have the status `running`.

2.2.10 SUM Observer Monitor

The Software Update Manager offers an additional user interface that is called the `observer monitor`. It is displayed as the *SUM Observer Monitor*.

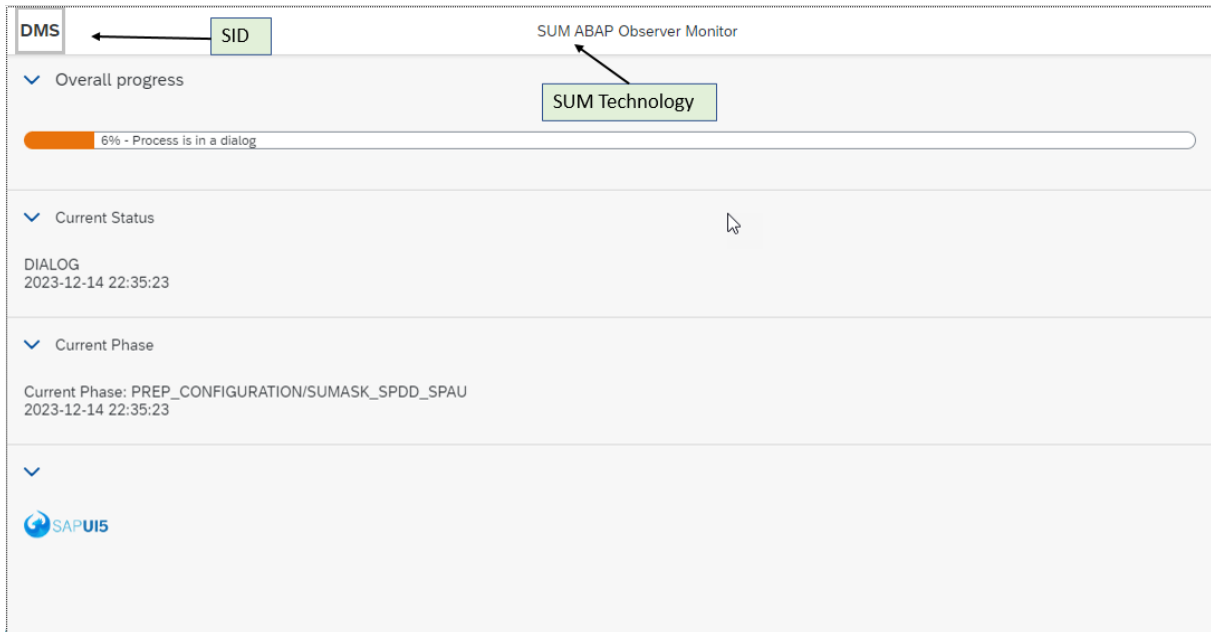
Default Display

The *SUM Observer Monitor* is a kind of non-administrative mode or guest mode of the SUM user interface. It allows you to monitor a current update procedure and provides you with information about its status. You cannot enter data or change the update procedure.

You can use the SUM Observer Monitor in browsers on different devices, such as on a desktop PC or on a mobile device. And you can use it with any Software Update Manager technology (SUM ABAP, SUM Java, or the SUM dual-stack version). The SUM UI automatically determines the type of the Software Update Manager, indicates it in the title bar, and displays the appropriate status information. In the following, you see an example of the *SUM Observer Monitor* in a browser window on a desktop PC.

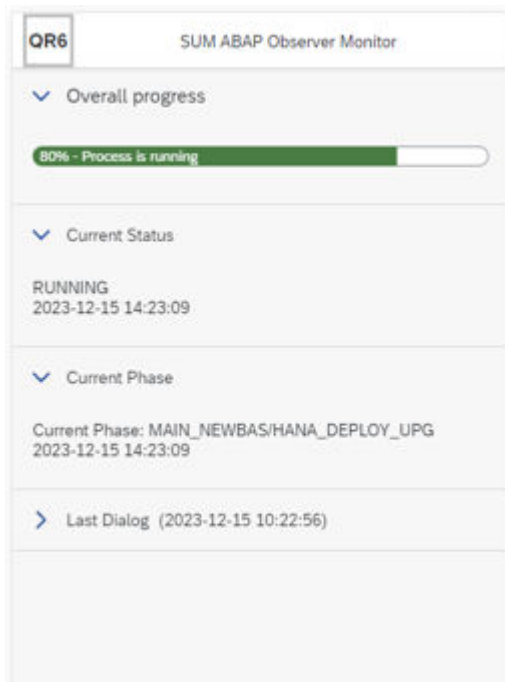
The monitor provides you with information in different sections about the

- the overall progress of the procedure (in percent)
- the current status (for example, running or in a dialog)
- the name of the current phase



SUM Observer Monitor in a Browser Window on a Desktop PC

In the following, you see an example of the SUM ABAP Observer Monitor on a mobile device.



SUM Observer Monitor in a Browser Window on a Mobile Device

For more information about starting the observer monitor, see [Starting the SUM Observer Monitor \[page 124\]](#).

Display of Additional Sections *Last Dialog* and *Trouble Ticket*

You have the option to expand the information display in the observer monitor with the areas *Last Dialog* and *Trouble Ticket*. To activate this display of these areas, the following lines must be present in the file `SAPup_add.par`:

```
/observer/show_dialogs = yes
```

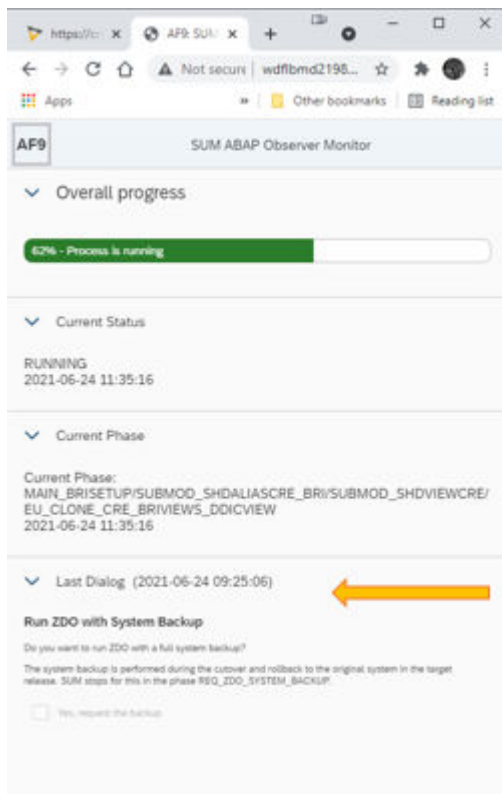
```
/observer/show_troubleticket = yes
```

Note

The file `SAPup_add.par` is located in the subdirectory `bin` of the SUM directory. If this file does not exist yet, create it manually.

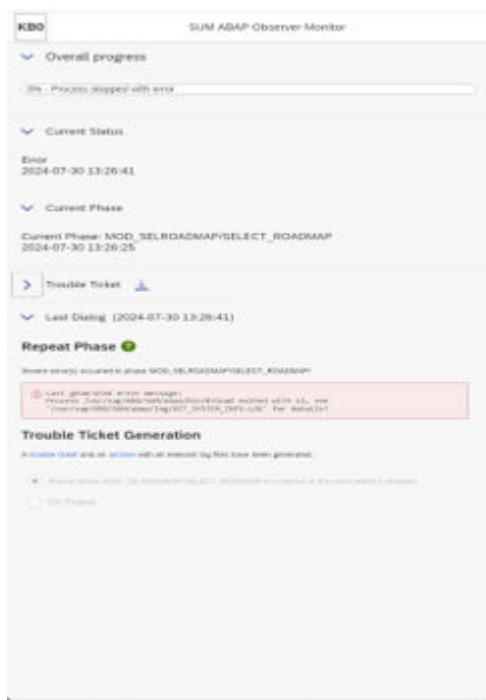
When these sections are activated, the SUM Observer Monitor displays the following:

1. If the Software Update Manager is waiting in a dialog, this dialog is also visible in the SUM Observer Monitor in a reduced form. However, the dialog display is read-only. That is, you have no possibility, for example, to enter data or to choose a button. Example:



2. If the Software Update Manager is in an error state, you see in the SUM Observer Monitor an excerpt of the error message that is displayed on the regular user interface. In addition, the section *Trouble Ticket* is

available, but initially collapsed. However, a download button is displayed with which you can download the SAPup_troubleticket.zip archive. Example:



3. After the download of the SAPup_troubleticket.zip archive, its content can be displayed in the *Trouble Ticket* section. Example:



2.2.11 SUM MailNotifier

The MailNotifier is a Java-based tool that notifies you by email when the Software Update Manager waits in a dialog for a user action.

If you are using the MailNotifier, you do not have to check the SUM user interface frequently, which is especially helpful during long-running update phases.

Structure

The MailNotifier tool of SUM consists of two Java files:

1. `MailNotifierApp.jar`: the executable jar file
2. `MailNotifierApp.props`: the properties file

Both files are part of the downloadable SUM archive. The MailNotifier files are unpacked to the subdirectory `<SUM directory>/abap/mailNotifier` of the SUM directory.

Copy both files to a PC or host that can be connected to both the SUM ABAP process (via HTTP or HTTPS) and the SMTP mail server. Furthermore, the PC or host must have at least Java 8 installed so that the MailNotifier can run on it. If necessary, you must ask your mail provider to enable SMTP connections.

Configuration

To configure the MailNotifier, add or update parameters and their descriptions such as for `Mail Server` and `SUM host` to the properties file `MailNotifierApp.props`. Other parameters are:

- `check.interval`: This parameter defines the interval in which the MailNotifier checks the status of the upgrade procedure.
- `check.dialog.tries`: This parameter defines how often the Software Update Manager provides the MailNotifier with the dialog status before it sends an email. This means that if you immediately handle the SUM dialog (and thus the MailNotifier receives the SUM dialog status only once, for example), the tool sends an email.

Instead of using the property file, you can provide the parameters on the command line using the schema `property=value` when starting the jar file.

⚠ Caution

For security reasons, we recommend that you do **not** enter any passwords in the property file or on the command line. The MailNotifier prompts you on the command-line interface to enter the passwords manually, as shown in the following example:

```
... \SUM\abap\mailNotifier> java -jar MailNotifierApp.jar
properties=MyMailNotifierApp.props
[30.06.2016 09:16:22] INFO SumMailNotifier (Version 1.4.5) - starting ...
[30.06.2016 09:16:22] INFO Reading properties from classpath
"com/sap/lm/sl/upg/notifier/MailNotifierApp.props"
[30.06.2016 09:16:22] INFO Reading properties from file "MyMailNotifierApp.props"
[30.06.2016 09:16:22] INFO Requesting missing mandatory properties:
```

```
Property sum.pwd:
Property mail.pwd:
```

📄 Note

- **https is the default as of SAP Host Agent 7.22 PL 52**

If you have installed the SAP Host Agent 7.22 with patch level 52 or a higher SAP Host Agent version, the URL with http is automatically redirected to the secure *https* communication protocol. For more information about this SAP Host Agent, see SAP Note [3036093](#) and on the SAP Help Portal the chapter [SSL Configuration for the SAP Host Agent](#) in the SAP Host Agent Guide.

If you want to use the MailNotifier with such a configuration, install the server certificate in the Java Development Kit or Java Runtime Environment that you use. In many Java Runtime Environments, this can be done with *keytool*. Note that the default SAP Host Agent certificate is not supported here. You must first install your own certificate in the SAP Host Agent.

- **Disabling Certificate Verification**

If necessary, you can also disable the certificate verification using the Java properties file. To do this, set the property *sum.ssl.use.keystore* property in the file to *false*: **`sum.ssl.use.keystore = false`**. By default, this property is set to *true* or handled as such if it is not found in the file.

Basic Functionality

The MailNotifier checks the completeness of the parameters and checks if it is able to reach the update procedure in SUM. Then the tool sends an initial email so that you can check if the configuration is working.

📧 Example

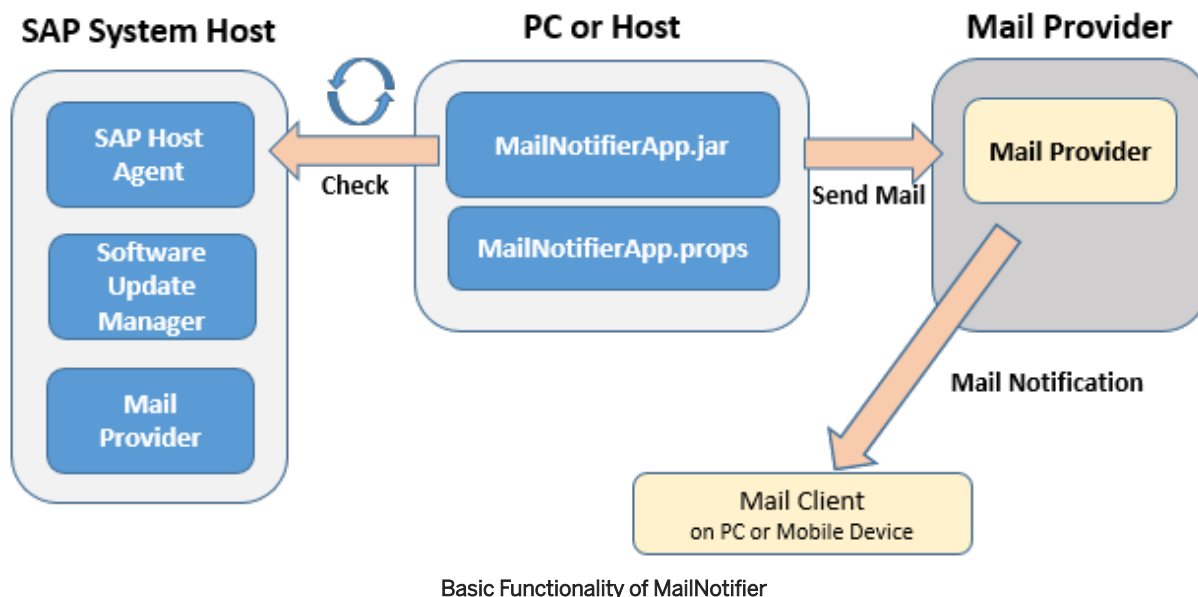
```
Subject: SumMailNotifier was started (DMS on wdflbmd15588)
Dear SUM user, this initial notification mail was sent and received successfully!
This e-mail was generated automatically, based on settings for SumMailNotifier.
Do not reply.
```

Then the tool starts checking the update frequently and if a dialog is waiting for your input, it sends an email notification.

📧 Example

```
Subject: SUM process (DMS on wdflbmd15588) requires action
Dear SUM user, your SUM process (DMS on wdflbmd15588) is in dialog state and
requires your action:
SUM ABAP process started
SAPup waiting in breakpoint dialog
This e-mail was generated automatically, based on settings for SumMailNotifier.
Do not reply.
```

The following figure shows the basic functionality of the MailNotifier:



Preparing the MailNotifier at a Glance

To prepare the MailNotifier, proceed as follows:

1. Check if the following files have been unpacked to the subdirectory `<SUM directory>/abap/mailNotifier` of the SUM directory:
 - `MailNotifierApp.jar`
 - `MailNotifierApp.props`
2. Copy these files to a PC or host that meets the following requirements:
 - It is able to connect to both the SUM ABAP process via HTTP or HTTPS and your SMTP mail server.
 - Java 8 or higher is installed.
3. Configure the MailNotifier by entering the necessary parameters in the properties file `MailNotifierApp.props`.

You can then start the MailNotifier as described in [Starting the MailNotifier \[page 125\]](#).

2.2.12 SUM Toolbox

The `Software Update Manager (SUM) Toolbox` provides you with various tools to support your activities with SUM.

The *SUM Toolbox* is realized as an ABAP-based transaction with transaction code `SUMTOOLBOX`. It allows you to execute specific tools and reports for different software maintenance scenarios using Software Update Manager, with a focus on the downtime-optimized approaches.

The transaction `SUMTOOLBOX` replaces the previous procedure of delivering the tools using separate SAP Notes. Attached to these were Z-reports that had to be implemented manually in the SAP system. With the *SUM Toolbox* as a central entry point for the tools, they are easier to access and to use.

The documentation for each tool is embedded in the SUM Toolbox and can be opened there.

For more information about *SUM Toolbox*, see:

- SAP Note [3092738](#) (central SAP Note for the *SUM Toolbox*)
- SAP Community blog <https://blogs.sap.com/2021/12/10/software-update-manager-toolbox-is-available-now/>

2.2.13 SUM Directory

When the SUM archive is unpacked on the host where the tool is initially started, the `SUM` directory is also created and the files and programs are copied to this directory.

One of these files is `summanifest.mf`, which contains important and useful information for the support, such as the Software Update Manager version, the assembly and compilation version, and the machine type.

The recommended standard path of the `SUM` directory is:

```
/usr/sap/<SID>/SUM
```

⚠ Caution

Make sure that unauthorized access to the `SUM` directory is prevented!

Note that for security reasons, the access rights for all subfolders of the `abap` subdirectory are set to `700` by default. This means that only the owners of the directories have full rights, all others have no access rights. For the subfolder `abap/log` you can switch off this setting, so that other users also have read and execute rights. To do this, the following entry must exist in the `SAPup_add.par` file:

```
/security/allow755.
```

The file `SAPup_add.par` is located in the subdirectory `abap/bin` of the `SUM` directory. If this file does not exist yet, create it manually.

The `SUM` directory has the following subdirectories:

- `jvm`
- `abap`

Each subdirectory contains files and further subdirectories:

- `jvm`
Depending on your operating system, this directory contains the Java Virtual Machine delivered by SAP.

ℹ Note

SAP delivers the Java Virtual Machine, which is contained in this subfolder, especially for the use by the Software Update Manager for the update procedure. Do not confuse this Java Virtual Machine with the SAP JVM that is used by SAP systems based on SAP NetWeaver Java or SAP NetWeaver ABAP+Java (dual stack).

- `abap`
Contains the following subdirectories:

Subdirectory	Description
<code>bin</code>	Contains the Software Update Manager, its libraries, and control files. The control files of the Software Update Manager are always updated automatically. The data they contain is critical for the smooth operation of the update tools. It is maintained exclusively by the Software Update Manager.
<code>buffer</code>	Contains control information for the transport control program <code>tp</code> .
<code>control</code>	Contains product-specific information.
<code>data and cofiles</code>	Contain files that are imported by <code>R3TRANS</code> during the update. They also contain the files for the language import as well as the data files of support packages and add-ons included in the update procedure.
<code>doc</code>	<p>Contains all files related to the SUM user interface, the files for the online upgrade guide, and the observer progress files for the <i>SUM Observer Monitor</i> as well.</p> <p>Moreover, it contains the subdirectory <code>analysis</code> with the ABAP phase documentation and the <code>Upgana.xml</code> and <code>UpgAnalysis.xml</code> files, which include information about the update after it has finished. The subdirectory <code>analysis</code> also contains the <code>phaseslist.xml</code> file with the phase descriptions, and some migration duration files as well for the Database Migration Option, such as <code>migrate_ut_dur.xml</code> and <code>migrate_dt_dur.xml</code>.</p>
<code>exe</code>	Contains versions of the SAP kernel. They can originate from an archive that you downloaded from SAP Support Portal to the download directory, or it can be a copy of the kernel used in the start configuration of the system.
<code>load</code>	Contains all subdirectories that are relevant for phases with <code>R3LOAD</code> such as <code>migrate_ut</code> , <code>migrate_dt</code> , <code>migrate_ut_create</code> , or <code>shdviews</code> . Note that some phases are important for the database migration option only.
<code>log</code>	Contains most of the information about the update. All log files generated during the update and related to it are collected here.
<div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p>Note</p> <p>See also the security notes at the beginning of the chapter in the caution box.</p> </div>	
<code>mailNotifier</code>	Contains the necessary files for the <code>MailNotifier</code> tool.
<code>mem</code>	Contains important information used for the restart of the <code>SAPUP</code> executable, such as current parameter allocations.
<code>sapnames</code>	Contains a backup of the profiles.

Subdirectory	Description
save	Contains files saved during the update by the Software Update Manager that can be used for subsequent updates, for example, the shadow system profile.
srv	Contains the HTTP-server.
system	Contains the working directory for shadow system.
tmp	Used for temporary storage. <code>R3TRANS</code> also stores its log files there before they are handled by <code>tp</code> . Some jobs that run directly in the SAP system also generate output files in the <code>tmp</code> directory. The most important of these output files include the distribution program, the activation program, and the conversion program, which are started by the Software Update Manager several times during the update.
trc	Contains trace files created by the Software Update Manager.
var	Contains files into which the Software Update Manager writes data during a procedure and reads it again for the procedure. The data is variable and refers only to the current procedure.

2.2.14 Storage of Passwords

During the update, you have to enter passwords for the users `<SID>adm` and `DDIC`. These passwords are stored in the memory file `MEMSAPup.dat`. The file is located in subdirectory `abap/mem` of the [SUM Directory \[page 50\]](#).

Although the passwords are encrypted, you have to deny the access to the `mem` subdirectory for other operating system users. Only the user `<SID>adm` needs access to this subdirectory. In addition, you should not share this subdirectory in the network.

If you save the SUM directory for later analysis after the update has finished, delete the file `MEMSAPup.dat`.

3 Planning

This part of the document contains information about planning your SAP system update.

Before you begin the actual update, you have to first plan it carefully. This includes requesting all the SAP Notes and SAP documentation that you need. Careful planning is a prerequisite for a successful update. The following information helps you plan your update so that downtime is reduced to a minimum, and the update runs as efficiently as possible.

When you plan your update, consider the following information:

- All the times specified in this document are based on hardware with medium performance levels.
- Do not perform any additional actions during the Software Update Manager run that could cause it to run less smoothly.
- Start planning your update at least **two weeks** before you start with the update preparations.
- To make sure that all requirements are met, run the preparation roadmap steps of the Software Update Manager, *Welcome*, *Select Target*, *Confirm Target*, *Execute Process*, *Initialization*, *Extraction*, *Configuration*, and *Checks* as soon as possible. You can reset and repeat the preparation roadmap steps as often as you need by choosing *Back* before you start the actual update in roadmap step *Preprocessing*. The successful execution of the preparation roadmap steps is a prerequisite for starting the update in roadmap step *Preprocessing*.
- If you are updating a modified system where changes have been made to the standard ABAP system, you have to start by updating a development or quality assurance system that has the same SAP system release (including Support Package level) and contains the same modifications. The adjustments you perform manually for the new standard in this system can be automatically exported to the global transport directory and are integrated into the update of the production system from there. This procedure eliminates the need for time-consuming adjustments to the production system.

3.1 Initial Dialogs for the Scenario Specification (Get Roadmap)

By means of a dialog sequence at the beginning, the Software Update Manager collects the needed information for the wanted scenario.

In a sequence of dialogs, you can determine the scenario category and the scenario strategy. Furthermore, you can enter additional relevant values and parameters that the Software Update Manager needs to get the roadmap.

Note

- If desired scenario strategies are not displayed for selection, see the log file `selroadmap.log` for more information about the reasons.
- The previous preconfiguration modes `Advanced` as well as the update strategy parameter `downtime-minimized` and `resource-minimized` are not available anymore.

- [Scenario Category \[page 54\]](#)
- [Decision on DMO \[page 55\]](#)
- [Scenario Strategy \[page 55\]](#)
- [Additional Parameters \[page 58\]](#)
- [Migration Parameters \[page 58\]](#)
- [Configuration of the Tools \[page 59\]](#)

Scenario Category

The main starting point is your specification whether you want to use the `stack.xml` configuration file provided by the *SAP Maintenance Planner*. For more information, see [Specifying the Scenario to Get the Roadmap \[page 138\]](#).

Scenario Category with Configuration File

Select the scenario category with configuration file if you want to perform scenarios such as:

- Release upgrades (major release change)
- System updates (EHP installation)
- Support Packages (SPs) / Support Package Stack applications
- Conversion of SAP systems to SAP S/4HANA

In addition, you can use options and features of SUM such as:

- DMO: Database Migration Option (update of an SAP system combined with a migration of the source database to a new target database)
- nZDM: near-Zero Downtime Maintenance (includes features to minimize Business Downtime)

Scenario Category Without Configuration File

If you select the scenario category without configuration file, you can carry out scenarios such as:

- DMO without System Update
Relevant for DMO with target database SAP HANA: You can run a DMO procedure for migration purpose only without updating the SAP system.
- Customer Transport Integration only
You want to import your customer transport requests only without performing a standard update procedure. See also [Integration of Customer Transports \[page 76\]](#).
- Benchmarking Tool
Relevant for DMO: With this migration tool, you can simulate the export and import processes or the export process only to estimate their speed.
- Check Cluster Data
Relevant for DMO: You want to check the consistency of cluster tables. This check is similar to the SAP_BASIS report `SDBI_CLUSTER_CHECK`. It is performed by the `R31oad` executable in discard mode and uses the same technology as the benchmarking tool.
- Table Comparison Check Tool
With this stand-alone migration tool, you can compare export and import table checksums for your database. The check can, for example, be relevant for the system copy procedure with the *Software Provisioning Manager*.

Further Dialogs After the Scenario Category Decision

After your decision, further initial dialogs are possible:

- Decision on DMO
- Decision on scenario strategy
- Selection of additional parameters
- Configuration of Benchmarking or Table Comparison Tool

These dialogs do not appear one after the other, but first depending on the chosen scenario category and the existing source database, then depending on selections that you made in the previous dialog. In the following, we describe the possible main dialogs. For more details, see:

- [Making Entries for Scenarios with Configuration File \[page 139\]](#)
- [Making Entries for Scenarios Without Configuration File \[page 143\]](#)

Decision on DMO

The Software Update Manager checks the database of your source system. If it is **not SAP HANA database** and the **database migration is not mandatory**, you are prompted to decide whether you want to carry out a database migration to SAP HANA or to SAP ASE database.

Note

- If DMO is not mandatory, you can also opt for *No migration*.
- The dialog is not displayed in the following case: Your source database is not SAP HANA database and you carry out a system conversion to SAP S/4HANA. In this case, a database migration DMO to SAP HANA database is required so that the Software Update Manager performs it automatically.

Scenario Strategy

Depending on the scenario category and the decision on DMO, the following options are available:

Strategy Mode	Features
<i>Single System</i>	<ul style="list-style-type: none">• Longer downtime• No shadow instance is running in uptime• Only available for the update of support packages or support package stacks

Strategy Mode

Features

Standard

- Strategy mode for the most scenarios
 - Standard downtime optimization
 - Late start of downtime – import and shadow system operation while the SAP system is still in production operation
 - Standard system resources available
 - Production operation stops in phase `DOWNCONF_DTTRANS` (at the end of the Preprocessing roadmap step).
 - Modification adjustment of the ABAP Dictionary objects during production operation
 - Import of the substitution set into the shadow tables during production operation
 - Activation and distribution during production operation
-

Strategy Mode

Features

Downtime-optimized

- Parallel operation of production system and shadow system
- Higher demand on system resources
- Shorter downtime
- Depending on your source database and your previous specifications, the following options are possible:
 - Uptime Migration (Downtime-optimized DMO)
This option allows the migration of selected large application tables partly during uptime.
 - near-Zero Downtime Maintenance (nZDM)
This option allows the move of table structure adaptations and the import of new table content partly to uptime processing for a system update or upgrade.
 - Downtime-optimized Conversion
This option allows the move of the migration and data conversion partly to uptime processing for a system conversion. It is only available if you perform a system conversion to SAP S/4HANA and if you have the necessary authorizations for this option.
For more information, see [Downtime-Optimized Conversion to SAP S/4HANA \[page 22\]](#).
 - Zero Downtime Option (ZDO)
The ZDO allows the reduction of the technical system downtime to a minimum. Users can apply the business functions of the system during the upgrade or update activities.
In a subsequent dialog, you are asked to report an incident to get a password that authorizes you to use the ZDO feature. For more information, see the *ZDO Guide* and the SAP Notes [2707731](#) (ZDO for SAP S/4HANA) or [2163060](#) (ZDO for SAP Business Suite).

For a list of possible combinations, see [Making Entries for Scenarios with Configuration File \[page 139\]](#).

Strategy Mode

Features

Prerequisite Check Tool

Possible options:

- *Prerequisite Check*
For more information, see [Performing a Prerequisites Check \[page 132\]](#).
- *Prerequisite Check Extended* (only for a system conversion to SAP S/4HANA or an upgrade or update of an SAP S/4HANA system)
For more information, see [Performing an Extended Prerequisites Check \[page 133\]](#).
- *Prerequisite Check Extended Without Target Database*
(A slightly reduced version of the extended prerequisite check that is applicable when no SAP HANA target database is available. The check runs only on the source database and some dialogs are not displayed.)

Additional Parameters

This dialog is relevant for scenarios with configuration file. You can decide on the following options:

- *Check Archive Authenticity*: Select the check box if the authenticity of all archives in the download directory shall be checked.
- *Switch expert mode on*: Select the checkbox if you want to decide on additional options to adapt the tool configuration.
- *Customer Transport Integration*: Include customer transport requests to reduce business downtime. This option is only available for strategy modes *Standard* or *Downtime-optimized*. It is not displayed if *Single System* has been selected.
Select the checkbox *Customer Buffer File*, if a customer buffer file shall be considered that contains customer transports for the target release. A subsequent dialog prompts you to enter the path and the name of the buffer file.

Migration Parameters

This dialog is relevant for DMO scenarios with or without configuration file.

- Decide on the table selection for the built-in *Table Comparison* tool
- Enter the *Migration Key*
- Enable the *Migration Repetition* option
- Enable the *System Move* option

Configuration of the Tools

This dialog is relevant for a DMO scenario without configuration file, and you have selected [Benchmarking tool](#) or [Table Comparison Check Tool](#). In this case, the initial dialog is enhanced to choose the options for the execution of the tools.

3.2 Unicode Aspects

A Combined Upgrade & Unicode Conversion (CU&UC) for target systems based on SAP NetWeaver 7.5 or higher (such as SAP ERP 6.0 EHP 8) is not possible.

Make sure that the SAP NetWeaver source system already supports Unicode because SAP NetWeaver supports as of version 7.5 Unicode only.

See also SAP Note [2033243](#).

3.3 Adaption of Parameters

Depending on your chosen preconfiguration mode, you can adapt further parameters to tailor the update to your specific needs.

There are several parameters with which you can influence the use of SAP system resources for the update procedure during uptime and downtime, such as the number of background processes used by `tp` during uptime and downtime.

Background Process and Tool Parameters

The preconfiguration modes make sure that these numbers fit to the upgrade strategy and database archiving strategy used.

Shadow Instance Parameters

There are several parameters used for running the shadow instance. Most of these parameters are set automatically, for example, an instance number not yet used in your system landscape.

SGEN Execution Mode

With transaction SGEN, you can generate ABAP loads in your SAP system. Depending on the preconfiguration mode, you can choose an execution strategy for the ABAP load generation: The system starts SGEN either during the uptime only, or during the uptime and after the downtime.

Memory-Optimized Activation

On 32 bit systems, the activation of ABAP Dictionary objects runs in a memory-optimized mode regardless of the chosen preconfiguration mode. Compared to the activation on 64 bit systems, the activation consumes less memory, but the runtime lasts longer.

In the following, you can find a description of the parameters and their influence on the runtime of the update:

- [Database Archiving Parameter \[page 60\]](#)
- [Process and Tool Parameters \[page 60\]](#)
- [Shadow Instance Parameters \[page 62\]](#)
- [SGEN Execution Modes \[page 63\]](#)

3.3.1 Database Archiving Parameter

Two options are available: Either the archiving mode is on during the update, or archiving is deactivated at the beginning of the downtime.

At the beginning of the downtime, you are prompted to deactivate archiving. You are prompted again at the end of the downtime to activate archiving.

3.3.2 Process and Tool Parameters

You must set the parameters associated with the different processes and tools to optimize the update process.

Configuration of Parallel Processes

Several processes have parameter values for uptime and downtime:

- *Downtime*: The downtime values are active during the SUM technical downtime.
- *Uptime*: The uptime values are active during the roadmap steps *Checks* and *Preprocessing*.

Note that high values for processes during productive time can have an impact on productive operations.

You can also change the values in the [SUM Utilities \(Extended UI\) \[page 39\]](#). To do this, choose ► *SUM Parameter* ► *SUM Process Parameters* ▾.

Processes

Comments

ABAP Processes

Number of parallel background processes and activator processes, and the number of batch processes scheduled on the application server.

The specifications affect the `JOB` and `RUN` phases that use parallelization, as well as the `DBCLONE`, `ACT_UPG`, `PARDIST*`, and `xPRA` runtime phases.

We recommend a value that is high enough to enable parallel processing, but small enough so that the production system is not affected.

Note

- For ABAP processes running in the original system, the number of processes available in the original system limits the number of parallel jobs.
- For technical reasons, a maximum of 10 parallel processes are possible in the phase `DBCLONE`.

SQL Processes

Number of parallel SQL processes used by

- `tp` to carry out database statements in the `PARMVNT*` and `PARCONV*` phases.
- `SCEXEC`, `SQLRUNTASK`, and `SQLSELEXE` phases

Note

Dynamic change of SQL processes in `SQLRUNTASK` phases

In some cases, it can be necessary to change the number of SQL processes during the `SQLRUNTASK` phases, such as to reduce them. You can do this in the [SUM Utilities \(Extended UI\) \[page 39\]](#). Choose

► [SUM Parameters](#) ► [SUM Process Parameters](#) ►

[SQL Processes](#) ►. The change should be directly reflected in the number of running processes.

R3trans Processes

Number of parallel import processes used by `tp` and `R3trans` to import data into the database. This occurs mainly in the phases `DDIC_UPG`, `TABIM_SHADOW*`, and `TABIM*`.

Note that these processes can cause a significant load on the database..

Processes	Comments
<i>R3load Processes</i>	<p>Number of R3load processes used for the EU_IMPORT and EU_CLONE phases.</p> <div style="border: 1px solid #ccc; background-color: #f9f9f9; padding: 10px; margin-top: 10px;"> <p>Note</p> <p>For migration phases in which both the export and the import are carried out, half of the processes are used on both sides.</p> </div>
<i>Table Split Processes</i>	<p>Maximum number of parallel processes to be used when splitting multiple tables at the same time.</p>
<i>Count Processes</i>	<p>Relevant for scenarios with Database Migration Option (DMO):</p> <p>Maximum number of parallel processes for the table count verification.</p>
<i>Table Comparison Processes</i>	<p>Relevant for scenarios with Database Migration Option (DMO):</p> <p>Maximum number of parallel processes for the table comparison.</p>

Batch Host Configuration

This is relevant for the hHost name of the background server. Usually, a background service is available on the application server instance. You can check it with transaction SM51.

In larger systems, however, the background service can be located in a different place to improve load distribution. In this case, enter the host name and the name of the relevant application server.

In addition, make sure that the update directory is mounted on the background service host and that the background server can process background jobs of class C.

The server you select must be available for background operations round the clock. Check the active operation modes with transaction SM63 to see if this requirement is met.

3.3.3 Shadow Instance Parameters

When the Software Update Manager installs the shadow instance locally, an unused instance number is selected automatically. Furthermore, a random password is generated.

If you want to enter a specific instance number and a password manually, choose the option *Switch expert mode on* in the initial dialogs. Make sure that you enter an instance number that is not used in your system landscape.

For more information about choosing the instance number for the shadow instance, see SAP Note [29972](#).

3.3.4 SGEN Execution Modes

If you selected the *Standard* or *Downtime-optimized* scenario strategy, you need to choose an execution strategy for the ABAP load generation (transaction SGEN).

You can select one of the following SGEN execution modes:

- *Do not start ABAP load generation during the upgrade*
If you plan to apply a high number of relevant changes to your system after the update in the form of a transport or a Support Package, we recommend that you generate the ABAP loads manually after the update.
For more information about starting the load generation manually, see [Generating Loads \[page 225\]](#).
- *Generate ABAP loads on shadow system during uptime*
With this option, the Software Update Manager uses the maximum number of processes entered below to generate the loads in the shadow system during the uptime.
- *Start asynchronously in post downtime*
If you select this option, transaction SGEN automatically starts after the downtime during the `Postprocessing` roadmap step to regenerate the ABAP loads that were invalidated during the downtime.
- *Generate ABAP loads on shadow system during uptime and start asynchronously in post downtime.*
With this option, the Software Update Manager uses the maximum number of processes entered below to generate the ABAP loads in the shadow system during the uptime. The transaction SGEN automatically starts again after the downtime during the *Postprocessing* roadmap step to regenerate the ABAP loads that were invalidated during the downtime.

⚠ Caution

The additional database space needed to generate ABAP loads is not added automatically to the space requirements reported in the *Checks* roadmap step. In addition, you will need approximately the size of REPOSRC~.

📘 Note

Usually, the shadow SGEN prolongs the uptime part of the update procedure or several hours. If you run into unexpected time issues with your update schedule and you want to save the SGEN time, you can abort a running shadow SGEN by executing the report RSUPG_SGEN_ABORT_SHADOW in the shadow system. Use the DDIC user for the logon. Note that as soon as the SUM run is completed, you have to perform a manual SGEN run to generate the missing loads.

3.4 Compatible Front-End Software

Ensure that the SAP GUI version or any other front-end software that you are using supports the target release of the SAP ABAP system.

📘 Note

This section is only relevant if you perform a release upgrade.

To interact directly with the SAP ABAP system, a compatible front-end software from the SAP GUI family is required. SAP GUI is the universal SAP client for accessing SAP functions in SAP applications and handles screen display and user interaction. Make sure that you use a current SAP GUI version that allows you to interact with the updated application server.

However, if you need or want to use a different front-end software for the target release of the ABAP system, you can import it. If the front-end software that you already use on the source system is not compatible with or supported by the target system, you must update the front-end software. This is possible before or during the update, but at the latest before logging on to the target release or the shadow system.

For more information on the maintenance strategy for SAP GUI for Windows and SAP GUI for Java, see SAP Note [147519](#).

For more information on hardware and software requirements of SAP GUI, see SAP Note [26417](#).

3.5 Database-Specific Aspects

In the following, the most important database-specific aspects are described that might have an impact on your overall planning.

Database Archiving and Backup

If you chose to deactivate the archiving option at the beginning of roadmap step *Execution*, the Software Update Manager switches the database log mode to `OVERWRITE`. However, you must first confirm that a complete backup (data and configuration files) has been created successfully.

After the mode has been switched, the contents of the log are lost permanently. You are then able to recover the database to the state it has at this point in time.

→ Recommendation

After you have isolated the application server instance, you are prompted to perform a complete backup.

Perform a complete backup after the update. How you back up the database depends on whether archiving was switched on or off.

For further information, see in the section *A.4 Administration* of the *SUM Guide* the chapter *Changing the SAP HANA DB Database Recovery Mode*.

ⓘ Note

Note that a dialog with the option to change the log mode is only available during a normal update procedure, but not during an update procedure with *Database Migration Option*.

Partitioning

Before the conversion, the partitioning for existing tables is kept as it is. New tables (such as table `ACDOCA`) are created during the uptime of the conversion procedure.

You can use the SAP HANA database utilities to partition these new tables. The Software Update Manager stops for it in a dialog during the downtime, that is, when the *Preprocessing* roadmap step is finished and before you choose *Next* to proceed the procedure.

For details on how to change the partitioning on HANA directly, see the *SAP HANA Administration Guide* for your SAP HANA platform (core) on the SAP Help Portal at: http://help.sap.com/hana_platform, ► *System Administration* ► *SAP HANA Administration Guide* ► *Partitioning Operations* ►.

3.6 Planning the Data Management

This section deals with the management of large database tables using methods such as data archiving.

Context

The upgrade runtime – and in particular the system downtime – is extended when dealing with large database tables. Table conversions during the upgrade and data adjustments at the end of the upgrade are the most time consuming actions and can result in long upgrade runtimes. To avoid these problems, you should minimize the quantity of table entries that have to be converted prior to the upgrade. The best way to achieve this is to carry out data management measures such as archiving or deleting data records from the tables.

As part of an overall Information Lifecycle Management (ILM) process, data management is vital for maintaining a “healthy” live system because it helps to keep system performance high and to make optimal use of existing hardware resources. One of the most effective data management methods is data archiving. It allows administrators to remove data that is no longer needed in everyday operations from the database and store it in archive files. These files can then be passed on to a storage system for long-term storage. After archiving, the data can still be accessed in read-only mode when the need arises, for example, during an audit.

For more information about data archiving, see the blog <https://blogs.sap.com/2014/04/02/sap-netweaver-information-lifecycle-management/>.

⚠ Caution

- **Archiving jobs**

Active archiving jobs managed in transaction SARA can significantly increase runtime and resource demands during an upgrade. We strongly recommend that you do not start any new archiving jobs while the Software Update Manager is running. Also, complete all running archiving jobs before the `Preprocessing` roadmap step begins.

- **Data aging jobs**

Data aging jobs can significantly increase runtime and resource demands during an upgrade. Therefore, as of start release SAP NetWeaver 7.4 SP08, starting new data aging jobs is blocked during the `Preprocessing` roadmap step of the upgrade procedure. If data aging jobs are still active, the Software Update Manager stops at a later phase (depending on your configuration settings). You can continue with the upgrade procedure once all data aging jobs are finished or canceled.

The start of new data aging jobs is only possible after the upgrade is reset or finished (in phase `POST_CLEAN`). You need to apply SAP Note [2276105](#) via SAP Note Assistant as a preparation step. The Software Update Manager will stop if this SAP Note is not implemented.

Procedure

1. Before the upgrade, analyze the database to find out which database tables can be reduced in size, and how this can be achieved.
2. If you use the CRM Marketing Segment Builder, you can reduce downtime by deleting target groups in your system. Two secondary indexes of database table CRMD_MKTTG_TG_I are deleted during the upgrade and one existing secondary index is enhanced by additional fields. The Software Update Manager deletes this index and re-creates it during downtime. The time needed to re-create the index depends on the number of records in table CRMD_MKTTG_TG_I. As a guide value, for 10 million records, the recreation needs 200 seconds on an average performance hardware.
3. Check the number of records in your CRMD_MKTTG_TG_I table and calculate the additional downtime. To reduce downtime, delete target groups in your system to remove entries from this table before you start the upgrade.

3.7 Data Transition Validation

The data transition validation is a tool that allows you to compare business data as part of a system conversion from SAP ECC to SAP S/4HANA.

The tool supports the validation of conversion scenarios with pre-delivered content for business validation. It uses business reports or transactions as instruments of comparison and is available as part of the standard license.

The following functionalities are offered:

- Definition of the test specification for validation
- Extraction of the results of test execution in the source and target release
- Comparison of the source and target release data and display of the comparison results

For more information on the data transition validation, see the following sources:

- SAP Note [3117879](#)
- SAP Help Portal: https://help.sap.com/docs/SAP_NETWEAVER, then navigate to **ABAP Platform 2023 (basis of SAP S/4HANA and SAP S/4HANA Foundation)** > **Adminstrating the ABAP Platform** > **Solution Life Cycle Management** > **Software Logistics** > **Data Transition Validation**
- SAP Help Portal: https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE, then navigate to **tab "Implement"** > **Conversion Guide**. See in the guide the chapter **3.8 Data Transition Validation**.
- SAP Community blogs: [An Introduction to the Data Transition Validation Tool](#)
- SAP Community blogs: [Business data validation using DTV tool](#)

3.8 Silent Data Migration

This section deals with the *Silent Data Migration Infrastructure (SDMI)*, which is a framework that enables automatic application data migration during system uptime.

The migration of application data during the system conversion usually takes place during downtime. In contrast, the *Silent Data Migration Infrastructure (SDMI)* enables conversions without downtime because it is then performed during business operations.

When the SDMIs are executed during uptime, the SDMI job starts from the job repository and calls the SDMIs in each client individually as soon as the system leaves the maintenance mode. You can call transaction `SDM_MON` to display all relevant SDMIs.

In each client is a user required that can be maintained in transaction `SDM_USER`. You can also create users during the SUM procedure when a SUM dialog box asks you if you want to create technical users for SDMIs. If you choose *No* here, SUM does not create the technical users in the clients in which they are missing.

During the *Postprocessing* roadmap step, SUM checks if technical users exist. If they do not exist, this is written to the corresponding log file. SDMIs cannot be started and data cannot be migrated without technical users. In addition, SDMI data migrations must be completed successfully in all clients before you can start the next system conversion.

Note

- It is also possible to create the technical users after the SUM run. For more information, see https://help.sap.com/s4hana_op, choose *Use* and navigate to **Product Assistance** > *English* > *Enterprise Technology* > *ABAP Platform* > *Administating the ABAP Platform* > *Administration Concepts and Tools* > *Solution Life Cycle Management* > *Silent Data Migration Infrastructure*.
- As of target release SAP S/4HANA 2021, the Software Update Manager offers the option to force the SDMIs during downtime. In that case, the SDMIs are finished by the time the system resumes business operations. For more information, see [Decision About Silent Data Migration \(Phase SUMASK_SDMI_DECISION\)](#) [page 150].

For more information about *Silent Data Migration Infrastructure*, see the following:

- the SAP Help Portal pages on SDMI. Follow the path that is described previously in the *Note* box.
- SAP Note [2850918](#): *Authorizations required for Silent Data Migration (SDMI) in SAP S/4HANA Release*
- SAP Note [2664638](#): *Create and assign SDMI User in a client*
- SAP Note [2907976](#): *Silent Data Migration (SDMI) - FAQ*
- SAP Note [2916801](#): *Silent Data Migration (SDMI) Configuration Options*
- <https://blogs.sap.com/2019/10/03/s4hana-silent-data-migration-infrastructure-quick-guide/>

3.9 Customizing of Environment Profiles

This section deals with the environment profiles of user `<sid>adm`.

If necessary, you can customize and prepare the environment profiles of user `<sid>adm` for the target system already during uptime. As a result, you do not need to perform this customizing after the update procedure.

The environment profiles are stored in the following environment files:

```
.cshrc
.profile
.dbenv.csh
.dbenv.sh
.sapenv.csh
.sapenv.sh
```

The Software Update Manager handles these environment files during the following three phases:

1. `ENVFILES_CHECK`
This phase runs in roadmap step `Checks`.
The Software Update Manager checks internally what has to be done.
2. `ENVFILES_PREP`
This phase runs in roadmap step `Preprocessing`.
The file templates of the environment files are copied to subdirectory `<SUM directory>/abap/sapnames/envfiles`. The Software Update Manager replaces generic placeholders in the files with corresponding values. For better distinction with the template file names, the files are saved with file names in uppercase letters and without leading period as follows:

<code>.cshrc</code>	→ <code>CSHRC</code>
<code>.profile</code>	→ <code>PROFILE</code>
<code>.dbenv.csh</code>	→ <code>DBENV.CSH</code>
<code>.dbenv.sh</code>	→ <code>DBENV.SH</code>
<code>.sapenv.csh</code>	→ <code>SAPENV.CSH</code>
<code>.sapenv.sh</code>	→ <code>SAPENV.SH</code>

An entry in the log file `checks.log` informs you that the user environment has been prepared. You have now the option to adjust the environment files to the environment profiles of target system user `<sid>adm`. You can make the changes up to the start of phase `ENVFILES_COPY`, in which the environment files are then copied to the home directory of user `<sid>adm` on your target system.

See also [Important Entries for the Preprocessing Roadmap Step \[page 167\]](#) → *Environment Profiles Customizing (Phase ENVFILES_PREP)*.

⚠ Caution

Do not copy back the environment files to the source directory of the templates.

3. `ENVFILES_COPY`
This phase runs in the `Execution` roadmap step.

The environment files are copied to the home directory of the <sid>adm user on the target system. Here, they are saved again with their original file names as follows:

CSHRC	→ .cshrc
PROFILE	→ .profile
DBENV.CSH	→ .dbenv.csh
DBENV.SH	→ .dbenv.sh
SAPENV.CSH	→ .sapenv.csh
SAPENV.SH	→ .sapenv.sh

📘 Note

Before the environment files are copied to the home directory, the Software Update Manager creates backup files in the directory <SUM directory>/abap/sapnames using the following file name pattern: ENVBACKUP<original file name>. (Example: ENVBACKUP.dbenv.csh)

Any changes you made to the files after the ENVFILES_PREP phase and before the ENVFILES_COPY phase are then applied to the target system.

See also [Important Entries for the Execution Roadmap Step \[page 181\]](#) → *Profile of User <SID>adm (Phase ENVFILES_COPY)*.

3.10 Modification and Enhancement Adjustment Planning

This section deals with modifications, which are changes to objects of the SAP standard.

There are two types of modifications: changes to the translation of an object text, and changes to the object itself.

In addition, the *Enhancement Framework* allows enhancements, such as source code plug-ins, implementations of the new kernel-based BAdI, and class enhancements. We recommend using the *Enhancement Framework* to enhance or adapt SAP development objects.

📘 Note

If you are sure that your SAP system corresponds exactly to the standard SAP system, you can skip this section.

Changes to the Translation of an Object Text

The changes are made in the translation environment (transaction SE63) or in the ABAP Workbench. An SSCR key is not required.

⚠ Caution

Changes to translations of SAP objects are not retained when you update your system. They are overwritten by a new version or deleted. For more information about retaining these changes, see SAP Note [485741](#).

Modifications and Enhancements of SAP Objects

You possibly need an SSCR key to perform the modification adjustment. Get the key **before** you start the update. For more information, see SAP Support Portal at <https://support.sap.com/sscr>.

All modified standard SAP objects are displayed for adjustment in transaction SPDD or SPAU. Objects that SAP no longer delivers are deleted. If you want to keep these objects, you have to accept the modifications in transaction SPDD or SPAU.

All enhancements that you have to adjust are shown in transaction SPAU_ENH. In contrast to modifications of source code units, you only have to adjust enhancements if the underlying SAP development objects were deleted or changed in an incompatible way.

Make sure that you perform the adjustments in transaction SPAU_ENH after the adjustments in transaction SPDD or SPAU and not the other way around.

⚠ Caution

Make sure that **before** the update there is at least one package in the customer namespace (Z*). You need this package if you have to create objects during the modification adjustment, for example, for an append structure for customer fields of an SAP table.

You cannot create packages during the update.

⚠ Caution

Potential ABAP Dictionary objects and data loss because of passive deletion of objects

Be aware of the following issue: You want to perform a system upgrade or a conversion to a product based on SAP NetWeaver 7.50 or higher, and you have created new SAP objects (for example a structure or data element) as part of a manual correction instruction of an SAP Note, either manually or by executing a report attached to an SAP Note. However, the target support package of the upgrade does not include these corrections.

The reason is that the Software Update Manager does not rescue the objects during the SUM run because they are registered in the system as modified SAP objects. Therefore, they do not exist in the target release anymore, but are deleted passively. The objects will show up as deleted objects in SPDD or SPAU. If ABAP Dictionary objects are not manually re-created during SPDD, data loss can occur. For example, this can happen if a structure is used as a table append. You possibly encounter such a situation, for example, if you have implemented larger legal changes, such as Goods and Services Tax in India.

As a solution, see SAP Note [2513585](#) for more information and for information about preventing the potential object loss, especially if you were requested to execute a report to create ABAP Dictionary objects. Contact SAP Support for assistance in identifying the objects to be saved.

Modification Adjustment in the First System (Development System)

Note

Since all modifications to standard SAP objects are displayed during the update and you have to adjust all the displayed objects, you have to schedule enough time for the modification adjustment.

This also applies to enhancements of the new Enhancement Framework that you have to adjust. However, you only have to adjust the enhancements if the underlying development objects were deleted or changed in an incompatible way.

You have to test the modification and enhancement adjustment in a development system that has the same SAP system release and that has been modified in the same way as the production system. If the development system contains more modifications or enhancements, or has a different Support Package level, contact an experienced SAP consultant for help. The following explanation assumes that the levels of modification are identical.

1. The list of objects that has to be adjusted in your SAP system is determined in the `ADJUSTCHK` phase. This phase is executed in the *Configuration* roadmap step and runs between the import of the substitution set and the end of the production period.
The list is part of the log file `UMODPROT.<SID>` that is located in the subdirectory `<SUM directory>/abap/log`.
2. The ABAP Dictionary objects (tables, data elements, domains, and so on) are adjusted during production operation. However, if you choose scenario strategy *Single System*, they are adjusted during downtime before the ABAP Dictionary is activated on the original system.
The adjusted objects are collected in a repair that is released to a transport request. You have to release the tasks of the SPDD transport request. Do not release this transport request. Instead, flag it using the menu option **► Modification Adjustment ► Assign Transport ►**.

Note

Only adjust the objects. However, do not activate them using transaction SE11 (ABAP Dictionary Maintenance).

3. Modified or enhanced repository objects (reports, screens, and so on) are adjusted towards the end of the update. At this stage, the import of SAP objects has already been completed. However, the old modified version is still available in the version database. As with ABAP Dictionary objects, all changes are released to a transport request that is flagged and then exported and registered by the Software Update Manager. If you need to adjust enhancements, release these adjustments to the flagged transport request that already contains the adjusted modified objects. Adjust all modifications before you adjust the enhancements.
Towards the end of the update, the Software Update Manager exports the request to the transport directory `/usr/sap/trans` and registers it for transport in the `umodauto.lst` file.

Note

Make sure that the user `<SID>adm` has write permissions for the file `<DIR_TRANS>/bin/umodauto.lst`.

Modification Adjustment in Subsequent Systems

For the quality assurance and production system, we recommend that instead of adjusting modifications and enhancements manually, you automatically transfer the transport requests exported from the first system: one for the ABAP Dictionary objects adjusted using transaction SPDD and one for the Repository objects adjusted using transactions SPAU and SPAU_ENH.

⚠ Caution

Make sure that the Support Package levels included in the update of the subsequent systems are similar to the Support Package levels included in the update of the first system.

The `ADJUSTPRP` phase in the *Configuration* roadmap step prepares the requests that you entered in phase `SUMASK_SPDD_SPAU` from the development system to be transferred. The phase checks whether all the modifications identified in the system are handled by transport requests. If this is the case, you do not need to perform a modification adjustment.

⚠ Caution

The number of objects in the adjustment transport requests can exceed the number of modifications in the receiving system. In this case, the Software Update Manager imports changes that previously did not exist in the receiving system.

For a detailed description of the modification adjustment function, see the SAP Help Portal for your target SAP NetWeaver release at <http://help.sap.com> and see ► *Application Help* ► *SAP NetWeaver Library: Function-Oriented View* ► *Application Server* ► *Application Server ABAP* ► *Application Development on AS ABAP* ► *Customer-Specific ABAP Development* ► *Changing the SAP Standard (BC)* ► *Modifying the Standard* ► *Modification Assistant* ► *Upgrade Procedure / Support Packages (link at the bottom of Modification Assistant page)* ►.

3.11 Import of Additional Languages

→ Recommendation

Importing new languages during an upgrade is a highly efficient process and is preferable to importing a language into a production system after an upgrade.

To import additional languages, you can choose between the following options:

- You import additional languages during the upgrade.
We recommend that you choose this option since importing new languages during an upgrade is a highly efficient process and is preferable to importing a language into a production system after an upgrade. In this way, you can avoid any sequencing problems arising from Support Packages included in the upgrade, or Support Packages you need to import after the upgrade.
- You import additional languages after the upgrade.
We recommend that you only use this option if the system contains the Support Packages for the language archives you are using. This is the case if you did not include any additional Support Packages in the

upgrade, or did not import any additional Support Packages after the upgrade. For more information, see the *Language Transport* documentation, or SAP Note [352941](#).

The upgrade procedure itself only offers to update existing languages. You cannot install any new languages during the upgrade. However, you do have the option of classifying new languages in the SAP system before the upgrade with transaction SMLT, and importing them during the upgrade. For more information about this procedure, see SAP Note [322982](#).

3.12 Handling Customer-Specific Translations and Languages

Using the translation environment in the SAP system, you can translate missing texts of SAP objects or translate existing texts, for example, to customize them with your own terminology. For the latter, define your own language in the SAP system.

Context

The Repository scanner scans during the upgrade the SAP system objects that you have changed. For these objects, the Software Update Manager provides a conflict resolution mechanism: Objects for which the SAP standard has not changed for the new release are taken on by the upgrade. Objects that collide with the new SAP standard are offered for modification adjustment.

Changes to language-dependent texts – that means translations of SAP system texts – are not considered as modifications to the SAP system and are not covered by any conflict resolution mechanism either. Therefore, these translations do not appear in the modification adjustment and are not saved during the upgrade of the SAP system. They have to be transported separately when an upgrade is performed.

Note

More Information

- For detailed information about the handling of customer translations during the update, see SAP Note [485741](#).
- For more information about using transactions SMLT_EX, SMLT, customer translations and languages, see the language transport documentation in the [SAP Help Portal](#) for your target SAP NetWeaver release. Navigate to ► [Application Help](#) ► [SAP NetWeaver Library: Function-Oriented View](#) ► [Solution Life Cycle Management](#) ► [Software Logistics](#) ► [Change and Transport System](#) ► [Language Transport](#) ►.

Caution

If you decide to save your translations, note the following:

- In addition to your translations, the transport request also contains language-independent parts. Importing these language-independent parts into the target system using the standard import tool

tp or TMS can harm your system considerably! Make sure that you only import them with report RSTLAN_IMPORT_SINGLE.

- If SAP has changed the texts for which you have created translations in the target system, the upload of your translation into the target system overwrites the changes made by SAP.

To preserve your translations, proceed as follows.

Procedure

1. Create a transport request or language package using transaction SMLT_EX to gather your translations on the source system.
2. Download the transport request or language package from the source system before the upgrade.
3. After the upgrade, upload the transport request or language package to the target system using transaction SMLT.

3.13 Removing or Excluding Languages

This topic deals with the exclusion of customer-specific languages or with the removal of languages from the System.

Context

Excluding Customer-Specific Languages

To avoid that the update procedure aborts, exclude the following languages from the update:

- Custom languages
- Languages provided by SAP that are not supported anymore for the target release

📌 Note

Besides the following procedure to remove languages, you can also exclude a custom language using an entry `languages_without_update =` in the file `SAPup_add.par`. This file is located in the subdirectory `bin` of the SUM directory. If this file does not exist yet, create it manually.

Example: If you want to exclude French and Spanish, add the following entry:

```
languages_without_update = FR; ES
```

⚠️ Caution

The removal or modification of customer-specific languages in the tables T002C and T1SY7 is executed immediately. A later reset of the update procedure does not restore the entries. See also [Resetting the Update \[page 127\]](#).

Removing Languages From the System

If you want to remove languages that have already been installed, that is, if you want to clean up the system, proceed as follows:

Procedure

1. Log on into your SAP system.
2. Call the data browser using transaction SE16 and open table T002.
3. Check the table for languages that are to be removed. Note that in the column LAISO (= *2-character SAP language code*), user-defined languages begin with a "Z".
4. Make a note of the corresponding language keys in the column SPRAS (= *Language Key*), such as "Z".
5. Open table T002C and check the column SPRAS for the language keys that you noted.
6. Check whether the affected languages are marked with an "X" in the column LAINST (= *Language can be installed*). If so, remove the "X".
7. Check whether the affected languages are also listed in table TLSY7. If so, remove their entries.

3.14 Component Levels Contained in the Upgrade Export

The transport requests that are imported during the upgrade from the *Upgrade Export* archives contain data for the main SAP system components and for add-on components that are included in the standard SAP delivery of SAP NetWeaver or your SAP solution. For Support Releases, the component levels in the archives are usually quite high.

In the IS_SELECT phase of the *Configuration* roadmap step, the Software Update Manager only prompts you for add-ons contained in the archive for which we may deliver another update. Add-ons from the standard delivery for which we will not ship updates until the next release are not offered on the screen. You do not have to make a decision about them as they are updated automatically.

In the BIND_PATCH phase of the *Configuration* roadmap step, the Software Update Manager asks you to include Support Packages in the upgrade. If the *Upgrade Export* archives already contains a Support Package level higher than 0, only include Support Packages above this level.

For information about the component levels of the *Upgrade Export* DVD and the minimum Support Package levels, see the SAP Note for SAP NetWeaver / your application:

SAP Notes with Component and Support Package Level Information

SAP NetWeaver / Application	SAP Note Number
SAP CRM	774615
SAP ERP	774615
SAP NetWeaver	789220

SAP NetWeaver / Application	SAP Note Number
SAP SCM	850038
SAP Solution Manager	781448
SAP SRM	819722

⚠ Caution

If, for some reason, you have to apply Support Packages shortly before the upgrade, make sure that at least the equivalent Support Package for the target release is included.

3.15 Integration of Customer Transports

This section deals with the integration of customer transports into the update procedure to reduce business downtime.

📌 Note

- The target release must be SAP NetWeaver 7.0 Enhancement Package 2 with SAP_BASIS support package 09 or a higher
- Note that the total technical downtime of the update procedure might become longer
- For more information about prerequisites and restrictions, see SAP Note [1759080](#).

After the update procedure and before you start the production system, that is, during the business downtime, you import your own transport requests, for example with new customizing or new developments for the target release. To reduce the business downtime, the Software Update Manager is equipped with the feature `Customer Transport Integration with SUM` that integrates your transport requests into the update procedure. Moreover, it enables the import of multiclient customer transport requests and - in connection with the near-Zero Downtime Maintenance (nZDM) technology - the conversions of custom tables during the uptime.

Basic Concept

The Software Update Manager processes during the update a customer transport buffer file from the `Change and Transport System (CTS)`. This file is a list of customer transport objects for the import into the target system during the update. It contains the following information:

- Transports in the correct order
- One target client per transport route
- Transport deliveries already calculated by the CTS or the `Change Request Management`

Do not include SAP objects in the customer transport buffer file that were exported in a release or support package lower than the target release or target support package used.

The customer transports are imported logically after the SAP packages (upgrade packages, enhancement packages, and support packages). For example, if the target release of the SAP enhancement package installation is SAP ERP 6.0 Enhancement Package 6 with Support Package Stack level 2, all customer transports to be included must be valid for this target release, too.

The results of the import are synchronized back from the Software Update Manager to the `Transport Management System` (TMS) during the *Postprocessing* roadmap step. Afterwards, the transaction `STMS` can be used to analyze the results of the import.

If you use the `Change Request Management` of SAP Solution Manager, you can also integrate transports that were created by the `Change Request Management`.

Note

It is also possible to process customer transport objects independently of a standard update procedure. A stack configuration file (`stack.xml`) is not necessary in this case.

Note that customer transport objects are processed according to certain predefined criteria, so that some objects are imported and integrated into the shadow operations and therefore processed in the uptime. Examples for those objects are ABAP Dictionary objects such as tables, view types, or search help, or ABAP objects such as classes, programs, or screens. Objects, which are not processed during uptime, are integrated with SUM downtime operations. Examples for these objects are roles, authorization objects, forms, or customizing.

Included Features and Products

The Customer Transport Integration feature of SUM includes the following features and products:

- **Modification handling**
Multiple SPDD and SPAU requests can be included in the customer buffer file together with customer transports. The dialogs to include SPDD or SPAU transport requests and single transport requests, which are normally displayed during the *Preprocessing* roadmap step, are not necessary and therefore not displayed. SPDD/SPAU-related transports in the customer buffer file are identified automatically during the update procedure.
The correct order of the SPDD and SPAU transport requests in the customer buffer is preserved by the update procedure and already adjusted objects are automatically recognized in the transactions SPDD and SPAU.
- **Multiple clients**
Client-specific transport routing is used by default. Therefore, transport requests for multiple target clients are supported. The customer buffer file can contain multiple lines per transport with one target client per transport route (`CTC=1` format).
- **Transport Management System (TMS)**
Information about customer transports managed in SUM is transferred to the TMS. The transport logs can be viewed in TMS.
- **Change Request Management**

The Change Request Management is a Solution Manager scenario that provides tracking and documentation of change requests and transports. Changes created in the Change Request Management can also be integrated in the update procedure.

More Information

The preparation and the use of the Software Update Manager with integrated customer transports is described in [Integrating Customer Transports into the Update Procedure \[page 134\]](#).

3.16 ASCS Instance Move

The Software Update Manager offers the option of an ASCS instance move.

This feature enables an update procedure even if the ASCS instance is running on an unsupported operating system. For more information about the reduction of supported operating systems, see SAP Note [2620910](#).

If the Software Update Manager detects an existing ASCS instance on a remote application server host in the *Configuration* roadmap step, it prompts you in a dialog in phase `ASCS_ASK` to choose one of the following options:

- *I want the ASCS Instance Move during the SUM run*
- *I want to keep the current instance setup*

If you select the ASCS instance move, the Software Update Manager moves the existing ASCS instance from the remote application server host to the SUM application host during the update procedure.

Note

- The Software Update Manager automatically assigns the number of the shadow instance to the new ASCS instance. However, if you have switched on the expert mode at the beginning of the update procedure, you can manually enter an instance number for the new ASCS instance.
- Note that you must delete the source ASCS instance manually after an ASCS move.
 1. Stop the `SAP Startservice` and remove the corresponding file from the `DIR_GLOBAL/sapcontrol` directory.
 2. If the old ASCS still appears in the `SAP Management Console` (SAP MMC), remove the outdated entries manually using *Delete*.
- If you perform an ASCS instance move on a high availability (HA) system, contact your HA partner if you have questions regarding the changes of the cluster configuration.
- The Software Update Manager does not offer the usage of the HA Maintenance Mode because the HA configuration is changed. This means that automation is not possible and manual action is required.
- If you use the database migration option (DMO) in addition, and you reset the procedure, you must restart the `SAP Startservice` of the ASCS instance from the remote application server **manually**. For more information, see the chapter *Reset Option* in the *DMO guide* that is mentioned in the [Other Required Documentation \[page 14\]](#).

3.17 Switch to Standalone Enqueue Server 2

As of target release ABAP platform 1809, the Software Update Manager changes the ASCS setting to Standalone Enqueue Server 2 and Enqueue Replicator 2.

With the new standalone enqueue server 2, which is offered as of SAP NetWeaver AS ABAP 7.51, the scalability has been further improved. As of SAP NetWeaver AS ABAP 7.52, the high availability architecture has been simplified and the new enqueue replicator 2 has been introduced, which provides an improved failover process. For more information about these features, see the blog [High Availability with Standalone Enqueue Server 2](#) in the SAP Community .

See also SAP Note [2630416](#) regarding the support for Standalone Enqueue Server 2, and the SAP Help Portal with information about [Switching to the Standalone Enqueue Server 2](#).

During the update procedure, the Software Update Manager:

- Applies the new SAP Kernel.
- Performs the required SAP profile changes.
- Deletes the old `enque/*` parameters except for the mandatory parameter `enque/process_location`.
- Sets the new `ENSA2` parameters accordingly, for example, `enq/enable`.






The automatic transition of old enqueue parameters is not possible during the update procedure. See the documentation in the SAP Help Portal mentioned above for further assistance.

After the update procedure, the production system will be started with the new `ENSA2/ERS2` setup, and you will be asked to change the high availability (HA) settings accordingly.

Note

- During the update procedure, the shadow instance and the downtime instance are configured with the new enqueue parameters.
- The Software Update Manager does not offer the usage of the HA Maintenance Mode because the HA configuration is changed. This means that automation is not possible and manual action is required.
- If you perform an ASCS update on an HA system, contact your HA partner if you have questions regarding the changes of the cluster configuration.
- Please also note the following information for your HA solution:

Company	HA Solution	Documentation		Operating System
		Type	Content	
NEC	NEC EXPRESSCLUS- TER	SAP Note	2635956	Windows, Linux x86_64, Linux on Power LE

Company	HA Solution	Documentation Type	Content	Operating System
Fujitsu	Fujitsu FlexFrame Orchestrator	Guide	See the mandatory FFO release-dependent <i>SAP Installation Guide</i> , chapter <i>ENSA2 New Services</i>	Linux x86_64
Suse Linux GmbH	SUSE Linux Enterprise Server for SAP Applications	SAP Note	2641019 	Linux x86_64, Linux on Power LE
HPE	HPE Serviceguard	Guide	Deployment of ENSA2 clusters with serviceguard is supported starting with Serviceguard 12.30. For technical details, see the latest version of the <i>Managing Serviceguard Extension for SAP for Linux</i> document available on the HPE Support Center at: https://support.hpe.com/hpesc/public/home	Linux x86_64
Red Hat	Red Hat HA solutions for SAP	SAP Note	2641322 	Linux x86_64
IBM	PowerHA	SAP Note	2645915 	AIX
Veritas	Veritas InfoScale Availability for ENSA2/ER2	SAP Note	2727341 	Linux x86_64
SIOS	SIOS Protection Suite for Linux	SAP Note	2854919 	Linux x86_64

3.18 Additional Planning Aspects for DMO

3.18.1 Performing DMO with System Move

You can run an update with database migration including a move of the application server instance from source to target system.

Prerequisites

1. You have prepared the target system landscape. See: [System Move: Preparing Target System Landscape \[page 113\]](#).
2. You have provided the complete download directory for the target system landscape in a separate directory. See: [System Move: Providing Download Directory for the Target System \[page 114\]](#)
3. If necessary, you have aligned the operating systems of the different AS instance hosts. See: [System Move: Switching the Operating System \[page 114\]](#).
4. In a Software Update Manager dialog, you have enabled the system move during the DMO procedure. See: [System Move: Enabling DMO with System Move \[page 115\]](#).

For further the prerequisites and restrictions concerning DMO with System Move, see section *! Important General Information* of the related SAP Note for the DMO that is mentioned in [Required SAP Notes \[page 12\]](#).

⚠ Caution

- During a "DMO with System Move" run, dump files are created in the SUM folder that contain the contents of source database tables in compressed form. Since the entire source database is exported, make sure that there is enough space available.
- Make sure that the release version and the patch level of the SUM tools are identical in both the source and the target system. To avoid different tool versions, we recommend downloading the same SUM version for both systems, ideally at the same time.

Context

The database migration option (DMO) of the Software Update Manager (SUM) offers the move of the application server instance from the source system landscape to a target system landscape during the DMO procedure.

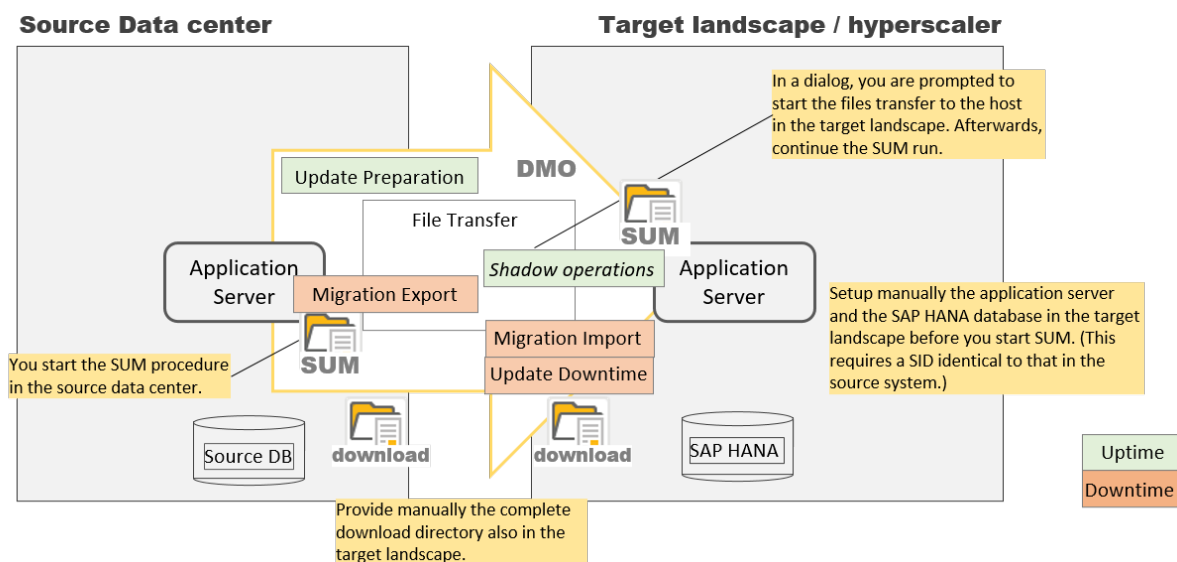
📌 Note

In the following, we use the term *system move* for this option.

The approach of this option is as follows: The SUM starts the system update and database migration procedure on the AS instance of the source system and executes the first part of the procedure, including the export of the database content into files.

Then the files and the SUM directory are transferred to the target system, and the remaining part of the SUM with DMO procedure happens here. See below an overview of the principle and the steps in detail:

Overview: DMO with System Move (parallel mode)



DMO with System Move: Overview

Note

If you want to choose *DMO with System Move* to convert your SAP ERP system to an SAP S/4HANA system on your Microsoft Azure account via SAP Cloud Appliance Library, see for more information the *SAP Cloud Appliance Library* on the *SAP Help Portal*. Open https://help.sap.com/docs/SAP_CLOUD_APPLIANCE_LIBRARY and choose then **Operations** > **Consuming Workloads** > **Working with Systems** > **Converting a System** > **System Conversion using DMO with System Move**.

Procedure

1. You start SUM on the AS instance host with the normal system update and database migration procedure.
2. During the SUM with DMO run, SUM displays a dialog in which you can enable the *system move* option (see also the prerequisites at the beginning of this chapter).
3. In a further dialog later on, you are prompted to transfer the SUM directory content from the source system to the target system.

For more information on the data transfer, see [System Move: Data Transfer \[page 204\]](#).

4. After the data transfer, the SUM with DMO procedure is complete on the source system, and you continue with the procedure on the target system.
5. You finish the system update and database migration procedure on the target system.
6. After the SUM run, carry out the necessary follow-up activities. Pay attention to the follow-up activities that are documented in [System Move: Performing Follow-Up Activities in the Target System \[page 234\]](#).

📘 Note

- If you need to perform a reset during the procedure on the source or target system, consider the explanations in section [Reset Option During System Move \[page 195\]](#).
- In the title bar of the Software Update Manager, you are informed about the applied tool version including support package and patch level, and the current scenario and strategy as well. Regarding the system move, you are in addition informed about the current host, on which the Software Update Manager runs. This can be useful to better distinguish between source and target system.

3.18.2 DMO Move to SAP S/4HANA (on Hyperscaler)

This section covers the approach *DMO move to SAP S/4HANA (on hyperscaler)* (DMOVE2S4) that allows you to convert and transition your SAP on-premise system to SAP S/4HANA (or to SAP S/4HANA foundation based products) on hyperscaler in one step.

Overview

This approach combines the following procedures into one step:

- the technical system conversion of your SAP on-premise system to SAP S/4HANA or to a SAP system based on SAP S/4HANA foundation
- the transition from SAP S/4HANA to a hyperscaler

Because of some adjustments in the Software Update Manager, you can use the standard database migration option (DMO) of SUM for the combination of system conversion and data center move as an alternative to the option *DMO with System Move*. The application-specific preparations such as *Simplification Item-Check* and follow-up activities such as *FIN Data Conversion* are similar to a standard system conversion with the Software Update Manager.

The main differences to DMOVE2S4 are

1. the use of an additional application server instance in the target system where the SUM is started
2. the move of the ABAP SAP Central Services (ASCS) to the target system

The latter move is offered in a dialog during the SUM run.

In addition, you can use downtime-optimized features such as downtime-optimized DMO or downtime-optimized conversion for the move to hyperscaler. Furthermore, you can also scale up the *Application Server VM into Hyperscaler* during the migration.

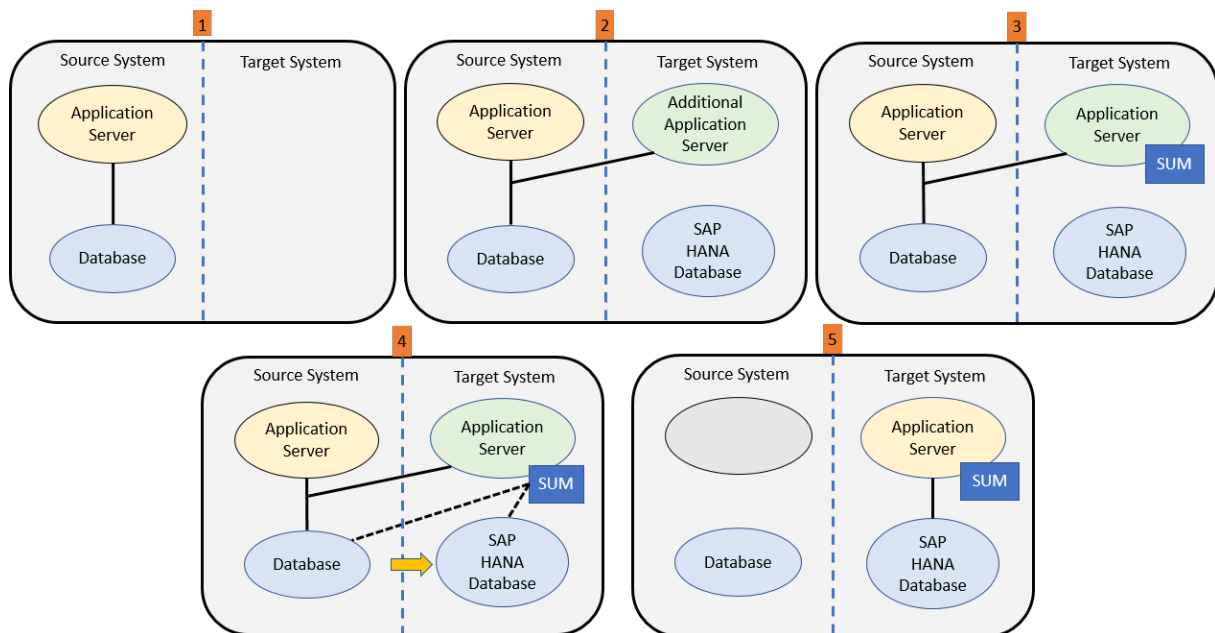
📘 Note

SUM does not use the name of this approach in the dialogs or on the user interface.

Procedure

The main steps of the procedure are as follows:

1. The source system meets the requirements for a standard system conversion. It is to be transferred to SAP S/4HANA and converted in one step.
2. You install in the environment of the target system
 - an SAP HANA database
 - an additional application server instance
 1. that belongs to the source system
 2. is isolated for processes and activities that are not specifically intended for SUM processing. For more information, see [DMOVE2S4: Isolating the Additional Application Server \[page 115\]](#).
3. On the target system, you start the Software Update Manager on the new application server instance.
4. During its run, SUM starts the R3load pairs in pipe mode and prompts you in a dialog to move the ASCS to the target system. You confirm the move.
5. SUM moves the ASCS to the new application server on the target system.



Restrictions and Preparation

Note the following restrictions and preparatory activities for the procedure:

- We highly recommend a latency lower than 20 ms, and a bandwidth higher than 400 Mbps. The Software Update Manager performs a latency check for
 - a system conversion to SAP S/4HANA with database migration
 - an extended prerequisite check with a target database

It writes the result to the `dbstat.log` file. If the latency is too high, a warning is additionally written to the `checks.log` file.

Use network tools such as *iPerf* or *niping* to check that the network connection is sufficient.

The benchmark migration tool for DMO can also be used to test the transfer rate and network quality from the source database to the additional application server host in the hyperscaler. The benchmarking mode *Benchmark export (discarding data)* is sufficient for this test. For more information, see [Benchmarking the Migration: Export Mode \[page 209\]](#).

- Perform and evaluate an extended prerequisite check to determine the best approach and tools to migrate to your hyperscaler.

.For more information, see the SAP Note for DMO that is mentioned in [Required SAP Notes \[page 12\]](#). Navigate in the SAP Note to section *l) Important General Information g) DMO move to SAP S/4HANA (on hyperscaler) Requirements and Restrictions*.

Follow-up Activities

- Move the directories `sapmnt` and `trans` to the hyperscaler.
- Check the connections to other systems, such as:
 - RFC connections
 - connections to mass printers
 - connections to secondary databases
- Perform the necessary follow-up activities that are described in the *SUM/Conversion Guide*. The guide is mentioned in [Follow-Up Activities \[page 216\]](#).
- Set up backup and recovery procedures and monitoring.

Further Information

For more information, see the following documents:

- "DMO to Azure": [combine SAP S/4HANA conversion with the move to Azure \(without "DMO with System Move"\)](#)
- [Converting from SAP ERP on Premise to SAP S/4HANA on Microsoft Azure](#)
- *Converting Systems* in the *SAP Cloud Appliance Library* on the *SAP Help Portal*. Open https://help.sap.com/docs/SAP_CLOUD_APPLIANCE_LIBRARY and choose then **Operations** > *Consuming Workloads* > *Working with Systems* > *Converting a System* > *System Conversion using DMO to Azure (DMOVE2S4)*.

3.18.3 Performance Optimization with Migration Duration File

You can provide the Software Update Manager with the information about table migration durations from a previous SUM with DMO run. SUM uses this data to optimize the performance of subsequent DMO runs.

Although SUM does consider the table sizes for the migration sequence, other factors can influence the migration duration. In other words, consider more criteria than just the table size for the duration of a table migration. The real durations are the best criteria, but they are only known after the migration of the tables.

During a migration, SUM creates a text file with the extension XML that contain the information about the migration duration for each migrated table. The file is called `migrate<*>dur.xml`, and is created in subdirectory `>> <SUM directory> > abap > doc > analysis`. It can be used for the next DMO run to improve the table splitting. For this purpose, put the file into the download directory so that SUM can consider it during the next run.

The Software Update Manager scans the download directory in the `SCANDIR_EXE` phase for existing files. The files found are listed in the log file `checks.log` or in the associated notification pop-up window. You can check the list to see if the migration duration file was also found. It is tagged with the `CLONEDURATIONS` keyword.

After the tables have been split in the `EU_CLONE_MIG*PRP` phases, you find in the [SUM Utilities for DMO \(Extended UI\) \[page 196\]](#) the information whether the duration file meets the requirements and was therefore used. To do this, select the [Table Splits](#) view in the [DMO Migration Preparation](#) menu.

Note

The `<*>` in the file name `migrate<*>dur.xml` is a placeholder for the middle part of the file name, which can change depending on the selected scenario. Example: For a standard DMO run, the file `migrate_dt_dur.xml` is created (where DT stands for "downtime").

The file with the duration information ("migration duration file") can even be reused for a similar system. The systems can also have a different SID.

For example, you can use the duration file from a copy of the productive system for a further DMO run on this productive system. The file contains both the table migration time and the table size. If there are different table sizes, `SAPUP` adapts the migration time accordingly.

3.18.4 Downtime-Optimized DMO

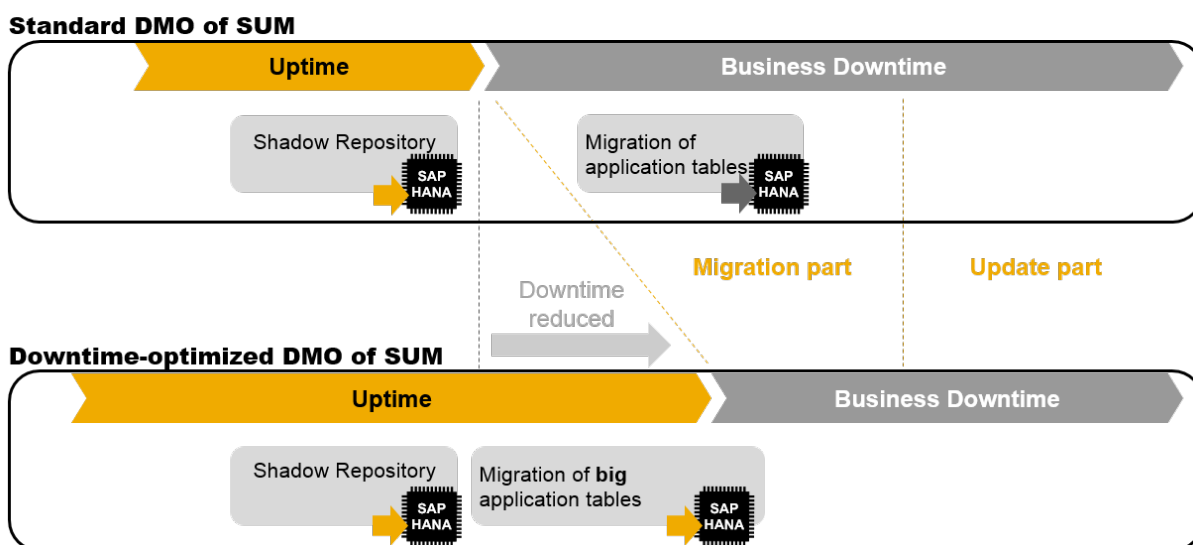
By means of the downtime-optimized database migration (*downtime-optimized DMO*) to SAP HANA database, you can migrate selected large application tables already in uptime to reduce the downtime.

Overview

The downtime-optimized DMO procedure performs a part of the data migration in the uptime processing. This technique significantly reduces the overall business downtime. The delta record and replay technology (CRR) ensures that any changes, which users made in the uptime but during the data migration, are considered.

In the following, you get a rough overview of the new approach and the difference to the standard DMO procedure:

Downtime-optimized DMO of SUM – procedure overview



The downtime-optimized DMO in a nutshell:

1. Determined large application tables are already migrated during the uptime in phase `EU_CLONE_MIG_OPTDMO_INI_RUN`. Changes to these tables are recorded after their migration.
2. A delta migration is carried out during the uptime in phase `RUNASYN_RRC_REPLICATE`. If necessary, a second delta migration takes place during the downtime in phase `RUN_RRC_REPLICATE_FINAL`. The delta migrations depend on the change rate of the users.
3. Afterwards during the downtime, the remaining tables are migrated in phase `EU_CLONE_MIG_DT_RUN`.

Prerequisites and Restrictions

For further the prerequisites and restrictions concerning downtime-optimized DMO, see section [// Important General Information](#) of the related SAP Note for the DMO that is mentioned in [Required SAP Notes \[page 12\]](#).

Enabling and Monitoring

To enable and monitor the downtime-optimized DMO, proceed as follows:

1. After the start of the Software Update Manager, the initial dialogs to specify the scenario and the roadmap appear. Choose the scenario category *with stack.xml configuration file*.
2. If a database migration to SAP HANA database is not mandatory anyway, choose in the dialog *Decision on DMO* the database migration to SAP HANA.
3. In a further dialog, select the scenario strategy *downtime-optimized*.

4. Sometime afterwards, the dialog *Migration Parameters* appears in which you specify the path and name of the file with the table names that are to be migrated during the uptime. The list must be a plain text file with one table name per line.
5. At the end of the uptime, that is at the end of the `Preprocessing` roadmap step, you can check the status in the *CRR Control Center* of the *SUM Utilities*. The dialog *Preparations for Downtime* in phase `DOWNCONF_DTTRANS` offers a link to it.

Note

The initial dialogs of the Software Update Manager and the SUM Utilities as well are described more detailed in the *SUM Guide*.

→ Recommendation

For the downtime-optimized DMO procedure, we recommend the following sequence:

1. Run a standard DMO procedure with optimizations, such as using duration files.
2. Determine large tables for the uptime migration.
3. Run a downtime-optimized DMO procedure on a copy of your productive system.
4. (Optional:) Run a downtime-optimized DMO procedure on your productive system until the end of the uptime. Then determine the change rate on selected tables. Reset SUM afterwards.
5. Start downtime-optimized DMO procedure on your productive system again. We recommend using one weekend for the initial data transfer, a second weekend for the downtime.
6. Note that an error is displayed, if tables cannot be replicated. Remove then the table name from the table list.

Table Selection

For various reasons, the table size as only criterion for the manual table selection is not always clear:

- The table migration duration is not always linear to the table size.
- You cannot include all tables. For more information, see SAP Note [2547309](#).
- The change rate is relevant. Therefore, it is recommended to consider tables with a high change rate only when needed to meet the downtime requirements.

To meet the requirements for the table selection, use the tool `Uptime Table Selection for downtime-optimized DMO` of the *SUM Toolbox* at the end of a DMO run on a sandbox system. The tool can be used in any system. If you run the tool on a system where a SUM run with DMO or downtime-optimized DMO has been completed, the tool automatically selects the required files from the `DIR_PUT` directory. Otherwise, the input files must be provided manually.

For more information about the installation of the *SUM Toolbox*, see SAP Note [3092738](#) and the SAP Notes referenced in it.

Impact Analysis

Changes on the content of those tables that are migrated already during uptime must be recorded by means of triggers. However, the change recording increases the daily database growth.

To avoid a business impact on your production system, it is necessary to estimate in advance how much additional database space is required. The *Impact Analysis* approach provides you with an estimation for this.

For more information, see SAP Note [2402270](#).

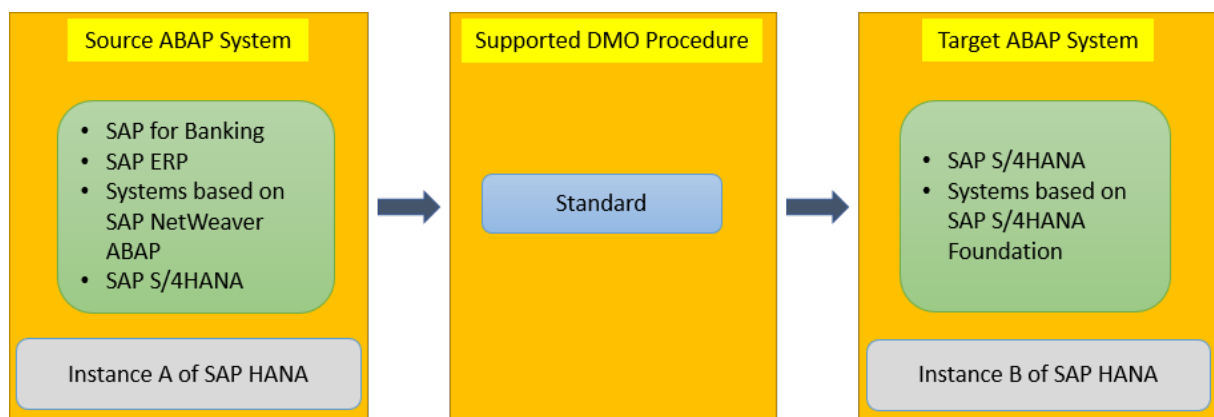
3.18.5 Homogeneous DMO

This section deals with homogeneous database migration (homogeneous DMO).

In a standard DMO scenario, existing ABAP systems are updated and, in the same step, the associated database is migrated from one database management system (DBMS) such as *Oracle Database Server* to another DBMS such as *SAP HANA Database*. This means that the DBMS is different in the source system and the target system.

However, in a homogeneous DMO scenario, the source and target ABAP systems use the SAP HANA database as the same DBMS. The source system is updated and, in the same step, the associated SAP HANA database is migrated from the database instance A in the source system to the database instance B in the target system.

The following gives you a brief overview of the current options offered by the homogeneous DMO:



The homogenous DMO is triggered using a dialog. After specifying the desired SUM scenario (with or without a configuration file), the Software Update Manager checks the source database. If it identifies SAP HANA as the source database and determines that a homogeneous DMO is possible, the dialog *Decision on Database Migration Option* is displayed. Select SAP HANA as the desired target database. After that, the corresponding procedure is started.

Note

- For the homogeneous DMO, the Software Update Manager only supports the SAP HANA database as the same database management system in the source and target systems. Other DBMS are not supported. With this feature, you can, for example, migrate
 - an SAP ERP system running on ABAP and an SAP HANA database

- an S/4HANA system
- to an SAP Cloud solution such as the *SAP HANA Enterprise Cloud (SAP HEC)*. In addition to migrating the database, the SAP S/4HANA system is updated or the SAP ERP system is converted to SAP S/4HANA in the same step.
- If the tables are created in the target system with the R3load tool during database migration, the load unit settings of the ABAP Dictionary of the target release are always used. The settings for the load units from the original system are not transferred. You have to adjust them manually in the target database.
In particular, if the ABAP Dictionary setting changes to a preferred setting (such as *Page Loadable* preferred, or *Column Loadable* preferred), this preferred setting is used for the setting in the target database, regardless of the setting made in the original database.
 - For the current prerequisites and restrictions for the homogeneous database migration, see in the SAP Note for DMO the section *Homogenous DMO: Requirements and Restrictions*. This SAP Note is mentioned in [Required SAP Notes \[page 12\]](#).

4 Preparation

This part of the document contains information about the preparations that you need to make before you update your system.

You can prepare for the update while the system is in production operation. Careful preparation of the update is the best guarantee that it runs without errors.

Note

In addition to the general preparations described in this document, you need to perform the preparations that are specific to your product version, which are described in an additional product-specific document. This document is referenced in the *Master Guide* (or *Upgrade Master Guide*, respectively) for your product.

The Software Update Manager supports you here by making most of the necessary checks automatically.

4.1 Determining the Host for the Preparations

Context

Execute and prepare the update on the host where a suitable, configured and set up AS instance is running.

Procedure

Check which hosts you need for the update preparation and the actual update of the ABAP system:

- Host with a configured and set up AS instance.
- Database host
Actions that affect the database must be performed on the database host.
- User management engine (UME) host
The remote instance host on which the UME is located must be running.

4.2 Checking the Hardware Requirements

CPU, Main Memory, Disk, and Swap Space

Check whether you have sufficient hardware resources such as CPU, main memory, disk space, and swap space. The minimum swap space is 20 GB.

For more information about sizing, see the SAP Portal at <https://www.sap.com/about/benchmark/sizing.html>.

Space Requirements for the File System

Make sure that there is enough temporary disk space available in the file system for the update. You need this free space for the `SUM` directory, the download directory, and directory `DIR_TRANS`. We recommend at least 40 GB free space for the `SUM` directory as well as for the download directory, and 20 GB for the directory `DIR_TRANS`.

As the space requirements depend on the product, see also the document with additional product-specific information for your update procedure to find information about the requirements. This document is referenced in the *Master Guide* or *Upgrade Master Guide*, respectively.

Space Requirements in the Database

Make sure that enough temporary and permanent free space is available in your database.

The Software Update Manager calculates the space requirements for the database. The free space required is in the range from 50 to 200 GB.

Note

For Unicode systems, the amount of free space needed is higher than for non-Unicode systems. This highly depends on the database type, application component, and customer data.

For more information about Unicode systems, see the SAP Portal at <https://www.sap.com/community/topic/internationalization-and-unicode.html> and SAP Note [1139642](#).

4.3 Checking the Software Requirements

You have to meet certain software requirements before you update the SAP system.

1. Check the [source release \[page 93\]](#) of the SAP system.

2. Check the [uninstallation of software components \[page 94\]](#).
3. Meet the [operating system-specific requirements \[page 96\]](#).
4. If necessary, upgrade the [operating system and database system \[page 97\]](#).
5. Perform the [Preparations with Regard to SAP HANA Database \[page 98\]](#): Make sure that the relevant software components for an update of the SAP HANA database are installed and that they have a sufficient version. Furthermore, familiarize yourself with encryption of data at rest and the password for root key backups.
6. Save the [environment files \[page 99\]](#).

4.3.1 Checking the Source Release of the SAP System

Make sure that your SAP system has one of the source releases that have been released for this update and apply to all databases.

Context

For information about the supported source releases, see the document with additional product-specific information, which is referenced in the *Master Guide* (or *Upgrade Master Guide*, respectively) for your product.

Different SAP NetWeaver product instances can have different minimum SP levels. If you update an SAP NetWeaver-based system containing various product instances, make sure that your source release is on any acceptable support package level for all product instances implemented in the system.

Note

This section is relevant if you perform a release upgrade.



The Software Update Manager checks if your source release is supported for the update.

Caution

If you have to apply support packages to your source release shortly before the update, check whether the equivalent support package for the target release is already available. Otherwise, this can delay your update schedule.

Procedure

Determine the source release of the SAP system

Log on to the system and choose  **System** **>** **Status** .

The release is displayed in the *Component version* field.

4.3.2 Checking the Uninstallation of Software Components

This section deals with the possible uninstallation of product instances and software components calculated by the Maintenance Planner.

Context

During the planning process with the Maintenance Planner, consider that the update can require the uninstallation of product instances and software components. The Maintenance Planner indicates the necessary uninstallations and the relevant SAP Notes. Read the SAP Notes carefully and, if necessary, carry out possible maintenance steps manually before you start the update.

During the update, the Software Update Manager lists the planned uninstallations and the relevant SAP Notes again in phase `PREP_EXTENSION/UNINSTALL_PREPARE`.

⚠ Caution

You cannot select further software components for the uninstallation in this phase.

Note that the uninstallation of software components requires the deletion of SAP repository or ABAP Dictionary objects, which might impact customer developments and functions. Using the *SAP Add-On Installation Tool* (transaction `SAINT`), you can carry out the uninstallation in a test scenario before the update. The *SAP Add-On Installation Tool* simulates the uninstallation, performs several detailed checks, and provides you with information about affected customer developments and functions. For more information, see the online help of the tool.

Note also that the uninstallation of the mentioned software components is integrated in the SUM procedure. This also applies if only the transaction `SAINT` is mentioned in the referenced SAP notes.

To simulate the uninstallation, proceed as follows:

Procedure

1. Start the *SAP Add-On Installation Tool* with transaction `SAINT`.
2. Choose **► Extras ► Settings ► Import Queue ►**, and select the scenario *Test*.
3. Choose the tab page *Uninstallable Software Components* and select the software components to be uninstalled.
4. Choose *Start* and follow the further instructions.

4.3.3 Settings for Secure by Default

This section deals with information concerning the settings for the "Secure by Default" concept.

Settings for the Security Audit Log

The *Security Audit Log* is an important component for "Secure by Default" concept. You can use it to record security-related system information such as changes to user master records or unsuccessful logon attempts. This log is a tool designed for auditors who need to take a detailed look at what occurs in the AS ABAP system. By activating the audit log, you keep a record of those activities that you specify for your audit. You can then access this information for evaluation in the form of an audit analysis report. For more information on the *Security Audit Log*, see the documentation about *ABAP Platform* or *SAP S/4HANA* on the SAP Help Portal at <http://help.sap.com>.

If you already use the *Security Audit Log*, you need to ensure several settings for the system conversion:

- Make sure that the current profile contains at least one active filter.
- Make sure that the kernel parameter for the *Security Audit Log* activation is activated in transaction SM19 on tab *Kernel Parameter*.
- Make sure that the parameter `rec/client` is used and set to client 000 and the business clients.

Enablement of Secure by Default Settings

As of SAP S/4HANA and SAP S/4HANA Foundation 1909, *Secure by Default* settings are applied for system conversions to SAP S/4HANA or SAP S/4HANA Foundation. Depending on the SAP S/4HANA release, the *Secure by Default* scope can vary. The settings affect the profile parameters, the ABAP platform configurations, and the SAP HANA auditing.

- Profile parameters: You have the choice to skip the activation of the secure profile parameters. However, this is not recommended.
- ABAP platform configurations and HANA auditing: *Secure by Default* settings are activated during the system conversion if no configuration has been done in the source system of the respective *Secure by Default* topic.

Note that if a corresponding configuration already exists in the source system, the *Secure by Default* settings are not applied. For example, if the source system has an *SAP Security Audit Log* configuration, existing settings are converted. Otherwise, the *Secure by Default* settings are activated during the system conversion. For more information, see SAP Note [2926224](#).

If you perform a system conversion to

- SAP S/4HANA 2021
- SAP BW/4HANA 2021
- SAP S/4HANA Foundation 2021

or a higher version, the Software Update Manager installs and enables HANA Audit Policies by default

- during downtime, if you perform a system conversion where the source system is already running on an SAP HANA database
- during the Prepare phase, if you perform a system conversion including database migration (DMO) to SAP HANA database

In addition, the following secure profile parameters for `tp` are provided for the *Secure by Default* settings:

Profile Name	Value
VERS_AT_IMP	ALWAYS
RECCLIENT	ALL
TLOGOCHECK	TRUE

Note

The Software Update Manager installs and enables the *Secure by Default* settings by default only during the system conversions, but not during release upgrades.

4.3.4 Meeting the Operating System-Specific Requirements

All Supported Operating Systems

For information about which operating systems are supported, see the Product Availability Matrix (PAM) on SAP Service Marketplace at <http://support.sap.com/pam>.

AIX

Depending on your target release, you require specific minimum C++ runtime level and according minimum SAP kernel version. To check them, proceed as described in SAP Note [1780629](#). For additional AIX-related recommendations, see SAP Note [1972803](#).

Linux

Check the minimum SAP kernel requirements for your operating system in SAP Note [1563102](#).

HP-UX

See SAP Note [837670](#) to check the minimum operating system patch recommendations for HP-UX.

UNIX-based Operating Systems: Setting Limits for System Users

To avoid errors during the update, ensure that the system user limits are set optimally. To do this, proceed as described in SAP Note [1704753](#).

4.3.5 Upgrading Operating System and Database

When you update the SAP system, you may have to upgrade your operating system and database to a new version.

Prerequisites

Prerequisite for starting the Software Update Manager: If the database server and the application server instance are not identical, install the latest database client software on the application server instance.

For information about the procedure, see SAP Help Portal at <http://help.sap.com/hana> ► [Installation and Upgrade](#) ► [SAP HANA Server Installation and Update Guide](#) ►.

Context

For more information about which versions are currently supported, see the Product Availability Matrix on SAP Support Portal at <http://support.sap.com/pam>. The Software Update Manager only checks the minimum versions required for the update.

If you need to upgrade an operating system or database, or migrate a database, then the timing and the sequence of the individual upgrades is of great importance. The procedure differs according to the database you use. The following text provides an overview of the main process steps for upgrading the operating system and database system for each database.

Note

- As of SAP NetWeaver 7.1, SAP only supports systems based on 64-bit on the target release. If you have to migrate the operating system and database to 64-bit, make sure that you plan enough time in your upgrade schedule for the migration, and perform the migration **before** the upgrade. If you need to change the hardware, we recommend that you use the SAP System Copy procedure to migrate to 64-bit. For more information about system copy, see the *System Copy Guide* on SAP Support Portal at <http://support.sap.com/sltoolset> ► [System Provisioning](#) ► [System Copy Option](#) ►.
- Make sure that your current database version is supported for your scenario. To check the minimum database version for updates to
 - **SAP NetWeaver 7.4 SPS08 and higher:**, see SAP Note [1951491](#).
 - **SAP NetWeaver 7.5 and higher:**, see SAP Note [2158828](#).
 - **SAP NetWeaver AS ABAP 7.51 Innovation Package:**, see SAP Note [2329005](#).

Procedure

1. If you have not already done so, upgrade the SAP HANA database to at least the minimum required major version.

For information about the required major version, see the Product Availability Matrix (PAM) for your SAP product version on SAP Support Portal at <http://support.sap.com/pam.html>.

2. We recommend that you always apply the latest SAP HANA database support package afterwards from SAP Support Portal, even if your system already matches the required major version.

For more information, see the documentation in the SAP Help Portal at <https://help.sap.com/hana>

3. Run the Software Update Manager up to the *Checks* roadmap step and analyze the results.
4. If necessary, upgrade the database or the operating system.
5. Upgrade the SAP system.

4.3.6 Preparations with Regard to SAP HANA Database

For systems on SAP HANA database, some aspects must be considered in advance, which are checked or prompted by SUM during the procedure.

Software Components for SAP HANA Database

Necessary software components for the SAP HANA database, such as delivery units or SAP HANA plugins, must be available in the system before you start the update procedure with the Software Update Manager. The relevant software components are calculated beforehand by the *SAP Maintenance Planner* tool. Afterwards they are added as software package to the `stack.xml` configuration file in addition to the other software archives.

During the update procedure, the Software Update Manager checks in phase `HDB_CHK_COMPONENTS` of the *Checks* roadmap step if the required SAP HANA components are installed, and if they have the correct version.

The Software Update Manager stops if the components are not installed, or if their version is not sufficient. Then you are prompted in a dialog to install or update the components.

SAP HANA Volume and Backup Encryption

During the SUM run, the dialog *SAP HANA Volume and Backup Encryption* is displayed in phase `HDB_VOLUME_ENCRYPTION`. In this dialog, you can enable the encryption of data at rest and assign a password for the root key backup.

For more information on data encryption and root key passwords, see the *SAP HANA Administration Guide for SAP HANA Platform*. To access the guide, go in the SAP Help Portal documentation for the SAP HANA Platform at https://help.sap.com/docs/SAP_HANA_PLATFORM. Choose then ► *Operate* ► *SAP HANA Administration*

[Guide for SAP HANA Platform](#) » Navigate in this guide to [Security Administration and User Management](#) » [Managing Data Encryption in SAP HANA](#) ».

Note

The dialog [SAP HANA Volume and Backup Encryption](#) is displayed if the target system is SAP S/4HANA 2023 or higher.

Encryption of Data at Rest

The *Encryption of Data at Rest* feature is used to protect data stored on the hard disk from unauthorized access at operating system level. The SAP HANA database supports data encryption in the persistence layer for the following data types:

- Persistence (data volumes)
- Log (redo log volumes)
- Backup (data and log backups)

To activate the encryption for all persistence layers, select in the dialog [SAP HANA Volume and Backup Encryption](#) the checkbox [Enable Data Volume, Log Volumes and Backup Encryption](#) in the *Data at Rest Encryption* section.

Note

SAP HANA 2.0 supports *Encryption of Data at Rest* as of version support package 03 and is enabled by default as of support package 07.

Password for Root Key Backup

You can use the root key backup password to back up the database root keys securely and then restore the backed-up root keys during data recovery. The root key backup password is stored in the secure store of the SAP HANA database. After a backup of the root keys has been created, this password is required to restore the keys later. If backup encryption is enabled, both the password and the root key backup must be stored in a secure location. If the backup or password is lost, the database possibly cannot be restored.

To set the password, select in the dialog [SAP HANA Volume and Backup Encryption](#) the checkbox [Set backup password for root key](#) in the *Password for Root Key Backup* section, and provide a suitable password.

4.3.7 Saving the Environment Files

This section deals with the environment files of user `<sid>adm`.

Context

In phase `ENVFILES` of the `Execution` roadmap step, the Software Update Manager adjusts the environment of user `<sid>adm`. Before you start the update, we recommend that you save your environment files with your specific settings.

Note

The Software Update Manager doesn't replace the environment files when you only update support packages or support package stacks.

For more information about the phase `ENVFILES`, see section *Profile of User <sid>adm (Phase ENVFILES)* in chapter [Important Entries for the Execution Roadmap Step \[page 181\]](#).

Procedure

Move or copy your environment files with your specific settings to the directory `$HOME/.cshrc`.

4.3.8 Installing or Updating SAP Host Agent

The SAP Host Agent tool is used for monitoring and controlling SAP instances and non-SAP instances, operating systems, and databases.

SAP Host Agent is present on all systems running on SAP Kernel 7.20 and higher. The software provisioning manager 1.0 installs or updates the SAP Host Agent in the course of the installation of an SAP instance based on SAP NetWeaver 7.0 SR3 or higher. If the SAP Host Agent is not available on the host of the SAP instance, it will be installed. If the SAP Host Agent is already preinstalled on the host of the SAP instance, the software provisioning manager checks its version and updates it if necessary.

Note

The Software Update Manager only updates SAP Host Agent if it was installed in the source release system. If this is not the case, you have to manually install SAP Host Agent.

If it is included in the `stack.xml` file, SUM automatically updates SAP Host Agent only on the local host where SUM is started. On remote hosts, you have to manually perform updates, as SAP Host Agent is not automatically replicated on these instances.

The tool can also be installed and upgraded independently from an SAP instance, whether by your choice to do so, or if the automatic update has not been performed (see SAP Note [1113545](#) for possible causes).

For a correct execution of the update procedure, make sure that you have installed on all application servers instances the latest version of the SAP Host Agent. Check the SAP Software Download Corner at <http://support.sap.com/swdc> for the versions that are available to download. For more information, such as the deprecation of lower versions, see SAP Note [2130510](#).

For additional information regarding SAP Host Agent, see SAP Notes [1031096](#) and [1907566](#).

Procedure

To manually install SAP Host Agent or update it on remote hosts, proceed as described in the abovementioned SAP Notes or in the SAP Help Portal for your target SAP NetWeaver release at <http://help.sap.com/nw>:

SAP Library Paths

Release	Path in SAP Library
SAP NetWeaver 7.5	▶ Application Help > Function-Oriented View <Language> > Solution Life Cycle Management > SAP Host Agent > sections SAP Host Agent Installation or SAP Host Agent Upgrade

4.4 Checking Cluster and Pool Data

You can use the cluster and pool data check integrated in SUM to check all pooled or cluster tables in the system.

Context

For example, if you use the Database Migration Option of SUM, you can check all pooled or cluster tables in the source system before the migration.

To use the cluster and pool data check, select the option *Check Cluster and Pool Data* in the initial dialogues of the Software Update Manager that are described in [Making Entries for Scenarios Without Configuration File \[page 143\]](#).

This check is similar to the SAP_BASIS report `SDBI_CLUSTER_CHECK`. It is performed by the `R3load` executable in discard mode and uses the same technology as the benchmarking tool. In addition to the report `SDBI_CLUSTER_CHECK`, further reports are available such as `SDBI_POOL_CHECK`.

Note

Note that some reports can have long runtimes for large datasets.

However, we strongly recommend checking cluster and pool data with the check integrated in SUM instead of the report `SDBI_CLUSTER_CHECK`. The integrated check is more performant and the runtime is lower because it can work with highly parallelized processing.

For more information about the cluster and pool data check and the reports, see SAP Note [1784377](#).

Procedure

- Option 1 (recommended): Check pooled and cluster tables using the built-in cluster and pool data check.

In the initial dialogs of SUM to get the roadmap, select the scenarios without configuration file and choose [Check Cluster and Pool Data](#). Then follow the instructions in the subsequent dialogs.

The Software Update Manager uses the `R3load` executable for checks and displays detected errors on the [SUM User Interface \(SUM UI\) \[page 24\]](#). The details are written to the log files `eumigrateexp.log` and `r3loadcallrun.elg`. Note that BCD (Binary Coded Decimals) numbers are also checked.

- Option 2: Check pooled and cluster tables using the reports that are described in SAP Note [1784377](#).

4.5 Checking the Central Services Requirements for ABAP

Context

You have to meet the following requirements before you update your system:

- The message server has to run at the SAP Central Services instance (SCS, ASCS) or on the host with the application server instance.
During the update, the Software Update Manager uses Remote Function Call (RFC) to call function modules and temporarily schedules ABAP report programs for background processing.
For this reason, the message server has to still be running, especially after the additional application server instances are stopped.

SAP systems installed in the standard way meet the specified Central Services requirements for ABAP.

If you are not running a distributed or high availability system, or you are not sure whether you have a standard installation, you can use the following procedure to check the Central Services requirements.

Procedure

1. Call transaction RZ10.
2. Choose **► Goto ► Profile values ► Of a server ►**.
3. Choose the server (host) where the application server instance is running.

The profile parameters for this server are displayed with their values.

4. Check the profile parameter `rdisp/mshost`.

This parameter contains the host name where the message server is running. It has to run on the central instance or on the same host as the application server instance. This makes sure that the message server is active during downtime, because only the application server instance runs during downtime, while all additional application server instances are stopped.

5. If you have made changes to the standard SAP system, check the profile parameter `rdisp/wp_no_vb`. This parameter displays the number of update processes for the application server instance. The number should be greater than 0.

4.6 Setting the Operation Mode for the Update

Prerequisites

No operation modes should exist that contain servers other than those belonging to the current system.

Context

Various background jobs are started during the upgrade. An operation mode defines how the resources of the individual instances of your system are configured. By specifying the operation mode, you can therefore determine which services are offered by the work processes (dialog, update, background processing, enqueue, spool, and so on) as well as the times that the services are available.

With the following steps, you perform the following tasks:

- Deleting invalid operation modes
- Defining the valid operation mode for the SAP instance on which you want to upgrade your SAP system

When you schedule background jobs, the Software Update Manager checks whether the SAP instance where the background jobs are intended to run is defined in an operation mode.

Procedure

1. Call transaction RZ04 to check the definition of your operation modes. In addition, check the DUMMY operation mode. The DUMMY operation mode may have `<host name>_<SID>` entered as the server name. Change this entry to `<host name>_<SID>_<instance number>`.
2. Delete the invalid operation modes. If operation modes contain names of servers other than those belonging to the system, problems may arise in the background interface in some phases. The jobs may be released, but not set as *active* (in theory, this affects all jobs scheduled to start on a specific server and triggered by an event).
3. If the SAP instance on which you want to perform the update is not entered in an operation mode, create the operation mode for the update as follows:
 - a. Call transaction RZ04.
 - b. Choose **Operation mode** **Create**.

Enter a name for the operation mode, for example, **Update**. Enter a short description and then save the operation mode.

- c. Make sure that the instance required for the update has been started up.
- d. Position the cursor on the new operation mode and choose ► *Operation mode* ► *Maintain instances* ► *Instances/OP modes* ►.
- e. Choose ► *Settings* ► *Based on act. status* ► *New Instances* ► *Generate* ►.

This displays all instances and their current configuration.

- f. Choose *Save*.
- g. Call transaction SM63 to enter the operation mode you have defined as an active operation mode for 24 hours (select *Normal operation (24 hours)*).

4.7 Making Preparations in the Monitoring Area

Context

ⓘ Note

This section is only relevant if your source release is based on SAP NetWeaver 7.0 or 7.0 EHP1.

As of SAP NetWeaver 7.0 including enhancement package 2, the agents infrastructure has changed significantly. Before the update, you need to perform several activities to ensure a smooth transition to the new release. The procedure depends on the use of a central monitoring system (CEN).

Procedure

Follow the instructions in the [SAP Help Portal](#) for your target SAP NetWeaver release.

Navigate to ► *Application Help* ► *SAP NetWeaver Library: Function-Oriented View* ► *Solution Life Cycle Management* ► *Solution Monitoring* ► *Monitoring the CCMS* ► *Infrastructure of the SAP NetWeaver Management Agents* ► *Technical Background of the SAP NetWeaver Management Agents* ► *CCMS Agents: Upgrade of Monitored Systems from NW 7.0x to 7.1x or higher* ►.

4.8 Checking the Requirements for the Modification Adjustment

If you modified SAP objects in your SAP system, make sure that you meet the requirements for the modification adjustment.

Context

⚠ Caution

If you do not make sure that you have met the requirements for the modification adjustment, we cannot guarantee complete support during the adjustment. You also risk losing the data for ABAP Dictionary objects.

For more information about the requirements for the modification adjustment, see the SAP Help Portal for your target SAP NetWeaver release at <http://help.sap.com/nw>:

Release	Path in SAP Help Portal
SAP NetWeaver 7.5 and higher	▶ Application Help > ▶ Function-Oriented View > ▶ Application Server > ▶ Application Server ABAP > ▶ Application Development on AS ABAP > ▶ ABAP Customer Development > ▶ Changing the SAP Standard > ▶ Modifying the Standard > ▶ The Modification Assistant ▶

Procedure

Check the requirements for the [modification adjustment \[page 69\]](#).

⚠ Caution

In particular, make sure that changes to the Repository are allowed in the client in which you want to perform the modification adjustment. To check this, call transaction SCC4.

4.9 Filling the Download Directory

You can put all files and software packages with which you want to update your system in a download directory.

Context

In the initial dialogs after the SUM start, you first select the scenario category with configuration file. Enter then the path to the `stack.xml` configuration file that has to be available in your download directory. The Software Update Manager reads the download directory, unpacks the `.SAR` files, and moves the files to the appropriate directories from where they are then further processed by the Software Update Manager.

You can put the following files in the download directory:

- Support package stacks of the target release
The support package stacks include among other things ABAP patches, which are optional. If you do not fill your download directory with ABAP patches, the Software Update Manager does not automatically extract them during the *Extraction* roadmap step.
- Enhancement packages
- SAP kernel for the target release
Unless you are performing the upgrade directly after you have downloaded the calculated software archives, you can always check whether there is a newer version of the SAP kernel available and download it to the download directory. The Software Update Manager then unpacks the files and moves them to subdirectory `exe` of the `abap` subdirectory of the `SUM` directory. Downloading the latest version of the SAP kernel has the following advantages:
 - You do not have to install the latest SAP kernel after the upgrade.
During the *Configuration* roadmap step, the Software Update Manager prompts you to put the latest SAP kernel into the download directory. If the latest SAP kernel is available in this subdirectory, the SAP kernel of your system is already up-to-date after the upgrade.
 - You can avoid this prompt if you download the latest SAP kernel from SAP Service Marketplace to the download directory. It appears if you have included SAP Basis support packages in the upgrade and dependencies exist between these support packages and the SAP kernel version.
- Additional archives
In addition to the SAP Kernel archives, the Software Update manager detects and unpacks other patch archives such as `disp+work` package, `Database Library`, `R3trans`, `tp`, `DB2RADM`, and `ILE`. Note that the SP stack kernel is automatically installed in your system according to the kernel update strategy. Other SAP kernel updates that are not required during the update are ignored. For more information, see the paper *Update Strategy for the Kernel of the Application Server ABAP in On Premise Landscapes* that is referenced in SAP Note [19466](#), section *Reason and Prerequisites*.
- Stack configuration XML file
- Calculated archive files
You can provide all necessary language archives in the download directory.

⚠ Caution

Make sure that the files and software packages that you want to include in the upgrade, such as `.SAR` files, are located at the top level of your download directory and not in any subdirectories. This can be the case, for example, when you just copy the upgrade archives into the download directory.

Note

Additional Kernel Components

Make sure that you have selected all necessary kernel components in the Maintenance Planner, such as the `IGSEXE.SAR` file. The Maintenance Planner does not calculate these files automatically.

Usage of Spanning Archives

The media content can be delivered as spanning archives on SAP Support Portal. This means that the archives are split into several files to avoid a large data volume and provided in multiple archive files. To use these files with the Software Update Manager, you extract the archive files that belong together into the provided subdirectories.

When the Software Update Manager requests DVD mount points, you enter the subdirectories that contain the `MID.XML` file.

Procedure

1. Create a download directory. The directory can be located anywhere on your host.
2. Put all software packages and files required during the update into the download directory.

4.10 Additional Preparation of Database Migration Option

4.10.1 Checking Pool and Cluster Tables

We recommend checking all pool tables or cluster tables in the source system before the migration.

Context

For example, you can check whether

- corrupt or initial cluster records exist
- the pool tables contained in a certain table pool are readable
- the BCD numbers in a table are correct

We recommend that you perform the check using the cluster data check that is integrated in SUM. To use it, select the option *Check Cluster Data* in the initial dialogues of the Software Update Manager, which are described in the *SUM Guide* in section *Making Entries for Scenarios Without Configuration File*.

This check is similar to the SAP_BASIS report `SDBI_CLUSTER_CHECK`. It is performed by the `R3Load` executable in discard mode and uses the same technology as the benchmarking tool. However, the check integrated in SUM is more performant than the report `SDBI_CLUSTER_CHECK`. Its runtime is significantly lower because the check can work with highly parallelized processing.

In addition to the report `SDBI_CLUSTER_CHECK`, further reports are available such as `SDBI_POOL_CHECK`. For more information about the cluster data check and the reports, see SAP Note [1784377](#).

Note

Note that some reports may have long runtimes for large datasets.

Procedure

- Option 1 (recommended): Check cluster tables using the built-in cluster data check.
In the initial dialogs of SUM to get the roadmap, select the scenarios without configuration file and choose [Check Cluster Data](#). Then follow the instructions in the subsequent dialogs.
- Option 2: Check pool and cluster tables using the reports that are described in SAP Note [1784377](#).

4.10.2 Oracle: Suppressing Long-Running Phases

If your source database is Oracle, you can suppress long-running phases before you start the update.

Context

During the update with DMO, the following phases can be long-running:

- `EU_CLONE_DT_SIZES`
- `EU_CLONE_UT_SIZES`

In the course of these phases, the system updates the database statistics regarding the usage of space that the tables need on the database. The aim is a better distribution of the tables during the system cloning. Before you start the update, you can suppress these long-running phases using the following procedure.

Caution

It is of the utmost importance to follow the entire procedure. Executing only parts of the procedure results in a longer downtime because the table split algorithm is based on correct statistical data.

Procedure

1. Log on to the host where the Oracle database instance is running.
Use user `ora<db>sid` for UNIX system or user `<sapsid>adm` for Windows.
2. Open a command prompt and execute the following command:

```
brconnect -u / -c -f stats -o <schema_owner> -t all -f allsel,collect,space -p 8
```

3. Add to file `SAPup_add.par` the following line:


```
/ORA/update_spacestat = 0
```

The file `SAPup_add.par` is located in the subdirectory `bin` of the SUM directory. If this file does not exist yet, create it.

4.10.3 Oracle: Checking Database Parameterization

If your source database is Oracle, make sure that the database parameterization is properly configured with regard to parameter `parallel_max_server`.

Procedure

Apply SAP Note [936441](#) .

4.10.4 Preparing Target Database SAP HANA

Prepare the target database SAP HANA for the SUM with DMO run.

Context

Note

- **Change log mode**

Note that the Software Update Manager changes the log mode to *Overwrite* during the update procedure with DMO. This is changed back to log mode *Normal* after the procedure. We therefore recommend that you back up the SAP HANA database after the database migration is complete. See also [Backing up the SAP HANA Database \[page 231\]](#).

- **Replication scenarios that include the target database**

If you want to run a replication scenario that includes the target database, start it at the earliest after the DMO run and not before.

Before a DMO run is completed, the target database is still in an initial state. As a consequence, replication scenarios in this phase can cause errors.

Procedure

1. Make sure that you have successfully installed an SAP HANA database.
2. Make sure that you are prepared to enter system details and the password of user `SYSTEM`.
3. Make sure that you are prepared to enter the password of your database user, and the name and the password of the database security user as well. If the user `SYSTEM` is deactivated, the Software Update Manager uses the security user to activate the user `SYSTEM` for a short time, if necessary, and to deactivate it again afterwards.

4.10.5 Requesting Migration Key for Target Database

Make sure that you have a valid migration key for the new target database.

Procedure

Request the migration from the SAP Support Portal at <https://support.sap.com/migrationkey>.

4.10.6 Downloading Latest Database Client Software

Make sure that you have the latest client software for your target database.

Context

Among other options, SAP Maintenance Planner also offers the SAP HANA database client for download. This way, a manual installation is not required.

Procedure

Ensure that the SAP HANA client is selected in SAP Maintenance Planner during the preparation activities.

The SAP HANA database client archive must be available later in the download directory.

4.10.7 Requesting Permanent SAP License

Make sure that you have a permanent SAP license for your system that will be migrated to the target database.

Context

You can request a new license key from the SAP Support Portal. It is mandatory that you keep your installation number to avoid a secure store migration.

Procedure

1. Download the license key from <http://support.sap.com/licensekey>.
2. Copy the SAP license file to the server that runs the DMO.

The SUM with DMO will request the path to this license file.

4.10.8 Downloading Files from Maintenance Planner

Download the files calculated by the SAP Maintenance Planner that are necessary for the update.

Context

The *Maintenance Planner* supports the download of a consistent queue that includes all necessary support packages and enhancement packages. In addition, it calculates a valid import queue for the selected SAP system and generates the stack configuration file `stack.xml`. In the `Select Target` phase of the SUM, you enter the path to the stack configuration file.

Procedure

1. In the *Maintenance Planner*, select for the download the following options:
 - SAP Kernel

Note

- We recommend using the path `/usr/sap/<SID>/download` to store the required files. Alternatively, you could create a symbolic link.
- **Additional kernel components**

Make sure that you have selected all necessary kernel components, such as the `IGSEXE.SAR` file, in the Maintenance Planner. Currently, the Maintenance Planner does not calculate these files automatically.

2. Upload the following files to a folder on the application server instance on which you run the Software Update Manager:
 - The files calculated by *Maintenance Planner* including kernel for the target database
 - `stack.xml` file
 - Target database client for the required operating system

Note

Additional SPAM files might be required:

The *Maintenance Planner* only offers the latest SPAM version for the target software release.

If the Software Update Manager prompts you during the SPAM version check to import the latest SPAM update for your source release, download the latest SPAM version for the current software release manually and extract the files to the directory `/usr/sap/trans/EP5/in`. Afterwards you confirm the directory in the dialogue so that SUM can find and check this SPAM version.

If the latest SPAM version for the source release is already in the download directory before the update, the Software Update Manager will extract the files automatically

4.10.9 Testing Update and Migration

Before your start the actual update and migration procedure for your productive system, it is necessary and highly recommended that you carry out DMO test runs.

Context

The aim of these DMO test runs is the optimization of the various parameters (such as the R3load processes) and the determination of the expected total length of the update and migration procedure of your productive system.

Procedure

Perform at least one update and migration procedure of an SAP system for testing purposes with a similar set of data, ideally with a system copy of your production system.

4.10.10 System Move: Preparing Target System Landscape

This preparatory step is relevant, if you want to perform a system move during the SUM with DMO run.

Context

In addition to the required preparation steps in the **source** system landscape (such as providing the `stack.xml` file and the SAP HANA database client archive, or updating SAP Host Agent), you prepare the **target** system landscape to perform a move to a new application server.

For more information about the system move, see [System Move: Enabling DMO with System Move \[page 115\]](#).

Note

SAP HANA and SAP NetWeaver AS ABAP on one server: The system ID of the database must not be the same as the system ID of the application server on the source system landscape.

See SAP Note [1953429](#) for more information on this scenario.

Note

Depending on the target product version, the term *SAP target system* in the procedure refers to the following systems:

- SAP Enhancement Package 8 for SAP ERP 6.0 Powered by SAP NetWeaver: SAP system based on SAP NetWeaver Application Server for ABAP 7.5
- SAP S/4HANA 1909 and subsequent versions: SAP system as (respective) SAP S/4HANA system

Note that the initial stack is sufficient for the installation of the SAP target systems.

Procedure

1. Prepare the target database.

See also [Preparing Target Database SAP HANA \[page 109\]](#).

2. Provide the host with the application server in the target system landscape with the same system ID as the host with the application server in the source system landscape:
 - a. Install the ASCS as SAP target system.
 - b. Install the application server as SAP target system.

Select in the SWPM (Software Provisioning Manager) tool the option *SAP AS ABAP Stub Installation for SAP System Move*, which is a reduced installation without SAP HANA database-specific activities.

For more information, access the SWPM guide at <https://support.sap.com/en/tools/software-logistics-tools.html>, choose the tab *System Provisioning*, then **► System Provisioning Scenarios** **► Install a System using Software Provisioning Manager** **► Installation Option of Software Provisioning**

[Manager 2.0 SP 14](#) > [Installation Guides - Application Server Systems](#) > In the guide, navigate to
> [Additional Information](#) > [Stub Installation of an SAP ABAP Application Server Instance](#) >.

3. Provide the SAP HANA database client archive.

See also [Downloading Latest Database Client Software \[page 110\]](#).

4. Update the SAP Host Agent.

4.10.11 System Move: Providing Download Directory for the Target System

For a system move, provide SUM with the complete download directory for the target system.

Context

During the DMO procedure including system move, you are prompted to specify the download directory on the host for the target system. It must contain all files and software packages from the download directory of the source system. This means that you must have copied the whole content from the download directory on the source system to that on target system before you start the DMO procedure. Proceed as follows:

Procedure

1. Create a download directory on the host for the target system.

Example for a Unix system: `/usr/sap/<SID>/download`

2. Copy the download directory content from the host for the source system into this directory.
3. After you have started the Software Update Manager with the scenario `DMO with System Move`, provide on request the path to the new download directory.

4.10.12 System Move: Switching the Operating System

For a system move, execute additional steps in case the operating systems do not match.

Context

If the operating system of the **source** source host with the application server instance is different to the operating system of the **target** host, you must execute an additional step after you have copied the SUM directory from the source to the target system landscape.

Procedure

After the initial transfer of the complete SUM directory (phase `HOSTCHANGE_MOVE_SOT`), extract the appropriate SUM archive, which belongs to the operating system of the **target** host with the AS instance, "over" the SUM directory that was copied from the **source** host with the AS instance.

As a result, the SUM executables match the operating system and can be started with the operating system of the **target** host with the AS instance.

4.10.13 System Move: Enabling DMO with System Move

You can move from an old application server instance (AS instance) to a new AS instance during the *SUM with DMO* run.

Prerequisites

You have prepared the **target** system landscape as described in

- [System Move: Preparing Target System Landscape \[page 113\]](#)
- [System Move: Providing Download Directory for the Target System \[page 114\]](#)

Context

The DMO of the SUM offers the option to perform a system move, that is, a switch from the AS instance of the **source** system to a new AS instance of the **target** system. To enable the feature, proceed as follows:

Procedure

When the Software Update Manager displays the dialog *Migration Parameters* during the initial dialogs sequence, activate the checkbox *Enable the migration with System Move* in section *DMO with System Move*.

4.10.14 DMOVE2S4: Isolating the Additional Application Server

This section covers the isolation of the additional application server as preparation step for the approach [DMO Move to SAP S/4HANA \(on Hyperscaler\) \[page 83\]](#).

Context

Processes can take a long time during production or can be stopped due to the long distance to the original system. To prevent this, we recommend that you isolate the additional application server (AAS), which is responsible for processes and activities that are not specifically intended for SUM processing, from the SAP ECC source system.

To do this, proceed as described in the following.

Note

Note that the activities listed in the procedure do not claim to be exhaustive and are offered as a suggestion based on our current level of knowledge. We encourage you to adapt or expand these activities according to your own expertise.

Procedure

1. Configure the AAS so that it only uses work processes of types of DIA and BTC.

Adjust the following instance profile parameters of the AAS so that no work processes of type UPD, UP2, or SPO are used:

Parameter	Value
rdisp/wp_no_vb	0
rdisp/wp_no_vb2	0
rdisp/sp_no_spo	0

2. Exclude the AAS from all logon groups using transaction SMLG.
3. Exclude the AAS from all RFC server groups using transaction RZ12.
4. Modify the RFC destinations so that an application server that is not an AAS is used as the gateway host.

In transaction SM59, open one after the other all RFC destinations for external hosts that cannot be accessed from the AAS. Specify for each destination in the *Gateway* options on the *Technical Settings* tab an application server host that can access the corresponding external host.

5. Exclude the AAS from batch processing.

In transaction SM61, define a group SAP_DEFAULT_BTC and add all application servers except the AAS to it.

6. Exclude the AAS from QIN or QOUT scheduler for queued RFC.

In transaction RZ12, define one or more dedicated groups that contain all application servers except the AAS. Assign these groups using transactions SMQS and SMQR.

7. Exclude the AAS from logical workflow destinations.

In transaction SM59, define a reference destination WORKFLOW_LOCAL_<CLIENT> that does not contain the AAS. If the reference destination already exists, adjust it accordingly.

- Exclude the AAS from background RFC processing.

In transaction `RZ12`, define a reference logon group that does not contain the AAS. Then carry out the following configuration in transaction `SBGRFCCONF`:

Tab	Field	Action
Scheduler System	Supervisor Srv. Grp	Reference the defined logon group
Define Inbound Dest.	Logon/Server group	Reference the defined logon group
Scheduler App	Server	Select the AAS in the list of the application servers. Then set for it the value in the field Scheduler Number to 0 in both the Inbound and Outbound sections.

- Consider certain corrections for systems used as embedded BW.

Make sure that the corrections from SAP Note [1488762](#) have been implemented so that any extractions use the RFC server group `BW_EXTRACTION`. See also SAP Notes [1626778](#) and [253441](#) for more information.

- Avoid timeout issues between the AAS and the enqueue server.

Follow the recommendations in SAP Note [3125994](#). Among other things, adjust the settings for TCP keepalive on all SAP servers in the operating system as follows:

- If the system is running with the standalone enqueue server v1 (*enqueue server process = "enserver"*), set the parameter *enque/encni/set_so_keepalive = TRUE* in the ASCS instance profile. Note that this requires a restart of the ASCS to activate the parameter.
- If the system is running with the standalone enqueue server v2 (*enqueue server process = "enq_server"*), the TCP keepalive element can be ignored.

- Adjust the settings on Azure Basic ILB for source systems running on MS Azure.

If an Azure load balancer is used, adjust the settings on Azure Basic ILB as follows:

- Set *Idle timeout (minutes)* to the maximum value of 30 minutes.
- Enable *Floating IP (direct server return)*.
- Make sure that you do **NOT** use *Network Virtual Appliances (NVA) for SAP on Azure*. For more information, see SAP Note [2731110](#).

5 Running the Software Update Manager

This part of the document contains information about the use of the Software Update Manager.

In section *Working with SUM Tool*, we inform you about important aspects on how to start and to use the SUM, and how to use the additional tools such as SUM Observer Monitor or MailNotifier.

In section *Important Actions During the Roadmap Steps* we mention important actions and entries to which you to pay attention, or that you have to must carry out.

When the update procedure is finished, you still have some further *options after the SUM run*. You can evaluate SUM and give feedback to the update procedure, you can run SUM again either for another update, or you can repeat an update without reentering system parameter values.

Finally, you can stop the Software Update Manager completely.

If you run a conversion including a database migration, you find *Additional Information for Database Migration Option*, for example, about the special DMO features or the migration tools.

5.1 Working with the SUM Tool

5.1.1 Prerequisites and Introductory Information

This section provides information about starting and running the Software Update Manager.

Prerequisites

Before you run the Software Update Manager, make sure that the following prerequisites are fulfilled:

- Make sure that the communication ports 1128 and 1129 of your system are open and not blocked by third-party software such as a firewall to ensure the correct operation of the SAP Host Agent. For more information, see [TCP/IP Ports of All SAP Products](#).
- Your system is up and running, including all system instances and all system processes. Do not stop the system manually. The Software Update Manager stops and starts it when needed.
- You are logged on to the update host as user <SID>adm.
- User <SID>adm has the required permissions:
The <SID>adm user has to be the owner and have full (*xrw*) permissions on all files in the `/usr/sap/<SID>` and `/sapmnt/<SID>` directories. If symbolic links are used, <SID>adm has to be the owner of these links as well.

Introductory Information

Note the following:

- All required planning and preparation actions have to be completed.
- The Software Update Manager controls the entire procedure, from checking the system requirements and importing the necessary programs through stopping production operation until production operation is resumed. The procedure is divided up into a number of different roadmap steps. The roadmap steps are in turn divided into individual steps. The successful completion of a step is a precondition for the success of all subsequent steps.
For a complete list of all steps, see the `phaseslist.xml` file available in the directory `<path to SUM directory>/SUM/abap/doc`.
Alternatively, you can use the SUM Analysis .
- The Software Update Manager can run on any host with an application server instance.
-
- **SPS Update:** All customer implementations to SAP exit function modules within the SAP BASIS are disabled on the shadow instance at the beginning of the update procedure. They are re-enabled at the end of the downtime so that they can be used productively again in the updated system.
The reason is, that SAP exit function modules with access to tables can be implemented within customer enhancement projects (R3TR CMOD). However, this could lead to errors during the update because these tables do not exist in the shadow system.
- To monitor the procedure, you can use the logs created by the Software Update Manager. To open them use either the *Logs* item in the SUM menu bar, or the log tail viewer in the user menu (see also: [SUM UI: Menu Bar \[page 31\]](#)). Alternatively, use the `SUM Analysis` utility.
- Many steps require no user input. In the following chapters, you can find a description of all necessary user input.
- User actions are also required when errors occur. If an error occurs, correct it and repeat the step in which the error has occurred. Once the step has been repeated successfully, you can continue with the update.

5.1.2 Meeting the Requirements for the SUM Directory

Context

When the SUM archive is unpacked on the host where the tool is initially started, the `SUM` directory is also created and data and programs are copied to this directory. For more information on the `SUM` directory, see [SUM Directory \[page 50\]](#).

Note

If a directory with this name already exists, it has to be empty. Otherwise, the startup of the update fails.

The update directory can be a soft link to another physical directory.

Procedure

Make sure that there is enough free disk space for the `SUM` directory. This space is required for the update and the logs and is distributed among several [subdirectories \[page 50\]](#). For an estimation of the disk space needed for the `SUM` directory, see the update guide that is specific to your product.

Note

The size in percentage of the subdirectories `data` and `log` of the directory `<SUM directory>/abap` may vary depending on several factors.

The following factors increase the amount of free space needed for these directories:

- Your systems include extensive customer developments or large amounts of individual documentation.
- You want to include Support Packages and add-ons in the update procedure.
- Your systems contain languages other than English or German.


5.1.3 Downloading and Unpacking the Software Update Manager

Procedure

1. Download the latest version of the Software Update Manager as SUM archive from the main Software Logistics Toolset page on the Support Portal at:

<http://support.sap.com/slttoolset>  [System Maintenance](#)  [Software Update Manager \(SUM\)](#)
 [Download SUM](#) 

Note

The latest version of the Software Update Manager can automatically be downloaded when calculating the target software components and the stack configuration file in SAP Maintenance Planner. For more information about using this function, see <https://blogs.sap.com/2015/07/09/maintenance-planner-2/> .

2. Log on to the host on which you want to run the Software Update Manager as user `<SID>adm`.
3. Unpack the Software Update Manager package with the following command:

```
SAPCAR -xf <download directory>/<path>/<Archive>.SAR -R /usr/sap/<SID>
```

This command creates the directory `SUM` under the `/usr/sap/<SID>` directory. You can also specify another directory. Hereafter, the directory `<path to SUM directory>/SUM` is referred to as `<update directory>`.

Caution

- According to the SAP Product Standard Security, sensitive data that is stored permanently (such as in a file system) must be protected against unauthorized access. This can be achieved by encrypting the file system. Since the Software Update Manager cannot provide file system

encryption, you must unpack the downloaded Software Update Manager package on an encrypted file system to protect sensitive data.

- Do not unpack SUM in the `DIR_GLOBAL` directory, as this can lead to issues during the update.
- Do not extract the Software Update Manager to a directory starting with `/usr/sap/<any capital three letters>/` where `<any capital three letters>` is not the SID of the managed system.

Note

- The complete path to the SUM directory must not exceed 25 characters.
- The SAP profile parameter `DIR_PUT` is the parameter used to define the directory in which temporary data is stored during the update. If you perform an update with multiple application server instances, make sure that:
 - The value of the SAP profile parameter `DIR_PUT` matches the current `<update directory>/abap`.
 - The parameter `DIR_PUT` is known to all application server instances.
 - All application server instances have read/write-permission for the `<update directory>`.

- If you want to run several updates in parallel on the same host, you have to unpack one SUM instance in each directory of the respective SID directories.

For example, if you have the SAP system IDs `AB1` and `AB2`, unpack one SUM instance in the respective directory of each SAP system ID. When starting the SUM user interface, you enter the corresponding SAP system ID in the URL, thus connecting to the corresponding SUM instance. For more information, see [Starting or Restarting the Software Update Manager \[page 123\]](#). Note that when running several SUM instances using the default location `/usr/sap/<SID>` is mandatory. Note that SUM creates a shadow instance. Therefore, ensure that SUM instances running in parallel on a host use different instance numbers for these shadow instances. To specify the shadow instance number for each SUM instance, switch on the expert mode, or access the [SUM Utilities \(Extended UI\) \[page 39\]](#) and choose **SUM Parameters** > **SUM Shadow System Parameters**.

5.1.4 Registering SUM in SAP Host Agent

A precondition for the use of SUM is its registration in the SAP Host Agent.

Prerequisites

- Make sure that you have installed on all application servers instances the latest version of the SAP Host Agent. Check the SAP Software Download Corner at <http://support.sap.com/swdc> for the versions that are available to download.
For more information, such as the deprecation of lower versions, see SAP Note [2130510](#).
For additional information regarding SAP Host Agent, see SAP Notes [1031096](#) and [1907566](#).
- We recommend using the Secure Hypertext Transmission Protocol (HTTPS) for [Starting or Restarting the Software Update Manager \[page 123\]](#): Make sure that the secure socket layer (SSL) for SAP Host Agent is

configured as described in the SAP Host Agent documentation in https://help.sap.com/viewer/host_agent

► [SAP Host Agent Configuration](#) ► [SSL Configuration for the SAP Host Agent](#) ►

Note

https is the default as of SAP Host Agent 7.22 PL 52

- The secure `https` communications protocol is the default to run the Software Update Manager. The URL with `http` is automatically redirected to the secure `https`, if you
 - use the insecure `http` communication protocol including port 1128. and
 - have installed the SAP Host Agent 7.22 with patch level 52 or a higher SAP Host Agent version
- The host agent issues a self-signed certificate automatically if no other certificate is configured. However, it can cause web browsers to issue warnings or error messages because self-signed certificates are considered untrusted.

For more information about this SAP Host Agent, see SAP Note [3036093](#) and on the SAP Help Portal the chapter [SSL Configuration for the SAP Host Agent](#) in the SAP Host Agent Guide..

- Make sure that you do not run the Software Update Manager during daylight saving time shifts. Otherwise, the update can fail.
- Always perform the procedure from within the SUM directory.

Context

SAP Host Agent is an agent that can accomplish several lifecycle management tasks, such as:

- operating system monitoring
- database monitoring
- system instance control
- system instance provisioning

Before you start an update, register the Software Update Manager in SAP Host Agent so that the operations and commands to the updated system are executed using SAP Host Agent mechanisms.

Procedure

- Register the Software Update Manager for SAP Host Agent by entering the following command in the PowerShell console as follows:

```
<SUM directory>/abap/SUMSTART confighostagent
```

Note

Always call the script with the `root` user.

- Optionally, you can customize the user authorization.

By default, the <SID>adm user is authorized to control the SUM user interface (UI). If you want to authorize a different user, you have to edit the file <HOSTAGENT directory>/exe/operations.d/sumabap.conf as follows:

1. At the end of the following line, separated with a comma, add the name of the user for the UI authorization :

```
Authorization:[SID:#required#tolower]adm
```

❁ Example

For user slcui, the line must look as follows:

```
Authorization:[SID:#required#tolower]adm, slcui
```

2. Restart the SAP Host Agent using the following commands:

```
<HOSTAGENT directory>/exe/saphostexec -restart
```

5.1.5 Starting or Restarting the Software Update Manager

This section describes how you start the SUM user interface and the SUM back-end process, or alternatively how you restart SUM if an error, a terminated step, or a system failure occurred.

Prerequisites

- You have met the requirements for the update.
- The SAP system and the database have been started.
- You have registered SUM in SAP Host Agent as described in [Registering SUM in SAP Host Agent \[page 121\]](#).
- The SAPCAR version that is referenced in the environment variable PATH is identical with the one that is located in the kernel directory. In addition, no reference to any other SAPCAR version must exist in the PATH variable.
- You have downloaded and unpacked the latest version of the [Downloading and Unpacking the Software Update Manager \[page 120\]](#) and the software packages that you need for the update.
- When using Internet Explorer, you have to make sure that the URL relevant for your system is listed in the “Trusted” security zone. To do so, proceed as described in the Internet Explorer documentation.
- In case of a SUM restart, you have corrected the errors as described in section [A.2 Troubleshooting](#) of the *SUM Guide*.

📌 Note

If you have various systems running on the same application server host, you can start a further Software Update Manager procedure on these systems for system maintenance.

The prerequisite is that the SUM directories remain unchanged and follow the standard path as described in chapter SUM directories.

Procedure

1. Open a web browser window.
2. In the address bar, enter the following URL: `https://<fully qualified hostname>:1129/lms1/sumabap/<SID>/slui`

Note

- Replace `<SID>` with your system ID.
- The system ID in the URL must be written in uppercase letters. Otherwise, errors can occur in the user interface.
- 1129 is the https port of the SAP Host Agent.
- If the SSL has not been configured, use http instead of https at the beginning of the URL and use port 1128 (`http://<fully qualified hostname>:1128/lms1/sumabap/<SID>/slui`). When using SAP Host Agent 7.22 with patch level 52 or a higher version, the URL is automatically redirected to https. For more information about this SAP Host Agent, see [Registering SUM in SAP Host Agent \[page 121\]](#).

3. In the dialog box that appears, enter the user name `<SID>adm` and the password.

The SAP Host Agent starts the Software Update Manager, and its user interface is displayed in the web browser.

Note

In case of a restart, SUM continues from the point where it had previously stopped.

Start Options: By default, the Software Update Manager starts without any special parameters, and you can skip the field *Start Options*. If you want to start with special parameters provided by SAP, enter them in the field *Start Options* and choose *Next*.

5.1.6 Starting the SUM Observer Monitor

The Software Update Manager offers an additional SUM user interface mode called the `observer` mode. This mode is displayed as `SUM observer monitor`.

Prerequisites

- You have created a user `<SID>obs` and set a password for this user.

Caution

For security reasons, do not use the user `<SID>adm` for the observer mode.

Linux only: The `<SID>obs` user must be added to the `sapsys` group.

- You have started the Software Update Manager at least one time with the SUM user interface as described in [Starting or Restarting the Software Update Manager \[page 123\]](#).
- You have made sure that the corresponding observer progress file `SUMOBSERVER.XML` exists in the subdirectory `<SUM_directory>/abap/doc/analysis`.

Note

The `observer` mode has been configured automatically once you have executed the `SUMSTART` script as described in [Registering SUM in SAP Host Agent \[page 121\]](#).

For more information, see [SUM Observer Monitor \[page 43\]](#).

Procedure

1. In the address bar of your browser, enter the following URL:

```
https://<fully qualified hostname>:1129/lms1/sumobserver/<SID>/monitor/index.html
```

- Replace `<SID>` with your system ID.
- The system ID in the URL must be written in uppercase letters.
- 1129 is the https port of the SAP Host Agent.
- If the SSL has not been configured, use `http` instead of `https` at the beginning of the URL and use port 1128:

```
http://<fully qualified hostname>:1128/lms1/sumobserver/<SID>/monitor/index.html
```

Note

If you have installed the SAP Host Agent as of version 7.22 with patch level 52, the URL with `http` is automatically redirected to `https`. See [Registering SUM in SAP Host Agent \[page 121\]](#) for more information.

2. Enter the observer user `<SID>obs` and the configured password.

5.1.7 Starting the MailNotifier

The MailNotifier informs you via e-mail when the Software Update Manager (SUM) displays a dialog that requires user interaction.

Prerequisites

- You have prepared the MailNotifier tool as described in [SUM MailNotifier \[page 47\]](#).
- You have started the Software Update Manager as described in [Starting or Restarting the Software Update Manager \[page 123\]](#).

Context

Especially during long-running phases, you have to check the SUM UI frequently to see if a dialog requires any actions or entries from you. To avoid frequent checking, you can configure the MailNotifier tool that notifies you as soon as a dialog is waiting for your input.

To start the MailNotifier, proceed as follows:

Procedure

1. Open a command line interface on the PC or host to which you have copied the `MailNotifierApp` files.
 - a. If you want so start the MailNotifier by referencing the properties file, enter the following:

```
java -jar MailNotifierApp.jar properties=<path-to-props-file>
```

- b. If you want so start the MailNotifier by providing the parameters in the command line, enter the following:

```
java -jar MailNotifierApp.jar sum.sid=<SID> sum.user=<user> <further parameters property=value, if available>
```

2. If you did not enter your passwords in the properties file or on the command line, which is what we strongly recommend for security reasons, enter the passwords in the command line interface when the MailNotifier prompts you.

The tool starts running

3. To make sure that the configuration is working, check the initial mail from the MailNotifier. If necessary, correct the configuration.

Results

If the configuration is correct, the MailNotifier starts checking the update frequently according to your parameter settings. If a dialog is displayed in the Software Update Manager that requires your input, the tool sends an e-mail notification.

For more information about the tool, see [SUM MailNotifier \[page 47\]](#).

5.1.8 Resetting the Update

The Software Update Manager offers the option to reset the update.

Prerequisites

- Make sure that the downtime has not yet started.
As of the beginning of the downtime, a reset is not possible anymore. To reset the update after the downtime has started, use the system backup created before the SUM process.
- Make sure that the SUM directory has not been cleaned up.
After the update procedure comes to an end, the Software Update Manager offers the option *Cleanup* in the user menu. It cleans up the SUM directory and terminates all running SAPup processes on the server. Note that after a cleanup, you cannot reset the update. For example, you cannot carry out a manual reset on the operating system level after a cleanup. Use a system backup created before the update procedure. Note that a cleanup is mandatory after a reset has been completed.
- If you use the database migration option, make sure that anyDB is still available.

Context

When you choose the *Reset* option, the system is set to a state that allows the update procedure to be restarted from the beginning.

ⓘ Note

Database Migration Option (DMO)

If you are executing the database migration option of the Software Update Manager, you can reset the update during any roadmap step. For more information, see the [Reset Option \[page 194\]](#).

All migration activities are also revoked, and the connection to the source database is reestablished. However, consider the following limitations:

- The target database client is not deleted from any AS instance automatically.
- BR tools are not restored.
- The user `DBACOCKPIT` and related roles are not deleted in the target database.

Excluding Customer-Specific Languages

The removal or modification of customer-specific languages in the tables `T002C` and `TLSY7` is executed immediately. A later reset of the update procedure does not restore the entries. See also: [Removing or Excluding Languages \[page 74\]](#).

Procedure

From the [SUM UI: Menu Bar \[page 31\]](#), open the *More* menu and choose *Reset*.

This possibility depends on the phase that the update procedure is currently going through. The update procedure consists of phases that can be reset and phases that you cannot reset directly. Whenever you are in a resettable phase, the Software Update Manager offers you the *Reset* option. If not, choose on the SUM UI *Back* repeatedly until you are in a resettable phase and the *Reset* option appears in the user menu. If the update procedure has not progressed far and you choose *Back* repeatedly, the *Welcome* dialog appears.

After you have chosen *Reset*, the Software Update Manager indicates the successful reset procedure and asks you to clean up the SUM directory. Choose *Cleanup* from the user menu. After the cleanup is completed, a message appears on the user interface indicating that the SUM ABAP server processes ("SAPup") have been ended. You can close the browser window or the browser tab page, or you can start the update procedure from the beginning.

Note

For more information about the user menu, see [SUM UI: Menu Bar \[page 31\]](#).

5.1.9 Breakpoints During the Update

You can use breakpoints to pause the update procedure at a specified point.

I. Setting Breakpoints

I.a. Setting Breakpoints in the SUM User Interface

On the right-hand side of the browser window, the SUM user interface offers you the option to maintain breakpoints from a list of available breakpoints. You can sort, filter, and search for breakpoints. The icons for the breakpoint status are described in the legend. For more information, see [SUM UI: Menu Bar \[page 31\]](#).

The breakpoint list displays icons in three different colors:

- Green - breakpoint lies in the past
- Orange - breakpoint lies in the currently processed phase
- Blue - breakpoint lies in a future phase

After opening the list, it scrolls automatically to a position where the breakpoint of the current phase is listed at the fourth position from the top, if available. You can scroll away from the position, but each time you choose *Refresh*, the breakpoint list is refreshed and displays the current phase highlighted at the fourth position of the table again.

If SUM stops at a selected breakpoint, it displays a dialog with the options listed in the following in section *Possible Options in the Breakpoint Dialog*.

Note

Stop at Next Phase

By means of the button *Stop Next Phase* located above the breakpoints list, you can switch on or off the single-step mode. With this feature, you can pause the procedure at every next phase.

When the next phase is reached, a selection dialog appears on the SUM UI with the following options.

- Continue in single-step mode (stop before each phase)
- Delete breakpoints and continue
- End single-step mode and continue to next breakpoint

I.b. Setting Breakpoints at Operating System Level

Alternatively, you can enter the following commands when you are in the update directory:

- Change the directory with the following command:
`cd <update directory>/abap/bin`
- If you want the ABAP program to stop at the **next** step, enter the following command:
`./SAPup stop`
- If you want the ABAP program to stop before a **specific** phase, enter the following command:
`./SAPup stop <phase name>`
- If you want the ABAP program to stop after a **specific** phase, enter the following command:
`./SAPup stop -after <phase name>`

Note

It is not possible to combine the commands `./SAPup stop <phase name>` and `./SAPup stop -after <phase name>`. The `SAPup stop -after <phase name>` command overwrites the other command and makes it ineffective. That is, you cannot stop the procedure before a phase and then immediately after the phase.

II. Possible Options in the Breakpoint Dialog

Note

Depending on your scenario and system, the available options may vary.

Once you have set a breakpoint, the Software Update Manager stops at that specific point and displays a dialog with the following options:

- *Continue to next breakpoint*
SUM continues the update automatically until the next breakpoint is reached. Then, the breakpoints dialog is displayed again.
- *Continue in single step mode (stop before each phase)*
SUM continues the process phase by phase. You manually move on to each next phase of the process, unless you choose another option.
- *Delete breakpoints and continue*
SUM deletes all set breakpoints and continues without any further stop.
- *End single step mode and continue to next breakpoint*
SUM returns to its regular operation, that is, continues automatically until it reaches the next breakpoint, and not at the next phase. When the next breakpoint is reached, the breakpoints dialog is displayed again.

- [Exit program](#)
The update process stops and you exit SUM. When you restart the update process, the breakpoint dialog appears again.

5.1.10 Verifying SAP Archives (Digital Signature Handling)

SUM offers the option to check the signature of SAP software archives that are located in the download folder.

Context

SAP offers digital signatures for selected software archives that are provided in the software download area of the SAP Support Portal. SAP Note [2342412](#) informs you about software archives and media that are currently signed by SAP. The signature of these archives can be verified during the update procedure.

At the beginning of the update, you can decide on the first dialog of the SUM (on which the download directory is specified) whether to check the authenticity of the archives. After selecting the appropriate checkbox, the Software Update Manager triggers during the update the signature check, which is carried out internally by the `SAPCAR` tool.

In addition, you can include a Certification Revocation List (CRL), which is provided by SAP and updated on a monthly basis. The CRL contains certifications that were revoked after the delivery of software archives. If you want to perform an additional check for revoked signatures, download the CRL and copy it to the download directory before you start the update.

If any archives with missing or wrong signatures are detected during the update, the Software Update Manager displays a dialog in which these archives are listed. In this case, you can either correct the archives in download directory and run the check again afterwards, or you can ignore the messages and continue with the update.

To correct the download directory, return to the initial dialog on which you find an error message stating that the dialog was canceled by the user.

Note

The initial dialog is then shown with an enhanced text that was not part of its first display.

You can now provide the download directory with new archives with new or updated signatures. Afterwards, keep the option [Check archives authenticity](#) selected and repeat the update. The signature check is triggered again. Alternatively, you can now switch off the signature check by deselecting the option. You can then repeat the update with disabled signature checking.

Procedure

1. On the initial dialog [Archive Verification](#), select the checkbox [Check archives authenticity](#) to switch on the signature checking.

2. Optional: Include the signature revocation list into the signature check by downloading the list from <https://tcs.mysap.com/crl/crlbag.p7s> and adding it to the download directory.

If SUM does not find a CRL in the download directory, it does not check the signatures for revocation.

3. Start the update procedure, and correct or ignore missing or wrong signatures.

A dialog is displayed that informs you if missing or wrong signatures are detected. You have the option to either ignore the messages, to correct the archives, or to switch off the signature checking.

- If you want to ignore the messages, select the checkbox *Confirm and continue the procedure* and choose *Next*.
- If you want to provide new archives with new or updated signatures, choose *Back* to return to the initial dialog. Maintain the archives in the download directory, keep *Check archives authenticity* selected, and choose *Next* to repeat the update procedure with a new signature check.
- If you want to switch off the signature checking, choose *Back* to return to the initial dialog. Deselect the checkbox *Check archives authenticity*, and choose *Next* to repeat the update procedure but with no further signature check.

5.1.11 Checking the Prerequisites for the Conversion with SUM

The Software Update Manager offers you two options to check whether the requirements for a system conversion are met.

Context

During the [Initial Dialogs for the Scenario Specification \(Get Roadmap\) \[page 53\]](#), you are prompted to specify the scenario strategy. One of the possible options is the *Prerequisite Check Tool* that allows you to check if requirements for a system conversion are fulfilled.

The following checks are available:

- Prerequisite Check (see: [Performing a Prerequisites Check \[page 132\]](#))
- Prerequisite Check Extended (see: [Performing an Extended Prerequisites Check \[page 133\]](#))

Procedure

Select the wanted option for the prerequisite check.

Note

Under certain conditions, the check is started directly based on a calculation in the SAP Maintenance Planner. The *Prerequisite Check Extended* is then not offered for selection.

5.1.11.1 Performing a Prerequisites Check

You perform a prerequisite check to check the source system before you start the SUM procedure.

Context

The aim of the prerequisite check is to find out if aspects such as source operating system, database version, SPAM version, or others meet the requirements for the target system.

In addition, the prerequisite check lists activities that you should carry out before you start the technical system conversion. An example might be the *Simplification Item Check*.

To perform the prerequisite check using the Software Update Manager, proceed as follows:

Note

- Make sure that the tools
 - Support Package Manager (SPAM)
 - SAP Add-On Installation Tool (SAINT)are already installed on your source system with version 47 or higher.
- After a successful check run, perform a cleanup of the Software Update Manager first before you start the normal update or conversion procedure.
In case the check aborts with an error, reset the Software Update Manager first and then perform a cleanup. Afterwards you can repeat the check, or you can start an update or conversion procedure. You can find both the *Reset* and the *Cleanup* option in the user menu as described in [SUM UI: Menu Bar \[page 31\]](#).

Procedure

1. Start the Software Update Manager.

For more information, see [Starting or Restarting the Software Update Manager \[page 123\]](#).

2. Specify the scenario category **with** `stack.xml` configuration file.

Enter the full path of the `stack.xml` configuration file calculated by the *Maintenance Planner*. For more information, see [Specifying the Scenario to Get the Roadmap \[page 138\]](#).

3. Select the scenario strategy *Prerequisite Check Tool* and the option *Prerequisite Check* to start the check.
4. After the check, analyze afterwards the corresponding log file. Its file name is provided by the check tool.

Note

During the prerequisite check, the Software Update Manager also performs in the phase `CHECK4NOTES_CHKTL` a check for SAP Notes that are required for the software maintenance process. As a result, you get a list of required SAP Notes in section *Required SAP Notes* of the result list. Note that you can ignore SAP Notes that are classified by SAP Note Assistant as *Cannot be Implemented* or *Obsolete*.

5.1.11.2 Performing an Extended Prerequisites Check

You perform an extended prerequisite check of your source system before you start a system conversion to SAP S/4HANA.

Context

Prerequisite Check Extended

The *Prerequisite Check Extended* performs a maintenance procedure such as a system conversion but not for productive use. The check ends before the downtime would have started.

The Software Update Manager ignores the relevant errors of checks and collects them in a list in `CSV` format. The list is available at the end of the check. It allows you to analyze the ignored errors so that you can solve them and start a regular system conversion from the beginning.

You can ignore errors from the following checks:

- Simplification items check
- Check for inconsistencies in custom software components and ABAP repository objects
- Version check of operating system and database
- Check for safety transport requests for objects adjusted with `SDDD`
- Check for unreleased repairs and corrections
- Check for SAP Notes that have to be implemented using Note Assistant

Note

- If you have selected the checkbox *Add-On Verification* in the dialog about the additional parameters, you can decide in addition on all installed add-ons as described in [Important Entries for the Configuration Roadmap Step \[page 147\]](#) → [Decision About Add-Ons \(Phase IS_SELECT\)](#). If the checkbox is not selected, the Software Update Manager handles add-ons without a version for the SAP S/4HANA target release internally as passive deletions in the extended precheck mode.
- The extended prerequisites check allows you to ignore detected errors. Note, however, that an ignored error can lead to a further error in the remaining course of the check.

Prerequisite Check Extended without Target Database

This check is a slightly reduced version of the extended prerequisites check described previously. It is applicable if no SAP HANA target database is available yet. In this case, the check runs only on the source database and certain dialogs related to the transfer are not displayed.

Procedure

1. Start the Software Update Manager.

For more information, see [Starting or Restarting the Software Update Manager \[page 123\]](#).

2. Specify the scenario category **with** `stack.xml` configuration file.

Enter the full path of the `stack.xml` configuration file calculated by the *Maintenance Planner*. For more information, see [Specifying the Scenario to Get the Roadmap \[page 138\]](#).

3. Select the scenario strategy *Prerequisite Check Tool* and the option *Prerequisite Check Extended* or *Prerequisite Check Extended without Target Database* to start the check.

Note

If relevant add-ons or business functions for the SAP S/4HANA version are not available, the *SAP Maintenance Planner* calculates a special `check.xml` file instead of the regular `stack.xml`. However, the new `xml` file is provided internally to the Software Update Manager as `stack.xml`.

In this case, the option *Prerequisite Check Extended* is not displayed and the extended prerequisites check starts automatically.

You can recognize the extended prerequisite check at the top of the `SUM UI`. The upper line displays as normal the applied tool version. However, the lower line displays *Prerequisite Check Extended* or *Prerequisite Check Extended without Target Database* instead of the current scenario and strategy.

During the extended prerequisite check run, a list in `csv` format is being created. It collects the ignored errors from the checks mentioned at the beginning of this topic.

At the end of roadmap step *Configuration*, you are prompted to confirm that you want to ignore failed checks and continue. Furthermore, you confirm during the roadmap step *Preprocessing* several times that you want to add errors to the error list and continue.

The check ends before the downtime would have started. The downtime cannot be started technically at this point in time.

After the check run is finished, the Software Update Manager is reset automatically to its initial state.

4. Analyze the collected ignored errors that are listed in file `precheckext_messages.csv`.

5.1.12 Integrating Customer Transports into the Update Procedure

This section deals with the Software Update Manager feature to integrate customer transports into the update procedure to reduce business downtime.

Prerequisites

- The customer transports must be made in a way that they can be imported in an `IMPORT-ALL` mode with return code 4 or 0.
- The customer transports must be tested successfully and verified.
- Make sure that you apply the latest `tp` and `R3trans` for the source release, and that you include the latest `tp` and `R3trans` in the download directory for the target release.
- For more information about prerequisites and restrictions, see SAP Note [1759080](#).

Context

The `Customer Transport Integration` feature offers you the possibility to integrate your transport requests into the update procedure to reduce business downtime. If you want to use the feature, the update procedure differs from the standard update procedure.

For more information about the feature, see [Integration of Customer Transports \[page 76\]](#).

Note

- To avoid errors in the `Switch Framework` during the activation, apply SAP Notes [585789](#), [574102](#), [1386114](#) and [1695884](#) in the source release. If the notes are obsolete, do not apply them!
- The following BADIs cannot be implemented during the update procedure as part of the customer transports:
 - `SFW_BF_STATE_CHANGE`
 - `SFW_SWITCH_STATE_CHANGE`
 - `SFW_SWITCH_CHANGED`

Procedure

1. Provide the Software Update Manager with transport buffer file

The transport buffer file is a list of customer transport objects to be imported. The transport buffer file is based on the import queue of the `Transport Management System (TMS)` of the system that you want to update. Make sure that the system use `Extended Transport Control`.

You have two options to provide the file: Either you copy an existing buffer file to the SUM directory, where it can be consumed, or you use a wizard.

- If you want to copy the buffer file, change first to operating system level. Then go to the subdirectory `buffer` of the transport directory in the system that you want to upgrade. Copy the file `<SID of the system to be upgraded>` to the download directory of the Software Update Manager. The buffer file contains all transports, which are part of the import queue and to be integrated into the update procedure. Check carefully that you integrate only the wanted transports into the update procedure.
- If you want to use a wizard, you can use the *Customer Transport Upgrade Integration Wizard*. SAP Note [2450902](#) gives you more information on how to generate the buffer file, and on how to include the file into the update procedure.

Caution

The buffer file must not contain buffer lines with `umodes F` or `C`.

Note

If `Change Request Management` is used, consider the following:

- Make sure that you only integrate transports of changes that were tested successfully. The `Change Request Management` cannot control it.

- Use transports for the production system only from projects with which you want to go live.

2. Monitor the parameters `CTC` and `mainimp_proc`.

In the transport buffer file, the customer transports are written in the correct order with client-specific `CTC=1` format. The update procedure automatically sets the parameter `CTC` to 1 in the transport profiles (`TPP files`) of the `tp` phases for customer transport integration. This default parameter `CTC=1` activates the client-specific transport control for all managed systems and enables the transport routing for multiple clients in the update procedure.

The parameter `mainimp_proc` must have the value 1.

⚠ Caution

Do not change the settings for the parameters `CTC` and `mainimp_proc` manually.

→ Recommendation

- We recommend configuring the sandbox system in SAP Transport Management System (STMS) just like the production system. Make sure that the `CTC` parameter is identical in both system landscapes.
- We recommend using the selection tool, which is available via the *Customer Transport Upgrade Integration Wizard* in SAP Note [2450902](#). The selection tool supports you in creating the customer buffer and generates it automatically in `CTC=1` format.
- If you do not use the selection tool, and the system is configured in `CTC=0` format, you can adapt the customer buffer using the following command in directory `<transdir>/buffer`:

```
tp fillclient ALL buffer=CUSTOMER defaultclient=100 pf=<DIR_TRANS>/bin/
TP_DOMAIN_<SID>.PFL -dCTC=1
```

3. Start the SUM as described in [Registering SUM in SAP Host Agent \[page 121\]](#) and the SUM user interface as described in [Starting or Restarting the Software Update Manager \[page 123\]](#).
4. During the initial dialogs of the update procedure, SUM asks you whether a `stack.xml` file exists or not.
 - If you want to import your customer transport requests only without performing a standard update procedure, select the scenario category without stack configuration file and choose *Customer Transport Integration only* in the next dialog.
 - If you want to import your customer transport requests during the update, select the scenario category with stack configuration file and specify the `stack.xml` file (name including path). In a further initial dialog concerning the additional parameters, select the *Consider Customer Buffer File* checkbox in the *Customer Transport Integration* section. A subsequent dialog prompts you to enter the path and the name of the buffer file that contains customer transports for the target release.

For more information, see [Making Entries for Scenarios with Configuration File \[page 139\]](#).

5. A dialog appears in phase `SUMASK_CUSTOMER_BUFFER` during the roadmap step *Configuration*.

If you have chosen a scenario **with** stack configuration file and selected that SUM shall consider a customer buffer file, the dialog shows the already entered path and name of the transport buffer file. If necessary, you can change it.

Otherwise, provide here path and name of the transport buffer file, which contains the customer transports to be included.

For the transport profile, preselected values are taken over from the transport profile file. However, you can override the preset value of parameter `VERS_AT_IMP` by defining in this dialog that SUM creates the transport profile versions at import time. Note that this option can prolong the update procedure.

Your entries are validated later on in phase `ADJUSTPRP`. If the validation is successful, no further action is required. Otherwise, the corresponding dialogs are displayed.

6. Note that the dialogs to include SPDD or SPAU transport requests are not displayed during the initial dialogs of SUM in phase `SUMASK_SPDD_SPAU`. SPDD- or SPAU-related transports in the customer buffer are identified automatically during the update procedure.

If necessary, the dialogs for including SPDD or SPAU transport requests are displayed in the `SUMASK_SPDD_SPAU` phase.

7. The Software Update Manager imports and activates one part of the transports in the shadow system and one part during the downtime.
8. If the `Change Request Management` is used to control the transports in your landscape, carry out the following procedure after the update:
 - a. Choose in the SAP Fiori Launchpad of the SAP Solution Manager the *Change Management Launchpad Group*.
 - b. Choose the tile *Administration Cockpit - Change Control Management*.
 - c. Choose the tab *Landscape Overview*.
 - d. Select *Delete Transport Tracking Data* to delete the transport tracking data of one or more selected systems.

You can use this function to delete the buffered transport data information that is contained in the SAP Solution Manager system in the following case: You want to copy a managed system, but the transport history of the central SAP Solution Manager system already contains transport data such as transport statuses and objects.

5.1.13 Importing or Installing Software After Starting the Upgrade

Context

After you have started the upgrade, you may have to import software such as SAP Support Packages, languages, or add-ons (and add-on updates), or you may have to install add-ins of Java software.

Procedure

1. Reset the upgrade procedure as described in [Resetting the Update \[page 127\]](#). If needed, close the browser window or the browser tab page with the SUM user interface.
2. Import or install the required software.
3. Restart the upgrade and repeat the preparation roadmap steps.

If you have closed the browser window or the browser tab page, start the SUM UI again as described in [Starting or Restarting the Software Update Manager \[page 123\]](#). Afterwards, restart the upgrade and repeat the preparation roadmap steps.

5.2 Actions During the Roadmap Steps

5.2.1 Specifying the Scenario to Get the Roadmap

A dialog sequence at the beginning collects the information to determine the wanted scenario.

Context

After you have started the Software Update Manager as described in [Starting or Restarting the Software Update Manager \[page 123\]](#), it displays as a first dialog the *Welcome* page, in which you are prompted to specify the scenario category. Depending on your selection, further dialogs follow. For more information on the scenario determination, see [Initial Dialogs for the Scenario Specification \(Get Roadmap\) \[page 53\]](#).

In a first step, you decide whether you want to use the `stack.xml` configuration file provided by the *SAP Maintenance Planner* or not.

Note

- **Invalid `stack.xml` file**
If a `stack.xml` file is not valid for the SUM procedure, you are informed by the following message: The specified stack file is not valid for system ID <system ID> and installation number <inst.number>.. In this case, specify a valid name and path to the `stack.xml` file.
- **Digitally Signed and Modified `stack.xml` file**
If a valid `stack.xml` file calculated in the SAP Maintenance Planner does not contain a validation hash, which may be the case with older files, the Software Update Manager does not perform a modification check. You are warned by the following message: Warning: The specified stack file is not digitally signed.
However, if the `stack.xml` file contains a validation hash, a modification check is performed. If the stack file has been modified in the meantime, you are warned by the following message: The specified stack file is not the originally calculated stack file. It has been modified.
In both cases, either cancel the procedure and calculate a new original `stack.xml` file, or confirm that you ignore the warning about the modified or non-digitally signed stack file and continue. Note that errors can then occur in the subsequent SUM procedure.
- **Missing scenarios**
If desired scenario strategies are not displayed for selection in the following dialogs, see the log file `selroadmap.log` for more information about the reasons.

Procedure

Specify the Scenario Category

Decide, whether you want to use a scenario with or without `stack.xml` configuration file.

- If you want to use a configuration file, enter a valid name and the path to it. Alternatively, you can browse for the file.
Afterwards, choose *Next* and continue with [Making Entries for Scenarios with Configuration File \[page 139\]](#).
- If you opt to use no configuration file, the field for the stack file name is hidden. Choose *Next* and continue with [Making Entries for Scenarios Without Configuration File \[page 143\]](#).

Results

After all selections have been made, SUM starts the wanted scenario. It is displayed for your information on the SUM UI under the tool name and version. See also [SUM User Interface \(SUM UI\) \[page 24\]](#), → item 1.

The next roadmap step is the *Extraction* roadmap step, in which you have to make entries and specifications, if necessary. For more information, see [Important Entries for the Extraction Roadmap Step \[page 145\]](#).

5.2.1.1 Making Entries for Scenarios with Configuration File

This section is relevant when you have specified a scenario category with `stack.xml` configuration file.

Context

After you have provided the Software Update Manager the path to the download directory with the `stack.xml` file, it checks in the background the source database of your system.

1. The source database is not SAP HANA

If your source database is **NOT** SAP HANA database, you must decide first whether you want to carry out a database migration. For this decision, the following dialog appears first:

- [Decision on Database Migration Option](#)

Then the following dialogs appear successively:

1. [Scenario Strategy](#)
2. [Additional Parameters for <scenario>](#)

2. The source database is SAP HANA

If your source database is already SAP HANA database, and the system requirements are met for the *Homogeneous DMO* scenario, the following dialog appears first:

- [Decision on Database Migration Option](#)

If your source database is SAP HANA database, and the system requirements are **NOT** met for the *Homogeneous DMO* scenario, the following dialogs are displayed immediately one after the other:

1. [Scenario Strategy](#)
2. [Additional Parameters for <scenario>](#)

Procedure

1. Decide on DMO

The dialog [Decision on Database Migration Option](#) appears only, if

- your source database is not SAP HANA database
- your source database is SAP HANA database and the system requirements are met for the *Homogeneous DMO* scenario

If your source database is not SAP HANA database, and you carry out a system conversion to SAP S/4HANA, the dialog is NOT displayed. In this case, a database migration to SAP HANA database is required so that the Software Update Manager performs it automatically.

You can decide if you want to use the Database Migration Option (DMO) of the Software Update Manager to migrate your source database to one of the displayed databases.

If you want to perform a homogeneous DMO scenario, you can confirm the SAP HANA database.

If you do not want to use the DMO feature, choose [No migration](#).

Note

For more information on DMO and the different migration options, see the SAP Note for DMO mentioned in the SAP Support Portal at <http://support.sap.com/slttoolset> > [System Maintenance](#) > [System Maintenance Scenarios](#) > [Database Migration Option \(DMO\) using SUM](#).

2. Specify the scenario strategy

Note

- If desired scenario strategies are not displayed for selection, see the log file `selroadmap.log` for more information about the reasons.
- The dialog [Scenario Strategy](#) is skipped in the following cases:
 - You want to carry out a database migration to SAP ASE database
 - You want to carry out a system conversion to SAP S/4HANA, but the source database does **not** support downtime-optimized database migrations. This can be checked in SAP Note [2547309](#). If the source database is SAP HANA, a system conversion based on near-Zero Downtime Maintenance (nZDM) is possible, as mentioned in the following.

Depending on the scenario category and the decision on DMO, one or more of the following options are available for selection:

- [Single System](#)
- [Standard](#)
- [Downtime-optimized](#)

- [Prerequisite Check Tool](#)

1. [Single System](#)

This option means a longer downtime, and no shadow instance is running in uptime. Note that this option is only available for the update of support packages or support package stacks.

2. [Standard](#)

This option is the standard configuration for the most scenarios.

3. [Downtime-optimized](#)

One of the following variants of this option is available:

Source database is SAP HANA?	Wanted scenario	Available option
Yes	Update or upgrade with business downtime reduction	near-Zero Downtime Maintenance (nZDM) or Zero Downtime Option (ZDO)
No	Update or upgrade with database migration to SAP HANA database	Uptime Migration (Downtime-optimized DMO)
No	Update or upgrade, but no database migration to SAP HANA database	near-Zero Downtime Maintenance (nZDM)
Yes	Conversion to SAP S/4HANA	near-Zero Downtime Maintenance (nZDM)
No, but <ul style="list-style-type: none"> • Oracle • IBM Db2 for Linux, Unix, and Windows (DB6) 	Conversion to SAP S/4HANA	Uptime Migration (Downtime-optimized DMO)
Yes, or <ul style="list-style-type: none"> • Oracle • IBM Db2 for Linux, Unix, and Windows (DB6) 	Downtime-optimized conversion to SAP S/4HANA	Downtime-optimized Conversion

4. [Prerequisite Check Tool](#)

You can choose between three checks:

- The Software Update Manager executes a [Prerequisite Check](#) as a separate step. If specific mandatory preparatory steps are required, the conversion procedure can stop to ensure a consistent system conversion. However, the conversion is stopped if errors persist. options are only available if you perform a system conversion to SAP S/4HANA or a release upgrade to a higher SAP S/4HANA version.
- The [Prerequisite Check Extended](#) executes a system conversion, but not for later productive use. The check ends before the downtime would have started. In contrast to the normal prerequisite check, the Software Update Manager ignores all identified errors and collects them. They are summarized at the end of the uptime in a list.
- The [Prerequisite Check Extended without Target Database](#) is similar to the extended prerequisite check.
You can apply this check if no SAP HANA target database is not available yet. The check runs only on the source database and certain dialogs related to the transfer are not displayed.

For more information, see [Checking the Prerequisites for the Conversion with SUM \[page 131\]](#).

For more information on the scenario strategy options, see [Initial Dialogs for the Scenario Specification \(Get Roadmap\) \[page 53\]](#).

3. Decide on additional parameters

The following options can be available:

- *Archive Verification*
options are only available if you perform a systemSelect this checkbox if you want the authenticity of all archives in the download directory to be checked. For more information, see [Verifying SAP Archives \(Digital Signature Handling\) \[page 130\]](#).
- *Add-On Verification*
Select this checkbox if you want the default add-on handling with all checks to be performed during the prerequisite check extended. You must then decide on all installed add-ons as described in [Important Entries for the Configuration Roadmap Step \[page 147\]](#) -> [Decision About Add-Ons \(Phase IS_SELECT\)](#) . Otherwise, add-ons without a version for the SAP S/4HANA target release are treated internally as passive deletions. For more information, see [Performing an Extended Prerequisites Check \[page 133\]](#).
- *Expert Mode*
Choose this option if you want to adapt additional tool configuration options during the update:
 - The Software Update Manager always displays a Support Package overview in phase BIND_PATCH, even if manual adjustment is not necessary. You can overrule the Support Package level, which is derived from the stack configuration file. For more information about phase BIND_PATCH, see [Important Entries for the Configuration Roadmap Step \[page 147\]](#).
 - You can change the automatically generated instance number for the shadow instance and enter a password manually. (See also: [Shadow Instance Parameters \[page 62\]](#).)
 - You can decide if you want to use saved profiles from a previous update for the shadow system.
- *Customer Transport Integration*
If you
 - have selected the strategy mode *Standard* or *Downtime-optimized*
 - meet the conditions for the Software Update Manager including customer transport requests according to SAP Note [1759080](#) you can include customer transport requests into the procedure to reduce business downtime. Select this option if a customer buffer file that contains customer transports for the target release is to be considered. A subsequent dialog prompts you to enter the path and the name of the buffer file. For more information, see [Integration of Customer Transports \[page 76\]](#). Note that this option is not displayed if the scenario strategy *Single System* has been selected beforehand.

4. Decide on Migration Parameters

You can

- decide on the table selection, if you want to perform a table comparison
- enter the migration key, if necessary
- enable the migration repetition option for testing purposes
- enable the *System Move* option, if you want to move the application server from source to target system

5.2.1.2 Making Entries for Scenarios Without Configuration File

This section is relevant when you have specified a scenario category `without_stack.xml` configuration file.

Context

If you opt to use no configuration file, a dialog with a list of possible scenarios appears. Select one option from the list.

Depending on your selection, further dialogs may appear, or the current dialog is enhanced to maintain further parameters and values.





Procedure

1. Select the scenario to start

The following options are available:

- *DMO without System Update*
Relevant for DMO with target database SAP HANA: You can run a DMO procedure for migration purpose only without updating the SAP system.
- *Customer Transport Integration only*
You want to import your customer transport requests only without performing a standard update procedure. See also [Integration of Customer Transports \[page 76\]](#).
Note that *DMO with Customer Transport Integration* is only supported for target database SAP HANA.
- *Benchmarking Tool*
Relevant for DMO: With this migration tool, you can simulate the export and import processes or the export process only to estimate their speed.
- *Check Cluster and Pool Data*
You want to check the consistency of all pooled or cluster tables in the system. See [Checking Cluster and Pool Data \[page 101\]](#) for more information.
- *Table Comparison Check Tool*
With this stand-alone migration tool, you can compare export and import table checksums for your database. The check can, for example, be relevant for the system copy procedure with the *Software Provisioning Manager*.

Note

- If desired scenario strategies are not displayed for selection, see the log file `selroadmap.log` for more information about the reasons.
- For more information on the DMO-relevant options, see the DMO Guide. The guide is available on the SAP Support Portal at <http://support.sap.com/sltoolset>  [System Maintenance](#)  [Software Update Manager \(SUM\)](#)  [Database Migration Option \(DMO\) using SUM](#) 

2. Specify the Scenario Strategy and Additional Parameters

If you selected in the dialog for selecting the start scenario the option

- *Customer Transport Integration only* or
- *DMO without System Update*

a dialog appears in which you can specify the scenario strategy. The following options are available:

- *Standard (standard configuration)*
This option is the standard configuration for the most scenarios.
- *Downtime-optimized (high configuration)*
Here, you can choose a further option:

Scenario	Additional Option	Use
<i>DMO without System Update</i>	<i>Uptime Migration (downtime-optimized DMO)</i>	If you want to migrate selected large application tables partly in uptime.
<i>Customer Transport Integration only</i>	<i>Near-Zero Downtime Maintenance (nZDM)</i>	If you want to move table structure adaptations and import of new table content partly to uptime processing for a system update or upgrade.

For more information on the scenario strategy options, see [Initial Dialogs for the Scenario Specification \(Get Roadmap\) \[page 53\]](#) and [Making Entries for Scenarios with Configuration File \[page 139\]](#).

Afterwards, more dialogs appear, where you can first switch on the expert mode. Then you enter the required system passwords, after that you can specify the download directory and switch on the archive verification.

In case of *DMO without System Update*, the dialog about the migration parameters appears in addition. In the following, you find more information about it.

3. Configure the Tools

If you selected in the dialog for selecting the start scenario one of the options

- *Benchmarking Tool* or
- *Check Cluster and Pool Data*
- *Table Comparison Check Tool*

the initial dialog is enhanced to select the wanted option for the execution of the tools. Afterwards, further dialogs appear as described in the *DMO Guide*.

4. Decide on Migration Parameters

You can

- decide on the table selection, if you want to perform a table comparison
- enter the migration key, if necessary
- enable the migration repetition option for testing purposes
- enable the *System Move* option, if you want to move application server instance on the host on which the Software Update Manager is running from the source to the target system

Note that this dialog does not appear if you have selected *Customer Transport Integration only*.

5.2.2 Important Entries for the Extraction Roadmap Step

This chapter deals with the roadmap step `EXTRACTION`, in which the Software Update Manager extracts the required software.

In the following, we go into detail of some important phases in which you enter information or confirm the existing values when prompted by the Software Update Manager:

- [Password of User DDIC and Database Users \(Phase SUMASK\) \[page 145\]](#)
- [Checking the Configuration of sapcpe \(Phase PREP_INIT/CHECKPROF_INI\) \[page 145\]](#)
- [SAP Note Implementation \(CHECK4NOTES_TOOL\) \[page 146\]](#)

Password of User DDIC and Database Users (Phase SUMASK)

Enter the password of the user `DDIC` in the system, client `000`.

This password is needed for the RFC connection to the SAP system. To be able to perform all necessary actions, the user `DDIC` needs the authorization `SAP_ALL`.

During the upgrade, you have to unlock the user. After the upgrade, the user is not locked again automatically.

Usually, it is not necessary to change the password of the user `DDIC` during the upgrade. If you do change the password, you have to change it in the original system, the shadow system, and in the Software Update Manager.

For a description of this procedure, see in the section [A.4 Administration](#) of the *SUM guide* the chapter [Changing the DDIC Password](#).

Enter in addition the SAP HANA database-specific passwords for the database user and for the database user `SYSTEM`.

Note

If you work with X509 certificates instead of passwords, the Software Update Manager supports certificates for the schema user and the system user. They can be maintained in the secure user store (`HDBUSERSTORE`) with the key `DEFAULT` for the schema user and the key `SUPER` for the system user.

Moreover, the Software Update Manager asks for the name and the password of the SAP HANA database security user. However, this dialog appears only when the database user `SYSTEM` is deactivated. In this case, the Software Update Manager asks for a *security user* that has the system privilege `USER ADMIN`. It uses this security user to activate the user `SYSTEM` if necessary. Then, the user `SYSTEM` is used for a short time and deactivated again afterwards.

Checking the Configuration of sapcpe (Phase PREP_INIT/CHECKPROF_INI)

During phase `PREP_INIT/CHECKPROF_INI`, the Software Update Manager is checking various profiles and their settings including the configuration of the program `sapcpe` for the kernel replication.

If there is a problem with the configuration of `sapcpe`, phase `PREP_INIT/CHECKPROF_INI` stops and points you to the problem with the kernel directory. Change the replication configuration so that the SAP kernel can be replicated to `$(DIR_INSTANCE)/exe`.

For more information and the corresponding procedure, see SAP Note [1649026](#).

SAP Note Implementation (CHECK4NOTES_TOOL)

A list of SAP Notes is displayed that you have to implement to avoid activation errors later in the procedure. Use the Note Assistant to apply the SAP Notes. After you have implemented all relevant SAP Notes, repeat the phase and then continue the process.

For the automatic implementation of SAP Notes, the system must meet the following prerequisites:

- an application programming interface for the Note Assistant (SNOTE API) is available
- the number range object `CWBRUNID` is available

Depending on the system type, the following additional requirements must also be met:

Update System Type	Requirement
Source system	The SAP Note 3293886 or the corresponding support packages are implemented.
Shadow system (during updates)	An SNOTE API is available. This requires a target system based on <i>SAP S/4HANA foundation 2023 SPS 00</i> or higher.
Temporary system	Both the source system and the shadow system fulfill the requirements.

→ Recommendation

You can ignore inapplicable SAP Notes that are classified as *Cannot be implemented* or *Obsolete*. However, we recommend that you transport both these inapplicable SAP Notes and the implementable SAP Notes into the system landscape. If you do not transport the inapplicable SAP Notes, too, the SUM execution in the follow-up systems stops in this phase because these SAP Notes are not at the latest level. To transport the SAP Notes, use report `SCWN_TRANSPORT_NOTES` as described in SAP Note [1788379](#). This SAP Note explains the report and its use. Note that the report itself is available in `SAP_BASIS` as of release 750.

ⓘ Note

- **Transport-Based Correction Instructions (TCI)**
Note that the Note Assistant also displays SAP Notes with ABAP-related corrections called *SAP Note transport-based correction instructions (TCI)*. You can apply the corrections later on manually using the transaction `SPAM`. For more information, see SAP Note [2187425](#).
- **Automatic Implementation of SAP Notes**
SAP Notes can be implemented automatically using an SNOTE API. This SNOTE API requires information about the user who is authorized to implement SAP Notes, and the name of a workbench transport request with an open repair task.
If the SNOTE API is used in your system, the dialog *Automatic Implementation of SAP Notes* is displayed during the SUM procedure in phase `CHECK4NOTES_ASKSILENT`. Here you are asked in whether the required SAP Notes should be implemented automatically. If you do not want to activate

this option at this point in time, you can implement the required SAP Notes manually with the Note Assistant later in phase `CHECK4NOTES_TOOL`. Note that the dialog *Automatic Implementation of SAP Notes* is not displayed and that you must implement the SAP Notes manually as before, if the `SNOTES` API is not used in the system.

If you activate the automatic implementation of SAP Notes, enter the following information in the dialog:

- Name of the workbench request that you created before. The task created must be of the type *Repair*.
- Name and password of the user for the SAP Notes implementation who you previously created as a copy of the user `DDIC`.

For more information about the system prerequisites for displaying the dialog and for the automatic implementation of SAP Notes, see SAP Note [3293886](#).

- **Prerequisite Check Extended**

If you [perform an extended prerequisite check \[page 133\]](#) of your source system, you can ignore the error message. The listed SAP Notes do not need to be implemented.

For more information about applying SAP Notes with the Note Assistant, see the SAP Help Portal at https://help.sap.com/docs/SAP_NETWEAVER. Navigate then as follows:

- *SAP NetWeaver Platform*: ▶ *Application Help* ▶ *Function-Oriented View* ▶ *Solution Life Cycle Management* ▶ *Software Logistics* ▶ *Note Assistant* ▶
- *ABAP Platform*: ▶ *Administrating the ABAP Platform* ▶ *Solution Life Cycle Management* ▶ *Software Logistics* ▶ *Note Assistant* ▶

5.2.3 Important Entries for the Configuration Roadmap Step

This chapter deals with the roadmap step `Configuration`, in which the Software Update Manager asks for all information required to run the update. Moreover, you take decisions about the software packages to be included in the procedure.

In the following, we go into detail of some important phases:

- [Required Configuration Parameters \(Phase `INITSUBST`\) \[page 148\]](#)
- [Add-On Requirements Check \(Phase `ADDONPRECHECK`\) \[page 148\]](#)
- [Request for Customer Buffer File \(Phase `SUMASK_CUSTOMER_BUFFER`\) \[page 149\]](#)
- [Request for Automatic Modification Adjustment \(Phase `SUMASK_SPDD_SPAU`\) \[page 149\]](#)
- [Request for Single Transport Request \(Phase `SUMASK_SINGLE_TRANSPORT_REQUEST`\) \[page 149\]](#)
- [Decision About Silent Data Migration \(Phase `SUMASK_SDMI_DECISION`\) \[page 150\]](#)
- [Saving Variants \(Phases `JOB_RASUVAR1` and `JOB_RASUVAR2`\) \[page 151\]](#)
- [Tool Versions \(Phase `TOOLCHECK_INI`\) \[page 151\]](#)
- [Add-on Strategy Check \(Phase `ADDON_INFO`\) \[page 152\]](#)
- [Mount Directories for Languages \(Phase `LANG_SELECT`\) \[page 152\]](#)
- [SPAM Version Check \(Phase `SPAMCHK_INI`\) \[page 153\]](#)
- [Decision About Add-Ons \(Phase `IS_SELECT`\) \[page 153\]](#)
- [Passwords for Add-ons \(Phase `ADDONKEY_CHK`\) \[page 155\]](#)

- [Support Package Confirmation Check \(Phase PATCH_CHK3\) \[page 155\]](#)
- [Including Support Packages \(Phase BIND_PATCH\) \[page 155\]](#)
- [Validation of the Specifications in the SUMASK*-Phases \(Phase ADJUSTPRP\) \[page 157\]](#)

Required Configuration Parameters (Phase INITSUBST)

In this dialogue, you are informed about the current scenario strategy, and you are asked to provide further parameters to configure the procedure:

- **Database Archiving Parameter**
Decide on the archiving mode of your database. For more information, see [Database Archiving Parameter \[page 60\]](#).
- **Parallel Processes Configuration**
Maintain parameter values for uptime and downtime processes. For more information, see [Process and Tool Parameters \[page 60\]](#).
- **Batch Host Configuration**
Enter the host name of the background server and select the instance of your system that shall be used as background server. For more information, see [Process and Tool Parameters \[page 60\]](#).
- **APO liveCache Execution Mode**
The APO liveCache must be saved before and restored after the downtime according to sections B and C of report `/SAPAPO/OM_LC_UPGRADE_70`. Select if you want an automatic or manual start of the report.
- **SGEN Execution Mode**
Configure the execution strategy for the ABAP load generation (transaction `SGEN`). For more information, see [SGEN Execution Modes \[page 63\]](#).

Add-On Requirements Check (Phase ADDONPRECHECK)

Note

This step is only relevant if you perform a release upgrade.

In this phase, a check is carried out for each installed add-on component to verify that a valid upgrade strategy exists and therefore that the requirements of the target system are met. This is particularly relevant for third-party add-on components, for which you must manually add the required *Attribute Change Packages (ACP)* and upgrade packages to the download directory.

If the SUM stops with an error message during this phase, you have the option to provide the *ACP* or upgrade package according to the upgrade strategy specified by SAP or the add-on vendor and repeat the check. However, you can also ignore the errors and continue with the SUM procedure. If necessary, you are then prompted to decide in phase `IS_SELECT`.

Note

The check requires SPAM version 85 or higher. The check does not run with a lower version.

Inclusion of Customer Transport Buffer File (Phase SUMASK_CUSTOMER_BUFFER)

This phase is performed if the scenario category *Customer Transport Integration only* has been selected.

The Software Update Manager prompts you enter the name and the path of the customer buffer file that you want to include in the update.

If you have

1. have chosen a scenario **with** stack configuration file
2. selected the *Consider Customer Buffer File* checkbox in the *Customer Transport Integration* section in the initial dialog concerning the additional parameters
3. entered in the subsequent dialog the path and the name of the customer transport buffer file that contains customer transports for the target release

this dialog *Inclusion of Customer Transport Buffer File* in this phase displays the already entered file name again. If necessary, you can change it.

You also get some information about the values for the transport file. For the transport profile, preselected values are taken over from the transport profile file. Moreover, you can decide if you want to override the preset value of the `VERS_AT_IMP` parameter. Your entries are validated later on in phase `ADJUSTPRP`. If the validation is successful, no further action is required. Otherwise, the corresponding dialogs are displayed.

Request for Automatic Modification Adjustment (Phase SUMASK_SPDD_SPAU)

If you have exported an ABAP Dictionary modification adjustment transport on a development system that belongs to the same system track as the current system, you can choose the appropriate request in this phase. In addition, you can decide whether you want to double-check the ABAP Dictionary modifications from that transport manually at the beginning of the `ACT_UPG` phase.

Your entries are validated later on in phase `ADJUSTPRP`. If the validation is then successful, no further action is required. Otherwise, the corresponding dialogs are displayed.

Note

- The phase is skipped if the scenario category *Customer Transport Integration only* has been selected.
- Make sure that the support package level of the transport request matches the target support package level of this update.

Request for Single Transport Request (Phase SUMASK_SINGLE_TRANSPORT_REQUEST)

In certain situations, you can use a single transport request to avoid data loss. The Software Update Manager prompts you enter the single change transport requests that you want to include in the update. Your entries

are validated later on in phase `BIND_PATCH`. If the validation is then successful, no further action is required. Otherwise, the corresponding dialogs are displayed.

The modification adjustment function ignores this request. In addition, the version history for the objects in such a transport request may not be correct after the update.

⚠ Caution

Using the *Single Transport Request* function is risky because it is not imported in the same way as a regular customer transport. For example, the transport is only imported into client 000. Use this function only if the owner of the request can guarantee that it is compatible with the upgrade.

📌 Note


- This phase is skipped if the scenario category *Customer Transport Integration only* has been selected.
- Apart from the single transport request and the requests for the modification adjustment, there is no other way of importing a request into the system before activation, or during the adjustment of the ABAP Dictionary objects.
- For the data and the cofiles of the single transport request, the Software Update Manager first checks the `DIR_TRANS` directory, then the `DIR_PUT` directory. If the wanted transport request exists in one of these directories, it is taken from there. Otherwise, SUM checks the download directory. If the transport request is found here, SUM copies it to the `DIR_PUT` directory for further processing.

Decision About Silent Data Migrations (Phase `SUMASK_SDMI_DECISION`)

📌 Note

This section is only valid for system conversions to SAP S/4HANA or SAP BW/4HANA as of version 2021 or higher.

The *Silent Data Migration Infrastructure (SDMI)* is a framework that enables automatic application data migration during system uptime. For more information about SDMI, see

- the *Upgrade Guide* or the *Conversion Guide* for SAP S/4HANA on the SAP Help Portal at <https://help.sap.com/s4hana>, tab **Implement** 
- [Silent Data Migration \[page 67\]](#)

Automatic data migrations are carried out after the upgrade in parallel with the productive use of the system. This is the recommended procedure.

The dialog *Decision About Silent Data Migrations* offers you as an alternative option the possibility to specify that the data migrations are already carried out during the upgrade procedure in the *Postprocessing* roadmap step in phase `RUN_SDMI_POST_PROCESSING`. However, this option has the only benefit that the business data is no longer changed by SDMI processes after the upgrade procedure is completed.

On the other hand, this option also includes disadvantages that you should be aware of:

- The overall system business downtime is extended by the time it takes to execute the data migration because the Software Update Manager runs the SDMI jobs synchronously and waits until they are completed.

- Depending on the available resources, the size of the migration tables and the configuration of the dialog work processes and the parallelization framework, the downtime can even reach a duration that is no longer tolerable.

Note

If you enable this feature, make sure that the batch server group `SAP_DEFAULT_BTC` is available and contains instances on which the silent data migration can be carried out. In the scenario *DMO with System Move*, these instances should already be available during the `Postprocessing` roadmap step already in the target data center.

Saving Variants (Phases `JOB_RASUVAR1` and `JOB_RASUVAR2`)

Note

This step is only relevant if you perform a release upgrade.

After the upgrade, many of your variants can no longer be used because the relevant selection screens have changed. To save the variants, the SAP system offers two reports:

- `RASUVAR1` saves your variants on the source system.
- `RASUVAR2` restores the variants in the target system.

During phase `SAVE_VAR_CHK`, you can decide whether you want the upgrade tool to run the report `RASUVAR1`. The report is started in phase `JOB_RASUVAR1`. If you have decided to run report `RASUVAR1`, phase `JOB_RASUVAR2` automatically starts report `RASUVAR2` towards the end of the upgrade.

For more information about the reports, see SAP Note [712297](#).

Tool Versions (Phase `TOOLCHECK_INI`)

The Software Update Manager checks the tool versions in your system (SAP kernel patch level, the `tp` version, and the date of `R3trans`).

Note

If necessary, the Software Update Manager prompts you to switch the SAP kernel or the other tools to a version and patch level released for the upgrade.

SAP Kernel

The subsequent roadmap steps require the version of the SAP kernel released for the upgrade. Older versions can contain errors that cause problems in some of the phases.

Caution

- Apart from the `disp+work` package, you also need the corresponding database library for the SAP kernel.

- Do **not** replace programs in the `abap/exe` subdirectory of the `SUM` directory. You may only do this if you receive approval from SAP Support.

If your current SAP kernel does not fulfill the requirements of the upgrade, proceed as follows:

1. Before switching the SAP kernel, back up the existing kernel directory.

⚠ Caution

When you switch the SAP kernel, you overwrite all files and subdirectories in directory `/usr/sap/<SID>/SYS/exe/run`.

For more information, see the log file `checks.log` or `checks.txt`.

2. Switch the SAP kernel.

⚠ Caution

Before continuing the upgrade, make sure that the SAP kernel has at least the minimum required patch level.

Tools R3trans and tp

The upgrade can require a certain version for tools `R3trans` and `tp`. For the required versions of these tools, see SAP Support Portal at:

<https://support.sap.com/swdc> ▶ [Support Packages and Patches](#) ▶ [Browse Our Download Catalog](#) ▶ [SAP NetWeaver and complementary products](#) ▶ [SAP NetWeaver](#) ▶ [SAP NETWEAVER <Release>](#) ▶ [Entry by Component](#) ▶ [Application Server ABAP](#) ▶ [SAP Kernel <Version>](#) ▶ [<operating system version>](#) ▶ [#Database independent](#) ▶

Add-On Strategy Check (Phase ADDON_INFO)

For most of the add-ons produced by SAP, there are special SAP Notes containing information about the upgrade strategy. In the `ADDON_INFO` phase, the Software Update Manager writes the SAP Note numbers for your upgrade into the `checks.log` file. The Software Update Manager lists the general add-on Note as well as, if possible, specific add-on upgrade Notes to the add-ons installed.

Before the upgrade, check all SAP Notes listed in the `checks.log` file. If there are add-ons installed in your SAP system for which there is no information in one of the listed SAP Notes, refer to the add-on producer for information.

Mount Directories for Languages (Phase LANG_SELECT)

If not all necessary language archives are available in the download directory, the Software Update Manager prompts you now to mount the necessary directories of the language archives. You must do this even if only the standard languages English and German are installed in your system.

Provided that you have chosen the *Expert Mode*, you also have the option to exclude those languages from the upgrade of which the language archives are missing and that are not yet registered in the ABAP system. You cannot deselect already installed languages. They must be manually removed from the ABAP system beforehand.

⚠ Caution

- If you exclude a language, you cannot work in this language directly afterwards.

In principle, it is possible to install additional languages during the upgrade. For more information, see [Importing Additional Languages \[page 72\]](#).

SPAM Version Check (Phase SPAMCHK_INI)

The Software Update Manager calls functions of the SAP Support Package Manager (transaction SPAM). For this, it checks if the level of the SPAM version on your source release is sufficient for the update. If your SPAM version is not high enough, the Software Update Manager searches for a higher version and installs it. If no higher SPAM version is found, the update stops with an error message prompting you to provide a higher SPAM update archive in the download directory.

For more information about importing a SPAM update, see the online help in transaction SPAM, or the SAP Help Portal for the corresponding source release at <http://help.sap.com/spmanager>. [▶ Support Package Manager](#) [▶ SAP Library](#) [▶ Importing Support Packages with Support Package Manager](#) [▶](#)

Decision About Add-Ons (Phase IS_SELECT)

The Software Update Manager determines all add-ons contained in the SAP system. The tool checks for which add-ons a decision has already been made in the stack configuration file of the maintenance planner. This is the XML file that you previously specified in phase SELSTACKXML.

In addition to the add-ons for which a decision has already been made, there are also add-ons for which no decision has yet been included in the stack configuration file, such as all optional add-ons that are not part of the stack configuration file. These add-ons are displayed in this phase IS_SELECT and can be processed by you.

📌 Note

To complete phase IS_SELECT successfully, none of the add-ons must have the status *UNDECIDED*.

Status of Add-Ons

Status	Comments	Action
Release upgrade only: <i>INST/UPG WITH EXPORT</i>	Add-ons in the <i>Upgrade Export</i> archive that can be upgraded to a new version	No decision is required unless you want to include a newer version of the add-on.
<i>KEEP YOURS</i>	Optional add-ons that can be taken over unchanged	No decision is required unless you want to include a newer version of the add-on or delete it with a SAINT package. Check with your software vendor for the predefined strategy for each add-on.
<i>UNDECIDED</i>	Optional add-ons installed on the source system.	A decision is required: Decide whether to delete the add-on or update it with a SAINT package. For target releases using a SAP NetWeaver version lower than 7.53, you can keep the current add-on version. However, this option requires a vendor key. Check with your software vendor for the predefined strategy for each add-on.

Handling of Add-Ons

Action	Comments
<i>Upgrade the add-on using SAINT package</i>	The packages must be in the EPS inbox of the transport directory <code>/usr/sap/trans/EPS/in</code> .
<i>Upgrade the add-on to the version delivered with export archives</i>	Only applicable if an add-on exists in the <i>Upgrade Export</i> archive. You do not need any additional archives or packages for the add-on.
<i>Keep the add-on in your version</i>	The add-on is taken over unchanged to the target version.
<i>Keep the current add-on version (Use this option only if it is supported by the add-on vendor! A vendor key is required.)</i>	The add-on is taken over unchanged to the target release. However, a vendor key is required for this. Contact your add-on provider for more information. Note that this option is only available for target releases lower than SAP NetWeaver 7.53. However, SAP provides the vendor keys only in exceptional cases. As of SAP NetWeaver 7.53 or SAP S/4HANA 1809, vendor keys can no longer be used because the concept of the vendor keys has been replaced by the <i>Attribute Change Package (ACP)</i> .

Action	Comments
<i>Delete the add-on using SAINT package</i>	You can delete an add-on with the <code>SAINT</code> package. This option includes a deletion package for deleting repository objects as well as for deleting add-on table data.
<i>Reset all decisions</i>	All decisions made are reset, the values are re-initialized and the selection screen for decisions about the add-ons is displayed again.

Passwords for Add-Ons (Phase ADDONKEY_CHK)

If you use SAP add-on components in your SAP system (such as IS components), you are prompted for passwords. SAP systems that have other software components (add-ons) installed on top of them have to wait until the upgrade has been released by the relevant add-on software vendor.

Support Package Confirmation Check (Phase PATCH_CHK3)

This phase tests whether all support packages have been confirmed.

Unconfirmed support packages are displayed on the screen and in the `patchout.log` file that is located in the subdirectory `log` of the SUM directory. Confirm these support packages with transaction `SPAM`.

If the source release contains support packages that are more recent than those in the delivered target release, a warning appears that informs you which support packages these are. All software components appear whose support package level is more up to date than the status of the software components in the *Upgrade Export* archives.

→ Recommendation

Always include all available support packages for the target release, and all available Basis support packages. This means that your system is up to date after the upgrade.

If you use an add-on component, you can find information about including the corresponding add-on support packages or Conflict Resolution Transports in the SAP Note for the add-on supplement archive.

If the Software Update Manager displays a warning that your support package level of the source release is too up to date and you want to include the corresponding support packages of the target release, you have to do this in the next phase `BIND_PATCH`. You can include the support packages for multiple software components in this phase.

Including Support Packages (Phase BIND_PATCH)

If you have activated the expert mode at the beginning of the update, you are asked in a dialog for possible additional support packages because it can be necessary to include support packages of certain software

components. These can be HR packages, for example, if these packages have a shorter release cycle than the entire support package stack. For these cases, you can select further support packages from a list and add them to the support packages already included in phase `SELSTACKXML`.

Note

- **Software components for which no support package can be included**

For some software components, it is not allowed to include additional support packages. They have a corresponding entry in column *Maximum Level*. If you want to include additional support packages to these components, update the stack configuration file first and restart then the update.

- **Downloading the list of support packages**

You can have a list of the support packages, such as for documentation purposes. The Software Update Manager generates on request a file `DATA.CSV` and downloads it.

Provide the information about the desired support package level for your different software components. You can also include a SPAM update and individual transport requests.

We recommend that you also check the correctness of the support package levels of the contained software components. Note that only software components that are activated in the system are displayed.

For a complete list of imported software components, see the *SUM Analysis* utility. More information about this utility can be found in the Appendix of the *SUM guide*.

Unpacking the support package data can take several minutes.

If the release of a component does not change during the update, the support packages previously installed for this component are automatically retained and do not have to be included again. A further adjustment of the modifications contained in the support package using transaction `SPDD` or `SPAU` is also not required. However, you can include additional support packages for this component.

To include support packages, proceed as follows:

1. Confirm that you want to include support packages in the `BIND_PATCH` phase.
2. Check and complete the following table:

Column	Entry
<i>Minimum Level</i>	The minimum support package level required for a component to meet the import prerequisites of the included add-on packages.
<i>Equivalence Level</i>	The support package level of the target release that corresponds to the support package level of the source release. To avoid data loss, the support package level of the target release must not be lower than the corresponding support package level of the source release.

Column	Entry
<i>Maximum Level</i>	The maximum support package level that can be included. It is set for some central components (such as SAP_BASIS and SAP_ABA) for which support packages can only be included in the stack configuration file. No further support packages can be included for these components in the phase <code>BIND_PATCH</code> .
<i>Calculated Level</i>	The standard support package queue provided that it could be calculated. To apply the queue, select in the dialog <i>Take over calculated to target level</i> .
<i>Target Level</i>	The highest support package level that is currently included. To determine the current state of the SAP system, the Software Update Manager checks the following support package level information: <ul style="list-style-type: none"> • The support package level already installed in the source system (only valid if the release of the SAP component does not change during the component upgrade procedure) • The support package level delivered with the upgrade archives (such as a Support Release level) • The support package level included in the stack configuration file • The support package level already selected and confirmed

3. You can also include the latest `SPAM` update for the target release. This avoids error messages if the `SPAM` version in the source release is newer than the `SPAM` version in the upgrade archive. You can also avoid an import of the latest `SPAM` update immediately after the update. The Software Update Manager automatically checks the EPS inbox for a current `SPAM` update and includes it automatically.
4. After your confirmation, all support packages up to the specified level are included into the update for this component. It may take a few minutes to unpack the support package data.

You can include any necessary *Conflict Resolution Transports (CRT)* in the upgrade. Any support packages that you cannot include in the upgrade have to be imported into the system after the upgrade.

Validation of the Specifications in the `SUMASK*-Phases (Phase ADJUSTPRP)`

In this phase, the Software Update Manager checks the entries that you have made in the phases

- [SUMASK_CUSTOMER_BUFFER \[page 149\]](#)
- [SUMASK_SPDD_SPAU \[page 149\]](#)
- [SUMASK_SINGLE_TRANSPORT_REQUEST \[page 149\]](#)

at the beginning of this roadmap step *Configuration*.

That is, your specifications regarding automatic modification adjustments, single transport requests, and customer buffers are validated. If the validation has no errors, no further action is required and SUM continues the procedure. Otherwise, the corresponding dialogs are displayed again in which you can correct your specifications.

5.2.4 Important Entries for the Shadow Instance Installation

This chapter deals with the shadow Instance installation.

The Software Update Manager creates the profiles, directories, and further prerequisites for the shadow instance.

Note

The Software Update Manager configures the instance profile of the shadow system setting `PHYS_MEMSIZE` to 40%. If necessary, adapt this to your specific needs.

In the following, we go into detail of some important phases:

- [Reusing Shadow Instance Profiles \(Phase SHDINST_CPY\) \[page 158\]](#)

Reusing Shadow Instance Profiles (Phase SHDINST_CPY)

If you have made a backup of the `save` directory from a previous upgrade, you can now use the [profiles for the shadow instance \[page 229\]](#) that have been stored in the directory.

Caution

Only use the profiles if both upgrades have the same environment and use the same scenario strategy.

If you want to use the shadow instance profiles, make sure that the `save` directory has been copied to the `SUM` directory and confirm the prompt with **Yes**.

5.2.5 Important Entries for the Checks Roadmap Step

This chapter deals with the roadmap step `checks`. The Software Update Manager checks if the operating system and database version of your source release match the requirements of the target release. Furthermore, it checks some application-specific requirements.

In the following, we go into detail of some important checks:

1. [Checking the Results of the System Check \[page 159\]](#)
2. [Checking for Database Triggers Switched or Modified by SUM During Technical Downtime \(Phases `RUN_CHECK_DB_TRIGGER_*`\) \[page 159\]](#)
3. [SPAU Fill Level Display \(Phase `PREP_GENCHECKS/SPAU_FILL_LEVEL_DEC`\) \[page 160\]](#)

Checking the Results of the System Check

At the end of the *Checks* roadmap step, the Software Update Manager displays the results of the system check. The entries can be error messages, information, or prompts for user actions.

Carry out the user actions before you can start with the *Preprocessing* roadmap step.

Checking for Database Triggers Switched or Modified by SUM During Technical Downtime (Phases `RUN_CHECK_DB_TRIGGER_*`)

Database triggers that are based on switch tables and tables to be converted can cause problems during the update. The reason for this is that the switch tables and the tables to be converted are replaced by a new version in the database during the update. The replaced tables are then renamed or deleted. If such database triggers exist, the behavior of the statements `Rename` or `Drop` can differ depending on the database.

There are two different categories of database triggers to consider:

1. Managed database triggers of the *SAP Landscape Transformation (SLT)* software or the *SAP HANA Smart Data Integration (SDI)* tools
2. Unmanaged database triggers that are created by third-party tools or customers

The *SAP Landscape Transformation (SLT)* software allows SAP customers to effectively manage the impact that new business or IT-driven transformation requirements have on their existing SAP landscape. The SLT Replication Server is the standard real-time replication tool for Big Data for SAP ABAP-based source systems (Unicode and non-Unicode). Targets are:

- SAP HANA database
- all databases by SAP
- SAP Business Suite
- SAP applications

It also supports non-SAP sources covered by the SAP Product Availability Matrix.

Similarly, the *SAP HANA Smart Data Integration (SDI)* provides tools for accessing source data and deploying, replicating, and transforming that data in SAP HANA On-Premise or SAP HANA Cloud.

Both SLT and SDI use database triggers to detect real-time data changes. Database triggers of the SLT and the SDI can update a database automatically in response to a certain event. However, database triggers that are based on switch tables and tables to be converted can cause issues during the update procedure. The reason is that during the update procedure, switch tables and tables to be converted are replaced in the database with a new version, and the replaced tables are renamed or dropped. If such database triggers exist, the behavior of the `Rename` or `Drop` statement for these tables can vary depending on the database.

To avoid later issues, the Software Update Manager checks if relevant database triggers exist and displays, if applicable, an error message. The check is performed in phase `RUN_CHECK_DB_TRIGGER_PRE` during the preparations of the update. You can ignore errors in this phase, but communicate them to the responsible SLT

or SDI operations team. Not all problematic tables can be identified at this early stage of an update. This means that the list can be incomplete.

The Software Update Manager checks again in phase `RUN_CHECK_DB_TRIGGER_DTTRANS` shortly before the downtime. In this phase, the list is complete. However, you still can ignore errors in this phase.

A further check is performed in phase `RUN_CHECK_DB_TRIGGER_DOWNTIME`. In this phase at the latest, you must resolve the errors.

The lines in the error log file are similar to the following:

```
2EETG010 "Found trigger" "/1LT/REPOSRC" "on switch table" "REPOSRC".
```

In this case, follow the instructions of SAP Note [1620618](#) for SLT triggers or SAP Note [3247939](#) for SDI triggers to delete the relevant database triggers. Create the deleted triggers again after the downtime, and an initial load of the affected tables is required.

Handling of Unmanaged Database Triggers for SAP S/4HANA or SAP S/4HANA foundation as of Target Release 2023

If the target release for SAP S/4HANA or SAP S/4HANA foundation is 2023 or higher, the Software Update Manager does not stop in phase `PARDIST_ORIG` due to unmanaged database triggers for certain tables as it does in previous releases. The ABAP Dictionary ignores these database triggers during the update procedure.

The Software Update Manager then checks in the `RUN_CHECK_DB_TRIGGER_*` phases whether such database triggers exist. If they are found, SUM prompts you to delete them before the technical downtime begins.

SPAU Fill Level Display (Phase `PREP_GENCHECKS/SPAU_FILL_LEVEL_DEC`)

In this phase, the Software Update Manager checks for SAP Notes and repository objects that were modified but not adjusted in the transactions SPDD and SPAU in previous updates. If such objects are detected, the phase `SPAU_FILL_LEVEL_DEC` displays the dialog *Open actions in transaction SPDD and SPAU*. This dialog offers you the possibility to complete all outstanding modification adjustments in an early stage of the current update to reduce the adjustment effort at a later point in time.

The dialog shows the following numbers:

- Obsolete and non-adjusted SAP Notes
- Non-adjusted objects that were modified either with or without Modification Assistant, and the SPDD-relevant objects of them
- Modified but non-adjusted objects with active SAP versions that can be reset to SAP standard versions

You can see the same statistics in transaction `SPAU`, provided that you use the default selections and you filter according to all possible statuses except for the status *adjusted*. Note that if one or more statuses are excluded in addition, the shown numbers may differ from the numbers in the dialog *Open actions in transaction SPDD and SPAU* of the Software Update Manager.

If you perform the current update on your development system, we strongly recommend that you perform the following actions:

- Confirm all obsolete notes.
- Reset all non-adjusted objects with active SAP version to SAP standard versions.
- Carry out the outstanding modification adjustments.

Afterwards, release the resulting workbench request into the system landscape before you continue with the current update procedure.

In the development system, you can use the report `RSUPG_AUTO_ADJ_SPAU`. It retrieves the non-adjusted objects that can be reset to the SAP original version and writes a detailed list to a log file. Depending on the number of objects listed in the summary, you can execute this report in the background.

Furthermore, this report offers you the possibility to perform the reset of the listed non-adjusted objects to the SAP original version automatically. For this purpose, set the parameter `p_check` to `<space>` and enter a valid and already existing workbench request as value for parameter `p_trkorr` during the execution of the report.

If you want to use the automatic reset, note the following:

- Import the workbench request, which is required for this automatic adjustment, into the subsequent systems **before** you start the update of these systems.
- Do **not** include this workbench request as single transport request or as SPDD/SPAU transport request during the update.

Preparing SAP Profiles

At the end of the preparation roadmap steps, you have the option to review the new SAP profiles for the SUM procedure and for the target release. These new profiles are available as template in different subfolders of the folder `DIR_PUT > sapnames` as follows:

<code>backup</code>	SAP profiles of the source system. They are used if there is a reset of the Software Update Manager.
<code>dttrans</code>	SAP profiles of the downtime system (single instance) that run with the source kernel.
<code>newbas</code>	SAP profiles of the downtime system (single instance) that run with the target kernel.
<code>prod</code>	SAP profiles of the productive system

During the downtime, the profiles are copied to the system profile directory.

If needed, you can modify the SAP profiles with regard to your customer-specific settings, SAP Memory Management, or deprecated parameters. The modification must be finished before entering the downtime.

You can also review and modify the SAP profiles as follow-up activity. For more information, see [Performing Follow-Up Activities for SAP Profiles \[page 217\]](#).

⚠ Caution

Carry out modifications with particular caution and utmost care to avoid incorrect settings.

📄 Note

SAP S/4HANA 1909 or higher: Set secure profile parameter values

If you perform a conversion to SAP S/4HANA 1909 or a higher version, the recommended security profile parameters of the SAP kernel are automatically written and stored in the default profile file `DIR_PUT/sapnames/prod/DEFAULT.PFL` of the target system according to SAP Note [2926224](#). You

are informed in a dialog on the SUM UI that you can opt out from this feature and therefore skip the setting of the security parameters. This is, however, not recommended and only necessary for compatibility reasons.

5.2.6 Evaluating the Results of the Checks Roadmap Step

This chapter deals with some results of the `Checks` roadmap step.

Context

The results of the `Checks` roadmap step are listed in the log file `checks.log` and displayed in the associated notification popup window that opens up once this roadmap step is completed. The entries in the window can be error messages, information, or prompts for user action. Carry out the required user actions before you can start with the `Preprocessing` roadmap step.

The file `checks.log` is located in subdirectory `<update_directory>/abap/log`.

Procedure

Check the entries in the dialog box and perform any measures required by the information it contains.

Most of the entries are self-explanatory. In the following, you can find information and troubleshooting procedures for entries that are not self-explanatory:

Message	Action
<code>Insufficient freespace in the database as follows:</code>	The new release needs more space in the database. The existing space in your database is not sufficient to import the data for the new release. For information about the extensions that you must make, see the table that follows the message in the dialog box. Add the space you need for any extra data that is created before you actually upgrade your system.

Note

Due to limited statistical data about table and index sizes, in rare cases the Software Update Manager may ask for more free space than is needed during the upgrade. This occurs especially for index tablespaces. In this case, report an incident to help us improve the statistics.

Message	Action
In Release <rel> you applied the following unconfirmed patches to your system.	There are unconfirmed Support Packages in your SAP system (such as Support Packages for technical components SAP_BASIS, or SAP_BW). To confirm these Support Packages, call transaction SPAM.
There are dependencies between Basis Support Packages included in phase BIND_PATCH and the patch level of the target release kernel in directory <upgrade directory>/exe. The disp+work needs at least patch level <number> or higher. Please proceed as described in note 211077.	A Support Package included in update requires a different patch level for the SAP kernel. Proceed as described in SAP Note 211077 .
Change the permission of these executables:	You have to be able to overwrite the programs of the old SAP kernel so that you can copy the new SAP kernel to directory /usr/sap/<SID>/SYS/exe/run during the upgrade. The programs that are affected are in the following lines: ERROR> No write permission for file <program file>. Change the write authorization with: chmod ug+w <program file> If the program does not belong to the group sapsys, you have to either change the group or add user <SID>adm to the group temporarily. We do not recommend that you give write authorization to others, for security reasons.
The following function groups (FUGR) are inconsistent. The TADIR entry (and the frame program) have no corresponding entry in the master table TLIBG.	Your SAP system contains customer function groups that have not been entered in table TLIBG. To enter the function groups in table TLIBG, call transaction SE80. If you do not fix the problem, the customer function groups are lost during the upgrade. In case of questions or problems, report an incident on component BC-DWB-TOO-FUB.
No write permission on <file name>:	The specified file in the directory of user <SID>ADM cannot be overwritten because the authorizations have not been set correctly or the owner of the file is not <SID>ADM. Correct this by changing the authorizations or the owner.

Message

Release these open transport requests and repairs:

Action

⚠ Caution

If you ignore open repairs, you could lose modifications.

Your SAP system contains locked SAP objects in open repairs or requests. The numbers of these repairs or requests are listed.

We recommend that you inform the owners of open repairs or requests so that they release them. You can continue with the update until the `REPACHK2` phase. In the `REPACHK2` phase, all listed open requests and repairs have to be released.

For more information, see in the section [A.4 Administration](#) of the *SUM Guide* the chapter [Releasing and Confirming Open Repairs and Requests](#).

📌 Note

If open repairs that do not belong to this system appear, then this system was created by a database copy. You cannot release these repairs in the normal way. To release these repairs, release all tasks and requests in the current system. Call the Workbench Organizer (transaction `SE06`). All locks created by repairs and requests not known to the system are deleted. The status of the affected tasks and requests changes in this case to *RELEASED*.

To release and confirm these open repairs, you have to log on to the system with the name of their owner. The list in the dialog box contains these names.

Restart logs of DB conversions found.
Outstanding DB conversions found.

Your SAP system contains outstanding conversions and restart logs of terminated conversions.

Clean these up as described in section [A.4 Administration](#) of the *SUM Guide* in chapter [Cleaning Up Terminated Conversions in the DB Conversion Phases](#).

Message	Action
<p>Unresolved request found in TRBAT.</p> <p>.....</p> <p>TRBAT entry indicates that a batch job is running.</p> <p>.....</p> <p>TRBAT entry indicates that a batch job has finished.</p> <p>.....</p> <p>Corrupted TRBAT entry found.</p> <p>.....</p>	<p>The transport control program <code>tp</code> uses table TRBAT to communicate with the SAP system. Entries found in this table by the Software Update Manager can be the remains of terminated or running imports or exports.</p> <p>When you prepare the update, locate any entries left over from imports or exports that terminated and clean them up. Do not delete entries made by running imports or exports during production operation.</p> <p>First try to process the TRBAT entries from <code>/usr/sap/trans/bin</code> with the following command:</p> <pre>tp getprots <SID></pre> <p>This does not affect any imports or exports that are still running. <code>tp</code> informs you about possible processing problems in the file <code>SLOG<YY><WW>.<SID></code>. You can monitor this file using the following command:</p> <pre>tail -f /usr/sap/trans/log/SLOG<YY><WW>.<SID></pre> <p>where <code><YY></code> is the year (two digits) and <code><WW></code> is the calendar week (two digits).</p> <p>To delete any entries in TRBAT that cannot be processed and that are no longer needed, call transaction SM31. In cases of doubt we recommend that you contact SAP Support, which can assess if an entry is still needed.</p> <p>For more information about the transport control program <code>tp</code>, see the SAP Help Portal for your SAP NetWeaver source release at http://help.sap.com.</p>
<p>The following indexes <code><number></code> were read:</p>	<p>Indexes whose names are identical up to the 14th character were found in a table belonging to the substitution set. The 14th character is an 'X' in one of the two names and is empty in the other. This is an inconsistency and would result in an error during the import of the substitution set.</p> <p>The index with the 'X' as the 14th character can only have occurred in a previous upgrade or have been created outside the SAP system. For more information, contact your SAP consultant.</p>
<p>The following database tables have names that are identical to names of Basis views. The views will be created in this upgrade. Therefore ...</p>	<p>Delivered views can have names identical to the names of customer tables in the SAP namespace. You have to delete these tables. If you need the table data, you should make a backup before deleting the tables.</p>

Message

Open update tasks found; please clean them up

Action

Make sure that you have cleaned up the following by the `JOB_RSVBCHCK_R`, `JOB_RSVBCHCK_D`, or `JOB_RSVBCHCK_D_MIG` phase (during downtime) at the latest:

- All outstanding updates
- All outbound queue RFC calls
- All open data extraction orders

If you are still in the preparation phase (before the beginning of the *Preprocessing* roadmap step) and therefore in production operation, you have to only delete the **terminated** updates.

→ Recommendation

We recommend that you clean up as many updates, RFC calls, and open data extraction orders as possible. Otherwise, you have to clean them up during downtime.

To find terminated or outstanding updates, proceed as follows:

1. Call transaction SM13.
2. Delete the default values for the client, user, and time.
3. Select all the update requests.

To find outstanding outbound queue RFC calls, proceed as follows:

1. Call transaction SMQ1.
2. Delete the default values for the client.
3. Make sure that the list of outbound queue RFC calls is empty. Otherwise, you might lose data in other systems (for example, in SAP BI).
4. Make also sure that there is no open data extraction order in the system anymore. Otherwise, changes to the ABAP Dictionary structures could have the effect that data extraction requests can no longer be read after the import and their processing terminates. See SAP Note [1081287](#) for more information.

Repeat these checks when production operation ends. For more information, see [Isolating the AS Instance \[page 179\]](#).

⚠ Caution

If you have installed the PI plug-in, more information is displayed.

5.2.7 Important Entries for the Preprocessing Roadmap Step

This chapter deals with the roadmap step `Preprocessing`, in which the Software Update Manager creates the shadow system.

The runtime of this roadmap step depends on the scenario strategy you have chosen. When the roadmap step is finished and you choose *Next*, the downtime starts.

In the following, we go into detail of some important phases:

- [Confirmation of Support Packages \(Phase PATCH_CHK\) \[page 167\]](#)
- [Automatic Reset of Non-Adjusted Repository Objects to SAP Original Version \(Phase RUN_SUM_SPDD_RESET_CANDIDATES or RUN_SUM_SPDD_RESET_CANDIDATES_TRANS\) \[page 168\]](#)
- [Consistency Check for Components and Objects \(RUN_RSUPG_TADIR_COMPONENT_CHECK\) \[page 169\]](#)
- [Operating System and Database Version \(Phase CONFCHK_X\) \[page 170\]](#)
- [Conflicts with Customer Tables in the SAP Namespace \(Phase VIEWCHK*\) \[page 170\]](#)
- [Environment Profiles Customizing \(Phase ENVFILES_PREP\) \[page 171\]](#)
- [Repairs and Requests Containing Objects Locked by SAP \(Phase REPACHK1\) \[page 171\]](#)
- [Outstanding or Incomplete Updates \(Phase JOB_RSVBCHCK2\) \[page 171\]](#)
- [Free Space in Subdirectory log \(Phase FREECHK_X\) \[page 171\]](#)
- [Unreleased Repairs and Corrections and ABAP Workbench Locking \(Phase REPACHK2\) \[page 172\]](#)
- [Terminated Conversion Cleanup \(Phase CNV_CHK_XT\) \[page 173\]](#)
- [Comparison of Modifications \(Phase ADJUSTCHK\) \[page 173\]](#)
- [Cleanup of Outstanding Updates \(Phases JOB_RSVBCHCK_R and JOB_RSVBCHCK_D\) \[page 173\]](#)
- [Modification Adjustment and Activation \(ACT_UPG\) \[page 174\]](#)
- [Safety Export for Objects Adjusted with SPDD \(Phase UEXP_SPDD_SAV\) \[page 176\]](#)
- [Creation of Database Indexes \(Phase RUNASYN_RSINDCRE\) \[page 177\]](#)
- [Partitioning of Table MATDOC \(Phase REQ_PARTITIONING_MATDOC\) \[page 177\]](#)
- [SAP Notes Implementation in the Shadow System \(CHECK4NOTES_TOOL_SHD2\) \[page 177\]](#)
- [Preparation of SAP System for Downtime \(Phase DOWNCONF*\) \[page 178\]](#)

Confirmation of Support Packages (Phase PATCH_CHK)

This phase checks that the following prerequisites are met:

- Confirm all support packages for the source release. Unconfirmed support packages are displayed on the screen, and in the `patchout.log` file located in the `log` subdirectory.
- The source release does not contain support packages that are more recent than those in the delivered target release.

If you have to confirm support packages for the source release, proceed as follows:

1. Call transaction SPAM and confirm the support packages that are proposed there.
2. If a warning appears that the support package level of your source release is too high, proceed as follows:
 - If you have already included support packages in the `BIND_PATCH` phase, you can ignore this warning.

- If you have not included any support packages in the `BIND_PATCH` phase, you lose data if you continue with the upgrade. In this case, reset the upgrade, repeat all phases including phase `BIND_PATCH`, and include the necessary support packages.

Automatic Reset of Non-Adjusted Repository Objects to SAP Original Version (Phase `RUN_SUM_SPDD_RESET_CANDIDATES` or `RUN_SUM_SPDD_RESET_CANDIDATES_TRANS`)

In this phase, the Software Update Manager identifies and lists ABAP Dictionary objects with active SAP versions that are modified but not yet adjusted, and that can be reset to SAP standard versions. The Software Update Manager compares the existing customer version of a repository object with the new, imported SAP version. If the SAP version is type compatible with the customer version, the Software Update Manager lists the object as a potential reset candidate. Type compatibility in this context means that the customer version is included in the SAP version.

❁ Example

- A domain in the customer version is of type `char` with length 10. The SAP version is of type `char` with length 10 or greater. In this case, the domain is listed as a potential reset candidate. However, if the SAP version of the object is of type `char` with length 9, the domain is not listed as a reset candidate because the customer version is larger than the SAP version.
- "Type compatibility" means that all fields in the customer version of a structure or a table are also part of the SAP version and are type compatible with the SAP version. Note that the SAP version can contain more fields than the customer version.

The compatibility check includes more data for a comparison than the data mentioned in the previous examples. The log file of the phase `RUN_SUM_SPDD_RESET_CANDIDATES` contains the details about the compared objects and informs you about the reasons why an object is considered to be a potential reset candidate or not. In addition, the log file contains a plain list of all potential reset candidates in the summary section.

The potential reset candidates can be reset automatically using the report `RSUPG_SPDD_RESET_CANDIDATES` that is mentioned in the dialog *Repository Modifications*. Per default, the report runs in a check mode and writes a log file. The following options are available for the execution of the report:

1. `p_check = X`
This is the check mode and the default. The report calculates the reset candidates and writes them in the log file. The parameter `p_trkorr` is not evaluated.
2. `p_check = <space>`
The report resets the reset candidates in the system and writes them in the transport request. Note that the parameter `p_check` must be filled.

Make sure that you check the candidates list before you execute the automatic reset because the compatibility check covers the technical perspective only.

❁ Example

You have added a field to a structure. SAP delivers the structure with a field that is named identically and technically compatible. You must decide whether the fields are semantically the same. If the fields have

been added for your own purpose, it is probably not identical to the use intended by SAP. On the other hand, the field could be added because of a manual correction described in an SAP Note.

Consistency Check for Components and Objects (RUN_RSUPG_TADIR_COMPONENT_CHECK)

During a System Switch Upgrade procedure (see also [Technical Details of the Upgrade Procedure \[page 15\]](#)), a new ABAP repository is set up in the shadow instance based on the data of the Upgrade Export archives. This repository replaces the repository of the source release. Customer repository objects, which do not belong to SAP and which are to be used after the update, must be rescued before the replacement.

The Software Update Manager performs this rescue by exporting the repository objects from the old ABAP repository and importing them to the new one. The information about the affected repository objects is calculated and collected in phase `RUN_RDDIT006`. It analyzes the SAP system to find customer objects as well as objects modified by the customer. All objects selected for the rescue are written to dedicated transport requests that are imported into the new ABAP repository in various `DIFFEX*` phases.

It is important for a complete and correct rescue that the correct owner is associated to customer objects and that all optional add-ons are correctly installed, too. To avoid a loss of ABAP repository objects, several checks for inconsistencies are performed in phase `RUN_RSUPG_TADIR_COMPONENT_CHECK`. If the Software Update Manager displays error messages as a result of the checks, you have to examine them carefully.

The log file of the phase `RUN_RSUPG_TADIR_COMPONENT_CHECK` also refers to a file that contains a list of all objects with issues.

The following checks are performed:

1. Check for customer indexes
This check identifies customer indexes on SAP tables in the customer namespaces `Z*` or `Y*` that are listed as modifications with status *Reset* but still exist in the ABAP Dictionary. These indexes will not be available in the target ABAP repository after the update. If you want to keep these indexes, they must be changed again so that they are listed as *Active* modification.
2. Check for ownership of customer objects
This check identifies *LOCAL* and *HOME* objects that cannot be identified normally as customer objects and are therefore removed from the repository during the update.

Note

Directly before the phase `RUN_RSUPG_TADIR_COMPONENT_CHECK`, the phase `RUN_RSUPG_TADIR_COMPONENT_CLEANUP` is executed. In this phase, the report `RSUPG_TADIR_COMPONENT_CHECK` checks the table `TADIR` of the SAP system for customer objects of the software components `LOCAL` or `HOME`, for which the value *SAP* exists as original system. These objects are then automatically updated by replacing the *SAP* entry with the SID of the original system. As a result, these objects are retained automatically and their entries for the original system do not have to be corrected manually.

A list of updated customer objects is written to the `UPGCOMPCHK_FIXLOCAL.LST_<SID>` file. This file is located in the subdirectory `var` of the SUM directory.

3. Check for unregistered software components

This check identifies software components that are not registered correctly as software components in the SAP system. This can be, for example, an add-on that is delivered by means of a transport and not via an add-on installation package. If such a component has been identified, contact its vendor to provide a regular add-on installation package. Only correctly installed software components are rescued.

4. Identify software components without add-on update information
This part of the log can be identified by searching for a log line `CHECK_COMPS_CVERS`. The main log contains the number of problematic objects per package of the software component. The detailed list of objects is written to an additional log file `<SW_Component>_NO_CUSTOBJ.LST_<SID>`.
5. Check for the completeness of add-ons to be rescued
This check identifies ABAP repository objects associated to an add-on component that is to be rescued but not part of any piece list by which the add-on was installed. The system rescues add-ons by collecting the objects listed in the piece lists by which the add-ons have been installed and patched. If a vendor has delivered new repository objects as a pre-correction by means of transport instead of a regular add-on support package, these objects are not rescued. Contact the vendor to provide a regular support package.

Operating System and Database Version (Phase CONFCHK_X)

This target release is released for certain combinations of operating system and database versions only. This phase checks that the operating system and database versions installed on your computer satisfy the requirements for the upgrade.

You can interrupt the procedure at this point if you must import additional software, or if you must upgrade the database or the operating system to a new version because of a version check.

Caution

Do not change the `SUM` directory.

Conflicts with Customer Tables in the SAP Namespace (Phase VIEWCHK*)

This phase displays conflicts between customer tables in the SAP namespace and views that are delivered for the first time. It also writes this information to a log file.

You have to rename or delete the tables. If the tables are transparent, you can delete the customer tables using the Software Update Manager. You have to delete pool or cluster tables manually in the SAP system. First save any data that you need in these tables.

Environment Profiles Customizing (Phase ENVFILES_PREP)

The file templates of the environment files are copied to subdirectory `<SUM_directory>/abap/sapnames/envfiles` and stored here with capital letters and without leading point as follows:

<code>.cshrc</code>	→ CSHRC
<code>.profile</code>	→ PROFILE
<code>.dbenv.csh</code>	→ DBENV.CSH
<code>.dbenv.sh</code>	→ DBENV.SH
<code>.sapenv.csh</code>	→ SAPENV.CSH
<code>.sapenv.sh</code>	→ SAPENV.SH

An entry in the log file `checks.log` informs you that the user environment has been prepared. You have now the option to adjust the environment files to the environment profiles of target system user `<sid>adm`. You can make the changes up to the start of phase `ENVFILES_COPY`, in which the environment files are then copied to the home directory of user `<sid>adm` on your target system.

For more information, see [Customizing of Environment Profiles \[page 68\]](#).

Repairs and Requests Containing Objects Locked by SAP (Phase REPACHK1)

This phase displays all repairs and requests containing objects locked by SAP and writes them to the `repachk1.log` file.

You can ignore the messages at this point. Release these objects and the repairs confirmed at the latest by the `REPACHK2` phase.

Outstanding or Incomplete Updates (Phase JOB_RSVBCHCK2)

If there are any outstanding or incomplete updates, the update stops in this phase with a message.

If errors occur in this phase and you have not stopped production operation yet, you can skip these errors with *ignore* without entering a password. However, we recommend that you check for these updates and clean them up. The message is:

```
Open update tasks found; please clean them up
```

Free Space in Subdirectory log (Phase FREECHK_X)

This phase checks whether there is enough free space in `log` subdirectory during the update. Make sure you have enough free space in the `log` subdirectory so that the update can run without errors.

If a kernel switch is performed, this phase also compares the free disk space in the SAP kernel directory with the space requirements of the new SAP kernel. Make sure that you are able to restore the old SAP kernel if this becomes necessary.

⚠ Caution

All files and subdirectories in the kernel directory `/usr/sap/<SID>/SYS/exe/run` are overwritten when the SAP kernel is switched. For more information, see the log file `checks.log`.

This log file includes, among other things, the protection list file `PROTECT.LST`, in which all files and subdirectories appear that can be protected from deletion. To prevent their deletion in the kernel directory, you copy the file `PROTECT.LST` from the directory `/usr/sap/<SID>/abap/var/` to the kernel directory `/usr/sap/<SID>/SYS/exe/run`. Note that the saved files may not fit to the new kernel version.

Unreleased Repairs and Corrections and ABAP Workbench Locking (Phase REPACHK2)

This phase displays all the repairs and corrections that are not released and writes them to the `repachk_ehpi.log` file. Furthermore, the Software Update Manager asks you during an upgrade in this phase to confirm the locking of the ABAP Workbench on all SAP instances.

Unreleased Repairs and Corrections

Before you continue, you have to release and confirm all the open repairs; otherwise, the objects in them are locked.

For a description of this procedure, see in the section *A.4 Administration* of the *SUM Guide* the chapter *Releasing and Confirming Open Repairs and Requests*.

⚠ Caution

If you ignore open repairs, you could lose modifications.

Once you have released and confirmed all the open repairs, you have to repeat the `REPACHK2` phase.

Any modifications made to SAP objects in your repairs might be overwritten during the update.

For information about how modifications are copied to the new SAP standard during the update, see the SAP Help Portal for your target release at: <http://help.sap.com>

► *Application Help* ► *SAP NetWeaver Library: Function-Oriented View* ► *Application Server* ► *Application Server ABAP* ► *Application Development on AS ABAP* ► *ABAP Customer Development* ► *Changing the SAP Standard* ► *Modifying the Standard* ► *The Modification Assistant* ◀. In section *The Modification Assistant*, choose *Upgrade Procedure / Support Packages*.

ABAP Workbench Locking

If you perform a release upgrade and you have chosen the scenario strategy *Standard* or *Downtime-optimized*, the Software Update Manager asks you in this phase if you want the ABAP Workbench to be locked on all SAP instances. This lock is needed to prevent development objects (for example, ABAP reports, table definitions, and so on) from being changed during the upgrade, since these modifications would be lost.

Note

After you have confirmed the ABAP Workbench lock, no more transports can be made into or out of the SAP system.

The Software Update Manager waits until the time you entered as the maximum synchronization time for all instances has expired.

This phase displays all the repairs that are still in open transport requests. They are also written to the `repachk_ehpi.log` file. Release these transport requests so that you can continue; otherwise, the objects contained in these repairs are locked.

Note

SUM checks in this phase also for inactive development objects. During this check, it can occur that SUM reports inactive objects, which cannot be found in the SAP system. For information about removing these inconsistencies, see SAP Note [538167](#).

Terminated Conversion Cleanup (Phase CNV_CHK_XT)

This phase checks whether the following still exist:

- Unprocessed conversion requests
- Restart logs

If there are errors, you receive an error message. Proceed as described in section [A.2 Troubleshooting](#) of the *SUM Guide* in chapter [Cleaning Up Terminated Conversions in the DB Conversion Phases](#).

Comparison of Modifications (Phase ADJUSTCHK)

If you chose to copy a request in the `SUMASK_SPDD_SPAU` phase, the modifications it contains are now compared with the modifications in the system. The result of this comparison appears.

You are prompted to confirm that the request was copied. If this request contains all the modifications found in the system, the Software Update Manager does not stop before the activation of the ABAP Dictionary objects. However, you can still specify that you want the Software Update Manager to stop in this phase.

Cleanup of Outstanding Updates (Phases JOB_RSVBCHCK_R and JOB_RSVBCHCK_D)

If some updates have not been performed yet, the Software Update Manager stops in the following phase:

- `JOB_RSVBCHCK_R` if you perform a support package stack (SPS) update with scenario strategy [Single system](#)

- JOB_RSVBCHCK_D if you perform an upgrade with scenario strategy *Standard* or *Downtime-optimized*
- JOB_RSVBCHCK_D_MIG if you are executing the database migration option of the Software Update Manager

In these phases, you must clean up all outstanding updates. Furthermore, you have to clean up all outbound queue RFC calls and all open data extraction orders that you notice in the system at this point in time.

Proceed as follows:

1. Clean up the outstanding updates, outbound queue RFC calls, and open data extraction orders as described in [Evaluating the Results of the Checks Roadmap Steps \[page 162\]](#).
See there under message: `Open update tasks found; please clean them up`
2. Repeat the current phase.

Modification Adjustment and Activation (ACT_UPG)

Depending on the results of the SUMASK_SPDD_SPAU phase, the Software Update Manager can ask you at the beginning of this phase to adjust your modifications to ABAP Dictionary objects. In this way, they correspond to the new SAP standard version of the objects.

Note

If you selected the scenario strategy *Standard* or *Downtime-optimized* in the initial dialogs, the Software Update Manager requests you to adjust your modifications to ABAP Dictionary objects during the *Preprocessing* roadmap step in phase ACT_UPG.

However, if you selected the scenario strategy *Single system* in the initial dialogs step, the Software Update Manager requests you to adjust your modifications to ABAP Dictionary objects during the *Execution* roadmap step in phase ACT_TRANS.

The ACT_UPG phase can take long, particularly when you have made many modifications to the SAP system or included many support packages. This is because the ABAP Dictionary activation program first calculates the dependent objects and the activation sequence for all ABAP Dictionary objects that must be activated. For example, structures have to be activated before they can be used in tables or table types. These dependencies between ABAP Dictionary objects are often complicated. The same kind of dependencies might have to be calculated several times with different input sets. Nevertheless, you can check in the process overview of transaction SM50 that the batch job RDDMASGL is still running.

Caution

Do not attempt to import adjustment transport requests into the system manually in this phase. This leads to the loss of data in customer fields.

Any requests for automatic adjustment from previous upgrades can be included in this upgrade in phase SUMASK_SPDD_SPAU only.

Modification Adjustment

Caution

If you have made structural changes to tables, you have to make adjustments in the ACT_UPG phase. Otherwise, data is lost.

The objects are adjusted on the shadow instance.

To make adjustments, proceed as follows:

1. The Software Update Manager prompts you to confirm that you want to perform a modification adjustment.
2. Add an entry for the shadow instance to the SAP Logon.
For the server and system ID, use the values from the original system; for the instance number, use the value you specified in the preparation units for the shadow instance. The default value is the instance number of the original system plus one.
Since the original system is still running if you use the scenario strategy *Standard* or *Downtime-optimized*, you can also log on to the shadow instance in transaction SM59 with the RFC connection SAP_UPGRADE_SHADOW_SYSTEM.
3. Log on to the shadow instance as user DDIC with the DDIC password of the original system.
Only the users DDIC and SAP* exist in the shadow instance.
4. To set the system change option, call transaction SEO6. Perform the following actions:
 1. Set the global setting to *Modifiable*.
 2. Set the change option for the software components to *Modifiable* or *Restricted modifiable*.
 3. Set the SAP namespace to *Modifiable*.
5. Call transaction SU01 to create one or more users to perform the modification adjustment. The new users exist only on the shadow instance and are not copied to the original system.
Copy the user DDIC of client 000.
6. Log on to the shadow instance with one of the new users.
Modification adjustment of ABAP Dictionary objects has to be performed in client 000.

Note

To adjust CDS objects, you can also connect to the shadow instance using the *ABAP development tools for Eclipse (ADT)*. To do this, you must create a new project with the server and system ID of the original system and the instance number of the shadow instance.

For more information about ADT, open in the SAP Help Portal the documentation about ABAP Cloud at <https://help.sap.com/docs/abap-cloud>. Choose here **Use > ABAP Development Tools for Eclipse**. Or see in the SAP Help Portal the page about [ABAP Development Tools for Eclipse](#).

7. To determine the ABAP Dictionary objects that must be adjusted, call transaction SPDD.

Caution

On the shadow system, adjust only objects of the ABAP Dictionary. You can make changes to the SAP Repository (changing and creating programs or packages, for example), but we do not recommend this since it may make the system inconsistent.

For more information about transaction SPDD, see the SAP Help Portal for the target release at <http://help.sap.com>:

Function-Oriented View > Application Server ABAP > Application Development on AS ABAP > ABAP Customer Development > Changing the SAP Standard (BC) > Modifying the Standard > The Modification Assistant > Upgrade Procedure /Support Packages (link at the bottom of the page) > Adjusting ABAP Dictionary Objects

For more information about Modification Assistant, see the SAP Help Portal for the target release at <http://help.sap.com>:

▶ [SAP NetWeaver Library Process Integration Library](#) ▶ [Function-Oriented View](#) ▶ [Application Server ABAP](#)
▶ [Application Development on AS ABAP](#) ▶ [ABAP Customer Development](#) ▶ [Changing the SAP Standard \(BC\)](#) ▶ [The Modification Assistant](#) ▶

Activation

Customer-defined ABAP Dictionary objects may have activation errors during the `ACT_UPG` phase. This happens, for example, when these objects refer to SAP objects that were deleted in the target release. For similar reasons, modifications of ABAP Dictionary objects that belong to the SAP standard delivery may also cause activation errors.

If your customer-defined objects have activation errors, you can correct them using transaction SE11 in the shadow system. If, however, you activate the objects using transaction SE11 in the shadow system, the objects are created with inactive runtime objects. This behavior is different compared to the regular behavior of transaction SE11 in a development system.

→ Recommendation

We recommend that you correct all activation errors in modified ABAP Dictionary objects because follow-up activities after the update might rely on the correctness of these objects.

All changes to an ABAP Dictionary object during the `ACT_UPG` phase are automatically recorded in a transport request. If you have to adjust modified SAP objects in transaction SPDD, the SAP system creates the transport request automatically, as mentioned above. If however, you correct your customer-defined objects, we recommend that you create a transport request and use it as a single transport request in your subsequent system during the update. For more information about including the single transport request, see *Request for Single Transport Request (Phase SUMASK_SINGLE_TRANSPORT_REQUEST)* in [Important Entries for the Configuration Roadmap Step \[page 147\]](#).

However, you can also choose *Accept errors and repeat phase ACT_UPG* to temporarily ignore these errors. You do not need a password to do this. If you chose this option here, you have to activate these objects after the update.

⚠ Caution

Only choose *ignore* if you are sure that this does not affect SAP objects.

In case of non-ignorable errors, you must not continue with the next phase. You first have to remove the cause of the termination.

Safety Export for Objects Adjusted with SPDD (Phase UEXP_SPDD_SAV)

During an update, subsequent systems might require an SPDD transport request before the *Postprocessing* roadmap step. To meet this requirement, the Software Update Manager creates and exports a safety transport request directly after the activation phase. This is phase `ACT_TRANS`, if you use scenario strategy *Single System*.

If you use scenario strategy *Standard* or *Downtime-optimized*, the activation phase is called `ACT_UPG`.

This transport request contains all objects of the flagged SPDD transport request. Both the data and the cofiles of the safety transport request are copied to the transport directory of your SAP system. The name of this transport request is stored in the log file `uexp_spdd_sav.log`.

Creation of Database Indexes (Phase RUNASYN_RSINDCRE)

The Software Update Manager starts the background job `RSINDCRE` that creates secondary database indexes. The Software Update Manager does not wait for the results of this phase, it continues with the next phase.

If the creation of a secondary database index fails, an error message is written to the log file `RSINDCRE.<SID>` and the creation of the index is repeated during the downtime. This can in rare cases increase the duration of the downtime.

If you want to make sure that all secondary database indexes have been created successfully before you start with the downtime, check log file `RSINDCRE.<SID>` for any error messages. If the log file `RSINDCRE.<SID>` displays error messages and you can solve these errors, restart the asynchronous index creation during the uptime by performing the following steps:

1. Check whether background job `RSINDCRE` has stopped and is no longer running as a background job.
2. Reschedule background job `RSINDCRE`.

Partitioning of Table MATDOC (Phase REQ_PARTITIONING_MATDOC)

In this phase, the Software Update Manager prompts you to provide a proper partitioning for table `MATDOC`, a new S/4HANA table for material documents. During the conversion to SAP S/4HANA or during the optional database migration procedure, this table may reach or exceed the SAP HANA limit of 2 billion records for non-partitioned column-store tables depending on the posting volume of material documents. This makes a partitioning for large tables necessary.

For more information, see SAP Note [2259038](#). If applicable, perform the corrections described in this SAP Note.

SAP Notes Implementation in the Shadow System (CHECK4NOTES_TOOL_SHD2)

Note

This information is relevant for all scenarios with a `stack.xml` configuration file.

The Software Update Manager displays in phase `CHECK4NOTES_TOOL_SHD2` in the shadow system a list of SAP Notes that have to be implemented using the SAP Note Assistant (transaction `SNOTE`). After the implementation of all relevant SAP Notes, repeat the phase and then continue the process.

Note that in ABAP systems, by default, the SAP Note Assistant must be able to download and consume digitally signed SAP Notes via HTTP connection as this type of SAP Note is now mandatory. The further

procedure in phase `CHECK4NOTES_TOOL_SHD2` depends on whether the SAP Note Assistant of your SAP source system is already configured accordingly:

1. The SAP Note Assistant of the source system is enabled to work with digitally signed SAP Notes

Configure your SAP target system to ensure that:

- the connectivity for the SAP Note Assistant via HTTPS protocol is configured
- the support package of the respective target software component `SAP_BASIS` is supported for digitally signed SAP Notes
- the passwords for the HTTP connections in the shadow system are entered correctly
- suitable trust anchor certificates to verify TLS server certificates are configured
- the profile parameter for the HTTP connection is set in file `DEFAULT.PFL` for the shadow system according to SAP Note [510007](#), and that this parameter is activated

Afterwards, the SAP Note Assistant can download and process the requested SAP Notes.

2. The SAP Note Assistant of the source system is not enabled to work with digitally signed SAP Notes

You can manually download the requested SAP Notes from SAP Support Portal and upload them in the shadow system. For a process description and more information, see SAP Note [2537133](#).

For more information on SAP Note Assistant and digitally signed SAP Notes, see the

- SAP Support Portal at <https://support.sap.com/en/my-support/knowledge-base/note-assistant.html>
- SAP Help Portal. See the SAP NetWeaver Library for your SAP NetWeaver source release at <https://help.sap.com/netweaver>, and go to **Application Help** > **Function-Oriented View** > **Solution Life Cycle Management** > **Software Logistics** > **Note Assistant** > **How to Enable and Use Note Assistant to Support Digitally Signed SAP Notes**.

Preparation of SAP System for Downtime (Phase DOWNCONF*)

At the end of the *Preprocessing* roadmap step, the Software Update Manager requests you in phase `DOWNCONF_DTTRANS` to perform actions that prepare your SAP system for the downtime.

Note

For the Database Migration option, the Software Update Manager will not request that you perform the database backup actions in this section.

The Software Update Manager requests you to perform the following actions:

1. Make sure that all production work in the SAP system is stopped and no users are logged on to the SAP system.
2. Make sure that no scheduled batch jobs can start anymore and await regular completion of currently running jobs.

Note

The Software Update Manager deschedules jobs by a direct SQL statement in phase `SQLDB_BTCTRS1` before the update starts. Thereby all jobs with the status *Released* are transferred to the status *Suspended*.

After the update, you can reschedule jobs using report `BTCTRS2`. See also [Rescheduling Background Jobs \[page 225\]](#).

3. Isolate the application server instance (AS instance). For more information, see [Isolating the AS Instance \[page 179\]](#).
4. After having completed these actions, choose *Next* to proceed to the next screen. The Software Update Manager stops the AS instance.
5. Before you enter the downtime, you are requested to perform the following backups:
 1. Back up your database.

⚠ Caution

To restart the update from this point, make sure that you can restore the database, the system directory, and the update directory to the current state.

In case of problems during the downtime, for example, a hardware failure, you need the backup of your database and the directories to reset the SAP system to the current state. The directories include, among others, profiles, trace files, and files for the SAP kernel needed for a reset of the SAP system.

2. Back up directory `/usr/sap/<SID>` including the update directory.

📌 Note

If the update directory is not part of directory `/usr/sap/<SID>`, make a separate backup of the complete directory including the subdirectory `sdt`.

3. Back up the home directory of user `<SID>adm`. If you must reset the update and problems occur when starting and stopping the SAP system, you may need to use the old user profiles contained in this directory.

📌 Note

If you experienced problems during the downtime and had to restore your SAP system, you can choose [Go productive again](#) to resume production operation. You can enter the downtime at a later point in time.

5.2.8 Isolating the AS Instance

This topic deals with the isolation of the application server instance (AS instance), so that only the Software Update Manager can work with the SAP system during downtime.

Context

Isolating in an ABAP system the AS instance means that you can use it exclusively for the update procedure using the Software Update Manager. The tool asks you to isolate the AS instance when the SUM technical downtime begins. During this downtime, all users have to be logged off from the system. You can use transaction `SM02` to inform the users who are logged on to the system.

Procedure

1. Check if the SAProuter is not active.

The SAProuter in the `run` subdirectory must not be active while the new SAP kernel is being imported. You have the following options:

- Stop the SAProuter now and restart it after the update procedure.
- SPS update: If you need the SAProuter during the update procedure, that is during the SUM run, stop it at the latest at the beginning of the downtime. If you need the SAProuter during the downtime, make sure that the update procedure is not running in parallel, especially during phase `KX_SWITCH`.

To display more information about the SAProuter:

- Enter `saprouter` at the operating system level.
A list of all the parameters appears.
- See the SAP Help Portal at: <http://help.sap.com/nw>:
 - ABAP Platform: `▶ <version> ▶ Application Server ABAP Infrastructure ▶ Components of Application Server ABAP ▶ SAProuter ▶`
 - SAP Netweaver Platform: `▶ <version> ▶ Application Help ▶ Function-Oriented View ▶ SAP NetWeaver Application Server for ABAP Infrastructure ▶ Components of Application Server ABAP ▶ SAProuter ▶`

2. Make sure that no `CRON` job is scheduled that affects the SAP system. Examples: Starting and stopping the SAP system, saving the database, or similar actions.

This could impair the full control of the Software Update Manager over the SAP system.

3. AIX-systems only: Check the restrictions for `cpu`, `fsize` and `core` for user `<SID>adm`.

Enter the command `lsuser` as user `root`.

The parameters should have the following values:

```
cpu=-1
```

```
fsize=-1
```

```
core=100000
```

If not, use the `chuser` command to change them (example: `chuser cpu=-1 <SID>adm`).

These changes only take effect for user `<SID>adm` when you have logged on again as `<SID>adm`.

Then restart the SAP system again.

Note

For more information about user limits on AIX, see SAP Note [323816](#).

4. Make sure that no change of operation mode is defined on the application server instance during the update.

If this is the case in normal operation, call transaction SM63 either to choose a single operation mode for all-time spans, or to delete all the assignments.

5. Clean up all outstanding updates as described in [Evaluating the Results of the Preparation Roadmap Steps \[page 162\]](#) when the message `update records still exist - Please process` appears.

6. Make sure that you can recover the database to its current state.
7. You can lock the database against remote access. Contact the database administrator, if the application server instance and the database server are on the same host.

⚠ Caution

Make sure that no transport requests are imported into the system during downtime. Otherwise, you may lose data. For example, by manually importing requests for the automatic adjustment, you may lose all your modifications to the standard SAP system.

5.2.9 Important Entries for the Execution Roadmap Step

This chapter deals with the roadmap step `Execution`, in which the system is in downtime and the Software Update Manager converts application tables and data to match the target release layout.

In the following, we go into detail of some important phases in which you enter information or confirm the existing values when prompted by the Software Update Manager:

- [Actions After Shutdown \(Phase STOPSAP_<x>\) \[page 181\]](#)
- [Modification Adjustment and Activation \(Phase ACT_UPG\) \[page 181\]](#)
- [Profile of User <SID>adm \(Phase ENVFILES_COPY\) \[page 182\]](#)
- [Manual Actions for the ASCS Instance \(Phase REQ_ASCS_SWITCH\) \[page 182\]](#)
- [Database Archiving and Backup \(Phase STARTSAP_PUPG\) \[page 182\]](#)

Actions After Shutdown (Phase STOPSAP_<X>)

If you want to use transaction `RZ10` to adjust the instance profile during or after the update, start by reimporting the current version of the profile into your SAP system. If you do not do this, the changes made by the update are reset, which can cause the update to stop running.

Modification Adjustment and Activation (Phase ACT_UPG)

📘 Note

If you selected the scenario strategy *Standard* or *Downtime-optimized* in the initial dialogs, the Software Update Manager requests you to adjust your modifications to ABAP Dictionary objects during the *Preprocessing* roadmap step.

For more information, see *Modification Adjustment and Activation (Phase ACT_UPG)* in [Making Entries for the Preprocessing Roadmap Step \[page 167\]](#).

Profile of User <SID>Adm (Phase ENVFILES_COPY)

In this phase, the environment files are copied from the `envfiles` subdirectory to the home directory of the `<sid>adm` user on the target system. Here, they are saved again with lowercase file names as follows:

CSHRC	→ <code>.cshrc</code>
PROFILE	→ <code>.profile</code>
DBENV.CSH	→ <code>.dbenv.csh</code>
DBENV.SH	→ <code>.dbenv.sh</code>
SAPENV.CSH	→ <code>.sapenv.csh</code>
SAPENV.SH	→ <code>.sapenv.sh</code>

Note

Before the environment files are copied to the home directory, the Software Update Manager creates backup files in the directory `<SUM_directory>/abap/sapnames` using the following file name pattern: `ENVBACKUP<original file name>`. (Example: `ENVBACKUP.dbenv.csh`)

If additional application servers with an own home directory of user `<SID>adm` exist, copy the environment files to these servers.

Any changes you made to the files after the `ENVFILES_PREP` phase and before the `ENVFILES_COPY` phase are then applied to the target system. For more information, see [Customizing of Environment Profiles \[page 68\]](#).

Manual Actions for the ASCS Instance (Phase REQ_ASCS_SWITCH)

You are prompted to install the latest SAP kernel on the host with the ASCS instance, when the following conditions are met:

- you are running the ASCS instance on a separate host (for example, in a high availability environment)
- the operating system of the host is different

Database Archiving and Backup (Phase STARTSAP_PUPG)

You are asked to make a full backup of your database. If you have deactivated archiving, you are asked to change the archiving mode of your database.

For more information about database archiving and backup strategies, see [Database-Specific Aspects \[page 64\]](#).

5.2.10 Important Entries for the Postprocessing Roadmap Step

This chapter deals with the roadmap step `Postprocessing`, in which the Software Update Manager saves the log files and prompts you to start with certain follow-up activities.

In the following, we go into detail of some important phases in which you enter information or confirm the existing values when prompted by the Software Update Manager:

- [Configuration of SAP Start Service \(Phase REQSTARTSRV\) \[page 183\]](#)
- [Load Generation \(Phase REQ_GENLD\) \[page 183\]](#)
- [Solution of P-Errors \(Phase CHK_POSTUP\) \[page 183\]](#)
- [Temporary Renaming of SPAU Transport Request Owner and Client \(Phase UEXP_SPAU\) \[page 185\]](#)
- [Modification Adjustment of Repository Objects \(Phase SPAUINFO\) \[page 185\]](#)
- [Starting Cleanup Processing \(Phase REQ_UP_FINAL\) \[page 186\]](#)
- [Finishing Imports \(Phase REQ_FINISH_IMPORT\) \[page 186\]](#)
- [Saving Log Files \(Phase SAVELOGS\) \[page 186\]](#)

Configuration of SAP Start Service (Phase REQSTARTSRV)

The upgrade does not configure the SAP start service (`sapstartsrv`) to start automatically as a daemon when you start the operating system. If you want to set up the automatic start, you have to perform some manual actions.

For more information about setting up the automatic start of the SAP start service during the operating system startup, see SAP Note [823941](#).

Load Generation (Phase REQ_GENLD)

You can now start to generate loads for your SAP system.

For more information, see [Generating Loads \[page 225\]](#).

Solution of P-Errors (Phase CHK_POSTUP)

Some of the problems, which occur during an update, can be tackled after you have completed the update but before you start the productive system. This type of problem is indicated by a *P* in the second column of the `.e1g` logs.

You can find a complete list of these P messages in the `CHK_POSTUP` phase in the `longpost.log` file.

⚠ Caution

It is stringently required that you remove the cause of the P messages before you start using your SAP applications again.

🔗 Example

Some of the secondary indexes may not have been created because they were not unique. Use the ABAP Dictionary tools (transaction SE14) to create these indexes in the database.

To remove an error, proceed as described in the long text of the message. You have two options to access the message long text in your SAP system: Either using transaction SE91 (*Message Maintenance*), or using transaction UPG_SHOW_LOGFILE (*Display a SUM LOG File*).

The transaction UPG_SHOW_LOGFILE displays only log files located in the subdirectory DIR_PUT/LOG of the SUM directory. It is provided by the Software Update Manager and remains in the SAP system after the update.

- Using transaction SE91:
 1. Identify the appropriate message class and the message number. In general, the message class is indicated by the letters after the Px, followed by message number, and the message short text. The system is the following: P<message language><message class><message number>

🔗 Example

P-message 4PEDH176 *Parameter list of append search help "PRCTR_APPEND" differs from appending one* means:

- Message type: *P*
- Message language: *E (English)*
- Message class: *DH*
- Message number: *176*
- Message short text: *Parameter list of append search help "PRCTR_APPEND" differs from appending one*

2. In your SAP system, choose transaction SE91 and fill in the fields *Message Class* and *Number* accordingly. Then choose *Display*.
 3. Select the message in the list and choose *Long Text*. The long text with further information appears. Note that no long text is displayed when the checkbox *Self-Explanatory* is selected. In this case, the short text describes the issue sufficiently.
- Using transaction UPG_SHOW_LOGFILE:
 1. In your SAP system, choose transaction UPG_SHOW_LOGFILE, and enter the log file name. Possible log file names are longpost.log or <file name>.<sid> (for example, SAPA731ESI.S41).
 2. Select a level of detail to which you want to expand the list of messages.
 3. In the displayed message list, an icon before a message indicates that a long text exists in addition. To open the associated long text, double-click the message.

Any messages that you do not handle immediately must be handled at the next opportunity.

Note

If you receive an error message stating that a table with the naming convention `M_<four-character matchcode object><one-character ID>` does not have an ABAP Dictionary reference, you can delete this table without informing SAP Support.

Temporary Renaming of SPAU Transport Request Owner and Client (Phase UEXP_SPAU)

If you carry out the modification adjustment during the update, note that the Software Update Manager performs the following in phase `UEXP_SPAU`:

- The owner of the modifications transport request changes temporarily to user `DDIC`.
- The client changes temporarily to client `000`.

After this phase, the Software Update Manager revokes the changes so that the client has the original number and the transport request has the original owner again.

If the Software Update Manager aborts during this phase and you have to look for the transport request, bear in mind that the request owner is user `DDIC`. The number of the transport request remains unchanged.

If you restart the Software Update Manager, it uses the original client and transport request owner again.

Modification Adjustment of Repository Objects (Phase SPAUINFO)

If you modified programs, screens or user interfaces, you have to adjust them with transaction `SPAU` and - if applicable - transaction `SPAU_ENH`. You can either do the modification adjustment now or after you have finished the update. If you adjust the modifications now, the Software Update Manager exports the related transport request to the transport directory and registers it for transport in the `umodauto.lst` file. Using this file, the Software Update Manager can integrate the transport into subsequent updates.

Note

Make sure that the user `<SID>ADM` has write permissions for the file `<DIR_TRANS>/bin/umodauto.lst`

To use this automatic registration of the transport in the `umodauto.lst` file, proceed as follows:

1. If needed, close the browser window or the browser tab page with the SUM UI.
2. Perform the modification adjustment.
3. Restart the update and choose *Adjustment completed*.

If you want to finish the update without adjusting modifications, choose *Continue*.

For more information, see [Adjusting Repository Objects \[page 220\]](#).

Starting Cleanup Processing (Phase REQ_UP_FINAL)

In this phase, the Software Update Manager informs you that it will start as a next step performing cleanup activities. While it is doing this, you can carry out the necessary manual post-processing activities.

Note that imports of customer transports and additional software installations are still possible until phase REQ_FINISH_IMPORT. In this phase, you must confirm that such imports are no longer running or being started. Imports of this type are then only possible again after the update.

Finishing Imports (Phase REQ_FINISH_IMPORT)

Before you continue with this phase, make sure and confirm that all imports of customer transports and additional software installations are completed, and that no such further imports are started until the end of the procedure. Imports of this type are only possible again after the update.

Saving Log Files (Phase SAVELOGS)

The Software Update Manager saves selected log files and control files. If there are problems after the update, SAP Support can use these files for error analysis. The files are saved in the following directory:

```
/usr/sap/trans/sum/<SID>/<target release of SAP Basis>
```

5.3 Options After the SUM Run

5.3.1 Evaluating the Software Update Manager

To give your feedback to the update process, you can send a feedback form to SAP.

Prerequisites

- The update has finished.
- The client with which the update is controlled needs an Internet connection.

Context

SAP is always interested in improving its tools. Our aim is to provide you with a fast and efficient update process. Upon completing the process successfully, the important statistics of the update are collected in

a comprehensive report: the `UPGANA.XML` file. Evaluating the collected information helps us to improve the update process but also brings benefits like transparency and predictability. Note that the form does not collect any business-related data.

To be able to identify areas in need of improvement, we would highly appreciate getting feedback on your experience with the SUM process. For this purpose, we have incorporated a simple feedback form directly in the SUM user interface (*Summary* roadmap step). The *Summary and Evaluation of the Process* dialog contains the following sections:

- *Summary*
Using the corresponding link in the dialog (`UPGANA.XML`), you can open a process report, which is designed to easily evaluate your update and to better plan follow-up updates. It includes all important artifacts in a single file.
- *Feedback Form*
This form consists of the following:
 - a simple questionnaire on your experiences with the SUM process
 - a free-text feedback field
 - XML data generated during the update process
 - an e-mail field

Note

SAP offers also the *Technical Downtime Optimization* app. Based on the data from the `UPGANA.XML` file, it can display a visual analysis and evaluation of the system maintenance procedure using SUM. Moreover, the app is able to simulate and estimate the potential downtime savings for nZDM, downtime-optimized DMO, downtime-optimized conversion, and ZDO. In this way, it can help you to optimize the next SUM run to achieve minimum downtime and smooth system maintenance.

For more information about this app, see SAP Note [2881515](#) and the SAP Community blog [Downtime Optimization - Get insights using the new TDO app](#).

Procedure

1. Answer the questions in the *Feedback Form* section.

Note

Answering the questions is optional.

2. Choose *SEND TO SAP*.

5.3.2 Running the Software Update Manager for Another Update

This section describes how you start the Software Update Manager again from the beginning for another update.

Prerequisites

You have successfully performed an update, and you have stopped the Software Update Manager afterwards as described in [Stopping the Software Update Manager \[page 188\]](#).

Procedure

1. Rename the update directory used for the update that has already finished.
2. Unpack SUM again and start it as described in [Starting the Software Update Manager \[page 121\]](#).

5.3.3 Stopping the Software Update Manager

After a successful update, you have to stop the Software Update Manager manually.

Context

After the update procedure has been performed successfully, the Software Update Manager displays an appropriate information in the web browser window. Afterwards, all remaining processes on operating system level must be terminated to stop SUM completely. This also applies after a reset and the subsequent cleanup if you do not want to continue the update.

You have three options to stop the Software Update Manager completely:

- Choosing *Exit* from the user menu.
- Choosing *Cleanup* from the user menu.
- Killing the `SAPUP` processes manually on the host.

Procedure

- **Option 1: Stopping the Software Update Manager using the *Exit* option:**

1. After the update procedure has been performed successfully, choose *Exit* from the user menu. This exits the current page and displays the initial dialog of the SUM user interface (*Tool start required*).
 2. Choose *Exit* again. This terminates the `SAPup` process on the server and therefore stops the Software Update Manager completely. An appropriate message appears on the SUM user interface.
 3. Close the web browser or web browser page.
- **Option 2: Stopping the Software Update Manager using the *Cleanup* option:**
 1. At the end of a successful update procedure or after a reset has finished successfully, choose *Cleanup* from the user menu. This option cleans up the `SUM` directory and terminates all running SUM ABAP server processes (`SAPup`) processes on the server. Afterwards an appropriate message appears on the user interface. The Software Update Manager is now completely stopped and the SUM directory is back in the state it was in after the SUM archive was unpacked and before the update procedure was started.
 2. Close the web browser or web browser page.
 - **Option 3: Stopping the Software Update Manager by killing the `SAPup` processes:**
 1. After the update procedure has been performed successfully, choose *Cancel* and then *Ok*.
 2. Close all web browser windows connected with SUM user interface.
 3. Search for all `SAPup` processes by entering the following:
 - `ps -ef | grep SAPup`
 4. Kill all found process IDs (PIDs) using the following command:
 - `kill <PID>`

5.4 Additional Information for Database Migration Option

5.4.1 DMO Features in the Roadmap Steps

5.4.1.1 Extraction

In this roadmap step, SUM extracts the required software.

The following actions are carried out:

- Provision of passwords for `DDIC` user and database user in the source system
- Check of relevant tool and system parameters

DMO-specific actions:

- Provision of target database type and the migration key
- Decision about [Using the Migration Repetition Option for Testing \[page 199\]](#)
- Decision about the option `Table Comparison with SUM` (see [Table Comparison \[page 198\]](#))
- Decision about the landscape reorganization for SAP HANA scale-out (see [Landscape Reorganization \[page 202\]](#))
- Implementation of SAP Notes required by SUM

Note

During the update and migration procedure, SUM works with the kernel set that is located in the SUM directory in subfolder `\abap\exe` or `/abap/exe`. This can be relevant in case you want to check the

existing version after SUM has extracted the kernel. If the tool asks you to provide a newer kernel version, copy it into the download folder.

A kernel for the source database is not necessary, as the shadow system runs on the target database.

Further features:

- The SUM UI can be accessed concurrently by several users. However, it is not possible to define different roles when using the URL of the SAP Host Agent.
- In the phase `PREP_PARSE_SETUP/CHECK4NOTES_TOOL`, SUM displays a list of SAP Notes that are prerequisite for a successful update.
- To transport SAP Notes that cannot be implemented using the SAP Note Assistant (SNOTE), use the report `SCWN_TRANSPORT_NOTES` as described in the SAP Note [1788379](#) or in the SCN blog *Provide SAP Note for SUM by transport, not SNOTE*

Related Information

SCN blog: [Provide SAP Note for SUM by transport, not SNOTE](#)

5.4.1.2 Configuration

In this roadmap step, SUM asks for all information required to run the update with DMO.

The following actions are carried out:

- Configuration of processes and other performance relevant parameters

DMO-specific actions:

- Provision of connection parameters and users of the target database
- Installation or update of target database client on the DMO host
- Extraction of kernel for target database
- Upload of additional packages, customer transport requests, and modifications

Further features:

- When you execute a migration to the target database, select either the *Standard* or *Downtime-optimized* scenario strategy in the initial dialogs of SUM. The option *Single System* is not intended for DMO. For more information about the options, see in the *SUM Guide* the section [► Planning ► Initial Dialogs for the Specification of the Scenario ►](#).
- The number of `R3load` processes, which you can set in the phase `PREP_CONFIGURATION/INITSUBST`, is the only visible parameter that affects the migration performance in the downtime. Note that you can configure the number of processes dynamically at a later point in time.
- In the new DMO-specific phases, you provide connection data and user credentials for the target database.
- In the phase `PREP_CONFIGURATION/SUBMOD_MIG_CONFIG/HDB_INSTCLIENT`, you provide details required for the installation of the target database client.
- In phase `SUMASK_LIVECACHE`, a dialog box prompts you to decide on the configuration of your SAP liveCache. You can either specify that your SAP liveCache is migrated to the liveCache integrated in the

SAP HANA database, or you can continue to use the external liveCache that is based on SAP MaxDB technology.

If you decide to migrate to the liveCache integrated in SAP HANA, you must still determine the execution mode of the report `/SAPAPO/OM_LC_DOWNLOAD_UPLOAD`. The liveCache must be backed up before the downtime and restored afterwards. This is done with sections 'B' and 'C' of the report (see SAP Note [632357](#) for more information). You can choose whether the report is to be executed manually or automatically.

5.4.1.3 Checks

In this roadmap step, SUM checks if your system fulfills the requirements for the update and migration procedure (for example, whether the required free space is available).

The following actions are carried out:

- Calculation of the space for the shadow system
- System health checks (such as `nametab`, `transport system`)
- Checks of relevant tool and system parameters

Further features:

- In the phase `MIG2NDDB_HANA_BW_PARAMS`, which is relevant for the usage of specific reports related to SAP BusinessObjects Business Intelligence (BI), you provide parameters for SAP BW-specific cleanup tasks. This includes
 - temporary BW query bookmarks
 - sent BW query bookmarks
 - BW traces
 - BW statistics
- Temporary database space, which is required for the shadow system and is calculated during the execution of the roadmap step `Checks`, is too generous. You can use the command `<SUM directory>/abap/bin/SAPup dmpspc` to check the used space at different points of time.
- If you perform a conversion to SAP S/4HANA 1909 or a higher version, the recommended security profile parameters of the SAP kernel are automatically written and stored in the default profile file `/DIR_PUT/sapnames/prod/DEFAULT.PFL` of the target system according to SAP Note [2926224](#). You are informed in a dialog on the SUM UI that you can opt out from this feature and therefore skip the setting of the security parameters. This is, however, not recommended and only necessary for compatibility reasons.

5.4.1.4 Preprocessing

In this roadmap step, SUM creates the shadow system.

The shadow system is then used for various update activities while you can still use the original system in production operation. The SUM builds up the shadow system by cloning parts of the original system. All tables of the SAP NetWeaver Application Server are needed as shadow tables to operate the shadow system.

The shadow system is used to perform the modification adjustment of the ABAP Dictionary objects and the activation of new ABAP Dictionary objects that are part of the update. Finally, the Software Update Manager performs the shadow import and writes directly into the shadow tables.

Modifications to the contents of the original tables are indicated by triggers. These tables are copied and imported during downtime.

The following actions are carried out:

- Checks for locked objects
- ABAP Workbench locking

Note

In contrast to the standard upgrade procedure, the Software Update Manager offers during the release upgrade with DMO a second phase `LOCKEU_PRE` to lock the ABAP Workbench. Thus, you can lock it either in phase `LOCKEU_PRE` or in phase `REPACHK2`, in which you have to perform the step at the latest.

If you confirm the lock already in phase `LOCKEU_PRE`, the Software Update Manager does not stop in the `REPACHK2` phase to allow you to confirm the lock on the ABAP Workbench. This increases the time in which the Software Update Manager does not need user input after the last request for a mount directory.

Furthermore, you may not perform any more transports into or out of the SAP system.

- Running the shadow system for preparation of new release (`ACT_UPG`, `PARDIST`, `SGEN`)
- (and subsequent to the following DMO-specific actions:) Transition to the downtime (system isolation)

DMO-specific actions:

- Uptime migration: Repository
- Execution of `SMIGR_CREATE_DDL`
- Execution of phases related to SAP Business Warehouse

Further features:

- In the phase `MIG2NDDB_HANA_BW_PARAMS`, provide parameters for SAP BW-specific cleanup tasks.
- Temporary database space, which is required for the shadow system and is calculated during the execution of the roadmap step `Checks`, is too generous.
You can use the command `<SUM directory>/abap/bin/SAPup dmpspc` to check the used space at different points of time.
- Phase `REQ_PARTITIONING_MATDOC`: After the completion of all `EU_CLONE*CREATE` phases, the Software Update Manager prompts you to provide a proper partitioning for table `MATDOC`, a new S/4HANA table for material documents. During database migration procedure, this table can reach or exceed the SAP HANA limit of 2 billion records for non-partitioned column-store tables depending on the posting volume of material documents. This makes a partitioning for large tables necessary.
For more information, see SAP Note [2259038](#). If applicable, perform the corrections described in this SAP Note.

Note

If the Software Update Manager stops in phase `EU_CLONE_MIG_UT_RUN`, for example due to an error, the option `init` does not restart the whole data migration from the beginning. The Software Update Manager

considers the status of the `TSK`-files for the restart of the failed export processes. The `TSK`-files are located in the `SUM` directory and here in the subdirectory `▶ abap ▶ load ▶ migrate_ut_run ▶`.

5.4.1.5 Execution

In this roadmap step, the switch to the target system takes place.

The `SUM` completes the copy import action during downtime for all tables with set triggers. The `EU_SWITCH` phase completes the switch to the new system. All tables prepared in the shadow system are copied to the target system. The `KX_SWITCH_1` phase switches the SAP kernel. The `PARCONV_UPG` phase converts the application table, and the phase `TABIM_UPG` imports the remaining data. Finally, the `XPRAS_AIMMRG` phase starts the `XPRAS` required by the system.

The following **DMO-specific actions** are carried out:

- Migration of application data
- Repository and kernel switch
- Adoptions of structures to new release (phase `PARCONV`)
- Main import (phase `TABIM`)
- `XPRAS`

Further features:

- Migration of application data from source database to target database
- You can change the number of `R3load` processes dynamically in the `SUM` Utilities (Extended UI).
- Consistency of the migrated content is checked by the command `SELECT COUNT(*) FROM "<table_name>"` on each table.
- Time estimation for the overall process and for long-running phases is written to the file `<SUM directory>/abap/log/SAPupStat.log`

Note

If the Software Update Manager stops in phase `EU_CLONE_MIG_DT_RUN`, for example due to an error, the option `Init` does not restart the whole data migration from the beginning. The Software Update Manager considers the status of the `TSK`-files in the `SUM` directory for the restart of the failed import processes.

5.4.1.6 Postprocessing

In this roadmap step, `SUM` saves the log files and prompts you to start certain follow-up activities.

The following actions are carried out:

- Cleanups
- Transaction `SPAU`
- Transport unlock

DMO-specific actions:

- Phases related to SAP Business Warehouse (SAP BW)
- Runtime evaluation

Further features:

- `Postprocessing` includes several SAP BW-specific phases
- Evaluation of the update and migration process is written to the file `<SUM directory>/abap/doc/upgana.xml`. To display this file in a human-readable form, store the file `UpgAnalysis.xml` in the same directory.

Note

The *SUM Analysis* utility visualizes the `upgana.xml`. You can access *SUM Analysis* in the SUM Utilities, which you can open via the *More* menu on the SUM UI menu bar.

5.4.2 Special DMO Features

5.4.2.1 Reset Option

The Software Update Manager offers the option to reset the update, that is, to undo all changes that have been made in the system during the update procedure.

The standard reset option is described in [Resetting the Update \[page 127\]](#).

When you use the *Reset* functionality in the built-in database migration option, SUM revokes all update and migration activities that are carried out the point in time you start the reset. Furthermore, it re-establishes the connection to the source database.

To perform this reset procedure, SUM offers in every roadmap step a *Reset* option in the *More* menu. This means that you can carry out the reset at every step of the update and migration procedure, even during or after the Business Downtime.

The system is not only reset to run on anyDB afterwards, but completely reset to its status before the update and migration procedure was started. You can then start the update and migration with the SUM again.

Note that after you have chosen the *Reset*-button, a *Confirmation* dialog box appears first to prevent an unintended reset.

Caution

- **Prerequisites**

To carry out the reset, it is required that

- anyDB is still available
- the SUM directory is not cleaned up

- **Limitations**

- Target database client is not deleted from the AS instance automatically
- BR*tools are not restored
- User `DBACOCKPIT` and related roles are not deleted in target database

- **No Reset possible after Cleanup**

After the update and migration procedure comes to an end, the Software Update Managers offers in addition to [Reset](#) the option [Cleanup](#). Note that after a cleanup, a reset is not possible anymore. For example, you cannot carry out a manual reset on operating system level (as described in SUM guide) after a cleanup.

- **ASCS Instance Move**

If you use the `ASCS Instance Move` feature in addition, and you reset the procedure, you must restart the `SAP Startservice` of the ASCS instance from the remote application server **manually**. For more information, see the chapter *ASCS Instance Move* in the *SUM guide*.

📌 Note

SAPup processes after a successful DMO run or a reset

After the update procedure has been performed successfully, SUM displays an appropriate information in the web browser window. Afterwards, you have to stop the Software Update Manager - as described in the SUM Guide in section [▶ Running the Software Update Manager](#) [▶ Stopping the Software Update Manager](#) ▶ - to terminate all remaining `SAPup` processes on operating system level.

This also applies after a reset and the subsequent cleanup in case you do not want to continue the update.

📌 Note

Access rights on source database Oracle

After a successful reset, the "old" SAP kernel is re-enabled. As a consequence, you have to adapt the access rights on the Oracle database again. Call the script `oraroot.sh` with the options `SID` and `oracle` user as follows: `oraroot.sh <SID> <oracle user>`. Example: `oraroot.sh XYZ oracle`. The script is provided together with the SAP kernel.

5.4.2.2 Reset Option During System Move

There are two ways to reset a DMO with System Move: You can either perform a reset on the source system or on the target system.

⚠ Caution

Before you perform a reset in either the source or target system, always ensure that a full backup is available including source system SUM directory, database, configuration files, profile data, etc.!

Reset of Source System

If you perform a reset on the source system, it is reset to a status that allows you to restart the SUM procedure from the beginning.

We strongly recommend that you only perform a reset of the source system in the following cases:

- on a test system for test purposes
- you want to continue working productively on the source system and use the migrated system for testing purposes or keep it as a reference
- the migration to the target system failed, or the target system is discarded

ⓘ Note

- After the reset, you must start the complete *DMO with system move* procedure from the beginning. It is not possible to only enter the downtime again.
- Productive parallel use of the original source system and the target system is not supported and leads to serious problems because the systems cannot be kept in sync.

Reset of Target System

The *Reset* option is also available for the SUM run on the target system. After you have started it, the Software Update Manager indicates afterwards as usual the successful reset and prompts you to clean up the SUM directory. Now, you can choose between two cleanup options:

- A cleanup to start the *DMO with System Move* feature on the target host again
- A cleanup to start the SUM tool on the target host from the beginning including scenario specification

The difference is that the first option deletes only those data from the SUM directory that has already been generated on the target system side during the *DMO with System Move* procedure. Only the SUM directory data of the data transfer from the source side is kept. In this way, you can restart the part of the *DMO with System Move* procedure, which takes place on the target system to continue and complete the procedure.

A regular cleanup, on the other hand, cleans up the SUM directory and several other directories on the target host and stops all running processes on the server. Note that the SUM directory on the source host is not affected by this option. This procedure allows you to restart the Software Update Manager tool on the target host from the beginning, including specifying the scenario. Source system data does not exist.

5.4.2.3 SUM Utilities for DMO (Extended UI)

The *Utilities* menu item of the menu *More* of the Software Update Manager offers you some DMO-related utilities.

In the upper-right corner of the SL Common UI, you find the menus *Legend*, *More*, and *Help*. The *More* menu contains among other things the item *Utilities*, which opens a new window with an extended user interface (extended UI). It offers you several options to configure or monitor the current update procedure. And it contains also various utilities that are only relevant for the DMO execution.

During the steps *Migration Preparation* and *Execution*, to be more precise during the *EU_CLONE** phases, the Software Update Manager creates several statistic files and stores them into the *doc* subdirectory. The extended UI allows you to visualize these generated statistic files using the SAPUI5 functionality.

Note

Be aware that some options of the *Utilities* can only be used during the update procedure if the corresponding data is available in the system.

DMO Migration Preparation

This option offers provides you with visualized information regarding the migration preparation during the uptime. All visualizations are based on statistic files that are stored in directory `SUM/abap/doc/analysis` and generated during phase `EU_CLONE_MIG_*_PRP`.

Table Sequence

After the phase `EU_CLONE_MIG_*_PRP` has been completed, this view displays the final sequence of all tables which will be migrated during uptime and downtime. The graph shows two bars for each table:

- One bar represents the real table size in Megabyte (MB).
- The other bar represents the estimated migration time for this table in seconds, determined automatically based on the duration file from the previous run (see also [Performance Optimization with Migration Duration File \[page 86\]](#)). The Software Update Manager considers for the calculation the table size and the migration time of the previous migration run, and the current table size as well.

You can click a column in the chart to open a popup with information about the name and the size of the table.

Table Splits

During the migration, several R3load processes run in parallel. All tables are distributed to these R3load processes (process slots). Some of the tables are split to avoid a process tail.

This view shows the result of the table distribution to the R3load processes. The green bars represent the tables that were distributed during the migration. This visualization helps you understand the result of the table split algorithm and find out exactly which table was split.

You can click a table to open a popup window with information about the selected table.

DMO Migration Post Analysis

This option offers provides you with visualized information regarding the migration execution after the migration phase `EU_CLONE_MIG_*_RUN` has been completed successfully.

<i>Tail Viewer</i> (R3load Processes)	Shows the number of running R3load processes depending on the time. You can see the migration duration, and you can verify if all processes run in parallel for the complete migration time. This view might be a good indicator in terms of evaluating the parallelization.
<i>Bucket Viewer</i> (R3load Statistics)	During the migration preparation, the SUM prepares a sequence of several buckets that are processed by R3load processes. This view visualizes the R3load bucket statistic, such as migration time per bucket, number of rows per bucket, or CPU usage per bucket. You can click a bar in the bar chart to see the CPU usage (<i>real, usr, sys time</i>) of one bucket. Furthermore, you can click the chart legend label <i>Export</i> or <i>Import</i> to see the aggregated CPU usage.
<i>Duration Viewer</i> (Table Durations)	Displays information about the real migration time of long running tables and when such a table was processed during the migration. This view also visualizes the generated durations file. By clicking on a table, a popup window appears that provides information about the selected table.

5.4.2.4 Table Comparison

This section covers the built-in Table Comparison tool.

After the migration of tables in both the uptime and the downtime, SUM applies the function `Table Comparison with SUM`. It compares the contents of the target database tables with the table contents in the source database based on calculated checksums. In a dialog in roadmap step `EXTRACTION`, SUM offers the following options:

- *Do not compare table contents*
- *Compare the content of all tables*
- *Compare only the content of selected tables*

The last option offers the possibility to check and compare the table contents of certain tables only. If you choose this option, you are then prompted to specify the location of the file that includes the table names to be checked. The file must be in TXT format, and each line in the file contains one table name without a separator character at the end.

The comparison of the tables runs in parallel processes. The number of the processes is defined by the number of R3load processes that you set in the configuration dialog in phase `PREP_CONFIGURATION/INITSUBST`.

→ Recommendation

Note that the scope of the selected tables influences the runtime of the subsequent phases. That is, the more tables have to be compared, the longer are the affected phases during uptime or downtime.

To avoid in particular a long downtime, we strongly recommend comparing the content of selected tables only, such as important application tables. We also highly recommend executing the table comparison not

on the productive system. Use a separate system instead such as a test system or a copy of the productive system.

The function `Table Comparison with SUM` calculates after the migration the checksum for an entire table on both the target database and the source database and compares the values. If the values are not equal, SUM displays an error message depending on uptime or downtime

- either in the `Preprocessing` roadmap step in phase `MAIN_SHDIMP/SUBMOD_MIG_UPTIME_RUN/EU_CLONE_MIG_UT_CRC_RUN`
- or during the `Execution` roadmap step in phase `MAIN_SWITCH/SUBMOD_MIG_SWITCH/EU_CLONE_MIG_DT_CRC_RUN`

In parallel, the system generates an LST-file, which informs you about the affected tables, the possible fixing or ignoring options and their consequences during the `Repeat` phase. The location of the file is displayed in the dialog, which accompanies the error message.

In case of errors, SUM offers you the following options:

1. Exit the program.
2. Fix the errors in the affected tables on the target database. Afterwards, you repeat the phase so that the table comparison runs again and the phase continues at the point it stopped.
3. Fix the errors in the affected tables on the source database. Afterwards, you initialize the phase to restart it from the beginning. The tables are migrated and checked again.

⚠ Caution

- The function `Table Comparison with SUM` is only available for update and migrations procedures with Unicode SAP systems.
- This function is only intended for SAP tables that belong to the ABAP dictionary. Other tables such as system catalog or database schema tables are not processed.
- This migration tool mode is similar to the stand-alone migration tool `Table Comparison`, which is described in section [Table Comparison \[page 208\]](#). However, while this function can be part of the update and migration procedure dependent on your decision in roadmap step `Extraction`, the stand-alone migration tool `Table Comparison` is designed for other tools such as the `System Copy` procedure.

5.4.2.5 Using the Migration Repetition Option for Testing

The option *Migration Repetition* allows the repetition of the downtime migration for testing purposes.

Context

To optimize the SUM with DMO procedure, it is necessary to manually adapt some parameters such as the number of `R3Load` processes to the performance of the application server, and to repeat the migration afterwards. However, the [Reset Option \[page 194\]](#) only allows the reset of the complete procedure. This means that all check and preprocessing phases will have to be passed again during the next run.

The option to jump back to the beginning of the downtime migration offers a fast test cycle by repeating the downtime migration phase only. This way, the repeated migration will start from the beginning with the

number of R3loads you detected as optimum. In addition, SUM will consider the table duration files from the previous run for the table split calculation automatically (see for more information: [Performance Optimization with Migration Duration File \[page 86\]](#)).

⚠ Caution

Use this option for test migrations only and not for any productive run, since the procedure will stop during the downtime.

You deal with the *Migration Repetition* option in the following dialogs during the run:

Procedure

1. Dialog *Migration Parameters* during the initial dialogs sequence after the start of the Software Update Manager:

You select in this dialog in section *Migration Repetition Option* the option *Enable migration repetition option*. As a result, SUM stops after the downtime migration phase and displays an additional dialog that allows you to repeat the downtime migration (see step 3).

2. Dialog *Preparations for Downtime* (phase DOWNCONF_DTTRANS)

If you have enabled the *Migration Repetition Option*, this dialog displays an additional warning that the SUM will stop after the downtime migration phase and allows you to repeat the phase. Be aware that you must not use this option for a productive run.

📌 Note

if you want to disable the option now, set the following parameter in the file
SUM\abap\bin\SAPup_add.par:

```
/migrate_option/OPTIMIZECLONING = 0
```

The file SAPup_add.par is located in the subdirectory bin of the SUM directory. If this file does not exist yet, create it manually.

3. Dialog *Test cycle* (after phase EU_CLONE_MIG_DT_RUN)

If the *Migration Repetition* option is still enabled, SUM displays the dialog *Test cycle* after the downtime migration phase in which you are asked if you want to repeat the phase.

Select *Yes*, if you want to initialize the downtime migration again and repeat it. As long as the *Migration Repetition* option is enabled, this dialog is shown after the downtime migration again and offers the possibility of another test cycle, if desired.

Select *No*, if you want that the DMO run continues without any additional dialogs or steps related to the test cycle.

5.4.2.6 Targeting SAP HANA Multitenant Database Containers

You can also choose as target database an SAP HANA system that supports SAP HANA multitenant database containers (SAP HANA MDC).

Context

If you target to an SAP HANA database with SAP HANA MDC option, the Software Update Manager offers a special sequence of dialogues to prepare the migration to that SAP HANA system.

Note

Database ID of tenant restricted to three characters

During the DMO run, SUM collects connection information to the SAP HANA database using the dialog [SAP HANA Database or Database Tenant](#). However, the requested database ID (that is, the database name of the tenant) is restricted to three characters. This means that you can only use a tenant with a three characters long database name.

Procedure

1. Enter the target Hostname of an SAP HANA database that supports SAP HANA MDC.

In the dialog [Database Migration Initialization](#), you enter in the field [Target Hostname](#) an SAP HANA database that supports SAP HANA MDC. Furthermore, you enter here the system-ID, the instance number, and the database schema of the target database.

2. Decide on the automatic creation or the configuration of the tenant.

The dialog [SAP HANA Tenant Configuration](#) appears.

If the specified system-ID of the target database does not exist, you see the message `The tenant "(ID)" does not exist`. You can now select whether the Software Update Manager creates the tenant "(ID)" in the further procedure or uses another tenant.

However, if the specified system-ID of the target database exists, you see the message `The tenant "(ID)" already exists`, and you have now the following options in the dialog:

- [Recreate existing tenant](#): The existing tenant is deleted and recreated.
- [Use existing tenant](#): The existing is used.
- [Use another tenant](#): This option opens the dialog [Database Migration Initialization](#) again.

3. Enter the password for the SAP HANA MDC superuser `SYSTEMDB`

To enable the creation of the tenant, it is necessary to authenticate with the password for the SAP HANA MDC superuser `SYSTEMDB`.

4. Enter the new password for the tenant database user `SYSTEM` and confirm it.

5. Continue with the update and migration procedure.

5.4.2.7 Landscape Reorganization

If you run an SAP HANA scale-out landscape as a target for a migration of SAP BW powered by SAP HANA, you can perform a landscape reorganization.

You can enable the landscape reorganization in phase `HDB_MIGCONFIG` during the preprocessing phases of the migration. If you decide not to run the SAP HANA landscape reorganization, which is usually the case for SAP ERP or SAP S/4HANA, SUM performs the phases for the scale-up scenario.

In phase `HDB_MIGCONFIG`, you can also enable or disable the automatic loading of table placement statements.

Example

You must modify the SQL files delivered by SAP and therefore disable the automatic loading of the table placement SQL files. Software Update Manager prompts you to import the SQL files in a dialog during the procedure.

SAP HANA Scale-Out

The scale-out scenario means the deployment of multiple server nodes if memory requirements exceed the available memory of a single-server node after the migration to SAP HANA database. For this, several phases are carried out during the SUM with DMO run.

If you have **disabled** automatic loading of table placement statements:

- `REQ_LANDSCAPE_REORG`
In this phase, SUM prompts you in a dialogue to import an SQL-file from SAP Note [1958346](#) into the database.
- `REQ_LANDSCAPE_REORG_2`
In this phase, SUM prompts you in a dialogue to import an SQL-file for SAP BW powered by SAP HANA from SAP Note [1908075](#) into the database.

Note

Scale-out scenarios with multiple worker nodes to scale memory are not yet released for **SAP Business Suite on HANA**. It is recommended to scale up memory by using a hardware configuration that maximizes the available database memory. For more information, see the SAP Notes [1774566](#) and [1825774](#).

For more information about the scale-out scenario for SAP S/4HANA, see SAP Note [2408419](#) and the guide *SAP S/4HANA Scale-Out* that is attached to this SAP Note.

If you have **enabled** automatic loading of table placement statements:

- `SQLDB_LANDSCAPE_REORG`
In this phase, SUM imports an SQL-file from SAP Note [1958346](#) into the database.

- `SQLDB_LANDSCAPE_REORG_2`
In this phase, SUM imports a procedure for the SQL-files for SAP BW powered by SAP HANA from SAP Note [1908075](#) into the database.
- `SQLDB_LANDSCAPE_REORG_EXEC`
In this phase, SUM executes the procedure loaded in phase `SQLDB_LANDSCAPE_REORG_2`.

The following landscape reorganization phases run automatically:

- `HDB_CHK_LANDSCAPE_REORG_PRE`
In this phase, SUM checks whether the prerequisites for the landscape reorganization are met.
- `HDB_LANDSCAPE_REORG`
In this phase, the landscape reorganization is performed.
- `HDB_CHK_LANDSCAPE_REORG_POST`
In this phase, SUM checks whether the landscape reorganization has been performed correctly.

SAP HANA Scale-Up

Even if you run an SAP HANA single-node system with a scale-up scenario, you must import a file with specific SQL-information to enable the optimal table partition. For this, the following phases are carried out during the SUM with DMO run.

If you have **disabled** automatic loading of table placement statements:

- `REQ_SCALEUP_PREREQ`
In this phase, SUM prompts you in a dialogue to import an SQL-file from one of the following notes into the database according to your product:
 - BW on SAP HANA: SAP Note [1908075](#)
 - SAP Business Suite on HANA or SAP S/4HANA: SAP Note [3289309](#)

If you have **enabled** automatic loading of table placement statements:

- `SQLDB_TABLE_PLACEMENT`
In this phase, SUM imports a procedure for the SQL-files from one of the following notes into the database according to your product:
 - BW on SAP HANA: SAP Note [1908075](#)
 - SAP Business Suite on HANA or SAP S/4HANA: SAP Note [3289309](#)
- `SQLDB_TABLE_PLACEMENT_EXEC`
In this phase, SUM executes the procedure loaded in previous phase `SQLDB_TABLE_PLACEMENT`.

5.4.2.8 System Move: Data Transfer

During the SUM with DMO run including system move, you transfer the SUM directory data to the target host using either a parallel or serial transfer mode.

⚠ Caution

We strongly recommend using the parallel mode. The shadow operations in the phases such as `EU_IMPORT`, `EU_CLONE_EXT`, `ACT_UPG`, `SHD_IMPORT` are carried out on the target system and take a long time. In serial mode, they are executed during the downtime.

During phase `HOSTCHANGE_MOVE_SOT`, SUM displays the dialog *DMO with System Move: Data Transfer*. This is the first point in time to trigger the SUM directory content transfer from the source system landscape to the target system landscape.

→ Recommendation

Unix only: We recommend using the `rsync` utility, if possible.

ⓘ Note

- To avoid that SAP Host Agent cannot start the `SAPUP` later on, keep the following in mind:
 - Do not use user `root` to transfer the SUM folder, use the `<SID>adm` user instead.
 - The SUM directory must not exceed 25 characters. You may use a symbolic link.
- Unix only: The shell script for the data transfer runs in the background as a daemon process and is monitored by the HTTP server. In this way, you can control the process in the *Process Control Center*. Furthermore, the *Failed Daemon Processes* flag on the SUM UI informs you when the process aborts or fails.

For more information, see in the *SUM Guide* in [▶ 2 Introduction](#) > [The Software Update Manager](#) ▶ the following sections about the

- *Process Control Center*: [▶ SUM Utilities \(Extended UI\)](#) > [Process Control Center](#) > [Process Control Center \(Background Process Monitor\)](#) ▶
- *Failed Daemon Processes Flag*: [▶ SUM UI: Flags](#) > [Failed Daemon Processes Flag](#) ▶

Parallel Data Transfer Mode

If you opt for the parallel data transfer in phase `HOSTCHANGE_MOVE_SOT`, transfer the SUM directory including all files to the target host. Then you continue the DMO procedure on the source host. SUM starts to create export files that you copy to the target system.

Meanwhile, you start SUM with DMO on the target host in parallel to the current SUM with DMO procedure on the source host. The SUM in the target system landscape starts the import of the copied files, while other export files are still being created on the source system. This means that one `SAPUP` executable on the source system landscape works (export) parallel to one `SAPUP` executable on the target system landscape (import).

In addition, you have to synchronize manually directories that are listed on the dialog *DMO with System Move: Data Transfer* in phase `HOSTCHANGE_MOVE_SOT`. Flag files are used to notify the `SAPUP` in the target system landscape about which files are ready to be imported.

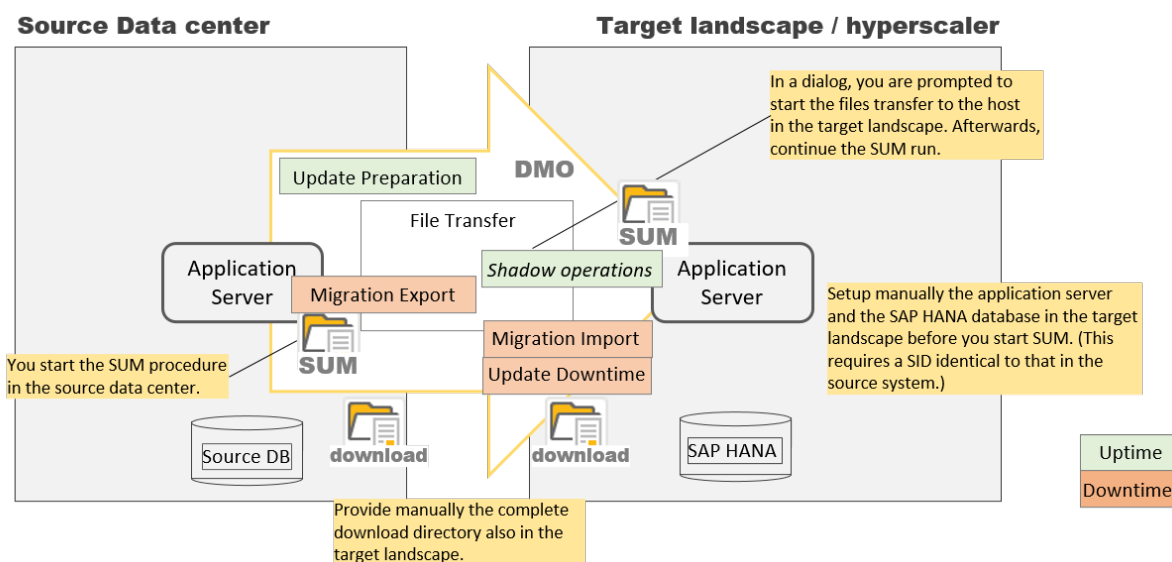
You can continuously synchronize the directories. Perform a final synchronization, as soon SUM has reached the phase `HOSTCHANGE_STOP`.

Note

The directories named `*crc*` are only existing if you have chosen to use [Table Comparison \[page 198\]](#): The Software Update Manager uses from the directory `>> <SUM directory> > abap > load >` the subdirectories `migrate_dt_crc` for a table comparison on all tables, and `migrate_dt_crc1st` for a table comparison on selected tables only.

See in the following a graphical overview of the *DMO with System Move* and parallel data transfer mode:

Overview: DMO with System Move (parallel mode)



Unix Only: Parallel Data Transfer Mode Using a Deamon Process

On UNIX systems, the Software Update Manager can also use a daemon process to automatically initiate the data transfer. The daemon process carries out commands to start and carry out the `rsync` utility.

To apply this option, enter the target host name in the appropriate field of the dialog *DMO with System Move: Data Transfer* in phase `HOSTCHANGE_MOVE_SOT`.

Note

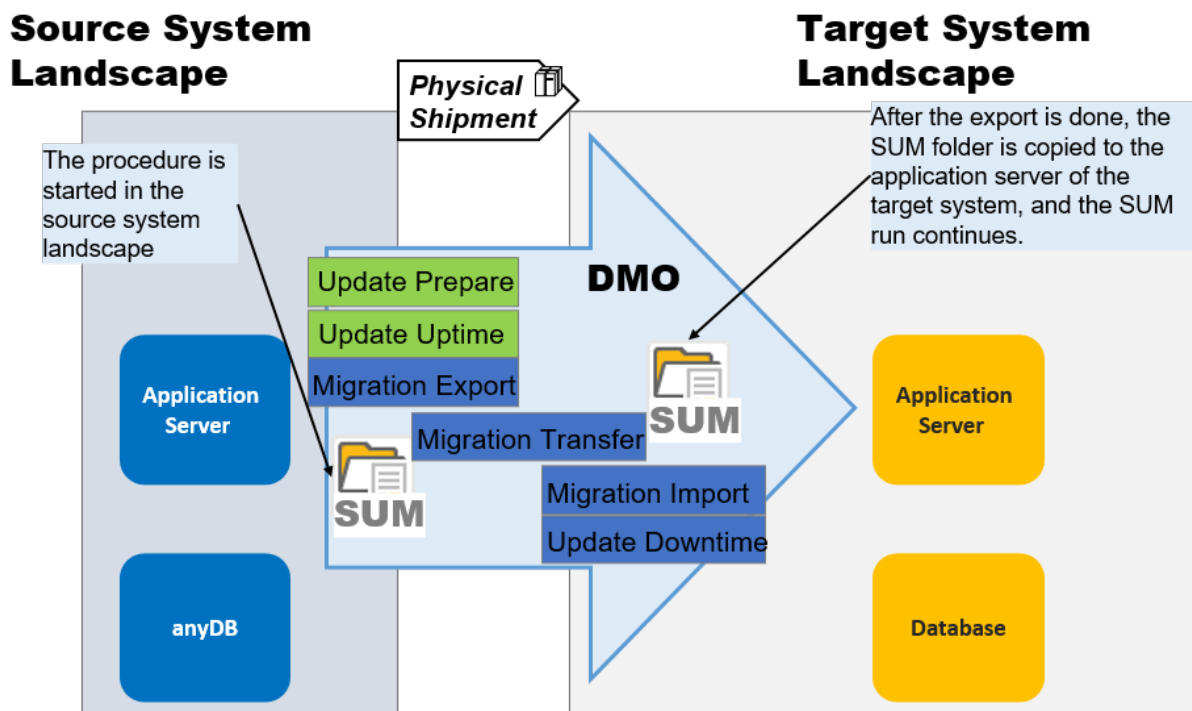
The `RSYNC` utility uses the SSH network protocol to connect to the target application server. You can use the SSH configuration to customize the `rsync` utility to your requirements, for example, to set the port. To do this, create an SSH configuration file named `config` (if it does not already exist). By default, the configuration file is stored in the `.ssh` directory under the user's home directory (`~/ .ssh/ config`). However, other custom locations are also possible.

Example for the port customizing:

```
Host host
Port < custom value >
```

Serial Data Transfer Mode

If you opt for the serial data transfer in phase `HOSTCHANGE_MOVE_SOT`, you can choose *Next* to continue with the DMO procedure on the source host. SUM exports then all files to the file system. As soon as SUM reaches the phase `HOSTCHANGE_STOP`, you are prompted to manually transfer at once the SUM directory including all files to the target host. After the transfer, you can continue with the DMO procedure on the target host. See in the following a graphical overview of the *DMO with System Move* and serial data transfer mode:



5.4.2.9 Table Partitioning as of Start Release 7.00

If the start release of your SAP system is SAP NetWeaver 7.0 or a higher version, automatic partitioning of large tables is provided for the DMO run.

If a table in the source system has more than 1 billion rows, it will be partitioned automatically. The default partitioning is configured in such a way that HASH partitioning is used with the entire primary key.

Exceptions to the default settings are defined in the file `SUM/abap/control/smigr_hashpart.txt`. This file should not be modified. It has the following format:

```
<tablename>:FIELD1,FIELD2,...
```

❖ Example

```
BSEG:MANDT , BUKRS , BELNR , GJAHR
```

The following placeholders can be used for `<tablename>`:

- `*` is a placeholder for a string of arbitrary length
- `?` is a placeholder for a single character

You can define additional filters for development classes using the following format:

```
<tablename>,DEVCLASS=<devclass>:FIELD1,FIELD2,...
```

❖ Example

```
CE1++++ , DEVCLASS=KEG0 : PERIO
```

If you would like to add or change settings, create the file `SUM/abap/control/smigr_hashpart_add.txt` and put your additions there. They will overwrite the settings from the delivered file.

5.4.2.10 Overriding Partitioning

If HASH partitioning is not suitable, or the capabilities of SUM regarding partitioning are not sufficient, you can override the partitioning settings applied by SUM.

Context

In DMO scenarios, the tables are already created during the uptime of the procedure, whereas the data migration takes place during the downtime for the application tables. As a consequence, the tables are empty when the SUM has stopped in the downtime dialog.

At that point in time, the content has not yet been migrated and the changes to the partitioning are not very costly. You can add or change the partitioning for application tables directly on the SAP HANA database while you are waiting in the downtime dialog of SUM, that is, when the `Preprocessing` roadmap step has finished and before you choose *Next*.

Procedure

Add or change the partitioning for application tables directly on the SAP HANA database, as described in *SAP HANA Administration Guide for SAP HANA Platform*. See ► [Managing Tables](#) ► [Table Partitioning](#) ► [Partitioning Operations](#) ►.

You can access the guide at https://help.sap.com/hana_platform in the section *Operate*.

5.4.3 Migration Tools

The Software Update Manager (SUM) offers migration tools as stand-alone options besides the standard update and migration procedure. These options are bundled as migration tools and run in the `migttool` mode of the SUM.

The migration tools in this context are basically use cases of the Software Update Manager. They are bundled separately and are not part of a standard SUM maintenance or of a standard DMO migration.

Currently the migration tools consist of

- benchmarking tool (see [Benchmark Migration \[page 208\]](#))
- table comparison standalone (see [Table Comparison \[page 208\]](#))

These migration tools can be started within the SUM. Select on the `welcome` dialog of the Software Update Manager that you want to perform a scenario without stack configuration file. On the next dialog screen, SUM displays a list with possible scenarios. Among them, you find the migration tools for benchmarking and table comparison.

For more information about the migration tools, see also the blog [DMO: table comparison and migration tools](#) in the SAP Community.

5.4.3.1 Table Comparison

Table Comparison offers you the possibility to compare export and import table checksums for your database.

This migration tool mode is similar to the built-in function that is described in [Table Comparison \[page 198\]](#). However, while this function can be part of the update and migration procedure dependent on your decision in roadmap step `EXTRACTION`, the stand-alone migration tool `Table Comparison` is designed for other tools such as the `System Copy` procedure.

For more information, see the section [9 Additional Information > Table Comparison with Software Update Manager](#) of the *System Copy guide* for ABAP technology, which is mentioned in [Other Required Documentation \[page 14\]](#).

Note

Keep in mind that only tables can be checked, but not views.

5.4.3.2 Benchmark Migration

Benchmark Migration offers you the possibility to simulate certain processes or only a part of it with the objective of estimating their speed.

A database migration consists of two processes:

- The export of data from the source system

- The import of data into the target system

The Software Update Manager offers a benchmarking of these two processes with the migration tool mode *Benchmark Migration*. You can simulate the export processes or the export and import processes to estimate their speed.

ⓘ Note

The Software Update Manager does not shut down the ABAP system during the benchmarking migration in any case.

Prerequisites

- You use an SAP system based on AS ABAP
- You have the latest SAP Host Agent installed and configured
- Your target database is available to ensure a complete procedure (not required for the discard mode)
- You have prepared the download directory with the kernel files for the target system

Access

To access the benchmark migration tool, select in the initial dialogs for the scenario specification ([Get Roadmap](#)) the scenario category `without stack.xml` configuration file. A dialog with a list of possible scenarios appears. Select from the list the option *Benchmarking Tool* and choose *Next*.

5.4.3.2.1 Benchmarking the Migration: Export Mode

This section covers the benchmarking of the export of data from the source system. To carry out the benchmarking, SUM displays a sequence of dialogues, which you have to maintain.

Procedure

[Get Roadmap](#)

1. After you have chosen to work without a stack configuration file and selected the option *Benchmarking Tool*, choose the benchmarking mode *Benchmark export (discarding data)* and click *Next*.
2. Dialog *Migration Parameters*
 - a. Table Selection: Select if the migration benchmark shall relate to all tables, that is, to the whole database, or to selected tables only.
 - If you choose *All tables*, you can specify additionally whether the benchmarking shall be performed for the whole database or on a sampling basis. Enter for this a value from 1 to 100 in percentage, where 100% means the whole database.

If you enter a lower value, the system determines internally the size of all tables, sorts them according to the size, and selects the tables based on a sequence until the given size of the database is reached.

In addition, you specify in percentage the maximum size of the largest table in the sample based on the database size.

🔗 Example

Assuming that the source database has a size of 1 TB and you want to export 10%. This means that 102.4 GB of the database will be the sample. However, the number of tables depends on their size. If, for example, the database contains among others one table with 102 GB, the sample would contain only this table.

Therefore, you specify the size of the largest table in the sample based on the size of the database. For example, 1% percent as maximum size means 1% of 1 TB database size. Hence, the largest table in the sample must not be bigger than 10.24 GB. In this case, the minimum number of tables in the sample is theoretically 10 tables with a size of 10.24 GB. The number increases with the number of smaller tables.

- If you choose *Selected tables*, enter the name and the path of the txt-file that includes the table names. The txt-file contains each table in one line.
- b. Migration Repetition Option: Activate the option *Enable migration repetition option* to stop the benchmarking tool after the downtime migration phase and to enable a simple repetition of the latter to optimize the procedure by adjusting the parameters (such as R3load processes).

You must not use this option for a productive run. For more information, see [Using the Migration Repetition Option for Testing \[page 199\]](#).

Roadmap Step Configuration

3. Dialog *Download Directory*
 - a. Download Directory: Specify the download directory that contains, for example, the required kernel files so that the Software Update Manager can update the kernel automatically.
 - Note that the folder for the duration files must be existing, but not filled.
 - You can skip this step when only customer transports are imported.
 - b. Archive Verification: Activate the option *Check the authenticity of SAP archives* if you want to check the authenticity of all the archives in the download directory.

For more information, see the chapter "Verifying SAP Archives" in section "Running the Software Update Manager" of the SUM guide.

4. Dialog *Parameters for Procedure*: Configure the number of parallel SQL and R3load processes.

📌 Note

For the benchmarking, *Uptime* means the `Preparation` roadmap steps, in which the tables for the export are determined, and *Downtime* means the `Execution` roadmap step, in which the table content is exported.

5. Dialog *Required System Passwords*: Database-specific password. Provide the password of the user `SYSTEM` of the source database.

Moreover, the Software Update Manager can ask for the name and the password of the SAP HANA database security user. However, this dialog appears only if the database user `SYSTEM` is deactivated. In this case, the Software Update Manager asks for a security user that has the system privilege `USER`

ADMIN. It uses this security user to activate the user SYSTEM if necessary. Then, the user SYSTEM is used for a short time and deactivated again afterwards.

Note

Note that not every source database requires a password. Therefore, this dialog appears only when a password is necessary.

Roadmap Step *Execution*

6. During the roadmap step *Execution*, the benchmarking is executed.

Roadmap Step *Postprocessing*

7. Dialog *Benchmarking completed*: The procedure is finished. Analyze the utility *DMO Migration Post Analysis* in the *SUM Utilities*.

To access the *SUM Utilities*, open the *More* menu in the upper-right corner on the menu bar. For more information, see also [SUM Utilities for DMO \(Extended UI\) \[page 196\]](#).

8. Fill in the evaluation form that SUM displays after the update and migration procedure is finished.
9. Optional: Save migration duration files for performance optimization, as described in chapter [Performance Optimization with Migration Duration File \[page 86\]](#).
10. Clean up the procedure at the end, so that you can the next time from the beginning.

5.4.3.2.2 Benchmarking the Migration: Export and Import

This section covers the benchmarking of the export of data from the source system and the import of data into the target system as well. To carry out the benchmarking, SUM displays a sequence of dialogues, which you have to maintain.

Procedure

Get Roadmap

1. After you have chosen to work without a stack configuration file and selected the option *Benchmarking Tool*, choose the benchmarking mode *Benchmark export and import* and click *Next*.
2. Dialog *Database Migration Option: Target Database*: Select your target database from the list of the available target database types.
3. Dialog *Migration Parameters*
 - a. *Table Selection*: Select if the migration benchmark shall relate to all tables, that is, to the whole database, or to selected tables only.
 - If you choose *All tables*, you can specify additionally whether the benchmarking shall be performed for the whole database or on a sampling basis. Enter for this a value from 1 to 100 in percentage, where 100% means the whole database.
If you enter a lower value, the system determines internally the size of all tables, sorts them according to the size, and selects the tables based on a sequence until the given size of the database is reached.

In addition, you specify in percentage the maximum size of the largest table in the sample based on the database size.

❁ Example

Assuming that the source database has a size of 1 TB and you want to export 10%. This means that 102.4 GB of the database is the sample. However, the number of tables depends on their size. If, for example, the database contains among others one table with 102 GB, the sample would contain only this table.

Therefore, you specify the size of the largest table in the sample based on the size of the database. For example, 1% percent as maximum size means 1% of 1 TB database size. Hence, the largest table in the sample must not be bigger than 10.24 GB. In this case, the minimum number of tables in the sample is theoretically 10 tables with a size of 10.24 GB. The number increases with the number of smaller tables.

- If you choose *Selected tables*, enter the name and the path of the txt-file that includes the table names. The txt-file contains each table in one line.
- b. *Table Count Verification*: Choose *Perform table count verification* if you want to verify the number of table entries.

Before a data migration, you can choose that after the migration the tool counts the table rows to verify that no data loss has occurred. However, the counting takes further time in addition to the actual migration.

Note that when the system is running, the table contents can change and therefore the table count does not match.

- c. *Migration Key*: Provide the migration key for the data import.

For more information on migration key generation, see SAP Note [317096](#).

- d. *Migration Repetition Option*: Choose the option *Enable migration repetition option* to stop the benchmarking tool after the downtime migration phase and to enable a simple repetition of the latter to optimize the procedure by adjusting the parameters (such as R3load processes).

Do not use this option for a productive run. For more information, see [Using the Migration Repetition Option for Testing \[page 199\]](#).

- e. *DMO with System Move*: Choose *Activate DMO with System Move* if you want the R3load to export the database contents to the file system on the target host, where you then continue the DMO procedure.

For more information about *DMO with System Move*, see [Performing DMO with System Move \[page 81\]](#).

Roadmap Step Configuration

4. Dialog *Download Directory*

- a. *Download Directory*: Specify the download directory that contains, for example, the required kernel files so that the Software Update Manager can update the kernel automatically.
 - Make sure that the SAP HANA database client archive is available.
 - Note that the folder for the duration files must be existing, but not filled.
 - You can skip this step when only customer transports are imported.
- b. *Archive Verification*: Activate the option *Check the authenticity of SAP archives* if you want to check the authenticity of all the archives in the download directory.

For more information, see the chapter "Verifying SAP Archives" in section "Running the Software Update Manager" of the SUM guide.

5. Dialog *Access to Target Database Client Required*: Specify the path strategy to the database client.
6. Dialog *Database Migration Initialization*: Specify the parameters for the migration initialization of the target database: hostname , SID , instance number.

Note

- The SUM displays in the dialog the SID of your source database. If the SID of the target database is different, adapt the SID accordingly.
- If your target database can only be reached via IP name and not via host name (for example for a cloned system), edit the `etc/hosts` file because the `hdbssl` used for the connection resolves and uses the host name.

7. Dialog *Required Migration-Specific Passwords*. Provide the migration-specific passwords for different users on the target database, such as:

Example

- User `SYSTEM`.
Moreover, the Software Update Manager can ask for the name and the password of the SAP HANA database security user. However, this dialog appears only if the database user `SYSTEM` is deactivated. In this case, the Software Update Manager asks for a security user that has the system privilege `USER ADMIN`. It uses this security user to activate the user `SYSTEM` if necessary. Then, the user `SYSTEM` is used for a short time and deactivated again afterwards.
- User `DBACOCKPIT` (only if it does not yet exist on the target database and SUM has to create it)
- User `SAP<SID>` (Note: SUM creates it on the target database)

8. Dialog *MultiDB Tenant Creation*: If you target to an SAP HANA database with SAP HANA MDC option, decide on the tenant.

You can use or re-create an existing tenant, or you can use another tenant.

9. Dialog *Schema Name in Target Database*: Determine the database schema in the target database.
10. Dialog *SAP HANA Migration Parameters*: Decide if you want to enable the automatic load of table placement statements for the SAP HANA database.
11. Dialog *Required System Passwords*: Database-specific password. Provide the password of the user `system` on the source database. You can be prompted under certain conditions to enter name and password of the SAP HANA database security user that has the system privilege `USER ADMIN`.
12. Dialog *Parameters for Procedure*: Configure the number of parallel SQL and `R3load` processes.

Note

For the benchmarking, *Uptime* means the `Preparation` roadmap steps, in which the tables for the export are determined, and *Downtime* means the `Execution` roadmap step, in which the table content is exported.

Roadmap Step *Execution*

13. During the roadmap step *Execution*, the benchmarking is executed.

Roadmap Step *Postprocessing*

14. Dialog *Benchmarking completed*: The procedure is finished. Analyze the utility *DMO Migration Post Analysis* in the *SUM Utilities*.

To access the *SUM Utilities*, open the *More* menu in the upper-right corner on the menu bar. For more information, see also [SUM Utilities for DMO \(Extended UI\) \[page 196\]](#).

15. Fill in the feedback form that SUM displays.
16. Optional: Save migration duration files for performance optimization, as described in chapter [Performance Optimization with Migration Duration File \[page 86\]](#).
17. Clean up the procedure at the end. Afterwards you can start the SUM from the beginning.

5.4.4 Troubleshooting

This part of the document contains additional information about how to proceed when you want to correct known problems that have occurred during the update.

Known problems and issues

Symptom	Solution
You run a dialogue instance installation after a DMO, and the database SID is shown incorrectly in the dialogue.	Set the parameter <code>j2ee/dbname = <YOUR_HDB_SID></code> in the default profile and start the installation again.
RFC connection errors occur during the <code>Postprocessing</code> roadmap step.	If RFC connection errors occur, check the connection information for <code>DBACOCKPIT</code> to the target database after the downtime processing of SUM and during <code>Postprocessing</code> roadmap step. If the user is locked, choose Activate user now and Reset connect attempts .
The system does not accept the password of user <code>SYSTEM</code> in phase <code>DBQUERY_PRE</code> .	Move the 720 database administration tools to the subdirectory <code>/abap/exe</code> of your SUM directory.
Error in the <code>Postprocessing</code> roadmap step in phase <code>RUN_PSA_VERSION_CREATE</code> .	Check with transaction <code>SECSTORE</code> your system for any inconsistent entries. Repair the connection to the SAP BW client following SAP Note 816861 after you have applied the new license.
Some secondary indexes, which are to be created on selected databases only, can be inconsistent after the migration. These inconsistencies are found in phase <code>RUN_RSDB02CK_END</code> and reported in the log file.	To fix the inconsistencies, use transaction <code>SE14</code> or <code>SE11</code> and repeat the phase after the correction.
The creation of a logical index for the master data terminates after the migration to the SAP HANA database. The error messages issued during the execution of the query are for example: <i>table config error; column store error: fail to create scenario/ Index does not exist</i>	See SAP Note 1695112 for further information and for a solution.

Symptom

The creation of an index (or primary key) in an `EU_CLONE_MIG_*` phase stops with an error message due to duplicate data records.

The dialog *Repeat Phase* appears with the error message and further information about the error. The details of the duplicates are listed in the corresponding log file.

Solution

You have the following options:

1. You manually check the duplicate data records and delete the unwanted duplicates. Afterwards, you continue with the procedure.
2. You activate the function *Delete duplicate records during creation of the following indexes* in the dialog *Repeat Phase*. If you now choose *Next*, the automatic deletion of duplicate records in the target system is activated before the indexes are created.

6 Follow-Up Activities

This part of the document contains information about the follow-up activities that you need to perform after you have updated your SAP system.

When you perform follow-up activities, note the following information:

- Before you start the follow-up activities, the Software Update Manager needs to have reached the `MODPROFP_UPG` phase. The Software Update Manager stops in the `MODPROFP_UPG` phase and prompts you to start several follow-up activities. It then executes the last phases and completes the procedure. At the same time, you can already perform the specified follow-up activities.

The follow-up activities are divided into three blocks:

- Actions needed before resuming production operation
These actions ensure that all the processes that are relevant to system operation are available again. You can start these actions while the Software Update Manager is finishing the update.
- Actions during limited production operation
During this time, your SAP system is already consistent and all the processes that are relevant to system operation are available. However, this system state does not yet contain measures for optimizing performance, or actions for resuming standard operation (resuming background processing, or adjusting authorizations, for example). Check the actions that are listed in this block and if necessary, perform them before you restart production operation.
- Actions during production operation
You can also perform these actions when the system is back to production operation.

⚠ Caution

In addition to the general follow-up activities described in this document, you need to perform the follow-up activities that are specific to your product version, which are described in an additional product-specific document. This document is referenced in the *Master Guide* (or *Upgrade Master Guide*, respectively) for your product.

6.1 Solving P-Errors

Some of the problems, which occur during an update, are stored as P-messages in the `longpost.log` file. They must be solved at the latest before you resume production operation.

Context

During the update execution, you are informed about P-messages on the SUM user interface by means of a `checks.log` flag (see also [SUM UI: Flags \[page 28\]](#)). The flag is displayed as warning with a corresponding message. At that moment, you can already process this type of error.

You can also tackle P-errors at a later point in time in the *Postprocessing* roadmap step. In any case you must ensure that all remaining P-errors are solved before you start the productive system.

If any of them still exist, process them as follow-up activity after the update procedure is completed.

Procedure

Process the P-errors as described in section *Solution of P-Errors (Phase CHK_POSTUP)* in [Important Entries for the Postprocessing Roadmap Step \[page 183\]](#).

6.2 Performing Follow-Up Activities for SAP Profiles

During the update, the start profile is automatically merged with the instance profile for all instances that are started on the target system.

Context

For those instances for which the profiles are not automatically merged during the update, you must merge the profiles manually. The procedure is described in SAP Note [1528297](#).

Note

Check all SAP profile changes made by the Software Update Manager. Rework is to be expected, especially in SAP Memory Management.

After the update, check the SAP profile settings for your target release as follows:

Procedure

1. Check the file `/usr/sap/sapservices` to ensure that all application server instances are configured properly. If necessary, correct the file as user `root`.

The automatic profile merge procedure registers the profile in file `/usr/sap/sapservices` using an SAP Host Agent call. Therefore, you must provide the credentials for user `<sid>adm`.

2. Call transaction RZ10 (*Maintain Profile Parameters*).
3. Enter the wanted profile.
4. From the menu bar, choose **► Profile ► Detailed Check ►**.
5. If necessary, correct the results.

6.3 Performing Follow-Up Activities for User root

To perform the necessary adjustments after the update, you need the user authorizations of the user `root`.

Context

Note

- The UNIX commands `chown` and `chmod` below are used to provide root permissions to the `icmbnd` executable. Root permissions are only required for binding ports with port numbers smaller than 1024. If no ICM server ports have been configured to use port numbers smaller than 1024, we recommend that you do not execute the `chown` and `chmod` commands. For more information about binding ports smaller than 1024, see SAP Note [421359](#).
- The ICM server ports are configured in the profile parameter `icm/server_port_<n>` that is contained in the instance profile or default profile.

Procedure

1. Log on as user `<SID>adm`.
2. Execute the following commands:

```
su - root
```

```
If you have one kernel directory: cd /usr/sap/<SID>/SYS/exe/run
```

```
If you have two kernel directories: cd /sapmnt/<SID>/exe/(n)uc/<platform>
```

```
cp -p ./icmbnd.new ./icmbnd
```

```
chown root:sapsys icmbnd
```

```
chmod 4750 icmbnd
```

```
exit
```

3. Start the SAP system again.

6.4 SAP HANA DB: Backing Up the Database

Prerequisites

You have not yet resumed production operation of the SAP system.

Procedure

Make sure that you can recover the database. This step depends on whether archiving is switched on or off:

- Archiving switched off
Since the log mode is reset to its original value after the update, you have to back up the database completely before you can start production operation again. You can then continue with the update.
- Archiving switched on
We recommend that you make a complete backup so that you do not have to restore all the logs again if you recover the database.

6.5 Performing Follow-Up Activities in the Monitoring Area

Setting Up the Monitoring Architecture

With the monitoring architecture of the Computing Center Management System (CCMS), you can monitor your entire IT landscape centrally, including quick and reliable problem reporting. SAP Support can only provide optimal support for landscapes for which the CCMS has been set up properly.

For more information about the configuration tasks, see the *Technical Monitoring Cockpit* section on the SAP Help Portal (<http://help.sap.com>) for your SAP NetWeaver version.

6.6 Performing Follow-Up Activities for the SAP Kernel

Installing the SAP Kernel

For production operation, you have to replace the SAP kernel that was installed during the update with the current SAP kernel from SAP Service Marketplace.

Note

If you have downloaded the latest SAP kernel files to the [download directory \[page 106\]](#) before the update, you do not have to replace the SAP kernel.

For more information about installing the current SAP kernel, see SAP Note [19466](#).

6.7 Reimporting Additional Programs

Context

During the update, the contents of directory `/usr/sap/<SID>/SYS/exe/run` are deleted before the new SAP kernel is imported. If you installed additional programs in this directory such as the RFC library, you have to install them again.

During the *Preprocessing* roadmap step in phase *FREECHK_X*, you were prompted to protect files and subdirectories that you do not want to be deleted during the kernel switch. This protection could be performed during the update by copying the file `PROTECT.LST` into this directory.

If you did not use the `PROTECT.LST` file and if you backed up files and subdirectories of the kernel directory before the update, you can now reimport them into this directory.

Procedure

Download the files for the RFC library, the CPIC library, or `ArchiveLink` and unpack them into the kernel directory.

You can now also reimport files and subdirectories that you have not protected using file `PROTECT.LST`.

6.8 Adjusting Repository Objects

If you have modified objects such as programs, screens or interfaces, you have to adjust them with transaction `SPAU`.

Context

Adjust notes before adjusting modifications. Modification adjustment of an object is only possible after all notes, which are changing the object, have been adjusted.

In the past, customer exits were used to enhance the standard SAP system without modifying it. To exploit the advantages of the new Business Add-In technology, and to unify enhancement techniques, some of the customer exit definitions you use might have been migrated to Business Add-Ins by SAP. You can migrate the customer exits you have implemented to Business Add-In implementations at the touch of a button. The implementations that need migrating are displayed by the modification adjustment functions.

If you have implemented

- enhancement framework options of the new `Enhancement Framework`, or
- a new kernel-based `BAdI` (also part of the new `Enhancement Framework`),

and the underlying development objects have changed in an incompatible way, adjust these objects in transaction `SPAU_ENH`. Make sure that you perform the adjustments in transaction `SPAU_ENH` after the adjustments in transaction `SPAU` and not the other way around.

We recommend modifying enhancement definitions or enhancement implementations. In some cases you can, however, replace enhancement implementations with your own enhancement implementations.

Procedure

1. Adjust repository objects.

For more information, open the SAP Help Portal for your SAP NetWeaver release and navigate to:

► *Development* ► *Development Information* ► *Application Development on AS ABAP* ► *Customer-Specific ABAP Development* ► *Changing the SAP Standard (BC)* ► *Installing Upgrades, Support Packages, and Enhancement Packages* ► *Adjusting Repository and ABAP Dictionary Objects* ►

2. Process Business Add-Ins (BADIs).

For more information, open the SAP Help Portal for your SAP NetWeaver release and navigate to:

► *Development* ► *Development Information* ► *Application Server ABAP* ► *Application Development on AS ABAP* ► *Customer-Specific ABAP Development* ► *Changing the SAP Standard (BC)* ► *Enhancements to the Standard* ► *Classic Techniques* ► *Classic BADIs* ►

3. Replace enhancement definitions or enhancement implementation.

For more information, see SAP Note [922557](#).

6.9 Updating the Where-Used List in the ABAP Workbench

Context

Note

This action is optional.

The where-used list for ABAP object types has its own index. If you need a complete display of the where-used list in your SAP system, you have to re-create the index after the update.

Procedure

To create the index, you need to run report `SAPRSEUB` in the background.

Note

Since the runtime of the report may be long, we recommend that you run it in the development system only.

For more information about this report, see SAP Note [28022](#).

6.10 Adjusting Customizing Settings

Context

After the upgrade, there are new and changed functions in your SAP system for which you may have to adjust the Customizing settings.

Caution

Adjusting the Customizing settings is done in close cooperation with the business consultants and other upgrade project team members.

Procedure

1. Call transaction `SPRO_ADMIN`.
2. Select your existing project IMG or create a new Customizing project.
3. Create one or more release-specific project views of your project IMG by selecting the activities for delta Customizing and upgrade Customizing.
4. Call transaction `SPRO`.
5. Choose *Add to work list* and add the project view.
6. Make the necessary Customizing settings in your release-specific project views.

For more information about creating project views and making Customizing settings, see the online documentation for the transactions.

6.11 Adjusting Customer Developments

Context

The programs and applications that you have written, which run without errors on the source release, may contain syntax or runtime errors after the update. These may be caused by additional developments of the ABAP Workbench, changes to the ABAP syntax, or stronger syntax checks when you update from one release

of SAP Basis, SAP Web AS, or SAP NetWeaver AS to the next one. You can solve these problems by adjusting your programs to the new version of the ABAP Workbench.

We also recommend to check the customer developments, which will be replaced by SAP standard during the update, if they are still necessary.

Procedure

For information about adjusting customer developments (recommendations for adjustments and instructions), see the composite SAP Note [2388441](#). It contains an overview of all SAP Notes for changes that must be kept in mind in the case of an ABAP release change.

See also the documentation on the SAP Help Portal for *SAP NetWeaver 7.5* or higher, or for *ABAP Platform* (as described in [Other Required Documentation \[page 14\]](#)), and see: [Development Information](#) > [Application Development on AS ABAP](#) > [Customer-Specific ABAP Development](#) > [Custom Code Migration](#) > [SAP S/4HANA Conversion](#).

6.12 Performing Follow-Up Activities for SAP Solution Manager

Use

To connect the newly updated system to SAP Solution Manager, you need to perform the following activities:

- Make sure that the data is up-to-date in the SAP Solution Manager system.
- Configure the diagnostics capabilities and the `wily` Introscope Agent.
- If required, update the product version of the system where the Integration Server is installed.

Procedure

Checking System Data

In the System Landscape Directory (SLD), check whether the system landscape is up-to-date. To do this, check whether the newest software component versions are assigned to the relevant technical systems in your system landscape. After having verified that the system information in the SLD is up-to-date, the system needs some time (up to 24 hours) to also update the system information in SAP Solution Manager.

Updating the System Data in SAP Solution Manager

After updating your system, you need to make sure that the correct product version is assigned to the system in SAP Solution Manager.

For more information, see the SAP Library at <http://help.sap.com/solutionmanager>:

SAP Library Paths

Release	Path in SAP Library
SAP Solution Manager 7.2	<p>▶ <i>Application Help</i> ▶ <i>SAP Library <version></i> ▶ <i>SAP Solution Manager Operations</i> ▶ <i>Managing System Landscape Information</i> ▶</p> <p>Read sections <i>Setting Up the Landscape Management Infrastructure</i> and <i>Managing Technical System Information</i>.</p>

Configuring Diagnostics Capabilities and Wily Introscope Agent

1. Start SAP Solution Manager.
2. Call transaction SOLMAN_SETUP.
3. On page *SAP Solution Manager: Overview*, choose *Managed System Configuration*.
4. Select the system where the Integration Server is installed.
5. On page *Managed System Configuration* in the process diagram, choose *Diagnostics Configuration*.
6. In row *Configure Diagnostics*, choose *Select URL*.
7. On page *Managed System Configuration* in the process diagram, choose *Wily Introscope Configuration*.
8. In row *Configure Wily Introscope Agent*, choose *Select URL*.
9. Under *Introscope Agent*, choose *Setup Introscope Agent*.

For more information about Wily Introscope Agent, see SAP Community Network at <http://wiki.scn.sap.com/wiki/x/CBkMDg>.

6.13 Adjusting the User and Role Administration

Use

After the update, you have to make adjustments to the user and role administration. What these are depends on whether you were already using the profile generator in the source release.

Procedure

For information about adjusting the user and role administration, see the SAP Help Portal for your target release at: <http://help.sap.com>

Release	Path in SAP NetWeaver Library
SAP NetWeaver 7.3 / 7.3 including enhancement package 1 / 7.4 / 7.5	SAP NetWeaver Library > Application Help > Function-Oriented View > Security > Identity Management > User and Role Administration of Application Server ABAP > Configuration of User and Role Administration > Checking for Changes in Authorizations After Upgrades

6.14 Rescheduling Background Jobs

Use this procedure to release all background jobs that were locked when you isolated the application server instance.

Context

Errors may occur if a background report was changed by the Software Update Manager, since the report variants are no longer correct. If this is the case, you have to reschedule the job.

Procedure

1. Log on in client 000 as user DDIC.
2. Execute report BTCTRS2.

6.15 Generating Loads

This section deals with the ABAP load generation (transaction `SGEN`) after the update.

Context

⚠ Caution

- Before you start the load generation after the update, make sure that the latest SAP kernel has been installed. If you have added the SAP kernel files to the [download directory \[page 106\]](#), the Software

Update Manager installs the SAP kernel. SAP kernel parameters introduced in the latest SAP kernel can otherwise invalidate the loads.

- The additional database space needed to generate ABAP loads is not added automatically to the space requirements reported in the *Checks* roadmap step. In addition, you need approximately the size of REPOSRC.

Load generation requires many system resources. There are several ways to create loads after the update, depending on how you use the SAP system.

- For objects that are new in the SAP system after the update, you can use transaction `SGEN` to create the following loads:
 - ABAP programs in the SAP system
When you call an ABAP program, a load is automatically generated if it does not already exist for this program. This may, however, impair performance in a production system. To avoid this, you can generate the missing loads using the option *Regenerate after an SAP System upgrade* in transaction `SGEN` before you use the system in production operation.
 - Business Server Page applications (BSP applications) or Web Dynpro applications

The transaction `SGEN` offers the following options:

- Selection of predefined generation tasks
- Selection of software components (such as SAP_ABA, SAP_BASIS) to restrict the number of objects being generated
- Selection of the application servers for parallel generation
- Generation in the background
- Job Monitor for checking the progress of the generation in the background
- Generation of webdynpro and BSP objects only

Note

The option to generate webdynpro and BSP objects option is available in releases up to SAP_BASIS 740 and as of SAP_BASIS 757. For systems as of SAP_BASIS 750 up to SAP_BASIS 756, use transaction `SGEN_OLD` instead.

- If you want to regenerate invalidated loads after the update, you can use report `RSGENINVLASM`. This report regenerates all invalidated ABAP loads for every machine type that exists in your system.

Note

- The load of an object becomes invalid if, since the load was generated, activated changes have been made to the object or objects used by this object (such as includes or tables). This can occur, for example, in SAP systems into which you regularly import objects.
- To minimize wait times while the SAP system regenerates invalidated loads, you can schedule the report `RSGENINVLASM` periodically, such as every night.
- Until SAP Basis 7.02 SP08, the name of the report is `RSGENINVLAS`.

Procedure

1. Generate loads using transaction `SGEN`.

Select one of the following options:

- *Generated all objects of selected components*
- *Generate all components of selected packages*
- *Regenerate after system upgrade*
- *Regenerate the objects of the last run*
- *Regenerate already existing loads*
- *Generate the objects of the transport requests*

For a detailed description of these features, see the online documentation in transaction `SGEN` under [▶ Information on the SAP Load Generator ▶](#) or in the job monitor under [▶ Job Monitor ▶](#).

2. (Optional:) Call transaction `SE38` and run report `RSGENINVLASM` or `RSGENINVLASM` depending on the release.

Note

- Running the report is optional.
- The report is called `RSGENINVLAS` until SAP Basis 7.02 SP08. As of SAP Basis 7.02 SP09, the name of the report is `RSGENINVLASM`.
- The report regenerates invalidated loads only, not new loads. Use `SGEN` in this case.

6.16 Importing Support Packages After the Update

To make sure that your SAP ABAP software is running smoothly, we recommend that you import new Support Packages into your system as soon as they become available. This also applies after the upgrade, to avoid potential problems in your system before they occur.

If you have not included all the necessary Support Packages in the update, you can still import them after the update.

6.17 Transport Management System: Distributing the Configuration

After an update, you have to distribute the information about the new release to all systems in the transport domain.

Procedure

1. Log on to the system that is configured as the domain controller.
2. Call transaction `STMS` and choose ► [Overview](#) ► [Systems](#) ►.
3. Select the system that has been updated and choose ► [SAP System](#) ► [Update Configuration](#) ►.
4. Choose ► [Extras](#) ► [Distribute and Activate Configuration](#) ►.

6.18 Performing Follow-Up Activities for the Language Transport

Prerequisites

- You have imported a language during the update.
- You are using a glossary or terminology in your system.

Context

To reduce downtime during the update, some data from the [Languages](#) archive was only imported into container tables, and has not yet been imported into the actual database tables of the system. This data includes glossary and terminology data. If you want to use a glossary or terminology in your system, use the following procedure to copy the data from the container tables to the database tables.

Procedure

Call transaction `SMLT`.

The transaction automatically recognizes that follow-up activities are necessary, and schedules a background job for this purpose.

⚠ Caution

For languages that have been supplemented before or imported during the update, you have to perform the supplementation after the update with transaction `SMLT`.

For more information about language supplementation, see SAP Note [1156507](#).

6.19 Saving Files for Subsequent Updates

Prerequisites

You are planning a subsequent update with the same environment and with the same scenario strategy.

Context

In phase `SAVEPRO`, several update files are saved in subdirectory `save` of the `abap` subdirectory of the update directory. If you perform a subsequent update with the same environment and with the same scenario strategy, you can reuse these files.

Procedure

1. After the update, make a backup of subdirectory `save` of the `abap` subdirectory of the current update directory.
2. When you start with the new update, copy the `save` subdirectory to the new update directory.

📌 Note

You can copy the subdirectory as soon as you have created the new `SUM` directory. The new `SUM` directory has to be empty.

The following files are saved in the directory and can be used in a subsequent update:

- Shadow system profile
In the preparation phase `SHDINST_COPY`, you can reuse the shadow system profiles.

6.20 Deleting Log Files

For security, data protection, and privacy-related reasons, we recommend that you delete the log files as soon as you no longer need them.

Context

For technical reasons, the Software Update Manager writes various log files. Among other things, these log files contain IDs of users such as <SID>ADM, DDIC, or SYSTEM.

In order to comply with data protection, privacy and security requirements, we strongly recommend that you delete these log files as soon as you no longer need them.

Procedure

Remove the log files from the [SUM Directory \[page 50\]](#) and its subdirectories on the host where the Software Update Manager has initially been started.

6.21 DMO-related Follow-up Activities

6.21.1 Configuring Domain Controller for Transport Management System

After an update, distribute the information about the new release to all systems in the transport domain.

Context

This procedure is described in the *SUM Guide* in section [► Follow-Up Activities ► Transport Management System: Distributing the Configuration ▾](#). However, due to the database change, it is necessary to configure the domain controller before you update the configuration.

Procedure

1. Log on to the system that is configured as the domain controller.
2. Call transaction STMS and choose ► *Overview* ► *Systems* ►
3. In the system overview, select the updated SAP System that runs on the target database and choose ► *SAP System* ► *Change* ► or double-click the system ID. The dialog for *Transport Management System (TMS) configuration* appears.
4. Choose the tab *Transport Tool*, replace the current parameters DBHOST and DBTYPE with the parameters of your target database and save your changes.
5. Go back to the system overview.
6. Select the system again and choose ► *SAP System* ► *Update Configuration* ►. A message box is displayed first, in which you select *Yes* to confirm.
7. Choose ► *Extras* ► *Distribute and Activate Configuration* ►. A message box is displayed first, in which you select the option that is suitable for your requirements.

6.21.2 Backing up the SAP HANA Database

We recommend backing up the SAP HANA database after the database migration has been completed.

Context

During the SUM procedure with DMO, the log mode *Overwrite* is used. This is changed back to log mode *Normal* after the successful database migration. We therefore recommend that you back up the SAP HANA database after the database migration is complete.

📘 Note

Make sure that you perform a full backup of your database.

Procedure

Back up the SAP HANA database as described in section *SAP HANA Database Backup and Recovery* of the *SAP HANA Administration Guide for SAP HANA Platform*.

The guide is available on the SAP Help Portal at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM. Choose tab *Operate*. Navigate in the guide to ► *Availability and Scalability* ► *SAP HANA Database Backup and Recovery* ►.

Alternatively, as of SAP HANA 2.0, you can use the SAP HANA Cockpit for this purpose. For more information, see the section *Backup and Recovery* in the guide *SAP HANA Administration with SAP HANA Cockpit*. This guide is also available on the SAP Help Portal at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM.

6.21.3 Checking and Adapting SecureStore with Customer-Specific Key

If you have encrypted your SecureStore with a customer-specific key and not with the default key, you have to execute some checks and adaptations.

Context

Note

During the database migration from source database to target database, the Software Update Manager saves the old SecureStore in `► SUM ► abap ► sapnames ► rsecssf` before it creates a new one. This allows you to retrieve old entries if necessary.

The procedure depends firstly on the SAP NetWeaver release on which your SAP system is based:

- SAP NetWeaver release lower than 7.40
- SAP NetWeaver release 7.40 and higher

Then it depends on the type of the `SECSTORE` error message, that you see.

Procedure

All SAP NetWeaver releases

1. Start transaction `SECSTORE` and choose *Check Entries and Execute*.
2. Filter the result by error messages.

SAP NetWeaver release lower than 7.40

3. `SECSTORE 030` (Incorrect global key for entry ...): Restore a legacy key-file that was used in the source system, and repeat the check afterwards.

For more information, see the SAP Help Portal for your SAP NetWeaver release at <http://help.sap.com/nw>.

Choose `► Application Help ► SAP NetWeaver Library: Function-Oriented View ► Security ► System Security ► System Security for SAP NetWeaver Application Server for ABAP Only ► Secure Storage (ABAP) ► Importing Keys after a System Copy ►`.

4. `SECSTORE 031` (System-dependent data for entry ... changed: ...): Perform a record migration.

For more information, see SAP Note. [816861](#).

SAP NetWeaver release 7.40 and higher

5. `SECSTORE 089` (Key ... for entry ... is missing in the secure storage in the file system): Reimport the encryption keys that were used in the source system and stored in the secure storage in the file system. Repeat the check afterwards.

For more information, see SAP Help Portal for your SAP NetWeaver release at <http://help.sap.com/nw>.

Choose `► Application Help ► SAP NetWeaver Library: Function-Oriented View ► Security ► System Security`

➤ [System Security for SAP NetWeaver Application Server for ABAP Only](#) ➤ [Secure Storage \(ABAP\)](#) ➤ [Key Management](#) ➤ [Using Individual Encryption Keys](#) ➤ [Importing Missing Encryption Keys](#) ↗.

6. SECSTORE 030 (Incorrect global key for entry ...): Restore a legacy key-file that was used in the source system.

For more information, see the information on the SAP Help Portal for your SAP NetWeaver release at <http://help.sap.com/nw>. Choose ▶ [Application Help](#) ➤ [SAP NetWeaver Library: Function-Oriented View](#) ➤ [Security](#) ➤ [System Security](#) ➤ [System Security for SAP NetWeaver Application Server for ABAP Only](#) ➤ [Secure Storage \(ABAP\)](#) ➤ [Key Management](#) ➤ [Legacy Method for Using Individual Encryption Keys](#) ➤ [Importing Keys after a System Copy](#) ↗.

7. SECSTORE 031 (System-dependent data for entry ... changed:...): Perform a record migration.

For more information, see SAP Note [816861](#) ↗.

6.21.4 Manual Actions for Remote Application Server Instances

The Software Update Manager cannot prepare the remote hosts for the new database connection during the update and migration procedure. This means that actions such as installing the database client software or changing the required environment variables are not possible.

This also means that the Software Update Manager cannot automatically start existing application server instances on remote hosts. As a consequence, you must manually reinstall and start application server instances on a remote host.

→ Recommendation

We recommend that you reinstall remote application server instances using the `Software Provisioning Manager` tool. This is, however, not obligatory. Advanced and experienced system administrators can also perform the necessary steps and configurations manually without this tool.

ⓘ Note

Note that the change of the database connection does not affect the remote `SAP ABAP Central Services (ASCS)` instance. That is, the Software Update Manager handles the ASCS instance during the update and migration procedure without special constraints.

6.21.5 System Move: Performing Follow-Up Activities in the Target System

Context

After you have performed the scenario *DMO with System Move*, carry out the follow-up activities already described in this guide. You must also carry out the necessary follow-up activities in the target system, as they must also be carried out after a system copy.

Procedure

Carry out the necessary follow-up activities that are documented in the *System Copy* guide.

To access the guide, proceed as follows:

1. Go to <https://support.sap.com/en/tools/software-logistics-tools.html>.
2. Choose the tab *System Provisioning*.
3. Go to ► *System Provisioning Scenarios* ► *Copy a System using Software Provisioning Manager* ► *System Copy Option of Software Provisioning Manager <Version>* ► *System Copy Guides* ▾.
4. Select the guide that is relevant to you.
5. Navigate in the guide to the section ► *Follow-up Activities* ► *Performing Follow-Up Activities in the Target System* ▾.

7 Appendix

7.1 Using the SUM Analysis Feature

This section covers the overview report that contains detailed information about the update process.

Context

With the intent to increase transparency, supportability, and predictability of software maintenance operations, SUM accumulates comprehensive update data during the tool run. The data can be displayed in a special report named *SUM Analysis*, and it is arranged in, but not limited to, the following categories:

- Information about the stack configuration file (`stack.xml`) and archives in the download directory. An additional window opens where several options are offered. For more information, see
- Software component versions and product structure changes
- Important parameter settings, process steps including descriptions of the manual steps and links to relevant SAP Notes
- Statistics about performance and downtime

The *SUM Analysis* report reflects the content of the `upgana.xml` file, which is stored in subdirectory `<SUM directory>/abap/doc/analysis`. The report generated upon successful execution additionally contains the time statistics of the performed update, for example, the calculated `SUM technical downtime` value.

Note

Note that at the beginning of the procedure no data can be displayed because the file `upgana.xml` has not yet been generated by the Software Update Manager. A data display is possible at a later point in time, after the first phases have been processed.

In addition to the *SUM Analysis* report, SAP offers the app *Technical Downtime Optimization*. It can display a visual analysis and evaluation of the system maintenance procedure using SUM. The application is furthermore able to simulate and estimate the potential downtime savings for nZDM, downtime-optimized DMO, downtime-optimized conversion, and ZDO. In this way, it can help you to optimize the next SUM run to achieve minimum downtime and smooth system maintenance.

For more information about this app, see SAP Note [2881515](#) and the SAP Community blog [Downtime Optimization - Get insights using the new TDO app](#).

Procedure

1. From the [SUM UI: Menu Bar \[page 31\]](#), open the user menu and choose *Utilities*.

A second web browser window with the [SUM Utilities \(Extended UI\) \[page 39\]](#) opens in which several options are offered.

2. Choose *SUM Analysis*.

7.2 Troubleshooting

This chapter contains information about how to proceed when you want to correct known problems that have occurred during the update.

Note

In the following, some information is related to steps. As long as the Software Update Manager is running, the step name is displayed on the program tool tab page.

If the Software Update Manager displays a dialog box and you need further information about the required input, you can identify the step you are currently in by using the `SAPupConsole.log`.

This log file is located in directory `<update_directory>/abap/log`.

- SUM user interface
 - [SUM UI: Known Issues \[page 237\]](#)
 - [Solving SUM User Interface Problems \[page 238\]](#)
- Logs
 - [Update Logs \[page 238\]](#)
 - [Evaluating the ELG Log Files \[page 243\]](#)
- Correcting errors in steps
 - [Accelerating the Runtime of Certain Phases \[page 244\]](#)
 - [Correcting Errors in the XPRAS Phase \[page 245\]](#)
 - [Correcting Errors in the DBCHK Phase \[page 248\]](#)
 - [Correcting Errors in the BATCHCHK Phase \[page 249\]](#)
 - [Correcting Errors in the INTCHK and INTCHK_SW Phases \[page 249\]](#)
 - [SPS update: Errors in the DBCLONE Phase \[page 250\]](#)
 - [Errors in the PARMVNT_APPL_VIEWS or PARDIST_ORIG Phase \[page 250\]](#)
 - [Correcting Errors in the SUMASK Phase on Systems with SNC \[page 251\]](#)
 - [Correcting Errors in the JOB Phases \[page 252\]](#)
 - [Cleaning Up Terminated Conversions in the DB Conversion Phases \[page 253\]](#)
 - [Correcting Errors in the TRBATCHK_XT Phase \[page 255\]](#)
 - [Correcting Errors in the ACT_UPG Phase \[page 256\]](#)
 - [Correcting Conversion Errors in the PARCONV Phase \[page 257\]](#)
 - [Correcting Errors in the VALCHK_INI Phase \[page 258\]](#)
- General problems
 - [Error Handling for ABAP \[page 258\]](#)
 - [Correcting Problems when Processing ABAP Steps \[page 261\]](#)

- [Switch of SAP Programs During the Update \[page 262\]](#)
- [Implementing SAP Notes during the update \[page 262\]](#)
- [Providing Information to SAP Support \[page 263\]](#)
- [Starting and Stopping the Shadow Instance Manually \[page 264\]](#)
- [Mitigating Issues with the Toolimport \[page 265\]](#)
- [Error Handling for the Replication Process Monitor \[page 265\]](#)

In addition to the problems listed here, also read the SAP Notes that are relevant to this update.

7.2.1 SUM UI: Known Issues

This part of the document contains additional information about how to proceed when you want to correct known problems that have occurred during the update.

Known Issues with the SUM UI

Symptom	Solution
The error message <code>sumabap [id=...] terminated with errors : 127 (null)</code> is displayed after entering the URL in the web browser.	For user <code><sid>adm</code> and group <code>sapsys</code> , correct the permissions of the following files and directories: <ul style="list-style-type: none"> • <code><SUM_DIR>/abap</code> and all subdirectories • <code>/tmp/.saphostagent__lms1</code>
Texts on the user interface are not displayed correctly.	Use the latest version of the Software Update Manager.
After having entered the URL in the web browser and the user name and password (see Starting or Restarting the Software Update Manager [page 123]), you see the error message: <code>This page can't be displayed.</code>	<ol style="list-style-type: none"> 1. Make sure that the complete path to the SUM directory does not exceed 25 characters. 2. Make sure that the latest SAP Host Agent version is installed.
You keep getting the error message: <code>Conflict with another Client:</code>	<ul style="list-style-type: none"> • Check if a concurrent user is working in parallel in another browser session with the same SUM tool for the same SAP system. • Make sure that your browser accepts cookies and that they can be read and saved. SUM stores session information in browser cookies. This is necessary for a proper communication between back-end and user interface.

7.2.2 Solving SUM User Interface Problems

This section is relevant, if you have problems with the SUM User Interface.

Context

You have several options that might help to solve a problem with SUM User Interface (SUM UI), for example, when an error or a system failure occurred. Note that the following procedure does not represent a sequence that you have to follow step by step, but it has to be read in this way: If the restart of the UI does not work, try step 2. If the restart of the SAP Host Agent does not lead to any success, try step 3, and so on.

Procedure

1. Restart the SUM UI as described in [Starting or Restarting the Software Update Manager \[page 123\]](#).
2. Restart the SAP Host Agent using the following command:

```
<HOSTAGENT directory>/exe/saphostexec -restart
```
3. Install the latest SAP Host Agent version.
4. Cancel the running `SAPup` processes that were started by the SUM UI. These processes are started again automatically as soon as you start the SUM UI again in the web browser.
5. To prevent that browser plug-ins and settings interfere with the SUM UI, enter the URL in a new browser window in *Private Browsing* mode of Microsoft Internet Explorer, Microsoft Edge, or Mozilla Firefox, or the *Incognito mode* of Google Chrome.
6. If the problems persist, report an incident on component BC-UPG-TLS-TLA.

7.2.3 Update Logs

The Software Update Manager logs all actions in log files to monitor the update, and if you encounter errors, you can analyze them to find a solution.

Unless otherwise specified below, the log files are stored in the `log` subdirectory of the SUM directory. You can access the log files using the [Log](#) option in the menu bar of the SUM user interface. For more information, see [SUM User Interface \(SUM UI\) \[page 24\]](#).

SAPup.log

The Software Update Manager records all activities in the ABAP system in the log file `SAPup.log`, and it is also the only tool that updates this file. The log file provides you with an overview of the update status. Among other things, the file contains

- information about all phases executed so far
- number of repetitions
- run times
- final status

In addition, `SAPup.log` lists a specific log file for each phase executed, which contains detailed information about this phase.

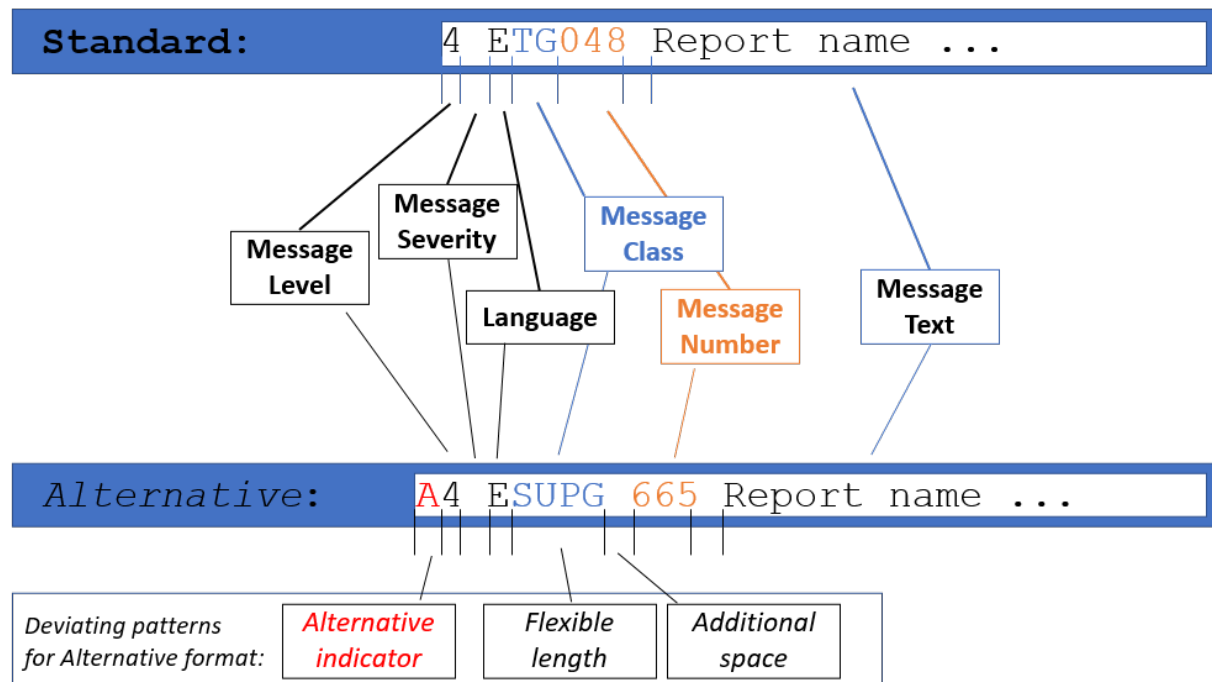
ABAP Report Logfiles

ABAP reports are mainly executed in `RUN` or `JOB` phases and write their own log files, which are usually listed in the log file of the phase with the extension `.<sid>` and analyzed by the `SAPup` executable.

❁ Example

The phase `JOB_RSVBCHCK_PRE` is logged in the file `phase_job_rsvbchck_pre.log`. This file contains the name of the `rsvbchck.<sid>` file in which the ABAP report `RSVBCHCK` logs.

For the line structure in the log file, either the standard format or the alternative format is used. The following figure illustrates the structure of both formats:



ⓘ Note

In case of messages with severity level E (= error), the executable `SAPup` identifies the errors and processes them. Usually the procedure is stopped and a dialog is displayed. However, errors can also be ignored or handled automatically.

Log Files Written by tp

SLOG<Rel>

The ABAP program `tp` lists all its steps in log file `slog<REL>`. It also writes additional detailed logs for each step.

A simple method of monitoring the progress of all `tp`-driven phases is to use `tail` to monitor the `SLOG` log. To do this, open another terminal window and enter the following command:

```
tail -f <update directory>/abap/log/SLOG<rel>
```

Each `tp`-driven phase is divided up into a number of different steps whose start and end times are noted in the `SLOG` log. The start and end of a phase are indicated by the lines `START put` and `STOP put`. The section in the `SLOG` log relating to the `ACT_UPG` phase looks like this:

Section of SLOG Log Relating to the ACT_<Rel> Phase

START	put	PS1		200103071824	psladm	ds0007
				23		
INFO: event SAP_IMPORT_START triggered successfully						
START	SET STOPMARK	PS1		200103071824	psladm	ds0007
				23		
INFO: Buffer saved as /usr/sap/<sid>/upg_ps1/buffer/PS1SAV.						
STOP	SET STOPMARK	PS1		200103071824	psladm	ds0007
				23		
LIST	put	PS1	(3{3			
START	tplock_eu	PS1	(200103071824	psladm	ds0007
				23		
STOP	tplock_eu	PS1	(200103071824	psladm	ds0007
				23		
START	tpsapstart	PS1	3	200103071824	psladm	ds0007
				23		
STOP	tpsapstart	PS1	3	200103071824	psladm	ds0007
				23		
START	locksysX	PS1	{	200103071824	psladm	ds0007
				23		
STOP	locksysX	PS1	{	200103071824	psladm	ds0007
				23		
START	tpsapstart	PS1	3	200103071824	psladm	ds0007
				23		

STOP	tpsapstart	PS1	3	200103071824	psladm	ds0007
				23		
START	locksys	PS1		200103071824	psladm	ds0007
				23		
STOP	locksys	PS1		200103071824	psladm	ds0007
				23		
INFO: event SAP_IMPORT_STOP triggered successfully						
STOP	put	PS1	0008	200103071824	psladm	ds0007
				23		

alog<Rel>

This file is also written by `tp`. It provides information about which actions were started by `tp`. For information about these actions, see section *Transport Phase Log Files* below.

ULOG<YY_Q>

In `ULOG<YY_Q>`, “YY” is the year, and “Q” is the quarter.

This file contains all `tp` calls, including the relevant call parameters, which have been executed by the Software Update Manager during the update.

Transport Phase Log Files

Additional detailed logs are also written for most steps in the ABAP system. These are in subdirectory `tmp` of the `abap` subdirectory of the update directory, where you can also monitor them with `tail -f`. After the various steps of the phase have been completed, `tp` moves the individual logs to subdirectory `log` of the `abap` subdirectory of the update directory.

The names of transport phase logs have to follow the naming convention `SAP<T><ID>.<SID>`, where `<T>` is the transport step, `<ID>` is any six (or sixteen) character string, and `<SID>` is the name of your SAP system.

You can determine the relevant transport request from the name of the log file by replacing the transport step `<T>` with a **K**, omitting `<SID>` and the preceding period. For example, `SAP<T><ID>.<SID>` corresponds to `SAPK<ID>`.

The table below lists the most important steps together with their log names, and specifies which programs execute the steps:

Log Files of Most Important Steps

Step	Log Name	Program Executing the Step
SHADOW_IMPORT	SAPK??????.<SID>	R3trans
DD IMPORT (H)	SAPH??????.<SID>	R3trans

Step	Log Name	Program Executing the Step
DD ACTIVATION (A)	SAPA?????.<SID>	ABAP program (RDDMASGL)
DISTRIBUTION OF DD OBJECTS (S)	DS<DATE>.<SID>	ABAP program (RDDDIS0L)
TBATG CONVERSION OF DD OBJECTS (N)	N<DATE>.<SID>	ABAP program (RDDGEN0L)
tpmvntabs	P<DATE>.<SID> PA<DATE>.<SID> PD<DATE>.<SID> PL<DATE>.<SID>	tp
MAIN IMPORT (I)	SAPI?????.<SID>	R3trans
tpmvkernel (c)	C<DATE>.<SID>	tp
TBATG CONVERSION OF MC OBJECTS (N)	N<DATE>.<SID>	ABAP program (RDDGEN0L)
IMPORT OF SELFDEFINED OBJECTS (N)	SAPD?????.<SID>	ABAP program (RDDIC1L)
VERSION UPDATE (V)	SAPV?????.<SID>	ABAP program (RDDVERSL)
EXECUTION OF REPORTS AFTER PUT (R)	SAPR?????.<SID>	ABAP program (RDDEXECL)

Once the logs are located in subdirectory `log` of the `abap` subdirectory of the update directory, you can also display them in the SAP system.

You can do this by executing program `RDDPROTT` with transaction `SE38`. `RDDPROTT` displays all the logs for a specific transport request. In the *Transport Request* field, enter the name of the transport request (for example, `SAPK<rel>D01`) and then choose *Execute*.

A brief overview of all the logs existing for this transport request appears. Double-click a line to display a log for this step. The logs are broken down into several levels. Level 1 only displays the return code for the step. Check at least level 2 to display any error messages. Double-click an error to see its long text.

After completing each `tp`-driven phase, the Software Update Manager creates a summary of all individual logs in this phase.

The names of the summaries usually comprise the phase name (without underscores) and the extension `.ELG` (for example, `DDIC<rel>.ELG`). The summary contains the names of the individual logs, any errors that occurred and the return codes. If no errors have occurred, you need to check these summaries only.

7.2.4 Evaluating the ELG Log Files

Context

The <PHASE>.elg log files are summary log files that contain a list of all the errors that occurred during a specific phase of the update. From these files, you can call up detailed log files that contain more information. When errors are detected during a phase, a message appears and prompts you to repeat that phase. First check the <PHASE>.elg log to find out why the step terminated. In some cases, you can choose *ignore* in the Software Update Manager to continue with the update and avoid repeating the failed phase. You always remove the cause of the error. When you choose *ignore*, the Software Update Manager prompts you to enter a password if the errors are serious. In this case, you have to get approval from SAP Support to ignore the error. Remove all errors to avoid the risk of follow-on errors. If you are not sure how to proceed, contact SAP Support.

Procedure

1. Analyze the errors using the detailed log file if necessary. The name of this log is listed in the header of each phase step.
 - No errors have occurred if a return code **less than 8** appears in the log at the end of a step, and no error messages appear for that step.
 - A return code of **8** indicates that some individual objects were not or not completely processed.
 - If a return code is greater than or equal to **12**, then `tp` or a program called by `tp` has terminated.
2. Determine when the program terminated from the last two lines of the `SLOG` log. If `tp` or `R3trans` have terminated, analyze the last log that was written.
3. If a background step in the SAP system terminates, you have to analyze the job log in the SAP system to determine the cause of the error.

- a. Log on as user `DDIC` and call transaction `SM37`. Enter the job name as the name of the report that usually processes the terminated step (`RDDMASGL` for `DD ACTIVATION`, for example).

Make sure that the date on the `SM37` input screen is correct and that an asterisk (*) appears in the *or after event* field. The job overview normally displays one canceled job and one background job that completed normally.

- b. Double-click the canceled job to display the job log.
- c. Double-click the error line to display the long text for the error.
- d. Correct the error.

Note

If you use a user ID other than `DDIC` to log on to the SAP system and correct the error, the SAP system may prevent you from logging on.

In this case, proceed as follows:

1. To unlock the SAP system, enter the following commands. The system may be either the original SAP system or the shadow system, depending on which one the error occurred.

- Original SAP system

```
cd <update directory>/abap/bin
./SAPup unlocksys
```

- Shadow system
`cd <update directory>/abap/bin`
`SAPup unlockshd`
- 2. Log on to the SAP system or shadow system and correct the error.
- 3. To lock the original SAP system or shadow system again, enter the following commands:
 - Original SAP system
`cd /<update directory>/abap/bin`
`./SAPup locksys`
 - Shadow system
`cd /<update directory>/abap/bin`
`SAPup lockshd`

4. Once you have found and corrected the error, repeat the phase by selecting *repeat* in the Software Update Manager.

The repeated phase is completed quickly, since the transport control program `tp` automatically starts from the point at which it terminated.

7.2.5 Accelerating the Runtime of Certain Phases

Phases Running ABAP Programs

These phases use the SAP system to operate. If you improve the performance of the SAP system, this can speed up these phases.

Phase RUN_RDDIT006

ⓘ Note

This is only relevant if you perform a release upgrade.

This phase analyzes the SAP system to find objects modified by the customer and customer objects. Therefore, the runtime of phase `RUN_RDDIT006` is longer for SAP systems with many modifications or customer objects. Since this phase starts an ABAP program, you can use the respective ABAP transactions to analyze the performance of this phase.

DIFFEXP Phases

ⓘ Note

This is only relevant if you perform a release upgrade.

Since these phases perform copy-to-shadow actions or export the transport requests generated during phase RDDIT006, they take longer for SAP systems with many modifications or customer objects.

SHADOW_IMPORT Phases

Release upgrade only:

These phases import the upgrade data into Customizing tables, as well as the transport requests of add-ons, support packages, and languages. During this phase, only the part for the shadow system is imported. The remaining parts are imported during the `TABIM_UPG` phase. These phases take longer for upgrades where many add-ons and support packages have been included in the upgrade or where many languages have to be imported. The duration of the import also depends on the number of clients in the system.

If you chose the scenario strategy *Standard* or *Downtime-optimized*, it uses the number of parallel background processes that you have entered during phase `INITSUBST`.

SPS update only:

These phases take longer if you have included many support packages.

Phase PARCONV_UPG

In this phase, tables are converted to the target release structure. The `PARCONV_UPG` phase uses the number of parallel background processes you specified and three `tp` processes.

The runtime of this phase can be longer for the following reasons:

- Very large tables have to be converted. The tables that are converted are listed in the analysis file, which also displays the conversion time for each table.
- If tables get a new index on the target release or an index needs to be regenerated, these tables are listed in the analysis file under DDLs. The time needed to create the index depends on the size of the table.
- In case of other DDL statements, the runtime of `ALTER TABLE` or `ADD FIELD` statements with fields that contain default values depends on the size of the table.

7.2.6 Correcting Errors in the XPRAS Phase

Context

If errors occur in the `XPRAS_AIMMRG` phase during the execution of XPRAs reports, the Software Update Manager stops and refers to the `xprasupg.elg` log, which contains error messages with the following header:

```
~~~~~  
XPRAS ERRORS and RETURN CODE in <file name>  
~~~~~
```

If this header is followed by lines other than the return code, then errors have occurred while the reports were being executed. In addition to the actual error lines, a separate line indicates the names of the reports that generated the preceding error messages.

You can display a detailed help text for each of these error messages in the SAP system. These texts usually contain all the information you need to correct the error.

Procedure

- Find help texts for error messages
 - a. Search the `xprasupg.e1g` log to find the file name specified in the header.

Note

The file name that appears in the header of `xprasupg.e1g` is important for finding the help text. The file name always has the following format:

```
sapr<target_release>xpra9<ID>.<sid> (where <ID> is a seven-digit number)
```

The name of the relevant transport request can be derived from the two names. Replace the `R` with a `K` and delete the period and all characters that follow it. You have now `SAPK<ID>` as the name of the transport request.

- b. Log on to the SAP system.
 - c. Call transaction `SE09`.
 - d. Choose **Request/task** **Display individually** and enter the name of the transport request `SAPK<ID>`.
 - e. Choose **Goto** **Transport logs** to display the individual transport logs.
 - f. Double-click the line *Exec after put* to navigate to the log display for this step. You can expand the log to view it in more detail. The error messages are visible as of the second level.
 - g. Position the cursor on the error message and choose *Long text* to display a help text.
- Correct Errors
 - a. Follow the instructions in the help text to correct the error.

If you are asked to implement an SAP Note, proceed as follows:

 1. Enter the following commands to unlock the SAP system:

```
cd <update directory>/abap/bin
./SAPup unlocksys
```
 2. Log on to the system with a user other than `DDIC` and implement the SAP Note using the SAP Note Assistant (transaction `SNOTE`).
 3. Lock the SAP system using the following command:

```
cd <update directory>/abap/bin
./SAPup locksys
```
 - b. After you have corrected all the errors, repeat the `XPRAS` phase.
 - c. Read the documentation of the report in question if you need more information, or if the report still results in errors when you repeat the `XPRAS_AIMMRG` phase. To access this information, log on to the SAP system. Call transaction `SE38` and display the documentation for the report that is named in the error log.

- d. Optionally, you can choose *Accept errors and repeat phase XPRAS_AIMMRG*.

The Software Update Manager repeats the phase and accepts all error messages with the return code 8. The errors have to be removed **after** the update.

You require a password for *ignore all errors*. The Software Update Manager then continues with the next phase, without executing the following XPRAs. Before you can choose *ignore*, you should have the approval from the SAP Support.

- Correct errors after the update

If possible, correct errors immediately. However, you can correct some errors that occur during the execution of XPRAs reports after you have completed the update.

This option makes sense, for example, when special measures in the SAP application areas are necessary to correct the errors, and the corresponding specialists are not available right now. To do this, you have to suppress the execution of the corresponding report before you repeat the update phase.

After the update, correct the error and run the report manually using transaction SE38.

For technical instructions on skipping an XPRAs report, see SAP Note [122597](#).

⚠ Caution

Skip an XPRAs report only if you are sure that you can execute it later (for example, if an SAP Note tells you that this is allowed).

If you cannot execute an XPRAs report later, and you still want to skip it, contact the SAP Support.

- Consider special error situations

- The error "Name xyz has already been used". e065(fdt_core)" occurs in method FDT_AFTER_IMPORT.

To solve the problem, proceed as follows:

1. Continue the update with option *Accept errors and repeat phase XPRAS_AIMMRG*.
2. Apply SAP Note [1301695](#).
3. Restart the after-import processing for method FDT_AFTER_IMPORT using report FDT_TRANS_Q_RESTART for S tables, T tables, and C tables.

- The following short dumps occur:

- Runtime Errors COMPUTE_INT_PLUS_OVERFLOW
- Exception CX_SY_ARITHMETIC_OVERFLOW
- Date and Time [...]

Check whether the short dump is the same as described in SAP Note [1243486](#). If so, proceed as described there. Otherwise, contact the SAP Support.

- Error messages appear in log files

- XPRAs are application reports that run at the end of an upgrade. Most XPRAs reports have a report documentation that explains what the report does and how errors can be corrected. Call transaction SE38 in the SAP system, enter the report name, choose *Documentation*, and click *Display*. The names of the erroneous XPRAs are mentioned in the log file in messages of type PU132.
- After-import methods are functions that are executed when a certain object type is part of the update. The name of the erroneous after-import method is mentioned in the log file in messages of type PU133. The corresponding component is mentioned in messages of type PU137.

- In some cases, a hard error occurs that leads to abortion of the batch Job. In these cases, no error logs are written.

7.2.7 Correcting Errors in the DBCHK Phase

Context

The DBCHK phase determines the database version and the release of the SAP system. For this, the Software Update Manager runs the transport control program `tp`, which logs on to the database and reads the necessary information from there. Usually, problems in this phase are caused by a failed database connection, and the system displays the error message `No information received from the database`.

Procedure

1. Check the `SLOG<rel>` file in directory `<SUM directory> \ abap \ log`.
Usually, problems with `tp` are caused by a non-initialized Transport Organizer.
2. Call transaction `STMS` from the Transport Management System (TMS) to initialize the Change and Transport System.

For more information, see the TMS online documentation.

To display the documentation, choose *Information* in transaction `STMS`. Or go to the [SAP Help Portal](#) and follow the path according to your source release:

SAP Help Portal Paths

Release	Path in SAP Help Portal
<ul style="list-style-type: none"> • SAP NetWeaver 7.3 • SAP NetWeaver 7.3 incl. EHP 1 • SAP NetWeaver 7.4 • SAP NetWeaver 7.5 • SAP NetWeaver AS for ABAP 7.51 innovation package • SAP NetWeaver AS for ABAP 7.52 	<ul style="list-style-type: none"> ▶ <i>Application Help</i> ▶ <i>SAP NetWeaver Library: Function-Oriented View</i> ▶ <i>Solution Life Cycle Management</i> ▶ <i>Software Logistics</i> ▶ <i>Change and Transport System</i> ▶ <i>Transport Management System (BC-CTS-TMS)</i> ▶
SAP NetWeaver 7.0 and EHPs up to 3	<ul style="list-style-type: none"> ▶ <i>Application Help</i> ▶ <i>SAP NetWeaver by Key Capability</i> ▶ <i>Solution Life Cycle Management by Key Capability</i> ▶ <i>Software Life Cycle Management</i> ▶ <i>Software Logistics</i> ▶ <i>Change and Transport System</i> ▶ <i>Transport Management System (BC-CTS-TMS)</i> ▶

7.2.8 Correcting Errors in the BATCHCHK Phase

Context

This phase tests whether the background server can access the update directory. To do this, the background job RDDIT008 is started on the specified background server. This job writes a test log in subdirectory `tmp` of the `abap` subdirectory of the update directory.

Procedure

1. If errors occur, call transaction SM37 to check whether the background job has run.
 - If the background job cannot be started, this is generally due to a problem with the name of the background server.
 1. Check whether the host specified in phase `INITPUT` is included in the list with a running background service.

To do this, perform a test call of function module `TH_SERVER_LIST` in transaction SE37. To display the list, double-click the table parameter `LIST` after executing the function module.
 2. Depending on the problem, you either have to change the network configuration or change the entries made in the `INITPUT` phase.

Note

If you have a setup where in `TH_SERVER_LIST` the entries in the columns `NAME` and `HOST` point to different host names, background jobs cannot be started correctly. To solve this problem, add the batch host information to the file `ConfigInput.xml`. Example:

```
<InputCatalog>
<Property key="BatchHost" value="MyBatchHost" />
</InputCatalog>
```

- If the job terminates, call transaction SM21 to check the system log of the SAP system.
 - If the job is successful, but the Software Update Manager cannot find the log, make sure of the following:
 1. The file system of the update directory has to be mounted on the background server.
 2. The value of the SAP profile parameter `DIR_PUT` has to match the current update directory.
2. To repeat the phase, choose *repeat*.

7.2.9 Correcting Errors in the INTCHK and INTCHK_SW Phases

Context

These phases check whether the inactive nametab is empty. If not, an error occurs.

Procedure

1. To find the affected objects, analyze the `ddxttchk.log` file.
2. Activate these objects using transaction `SE11`.

The inactive nametab is then empty.

3. Continue the update with *repeat*.

7.2.10 Errors in the DBCLONE Phase

This section deals with the handling of errors in the `DBCLONE` phase.

Note

This section is relevant if you perform an SPS update.

In the `DBCLONE` phase, the Software Update Manager starts a number of background jobs to create copies of the tables required for operating the shadow system. Depending on your system and your hardware, this operation can take several hours. These background jobs are executed on the background server that is configured with the `BATCH_HOST` parameter. The number of jobs is determined by the parameter `MAX_BATCH_PROCESSES`. It cannot be higher than nine or the number of background processes configured on the background server.

Each cloning job writes a log file called `dbclone<number>.<sid>`. At the end of the phase, all errors found in these log files are collected in the `dbclone.elg` file. The information in the `dbclone.elg` file is rather sparse. Therefore, you also have to check the corresponding log files to find detailed information about the error.

7.2.11 Errors in the PARMVNT_APPL_VIEWS or PARDIST_ORIG Phase

This section deals with errors in the phases `PARMVNT_APPL_VIEWS` or `PARDIST_ORIG` during the handling of views and its dependencies.

The phases handle views and its dependencies. To process all dependent views in the correct order, the Software Update Manager distributes dependent views into different groups. As a consequence, all views within one group can be handled in parallel, while multiple groups are processed sequentially according to the dependencies.

If an activation error occurs during the handling of one group, the Software Update Manager stops the update procedure and thus also the processing of the other groups. You can now choose *Accept errors and repeat <phase name>* to continue the processing of the next group.

In this case, the Software Update Manager creates the log file `handle_dependent_views.log` and writes corresponding P-messages that are then be displayed in phase `CHK_POSTUP`. (See also *Solution of P-Errors (Phase `CHK_POSTUP`)* in [Important Entries for the Postprocessing Roadmap Step \[page 183\]](#)).

As the option *Accept errors and repeat <phase name>* only affects the handling of one group, you can select this option several times when you have multiple activation errors in different groups.

7.2.12 Correcting Errors in the SUMASK Phase on Systems with SNC

This section deals with errors in phase `SUMASK` on an SAP ABAP system with *Secure Network Communications (SNC)*.

Context

If the SCN is enabled in the system, the Software Update Manager uses the SNC settings. However, if the settings are not configured correctly, the phase `SUMASK` stops with an error when trying to connect to the system. This can be caused by at least one of the following options:

1. The SNC configuration is not working properly for the Software Update Manager.
2. Only single sign-on (SSO) authentication is permitted.
3. The RFC authentication with user and password is allowed, but you have created your own SUM certificates.

Depending on the cause, use the appropriate procedure to solve the problem.

Note

- The `SAPup_add.par` file is located in the `bin` subdirectory of the SUM directory. If this file does not yet exist, create it manually.
- During the SUM run, also pay attention to your SNC library, especially during the kernel switch step. The library file is not known to the Software Update Manager and is deleted.
- You can reproduce the errors. To do this, execute the following command on the command-line interface: `SAPup rfcping sectrace`. The error that has occurred is then displayed again in the output and in the trace files in the directory `sectrace`. Contact SAP support to solve the SNC problems.

Procedure

- Option 1: The SNC configuration is not working properly for the Software Update Manager.

Disable the SNC setting in the SUM configuration by adding the following line to the file `SAPup_add.par`:

```
SNC_ENABLED = 0
```

The Software Update Manager then behaves as in previous SUM releases and does not consider the SNC settings of the system for the external RFC call. Nevertheless, check the SNC settings of the system and correct them if necessary.

You can reproduce the errors by executing `SAPup rfcping` and checking the output. Contact SAP Support to resolve the SNC issues.

- Option 3: Only single sign-on (SSO) authentication is permitted.

You have set up and configured your SAP ABAP system for use with SNC and SSO and want to run the Software Update Manager on this system. In this case, the `SAPup` executable file must be set up and

configured as an external RFC client with its own SNC credentials so that the Software Update Manager can establish a connection to this system.

For more information, see [Configuring SAPup for SAP ABAP System with SNC \[page 273\]](#).

- Option 2: RFC authentication with user and password is allowed, but you have created your own SUM certificates.

The parameter `snc/accept_insecure_rfc` has either the value `1` or `U` and is therefore active in the system. This allows RFC authentication with user and password. In this case, the SUM certificates are not required. Therefore, undo their creation.

For more information, see [Configuring SAPup for SAP ABAP System with SNC \[page 273\]](#).

7.2.13 Correcting Errors in the JOB Phases

Context

A `JOB` phase starts a background job in the SAP system and waits for it to be completed. If problems occur during the execution of the background job, you receive an error message.

Note

The naming convention for the `JOB` phases is `JOB_<name>` or `RUN_<name>`, where `<name>` is the name of the job or report.

Procedure

1. Log on to the SAP system as user `DDIC`.
2. Call transaction `SM37` and restrict the start time and start date of the background job as much as possible.
 - If no background job was started, this is generally due to a syntax error in the calling program. If there is no SAP Note explaining this error, contact SAP Support.
 - If the background job was started, there are two possible situations:
 - The job was terminated.
Check whether the error can be reproduced by selecting *repeat* in the Software Update Manager. If the error occurs again, contact SAP Support. In this case, proceed as described in [Providing Information to SAP Support \[page 263\]](#).
 - The job was completed, but with error messages.
In certain situations, you can ignore these error messages. In this case the Software Update Manager does not require a password if you choose *ignore*. If you are not sure how to proceed, contact SAP Support.

7.2.14 Cleaning up Terminated Database Conversions

This topic deals with cleaning up terminated conversions in the database conversion phases.

Context

The Software Update Manager indicates terminated conversions with the following error messages:

- WARNING: The following restart logs of database conversions were found
- WARNING: The following unprocessed database conversion requests were found

The messages are followed by a list with the corresponding entries. These errors can occur in one of the phases

CNV_CHK_GEN
CNV_CHK_IMP
CNV_CHK_XT

Note

If both messages appear, process the found terminated conversions due to restart logs of database conversions first.

Procedure

Cleaning up Terminated Conversions When Restart Logs of Database Conversions Were Found

1. Call transaction SE14 (Database Utility) to determine the terminated conversions.
2. Choose **DB Requests > Terminated**.
3. If terminated conversions are found, double-click a table name for more details.
4. Check the meaning and status of the table.
 - a. Find out whether the table is still needed. Sometimes the tables are test tables that are no longer needed. For SAP tables, contact SAP Support, which can assess if an SAP table is still needed.
 - b. Ask the last person who changed the table, or the table owner, to find out its status.

If the table is no longer needed, choose *Unlock table* in the detailed display. This prevents the conversion from being continued automatically. The table itself does not return to a consistent state. Any data that is still in the temporary table is lost during the next conversion. In some cases, however, the table was already corrected without the reset log being deleted. The function *Unlock table* is harmless in this case.

- c. You can determine the state of the table with **Check > Database object and Check > Runtime object**.
- d. Check if the table contains the data you expect.

You can do this with transaction SE16 (Data Browser), for example. If the data does not exist, it could still be in the temporary table. Contact your SAP consultant or SAP Support for help with saving this data.

5. Determine the cause of the error.

If you find out that the table is still needed, choose *Object log*. Look for error messages that explain why the conversions were terminated. You could encounter the following problems here:

- You cannot find a log because it was deleted at some time in the past. Continue with step 6 (continue the conversion to the end).
- The log does not contain an error message, but ends abruptly. This indicates that the conversion was stopped by an external event. Call transaction SM21 to read the system log and find out the approximate time the conversion was terminated, and to look for the cause of the error.
- If the log clearly gives a reason for the error, you have to correct it.

6. Continue the conversion to the end.

In the detailed display, choose *Continue adjustment*. Since you do not know how long this takes, choose processing type *Background*.

The situation can be as follows:

- The conversion finished successfully. You can see this because the error message disappears, the *Check* function does not display any further problems, and there is a success message in the object log.
- The conversion terminates again. A log now exists. Repeat the analysis from step 5 (*Determine the cause of the error*).

Note

If you still cannot complete the conversion after several attempts, contact an SAP consultant or SAP Support.

Cleaning up Terminated Conversions When Inprocessed Database Conversion Requests Were Found

Caution

Process the terminated conversions due to unprocessed database conversion requests only after you have processed the terminated conversions due to restart logs of database conversions.

7. Determine the objects that are affected.

- a. Call transaction SE14 (Database Utility) and choose **DB Requests** > **Mass Processing**.
- b. Choose *All requests*.

The worklist of the conversion program is displayed. This worklist was generated by developments or modifications in your SAP system, but has not yet been processed.

- c. Choose **DB requests** > **Created with import**.

The worklist, which was not processed correctly during the last update, appears.

8. Check the meaning and status of the requests.

In contrast to the procedure for the message `The following restart logs of database conversions were found`, this procedure can also include requests for indexes, views, and matchcode objects. The requests that are found are not always terminated. They might not even have been started.

- a. Ask the last person who changed the object if the request should still be processed.
- b. If the user does not want it to be processed, select the request and choose *Delete selected*.

This removes the objects from the worklist of the conversion program.

Do not remove requests from the last update.

9. Process the unprocessed requests.

You can select the requests from the list of mass processing requests and schedule a job for execution with the function *Schedule selections*.

- a. In the list of requests created by the import, double-click on an object for a detailed display.
- b. Schedule the request, or continue it. Since you do not know how long this takes, choose processing type *Background*.

7.2.15 Correcting Errors in the TRBATCHK Phases

The `tp` program uses table `TRBAT` to communicate with the SAP ABAP system.

Context

The Software Update Manager checks the table `TRBAT` several times in different roadmap steps, whether it still contains entries. The entries can be the remains of an import or export that either terminated or is still running.

To clean up table `TRBAT`, try the following procedure.

Note

For more information about the transport control program `tp`, search the SAP Help Portal (<https://help.sap.com>) for the *Change and Transport System*. Then choose ► *Transport Tools* ► *Transport Control Program tp* .

Procedure

1. Enter the following command:

```
tp getprots <SID>
```

This does not affect any imports or exports that are still running. The `tp` program informs you about possible processing problems in the `SLOG` file in the transport directory of your SAP system.

2. Check the file `SLOG<YY><WW> .<SID>` for recent entries.

The file is located in the `log` subdirectory of your transport directory. `<YY>` means the year (two digits) and `<WW>` is the calendar week (two digits).

3. Call transaction `SM31` to delete any entries in `TRBAT` that cannot be processed and that are no longer needed.

7.2.16 Correcting Errors in the ACT_UPG Phase

Context

Depending on the results of the `ADJUSTCHK` phase, you may be asked in the `ACT_UPG` phase to adjust your modifications to SAP objects so that they correspond to the latest SAP standard version of the objects. If your SAP system has been modified, error messages with return code 8 might occur during the `ACT_UPG` phase.

The errors are listed in the `actupg.elg` log file. It shows the same return code for all requests, no matter in which request the errors occurred. Check the error messages in the log file. Errors occurring several times for different objects can have the same cause. In this case, only the object that causes the original error should be corrected and the activation should be restarted. For example, a missing data element leads to error messages for all objects using it.

The shadow instance is automatically unlocked to correct the errors and locked again afterwards.

Procedure

1. Log on to the shadow instance as a user other than `DDIC`.

If you have not yet created users on the shadow instance, do so now as described in [Making Entries for the Preprocessing Roadmap Step \[page 167\]](#) under *Modification Adjustment and Activation (ACT_UPG)*.

2. Make the required corrections.

⚠ Caution

- Use only the maintenance transaction of the ABAP Dictionary (**SE11**) for corrections. Do not try to repair the objects with the *Database Utility* transaction (**SE14**)! It can cause serious inconsistencies.
- Do not activate objects manually! The activation does not work yet at this point of time. Use the *Check* functionality to verify your changes.

Results

Once you have corrected all the errors, select *Repeat* to proceed with the update from where it terminated. The phase `ACT_UPG` continues processing all objects that are not yet processed or that have the status *Error*.

If you cannot correct errors at this point in time, ignore them and proceed. Erroneous objects are then not activated which may lead to errors in later phases.

If you choose *Accept errors and repeat phase*, all error messages with return code 8 are ignored, and the activation of the objects mentioned in the error messages is skipped.

7.2.17 Correcting Conversion Errors in the PARCONV Phase

Context

This procedure enables you to correct problems that occur in the `PARCONV_UPG` phase. The errors can roughly be divided into two classes:

- Technical problems on the database
You can recognize these in the system log (transaction SM21), where they are marked with `SQL-ERROR` followed by an abbreviation with an error number. The problem is often caused by a lack of space.
- Logical errors in the object definition
These could also appear in the form of SQL errors. Some of them, however, are already detected by the system before a command can be given to the database. This type of error frequently occurs if you decide to revert to the SAP standard when you use the modification adjustment functions in transaction SPDD (`ACT_UPG` phase).

Example

A field was added to an SAP table. This field was also used in an index or view. In the `ACT_UPG` phase, however, you decided to return to the standard definition of the table (using transaction SPDD) and this additional field was removed. The index or view definition is now incorrect since the relevant table field is missing. If the index definition is not corrected and the `ACT_UPG` phase was completed with *ignore*, errors occur when the objects are created.

Procedure

1. Analyze the `parconv.elg` log.
2. Remove the cause of the error.
 - Technical problems on the database
Read the documentation in the database system about how to correct the error. If necessary, extend the database.
 - Logical errors in the object definition
Correct the objects. To do this, you can use transaction SE11. In the above example, you could, for instance, remove the deleted field from the index or view definition or reinsert the deleted field into the table. In addition, check whether the objects that are not contained in the standard system and that are now incorrect can be deleted completely.
3. Repeat the `PARCONV_UPG` phase.

For more information about alternative procedures, see SAP Note [177680](#).

7.2.18 Correcting Errors in the VALCHK_INI Phase

Context

An error can occur when you have reset the update incorrectly. For example, you have aborted the Software Update Manager and deleted the update directory. This results in an inconsistent system state and a failure in phase `VALCHK_INI` when you start the Software Update Manager again.

If you were in one of the preparation roadmap steps when you tried to reset the update, proceed as described below. If you had already reached the *Preprocessing* roadmap step, then contact SAP Support.

Procedure

1. Close the browser window or the browser tab page with the SUM user interface.
2. Change to the `<update directory>/abap/bin` directory.
3. Enter the following command:

```
./SAPup reset prepare
```
4. Delete the update directory.
5. Extract the Software Update Manager archive and start the Software Update Manager again as described in [Starting or Restarting the Software Update Manager \[page 123\]](#).

7.2.19 Error Handling for ABAP

If the Software Update Manager reports an error during the update, it is essential that you find out what caused this error before you continue with the update.

Tool Reaction

The Software Update Manager reacts on errors in different ways:

- The phase in which the error occurs is interrupted. There is an error message on the screen and in the corresponding [log file \[page 238\]](#), and a trouble ticket is created.
- The phase in which the error occurs continues but writes an error message into the corresponding log file.
- The tool aborts.
- In rare cases, the Software Update Manager waits for processes (`tp`, background jobs, and so on) which have terminated or cannot be started.

Error Analysis

Help in the Software Update Manager

The Software Update Manager provides help for many known errors.

Trouble Ticket

As soon as the Software Update Manager writes an error message to the log file, it also creates a trouble ticket. The trouble ticket mentions the phase in which the error occurred and various system parameters. In addition, an archive is created that contains all the relevant log files.

You can find the `SAPup_troubleticket.log` and `SAPup_troubleticket.zip` files in the `<update directory>/abap/log` directory.

Note that these files are overwritten as soon as a new error occurs.

If you cannot solve the cause of the error yourself, report an [incident in SAP Support Portal \[page 263\]](#) and attach the `SAPup_troubleticket.log` and `SAPup_troubleticket.zip` files.

File dev_SAPup

The Software Update Manager can abort due to internal program errors. An error message appears on the user interface. In some cases, the Software Update Manager creates a stack trace. You can find it in file `dev_SAPup` either in subdirectory `tmp` of the `abap` subdirectory of the update directory or, rarely, directly in the update directory.

If the error persists after repeating a phase, report an incident and include the stack trace. The stack trace speeds up processing of the incident.

If you can continue the update after a restart, report an incident anyway and include the stack trace. This helps SAP fix the tool error for future versions of the Software Update Manager.

Log Files

- **ELG Log Files**

Provided that an [.ELG file \[page 243\]](#) was generated at the end of the phase that terminated, this file provides helpful additional information about the error(s) that occurred during the phase. For more information, see [Evaluating the ELG Log Files \[page 243\]](#).

- **Detailed Log Files**

In the ELG file, the heading of each phase step displays the name of a log file that contains more detailed information about the error.

The detailed log files are stored in subdirectory `log` of the `abap` subdirectory of the update directory.

Background Jobs

The reasons for terminated background jobs are either a lack of resources or program errors. The job log records the processing of background jobs. All background job steps executed are listed in the job log with their exit statuses. If a background job is terminated, you can obtain further information about the reasons using the job log. Proceed as follows:

1. Log on to the application server instance of the SAP system. During the phases `START_SHDI_FIRST` and `STOP_SHDI_LAST`, it may occur that you have to log on to the shadow instance instead. A SUM dialogue informs you about the correct log on.
2. Call transaction `SM37` as user `DDIC`.

3. Enter * as the job name and specify the job conditions (for *or after event* enter *).
4. Start the job display (F8).
5. Sort the job list so that it is displayed chronologically.
The job name of the job displayed last is the most recent job and generally the job belonging to the terminated step.
6. To display the job log file, double-click the terminated job.
For some releases, you need to select the terminated job and choose *Job Log* to display the job log file.
7. To display the long text for the error or the ABAP short dump if it was an ABAP job that has terminated with a syntax error, double-click the error line in the job log file.

SAP System Log

The system log provides more accurate information about errors. It logs the incorrect system states occurring during operation. All irregularities such as a lack of resources or database errors during operation are collected here. The system log is administered by the SAP system and is available in the file system as a non-readable file. You use transaction SM21 to display the system log.

Since the update is always performed by user DDIC, it is mainly the system log entries for this user that are relevant for error analysis. The Software Update Manager itself does not know about the system log.

Note that no system log exists on the shadow instance.

To analyze the system log, proceed as follows:

1. Call transaction SM21 as user DDIC.
2. Choose *Reread system log*.
Make sure that you enter the correct period so that only those entries are displayed which correspond to the time when the terminated phase ran.
3. Look for entries for user DDIC.
4. To display detailed error descriptions, double-click a single line in the system log.

Sometimes errors occur at the lowest system level. These errors are normally stored in the instance logs.

During the update, you can find these logs in the current working directory of your SAP instance as follows:

1. Open the current working directory of your application server instance:
`<update directory>/abap/system/<SID>/DVEBMGS<shadow instance no.>/work` or `/<update directory>/abap/system/<SID>/D<shadow instance no.>/work`
2. Find out which log files have been written.
To do this, you can use command `ls -ltr`.
3. Examine the log files generated last for errors that may be related to the update.

Other Sources of Problems

If no clear errors are found, there may also be a lack of resources in the database or the file system or incorrect profile parameters may have caused the phase to terminate.

7.2.20 Correcting Problems When Processing ABAP Steps

Context

The following ABAP steps are performed in the SAP system:

- ABAP Dictionary activation (A)
- Distribution of ABAP Dictionary objects (S)
- Table conversion (N)
- Matchcode activation (M)
- Import of application objects (D)
- Update of version management (U)
- Execution of XPRAs (R)

The `TRBAT` table forms the interface between the transport control program `tp` and the SAP system. To trigger an ABAP step, `tp` writes control information to this table.

The `JOB_RDDNEWPP` phase schedules the event-driven background job.

For more information about the transport control program `tp` and the communication between `tp` and the SAP system, see the [SAP Help Portal](#) and follow the path according to your source release:

Release	Path in SAP Help Portal
<ul style="list-style-type: none">• SAP NetWeaver 7.3• SAP NetWeaver 7.3 incl. EHP 1• SAP NetWeaver 7.4• SAP NetWeaver 7.5• SAP NetWeaver AS for ABAP 7.51 innovation package• SAP NetWeaver AS for ABAP 7.52	<p>▶▶ Application Help ▶ SAP NetWeaver Library: Function-Oriented View ▶ Solution Life Cycle Management ▶ Software Logistics ▶ Change and Transport System ▶ Transport Tools (BC-CTS-TLS) ▶ Transport Control Program tp ▶</p>
SAP NetWeaver 7.0 and EHPs up to 3	<p>▶▶ Application Help ▶ SAP NetWeaver by Key Capability ▶ Solution Life Cycle Management by Key Capability ▶ Software Life Cycle Management ▶ Software Logistics ▶ Change and Transport System ▶ Transport Tools (BC-CTS-TLS) ▶ Transport Control Program tp ▶</p>

Procedure

1. Make sure that the SAP system was started correctly. Log on in client 000 as user `DDIC`.
2. Call transaction `SM37` and check whether the background job `RDDIMPDP` has been scheduled.

Note

Make sure that the job `RDDIMPDP` has been scheduled in client 000 as user `DDIC`. Otherwise, you encounter during the update the error message `Upgrade still running: Logon not possible` in the log file. See also [Evaluating the ELG Log Files \[page 243\]](#).

In the *or after event* field, enter an asterisk (*) so that event-driven jobs are also displayed.

3. Check when `RDDIMPDP` last ran and whether it ran without errors.
4. Check whether the control information in table `TRBAT` has been entered correctly.

The table should have one `HEADER` entry and should contain one entry for each transport request. While the ABAP Dictionary objects are being distributed (S) and the tables converted (N), table `TRBAT` may contain only one `HEADER` entry, since these steps are not carried out by transport request.

5. Call transactions `SM37` and `SM50` to check whether `RDDIMPDP` has already started the background job that processes the ABAP step.

7.2.21 Switch of SAP Programs During the Update

In the `KX_SWITCH` phase, the SAP programs in directory `/usr/sap/<SID>/SYS/exe/run` are switched when the kernel switch takes place.

Do not start the SAP system during this period; otherwise, the Software Update Manager cannot overwrite the old files.

7.2.22 Implementing SAP Notes during the update

This section deals with the options to implement SAP Notes during the update.

Context

During the update process, a problem can occur and you are prompted to make changes to SAP objects, usually to the source code, by implementing SAP Notes. However, the necessary transaction `SNOTE` is deactivated during the SUM run to avoid damaging the system status.

However, to enable the implementation of changes to SAP objects during the update, the `SNOTE` transaction is activated in some phases of the SUM procedure. The following options are possible:

- You want to implement SAP Notes because of problems during
 1. the DDIC conversion in phase `PARCONV_UPG`
 2. the execution of XPRAS or after-import methods (AIM) in the technical downtime of the Software Update Manager
 3. the application of the *Silent Data Migration Infrastructure* (SDMI) or during.

To do this, set a breakpoint either for the phase `PARCONV_UPG` (1.), `XPRAS_AIMMRG` (2. or 3.), or a phase specified by SAP support. As soon as the breakpoint is reached, unlock the system, log on to the system with another user as `DDIC` and implement the necessary SAP Notes with the transaction `SNOTE`. You then lock the system again.

- You want to Implement SAP Notes into the shadow system
To do this, set a breakpoint for the phase `CHECK4NOTES_TOOL_SHD2`. As soon as the breakpoint is reached, you can implement the necessary notes as described in the previous option.
- You want to implement corrections from SAP Notes during shadow execution or downtime and the transaction `SNOTE` is locked.
In this case, implement the SAP Notes manually.

The corrections can be integrated into the update process of other systems. For this purpose, you can use the *single transport request* functionality of the Software Update Manager or merge the corrections into a SPAU transport request.

Procedure

Read SAP Note [2207944](#) to get detailed information about implementing SAP Notes during the update process and follow the provided instructions.

7.2.23 Providing Information to SAP Support

If none of the troubleshooting measures solves your problem, you can contact SAP Support.

Context

If the measures described in [Troubleshooting \[page 236\]](#) do not solve your problem, contact the SAP Support. To enable us to help you as quickly and efficiently as possible, follow the procedure given here.

ⓘ Note

If you are certain that the problem is not an update-specific one but a product-specific one, assign your incident to the appropriate product-specific component.

Procedure

If you encounter problems that are specific to the update procedure, report an incident in SAP Support Portal (<http://support.sap.com>) and assign it to component BC-UPG-TLS-TLA.

Answer the following questions and put these answers in your incident:

1. For which SAP component do you want to perform the update?
2. We recommend that you attach a copy of the [Using the SUM Analysis Feature \[page 235\]](#) to the incident.
3. If a trouble ticket exists, attach it to the incident together with the log archive (SAPup_troubleticket.zip). If there is no trouble ticket, include the following information in your incident:
 - Which operating system version are you using?
 - What was the original release of your SAP system?
 - In which phase does the error occur?
This information is listed at the end of the SAPup.log file located in the SUM/abap/log directory.
4. Did you have problems with the SAP system before the update?

Note

We can find the cause of the error more quickly if you set up an online connection to the SAP system.

7.2.24 Starting and Stopping the Shadow Instance Manually

Context

If a problem with the update process occurs that requires actions with regard to the shadow instance to solve the problem, then it might be necessary to start and stop the shadow instance manually.

Procedure

1. Stop the shadow instance manually as follows:
 1. `cd <update directory>/abap/bin`
 2. `./SAPup stopshd`
2. Start the shadow instance manually as follows:
 1. `cd <update directory>/abap/bin`
 2. `./SAPup startshd`

7.2.25 Mitigating Issues with the Toolimport

This section covers problems with the import of ABAP tools performed by SUM.

Context

To prepare the original SAP system for the update procedure, the Software Update Manager imports its own ABAP tools into this start system. This procedure is called `Toolimport` and performed during the *Extraction* roadmap step.

However, short dumps in the running system may occur during or after the implementation of the ABAP tools. This can be caused by API calls to one of the objects that were imported by SUM. Unfortunately, these changes cannot be omitted.

To mitigate possible issues due to the `Toolimport`, you can define the time when the ABAP tools is to be imported, for example, when the system is not or only little used.

Procedure

Set a breakpoint before phase `PREP_IMPORT/TOOLIMPD`.

The Software Update Manager stops the update procedure before this phase. Once you continue, the `Toolimport` will start importing the necessary ABAP tools.

For more information about setting breakpoints, see [Breakpoints During the Update \[page 128\]](#).

7.2.26 Error Handling for the Replication Process Monitor

The *CRR Control Center (Replication Process Monitor)* displays the current status of the Change Recording and Replay (CRR) procedure during the uptime.

Note

For more information about the *CRR Control Center (Replication Process Monitor)*, see section *Process Control Center* in [SUM Utilities \(Extended UI\) \[page 39\]](#).

The following issues regarding the Replication Process Monitor are known and may possibly occur:

Replication Not Running

The Software Update Manager stops with the following error message:

```
You cannot enter the downtime yet. You must wait until the replication progress has reached at least 75 percent.
```

If possible, restart the replication as follows:

1. Open the extended UI as described in [SUM Utilities \(Extended UI\) \[page 39\]](#) and navigate to the *Process Control Center*.
2. Select the *CRR Control Center* and check in the current replication status if the replication is **not** running. If so, start the replication.

PXA Buffer Too Small (ABAP-Based Replication Only)

Note that this issue applies to the **ABAP-based** replication only. If the `PXA buffer` is too small, short dumps during the update can occur that contain `PXA_NO_FREE_SPACE` in the error message. This `PXA buffer` contains the ABAP loads that are needed for the ABAP runtime in the shadow instance.

To solve the issue, reduce the number of processes used for the replication or increase the system parameter `abap/buffersize` as follows:

1. Stop the shadow instance (including transfer).
2. Adapt the shadow instance profile in directory `<SUM_directory>/system/<SID>/SYS/profile` by adding or adjusting the parameter `abap/buffersize` with an appropriate value.
3. Start the shadow instance (including transfer).
4. Restart the replication from the *CRR Control Center (Replication Process Monitor)*.

Tablespace Too Small

If you encounter short dumps indicating that a tablespace overflow occurred, increase the tablespace and restart the transfer.

Error Message in Phase PROCESS_REPLICATE_RRC_STOP

In the log file `replicaterrc.log`, you detect the following error message:

```
Replay of changes could not be stopped
```

To solve the issue, proceed as follows:

1. Log on to the shadow instance.
2. Start transaction SM37 (*Overview of job selection*).
3. Select the running transfer job and check its status by choosing **Job** > **Check Status**. When the list is refreshed, the job status changes from status *Active* to *Canceled*.
4. Restart the transfer from the *CRR Control Center (Replication Process Monitor)*.
5. Repeat the phase `PROCESS_REPLICATE_RRC_STOP`.

The System Shows a Slow Replication Progress

You notice that the replication process is slow. In transaction SM50, you can see that the jobs for a lock on table `CRRTI` or a select on table `CRRTASKINFO` take a long waiting time. Furthermore, the select on table `CRRTASKINFO` takes longer than 1 second.

To solve the issue, update the statistics for the tables `CRRTASKINFO~`, `UPGTRTOUCH`, `CRRRTI~`, and `CRRRTIT~`.

Replication Fails on Tables with Secondary Unique Indices

You added a table manually to the uptime handling of the downtime-optimized DMO procedure. The table does not receive any structural changes or imports. However, the replication of the table repeatedly fails, and the replication log file contains the following error message:

```
MODIFY unexpectedly failed for table <...>.
```

The reason is that the update patterns of the table on the source database are too complicated for the replication so that conflicts in secondary unique indices cannot be resolved. As a result, the writing to the target database is prevented.

To solve the issue, proceed as follows:

1. Set a breakpoint at phase `PROCESS_REPLICATE_RRC_START`.
2. Drop the secondary unique indices before the phase `PROCESS_REPLICATE_RRC_START` starts. Do it at the latest when the breakpoint is reached.
3. Set a breakpoint at phase `XPRAS_AIMMRG` and continue with the SUM procedure.
4. Recreate the indices manually. Carry this out asynchronously after the phase `RUN_RRC_REPLICATE_FINAL` is completed.
Note that phase `RUN_RRC_REPLICATE_FINAL` begins shortly after phase `DOWNCONF_DTTRANS`.
5. When the phase `XPRAS_AIMMRG` is reached, wait until all indices are successfully recreated.
6. Afterwards, remove the breakpoints and proceed as normal.

If the table was NOT added manually, other reasons are possible: a structural change, a new secondary unique index, or imports. In this case, the issue must be solved by the component of the affected table.

Aborted CRR Agent Batch, Status Black in Phase DOWNCONF_DTTRANS or Error in Phase RUN_RRC_READYFINAL

The following errors may occur:

- during the uptime replication:
 - you detect in the shadow system dumps with an aborted CRR agent batch process of class `CL_CRR_AGENT_BATCH`
 - the replication status is *Black* (= the downtime after phase `DOWNCONF_DTTRANS` cannot be entered) without single tables showing errors
- during the downtime:
 - the SUM stops in phase `RUN_RRC_READYFINAL` with the error message *ERROR: there are still <...> tasks not in state READY*

To solve the problems, proceed as described in the following. The first steps apply equally to downtime and uptime. This is followed by additional steps for uptime or downtime.

1. Uptime and Downtime:

1. Log on with user `DDIC` to the shadow (!) system.
2. Call transaction `SM50` and note down the replication jobs.
3. In a second window, call transaction `SE37`.
4. Enter function module `CRR_TRANSFER_CONTROL`.
5. Execute (F8) the function module for testing purposes with parameter `IV_ACTION = STOP`.
6. Check the first window, in which transaction `SM50` is running, wait until all replication jobs are stopped. It should only take some seconds.
7. In the second window, in which transaction `SM37` is running, check if the function module is still being executed. If so, cancel the process using the menu items **► Symbol ► Stop Transaction ◄**.
8. Call transaction `SE37` and enter function module `CRR_TRANSFER_CONTROL` again.
9. For testing purposes, execute the function module with parameter `IV_ACTION = START` and `IV_REQUESTED_BATCHES = <number of uptime replication processes>`.

📌 Note

if you do not know the number of uptime replication processes, navigate to directory `SUM/abap/tmp`. Here, numbered files `rrc_replicate_<number>` are available. This highest number is also number of the uptime replication processes.

10. Within a few seconds, the replication jobs should return and be visible in transaction `SM50`. There should also be a new process `RSUPG_ASYN_RUN_REPLICATE`, which is the previously aborted but now restarted job.
 11. Call transaction `AL11` and navigate to the directory **► DIR_PUT ► abap ► tmp ◄**.
 12. Check if the file `rrc_replicate.<sid>` has been updated at the restart of the replication.
2. The following steps for **uptime** only:
1. Go to the *CRR Control Center* of the *SUM Utilities* and start the replication.
 2. Check using transaction `AL11` that the file `crr_transfer_control_status.<sid>` is updated again about every 15 seconds.

3. The following steps for **downtime** only:
 1. Switch to the second window, in which transaction SM37 is running for function module CRR_TRANSFER_CONTROL.
 2. Execute (F8) the function module for testing purposes with parameter *IV_ACTION = STOP* and wait until the process is finished.
 3. Resume the procedure in the Software Update Manager. The issue is solved, if the phase RUN_RRC_READYFINAL is passed.

7.3 Administration

This part of the document contains additional information about the various administrative tasks that you can or should perform before and during the update.

- [Reducing Downtime \[page 269\]](#)
- [Configuring Parallel Processes During the Runtime \[page 271\]](#)
- [Changing the DDIC Password \[page 272\]](#)
- [Determining Versions \[page 272\]](#)
- [Changing the SAP HANA DB Database Recovery Mode \[page 275\]](#)
- Release upgrade only: [Deleting Archived Upgrade Logs \[page 275\]](#)
- [Using the SUM Phase List for the Update \[page 276\]](#)
- [Shadow Instance Handling During The Upgrade \[page 276\]](#)
- [Deactivating Triggers \[page 278\]](#)

7.3.1 Reducing Downtime

This chapter deals with options to further reduce the downtime.

Context

The System Switch Upgrade procedure has been designed to reduce downtime to a minimum. The scenario strategy for the shortest possible downtime is *Downtime-optimized*. In addition to the scenario strategy, there are other options to further reduce the downtime.

Procedure

- Use faster hardware

Fast hardware is key to speeding up the update. With faster hardware, the overall runtime decreases and, therefore, the downtime as well.

Some phases benefit from a faster CPU and additional memory. Other phases require fast disk I/O.

- CPU
Several phases run parallel processes. However, since the number of parallel processes is not larger than eight, more CPUs may thus not be exploited fully. Four CPUs with 800 MHz are faster than eight CPUs with 400 MHz, for example.
- RAM
Additional memory for the database and the SAP kernel can improve speed, especially for phases that use the SAP system, such as the activation phase or the `XPRAS` phase.
- Disk I/O
During the main import phases (`EU_IMPORT` (release upgrade only), `SHADOW_IMPORT`, `TABIM`), a fast disk I/O is the key to reducing the upgrade runtime.
- Use fast backup mechanism

You need to be able to restore the update to the point when downtime began. You can do this using your usual backup and archiving model. You also need to make a backup of your database after the update has finished.

You can reduce the downtime significantly if you use a fast backup mechanism, such as a RAID-based mechanism or a hardware-based mirror mechanism.

- Configure the update

You can configure the update by modifying the number of processes used:

- Number of background processes
This is the key parameter for running ABAP reports in parallel. Increasing this parameter speeds up phases like `PARDIST_ORIG`, `PARCONV_UPG`, and `XPRAS_UPG`. A value larger than **8** does not usually decrease the runtime.
- Number of `R3trans` processes
This parameter affects the number of `R3trans` processes that `tp` starts during phases `SHADOW_IMPORT` and `TABIM`. A value larger than **8** does not usually decrease the runtime.

Do not increase these parameters to values much larger than the number of CPUs in your system.

- Delete unused clients

The number of clients has a significant influence on the runtime. During phases `SHADOW_IMPORT` and `TABIM`, the data import for some client-specific tables needs to be cascaded into the different clients. The import time therefore increases with the number of clients.

The duration of the `XPRAS` phase, especially the duration of the after-import methods, also depends on the number of clients.

If you no longer need certain clients, you should delete them before you start the Software Update Manager because the free space calculation depends on the number of clients.

- Decrease the size of large tables and by archiving content

In some cases, it is useful to archive some of the content of large tables. If tables are converted during the update, the conversion time depends on the size of the table. If you can decrease the size of a table that needs to be converted, the downtime is reduced. The tables converted during the update are summarized in the reports of the [Using the SUM Analysis Feature \[page 235\]](#) utility.

The duration of the phase `XPRAS_UPG` also depends on the size of large tables.

- Keep your modification

If you have modified some tables in the source release, you may need to convert them if you choose to return to the SAP standard.

This may mean that you need to remove some fields or reduce a field length. You may want to consider keeping your modification to avoid such a conversion.

- Eliminate errors

During a test update, errors might occur. These errors increase the runtime and downtime of the update significantly.

During the tests, find out, if necessary with the help of SAP Support, how to prepare the SAP system so that these errors do not occur again. For example, if the process fails in phase `PARCONV_UPG` because the tablespaces or containers are too small, increase the free space by the amount of space you need to run the phase.

7.3.2 Configuring Parallel Processes During the Runtime

This section covers the configuration of parallel processes during the update procedure.

Context

At any time during the update procedure, you can increase or decrease the limits that have been specified for the different types of parallel processes.

For some phases, these changes have an immediate effect. For example, changing the values for `R3trans` processes during downtime influences the phase `TABIM_UPG` immediately.

For other phases, you have to carry out the change before the corresponding phase is running. For example, the values for parallel background processes during uptime have to be set before the profiles for the shadow system are created and take effect.

Procedure

Access via [SUM Utilities \(Extended UI\) \[page 39\]](#)

1. Select in the user menu the *SUM Utilities* and navigate there to ► *SUM Parameters* ► *SUM Process Parameters* ▾.

Access via Command-Line Interface

2. Enter the following commands to access the command-line interface in scroll mode (for example, using `ssh`):

```
cd <update directory>/abap/bin
./SAPup set procpa gt=scroll
```

7.3.3 Changing the DDIC Password

Context

In the `PROFREAD` phase, you enter the `DDIC` password. It is not usually necessary to change the password of the user `DDIC` later. After the installation of the shadow system, the password of user `DDIC` in client `000` is the same as on the original system.

However, if you want to change the password after the `PROFREAD` phase, you have to change it in the system as well as in the Software Update Manager parameter. The passwords in the original system and in the shadow system have to be identical with the passwords known by the Software Update Manager.

Procedure

1. From the [SUM UI: Menu Bar \[page 31\]](#), open the user menu and choose *Utilities*.
A second web browser window with the [SUM Utilities \(Extended UI\) \[page 39\]](#) opens in which several options are offered.
2. Choose *SUM Parameters*. You can maintain the password for system user `DDIC` or for shadow system user `DDIC`.

7.3.4 Determining Versions

Determining the Operating System Version

At the UNIX level, enter the following command:

```
uname -a
```

Determining the Database Version for SAP HANA DB

For the version of the SAP HANA client software, enter the following operating system command as user `sidadm` on the application server:

```
/usr/sap/<SID>/hdbclient/install/hdbuninst --version
```

For the version of the SAP HANA server software, enter the following operating system command as user `sidadm` on the database server:

```
/usr/sap/<SID>/HDB<instance number>/HDB version
```


Determining the SAP System Release

To determine your SAP source release, choose **System > Status** in your SAP system.

The release appears in the *SAP Release* field.

Determining the SAP Kernel Version

To determine the version of the SAP kernel you are using and its patch level, proceed as follows:

1. In the SAP system, choose **Administration > System Administration > Monitor > System Monitoring > Servers**.
2. Select a server and choose *Release Notes*.

Determining the Date of R3trans

Call `R3trans` with the following command:

```
R3trans -V
```

The program displays the date and the version number.

Determining the Version of tp

Call `tp` with the following command:

```
tp -V
```

The last line displays the highest patch level.

7.3.5 Configuring SAPup for SAP ABAP System with SNC

The section contain information how to set up the SAPup executable with own Single-Sign On credentials as prerequisites for the SUM run on an SAP ABAP system with Secure Network Communications.

Context

You have set up and configured your SAP ABAP system for use with Secure Network Communications (SNC) and Single Sign-On (SSO). SNC integrates SAP SSO or an external security product with SAP systems. With

SNC, you strengthen security by using additional security functions provided by a security product that are not directly available with SAP systems.

For more information about SNC and SSO, see the SAP Help Portal. Example: <https://help.sap.com/nw>,
▶ [ABAP Platform](#) ▶ [ABAP Platform 2022 \(or higher\)](#) ▶ [Securing the ABAP Platform](#) ▶ [ABAP Platform Security Guide](#) ▶ [User Administration and Authentication](#) ▶ [User Authentication and Single Sign-On](#) ▶ [Integration in Single Sign-On Environments](#) ▶ [Secure Network Communications \(SNC\)](#) ▶

During the *Extraction* roadmap step, you must enter the password of user DDIC in the system, client 000. This password is needed for the RFC connection to the SAP system. See also [Important Entries for the Extraction Roadmap Step \[page 145\]](#).

If you want to run the Software Update Manager on an SAP ABAP system with SSO and SNC, RFC calls with traditional user ID and password-based authentication are not permitted. In this case, the executable SAPup must be set up and configured with own SSO credentials so that the user DDIC can be authenticated securely.

Note

- The Software Update Manager must run with an own `SECUDIR` subdirectory, that is located in `<SUM directory>/abap/sec`. This subdirectory contains the file `SAPup.pse` with credentials for issuer `CN:SAPup`.
- The SAPup certificate must be registered in the SAP ABAP system.
- SUM certificates are not required if the RFC authentication with user and password is allowed, that is, if the parameter `snc/accept_insecure_rfc` is active in your system.

Procedure

1. Create SAPup security `SECUDIR` subdirectory `sec`. The subdirectory must have the following path: `<SUM directory>/abap/sec`.
2. To execute the following console commands, first set the environment variable `SECUDIR` with the path to the `sec` subdirectory as its value.
3. Use the command `sapgenpse gen_pse -p SAPup.pse` to create the *Personal Security Environment (PSE)* for the SAPup with the distinguished name `CN=SAPup`.
4. Export the own SAPup certificate using the SAP security tool `sapgenpse`.

Enter the command: `sapgenpse export_own_cert -p SAPup.pse -o SAPup.cer`

5. Import the SAPup certificate into the SAP ABAP System using transaction `STRUST`.
6. Export the SAP system certificate for the SAPup PSE using transaction `STRUST` and the file `system.cer`.
7. Update the file `SAPup.pse` with the SAP system certificate using the tool `sapgenpse`.

Enter the command: `sapgenpse maintain_pk -a system.cer -p SAPup.pse`

8. Update the secure login for the operating system user using the tool `sapgenpse`.

Enter the command: `sapgenpse seclogin -p SAPup.pse`

9. Edit the SNC name `p:CN=SAPup` for user DDIC in the SAP ABAP system using transaction `ST01`.
10. Edit the SNC `access control List (ACL)` in the SAP ABAP system using transaction `SNC0`.
11. Execute the Software Update Manager.

12. Enter the command `SAPup rfcping` after the phase PROFREAD to verify if the RFC login with SNC was successful.

7.3.6 Changing the SAP HANA DB Database Recovery Mode

Use

At the beginning of downtime, the Software Update Manager automatically deactivates archiving. You may change the recovery mode of the database at the end of downtime.

Procedure

At the end of downtime, make a complete backup to reactivate archiving.

7.3.7 Deleting Archived Upgrade Logs

Context

📘 Note

This section is only relevant if you perform a release upgrade.

You can create more space by deleting archived logs from earlier upgrades that you no longer need.

Procedure

To do this, delete the subdirectories `<target release>` along with their contents:

```
/usr/sap/trans/sum/<SID>/<target release>
```

🔗 Example

If you no longer need the logs of the upgrades to 7.40 and 7.50, you can delete the subdirectories **740** and **750**:

```
/usr/sap/trans/sum/P11/740
```

```
/usr/sap/trans/sum/P11/750
```

```
.....
```

```
/usr/sap/trans/sum/T11/740
```

```
/usr/sap/trans/sum/T11/750
```

```
.....
```

7.3.8 Using the SUM Phase List for the Update

Context

The *Tasklist* of the SUM UI provides information about the phases during the SUM procedure and, if available, their description. The phase list is a visualization of the file `phasetlist.xml`.

Procedure

From the menu bar of SUM UI, select the item *Tasklist*. For more information, see [SUM UI: Menu Bar \[page 31\]](#).

7.3.9 Shadow Instance Handling During The Upgrade

This topic deals with the setup and operation of the shadow instance that was installed in parallel to the productive instances. It involves the environment in which the kernel is operated during the upgrade.

Database Implementation

All basis tables are imported into the productive database schema with a specific shadow table name. These shadow table names are composed of the original table name and a question mark ? for the IBM i database and a tilde ~ for all other databases.

Then an additional user or schema is installed in parallel, under which the views are created for all the new SAP basis tables. These views can be implemented as database synonyms, aliases, or views. In addition, all other shadow objects (such as views or functions) are created for the system.

The views of the new basis tables on the shadow instance have the same name as the original table and refer to the shadow table of the user, schema, or database.

❁ Example

Example for SAP HANA database:

- Production database user: `SAPABAP1`
- Shadow database user: `SAPABAP1SHD`
- Original table: `SAPABAP1.DD02L`

- Shadow table: `SAPABAP1 . DD02L~`
- Synonym of table name `SAPABAP1SHD . DD02L` with shadow database user: `SAPABAP1 . "DD02L~"`

The connection for the kernel and the tools to the shadow instance is controlled as follows:

- The environment variable `auth_shadow_upgrade = 1` or profile parameter `auth/shadow_upgrade = 1` switches the connection to the shadow system.
- During the shadow operation, the kernel of the shadow Instance uses the synonyms, aliases, or views with the original names of the tables to access the shadow tables of the original database.
- Do not configure or setup the connection to the shadow system manually. If necessary, the Software Update Manager takes care of the configuration

Kernel Directories

The Software Update Manager automatically starts the load of the shadow instance kernel from the directory `<SUM_directory>/exe`

The directories for the shadow instance are `<SUM_directory>/system/<SID>/SYS/profile` and `<SUM_directory>/system/<SID>/D<NR>/work`.

The shadow instance has its own instance number message server, enqueue server, dispatcher, dialog process, batch process, and update process. The `<SID>` is identical to the one in the original system.

Starting the Shadow Instance

SAPup automatically starts the shadow instance in the `START_SHDI_*` phases. You can manually start or stop the shadow instance using the commands `SAPup startshd` or `SAPup stopshd`.

To lock or unlock the shadow instance, use the commands `SAPup lockshd` or `SAPup unlockshd`.

Logging on to the Shadow Instance

Follow the regular logon procedure when you log on to the shadow instance. However, you must specify the instance number of the shadow instance.

The user `DDIC` is created in the shadow instance by default in client `000`. It has the same password as the user `DDIC` in client `000` in the original system.

The functions of the shadow instance are limited.

7.3.10 Deactivating Triggers

It can be necessary to deactivate all database triggers generated by the Software Update Manager in a downtime-optimized approach.

Context

This is then like an emergency stop, and the continuation of the SUM procedure is no longer possible afterwards.

You can perform the deactivation either with the Reset-function on the SUM user interface, or on the operating system level. All triggers are deactivated, which the SUM generated during a downtime-optimized update procedure at the beginning of the `REV_PREPROC` module, which is used for the rollback.

Procedure



- Option 1 (recommended): Use the reset function as described in [Resetting the Update \[page 127\]](#).
- Option 2: Deactivate the triggers on operating system level as follows:
 1. Close the browser window or the browser tab page with the SUM user interface.
 2. Open a command-line interface.
 3. Change to the directory `▶ <SUM directory> ▶ abap ▶ bin ▶`.
 4. Enter the following command: `SAPup reset execution [ignore_processes]`

Important Disclaimers and Legal Information

Hyperlinks

Some links are classified by an icon and/or a mouseover text. These links provide additional information.

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